



Barker Logistics

TRAFFIC IMPACT ANALYSIS

COUNTY OF RIVERSIDE

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12216-03 TIA Report

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LIST OF ABBREVIATED TERMS

(1)	Reference
ADT	Average Daily Traffic
CA MUTCD	California Manual on Uniform Traffic Control Devices
Caltrans	California Department of Transportation
CEQA	California Environmental Quality Act
CMP	Congestion Management Program
DIF	Development Impact Fee
E+P	Existing Plus Project
EAP	Existing Plus Ambient Growth Plus Project
EAPC	Existing Plus Ambient Growth Plus Project Plus Cumulative
HCM	Highway Capacity Manual
ITE	Institute of Transportation Engineers
LOS	Level of Service
N/A	Not Applicable
PCE	Passenger Car Equivalents
PEMS	Performance Measurement System
PHF	Peak Hour Factor
Project	Barker Logistics
RTA	Riverside Transit Authority
RTP/SCS	Regional Transportation Plan/Sustainable Communities Strategy
SCAG	Southern California Association of Governments
sf	Square Feet
SHS	State Highway System
TIA	Traffic Impact Analysis
TSF	Thousand Square Feet
TUMF	Transportation Uniform Mitigation Fee
WRCOG	Western Riverside Council of Governments
V/C	Volume to Capacity

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1 INTRODUCTION

This report presents the results of the traffic impact analysis (TIA) for the proposed Barker Logistics development (“Project”), which is located on the northeast corner of Patterson Avenue and Placentia Street, as shown on Exhibit 1-1.

The purpose of this traffic impact analysis is to evaluate the potential impacts related to traffic and circulation system deficiencies that may result from the development of the proposed Project, and to recommend improvements to mitigate impacts considered significant in comparison to established regulatory thresholds and to achieve acceptable circulation system operational conditions. This traffic study has been prepared in accordance with the County of Riverside’s Traffic Impact Analysis Preparation Guide (August 2008) and through consultation with County of Riverside staff during the scoping process. (1) The approved Project Traffic Study Scoping agreement is provided in Appendix 1.1 of this TIA.

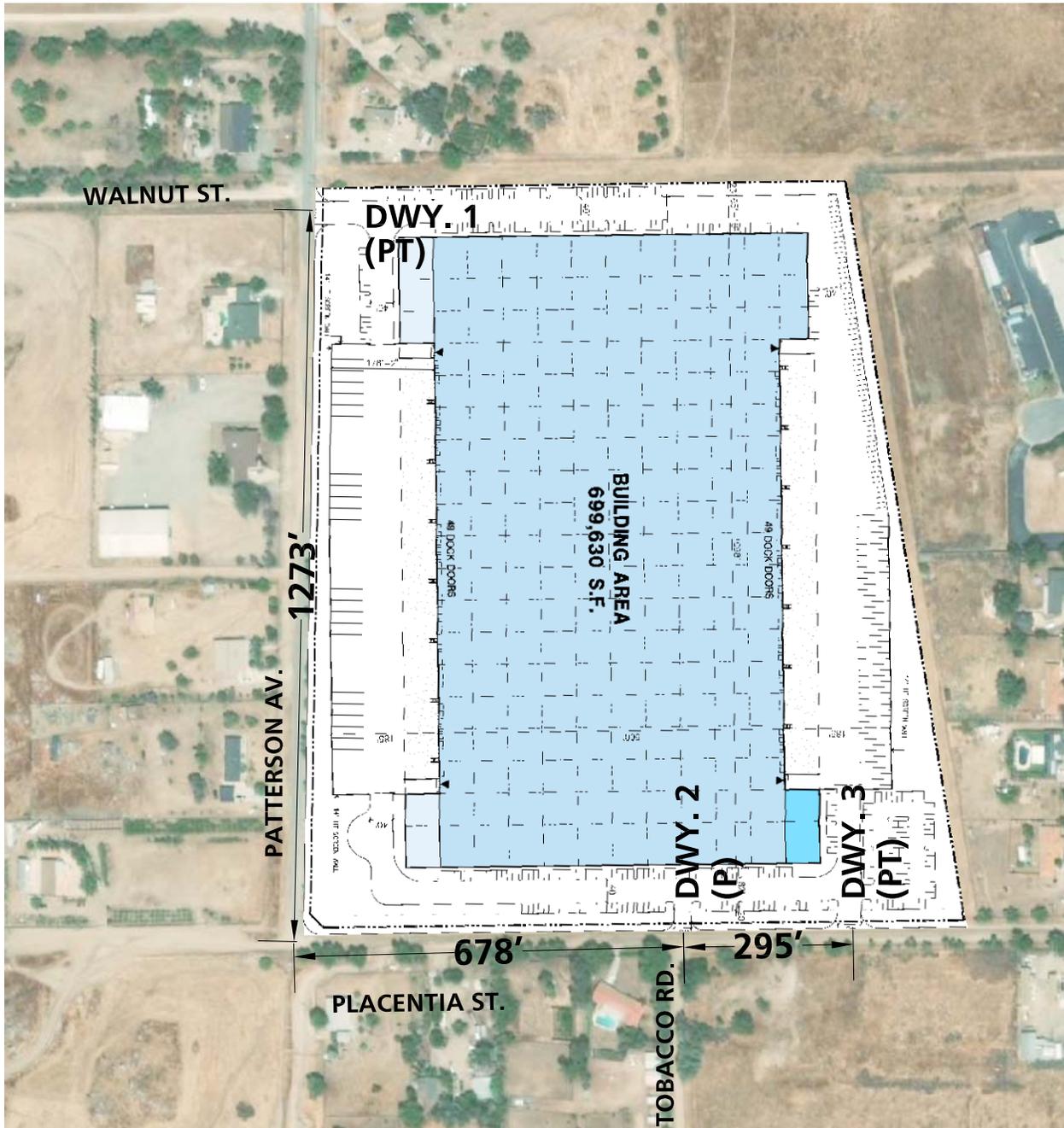
1.1 SUMMARY OF FINDINGS

Trips generated by the Project’s proposed land uses have been estimated based on trip generation rates collected by the DRAFT Transportation Uniform Mitigation Fee (TUMF) High Cube Warehouse Trip Generation Study, 2018. (2) The Project is estimated to generate a net total of 1,980 passenger-car-equivalent (PCE) trip-ends per day on a typical weekday with approximately 112 net AM PCE peak hour trips and 142 net PM PCE 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. For Existing (2019), E+P, EAP (2021), and EAPC (2021) With I-215/Placentia Avenue Interchange traffic conditions the addition of Project traffic to study area intersections did not result in any deficient intersection operations.

Although the I-215/Placentia Avenue Interchange project is funded and construction is anticipated to commence in 2020, at the County’s request, the EAP (2021) and EAPC (2021) analysis scenarios have been evaluated both without and with the proposed interchange in the event the Project were to open before the completion of the interchange. Without the I-215/Placentia Avenue Interchange project, the proposed Project is anticipated to have a cumulative impact to the intersection of Harvill Avenue and N. A Street. The recommended traffic signal at this intersection is included in the Development Impact Fee (DIF) program and the Project’s payment of DIF fees would mitigate its impact to this intersection.

The Project will construct its ultimate half-section of Patterson Avenue and Placentia Avenue along the Project’s frontage. Access to the Project site will be provided via Patterson Avenue and Placentia Avenue. It is our understanding that the Project is in the process of attempting to acquire the right-of-way to align Driveway 1 with Walnut Street to the west on Patterson Avenue. If the right-of-way cannot be acquired, the Project Applicant will need to work with County staff in order to develop an interim design for Driveway 1 due to the off-set with Walnut Street.

EXHIBIT 1-1: PRELIMINARY SITE PLAN



LEGEND:

- P = PASSENGER CARS ONLY
- T = TRUCKS ONLY
- PT = PASSENGER CARS AND TRUCKS



1.2 PROJECT OVERVIEW

The Project is proposed to consist of up to 699,630 square feet (sf) of high-cube fulfillment center use. The Project is anticipated to be constructed in a single phase by the year 2021.

Vehicular and truck traffic access will be provided via the following driveways (see Exhibit 1-1):

- Patterson Avenue and Walnut Street via Driveway 1 – full access for passenger cars and trucks
- Placentia Street via Driveway 2 – full access for passenger cars only
- Placentia Street via Driveway 3 – full access for passenger cars and trucks

Regional access to the Project site is available from the I-215 Freeway via Cajalco Expressway/Ramona Expressway, Harvill Avenue/Nuevo Road, and the future interchange at Placentia Avenue.

1.3 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 (2019)
- Existing Plus Project (E+P) (without I-215/Placentia Avenue Interchange only)
- Existing Plus Ambient Growth Plus Project (EAP) (2021) (without and with I-215/Placentia Avenue Interchange)
- Existing Plus Ambient Growth Plus Project Plus Cumulative Projects (EAPC) (2021) (without and with I-215/Placentia Avenue Interchange)

1.3.1 EXISTING (2019) CONDITIONS

Information for Existing (2019) conditions is disclosed to represent the baseline traffic conditions as they existed at the time this report was prepared. Traffic counts were conducted in February 2019 based on vehicle classification and were converted to PCE due to the presence of heavy trucks within the study area.

1.3.2 EXISTING PLUS PROJECT CONDITIONS

The Existing Plus Project (E+P) analysis determines any significant traffic impacts and circulation system deficiencies that would occur on the existing roadway system in the scenario of the Project being placed upon Existing conditions. This analysis scenario has also been provided for informational purposes only as Project impacts have been discerned from a comparison of Existing (2019) to EAP (2021) traffic conditions (per the County's traffic study guidelines). The E+P analysis does not evaluate the proposed I-215/Placentia Avenue Interchange.

1.3.3 EXISTING PLUS AMBIENT GROWTH AND EXISTING PLUS AMBIENT GROWTH PLUS PROJECT (2021) CONDITIONS

The EAP (2021) conditions analysis determines the potential traffic impacts based on a comparison of the EAP traffic conditions to Existing conditions. To account for background traffic

growth, an ambient growth factor from Existing (2019) conditions of 4.04% (2 percent per year, compounded over 2 years) is included for EAP (2021) traffic conditions. Consistent with Riverside County traffic study guidelines, the EAP analysis is intended to identify “Opening Year” deficiencies associated with the development of the proposed Project based on the expected background growth within the study area. Intersection operations have been assessed for both without and with the proposed I-215/Placentia Avenue Interchange project for EAP traffic conditions as the proposed interchange would change both existing travel patterns and the travel patterns of the proposed Project.

1.3.4 EXISTING PLUS AMBIENT GROWTH PLUS PROJECT PLUS CUMULATIVE (2021) CONDITIONS

The EAPC (2021) traffic conditions analysis determines the potential near-term cumulative circulation system deficiencies. To account for background traffic growth, an ambient growth factor of 4.04% from Existing conditions are included for EAPC traffic conditions (2 percent per year, compounded over 2 years). Intersection operations have been assessed for both without and with the proposed I-215/Placentia Avenue Interchange project for EAPC traffic conditions as the proposed interchange would change both existing travel patterns and the travel patterns of the proposed Project.

Conservatively, the TIA estimates the area traffic growth then adds traffic generated by other known or probable related projects. These related projects are at least in part already accounted for in the assumed 4.04% total ambient growth in traffic noted above; and some of these related projects would likely not be implemented and operational within the 2021 Opening Year time frame assumed for the Project. The resulting traffic growth rate utilized in the TIA (4.04% ambient growth + traffic generated by related projects) would therefore tend to overstate rather than understate background cumulative traffic impacts under 2021 conditions.

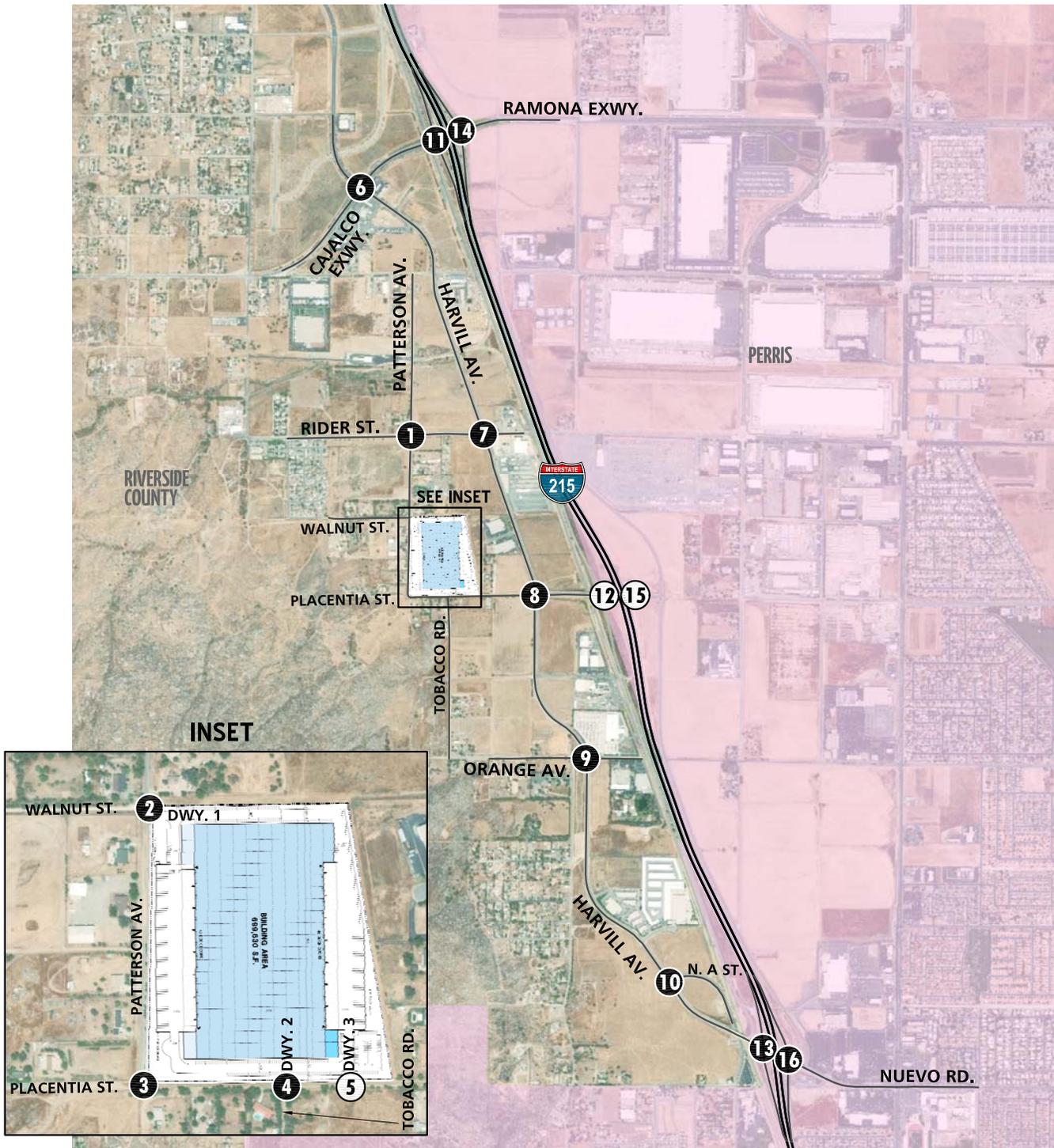
1.4 STUDY AREA

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

1.4.1 INTERSECTIONS

The following 16 study area intersections shown on Exhibit 1-2 and listed in Table 1-1 were selected for this TIA based on consultation with County of Riverside staff. The study area includes intersections where the Project is anticipated to contribute 50 or more peak hour trips per the County of Riverside’s traffic study guidelines. (1) The “50 peak hour trip” criteria 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).

EXHIBIT 1-2: LOCATION MAP



LEGEND:

- ① ■ EXISTING INTERSECTION ANALYSIS LOCATION
- ■ FUTURE INTERSECTION ANALYSIS LOCATION



Pursuant to the Traffic Study Guidelines, the California Department of Transportation (Caltrans) requires analysis of freeway mainline segments when the Project contributes 50 or more peak hour trips. (3) Based on the Project trip distributions, assessment of state facilities is not required as the Project's traffic contribution to the State facilities is considered less than significant. The project trip generation, distribution, and volumes are further explained in Chapter 4 *Project Future Traffic* of this TIA.

TABLE 1-1: INTERSECTION ANALYSIS LOCATIONS

ID	Intersection Location	Jurisdiction	CMP?
1	Patterson Avenue & Rider Street	County of Riverside	No
2	Patterson Av. & Walnut St./Driveway 1	County of Riverside	No
3	Patterson Av. & Placentia St.	County of Riverside	No
4	Driveway 2/Tobacco Rd. & Placentia St.	County of Riverside	No
5	Driveway 3 & Placentia St. – Future Intersection	County of Riverside	No
6	Harvill Av. & Cajalco Expressway	County of Riverside	No
7	Harvill Av. & Rider St.	County of Riverside	No
8	Harvill Av. & Placentia St.	County of Riverside	No
9	Harvill Av. & Orange St.	County of Riverside	No
10	Harvill Av. & A St.	County of Riverside	No
11	I-215 SB Ramps & Ramona Expressway	County of Riverside, Caltrans	No
12	I-215 SB Ramps & Placentia Av. – Future Intersection	City of Perris, Caltrans	No
13	I-215 SB Ramps & Nuevo Rd.	City of Perris, Caltrans	No
14	I-215 NB Ramps & Ramona Expressway	City of Perris, Caltrans	No
15	I-215 NB Ramps & Placentia Av. – Future Intersection	City of Perris, Caltrans	No
16	I-215 NB Ramps & Nuevo Rd.	City of Perris, Caltrans	No

The intent of a Congestion Management Program (CMP) is to more directly link land use, transportation, and air quality, thereby prompting reasonable growth management programs that will effectively utilize new transportation funds, alleviate traffic congestion and related impacts, and improve air quality. Counties within California have developed CMPs with varying methods and strategies to meet the intent of the CMP legislation. None of the study area intersections are identified as CMP facilities in the County of Riverside CMP. (4)

1.4.2 FREEWAY FACILITY LOCATIONS

Study area freeway segment and merge/diverge ramp junction analysis locations were selected based on Caltrans traffic study guidelines, which may require the analysis of State highway facilities. (3) 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. The study area freeway merge/diverge ramp junction analysis locations include freeway ramp junctions for each direction of flow where the Project is anticipated to contribute 50 or more one-way peak hour trips. The freeway segments and ramp junctions evaluated for this TIA are shown in Table 1-2.

TABLE 1-2: FREEWAY FACILITY ANALYSIS LOCATIONS

ID	Freeway Mainline Segments
1	I-215 Freeway Southbound, North of Ramona Expressway
2	I-215 Freeway Southbound, Off-Ramp at Ramona Expressway
3	I-215 Freeway Southbound, On-Ramp at Ramona Expressway
4	I-215 Freeway Southbound, Ramona Expressway to Placentia Avenue
5	I-215 Freeway Southbound, Off-Ramp at Placentia Avenue – Future Ramp Location
6	I-215 Freeway Southbound, On-Ramp at Placentia Avenue – Future Ramp Location
7	I-215 Freeway Southbound, Placentia Avenue to Nuevo Road – Future Freeway Segment
8	I-215 Freeway Southbound, Off-Ramp at Nuevo Road
9	I-215 Freeway Southbound, On-Ramp at Nuevo Road
10	I-215 Freeway Southbound, South of Nuevo Road
11	I-215 Freeway Northbound, North of Ramona Expressway
12	I-215 Freeway Northbound, On-Ramp at Ramona Expressway
13	I-215 Freeway Northbound, Off-Ramp at Ramona Expressway
14	I-215 Freeway Northbound, Ramona Expressway to Placentia Avenue
15	I-215 Freeway Northbound, On-Ramp at Placentia Avenue – Future Ramp Location
16	I-215 Freeway Northbound, Off-Ramp at Placentia Avenue – Future Ramp Location
17	I-215 Freeway Northbound, Placentia Avenue to Nuevo Road – Future Freeway Segment
18	I-215 Freeway Northbound, On-Ramp at Nuevo Road
19	I-215 Freeway Northbound, Off-Ramp at Nuevo Road
20	I-215 Freeway Northbound, South of Nuevo Road

1.5 ANALYSIS FINDINGS

This section provides a summary of the analysis results for Existing (2019), E+P, EAP (2021), and EAPC (2021) traffic conditions.

1.5.1 EXISTING (2019) CONDITIONS

Intersection Operations Analysis

A summary of LOS results for Existing traffic conditions is presented on Exhibit 1-3. For Existing (2019) traffic conditions, the following intersection currently operates at an unacceptable level of service (LOS) (i.e., LOS E or worse) during one or both of the peak hours:

- Harvill Avenue & N. A Street (#10) – LOS F AM peak hour only

Traffic Signal Warrant Analysis

The following unsignalized intersections currently warrant a traffic signal, based on Existing (2019) peak hour traffic volumes:

- Harvill Avenue & Placentia Street (#8)
- Harvill Avenue & N. A Street (#10)

Off-Ramp Queuing Analysis

A queuing analysis was performed for the northbound and southbound off-ramps at the I-215 Freeway at the Cajalco Expressway/Ramona Expressway and Harvill Avenue/Nuevo Road interchanges for Existing (2019) traffic conditions. The analysis indicates there are currently no queuing issues that may potentially result in “spill back” onto the I-215 Freeway mainline.

Freeway Operations Analyses

For Existing (2019) traffic conditions, the study area freeway mainline segments are currently operating at an unacceptable LOS (i.e., LOS E or worse) during the peak hours for Existing (2019) traffic conditions:

- I-215 Freeway Northbound, North of Ramona Exwy. – LOS E AM peak hour only (#11)
- I-215 Freeway Northbound, Ramona Exwy. to Nuevo Rd. – LOS E AM peak hour only (#20)

The ramp merge/diverge junctions are currently operating at an acceptable LOS (i.e., LOS D or better) during one or both peak hours. The freeway analyses are based on the reported Caltrans Performance Measurement System (PeMS) data.

At this time, Caltrans has no near-term fee programs or other improvement programs in place to address the deficiencies on the SHS freeway facilities. As such, no improvements have been recommended to address the Existing (2019) deficiencies on the SHS.

Recommended Improvements

The following improvements are needed to improve the Existing (2019) peak hour deficiencies back to acceptable levels.

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

#	Intersection	Existing (2019)	E+P	EAP (2021) With Interchange	EAP (2021) Without Interchange	EAPC (2021) With Interchange	EAPC (2021) Without Interchange
1	Patterson Av. & Rider St.	●	●	●	●	●	●
2	Patterson Av. & Walnut St./Dwy. 1	●	●	●	●	●	●
3	Patterson Av. & Placentia St.	●	●	●	●	●	●
4	Dwy. 2/Tobacco Rd. & Placentia St.	●	●	●	●	●	●
5	Dwy. 3 & Placentia St.	NA	●	●	●	●	●
6	Harvill Av. & Cajalco Exwy.	●	●	●	●	●	●
7	Harvill Av. & Rider St.	●	●	●	●	●	●
8	Harvill Av. & Placentia St.	●	●	●	●	●	●
9	Harvill Av. & Orange St.	●	●	●	●	●	●
10	Harvill Av. & N. A St.	●	●	●	●	●	●
11	I-215 SB Ramps & Ramona Exwy.	●	●	●	●	●	●
12	I-215 SB Ramps & Placentia Av.	NA	NA	NA	●	NA	●
13	I-215 SB Ramps & Nuevo Rd.	●	●	●	●	●	●
14	I-215 NB Ramps & Ramona Exwy.	●	●	●	●	●	●
15	I-215 NB Ramps & Placentia Av.	NA	NA	NA	●	NA	●
16	I-215 NB Ramps & Nuevo Rd.	●	●	●	●	●	●

LEGEND:

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

Harvill Avenue & N. A Street (#10)

- Install a Traffic Signal.
- Add a northbound right turn lane with overlap phasing.

1.5.2 E+P CONDITIONS

This analysis scenario has been provided for informational purposes only as Project impacts have been discerned from a comparison of Existing (2019) to EAP (2020) and EAPC (2020) traffic conditions (per the County's traffic study guidelines).

Intersection Operations Analysis

As shown on Exhibit 1-3, with the addition of Project traffic, there are no additional intersections anticipated to operate as an unacceptable LOS for E+P traffic conditions, in addition to the location identified for Existing (2019) traffic conditions.

Traffic Signal Warrant Analysis

There are no additional study area intersections anticipated to meet planning level (average daily traffic or ADT) or peak hour volume-based traffic signal warrants under E+P traffic conditions, in addition to the intersections previously identified under Existing (2019) traffic conditions.

Off-Ramp Queuing Analysis

A queuing analysis was performed for the northbound and southbound off-ramps at the I-215 Freeway at the Cajalco Expressway/Ramona Expressway and Harvill Avenue/Nuevo Road interchanges. Consistent with Existing (2019) traffic conditions, the analysis indicates there are no queuing issues anticipated for E+P traffic conditions that may potentially result in "spill back" onto the I-215 Freeway mainline.

Freeway Operations Analyses

For E+P traffic conditions, there are no additional freeway mainline segments that are anticipated to operate at an unacceptable LOS (i.e., LOS E or worse) during the peak hours for E+P traffic conditions, in addition to those currently operating at a deficient LOS under Existing (2019) traffic conditions.

The ramp merge/diverge junctions are anticipated to continue to operate at an acceptable LOS (i.e., LOS D or better) during the peak hours, consistent with Existing (2019) traffic conditions.

At this time, Caltrans has no near-term fee programs or other improvement programs in place to address the deficiencies caused by development projects on the SHS freeway facilities. As such, no improvements have been recommended to address the E+P deficiencies on the SHS. The Project is anticipated to contribute less than 50 peak hour trips to these deficient facilities.

Recommended Improvements

There are no additional improvements required to improve the E+P peak hour deficiency at Harvill Avenue and N. A Street, in addition to the improvements previously identified under Existing (2019) traffic conditions.

1.5.3 EAP (2021) CONDITIONS

Intersection Operations Analysis

The intersection analysis results indicate that there are no additional study area intersections anticipated to operate at an unacceptable LOS under EAP (2020) Without I-215/Placentia Avenue Interchange traffic conditions, in addition to the locations previously identified under Existing (2019) traffic conditions (see Exhibit 1-3).

With the proposed I-215/Placentia Avenue Interchange, the following additional intersection is anticipated to operate at an unacceptable level of service (LOS) (i.e., LOS E or worse) during one or both of the peak hours:

- Harvill Avenue & Placentia Street (#8) – LOS F AM and PM peak hours

Traffic Signal Warrant Analysis

In addition to the intersections previously identified under Existing (2019) traffic conditions, the following unsignalized intersection is anticipated to warrant a traffic signal, based on EAP (2021) Without I-215/Placentia Avenue Interchange peak hour traffic volumes:

- Harvill Avenue & Rider Street (#7)

With the proposed I-215/Placentia Avenue Interchange, the following additional two intersections are anticipated to warrant a traffic signal based on EAP (2021) With I-215/Placentia Avenue Interchange ADT traffic forecasts:

- I-215 Southbound Ramps & Placentia Avenue (#12)
- I-215 Northbound Ramps & Placentia Avenue (#15)

Off-Ramp Queuing Analysis

A queuing analysis was performed for the northbound and southbound off-ramps at the I-215 Freeway at the Cajalco Expressway/Ramona Expressway and Harvill Avenue/Nuevo Road interchanges. The analysis indicates there are no queuing issues anticipated for EAP (2021) traffic conditions that may potentially result in “spill back” onto the I-215 Freeway mainline, consistent with Existing (2019) traffic conditions.

Freeway Operations Analyses

For EAP (2021) Without I-215/Placentia Avenue Interchange traffic conditions, there are no additional study area freeway mainline segments and ramp merge/diverge junctions that would operate at an unacceptable LOS (i.e., LOS E or worse) during one or both peak hours, in addition to the locations previously identified for E+P traffic conditions. With the proposed I-

215/Placentia Avenue Interchange, there are no deficiencies anticipated for freeway mainline segments and ramp merge/diverge junctions.

At this time, Caltrans has no near-term fee programs or other improvement programs in place to address the deficiencies caused by development projects on the SHS freeway facilities. As such, no improvements have been recommended to address the EAP (2021) deficiencies on the SHS. The Project is anticipated to contribute less than 50 peak hour trips to these deficient facilities.

Recommended Improvements

There are no additional improvements required to improve the EAP (2021) Without I-215/Placentia Avenue Interchange peak hour deficiency at Harvill Avenue and N. A Street, in addition to the improvements previously identified under Existing (2019) traffic conditions. With the proposed I-215/Placentia Avenue Interchange, the following additional improvements are needed to improve the EAP (2021) With I-215/Placentia Avenue Interchange peak hour deficiencies back to acceptable levels. These improvements are consistent with the planned improvements for the I-215/Placentia Avenue Interchange.

1.5.4 EAPC (2021) CONDITIONS

Intersection Operations Analysis

Without the proposed I-215/Placentia Avenue Interchange, an additional intersection is anticipated to operate at an unacceptable level of service (LOS) (i.e., LOS E or worse) during one or both of the peak hours:

- I-215 Northbound Ramps & Ramona Exwy. (#14) – LOS E AM peak hour only

With the proposed I-215/Placentia Avenue Interchange, there are no additional study area intersections anticipated to operate at a deficient LOS in addition to the intersections previously identified for EAP (2021) With I-215/Placentia Avenue Interchange traffic conditions.

Traffic Signal Warrant Analysis

The traffic signal warrant analysis results indicate that there are no additional study area intersections anticipated to warrant a traffic signal for EAPC (2021) traffic conditions, in addition to the previously identified intersections under Existing (2019) and EAP (2021) traffic conditions.

Off-Ramp Queuing Analysis

A queuing analysis was performed for the northbound and southbound off-ramps at the I-215 Freeway at the Cajalco Expressway/Ramona Expressway and Harvill Avenue/Nuevo Road interchanges. The analysis indicates there are no queuing issues anticipated for EAPC (2021) traffic conditions that may potentially result in “spill back” onto the I-215 Freeway mainline, consistent with Existing (2019) traffic conditions.

Freeway Operations Analyses

For EAPC (2021) Without I-215/Placentia Avenue Interchange traffic conditions, the following additional I-215 Freeway segments are anticipated to operate at an unacceptable LOS (i.e., LOS E or worse) during the peak hours, in addition to EAP (2021) Without I-215/Placentia Avenue Interchange traffic conditions:

- I-215 Freeway Southbound, Ramona Exwy. to Placentia Av. – LOS E PM peak hour only (#4)
- I-215 Freeway Northbound, South of Nuevo Rd. – LOS E AM peak hour only (#20)

The following ramp/merge/diverge areas are anticipated to operate at LOS E or worse during the peak hours:

- I-215 Freeway Southbound, Off-Ramp at Ramona Exwy. – LOS E PM peak hour only (#2)
- I-215 Freeway Southbound, On-Ramp at Ramona Exwy. – LOS E PM peak hour only (#3)
- I-215 Freeway Southbound, Off-Ramp at Nuevo Rd. – LOS E PM peak hour only (#8)
- I-215 Freeway Northbound, On-Ramp at Ramona Exwy. – LOS F AM peak hour only (#12)
- I-215 Freeway Northbound, Off-Ramp at Ramona Exwy. – LOS E AM peak hour only (#13)
- I-215 Freeway Northbound, On-Ramp at Nuevo Rd. – LOS F AM peak hour only (#18)

With the proposed I-215/Placentia Avenue Interchange, the freeway segments are anticipated to operate at acceptable LOS (i.e., LOS D or better) during the peak hours for EAPC (2021) With I-215/Placentia Avenue Interchange traffic conditions. For the freeway mainline analysis and ramp merge/diverge analysis, the following two locations are anticipated to operate at LOS E or worse during the peak hours:

- I-215 Freeway Southbound, Off-Ramp at Ramona Exwy. – LOS E PM peak hour only (#2)
- I-215 Freeway Southbound, Off-Ramp at Nuevo Rd. – LOS E PM peak hour only (#8)

At this time, Caltrans has no near-term fee programs or other improvement programs in place to address the deficiencies caused by development projects on the SHS freeway facilities. As such, no improvements have been recommended to address the EAPC (2021) deficiencies on the SHS. The Project is anticipated to contribute less than 50 peak hour trips to these deficient facilities.

Recommended Improvements

There are no additional improvements required to improve EAPC (2021) peak hour deficiencies in addition to those previously indicated in Existing (2019) and EAP (2021) With I-215/Placentia Interchange traffic conditions. Although the intersection of I-215 Northbound Ramps at Ramona Expressway is anticipated to operate at a deficient LOS during the AM peak hour for EAPC (2021) Without I-215/Placentia Avenue Interchange traffic conditions, the Project is anticipated to contribute less than 50 peak hour trips to this intersection. As such, the impact is less than significant.

The Project Applicant shall participate in the funding of off-site improvements that are needed to serve cumulative traffic conditions through the payment to the County of Riverside Transportation Uniform Mitigation Fee (TUMF) and Development Impact Fee (DIF) programs.

These fees shall be collected by the County of Riverside, 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.

1.6 CIRCULATION SYSTEM IMPACTS AND MITIGATION MEASURES

A summary of the operationally deficient study area intersection and recommended improvements required to achieve acceptable circulation system performance are described in detail within Section 7 *EAPC (2021) Traffic Conditions* of this report.

1.6.1 CUMULATIVE IMPACTS

Improvements found to be included in the Western Riverside Council of Governments (WRCOG) Transportation Uniform Mitigation Fee (TUMF) or the County of Riverside's (lead agency) DIF fee program have been identified as such. These fees (both to the County of Riverside and TUMF) 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. Additional information related to these various fee programs are contained in Section 1.7 *Local and Regional Funding Mechanisms* of this report.

1.6.2 CUMULATIVE MITIGATION MEASURES

Mitigation Measure 1.1 – Prior to the issuance of building permits, the Project applicant shall participate in the County's TUMF and DIF programs by paying the requisite fees at the time of building permit for the improvements identified in Table 7-4, or as agreed to by the County and Project Applicant.

1.7 LOCAL AND REGIONAL FUNDING MECHANISMS

Transportation improvements throughout the County of Riverside are funded through a combination of project mitigation or development impact fee programs, such as TUMF program or the County's DIF program.

1.7.1 TRANSPORTATION UNIFORM MITIGATION FEE (TUMF) PROGRAM

The TUMF program is administered by the WRCOG based upon a regional Nexus Study most recently updated in 2016 to address major changes in right of way acquisition and improvement cost factors. (5) This regional program was put into place to ensure that development pays its fair share and that funding is in place for construction of facilities needed to maintain the requisite level of service and critical to mobility in the region. TUMF is a truly regional mitigation fee program and is imposed and implemented in every jurisdiction in Western Riverside County.

TUMF guidelines empower a local zone committee to prioritize and arbitrate certain projects. The Project is located in the Central Zone. The zone has developed a 5-year capital improvement program to prioritize public construction of certain roads. TUMF is focused on improvements necessitated by regional growth.

1.7.2 COUNTY OF RIVERSIDE DEVELOPMENT IMPACT FEE (DIF) PROGRAM

The Project is located within the County's Mead Valley Area Plan and therefore will be subject to County of Riverside DIF in an effort, by the County, to address development throughout its unincorporated area. The DIF program consists of two separate transportation components: the Roads, Bridges and Major Improvements component and the Traffic Signals component. Eligible facilities for funding by the County DIF program are identified on the County's Public Needs List, which currently extends through the year 2020. (5)

The cost of signaling DIF network intersections is identified under the Traffic Signals component of the DIF program. County staff generally defines DIF eligible intersections as those consisting of two intersecting general plan roadways. If the intersection meets this requirement, it is potentially eligible for up to \$235,000 of credit, which is subject to negotiations with the County.

1.8 ON-SITE ROADWAY IMPROVEMENTS

The recommended site-adjacent roadway improvements for the Project are described below. Exhibit 1-4 illustrates the site-adjacent roadway improvement recommendations.

Patterson Avenue – Patterson Avenue is a north-south oriented roadway located along the Project's western boundary. Construct Patterson Avenue at its ultimate half-section width as a Secondary Highway (100-foot right-of-way) between the Project's northern boundary and Placentia Street, in compliance with applicable County of Riverside and Caltrans standards.

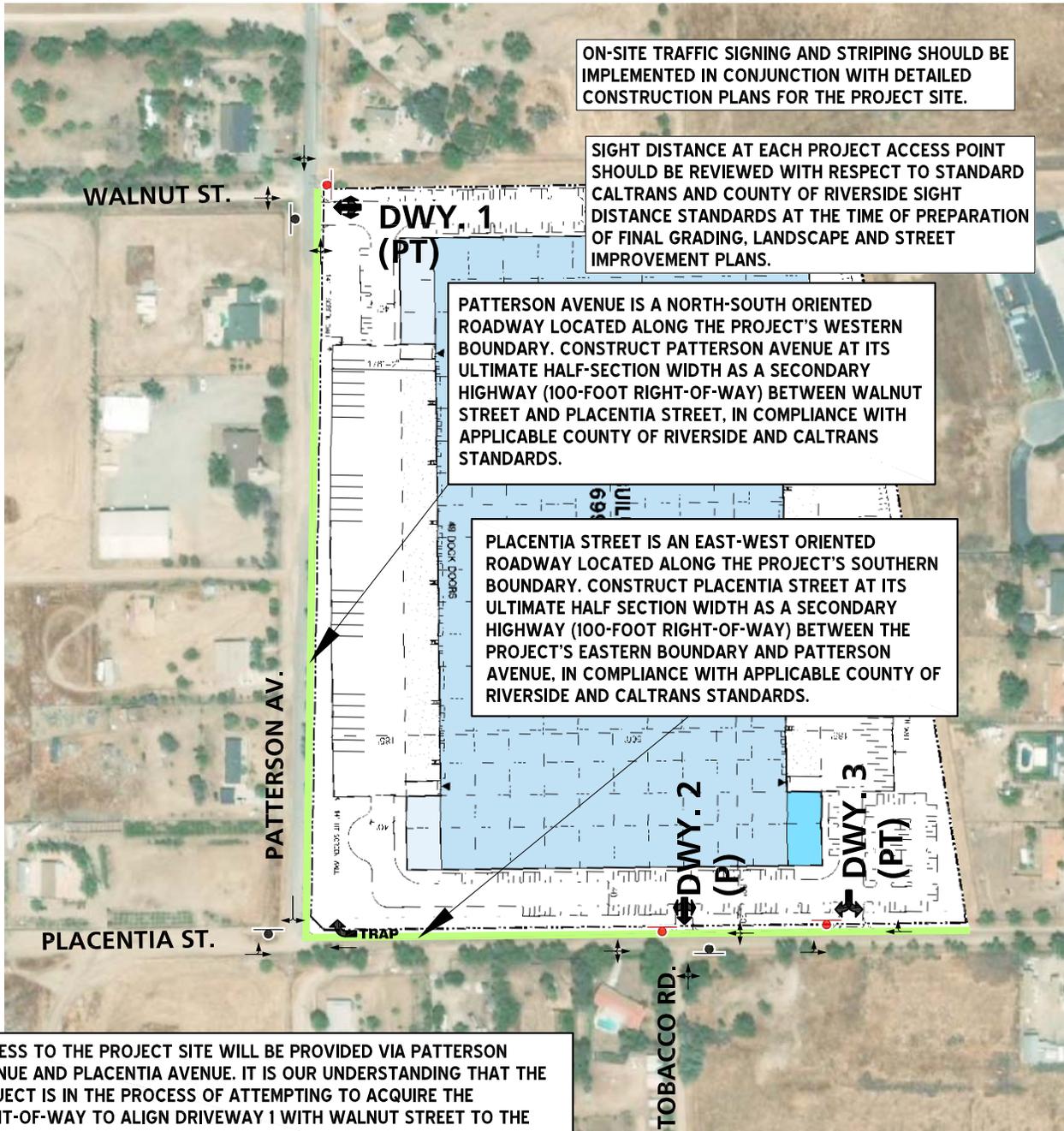
Placentia Street – Placentia Street is an east-west oriented roadway located along the Project's southern boundary. Construct Placentia Street at its ultimate half-section width as a Secondary Highway (100-foot right-of-way) between the Project's Patterson Avenue and the Project's eastern boundary, in compliance with applicable County of Riverside and Caltrans standards.

Access to the Project site will be provided via Patterson Avenue and Placentia Avenue. It is our understanding that the Project is in the process of attempting to acquire the right-of-way to align Driveway 1 with Walnut Street to the west on Patterson Avenue. If the right-of-way cannot be acquired, the Project Applicant will need to work with County staff in order to develop an interim design for Driveway 1 due to the off-set with Walnut Street.

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

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



LEGEND:

- = STOP SIGN
- = STOP SIGN IMPROVEMENT
- ↑ = EXISTING LANE
- ↑ = LANE IMPROVEMENT
- TRAP = TRAP LANE
- = SECONDARY HIGHWAY (100-FOOT R.O.W.)



1.9 SITE ACCESS IMPROVEMENTS

The recommended site access driveway improvements for the Project are described below. Exhibit 1-4 also illustrates the site access improvements. Construction of on-site and site adjacent improvements shall occur in conjunction with adjacent Project development activity or as needed for Project access purposes.

Patterson Avenue & Driveway 1 (#2) – Install a stop control on the westbound approach and construct the intersection with the following geometrics:

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

Patterson Avenue & Placentia Street (#3) – Maintain the existing traffic control and construct the intersection with the following geometrics:

- Northbound Approach: Not Applicable (N/A)
- Southbound Approach: One shared left- right turn lane.
- Eastbound Approach: One shared left-through lane.
- Westbound Approach: One through lane and one right turn lane.

Driveway 2/Tobacco Road & Placentia Street (#4) – Install a stop control on the southbound approach and construct the intersection with the following geometrics:

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

Driveway 3 & Placentia Street (#5) – Install a stop control on the southbound approach and construct the intersection with the following geometrics:

- Northbound Approach: N/A
- Southbound Approach: One shared left- right turn lane.
- Eastbound Approach: One shared left-through lane.
- Westbound Approach: One shared through-right turn lane.

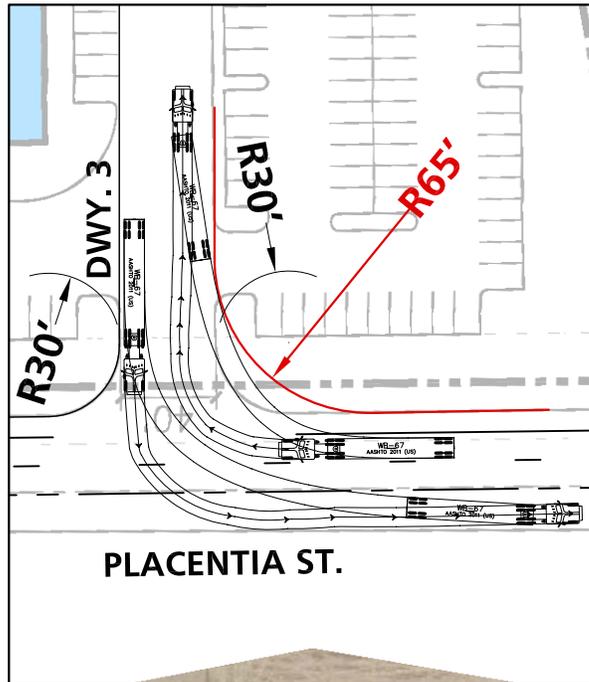
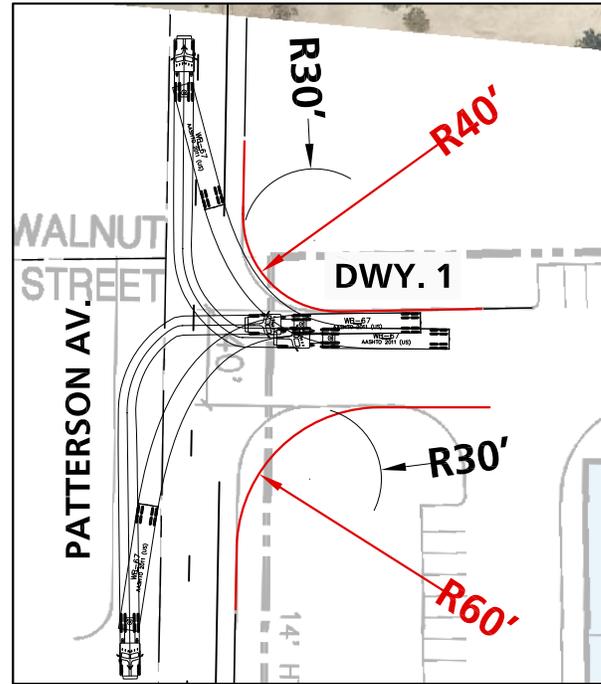
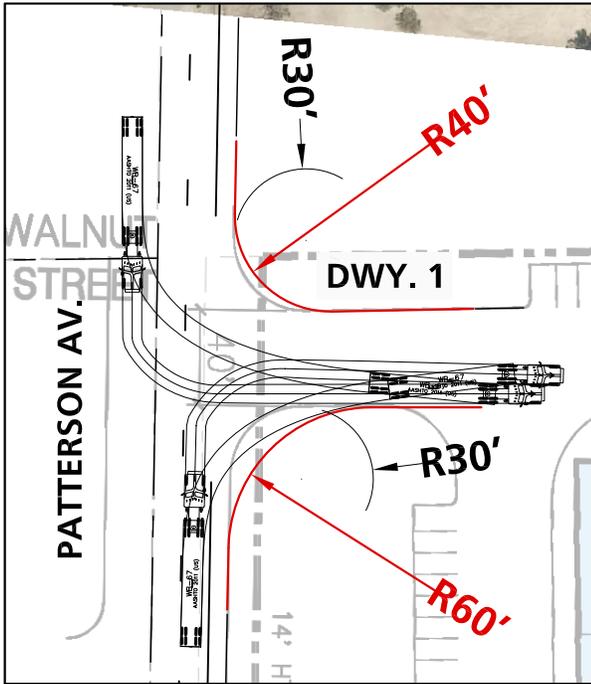
Wherever necessary, roadways adjacent to the Project, site access points and site-adjacent intersections will be constructed to be consistent with the identified roadway classifications and respective cross-sections in the County of Riverside General Plan Circulation Element.

1.10 TRUCK ACCESS

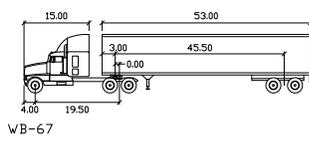
Due to the typical wide turning radius of large trucks, a truck turning template has been overlaid on the site plan at each applicable Project driveway anticipated to be utilized by heavy trucks in order to determine appropriate curb radii and to verify that trucks will have sufficient space to execute turning maneuvers (see Exhibit 1-5). A WB-67 truck (53-foot trailer) has been utilized for the purposes of this analysis. As shown on Exhibit 1-5, the following curb radius change is necessary in order to accommodate the ingress and egress of heavy trucks:

- Driveway 1 on Patterson Avenue should be modified to provide a 40-foot curb radius on the northeast corner and 60-foot curb radius on the southeast corner.
- At the intersection of Patterson Avenue and Placentia Street, the curb should be designed in tandem with the roadway design at construction of the ultimate half section of the intersection.
- Driveway 3 on Placentia Street should be modified to provide a 65-foot curb radius on the northeast corner.

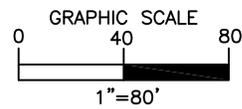
EXHIBIT 1-5: TRUCK ACCESS



LEGEND:



Feet	
Tractor Width	8.00
Trailer Width	8.50
Tractor Track	8.00
Trailer Track	8.50
Lock to Lock Time	6.0
Steering Angle	28.4
Articulating Angle	75.0



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2 METHODOLOGIES

This section of the report presents the methodologies used to perform the traffic analyses summarized in this report. The methodologies described are generally consistent with County of Riverside and Caltrans traffic study guidelines. (3)

2.1 LEVEL OF SERVICE

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

2.2 INTERSECTION CAPACITY ANALYSIS

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

2.2.1 SIGNALIZED INTERSECTIONS

The County of Riverside, City of Perris, and Caltrans require signalized intersection operations analysis based on the methodology described in the HCM (6th Edition). Intersection LOS operations are based on an intersection's average control delay. Control delay includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. For signalized intersections LOS is directly related to the average control delay per vehicle and is correlated to a LOS designation as described in Table 2-1. Study area intersections have been evaluated using the Synchro (Version 10) analysis software package.

The traffic modeling and signal timing optimization software package Synchro (Version 10) is utilized to analyze signalized intersections within the County of Riverside. Synchro is a macroscopic traffic software program that is based on the signalized intersection capacity analysis as specified in the HCM. Macroscopic level models represent traffic in terms of aggregate measures for each movement at the study intersections. Equations are used to determine measures of effectiveness such as delay and queue length. The level of service and capacity analysis performed by Synchro takes into consideration optimization and coordination of signalized intersections within a network.

TABLE 2-1: SIGNALIZED INTERSECTION LOS THRESHOLDS

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

Source: HCM, 6th Edition

The peak hour traffic volumes are adjusted using a peak hour factor (PHF) to reflect peak 15-minute volumes. Common practice for LOS analysis is to use a peak 15-minute rate of flow. However, flow rates are typically expressed in vehicles per hour. The PHF is the relationship between the peak 15-minute flow rate and the full hourly volume (e.g. $PHF = [Hourly Volume] / [4 \times Peak\ 15\text{-minute\ Flow\ Rate}]$). The use of a 15-minute PHF produces a more detailed analysis as compared to analyzing vehicles per hour. Existing PHFs have been used for all analysis scenarios. Per the HCM, PHF values over 0.95 often are indicative of high traffic volumes with capacity constraints on peak hour flows while lower PHF values are indicative of greater variability of flow during the peak hour. (7)

2.2.2 UNSIGNALIZED INTERSECTIONS

The County of Riverside requires the operations of unsignalized intersections be evaluated using the methodology described the HCM. (6) The LOS rating is based on the weighted average control delay expressed in seconds per vehicle (see Table 2-2).

TABLE 2-2: UNSIGNALIZED INTERSECTION LOS THRESHOLDS

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

Source: HCM, 6th Edition

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

2.3 TRAFFIC SIGNAL WARRANT ANALYSIS METHODOLOGY

The term "signal warrants" refers to the list of established criteria used by the Caltrans and other public agencies to quantitatively justify or ascertain the potential need for installation of a traffic signal at an otherwise unsignalized intersection. This TIA uses the signal warrant criteria presented in the latest edition of the Caltrans California Manual on Uniform Traffic Control Devices (CA MUTCD) for all study area intersections. (8)

The signal warrant criteria for Existing conditions are based upon several factors, including volume of vehicular and pedestrian traffic, frequency of accidents, and location of school areas. The Caltrans CA MUTCD indicates that the installation of a traffic signal should be considered if one or more of the signal warrants are met. (8) Specifically, this TIA utilizes the Peak Hour Volume-based Warrant 3 as the appropriate representative traffic signal warrant analysis for existing study area intersections for all analysis scenarios. Warrant 3 is appropriate to use for this TIA because it provides specialized warrant criteria for intersections with rural characteristics (e.g. located in communities with populations of less than 10,000 persons or with adjacent major streets operating above 40 miles per hour). For the purposes of this study, the speed limit was the basis for determining whether Urban or Rural warrants were used for a given intersection.

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

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

TABLE 2-3: TRAFFIC SIGNAL WARRANT ANALYSIS LOCATIONS

ID	Intersection Location	Jurisdiction
1	Patterson Avenue & Rider Street	County of Riverside
2	Patterson Av. & Walnut St./Driveway 1	County of Riverside
3	Patterson Av. & Placentia St.	County of Riverside
4	Driveway 2/Tobacco Rd. & Placentia St.	County of Riverside
5	Driveway 3 & Placentia St. – Future intersection	County of Riverside
7	Harvill Av. & Rider St.	County of Riverside
8	Harvill Av. & Placentia St.	County of Riverside
9	Harvill Av. & Orange St.	County of Riverside
10	Harvill Av. & A St.	County of Riverside
12	I-215 SB Ramps & Placentia Av.	City of Perris, Caltrans
15	I-215 NB Ramps & Placentia Av.	City of Perris, Caltrans

The Existing conditions traffic signal warrant analysis is presented in the subsequent section, Section 3 *Area Conditions* of this report. The traffic signal warrant analyses for future conditions are presented in Section 5 *E+P Traffic Conditions*, Section 6 *EAP (2021) Traffic Conditions*, and Section 7 *EAPC (2021) Traffic Conditions* 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 MAINLINE SEGMENT ANALYSIS METHODOLOGY

Consistent with recent Caltrans guidance, the traffic study has evaluated all freeway segments where the Project is anticipated to contribute 50 or more peak hour one-way trips, in an effort to conduct a conservative analysis and overstate as opposed to understand potential deficiencies.

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 HCS 7 software. The performance measure preferred by Caltrans to calculate LOS is density. Density is expressed in terms of passenger cars per mile per lane. Table 2-4 illustrates the freeway segment LOS descriptions for each density range utilized for this analysis.

TABLE 2-4: DESCRIPTION OF FREEWAY MAINLINE LOS

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

¹ pc/mi/ln = passenger cars per mile per lane. Source: HCM, 6th Edition

The number of lanes for existing baseline conditions has been obtained from field observations conducted by Urban Crossroads in February 2019. These existing freeway geometrics have been utilized for Existing, E+P, EAP, EAPC conditions.

The I-215 Freeway mainline volume data were obtained from the Caltrans PeMS website for the segments of the I-215 Freeway interchange at Ramona Expressway. The data was obtained from February 2019. In an effort to conduct a conservative analysis, the maximum value observed within the 3-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 and actual vehicles (as opposed to PCE volumes) have been utilized for the purposes of the basic freeway segment analysis. (9)

2.5 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 where the Project is anticipated to contribute 50 or more peak hour trips (see Table 1-2). 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 freeway facility analysis is performed using the HCS7 software and analyzes the freeway facility as a whole, including both freeway segments and ramp junctions. The measure of effectiveness (reported in passenger car/mile/lane) are calculated based on the existing number of travel lanes, number of lanes at the on and off-ramps both at the analysis junction and at upstream and

downstream locations (if applicable) and acceleration/deceleration lengths at each merge/diverge point. Table 2-5 presents the merge/diverge area level of service descriptions for each density range utilized for this analysis.

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

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

¹ pc/mi/ln = passenger cars per mile per lane. Source: HCM, 6th Edition

Similar to the basic freeway segment analysis, the I-215 Freeway volume data was obtained from the Caltrans maintained PeMS website for the segments of the I-215 Freeway north of Ramona Expressway. The ramp data (per the count data presented in Appendix 3.1) was then utilized to flow conserve the mainline volumes to determine the remaining I-215 Freeway mainline segment volumes. Flow conservation checks ensure that traffic flows from north to south (and vice versa) of the interchange area with no unexplained loss of vehicles. The data was obtained from February 2019. In an effort to conduct a conservative analysis, the maximum value observed within the 3-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 and actual vehicles (as opposed to PCE volumes) have been utilized for the purposes of the freeway ramp junction (merge/diverge) analysis. (10)

2.6 MINIMUM LEVEL OF SERVICE (LOS)

2.6.1 COUNTY OF RIVERSIDE

The definition of an intersection deficiency has been obtained from the County of Riverside General Plan. Riverside County General Plan Policy C 2.1 states that the County will maintain the following County-wide target LOS:

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

- *LOS C shall apply to all development proposals in any area of the Riverside County not located within the boundaries of an Area Plan, as well as those areas located within the following Area Plans: REMAP, Eastern Coachella Valley, Desert Center, Palo Verde Valley, and those non-Community Development areas of the Elsinore, Lake Mathews/Woodcrest, Mead Valley and Temescal Canyon Area Plans.*

- *LOS D shall apply to all development proposals located within any of the following Area Plans: Eastvale, Jurupa, Highgrove, Reche Canyon/Badlands, Lakeview/Nuevo, Sun City/Menifee Valley, Harvest Valley/Winchester, Southwest Area, The Pass, San Jacinto Valley, Western Coachella Valley and those Community Development Areas of the Elsinore, Lake Mathews/Woodcrest, Mead Valley and Temescal Canyon Area Plans.*
- *LOS E may be allowed by the Board of Supervisors within designated areas where transit-oriented development and walkable communities are proposed.*

The applicable minimum LOS utilized for the purposes of this analysis is LOS D per the County-wide target LOS for projects located within a Community Development Area.

2.6.2 CITY OF PERRIS

The definition of an intersection deficiency has been obtained from the City of Perris' General Plan:

LOS D along all City maintained roads (including intersections) and LOS D along I-215 and SR-74 (including intersections with local streets and roads). An exception to the local road standard is LOS E, at intersections of any Arterials and Expressways with SR-74, the Ramona-Cajalco Expressway, or at I-215 Freeway ramps. (11)

LOS E may be allowed within the boundaries of the Downtown Specific Plan Area to the extent that it would support transit-oriented development and walkable communities. Increased congestion in this area will facilitate an increase in transit ridership and encourage development of a complementary mix of land uses within a comfortable walking distance from light rail stations.

2.6.3 CALTRANS

Caltrans endeavors to maintain a target LOS at the transition between LOS C and LOS D on SHS facilities, however, Caltrans acknowledges that this may not always be feasible and recommends that the lead agency consult with Caltrans to determine the appropriate target LOS. If an existing State highway facility is operating at less than this target LOS, the existing LOS should be maintained. In general, the region-wide goal for an acceptable LOS on all freeways, roadway segments, and intersections is LOS D. Consistent with the County of Riverside 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.

2.7 DEFICIENCY CRITERIA

This section outlines the methodology used in this analysis related to identifying circulation system deficiencies. The following deficiency criteria has been utilized for the County of Riverside and Caltrans.

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

- A deficiency occurs at study area intersections if the pre-Project condition is at or better than LOS D (i.e., acceptable LOS), and the addition of project trips causes the peak hour LOS of the study area intersection to operate at unacceptable LOS (i.e., LOS E or F). Per the County of Riverside traffic study guidelines, for intersections currently operating at unacceptable LOS (LOS E or F), a deficiency would occur if the Project contributes 50 or more peak hour trips to pre-project traffic conditions.

Table 2-6 below summarizes the Project's contribution to each study area intersections for both Without and With the I-215 Freeway at Placentia Avenue interchange (in PCE). Table 2-7 summarizes the Project's contribution to the freeway facilities (in actual vehicles).

TABLE 2-6: SUMMARY OF PROJECT TRIPS AT STUDY AREA INTERSECTIONS

ID	Intersection Location	Without Interchange		With Interchange	
		AM	PM	AM	PM
1	Patterson Avenue & Rider Street	21	26	8	11
2	Patterson Av. & Walnut St./Driveway 1	30	37	30	38
3	Patterson Av. & Placentia St.	9	11	22	27
4	Driveway 2/Tobacco Rd. & Placentia St.	43	58	56	74
5	Driveway 3 & Placentia St. – Future Intersection	91	116	104	131
6	Harvill Av. & Cajalco Expressway	70	85	20	24
7	Harvill Av. & Rider St.	69	85	20	25
8	Harvill Av. & Placentia St.	91	116	106	131
9	Harvill Av. & Orange St.	43	57	12	15
10	Harvill Av. & A St.	43	57	12	15
11	I-215 SB Ramps & Ramona Expressway	54	66	4	5
12	I-215 SB Ramps & Placentia Av. – Future Intersection	0	0	82	102
13	I-215 SB Ramps & Nuevo Rd.	43	57	12	15
14	I-215 NB Ramps & Ramona Expressway	16	49	4	5
15	I-215 NB Ramps & Placentia Av. – Future Intersection	0	0	36	55
16	I-215 NB Ramps & Nuevo Rd.	36	26	12	15

TABLE 2-7: SUMMARY OF PROJECT TRIPS ON STUDY AREA FREEWAY FACILITIES

ID	Freeway Mainline Segments	Without Interchange		With Interchange	
		AM	PM	AM	PM
1	I-215 SB, North of Ramona Exwy.	27	13	27	13
2	I-215 SB, Off-Ramp at Ramona Exwy.	27	13	0	0
3	I-215 SB, On-Ramp at Ramona Exwy.	0	0	0	0
4	I-215 SB, Ramona Exwy. to Placentia Av.	0	0	27	13
5	I-215 SB, Off-Ramp at Placentia Av.	0	0	27	13
6	I-215 SB, On-Ramp at Placentia Av.	0	0	6	26
7	I-215 SB, Placentia Av. to Nuevo Rd.	0	0	6	26
8	I-215 SB, Off-Ramp at Nuevo Rd.	0	0	0	0
9	I-215 SB, On-Ramp at Nuevo Rd.	6	26	0	0
10	I-215 SB, South of Nuevo Rd.	6	26	6	26
11	I-215 NB, North of Ramona Exwy.	8	34	8	34
12	I-215 NB, On-Ramp at Ramona Exwy.	8	34	0	0
13	I-215 NB, Off-Ramp at Ramona Exwy.	0	0	0	0
14	I-215 NB, Ramona Exwy. to Placentia Av.	0	0	8	34
15	I-215 NB, On-Ramp at Placentia Av.	0	0	8	34
16	I-215 NB, Off-Ramp at Placentia Av.	0	0	20	10
17	I-215 NB, Placentia Av. to Nuevo Rd.	0	0	20	10
18	I-215 NB, On-Ramp at Nuevo Rd.	0	0	0	0
19	I-215 NB, Off-Ramp at Nuevo Rd.	20	11	0	0
20	I-215 NB, South of Nuevo Rd.	20	11	20	10

2.8 PROJECT FAIR SHARE CALCULATION METHODOLOGY

Improvements found to be included in the TUMF and/or DIF will be identified as such. For improvements that do not appear to be in either of the pre-existing fee programs, a fair share financial contribution based on the Project's proportional share may be imposed in order to mitigate the Project's share of deficiencies in lieu of construction. It should be noted that fair share calculations are for informational purposes only and the County Traffic Engineer will determine the appropriate improvements to be implemented by a project (to be identified in the conditions of approval).

If the intersection is currently operating at acceptable LOS under Existing traffic conditions, the Project's fair share cost of improvements would be determined based on the following equation, which is the ratio of Project traffic to new traffic, where new traffic is total future traffic less existing baseline traffic:

$$\text{Project Fair Share \%} = \text{Project Traffic} / (\text{EAPC (2021) Total Traffic} - \text{Existing (2019) Traffic})$$

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3 AREA CONDITIONS

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

3.1 EXISTING CIRCULATION NETWORK

Pursuant to the scoping agreement with County of Riverside staff (Appendix 1.1), the study area includes a total of 16 existing and future intersections as shown previously on Exhibit 1-2 where the Project is anticipated to contribute 50 or more peak hour trips or has been added at the direction of County staff. 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 GENERAL PLAN CIRCULATION ELEMENTS

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

Expressways can accommodate eight travel lanes. These facilities serve as multi-modal corridors for through traffic to which access from abutting property is restricted. The following roadway is classified as an Expressway within the study area:

- Cajalco Expressway/Ramona Expressway

Arterial Highways can accommodate six travel lines. These facilities primarily serve through traffic to which access from abutting property shall be kept at a minimum. The following roadways are classified as an Arterial Highway within the study area:

- Harvill Avenue (east of overpass above N. A Street)
- Placentia Street (east of Harvill Avenue)

Major Highways can accommodate four travel lanes. These facilities serve property zoned for major industrial and commercial uses, or to serve through traffic. The following roadway is classified as a Major Highway within the study area:

- Harvill Avenue (west of overpass above N. A Street)

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

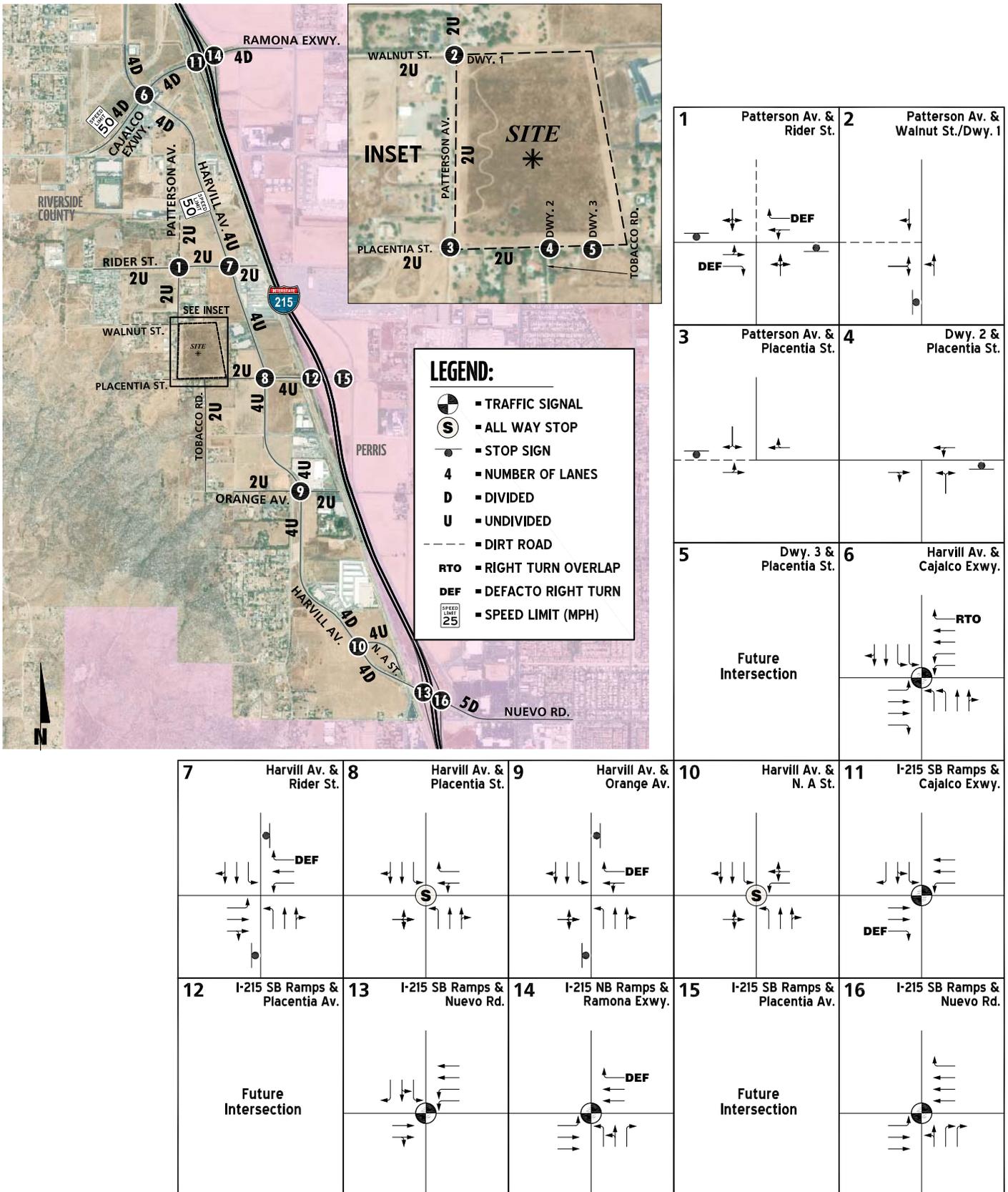
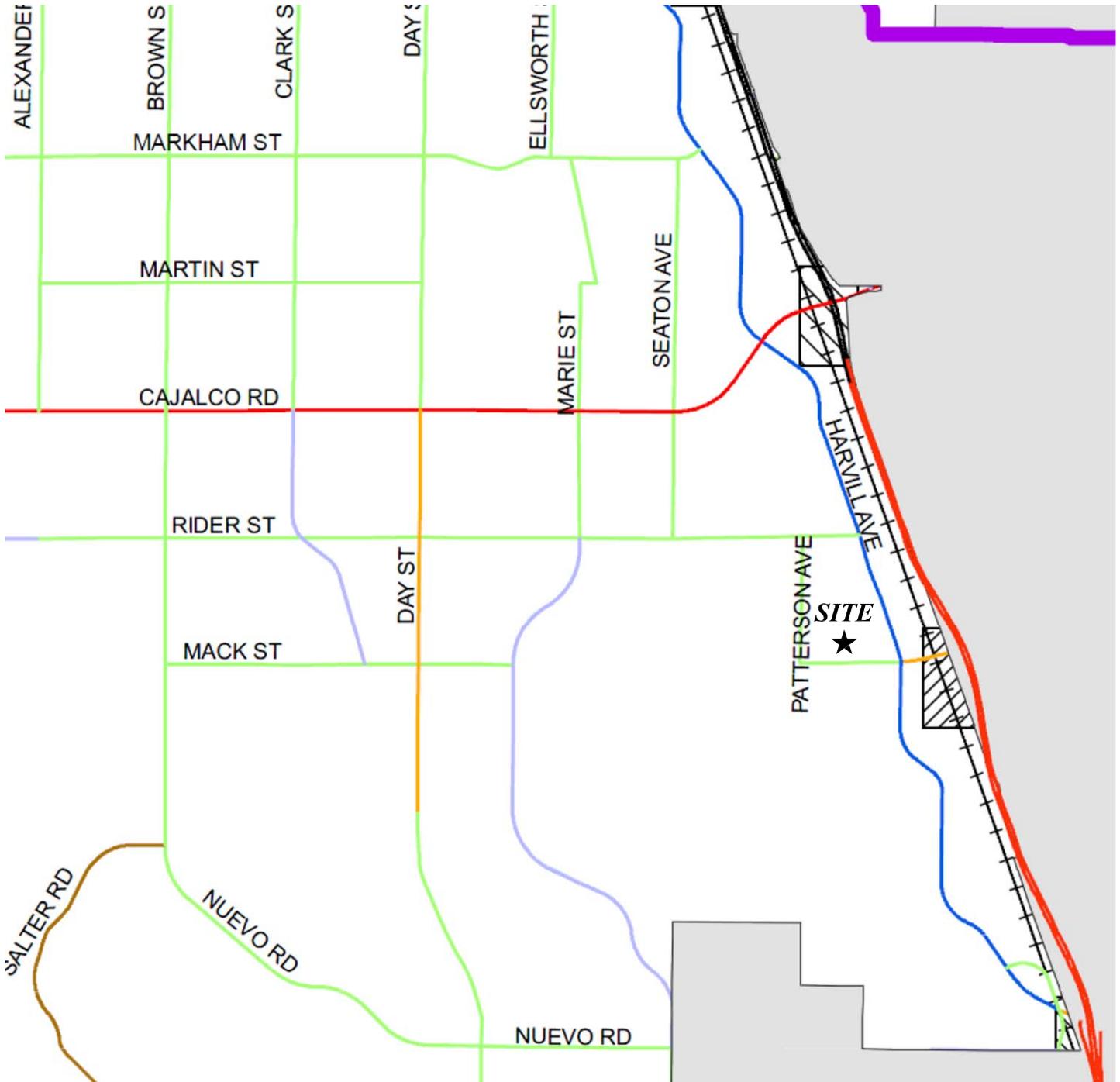


EXHIBIT 3-2: COUNTY OF RIVERSIDE GENERAL PLAN CIRCULATION ELEMENT

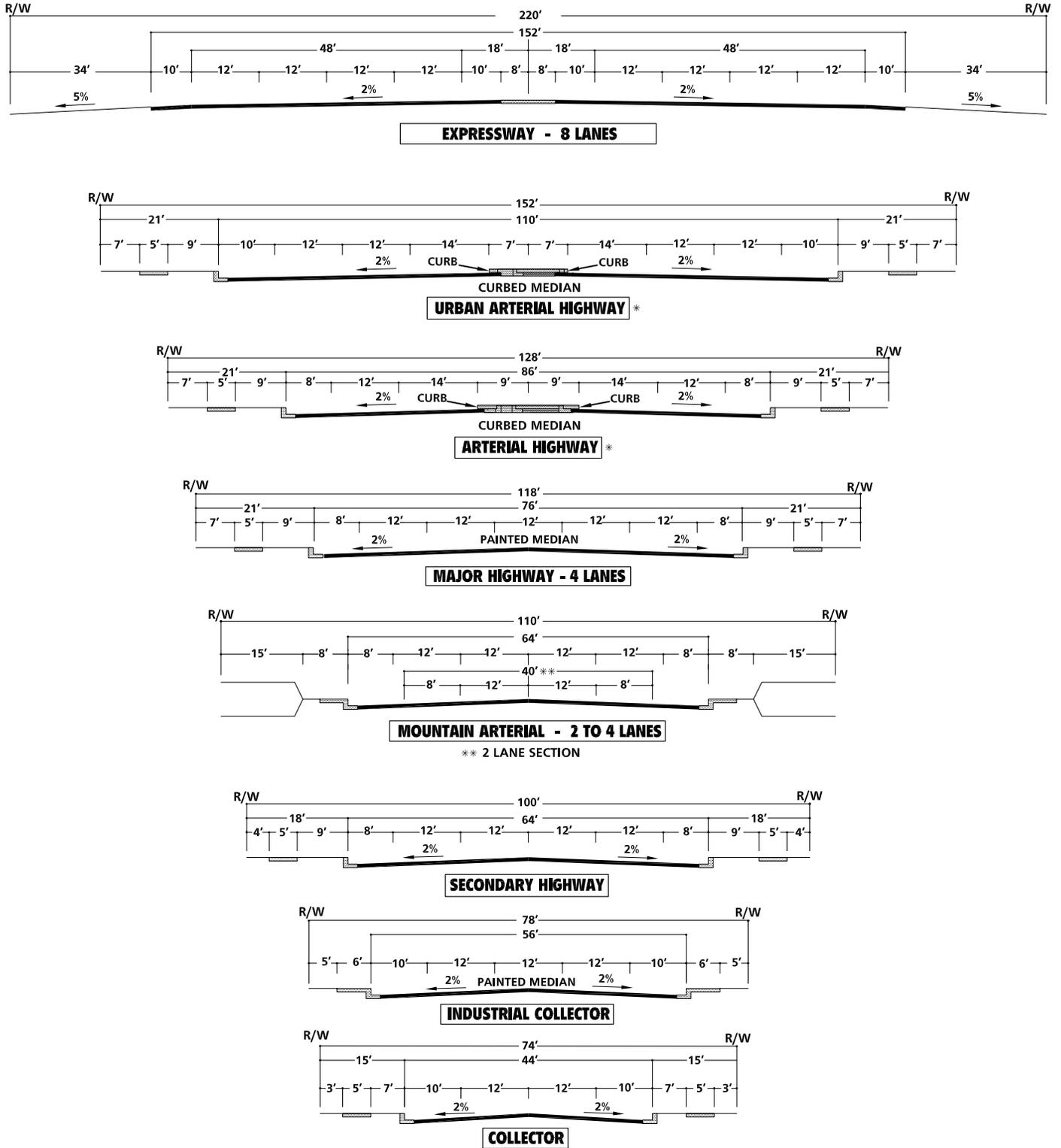


- | | | |
|------------------------------|-------------------------|------------------------------|
| Freeway | Cajalco Romona Corridor | Highways |
| Expressway (220' ROW) | Existing Interchange | Area Plan Boundary |
| Urban Arterial (102' ROW) | Proposed Interchange | March Joint Powers Authority |
| Arterial (128' ROW) | Rail | City Boundary |
| Major (118' ROW) | | Waterbodies |
| Mountain Arterial (110' ROW) | | |
| Secondary (100' ROW) | | |
| Collector (74' ROW) | | |



SOURCE: RIVERSIDE COUNTY INTEGRATED PROJECT (RCIP)
DECEMBER 8, 2015

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



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

NOT TO SCALE

SOURCE: COUNTY OF RIVERSIDE

Secondary Highways can accommodate four travel lanes. These facilities typically provide access between the regional highway system and collector streets. The following roadways are classified as a Secondary Highway within the study area:

- N. A Street
- Patterson Avenue
- Placentia Street (west of Harvill Avenue)
- Rider Street

3.3 BICYCLE & PEDESTRIAN FACILITIES

In an effort to promote alternative modes of transportation, the County of Riverside also includes a trails and bikeway system. The trails and bikeway system, shown on Exhibit 3-4, shows the proposed trails connected with major features within the County. There is a proposed Class II bike path along Cajalco Expressway, Regional Trail along Placentia Avenue, and Community Trail along Tobacco Road within the study area.

Field observations conducted in February 2019 indicates nominal pedestrian and bicycle activity within the study area. Exhibit 3-5 illustrates the existing pedestrian facilities, including sidewalks and crosswalks. As shown on Exhibit 3-5, there are existing pedestrian facilities located along portions of Harvill Avenue and Cajalco Expressway within the study area.

3.4 TRANSIT SERVICE

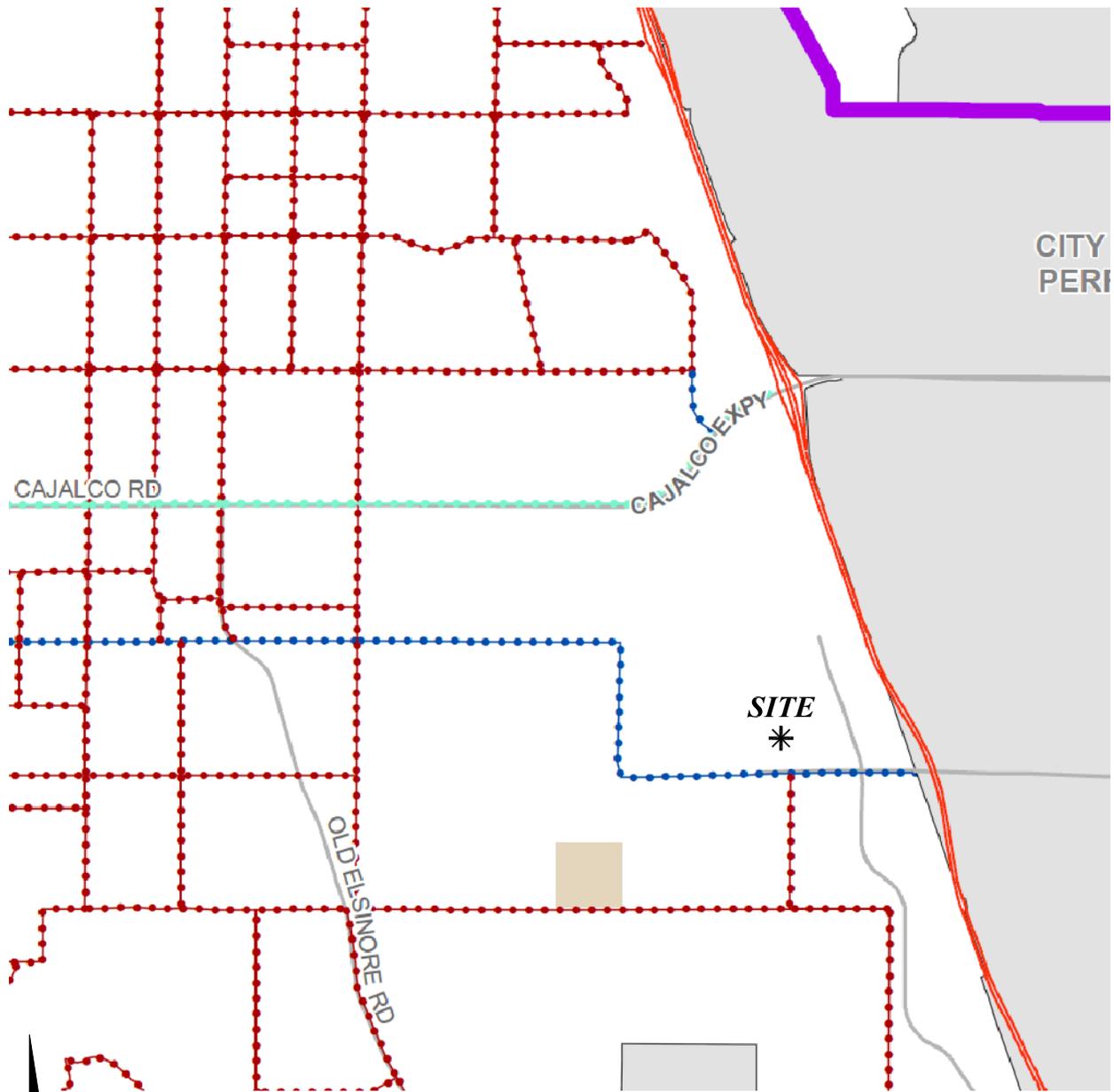
The County of Riverside is currently served by the Riverside Transit Authority (RTA), a public transit agency serving the unincorporated Riverside County region. There are currently no existing bus routes that serve the roadways within the study area in close proximity to the proposed Project. As shown on Exhibit 3-6, the only existing transit routes within the study area are RTA Routes 41, 27, and 208/212, which run along the I-215 Freeway and Cajalco Expressway. Transit service is reviewed and updated by RTA periodically to address ridership, budget and community demand needs. Changes in land use can affect these periodic adjustments which may lead to either enhanced or reduced service where appropriate. As such, it is recommended that the Project Applicant work in conjunction with RTA to potentially accommodate bus service to the site.

3.5 EXISTING TRAFFIC COUNTS

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

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

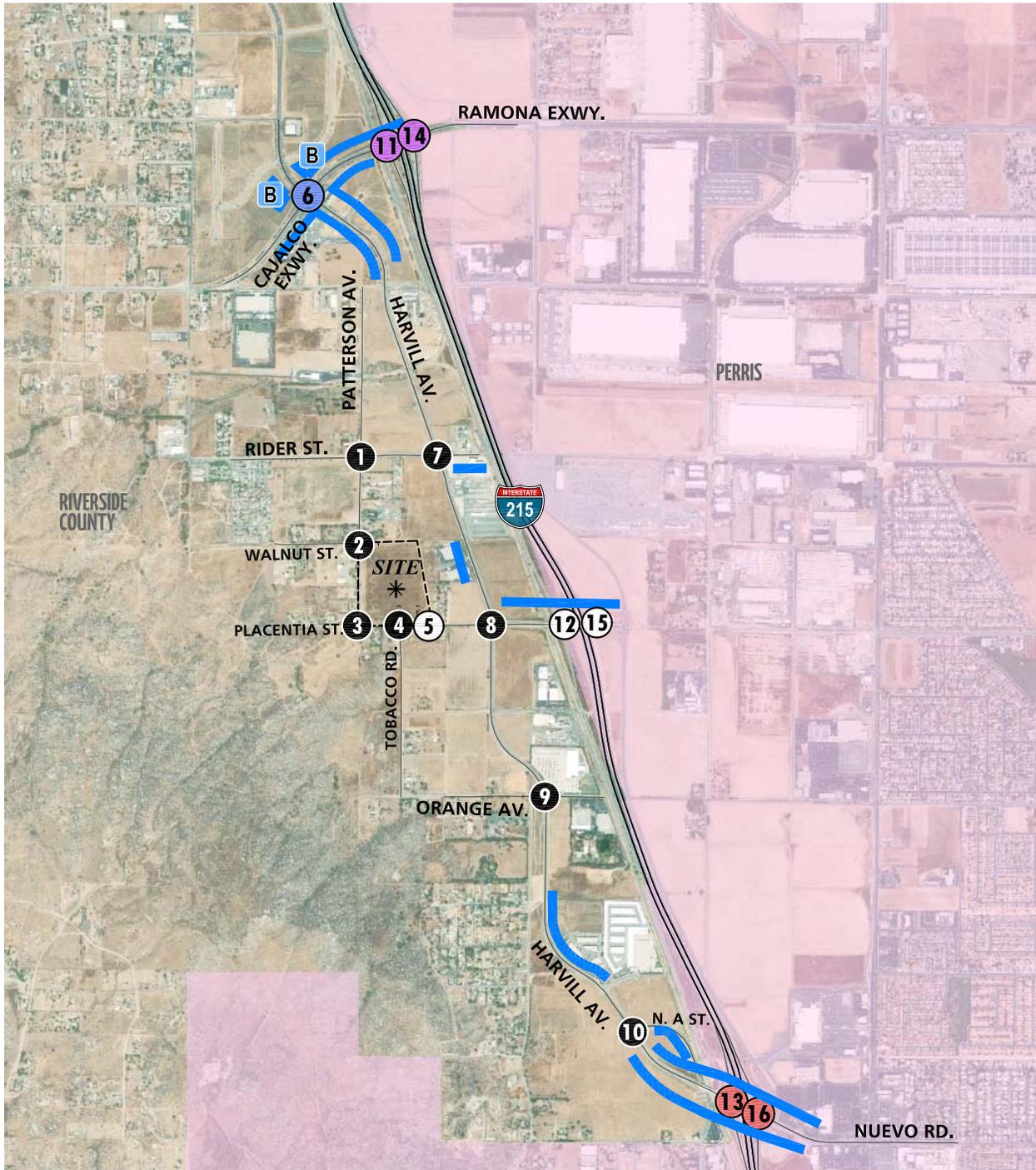
EXHIBIT 3-4: COUNTY OF RIVERSIDE TRAILS AND BIKEWAY SYSTEM



LEGEND:

- | | |
|--|---|
|  Regional Trail: Urban/Suburban |  Highways |
|  Community Trail |  Area Plan Boundary |
|  Class II Bike Path |  March Joint Powers Authority |
|  Non-County Trail (Public and Quasi-Public Lands) |  City Boundary |
| |  Waterbodies |
| |  Bureau of Land Management (BLM) Lands |

EXHIBIT 3-5: EXISTING PEDESTRIAN FACILITIES

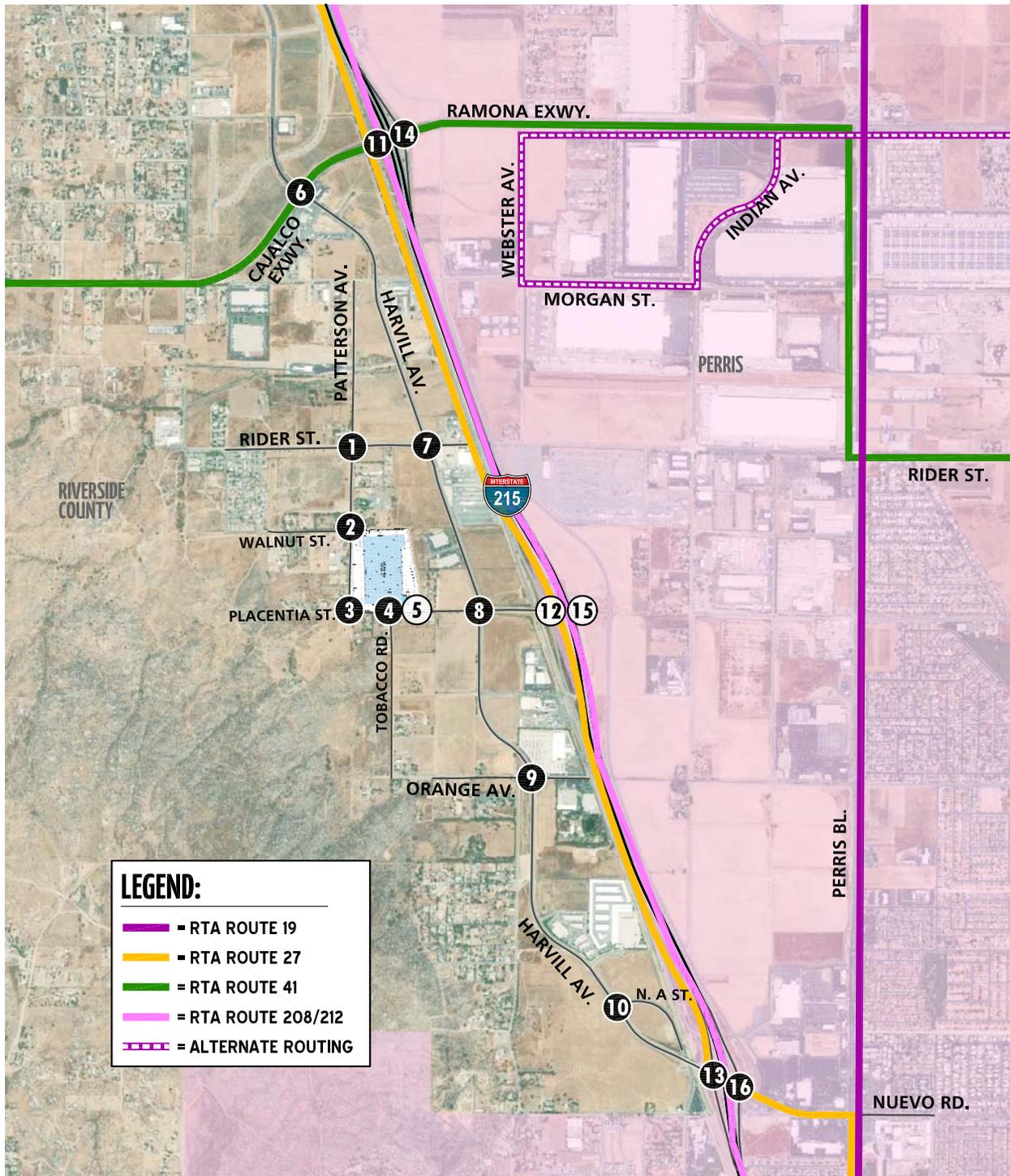


LEGEND:

- ▬ = SIDEWALK
- B = BUS STOP
- 0 = NO CROSSWALK
- 0 = FUTURE INTERSECTION
- 0 = CROSSWALK ON THREE APPROACHES
- 0 = CROSSWALK ON TWO APPROACHES
- 0 = CROSSWALK ON ONE APPROACH



EXHIBIT 3-6: EXISTING TRANSIT ROUTES



LEGEND:

- = RTA ROUTE 19
- = RTA ROUTE 27
- = RTA ROUTE 41
- = RTA ROUTE 208/212
- - - = ALTERNATE ROUTING



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

The raw manual peak hour turning movement traffic count data sheets are included in Appendix 3.1. These raw turning volumes have been flow conserved between intersections with limited access, no access, and where there are currently no uses generating traffic. The traffic counts collected in February 2019 include the vehicle classifications as shown below:

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

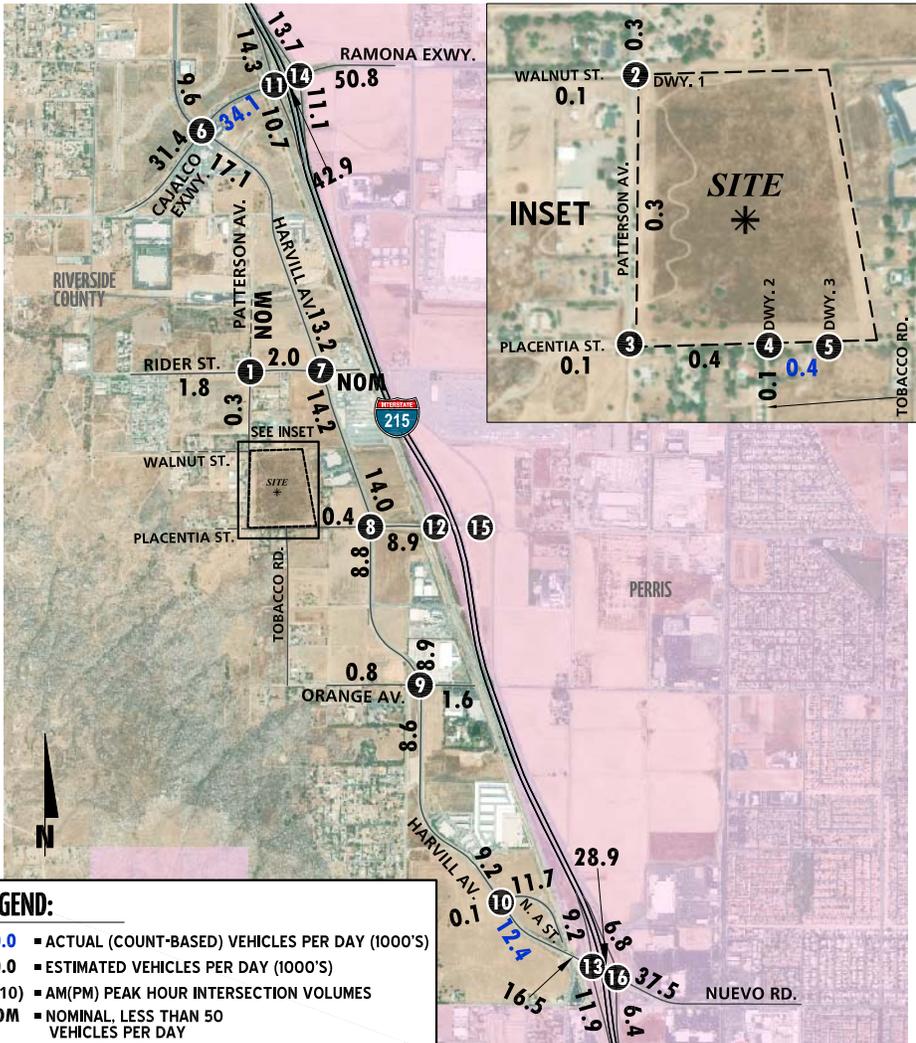
To represent the impact large trucks, buses, and recreational vehicles have on traffic flow, all trucks were converted into PCEs. By their size alone, these vehicles occupy the same space as two or more passenger cars. In addition, the time it takes for them to accelerate and slow-down is also much longer than for passenger cars and varies depending on the type of vehicle and number of axles. For this analysis, a PCE factor of 2.0 has been applied to 2-4 axle trucks and 3.0 for 5+-axle trucks to estimate each turning movement. These factors are consistent with the values recommended for use in the San Bernardino County CMP and are in excess of the factor recommended for use in the County of Riverside traffic study guidelines. (12) Although the County of Riverside has a recommended PCE factor of 2.0, the San Bernardino County CMP PCE factors have been utilized in an effort to conduct a more conservative analysis.

Existing weekday ADT volumes on arterial highways throughout the study area are shown on Exhibit 3-7. Where actual 24-hour tube count data was not available, Existing ADT volumes were based upon factored intersection peak hour counts collected by Urban Crossroads, Inc. using the following formula for each intersection leg:

$$\text{Weekday PM Peak Hour (Approach Volume + Exit Volume)} \times 14.66 = \text{Leg Volume}$$

A comparison of the PM peak hour and daily traffic volumes of various roadway segments within the study area indicated that the peak-to-daily relationship is approximately 6.822 percent. As such, the above equation utilizing a factor of 14.66 estimates the ADT volumes on the study area roadway segments assuming a peak-to-daily relationship of approximately 6.822 percent (i.e., $1/0.06822 = 14.66$) 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 also shown on Exhibit 3-7.

EXHIBIT 3-7: EXISTING (2019) TRAFFIC VOLUMES (IN PCE)



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

1 Patterson Av. & Rider St.	2 Patterson Av. & Walnut St./Dwy. 1
3 Patterson Av. & Placentia St.	4 Dwy. 2 & Placentia St.
5 Dwy. 3 & Placentia St.	6 Harvill Av. & Cajalco Exwy.
7 Harvill Av. & Rider St.	8 Harvill Av. & Placentia St.
9 Harvill Av. & Orange Av.	10 Harvill Av. & N. A St.
11 I-215 SB Ramps & Cajalco Exwy.	12 I-215 SB Ramps & Placentia Av.
13 I-215 SB Ramps & Nuevo Rd.	14 I-215 NB Ramps & Ramona Exwy.
15 I-215 NB Ramps & Placentia Av.	16 I-215 NB Ramps & Nuevo Rd.

3.6 INTERSECTION OPERATIONS ANALYSIS

Existing peak hour traffic operations have been evaluated for the study area intersections based on the analysis methodologies presented in Section 2.2 *Intersection Capacity Analysis* of this report. The intersection operations analysis results are summarized in Table 3-1 which indicates that the following study area intersection is currently operating at an unacceptable LOS during the peak hours (i.e., LOS E or worse) during one of both of the peak hours:

- Harvill Avenue & N. A Street (#10) – LOS F AM peak hour only

Consistent with Table 3-1, a summary of the peak hour intersection LOS for Existing conditions are shown on Exhibit 3-8. The intersection operations analysis worksheets are included in Appendix 3.2 of this TIA.

3.7 TRAFFIC SIGNAL WARRANTS ANALYSIS

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

- Harvill Avenue & Placentia Street (#8)
- Harvill Avenue & N. A Street (#10)

However, the intersection of Harvill Avenue and Placentia Avenue currently operates at an acceptable LOS as an all-way stop-controlled intersection. Existing conditions traffic signal warrant analysis worksheets are provided in Appendix 3.3.

3.8 OFF-RAMP QUEUING ANALYSIS

A queuing analysis was performed for the off-ramps at the I-215 Freeway Cajalco Expressway/Ramona Expressway and Harvill Avenue/Nuevo Road 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 result in “spill back” onto the I-215 Freeway mainline. Queuing analysis findings are presented in Table 3-2. It is important to note that off-ramp lengths are consistent with the measured distance between the intersection and the freeway mainline. As shown in Table 3-2, there are no movements that are currently experiencing queuing issues during the weekday AM or weekday PM peak 95th percentile traffic flows. Worksheets for Existing traffic conditions off-ramp queuing analysis are provided in Appendix 3.4.

Table 3-1

Intersection Analysis for Existing (2019) Conditions

#	Intersection	Traffic Control ³	Intersection Approach Lanes ¹												Delay ² (secs.)		Level of Service	
			Northbound			Southbound			Eastbound			Westbound			AM	PM	AM	PM
			L	T	R	L	T	R	L	T	R	L	T	R				
1	Patterson Av. & Rider St.	CSS	0	1	0	0	1	0	0	1	d	0	1	d	9.0	9.8	A	A
2	Patterson Av. & Walnut St./Dwy. 1	CSS	0	1	0	0	1	0	0	1	0	0	0	0	8.4	8.5	A	A
3	Patterson Av. & Placentia St.	CSS	0	0	0	0	1	0	0	1	0	0	1	0	8.7	8.6	A	A
4	Dwy. 2/Tobacco Rd. & Placentia St.	CSS	0	1	0	0	0	0	0	1	0	0	1	0	8.6	8.5	A	A
5	Dwy. 3 & Placentia St.		Future Intersection												Future Intersection			
6	Harvill Av. & Cajalco Exwy.	TS	2	2	0	2	2	0	1	2	1	2	2	1>	25.6	22.9	C	C
7	Harvill Av. & Rider St.	CSS	1	2	0	1	2	0	1	2	0	1	1	d	13.4	15.4	B	C
8	Harvill Av. & Placentia St.	AWS	1	2	0	1	2	0	0	1	0	0	1	1	16.4	14.0	C	B
9	Harvill Av. & Orange Av.	CSS	1	2	0	1	2	0	0	1	0	0	1	d	15.5	13.4	C	B
10	Harvill Av. & N. A St.	AWS	1	2	0	1	2	0	0	1	0	1	1	0	>100.0	16.7	F	C
11	I-215 SB Ramps & Ramona Exwy.	TS	0	0	0	1	1	1	0	2	d	1	2	0	23.4	28.6	C	C
12	I-215 SB Ramps & Placentia Av.		Does Not Exist												Does Not Exist			
13	I-215 SB Ramps & Nuevo Rd.	TS	0	0	0	1	1	1	0	2	0	2	2	0	17.6	33.5	B	C
14	I-215 NB Ramps & Ramona Exwy.	TS	1	1	1	0	0	0	1	2	0	0	2	d	25.3	14.0	C	B
15	I-215 NB Ramps & Placentia Av.		Does Not Exist												Does Not Exist			
16	I-215 NB Ramps & Nuevo Rd.	TS	0	1	2	0	0	0	1	2	0	0	3	1	18.0	10.1	B	B

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

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

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

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

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

Table 3-2

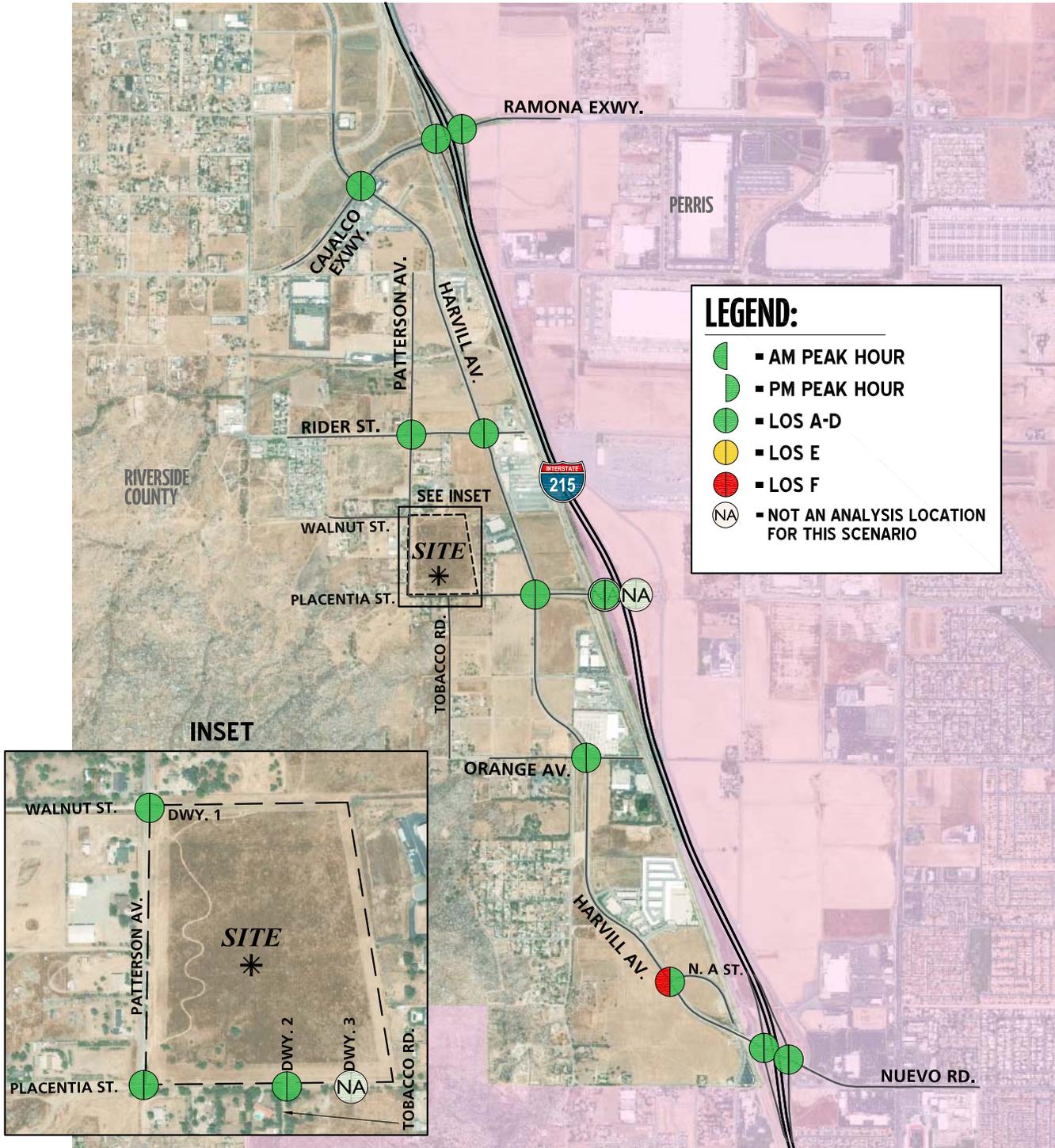
Peak Hour Freeway Off-Ramp Queuing Summary for Existing (2019) Conditions

Intersection	Movement	Available Stacking Distance (Feet)	95th Percentile Queue (Feet)		Acceptable? ¹	
			AM Peak Hour	PM Peak Hour	AM	PM
I-215 Southbound Ramps & Ramona Exwy.	SBL	530	265 ²	286 ²	Yes	Yes
	SBL/T	1,100	267 ²	290 ²	Yes	Yes
	SBR	530	63	36	Yes	Yes
I-215 Southbound Ramps & Nuevo Rd.	SBL	1,020	116 ²	249 ²	Yes	Yes
	SBL/T	1,020	121 ²	252 ²	Yes	Yes
	SBR	300	19	8	Yes	Yes
I-215 Northbound Ramps & Ramona Exwy.	NBL	520	93	110	Yes	Yes
	NBL/T	1,120	91	112	Yes	Yes
	NBR	520	265 ²	235 ²	Yes	Yes
I-215 Northbound Ramps & Nuevo Rd.	NBL/T	1,010	171	64	Yes	Yes
	NBR	300	110	65	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.

EXHIBIT 3-8: EXISTING (2019) SUMMARY OF LOS



3.9 FREEWAY FACILITY ANALYSIS

Existing (2019) mainline directional volumes for the AM and PM peak hours are provided on Exhibit 3-9. As shown in Table 3-3, the I-215 Freeway segments analyzed for this study currently operate at an unacceptable LOS (i.e., LOS E or worse) during the peak hours for Existing (2019) traffic conditions:

- I-215 Freeway Northbound, North of Ramona Exwy. – LOS E AM peak hour only (#11)
- I-215 Freeway Northbound, Ramona Exwy. to Nuevo Rd. – LOS E AM peak hour only (#20)

The ramp merge/diverge junctions are currently operating at an acceptable LOS (i.e., LOS D or better) during one or both peak hours.

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

Field observations indicate constrained flow conditions during the AM peak hour in the northbound direction on the I-215 Freeway. According to the Caltrans PeMS data, the I-215 Northbound has an average speed of 25 miles per hour during the AM peak hour. The freeway is slow moving, therefore, fewer vehicles are passing by and being reported in the PeMS data. The LOS for the I-215 Freeway mainline analyses is based on the PeMS data and HCS7 software.

3.10 RECOMMENDED IMPROVEMENTS

3.10.1 INTERSECTIONS

The following improvements are needed to improve the Existing (2019) peak hour deficiency back to acceptable levels.

Harvill Avenue & N. A Street (#10)

- Install a Traffic Signal.
- Add a northbound right turn lane with overlap phasing.

Resulting analysis of the above improvements at the respective intersection has rectified the deficiency and resulted in an acceptable LOS (see Table 3-4). The intersection operations analysis worksheets with improvements are included in Appendix 3.6 of this TIA.

3.10.2 FREEWAY FACILITIES

At this time, Caltrans has no near-term fee programs or other improvement programs in place to address the deficiencies on the SHS freeway facilities. As such, no improvements have been recommended to address the Existing (2019) deficiencies on the SHS.

Table 3-3

Freeway Facility Analysis for Existing (2019) Conditions

Freeway	Direction	Segment	Lanes ¹	Density ²		LOS ³	
				AM	PM	AM	PM
I-215 Freeway	Southbound	North of Ramona Exwy.	3	18.9	27.9	B	D
		SB Off-Ramp at Ramona Exwy.	3	27.1	33.9	C	D
		SB On-Ramp at Ramona Exwy.	3	21.8	29.2	C	D
		Ramona Exwy. to Nuevo Rd.	3	18.1	26.7	B	D
		SB Off-Ramp at Nuevo Rd.	3	25.0	32.4	C	D
		SB On-Ramp at Nuevo Rd.	3	15.5	21.9	B	C
		South of Nuevo Rd.	4	14.0	19.7	B	B
	Northbound	North of Ramona Exwy.	3	42.1	21.9	E	C
		NB On-Ramp at Ramona Exwy.	3	31.7	26.1	D	C
		NB Off-Ramp at Ramona Exwy.	3	31.6	28.6	D	D
		Ramona Exwy. to Nuevo Rd.	3	39.4	21.4	E	C
		NB On-Ramp at Nuevo Rd.	3	28.1	24.9	D	C
		NB Off-Ramp at Nuevo Rd.	4	30.7	15.4	D	B
		South of Nuevo Rd.	4	31.6	15.7	D	B

* **BOLD** = Unacceptable Level of Service

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

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

³ LOS = Level of Service

Table 3-4

Intersection Analysis for Existing (2019) Conditions With Improvements

#	Intersection	Traffic Control ³	Intersection Approach Lanes ¹												Delay ² (secs.)		Level of Service	
			Northbound			Southbound			Eastbound			Westbound			AM	PM	AM	PM
			L	T	R	L	T	R	L	T	R	L	T	R				
10	Harvill Av. & N. A St.																	
	Without Improvements:	AWS	1	2	0	1	2	0	0	1	0	1	1	0	>100.0	16.7	F	C
	With Improvements:	TS	1	2	1>	1	2	0	0	1	0	1	1	0	20.3	13.8	C	B

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

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

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

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

EXHIBIT 3-9: EXISTING (2019) FREEWAY MAINLINE VOLUMES



LEGEND:

← 100/200 = AM/PM PEAK HOUR VOLUMES

NOTE: VOLUMES IN ACTUAL VEHICLES (NOT PCE)



4 PROJECTED FUTURE TRAFFIC

This section presents the traffic volumes estimated to be generated by the Project, as well as the Project's trip assignment, onto the study area roadway network. The Project is proposed to consist of up to 699,630 sf of high-cube fulfillment center use. The Project is anticipated to be constructed in a single phase by the year 2021. Vehicular and truck traffic access will be provided via the following driveways (see Exhibit 1-1):

- Patterson Avenue and Walnut Street via Driveway 1 – full access for passenger cars and trucks
- Placentia Avenue via Driveway 2 – full access for passenger cars only
- Placentia Avenue via Driveway 3 – full access for passenger cars and trucks

Regional access to the Project site is available from the I-215 Freeway via Cajalco Expressway/Ramona Expressway, Harvill Avenue/Nuevo Road, and the future interchange at Placentia Avenue.

4.1 PROJECT TRIP GENERATION

Trip generation represents the amount of traffic that is attracted and produced by a development and is based upon the specific land uses planned for a given project. Trip generation rates (PCE) for the Project are shown in Table 4-1 and trip generation rates (actual vehicles) for the Project are shown in Table 4-2 illustrating daily and peak hour trip generation estimates based on the trip-generation statistics published in the DRAFT TUMF High-Cube Warehouse Trip Generation Study (WSP, November 6, 2018) which was commissioned by Western Riverside Council of Governments (WRCOG) in support of the TUMF update. However, the WSP study does not include a vehicle split, as such, the vehicle splits per the Institute of Transportation Engineers (ITE) High-Cube Warehouse Vehicle Trip Generation Analysis (October 2016) have been utilized. Trip generation rates for the Project are shown in Table 4-1 for both passenger car equivalent (PCE) and actual vehicles. (13) The trip generation summary illustrating daily and peak hour trip generation estimates for the proposed Project in actual vehicles and PCE are shown in Table 4-2.

Finally, 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 Congestion Management Program (CMP) (2016 Update), as these factors are more conservative than Riverside County's PCE factor of 2.0 for heavy trucks.

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	
Actual Vehicle Trip Generation Rates									
High-Cube Fulfillment Center Warehouse	TSF	--	0.098	0.029	0.127	0.048	0.123	0.171	2.209
		Passenger Cars	0.082	0.025	0.107	0.042	0.107	0.149	1.816
		2-4 Axle Trucks	0.006	0.002	0.008	0.003	0.008	0.011	0.168
		5+-Axle Trucks	0.009	0.003	0.012	0.003	0.008	0.011	0.225
Passenger Car Equivalent (PCE) Trip Generation Rates³									
High-Cube Fulfillment Center Warehouse	TSF	--	0.098	0.029	0.127	0.048	0.123	0.171	2.209
		Passenger Cars	0.082	0.025	0.107	0.042	0.107	0.149	1.816
		2-4 Axle Trucks (PCE = 2.0)	0.012	0.004	0.016	0.006	0.016	0.022	0.336
		5+-Axle Trucks (PCE = 3.0)	0.028	0.008	0.036	0.009	0.024	0.033	0.675

¹ Vehicle Mix Source: DRAFT TUMF High Cube Warehouse Trip Generation Study, WSP, November 6, 2018.

Inbound and outbound split source: High Cube Warehouse Vehicle Trip Generation Analysis October 2016, ITE.

² TSF = thousand square feet

³ PCE rates are per SBCTA.

Table 4-2

Project Trip Generation Summary

Land Use	Quantity	Units ¹	AM Peak Hour			PM Peak Hour			Daily
			In	Out	Total	In	Out	Total	
Actual Vehicles									
High-Cube Fulfillment Center Warehouse	699.630	TSF							
Passenger Cars:			58	17	75	29	75	104	1,272
Truck Trips:									
2-4 axle:			4	1	5	2	6	8	118
5+-axle:			6	2	8	2	6	8	158
- Net Truck Trips			10	3	13	4	12	16	276
FULFILLMENT CENTER TOTAL NET TRIPS (Actual Vehicles)²			68	20	88	33	87	120	1,548
Passenger Car Equivalent (PCE)									
High-Cube Fulfillment Center Warehouse	699.630	TSF							
Passenger Cars:			58	17	75	29	75	104	1,272
Truck Trips:									
2-4 axle:			9	3	12	4	11	15	236
5+-axle:			19	6	25	6	17	23	472
- Net Truck Trips			28	9	37	10	28	38	708
FULFILLMENT CENTER TOTAL NET TRIPS (PCE)²			86	26	112	39	103	142	1,980

¹ TSF = thousand square feet

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

As noted in Table 4-1 and Table 4-2, refinements to the raw trip generation estimates have been made to provide a more detailed breakdown of trips between passenger cars and trucks. Trip generation for heavy trucks was further broken down by truck type (or axle type). The total truck percentage is comprised of 2 different truck types: 2-4 axle, and 5+-axle trucks. PCE factors were applied to the trip generation rates for heavy trucks (large 2-4 axles, 5+-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 Congestion Management Program (CMP), 2016 Update. (12) Note that these procedures are consistent with those adopted by the County of Riverside for warehouse projects, with the exception of the PCE factors, where the San Bernardino County CMP factors have been utilized in an effort to conduct a conservative analysis.

The Project is estimated to generate a net total of 1,980 PCE trip-ends per day on a typical weekday with approximately 112 net AM PCE peak hour trips and 142 net PM PCE peak hour trips, as shown in Table 4-2. The proposed Project's trip generation, based on actual vehicles, has also been included in Table 4-2 for informational purposes only.

4.2 PROJECT TRIP DISTRIBUTION

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

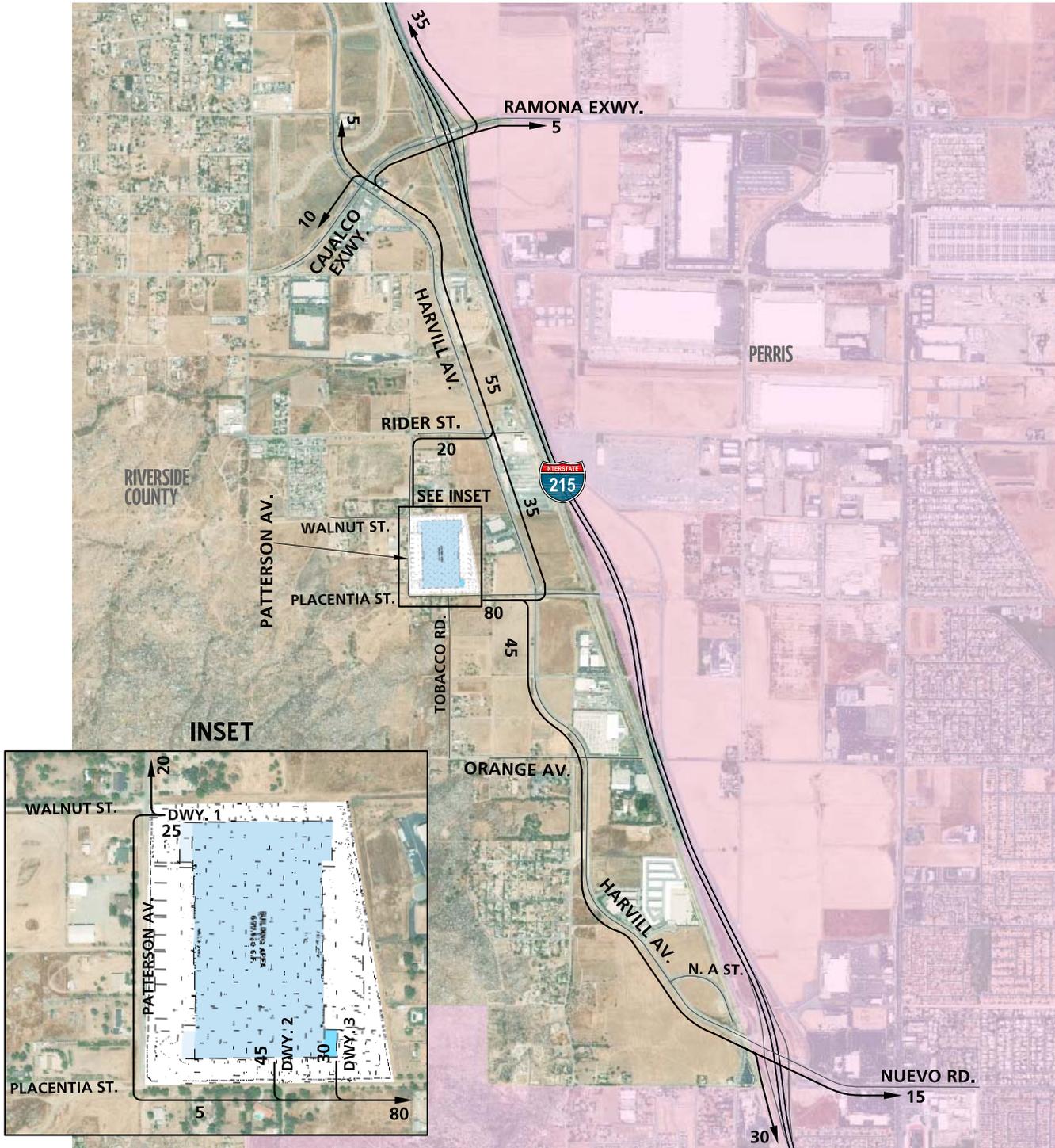
The Project trip distribution was developed based on anticipated travel patterns to and from the Project site for both passenger cars and truck traffic and are consistent with other similar projects that have been reviewed and approved by County of Riverside staff. The Project trip distribution patterns for both passenger cars and trucks were developed based on an understanding of existing travel patterns in the area, the geographical location of the site, and the site's proximity to the regional arterial and state highway system. Each of these distribution patterns were reviewed by the County of Riverside as part of the traffic study scoping process (see Appendix 1.1).

The Project passenger car trip distribution patterns are graphically depicted on Exhibit 4-1 and 4-3 for without and with the proposed future I-215/Placentia Avenue Interchange traffic conditions, respectively. The Project truck trip distribution patterns are graphically depicted on Exhibit 4-2 and 4-4 for without and with the proposed future I-215/Placentia Avenue Interchange traffic conditions, respectively.

4.3 MODAL SPLIT

The traffic reducing potential of public transit, walking, or bicycling have not been considered in this TIA. Essentially, the traffic projections are "conservative" in that these alternative travel modes might be able to reduce the forecasted traffic volumes (employee trips only).

EXHIBIT 4-1: PROJECT (PASSENGER CAR) (WITHOUT I-215/PLACENTIA INTERCHANGE) TRIP DISTRIBUTION

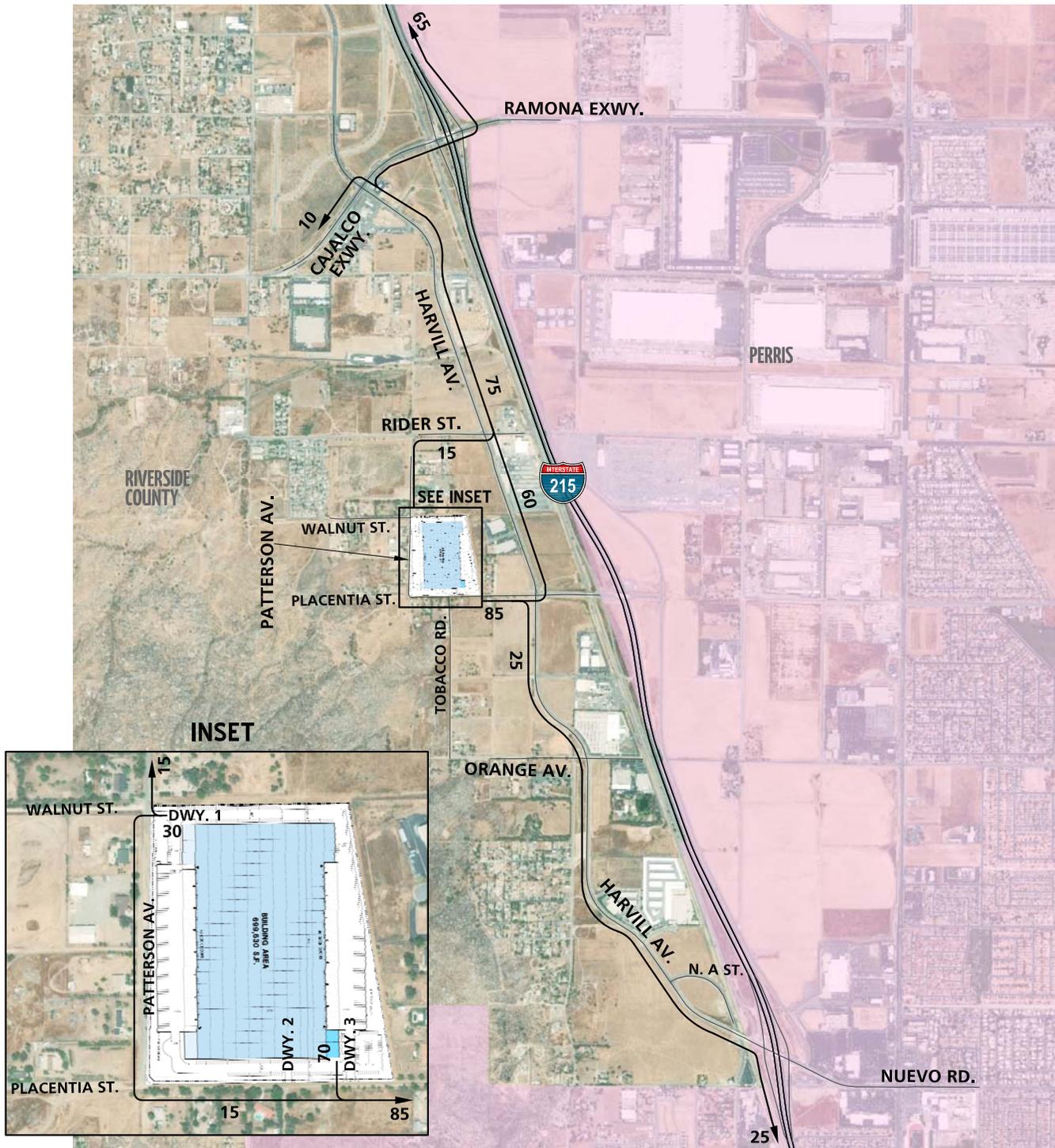


LEGEND:

10 = PERCENT TO/FROM PROJECT



EXHIBIT 4-2: PROJECT (TRUCK) (WITHOUT I-215/PLACENTIA INTERCHANGE) TRIP DISTRIBUTION

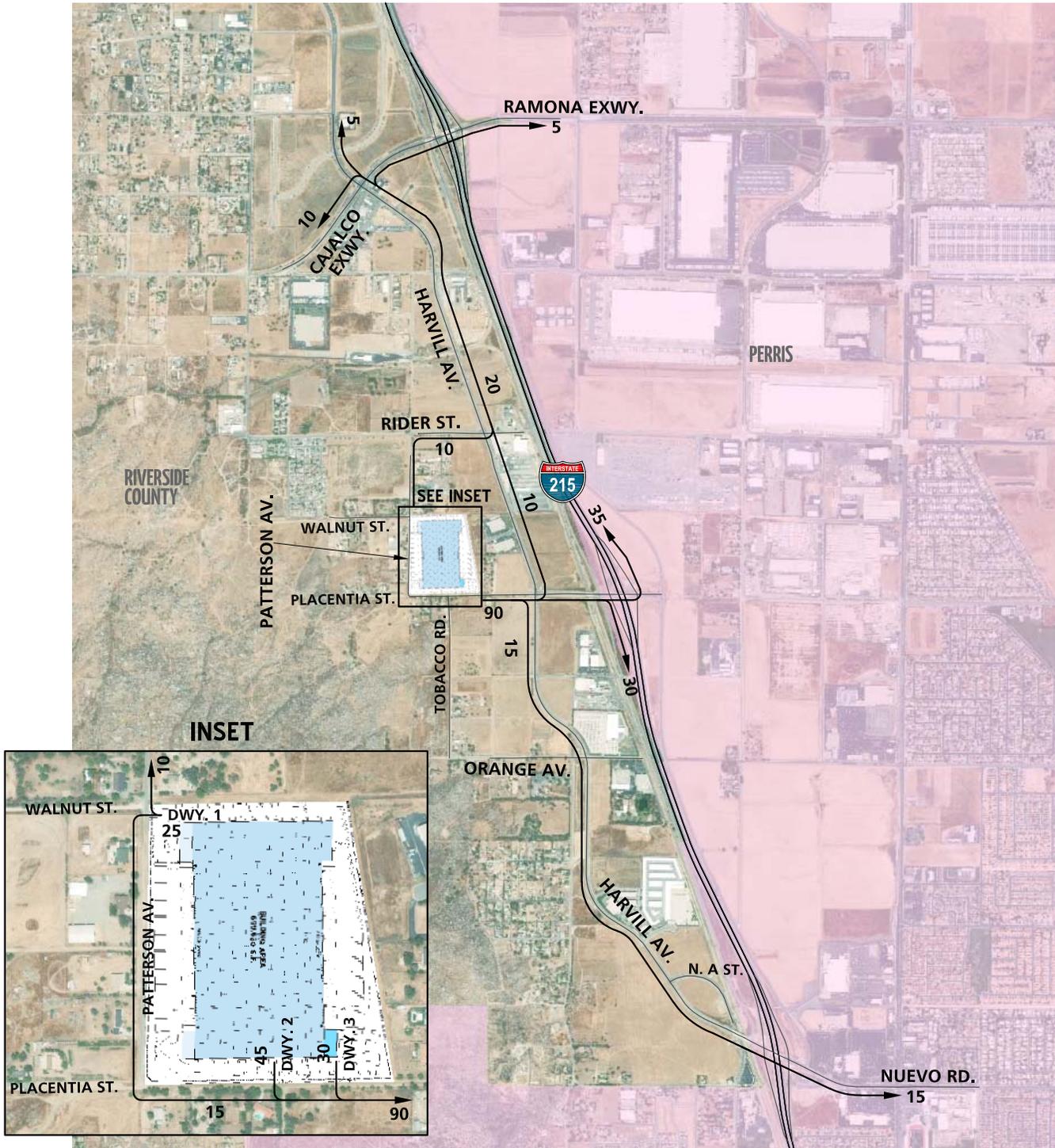


LEGEND:

10 = PERCENT TO/FROM PROJECT



EXHIBIT 4-3: PROJECT (PASSENGER CAR) (WITH I-215/PLACENTIA INTERCHANGE) TRIP DISTRIBUTION

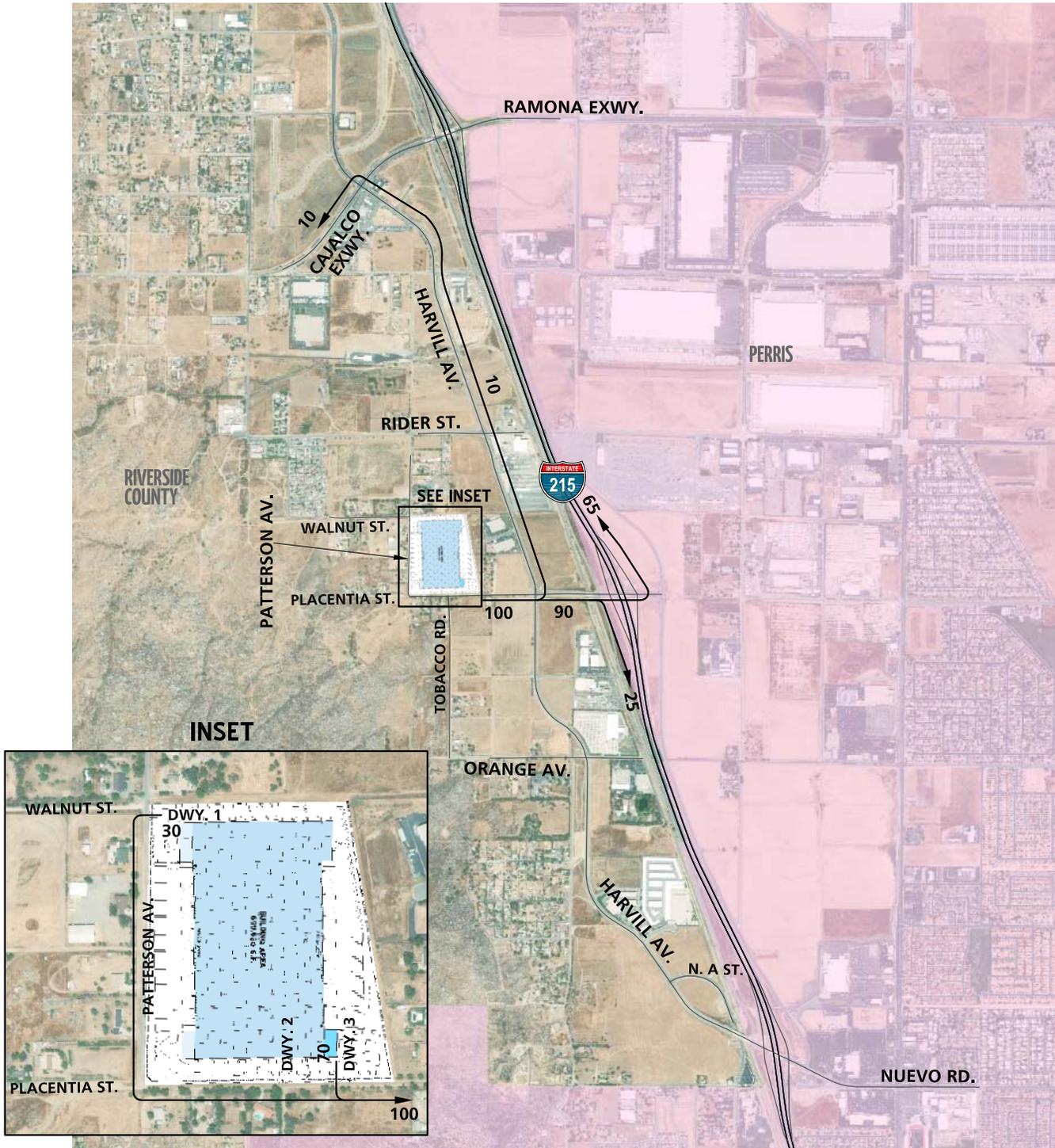


LEGEND:

10 = PERCENT TO/FROM PROJECT



EXHIBIT 4-4: PROJECT (TRUCK) (WITH I-215/PLACENTIA INTERCHANGE) TRIP DISTRIBUTION



LEGEND:

10 = PERCENT TO/FROM PROJECT



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 in PCE are shown on Exhibit 4-5 and Exhibits 4-6, without and with the proposed I-215/Placentia Interchange, respectively.

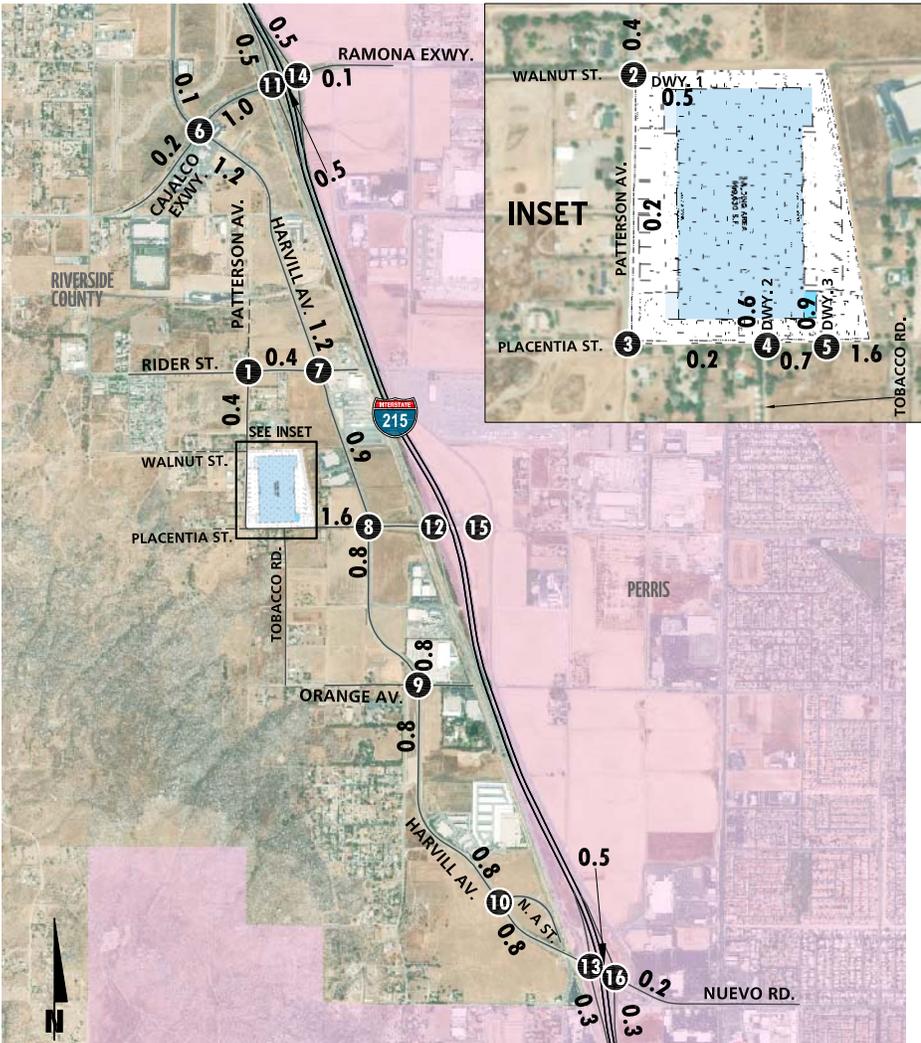
4.5 BACKGROUND TRAFFIC

Future year traffic forecasts have been based upon a background (ambient) growth factor of 2% per year for 2021 traffic conditions. The ambient growth factor is intended to approximate traffic growth. The total ambient growth is 4.04% for 2021 traffic conditions (compounded growth of 2 percent per year over 2 years). This ambient growth rate is added to existing traffic volumes to account for area-wide growth not reflected by cumulative development projects. Ambient growth has been added to daily and peak hour traffic volumes on surrounding roadways.

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.

The currently adopted Southern California Association of Governments (SCAG) 2016 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS) (April 2016) growth forecasts for the County of Riverside identifies projected growth in population of 359,500 in 2012 to 499,200 in 2040, or a 39.1 percent increase over the 28-year period. (14) The change in population equates to roughly a 1.18 percent growth rate, compounded annually. Similarly, growth over the same 28-year period in households is projected to increase by 45.1 percent, or 1.33 percent annual growth rate. Finally, growth in employment over the same 28-year period is projected to increase by 122.1 percent, or a 2.89 percent annual growth rate.

EXHIBIT 4-5: PROJECT ONLY (WITHOUT I-215/PLACENTIA INTERCHANGE) TRAFFIC VOLUMES (IN PCE)

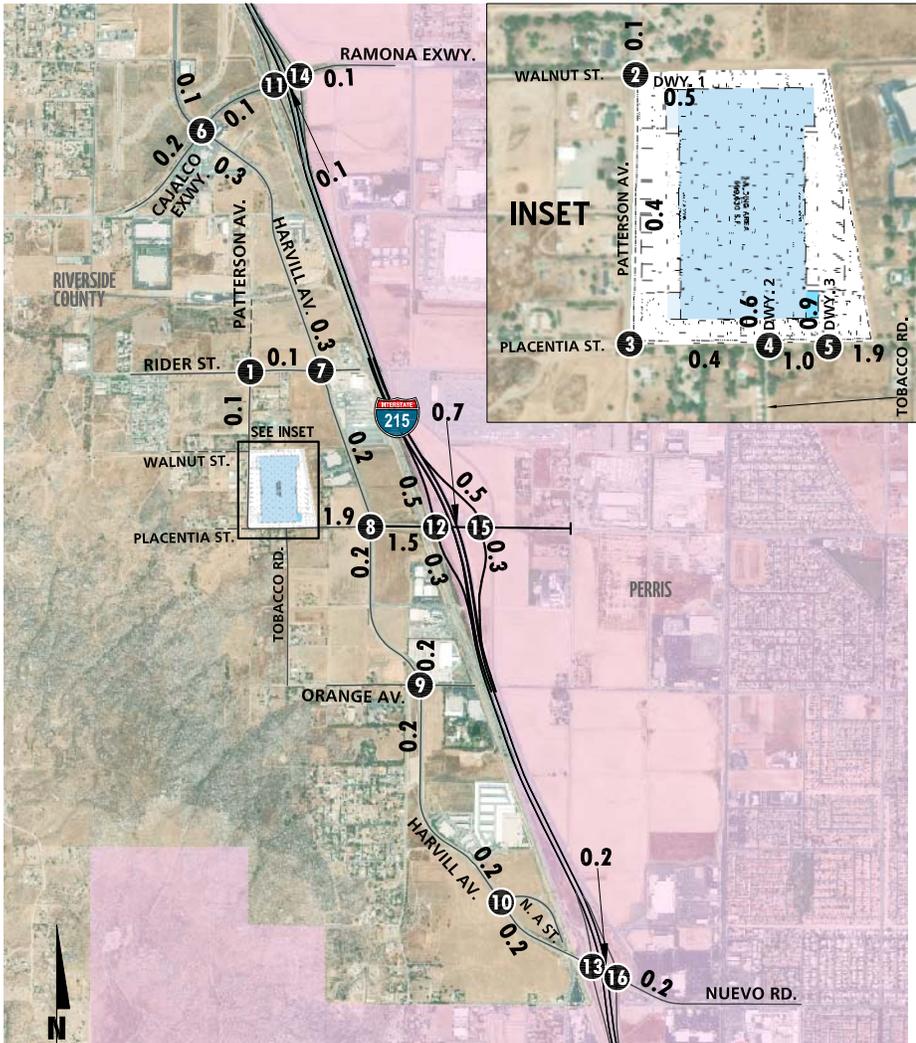


LEGEND:

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

<p>1 Patterson Av. & Rider St.</p>	<p>2 Patterson Av. & Walnut St./Dwy. 1</p>			
<p>3 Patterson Av. & Placentia St.</p>	<p>4 Dwy. 2 & Placentia St.</p>			
<p>5 Dwy. 3 & Placentia St.</p>	<p>6 Harvill Av. & Cajalco Exwy.</p>			
<p>7 Harvill Av. & Rider St.</p>	<p>8 Harvill Av. & Placentia St.</p>	<p>9 Harvill Av. & Orange Av.</p>	<p>10 Harvill Av. & N. A. St.</p>	<p>11 I-215 SB Ramps & Cajalco Exwy.</p>
<p>12 I-215 SB Ramps & Placentia Av.</p> <p>Future Intersection</p>	<p>13 I-215 SB Ramps & Nuevo Rd.</p>	<p>14 I-215 NB Ramps & Ramona Exwy.</p>	<p>15 I-215 NB Ramps & Placentia Av.</p> <p>Future Intersection</p>	<p>16 I-215 NB Ramps & Nuevo Rd.</p>

EXHIBIT 4-6: PROJECT ONLY (WITH I-215/PLACENTIA INTERCHANGE) TRAFFIC VOLUMES (IN PCE)



LEGEND:

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

<p>1 Patterson Av. & Rider St.</p>	<p>2 Patterson Av. & Walnut St./Dwy. 1</p>			
<p>3 Patterson Av. & Placentia St.</p>	<p>4 Dwy. 2 & Placentia St.</p>			
<p>5 Dwy. 3 & Placentia St.</p>	<p>6 Harvill Av. & Cajalco Exwy.</p>			
<p>7 Harvill Av. & Rider St.</p>	<p>8 Harvill Av. & Placentia St.</p>	<p>9 Harvill Av. & Orange Av.</p>	<p>10 Harvill Av. & N. A St.</p>	<p>11 I-215 SB Ramps & Cajalco Exwy.</p>
<p>12 I-215 SB Ramps & Placentia Av.</p>	<p>13 I-215 SB Ramps & Nuevo Rd.</p>	<p>14 I-215 NB Ramps & Ramona Exwy.</p>	<p>15 I-215 NB Ramps & Placentia Av.</p>	<p>16 I-215 NB Ramps & Nuevo Rd.</p>

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 County of Riverside. The cumulative project list includes known and foreseeable projects that are anticipated to contribute traffic to the study area intersections. Adjacent jurisdictions of the City of Perris (15) and the City of Moreno Valley (16) have also been contacted to obtain the most current list of cumulative projects from their respective jurisdictions.

Where applicable, cumulative projects anticipated to contribute measurable traffic (i.e. 50 or more peak hour trips) to study area intersections have been manually added to the study area network to generate EAPC forecasts. In other words, this list of cumulative development projects has been reviewed to determine which projects would likely contribute measurable traffic through the study area intersections (e.g., those cumulative projects in close proximity to the proposed Project). For the purposes of this analysis, the cumulative projects that were determined to affect one or more of the study area intersections are shown on Exhibit 4-7, listed in Table 4-3, and have been considered for inclusion.

Although it is unlikely that all of these cumulative projects would be fully built and occupied by Year 2021, they have been included in an effort to conduct a conservative analysis and overstate as opposed to understate potential traffic impacts.

Any other cumulative projects located beyond the cumulative study area that are not expected to contribute measurable traffic to study area intersections have not been included since the traffic would dissipate due to the distance from the Project site and study area intersections. Any additional traffic generated by other projects not on the cumulative projects list is accounted for through background ambient growth factors that have been applied to the peak hour volumes at study area intersections as discussed in Section 4.5 *Background Traffic*. Cumulative Only traffic volumes in PCE Without and With I-215/Placentia Interchange are shown on Exhibit 4-8 and 4-9.

EXHIBIT 4-7: CUMULATIVE DEVELOPMENT LOCATION MAP

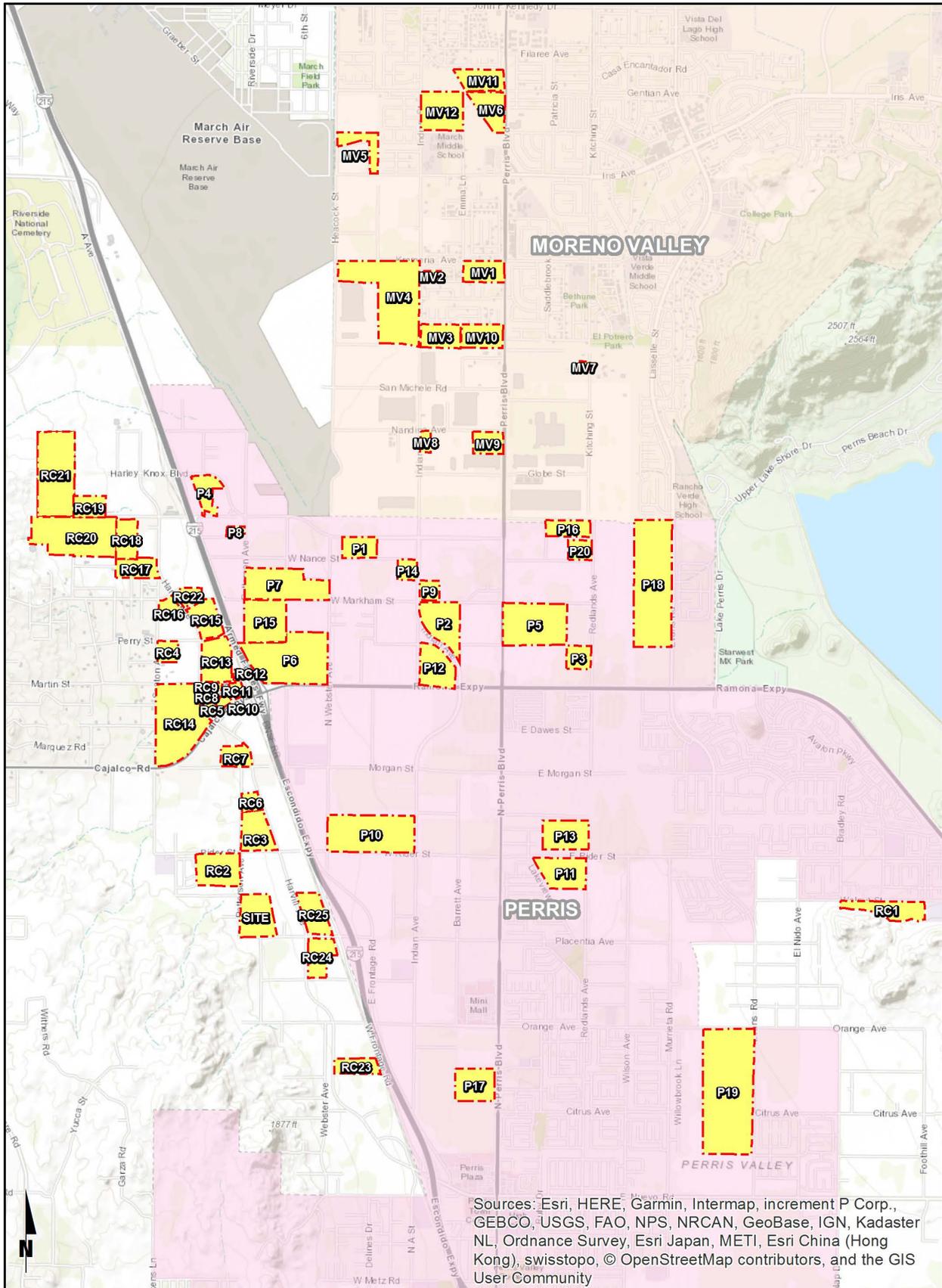
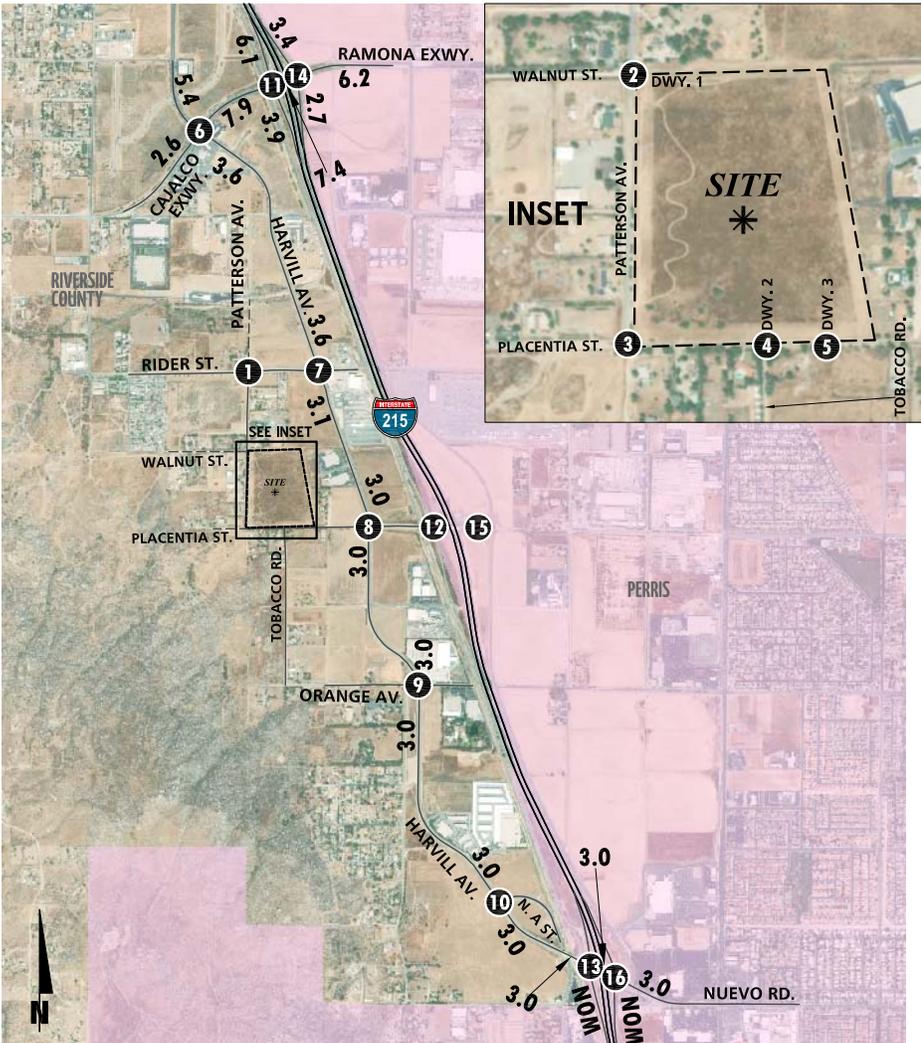


EXHIBIT 4-8: CUMULATIVE ONLY (WITHOUT I-215/PLACENTIA INTERCHANGE) TRAFFIC VOLUMES (IN PCE)

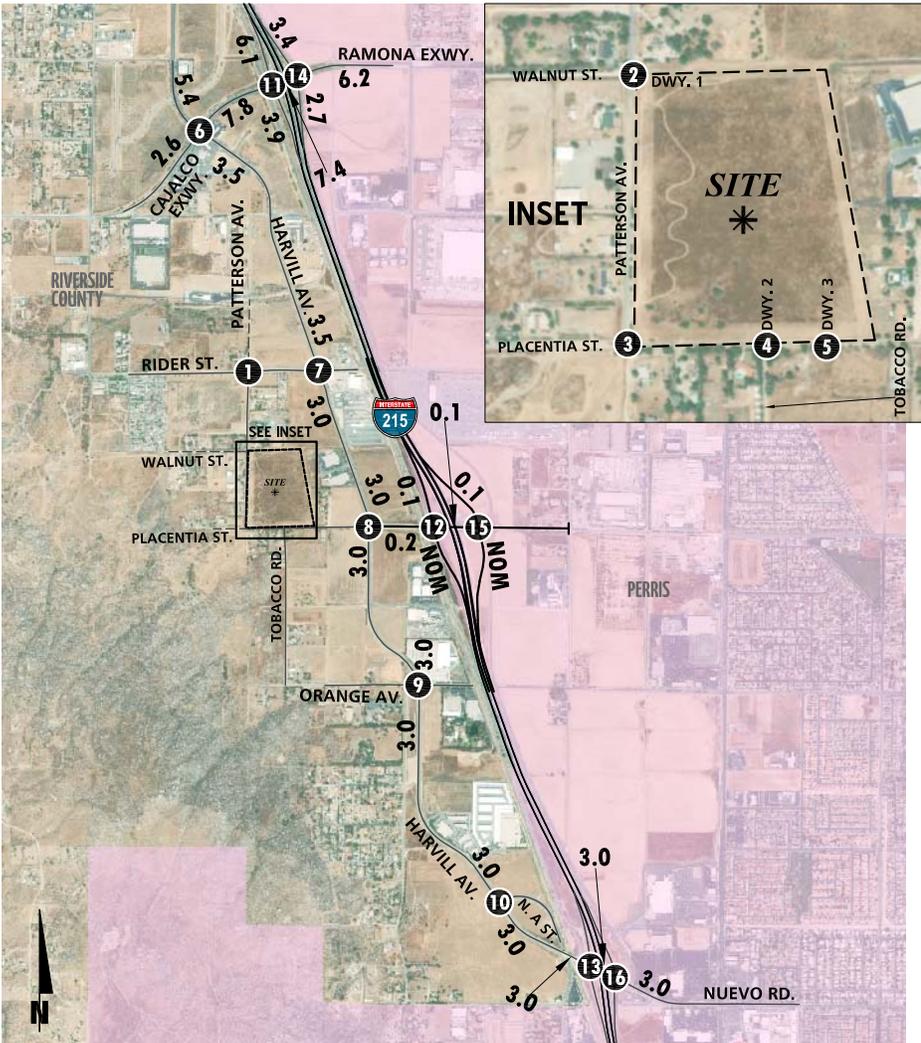


LEGEND:

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

<p>1 Patterson Av. & Rider St.</p>	<p>2 Patterson Av. & Walnut St./Dwy. 1</p>
<p>3 Patterson Av. & Placentia St.</p>	<p>4 Dwy. 2 & Placentia St.</p>
<p>5 Dwy. 3 & Placentia St.</p> <p>Future Intersection</p>	<p>6 Harvill Av. & Cajalco Exwy.</p>
<p>7 Harvill Av. & Rider St.</p>	<p>8 Harvill Av. & Placentia St.</p>
<p>9 Harvill Av. & Orange Av.</p>	<p>10 Harvill Av. & N. A St.</p>
<p>11 I-215 SB Ramps & Cajalco Exwy.</p>	
<p>12 I-215 SB Ramps & Placentia Av.</p> <p>Future Intersection</p>	<p>13 I-215 SB Ramps & Nuevo Rd.</p>
<p>14 I-215 NB Ramps & Ramona Exwy.</p>	<p>15 I-215 NB Ramps & Placentia Av.</p> <p>Future Intersection</p>
<p>16 I-215 NB Ramps & Nuevo Rd.</p>	

EXHIBIT 4-9: CUMULATIVE ONLY (WITH I-215/PLACENTIA INTERCHANGE) TRAFFIC VOLUMES (IN PCE)



LEGEND:

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

<p>1 Patterson Av. & Rider St.</p>	<p>2 Patterson Av. & Walnut St./Dwy. 1</p>
<p>3 Patterson Av. & Placentia St.</p>	<p>4 Dwy. 2 & Placentia St.</p>
<p>5 Dwy. 3 & Placentia St.</p> <p>Future Intersection</p>	<p>6 Harvill Av. & Cajalco Exwy.</p>
<p>7 Harvill Av. & Rider St.</p>	<p>8 Harvill Av. & Placentia St.</p>
<p>9 Harvill Av. & Orange Av.</p>	<p>10 Harvill Av. & N. A. St.</p>
<p>11 I-215 SB Ramps & Cajalco Exwy.</p>	
<p>12 I-215 SB Ramps & Placentia Av.</p>	<p>13 I-215 SB Ramps & Nuevo Rd.</p>
<p>14 I-215 NB Ramps & Ramona Exwy.</p>	<p>15 I-215 NB Ramps & Placentia Av.</p>
<p>16 I-215 NB Ramps & Nuevo Rd.</p>	

Table 4-3
Page 1 of 2

Cumulative Development Land Use Summary

No.	Project Name / Case Number	Land Use ¹	Quantity	Units ²	Location
Riverside County					
RC1	McCanna Hills / TTM 33978	SFDR	63	DU	SWC OF SHERMAN AVE. & WALNUT AVE.
RC2	PP26293	High-Cube Warehouse	612,481	TSF	SWC OF PATTERSON AVE. & RIDER ST.
RC3	PPT180023: Rider Commerce Center	Warehousing	204,330	TSF	NEC OF PATTERSON AVE. & RIDER ST.
RC4	PPT180025: Seaton Commerce Center	High-Cube Warehouse	210,800	TSF	SEC OF SEATON AV. & PERRY ST.
RC5	Farmer Boys/Retail Shop	Retail	16,306	TSF	NEC OF HARVILL AVE. & CAJALCO RD.
		Fast-Food with Drive Thru	3,252	TSF	
RC6	PP26173	High-Cube Warehouse	423,665	TSF	SWC OF HARVILL AVE. & RIDER ST.
RC7	Val Verde Logistics Center	High-Cube Warehouse	280,308	TSF	NWC OF HARVILL AVE. & OLD CAJALCO RD.
RC8	Majestic Freeway Business Center - Building 5	Warehousing	40,000	TSF	NEC OF HARVILL AVE. & MESSENERIA LN.
RC9	Majestic Freeway Business Center - Building 6	Warehousing	72,000	TSF	NORTH OF MESSENERIA LN., EAST OF HARVILL AVE.
RC10	Majestic Freeway Business Center - Building 7	Warehousing	80,000	TSF	NORTH OF CAJALCO EXWY., EAST OF HARVILL AVE.
RC11	Majestic Freeway Business Center - Building 8	Warehousing	110,000	TSF	NORTH OF CAJALCO EXWY., EAST OF HARVILL AVE.
RC12	Majestic Freeway Business Center - Building 9	Warehousing	45,000	TSF	EAST OF MESSENERIA LN., NORTH OF HARVILL AVE.
RC13	Majestic Freeway Business Center - Building 10	High-Cube Warehouse	600,000	TSF	SEC OF HARVILL AVE. & PERRY ST.
RC14	Majestic Freeway Business Center - Buildings 1, 3 & 4	Warehousing	48,930	TSF	NWC OF HARVILL AVE. & CAJALCO RD.
		High-Cube Warehouse	1,195,740	TSF	
RC15	Majestic Freeway Business Center - Building 11	High-Cube Warehouse	391,045	TSF	NEC OF HARVILL AVE. & PERRY ST.
RC16	Majestic Freeway Business Center - Building 15	Warehousing	90,279	TSF	NWC OF HARVILL AVE. & COMMERCE CENTER DR.
RC17	Majestic Freeway Business Center - Building 19	Warehousing	364,560	TSF	SWC OF HARVILL AVE. & OLD OLEANDER AVE.
RC18	Majestic Freeway Business Center - Building 20	Warehousing	425,830	TSF	SWC OF HARVILL AVE. & OLD OLEANDER AVE.
RC19	Majestic Freeway Business Center - Building 21,22	Warehousing	241,059	TSF	NEC OF DECKER RD. & OLD OLEANDER AVE.
RC20	Knox Logistics Center	High-Cube Warehouse	1259,410	TSF	NWC OF DECKER RD. & OLD OLEANDER AVE.
RC21	Oleander Business Park	High-Cube Warehouse	680,000	TSF	NWC OF DECKER RD. & HARLEY KNOX BLVD.
RC22	Majestic Freeway Business Center - Building 12	Warehousing	154,751	TSF	NEC OF HARVILL AVE. & COMMERCE CENTER DR.
RC23	Harvill Distribution Center	High-Cube Warehouse	345,103	TSF	EAST OF HARVILL AVE., SOUTH OF ORANGE ST.
RC24	PP26241	Warehousing	23,600	TSF	SEC OF HARVILL AVE. & PLACENTIA ST.
RC25	PP26220	Warehousing	66,000	TSF	EAST OF HARVILL AVE., NORTH OF PLACENTIA ST.
City of Perris					
P1	Bargemann / DPR 07-09-0018	Warehousing	173,000	TSF	NEC OF WEBSTER & NANCE
P2	Duke 2 / DPR 16-00008	High-Cube Warehouse	669,000	TSF	NEC OF INDIAN & MARKHAM
P3	First Perry / DPR 16-00013	High-Cube Warehouse	240,000	TSF	SWC OF REDLANDS AVE. & PERRY ST.
P4	Gateway / DPR 16-00003	High-Cube Warehouse	400,000	TSF	SOUTH OF HARLEY KNOX BLVD., EAST OF HWY. 215
P6	OLC 1 / DPR 12-10-0005	High-Cube Warehouse	1,455,000	TSF	WEST OF WEBSTER AVE., NORTH OF RAMONA EXWY.

Table 4-3
Page 2 of 2

Cumulative Development Land Use Summary

No.	Project Name / Case Number	Land Use ¹	Quantity	Units ²	Location
P5	Duke Realty - Perris & Markham	High-Cube Warehouse	1,189,860	TSF	SEC OF PERRIS BL. & MARKHAM ST.
P7	OLC2 / DPR 14-01-0015	High-Cube Warehouse	1,037,000	TSF	WEST OF WEBSTER AVE., NORTH OF MARKHAM ST.
P8	Canyon Steel	Manufacturing	28,124	TSF	NWC OF PATTERSON AVE. & CALIFORNIA AVE.
P9	Markham Industrial / DPR 16-00015	Warehousing	170,000	TSF	NEC OF INDIAN AVE. & MARKHAM ST.
P10	Rados / DPR 07-0119	High-Cube Warehouse	1,200,000	TSF	NWC OF INDIAN AVE. & RIDER ST.
P11	Rider 1 / DPR 16-0365	High-Cube Warehouse	350,000	TSF	SWC OF REDLANDS AVE. & RIDER ST.
P12	Indian/Ramona Warehouse	High-Cube Warehouse	428,730	TSF	NORTH OF RAMONA EXWY., WEST OF INDIAN AVE.
P13	Rider 3 / DPR 06-0432	High-Cube Warehouse	640,000	TSF	NORTH OF RIDER ST., WEST OF REDLANDS
P14	Westcoast Textile / DPR 16-00001	Warehousing	180,000	TSF	SWC OF INDIAN ST. & NANCE ST.
P15	Duke at Patterson / DPR 17-00001	High-Cube Warehouse	811,000	TSF	SEC OF PATTERSON AVE. & MARKHAM ST.
P16	Harley Knox Commerce Park / DPR 16-004	High-Cube Warehouse	386,278	TSF	NWC OF HARLEY KNOX BLVD. & REDLANDS AVE.
P17	Perris Marketplace / DPR 05-0341	Commercial Retail	520,000	TSF	WEST OF PERRIS BLVD. AT AVOCADO AVE.
P18	Stratford Ranch Residential / TTM 36648	SFDR	270	DU	WEST OF EVANS RD. AT MARKHAM ST.
P19	Pulte Residential / TTM 30850	SFDR	496	DU	WEST OF EVANS RD. AT CITRUS AVE.
P20	Perris Circle 3	Warehousing	210,900	TSF	NWC OF REDLANDS AVE. & NANCE AVE.
City of Moreno Valley					
MV1	PEN18-0042	SFDR	2	DU	SEC OF INDIAN ST. & KRAMERIA AVE.
MV2	Tract 33024	SFDR	8	DU	SEC OF INDIAN ST. & KRAMERIA AVE.
MV3	Tract 32716	SFDR	57	DU	NEC OF INDIAN ST. & MARIPOSA AVE.
MV4	Prologis 1	High-Cube Warehouse	1000,000	TSF	NEC OF INDIAN AVE. & MARIPOSA AVE.
MV5	Moreno Valley Industrial Park	High-Cube Warehouse	207,684	TSF	NEC OF HEACOCK ST. & IRIS AVE.
MV6	Moreno Valley Walmart	Retail	193,000	TSF	SWC OF PERRIS BLVD. & GENTIAN AVE.
MV7	Moreno Valley Utility Substation	High-Cube Warehouse	PUBLIC	TSF	NWC OF EDWIN RD. & KITCHING ST.
MV8	Phelan Development	High-Cube Warehouse	98,210	TSF	SEC OF INDIAN ST. & NANDINA AVE.
MV9	Nandina Industrial Center	High-Cube Warehouse	335,966	TSF	SOUTH OF NANDINA AVE., WEST OF PERRIS BLVD.
MV10	Tract 31442	SFDR	63	DU	NWC OF PERRIS BLVD. & MARIPOSA AVE.
MV11	Tract 22180	SFDR	140	DU	NORTH OF GENTIAN AVE., EAST OF INDIAN ST.
MV12	Tract 36760	SFDR	221	DU	SEC OF INDIAN ST. & GENTIAN AVE.

¹ SFDR = Single Family Detached Residential

² DU = Dwelling Units; TSF = Thousand Square Feet

4.7 NEAR-TERM TRAFFIC CONDITIONS

The “buildup” approach combines existing traffic counts with a background ambient growth factor to forecast EAP (2021) and EAPC (2021) traffic conditions. An ambient growth factor of 2.0% per year account for background (area-wide) traffic increases that occur over time up to the year 2021 from the year 2019 (2.0 percent per year growth rate, compounded over a 2-year period). Traffic volumes generated by the Project are then added to assess the near-term traffic conditions. The 2021 roadway network is similar to the Existing conditions roadway network, with the exception of future driveways proposed to be developed by the Project.

The near-term traffic analysis includes the following traffic conditions, with the various traffic components:

- Existing Plus Ambient Growth Plus Project (2021)
 - Existing 2019 counts
 - Ambient growth traffic (4.04%)
 - Project traffic

- Existing Plus Ambient Growth Plus Project Plus Cumulative (2021)
 - Existing 2019 counts
 - Ambient growth traffic (4.04%)
 - Cumulative Development traffic
 - Project traffic

5 E+P TRAFFIC CONDITIONS

This section discusses the traffic forecasts for Existing Plus Project (E+P) conditions and the resulting intersection operations, traffic signal warrant, and freeway facility analyses. This analysis scenario has also been provided for informational purposes only as Project impacts have been discerned from a comparison of Existing (2019) to EAP (2021) traffic conditions (per the County's traffic study guidelines).

5.1 ROADWAY IMPROVEMENTS

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

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

5.2 E+P TRAFFIC VOLUME FORECASTS

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

5.3 INTERSECTION OPERATIONS ANALYSIS

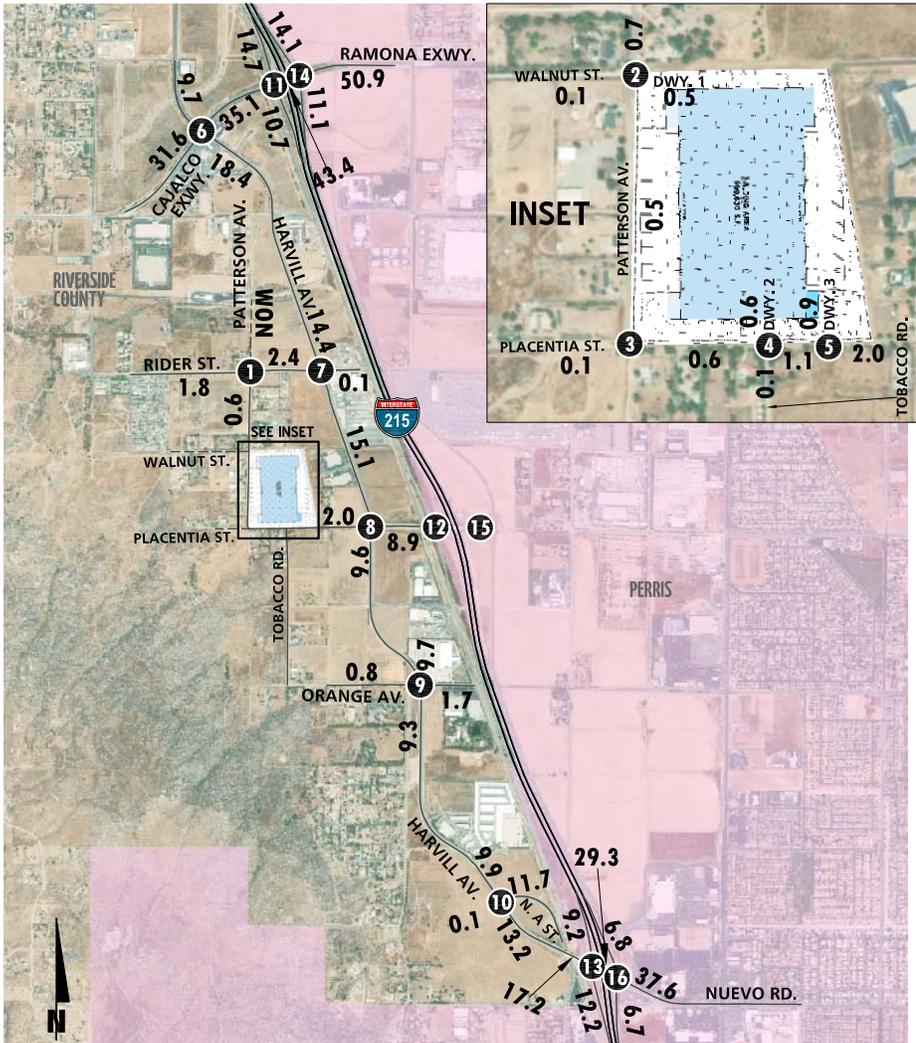
E+P peak hour traffic operations have been evaluated for the study area intersections based on the analysis methodologies presented in Section 2 *Methodologies* of this TIA. The intersection analysis results are summarized in Table 5-1, which indicates that the study area intersections are anticipated to continue to operate at acceptable LOS under E+P traffic conditions, with the exception of the intersection of Harvill Avenue and N. A Street, consistent with Existing traffic conditions.

A summary of the peak hour intersection LOS for E+P conditions are shown on Exhibit 5-2. The intersection operations analysis worksheets for E+P traffic conditions are included in Appendix 5.1 of this TIA.

5.4 TRAFFIC SIGNAL WARRANTS ANALYSIS

There are no additional study area intersections anticipated to meet planning-level ADT or peak hour volume-based traffic signal warrants under E+P traffic conditions, in addition to the intersection previously identified under Existing (2019) traffic conditions (see Appendix 5.2).

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



LEGEND:

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

<p>1 Patterson Av. & Rider St.</p>	<p>2 Patterson Av. & Walnut St./Dwy. 1</p>
<p>3 Patterson Av. & Placentia St.</p>	<p>4 Dwy. 2 & Placentia St.</p>
<p>5 Dwy. 3 & Placentia St.</p>	<p>6 Harvill Av. & Cajalco Exwy.</p>
<p>7 Harvill Av. & Rider St.</p>	<p>8 Harvill Av. & Placentia St.</p>
<p>9 Harvill Av. & Orange Av.</p>	<p>10 Harvill Av. & N. A St.</p>
<p>11 I-215 SB Ramps & Cajalco Exwy.</p>	<p>12 I-215 SB Ramps & Placentia Av.</p> <p>Future Intersection</p>
<p>13 I-215 SB Ramps & Nuevo Rd.</p>	<p>14 I-215 NB Ramps & Ramona Exwy.</p>
<p>15 I-215 NB Ramps & Placentia Av.</p> <p>Future Intersection</p>	<p>16 I-215 NB Ramps & Nuevo Rd.</p>

EXHIBIT 5-2: E+P SUMMARY OF LOS

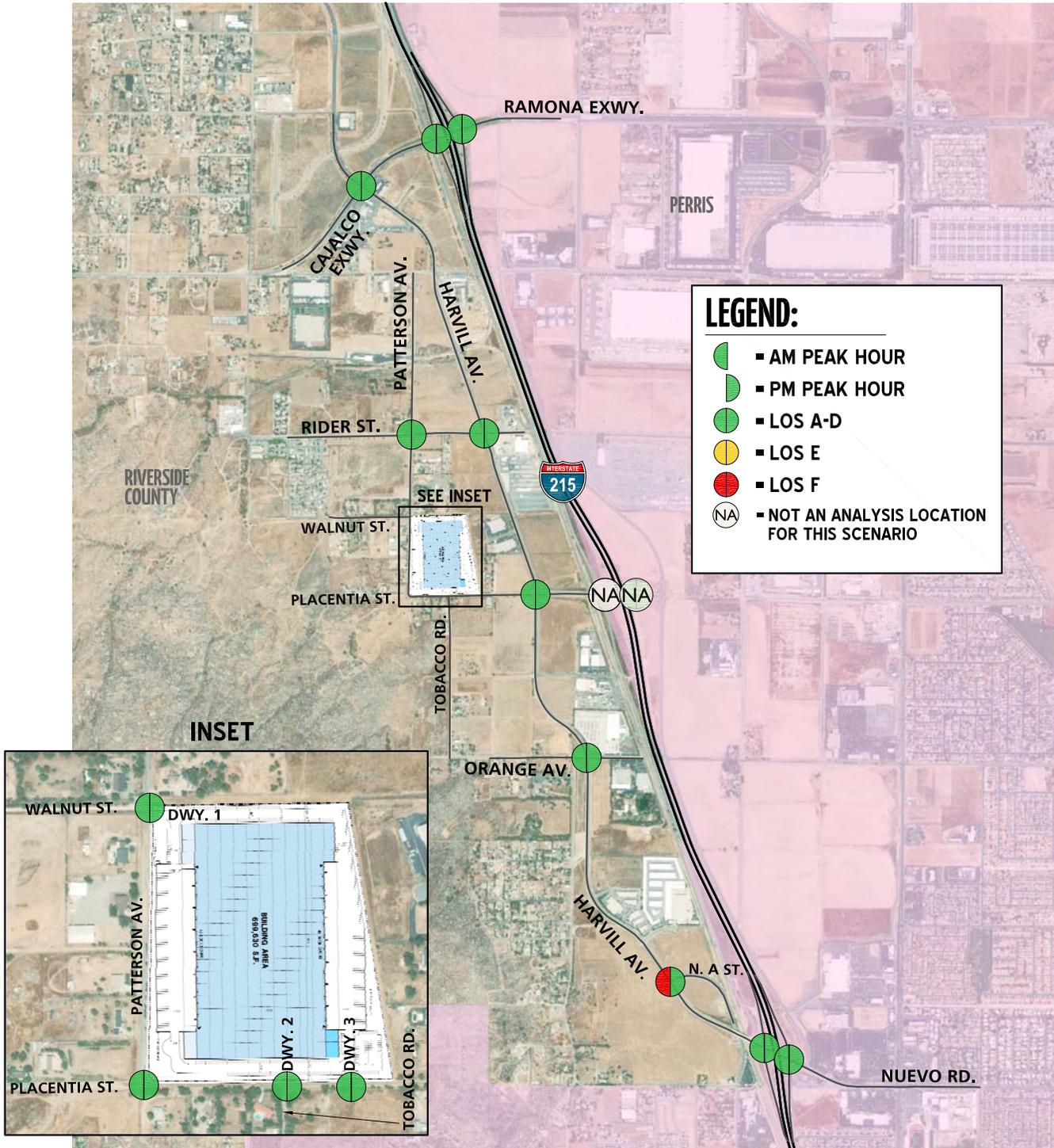


Table 5-1

Intersection Analysis for E+P Conditions

#	Intersection	Traffic Control ²	Existing (2019)				E+P			
			Delay ¹ (secs.)		Level of Service		Delay ¹ (secs.)		Level of Service	
			AM	PM	AM	PM	AM	PM	AM	PM
1	Patterson Av. & Rider St.	CSS	9.0	9.8	A	A	8.9	9.9	A	A
2	Patterson Av. & Walnut St./Dwy. 1	CSS	8.4	8.5	A	A	8.7	8.7	A	A
3	Patterson Av. & Placentia St.	CSS	8.7	8.6	A	A	8.7	8.7	A	A
4	Dwy. 2/Tobacco Rd. & Placentia St.	CSS	8.6	8.5	A	A	9.1	9.0	A	A
5	Dwy. 3 & Placentia St.	CSS	Future Intersection				9.1	9.2	A	A
6	Harvill Av. & Cajalco Exwy.	TS	25.6	22.9	C	C	26.1	23.1	C	C
7	Harvill Av. & Rider St.	CSS	13.4	15.4	B	C	14.0	16.5	B	C
8	Harvill Av. & Placentia St.	AWS	16.4	14.0	C	B	17.4	16.2	C	C
9	Harvill Av. & Orange Av.	CSS	15.5	13.4	C	B	13.1	14.4	B	B
10	Harvill Av. & N. A St.	AWS	>100.0	16.7	F	C	>100.0	18.3	F	C
11	I-215 SB Ramps & Ramona Exwy.	TS	23.4	28.6	C	C	23.6	30.1	C	C
12	I-215 SB Ramps & Placentia Av.		Does Not Exist				Does Not Exist			
13	I-215 SB Ramps & Nuevo Rd.	TS	17.6	33.5	B	C	17.6	35.0	B	C
14	I-215 NB Ramps & Ramona Exwy.	TS	25.3	14.0	C	B	25.6	16.0	C	B
15	I-215 NB Ramps & Placentia Av.		Does Not Exist				Does Not Exist			
16	I-215 NB Ramps & Nuevo Rd.	TS	18.0	10.1	B	B	18.0	10.3	B	B

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

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

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

5.5 OFF-RAMP QUEUING ANALYSIS

A queuing analysis was performed for the off-ramps at the I-215 Freeway Cajalco Expressway/Ramona Expressway and Harvill Avenue/Nuevo Road 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 result in “spill back” onto the I-215 Freeway mainline. Queuing analysis findings are presented in Table 5-2. It is important to note that off-ramp lengths are consistent with the measured distance between the intersection and the freeway mainline. As shown in Table 5-2 and consistent with Existing (2019) traffic conditions, there are no movements that are anticipated to experience queuing issues during the weekday AM or weekday PM peak 95th percentile traffic flows. Worksheets for E+P traffic conditions off-ramp queuing analysis are provided in Appendix 5.3.

5.6 FREEWAY FACILITY ANALYSIS

E+P mainline directional volumes for the AM and PM peak hours are provided on Exhibit 5-3. As shown in Table 5-3, there are no additional I-215 Freeway segments that are anticipated to operate at an unacceptable LOS (i.e., LOS E or worse) during the peak hours for E+P traffic conditions.

The ramp merge/diverge junctions are anticipated to continue to operate at an acceptable LOS (i.e., LOS D or better) during one or more peak hours, consistent with Existing (2019) conditions.

E+P basic freeway segment analysis worksheets are provided in Appendix 5.4.

5.7 RECOMMENDED IMPROVEMENTS

5.7.1 INTERSECTIONS

There are no additional improvements required to improve the E+P peak deficiency, in addition to the improvements previously identified under Existing (2019) traffic conditions. Table 5-4 identifies delay and associated LOS at Harvill Avenue and N. A Street with improvements.

5.7.2 FREEWAY FACILITIES

At this time, Caltrans has no near-term fee programs or other improvement programs in place to address the deficiencies caused by development projects on the SHS freeway facilities. As such, no improvements have been recommended to address the E+P deficiencies on the SHS. The Project is anticipated to contribute less than 50 peak hour trips to these deficient facilities.

Table 5-2

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

Intersection	Movement	Available Stacking Distance (Feet)	Existing (2019)				E+P			
			95th Percentile Queue (Feet)		Acceptable? ¹		95th Percentile Queue (Feet)		Acceptable? ¹	
			AM Peak Hour	PM Peak Hour	AM	PM	AM Peak Hour	PM Peak Hour	AM	PM
I-215 Southbound Ramps & Ramona Exwy.	SBL	530	265 ²	286 ²	Yes	Yes	265 ²	289 ²	Yes	Yes
	SBL/T	1,100	267 ²	290 ²	Yes	Yes	267 ²	294 ²	Yes	Yes
	SBR	530	63	36	Yes	Yes	83	50	Yes	Yes
I-215 Southbound Ramps & Nuevo Rd.	SBL	1,020	116 ²	249 ²	Yes	Yes	116 ²	232 ²	Yes	Yes
	SBL/T	1,020	121 ²	252 ²	Yes	Yes	121 ²	236 ²	Yes	Yes
	SBR	300	19	8	Yes	Yes	19	9	Yes	Yes
I-215 Northbound Ramps & Ramona Exwy.	NBL	520	93	110	Yes	Yes	93	114	Yes	Yes
	NBL/T	1,120	91	112	Yes	Yes	91	115	Yes	Yes
	NBR	520	265 ²	235 ²	Yes	Yes	265 ²	238 ²	Yes	Yes
I-215 Northbound Ramps & Nuevo Rd.	NBL/T	1,010	171	64	Yes	Yes	194 ²	73	Yes	Yes
	NBR	300	110	65	Yes	Yes	111	68	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.

Table 5-3

Freeway Facility Analysis for E+P Conditions

Freeway	Direction	Segment	Lanes ¹	Existing (2019)				E+P			
				Density ²		LOS ³		Density ²		LOS ³	
				AM	PM	AM	PM	AM	PM	AM	PM
I-215 Freeway	Southbound	North of Ramona Exwy.	3	18.9	27.9	B	D	19.3	27.9	B	D
		SB Off-Ramp at Ramona Exwy.	3	27.1	33.9	C	D	27.5	34.0	C	D
		SB On-Ramp at Ramona Exwy.	3	21.8	29.2	C	D	21.8	29.2	C	D
		Ramona Exwy. to Nuevo Rd.	3	18.1	26.7	B	D	18.1	26.7	C	D
		SB Off-Ramp at Nuevo Rd.	3	25.0	32.4	C	D	25.0	32.4	C	D
		SB On-Ramp at Nuevo Rd.	3	15.5	21.9	B	C	15.5	21.9	B	C
		South of Nuevo Rd.	4	14.0	19.7	B	B	14.1	19.8	B	C
	Northbound	North of Ramona Exwy.	3	42.1	21.9	E	C	42.2	22.3	E	C
		NB On-Ramp at Ramona Exwy.	3	31.7	26.1	D	C	31.8	26.5	D	C
		NB Off-Ramp at Ramona Exwy.	3	31.6	28.6	D	D	31.6	28.6	D	D
		Ramona Exwy. to Nuevo Rd.	3	39.4	21.4	E	C	39.4	21.4	E	C
		NB On-Ramp at Nuevo Rd.	3	28.1	24.9	D	C	28.1	24.9	D	C
		NB Off-Ramp at Nuevo Rd.	4	30.7	15.4	D	B	30.8	15.4	D	B
		South of Nuevo Rd.	4	31.6	15.7	D	B	31.7	15.7	D	B

* **BOLD** = Unacceptable Level of Service

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

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

³ LOS = Level of Service

Table 5-4

Intersection Analysis for E+P Conditions With Improvements

#	Intersection	Traffic Control ³	Intersection Approach Lanes ¹												Delay ² (secs.)		Level of Service	
			Northbound			Southbound			Eastbound			Westbound			AM	PM	AM	PM
			L	T	R	L	T	R	L	T	R	L	T	R				
10	Harvill Av. & N. A St.																	
	Without Improvements:	AWS	1	2	0	1	2	0	0	1	0	1	1	0	>100.0	18.3	F	C
	With Improvements:	TS	1	2	1>	1	2	0	0	1	0	1	1	0	20.3	13.9	C	B

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

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

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

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

EXHIBIT 5-3: E+P FREEWAY MAINLINE VOLUMES



LEGEND:

← 100/200 = AM/PM PEAK HOUR VOLUMES

NOTE: VOLUMES IN ACTUAL VEHICLES (NOT PCE)



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6 EAP (2021) TRAFFIC CONDITIONS

This section discusses the methods used to develop EAP (2021) traffic forecasts, and the resulting intersection operations, traffic signal warrant, and freeway facility analyses. The proposed future I-215/Placentia Avenue Interchange will be evaluated, as well as current traffic conditions, for EAP (2021) traffic conditions. Exhibit 6-1 illustrates the future Placentia Avenue Interchange design. Although the I-215/Placentia Avenue Interchange project is funded and construction is anticipated to commence in 2020, at the County's request, the EAP (2021) analysis scenario has been evaluated both without and with the proposed interchange in the event the Project were to open before the completion of the interchange.

6.1 ROADWAY IMPROVEMENTS

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

- Project driveways and those facilities assumed to be constructed by the Project to provide site access are also assumed to be in place for EAP conditions only (e.g., intersection and roadway improvements at the Project's frontage and driveways).
- The I-215/Placentia Avenue Interchange is assumed for the With Interchange alternative only.

6.2 EAP (2021) TRAFFIC VOLUME FORECASTS

This scenario includes Existing (2019) traffic volumes plus an ambient growth factor of 4.04% and the addition of Project traffic. Exhibit 6-2 and 6-3 show the weekday ADT volumes and peak hour volumes which can be expected for EAP (2021) traffic conditions (in PCE) Without and With I-215/Placentia Avenue Interchange, respectively.

6.3 INTERSECTION OPERATIONS ANALYSIS

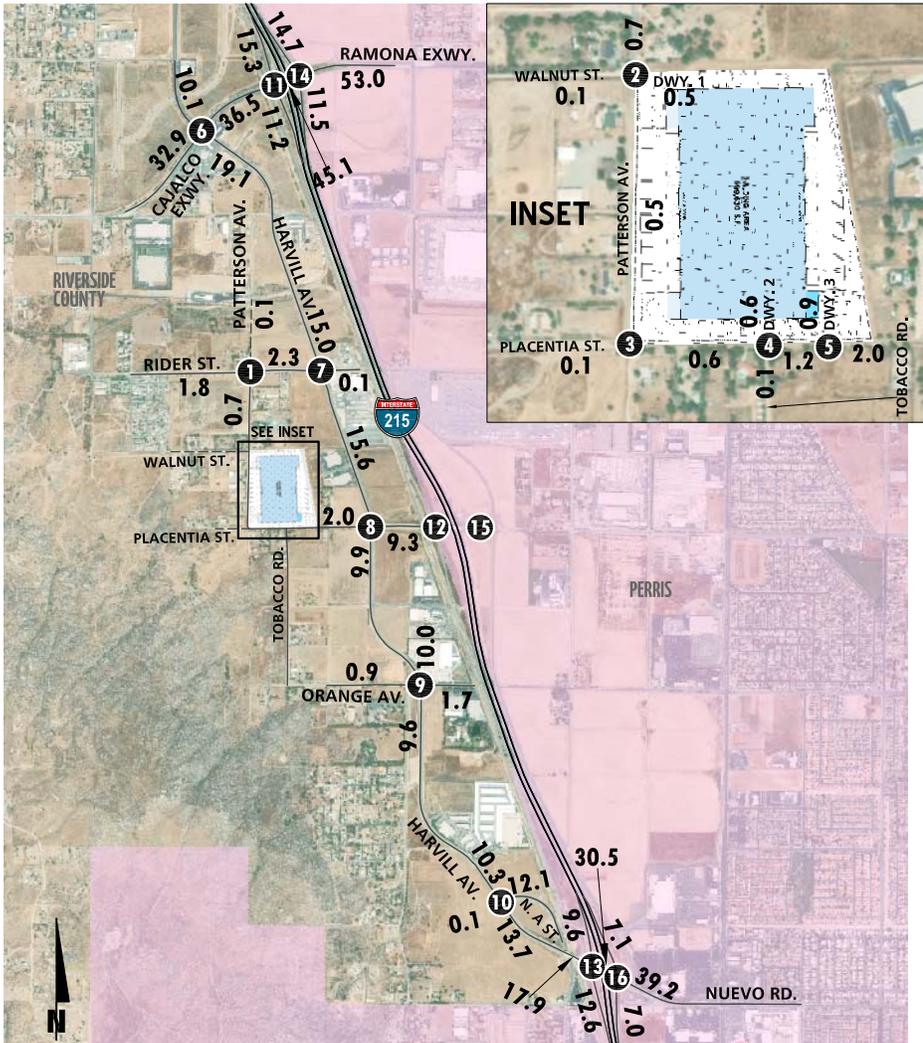
LOS calculations were conducted for the study intersections to evaluate their operations under EAP conditions with roadway and intersection geometrics consistent with Section 6.1 *Roadway Improvements*. As shown in Table 6-1, and consistent with Existing conditions, the study area intersections are anticipated to continue to operate at acceptable LOS during the peak hours with the addition of Project traffic for EAP (2021) Without I-215/Placentia Avenue Interchange traffic conditions, with the exception of the intersection of Harvill Avenue and N. A Street. With the proposed I-215/Placentia Avenue Interchange, the following additional intersection is anticipated to operate at an unacceptable LOS (i.e., LOS E or worse) during one or both of the peak hours:

- Harvill Avenue & Placentia Street (#8) – LOS F AM and PM peak hours

EXHIBIT 6-1: I-215/PLACENTIA AVENUE INTERCHANGE



EXHIBIT 6-2: EAP (2021) (WITHOUT I-215/PLACENTIA INTERCHANGE) TRAFFIC VOLUMES (IN PCE)

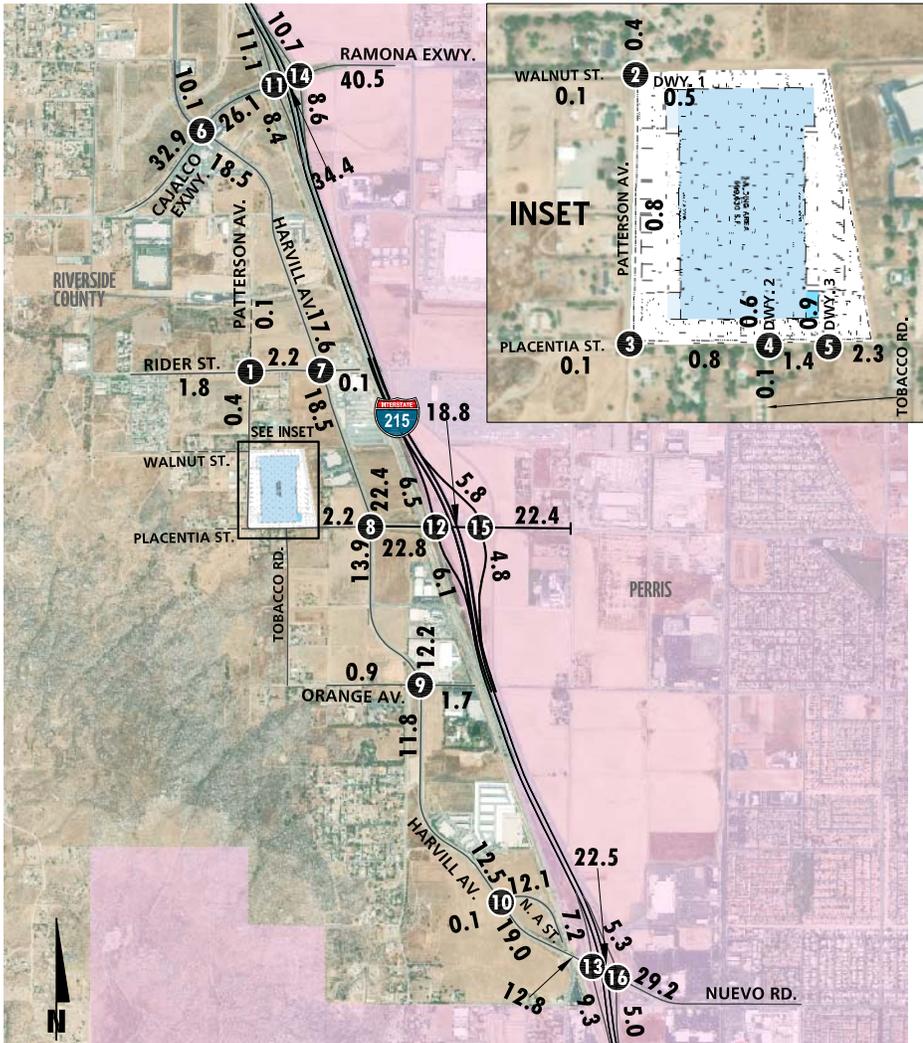


LEGEND:

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

<p>1 Patterson Av. & Rider St.</p> <p>5(0) ← 1(1) ↓ 0(0) →</p> <p>1(2) ↓ 44(84) → 5(4) ↓</p>	<p>2 Patterson Av. & Walnut St./Dwy. 1</p> <p>1(0) ↓ 10(11) ↓ 16(7) ↓</p> <p>5(19) ↓ 0(0) ↓ 2(8) ↓</p>			
<p>3 Patterson Av. & Placentia St.</p> <p>2(1) ↓ 14(19) ↓</p> <p>22(13) ↓ 4(4) ↓</p> <p>2(1) ↓ 2(1) ↓</p>	<p>4 Dwy. 2 & Placentia St.</p> <p>0(0) ↓ 0(0) ↓ 8(34) ↓</p> <p>26(13) ↓ 23(15) ↓ 3(2) ↓</p> <p>0(0) ↓ 16(18) ↓ 1(2) ↓</p> <p>3(2) ↓ 0(0) ↓ 6(3) ↓</p>			
<p>5 Dwy. 3 & Placentia St.</p> <p>0(0) ↓ 11(42) ↓</p> <p>37(16) ↓ 52(31) ↓</p> <p>0(0) ↓ 30(56) ↓</p>	<p>6 Harvill Av. & Cajalco Exwy.</p> <p>11(16) ↓ 143(191) ↓ 191(174) ↓</p> <p>191(142) ↓ 790(735) ↓ 224(205) ↓</p> <p>26(28) ↓ 696(871) ↓ 152(281) ↓</p> <p>364(311) ↓ 320(138) ↓ 163(174) ↓</p>			
<p>7 Harvill Av. & Rider St.</p> <p>24(23) ↓ 297(541) ↓ 0(0) ↓</p> <p>0(0) ↓ 0(1) ↓ 0(1) ↓</p> <p>28(41) ↓ 0(0) ↓ 34(72) ↓</p> <p>21(32) ↓ 665(417) ↓ 3(2) ↓</p>	<p>8 Harvill Av. & Placentia St.</p> <p>40(19) ↓ 146(316) ↓ 158(285) ↓</p> <p>339(214) ↓ 3(4) ↓ 114(68) ↓</p> <p>16(47) ↓ 5(3) ↓ 17(46) ↓</p> <p>41(22) ↓ 376(173) ↓ 108(58) ↓</p>	<p>9 Harvill Av. & Orange Av.</p> <p>17(32) ↓ 230(383) ↓ 15(23) ↓</p> <p>11(30) ↓ 0(0) ↓ 8(38) ↓</p> <p>23(14) ↓ 0(2) ↓ 8(6) ↓</p> <p>9(4) ↓ 491(207) ↓ 17(24) ↓</p>	<p>10 Harvill Av. & N. A St.</p> <p>3(1) ↓ 140(339) ↓ 130(116) ↓</p> <p>229(79) ↓ 0(0) ↓ 544(301) ↓</p> <p>0(2) ↓ 4(0) ↓ 1(5) ↓</p> <p>4(1) ↓ 267(172) ↓ 605(332) ↓</p>	<p>11 I-215 SB Ramps & Cajalco Exwy.</p> <p>240(179) ↓ 3(5) ↓ 732(845) ↓</p> <p>965(904) ↓ 352(417) ↓</p> <p>732(927) ↓ 340(340) ↓</p>
<p>12 I-215 SB Ramps & Placentia Av.</p> <p>Future Intersection</p>	<p>13 I-215 SB Ramps & Nuevo Rd.</p> <p>93(76) ↓ 3(4) ↓ 312(572) ↓</p> <p>925(452) ↓ 390(612) ↓</p> <p>524(440) ↓ 165(257) ↓</p>	<p>14 I-215 NB Ramps & Ramona Exwy.</p> <p>994(746) ↓ 1037(951) ↓</p> <p>203(268) ↓ 1261(1504) ↓</p> <p>281(370) ↓ 3(2) ↓ 429(412) ↓</p>	<p>15 I-215 NB Ramps & Placentia Av.</p> <p>Future Intersection</p>	<p>16 I-215 NB Ramps & Nuevo Rd.</p> <p>392(428) ↓ 997(942) ↓</p> <p>42(54) ↓ 795(958) ↓</p> <p>317(121) ↓ 2(1) ↓ 568(345) ↓</p>

EXHIBIT 6-3: EAP (2021) (WITH I-215/PLACENTIA INTERCHANGE) TRAFFIC VOLUMES (IN PCE)



LEGEND:

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

<p>1 Patterson Av. & Rider St.</p>	<p>2 Patterson Av. & Walnut St./Dwy. 1</p>
<p>3 Patterson Av. & Placentia St.</p>	<p>4 Dwy. 2 & Placentia St.</p>
<p>5 Dwy. 3 & Placentia St.</p>	<p>6 Harvill Av. & Cajalco Exwy.</p>
<p>7 Harvill Av. & Rider St.</p>	<p>8 Harvill Av. & Placentia St.</p>
<p>9 Harvill Av. & Orange Av.</p>	<p>10 Harvill Av. & N. A. St.</p>
<p>11 I-215 SB Ramps & Cajalco Exwy.</p>	
<p>12 I-215 SB Ramps & Placentia Av.</p>	<p>13 I-215 SB Ramps & Nuevo Rd.</p>
<p>14 I-215 NB Ramps & Ramona Exwy.</p>	<p>15 I-215 NB Ramps & Placentia Av.</p>
<p>16 I-215 NB Ramps & Nuevo Rd.</p>	

Table 6-1

Intersection Analysis for EAP (2021) Conditions

#	Intersection	Traffic Control ²	Existing (2019)				EAP (2021) - w/o Placentia				EAP (2021) - w/ Placentia			
			Delay ¹ (secs.)		Level of Service		Delay ¹ (secs.)		Level of Service		Delay ¹ (secs.)		Level of Service	
			AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
1	Patterson Av. & Rider St.	CSS	9.0	9.8	A	A	8.9	10.0	A	B	8.9	9.9	A	A
2	Patterson Av. & Walnut St./Dwy. 1	CSS	8.4	8.5	A	A	8.8	8.7	A	A	9.0	8.8	A	A
3	Patterson Av. & Placentia St.	CSS	8.7	8.6	A	A	8.7	8.7	A	A	8.7	8.8	A	A
4	Dwy. 2/Tobacco Rd. & Placentia St.	CSS	8.6	8.5	A	A	9.1	9.0	A	A	9.2	9.2	A	A
5	Dwy. 3 & Placentia St.	CSS	Future Intersection				9.1	9.2	A	A	9.2	9.3	A	A
6	Harvill Av. & Cajalco Exwy.	TS	25.6	22.9	C	C	26.5	23.5	C	C	26.0	23.1	C	C
7	Harvill Av. & Rider St.	CSS	13.4	15.4	B	C	14.3	16.6	B	C	15.8	19.5	C	C
8	Harvill Av. & Placentia St.	AWS	16.4	14.0	C	B	18.7	25.6	C	D	>100.0	>100.0	F	F
9	Harvill Av. & Orange Av.	CSS	15.5	13.4	C	B	16.8	14.8	C	B	19.2	17.6	C	C
10	Harvill Av. & N. A St.	AWS	>100.0	16.7	F	C	>100.0	19.8	F	C	>100.0	24.8	F	C
11	I-215 SB Ramps & Ramona Exwy.	TS	23.4	28.6	C	C	24.8	31.1	C	C	19.5	19.7	B	B
12	I-215 SB Ramps & Placentia Av.	TS	Does Not Exist				Does Not Exist				12.9	13.6	B	B
13	I-215 SB Ramps & Nuevo Rd.	TS	17.6	33.5	B	C	18.0	39.1	B	D	17.6	20.7	B	C
14	I-215 NB Ramps & Ramona Exwy.	TS	25.3	14.0	C	B	32.3	17.9	C	B	11.7	10.2	B	B
15	I-215 NB Ramps & Placentia Av.	TS	Does Not Exist				Does Not Exist				16.0	11.1	B	B
16	I-215 NB Ramps & Nuevo Rd.	TS	18.0	10.1	B	B	17.0	10.2	B	B	19.3	12.5	B	B

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

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

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

A summary of the peak hour intersection LOS for EAP traffic conditions is shown on Exhibit 6-4 and Exhibit 6-5 for Without and With I-215/Placentia Avenue Interchange traffic conditions. The intersection operations analysis worksheets for EAP (2021) Without and With I-215/Placentia Avenue Interchange traffic conditions are included in Appendix 6.1 and 6.2 of this TIA, respectively.

6.4 TRAFFIC SIGNAL WARRANTS ANALYSIS

Traffic signal warrants have been performed (based on CA MUTCD) for EAP (2021) traffic conditions based on peak hour and daily volumes. With the addition of Project traffic, there are additional study area intersections anticipated to meet planning-level ADT or peak hour volume-based traffic signal warrants under EAP (2021) Without and With I-215/Placentia Avenue Interchange traffic conditions, in addition to the intersection previously identified under Existing (2019) traffic conditions (see Appendix 6.3 and 6.4).

In addition to the intersections previously warranted under Existing (2019) traffic conditions, the following unsignalized intersection is anticipated to warrant a traffic signal, based on EAP (2021) Without I-215/Placentia Avenue Interchange peak hour traffic volumes:

- Harvill Avenue & Rider Street (#7)

With the proposed I-215/Placentia Avenue Interchange, the following additional two intersections are anticipated to warrant a traffic signal based on EAP (2021) With I-215/Placentia Avenue Interchange ADT traffic forecasts:

- I-215 Southbound Ramps & Placentia Avenue (#12)
- I-215 Northbound Ramps & Placentia Avenue (#15)

6.5 OFF-RAMP QUEUING ANALYSIS

A queuing analysis was performed for the off-ramps at the I-215 Freeway Cajalco Expressway/Ramona Expressway and Harvill Avenue/Nuevo Road 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 result in “spill back” onto the I-215 Freeway mainline. Queuing analysis findings are presented in Table 6-2. It is important to note that off-ramp lengths are consistent with the measured distance between the intersection and the freeway mainline. As shown in Table 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. Worksheets for EAP (2021) Without and With I-215/Placentia Avenue Interchange traffic conditions off-ramp queuing analysis are provided in Appendix 6.5 and 6.6 of this report.

EXHIBIT 6-4: EAP (2021) (WITHOUT I-215/PLACENTIA INTERCHANGE) SUMMARY OF LOS

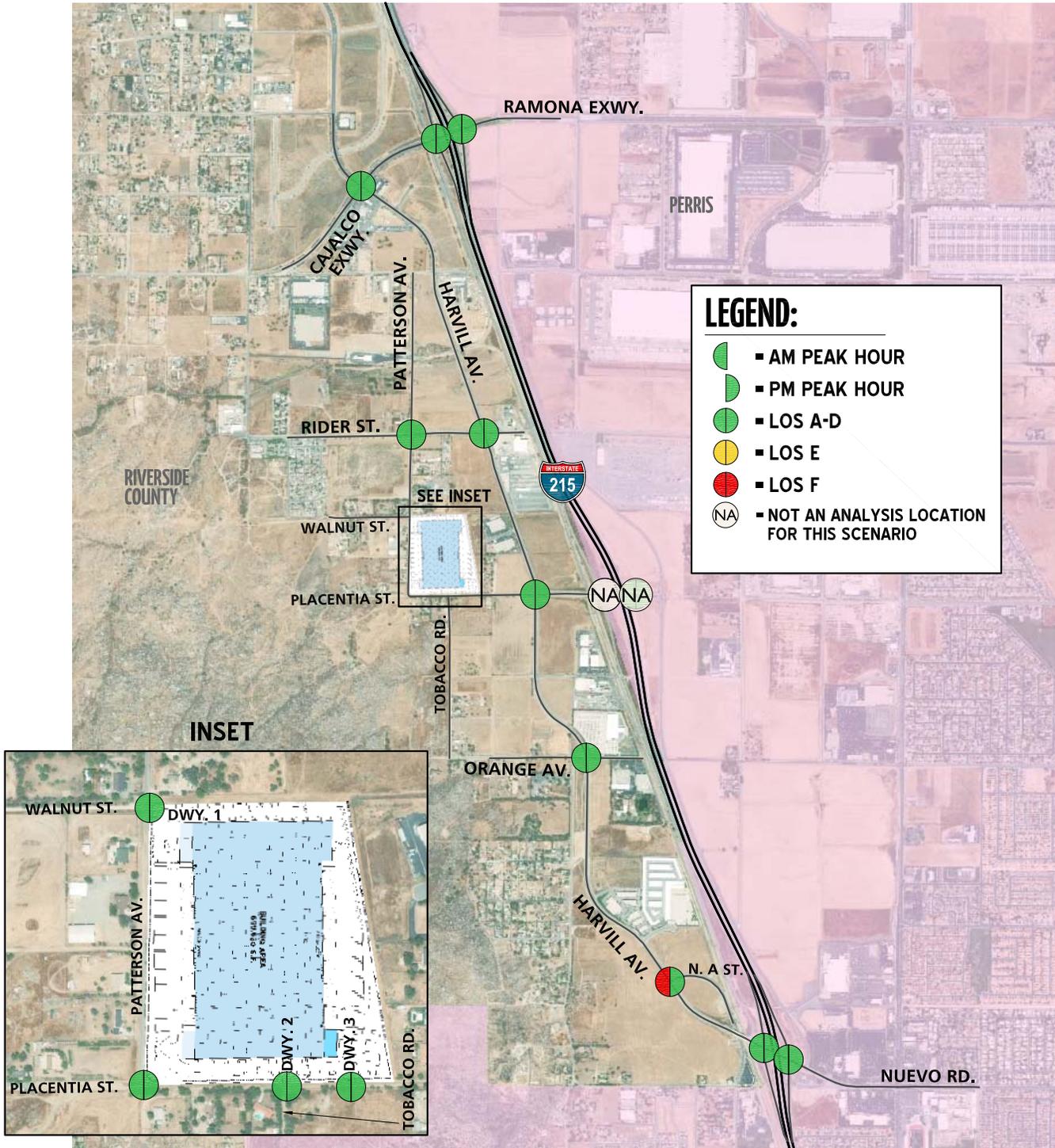


EXHIBIT 6-5: EAP (2021) (WITH I-215/PLACENTIA INTERCHANGE) SUMMARY OF LOS

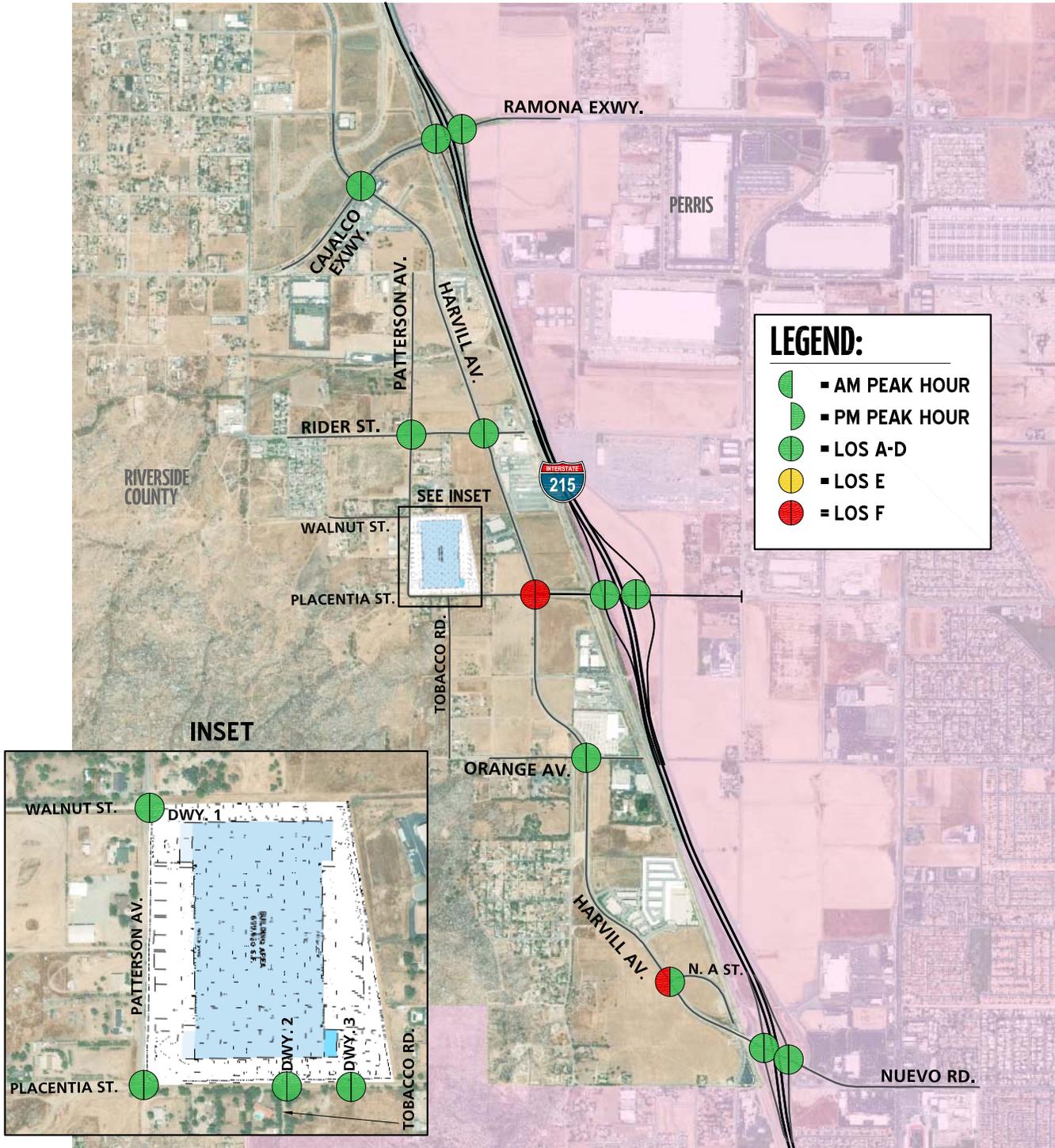


Table 6-2

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

Intersection	Movement	Available Stacking Distance (Feet)	EAP (2021) - Without Placentia Interchange				EAP (2021) - With Placentia Interchange			
			95th Percentile Queue (Feet)		Acceptable? ¹		95th Percentile Queue (Feet)		Acceptable? ¹	
			AM Peak Hour	PM Peak Hour	AM	PM	AM Peak Hour	PM Peak Hour	AM	PM
I-215 Southbound Ramps & Ramona Exwy.	SBL	530	278 ²	317 ²	Yes	Yes	172 ²	223 ²	Yes	Yes
	SBL/T	1,100	282 ²	323 ²	Yes	Yes	175 ²	228 ²	Yes	Yes
	SBR	530	87	54	Yes	Yes	38	29	Yes	Yes
I-215 Southbound Ramps & Placentia Av.	SBL	1,030					94	118	Yes	Yes
	SBL/T	1,030					94	118	Yes	Yes
	SBR	330		Does Not Exist			31	13	Yes	Yes
I-215 Southbound Ramps & Nuevo Rd.	SBL	1,020	130 ²	242 ²	Yes	Yes	94	165 ²	Yes	Yes
	SBL/T	1,020	134 ²	246 ²	Yes	Yes	91	169 ²	Yes	Yes
	SBR	300	21	10	Yes	Yes	9	0	Yes	Yes
I-215 Northbound Ramps & Ramona Exwy.	NBL	520	95	117	Yes	Yes	75	91	Yes	Yes
	NBL/T	1,120	96	120	Yes	Yes	74	92	Yes	Yes
	NBR	520	280 ²	254 ²	Yes	Yes	175 ²	134	Yes	Yes
I-215 Northbound Ramps & Placentia Av.	NBL	575					66	51	Yes	Yes
	NBL/T	1,360					66	52	Yes	Yes
	NBR	1,360		Does Not Exist			52	44	Yes	Yes
I-215 Northbound Ramps & Nuevo Rd.	NBL/T	1,010	217 ²	76	Yes	Yes	132	55	Yes	Yes
	NBR	300	123	73	Yes	Yes	53	27	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.

6.6 FREEWAY FACILITY ANALYSIS

EAP (2021) mainline directional volumes for the AM and PM peak hours are provided on Exhibit 6-6 and 6-7 for Without and With I-215/Placentia Avenue Interchange traffic conditions, respectively. As shown in Table 6-3, there are no additional study area freeway mainline segments and ramp merge/diverge junctions that would operate at an unacceptable LOS (i.e., LOS E or worse) during one or both peak hours for EAP (2021) traffic conditions, in addition to the locations previously identified for E+P traffic conditions. With the proposed I-215/Placentia Avenue Interchange, there are no deficiencies anticipated for freeway mainline segments and ramp merge/diverge junctions. EAP (2021) Without and With I-215/Placentia Avenue Interchange basic freeway segment analysis worksheets are provided in Appendix 6.7 and 6.8 of this report.

6.7 RECOMMENDED IMPROVEMENTS

6.7.1 INTERSECTIONS

As shown in Table 6-4, there are no additional improvements required to improve the EAP (2021) Without I-215/Placentia Avenue Interchange peak hour deficiency at Harvill Avenue and N. A Street, in addition to the improvements previously identified under Existing (2019) traffic conditions.

For With I-215/Placentia Avenue Interchange traffic conditions, the recommended improvements are consistent with the proposed I-215/Placentia Avenue Interchange have been assumed (see Exhibit 6-1). These improvements include signalization of Harvill Avenue and Placentia Street. The deficiency at Harvill Avenue and N. A Street is less than significant with the proposed I-215/Placentia Avenue Interchange as the Project would contribute less than 50 peak hour trips to this intersection.

6.7.2 FREEWAY FACILITIES

At this time, Caltrans has no near-term fee programs or other improvement programs in place to address the deficiencies caused by development projects on the SHS freeway facilities. As such, no improvements have been recommended to address the EAP (2021) deficiencies on the SHS. The Project is anticipated to contribute less than 50 peak hour trips to these deficient facilities.

EXHIBIT 6-6: EAP (2021) (WITHOUT I-215/PLACENTIA INTERCHANGE) FREEWAY MAINLINE VOLUMES



LEGEND:

← 100/200 = AM/PM PEAK HOUR VOLUMES

NOTE: VOLUMES IN ACTUAL VEHICLES (NOT PCE)



EXHIBIT 6-7: EAP (2021) (WITH I-215/PLACENTIA INTERCHANGE) FREEWAY MAINLINE VOLUMES



LEGEND:

← 100/200 = AM/PM PEAK HOUR VOLUMES

NOTE: VOLUMES IN ACTUAL VEHICLES (NOT PCE)

Table 6-3

Freeway Facility Analysis for EAP (2021) Conditions

Freeway	Direction	Segment	Lanes ¹	Existing (2019)				EAP (2021) - w/o Placentia Interchange				EAP (2021) - w/ Placentia Interchange			
				Density ²		LOS ³		Density ²		LOS ³		Density ²		LOS ³	
				AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
I-215 Freeway	Southbound	North of Ramona Exwy.	3	18.9	27.9	B	D	20.1	29.6	C	D	18.9	27.9	C	D
		SB Off-Ramp at Ramona Exwy.	3	27.1	33.9	C	D	28.3	34.9	D	D	26.5	33.4	C	D
		SB On-Ramp at Ramona Exwy.	3	21.8	29.2	C	D	22.6	30.2	C	D	21.5	28.7	C	D
		Ramona Exwy. to Placentia Av.	3	18.1	26.7	B	D	18.8	28.1	C	D	18.3	26.9	C	C
		SB Off-Ramp at Placentia Av.	3	Does Not Exist				Does Not Exist				22.3	29.4	C	D
		SB On-Ramp at Placentia Av.	3	Does Not Exist				Does Not Exist				20.9	28.5	C	D
		Placentia Av. to Nuevo Rd.	3	Does Not Exist				Does Not Exist				18.1	27.1	C	D
		SB Off-Ramp at Nuevo Rd.	3	25.0	32.4	C	D	25.8	33.3	C	D	24.7	32.4	C	D
		SB On-Ramp at Nuevo Rd.	3	15.5	21.9	B	C	16.1	23.0	B	C	15.8	23.0	B	C
		South of Nuevo Rd.	4	14.0	19.7	B	B	14.6	20.7	B	C	13.9	20.1	B	C
	Northbound	North of Ramona Exwy.	3	42.1	21.9	E	C	43.9	23.3	E	C	27.7	21.4	D	C
		NB On-Ramp at Ramona Exwy.	3	31.7	26.1	D	C	33.0	27.4	D	C	30.6	25.4	D	C
		NB Off-Ramp at Ramona Exwy.	3	31.6	28.6	D	D	32.5	29.4	D	D	31.4	28.3	D	D
		Ramona Exwy. to Placentia Av.	3	39.4	21.4	E	C	41.0	22.4	E	C	25.2	20.9	C	C
		NB On-Ramp at Placentia Av.	3	Does Not Exist				Does Not Exist				27.5	24.0	C	C
		NB Off-Ramp at Placentia Av.	3	Does Not Exist				Does Not Exist				28.6	24.8	D	C
		Placentia Av. to Nuevo Rd.	3	Does Not Exist				Does Not Exist				25.4	20.5	C	C
		NB On-Ramp at Nuevo Rd.	3	28.1	24.9	D	C	29.1	25.7	D	C	27.9	24.1	C	C
		NB Off-Ramp at Nuevo Rd.	4	30.7	15.4	D	B	32.0	16.0	D	B	19.6	15.0	C	B
		South of Nuevo Rd.	4	31.6	15.7	D	B	33.0	16.3	D	B	19.6	15.0	C	B

* **BOLD** = Unacceptable Level of Service

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

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

³ LOS = Level of Service

Table 6-4

Intersection Analysis for EAP (2021) Conditions With Improvements

#	Intersection	Traffic Control ³	Intersection Approach Lanes ¹												Delay ² (secs.)		Level of Service	
			Northbound			Southbound			Eastbound			Westbound			AM	PM	AM	PM
			L	T	R	L	T	R	L	T	R	L	T	R				
8	Harvill Av. & Placentia St.																	
	EAP (2021) Without Interchange																	
	Without Improvements:	AWS	1	2	0	1	2	0	0	1	0	0	1	1	18.7	25.6	C	D
	With Improvements:		Not Applicable															
10	Harvill Av. & N. A St.																	
	EAP (2021) Without Interchange																	
	Without Improvements:	AWS	1	2	0	1	2	0	0	1	0	1	1	0	>100.0	19.8	F	C
	With Improvements:	TS	1	2	1>	1	2	0	0	1	0	1	1	0	21.1	14.1	C	B
10	EAP (2021) With Interchange																	
	Without Improvements:	AWS	1	2	0	1	2	0	0	1	0	1	1	0	>100.0	24.8	F	C
	With Improvements:		Project Contributes < 50 Peak Hour Trips															

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

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

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

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

7 EAPC (2021) TRAFFIC CONDITIONS

This section discusses the methods used to develop EAPC (2021) traffic forecasts and the resulting intersection operations, traffic signal warrant, and freeway facility analyses. The proposed future I-215/Placentia Avenue Interchange will be evaluated, as well as current traffic conditions, for EAPC (2021) traffic conditions. Although the I-215/Placentia Avenue Interchange project is funded and construction is anticipated to commence in 2020, at the County's request, the EAPC (2021) analysis scenario has been evaluated both without and with the proposed interchange in the event the Project were to open before the completion of the interchange.

7.1 ROADWAY IMPROVEMENTS

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

- Project driveways and those facilities assumed to be constructed by the Project to provide site access are also assumed to be in place for EAPC 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 EAPC (2021) conditions only (e.g., intersection and roadway improvements along the cumulative development's frontages).
- The I-215/Placentia Avenue Interchange is assumed for the With Interchange alternative only (see Exhibit 6-1).

7.2 EAPC (2021) TRAFFIC VOLUME FORECASTS

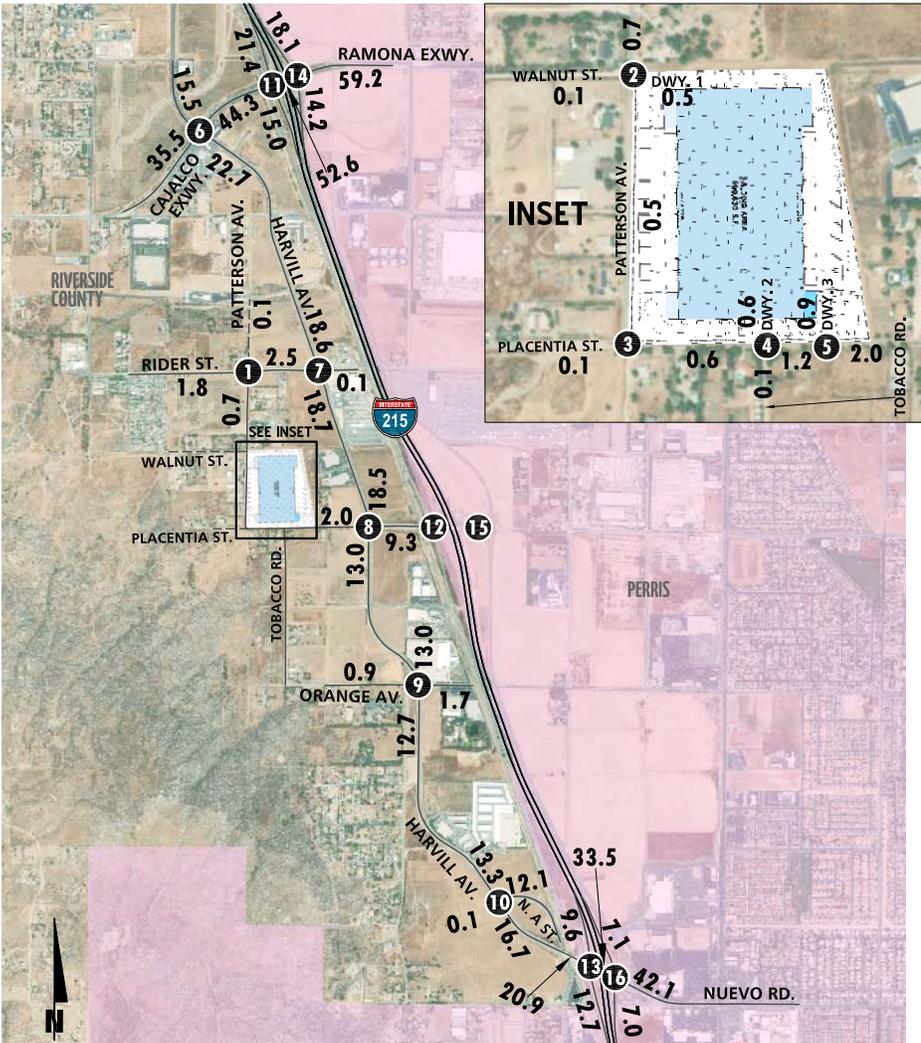
To account for background traffic, other known cumulative development projects in the study area were included in addition to 4.04% of ambient growth for EAPC (2021) traffic conditions in conjunction with traffic associated with the proposed Project. The weekday ADT and weekday AM and PM peak hour volumes which can be expected for EAPC (2021) traffic conditions are shown on Exhibit 7-1 Without I-215/Placentia Avenue Interchange and Exhibit 7-2 With I-215/Placentia Avenue Interchange.

7.3 INTERSECTION OPERATIONS ANALYSIS

Level of service calculations were conducted for the study intersections to evaluate their operations under EAPC (2021) conditions with existing roadway and intersection geometrics consistent with those described under Section 7.1 *Roadway Improvements*. As shown in Table 7-1 and illustrated on Exhibit 7-3 and 7-4, the following additional study area intersection is anticipated to operate at an unacceptable LOS under EAPC (2021) Without I-215/Placentia Avenue Interchange traffic conditions, in addition to those previously identified under Existing and EAP (2021) traffic conditions:

- I-215 Northbound Ramps & Ramona Exwy. (#14) – LOS E AM peak hour only

EXHIBIT 7-1: EAPC (2021) (WITHOUT I-215/PLACENTIA INTERCHANGE) TRAFFIC VOLUMES (IN PCE)

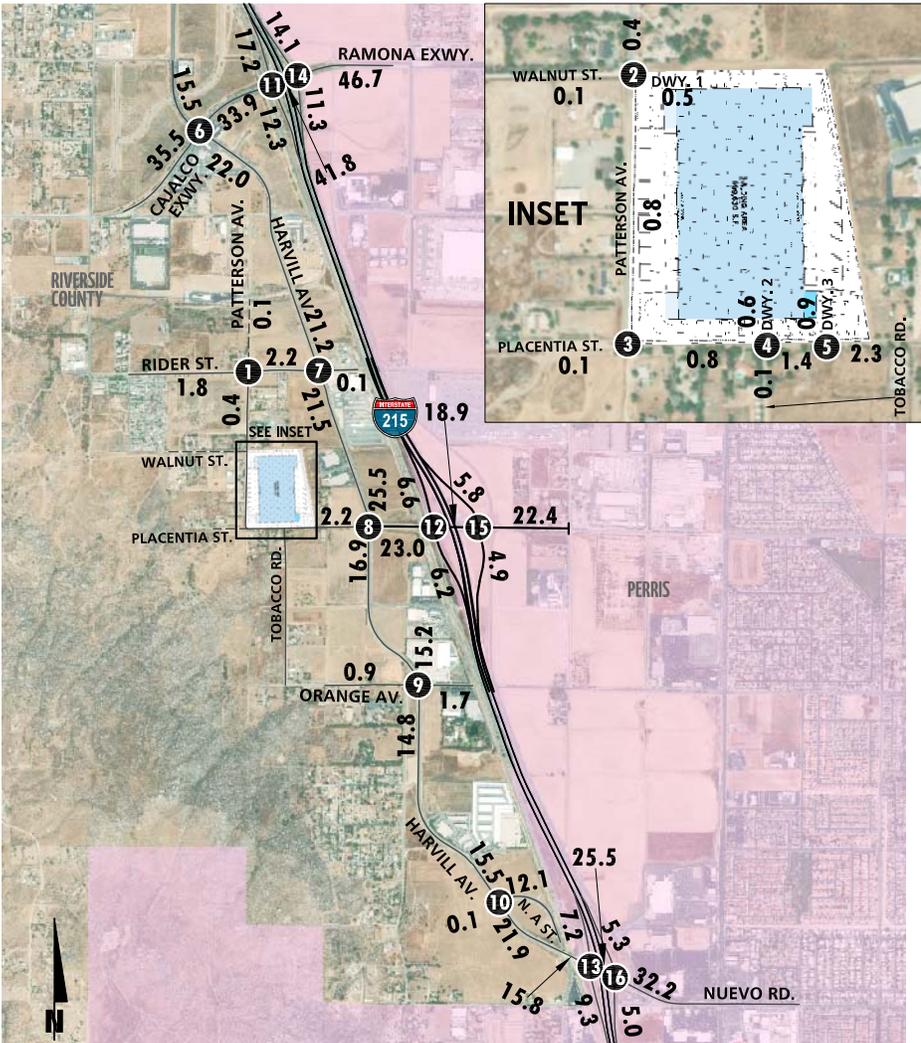


LEGEND:

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

<p>1 Patterson Av. & Rider St.</p>	<p>2 Patterson Av. & Walnut St./Dwy. 1</p>			
<p>3 Patterson Av. & Placentia St.</p>	<p>4 Dwy. 2 & Placentia St.</p>			
<p>5 Dwy. 3 & Placentia St.</p>	<p>6 Harvill Av. & Cajalco Exwy.</p>			
<p>7 Harvill Av. & Rider St.</p>	<p>8 Harvill Av. & Placentia St.</p>	<p>9 Harvill Av. & Orange Av.</p>	<p>10 Harvill Av. & N. A St.</p>	<p>11 I-215 SB Ramps & Cajalco Exwy.</p>
<p>12 I-215 SB Ramps & Placentia Av.</p> <p>Future Intersection</p>	<p>13 I-215 SB Ramps & Nuevo Rd.</p>	<p>14 I-215 NB Ramps & Ramona Exwy.</p>	<p>15 I-215 NB Ramps & Placentia Av.</p> <p>Future Intersection</p>	<p>16 I-215 NB Ramps & Nuevo Rd.</p>

EXHIBIT 7-2: EAPC (2021) (WITH I-215/PLACENTIA INTERCHANGE) TRAFFIC VOLUMES (IN PCE)



LEGEND:

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

<p>1 Patterson Av. & Rider St.</p> <p>5(0) ← 1(1) ← 0(0) ←</p> <p>1(2) → 45(88) → 5(4) →</p>	<p>2 Patterson Av. & Walnut St./Dwy. 1</p> <p>1(0) ← 11(12) ← 12(6) ←</p> <p>0(1) → 0(0) → 4(1) →</p> <p>4(16) ← 0(0) ← 10(41) ←</p>			
<p>3 Patterson Av. & Placentia St.</p> <p>2(1) ← 23(53) ← 4(4) ←</p> <p>2(1) → 2(1) →</p>	<p>4 Dwy. 2 & Placentia St.</p> <p>0(0) ← 0(0) ← 16(69) ←</p> <p>0(0) → 24(52) → 1(2) →</p> <p>53(27) ← 51(27) ← 3(2) ←</p>			
<p>5 Dwy. 3 & Placentia St.</p> <p>0(0) ← 22(86) ←</p> <p>0(0) → 47(122) →</p>	<p>6 Harvill Av. & Cajalco Exwy.</p> <p>32(76) ← 160(217) ← 281(421) ←</p> <p>88(59) → 606(810) → 323(462) →</p> <p>431(246) ← 765(692) ← 217(111) ←</p> <p>495(458) ↑ 348(159) ↑ 58(199) ↑</p>			
<p>7 Harvill Av. & Rider St.</p> <p>21(23) ← 569(786) ← 0(0) ←</p> <p>0(0) → 0(1) → 0(1) →</p> <p>22(34) → 847(660) → 3(2) →</p>	<p>8 Harvill Av. & Placentia St.</p> <p>22(11) ← 300(404) ← 436(606) ←</p> <p>12(25) → 44(154) → 14(28) →</p> <p>26(15) → 444(332) → 247(236) →</p>	<p>9 Harvill Av. & Orange Av.</p> <p>18(33) ← 484(552) ← 15(24) ←</p> <p>24(14) → 0(2) → 8(6) →</p> <p>9(4) → 630(458) → 17(25) →</p>	<p>10 Harvill Av. & N. A St.</p> <p>3(1) ← 391(505) ← 135(121) ←</p> <p>0(2) → 4(0) → 1(5) →</p> <p>4(1) → 397(420) → 629(346) →</p>	<p>11 I-215 SB Ramps & Cajalco Exwy.</p> <p>298(181) ← 3(5) ← 731(815) ←</p> <p>642(955) → 311(417) →</p> <p>1041(877) ← 337(442) ←</p>
<p>12 I-215 SB Ramps & Placentia Av.</p> <p>208(118) ← 0(0) ← 325(421) ←</p> <p>315(470) → 160(263) →</p>	<p>13 I-215 SB Ramps & Nuevo Rd.</p> <p>73(59) ← 3(4) ← 244(446) ←</p> <p>602(432) → 123(177) →</p>	<p>14 I-215 NB Ramps & Ramona Exwy.</p> <p>866(723) ← 1016(962) ←</p> <p>192(316) → 1180(1452) →</p>	<p>15 I-215 NB Ramps & Placentia Av.</p> <p>391(352) ← 425(502) ←</p> <p>101(216) → 538(675) →</p>	<p>16 I-215 NB Ramps & Nuevo Rd.</p> <p>306(334) ← 895(879) ←</p> <p>32(42) → 813(836) →</p>

EXHIBIT 7-3: EAPC (2021) (WITHOUT I-215/PLACENTIA INTERCHANGE) SUMMARY OF LOS

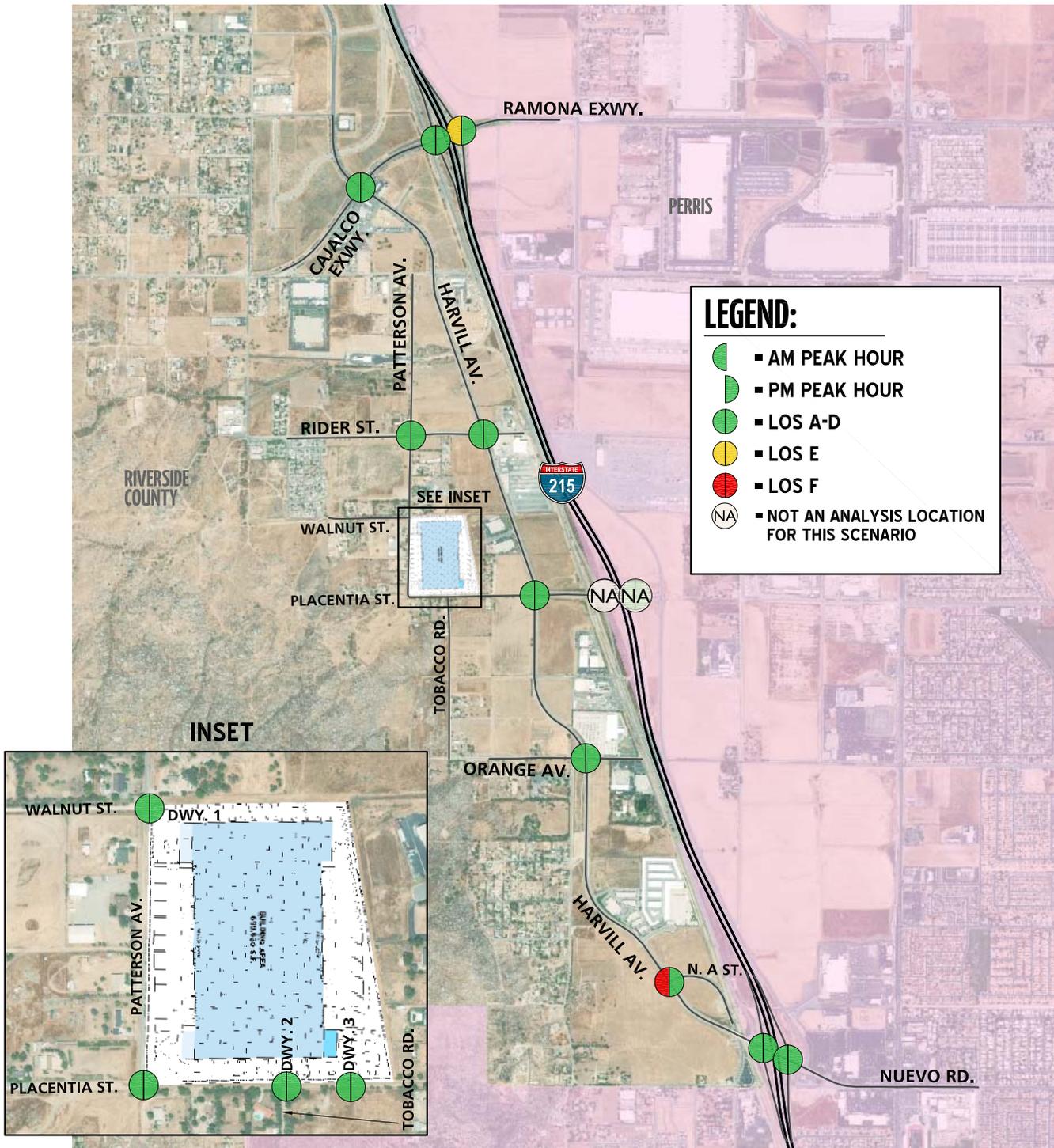


EXHIBIT 7-4: EAPC (2021) (WITH I-215/PLACENTIA INTERCHANGE) SUMMARY OF LOS

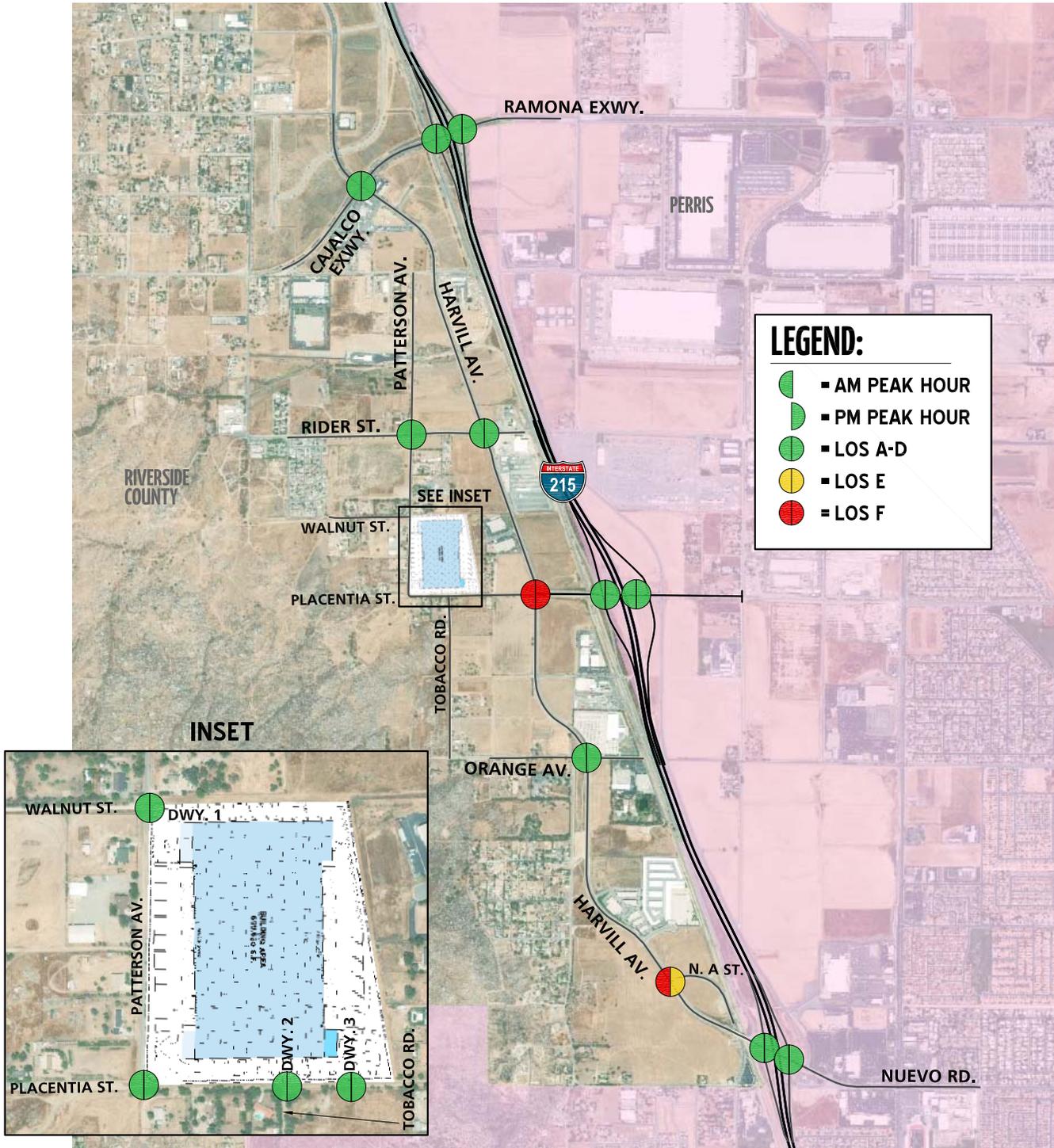


Table 7-1

Intersection Analysis for EAPC (2021) Conditions

#	Intersection	Traffic Control ²	EAPC (2021) - w/o Placentia				EAPC (2021) - w/ Placentia			
			Delay ¹ (secs.)		Level of Service		Delay ¹ (secs.)		Level of Service	
			AM	PM	AM	PM	AM	PM	AM	PM
1	Patterson Av. & Rider St.	CSS	8.9	10.0	A	B	8.9	10.0	A	B
2	Patterson Av. & Walnut St./Dwy. 1	CSS	8.8	8.7	A	A	9.3	9.1	A	A
3	Patterson Av. & Placentia St.	CSS	8.7	8.7	A	A	8.8	8.9	A	A
4	Dwy. 2/Tobacco Rd. & Placentia St.	CSS	9.1	9.0	A	A	9.6	9.8	A	A
5	Dwy. 3 & Placentia St.	CSS	9.1	9.2	A	A	9.7	10.2	A	B
6	Harvill Av. & Cajalco Exwy.	TS	33.9	23.5	C	C	30.7	32.1	C	C
7	Harvill Av. & Rider St.	CSS	16.5	17.0	C	C	19.2	24.3	C	C
8	Harvill Av. & Placentia St.	AWS	24.6	17.3	C	C	>100.0	>100.0	F	F
9	Harvill Av. & Orange Av.	CSS	20.0	14.8	C	B	24.4	26.6	C	D
10	Harvill Av. & N. A St.	AWS	>100.0	19.8	F	C	>100.0	47.4	F	E
11	I-215 SB Ramps & Ramona Exwy.	TS	42.4	35.6	D	D	23.3	30.9	C	C
12	I-215 SB Ramps & Placentia Av.	TS	Does Not Exist				14.8	14.8	B	B
13	I-215 SB Ramps & Nuevo Rd.	TS	18.6	50.9	B	D	16.2	20.2	B	C
14	I-215 NB Ramps & Ramona Exwy.	TS	57.6	17.9	E	B	17.5	22.3	B	C
15	I-215 NB Ramps & Placentia Av.	TS	Does Not Exist				18.7	12.9	B	B
16	I-215 NB Ramps & Nuevo Rd.	TS	17.1	10.2	B	B	18.3	11.0	B	B

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

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

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

With the proposed I-215/Placentia Avenue Interchange, there are no additional study area intersections anticipated to operate at a deficient LOS in addition to the intersections previously identified for EAP (2021) With I-215/Placentia Avenue Interchange traffic conditions. The intersection operations analysis worksheets for EAPC (2021) conditions are included in Appendix 7.1 of this report.

7.4 TRAFFIC SIGNAL WARRANTS ANALYSIS

Traffic signal warrants have been performed (based on CA MUTCD) for EAPC (2021) traffic conditions based on peak hour and daily volumes. For EAPC (2021) traffic conditions, no additional study area intersections are anticipated to meet planning-level ADT or peak hour volume-based traffic signal warrants under EAPC (2021) Without and With I-215/Placentia Avenue Interchange traffic conditions, in addition to the intersection previously identified under Existing (2019) and EAP (2021) traffic conditions (see Appendix 7.3 and 7.4).

7.5 OFF-RAMP QUEUING ANALYSIS

A queuing analysis was performed for the off-ramps at the I-215 Freeway Cajalco Expressway/Ramona Expressway and Harvill Avenue/Nuevo Road 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 result in “spill back” onto the I-215 Freeway mainline. Queuing analysis findings are presented in Table 7-2. It is important to note that off-ramp lengths are consistent with the measured distance between the intersection and the freeway mainline. As shown in Table 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. Worksheets for EAPC (2021) Without and With I-215/Placentia Avenue Interchange traffic conditions off-ramp queuing analysis are provided in Appendices 7.5 and 7.6 of this report.

7.6 BASIC FREEWAY SEGMENT ANALYSIS

EAPC (2021) mainline directional volumes for the AM and PM peak hours are provided on Exhibit 7-5 and 7-6 for Without and With I-215/Placentia Avenue Interchange, respectively. As shown in Table 7-3, the following additional I-215 Freeway segments are anticipated to operate at an unacceptable LOS (i.e., LOS E or worse) during the peak hours for EAPC (2021) Without I-215/Placentia Avenue Interchange traffic conditions:

- I-215 Freeway Southbound, Ramona Exwy. to Placentia Av. – LOS E PM peak hour only (#4)
- I-215 Freeway Northbound, South of Nuevo Rd. – LOS E AM peak hour only (#20)

Table 7-2

Peak Hour Freeway Off-Ramp Queuing Summary for EAPC (2021) Conditions

Intersection	Movement	Available Stacking Distance (Feet)	EAPC (2021) - Without Placentia Interchange			EAPC (2021) - With Placentia Interchange		
			95th Percentile Queue (Feet)			95th Percentile Queue (Feet)		
			AM Peak Hour	PM Peak Hour	Acceptable? ¹	AM Peak Hour	PM Peak Hour	Acceptable? ¹
I-215 Southbound Ramps & Ramona Exwy.	SBL	530	384 ²	341 ²	Yes	278 ²	314 ²	Yes
	SBL/T	1,100	387 ²	346 ²	Yes	281 ²	318 ²	Yes
	SBR	530	261 ²	53	Yes	121	52	Yes
I-215 Southbound Ramps & Placentia Av.	SBL	1,030				114	141	Yes
	SBL/T	1,030		Does Not Exist		114	141	Yes
	SBR	330				47	32	Yes
I-215 Southbound Ramps & Nuevo Rd.	SBL	1,020	130 ²	221 ²	Yes	96	173 ²	Yes
	SBL/T	1,020	134 ²	225 ²	Yes	95	177 ²	Yes
	SBR	300	21	9	Yes	10	1	Yes
I-215 Northbound Ramps & Ramona Exwy.	NBL	520	173 ²	117	Yes	120	112	Yes
	NBL/T	1,120	176 ²	120	Yes	122	112	Yes
	NBR	520	349 ²	254 ²	Yes	241 ²	213 ²	Yes
I-215 Northbound Ramps & Placentia Av.	NBL	575				92	64	Yes
	NBL/T	1,360		Does Not Exist		92	64	Yes
	NBR	1,360				55	47	Yes
I-215 Northbound Ramps & Nuevo Rd.	NBL/T	1,010	221 ²	76	Yes	138	57	Yes
	NBR	300	142	73	Yes	86	43	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 I-215 Freeway mainline.



Table 7-3

Freeway Facility Analysis for EAPC (2021) Conditions

Freeway	Direction	Segment	Lanes ¹	EAPC (2021) - w/o Placentia Interchange				EAPC (2021) - w/ Placentia Interchange			
				Density ²		LOS ³		Density ²		LOS ³	
				AM	PM	AM	PM	AM	PM	AM	PM
I-215 Freeway	Southbound	North of Ramona Exwy.	3	24.4	34.8	C	D	22.9	32.7	C	D
		SB Off-Ramp at Ramona Exwy.	3	33.5	38.5	D	E	31.2	36.7	D	E
		SB On-Ramp at Ramona Exwy.	3	24.8	36.9	C	E	24.0	34.4	C	D
		Ramona Exwy. to Placentia Av.	3	20.5	35.6	C	E	20.3	33.3	C	D
		SB Off-Ramp at Placentia Av.	3	Does Not Exist				24.6	33.0	C	D
		SB On-Ramp at Placentia Av.	3	Does Not Exist				22.5	33.5	C	D
		Placentia Av. to Nuevo Rd.	3	Does Not Exist				19.6	34.2	C	D
		SB Off-Ramp at Nuevo Rd.	3	27.3	36.8	C	E	26.2	35.9	C	E
		SB On-Ramp at Nuevo Rd.	3	17.5	28.9	B	D	17.2	29.0	B	D
	South of Nuevo Rd.	4	15.7	24.5	B	C	15.0	23.8	B	C	
	Northbound	North of Ramona Exwy.	3	45.6	28.7	F	D	30.5	26.7	D	D
		NB On-Ramp at Ramona Exwy.	3	48.5	33.6	F	D	33.0	30.9	D	D
		NB Off-Ramp at Ramona Exwy.	3	35.6	31.8	E	D	34.1	31.0	D	D
		Ramona Exwy. to Placentia Av.	3	43.0	24.5	E	C	28.5	23.6	D	C
		NB On-Ramp at Placentia Av.	3	Does Not Exist				30.0	26.8	D	C
		NB Off-Ramp at Placentia Av.	3	Does Not Exist				31.0	26.6	D	C
		Placentia Av. to Nuevo Rd.	3	Does Not Exist				29.0	22.6	D	C
		NB On-Ramp at Nuevo Rd.	3	46.4	27.4	F	C	30.3	25.8	D	C
		NB Off-Ramp at Nuevo Rd.	4	34.7	17.4	D	B	21.5	16.3	C	B
South of Nuevo Rd.	4	36.0	17.7	E	B	21.5	16.3	C	B		

* **BOLD** = Unacceptable Level of Service

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

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

³ LOS = Level of Service

EXHIBIT 7-5: EAPC (2021) (WITHOUT I-215/PLACENTIA INTERCHANGE) FREEWAY MAINLINE VOLUMES



LEGEND:

← 100/200 = AM/PM PEAK HOUR VOLUMES

NOTE: VOLUMES IN ACTUAL VEHICLES (NOT PCE)



EXHIBIT 7-6: EAPC (2021) (WITH I-215/PLACENTIA INTERCHANGE) FREEWAY MAINLINE VOLUMES



LEGEND:

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

The following ramp/merge/diverge areas are anticipated to operate at LOS E or worse during the peak hours for EAPC (2021) Without I-215/Placentia Avenue Interchange traffic conditions:

- I-215 Freeway Southbound, Off-Ramp at Ramona Exwy. – LOS E PM peak hour only (#2)
- I-215 Freeway Southbound, On-Ramp at Ramona Exwy. – LOS E PM peak hour only (#3)
- I-215 Freeway Southbound, Off-Ramp at Nuevo Rd. – LOS E PM peak hour only (#8)
- I-215 Freeway Northbound, On-Ramp at Ramona Exwy. – LOS F AM peak hour only (#12)
- I-215 Freeway Northbound, Off-Ramp at Ramona Exwy. – LOS E AM peak hour only (#13)
- I-215 Freeway Northbound, On-Ramp at Nuevo Rd. – LOS F AM peak hour only (#18)

With the proposed I-215/Placentia Avenue Interchange, the freeway segments are anticipated to operate at acceptable LOS (i.e., LOS D or better) during the peak hours for EAPC (2021) With I-215/Placentia Avenue Interchange traffic conditions. For the freeway mainline analysis and ramp merge/diverge analysis, the following two locations are anticipated to operate at LOS E or worse during the peak hours:

- I-215 Freeway Southbound, Off-Ramp at Ramona Exwy. – LOS E PM peak hour only (#2)
- I-215 Freeway Southbound, Off-Ramp at Nuevo Rd. – LOS E PM peak hour only (#8)

EAPC (2021) Without and With I-215/Placentia Avenue Interchange basic freeway segment analysis worksheets are provided in Appendix 7.7 and 7.8 of this report.

7.7 RECOMMENDED IMPROVEMENTS

7.7.1 INTERSECTIONS

As shown in Table 7-4, there are no additional improvements required to improve the EAPC (2021) Without I-215/Placentia Avenue Interchange peak hour deficiency at Harvill Avenue and N. A Street, in addition to the improvements previously identified under Existing (2019) traffic conditions.

For With I-215/Placentia Avenue Interchange traffic conditions, the recommended improvements are consistent with the proposed I-215/Placentia Avenue Interchange have been assumed (see Exhibit 6-1). These improvements include signalization of Harvill Avenue and Placentia Street. The deficiency at Harvill Avenue and N. A Street is less than significant with the proposed I-215/Placentia Avenue Interchange as the Project would contribute less than 50 peak hour trips to this intersection.

Worksheets for EAPC (2021) Without and With I-215/Placentia Avenue Interchange traffic conditions, with improvements, HCM calculations are provided in Appendix 7.9 and 7.10, respectively.

Table 7-4

Intersection Analysis for EAPC (2021) Conditions With Improvements

#	Intersection	Traffic Control ³	Intersection Approach Lanes ¹												Delay ² (secs.)		Level of Service	
			Northbound			Southbound			Eastbound			Westbound			AM	PM	AM	PM
			L	T	R	L	T	R	L	T	R	L	T	R				
8	Harvill Av. & Placentia St.																	
	EAPC (2021) Without Interchange																	
	Without Improvements:	AWS	1	2	0	1	2	0	0	1	0	0	1	1	24.6	17.3	C	C
	With Improvements:		Not Applicable															
10	Harvill Av. & N. A St.																	
	EAPC (2021) Without Interchange																	
	Without Improvements:	AWS	1	2	0	1	2	0	0	1	0	1	1	0	>100.0	19.8	F	C
	With Improvements:	TS	1	2	1>	1	2	0	0	1	0	1	1	0	20.9	29.6	C	C
10	Harvill Av. & N. A St.																	
	EAPC (2021) With Interchange																	
	Without Improvements:	AWS	1	2	0	1	2	0	0	1	0	1	1	0	>100.0	47.4	F	E
	With Improvements:		Project Contributes < 50 Peak Hour Trips															

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

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

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

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

The Project Applicant shall participate in the funding of off-site improvements that are needed to serve cumulative traffic conditions through the payment the County of Riverside TUMF/DIF fees and fair share construction buildout costs based upon the project's impact on existing infrastructure. These fees shall be collected by the County of Riverside, 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.

7.7.2 FREEWAY FACILITIES

At this time, Caltrans has no near-term fee programs or other improvement programs in place to address the deficiencies caused by development projects on the SHS freeway facilities. As such, no improvements have been recommended to address the EAPC (2021) deficiencies on the SHS. The Project is anticipated to contribute less than 50 peak hour trips to these deficient facilities.

8 REFERENCES

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