URBAN CROSSROADS

Rancho Palma

TRAFFIC IMPACT ANALYSIS

CITY OF SAN BERNARDINO

PREPARED BY:

Aric Evatt, PTP
aevatt@urbanxroads.com
(949) 660-1994 x204

Charlene So, PE
cso@urbanxroads.com
(949) 660-1994 x222

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LIST OF ABBREVIATED TERMS

(1)	Reference
ADT	Average Daily Traffic
Av.	Avenue
BT&H	California Business, Transportation & Housing Agency
Caltrans	California Department of Transportation
CEQA	California Environmental Quality Act
CMP	Congestion Management Program
CTC	California Transportation Commission
DIF	Development Impact Fee
Dr	Drive
DU	Dwelling Unit
E+P	Existing Plus Project
EA	Existing Plus Ambient Growth
EAP	Existing Plus Ambient Growth Plus Project
FHWA	Federal Highway Administration
HCM	Highway Capacity Manual
ITE	Institute of Transportation Engineers
ITIP	Interregional Transportation Improvement Program
LOS	Level of Service
MPO	Metropolitan Planning Organization
MUTCD	Manual on Uniform Traffic Control Devices
NCHRP	National Cooperative Highway Research Program
PHF	Peak Hour Factor
Pkwy	Parkway
Project	Rancho Palma
RTIP	Regional Transportation Improvement Program
RTP	Regional Transportation Plan
RTPA	Regional Transportation Planning Agency
SANBAG	San Bernardino Associated Governments
SBTAM	San Bernardino Transportation Analysis Model
SCAG	Southern California Association of Governments
Sf	Square Feet
SHOPP	State Highway Operation and Protection Program
SHS	State Highway System
STIP	State Transportation Improvement Program
TIA	Traffic Impact Analysis
v/c	Volume-to-Capacity Ratio

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1 INTRODUCTION

This report presents the results of the traffic impact analysis (TIA) for the proposed Rancho Palma ("Project") located in the City of San Bernardino northeast of W. Little League Drive and northwest of Palm Avenue, as shown on Exhibit 1-1.

The purpose of this traffic impact analysis is to evaluate the potential impacts to traffic and circulation associated with the development of the proposed Project, and to recommend improvements to mitigate impacts considered significant in comparison to established regulatory thresholds. The scope of this study has been developed through consultation with the City of San Bernardino, and follows the City of San Bernardino Traffic Impact Study Guidelines (September 2004), and also where appropriate addresses requirements as identified by the County of San Bernardino Congestion Management Program (CMP) and Caltrans traffic study guidelines. (1) (2) (3) The approved Project Traffic Study Scoping agreement with the City of San Bernardino is provided in Appendix 1.1 of this TIA.

1.1 PROJECT OVERVIEW

The Project is proposed to include the development of 120 single family detached residential dwelling units and 98,000 square feet of commercial retail use. For the purposes of this analysis, potential impacts have been assessed for two development phases. The two phases and their anticipated opening years are as follows:

- Phase 1 (2018) – 120 single family detached residential dwelling units (Western Half)
- Phase 2 (2019) – 98,000 square feet of commercial retail use (Eastern Half)

Trips generated by the Project's proposed land uses have been estimated based on trip generation rates collected by the Institute of Transportation Engineers (ITE) *Trip Generation Manual*, 9th Edition, 2012. (4) The Project is estimated to generate a net total of 4,728 trip-ends per day on a typical weekday with approximately 242 AM peak hour trips and 425 PM peak hour trips. The assumptions and methods used to estimate the Project's trip generation characteristics are discussed in greater detail in Section 4.1 *Project Trip Generation* of this report.

1.2 ANALYSIS SCENARIOS

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

- Existing (2015) (1 scenario)
- Existing plus Project (E+P) (Phase 1 and Project Buildout) (2 scenarios)
- Existing Plus Ambient Growth (EA) (2018) and (2019) (2 scenarios) – ambient growth
- Existing Plus Ambient Growth Plus Project (EAP) (2019) and (2020) (2 scenarios) – ambient growth and Project traffic

EXHIBIT 1-1: PRELIMINARY SITE PLAN

URBAN CROSSROADS

- Opening Year Cumulative (2018) Without and With Project (2 scenarios) – ambient growth, Project (Phase 1), and cumulative development projects
- Opening Year Cumulative (2019) Without and With Project (2 scenarios) – ambient growth, Project (Buildout), and cumulative development projects
- Horizon Year (2035) Without and With Project (2 scenarios) – County of San Bernardino Association of Governments (SANBAG) San Bernardino Transportation Analysis Model (SBTAM) forecasts, Project (Buildout) traffic

1.2.1 EXISTING CONDITIONS

Existing (2015) physical conditions have been disclosed to represent the baseline traffic conditions as they existed at the time this report was prepared.

1.2.2 EXISTING PLUS PROJECT (E+P) CONDITIONS

The E+P analysis determines circulation system deficiencies that would occur on the existing roadway system in the scenario of the Project being placed upon Existing conditions. The analysis has been prepared for each phase of development (i.e., E+P (Phase 1) and E+P (Project Buildout)).

1.2.3 EXISTING PLUS AMBIENT GROWTH (EA) AND EXISTING PLUS AMBIENT GROWTH PLUS PROJECT (EAP) CONDITIONS

The EA (2018), EAP (2018), EA (2019), and EAP (2019) traffic conditions analyses determine potential traffic impacts based on a comparison of the EAP traffic conditions to EA conditions. To account for background traffic growth, an ambient growth factor from Existing conditions of 6.12% (2 percent per year over 3 years, compounded annually) for 2018 conditions and 8.24% (2 percent per year over 4 years, compounded annually) for 2019 conditions are included for EA and EAP traffic conditions.

1.2.4 OPENING YEAR CUMULATIVE WITHOUT AND WITH PROJECT CONDITIONS

The Opening Year Cumulative (2018) and (2019) Without and With Project traffic conditions analysis determines the potential near-term cumulative circulation system deficiencies. To account for background traffic growth, traffic associated with other known cumulative development projects in conjunction with an ambient growth factor from Existing conditions of 6.12% (for 2018 conditions) and 8.24% (for 2019 conditions) are included for Opening Year Cumulative traffic conditions. This comprehensive list was compiled from information provided by the City of San Bernardino and County of San Bernardino.

The currently adopted Southern California Association of Governments (SCAG) 2012 Regional Transportation Plan (RTP) (April 2012) growth forecasts for the City of San Bernardino identifies projected growth in population of 209,900 in 2008 to 261,400 in 2035, or a 24.54 percent increase over the 27 year period. (5) The change in population equates to roughly a 0.82 percent annual growth rate, compounded annually. Similarly, growth over the same 27 year period in households is projected to increase by 29.51 percent, or 0.96 percent annual growth rate. Finally, growth in employment over the same 27 year period is projected to increase by 43.44 percent, or a 1.34 percent annual growth rate.

Based on a comparison of Existing traffic volumes to the Horizon Year (2035) forecasts, the average growth rate is estimated at approximately 2.20 percent compounded annually between Existing and Horizon Year (2035) traffic conditions. The annual growth rate at each individual intersection is not lower than 1.27 percent to as high as 4.67 percent compounded annually over the same time period. Therefore, the annual growth rate utilized for the purposes of this analysis would appear to conservatively approximate the anticipated regional growth in traffic volumes in the City of San Bernardino for both Opening Year Cumulative and Horizon Year (2035) traffic conditions, especially when considered along with the addition of cumulative development project traffic and project-related traffic. As such, the growth in traffic volumes assumed in this traffic impact analysis would tend to overstate, as opposed to understate, the potential impacts to traffic and circulation.

1.2.5 HORIZON YEAR (2035) CONDITIONS

The Horizon Year (2035) conditions analysis will be utilized to determine if improvements funded through local and regional transportation mitigation fee programs, such as the City of San Bernardino Development Impact Fee (DIF) program, or other approved funding mechanism can accommodate the cumulative traffic at the target Level of Service (LOS) identified by the City of San Bernardino. If the planned and funded improvements can provide the necessary improvements in delay, then the Project's payment into these established fee programs will be considered as long-range cumulative mitigation. Other improvements needed beyond the "funded" improvements (such as localized improvements to non-funded facilities) are identified as such and would be subject to fair share or as identified by City staff. Traffic projections for Horizon Year (2035) With Project conditions were derived from the SBTAM using accepted procedures for model forecast refinement and smoothing.

Horizon Year traffic conditions have been evaluated for without and with the Magnolia Avenue crossing over the Cajon Creek Wash. The currently SBTAM model does not account for the extension of Magnolia Avenue over the Cajon Creek Wash. However, the City of San Bernardino's General Plan Circulation Element shows the extension of Magnolia Avenue as a future roadway connection. As such, the Magnolia Avenue extension has been evaluated as an alternative analysis scenario for Horizon Year traffic conditions.

1.3 STUDY AREA

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

1.3.1 INTERSECTIONS

The following study area intersections were selected for this TIA based on the City of San Bernardino's traffic study guidelines that require analysis of intersection locations in which the proposed Project is anticipated to contribute 50 or more peak-hour trips, or were added based on discussions with City staff. Furthermore, the rationale for evaluating intersections where a project would contribute 50 or more peak-hour trips is standard industry practice and supported by substantial evidence. The intersection locations are listed in Table 1-1 and are also shown on Exhibit 1-2.

TABLE 1-1: INTERSECTION ANALYSIS LOCATIONS

ID	Intersection Location	Jurisdiction	CMP
1	N. Little League Drive / W. Little League Drive	City of San Bernardino	No
2	N. Little League Drive / Kendall Drive	City of San Bernardino	Yes
3	Magnolia Avenue / Irvington Avenue	City of San Bernardino	No
4	Magnolia Avenue / Driveway 1 – Future Intersection	City of San Bernardino	No
5	Magnolia Avenue / W. Little League Drive – Future Intersection	City of San Bernardino	No
6	Driveway 2 / W. Little League Drive – Future Intersection	City of San Bernardino	No
7	Driveway 3 / W. Little League Drive – Future Intersection	City of San Bernardino	No
8	Driveway 4 / W. Little League Drive – Future Intersection	City of San Bernardino	No
9	Driveway 5 / W. Little League Drive – Future Intersection	City of San Bernardino	No
10	Palm Avenue / Belmont Avenue	City of San Bernardino	Yes
11	Palm Avenue / Irvington Avenue	City of San Bernardino	No
12	Palm Avenue / Kendall Avenue	City of San Bernardino	Yes
13	Palm Avenue / I-215 Northbound Ramps	San Bernardino, Caltrans	Yes
14	Palm Avenue / I-215 Southbound Ramps	San Bernardino, Caltrans	Yes
15	Palm Avenue / Hallmark Parkway	City of San Bernardino	Yes
16	Pine Avenue / Belmont Avenue	City of San Bernardino	Yes
17	Pine Avenue / Kendall Drive	City of San Bernardino	Yes
18	Campus Parkway / Kendall Drive	City of San Bernardino	Yes
19	University Parkway / Kendall Drive	City of San Bernardino	Yes

Study area intersections are anticipated to be affected by the potential future extension of Magnolia Avenue over the Cajon Creek Wash and have been evaluated for Horizon Year (2035) (Alternative) traffic conditions (shown on Table 1-2).

EXHIBIT 1-2: LOCATION MAP

TABLE 1-2: INTERSECTION ANALYSIS LOCATIONS FOR HORIZON YEAR (2035) (ALTERNATIVE) TRAFFIC CONDITIONS

ID	Intersection Location	Jurisdiction	CMP
3	Magnolia Avenue / Irvington Avenue	City of San Bernardino	No
4	Magnolia Avenue / Driveway 1 – Future Intersection	City of San Bernardino	No
5	Magnolia Avenue / W. Little League Drive – Future Intersection	City of San Bernardino	No
6	Driveway 2 / W. Little League Drive – Future Intersection	City of San Bernardino	No
7	Driveway 3 / W. Little League Drive – Future Intersection	City of San Bernardino	No
8	Driveway 4 / W. Little League Drive – Future Intersection	City of San Bernardino	No
9	Driveway 5 / W. Little League Drive – Future Intersection	City of San Bernardino	No
11	Palm Avenue / Irvington Avenue	City of San Bernardino	No
12	Palm Avenue / Kendall Avenue	City of San Bernardino	Yes

It should also be noted that the 50 peak hour trip threshold is used by numerous other agencies throughout Southern California including Caltrans, County of San Bernardino, County of Riverside, and the County of Orange. The 50 peak hour trip threshold is based on the desire to analyze potential impacts when a project contributes 3 percent or more of the capacity of a typical signalized intersection. The 50 peak hour threshold represents less than 3 percent of capacity of a signalized intersection for critical movements, estimated based on the Highway Capacity Manual (HCM) at approximately 1700 vehicles per hour. In effect, acting as the lead agency, these jurisdictions have established 50 project trips as the threshold for when to analyze signalized intersections. Therefore, a project trip contribution of less than 50 peak hour trips is considered less than significant and is typically not evaluated. The Project is anticipated to contribute less than 50 peak hour trips at the locations indicated, but have been evaluated in an effort to conduct a conservative analysis.

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. The County of San Bernardino CMP became effective with the passage of Proposition 111 in 1992 and updated most recently updated in 2011. The San Bernardino Associated Governments (SANBAG) adopted the 2011 CMP for the County of San Bernardino in November 2011. (2) There are 10 study area intersections that are identified as CMP facilities.

1.3.2 FREEWAY MAINLINE SEGMENTS

Study area freeway mainline analysis locations were selected based on Caltrans traffic study guidelines, which may require the analysis of State highway facilities. (3) Although the Project is anticipated to contribute less than 50 peak hour directional trips to the following freeway

segments adjacent to the point of entry to the State Highway System (SHS), they have been evaluated for the purposes of this traffic study in an effort to conduct a conservative analysis (see Table 1-3):

TABLE 1-3: FREEWAY MAINLINE SEGMENT ANALYSIS LOCATIONS

ID	Freeway Mainline Segments
1	I-215 Freeway – Southbound, North of Palm Avenue
2	I-215 Freeway – Southbound, South of Palm Avenue
3	I-215 Freeway – Northbound, North of Palm Avenue
4	I-215 Freeway – Northbound, South of Palm Avenue

1.3.3 FREEWAY MERGE/DIVERGE RAMP JUNCTIONS

The study area freeway merge/diverge ramp junction analysis locations include the following freeway ramp junctions for each direction of flow (Table 1-4), although the Project is anticipated to contribute less than 50 peak hour directional trips:

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

ID	Freeway Merge/Diverge Ramp Junctions
1	I-215 Freeway – Southbound, Palm Avenue Off-Ramp (Diverge)
2	I-215 Freeway – Southbound, Palm Avenue On-Ramp (Merge)
3	I-215 Freeway – Northbound, Palm Avenue On-Ramp (Merge)
4	I-215 Freeway – Northbound, Palm Avenue Off-Ramp (Diverge)

1.4 POTENTIAL PROJECT IMPACTS

This section provides a summary of recommended mitigation measures necessary to address Project impacts for E+P and EA/EAP traffic conditions. Section 2 *Methodologies* provides information on the methodologies used in the analysis and Section 5 *E+P Traffic Analysis*, Section 6 *EA (2018) and EAP (2018) Traffic Analysis*, and Section 7 *EA (2019) and EAP (2019) Traffic Analysis* includes the detailed analysis. A summary of the peak hour intersection LOS are provided on Table 1-5 for each of the analysis scenarios.

1.4.1 PHASE 1 (2018)

Based on an assessment of E+P (Phase 1), EA (2018), and EAP (2018) traffic conditions, the Project's potential impact to the surrounding study area intersections was found to be less-than-significant. Section 5 *E+P Traffic Analysis* and Section 6 *EA (2018) and EAP (2018) Traffic Analysis* includes the detailed analysis results.

Table 1-5

Summary of Intersection Level of Service by Analysis Scenario

#	Intersection	Traffic Control[2]	Existing LOS[2]		E+P (Phase 1) LOS[2]		E+P (Project Buildout) LOS[2]		EA (2018) LOS[2]		EAP (2018) LOS[2]		EA (2019) LOS[2]		EAP (2019) LOS[2]		2018 NP[3] LOS[2]		2018 WP[3] LOS[2]		2019 NP[3] LOS[2]		2019 WP[3] LOS[2]		2035 NP[3] LOS[2]		2035 WP[3] LOS[2]	
			AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
1	N. Little League Dr. / W. Little League Dr.	CSS	B	A	B	A	B	B	B	A	B	B	B	A	B	B	B	A	B	B	B	B	B	B	B	B	B	B
2	N. Little League Dr. / Kendall Dr.	CSS	B	B	B	B	B	B	B	B	B	B	B	B	B	C	B	B	B	B	B	B	B	C	B	C	B	C
3	Magnolia Av. / Irvington Av.	CSS	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A
4	Magnolia Av. / Driveway 1	**CSS**	NA[4]		A	A	A	A	NA[4]		A	A	NA[4]		A	A	NA[4]		A	A	NA[4]		A	A	NA[4]		A	A
5	Magnolia Av. / W. Little League Dr.	**CSS**	NA[4]		A	A	A	A	NA[4]		A	A	NA[4]		A	A	NA[4]		A	A	NA[4]		A	B	NA[4]		A	B
6	Driveway 2 / W. Little League Dr.	**CSS**	NA[4]		A	B	B	B	NA[4]		A	B	NA[4]		B	B	NA[4]		A	B	NA[4]		B	B	NA[4]		B	B
7	Driveway 3 / W. Little League Dr.	**CSS**	NA[4]		NA[4]		B	B	NA[4]		NA[4]		NA[4]		B	B	NA[4]		NA[4]		NA[4]		B	B	NA[4]		B	B
8	Driveway 4 / W. Little League Dr.	**CSS**	NA[4]		NA[4]		B	B	NA[4]		NA[4]		NA[4]		B	B	NA[4]		NA[4]		NA[4]		B	B	NA[4]		B	B
9	Driveway 5 / W. Little League Dr.	**CSS**	NA[4]		NA[4]		B	B	NA[4]		NA[4]		NA[4]		B	B	NA[4]		NA[4]		NA[4]		B	B	NA[4]		B	B
10	Palm Av. / Belmont Av.	AWS	C	A	C	A	C	B	C	A	C	A	C	B	C	B	C	B	C	B	C	B	C	B	**E**	B	**E**	B
11	Palm Av. / Irvington Av.	TS	C	B	C	B	C	B	D	B	D	B	D	B	D	B	D	B	D	B	D	B	D	B	**E**	B	**E**	B
12	Palm Av. / Kendall Dr.	TS	D	C	D	C	D	D	D	C	D	D	D	C	D	D	D	D	D	D	D	D	D	D	D	D	D	D
13	Palm Av. / I-215 NB Ramps	TS	A	A	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	B	B	D	C
14	Palm Av. / I-215 SB Ramps	TS	C	B	D	B	D	B	D	B	D	B	D	B	D	B	D	C	D	C	D	C	D	C	D	**E**	D	**E**
15	Palm Av. / Hallmark Pkwy.	AWS	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	C	**E**	C	**E**
16	Pine Av. / Belmont Av.	CSS	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	C	C	C	C
17	Pine Av. / Kendall Dr.	TS	C	B	C	B	C	B	C	B	C	B	C	B	C	B	C	B	C	B	C	B	C	C	C	C	C	C
18	Campus Pkwy. / Kendall Dr.	TS	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C
19	University Pkwy. / Kendall Dr.	TS	D	D	D	D	D	D	D	D	D	D	D	**E**	D	**E**	D	**E**	D	**E**	D	**E**	D	**E**	D	**F**	D	**F**

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

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

[2] LOS = Level of Service

[3] NP = Without Project; WP = With Project

[4] NA = Not Applicable; Intersection not evaluated for analysis scenario.

1.4.2 PHASE 2 (PROJECT BUILDOUT – 2019)

Based on a comparison of Existing and E+P (Project Buildout) traffic conditions, the Project's potential impact to the surrounding study area intersections was found to be less-than-significant. The intersection of University Parkway at Kendall Drive is anticipated to operate at an unacceptable LOS (LOS E) during the PM peak hour under EA (2019) traffic conditions, and is anticipated to continue to operate at unacceptable levels during the PM peak hour only with the addition of Project Buildout traffic. The addition of Project traffic is anticipated to increase the volume-to-capacity (v/c) ratio by more than the City's minimum threshold of 0.01 for intersections operating at LOS E or F under pre-project traffic conditions. As such, the Project's contribution to this impact is cumulatively considerable (see Section 1.7 *Project Mitigation Measures*).

1.5 CUMULATIVE IMPACTS

A summary of the operationally deficient study area intersections and recommended improvements required to achieve acceptable circulation system operational conditions are described in detail within Section 8 *Opening Year Cumulative (2018) Traffic Analysis,* Section 9 *Opening Year Cumulative (2019) Traffic Analysis,* and Section 10 *Horizon Year (2035) Traffic Analysis* of this report. The peak hour intersection LOS are summarized on Table 1-5 for each of the analysis scenarios.

Cumulative traffic impacts are deficiencies that are not directly caused by the Project, but occur as a result of regional growth combined with that or other nearby cumulative development projects. The Project's contribution to a particular cumulative transportation deficiency is deemed significant cumulative impacts if the Project adds significant traffic to the forecasted deficiency (as measured by the 50 or more peak hour trip threshold).

1.5.1 CUMULATIVE IMPACTS FOR OPENING YEAR CUMULATIVE (2018) TRAFFIC CONDITIONS

The following study area intersection is anticipated to operate at unacceptable LOS during the peak hours under Opening Year Cumulative (2018) Without Project traffic conditions:

ID	Intersection Location
19	University Parkway / Kendall Drive – LOS E PM peak hour only

The addition of Project traffic is not anticipated to result in any additional deficiencies. However, the addition of Project traffic is anticipated to increase the v/c by more than the City's minimum threshold of 0.01 for intersections operating at LOS E or F under pre-project traffic conditions. There are no queuing issues anticipated at the Palm Avenue and I-215 Freeway off-ramps during the peak hours for Opening Year Cumulative (2018) traffic conditions. Similar to Existing, E+P, EA, and EAP traffic conditions, the I-215 Freeway mainline segments and merge/diverge ramp junctions are anticipated to operate at acceptable LOS under Opening Year Cumulative (2018) traffic conditions (see Table 1-6 and Table 1-7).

Table 1-6

Summary of Basic Freeway Segment Level of Service by Analysis Scenario

Freeway	Direction	Mainline Segment	Lanes[1]	Existing LOS[2]		E+P (Phase 1) LOS[2]		E+P (Project Buildout) LOS[2]		EA (2018) LOS[2]		EAP (2018) LOS[2]		EA (2019) LOS[2]		EAP (2019) LOS[2]		2018 NP[3] LOS[2]		2018 WP[3] LOS[2]		2019 NP[3] LOS[2]		2019 WP[3] LOS[2]		2035 NP[3] LOS[2]		2035 WP[3] LOS[2]	
				AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
I-215 Freeway	SB	North of Palm Avenue	2	C	B	C	B	C	B	C	B	C	B	C	B	C	B	C	B	C	B	C	B	C	B	**F**	**F**	**F**	**F**
		South of Palm Avenue	2	C	B	C	B	C	B	C	B	C	B	C	B	D	B	C	B	C	B	D	B	D	B	**F**	**F**	**F**	**F**
	NB	North of Palm Avenue	2	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	C	D	C	D
		South of Palm Avenue	2	A	C	A	C	A	C	A	C	A	C	B	C	B	C	B	C	B	C	B	C	B	C	D	D	D	D

* **BOLD** = Unacceptable Level of Service

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

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

Table 1-7

Summary of Freeway Ramp Junction Merge/Diverge Level of Service by Analysis Scenario

Freeway	Direction	Ramp or Segment	Lanes on Freeway[1]	Existing LOS[2]		E+P (Phase 1) LOS[2]		E+P (Project Buildout) LOS[2]		EA (2018) LOS[2]		EAP (2018) LOS[2]		EA (2019) LOS[2]		EAP (2019) LOS[2]		2018 NP[3] LOS[2]		2018 WP[3] LOS[2]		2019 NP[3] LOS[2]		2019 WP[3] LOS[2]		2035 NP[3] LOS[2]		2035 WP[3] LOS[2]	
				AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
I-215 Freeway	SB	Off-Ramp at Palm Avenue	2	C	B	C	C	C	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	**F**	**F**	**F**	**F**
		On-Ramp at Palm Avenue	2	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	**F**	**F**	**F**	**F**
	NB	On-Ramp at Palm Avenue	2	B	C	B	C	B	C	B	C	B	C	B	C	B	C	B	C	B	C	B	C	B	C	B	C	D	D	D	D
		Off-Ramp at Palm Avenue	2	B	C	B	C	B	C	B	C	B	D	B	D	B	D	B	D	B	D	B	D	B	D	B	D	D	**E**	D	**E**

* **BOLD** = Unacceptable Level of Service

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

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

1.5.2 CUMULATIVE IMPACTS FOR OPENING YEAR CUMULATIVE (2019) TRAFFIC CONDITIONS

There are no additional study area intersections anticipated to operate at an unacceptable LOS in addition to the location previously identified under Opening Year Cumulative (2018) Without Project traffic conditions. The addition of Project traffic is not anticipated to result in any additional deficiencies.

There are no queuing issues anticipated at the Palm Avenue and I-215 Freeway off-ramps during the peak hours for Opening Year Cumulative (2019) traffic conditions. Similar to Existing, E+P, EA, EAP, and Opening Year Cumulative (2018) traffic conditions, the I-215 Freeway mainline segments and merge/diverge ramp junctions are anticipated to operate at acceptable LOS under Opening Year Cumulative (2019) traffic conditions (see Table 1-6 and Table 1-7).

1.5.3 CUMULATIVE IMPACTS FOR HORIZON YEAR (2035) TRAFFIC CONDITIONS

The following study area intersections are anticipated to operate at unacceptable LOS during the peak hours under Horizon Year (2035) Without Project traffic conditions:

ID	Intersection Location
10	Palm Avenue / Belmont Avenue – LOS E AM peak hour only
11	Palm Avenue / Irvington Avenue – LOS E AM peak hour only
14	Palm Avenue / I-215 Southbound Ramps – LOS E PM peak hour only
15	Palm Avenue / Hallmark Parkway – LOS E PM peak hour only
19	University Parkway / Kendall Drive – LOS F PM peak hour only

The addition of Project traffic is not anticipated to result in any additional deficiencies. There are no queuing issues anticipated at the Palm Avenue and I-215 Freeway off-ramps during the peak hours for Opening Year Cumulative (2018) traffic conditions. The following I-215 Freeway mainline segments and merge/diverge ramp junctions are anticipated to operate at an unacceptable LOS under Horizon Year (2035) Without and With Project traffic conditions (see Table 1-6 and Table 1-7):

ID	Freeway Mainline Segments
1	I-215 Freeway – Southbound, North of Palm Avenue – LOS F AM and PM peak hour
2	I-215 Freeway – Southbound, South of Palm Avenue – LOS F AM and PM peak hours

ID	Freeway Merge/Diverge Ramp Junctions
1	I-215 Freeway – Southbound, Palm Avenue Off-Ramp – LOS F AM and PM peak hours
2	I-215 Freeway – Southbound, Palm Avenue On-Ramp – LOS F AM and PM peak hours
4	I-215 Freeway – Northbound, Palm Avenue Off-Ramp – LOS E PM peak hour only

1.5.4 CUMULATIVE IMPACTS FOR HORIZON YEAR (2035) (WITH MAGNOLIA AVENUE BRIDGE ALTERNATIVE) TRAFFIC CONDITIONS

The following study area intersection is anticipated to operate at unacceptable LOS during the peak hours under Horizon Year (2035) Without and With Project traffic conditions with the Magnolia Avenue extension over the Cajon Creek Wash:

ID	Intersection Location
12	Palm Avenue / Kendall Avenue – LOS F AM peak hour only

Freeway off-ramp queues, freeway mainline segments, and freeway merge/diverge ramp junctions were not evaluated for the With Magnolia Avenue Bridge alternative as the extension is not anticipated to effect the traffic forecasts south of Kendall Drive.

1.6 LOCAL AND REGIONAL FUNDING MECHANISMS

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

1.6.1 MEASURE "I" FUNDS

In 2004, the voters of San Bernardino County approved the 30-year extension of Measure "I", a one-half of one percent sales tax on retail transactions, through the year 2040, for transportation projects including, but not limited to, infrastructure improvements, commuter rail, public transit, and other identified improvements. The Measure "I" extension requires that a regional traffic impact fee be created to ensure development is paying its fair share. A regional Nexus study was prepared by SANBAG and concluded that each jurisdiction should include a regional fee component in their local programs in order to meet the Measure "I" requirement. The regional component assigns specific facilities and cost sharing formulas to each jurisdiction and was most recently updated in November 2013. Revenues collected through these programs are used in tandem with Measure "I" funds to deliver projects identified in the Nexus Study.

While Measure "I" is a self-executing sales tax administered by SANBAG, it bears discussion here because the funds raised through Measure "I" have funded in the past and will continue to fund new transportation facilities in San Bernardino County, including within the City of San Bernardino. The following is a summary of the Measure "I" facilities located within the City of San Bernardino and identified in Appendix K (Development Mitigation Nexus Study) of the CMP: (2)

- Campus Parkway widening from Kendall Drive to I-215 Freeway
- Kendall Drive widening from Cambridge Avenue to Pine Avenue
- Little League Drive widening from Palm Avenue to I-215 Frontage Road
- Little League Drive widening from Belmont Avenue to I-215 Frontage Road
- Palm Avenue widening from Cajon Boulevard to I-215 Freeway
- Pine Avenue widening from Kendall Drive to Belmont Avenue
- Kendall Drive widening from Palm Avenue to Cajon Boulevard
- I-215 Freeway/Palm Avenue interchange
- I-215 Freeway Mainline

1.6.2 CITY OF SAN BERNARDINO DEVELOPMENT IMPACT FEE (DIF) PROGRAM

The City of San Bernardino has created its own local Development Impact Fee (DIF) program to impose and collect fees from new residential, commercial and industrial development for the purpose of funding roadways and intersections necessary to accommodate City growth as identified in the City's General Plan Circulation Element. The City's DIF includes a Regional Circulation System Fee to comply with Measure "I" and a Local Circulation System Fee to address transportation improvements which are locally significant. The fee schedule was recently updated in June 2014 and is adjusted annually based upon changes in the construction cost index (CCI). Under the City's DIF program, the City may grant to developers a credit against specific components of fees when those developers construct certain facilities and landscaped medians identified in the list of improvements funded by the DIF program. The City may grant to developers a credit against specific components of fees when those developers construct certain facilities and landscaped medians identified in the list of improvements funded by the DIF program.

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

The Project applicant will be subject to the City's DIF fee program, and will pay the requisite City DIF fees at the rates then in effect. The Project Applicant's payment of the requisite DIF fees at the rates then in effect pursuant to the DIF Program will mitigate its impacts to DIF-funded facilities. After the City's DIF fees are collected, they are placed in a separate interest bearing account pursuant to the requirements of Government Code § 66000 *et seq*. The timing to use the DIF fees is established through periodic capital improvement programs which are overseen by the City's Public Works Department.

1.6.3 FAIR SHARE CONTRIBUTION

Project mitigation may include a combination of fee payments to established programs (e.g., DIF), construction of specific improvements, payment of a fair share contribution toward future improvements or a combination of these approaches. Improvements constructed by development may be eligible for a fee credit or reimbursement through the program where appropriate (to be determined at the City of San Bernardino's discretion).

When off-site improvements are identified with a minor share of responsibility assigned to proposed development, the approving jurisdiction may elect to collect a fair share contribution or require the development to construct improvements. Detailed fair share calculations, for each peak hour, has been provided on Table 1-8 for the applicable deficient intersections shown on Table 1-9 and Table 1-10.

Table 1-8

Project Fair Share Calculations for Intersections

#	Intersection		Existing	Project	2035 WP[1]	Total New Traffic	Project % of New Traffic
10	Palm Av. / Belmont Av.						
		AM:	780	30	1,028	248	**12.1%**
		PM:	561	59	814	253	23.3%
11	Palm Av. / Irvington Av.						
		AM:	1,336	42	1,720	384	**10.9%**
		PM:	977	87	1,344	367	23.7%
19	University Pkwy. / Kendall Dr.						
		AM:	2,947	28	4,038	1,091	2.6%
		PM:	3,775	64	5,217	1,442	**4.4%**

* Highest deficient peak hour represented in **BOLD** and shown on Table 1-8.

[1] Project fair share based on net new trips between Existing and Horizon Year (2035) traffic conditions.

Table 1-9

Summary of Project Impacts and Recommended Improvements

#	Intersection Location	Jurisdiction	Existing	E+P (Phase 1)	E+P (Project Buildout)	EA (2018)	EAP (2018)	EA (2019)	EAP (2019)	Improvements in DIF Fee Program?[1]	Fair Share %[2]
10	Palm Av. / Belmont Av.	City of San Bernardino	None	None	None	None	None	None	None	NA[3]	NA[3]
11	Palm Av. / Irvington Av.	City of San Bernardino	None	None	None	None	None	None	None	NA[3]	NA[3]
12	Palm Av. / Kendall Dr.	City of San Bernardino	None	None	None	None	None	None	None	NA[3]	NA[3]
14	Palm Av. / I-215 SB Ramps	City of San Bernardino,	None	None	None	None	None	None	None	NA[3]	NA[3]
15	Palm Av. / Hallmark Pkwy.	City of San Bernardino	None	None	None	None	None	None	None	NA[3]	NA[3]
19	University Pkwy. / Kendall Dr.	City of San Bernardino	None	None	None	None	None	2nd SB left turn lane	Same	No	4.4%

[1] Improvements included in City of San Bernardino DIF program for local and regional components.

[2] Program improvements constructed by project may be eligible for fee credit, at discretion of City. See Table 1-7 for Fair Share Calculations.

[3] Not applicable; no improvements recommended.

Table 1-10

Summary of Cumulative Impacts and Recommended Improvements

#	Intersection Location	Jurisdiction	2018 Without Project	2018 With Project	2019 Without Project	2019 With Project	2035 Without Project	2035 With Project	Improvements in DIF Fee Program?[1]	Total Cost[2]	Fair Share %[3]	Fair Share Cost[4]
10	Palm Av. / Belmont Av.	City of San Bernardino	None	None	None	None	Restripe NB w/ 1 left turn lane and 1 shared through-right turn lane	Same	No	$37,100	12.1%	$4,488
							1 SB left turn lane	Same	No	$74,200		$8,976
							1 EB left turn lane	Same	No	$74,200		$8,976
							1 WB left turn lane	Same	No	$74,200		$8,976
									Total	**$259,700**		**$31,415**
11	Palm Av. / Irvington Av.	City of San Bernardino	None	None	None	None	EB right turn lane w/ overlap phasing	Same	No	$111,300	10.9%	$12,173
									Total	**$111,300**		**$12,173**
14	Palm Av. / I-215 SB Ramps	City of San Bernardino, Caltrans	None	None	None	None	2nd SB left turn lane	Same	Yes	--	NA[6]	--
									Total	**$0**		**$0**
15	Palm Av. / Hallmark Pkwy.	City of San Bernardino	None	None	None	None	2nd NB through lane	Same	Yes	--	NA[6]	--
							2nd SB through lane	Same	Yes	--		--
									Total	**$0**		**$0**
19	University Pkwy. / Kendall Dr.	City of San Bernardino	None	None	2nd SB left turn lane	Same	Same	Same	No	$74,200	4.4%	$3,293
							1 NB right turn lane	Same	No	$74,200		$3,293
							2nd SB left turn lane	Same	No	$74,200		$3,293
							3rd EB through lane	Same	No	$267,120		$11,856
							1 EB right turn lane	Same	No	$74,200		$3,293
							3rd WB through lane	Same	No	$267,120		$11,856
							Modify traffic signal with overlap phasing on the NB and EB right turn lanes	Same	No	$111,300		$4,940
									Total	**$942,340**		**$41,824**
									Total Costs for Horizon Year (2035) Improvements[5]	**$1,313,340**		**$85,412**

[1] Improvements included in City of San Bernardino DIF program for local and regional components.

[2] Costs have been estimated using the data provided in Appendix "G" of the CMP (2003 Update) for preliminary construction costs. Appendix "G" costs escalated by a factor of 1.484, except Traffic Signals, to reflect 2015 costs.

[3] Program improvements constructed by project may be eligible for fee credit, at discretion of City. See Table 1-7 for Fair Share Calculations.

[4] Rough order of magnitude cost estimate.

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

[6] "N/A or Not Applicable" because improvements are included in a pre-existing fee program.

1.7 PROJECT MITIGATION MEASURES

1.7.1 MITIGATION MEASURES TO ADDRESS CUMULATIVE IMPACTS AT INTERSECTIONS

Table 1-9 and Table 1-10 list the recommended improvements necessary to reduce the identified intersection LOS deficiencies. Street and intersection improvements that may be funded though the City's DIF program are noted. If a particular facility tentatively listed in Table 1-9 and Table 1-10 are ultimately excluded from the DIF program, the Project would be responsible for, and would be required to pay, fair share fees for improvement of affected facilities. These fees are collected as part of a funding mechanism aimed at ensuring that regional highways and arterial expansions keep pace with the projected vehicle trip increases. Alternatively, minor fair share responsibilities may be waived when collection is infeasible or where other mitigation assignments substantially exceed the Project's demonstrated impacts.

Improvements included in a defined program and constructed by development may be eligible for a fee credit or reimbursement through the program where appropriate. A rough order of magnitude cost has been prepared to determine the appropriate contribution value based upon the project's fair share of traffic as part of the project approval process. Table 1-9 and Table 1-10 also summarize the applicable cost associated with each of the recommended improvements based on the preliminary construction cost estimates found in Appendix "G" of the San Bernardino County CMP in conjunction with a cost escalation factor of 1.484% to reflect current (2015) costs. These estimates are a rough order of magnitude only as they are intended only for discussion purposes and do not imply any legal responsibility or formula for contributions or mitigation.

Phase 1 (2018)

Based on an assessment of E+P (Phase 1), EA (2018), and EAP (2018) traffic conditions, the Project's potential impact to the surrounding study area intersections was found to be less-than-significant. As such, no mitigation measures have been identified.

Phase 2 (Project Buildout – 2019)

Mitigation Measure 1.1 – University Parkway / Kendall Drive (#19) – The following improvement is necessary to reduce the Project's proportionate increase in delay to pre-project levels or better, thus reducing the Project's cumulative impact to less-than-significant:

- Payment of the Project's fair share towards a 2nd southbound left turn lane.

Mitigation Measure 2.1 – Prior to the issuance of building permits, the Project applicant shall participate in the City's DIF fee program by paying the requisite fees at the time of building permit, and in addition pay the Project's fair share amount of $85,412 for the improvements identified in Table 1-10 that are consistent with the improvements shown on Table 10-5 and Table 10-6, or as agreed to by the City and applicant. This fair share payment should only be collected if the City creates a fee program that includes the improvements in which this fair share contribution is intended to construct. The City shall ensure that the improvements will be constructed pursuant to the fee program at that point in time necessary to avoid identified significant impacts.

1.7.2 CUMULATIVE MITIGATION MEASURES TO ADDRESS DEFICIENCIES ON FREEWAY FACILITIES

Changes and/or expansions to the I-215 Freeway mainline are not within the jurisdiction of the City of San Bernardino. Rather, those improvements are planned, funded, and constructed by the State through a complicated legislative and political process involving the State Legislature, the California Transportation Commission (CTC), the California Business, Transportation and Housing Agency (BT&H), and Caltrans.

In California, most of SHS improvements are programs through two documents, the State Transportation Improvement Program (STIP) or the State Highway Operation and Protection Program (SHOPP). State and federal fuel taxes generate most of the funds used to pay for these improvements. Funds are expected to be available for transportation improvements are identified through a Fund Estimate prepared by Caltrans and adopted by the CTC. These funds, along with other fund sources, are deposited in the State Highway Account to be programmed and allocated to specific project improvements in both the STIP and SHOPP by the CTC.

The STIP is built from Regional Transportation Improvement Programs (RTIPs) proposed by Regional Transportation Planning Agencies/Metropolitan Planning Organizations (RTPA/MPOs) throughout California and the Interregional Transportation Improvement Program (ITIP) proposed by Caltrans. Of the funds made available by the CTC for the STIP, 25 percent is made available for Caltrans to propose expansion and capacity-enhancements on the statutorily designated interregional road system. Seventy-five percent of the funds are made available to the RTPA/MPOs to propose all types of improvements on all other State highway system roads, other non-State highway roads eligible to use federal funds, and on the Interregional Road System. Transportation funds generally come from a variety of sources including the National Highway System fund, State fuel taxes, federal fuel taxes, sales taxes on fuel, truck weight fees, roadway and bridge tolls, user fares, local sales tax measures, development fees, where applicable, bond revenues, and State and local general and matching funds.

Improvements to SHS are deemed to be matters of federal, State, regional, and local concern. On the federal level, the City, through its congressional delegation along with other Cities in the Western Riverside region, has aggressively sought federal monies for regional roadway improvements. On the local level, the City through its Circulation Element contained within its General Plan, maintains policies whereby the City commits to work closely with regional infrastructure planning entities and to continue to identify new circulation and roadway improvements.

The traffic study prepared for this Project concludes that segments of the I-215 Freeway would operate at LOS E or F without the Project for Horizon Year (2035) conditions. The Project's contributions to cumulative impacts under Horizon Year (2035) conditions are relatively di minimis, involving only a small percentage of the forecast traffic occurring on the identified segments at Horizon Year (2035) conditions (e.g., less than 1 percent of the total traffic). Caltrans recognizes that many of its facilities will operate at LOS E and F even at the ultimate build out of the identified facility as is the case here in the context of the identified I-215 Freeway under Horizon Year (2035) conditions. Because the City of San Bernardino has no control over State facilities, and because the State facilities funded and planned to be

developed under Horizon Year (2035) conditions are already anticipated to operate at LOS E or F even without the proposed Project, there are no further mitigation measures that can be imposed upon the Project to mitigate its small cumulative contribution to impacts on segments of I-215 Freeway under Horizon Year (2035) conditions. Caltrans has exclusive control over State highway improvements and State highway improvements are by and large a matter of State-wide control.

In addition, State highway funding is an extraordinarily complex State-wide and regional problem the cities have grappled with for decades. By definition, State highways are impacted by interstate, State-wide and regional traffic. To this end, in 2007, State Senator Alan Lowenthal (D, Long Beach) chair of the Senate Transportation Committee, held hearings on alternative funding mechanisms for State highway improvements, including legislation that would allow private companies to build and operate State highways. The State Legislature, Caltrans, the Executive Branch and public-private partnerships are all engaged in multi-jurisdictional and creative solutions to feasibly alleviate congestion on the State's highways. Thus, for the aforementioned reasons there are no available and feasible mitigation measures available to mitigate the projects di minimis cumulative contribution to traffic on the I-215 Freeway under Horizon Year (2035) conditions.

1.8 SITE ADJACENT ROADWAY AND SITE ACCESS IMPROVEMENTS

This section summarizes Project site access and on-site circulation recommendations. Vehicular access will be provided via the following driveways (see Exhibit 1-1) and all driveways are assumed to allow for full access (i.e., no turning movement restrictions):

- Magnolia Avenue / Driveway 1 – Access to Phase 1 (Residential)
- Driveway 2 / W. Little League Drive – Access to Phase 1 (Residential)
- Driveway 3 / W. Little League Drive – Access to Phase 2 (Commercial Retail)
- Driveway 4 / W. Little League Drive – Access to Phase 2 (Commercial Retail)
- Driveway 5 / W. Little League Drive – Access to Phase 2 (Commercial Retail)

Regional access to the project site is provided via the I-215 Freeway at the Palm Avenue interchange. Roadway improvements necessary to provide site access and on-site circulation are assumed to be constructed in conjunction with site development and are described below. These improvements are required to be in place prior to occupancy. Construction of on-site and site adjacent improvements are recommended to occur in conjunction with adjacent Project development activity or as needed for Project access purposes.

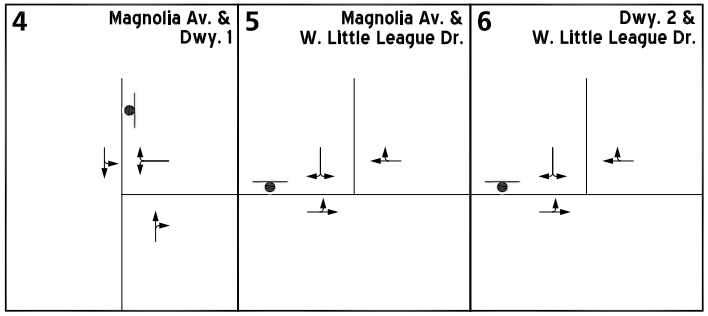
1.8.1 ON-SITE ROADWAY IMPROVEMENTS

Exhibit 1-3 illustrates the site-adjacent roadway improvement recommendations and site access improvements for Phase 1 (2018) conditions.

Phase 1 (2018)

Magnolia Avenue – Magnolia Avenue is a north-south oriented roadway along the western Project boundary. Construct Magnolia Avenue from the northern Project boundary to W. Little

EXHIBIT 1-3: PHASE 1 (2018) SITE ACCESS AND SITE ADJACENT ROADWAY RECOMMENDATIONS



LEGEND:

= COLLECTOR

URBAN CROSSROADS

League Drive at its ultimate half-section width as a Collector (60-foot right-of-way), in compliance with applicable City of San Bernardino standards.

W. Little League Drive – W. Little League Drive is an east-west oriented roadway along the southern Project boundary. Construct W. Little League Drive from Magnolia Avenue to the eastern Project boundary of Phase 1 at its ultimate half-section width as a Collector (60-foot right-of-way), in compliance with applicable City of San Bernardino standards.

Phase 2 (Project Buildout – 2019)

Exhibit 1-4 illustrates the site-adjacent roadway improvement recommendations and site access improvements for Phase 2 (2019 – Project Buildout) conditions.

W. Little League Drive – W. Little League Drive is an east-west oriented roadway along the southern Project boundary. Construct W. Little League Drive from the western boundary of Phase 2 to the eastern Project boundary at its ultimate half-section width as a Collector (60-foot right-of-way), in compliance with applicable City of San Bernardino standards.

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

1.8.2 SITE ACCESS IMPROVEMENTS

The recommended site access driveway improvements for the Project are described below. Exhibit 1-3 (Phase 1) and Exhibit 1-4 (Project Buildout) illustrate the on-site and site adjacent recommended roadway lane 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.

Phase 1 (2018)

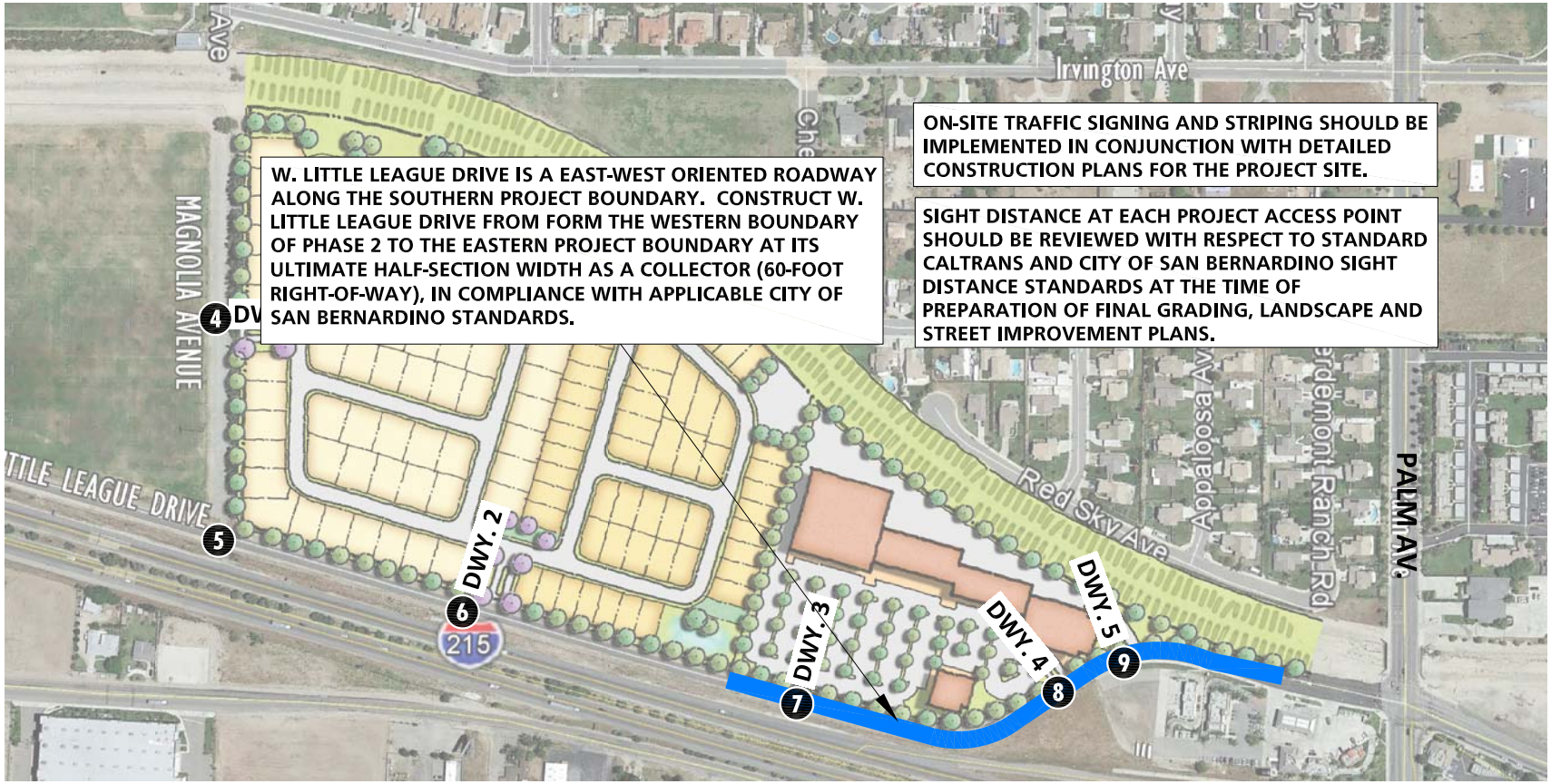
Magnolia Avenue / Driveway 1 – Install a stop control on the westbound approach and construct the intersection with the following geometrics:

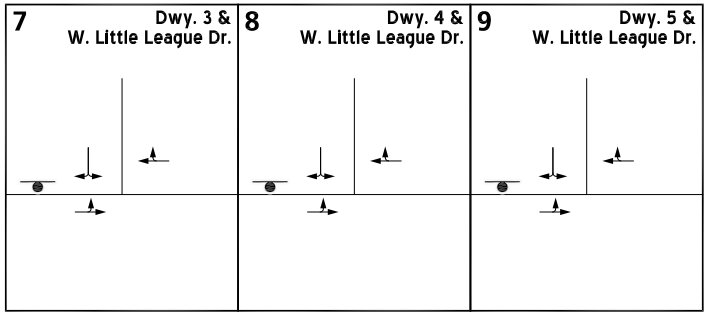
- Northbound Approach: One shared through-right turn lane.
- Southbound Approach: One shared left-through lane.
- Eastbound Approach: Not applicable.
- Westbound Approach: One shared left-right turn lane.

Magnolia Avenue / W. Little League Drive – Install a stop control on the southbound approach and construct the intersection with the following geometrics:

- Northbound Approach: Not applicable.
- Southbound Approach: One shared left-right turn lane.
- Eastbound Approach: One shared left-through lane.
- Westbound Approach: One shared through-right turn lane.

EXHIBIT 1-4: PHASE 2 (2019) SITE ACCESS AND SITE ADJACENT ROADWAY RECOMMENDATIONS





LEGEND:

▬ COLLECTOR

URBAN CROSSROADS

Driveway 2 / W. Little League Drive – Install a stop control on the southbound approach and construct the intersection with the following geometrics:

- Northbound Approach: Not applicable.
- Southbound Approach: One shared left-right turn lane.
- Eastbound Approach: One shared left-through lane.
- Westbound Approach: One shared through-right turn lane.

Phase 2 (Project Buildout – 2019)

Driveway 3 / W. Little League Drive – Install a stop control on the southbound approach and construct the intersection with the following geometrics:

- Northbound Approach: Not applicable.
- Southbound Approach: One shared left-right turn lane.
- Eastbound Approach: One shared left-through lane.
- Westbound Approach: One shared through-right turn lane.

Driveway 4 / W. Little League Drive – Install a stop control on the southbound approach and construct the intersection with the following geometrics:

- Northbound Approach: Not applicable.
- Southbound Approach: One shared left-right turn lane.
- Eastbound Approach: One shared left-through lane.
- Westbound Approach: One shared through-right turn lane.

Driveway 5 / W. Little League Drive – Install a stop control on the southbound approach and construct the intersection with the following geometrics:

- Northbound Approach: Not applicable.
- Southbound Approach: One shared left-right turn lane.
- Eastbound Approach: One shared left-through lane.
- Westbound Approach: One shared through-right turn lane.

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

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

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2 METHODOLOGIES

This section of the report presents the methodologies used to perform the traffic analyses summarized in this report. The methodologies described are generally consistent with City of San Bernardino traffic study guidelines. (1)

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. (6)

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 City of San Bernardino requires signalized intersection operations analysis based on the methodology described in the (HCM). 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 8 Build 806) analysis software package.

TABLE 2-1: SIGNALIZED INTERSECTION LOS THRESHOLDS

Description	Average Control Delay (Seconds), V/C ≤ 1.0	Level of Service, V/C ≤ 1.0	Level of Service, V/C > 1.0
Operations with very low delay occurring with favorable progression and/or short cycle length.	0 to 10.00	A	F
Operations with low delay occurring with good progression and/or short cycle lengths.	10.01 to 20.00	B	F
Operations with average delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures begin to appear.	20.01 to 35.00	C	F

Description	Average Control Delay (Seconds), V/C ≤ 1.0	Level of Service, V/C ≤ 1.0	Level of Service, V/C > 1.0
Operations with longer delays due to a combination of unfavorable progression, long cycle lengths, or high V/C ratios. Many vehicles stop and individual cycle failures are noticeable.	35.01 to 55.00	D	F
Operations with high delay values indicating poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences. This is considered to be the limit of acceptable delay.	55.01 to 80.00	E	F
Operation with delays unacceptable to most drivers occurring due to over saturation, poor progression, or very long cycle lengths	80.01 and up	F	F

Source: HCM

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

The peak hour traffic volumes have been adjusted using a peak hour factor (PHF) to reflect peak 15 minute volumes. Common practice for LOS analysis is to use a peak 15-minute rate of flow. However, flow rates are typically expressed in vehicles per hour. The PHF is the relationship between the peak 15-minute flow rate and the full hourly volume (e.g. PHF = [Hourly Volume] / [4 x Peak 15-minute Flow Rate]). The use of a 15-minute PHF produces a more detailed analysis as compared to analyzing vehicles per hour. Existing PHFs have been used for all analysis scenarios. Per the HCM, PHF values over 0.95 often are indicative of high traffic volumes with capacity constraints on peak hour flows while lower PHF values are indicative of greater variability of flow during the peak hour. (6)

Consistent with Appendix C, Page C-13 of the San Bernardino County CMP, 2005 Update, the following saturation flow rates, in vehicles per hour green per lane (vphgpl), will be utilized in the traffic analysis for signalized intersections: (2)

Existing, E+P, EA, EAP, and Opening Year Cumulative Traffic Conditions:

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

Horizon Year (2035) Traffic Conditions:

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

California Department of Transportation (Caltrans)

Per the Caltrans *Guide for the Preparation of Traffic Impact Studies*, the traffic modeling and signal timing optimization software package Synchro (Version 8 Build 806) has also been utilized to analyze signalized intersections under Caltrans' jurisdiction, which include interchange to arterial ramps (i.e. I-215 Freeway ramps at Palm Avenue). (3) Signal timing for the freeway arterial-to-ramp intersections have been obtained from Caltrans District 8 and were utilized for the purposes of this analysis.

2.2.2 UNSIGNALIZED INTERSECTIONS

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

TABLE 2-2: UNSIGNALIZED INTERSECTION LOS THRESHOLDS

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

Source: HCM

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

2.3 FREEWAY OFF-RAMP QUEUING ANALYSIS

The study area for this TIA includes the freeway-to-arterial interchange of the I-215 Freeway at Palm Avenue off-ramps. Consistent with Caltrans requirements, the 95th percentile queuing of vehicles has been assessed at the off-ramps to determine potential queuing impacts at the

freeway ramp intersections on Palm Avenue. Specifically, the queuing analysis is utilized to identify any potential queuing and "spill back" onto the I-215 Freeway mainline from the off-ramps.

The traffic progression analysis tool and HCM intersection analysis program, Synchro, has been used to assess the potential impacts/needs of the intersections with traffic added from the proposed Project. Storage (turn-pocket) length recommendations at the ramps have been based upon the 95th percentile queue resulting from the Synchro progression analysis. The queue length reported is for the lane with the highest queue in the lane group.

The traffic modeling and signal timing optimization software package Synchro/SimTraffic (Version 8 Build 806) has been utilized to assess queues at the I-215 Freeway interchange at Palm Avenue. Synchro is a macroscopic traffic software program that is based on the signalized and unsignalized intersection capacity analyses as specified in the HCM. Macroscopic level models represent traffic in terms of aggregate measures for each movement at the study intersections.

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

A vehicle is considered queued whenever it is traveling at less than 10 feet/second. A vehicle will only become queued when it is either at the stop bar or behind another queued vehicle. Although only the 95th percentile queue has been reported in the tables, the 50th percentile queue can be found in the appendix alongside the 95th percentile queue for each ramp location. The 50th percentile maximum queue is the maximum back of queue on a typical cycle during the peak hour, while the 95th percentile queue is the maximum back of queue with 95th percentile traffic volumes during the peak hour. In other words, if traffic were observed for 100 cycles, the 95th percentile queue would be the queue experienced with the 95th busiest cycle (or 5% of the time). The 50th percentile or average queue represents the typical queue length for peak hour traffic conditions, while the 95th percentile queue is derived from the average queue plus 1.65 standard deviations. The 95th percentile queue is not necessarily ever observed, it is simply based on statistical calculations.

2.4 TRAFFIC SIGNAL WARRANT ANALYSIS METHODOLOGY

The term "signal warrants" refers to the list of established criteria used by Caltrans and other public agencies to quantitatively justify or ascertain the potential need for installation of a traffic signal at an otherwise unsignalized intersection. This TIA uses the signal warrant criteria presented in the latest edition of the Federal Highway Administration's (FHWA) *Manual on Uniform Traffic Control Devices (MUTCD)*, as amended by *the MUTCD 2014 California Supplement*, for all study area intersections. (7)

The signal warrant criteria for Existing study area intersections are based upon several factors, including volume of vehicular and pedestrian traffic, frequency of accidents, and location of school areas. Both the FHWA's *MUTCD* and the *MUTCD 2014 California Supplement* indicate that the installation of a traffic signal should be considered if one or more of the signal warrants are met. (7) Specifically, this TIA utilizes the Peak Hour Volume-based Warrant 3 as the appropriate representative traffic signal warrant analysis for existing traffic conditions. Warrant 3 criteria are basically identical for both the FHWA's *MUTCD* and the *MUTCD 2014 California Supplement*. Warrant 3 is appropriate to use for this TIA because it provides specialized warrant criteria for intersections with rural characteristics (e.g. located in communities with populations of less than 10,000 persons or with adjacent major streets operating above 40 miles per hour). For the purposes of this study, the speed limit was the basis for determining whether Urban or Rural warrants were used for a given intersection.

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

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

TABLE 2-3: TRAFFIC SIGNAL WARRANT ANALYSIS LOCATIONS

ID	Intersection Location	Jurisdiction	CMP
1	N. Little League Drive / W. Little League Drive	City of San Bernardino	No
2	N. Little League Drive / Kendall Drive	City of San Bernardino	Yes
3	Magnolia Avenue / Irvington Avenue	City of San Bernardino	No
4	Magnolia Avenue / Driveway 1 – Future Intersection	City of San Bernardino	No
5	Magnolia Avenue / W. Little League Drive – Future Intersection	City of San Bernardino	No
6	Driveway 2 / W. Little League Drive – Future Intersection	City of San Bernardino	No
7	Driveway 3 / W. Little League Drive – Future Intersection	City of San Bernardino	No
8	Driveway 4 / W. Little League Drive – Future Intersection	City of San Bernardino	No
9	Driveway 5 / W. Little League Drive – Future Intersection	City of San Bernardino	No
10	Palm Avenue / Belmont Avenue	City of San Bernardino	Yes
15	Palm Avenue / Hallmark Parkway	City of San Bernardino	Yes
16	Pine Avenue / Belmont Avenue	City of San Bernardino	Yes

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 5.0 *E+P Traffic Analysis,* Section 6.0 *EA (2018) and EAP (2018) Traffic Analysis*, Section 7.0 *EA (2019) and EAP (2019) Traffic Analysis*, Section 8.0 *Opening Year Cumulative (2018) Traffic Analysis*, Section 9.0 *Opening Year Cumulative (2019) Traffic Analysis,* and Section 10.0 *Horizon Year (2035) Traffic Analysis* of this report.

It is important to note that a signal warrant defines the minimum condition under which the installation of a traffic signal might be warranted. Meeting this threshold condition does not require that a traffic control signal be installed at a particular location, but rather, that other traffic factors and conditions be evaluated in order to determine whether the signal is truly justified. It should also be noted that signal warrants do not necessarily correlate with LOS. An intersection may satisfy a signal warrant condition and operate at or above acceptable LOS or operate below acceptable LOS and not meet a signal warrant.

2.5 FREEWAY MAINLINE SEGMENT ANALYSIS METHODOLOGY

Consistent with recent Caltrans guidance and because impacts to freeway segments dissipate with distance from the point of State Highway System (SHS) entry, quantitative study of freeway segments beyond those immediately adjacent to the point of entry is not required. As such, the traffic study has evaluated the freeway segments along the I-215 Freeway where the Project is anticipated to contribute traffic. Because impacts to freeway segments dissipate with distance from the point of SHS entry, quantitative evaluation of freeway segments with less than 50 peak hour trips is not necessary. Although the Project is anticipated to contribute less than 50 peak hour directional trips to the I-215 Freeway adjacent to the point of entry to the SHS, they have been evaluated for the purposes of this traffic study in an effort to conduct a conservative analysis.

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

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

The number of lanes for existing baseline conditions has been obtained from field observations conducted by Urban Crossroads in May 2015. These existing freeway geometrics have been utilized for Existing, E+P, EA, EAP, Opening Year Cumulative, and Horizon Year Without and With Project conditions.

The I-215 Freeway mainline volume data were obtained from the Caltrans Performance Measurement System (PeMS) website for the segments of the I-215 Freeway interchange, south of Palm Avenue. The data was obtained from May 2015. In an effort to conduct a conservative analysis, the maximum value observed within the three day period was utilized for the weekday morning (AM) and weekday evening (PM) peak hours. In addition, truck traffic, represented as a percentage of total traffic, has been utilized for the purposes of this analysis in an effort to not overstate traffic volumes and peak hour deficiencies. As such, actual vehicles (as opposed to PCE volumes) have been utilized for the purposes of the basic freeway segment analysis. (8)

2.6 FREEWAY MERGE/DIVERGE RAMP JUNCTION ANALYSIS

The freeway system in the study area has been broken into segments defined by freeway-to-arterial interchange locations resulting in 6 existing on and off ramp locations where the Project is anticipated to contribute traffic. 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. Per HCM guidelines, analysis of the adjacent freeway

mainline segments to each of these ramp junctions is sufficient to evaluate the peak hour operations.

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

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

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

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

Similar to the basic freeway segment analysis, the I-215 Freeway mainline volume data were obtained from the Caltrans maintained PeMS website for the segments of the I-215 Freeway interchange south of Palm Avenue. The ramp data (per the count data presented in Appendix 3.1) were then utilized to flow conserve the mainline volumes to determine the remaining I-215 Freeway mainline segment volumes. Flow conservation checks ensure that traffic flows from west to east (and vice versa) of the interchange area with no unexplained loss of vehicles. The data was obtained from May 2015. In an effort to conduct a conservative analysis, the maximum value observed within the three day period was utilized for the weekday morning (AM) and weekday evening (PM) peak hours. In addition, truck traffic, represented as a percentage of total traffic, has been utilized for the purposes of this analysis in an effort to not overstate traffic volumes and peak hour deficiencies. (8) As such, actual vehicles (as opposed to PCE volumes) have been utilized for the purposes of the freeway ramp junction (merge/diverge) analysis.

2.7 LOS CRITERIA

2.7.1 CITY OF SAN BERNARDINO

The definition of an intersection deficiency in the City of San Bernardino is based on the City of San Bernardino General Plan Circulation Element. The City of San Bernardino General Plan states that target LOS D be maintained at City intersections wherever possible.

2.7.2 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. Caltrans acknowledges that the region-wide goal for an acceptable LOS on all freeways, roadway segments, and intersections is LOS D. Consistent with the City of San Bernardino LOS threshold of LOS D and in excess of the CMP stated LOS threshold of LOS E, LOS D will be used as the target LOS for freeway ramps, freeway segments, and freeway merge/diverge ramp junctions.

2.8 THRESHOLDS OF SIGNIFICANCE

2.8.1 INTERSECTIONS

Based on the City of San Bernardino TIA Guidelines, a "significant" project-related traffic impact occurs when the addition of project traffic as defined by the EAP scenario causes an intersection that operates at an acceptable LOS under EA traffic conditions (i.e., LOS D or better) to fall to an unacceptable LOS (i.e., LOS E or worse). Therefore, EAP traffic conditions are compared to EA traffic conditions in order to identify significant project-related traffic impacts according to the following criteria:

- If an intersection is projected to operate at an acceptable level of service (i.e., LOS D or better) without the project and the addition of Project traffic, as measured by 50 or more peak hour trips, is expected to cause the intersection to operate at an unacceptable level of service (i.e., LOS E or worse), the impact is considered a significant impact.
- If an intersection is projected to operate at an unacceptable level of service (i.e., LOS E or F) without the project, and the project contributes 50 or more peak hour trips and increases the v/c by more than 0.01, the impact is considered a significant impact.

A significant cumulative impact is identified when a facility is projected to operate below the level of service standards due to cumulative future traffic AND a project-related increase to the v/c of 0.01 or more for intersections operating at LOS E Or LOS F under pre-project traffic conditions. Cumulative traffic impacts are created as a result of a combination of the proposed Project together with other future developments contributing to the overall traffic impacts requiring additional improvements to maintain acceptable level of service operations with or without the Project.

A Project's contribution to a cumulatively significant impact can be reduced to less-than-significant if the Project is required to implement or fund its fair share of improvements designed to alleviate the potential cumulative impact. If full funding of future cumulative improvements is not reasonably assured, a temporary unmitigated cumulative impact may occur until the needed improvement is fully funded and constructed.

2.8.2 CALTRANS FACILITIES

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

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

2.9 PROJECT FAIR SHARE CALCULATION METHODOLOGY

Improvements found to be included in the City of San Bernardino's DIF will be identified as such. For improvements that do not appear to be in a pre-existing fee program, a fair share financial contribution based on the Project's fair share impact may be imposed in order to mitigate the Project's share of impacts in lieu of construction.

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:

Project Fair Share % = Project Traffic / (Horizon Year Total Traffic – Existing Traffic)

3 EXISTING CONDITIONS

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

3.1 EXISTING CIRCULATION NETWORK

Pursuant to the Traffic Study Scoping Agreement (Appendix 1.1) and discussion with City of San Bernardino staff, the study area includes a total of 19 existing and future intersections as shown previously on Exhibit 1-2. Exhibit 3-1 illustrates the study area intersections located near the proposed Project and identifies the number of through traffic lanes for existing roadways and intersection traffic controls.

3.2 CITY OF SAN BERNARDINO GENERAL PLAN CIRCULATION ELEMENT

As previously noted, the Project site is located within the City of San Bernardino. Exhibit 3-2 shows the City of San Bernardino General Plan Circulation Element, and Exhibit 3-3 illustrates the City of San Bernardino General Plan roadway cross-sections.

The roadway classifications and planned (ultimate) roadway cross-sections of the major roadways within the City of San Bernardino in the vicinity of the proposed Project as identified on the City's General Plan Circulation Element are described subsequently.

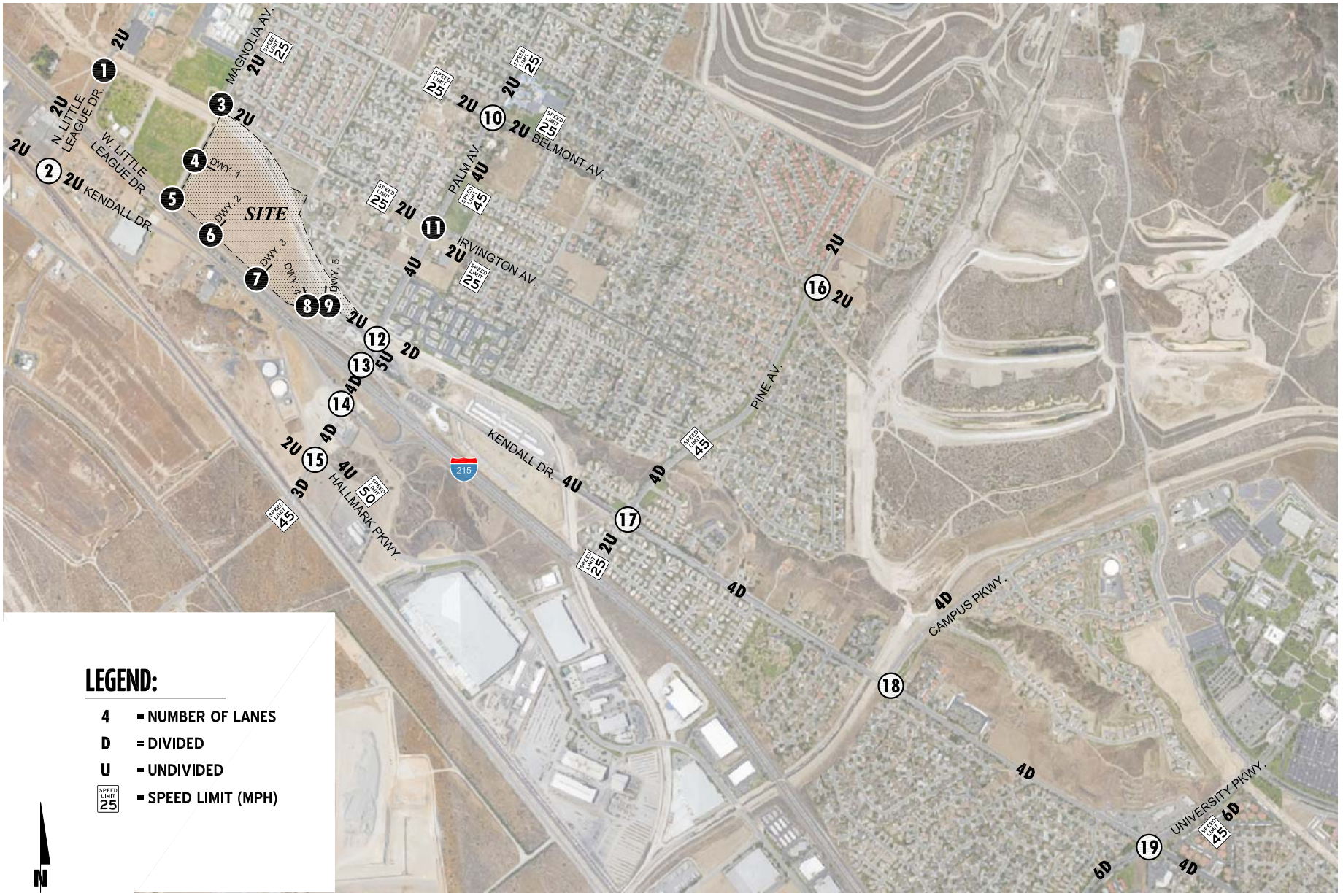
Major Arterials can accommodate six or eight travel lanes and may have raised medians. These facilities typically carry a high volume of traffic and are the primary thoroughfares linking San Bernardino with adjacent cities and the regional highway system. Driveway access to these roadways are typically limited in order to provide efficient high volume traffic flow. Examples of Major Arterials within the study area include:

- Kendall Drive, east of Palm Avenue
- Campus Parkway, south of Kendall Drive (Future Extension)
- University Parkway, south of Kendall Drive

Secondary Arterials are typically four-lane streets, providing two lanes in each direction. These highways carry traffic along the perimeters of major developments, provide support to the major arterials, and are also through streets enabling traffic to travel uninterrupted for longer distances throughout the City. Examples of Secondary Arterials within the study area include:

- N. Little League Drive
- Kendall Drive, west of Palm Avenue
- Industrial Parkway, east of Palm Avenue
- Palm Avenue, south of Ohio Avenue
- Pine Avenue, south of Ohio Avenue
- Campus Parkway, north of Kendall Drive

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



URBAN CROSSROADS

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

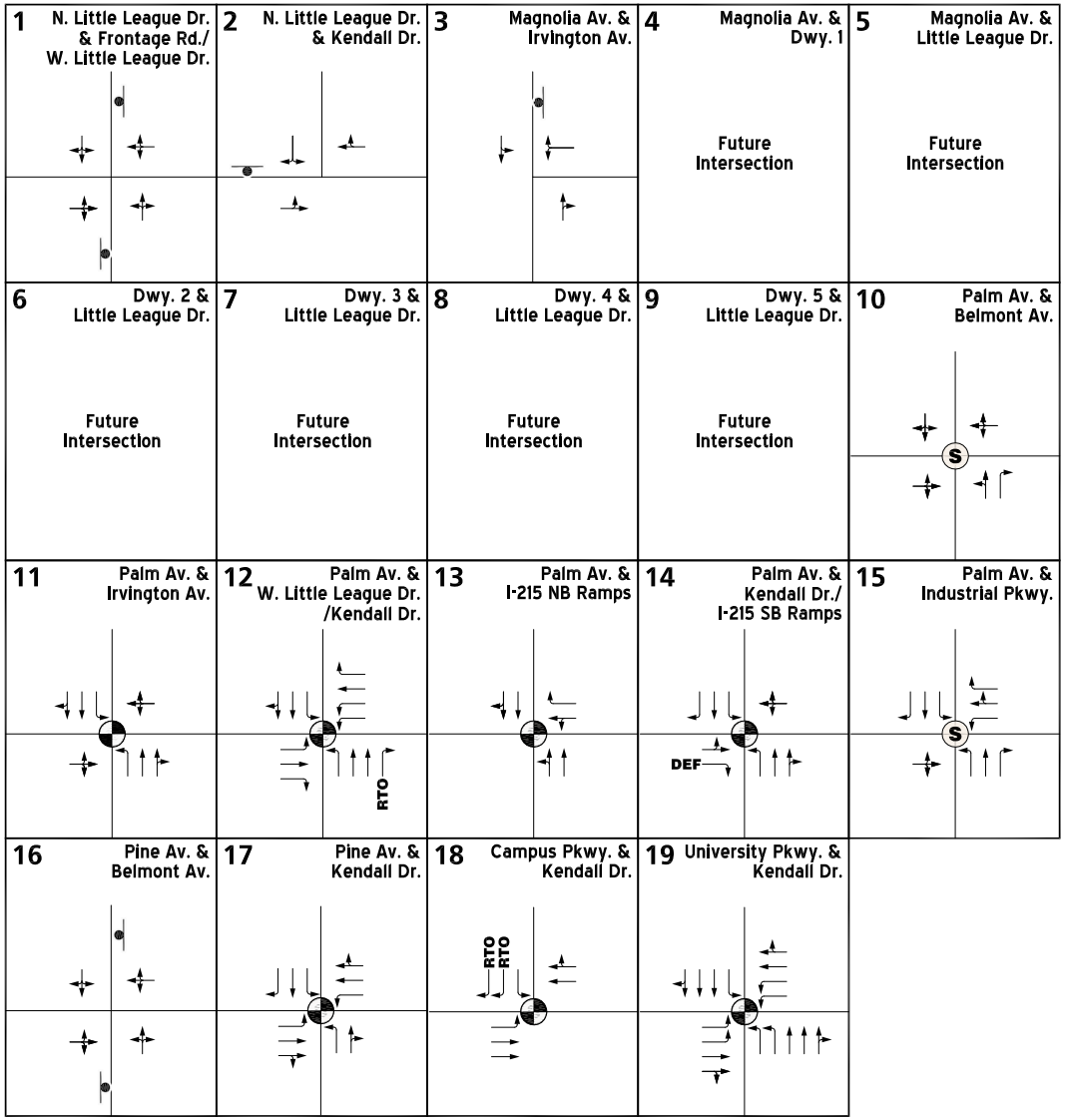


EXHIBIT 3-2: CITY OF SAN BERNADINO GENERAL PLAN CIRCULATION ELEMENT

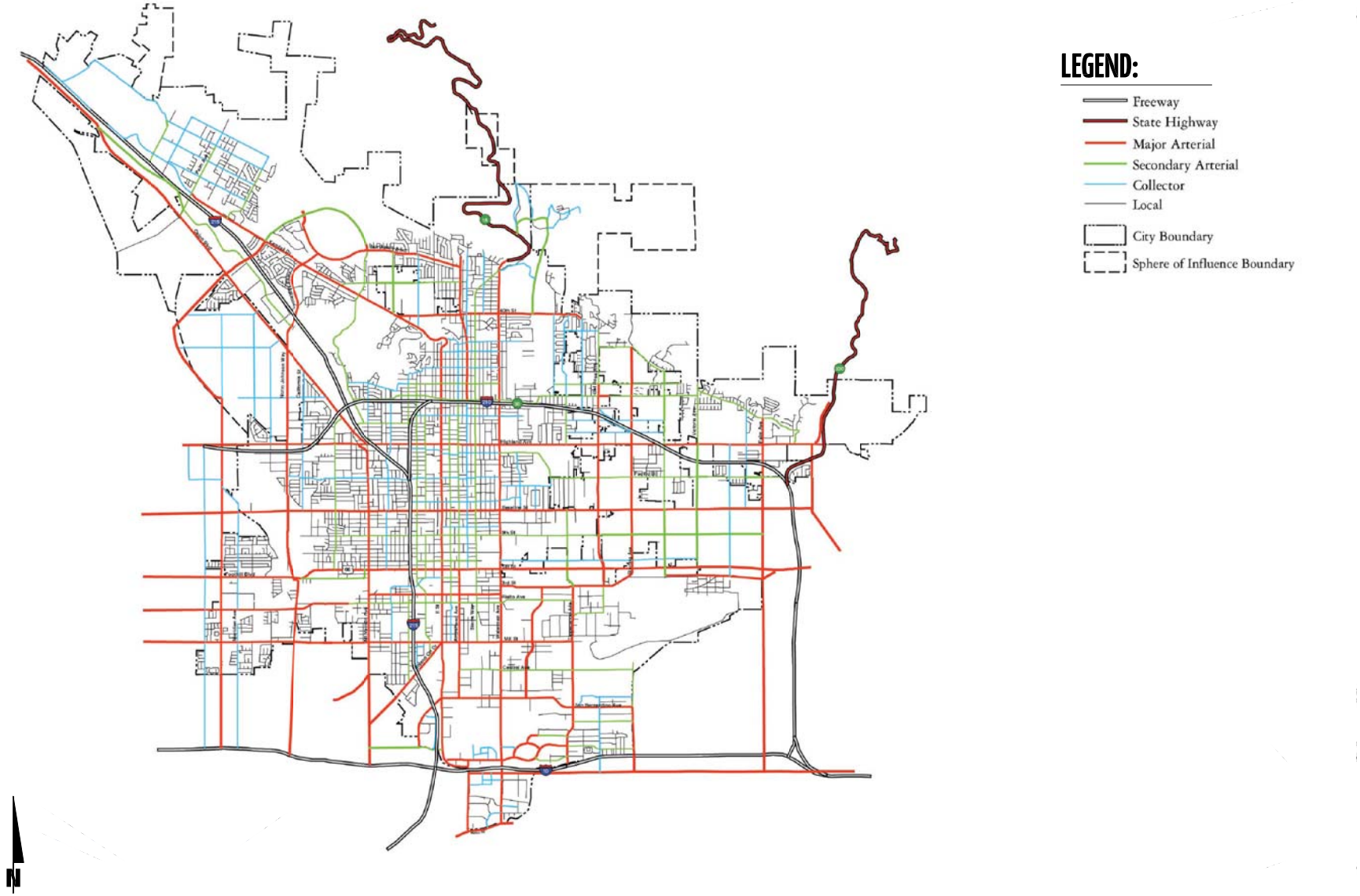
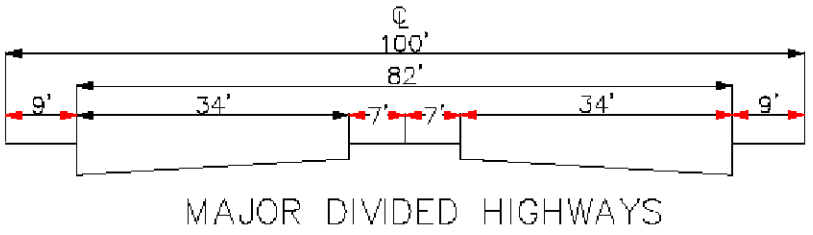
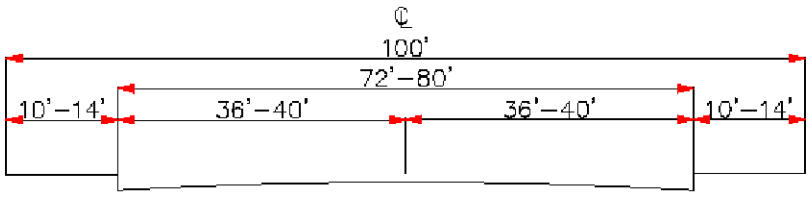


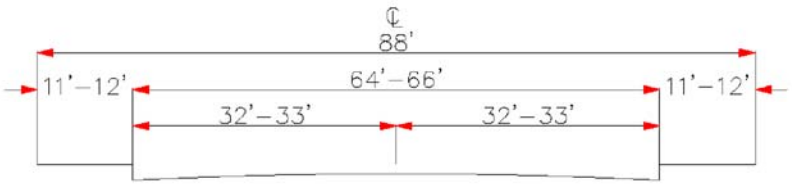
EXHIBIT 3-3: CITY OF SAN BERNADINO GENERAL PLAN ROADWAY CROSS-SECTIONS



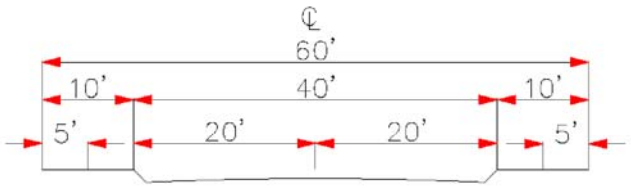
MAJOR DIVIDED HIGHWAYS



MAJOR HIGHWAY



SECONDARY HIGHWAY



COLLECTOR STREET

FOR USE IN QUARTER MILE STREETS,
SCHOOL AND INDUSTRIAL AREAS.

Collector Streets are typically two-lane streets that connect the local streets with secondary arterials allowing local traffic to access the regional transportation facilities. Examples of Collector Streets within the study area include:

- Frontage Road/W. Little League Drive
- Magnolia Avenue
- Belmont Avenue
- Irvington Avenue

3.3 TRANSIT SERVICE

The study area is currently served by Omnitrans, a public transit agency serving the County of San Bernardino and the City of San Bernardino, with bus service in the vicinity of the Project site along Kendall Drive and University Parkway. SbX is a rapid transit service offering quick, convenient, comfortable, and affordable transportation to major destinations within the City of San Bernardino and City of Loma Linda. There is an existing sbX transit station/transfer point on Kendall Drive, just east of Palm Avenue. Omnitrans Route 2, Route 7, Route 11, and sbX route are illustrated on Exhibit 3-4. Transit service is reviewed and updated by Omnitrans periodically to address ridership, budget and community demand needs. Changes in land use can affect these periodic adjustments which may lead to either enhanced or reduced service where appropriate.

3.4 BICYCLE & PEDESTRIAN FACILITIES

The existing pedestrian facilities within the study area are shown on Exhibit 3-5. Existing bus stop locations, crosswalks, bike lanes, trails, and sidewalks are shown. Pedestrian facilities are limited within the western portion of the study area.

The City of San Bernardino Conceptual Trail System is illustrated on Exhibit 3-6. As shown on the Conceptual Trail System, there are proposed regional multi-purpose trail west of Palm Avenue and along Pine Avenue, north of Kendall Drive. Additionally, there are proposed bicycle routes along Cajon Boulevard, west of Palm Avenue.

3.5 EXISTING (2015) TRAFFIC COUNTS

The intersection LOS analysis is based on the traffic volumes observed during the peak hour conditions using traffic count data collected in May 2015, while local schools were in session and operating on normal bell schedules. 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: CITY OF SAN BERNADINO TRANSIT SERVICES

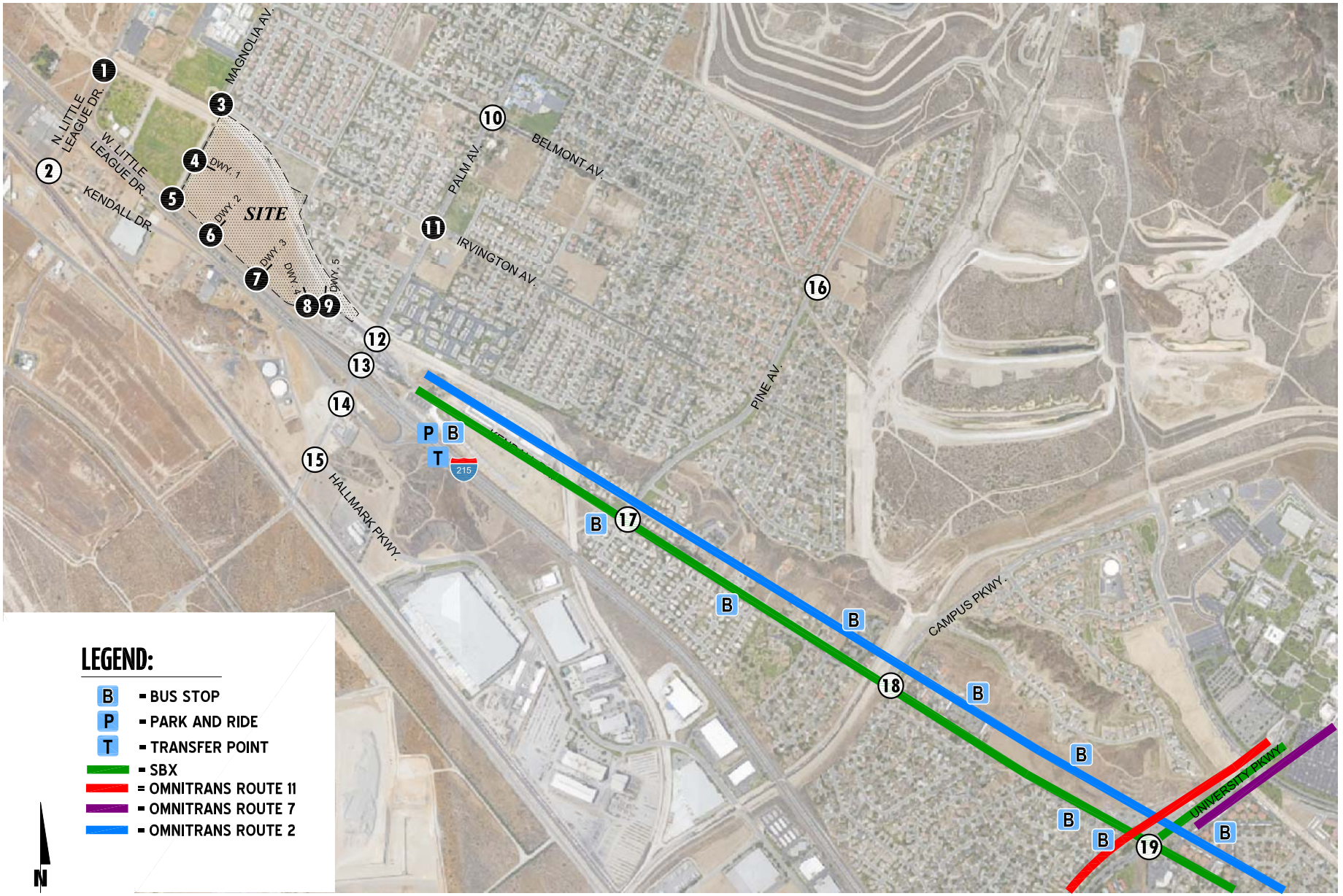


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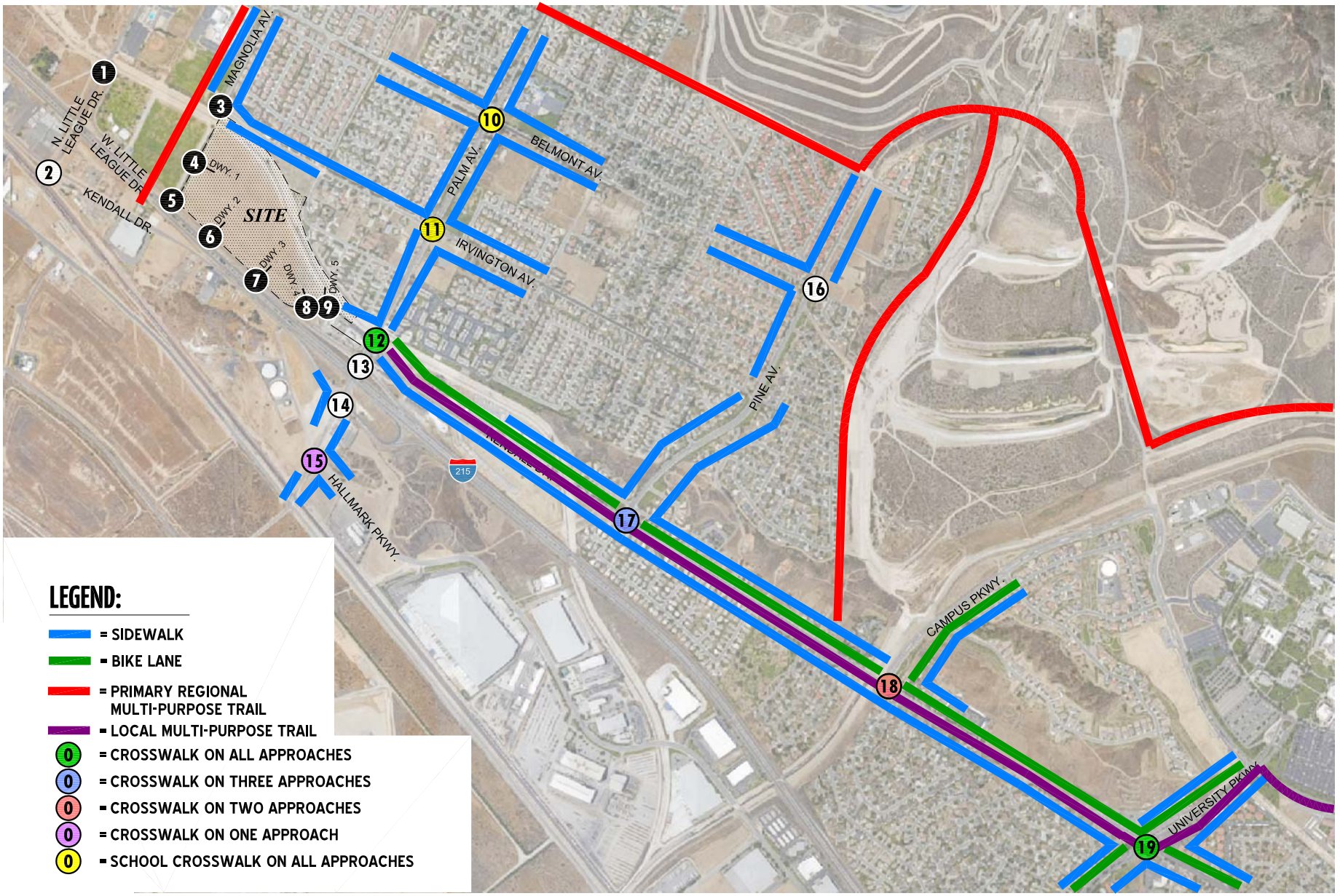
EXHIBIT 3-5: EXISTING PEDESTRIAN FACILITIES



URBAN CROSSROADS

EXHIBIT 3-6: CITY OF SAN BERNADINO CONCEPTUAL TRAIL SYSTEM

The weekday AM and PM peak hour count data is representative of typical 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 that would prevent or limit roadway access and detour routes. In consultation with nearby school schedules, this count date is considered representative of traffic in this effort as nearby schools were in session. 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.

Existing weekday average daily traffic (ADT) volumes on arterial highways throughout the study area are shown on Exhibit 3-7. Existing ADT volumes are based upon factored intersection peak hour counts collected by Urban Crossroads, Inc. using the following formula for each intersection leg:

Weekday PM Peak Hour (Approach Volume + Exit Volume) x 13.7339 = Leg Volume

For those roadway segments which have 24-hour tube count data available in close proximity to the study area, a comparison between the PM peak hour and daily traffic volumes indicated that the peak-to-daily relationship of approximately 7.28 percent would sufficiently estimate average daily traffic (ADT) volumes for planning-level analyses. As such, the above equation utilizing a factor of 13.7339 estimates the ADT volumes on the study area roadway segments assuming a peak-to-daily relationship of approximately 7.28 percent (i.e., 1/0.0728 = 13.7339). Existing weekday AM and PM peak hour intersection volumes are also shown on Exhibit 3-7.

3.6 INTERSECTION OPERATIONS ANALYSIS

Existing (2015) 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 existing study area intersections are currently operating at acceptable LOS during the peak hours.

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

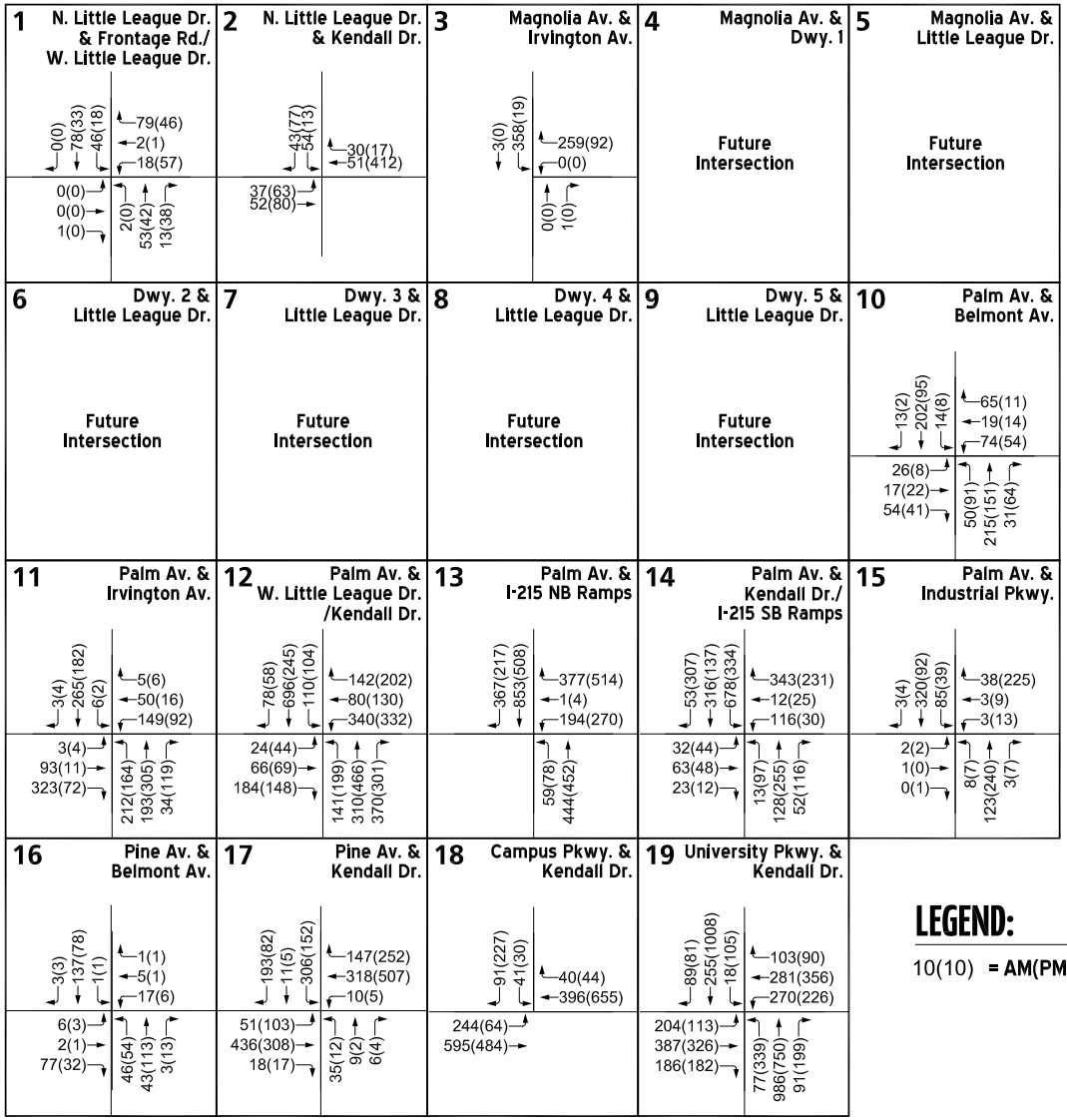
3.7 OFF-RAMP QUEUING ANALYSIS

A queuing analysis was performed for the off-ramps at the I-215 Freeway and Palm Avenue interchange to assess vehicle queues for the off ramps that may potentially result in deficient peak hour operations at the ramp-to-arterial intersections and may potentially "spill back" onto the I-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 on Table 3-2, there are no movements that are currently experiencing queuing issues during the weekday AM or weekday PM peak 95th percentile traffic flows. Worksheets for Existing traffic conditions off-ramp queuing analysis are provided in Appendix 3.3.

EXHIBIT 3-7 (1OF2) : EXISTING (2015) TRAFFIC VOLUMES

URBAN CROSSROADS

EXHIBIT 3-7 (2OF2): EXISTING (2015) TRAFFIC VOLUMES



URBAN CROSSROADS

EXHIBIT 3-8: SUMMARY OF LOS FOR EXISTING (2015) CONDITIONS

Table 3-1

Intersection Analysis for Existing (2015) Conditions

#	Intersection	Traffic Control[4]	Intersection Approach Lanes[1]												Delay[2] (secs.)		Level of Service	
			Northbound			Southbound			Eastbound			Westbound						
			L	T	R	L	T	R	L	T	R	L	T	R	AM	PM	AM	PM
1	N. Little League Dr. / W. Little League Dr.	CSS	0	1	0	0	1	0	0	1	0	0	1	0	10.1	9.8	B	A
2	N. Little League Dr. / Kendall Dr.	CSS	0	0	0	0	1	0	0	1	0	0	1	0	10.3	13.3	B	B
3	Magnolia Av. / Irvington Av.	CSS	0	1	0	0	1	0	0	0	0	0	1	0	10.4	0.0	B	A
4	Magnolia Av. / Driveway 1		Future Intersection															
5	Magnolia Av. / W. Little League Dr.		Future Intersection															
6	Driveway 2 / W. Little League Dr.		Future Intersection															
7	Driveway 3 / W. Little League Dr.		Future Intersection															
8	Driveway 4 / W. Little League Dr.		Future Intersection															
9	Driveway 5 / W. Little League Dr.		Future Intersection															
10	Palm Av. / Belmont Av.	AWS	0	1	1	0	1	0	0	1	0	0	1	0	15.7	9.7	C	A
11	Palm Av. / Irvington Av.	TS	1	2	0	1	2	0	0	1	0	0	1	0	31.0	15.2	C	B
12	Palm Av. / Kendall Dr.	TS	1	2	1>	1	2	0	1	1	1	2	1	1	35.1	33.9	D	C
13	Palm Av. / I-215 NB Ramps	TS	0	2	0	0	2	0	0	0	0	0	1	1	8.0	9.8	A	A
14	Palm Av. / I-215 SB Ramps	TS	1	2	0	1	1	1	0	1	d	0	1	0	32.3	15.3	C	B
15	Palm Av. / Hallmark Pkwy.	AWS	1	1	1	1	1	1	0	1	0	1	1	1	11.5	10.9	B	B
16	Pine Av. / Belmont Av.	CSS	0	1	0	0	1	0	0	1	0	0	1	0	12.6	11.5	B	B
17	Pine Av. / Kendall Dr.	TS	1	1	0	1	1	1	1	2	0	1	2	0	20.0	18.0	C	B
18	Campus Pkwy. / Kendall Dr.	TS	0	0	0	1	0	2>	1	2	0	0	2	0	37.5	26.7	D	C
19	University Pkwy. / Kendall Dr.	TS	2	3	0	1	3	0	2	2	0	2	2	0	37.1	49.6	D	D

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

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

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

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

Table 3-2

Peak Hour Freeway Off-Ramp Queuing Summary for Existing (2015) Conditions

Intersection	Movement	Available Stacking Distance (Feet)	95th Percentile Queue (Feet)[2]		Acceptable?[1]	
			AM Peak	PM Peak	AM	PM
I-215 NB Off-Ramp / Palm Av.	NBL/T	910	105	133	Yes	Yes
	NBR	415	104	165	Yes	Yes
I-215 SB Off-Ramp / Palm Av.	NBL/T/R	1,470	429 [2]	74	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 fee 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.

3.8 TRAFFIC SIGNAL WARRANTS ANALYSIS

Traffic signal warrants for Existing traffic conditions are based on existing peak hour intersection turning volumes. There are no study area intersections that currently warrant a traffic signal based on peak hour intersection turning volumes. Existing conditions traffic signal warrant analysis worksheets are provided in Appendix 3.4.

3.9 BASIC FREEWAY SEGMENT ANALYSIS

Existing mainline directional volumes for the weekday AM and PM peak hours are provided on Exhibit 3-9. As shown on Table 3-3, the basic freeway segments evaluated for the purposes of this TIA were found to operate at an acceptable LOS (i.e., LOS C or better) during the peak hours. Existing basic freeway segment analysis worksheets are provided in Appendix 3.5.

3.10 FREEWAY MERGE/DIVERGE ANALYSIS

Ramp merge and diverge operations were also evaluated for Existing conditions and the results of this analysis are presented in Table 3-4. As shown in Table 3-4, the freeway ramp merge and diverge areas currently operate at acceptable LOS (i.e., LOS D or better). Existing freeway ramp junction operations analysis worksheets are provided in Appendix 3.6.

EXHIBIT 3-9: EXISTING (2015) FREEWAY MAINLINE VOLUMES (ACTUAL VEHICLES)

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Table 3-3

Basic Freeway Segment Analysis for Existing (2015) Conditions

Freeway	Direction	Mainline Segment	Lanes[1]	Volume		Truck %	Truck %	Density[2]		LOS	
				AM	PM	AM	PM	AM	PM	AM	PM
I-215 Freeway	SB	North of Palm Avenue	2	2,550	1,693	5%	9%	20.5	13.7	C	B
		South of Palm Avenue	2	2,872	1,905	5%	8%	23.5	15.4	C	B
	NB	North of Palm Avenue	2	1,108	1,978	9%	5%	9.0	15.7	A	B
		South of Palm Avenue	2	1,253	2,467	10%	5%	10.2	19.7	A	C

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

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

Table 3-4

Freeway Ramp Junction Merge/Diverge Analysis for Existing (2015) Conditions

Freeway	Direction	Ramp or Segment	Lanes on Freeway[1]	AM Peak Hour		PM Peak Hour	
				Density[2]	LOS	Density[2]	LOS
I-215 Freeway	SB	Off-Ramp at Palm Avenue	2	27.8	C	19.9	B
		On-Ramp at Palm Avenue	2	28.8	D	20.7	C
	NB	On-Ramp at Palm Avenue	2	13.3	B	20.7	C
		Off-Ramp at Palm Avenue	2	15.2	B	26.5	C

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

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

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4 PROJECTED FUTURE TRAFFIC

This section presents the traffic volumes estimated to be generated by the Project, as well as the Project's trip assignment onto the study area roadway network. The Project is proposed to consist of 120 single-family residential units and 98,000 square feet of commercial retail use. The Project is anticipated to be developed in two phases as listed below:

- Phase 1 (2018) – 120 single family detached residential dwelling units (Western Half)
- Phase 2 (2019) – 98,000 square feet of commercial retail use (Eastern Half)

Vehicular access will be provided via the following driveways and all driveways are assumed to allow for full access (i.e., no turning movement restrictions):

- Magnolia Avenue / Driveway 1 – Access to Phase 1 (Residential)
- Driveway 2 / W. Little League Drive – Access to Phase 1 (Residential)
- Driveway 3 / W. Little League Drive – Access to Phase 2 (Commercial Retail)
- Driveway 4 / W. Little League Drive – Access to Phase 2 (Commercial Retail)
- Driveway 5 / W. Little League Drive – Access to Phase 2 (Commercial Retail)

4.1 PROJECT TRIP GENERATION

4.1.1 PROPOSED PROJECT

Trip generation represents the amount of traffic which is both attracted to and produced by a development. Determining traffic generation for a specific project is therefore based upon forecasting the amount of traffic that is expected to be both attracted to and produced by the specific land uses being proposed for a given development. Trip generation rates used to estimate Project traffic are shown in Table 4-1. The trip generation rates are based upon data collected by the Institute of Transportation Engineers (ITE) Trip Generation manual, 9th Edition, 2012. (4)

Pass-by trips are defined as intermediate stops on the way from an origin to a primary trip destination without a route diversion. Pass-by trips are attracted from traffic passing the site on an adjacent street or roadway that offers direct access to the generator. These types of trips are many times associated with retail uses such as fast-food restaurants and coffee/donut shops with drive-through windows. Pass-by percentages have been obtained from Table 5.6 from the ITE Trip Generation Handbook, 2nd Edition, 2004. (9)

Internal capture is a percentage reduction that can be applied to the trip generation estimates for individual land uses to account for trips internal to the site. In other words, trips may be made between individual retail uses on-site and can be made either by walking or using internal roadways without using external streets. An internal capture reduction was applied to recognize the interactions that would occur between the various complimentary land uses. For example, residents may visit the elementary school or commercial site without leaving the site and are therefore considered as vehicle trips that are internal to the site. The NCHRP 684 Internal Trip Capture Estimation Tool was used to compute internal capture reduction for residential-to-retail.

Table 4-1

Proposed Project Trip Generation Summary

Land Use	Units[2]	ITE LU Code	AM Peak Hour			PM Peak Hour			Daily
			In	Out	Total	In	Out	Total	
Project Trip Generation Rates[1]									
Single Family Residential	DU	210	0.19	0.56	0.75	0.63	0.37	1.00	9.52
Commercial Retail[3]	TSF	820	0.97	0.60	1.57	2.90	3.14	6.04	68.39

Land Use	Quantity	Units[2]	AM Peak Hour			PM Peak Hour			Daily
			In	Out	Total	In	Out	Total	
Project Trip Generation Summary									
Phase 1:									
Single Family Residential	120	DU	23	67	90	76	44	120	1,142
Phase 2:									
Single Family Residential	120	DU	23	67	90	76	44	120	1,142
Internal Capture - Residential to Commercial[2]			0	-1	-1	-35	-18	-53	-505
Residential Subtotal			*23*	*66*	*89*	*41*	*26*	*67*	*638*
Commercial Retail	98.000	TSF	95	59	154	284	308	592	6,702
Internal Capture - Commercial to Residential[4]			-1	0	-1	-18	-35	-53	-505
Pass-by Reduction (34% - PM Peak Hour and Daily)[5]			--	--	--	*-91*	*-91*	*-181*	*-2,107*
Commercial Retail Subtotal			*94*	*59*	*153*	*176*	*182*	*358*	*4,090*
Project Buildout Total			**117**	**125**	**242**	**217**	**208**	**425**	**4,728**

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

[2] DU = Dwelling Units; TSF = Thousand Square Feet

[3] Trip generation rates based on the regression equation for ITE Land Use 820.

[4] Internal capture is based on the NCHRP 684 Internal Capture Estimation Tool.

[5] Pass-by reduction percentage is based on the ITE methodology per Table 5.6 of ITE Trip Generation Handbook (2nd Edition, 2004).

A summary of the Project's trip generation for Phase 1 (2018) and Project Buildout (2019) are also shown on Table 4-1. As shown on Table 4-1, the Phase 1 (2018) of the Project is estimated to generate a net total of 1,142 trip-ends per day on a typical weekday with approximately 90 AM peak hour trips and 120 PM peak hour trips. The Project is estimated to generate a net total of 4,728 trip-ends per day on a typical weekday with 242 AM peak hour trips and 425 PM peak hour trips at Project Buildout (2019).

4.1.2 CURRENTLY APPROVED LAND USE

Table 4-2 summarizes the resulting trip generation estimates based on the currently approved land use (Commercial Retail). The Project site's current General Plan designation is all commercial retail. Assuming a conservative floor-to-area ratio of 0.24 for the 37.6 acre site, the General Plan would allow for the development of up to 393,085 square feet of commercial retail use. The currently approved land use is anticipated to generate a net total of approximately 10,912 trip-ends per day with 362 AM peak hour trips and 1,008 PM peak hour trips.

4.1.3 TRIP GENERATION COMPARISON

As shown in Table 4-3, the development of the proposed Project is anticipated to generate 6,184 fewer trip-ends per day with 120 fewer AM peak hour trip and 583 fewer PM peak hour trips as compared to the land uses and intensities currently allowed as adopted under the General Plan.

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. The Project trip distribution patterns were developed based on an understanding of existing travel patterns in the area, the geographical location of the site, and the site's proximity to the regional arterial and state highway system in conjunction with City of San Bernardino staff.

Trip distribution patterns have been provided for both residential and commercial retail uses. In addition, an alternative long range roadway network that would include the potential extension of Magnolia Avenue over the Cajon Creek Wash has also been evaluated for the purposes of this TIA. As such, trip distribution patterns are anticipated to change for long range traffic conditions for both the residential and commercial retail uses for the With Magnolia Avenue Bridge alternative. Exhibit 4-1 illustrates the proposed Residential trip distribution patterns that will be utilized for both 2018 and 2019 traffic conditions and Exhibit 4-2 illustrates the proposed Commercial Retail trip distribution patterns which will be utilized for 2019 traffic conditions. Exhibit 4-3 illustrates the proposed Horizon Year (2035) Residential trip distribution patterns and Exhibit 4-4 illustrates the proposed Horizon Year (2035) Commercial Retail trip distribution patterns. The With Magnolia Avenue Bridge alternative trip distributions for Horizon Year (2035) traffic conditions are shown on an inset on Exhibit 4-3 and Exhibit 4-4.

Table 4-2

Currently Approved General Plan Land Use Trip Generation Summary

Land Use	Units[2]	ITE LU Code	AM Peak Hour			PM Peak Hour			Daily
			In	Out	Total	In	Out	Total	
Trip Generation Rates[1]									
Commercial Retail[3]	TSF	820	0.57	0.35	0.92	1.83	1.98	3.81	42.06

Land Use	Quantity	Units[2]	AM Peak Hour			PM Peak Hour			Daily
			In	Out	Total	In	Out	Total	
Trip Generation Summary									
Commercial Retail	393.085	TSF	224	138	362	719	778	1,498	16,533
Pass-by Reduction (34% - PM Peak Hour and Daily)[4]			--	--	--	*-245*	*-245*	*-490*	*-5,621*
Total			**224**	**138**	**362**	**474**	**533**	**1,008**	**10,912**

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

[2] TSF = Thousand Square Feet

[3] Trip generation rates based on the regression equation for ITE Land Use 820.

[4] Pass-by reduction percentage is based on the ITE methodology per Table 5.6 of ITE Trip Generation Handbook (2nd Edition, 2004).

Table 4-3

Trip Generation Comparison

Land Use	AM Peak Hour			PM Peak Hour			Daily
	In	Out	Total	In	Out	Total	
Trip Generation Summary							
Proposed Project	117	125	242	217	208	425	4,728
Currently Approved Land Use	224	138	362	474	533	1,008	10,912
Variance[1]	**-107**	**-13**	**-120**	**-257**	**-325**	**-583**	**-6,184**

[1] Variance = Proposed Project - Currently Approved Land Use

EXHIBIT 4-1: PROJECT (RESIDENTIAL 2018 & 2019) TRIP DISTRIBUTION

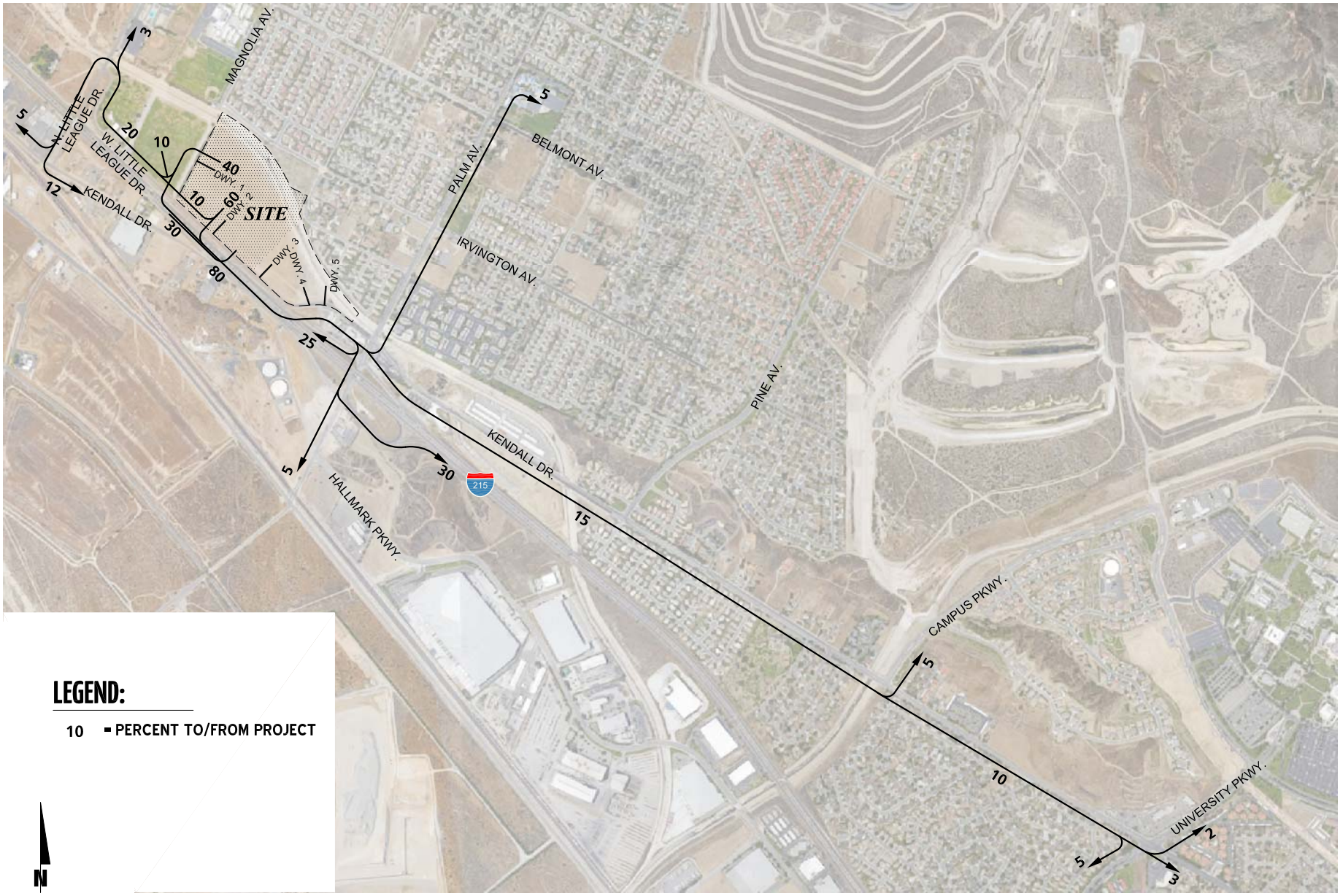

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EXHIBIT 4-2: PROJECT (COMMERCIAL RETAIL 2019) TRIP DISTRIBUTION

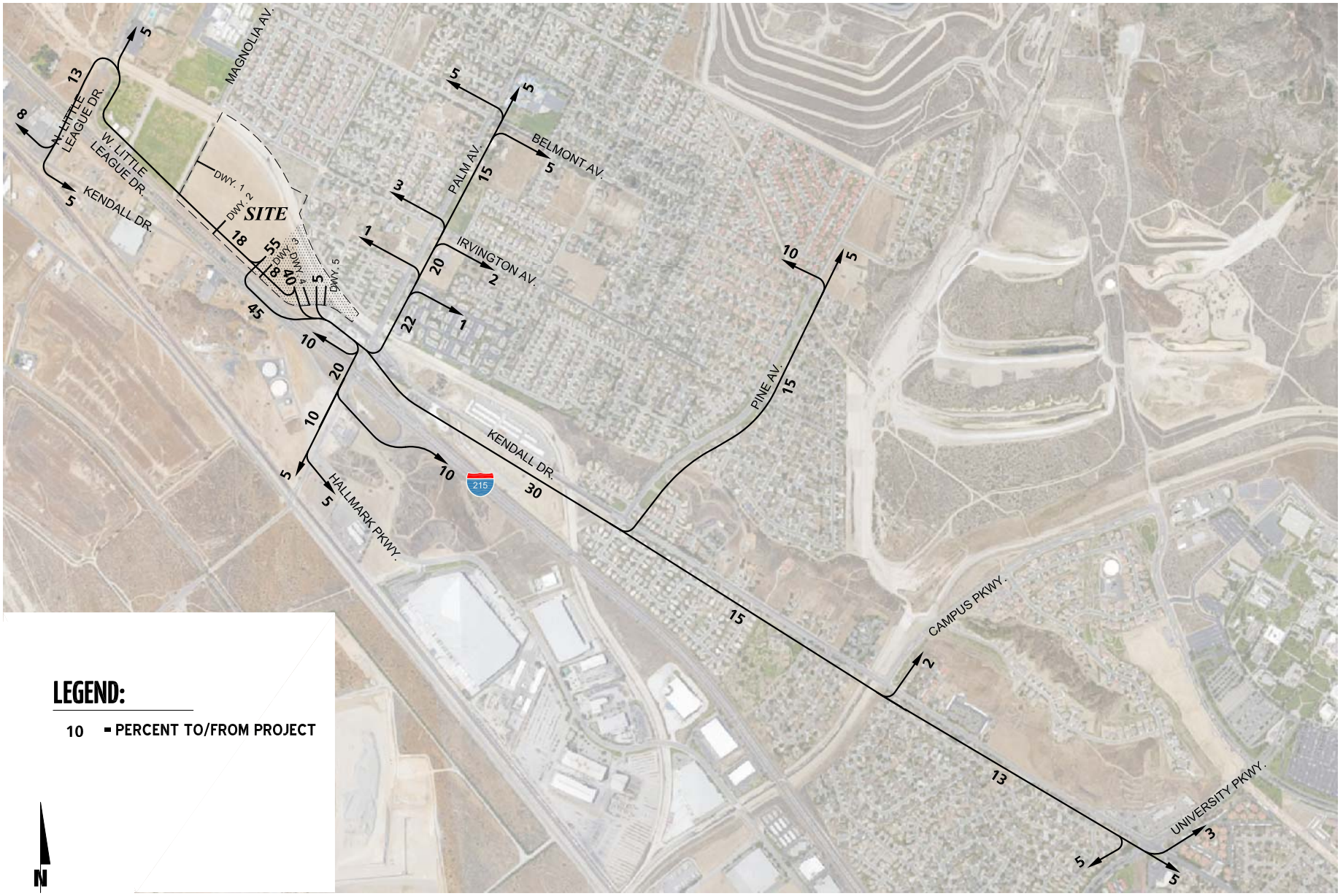


EXHIBIT 4-3: HORIZON YEAR (2035) PROJECT (RESIDENTIAL) TRIP DISTRIBUTION

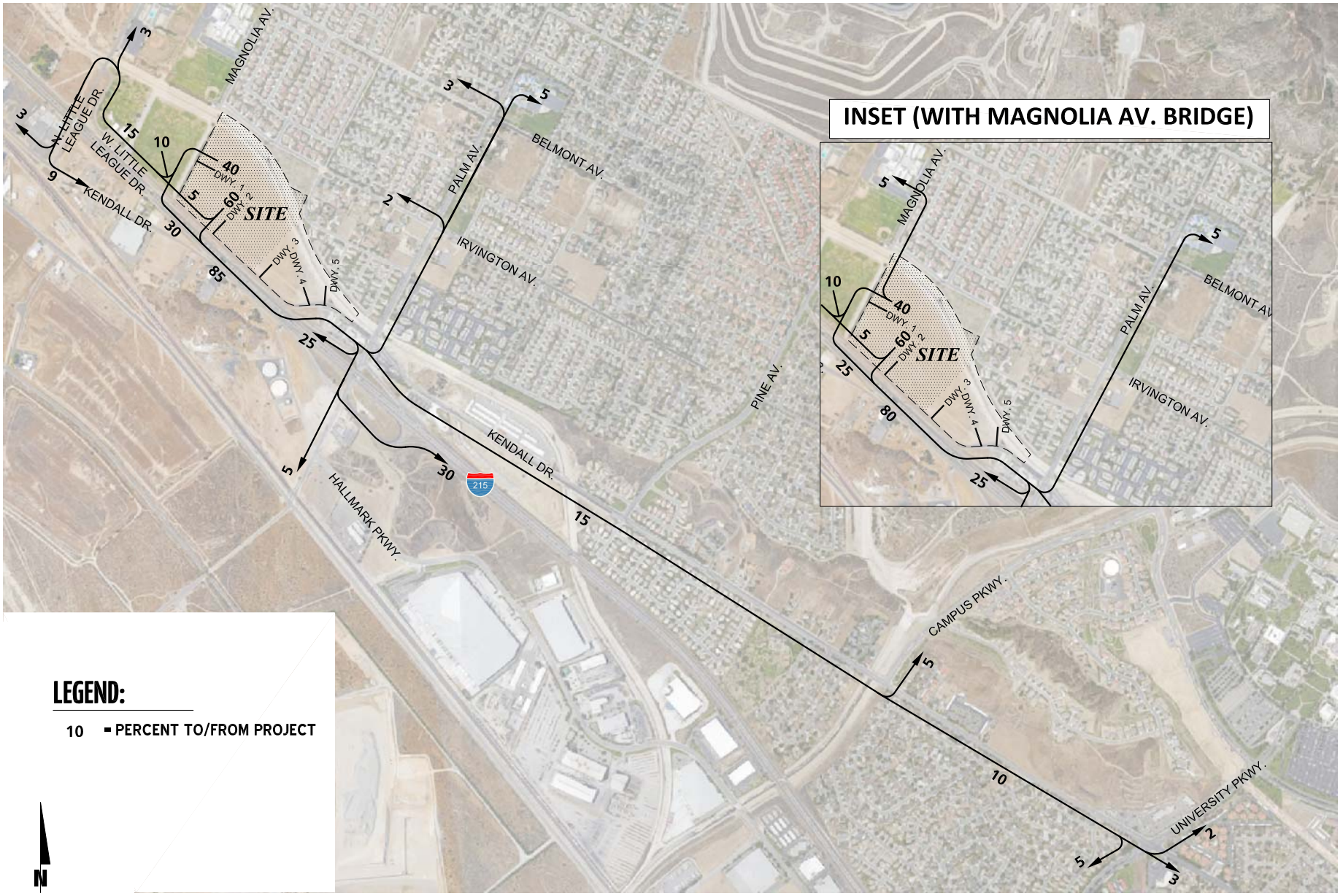
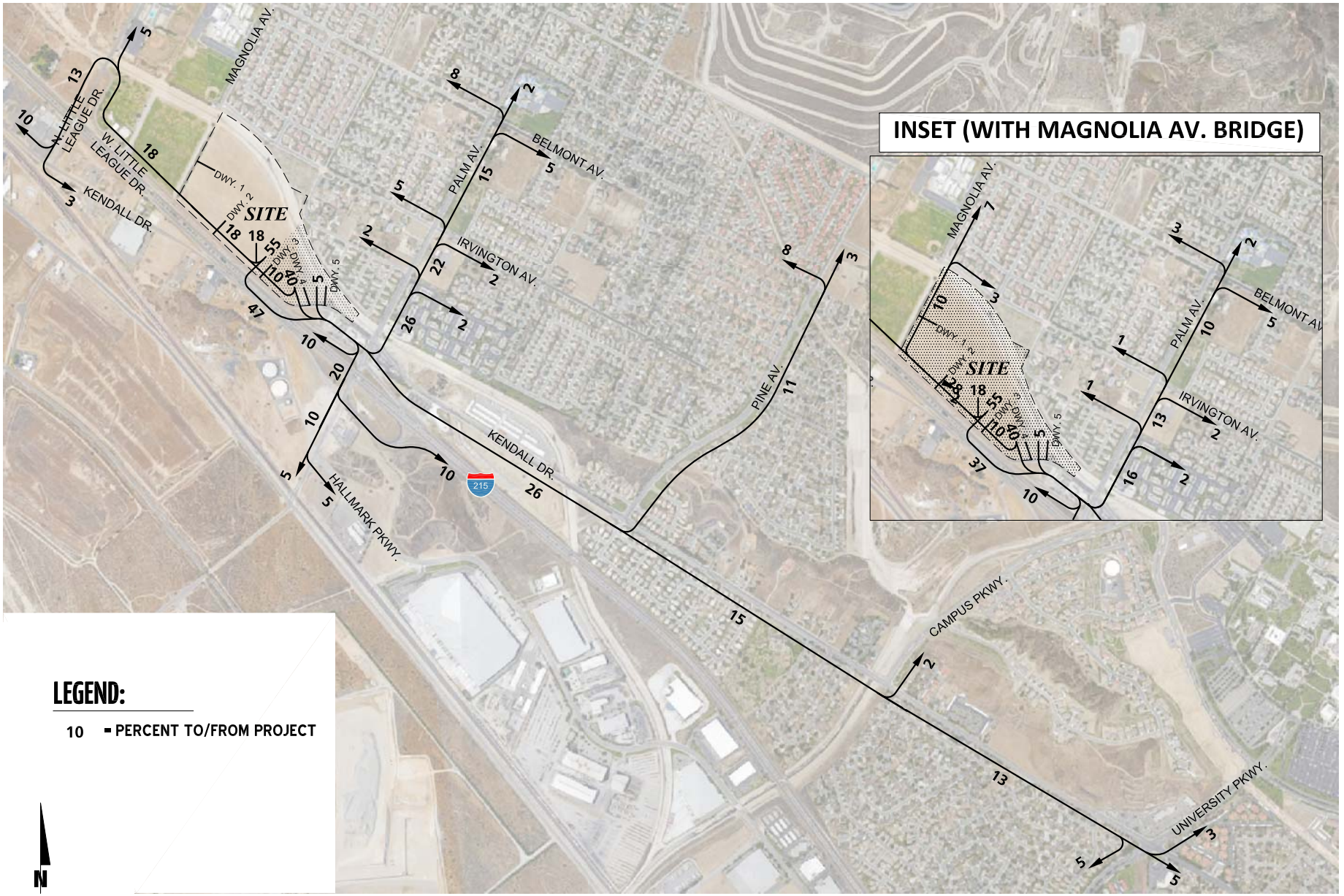


EXHIBIT 4-4: HORIZON YEAR (2035) PROJECT (COMMERCIAL RETAIL) TRIP DISTRIBUTION



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4.3 MODAL SPLIT

Although the use of public transit, walking, and/or bicycling have the potential to reduce Project-related traffic, such reductions have not been taken into consideration in this traffic study in order to provide a conservative analysis of the Project's potential to contribute to circulation system deficiencies. Specifically, no reductions have been taken to account for the use of the existing Verdemont Transit Center located south of Kendall Drive, just east of Palm Avenue.

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, AM and PM peak hour volumes are shown on Exhibit 4-5 for Phase 1 (2018) conditions, Exhibit 4-6 for Project Buildout (2019) conditions, and Exhibit 4-7 for Horizon Year (2035) conditions.

4.5 CONSTRUCTION TRAFFIC

Project construction activities may potentially result in temporary and transient traffic deficiencies related to:

- Construction employee commutes;
- Import of construction materials and soils; and
- Transport and use of heavy construction equipment.

The Applicant would be required to develop and implement a City-approved Construction Traffic Management Plan addressing potential construction-related traffic detours and disruptions. In general, the Construction Traffic Management Plan would ensure that to the extent practical, construction traffic would access the Project site during off-peak hours; and that construction traffic would be routed to avoid travel through, or proximate to, sensitive land uses.

4.6 BACKGROUND TRAFFIC

Future year traffic forecasts have been based upon a background (ambient) growth factor of 2% per year. The ambient growth factor is intended to approximate traffic growth. The total ambient growth is 6.12% for 2018 traffic conditions (compounded growth of two percent per year over 3 years) and 8.24% for 2019 traffic conditions (compounded growth of two percent per year over 4 years). This ambient growth rate is added to existing traffic volumes to account for area-wide growth not reflected by cumulative development projects. Ambient growth has been added to daily and peak hour traffic volumes on surrounding roadways, in addition to traffic generated by the development of future projects that have been approved but not yet built and/or for which development applications have been filed and are under consideration by governing agencies.

EXHIBIT 4-5 (1OF2) : PROJECT (2018) TRAFFIC VOLUMES

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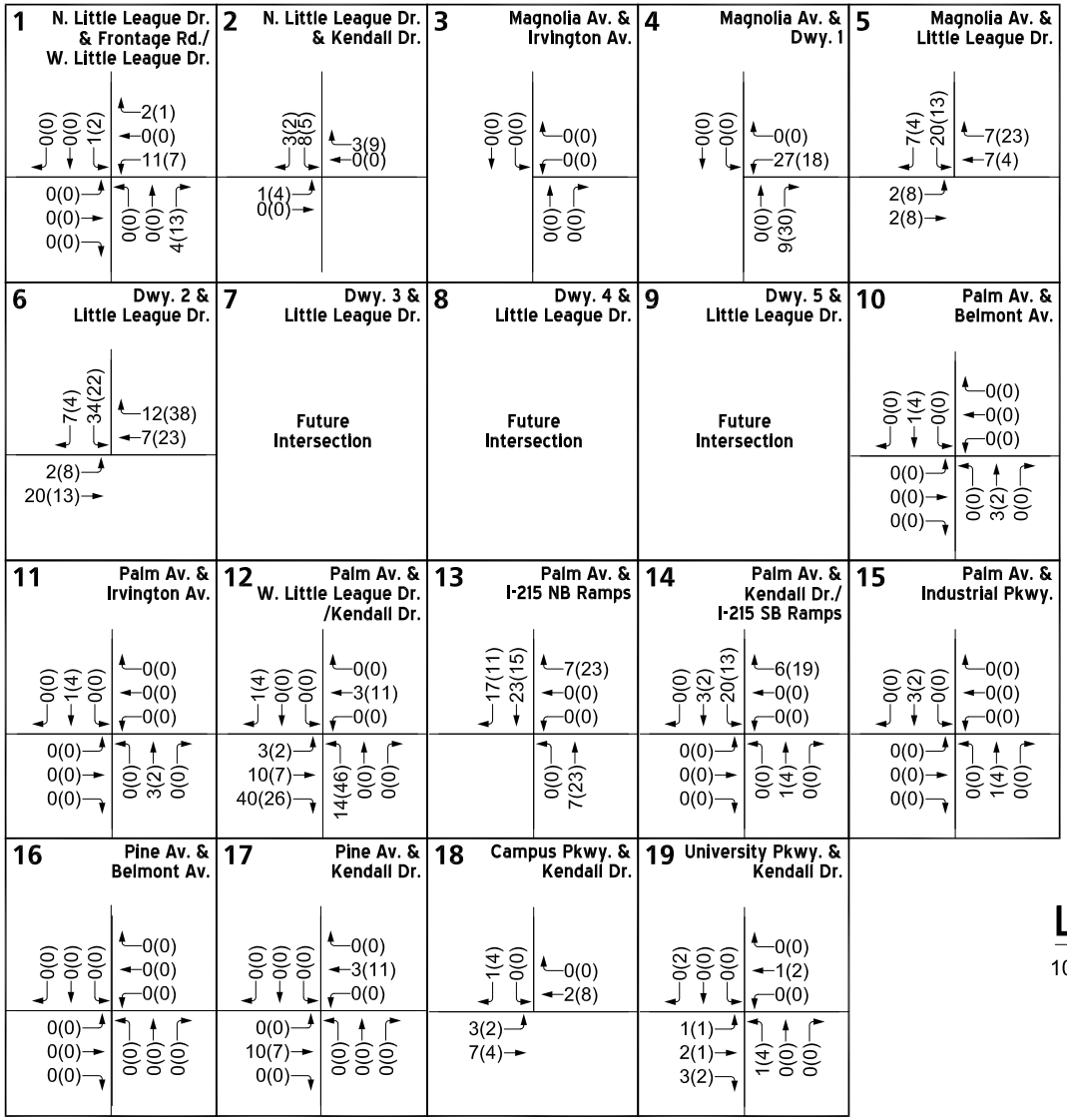
EXHIBIT 4-5 (2OF2) : PROJECT (2018) TRAFFIC VOLUMES



LEGEND:

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

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EXHIBIT 4-6 (1OF2) : PROJECT (2019) TRAFFIC VOLUMES

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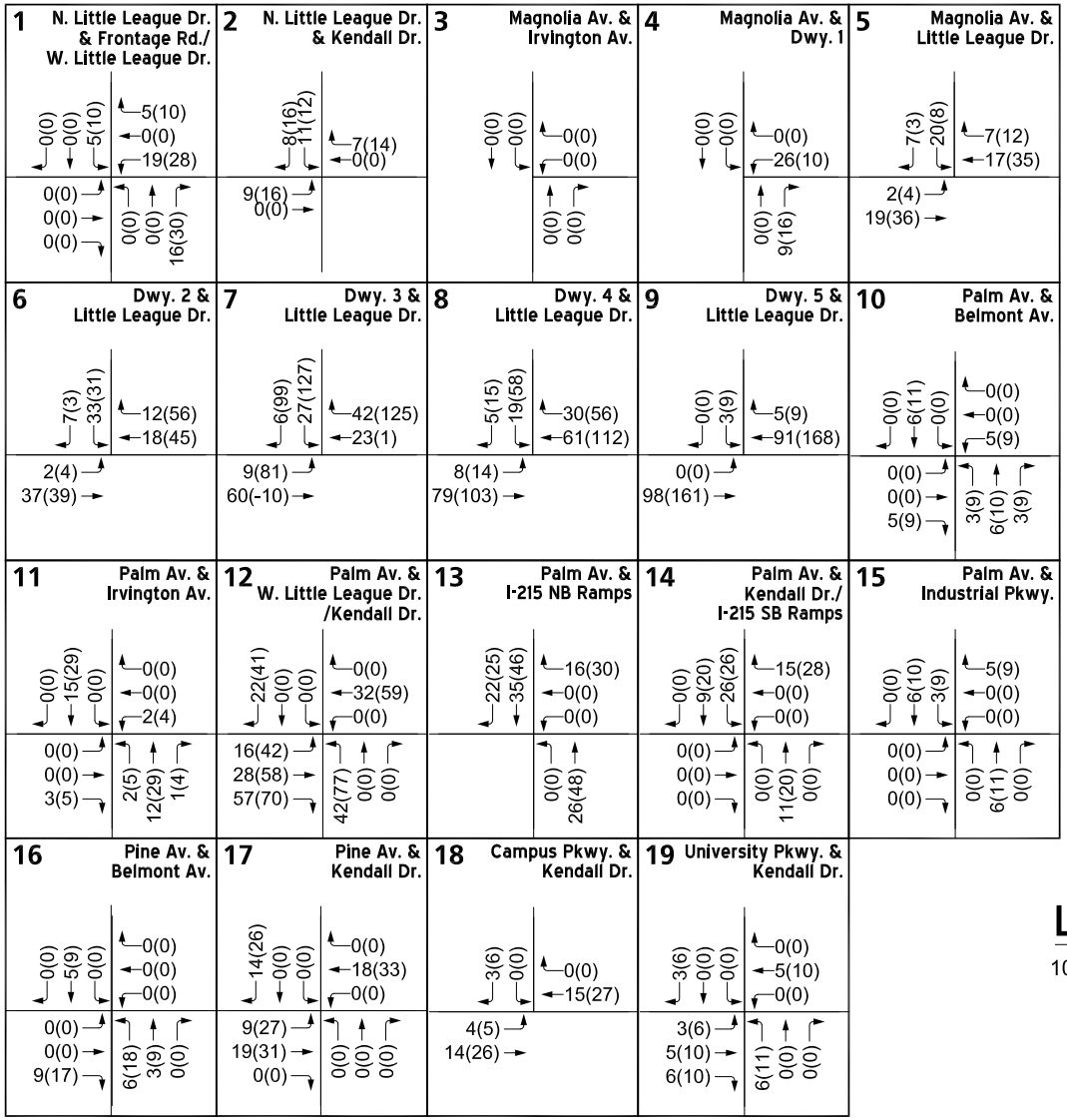
EXHIBIT 4-6 (2OF2) : PROJECT (2019) TRAFFIC VOLUMES



LEGEND:

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

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EXHIBIT 4-7 (1OF2) : PROJECT (2035) TRAFFIC VOLUMES

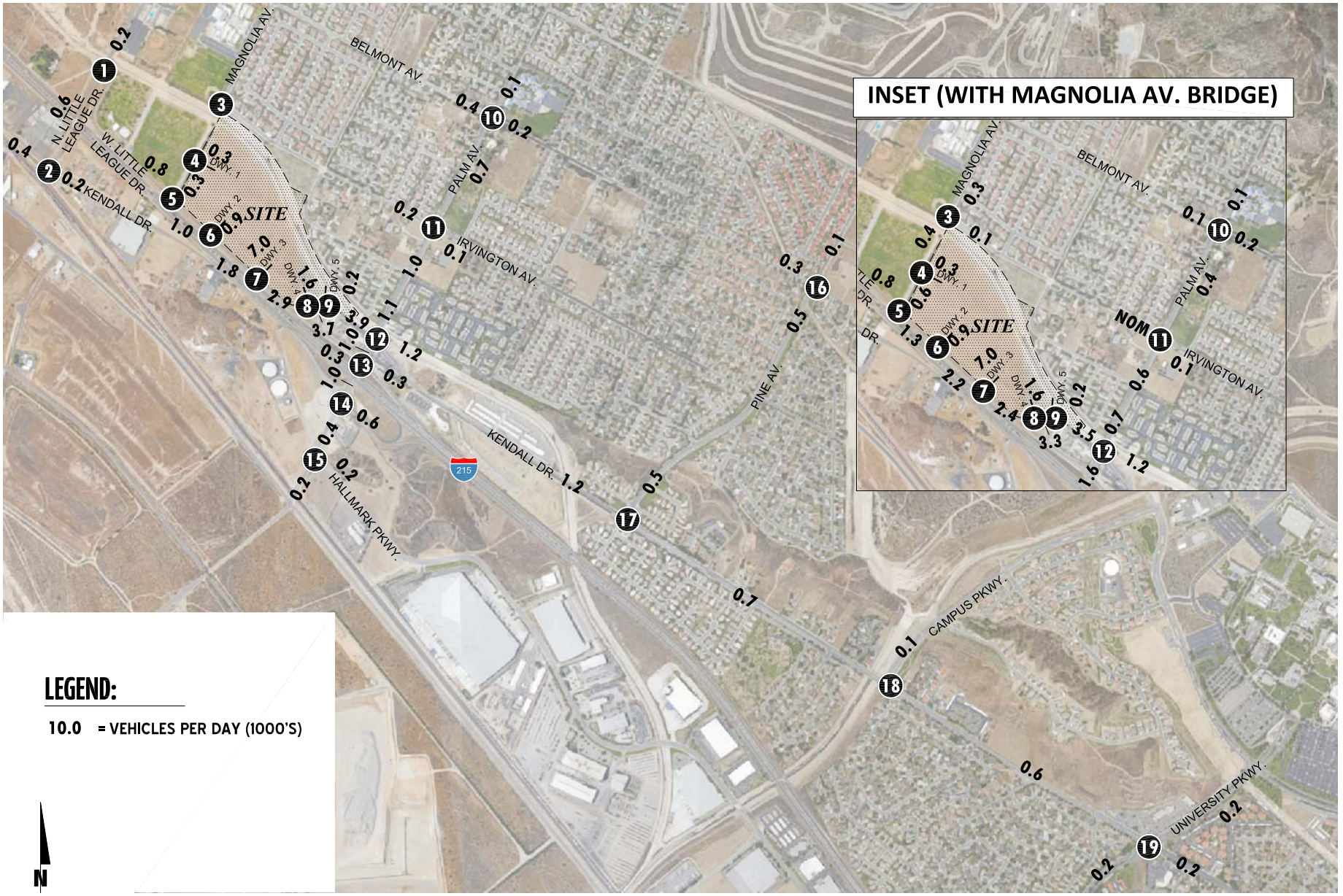

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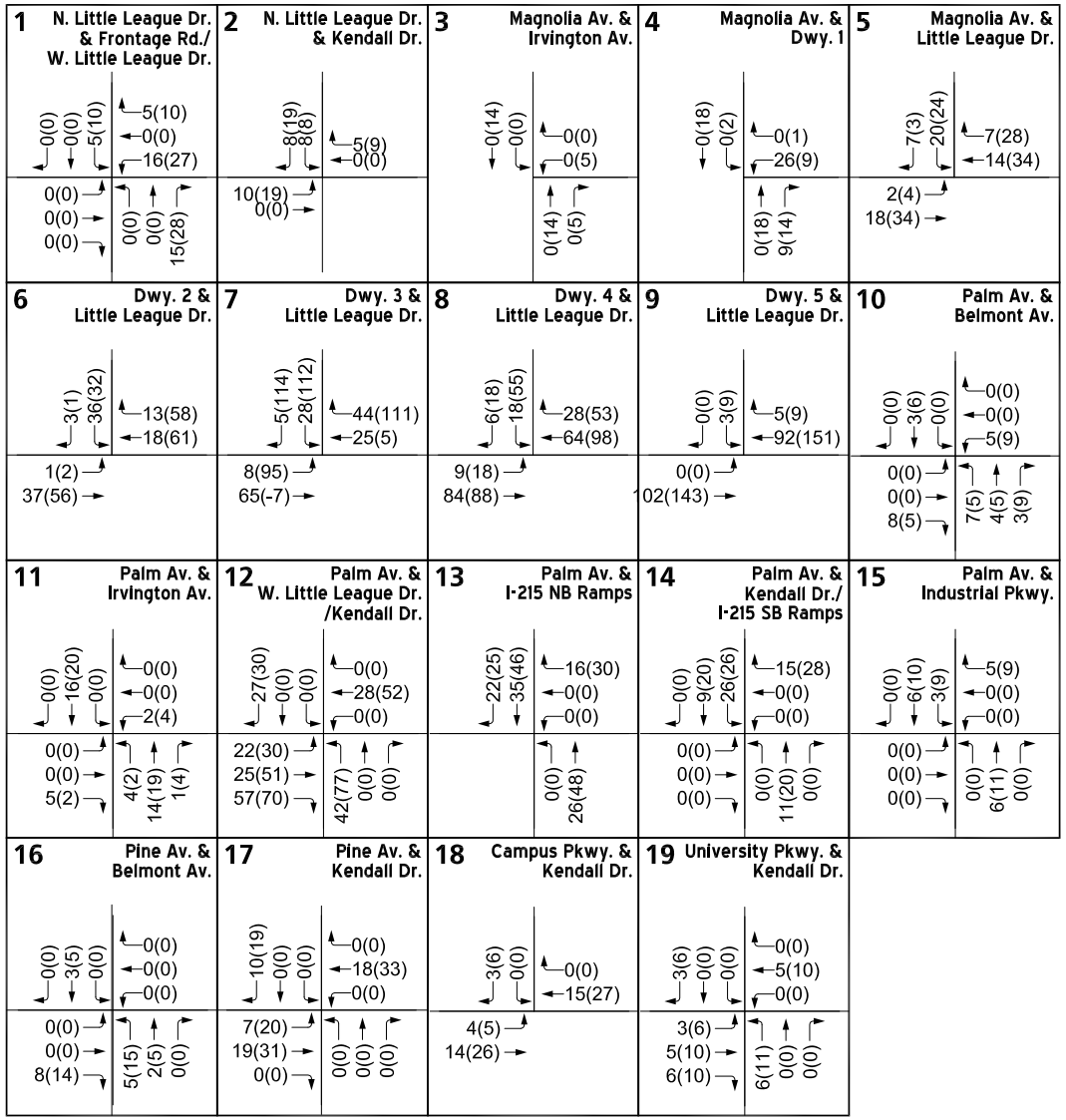
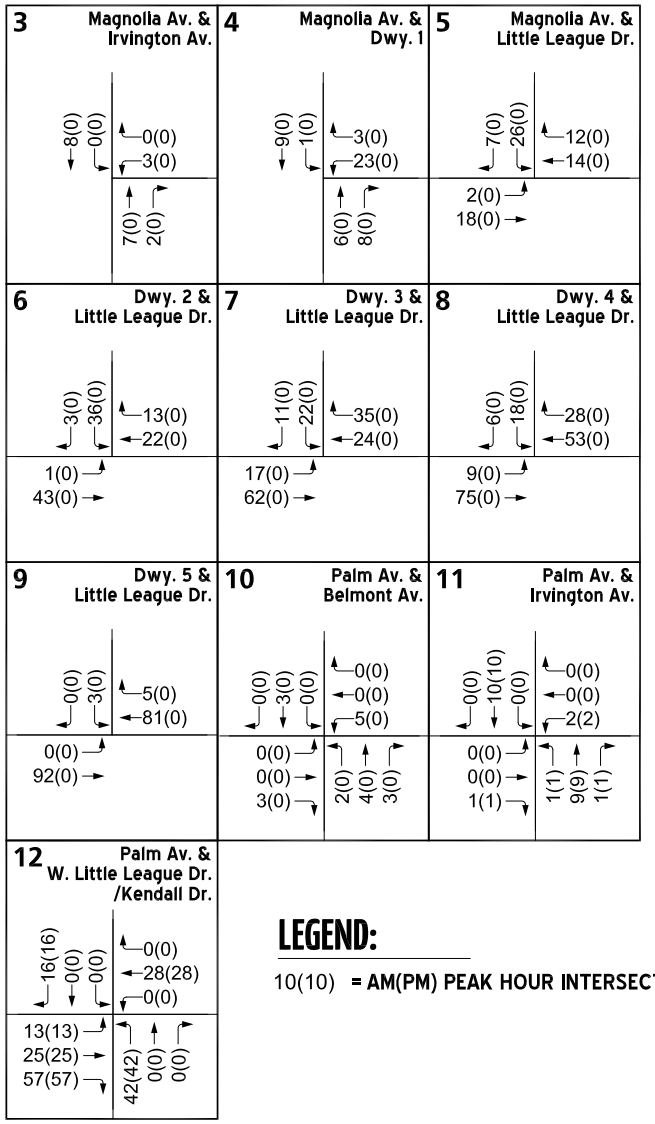
EXHIBIT 4-7 (2OF2) : PROJECT (2035) TRAFFIC VOLUMES



2035 ALTERNATIVE



LEGEND:

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

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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) 2012 Regional Transportation Plan (RTP) (April 2012) growth forecasts for the City of San Bernardino identifies projected growth in population of 209,900 in 2008 to 261,400 in 2035, or a 24.54 percent increase over the 27 year period. (5) The change in population equates to roughly a 0.82 percent annual growth rate, compounded annually. Similarly, growth over the same 27 year period in households is projected to increase by 29.51 percent, or 0.96 percent annual growth rate. Finally, growth in employment over the same 27 year period is projected to increase by 43.44 percent, or a 1.34 percent annual growth rate.

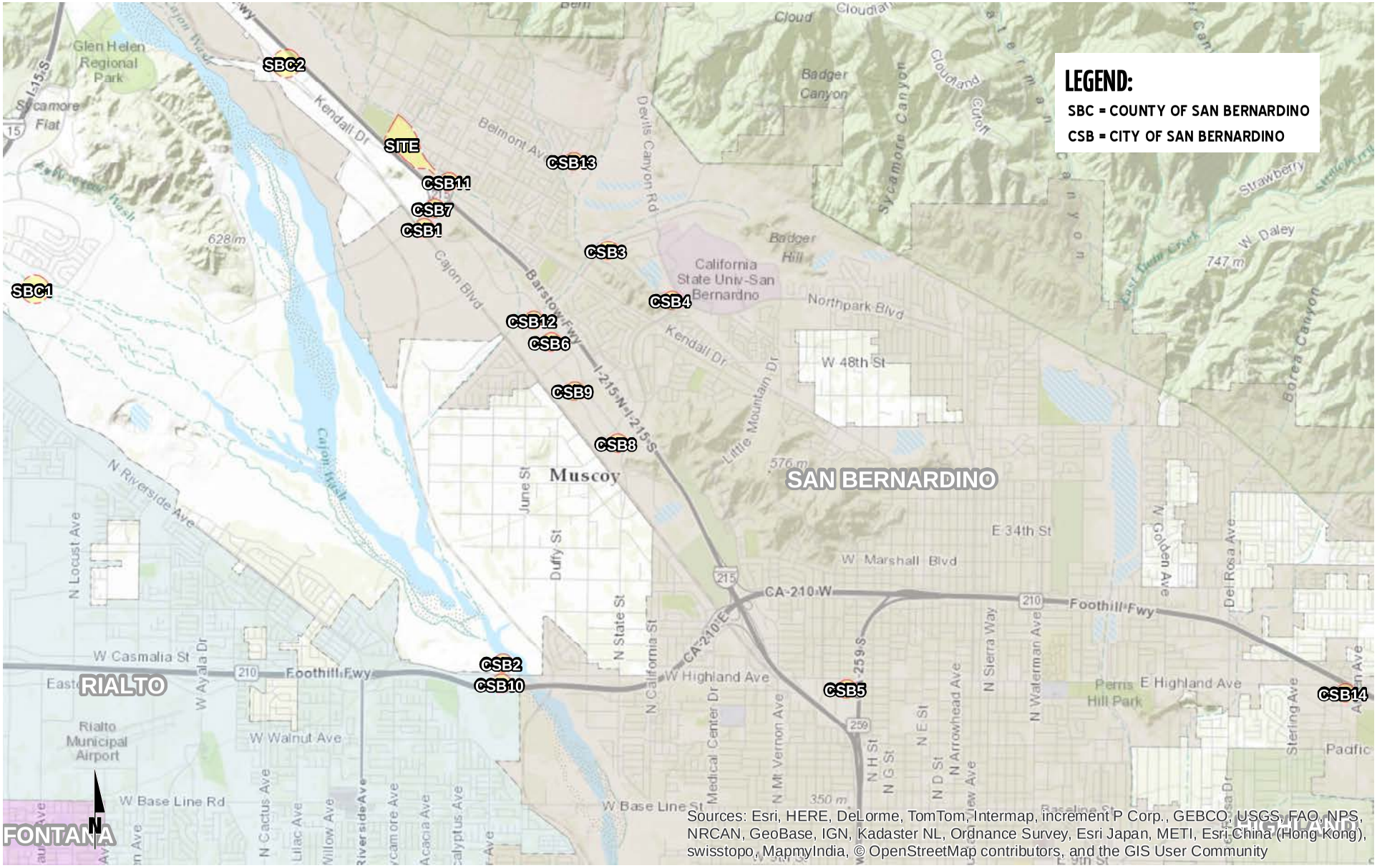
Based on a comparison of Existing traffic volumes to the Horizon Year (2035) forecasts, the average growth rate is estimated at approximately 2.20 percent compounded annually between Existing and Horizon Year (2035) traffic conditions. The annual growth rate at each individual intersection is not lower than 1.27 percent to as high as 4.67 percent compounded annually over the same time period. Therefore, the annual growth rate utilized for the purposes of this analysis would appear to conservatively approximate the anticipated regional growth in traffic volumes in the City of San Bernardino for both Opening Year Cumulative and Horizon Year (2035) traffic conditions, especially when considered along with the addition of cumulative development project traffic and project-related traffic. As such, the growth in traffic volumes assumed in this traffic impact analysis would tend to overstate, as opposed to understate, the potential impacts to traffic and circulation.

4.7 CUMULATIVE DEVELOPMENT TRAFFIC

California Environmental Quality Act (CEQA) guidelines require that other reasonably foreseeable development projects which are either approved or being processed concurrently in the study area also be included as part of a cumulative analysis scenario. A cumulative project list was developed for the purposes of this analysis through consultation with planning and engineering staff from the City of San Bernardino and the County of San Bernardino (see Appendix 4.1). Exhibit 4-8 illustrates the cumulative development location map. A summary of cumulative development projects and their proposed land uses are shown on Table 4-4. If applicable, the traffic generated by individual cumulative projects was manually added to both the Opening Year Cumulative and Horizon Year forecasts to ensure that traffic generated by the listed cumulative development projects in Table 4-4 are reflected as part of the background traffic.

Based on the identified cumulative development project traffic generation and trip distribution patterns, cumulative development project ADT, AM and PM peak hour volumes are shown on Exhibit 4-9.

EXHIBIT 4-8: CUMULATIVE DEVELOPMENT PROJECTS LOCATION MAP

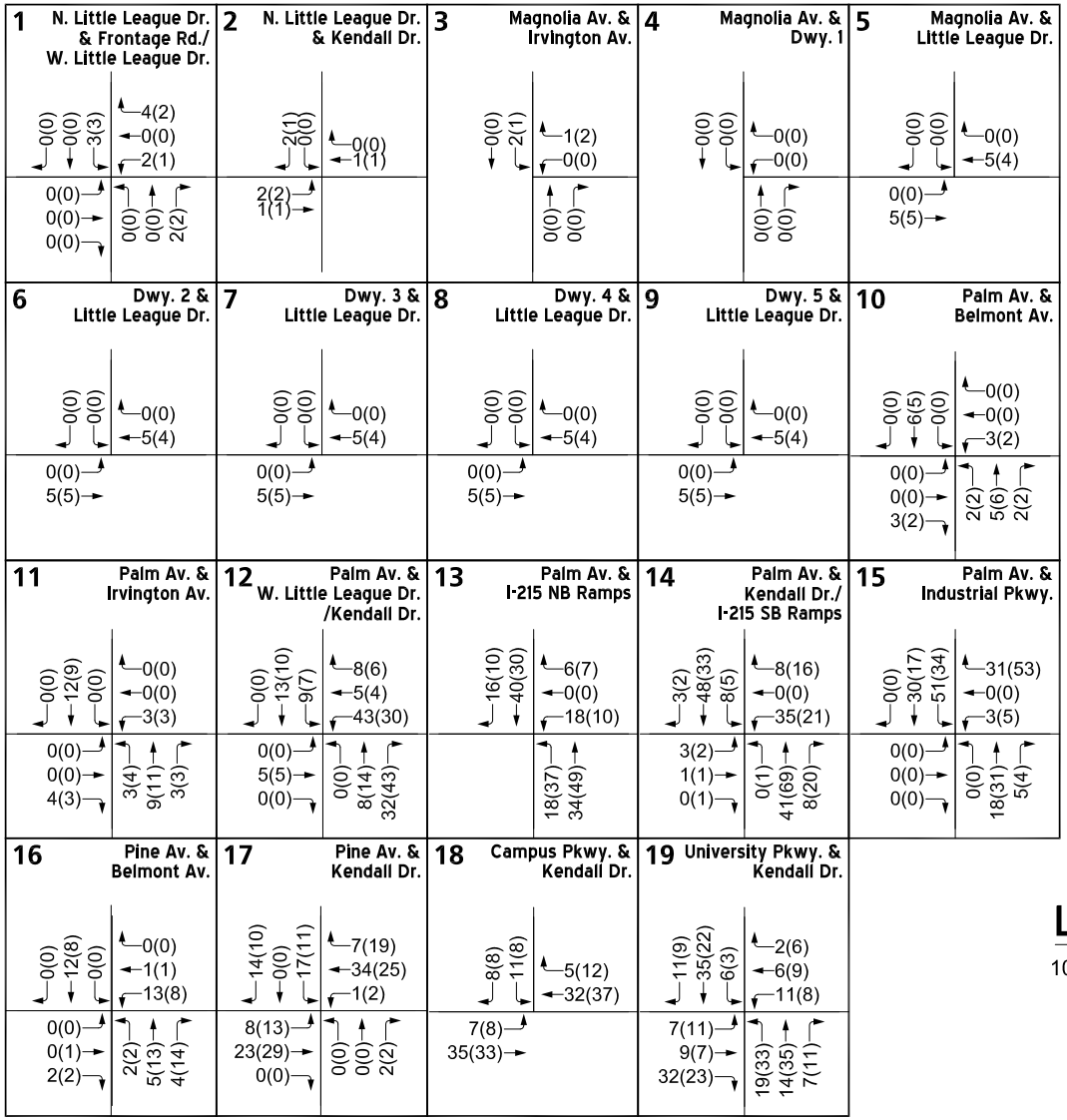


URBAN CROSSROADS

EXHIBIT 4-9 (1OF2) : CUMULATIVE DEVELOPMENT PROJECTS TRAFFIC VOLUMES

URBAN CROSSROADS

EXHIBIT 4-9 (2OF2) : CUMULATIVE DEVELOPMENT PROJECTS TRAFFIC VOLUMES



LEGEND:

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

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Table 4-4

Cumulative Development Land Use Summary

#	Project/Location	Land Use[1]	Quantity	Units[2]
City of San Bernardino				
CSB1	DP206-28	Distribution Center	678.275	TSF
CSB2	ADP15-05	Market	18.000	TSF
CSB3	The Colonies at University Park	SFDR	22	DU
CSB4	The Promenade at University Park	Student Housing	104	DU
CSB5	CUP12-06	Fast Food Restaurant with Drive-Thru	2.300	TSF
CSB6	CUP14-04	Water Treatment Plant	63.000	TSF
CSB7	CUP14-08	Gas Station / Commercial	5.000	TSF
CSB8	CUP14-19	Car Wash	3.650	TSF
CSB9	CUP14-21	Church	121.000	TSF
CSB10	Harbor Flight Tools (DP-D14-18)	Retail	17.541	TSF
CSB11	CUP15-03	Restaurants with Drive-Thru	5.422	TSF
CSB12	DP-D15-02	Warehouse	155.000	TSF
CSB13	DP-P13-07	SFDR	39	DU
CSB14	CUP11-08	Home Improvement	136.090	TSF
		Retail / Restaurant	68.630	TSF
County of San Bernardino				
SBC1	P201400536	Recreational Facility Expansion		
SBC2	P201200390	Truck Terminal	4.298	TSF
SBC3	Silverleaf at Rosena Ranch (P201400397)	SFDR		
SBC4	P201400346	Vehicle Service Shop Expansion	1.462	TSF

[1] SFDR = Single Family Detached Residential

[2] TSF = Ten Thousand Square Feet; DU = Dwelling Unit

4.8 NEAR-TERM CONDITIONS

The "buildup" approach combines existing traffic counts with a background ambient growth factor to forecast the EA (2018), EAP (2018), EA (2019), EAP (2018), Opening Year Cumulative (2018), and Opening Year Cumulative (2019) traffic conditions. An ambient growth factor of 6.12% accounts for background (area-wide) traffic increases that occur over time up to the year 2018 from the year 2015 (compounded two percent per year growth over a 3 year period) and 8.24% for year 2019 from the year 2015 (compounded two percent per year over a 4 year period). Phase 1 and Phase 2 Project traffic is added to assess EAP (2018) and EAP (2019) traffic conditions, respectively. Traffic volumes generated by cumulative development projects are then added to assess the Opening Year Cumulative traffic conditions. The 2018 and 2019 roadway networks are similar to the existing conditions roadway network with the exception of future roadways and intersections proposed to be developed by the Project.

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

- EA (2018)
    - Existing 2015 counts
    - Ambient growth traffic (6.12%)
- EAP (2018)
    - Existing 2015 counts
    - Ambient growth traffic (6.12%)
    - Project (Phase 1) Traffic
- EA (2019)
    - Existing 2015 counts
    - Ambient growth traffic (8.24%)
- EAP (2019)
    - Existing 2015 counts
    - Ambient growth traffic (8.24%)
    - Project Buildout Traffic
- Opening Year Cumulative (2018) Without Project
    - Existing 2015 counts
    - Ambient growth traffic (6.12%)
    - Cumulative Development traffic
- Opening Year Cumulative (2018) With Project
    - Existing 2015 counts
    - Ambient growth traffic (6.12%)
    - Cumulative Development traffic
    - Project (Phase 1) Traffic

- Opening Year Cumulative (2019) Without Project
  - Existing 2015 counts
  - Ambient growth traffic (8.24%)
  - Cumulative Development traffic
- Opening Year Cumulative (2019) With Project
  - Existing 2015 counts
  - Ambient growth traffic (8.24%)
  - Cumulative Development traffic
  - Project Buildout Traffic

4.9 HORIZON YEAR (2035) VOLUME DEVELOPMENT

Traffic projections for Horizon Year (2035) Without Project conditions were derived from the SBTAM using accepted procedures for model forecast refinement and smoothing. The traffic forecasts reflect the area-wide growth anticipated between Existing conditions and Horizon Year (2035) traffic conditions. In most instances the traffic model zone structure is not designed to provide accurate turning movements along arterial roadways unless refinement and reasonableness checking is performed. Therefore, the Horizon Year (2035) peak hour forecasts were refined using the model derived long-range forecasts, base (validation) year model forecasts, along with existing peak hour traffic count data. The SBTAM has a base (validation) year of 2008 and a horizon (future forecast) year of 2035. The difference in model volumes (2035-2008) defines the growth in traffic over the 27-year period.

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

The future Horizon Year (2035) Without Project peak hour turning movements were then reviewed by Urban Crossroads for reasonableness, and in some cases, were adjusted to achieve reasonable growth. Horizon Year (2035) turning volumes were compared to Opening Year Cumulative (2019) volumes in order to ensure a minimum growth as a part of the refinement process. The minimum growth includes any additional growth between Opening Year Cumulative (2019) and Horizon Year (2035) traffic conditions that is not accounted for by the traffic generated by cumulative development projects and ambient growth rates assumed between Existing and Opening Year Cumulative (2019) conditions. Future estimated peak hour traffic data was used for new intersections to further refine the Horizon Year (2035) peak hour forecasts.

The Project only traffic forecasts have been generated by applying the trip generation, distribution and traffic assignment calculations. Project traffic volumes were then added to the refined future year SBTAM traffic model volumes to determine Horizon Year (2035) With

Project traffic conditions. Flow conservation checks and forecast adjustments were performed as necessary to ensure that all future Opening Year Cumulative (2019) and Horizon Year (2035) traffic volume forecasts are reasonable and to ensure the flow of traffic volumes between closely spaced intersections is maintained. In order words, traffic flow between two closely spaced intersections, such as two freeway ramp locations, is verified in order to make certain that vehicles leaving one intersection are entering the adjacent intersection and that there are no unexplained loss of vehicles. The result of this traffic forecasting procedure is a series of traffic volumes which are suitable for traffic operations analysis.

Post-processing worksheets for Horizon Year (2035) with Project traffic conditions are provided in Appendix 4.2.

5 EXISTING PLUS PROJECT TRAFFIC ANALYSIS

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

5.1 ROADWAY IMPROVEMENTS

The lane configurations and traffic controls assumed to be in place for E+P conditions are consistent with those shown previously on Exhibit 3-1, with the exception of the Project driveways and those facilities assumed to be in place prior to or constructed by the Project to provide site access are also assumed to be in place for E+P conditions.

5.2 EXISTING PLUS PROJECT TRAFFIC VOLUME FORECASTS

This scenario includes Existing traffic volumes plus Phase 1 Project traffic. Exhibit 5-1 shows the weekday ADT and peak hour volumes which can be expected for E+P (Phase 1) traffic conditions.

5.3 EXISTING PLUS PROJECT TRAFFIC VOLUME FORECASTS

This scenario includes Existing traffic volumes plus Project Buildout traffic. Exhibit 5-2 shows the weekday ADT and peak hour volumes which can be expected for E+P (Project Buildout) traffic conditions.

5.4 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 for both E+P (Phase 1) and E+P (Project Buildout) conditions.

5.4.1 E+P (PHASE 1) CONDITIONS

All study area intersections are anticipated to continue to operate at acceptable levels of service with the addition of Phase 1 Project traffic, consistent with Existing traffic conditions. Consistent with Table 5-1, a summary of the peak hour intersection LOS for E+P (Phase 1) conditions are shown on Exhibit 5-3. The intersection operations analysis worksheets for E+P (Phase 1) traffic conditions are included in Appendix 5.1 of this TIA.

5.4.2 E+P (PROJECT BUILDOUT) CONDITIONS

All study area intersections are anticipated to continue to operate at acceptable levels of service with the addition of Project Buildout traffic, consistent with Existing traffic conditions. Consistent with Table 5-1, a summary of the peak hour intersection LOS for E+P (Project Buildout) conditions are shown on Exhibit 5-4. The intersection operations analysis worksheets for E+P (Project Buildout) traffic conditions are included in Appendix 5.2 of this TIA.

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

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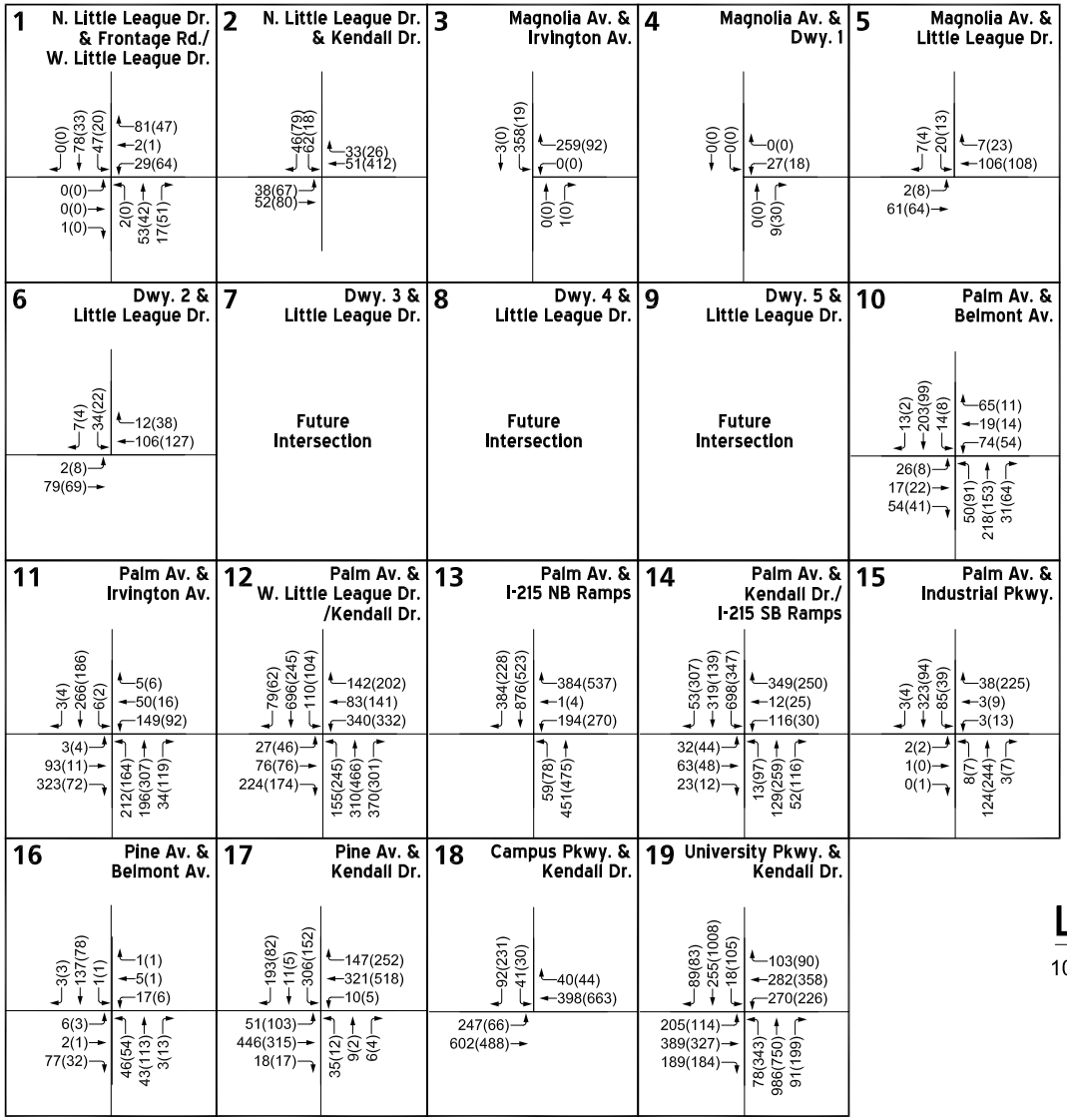
EXHIBIT 5-1 (2OF2) : E+P (PHASE 1) TRAFFIC VOLUMES

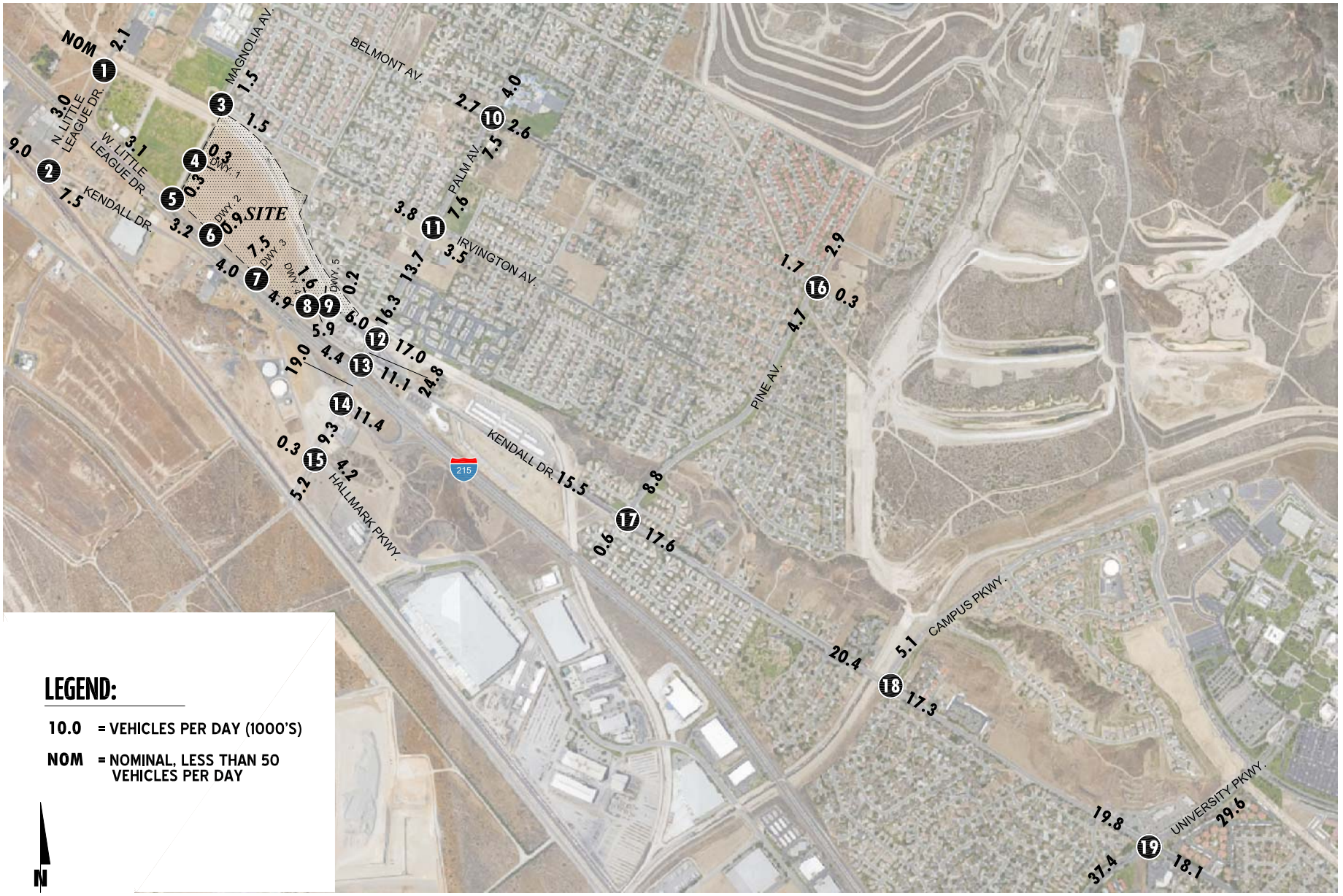


LEGEND:

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

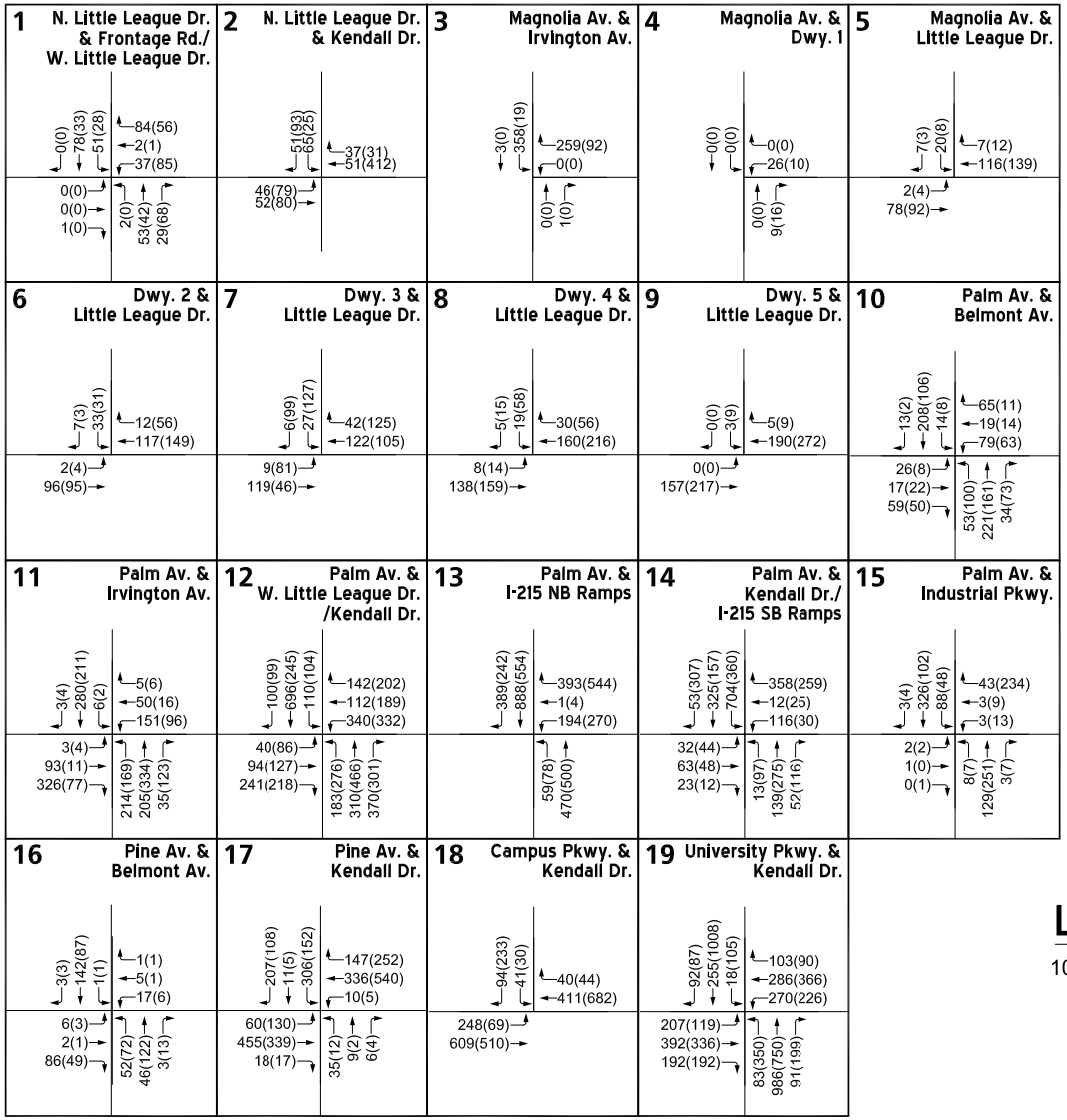
URBAN CROSSROADS

EXHIBIT 5-2 (1OF2) : E+P (PROJECT BUILDOUT) TRAFFIC VOLUMES



URBAN CROSSROADS

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



LEGEND:

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

EXHIBIT 5-3: SUMMARY OF LOS FOR E+P (PHASE 1) CONDITIONS

EXHIBIT 5-4: SUMMARY OF LOS FOR E+P (PROJECT BUILDOUT) CONDITIONS

Table 5-1

Intersection Analysis for E+P Conditions

#	Intersection	Traffic Control[2]	Existing (2015)				E+P (Phase 1)				E+P (Project Buildout)			
			Delay[1] (secs.)		LOS		Delay[1] (secs.)		LOS		Delay[1] (secs.)		LOS	
			AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
1	N. Little League Dr. / W. Little League Dr.	CSS	10.1	9.8	B	A	10.6	9.9	B	A	11.1	10.4	B	B
2	N. Little League Dr. / Kendall Dr.	CSS	10.3	13.3	B	B	10.5	13.8	B	B	10.7	14.8	B	B
3	Magnolia Av. / Irvington Av.	CSS	10.4	0.0	B	A	10.4	0.0	B	A	10.4	0.0	B	A
4	Magnolia Av. / Driveway 1	**CSS**	Future Intersection				8.6	8.7	A	A	8.6	8.6	A	A
5	Magnolia Av. / W. Little League Dr.	**CSS**	Future Intersection				9.5	9.6	A	A	9.7	9.8	A	A
6	Driveway 2 / W. Little League Dr.	**CSS**	Future Intersection				9.8	10.0	A	B	10.0	10.4	B	B
7	Driveway 3 / W. Little League Dr.	**CSS**	Future Intersection				Future Intersection				10.3	13.7	B	B
8	Driveway 4 / W. Little League Dr.	**CSS**	Future Intersection				Future Intersection				10.6	12.2	B	B
9	Driveway 5 / W. Little League Dr.	**CSS**	Future Intersection				Future Intersection				10.8	12.3	B	B
10	Palm Av. / Belmont Av.	AWS	15.7	9.7	C	A	16.0	9.7	C	A	16.8	10.1	C	B
11	Palm Av. / Irvington Av.	TS	31.0	15.2	C	B	31.0	15.2	C	B	31.6	15.4	C	B
12	Palm Av. / Kendall Dr.	TS	35.1	33.9	D	C	36.8	33.9	D	C	40.5	36.0	D	D
13	Palm Av. / I-215 NB Ramps	TS	8.0	9.8	A	A	8.1	10.2	A	B	8.2	10.3	A	B
14	Palm Av. / I-215 SB Ramps	TS	32.3	15.3	C	B	35.5	15.6	D	B	38.0	16.1	D	B
15	Palm Av. / Hallmark Pkwy.	AWS	11.5	10.9	B	B	11.6	11.1	B	B	11.6	11.4	B	B
16	Pine Av. / Belmont Av.	CSS	12.6	11.5	B	B	12.6	11.5	B	B	13.1	12.4	B	B
17	Pine Av. / Kendall Dr.	TS	20.0	18.0	C	B	20.1	18.0	C	B	21.0	18.3	C	B
18	Campus Pkwy. / Kendall Dr.	TS	37.5	26.7	D	C	37.5	26.7	D	C	37.7	28.1	D	C
19	University Pkwy. / Kendall Dr.	TS	37.1	49.6	D	D	37.2	50.2	D	D	37.4	51.3	D	D

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

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

5.5 OFF-RAMP QUEUING ANALYSIS

A queuing analysis was performed for the off-ramps at the I-215 Freeway and Palm Avenue interchange to assess vehicle queues for the off ramps that may potentially result in deficient peak hour operations at the ramp-to-arterial intersections and may potentially "spill back" onto the I-215 Freeway mainline. Queuing analysis findings are presented in Table 5-2 for E+P (Phase 1) and E+P (Project Buildout) traffic conditions. It is important to note that off-ramp lengths are consistent with the measured distance between the intersection and the freeway mainline.

5.5.1 E+P (PHASE 1) CONDITIONS

As shown on Table 5-2, consistent with Existing 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 for E+P (Phase 1) traffic conditions. Worksheets for E+P (Phase 1) traffic conditions off-ramp queuing analysis are provided in Appendix 5.3.

5.5.2 E+P (PROJECT BUILDOUT) CONDITIONS

As shown on Table 5-2, consistent with Existing 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 for E+P (Project Buildout) traffic conditions. Worksheets for E+P (Project Buildout) traffic conditions off-ramp queuing analysis are provided in Appendix 5.4.

5.6 TRAFFIC SIGNAL WARRANTS ANALYSIS

There are no traffic signals anticipated to meet peak hour volume based or planning level (Caltrans) ADT traffic signal warrants with the addition of either Phase 1 Project traffic or at Project Buildout (see Appendix 5.5 and Appendix 5.6).

5.7 BASIC FREEWAY SEGMENT ANALYSIS

5.7.1 E+P (PHASE 1) CONDITIONS

E+P (Phase 1) mainline directional volumes for the weekday AM and PM peak hours are provided on Exhibit 5-5. As shown on Table 5-3, the basic freeway segments analyzed for this study are anticipated to operate at an acceptable LOS (i.e., LOS C or better) during the peak hours, with the addition of Phase 1 Project traffic. E+P (Phase 1) basic freeway segment analysis worksheets are provided in Appendix 5.7.

5.7.2 E+P (PROJECT BUILDOUT) CONDITIONS

E+P (Project Buildout) mainline directional volumes for the weekday AM and PM peak hours are provided on Exhibit 5-6. As shown on Table 5-3, the basic freeway segments analyzed for this study are anticipated to operate at an acceptable LOS (i.e., LOS C or better) during the peak hours, with the addition of Project Buildout traffic. E+P (Project Buildout) basic freeway segment analysis worksheets are provided in Appendix 5.8.

Table 5-2

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

Intersection	Movement	Available Stacking Distance (Feet)	Existing (2015)				E+P (Phase 1)				E+P (Project Buildout)			
			95th Percentile Queue (Feet)[2]		Acceptable?[1]		95th Percentile Queue (Feet)[2]		Acceptable?[1]		95th Percentile Queue (Feet)[2]		Acceptable?[1]	
			AM Peak Hour	PM Peak Hour	AM	PM	AM Peak Hour	PM Peak Hour	AM	PM	AM Peak Hour	PM Peak Hour	AM	PM
I-215 NB Off-Ramp / Palm Av.	NBL/T	910	105	133	Yes	Yes	104	133	Yes	Yes	102	133	Yes	Yes
	NBR	415	104	165	Yes	Yes	109	188	Yes	Yes	118	202	Yes	Yes
I-215 SB Off-Ramp / Palm Av.	NBL/T/R	1,470	429[2]	74	Yes	Yes	436[2]	76	Yes	Yes	445[2]	77	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] Maximum queue length for the approach reported.

Table 5-3

Basic Freeway Segment Analysis for E+P Conditions

Freeway	Direction	Mainline Segment	Lanes[1]	Existing (2015)				E+P (Phase 1)				E+P (Project Buildout)			
				Density[2]		LOS		Density[2]		LOS		Density[2]		LOS	
				AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
I-215 Freeway	SB	North of Palm Avenue	2	20.5	13.7	C	B	20.5	13.9	C	B	20.6	13.9	C	B
		South of Palm Avenue	2	23.5	15.4	C	B	23.7	15.5	C	B	23.7	15.6	C	B
	NB	North of Palm Avenue	2	9.0	15.7	A	B	9.1	15.8	A	B	9.2	15.9	A	B
		South of Palm Avenue	2	10.2	19.7	A	C	10.3	19.9	A	C	10.3	20.0	A	C

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

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

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

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EXHIBIT 5-6: E+P (PROJECT BUILDOUT) FREEWAY MAINLINE VOLUMES (ACTUAL VEHICLES)

URBAN CROSSROADS

5.8 FREEWAY MERGE/DIVERGE ANALYSIS

5.8.1 E+P (PHASE 1) CONDITIONS

Ramp merge and diverge operations were evaluated for E+P (Phase 1) traffic conditions and the results of this analysis are presented in Table 5-4. As shown in Table 5-4, the freeway ramp merge and diverge areas are anticipated to operate at acceptable LOS (i.e., LOS D or better). E+P (Phase 1) freeway ramp junction operations analysis worksheets are provided in Appendix 5.9.

5.8.2 E+P (PROJECT BUILDOUT) CONDITIONS

Ramp merge and diverge operations were evaluated for E+P (Project Buildout) traffic conditions and the results of this analysis are presented in Table 5-4. As shown in Table 5-4, the freeway ramp merge and diverge areas are anticipated to operate at acceptable LOS (i.e., LOS D or better). E+P (Project Buildout) freeway ramp junction operations analysis worksheets are provided in Appendix 5.10.

Table 5-4

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

Freeway	Direction	Ramp or Segment	Lanes on Freeway[1]	Existing (2015)				E+P (Phase 1)				E+P (Project Buildout)			
				AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
				Density[2]	LOS	Density[2]	LOS	Density[2]	LOS	Density[2]	LOS	Density[2]	LOS	Density[2]	LOS
I-215 Freeway	SB	Off-Ramp at Palm Avenue	2	27.8	C	19.9	B	27.9	C	20.1	C	27.9	C	20.1	C
		On-Ramp at Palm Avenue	2	28.8	D	20.7	C	29.0	D	20.8	C	29.0	D	20.9	C
	NB	On-Ramp at Palm Avenue	2	13.3	B	20.7	C	13.4	B	20.8	C	13.5	B	20.9	C
		Off-Ramp at Palm Avenue	2	15.2	B	26.5	C	15.3	B	26.8	C	15.3	B	26.8	C

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

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

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6 EA (2018) AND EAP (2018) TRAFFIC ANALYSIS

This section discusses the traffic forecasts for EA (2018) and EAP (2018) conditions and the resulting intersection operations, traffic signal warrant, and freeway mainline operations analyses.

6.1 ROADWAY IMPROVEMENTS

The lane configurations and traffic controls assumed to be in place for EA (2018) and EAP (2018) conditions are consistent with those shown previously on Exhibit 3-1, with the exception of the Project driveways and those facilities assumed to be in place prior to or constructed by the Project to provide site access are also assumed to be in place for EAP (2018) conditions.

6.2 EA (2018) TRAFFIC VOLUME FORECASTS

This scenario includes Existing traffic volumes plus an ambient growth factor of 6.12%. The weekday ADT, weekday AM, and PM peak hour volumes which can be expected for EA (2018) traffic conditions are shown on Exhibit 6-1.

6.3 EAP (2018) TRAFFIC VOLUME FORECASTS

This scenario includes Existing traffic volumes plus an ambient growth factor of 6.12% and the addition of Phase 1 Project traffic. The weekday ADT, weekday AM, and PM peak hour volumes which can be expected for EAP (2018) traffic conditions are shown on Exhibit 6-2.

6.4 INTERSECTION OPERATIONS ANALYSIS

EA and EAP (2018) 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 6-1 for both EA and EAP (2018) conditions.

6.4.1 EA (2018) CONDITIONS

All study area intersections are anticipated to continue to operate at acceptable levels of service with the application of a 6.12% ambient growth factor on existing traffic forecasts. Consistent with Table 6-1, a summary of the peak hour intersection LOS for EA (2018) conditions are shown on Exhibit 6-3. The intersection operations analysis worksheets for EA (2018) traffic conditions are included in Appendix 6.1 of this TIA.

6.4.2 EAP (2018) CONDITIONS

All study area intersections are anticipated to continue to operate at acceptable levels of service with the addition of Project Buildout traffic, consistent with Existing traffic conditions. Consistent with Table 6-1, a summary of the peak hour intersection LOS for EAP (2018) conditions are shown on Exhibit 6-4. The intersection operations analysis worksheets for EAP (2018) traffic conditions are included in Appendix 6.2 of this TIA.

EXHIBIT 6-1 (1OF2) : EA (2018) TRAFFIC VOLUMES

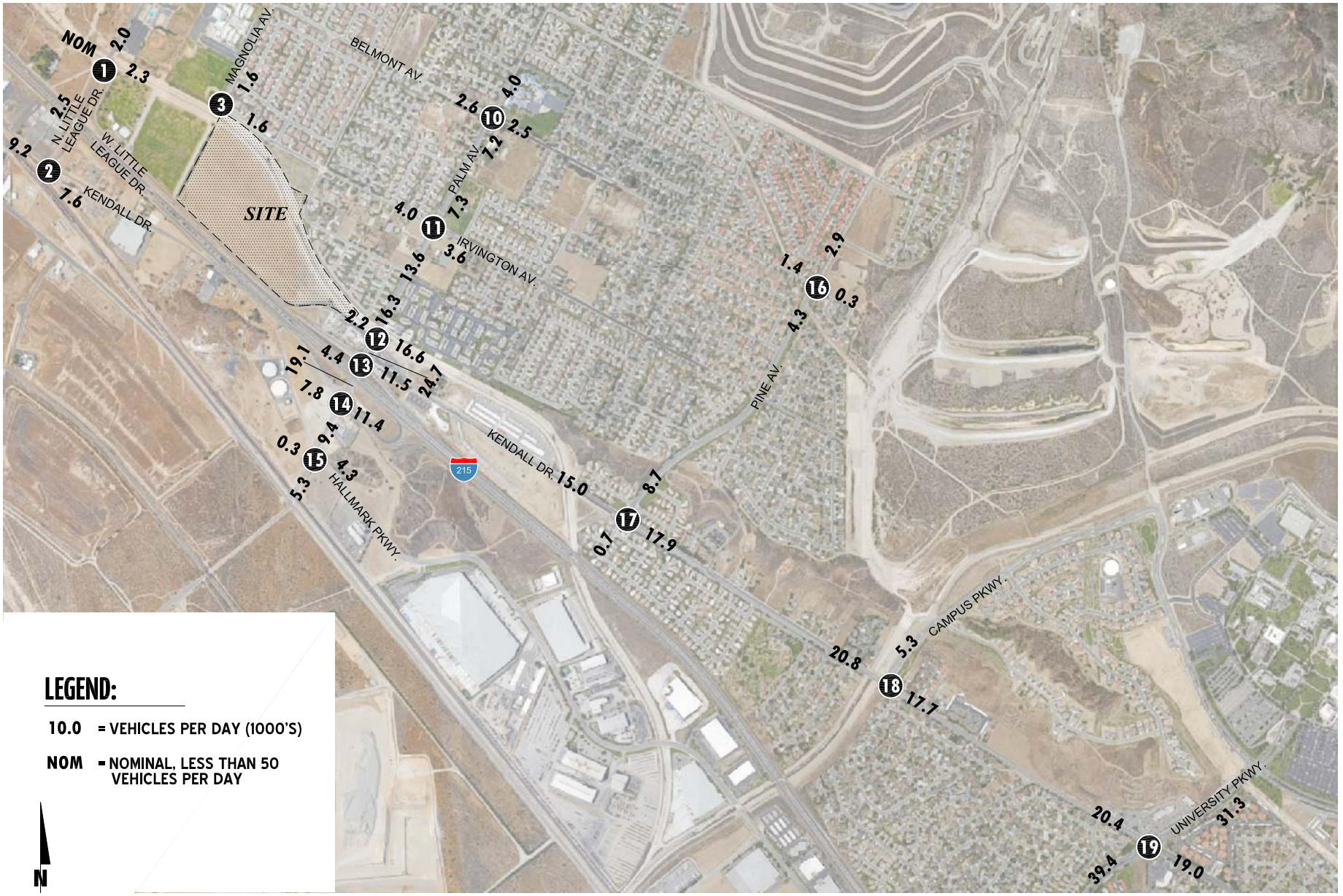

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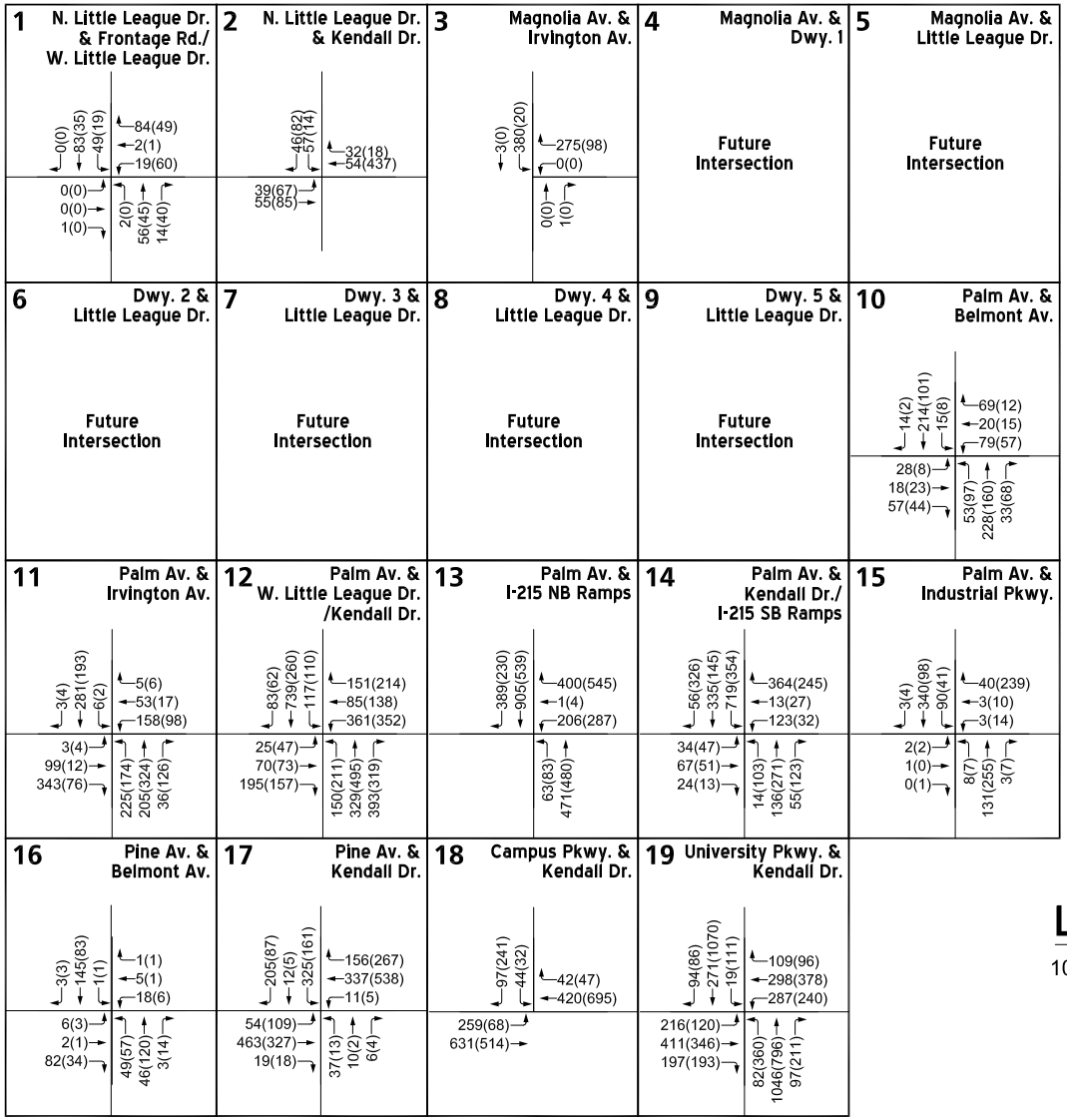
EXHIBIT 6-1 (2OF2) : EA (2018) TRAFFIC VOLUMES



LEGEND:

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

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EXHIBIT 6-2 (1OF2) : EAP (2018) TRAFFIC VOLUMES

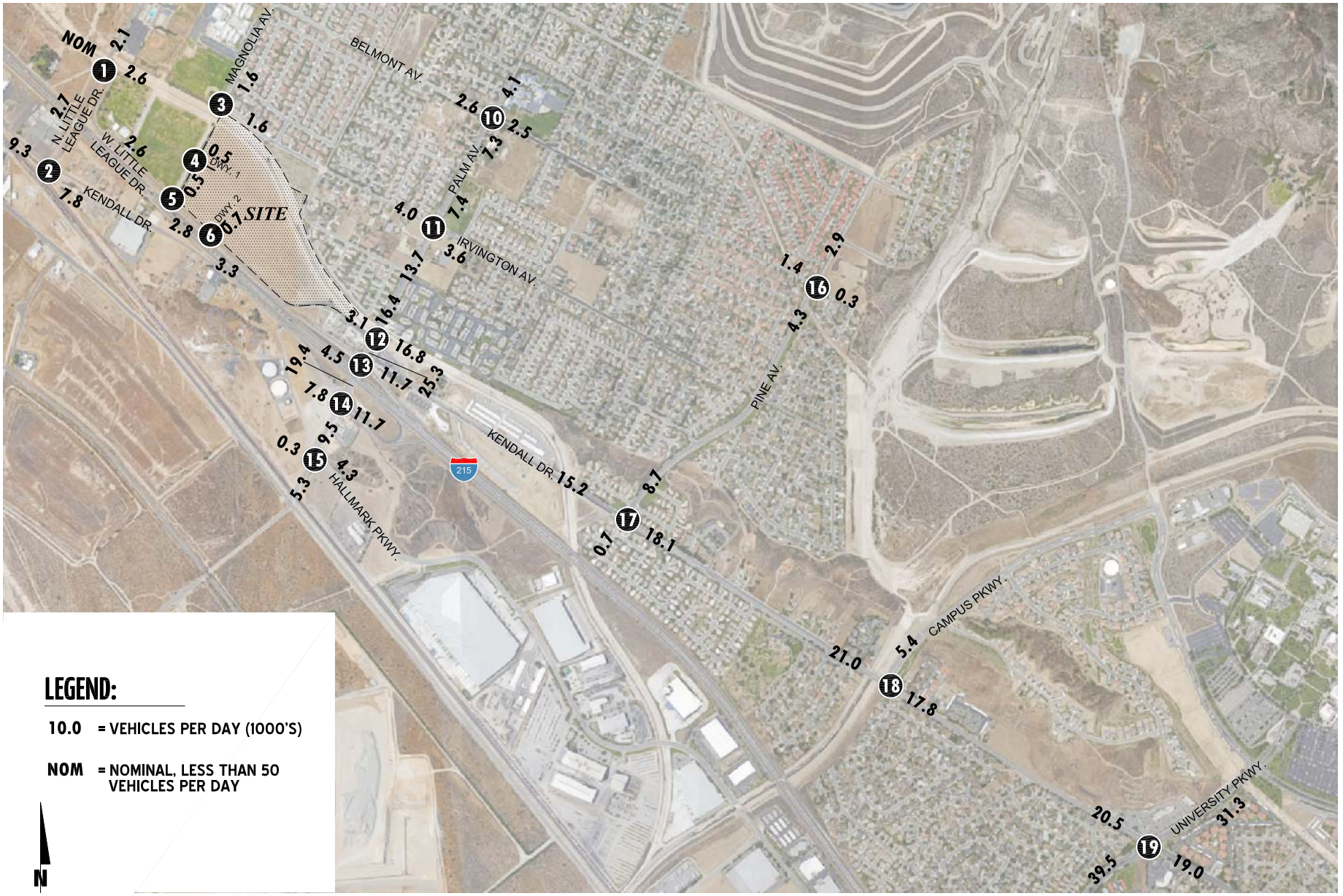

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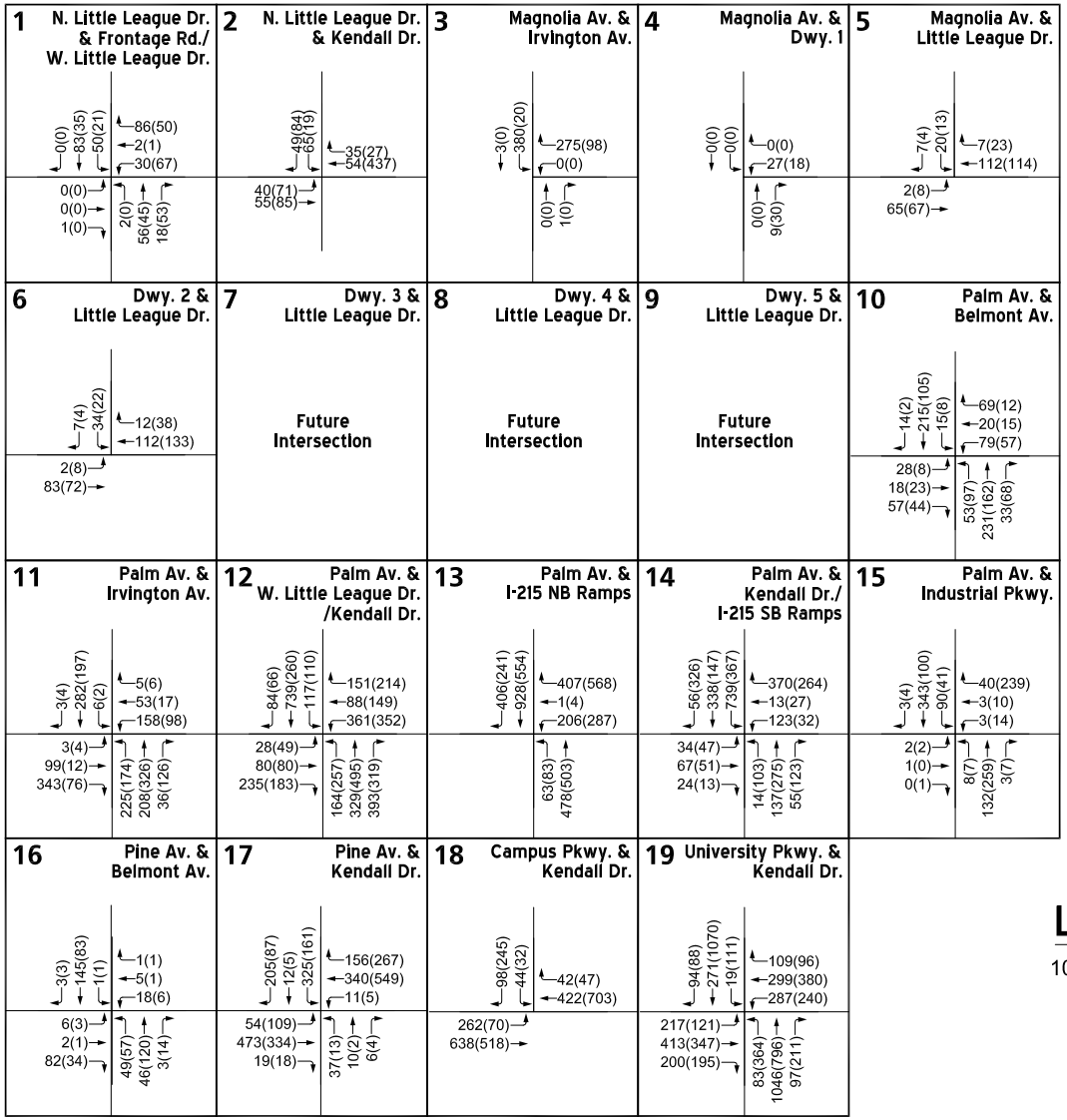
EXHIBIT 6-2 (2OF2) : EAP (2018) TRAFFIC VOLUMES



LEGEND:

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

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EXHIBIT 6-3: SUMMARY OF LOS FOR EA (2018) CONDITIONS

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EXHIBIT 6-4: SUMMARY OF LOS FOR EAP (2018) CONDITIONS

Table 6-1

Intersection Analysis for EA and EAP (2018) Conditions

#	Intersection	Traffic Control[2]	Existing (2015)				EA (2018)				EAP (Phase 1 - 2018)			
			Delay[1] (secs.)		LOS		Delay[1] (secs.)		LOS		Delay[1] (secs.)		LOS	
			AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
1	N. Little League Dr. / W. Little League Dr.	CSS	10.1	9.8	B	A	10.3	9.9	B	A	10.8	10.0	B	B
2	N. Little League Dr. / Kendall Dr.	CSS	10.3	13.3	B	B	10.4	13.9	B	B	10.6	14.5	B	B
3	Magnolia Av. / Irvington Av.	CSS	10.4	0.0	B	A	10.6	0.0	B	A	10.6	0.0	B	A
4	Magnolia Av. / Driveway 1	**CSS**	Future Intersection				Future Intersection				8.6	8.7	A	A
5	Magnolia Av. / W. Little League Dr.	**CSS**	Future Intersection				Future Intersection				9.6	9.7	A	A
6	Driveway 2 / W. Little League Dr.	**CSS**	Future Intersection				Future Intersection				9.8	10.0	A	B
7	Driveway 3 / W. Little League Dr.	**CSS**	Future Intersection				Future Intersection				Future Intersection			
8	Driveway 4 / W. Little League Dr.	**CSS**	Future Intersection				Future Intersection				Future Intersection			
9	Driveway 5 / W. Little League Dr.	**CSS**	Future Intersection				Future Intersection				Future Intersection			
10	Palm Av. / Belmont Av.	AWS	15.7	9.7	C	A	18.1	9.9	C	A	18.4	10.0	C	A
11	Palm Av. / Irvington Av.	TS	31.0	15.2	C	B	38.1	15.5	D	B	38.1	15.5	D	B
12	Palm Av. / Kendall Dr.	TS	35.1	33.9	D	C	36.5	34.6	D	C	38.3	35.1	D	D
13	Palm Av. / I-215 NB Ramps	TS	8.0	9.8	A	A	8.5	10.5	A	B	8.7	11.2	A	B
14	Palm Av. / I-215 SB Ramps	TS	32.3	15.3	C	B	44.8	16.2	D	B	50.3	16.6	D	B
15	Palm Av. / Hallmark Pkwy.	AWS	11.5	10.9	B	B	12.0	11.4	B	B	12.0	11.6	B	B
16	Pine Av. / Belmont Av.	CSS	12.6	11.5	B	B	13.0	11.7	B	B	12.6	11.7	B	B
17	Pine Av. / Kendall Dr.	TS	20.0	18.0	C	B	21.2	18.1	C	B	21.3	18.5	C	B
18	Campus Pkwy. / Kendall Dr.	TS	37.5	26.7	D	C	37.8	27.7	D	C	37.8	27.9	D	C
19	University Pkwy. / Kendall Dr.	TS	37.1	49.6	D	D	38.3	54.3	D	D	38.3	54.8	D	D

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

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

6.5 OFF-RAMP QUEUING ANALYSIS

A queuing analysis was performed for the off-ramps at the I-215 Freeway and Palm Avenue interchange to assess vehicle queues for the off ramps that may potentially result in deficient peak hour operations at the ramp-to-arterial intersections and may potentially "spill back" onto the I-215 Freeway mainline. Queuing analysis findings are presented in Table 6-2 for EA and EAP (2018) traffic conditions. It is important to note that off-ramp lengths are consistent with the measured distance between the intersection and the freeway mainline.

6.5.1 EA (2018) CONDITIONS

As shown on Table 6-2, consistent with Existing 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 for EA (2018) traffic conditions. Worksheets for EA (2018) traffic conditions off-ramp queuing analysis are provided in Appendix 6.3.

6.5.2 EAP (2018) CONDITIONS

As shown on Table 6-2, consistent with Existing 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 for EAP (2018) traffic conditions. Worksheets for EAP (2018) traffic conditions off-ramp queuing analysis are provided in Appendix 6.4.

6.6 TRAFFIC SIGNAL WARRANTS ANALYSIS

There are no traffic signals anticipated to meet peak hour volume based or planning level (Caltrans) ADT traffic signal warrants under EA or EAP (2018) traffic conditions (see Appendix 6.5 and Appendix 6.6).

6.7 BASIC FREEWAY SEGMENT ANALYSIS

6.7.1 EA (2018) CONDITIONS

EA (2018) mainline directional volumes for the weekday AM and PM peak hours are provided on Exhibit 6-5. As shown on Table 6-3, the basic freeway segments analyzed for this study are anticipated to operate at an acceptable LOS (i.e., LOS C or better) during the peak hours. EA (2018) basic freeway segment analysis worksheets are provided in Appendix 6.7.

6.7.2 EAP (2018) CONDITIONS

EAP (2018) mainline directional volumes for the weekday AM and PM peak hours are provided on Exhibit 6-6. As shown on Table 6-3, the basic freeway segments analyzed for this study are anticipated to operate at an acceptable LOS (i.e., LOS C or better) during the peak hours, with the addition of Phase 1 Project traffic. EAP (2018) basic freeway segment analysis worksheets are provided in Appendix 6.8.

Table 6-2

Peak Hour Freeway Off-Ramp Queuing Summary for EA and EAP (2018) Conditions

Intersection	Movement	Available Stacking Distance (Feet)	Existing (2015)				EA (2018)				EAP (Phase 1 - 2018)			
			95th Percentile Queue (Feet)[2]		Acceptable?[1]		95th Percentile Queue (Feet)[2]		Acceptable?[1]		95th Percentile Queue (Feet)[2]		Acceptable?[1]	
			AM Peak Hour	PM Peak Hour	AM	PM	AM Peak Hour	PM Peak Hour	AM	PM	AM Peak Hour	PM Peak Hour	AM	PM
I-215 NB Off-Ramp / Palm Av.	NBL/T	910	105	133	Yes	Yes	108	143	Yes	Yes	108	143	Yes	Yes
	NBR	415	104	165	Yes	Yes	123	196	Yes	Yes	130	219	Yes	Yes
I-215 SB Off-Ramp / Palm Av.	NBL/T/R	1,470	429 [2]	74	Yes	Yes	473 [2]	79	Yes	Yes	478 [2]	80	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] Maximum queue length for the approach reported.

Table 6-3

Basic Freeway Segment Analysis for EA and EAP (2018) Conditions

Freeway	Direction	Mainline Segment	Lanes[1]	Existing (2015)				EA (2018)				EAP (Phase 1 - 2018)			
				Density[2]		LOS		Density[2]		LOS		Density[2]		LOS	
				AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
I-215 Freeway	SB	North of Palm Avenue	2	20.5	13.7	C	B	21.9	14.6	C	B	21.9	14.7	C	B
		South of Palm Avenue	2	23.5	15.4	C	B	25.3	16.3	C	B	25.5	16.4	C	B
	NB	North of Palm Avenue	2	9.0	15.7	A	B	9.5	16.7	A	B	9.7	16.8	A	B
		South of Palm Avenue	2	10.2	19.7	A	C	10.8	21.1	A	C	10.9	21.3	A	C

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

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

EXHIBIT 6-5: EA (2018) FREEWAY MAINLINE VOLUMES (ACTUAL VEHICLES)

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EXHIBIT 6-6: EAP (2018) FREEWAY MAINLINE VOLUMES (ACTUAL VEHICLES)

URBAN CROSSROADS

6.8 FREEWAY MERGE/DIVERGE ANALYSIS

6.8.1 EA (2018) CONDITIONS

Ramp merge and diverge operations were evaluated for EA (2018) traffic conditions and the results of this analysis are presented in Table 6-4. As shown in Table 6-4, the freeway ramp merge and diverge areas are anticipated to operate at acceptable LOS (i.e., LOS D or better). EA (2018) freeway ramp junction operations analysis worksheets are provided in Appendix 6.9.

6.8.2 EAP (2018) CONDITIONS

Ramp merge and diverge operations were evaluated for EAP (2018) traffic conditions and the results of this analysis are presented in Table 6-4. As shown in Table 6-4, the freeway ramp merge and diverge areas are anticipated to operate at acceptable LOS (i.e., LOS D or better). EAP (2018) freeway ramp junction operations analysis worksheets are provided in Appendix 6.10.

Table 6-4

Freeway Ramp Junction Merge/Diverge Analysis for EA and EAP (2018) Conditions

Freeway	Direction	Ramp or Segment	Lanes on Freeway[1]	Existing (2015)				EA (2018)				EAP (Phase 1 - 2018)			
				AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
				Density[2]	LOS	Density[2]	LOS	Density[2]	LOS	Density[2]	LOS	Density[2]	LOS	Density[2]	LOS
I-215 Freeway	SB	Off-Ramp at Palm Avenue	2	27.8	C	19.9	B	29.3	D	20.9	C	29.3	D	21.1	C
		On-Ramp at Palm Avenue	2	28.8	D	20.7	C	30.3	D	21.7	C	30.5	D	21.9	C
	NB	On-Ramp at Palm Avenue	2	13.3	B	20.7	C	13.9	B	21.8	C	14.0	B	21.9	C
		Off-Ramp at Palm Avenue	2	15.2	B	26.5	C	16.0	B	28.0	C	16.0	B	28.2	D

[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).

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7 EA (2019) AND EAP (2019) TRAFFIC ANALYSIS

This section discusses the traffic forecasts for EA (2019) and EAP (2019) conditions and the resulting intersection operations, traffic signal warrant, and freeway mainline operations analyses.

7.1 ROADWAY IMPROVEMENTS

The lane configurations and traffic controls assumed to be in place for EA (2019) and EAP (2019) conditions are consistent with those shown previously on Exhibit 3-1, with the exception of the Project driveways and those facilities assumed to be in place prior to or constructed by the Project to provide site access are also assumed to be in place for EAP (2019) conditions.

7.2 EA (2019) TRAFFIC VOLUME FORECASTS

This scenario includes Existing traffic volumes plus an ambient growth factor of 8.24%. The weekday ADT, weekday AM, and PM peak hour volumes which can be expected for EA (2019) traffic conditions are shown on Exhibit 7-1.

7.3 EAP (2019) TRAFFIC VOLUME FORECASTS

This scenario includes Existing traffic volumes plus an ambient growth factor of 8.24% and the addition of Project Buildout traffic. The weekday ADT, weekday AM, and PM peak hour volumes which can be expected for EAP (2019) traffic conditions are shown on Exhibit 7-2.

7.4 INTERSECTION OPERATIONS ANALYSIS

EA and EAP (2019) 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 7-1 for both EA and EAP (2019) conditions.

7.4.1 EA (2019) CONDITIONS

All study area intersections are anticipated to continue to operate at acceptable levels of service with the application of an 8.24% ambient growth factor on existing traffic forecasts, with the exception of the following:

ID	Intersection Location
19	University Parkway / Kendall Drive – LOS E PM peak hour only

Consistent with Table 7-1, a summary of the peak hour intersection LOS for EA (2019) conditions are shown on Exhibit 7-3. The intersection operations analysis worksheets for EA (2019) traffic conditions are included in Appendix 7.1 of this TIA.

EXHIBIT 7-1 (1OF2) : EA (2019) TRAFFIC VOLUMES

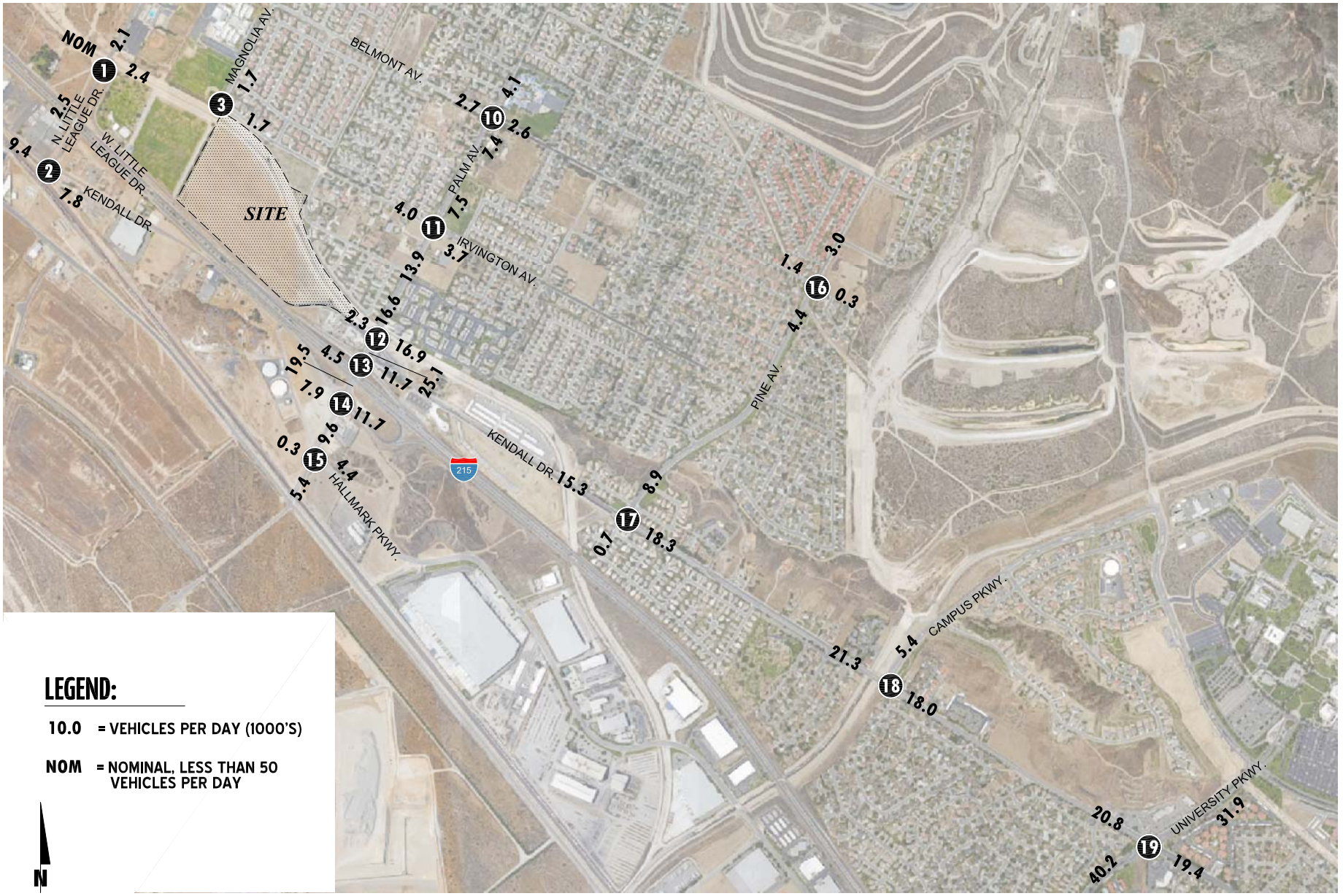
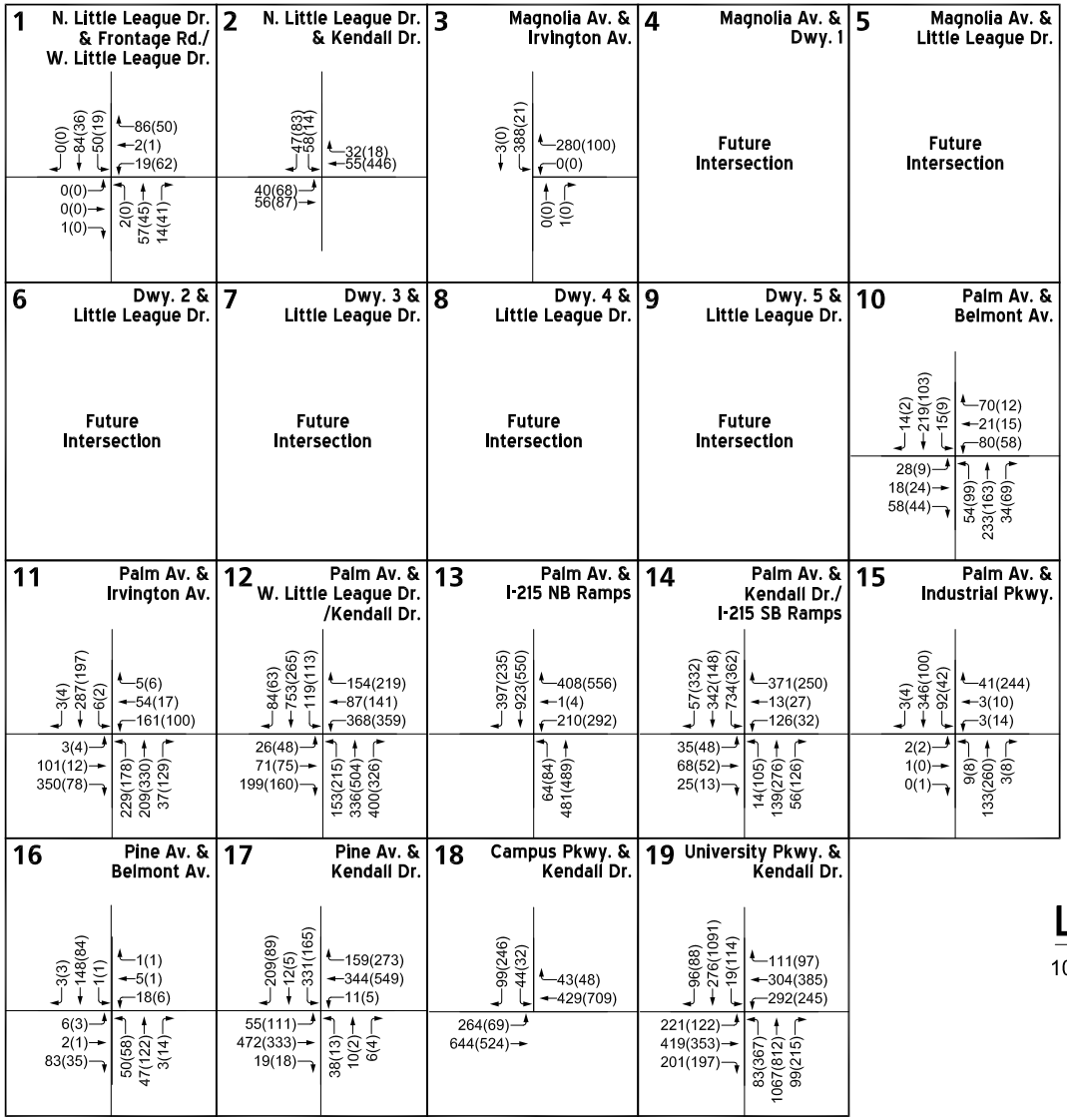


EXHIBIT 7-1 (2OF2) : EA (2019) TRAFFIC VOLUMES



LEGEND:

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

EXHIBIT 7-2 (1OF2) : EAP (2019) TRAFFIC VOLUMES

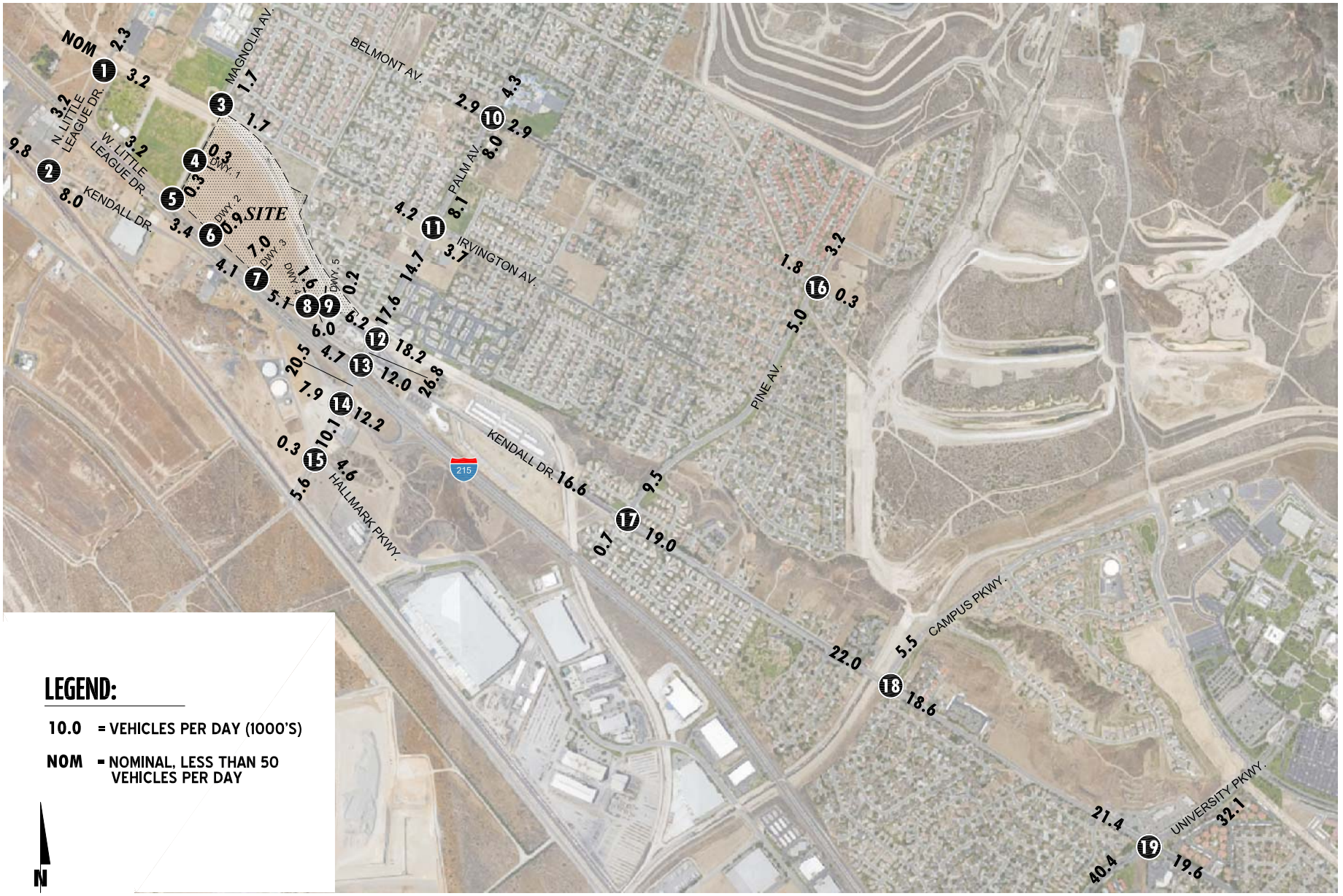


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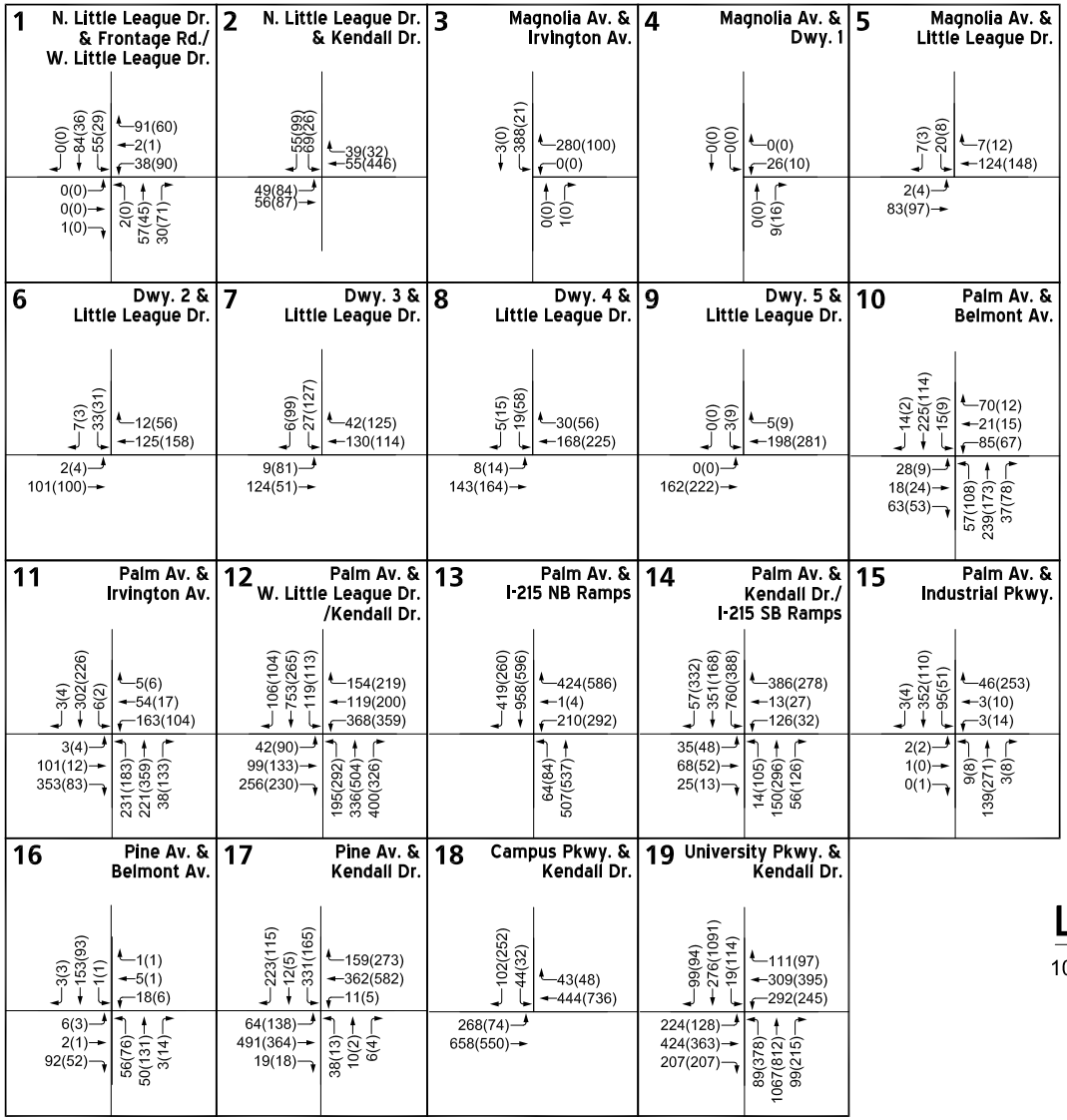
EXHIBIT 7-2 (2OF2) : EAP (2019) TRAFFIC VOLUMES



LEGEND:

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

N

URBAN CROSSROADS

EXHIBIT 7-3: SUMMARY OF LOS FOR EA (2019) CONDITIONS

Table 7-1

Intersection Analysis for EA and EAP (2019) Conditions

#	Intersection	Traffic Control[2]	Existing (2015)				EA (2019)				EAP (2019)			
			Delay[1] (secs.)		LOS		Delay[1] (secs.)		LOS		Delay[1] (secs.)		LOS	
			AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
1	N. Little League Dr. / W. Little League Dr.	CSS	10.1	9.8	B	A	10.3	9.9	B	A	11.3	10.6	B	B
2	N. Little League Dr. / Kendall Dr.	CSS	10.3	13.3	B	B	10.5	14.1	B	B	11.0	15.9	B	C
3	Magnolia Av. / Irvington Av.	CSS	10.4	0.0	B	A	10.7	0.0	B	A	10.7	0.0	B	A
4	Magnolia Av. / Driveway 1	**CSS**	Future Intersection				Future Intersection				8.6	8.6	A	A
5	Magnolia Av. / W. Little League Dr.	**CSS**	Future Intersection				Future Intersection				9.7	9.9	A	A
6	Driveway 2 / W. Little League Dr.	**CSS**	Future Intersection				Future Intersection				10.0	10.6	B	B
7	Driveway 3 / W. Little League Dr.	**CSS**	Future Intersection				Future Intersection				10.4	13.9	B	B
8	Driveway 4 / W. Little League Dr.	**CSS**	Future Intersection				Future Intersection				10.7	12.3	B	B
9	Driveway 5 / W. Little League Dr.	**CSS**	Future Intersection				Future Intersection				10.9	12.4	B	B
10	Palm Av. / Belmont Av.	AWS	15.7	9.7	C	A	19.0	10.1	C	B	20.7	10.5	C	B
11	Palm Av. / Irvington Av.	TS	31.0	15.2	C	B	41.5	15.5	D	B	43.0	15.8	D	B
12	Palm Av. / Kendall Dr.	TS	35.1	33.9	D	C	37.0	35.0	D	C	43.8	37.1	D	D
13	Palm Av. / I-215 NB Ramps	TS	8.0	9.8	A	A	8.7	10.9	A	B	9.0	11.7	A	B
14	Palm Av. / I-215 SB Ramps	TS	32.3	15.3	C	B	46.2	16.5	D	B	49.9	17.5	D	B
15	Palm Av. / Hallmark Pkwy.	AWS	11.5	10.9	B	B	12.1	11.7	B	B	12.3	12.2	B	B
16	Pine Av. / Belmont Av.	CSS	12.6	11.5	B	B	13.1	11.8	B	B	13.7	12.7	B	B
17	Pine Av. / Kendall Dr.	TS	20.0	18.0	C	B	21.1	18.0	C	B	22.1	18.7	C	B
18	Campus Pkwy. / Kendall Dr.	TS	37.5	26.7	D	C	37.6	27.7	D	C	37.9	27.8	D	C
19	University Pkwy. / Kendall Dr.	TS	37.1	49.6	D	D	38.7	**56.1**	D	**E**	39.1	**58.0**	D	**E**

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

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

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

7.4.2 EAP (2019) CONDITIONS

There are no additional study area intersections anticipated to operate at unacceptable LOS with the addition of Project Buildout traffic, in addition to the location previously identified for EA (2019) traffic conditions. However, the addition of Project traffic is anticipated to exceed the City's minimum v/c threshold of 0.01 for intersections operating at LOS E or LOS F under pre-project traffic conditions:

ID	Intersection Location	v/c for EA (2019) – PM Peak Hour	v/c for EAP (2019) – PM Peak Hour	Variance
19	University Parkway / Kendall Drive	0.734	0.749	0.015

NOTE: v/c not reported by Synchro 8 for HCM 2010 methodology; as such, v/c has been reported using Vistro Version 3.00-04.

As such, the Project's impact to the deficient intersection is considered to be cumulatively considerable. Consistent with Table 7-1, a summary of the peak hour intersection LOS for EAP (2019) conditions are shown on Exhibit 7-4. The intersection operations analysis worksheets for EAP (2019) traffic conditions are included in Appendix 7.2 of this TIA.

7.5 OFF-RAMP QUEUING ANALYSIS

A queuing analysis was performed for the off-ramps at the I-215 Freeway and Palm Avenue interchange to assess vehicle queues for the off ramps that may potentially result in deficient peak hour operations at the ramp-to-arterial intersections and may potentially "spill back" onto the I-215 Freeway mainline. Queuing analysis findings are presented in Table 7-2 for EA and EAP (2019) traffic conditions. It is important to note that off-ramp lengths are consistent with the measured distance between the intersection and the freeway mainline.

7.5.1 EA (2019) CONDITIONS

As shown on Table 7-2, consistent with Existing 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 for EA (2019) traffic conditions. Worksheets for EA (2019) traffic conditions off-ramp queuing analysis are provided in Appendix 7.3.

7.5.2 EAP (2019) CONDITIONS

As shown on Table 7-2, consistent with Existing 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 for EAP (2019) traffic conditions. Worksheets for EAP (2019) traffic conditions off-ramp queuing analysis are provided in Appendix 7.4.

7.6 TRAFFIC SIGNAL WARRANTS ANALYSIS

There are no traffic signals anticipated to meet peak hour volume based or planning level (Caltrans) ADT traffic signal warrants under EA or EAP (2019) traffic conditions (see Appendix 7.5 and Appendix 7.6).

Table 7-2

Peak Hour Freeway Off-Ramp Queuing Summary for EA and EAP (2019) Conditions

Intersection	Movement	Available Stacking Distance (Feet)	Existing (2015)				EA (2019)				EAP (2019)			
			95th Percentile Queue (Feet)[2]		Acceptable?[1]		95th Percentile Queue (Feet)[2]		Acceptable?[1]		95th Percentile Queue (Feet)[2]		Acceptable?[1]	
			AM Peak Hour	PM Peak Hour	AM	PM	AM Peak Hour	PM Peak Hour	AM	PM	AM Peak Hour	PM Peak Hour	AM	PM
I-215 NB Off-Ramp / Palm Av.	NBL/T	910	105	133	Yes	Yes	110	146	Yes	Yes	110	146	Yes	Yes
	NBR	415	104	165	Yes	Yes	131	207	Yes	Yes	149	259[2]	Yes	Yes
I-215 SB Off-Ramp / Palm Av.	NBL/T/R	1,470	429[2]	74	Yes	Yes	488[2]	79	Yes	Yes	504[2]	82	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] Maximum queue length for the approach reported.

EXHIBIT 7-4: SUMMARY OF LOS FOR EAP (2019) CONDITIONS

7.7 BASIC FREEWAY SEGMENT ANALYSIS

7.7.1 EA (2019) CONDITIONS

EA (2019) mainline directional volumes for the weekday AM and PM peak hours are provided on Exhibit 7-5. As shown on Table 7-3, the basic freeway segments analyzed for this study are anticipated to operate at an acceptable LOS (i.e., LOS C or better) during the peak hours. EA (2019) basic freeway segment analysis worksheets are provided in Appendix 7.7.

7.7.2 EAP (2019) CONDITIONS

EAP (2019) mainline directional volumes for the weekday AM and PM peak hours are provided on Exhibit 7-6. As shown on Table 7-3, the basic freeway segments analyzed for this study are anticipated to operate at an acceptable LOS (i.e., LOS D or better) during the peak hours, with the addition of Project Buildout traffic. EAP (2019) basic freeway segment analysis worksheets are provided in Appendix 7.8.

7.8 FREEWAY MERGE/DIVERGE ANALYSIS

7.8.1 EA (2019) CONDITIONS

Ramp merge and diverge operations were evaluated for EA (2019) traffic conditions and the results of this analysis are presented in Table 7-4. As shown in Table 7-4, the freeway ramp merge and diverge areas are anticipated to operate at acceptable LOS (i.e., LOS D or better). EA (2019) freeway ramp junction operations analysis worksheets are provided in Appendix 7.9.

7.8.2 EAP (2019) CONDITIONS

Ramp merge and diverge operations were evaluated for EAP (2019) traffic conditions and the results of this analysis are presented in Table 7-4. As shown in Table 7-4, the freeway ramp merge and diverge areas are anticipated to operate at acceptable LOS (i.e., LOS D or better). EAP (2019) freeway ramp junction operations analysis worksheets are provided in Appendix 7.10.

7.9 PROJECT IMPACTS AND RECOMMENDED IMPROVEMENTS

This section provides a summary of Project impacts and recommended improvements.

7.9.1 RECOMMENDED IMPROVEMENTS TO ADDRESS DEFICIENCIES AT INTERSECTIONS

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

EXHIBIT 7-5: EA (2019) FREEWAY MAINLINE VOLUMES (ACTUAL VEHICLES)

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EXHIBIT 7-6: EAP (2019) FREEWAY MAINLINE VOLUMES (ACTUAL VEHICLES)

Table 7-3

Basic Freeway Segment Analysis for EA and EAP (2019) Conditions

Freeway	Direction	Mainline Segment	Lanes[1]	Existing (2015)				EA (2019)				EAP (2019)			
				Density[2]		LOS		Density[2]		LOS		Density[2]		LOS	
				AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
I-215 Freeway	SB	North of Palm Avenue	2	20.5	13.7	C	B	22.4	14.9	C	B	22.5	15.0	C	B
		South of Palm Avenue	2	23.5	15.4	C	B	26.0	16.6	C	B	26.2	16.9	D	B
	NB	North of Palm Avenue	2	9.0	15.7	A	B	9.7	17.0	A	B	9.9	17.2	A	B
		South of Palm Avenue	2	10.2	19.7	A	C	11.1	21.5	B	C	11.1	21.8	B	C

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

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

Table 7-4

Freeway Ramp Junction Merge/Diverge Analysis for EA and EAP (2019) Conditions

Freeway	Direction	Ramp or Segment	Lanes on Freeway[1]	Existing (2015)				EA (2019)				EAP (2019)			
				AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
				Density[2]	LOS	Density[2]	LOS	Density[2]	LOS	Density[2]	LOS	Density[2]	LOS	Density[2]	LOS
I-215 Freeway	SB	Off-Ramp at Palm Avenue	2	27.8	C	19.9	B	29.8	D	21.3	C	29.9	D	21.4	C
		On-Ramp at Palm Avenue	2	28.8	D	20.7	C	30.8	D	22.1	C	31.1	D	22.3	C
	NB	On-Ramp at Palm Avenue	2	13.3	B	20.7	C	14.1	B	22.1	C	14.3	B	22.3	C
		Off-Ramp at Palm Avenue	2	15.2	B	26.5	C	16.2	B	28.5	D	16.3	B	28.8	D

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

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

Table 7-5

Intersection Analysis for EA and EAP (2019) Conditions With Improvements

#	Intersection	Traffic Control[3]	Intersection Approach Lanes[1]												Delay[2] (secs.)		Level of Service	
			Northbound			Southbound			Eastbound			Westbound						
			L	T	R	L	T	R	L	T	R	L	T	R	AM	PM	AM	PM
19	University Pkwy. / Kendall Dr.																	
	- EA (2019)																	
	- Without Improvements	TS	2	3	0	1	3	0	2	2	0	2	2	0	38.7	**56.1**	D	**E**
	- With Improvements	TS	2	3	0	**2**	3	0	2	2	0	2	2	0	38.5	49.5	D	D
	- EAP (2019)																	
	- Without Improvements	TS	2	3	0	1	3	0	2	2	0	2	2	0	39.1	**58.0**	D	**E**
	- With Improvements	TS	2	3	0	**2**	3	0	2	2	0	2	2	0	38.7	50.3	D	D

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

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

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

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

[3] TS = Traffic Signal

The intersection of University Parkway at Kendall Drive is anticipated to operate at an unacceptable LOS (LOS E) during the PM peak hour under EA (2019) traffic conditions, and is anticipated to continue to operate at unacceptable levels during the PM peak hour only with the addition of Project Buildout traffic. As such, the Project's contribution to this impact is cumulatively considerable. It is recommended that the Project pay their fair share towards a 2nd southbound left turn lane at the intersection of University Parkway and Kendall Drive to reduce the Project's proportionate increase in delay to pre-project levels or better, thus reducing the Project's cumulative impact to less-than-significant.

Worksheets for EA (2019) and EAP (2019) traffic conditions, with improvements, HCM calculation worksheets are provided in Appendix 7.11 and 7.12, respectively.

7.9.2 Recommended Improvements to Address Off-Ramp Queues

As shown previously on Table 7-2, there are no peak hour queuing issues at the I-215 Freeway at Palm Avenue interchange for both EA and EAP (2019) traffic conditions. As such, no improvements have been recommended.

7.9.3 Recommended Improvements to Address Deficiencies on Freeway Facilities

As shown previously on Table 7-3 and Table 7-4, there are no deficient freeway mainline segments or merge/diverge ramp junctions anticipated for EA and EAP (2019) traffic conditions. As such, no improvements have been recommended.

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8 OPENING YEAR CUMULATIVE (2018) TRAFFIC ANALYSIS

This section discusses the methods used to develop Opening Year Cumulative (2018) traffic forecasts, and the resulting intersection operations, traffic signal warrant, and freeway mainline operations analyses.

8.1 ROADWAY IMPROVEMENTS

The lane configurations and traffic controls assumed to be in place for Opening Year Cumulative conditions are consistent with those shown previously on Exhibit 3-1, with the exception of the Project driveways and those facilities assumed to be in place prior to or constructed by the Project to provide site access are also assumed to be in place for Opening Year Cumulative (2018) conditions only.

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

This scenario includes Existing traffic volumes plus an ambient growth factor of 6.12% plus traffic from pending and approved but not yet constructed but known development projects (as previously shown on Table 4-2) in the area. The weekday ADT, weekday AM, and PM peak hour volumes which can be expected for Opening Year Cumulative (2018) Without Project traffic conditions are shown on Exhibit 8-1.

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

This scenario includes Existing traffic volumes plus an ambient growth factor of 6.12%, traffic from pending and approved but not yet constructed but known development projects in the area and the addition of Phase 1 Project traffic. The weekday ADT, weekday AM, and PM peak hour volumes which can be expected for Opening Year Cumulative (2018) With Project traffic conditions are shown on Exhibit 8-2.

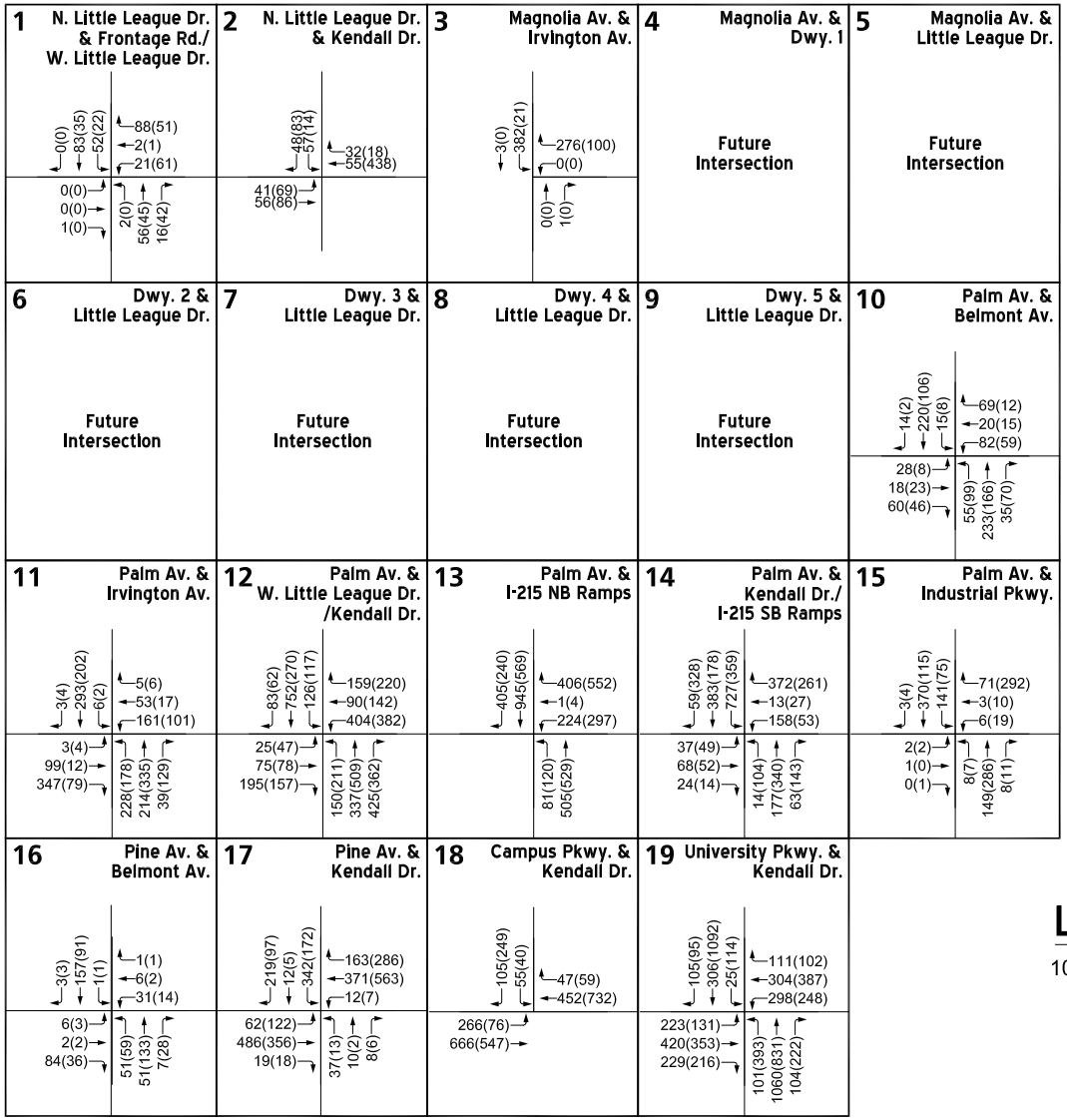
8.4 INTERSECTION OPERATIONS ANALYSIS

Opening Year Cumulative (2018) 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 8-1 for Opening Year Cumulative (2018) conditions.

EXHIBIT 8-1 (1OF2) : OPENING YEAR CUMULATIVE (2018) WITHOUT PROJECT TRAFFIC VOLUMES

URBAN CROSSROADS

EXHIBIT 8-1 (2OF2) : OPENING YEAR CUMULATIVE (2018) WITHOUT PROJECT TRAFFIC VOLUMES



LEGEND:

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

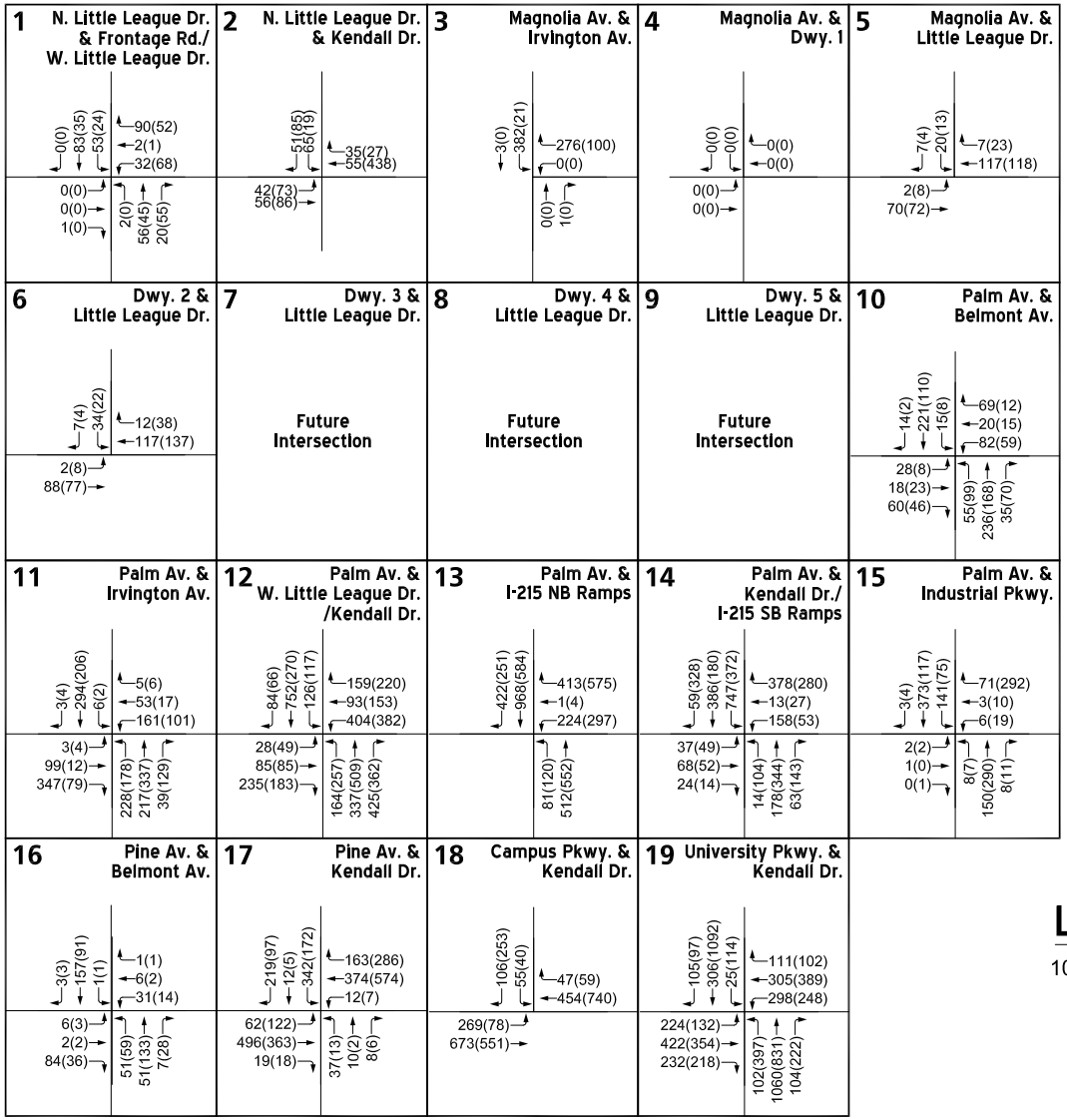
N

URBAN CROSSROADS

EXHIBIT 8-2 (1OF2) : OPENING YEAR CUMULATIVE (2018) WITH PROJECT TRAFFIC VOLUMES

URBAN CROSSROADS

EXHIBIT 8-2 (2OF2) : OPENING YEAR CUMULATIVE (2018) WITH PROJECT TRAFFIC VOLUMES



LEGEND:

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

N

URBAN CROSSROADS

Table 8-1

Intersection Analysis for Opening Year Cumulative (2018) Conditions

#	Intersection	Traffic Control[2]	2018 Without Project				2018 With Project			
			Delay[1] (secs.)		LOS		Delay[1] (secs.)		LOS	
			AM	PM	AM	PM	AM	PM	AM	PM
1	N. Little League Dr. / W. Little League Dr.	CSS	10.4	9.9	B	A	10.9	10.1	B	B
2	N. Little League Dr. / Kendall Dr.	CSS	10.5	14.0	B	B	10.7	14.6	B	B
3	Magnolia Av. / Irvington Av.	CSS	10.7	0.0	B	A	10.7	0.0	B	A
4	Magnolia Av. / Driveway 1	**CSS**	Future Intersection				8.6	8.7	A	A
5	Magnolia Av. / W. Little League Dr.	**CSS**	Future Intersection				9.6	9.7	A	A
6	Driveway 2 / W. Little League Dr.	**CSS**	Future Intersection				9.9	10.1	A	B
7	Driveway 3 / W. Little League Dr.	**CSS**	Future Intersection				Future Intersection			
8	Driveway 4 / W. Little League Dr.	**CSS**	Future Intersection				Future Intersection			
9	Driveway 5 / W. Little League Dr.	**CSS**	Future Intersection				Future Intersection			
10	Palm Av. / Belmont Av.	AWS	19.3	10.1	C	B	19.6	10.1	C	B
11	Palm Av. / Irvington Av.	TS	40.0	15.6	D	B	39.9	15.6	D	B
12	Palm Av. / Kendall Dr.	TS	40.1	36.0	D	D	41.7	37.0	D	D
13	Palm Av. / I-215 NB Ramps	TS	8.8	10.5	A	B	9.0	11.3	A	B
14	Palm Av. / I-215 SB Ramps	TS	47.3	20.5	D	C	48.2	21.1	D	C
15	Palm Av. / Hallmark Pkwy.	AWS	13.2	13.2	B	B	13.3	13.5	B	B
16	Pine Av. / Belmont Av.	CSS	14.0	12.5	B	B	14.0	12.5	B	B
17	Pine Av. / Kendall Dr.	TS	21.0	18.0	C	B	21.1	18.2	C	B
18	Campus Pkwy. / Kendall Dr.	TS	36.9	27.9	D	C	37.2	28.0	D	C
19	University Pkwy. / Kendall Dr.	TS	39.9	**60.6**	D	**E**	40.0	**61.4**	D	**E**

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

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

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

8.4.1 OPENING YEAR CUMULATIVE (2018) WITHOUT PROJECT CONDITIONS

All study area intersections are anticipated to operate at acceptable levels of service, with the exception of the following:

ID	Intersection Location
19	University Parkway / Kendall Drive – LOS E PM peak hour only

Consistent with Table 8-1, a summary of the peak hour intersection LOS for Opening Year Cumulative (2018) Without Project conditions are shown on Exhibit 8-3. The intersection operations analysis worksheets for Opening Year Cumulative (2018) Without Project traffic conditions are included in Appendix 8.1 of this TIA.

8.4.2 OPENING YEAR CUMULATIVE (2018) WITH PROJECT CONDITIONS

There are no additional study area intersections anticipated to operate at unacceptable LOS with the addition of Phase 1 Project traffic, in addition to the location previously identified for Opening Year Cumulative (2018) Without Project traffic conditions. However, the addition of Project traffic is anticipated to exceed the City's minimum v/c threshold of 0.01 for intersections operating at LOS E or LOS F under pre-project traffic conditions:

ID	Intersection Location	v/c for 2018 NP – PM Peak Hour	v/c for 2018 WP – PM Peak Hour	Variance
19	University Parkway / Kendall Drive	0.725	0.728	0.003

NOTE: v/c not reported by Synchro 8 for HCM 2010 methodology; as such, v/c has been reported using Vistro Version 3.00-04.

As such, the Project's impact to the deficient intersection is less than significant. Consistent with Table 8-1, a summary of the peak hour intersection LOS for Opening Year Cumulative (2018) With Project conditions are shown on Exhibit 8-4. The intersection operations analysis worksheets for Opening Year Cumulative (2018) With Project traffic conditions are included in Appendix 8.2 of this TIA.

8.5 OFF-RAMP QUEUING ANALYSIS

A queuing analysis was performed for the off-ramps at the I-215 Freeway and Palm Avenue interchange to assess vehicle queues for the off ramps that may potentially result in deficient peak hour operations at the ramp-to-arterial intersections and may potentially "spill back" onto the I-215 Freeway mainline. Queuing analysis findings are presented in Table 8-2 for Opening Year Cumulative (2018) traffic conditions. It is important to note that off-ramp lengths are consistent with the measured distance between the intersection and the freeway mainline.

8.5.1 OPENING YEAR CUMULATIVE (2018) WITHOUT PROJECT CONDITIONS

As shown on Table 8-2, consistent with Existing 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 for Opening Year Cumulative (2018) Without Project traffic conditions. Worksheets for Opening Year Cumulative (2018) Without Project traffic conditions off-ramp queuing analysis are provided in Appendix 8.3.

EXHIBIT 8-3: SUMMARY OF LOS FOR OPENING YEAR CUMULATIVE (2018) WITHOUT PROJECT CONDITIONS

EXHIBIT 8-4: SUMMARY OF LOS FOR OPENING YEAR CUMULATIVE (2018) WITH PROJECT CONDITIONS

Table 8-2

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

Intersection	Movement	Available Stacking Distance (Feet)	2018 Without Project				2018 With Project			
			95th Percentile Queue (Feet)[2]		Acceptable?[1]		95th Percentile Queue (Feet)[2]		Acceptable?[1]	
			AM Peak Hour	PM Peak Hour	AM	PM	AM Peak Hour	PM Peak Hour	AM	PM
I-215 NB Off-Ramp / Palm Av.	NBL/T	910	118	148	Yes	Yes	118	148	Yes	Yes
	NBR	415	137	216	Yes	Yes	143	248 [2]	Yes	Yes
I-215 SB Off-Ramp / Palm Av.	NBL/T/R	1,470	572 [2]	108	Yes	Yes	578 [2]	112	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] Maximum queue length for the approach reported.

8.5.2 OPENING YEAR CUMULATIVE (2018) WITH PROJECT CONDITIONS

As shown on Table 8-2, consistent with Existing 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 for Opening Year Cumulative (2018) With Project traffic conditions. Worksheets for Opening Year Cumulative (2018) With Project traffic conditions off-ramp queuing analysis are provided in Appendix 8.4.

8.6 TRAFFIC SIGNAL WARRANTS ANALYSIS

The following intersection is anticipated to meet a peak hour traffic signal warrant under Opening Year Cumulative (2018) Without Project traffic conditions (see Appendix 8.5):

ID	Intersection Location	Jurisdiction	CMP
15	Palm Avenue / Hallmark Parkway	City of San Bernardino	Yes

There are no additional traffic signals anticipated to meet peak hour volume based or planning level (Caltrans) ADT traffic signal warrants under Opening Year Cumulative (2018) With Project traffic conditions, in addition to the intersection previously warranted under Opening Year Cumulative (2018) Without Project traffic conditions (see Appendix 8.6).

However, 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. As such, the installation of a traffic signal at the intersection of Palm Avenue and Hallmark Parkway has not been recommended for the purposes of this TIA as the intersection is anticipated to operate at acceptable LOS under Opening Year Cumulative (2018) traffic conditions.

8.7 BASIC FREEWAY SEGMENT ANALYSIS

8.7.1 OPENING YEAR CUMULATIVE (2018) WITHOUT PROJECT CONDITIONS

Opening Year Cumulative (2018) Without Project mainline directional volumes for the weekday AM and PM peak hours are provided on Exhibit 8-5. As shown on Table 8-3, the basic freeway segments analyzed for this study are anticipated to operate at an acceptable LOS (i.e., LOS C or better) during the peak hours. Opening Year Cumulative (2018) Without Project basic freeway segment analysis worksheets are provided in Appendix 8.7.

Table 8-3

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

Freeway	Direction	Mainline Segment	Lanes[1]	2018 Without Project				2018 With Project			
				Density[2]		LOS		Density[2]		LOS	
				AM	PM	AM	PM	AM	PM	AM	PM
I-215 Freeway	SB	North of Palm Avenue	2	22.4	14.9	C	B	22.5	15.0	C	B
		South of Palm Avenue	2	25.5	16.5	C	B	25.7	16.6	C	B
	NB	North of Palm Avenue	2	9.8	17.1	A	B	10.0	17.2	A	B
		South of Palm Avenue	2	11.0	21.2	B	C	11.1	21.4	B	C

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

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

EXHIBIT 8-5: OPENING YEAR CUMULATIVE (2018) WITHOUT PROJECT FREEWAY MAINLINE VOLUMES (ACTUAL VEHICLES)

8.7.2 Opening Year Cumulative (2018) With Project Conditions

Opening Year Cumulative (2018) With Project mainline directional volumes for the weekday AM and PM peak hours are provided on Exhibit 8-6. As shown on Table 8-3, the basic freeway segments analyzed for this study are anticipated to operate at an acceptable LOS (i.e., LOS C or better) during the peak hours, with the addition of Phase 1 Project traffic. Opening Year Cumulative (2018) With Project basic freeway segment analysis worksheets are provided in Appendix 8.8.

8.8 Freeway Merge/Diverge Analysis

8.8.1 Opening Year Cumulative (2018) Without Project Conditions

Ramp merge and diverge operations were evaluated for Opening Year Cumulative (2018) Without Project traffic conditions and the results of this analysis are presented in Table 8-4. As shown in Table 8-4, the freeway ramp merge and diverge areas are anticipated to operate at acceptable LOS (i.e., LOS D or better). Opening Year Cumulative (2018) Without Project freeway ramp junction operations analysis worksheets are provided in Appendix 8.9.

8.8.2 Opening Year Cumulative (2018) With Project Conditions

Ramp merge and diverge operations were evaluated for Opening Year Cumulative (2018) With Project traffic conditions and the results of this analysis are presented in Table 8-4. As shown in Table 8-4, the freeway ramp merge and diverge areas are anticipated to operate at acceptable LOS (i.e., LOS D or better). Opening Year Cumulative (2018) With Project freeway ramp junction operations analysis worksheets are provided in Appendix 8.10.

8.9 Cumulative Impacts and Recommended Improvements

This section provides a summary of cumulative impacts and recommended improvements.

8.9.1 Recommended Improvements to Address Deficiencies at Intersections

Improvement strategies have not been recommended as the Project's contribution to the deficient study area intersection (University Parkway and Kendall Drive) is anticipated to be less-than-significant (i.e., the addition of Project traffic is anticipated to increase the v/c by less than 0.01 from the pre-project traffic condition).

8.9.2 Recommended Improvements to Address Off-Ramp Queues

As shown previously on Table 8-2, there are no peak hour queuing issues at the I-215 Freeway at Palm Avenue interchange for both Opening Year Cumulative (2018) Without and With Project traffic conditions. As such, no improvements have been recommended.

8.9.3 Recommended Improvements to Address Deficiencies on Freeway Facilities

As shown previously on Table 8-3 and Table 8-4, there are no deficient freeway mainline segments or merge/diverge ramp junctions anticipated for Opening Year Cumulative (2018) traffic conditions. As such, no improvements have been recommended.

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

Table 8-4

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

Freeway	Direction	Ramp or Segment	Lanes on Freeway[1]	2018 Without Project				2018 With Project			
				AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
				Density[2]	LOS	Density[2]	LOS	Density[2]	LOS	Density[2]	LOS
I-215 Freeway	SB	Off-Ramp at Palm Avenue	2	29.8	D	21.3	C	29.9	D	21.5	C
		On-Ramp at Palm Avenue	2	30.5	D	22.0	C	30.6	D	22.1	C
	NB	On-Ramp at Palm Avenue	2	14.2	B	22.2	C	14.3	B	22.3	C
		Off-Ramp at Palm Avenue	2	16.2	B	28.2	D	16.3	B	28.4	D

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

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

9 OPENING YEAR CUMULATIVE (2019) TRAFFIC ANALYSIS

This section discusses the methods used to develop Opening Year Cumulative (2019) traffic forecasts, and the resulting intersection operations, traffic signal warrant, and freeway mainline operations analyses.

9.1 ROADWAY IMPROVEMENTS

The lane configurations and traffic controls assumed to be in place for Opening Year Cumulative conditions are consistent with those shown previously on Exhibit 3-1, with the exception of the Project driveways and those facilities assumed to be in place prior to or constructed by the Project to provide site access are also assumed to be in place for Opening Year Cumulative (2019) conditions only.

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

This scenario includes Existing traffic volumes plus an ambient growth factor of 8.24% plus traffic from pending and approved but not yet constructed but known development projects (as previously shown on Table 4-2) in the area. The weekday ADT, weekday AM, and PM peak hour volumes which can be expected for Opening Year Cumulative (2019) Without Project traffic conditions are shown on Exhibit 9-1.

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

This scenario includes Existing traffic volumes plus an ambient growth factor of 8.24%, traffic from pending and approved but not yet constructed but known development projects in the area and the addition of Project Buildout traffic. The weekday ADT, weekday AM, and PM peak hour volumes which can be expected for Opening Year Cumulative (2019) With Project traffic conditions are shown on Exhibit 9-2.

9.4 INTERSECTION OPERATIONS ANALYSIS

Opening Year Cumulative (2019) 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 9-1 for Opening Year Cumulative (2019) conditions.

EXHIBIT 9-1 (1OF2) : OPENING YEAR CUMULATIVE (2019) WITHOUT PROJECT TRAFFIC VOLUMES

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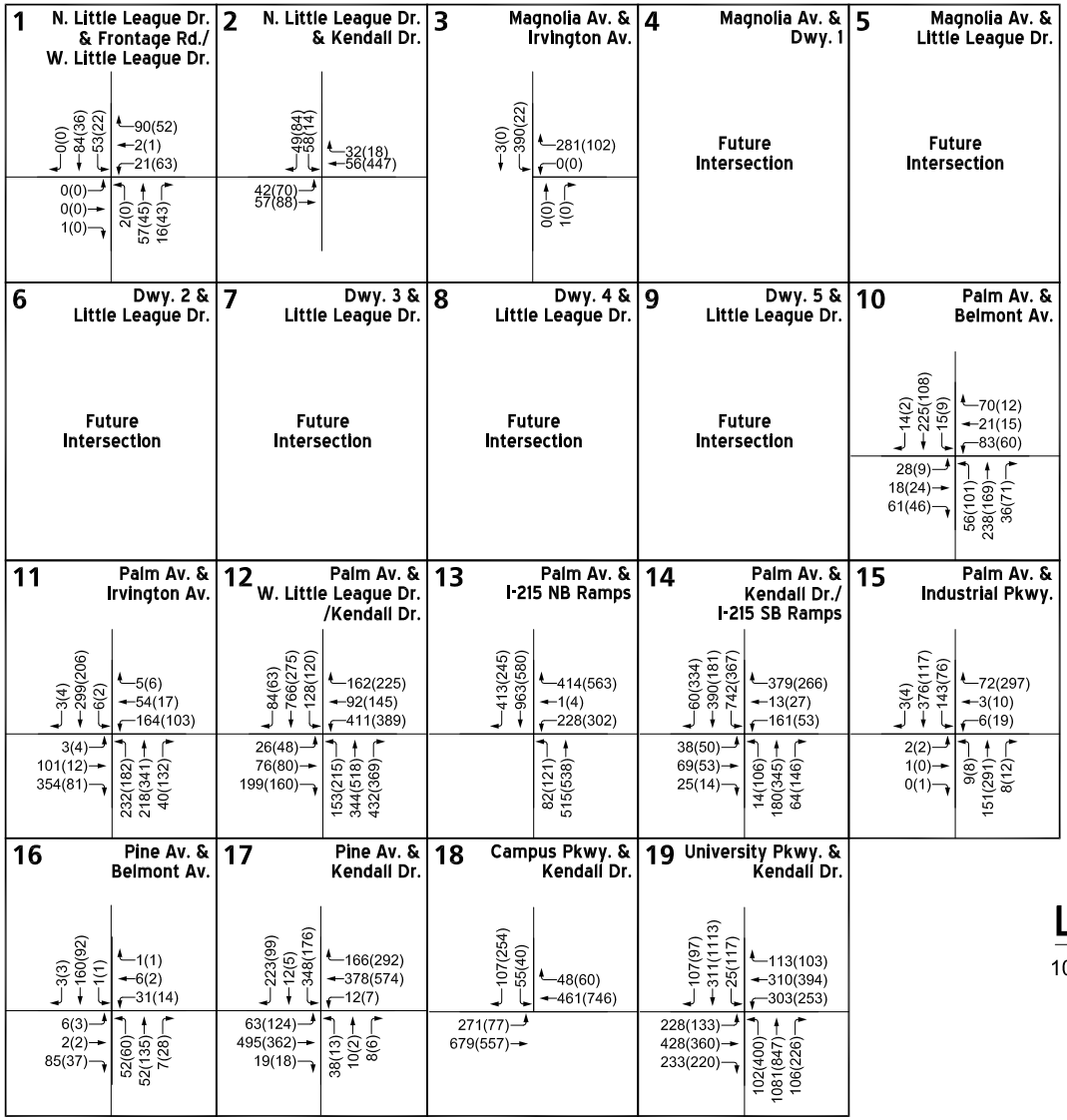
EXHIBIT 9-1 (2OF2) : OPENING YEAR CUMULATIVE (2019) WITHOUT PROJECT TRAFFIC VOLUMES



LEGEND:

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

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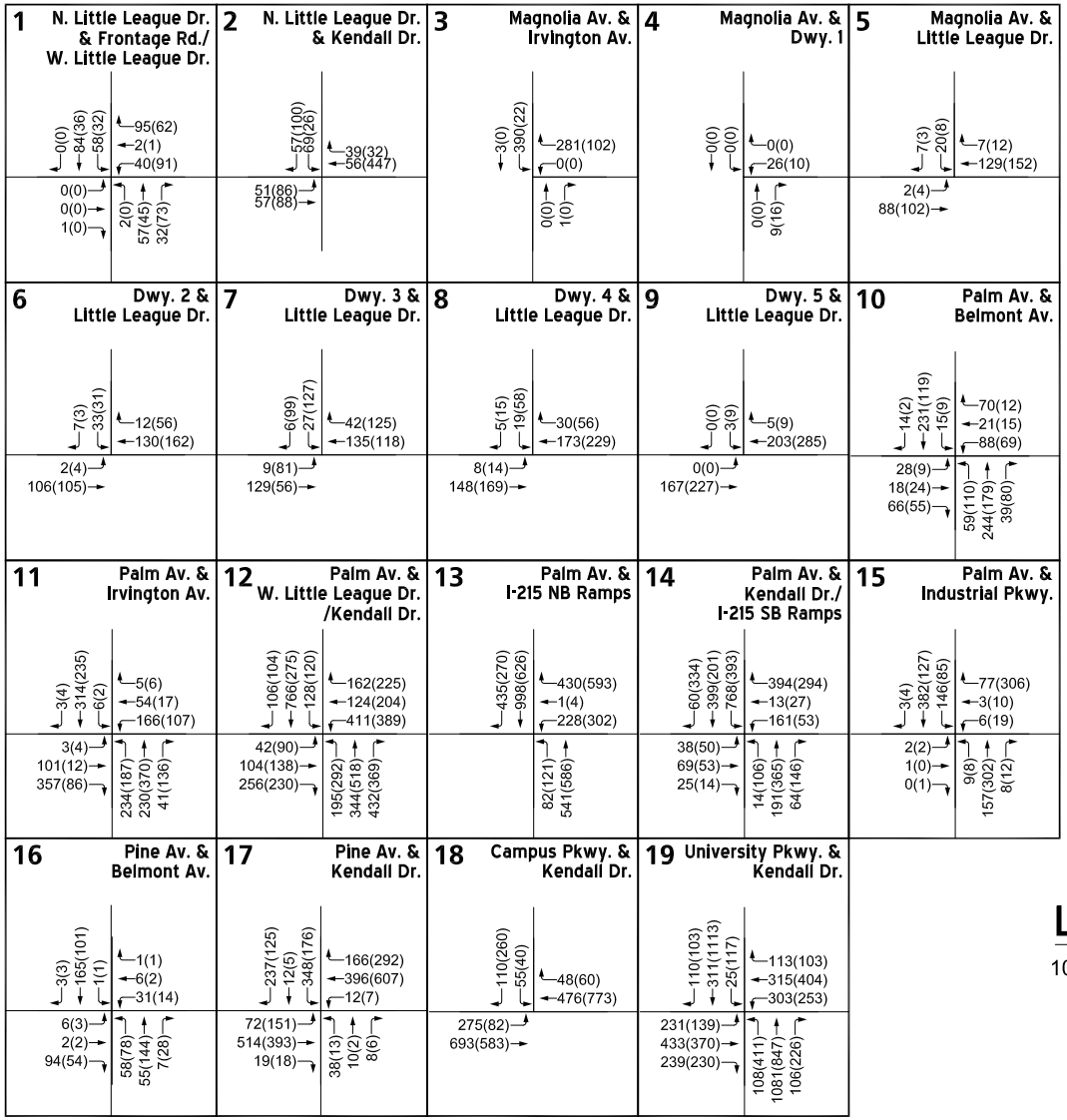
EXHIBIT 9-2 (1OF2) : OPENING YEAR CUMULATIVE (2019) WITH PROJECT TRAFFIC VOLUMES

URBAN CROSSROADS

EXHIBIT 9-2 (2OF2) : OPENING YEAR CUMULATIVE (2019) WITH PROJECT TRAFFIC VOLUMES



LEGEND:

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

N

URBAN CROSSROADS

Table 9-1

Intersection Analysis for Opening Year Cumulative (2019) Conditions

#	Intersection	Traffic Control[2]	2019 Without Project				2019 With Project			
			Delay[1] (secs.)		LOS		Delay[1] (secs.)		LOS	
			AM	PM	AM	PM	AM	PM	AM	PM
1	N. Little League Dr. / W. Little League Dr.	CSS	10.4	10.0	B	B	11.5	10.7	B	B
2	N. Little League Dr. / Kendall Dr.	CSS	10.5	14.2	B	B	11.0	16.0	B	C
3	Magnolia Av. / Irvington Av.	CSS	10.7	0.0	B	A	10.7	0.0	B	A
4	Magnolia Av. / Driveway 1	**CSS**	Future Intersection				8.6	8.6	A	A
5	Magnolia Av. / W. Little League Dr.	**CSS**	Future Intersection				9.8	10.0	A	B
6	Driveway 2 / W. Little League Dr.	**CSS**	Future Intersection				10.1	10.6	B	B
7	Driveway 3 / W. Little League Dr.	**CSS**	Future Intersection				10.5	14.1	B	B
8	Driveway 4 / W. Little League Dr.	**CSS**	Future Intersection				10.8	12.4	B	B
9	Driveway 5 / W. Little League Dr.	**CSS**	Future Intersection				11.0	12.5	B	B
10	Palm Av. / Belmont Av.	AWS	20.3	10.2	C	B	22.3	10.7	C	B
11	Palm Av. / Irvington Av.	TS	43.6	15.7	D	B	44.3	15.9	D	B
12	Palm Av. / Kendall Dr.	TS	41.1	36.9	D	D	47.3	38.6	D	D
13	Palm Av. / I-215 NB Ramps	TS	9.1	10.9	A	B	9.3	11.9	A	B
14	Palm Av. / I-215 SB Ramps	TS	51.6	21.1	D	C	54.7	23.0	D	C
15	Palm Av. / Hallmark Pkwy.	AWS	13.5	13.6	B	B	13.8	14.2	B	B
16	Pine Av. / Belmont Av.	CSS	14.1	12.6	B	B	14.8	13.8	B	B
17	Pine Av. / Kendall Dr.	TS	21.0	18.3	C	B	22.2	20.4	C	C
18	Campus Pkwy. / Kendall Dr.	TS	36.7	27.9	D	C	36.8	28.0	D	C
19	University Pkwy. / Kendall Dr.	TS	40.3	**62.7**	D	**E**	40.8	**65.0**	D	**E**

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

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

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

9.4.1 OPENING YEAR CUMULATIVE (2019) WITHOUT PROJECT CONDITIONS

All study area intersections are anticipated to operate at acceptable levels of service, with the exception of the following:

ID	Intersection Location
19	University Parkway / Kendall Drive – LOS E PM peak hour only

Consistent with Table 9-1, a summary of the peak hour intersection LOS for Opening Year Cumulative (2019) Without Project conditions are shown on Exhibit 9-3. The intersection operations analysis worksheets for Opening Year Cumulative (2019) Without Project traffic conditions are included in Appendix 9.1 of this TIA.

9.4.2 OPENING YEAR CUMULATIVE (2019) WITH PROJECT CONDITIONS

There are no additional study area intersections anticipated to operate at unacceptable LOS with the addition of Project Buildout traffic, in addition to the location previously identified for Opening Year Cumulative (2019) Without Project traffic conditions. However, the addition of Project traffic is anticipated to exceed the City's minimum v/c threshold of 0.01 for intersections operating at LOS E or LOS F under pre-project traffic conditions:

ID	Intersection Location	v/c for 2019 NP – PM Peak Hour	v/c for 2019 WP – PM Peak Hour	Variance
19	University Parkway / Kendall Drive	0.739	0.752	0.013

NOTE: v/c not reported by Synchro 8 for HCM 2010 methodology; as such, v/c has been reported using Vistro Version 3.00-04.

As such, the Project's impact to the deficient intersection is considered to be cumulatively considerable. Consistent with Table 9-1, a summary of the peak hour intersection LOS for Opening Year Cumulative (2019) With Project conditions are shown on Exhibit 9-4. The intersection operations analysis worksheets for Opening Year Cumulative (2019) With Project traffic conditions are included in Appendix 9.2 of this TIA.

9.5 OFF-RAMP QUEUING ANALYSIS

A queuing analysis was performed for the off-ramps at the I-215 Freeway and Palm Avenue interchange to assess vehicle queues for the off ramps that may potentially result in deficient peak hour operations at the ramp-to-arterial intersections and may potentially "spill back" onto the I-215 Freeway mainline. Queuing analysis findings are presented in Table 9-2 for Opening Year Cumulative (2019) traffic conditions. It is important to note that off-ramp lengths are consistent with the measured distance between the intersection and the freeway mainline.

9.5.1 OPENING YEAR CUMULATIVE (2019) WITHOUT PROJECT CONDITIONS

As shown on Table 9-2, consistent with Existing 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 for Opening Year Cumulative (2019) Without Project traffic conditions. Worksheets for Opening Year Cumulative (2019) Without Project traffic conditions off-ramp queuing analysis are provided in Appendix 9.3.

EXHIBIT 9-3: SUMMARY OF LOS FOR OPENING YEAR CUMULATIVE (2019) WITHOUT PROJECT CONDITIONS

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EXHIBIT 9-4: SUMMARY OF LOS FOR OPENING YEAR CUMULATIVE (2019) WITH PROJECT CONDITIONS

URBAN CROSSROADS

Table 9-2

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

Intersection	Movement	Available Stacking Distance (Feet)	2019 Without Project				2019 With Project			
			95th Percentile Queue (Feet)[2]		Acceptable?[1]		95th Percentile Queue (Feet)[2]		Acceptable?[1]	
			AM Peak Hour	PM Peak Hour	AM	PM	AM Peak Hour	PM Peak Hour	AM	PM
I-215 NB Off-Ramp / Palm Av.	NBL/T	910	120	151	Yes	Yes	120	151	Yes	Yes
	NBR	415	145	228	Yes	Yes	163	310 [2]	Yes	Yes
I-215 SB Off-Ramp / Palm Av.	NBL/T/R	1,470	585 [2]	109	Yes	Yes	601 [2]	115	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] Maximum queue length for the approach reported.

9.5.2 OPENING YEAR CUMULATIVE (2019) WITH PROJECT CONDITIONS

As shown on Table 9-2, consistent with Existing 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 for Opening Year Cumulative (2019) With Project traffic conditions. Worksheets for Opening Year Cumulative (2019) With Project traffic conditions off-ramp queuing analysis are provided in Appendix 9.4.

9.6 TRAFFIC SIGNAL WARRANTS ANALYSIS

There are no additional traffic signals anticipated to meet peak hour volume based or planning level (Caltrans) ADT traffic signal warrants under Opening Year Cumulative (2019) traffic conditions in addition to the intersection previously warranted under Opening Year Cumulative (2018) traffic conditions (see Appendix 9.5 and Appendix 9.6).

9.7 BASIC FREEWAY SEGMENT ANALYSIS

9.7.1 OPENING YEAR CUMULATIVE (2019) WITHOUT PROJECT CONDITIONS

Opening Year Cumulative (2019) Without Project mainline directional volumes for the weekday AM and PM peak hours are provided on Exhibit 9-5. As shown on Table 9-3, the basic freeway segments analyzed for this study are anticipated to operate at an acceptable LOS (i.e., LOS D or better) during the peak hours. Opening Year Cumulative (2019) Without Project basic freeway segment analysis worksheets are provided in Appendix 9.7.

9.7.2 OPENING YEAR CUMULATIVE (2019) WITH PROJECT CONDITIONS

Opening Year Cumulative (2019) With Project mainline directional volumes for the weekday AM and PM peak hours are provided on Exhibit 9-6. As shown on Table 9-3, the basic freeway segments analyzed for this study are anticipated to operate at an acceptable LOS (i.e., LOS D or better) during the peak hours, with the addition of Project Buildout traffic. Opening Year Cumulative (2019) With Project basic freeway segment analysis worksheets are provided in Appendix 9.8.

9.8 FREEWAY MERGE/DIVERGE ANALYSIS

9.8.1 OPENING YEAR CUMULATIVE (2019) WITHOUT PROJECT CONDITIONS

Ramp merge and diverge operations were evaluated for Opening Year Cumulative (2019) Without Project traffic conditions and the results of this analysis are presented in Table 9-4. As shown in Table 9-4, the freeway ramp merge and diverge areas are anticipated to operate at acceptable LOS (i.e., LOS D or better). Opening Year Cumulative (2019) Without Project freeway ramp junction operations analysis worksheets are provided in Appendix 9.9.

Table 9-3

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

Freeway	Direction	Mainline Segment	Lanes[1]	2019 Without Project				2019 With Project			
				Density[2]		LOS		Density[2]		LOS	
				AM	PM	AM	PM	AM	PM	AM	PM
I-215 Freeway	SB	North of Palm Avenue	2	22.9	15.2	C	B	23.1	15.4	C	B
		South of Palm Avenue	2	26.1	16.9	D	B	26.4	17.1	D	B
	NB	North of Palm Avenue	2	10.0	17.4	A	B	10.2	17.6	A	B
		South of Palm Avenue	2	11.2	21.7	B	C	11.4	22.0	B	C

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

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

Table 9-4

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

Freeway	Direction	Ramp or Segment	Lanes on Freeway[1]	2019 Without Project				2019 With Project			
				AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
				Density[2]	LOS	Density[2]	LOS	Density[2]	LOS	Density[2]	LOS
I-215 Freeway	SB	Off-Ramp at Palm Avenue	2	30.3	D	21.6	C	30.5	D	21.9	C
		On-Ramp at Palm Avenue	2	31.0	D	22.3	C	31.2	D	22.5	C
	NB	On-Ramp at Palm Avenue	2	14.4	B	22.6	C	14.5	B	22.8	C
		Off-Ramp at Palm Avenue	2	16.4	B	28.7	D	16.6	B	28.9	D

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

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

EXHIBIT 9-5: OPENING YEAR CUMULATIVE (2019) WITHOUT PROJECT FREEWAY MAINLINE VOLUMES (ACTUAL VEHICLES)

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EXHIBIT 9-6: OPENING YEAR CUMULATIVE (2019) WITH PROJECT FREEWAY MAINLINE VOLUMES (ACTUAL VEHICLES)

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9.8.2 OPENING YEAR CUMULATIVE (2019) WITH PROJECT CONDITIONS

Ramp merge and diverge operations were evaluated for Opening Year Cumulative (2019) With Project traffic conditions and the results of this analysis are presented in Table 9-4. As shown in Table 9-4, the freeway ramp merge and diverge areas are anticipated to operate at acceptable LOS (i.e., LOS D or better). Opening Year Cumulative (2019) With Project freeway ramp junction operations analysis worksheets are provided in Appendix 9.10.

9.9 CUMULATIVE IMPACTS AND RECOMMENDED IMPROVEMENTS

This section provides a summary of cumulative impacts and recommended improvements.

9.9.1 RECOMMENDED IMPROVEMENTS TO ADDRESS DEFICIENCIES AT INTERSECTIONS

Improvement strategies have been recommended at intersections that have been identified as deficient in an effort to reduce each location's peak hour delay and improve the associated LOS grade to an acceptable LOS (LOS D or better). The effectiveness of the recommended improvement strategies discussed below to address Opening Year Cumulative (2019) traffic deficiencies is presented in Table 9-5.

Worksheets for Opening Year Cumulative (2019) Without and With Project traffic conditions, with improvements, HCM calculation worksheets are provided in Appendix 9.11 and 9.12, respectively.

9.9.2 RECOMMENDED IMPROVEMENTS TO ADDRESS OFF-RAMP QUEUES

As shown previously on Table 9-2, there are no peak hour queuing issues at the I-215 Freeway at Palm Avenue interchange for both Opening Year Cumulative (2019) Without and With Project traffic conditions. As such, no improvements have been recommended.

9.9.3 RECOMMENDED IMPROVEMENTS TO ADDRESS DEFICIENCIES ON FREEWAY FACILITIES

As shown previously on Table 9-3 and Table 9-4, there are no deficient freeway mainline segments or merge/diverge ramp junctions anticipated for Opening Year Cumulative (2019) traffic conditions. As such, no improvements have been recommended.

Table 9-5

Intersection Analysis for Opening Year Cumulative (2019) Conditions With Improvements

#	Intersection	Traffic Control[3]	Intersection Approach Lanes[1]												Delay[2] (secs.)		Level of Service	
			Northbound			Southbound			Eastbound			Westbound						
			L	T	R	L	T	R	L	T	R	L	T	R	AM	PM	AM	PM
19	University Pkwy. / Kendall Dr.																	
	- 2019 Without Project																	
	- Without Improvements	TS	2	3	0	1	3	0	2	2	0	2	2	0	38.7	**56.1**	D	**E**
	- With Improvements	TS	2	3	0	**2**	3	0	2	2	0	2	2	0	39.9	52.6	D	D
	- 2019 With Project																	
	- Without Improvements	TS	2	3	0	1	3	0	2	2	0	2	2	0	39.1	**58.0**	D	**E**
	- With Improvements	TS	2	3	0	**2**	3	0	2	2	0	2	2	0	40.2	53.2	D	D

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

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

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

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

[3] TS = Traffic Signal

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10 HORIZON YEAR (2035) TRAFFIC ANALYSIS

This section discusses the methods used to develop Horizon Year (2035) traffic forecasts, and the resulting intersection operations, traffic signal warrant, and freeway mainline operations analyses.

10.1 ROADWAY IMPROVEMENTS

The lane configurations and traffic controls assumed to be in place for Horizon Year conditions are consistent with those shown previously on Exhibit 3-1, with the exception of Project driveways and those facilities assumed to be constructed by the Project to provide site access.

10.2 HORIZON YEAR (2035) WITHOUT PROJECT TRAFFIC VOLUME FORECASTS

This scenario includes the refined post-processed volumes based on SBTAM (see Section 4.9 *Horizon Year (2035) Volume Forecasts* of this TIA for a detailed discussion on the post-processing methodology). Exhibit 10-1 shows the weekday ADT and peak hour volumes which can be expected for Horizon Year (2035) Without Project traffic conditions.

Peak hour intersection operations have also been evaluated at study area intersections that were determined to potentially be impacted by the future Magnolia Avenue Bridge over the Cajon Creek Wash. Traffic forecasts for Horizon Year (2035) Without Project conditions with the Magnolia Avenue Bridge are also shown on Exhibit 10-1.

10.3 HORIZON YEAR (2035) WITH PROJECT TRAFFIC VOLUME FORECASTS

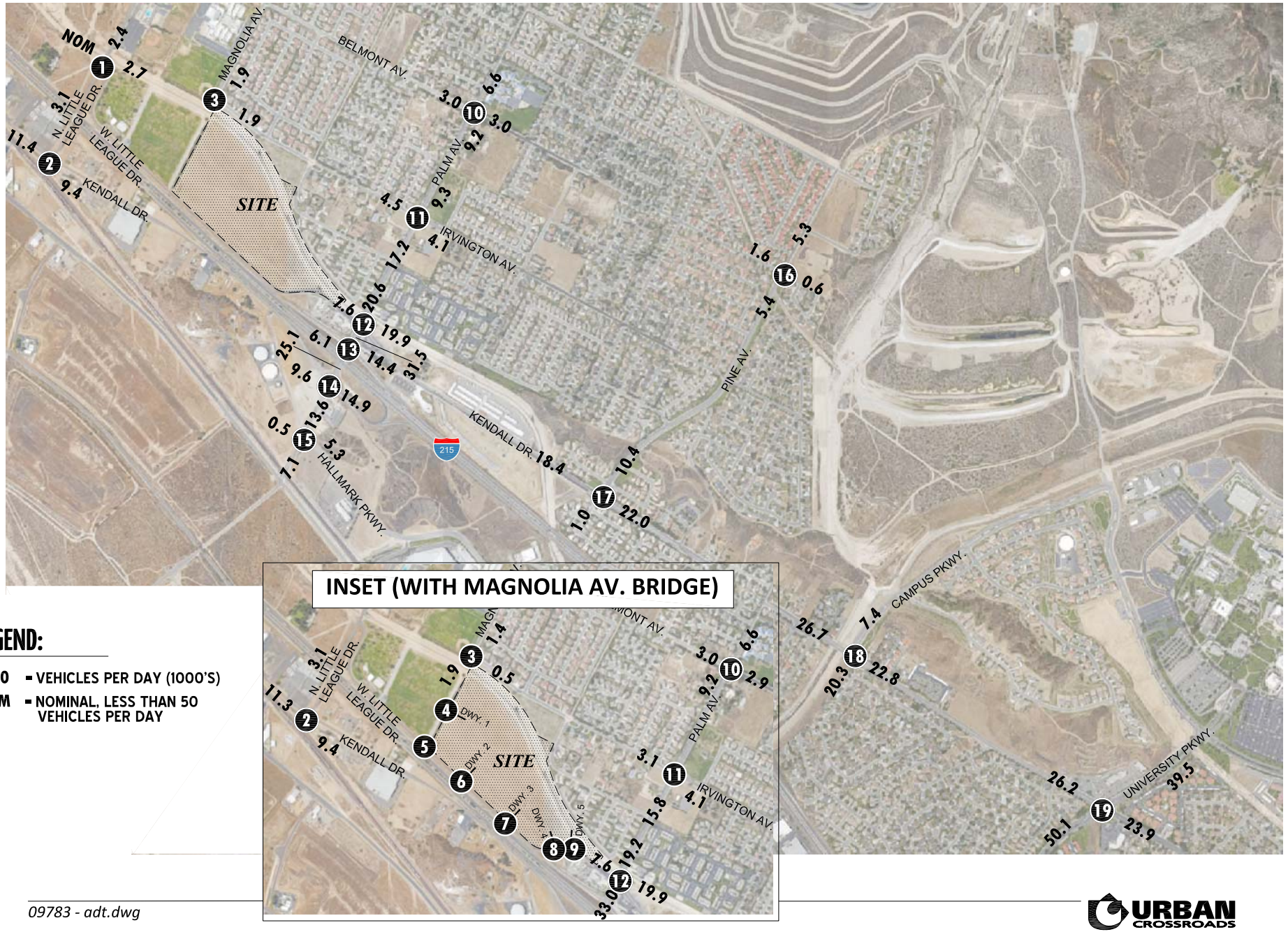
This scenario includes the refined post-processed volumes based on SBTAM, plus the addition of Project Buildout traffic. Exhibit 10-2 shows the weekday ADT and peak hour volumes which can be expected for Horizon Year (2035) With Project traffic conditions.

Peak hour intersection operations have also been evaluated at study area intersections that were determined to potentially be impacted by the future Magnolia Avenue Bridge over the Cajon Creek Wash. Traffic forecasts for Horizon Year (2035) With Project conditions with the Magnolia Avenue Bridge are also shown on Exhibit 10-2.

10.4 INTERSECTION OPERATIONS ANALYSIS

Horizon Year (2035) 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 10-1 for Horizon Year (2035) traffic conditions.

EXHIBIT 10-1 (1OF2) : HORIZON YEAR CUMULATIVE (2035) WITHOUT PROJECT TRAFFIC VOLUMES



LEGEND:

10.0	= VEHICLES PER DAY (1000'S)
NOM	= NOMINAL, LESS THAN 50 VEHICLES PER DAY

N

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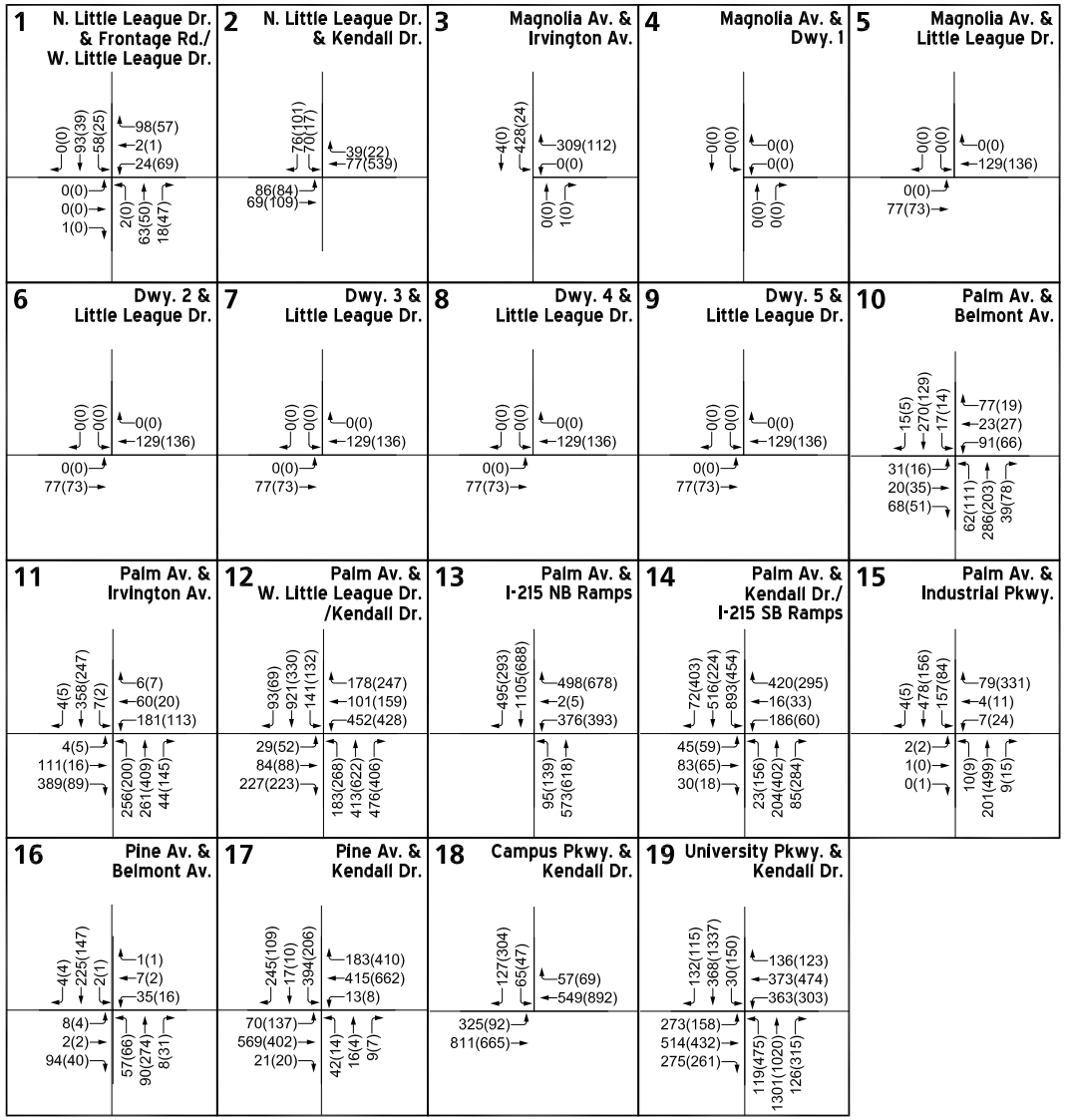
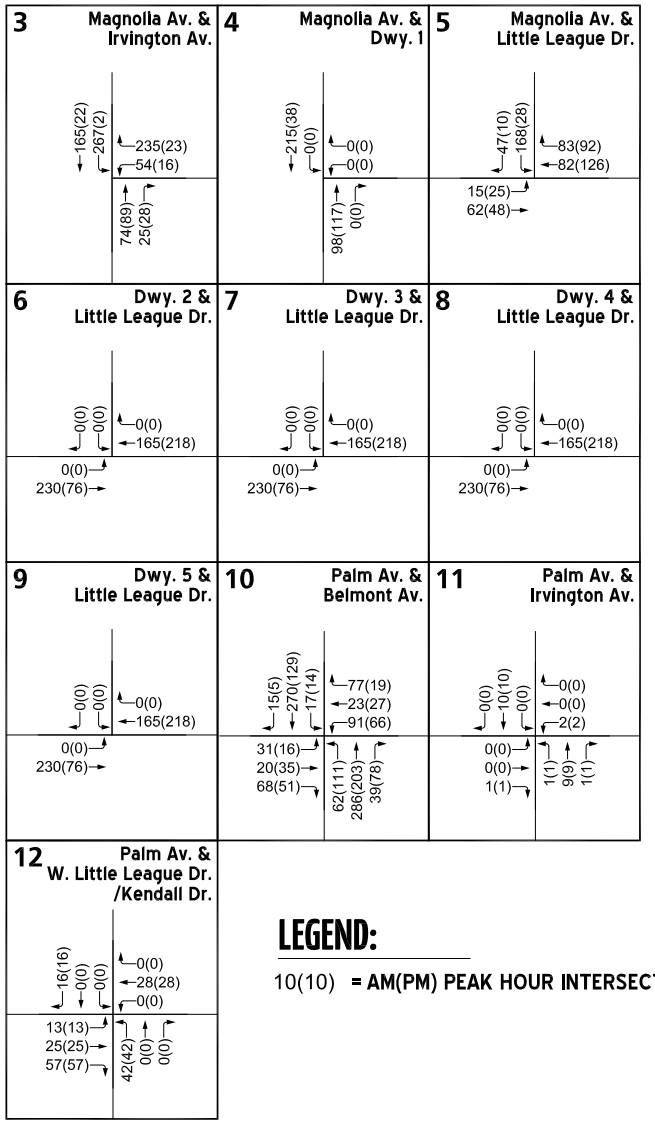
EXHIBIT 10-1 (2OF2) : HORIZON YEAR CUMULATIVE (2035) WITHOUT PROJECT TRAFFIC VOLUMES



2035 ALTERNATIVE



LEGEND:

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

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EXHIBIT 10-2 (1OF2) : HORIZON YEAR CUMULATIVE (2035) WITH PROJECT TRAFFIC VOLUMES

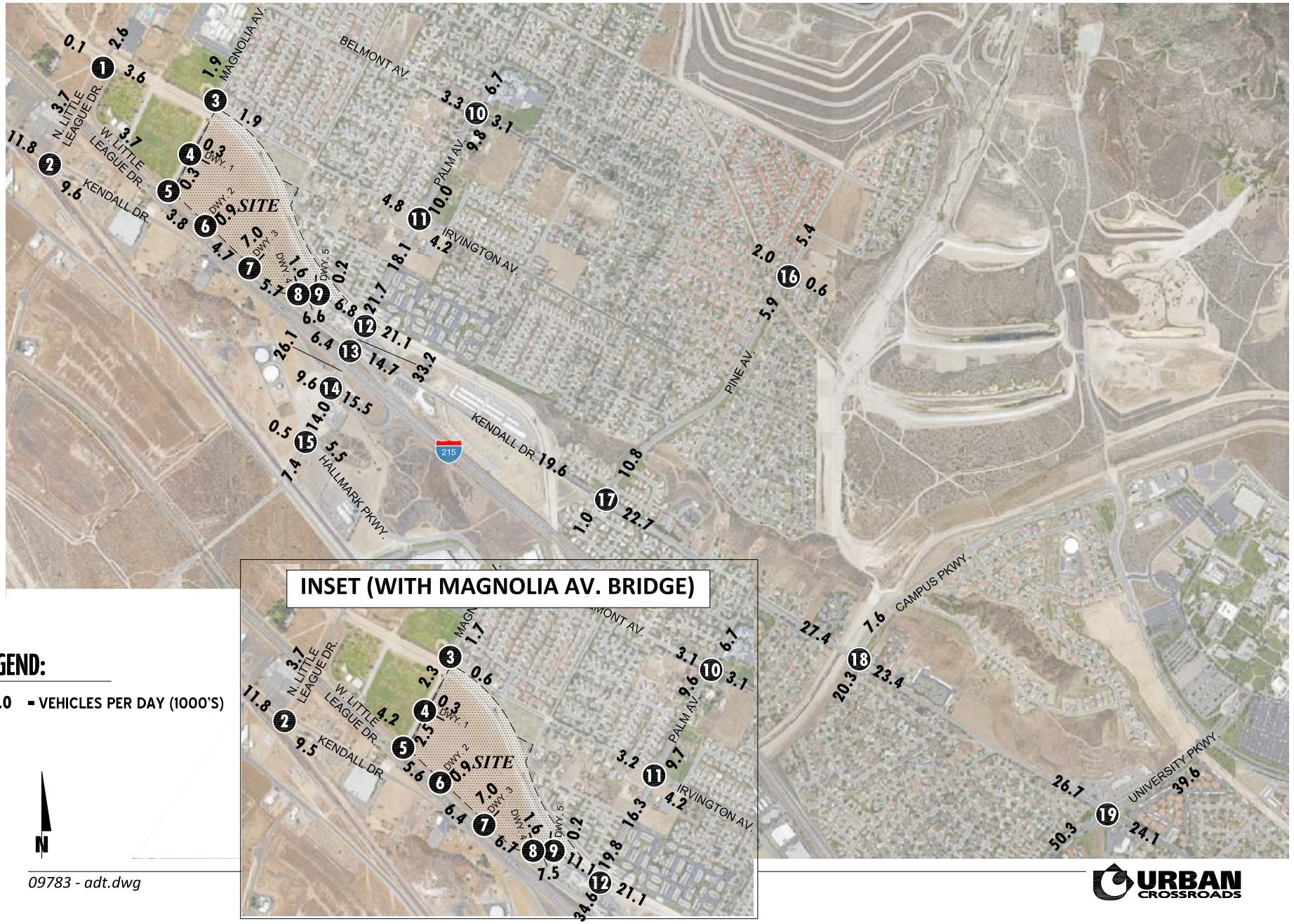

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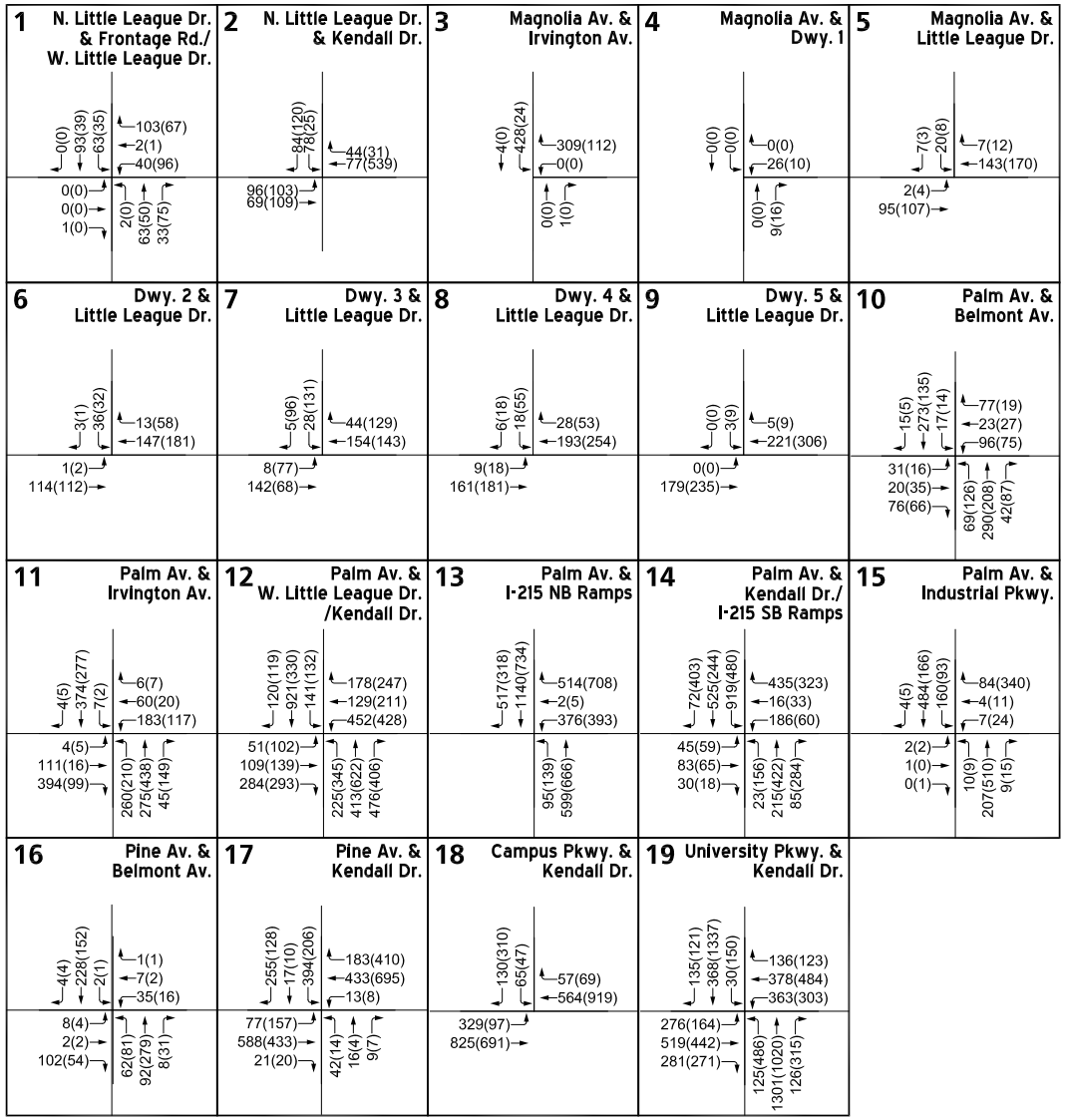
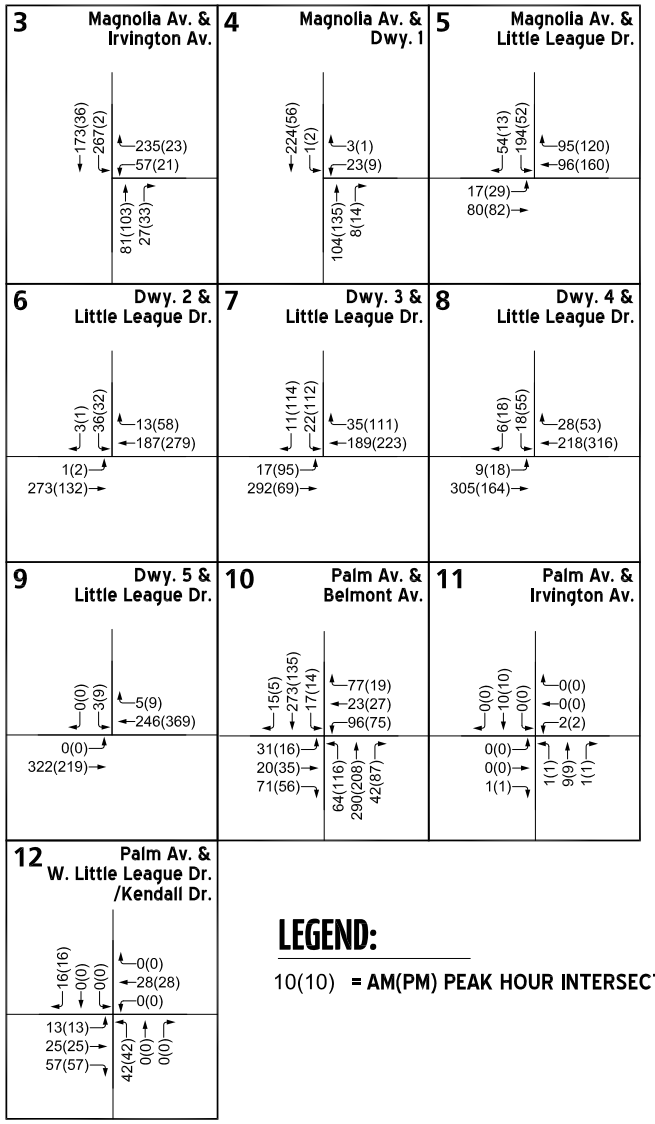
EXHIBIT 10-2 (2OF2) : HORIZON YEAR CUMULATIVE (2035) WITH PROJECT TRAFFIC VOLUMES



2035 ALTERNATIVE



LEGEND:

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

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Table 10-1

Intersection Analysis for Horizon Year (2035) Conditions

#	Intersection	Traffic Control[2]	2035 Without Project				2035 With Project				2035 Without Project (w/ Magnolia Av Bridge)				2035 With Project (w/ Magnolia Av Bridge)			
			Delay[1] (secs.)		LOS		Delay[1] (secs.)		LOS		Delay[1] (secs.)		LOS		Delay[1] (secs.)		LOS	
			AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
1	N. Little League Dr. / W. Little League Dr.	CSS	10.8	10.2	B	B	11.9	11.0	B	B	Not Applicable[3]				Not Applicable[3]			
2	N. Little League Dr. / Kendall Dr.	CSS	12.4	17.3	B	C	13.2	20.0	B	C	Not Applicable[3]				Not Applicable[3]			
3	Magnolia Av. / Irvington Av.	CSS	11.2	0.0	B	A	11.2	0.0	B	A	21.6	10.5	C	B	23.8	11.1	C	B
4	Magnolia Av. / Driveway 1	**CSS**	Future Intersection				8.6	8.6	A	A	Future Intersection				10.7	9.7	B	A
5	Magnolia Av. / W. Little League Dr.	**CSS**	Future Intersection				9.9	10.1	A	B	11.6	10.3	B	B	12.7	11.5	B	B
6	Driveway 2 / W. Little League Dr.	**CSS**	Future Intersection				10.4	10.9	B	B	Future Intersection				12.3	12.1	B	B
7	Driveway 3 / W. Little League Dr.	**CSS**	Future Intersection				10.8	14.9	B	B	Future Intersection				12.0	17.0	B	C
8	Driveway 4 / W. Little League Dr.	**CSS**	Future Intersection				11.0	12.9	B	B	Future Intersection				12.4	13.5	B	B
9	Driveway 5 / W. Little League Dr.	**CSS**	Future Intersection				11.3	12.9	B	B	Future Intersection				13.0	13.4	B	B
10	Palm Av. / Belmont Av.	AWS	**41.1**	11.5	**E**	B	**41.3**	12.5	**E**	B	Not Applicable[3]				Not Applicable[3]			
11	Palm Av. / Irvington Av.	TS	**58.1**	16.2	**E**	B	**60.6**	16.5	**E**	B	28.6	15.4	C	B	28.8	15.6	C	B
12	Palm Av. / Kendall Dr.	TS	49.0	41.6	D	D	54.1	46.4	D	D	**62.1**	42.3	**E**	D	**83.0**	51.3	**F**	D
13	Palm Av. / I-215 NB Ramps	TS	18.0	18.2	B	B	44.1	27.6	D	C	Not Applicable[3]				Not Applicable[3]			
14	Palm Av. / I-215 SB Ramps	TS	48.9	**57.5**	D	**E**	53.7	**57.9**	D	**E**	Not Applicable[3]				Not Applicable[3]			
15	Palm Av. / Hallmark Pkwy.	AWS	20.8	**36.0**	C	**E**	21.9	**36.2**	C	**E**	Not Applicable[3]				Not Applicable[3]			
16	Pine Av. / Belmont Av.	CSS	17.7	16.6	C	C	18.5	18.1	C	C	Not Applicable[3]				Not Applicable[3]			
17	Pine Av. / Kendall Dr.	TS	21.5	25.9	C	C	21.5	32.4	C	C	Not Applicable[3]				Not Applicable[3]			
18	Campus Pkwy. / Kendall Dr.	TS	36.9	27.7	D	C	36.9	28.2	D	C	Not Applicable[3]				Not Applicable[3]			
19	University Pkwy. / Kendall Dr.	TS	48.9	**89.3**	D	**F**	49.6	**92.9**	D	**F**	Not Applicable[3]				Not Applicable[3]			

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

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

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

10.4.1 HORIZON YEAR (2035) WITHOUT PROJECT CONDITIONS

All study area intersections are anticipated to operate at acceptable levels of service, with the exception of the following:

ID	Intersection Location
10	Palm Avenue / Belmont Avenue – LOS E AM peak hour only
11	Palm Avenue / Irvington Avenue – LOS E AM peak hour only
14	Palm Avenue / I-215 Southbound Ramps – LOS E PM peak hour only
15	Palm Avenue / Hallmark Parkway – LOS E PM peak hour only
19	University Parkway / Kendall Drive – LOS F PM peak hour only

Consistent with Table 10-1, a summary of the peak hour intersection LOS for Horizon Year (2035) Without Project conditions are shown on Exhibit 10-3. The intersection operations analysis worksheets for Horizon Year (2035) Without Project traffic conditions are included in Appendix 10.1 of this TIA.

The following study area intersection is anticipated to operate at unacceptable LOS during the peak hours under Horizon Year (2035) Without Project traffic conditions with the Magnolia Avenue extension over the Cajon Creek Wash:

ID	Intersection Location
12	Palm Avenue / Kendall Avenue – LOS F AM peak hour only

The intersection operations analysis worksheets for Horizon Year (2035) Without Project (With Magnolia Avenue Bridge) traffic conditions are included in Appendix 10.2 of this TIA.

10.4.2 HORIZON YEAR (2035) WITH PROJECT CONDITIONS

There are no additional study area intersections anticipated to operate at unacceptable LOS with the addition of Project Buildout traffic, in addition to the locations previously identified for Horizon Year (2035) Without Project traffic conditions. However, the addition of Project traffic is anticipated to exceed the City's minimum v/c threshold of 0.01 for intersections operating at LOS E or LOS F under pre-project traffic conditions:

ID	Intersection Location	v/c for 2035 NP – Deficient Peak Hour	v/c for 2035 WP – Deficient Peak Hour	Variance
10	Palm Av. / Belmont Av.	0.990	1.033	0.043
11	Palm Av. / Irvington Av.	1.140	1.190	0.050
14	Palm Av. / I-215 SB Ramps	0.952	1.077	0.125
15	Palm Av. / Industrial Pkwy.	1.099	1.149	0.050
19	University Pkwy. / Kendall Dr.	0.888	0.902	0.014

NOTE: v/c not reported by Synchro 8 for HCM 2010 methodology at signalized intersections; as such, v/c has been reported using Vistro Version 3.00-04.

EXHIBIT 10-3: SUMMARY OF LOS FOR HORIZON YEAR CUMULATIVE (2035) WITHOUT PROJECT CONDITIONS

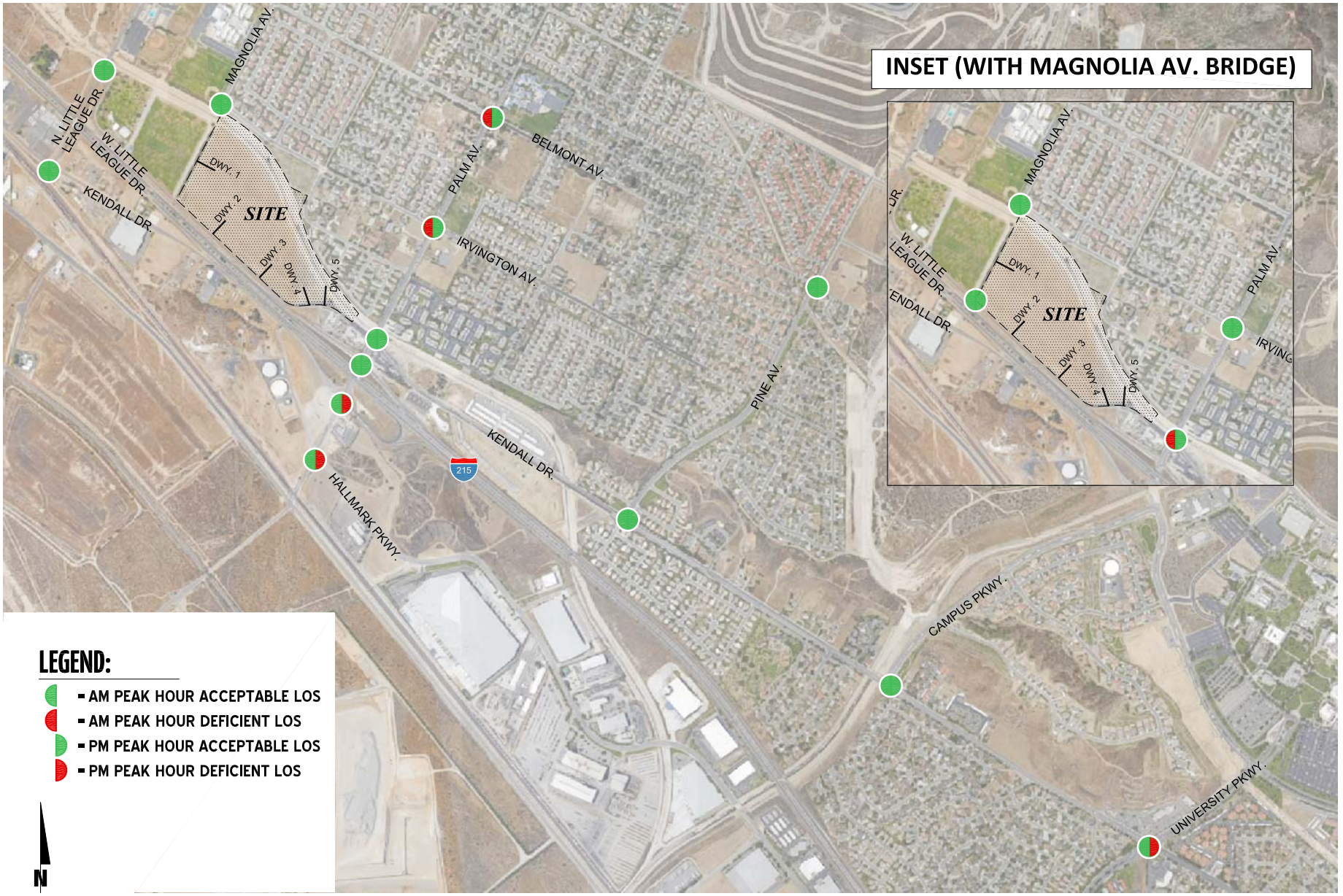

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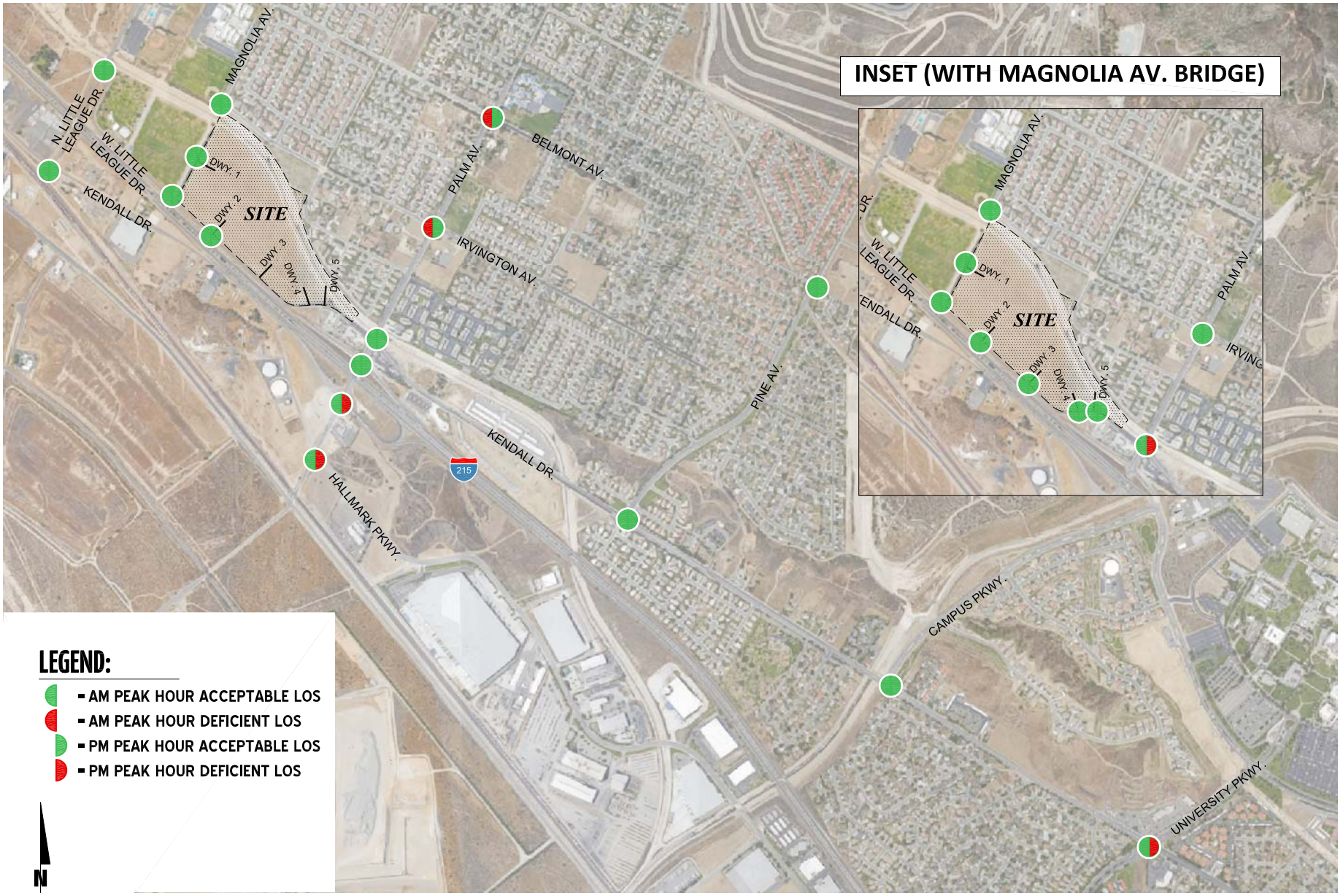
EXHIBIT 10-4: HORIZON YEAR CUMULATIVE (2035) WITH PROJECT CONDITIONS
FREEWAY MAINLINE VOLUMES (ACTUAL VEHICLES)



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As such, the Project's impact to the deficient intersection is considered to be cumulatively considerable. Consistent with Table 10-1, a summary of the peak hour intersection LOS for Horizon Year (2035) With Project conditions are shown on Exhibit 10-4. The intersection operations analysis worksheets for Horizon Year (2035) With Project traffic conditions are included in Appendix 10.3 of this TIA.

There are no additional study area intersections anticipated to operate at an unacceptable LOS during the peak hours under Horizon Year (2035) With Project traffic conditions with the Magnolia Avenue extension over the Cajon Creek Wash in addition to the intersection previously identified under Horizon Year (2035) Without Project conditions. However, the addition of Project traffic is anticipated to exceed the City's minimum v/c threshold of 0.01 for intersections operating at LOS E or LOS F under pre-project traffic conditions:

ID	Intersection Location	v/c for 2035 NP – AM Peak Hour	v/c for 2035 WP – AM Peak Hour	Variance
12	Palm Av. / Kendall Dr.	0.217	0.217	0.000

NOTE: v/c not reported by Synchro 8 for HCM 2010 methodology at signalized intersections; as such, v/c has been reported using Vistro Version 3.00-04.

As such, the Project's impact to the deficient intersection is less-than-significant. The intersection operations analysis worksheets for Horizon Year (2035) With Project (With Magnolia Avenue Bridge) traffic conditions are included in Appendix 10.4 of this TIA.

10.5 OFF-RAMP QUEUING ANALYSIS

A queuing analysis was performed for the off-ramps at the I-215 Freeway and Palm Avenue interchange to assess vehicle queues for the off ramps that may potentially result in deficient peak hour operations at the ramp-to-arterial intersections and may potentially "spill back" onto the I-215 Freeway mainline. Queuing analysis findings are presented in Table 10-2 for Horizon Year (2035) traffic conditions. It is important to note that off-ramp lengths are consistent with the measured distance between the intersection and the freeway mainline.

10.5.1 HORIZON YEAR (2035) WITHOUT PROJECT CONDITIONS

As shown on Table 10-2, consistent with Existing 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 for Horizon Year (2035) Without Project traffic conditions. Worksheets for Horizon Year (2035) Without Project traffic conditions off-ramp queuing analysis are provided in Appendix 10.5.

10.5.2 HORIZON YEAR (2035) WITH PROJECT CONDITIONS

As shown on Table 10-2, consistent with Existing 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 for Horizon Year (2035) With Project traffic conditions. Worksheets for Horizon Year (2035) With Project traffic conditions off-ramp queuing analysis are provided in Appendix 10.6.

Table 10-2

Peak Hour Freeway Off-Ramp Queuing Summary for Horizon Year (2035) Conditions

Intersection	Movement	Available Stacking Distance (Feet)	2035 Without Project				2035 With Project			
			95th Percentile Queue (Feet)[2]		Acceptable?[1]		95th Percentile Queue (Feet)[2]		Acceptable?[1]	
			AM Peak Hour	PM Peak Hour	AM	PM	AM Peak Hour	PM Peak Hour	AM	PM
I-215 NB Off-Ramp / Palm Av.	NBL/T	910	218 [2]	208	Yes	Yes	218 [2]	208	Yes	Yes
	NBR	415	226 [2]	400 [2]	Yes	Yes	281 [2]	441 [2]	Yes	Yes[3]
I-215 SB Off-Ramp / Palm Av.	NBL/T/R	1,470	700 [2]	179 [2]	Yes	Yes	718 [2]	191 [2]	Yes	Yes

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

[2] Maximum queue length for the approach reported.

[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.

Freeway off-ramp queues were not evaluated for the With Magnolia Avenue Bridge alternative as the extension is not anticipated to effect the traffic forecasts south of Kendall Drive.

10.6 TRAFFIC SIGNAL WARRANTS ANALYSIS

The following intersection is anticipated to meet a peak hour traffic signal warrant under Horizon Year (2035) Without Project traffic conditions (see Appendix 10.7):

ID	Intersection Location	Jurisdiction	CMP
10	Palm Avenue / Belmont Avenue	City of San Bernardino	Yes

There are no additional traffic signals anticipated to meet peak hour volume based or planning level (Caltrans) ADT traffic signal warrants under Horizon Year (2035) With Project traffic conditions, in addition to the intersection previously warranted under Horizon Year (2035) Without Project traffic conditions (see Appendix 10.8). However, 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. As such, the installation of a traffic signal at the intersections of Palm Avenue at Belmont Avenue and Palm Avenue at Hallmark Parkway have not been recommended for the purposes of this TIA as the intersection is anticipated to operate at acceptable LOS under Horizon Year (2035) traffic conditions, without the installation of a traffic signal.

10.7 BASIC FREEWAY SEGMENT ANALYSIS

10.7.1 HORIZON YEAR (2035) WITHOUT PROJECT CONDITIONS

Horizon Year (2035) Without Project mainline directional volumes for the weekday AM and PM peak hours are provided on Exhibit 10-5. As shown on Table 10-3, the basic freeway segments analyzed for this study are anticipated to operate at an acceptable LOS (i.e., LOS D or better) during the peak hours, with the exception of the following:

ID	Freeway Mainline Segments
1	I-215 Freeway – Southbound, North of Palm Avenue – LOS F AM and PM peak hour
2	I-215 Freeway – Southbound, South of Palm Avenue – LOS F AM and PM peak hours

Horizon Year (2035) Without Project basic freeway segment analysis worksheets are provided in Appendix 10.9.

Table 10-3

Basic Freeway Segment Analysis for Horizon Year (2035) Conditions

Freeway	Direction	Mainline Segment	Lanes[1]	2035 Without Project				2035 With Project			
				Density[2]		LOS		Density[2]		LOS	
				AM	PM	AM	PM	AM	PM	AM	PM
I-215 Freeway	SB	North of Palm Avenue	2	**60.2**	**63.8**	**F**	**F**	**60.7**	**65.0**	**F**	**F**
		South of Palm Avenue	2	**82.3**	**87.0**	**F**	**F**	**84.2**	**89.1**	**F**	**F**
	NB	North of Palm Avenue	2	23.5	26.1	C	D	23.7	26.4	C	D
		South of Palm Avenue	2	26.5	34.5	D	D	26.7	34.9	D	D

* **BOLD** = Unacceptable Level of Service

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

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

EXHIBIT 10-5: HORIZON YEAR CUMULATIVE (2035) WITHOUT PROJECT FREEWAY MAINLINE VOLUMES (ACTUAL VEHICLES)

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10.7.2 HORIZON YEAR (2035) WITH PROJECT CONDITIONS

Horizon Year (2035) With Project mainline directional volumes for the weekday AM and PM peak hours are provided on Exhibit 10-6. As shown on Table 10-3, there are no additional basic freeway segments anticipated to operate at an unacceptable LOS during the peak hours for Horizon Year (2035) With Project traffic conditions, in addition to those previously identified for Horizon Year (2035) Without Project traffic conditions. Horizon Year (2035) With Project basic freeway segment analysis worksheets are provided in Appendix 10.10.

Freeway mainline segments were not evaluated for the With Magnolia Avenue Bridge alternative as the extension is not anticipated to effect the traffic forecasts south of Kendall Drive.

10.8 FREEWAY MERGE/DIVERGE ANALYSIS

10.8.1 HORIZON YEAR (2035) WITHOUT PROJECT CONDITIONS

Ramp merge and diverge operations were evaluated for Horizon Year (2035) Without Project traffic conditions and the results of this analysis are presented in Table 10-4. As shown in Table 10-4, the freeway ramp merge and diverge areas are anticipated to operate at acceptable LOS (i.e., LOS D or better), with the exception of the following:

ID	Freeway Merge/Diverge Ramp Junctions
1	I-215 Freeway – Southbound, Palm Avenue Off-Ramp – LOS F AM and PM peak hours
2	I-215 Freeway – Southbound, Palm Avenue On-Ramp – LOS F AM and PM peak hours
4	I-215 Freeway – Northbound, Palm Avenue Off-Ramp – LOS E PM peak hour only

Horizon Year (2035) Without Project freeway ramp junction operations analysis worksheets are provided in Appendix 10.11.

10.8.2 HORIZON YEAR (2035) WITH PROJECT CONDITIONS

Ramp merge and diverge operations were evaluated for Horizon Year (2035) With Project traffic conditions and the results of this analysis are presented in Table 10-4. As shown in Table 10-4, there are no additional freeway ramp merge and diverge areas are anticipated to operate at an unacceptable LOS for Horizon Year (2035) With Project traffic conditions, in addition to those previously identified for Horizon Year (2035) Without Project traffic conditions. Horizon Year (2035) With Project freeway ramp junction operations analysis worksheets are provided in Appendix 10.12.

Freeway merge/diverge ramp junctions were not evaluated for the With Magnolia Avenue Bridge alternative as the extension is not anticipated to effect the traffic forecasts south of Kendall Drive.

EXHIBIT 10-6: HORIZON YEAR CUMULATIVE (2035) WITH PROJECT FREEWAY MAINLINE VOLUMES (ACTUAL VEHICLES)

URBAN CROSSROADS

Table 10-4

Freeway Ramp Junction Merge/Diverge Analysis for Horizon Year (2035) Conditions

Freeway	Direction	Ramp or Segment	Lanes on Freeway[1]	2035 Without Project				2035 With Project			
				AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
				Density[2]	LOS	Density[2]	LOS	Density[2]	LOS	Density[2]	LOS
I-215 Freeway	SB	Off-Ramp at Palm Avenue	2	**49.5**	**F**	**50.3**	**F**	**49.6**	**F**	**50.6**	**F**
		On-Ramp at Palm Avenue	2	**49.3**	**F**	**50.0**	**F**	**49.5**	**F**	**50.2**	**F**
	NB	On-Ramp at Palm Avenue	2	28.3	D	30.6	D	28.5	D	30.8	D
		Off-Ramp at Palm Avenue	2	33.2	D	**38.9**	**E**	33.3	D	**39.2**	**E**

* **BOLD** = Unacceptable Level of Service

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

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

10.9 CUMULATIVE IMPACTS AND RECOMMENDED IMPROVEMENTS

This section provides a summary of cumulative impacts and recommended improvements.

10.9.1 RECOMMENDED IMPROVEMENTS TO ADDRESS DEFICIENCIES AT INTERSECTIONS

Improvement strategies have been recommended at intersections that have been identified as deficient in an effort to reduce each location's peak hour delay and improve the associated LOS grade to an acceptable LOS (LOS D or better). The effectiveness of the recommended improvement strategies discussed below to address Horizon Year (2035) traffic deficiencies is presented in Table 10-5 for the Without Magnolia Avenue Bridge alternative. Improvement strategies have not been recommended for the With Magnolia Avenue Bridge alternative, as the Project's contribution to the deficient study area intersection (Palm Avenue and Kendall Drive) is anticipated to be less-than-significant (i.e., the addition of Project traffic is anticipated to increase the v/c by less than 0.01 from the pre-project traffic condition).

The applicant shall participate in the funding of off-site improvements, including traffic signals that are needed to serve cumulative traffic conditions through the payment of City of San Bernardino DIF (if the improvements are included in the DIF program), or on a fair share basis (if the improvements are not included in the DIF fee program). These fees shall be collected by the City of San Bernardino, with the proceeds solely used as part of a funding mechanism aimed at ensuring that regional highways and arterial expansions keep pace with the projected population increases. Each of the improvements discussed above have been identified as being included as part of City DIF fee program or fair share contribution in Section 1.6 *Local and Regional Funding Mechanisms* of this TIA.

Worksheets for Horizon Year (2035) Without Project traffic conditions, with improvements, HCM calculation worksheets are provided in Appendix 10.13 (Without Magnolia Avenue Bridge). Worksheets for Horizon Year (2035) With Project traffic conditions, with improvements, HCM calculation worksheets are provided in Appendix 10.14 (Without Magnolia Avenue Bridge).

10.9.2 RECOMMENDED IMPROVEMENTS TO ADDRESS OFF-RAMP QUEUES

As shown previously on Table 10-2, there are no peak hour queuing issues at the I-215 Freeway at Palm Avenue interchange for both Horizon Year (2035) Without and With Project traffic conditions. As such, no improvements have been recommended.

10.9.3 RECOMMENDED IMPROVEMENTS TO ADDRESS DEFICIENCIES ON FREEWAY FACILITIES

The SCAG 2012 RTP identifies the construction of an additional high-occupancy vehicle (HOV) lane in each direction of the I-215 Freeway and the construction of a mixed flow lane in each direction of travel along the I-215 Freeway within the study area. (5) Caltrans typically assumes a reduction of fourteen percent to the freeway mainline through volumes in this region to account for vehicles utilizing the carpool (high-occupancy vehicle) lanes. The reduction to the I-215 Freeway mainline volumes has been applied to account for the proposed HOV lanes in conjunction with the additional mixed flow lane in each direction of travel.

Table 10-5

Intersection Analysis for Horizon Year (2035) Conditions With Improvements

#	Intersection	Traffic Control[3]	Intersection Approach Lanes[1]												Delay[2] (secs.)		Level of Service	
			Northbound			Southbound			Eastbound			Westbound						
			L	T	R	L	T	R	L	T	R	L	T	R	AM	PM	AM	PM
10	Palm Av. / Belmont Av.																	
	- 2035 Without Project																	
	- Without Improvements	AWS	0	1	1	0	1	0	0	1	0	0	1	0	**41.1**	11.5	**E**	B
	- With Improvements	AWS	**1**	1	**0**	**1**	1	0	**1**	1	0	**1**	1	0	28.4	10.8	C	B
	- 2035 With Project																	
	- Without Improvements	AWS	0	1	1	0	1	0	0	1	0	0	1	0	**41.3**	12.5	**E**	B
	- With Improvements	AWS	**1**	1	**0**	**1**	1	0	**1**	1	0	**1**	1	0	31.5	11.4	D	B
11	Palm Av. / Irvington Av.																	
	- 2035 Without Project																	
	- Without Improvements	TS	1	2	0	1	2	0	0	1	0	0	1	0	**58.1**	16.2	**E**	B
	- With Improvements	TS	1	2	0	1	2	0	0	1	**1>**	0	1	0	40.3	16.0	D	B
	- 2035 With Project																	
	- Without Improvements	TS	1	2	0	1	2	0	0	1	0	0	1	0	**60.6**	16.5	**E**	B
	- With Improvements	TS	1	2	0	1	2	0	0	1	**1>**	0	1	0	41.5	16.3	D	B
14	Palm Av. / I-215 SB Ramps																	
	- 2035 Without Project																	
	- Without Improvements	TS	1	2	0	1	1	1	0	1	d	0	1	0	48.9	**57.5**	D	**E**
	- With Improvements	TS	1	2	0	**2**	1	1	0	1	d	0	1	0	26.5	20.1	C	C
	- 2035 With Project																	
	- Without Improvements	TS	1	2	0	1	1	1	0	1	d	0	1	0	53.7	**57.9**	D	**E**
	- With Improvements	TS	1	2	0	**2**	1	1	0	1	d	0	1	0	29.8	24.1	C	C
19	University Pkwy. / Kendall Dr.																	
	- 2035 Without Project																	
	- Without Improvements	TS	2	3	0	1	3	0	2	2	0	2	2	0	48.9	**89.3**	D	**F**
	- With Improvements	TS	2	3	**1>**	**2**	3	0	2	**3**	**1>**	2	**3**	0	40.9	52.4	D	D
	- 2035 With Project																	
	- Without Improvements	TS	2	3	0	1	3	0	2	2	0	2	2	0	49.6	**92.9**	D	**F**
	- With Improvements	TS	2	3	**1>**	**2**	3	0	2	**3**	**1>**	2	**3**	0	41.1	54.8	D	D

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

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

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

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

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

As shown on Table 10-6, the I-215 freeway mainline segments are anticipated to operate at an acceptable LOS with the improvements discussed above (i.e., LOS C or better). Worksheets for Horizon Year (2035) Without and With Project conditions freeway mainline level of service analysis, with improvements, are provided in Appendix 10.15 and Appendix 10.16.

Similarly, Table 10-7 shows that the I-215 freeway ramp junctions are anticipated to operate at an acceptable LOS with the improvements discussed above (i.e., LOS D or better). Horizon Year (2035) Without and With Project freeway ramp junction level of service analysis worksheets, with improvements, are provided in Appendix 10.17 and Appendix 10.18.

Table 10-6

Basic Freeway Segment Analysis for Horizon Year (2035) Conditions With Improvements

Freeway	Direction	Mainline Segment	Lanes[1]	2035 Without Project				2035 With Project			
				Density[2]		LOS		Density[2]		LOS	
				AM	PM	AM	PM	AM	PM	AM	PM
I-215 Freeway	SB	North of Palm Avenue	**3**	22.4	23.0	C	C	22.5	23.2	C	C
		South of Palm Avenue	**3**	25.3	25.7	C	C	25.5	25.9	C	C
	NB	North of Palm Avenue	**3**	13.1	14.3	B	B	13.2	14.4	B	B
		South of Palm Avenue	**3**	14.7	17.7	B	B	14.8	17.9	B	B

[1] Per the SCAG RTP, planned improvements along this segment of the I-215 Freeway include an additional mixed flow lane and an HOV lane in each direction of travel.

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

Table 10-7

Freeway Ramp Junction Merge/Diverge Analysis for Horizon Year (2035) Conditions

Freeway	Direction	Ramp or Segment	Lanes on Freeway[1]	2035 Without Project				2035 With Project			
				AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
				Density[2]	LOS	Density[2]	LOS	Density[2]	LOS	Density[2]	LOS
I-215 Freeway	SB	Off-Ramp at Palm Avenue	**3**	30.0	D	30.0	D	30.1	D	30.1	D
		On-Ramp at Palm Avenue	**3**	30.3	D	29.8	D	30.5	D	30.0	D
	NB	On-Ramp at Palm Avenue	**3**	18.1	B	18.8	B	18.3	B	19.0	B
		Off-Ramp at Palm Avenue	**3**	22.9	C	26.5	C	23.0	C	26.7	C

* **BOLD** = Unacceptable Level of Service

[1] Per the SCAG RTP, planned improvements along this segment of the I-215 Freeway include an additional mixed flow lane and an HOV lane in each direction of travel.

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

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