Indian Street Commerce Center

TRAFFIC IMPACT ANALYSIS

CITY OF MORENO VALLEY

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LIST OF ABBREVIATED TERMS

(1)	Reference
ADT	Average Daily Traffic
Caltrans	California Department of Transportation
CEQA	California Environmental Quality Act
CMP	Congestion Management Program
DIF	Development Impact Fee
E+P	Existing Plus Project
FHWA	Federal Highway Administration
HCM	Highway Capacity Manual
ITE	Institute of Transportation Engineers
JPA	Joint Powers Authority
LOS	Level of Service
MUTCD	Manual on Uniform Traffic Control Devices
MVIAP	Moreno Valley Industrial Area Plan
NP	No Project (or Without Project)
PCE	Passenger Car Equivalents
PHF	Peak Hour Factor
Project	Indian Street Commerce Center
RCTC	Riverside County Transportation Commission
RTA	Riverside Transit Authority
RTP	Regional Transportation Plan
SCAG	Southern California Association of Governments
SCAQMD	South Coast Air Quality Management District
SHS	State Highway System
sf	Square Feet
TIA	Traffic Impact Analysis
TSF	Thousand Square Feet
TUMF	Transportation Uniform Mitigation Fee
WP	With Project
WRCOG	Western Riverside Council of Governments
V/C	Volume to Capacity

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1 INTRODUCTION

This report presents the results of the traffic impact analysis (TIA) for the proposed Indian Street Commerce Center development ("Project") located at 17845 Indian Street in the City of Moreno Valley as shown on Exhibit 1-1.

The purpose of this traffic impact analysis is to evaluate the potential circulation system deficiencies that may result from the development of the proposed Project, and to recommend improvements to achieve acceptable circulation system operational conditions. This traffic study has been prepared in accordance with the City of Moreno Valley Transportation Engineering Division's *Traffic Impact Analysis Preparation Guide* (August 2007), the California Department of Transportation (Caltrans) Guide for the Preparation of Traffic Impact Studies (December 2002), and consultation with City of Moreno Valley staff during the scoping process. (1) (2) The approved Project Traffic Study Scoping agreement is provided in Appendix 1.1 of this TIA.

1.1 PROJECT OVERVIEW

The Project is proposed to consist of a total of 446,350 square feet, of which 357,080 square feet (sf) would be allocated to High-Cube Warehouse / Distribution Center use and 89,270 sf to Manufacturing use within a single building. Per the City's traffic study guidelines, the Opening Year will have a 5-year minimum horizon from baseline conditions. As such, the Opening Year analysis will assess 2020 traffic conditions.

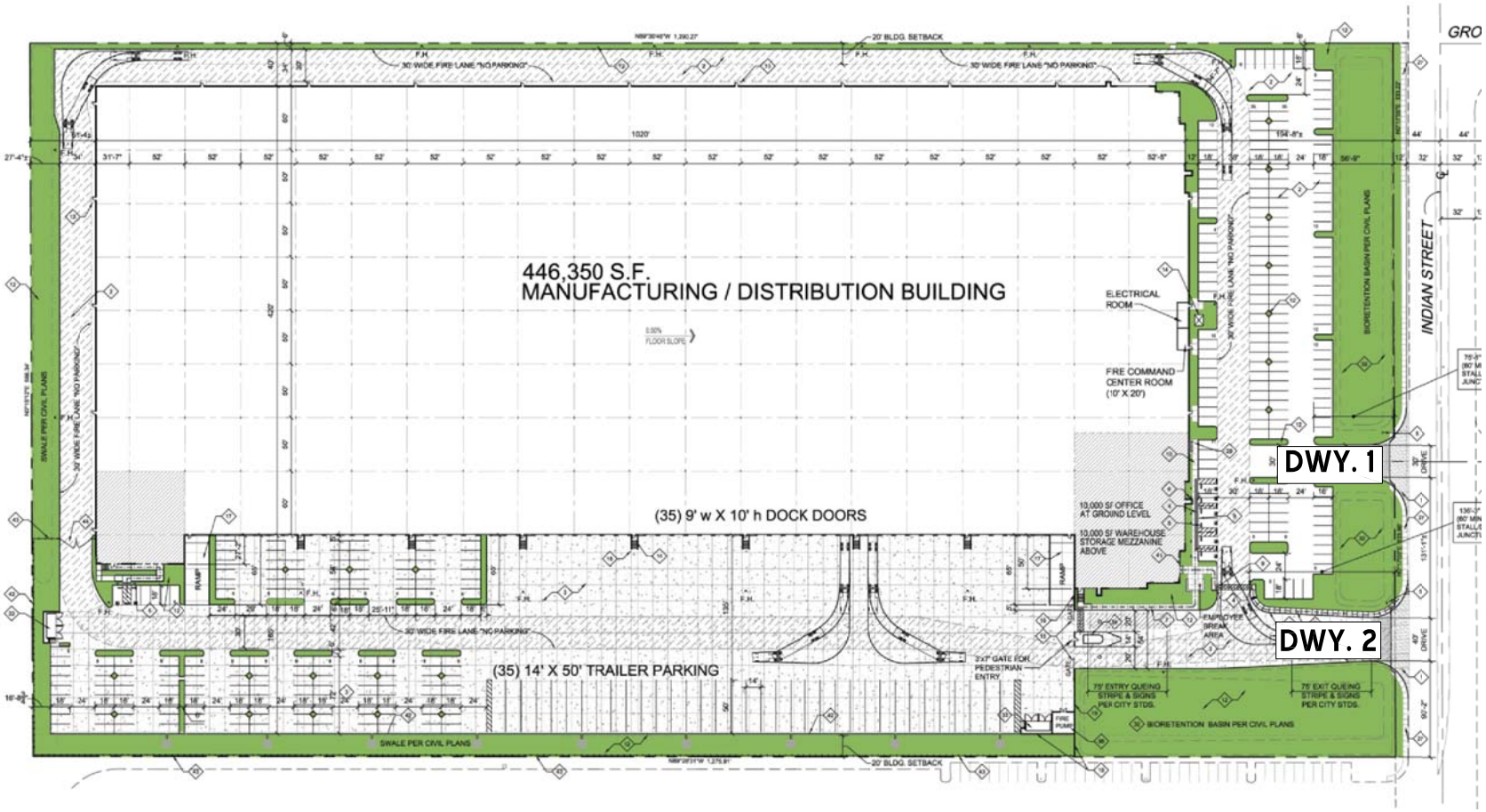
Vehicular and truck traffic access will be provided via the following driveways (see Exhibit 1-1):

- Indian Street / Driveway 1 – Full access driveway providing access to passenger cars only. This driveway is proposed to align with the proposed future driveway on the east side of Indian Street.
- Indian Street / Driveway 2 – Full access driveway providing access to trucks only.

Regional access to the project site is provided via the I-215 Freeway at Harley Knox Boulevard interchanges.

Trips generated by the Project's proposed land uses have been estimated based on trip generation rates collected by the Institute of Transportation Engineers (ITE) *Trip Generation Manual*, 9th Edition, 2012. (3) The Project is estimated to generate a net total of 1,472 passenger-car-equivalent (PCE) trip-ends per day on a typical weekday with approximately 157 net AM PCE peak hour trips and 166 net PM PCE peak hour trips. The assumptions and methods used to estimate the Project's trip generation characteristics are discussed in greater detail in Section 4.1 *Project Trip Generation* of this report.

EXHIBIT 1-1: CONCEPTUAL SITE PLAN



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) (1 scenario)
- Opening Year Cumulative (2020), Without and With Project (2 scenarios)

1.2.1 EXISTING (2015) CONDITIONS

Information for Existing (2015) conditions is disclosed to represent the baseline traffic conditions as they existed at the time this report was prepared.

1.2.2 EXISTING PLUS PROJECT CONDITIONS

The Existing plus Project (E+P) analysis determines circulation system deficiencies that would occur on the existing roadway system in the scenario of the Project being placed upon Existing conditions.

1.2.3 OPENING YEAR CUMULATIVE (2020) CONDITIONS

To account for growth in traffic between Existing Conditions (2015) and the Project Opening Year (2020), a compounded annual traffic growth rate of 2 percent was assumed (10.41 percent aggregate growth in background traffic for the period 2015—2020). The 2 percent annual growth rate is intended to capture non-specific ambient traffic growth.

In context, the TIA's assumed 2 percent compounded annual growth rate is considered a reasonable approximation of future traffic growth when compared to demographic projections reflected in other local and regional growth modeling efforts. More specifically, the Southern California Association of Governments (SCAG) 2012—2035 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS) growth forecasts for the City of Moreno Valley assume the City population to increase from 187,400 in 2008 to 255,200 by the year 2035, or an approximate 1.15 percent growth rate compounded annually. The RTP/SCS assumed growth in households over the same 27-year period reflects an increase from 51,100 households to 72,800 households; a rate of 1.32 percent compounded annually. At the upper end of assumed RTP/SCS growth rates, employment over the same 27-year period is projected to increase from 32,300 jobs to 64,400 jobs; a rate of approximately 2.59 percent compounded annually. (4) The 2 percent compounded annual traffic growth rate employed in the TIA reflects the fact that not all persons comprising population growth, household growth, or employment growth would translate on a one to one basis as a new vehicle trip in the region; and establishes a judicious midrange estimate lying between the RTP/SCS assumed regional population growth rate (1.15 percent) and the RTP/SCS assumed regional employment growth rate (2.59 percent).

Conservatively, the TIA estimates of area traffic growth then add traffic generated by other known or probable related projects. These related projects are at least in part already accounted for in the assumed annual 2 percent ambient growth in traffic noted above; and in some instances

these related projects would likely not be implemented and operational within the 2020 Opening Year time frame assumed for the Project. The resultant assumed traffic growth rate employed in the TIA (2 percent annual ambient growth + traffic generated by related projects) would therefore tend to overstate rather than understate background cumulative traffic impacts under 2020 conditions

The Opening Year Cumulative (2020) Without and With Project traffic conditions analyses will be utilized to determine if improvements funded through regional transportation mitigation fee programs, such as the Transportation Uniform Mitigation Fee (TUMF) and Development Impact Fee (DIF) programs, or other approved funding mechanism can accommodate the near-term cumulative traffic at the target level of service (LOS) identified in the City of Moreno Valley General Plan. (5) If the "funded" improvements can provide the target LOS, then the Project's payment into TUMF and/or DIF will be considered as near-term cumulative mitigation through the conditions of approval. Other improvements needed beyond the "funded" improvements (such as localized improvements to non-TUMF facilities) are identified as such.

1.3 STUDY AREA

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

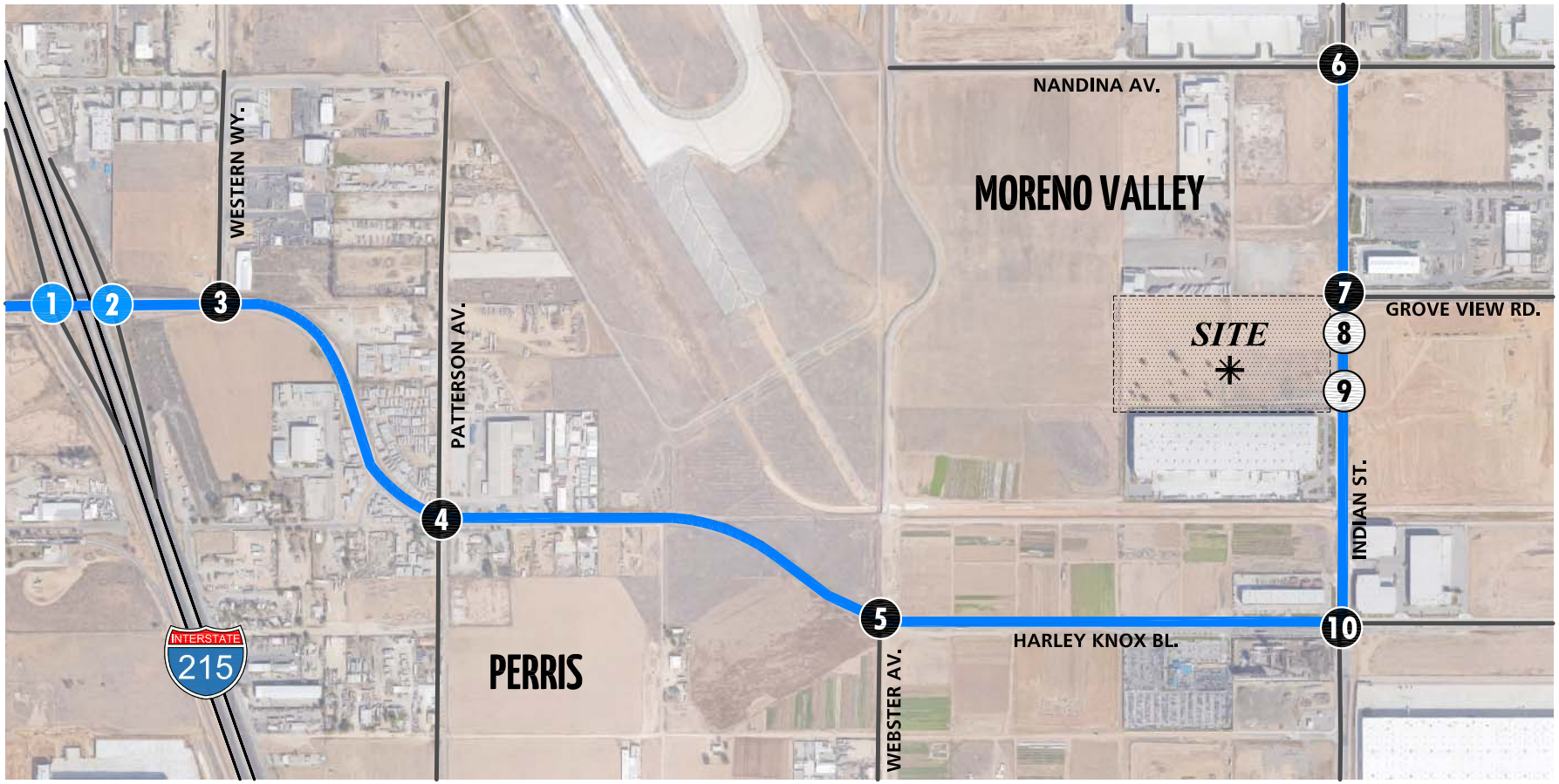
1.3.1 INTERSECTIONS

The 10 study area intersections shown on Exhibit 1-2 and listed at Table 1-1 were selected for this TIA based on the City of Moreno Valley's Traffic Study Guidelines and in consultation with City of Moreno Valley staff. Pursuant to the Traffic Study Guidelines, the City requires analysis of intersections where the Project would contribute 50 or more peak hour trips.[1]

Although the Project is anticipated to distribute traffic northerly on Indian Street and easterly on Nandina Avenue, less than 50 peak hour trips would be contributed at intersections in these directions. As such, the study area excludes affected intersections to the north and east, but does however include intersections to the south and west, where the Project is anticipated to contribute 50 or more peak hour trips. (1)

[1] The "50 or more peak hour trips" intersection analytic protocol stipulated in the City Traffic Study Guidelines is consistent with standard industry practice. It is noted further that the 50 peak hour trip threshold is employed by other agencies throughout southern California including Caltrans, County of Riverside, County of San Bernardino, and the County of Orange.

EXHIBIT 1-2: LOCATION MAP



LEGEND:

- 0 = EXISTING INTERSECTION ANALYSIS LOCATION
- 0 = FUTURE INTERSECTION ANALYSIS LOCATION
- 0 = RIVERSIDE COUNTY CMP INTERSECTION ANALYSIS LOCATION
- = ROADWAY SEGMENT ANALYSIS LOCATION

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URBAN CROSSROADS

TABLE 1-1: INTERSECTION ANALYSIS LOCATIONS

ID	Intersection Location	Jurisdiction	CMP?
1	I-215 Southbound Ramps / Harley Knox Boulevard	Caltrans, Riverside Co.	Yes
2	I-215 Northbound Ramps / Harley Knox Boulevard	Caltrans, Perris	Yes
3	Western Way / Harley Knox Boulevard	Perris	No
4	Patterson Avenue / Harley Knox Boulevard	Perris	No
5	Webster Avenue / Harley Knox Boulevard	Perris	No
6	Indian Street / Nandina Avenue	Moreno Valley	No
7	Indian Street / Grove View Road	Moreno Valley	No
8	Indian Street / Driveway 1	Moreno Valley	No
9	Indian Street / Driveway 2	Moreno Valley	No
10	Indian Street / Harley Knox Boulevard	Perris	No

The intent of a Congestion Management Program (CMP) is to more directly link land use, transportation, and air quality, thereby prompting reasonable growth management programs that will effectively utilize new transportation funds, alleviate traffic congestion and related impacts, and improve air quality. Counties within California have developed CMPs with varying methods and strategies to meet the intent of the CMP legislation. The County of Riverside CMP became effective with the passage of Proposition 111 in 1990 and updated most recently in 2011. The Riverside County Transportation Commission (RCTC) adopted the 2011 CMP for the County of Riverside in December 2011. (6) There are 2 study area intersections that are ramp-to-arterial intersections with the I-215 Freeway, which are identified as CMP facilities.

1.3.2 ROADWAY SEGMENTS

The roadway segment study area utilized for this analysis is based on a review of the key roadway segments in which the Project is anticipated to contribute 50 or more peak hour trips. The study area identifies a total of 12 existing/future roadway segments. The roadway segments include the segments on either side of the study area intersections and are listed in Table 1-2 and are identified on Exhibit 1-2.

TABLE 1-2: ROADWAY SEGMENT ANALYSIS LOCATIONS

ID	Street	Segment	Jurisdiction
1	Harley Knox Boulevard	I-215 SB Ramps to I-215 NB Ramps	Perris
2		I-215 NB Ramps to Western Way	Perris
3		East of Western Way	Perris
4		West of Patterson Avenue	Perris
5		East of Patterson Avenue	Perris
6		West of Webster Avenue	Perris
7		East of Webster Avenue	Perris
8		West of Indian Street	Perris
9	Indian Street	South of Nandina Avenue	Moreno Valley
10		North of Grove View Road	Moreno Valley
11		South Grove View Road	Moreno Valley
12		North of Harley Knox Boulevard	Perris

1.4 SUMMARY OF INTERSECTION ANALYSIS

1.4.1 INTERSECTIONS

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 3.0 *Existing Conditions*, Section 5.0 *E+P Traffic Conditions*, and Section 6.0 *Opening Year Cumulative (2020) Traffic Conditions* of this report. The peak hour intersection LOS are summarized on Table 1-3 for each of the analysis scenarios.

1.4.2 ROADWAY SEGMENTS

A summary of the operationally deficient study area roadway segments and recommended improvements required to achieve acceptable circulation system operational conditions are described in detail within Section 3.0 *Existing Conditions*, Section 5.0 *E+P Traffic Conditions*, and Section 6.0 *Opening Year Cumulative (2020) Traffic Conditions* of this report. The roadway segment LOS are summarized on Table 1-4 for each of the analysis scenarios.

1.5 LOCAL AND REGIONAL FUNDING MECHANISMS

Transportation improvements throughout the City of Moreno Valley are funded through a combination of project mitigation, fair share contributions or development impact fee programs, such as Transportation Uniform Mitigation Fee (TUMF) program or the City's Development Impact Fee (DIF) program.

Table 1-3

Summary of Intersection Operations by Analysis Scenario

#	Intersection	Traffic Control [1]	Existing (2015)				E+P				2020 NP				2020 WP			
			Delay		LOS[2]		Delay		LOS[2]		Delay		LOS[2]		Delay		LOS[2]	
			AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
1	I-215 SB Ramps / Harley Knox Bl	TS	29.1	32.9	C	C	32.0	34.8	C	C	**180.2**	**119.9**	**F**	**F**	**199.3**	**130.7**	**F**	**F**
2	I-215 NB Ramps / Harley Knox Bl	TS	19.3	18.4	B	B	19.7	19.1	B	B	**78.5**	**>200.0**	**E**	**F**	**81.9**	**>200.0**	**F**	**F**
3	Western Wy / Harley Knox Bl	TS	13.9	14.0	B	B	14.3	15.2	B	C	**>100.0**	**>100.0**	**F**	**F**	**>100.0**	**>100.0**	**F**	**F**
4	Patterson Av / Harley Knox Bl	TS	19.9	20.2	B	C	20.4	21.1	C	C	**74.0**	**85.2**	**E**	**F**	**86.5**	**114.1**	**F**	**F**
5	Webster Av / Harley Knox Bl	TS	9.5	9.6	A	A	9.5	9.6	A	A	12.9	10.7	B	B	13.3	10.9	B	B
6	Indian St / Nandina Av	TS	18.9	25.8	B	C	19.7	26.4	B	C	29.3	44.3	C	D	30.5	53.1	C	D
7	Indian St / Grove View Rd	CSS	12.0	18.6	B	C	12.4	19.4	B	C	**78.5**	25.6	**F**	D	**98.4**	26.3	**F**	D
8	Indian St / Driveway 1	**CSS**	Does Not Exist				10.5	13.1	B	B	Does Not Exist				31.6	31.5	D	D
9	Indian St / Driveway 2	**CSS**	Does Not Exist				9.6	12.2	A	B	Does Not Exist				10.9	33.4	B	D
10	Indian St / Harley Knox Bl	TS	16.8	24.2	B	C	22.1	28.4	C	C	29.6	**>200.0**	C	**F**	34.4	**>200.0**	C	**F**

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

-- = Not Applicable/Future Intersection

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

[2] LOS = Level of Service

Table 1-4

Summary of Roadway Segment Level of Service

#	Roadway	Segment Limits	Roadway Section	Existing V/C[1]	Existing LOS[2]	E+P V/C[1]	E+P LOS[2]	2020 NP V/C[1]	2020 NP LOS[2]	2020 WP V/C[1]	2020 WP LOS[2]	Acceptable LOS[2]
1	Harley Knox Boulevard	I-215 SB Ramps to I-215 NB Ramps	4D	0.38	A	0.40	A	0.74	C	0.75	C	D
2		I-215 NB Ramps to Western Way	4D	0.50	A	0.52	A	**0.98**	**E**	**1.01**	**F**	D
3		East of Western Way	4U	0.72	C	0.76	C	**1.40**	**F**	**1.43**	**F**	D
4		West of Patterson Avenue	4U	0.69	B	0.73	C	**1.36**	**F**	**1.40**	**F**	D
5		East of Patterson Avenue	6D	0.32	A	0.34	A	0.64	B	0.66	B	D
6		West of Webster Avenue	6D	0.31	A	0.33	A	0.63	B	0.65	B	D
7		East of Webster Avenue	6D	0.31	A	0.33	A	0.62	B	0.64	B	D
8		West of Indian Street	6D	0.37	A	0.39	A	0.69	B	0.71	C	D
9	Indian Street	South of Nandina Avenue	2D	0.67	B	0.68	B	**1.86**	**F**	**1.87**	**F**	D
10		North of Grove View Road	2D	0.66	B	0.67	B	**1.80**	**F**	**1.81**	**F**	C
11		South of Grove View Road	2D	0.74	C	0.75	C	**1.40**	**F**	**1.42**	**F**	C
12		North of Harley Knox Boulevard	4D	0.38	A	0.41	A	0.73	C	0.76	C	D

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

[1] V/C = Volume to Capacity Ratio

[2] LOS = Level of Service

1.5.1 TRANSPORTATION UNIFORM MITIGATION FEE (TUMF) PROGRAM

The Western Riverside Council of Governments (WRCOG) is responsible for establishing and updating TUMF rates. The County may grant to developers a credit against the specific components of fees for the dedication of land or the construction of facilities identified in the list of improvements funded by each of these fee programs. Fees are based upon projected land uses and a related transportation need to address growth based upon a 2009 Nexus study.

TUMF is an ambitious regional program created to address cumulative impacts of growth throughout western Riverside County. Program guidelines are being handled on an iterative basis. Exemptions, credits, reimbursements and local administration are being deferred to primary agencies. The County of Riverside serves this function for the proposed Project. Fees submitted to the County are passed on to the WRCOG as the ultimate program administrator.

TUMF guidelines empower a local zone committee to prioritize and arbitrate certain projects. The Project is located in the Central Zone. The zone has developed a 5-year capital improvement program to prioritize public construction of certain roads. TUMF is focused on improvements necessitated by regional growth. The I-215/Harley Knox Boulevard interchange, Harley Knox Boulevard, Indian Street, and Perris Boulevard are designated TUMF roadways/facilities within the Project's traffic study area. The TUMF Central Zone Transportation Improvement Program map is included in Appendix 1.2.

1.5.2 CITY OF MORENO VALLEY DEVELOPMENT IMPACT FEE (DIF) PROGRAM

The City of Moreno Valley 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 program includes facilities that are not part of, or which may exceed improvements identified and covered by the TUMF program. As a result, the pairing of the regional and local fee programs provides a more comprehensive funding and implementation plan to ensure an adequate and interconnected transportation system. 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 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 Project Applicant would pay requisite DIF pursuant to incumbent City ordinance requirements. Payment of requisite DIF would satisfy the Applicant's mitigation responsibilities for potentially significant impacts affecting DIF-funded facilities.

1.5.3 FAIR SHARE FEES

The Project Applicant's mitigation responsibilities may also be may be fulfilled through payment of fair-share fees. Fair share fees would be paid in instances where required traffic facilities are not otherwise funded by TUMF and/or DIF programs noted above.

1.6 PROJECT IMPACTS AND MITIGATION MEASURES

Based on the assessment of E+P traffic conditions, there were no study area intersections that were found to be impacted by the Project. Section 5 *E+P Traffic Analysis* includes the detailed analysis results.

1.7 CUMULATIVE IMPACTS AND MITIGATION MEASURES

This section provides a summary of recommended improvements and associated fee assessments necessary to address the Project's contributions to study area cumulative traffic impacts.

Table 1-5 lists the recommended improvements necessary to reduce the identified intersection LOS deficiencies, by analysis scenario. Street and intersection improvements that may be funded though the TUMF and/or DIF programs are noted. If a particular facility tentatively listed in Table 1-5 is ultimately excluded from the TUMF and/or DIF programs, 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. A summary of recommended intersection improvements for each analysis scenario is also shown on Exhibit 1-3.

Improvements included in a defined program and constructed by development may be eligible for a fee credit or reimbursement through the program where appropriate. Tables 1-5 also summarizes the applicable fair share percentage associated with each of the recommended improvements. Detailed fair share calculations, for each peak hour, has been provided on Table 1-6 for the applicable deficient intersections shown previously on Table 1-5.

Mitigation Measure 1.1 – Prior to the issuance of building permits, the Project applicant shall participate in the City's DIF and County TUMF fee programs by paying the requisite fees at the time of building permit, and in addition pay the Project's fair share amount of $3,198 for the improvements identified in Table 1-5 that are consistent with the improvements shown on Table 6-4, or as otherwise agreed to by the City and Applicant. Project fair share payment shall only be collected if the City creates a fee program that includes the improvements the fair share contribution is intended to construct.

Table 1-5

Summary of Improvements by Analysis Scenario

#	Intersection Location	Jurisdiction	Recommended Improvements[1]				Improvements in DIF, TUMF, etc.[1]	Total Cost[2]	Fair Share %[3]	Fair Share Cost[3]
			Existing (2015)	E+P	2020 Without Project	2020 With Project				
1	I-215 SB Ramps / Harley Knox Bl	Caltrans, Riverside Co.	None	None	Restripe SB approach w/ 2 left turn lanes and shared through-right turn lane	Same	Yes (TUMF)[4]		NA[5]	
					2nd WB left turn lane	Same	Yes (TUMF)[4]			
							TOTAL	**$0**		**$0**
2	I-215 NB Ramps / Harley Knox Bl	Caltrans, Perris	None	None	2nd EB left turn lane	Same	Yes (TUMF)[4]		NA[5]	
					WB free-right turn lane	Same	Yes (TUMF)[4]			
							TOTAL	**$0**		**$0**
3	Western Wy / Harley Knox Bl	Perris	None	None	Traffic signal	Same	No	$294,693	4.9%	$14,297
					EB left turn lane	Same	No	$87,465		$4,243
							TOTAL	**$382,158**		**$18,541**
4	Patterson Av / Harley Knox Bl	Perris	None	None	3rd EB through lane	Same	Yes (TUMF)[4]		NA[5]	
					3rd WB through lane	Same	Yes (TUMF)[4]			
							TOTAL	**$0**		**$0**
7	Indian St / Grove View Rd	Moreno Valley	None	None	Traffic signal	Same	No	$294,693	1.7%	$4,885
					Add 2nd NB through lane	Same	Yes (TUMF)[4]			
					Add 2nd SB through lane	Same	Yes (TUMF)[4]			
							TOTAL	**$294,693**		**$4,885**
10	Indian St / Harley Knox Bl	Perris	None	None	SB right turn lane w/ overlap phasing	Same	No	$175,873	5.3%	$9,354
					2nd EB left turn lane	Same	No	$87,465		$4,652
							TOTAL	**$263,338**		**$14,006**
Total Project Fair Share Contribution to the City of Moreno Valley (non-DIF/TUMF)[6]								**$294,693**		**$4,885**
Total Project Fair Share Contribution to the City of Perris[7]								**$645,495**		**$32,547**

[1] Improvements included in TUMF Nexus or City of Moreno Valley DIF programs.

[2] Costs have been estimated using the data provided in Appendix G of the San Bernardino County CMP (2003 Update) for preliminary construction costs. Appendix G costs escalated by a factor of 1.7493 to reflect 2020 conditions, except for Traffic Signals. Traffic signal costs have been escalated by a factor 1.17877 from 2015 costs of $250,000 to reflect 2020 conditions

[3] Program improvements constructed by project may be eligible for fee credit. In lieu fee payment is at discretion of City. Represents the fair share percentage for the Project during the most impacted peak hour.

[4] Although the interchange is identified as a TUMF interchange, the interchange is not currently identified on the Central Zone 5-Year Transportation Improvement Program Amendment (adopted January 6, 2014).

[5] Fair share percentage is not shown as the recommended improvements at this location are included in a pre-existing fee program.

[6] Total project fair share contribution consists of the improvements which are not already included in the City-wide DIF/County TUMF for those intersections wholly or partially within the City of Moreno Valley.

[7] 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 Perris.

Table 1-6

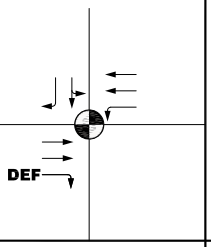
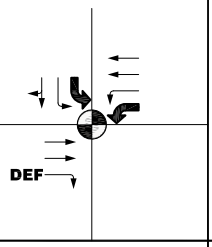
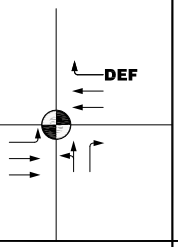
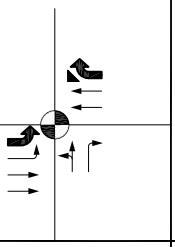
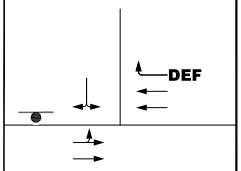
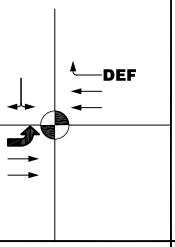
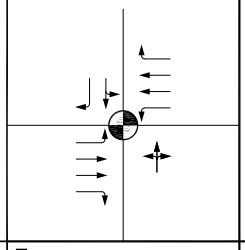
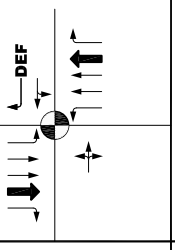
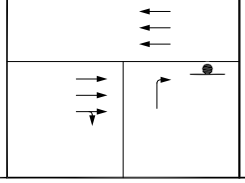
Project Fair Share Calculations

#	Intersection		Existing	Project	2020 With Project	Total New Traffic	Project Fair Share[1]
3	Western Wy / Harley Knox Bl						
		AM:	1,598	103	3,721	2,123	**4.9%**
		PM:	1,550	109	3,946	2,396	4.5%
7	Indian St / Grove View Rd						
		AM:	607	34	2,658	2,051	**1.7%**
		PM:	1,027	35	3,178	2,151	1.6%
10	Indian St / Harley Knox Bl						
		AM:	1,511	125	3,669	2,158	5.8%
		PM:	1,742	131	4,205	2,463	**5.3%**

* Highest deficient peak hour represented in **BOLD** and shown on Table 1-4.

[1] Fair share based on net new traffic which is calculated from Opening Year Cumulative (2020) with Project traffic volumes less Existing (2015) traffic volumes.

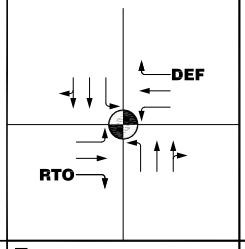
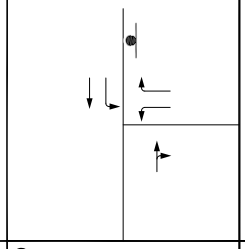
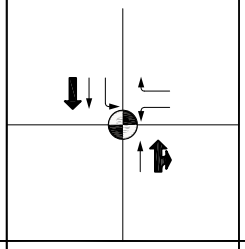
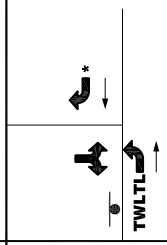
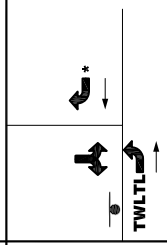
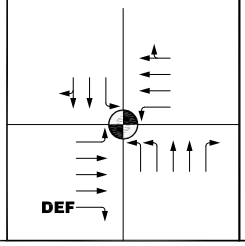
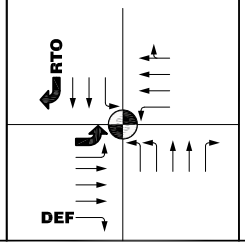
EXHIBIT 1-3 (1 OF 2): SUMMARY OF RECOMMENDED IMPROVEMENTS

	Existing	E+P	2020 NP	2020 WP
I-215 SB Ramps / Harley Knox Bl.	1 	Same as Existing		Same as 2020 NP
I-215 NB Ramps / Harley Knox Bl.	2 	Same as Existing		Same as 2020 NP
Western Wy. / Harley Knox Bl.	3 	Same as Existing		Same as 2020 NP
Patterson Av. / Harley Knox Bl.	4 	Same as Existing		Same as 2020 NP
Webster Av. / Harley Knox Bl.	5 	Same as Existing	Same as Existing	Same as Existing

LEGEND:

- = TRAFFIC SIGNAL
- = STOP SIGN
- = IMPROVEMENT
- = EXISTING LANE
- DEF = DEFACTO RIGHT TURN
- = FREE RIGHT TURN

EXHIBIT 1-3 (2 OF 2): SUMMARY OF RECOMMENDED IMPROVEMENTS

	Existing	E+P	2020 NP	2020 WP
Indian St. / Nandina Av.	6 	Same as Existing	Same as Existing	Same as Existing
Indian St. / Grove View Rd.	7 	Same as Existing		Same as 2020 NP
Indian St. / Driveway 1	8 Intersection Does Not Exist		Intersection Does Not Exist	Same as E+P
Indian St. / Driveway 2	9 Intersection Does Not Exist		Intersection Does Not Exist	Same as E+P
Indian St. / Harley Knox Bl.	10 	Same as Existing		Same as 2020 NP

LEGEND:

- = TRAFFIC SIGNAL
- = STOP SIGN
- = IMPROVEMENT
- = EXISTING LANE
- RTO = RIGHT TURN OVERLAP
- DEF = DEFACTO RIGHT TURN
- TWLTL = TWO WAY LEFT TURN LANE
- * = TRAP LANE TO BE STRIPED AS A SHARED THROUGH-RIGHT IN THE FUTURE.

1.8 SITE ADJACENT ROADWAY AND SITE ACCESS IMPROVEMENTS

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

The Project is proposed to have access on Indian Street via Driveway 1 and Driveway 2. Both driveways are assumed to allow full-access. Driveway 1 is proposed to serve passenger cars only, while trucks would utilize Driveway 2. Driveway 1 is proposed to align with the proposed future driveway on the east side of Indian Street. Regional access to the project site is provided via the I-215 Freeway at Harley Knox Boulevard interchanges.

Roadway improvements necessary to provide site access and on-site circulation are assumed to be constructed in conjunction with site development and are described below. These improvements are required to be in place prior to occupancy. Exhibit 1-4 illustrates the site-adjacent roadway improvement recommendations and site access improvements. Construction of on-site and site adjacent improvements are recommended to occur in conjunction with adjacent Project development activity or as needed for Project access purposes. A queuing analysis has been provided for the site access driveways in Appendix 1.3.

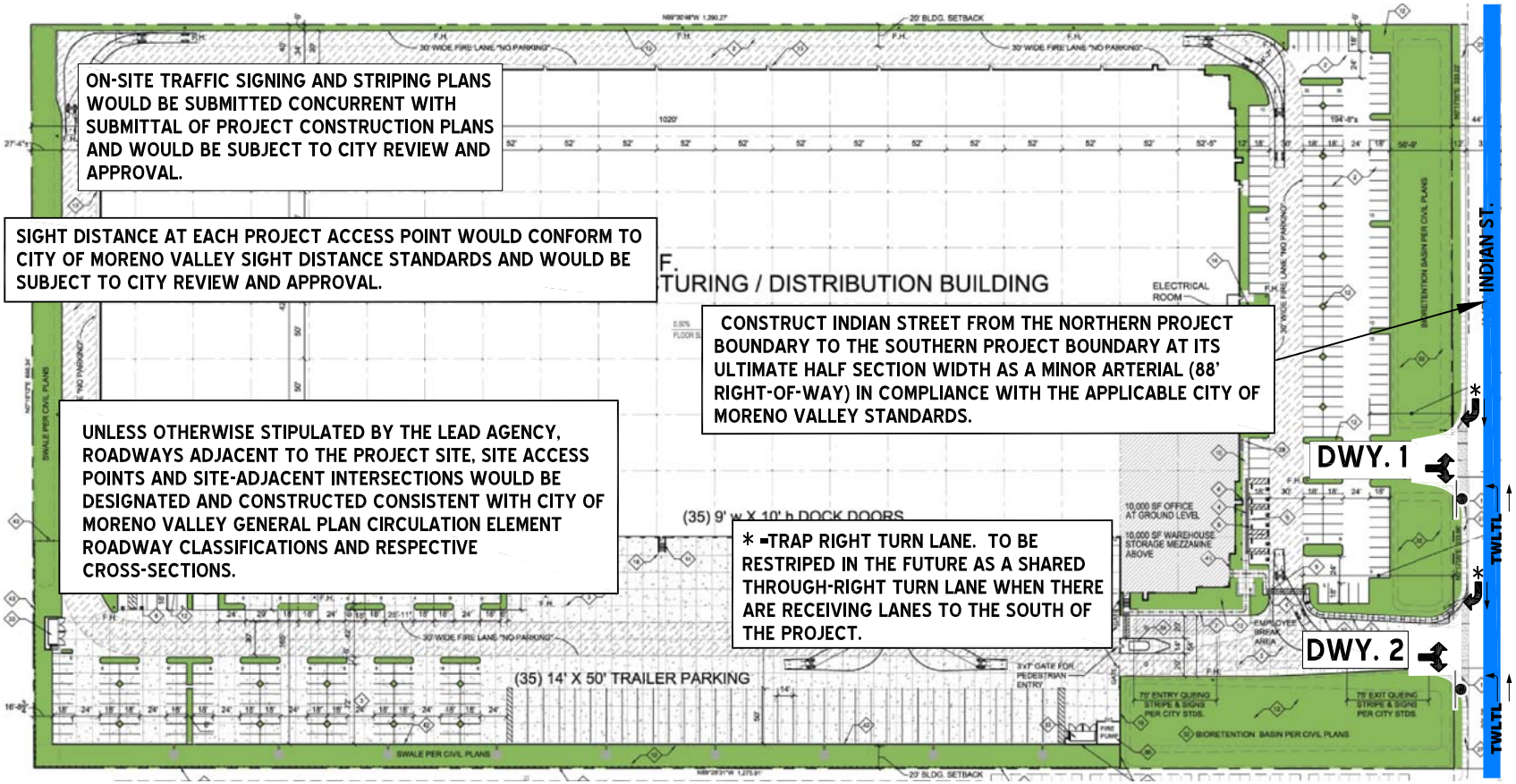
GENERAL:

- Unless otherwise stipulated by the Lead Agency, roadways adjacent to the Project site, site access points and site-adjacent intersections would be designed and constructed consistent with City of Moreno Valley General Plan Circulation Element roadway classifications and respective cross-sections.
- On-site traffic signing and striping plans would be submitted concurrent with submittal of Project construction plans and would be subject to City review and approval.
- Sight distance at each Project access point would conform to City of Moreno Valley sight distance standards and would be subject to City review and approval.

INDIAN STREET:

- Construct Indian Street from the northern Project boundary to the southern Project boundary at its ultimate half-section width as a Minor Arterial (88-foot right-of-way), in compliance with applicable City of Moreno Valley standards.

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



LEGEND:

- = STOP SIGN IMPROVEMENT
- = EXISTING LANE
- = LANE IMPROVEMENT
- TWLTL = TWO WAY LEFT TURN LANE
- = MINOR ARTERIAL (88' R.O.W.)

N

1.9 TRUCK ACCESS AND CIRCULATION

A truck turning template has been overlaid on the site plan at each applicable Project driveway anticipated to be utilized by heavy trucks in order to determine appropriate curb radii and to verify that trucks will have sufficient space to execute turning maneuvers. For the purposes of this evaluation, the WB-67 class truck template has been utilized. WB-67 class trucks are approximately 73.5 feet in length.

Exhibit 1-5 illustrates the proposed truck access for the site and circulation for Driveway 2. As shown on Exhibit 1-5, it is recommended that Driveway 2 be designed with a minimum 50-foot curb radius in order to accommodate the ingress and egress of WB-67 trucks (or smaller).

1.10 FREEWAY MAINLINE SEGMENT IMPACT CONSIDERATIONS

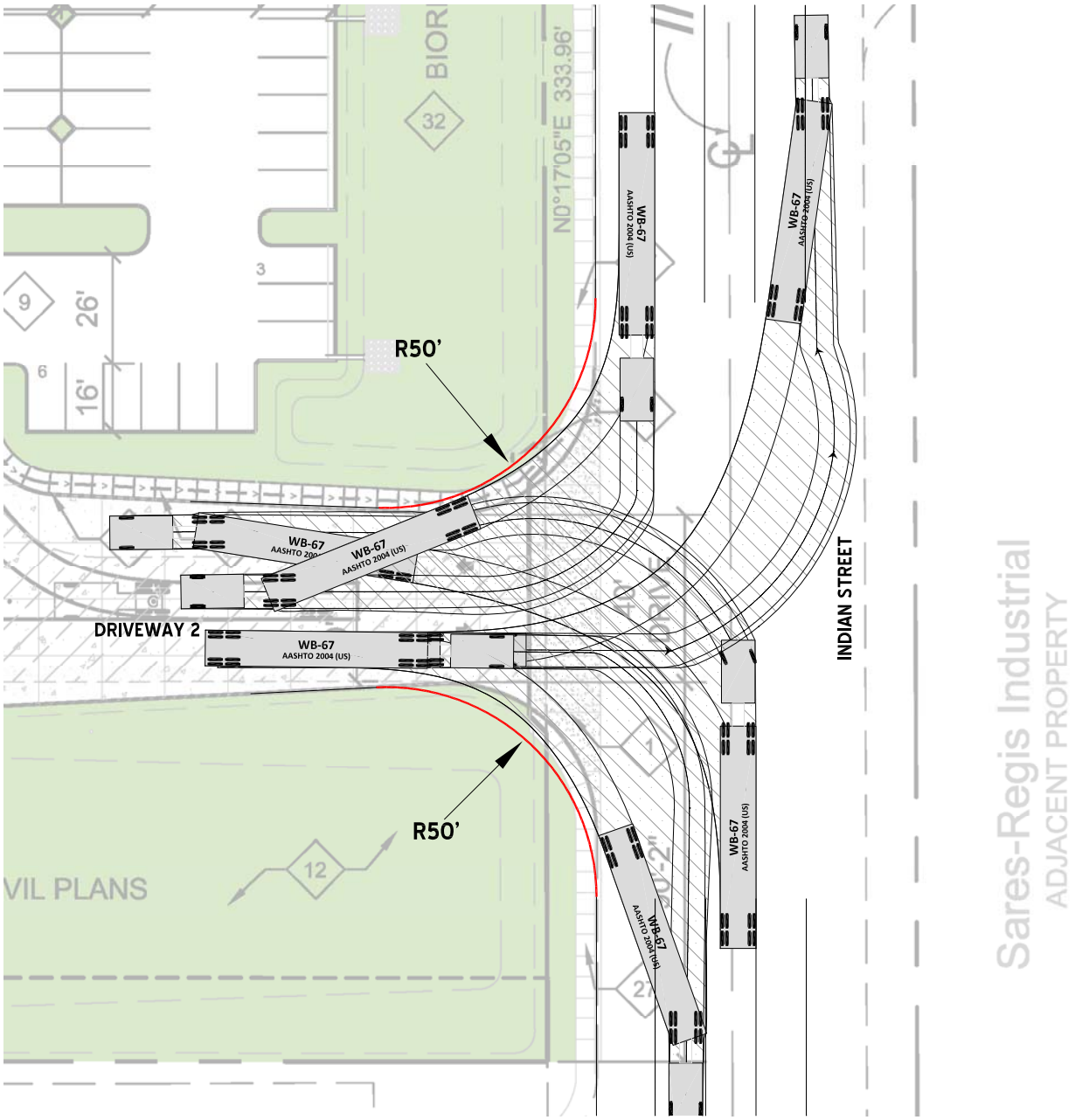
The TIA Scoping Agreement did not specifically require an evaluation of potential Opening Year mainline freeway segments impacts. The Lead Agency considers other recent CEQA documentation for proximate (and similar) projects within the Moreno Valley Industrial Area Plan (MVIAP) to have adequately addressed freeway operating conditions; and that further detailed analysis for the proposed Indian Street Commerce Center Project is not warranted. Related relevant CEQA documentation includes, but is not limited to: Modular Logistics Center Draft EIR, Moreno Valley, California (SCH No. 2014031068) (T&B Planning, Inc.) October 24, 2014; and *First Nandina Logistics Center Environmental Impact Report* (SCH No. 2013111047) (T&B Planning, Inc.) June 26, 2014. These documents are available for review at/through the City of Moreno Valley and are incorporated herein by reference. Notwithstanding the preceding, as means of disclosure, potential Opening Year mainline freeway segment impacts that would result from the Project are summarized below.

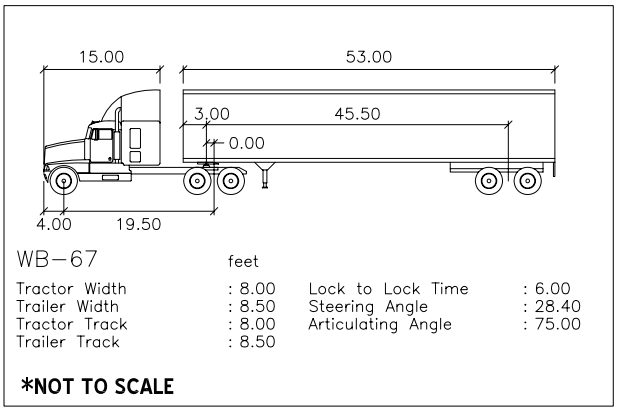
Under 2020 baseline conditions, certain segments of I-215 Freeway are projected to operate at deficient LOS. [1] These are cumulatively significant impacts. Deficient freeway segments include:

ID	Segment
1	I-215 Southbound, between Harley Knox Boulevard and Van Buren Boulevard
2	I-215 Northbound, between Box Springs Road and the SR-60/I-215 Freeway Interchange
3	I-215 Northbound, between the SR-60 Freeway and Eucalyptus Avenue
4	I-215 Northbound, between Harley Knox Boulevard and Van Buren Boulevard

[1] *First Nandina Logistics Center Environmental Impact Report* (SCH No. 2013111047) (T&B Planning, Inc.) June 26, 2014; pp. 4.9-55. The First Nandina Logistics Center is located northerly adjacent to the Indian Street Commerce Center Project site. Based on the proximity of the Nandina Logistics Center project and the currency of analysis presented in the *First Nandina Logistics Center Environmental Impact Report,* the analysis of i-215 operating conditions contained in the *First Nandina Logistics Center Environmental Impact Report* is considered germane and accurate for analytic purposes of this TIA.

EXHIBIT 1-5: TRUCK ACCESS





09912 - trucks.dwg

There are no near-term solutions for the deficiencies noted above; and these freeway mainline segment deficiencies are therefore projected to carry forward to the Opening Year Cumulative (2020) conditions evaluated in this TIA. Under Opening Year Cumulative (2020) Conditions, the Project would contribute additional traffic to the already deficient I-215 Freeway mainline segment deficiencies noted above. Globally, Project payment of TUMF would fulfill its mitigation responsibilities for contributions for cumulative traffic impacts deficiencies affecting I-215 Freeway mainline segments. However, it is not within the jurisdictional authority or purview of the Lead Agency or Applicant to adopt, implement, or enforce mitigation measures requiring the construction of improvements by Caltrans, or upon facilities within Caltrans' jurisdiction. As such, there are no feasible mitigation measures that will reduce cumulative freeway mainline segments impacts below significance thresholds. As such, the project's contribution to cumulative-level Opening Year Cumulative traffic impacts affecting the I-215 Freeway is considered significant and unavoidable.

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 Moreno Valley and Caltrans traffic study guidelines. (1) (2)

2.1 LEVEL OF SERVICE

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

2.2 INTERSECTION CAPACITY ANALYSIS

The definitions of LOS for interrupted traffic flow (flow restrained by the existence of traffic signals and other traffic control devices) differ slightly depending on the type of traffic control. The LOS is typically dependent on the quality of traffic flow at the intersections along a roadway. The *Highway Capacity Manual* (HCM) methodology expresses the LOS at an intersection in terms of delay time for the various intersection approaches. (7) The HCM uses different procedures depending on the type of intersection control.

2.2.1 SIGNALIZED INTERSECTIONS

City of Moreno Valley, City of Perris, and County of Riverside

The City of Moreno Valley, City of Perris, and the County of Riverside require signalized intersection operations analysis based on the methodology described in the HCM. (7) 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 9 Build 904) analysis software package.

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

TABLE 2-1: SIGNALIZED INTERSECTION LOS THRESHOLDS

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

Source: HCM

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. (7)

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 Harley Knox Boulevard). (2) Signal timing for the freeway arterial-to-ramp intersections have been obtained from Caltrans District 8 and were utilized for the purposes of this analysis.

2.2.2 UNSIGNALIZED INTERSECTIONS

The unsignalized intersections in the study area are located within the City of Moreno Valley and City of Perris. The City of Moreno Valley and City of Perris require the operations of unsignalized intersections be evaluated using the methodology described the HCM. (7) 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 ROADWAY SEGMENT CAPACITY ANALYSIS

Roadway segment operations have been evaluated using the City of Moreno Valley Daily Roadway Capacity Values provided in the *City of Moreno Valley Transportation Engineering Division Traffic Impact Analysis (TIA) Preparation Guide* and the City of Perris Daily Roadway Capacity Values provided in the City of Perris General Plan Circulation Element. (1) (8) Per the City of Moreno Valley TIA guidelines, roadway segments within the study area should maintain the LOS capacities illustrated on Exhibit 2-1. The City of Perris requires LOS D capacities to be maintained on City roadways. The daily roadway segment capacities for each type of roadway are summarized in Table 2-3. These roadway capacities are "rule of thumb" estimates for planning purposes and are affected by such factors as intersections (spacing, configuration and control features), degree of access control, roadway grades, design geometrics (horizontal and vertical alignment standards), sight distance, vehicle mix (truck and bus traffic), and pedestrian bicycle traffic. As such, where the average daily traffic (ADT) based roadway segment analysis indicates a deficiency (unacceptable LOS), a review of the more detailed peak hour intersection analysis and progression analysis are undertaken. The more detailed peak hour intersection analysis explicitly accounts for factors that affect roadway capacity. Therefore, roadway segment widening is typically only recommended if the peak hour intersection analysis indicates the need for additional through lanes.

TABLE 2-3: ROADWAY SEGMENT CAPACITY LOS THRESHOLDS[1]

City of Moreno Valley:

Facility Type	Level of Service Capacity[1]				
	A	B	C	D	E
Six Lane Divided Arterial	33,900	39,400	45,000	50,600	56,300
Four Lane Divided Arterial	22,500	26,300	30,000	33,800	37,500
Four Lane Undivided Arterial	15,000	17,500	20,000	22,500	25,000
Two Lane Industrial Collector	7,500	8,800	10,000	11,300	12,500
Two Lane Undivided Residential	N/A	N/A	N/A	N/A	2,000

[1] These maximum roadway capacities have been extracted from the City of Moreno Valley's Transportation Division's TIA Preparation Guidelines (August 2007). These roadway capacities are "rule of thumb" estimates for planning purposes. The LOS "E" service volumes are estimated maximum daily capacity for respective roadway classifications. Capacity is affected by such factors as intersections (spacing, configuration and control features), degree of access control, roadway grades, design geometrics (horizontal and vertical alignment standards), sight distance, vehicle mix (truck and bus traffic) and pedestrian and bicycle traffic.

City of Perris:

Facility Type	Level of Service Capacity[1]				
	A	B	C	D	E
Six Lane Urban Arterial	32,340	37,730	43,100	48,500	53,900
Four Lane Urban Arterial	21,540	25,130	28,700	32,300	35,900
Two Lane Arterial	10,800	12,600	14,400	16,200	18,000
Four Lane Secondary Arterial	15,540	18,130	20,700	23,300	25,900
Two Lane Collector	7,800	9,100	10,400	11,700	13,000

[1] Source: Table CE-9 of the City of Perris General Plan Circulation Element and Figure C-2 of the County of Riverside General Plan Circulation Element.

All capacity exhibits are based on optimum conditions and are intended as guidelines for planning purposes only.

2.4 FREEWAY OFF-RAMP QUEUING ANALYSIS

The study area for this TIA includes the freeway-to-arterial interchange of the I-215 Freeway at Harley Knox Boulevard 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 Harley Knox Boulevard. 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.

There are two footnotes which appear on the Synchro outputs. One footnote indicates if the 95th percentile cycle exceeds capacity. Traffic is simulated for two complete cycles of the 95th percentile traffic in Synchro in order to account for the effects of spillover between cycles. In

practice, the 95th percentile queue shown will rarely be exceeded and the queues shown with the footnote are acceptable for the design of storage bays. The other footnote indicates whether or not the volume for the 95th percentile queue is metered by an upstream signal. In many cases, the 95th percentile queue will not be experienced and may potentially be less than the 50th percentile queue due to upstream metering. If the upstream intersection is at or near capacity, the 50th percentile queue represents the maximum queue experienced.

A vehicle is considered queued whenever it is traveling at less than 10 feet/second. A vehicle will only become queued when it is either at the stop bar or behind another queued vehicle. Although only the 95th percentile queue has been reported in the tables, the 50th percentile queue can be found in the appendix alongside the 95th percentile queue for each ramp location. The 50th percentile maximum queue is the maximum back of queue on a typical cycle during the peak hour, while the 95th percentile queue is the maximum back of queue with 95th percentile traffic volumes during the peak hour. In other words, if traffic were observed for 100 cycles, the 95th percentile queue would be the queue experienced with the 95th busiest cycle. In other words, queues are lower than the reported 95th percentile queue 95 percent of the time and is only observed to exceed the 95th percentile queue 5 percent 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.

2.5 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. (9)

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. (9) 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 also 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 2-4, traffic signal warrant analyses were performed for the following unsignalized study area intersections during the peak weekday conditions wherein the Project is anticipated to contribute the highest trips:

TABLE 2-4: TRAFFIC SIGNAL WARRANT ANALYSIS LOCATIONS

ID	Intersection Location	Jurisdiction
3	Western Way / Harley Knox Boulevard	Perris
5	Webster Avenue / Harley Knox Boulevard	Perris
7	Indian Street / Grove View Road	Moreno Valley
8	Indian Street / Driveway 1	Moreno Valley
9	Indian Street / Driveway 2	Moreno Valley

The Existing conditions traffic signal warrant analysis is presented in the subsequent section, Section 3 *Area Conditions* of this report. The traffic signal warrant analyses for future conditions are presented in Section 5 *E+P Traffic Analysis,* and Section 6 *Opening Year Cumulative (2020) 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.

2.6 MINIMUM LEVEL OF SERVICE (LOS)

The definition of an intersection deficiency has been obtained from each of the applicable surrounding jurisdictions.

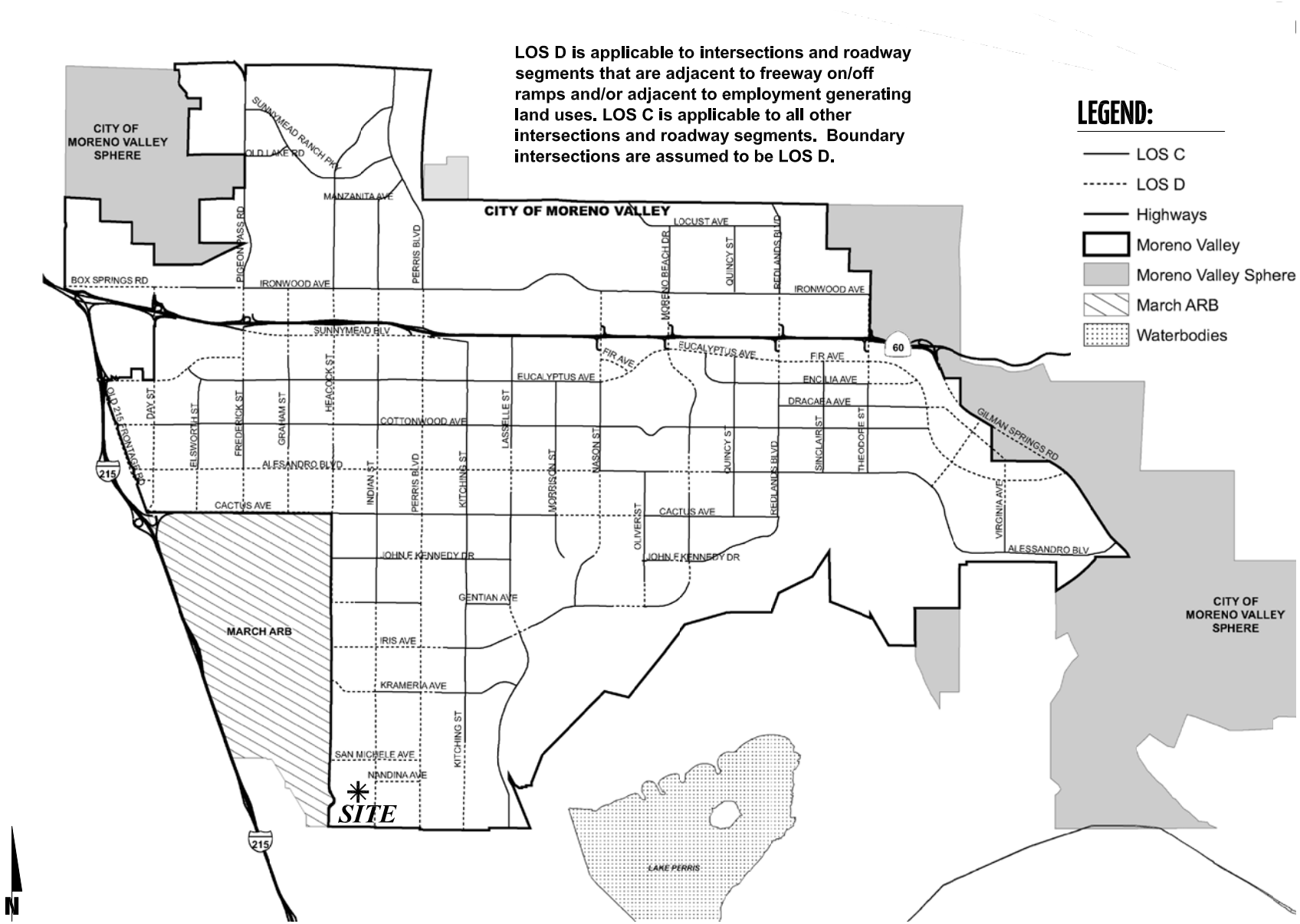
2.6.1 CITY OF MORENO VALLEY

The definition of an intersection deficiency in the City of Moreno Valley is based on the City of Moreno Valley General Plan Circulation Element. The City of Moreno Valley General Plan states that target LOS C or LOS D be maintained along City roads (including intersections) wherever possible. Exhibit 2-1 depicts the level of service standards within the City.

2.6.2 CITY OF PERRIS

LOS D is considered to be the limit of acceptable traffic operations during the peak hour in the City of Perris.

EXHIBIT 2-1: CITY OF MORENO VALLEY LEVEL OF SERVICE (LOS) STANDARDS



2.6.3 CALTRANS

Caltrans endeavors to maintain a target LOS at the transition between LOS C and LOS D on the State Highway System (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 Moreno Valley 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.

2.6.4 CMP

In an effort to more directly link land use, transportation and air quality and promote reasonable growth, the County of Riverside adopted a CMP (December 2011). The RCTC monitors the CMP roadway network system to minimize LOS deficiencies. Within the project study area, the I-215 Freeway is recognized as a key transportation facility within the CMP system. Although Caltrans utilizes LOS D as their stated threshold, RCTC has adopted LOS E as the minimum standard for intersections and segments along the CMP System of Highways and Roadways. However, for the purposes of this traffic impact analysis, LOS D has been considered to be the limit of acceptable traffic operations for the I-215 Freeway mainline segments and ramp junctions in an effort to be conservative.

2.7 PROJECT FAIR SHARE CALCULATION METHODOLOGY

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

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

Project Fair Share % = Project Traffic / (2020 With Project Total Traffic – Existing Traffic)

3 AREA CONDITIONS

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

3.1 EXISTING CIRCULATION NETWORK

Pursuant to the scoping agreement with City of Moreno Valley staff (Appendix 1.1), the study area includes a total of 10 existing and future intersections as shown previously on Exhibit 1-2 where the Project is anticipated to contribute 50 or more peak hour trips. 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 MORENO VALLEY GENERAL PLAN CIRCULATION ELEMENT

As noted previously, the Project site is located within the City of Moreno Valley. However, the study area includes intersections within the neighboring jurisdiction of Perris (e.g., study area intersections along Harley Knox Boulevard).

3.2.1 CITY OF MORENO VALLEY

The roadway classifications and planned (ultimate) roadway cross-sections of the major roadways within the study area, as identified on the City of Moreno Valley General Plan Circulation Element, are described subsequently. Exhibit 3-2 shows the City of Moreno Valley General Plan Circulation Element, and Exhibit 3-3 illustrates the City of Moreno Valley General Plan roadway cross-sections.

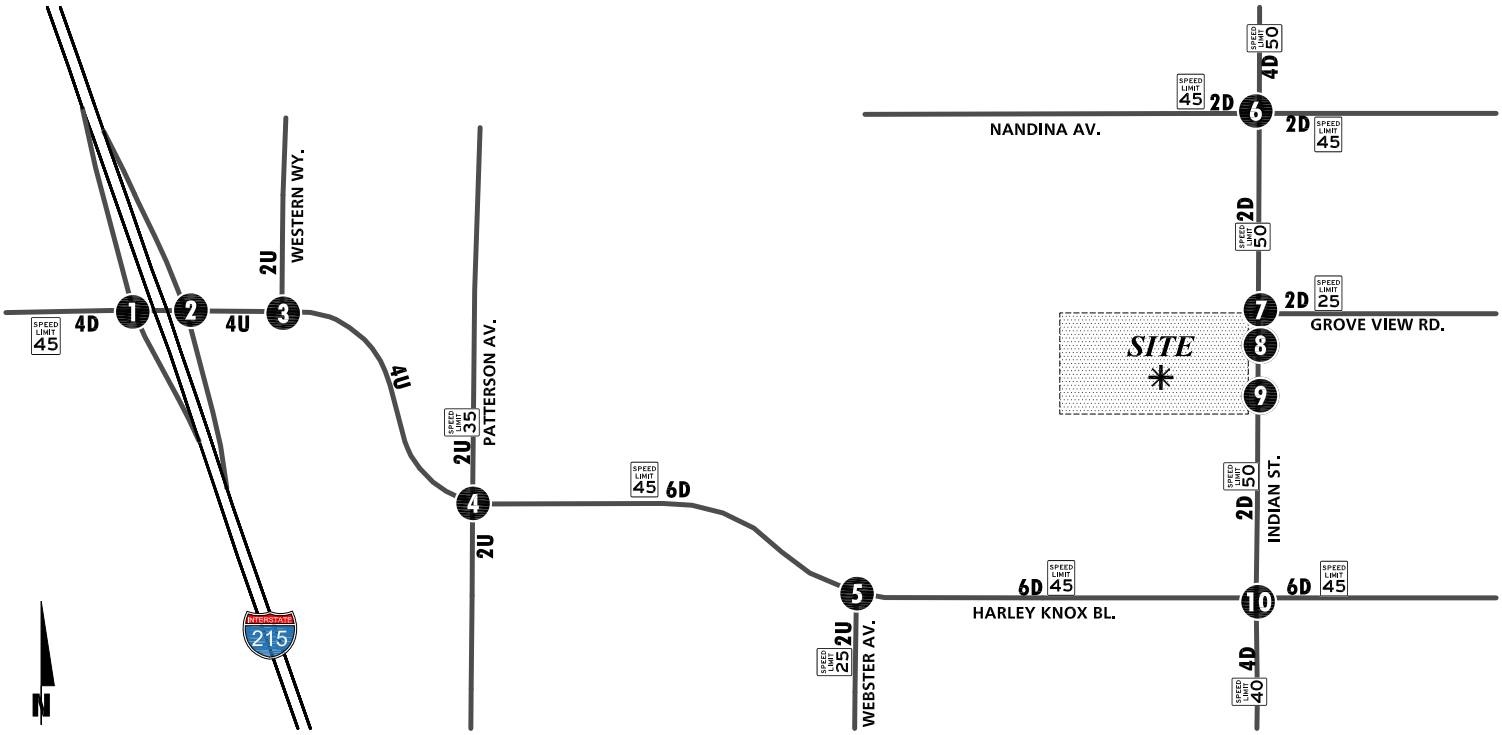
3.2.2 CITY OF PERRIS

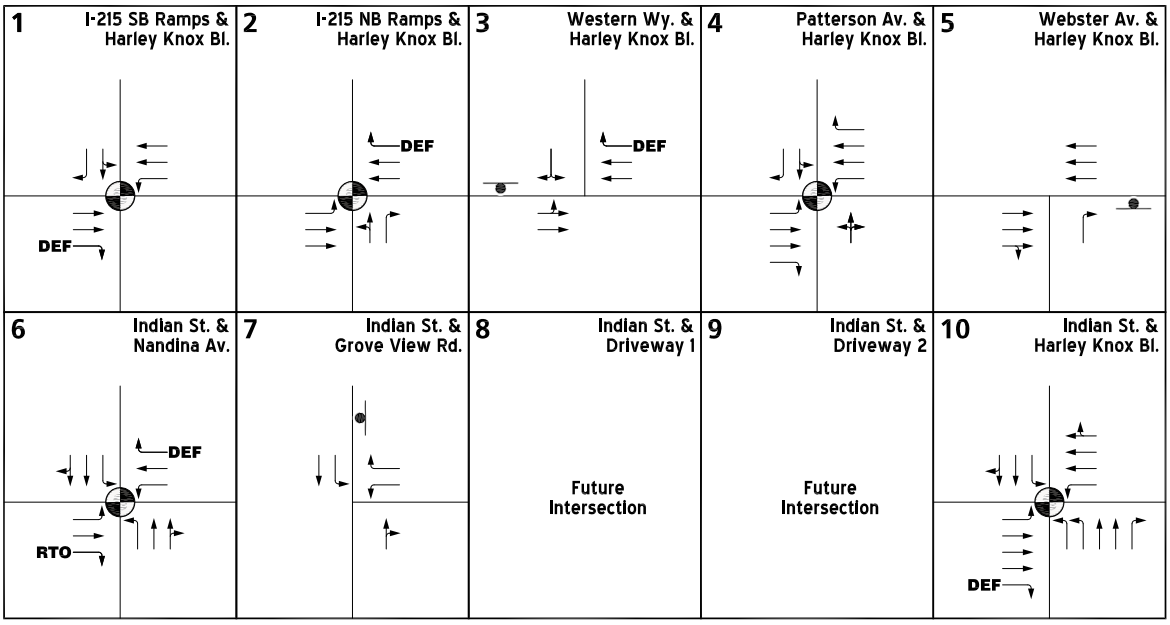
The roadway classifications and planned (ultimate) roadway cross-sections of the major roadways within the City of Perris as identified in the City of Perris General Plan Circulation Element are described subsequently. The circulation plan and proposed roadway cross-sections defined within the City of Perris are shown on Exhibits 3-4 and 3-5.

3.2.3 COUNTY OF RIVERSIDE

The roadway classifications and planned (ultimate) roadway cross-sections of the major roadways within the study area, as identified on the Riverside County General Plan Circulation Element, are described subsequently. Exhibit 3-6 shows the Riverside County General Plan Circulation Element, and Exhibit 3-7 illustrates the Riverside County General Plan roadway cross-sections.

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





LEGEND:

- TRAFFIC SIGNAL
- STOP SIGN
- 4 = NUMBER OF LANES
- D = DIVIDED
- U = UNDIVIDED
- RTO = RIGHT TURN OVERLAP
- DEF = DEFACTO RIGHT TURN
- SPEED LIMIT 25 = SPEED LIMIT (MPH)

EXHIBIT 3-2: CITY OF MORENO VALLEY GENERAL PLAN CIRCULATION ELEMENT

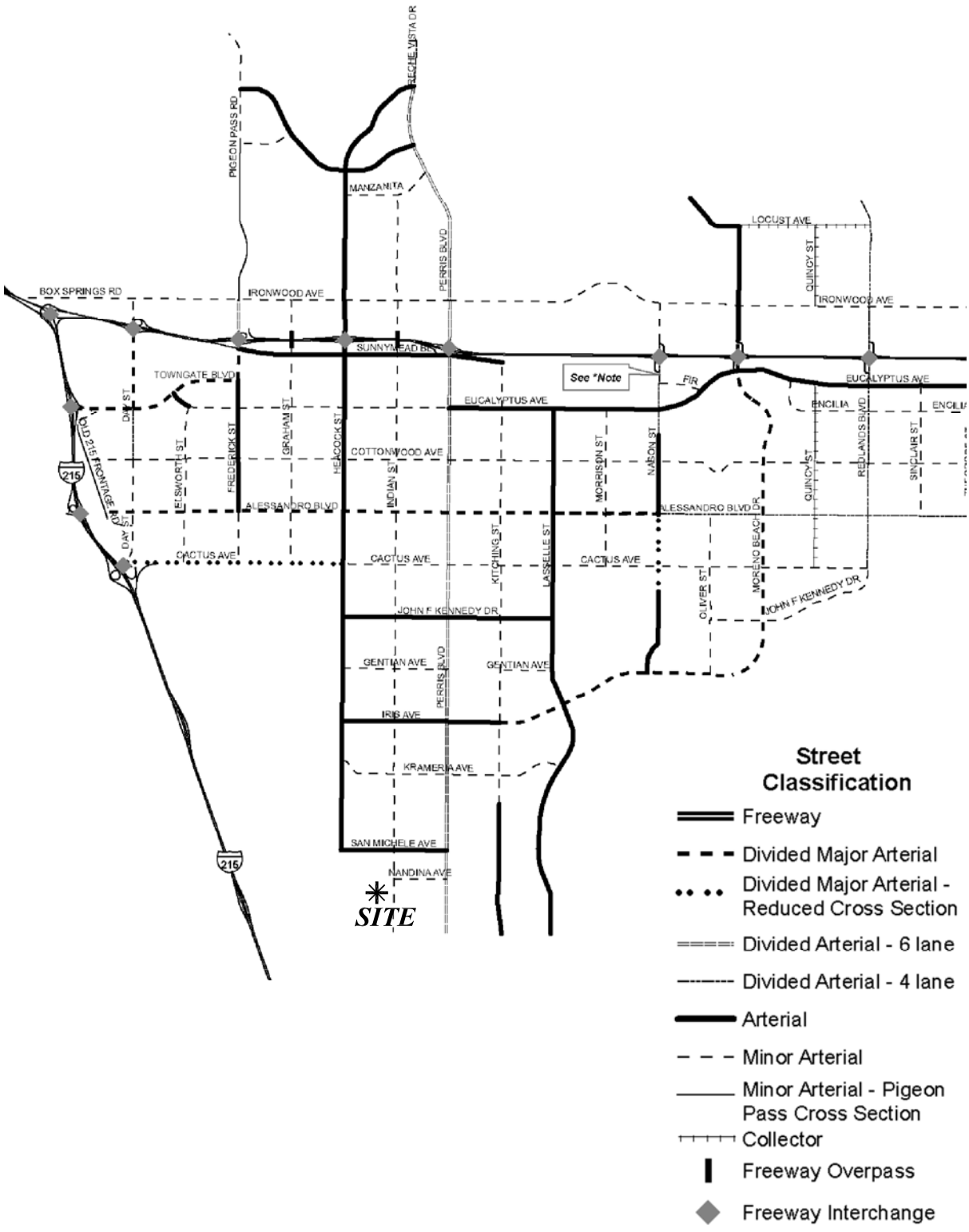


EXHIBIT 3-3: CITY OF MORENO VALLEY GENERAL PLAN ROADWAY CROSS-SECTIONS

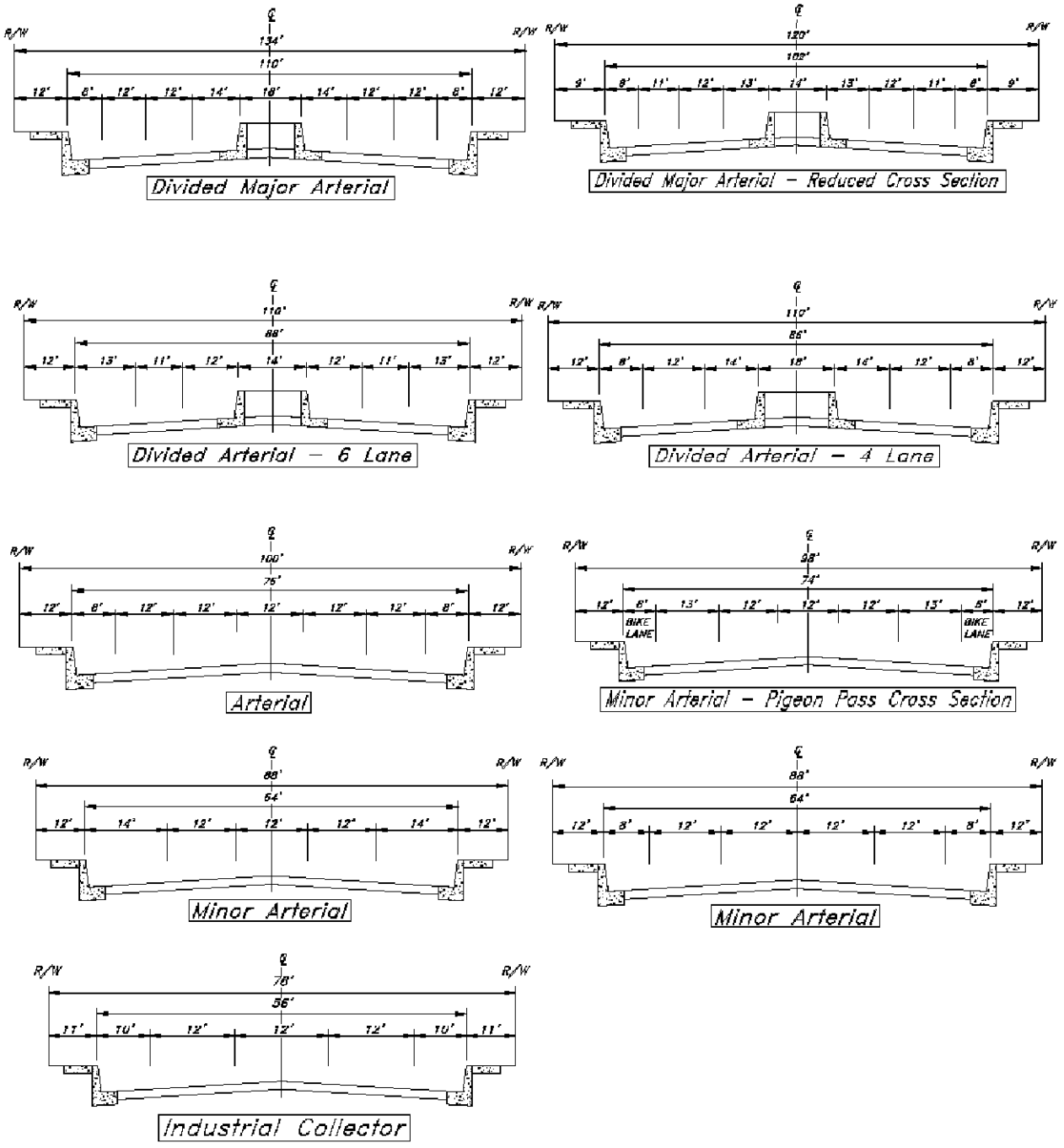
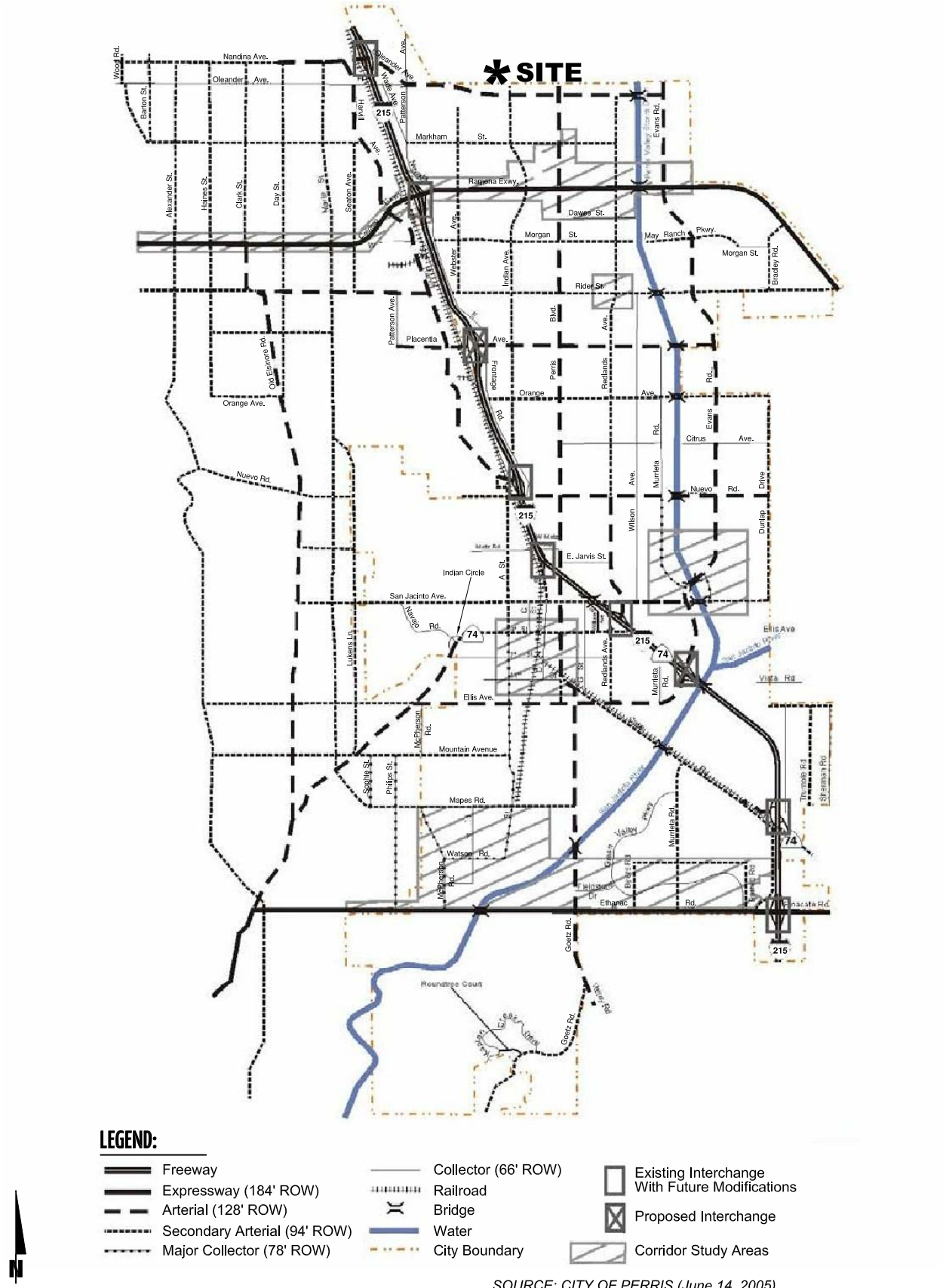


EXHIBIT 3-4: CITY OF PERRIS GENERAL PLAN CIRCULATION ELEMENT



SOURCE: CITY OF PERRIS (June 14, 2005)

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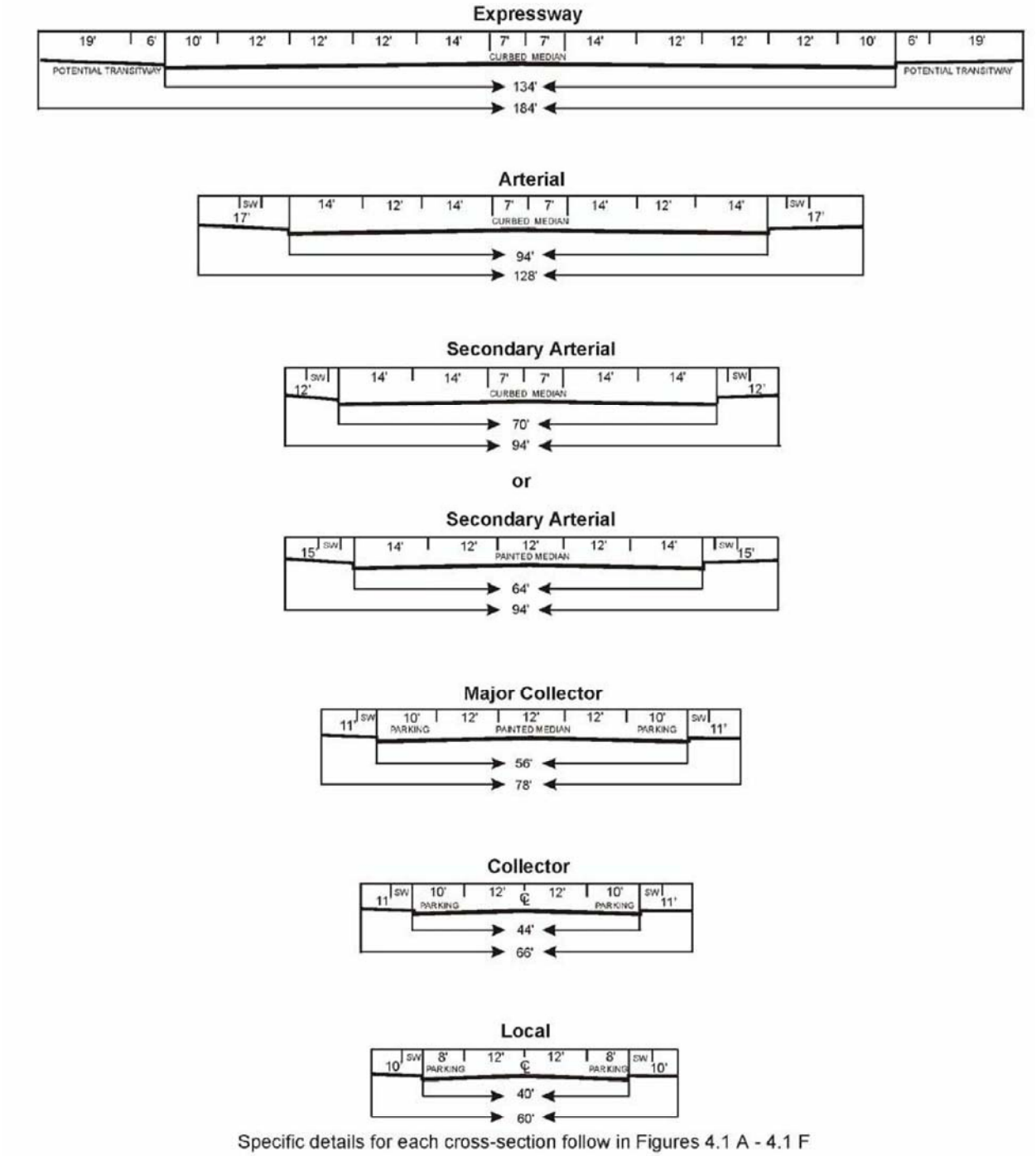
EXHIBIT 3-5: CITY OF PERRIS GENERAL PLAN ROADWAY CROSS-SECTIONS

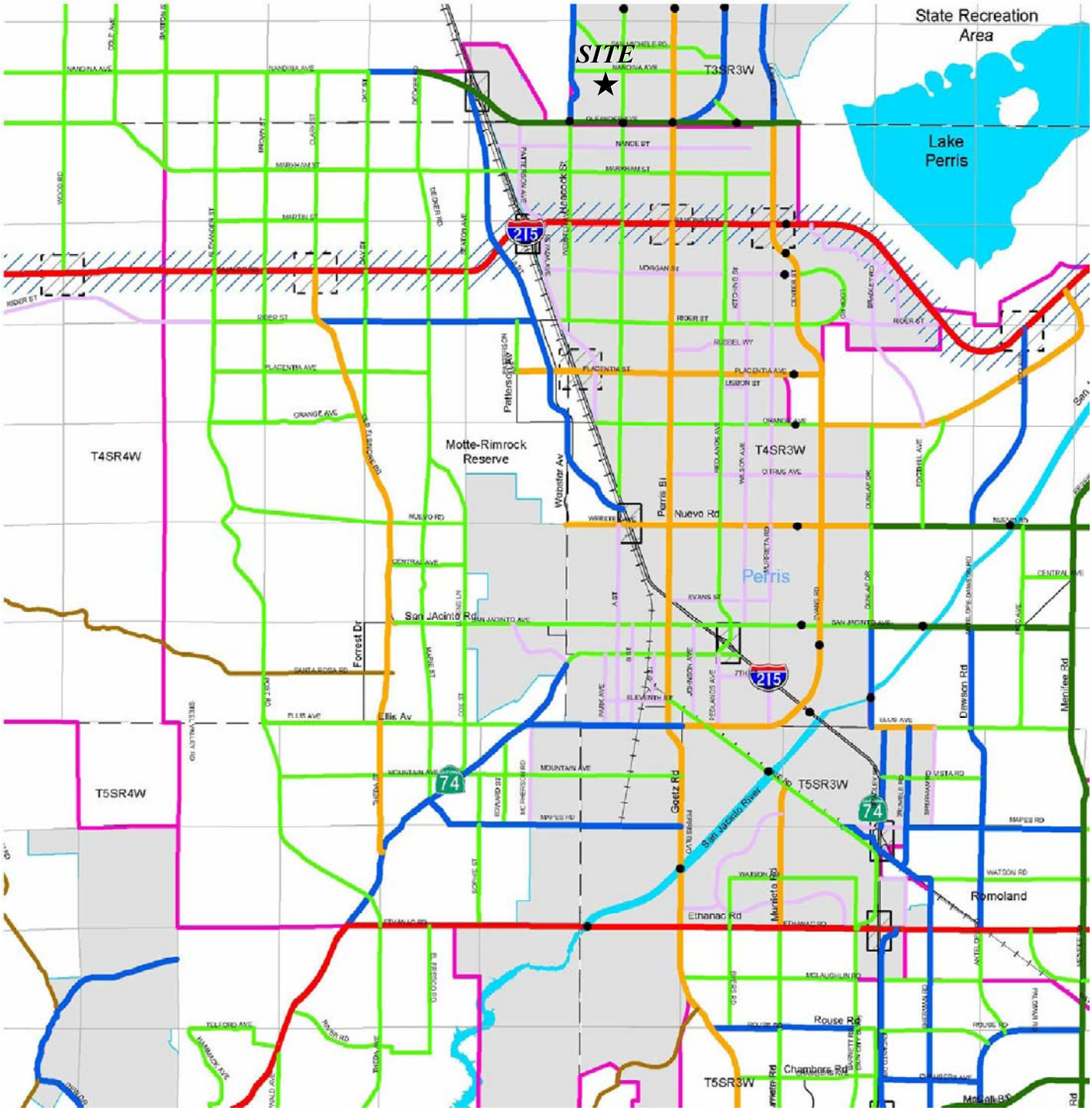


Specific details for each cross-section follow in Figures 4.1 A - 4.1 F

Legend

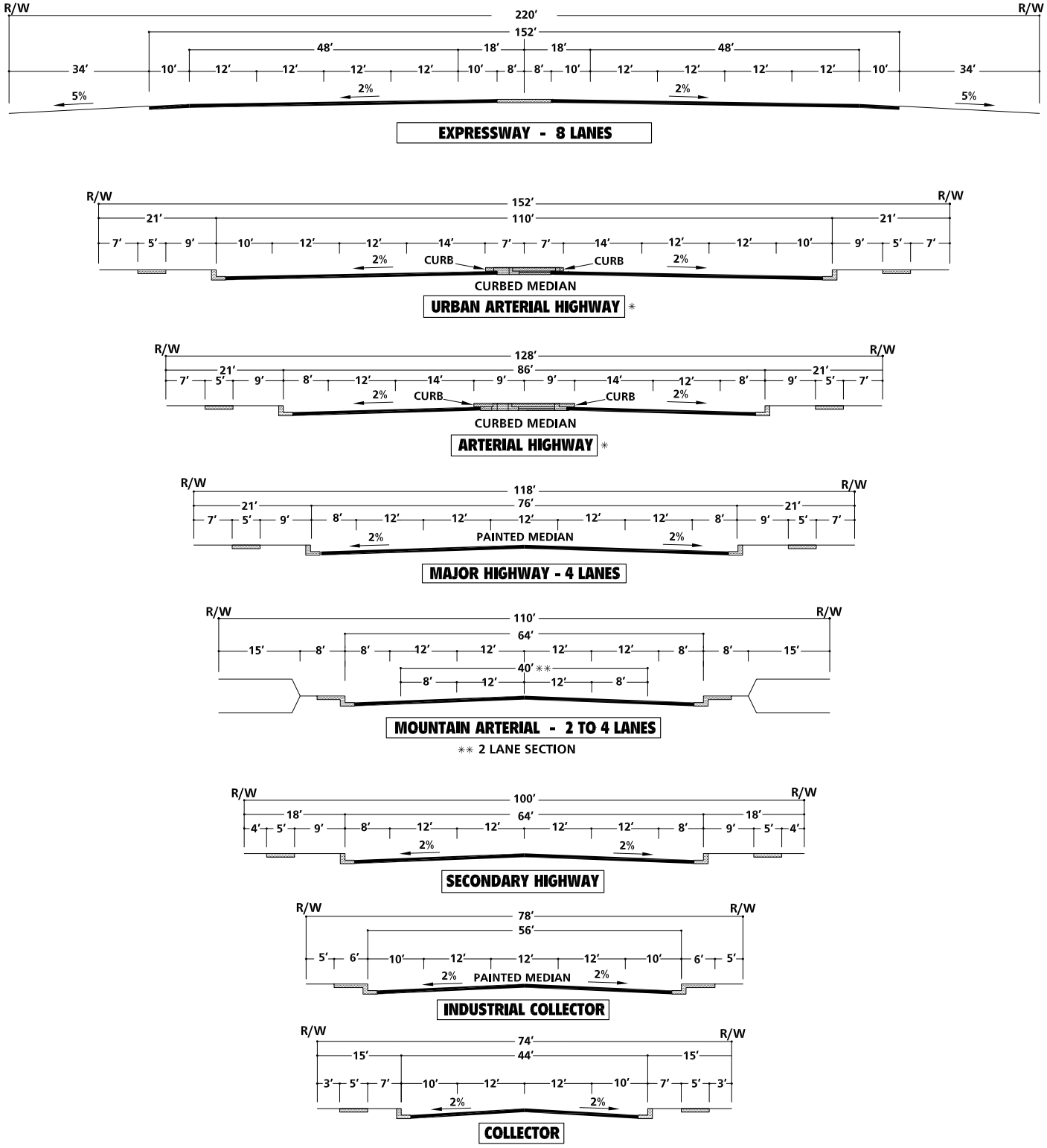
SW	Sidewalk or Trail (at least 4 feet)
PARKING	Parking or Bike Lane
PAINTED MEDIAN	Center Median and/or Continuous Left Turning Lane
CURBED MEDIAN	Landscaped Center Median

EXHIBIT 3-6: RIVERSIDE COUNTY GENERAL PLAN CIRCULATION ELEMENT



SOURCE: RIVERSIDE COUNTY INTEGRATED PROJECT (RCIP) (OCTOBER 7, 2003)

EXHIBIT 3-7: RIVERSIDE COUNTY GENERAL PLAN ROADWAY CROSS-SECTIONS



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

NOT TO SCALE

SOURCE: COUNTY OF RIVERSIDE

3.3 TRUCK ROUTES

While the City of Moreno Valley's General Plan recognizes the trucking industry and the importance of the region's role in the movement of goods, there are no truck routes defined within the County. Exhibit 3-8 shows the existing truck routes throughout the City of Moreno Valley. Based on the exhibit, Perris Boulevard and Nandina Avenue are roadways within the study area identified as truck routes. The City of Perris also has a designated truck route map in their General Plan, which is shown on Exhibit 3-9. As shown, Harley Knox Boulevard, east of the I-215 Freeway, Perris Boulevard, and Indian Street, are identified as designated City of Perris truck routes within the study area.

3.4 TRANSIT SERVICE

The study area is currently served by the Riverside Transit Authority (RTA), a public transit agency serving the unincorporated Riverside County region. As shown on Exhibit 3-10, RTA Route 19 is the only existing bus route that serves a roadway within the study area in close proximity to the proposed Project. RTA Route 19 serves Perris Boulevard throughout the study area.

Transit service is reviewed and updated by RTA periodically to address ridership, budget, and community demands Changes in land use can affect these periodic adjustments which may lead to either enhanced or reduced service where appropriate.

3.5 BICYCLE & PEDESTRIAN FACILITIES

In an effort to promote alternative modes of transportation, the City of Moreno Valley also includes a trails and bikeway system. The City of Moreno Valley trails and bikeway system are shown on Exhibit 3-11 and Exhibit 3-12. There are no trails planned near the vicinity of the proposed Project; however, Indian Street is a Class III bike route.

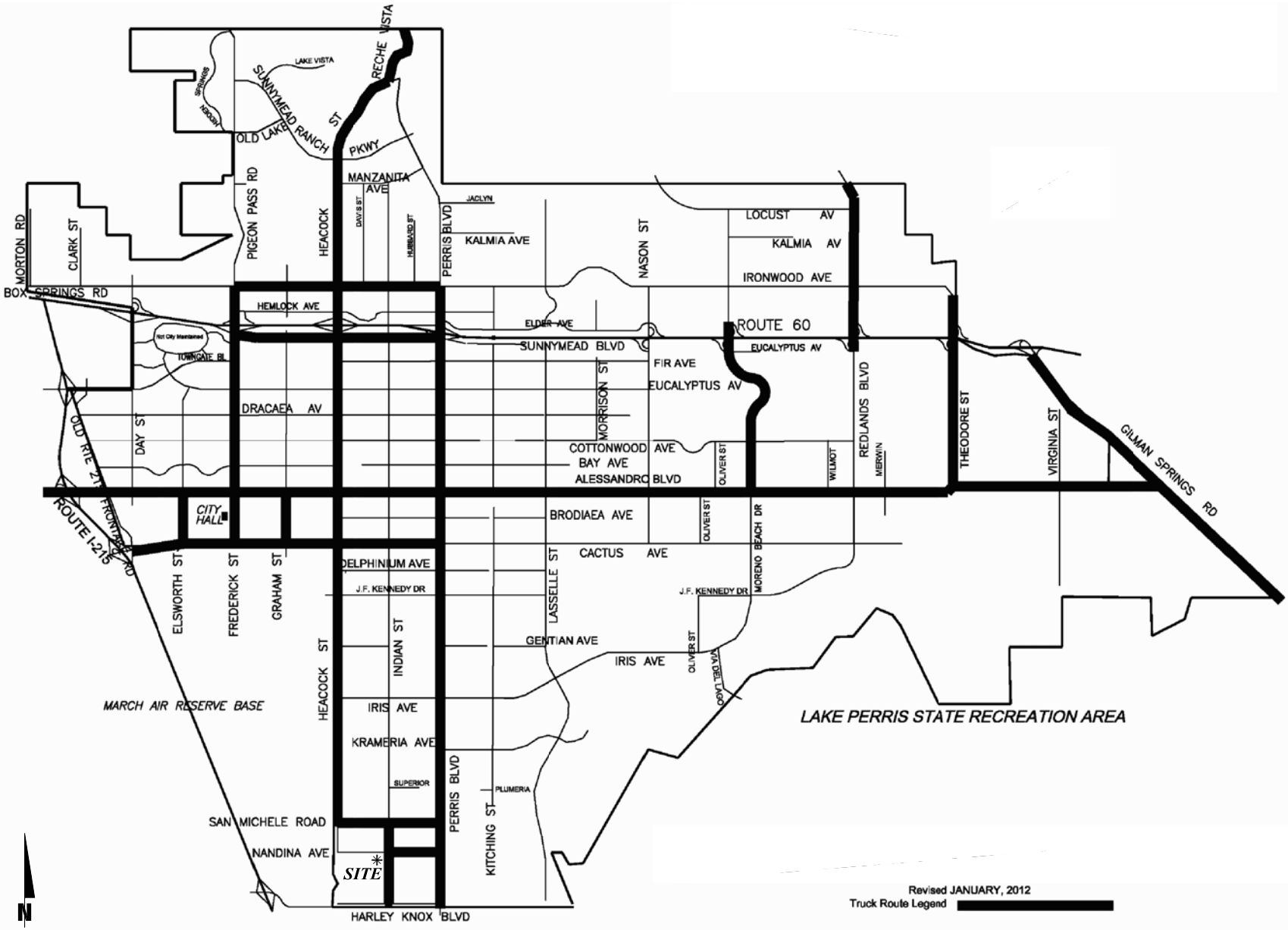
Field observations conducted in December 2015 indicate nominal pedestrian and bicycle activity within the study area. Exhibit 3-13 illustrates the existing pedestrian facilities, including sidewalks and crosswalk locations.

3.6 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 April 2015. 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 3-8: EXISTING TRUCK ROUTES



URBAN CROSSROADS

EXHIBIT 3-9: CITY OF PERRIS TRUCK ROUTES

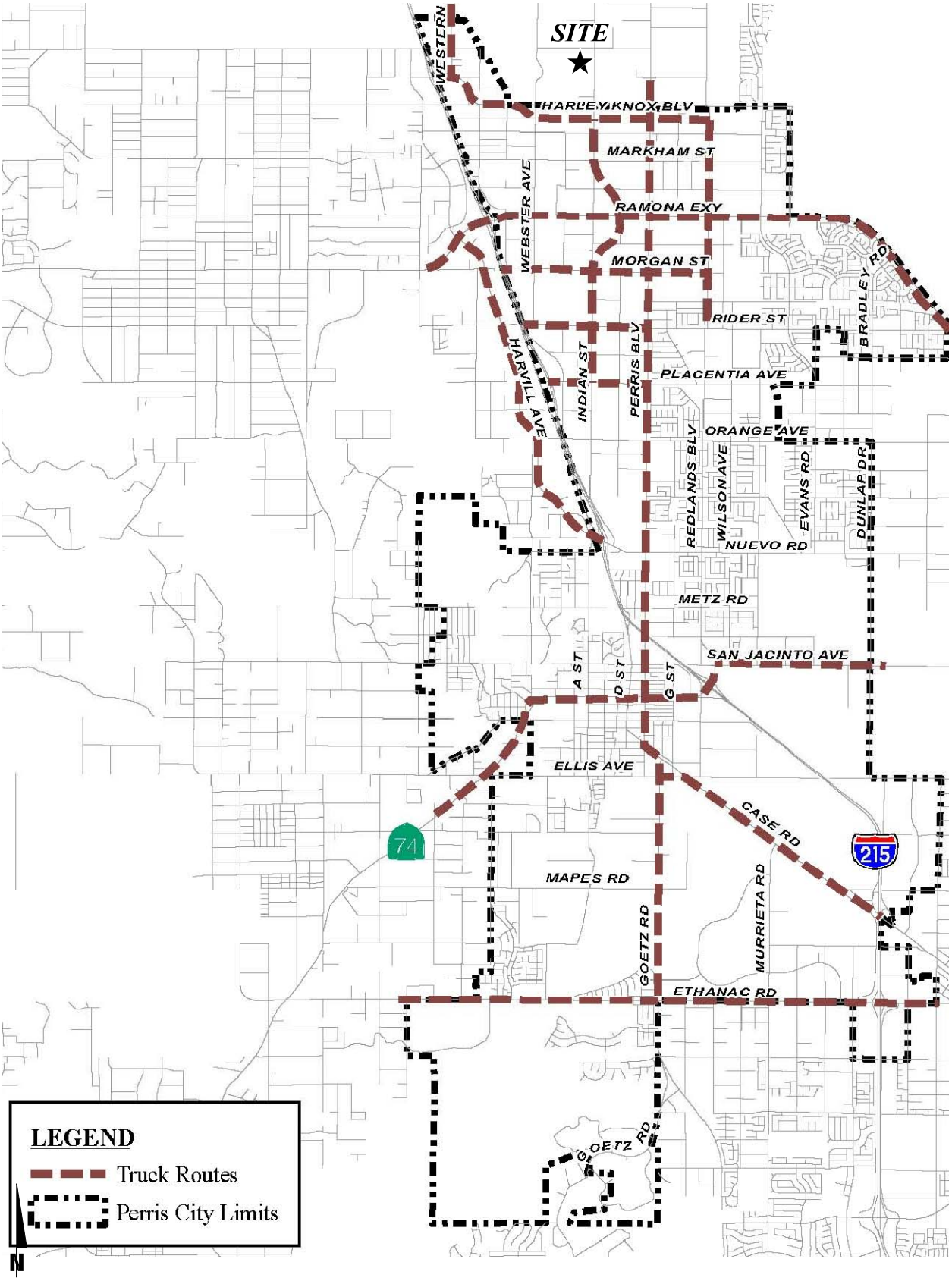


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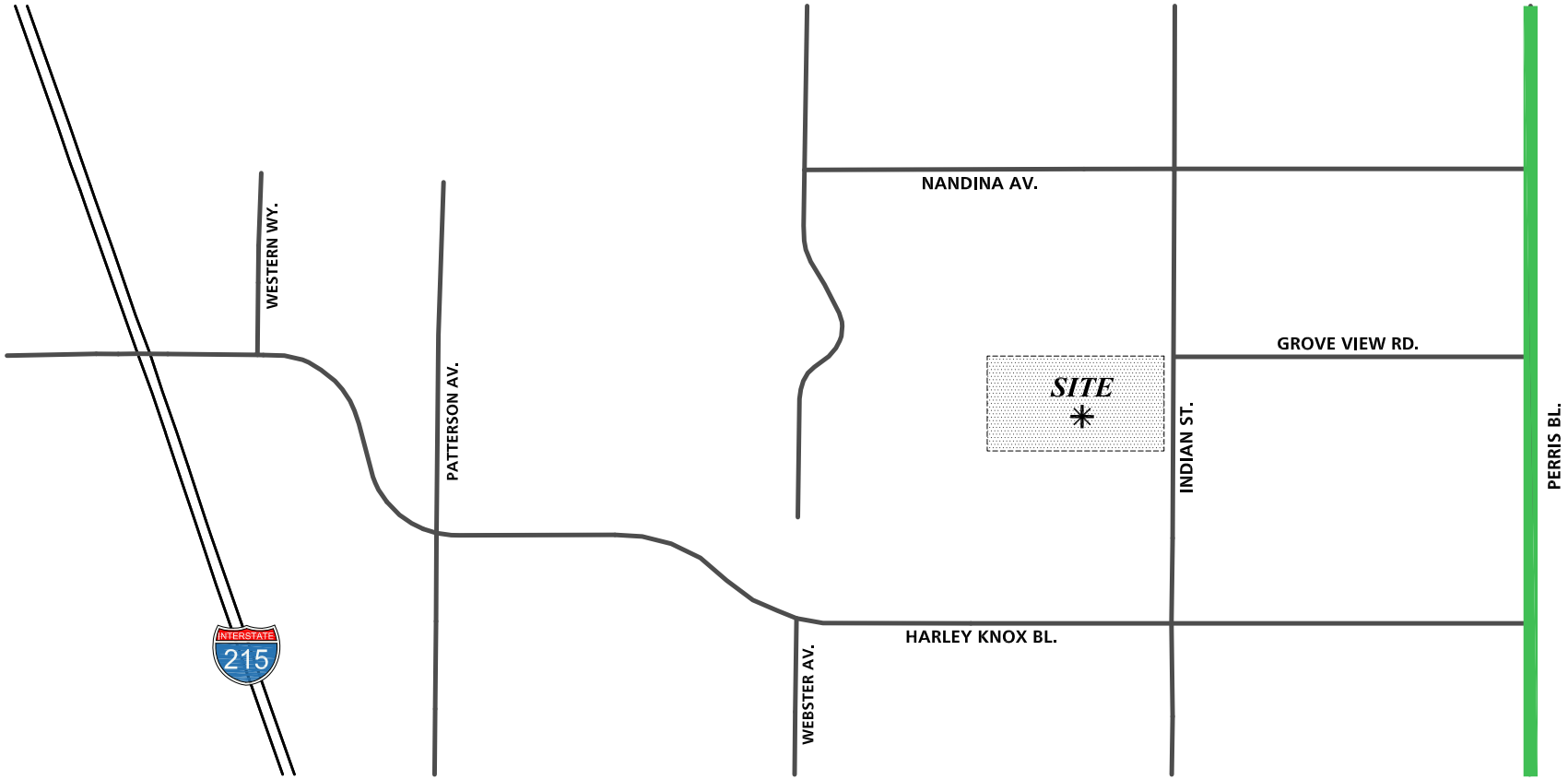
EXHIBIT 3-10: EXISTING TRANSIT ROUTES



SOURCE: RIVERSIDE TRANSIT AGENCY SYSTEM MAP

EXHIBIT 3-11: CITY OF MORENO VALLEY MASTER PLAN OF TRAILS

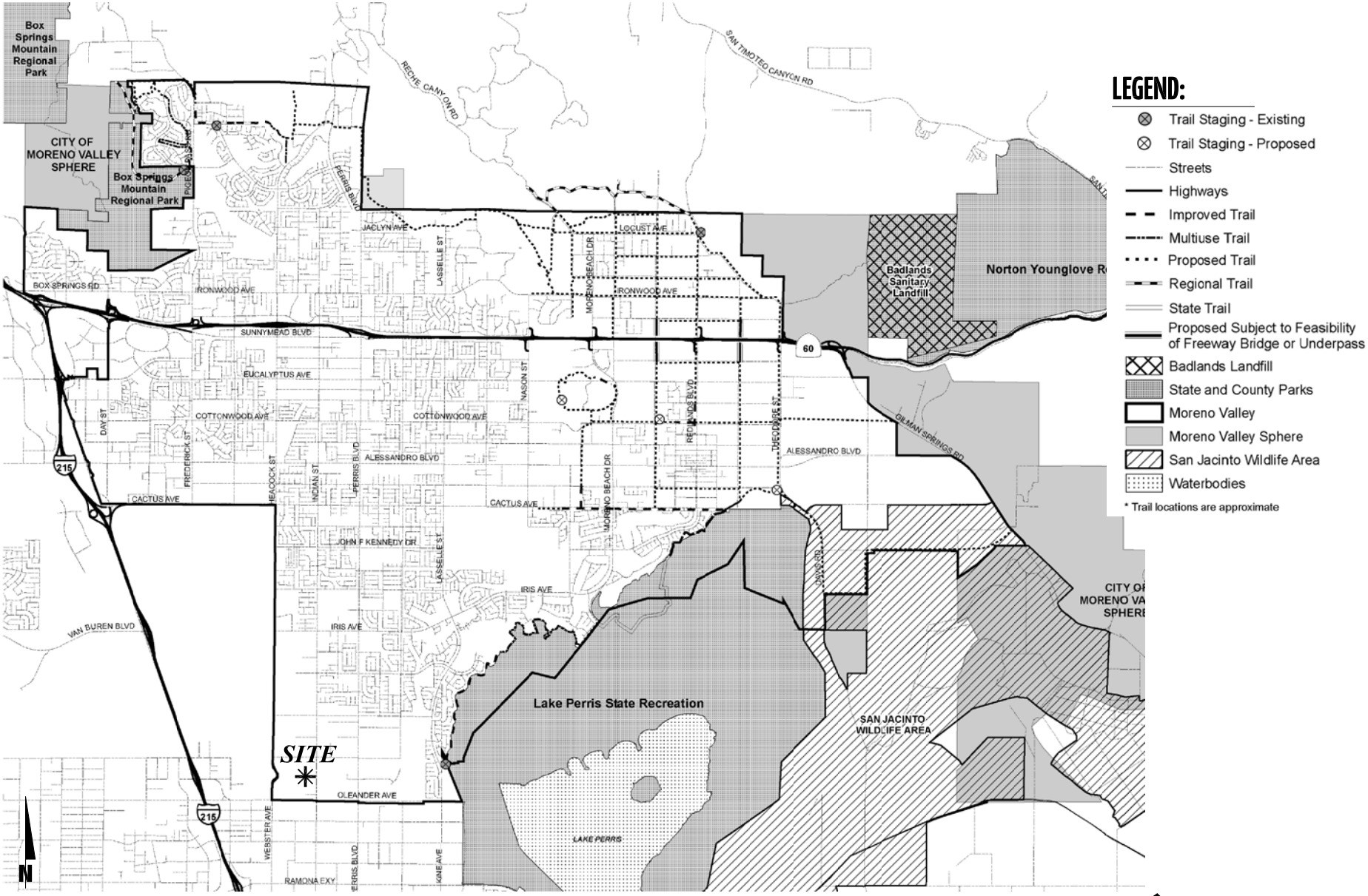


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EXHIBIT 3-12: CITY OF MORENO VALLEY BIKE PLAN

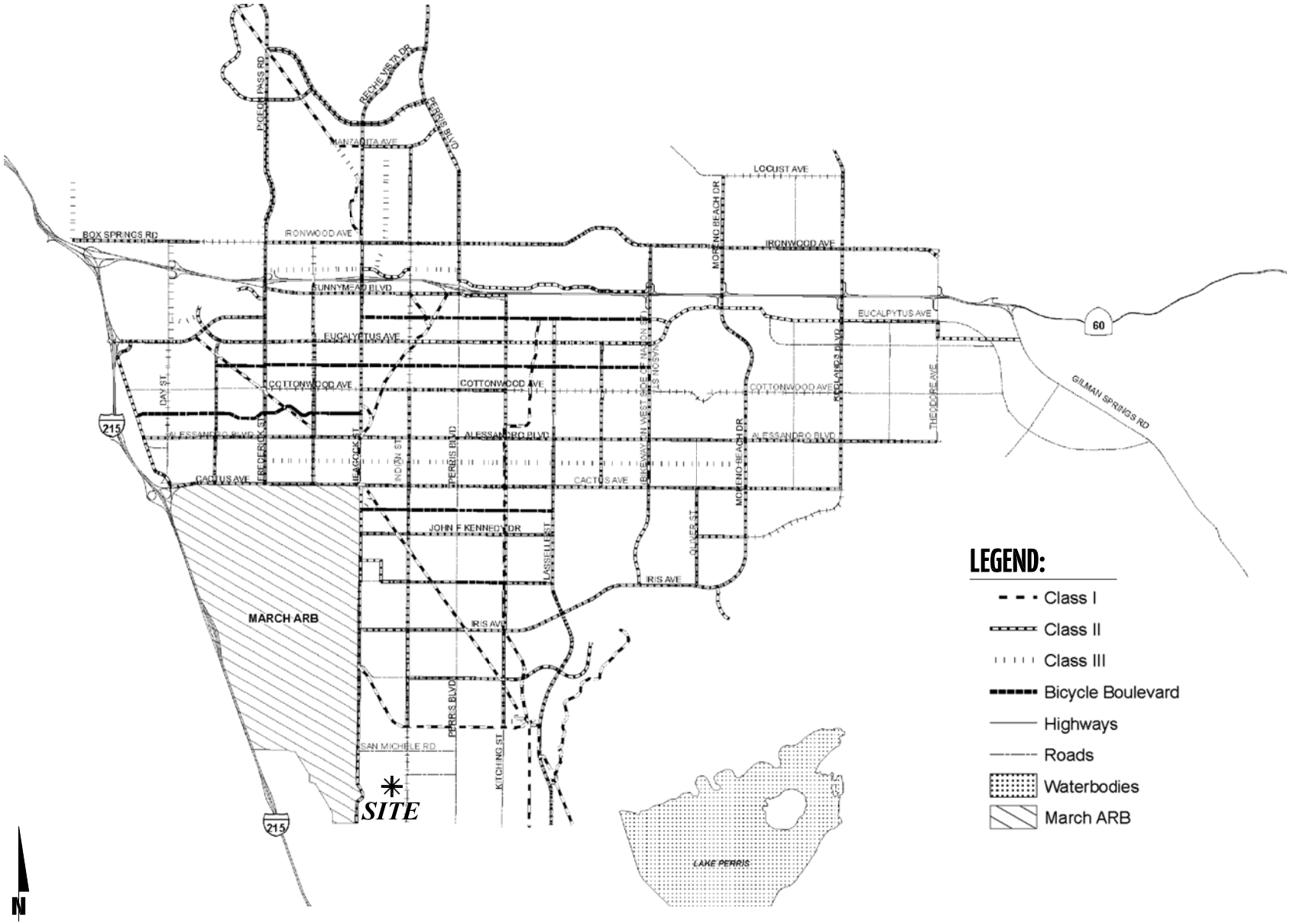


EXHIBIT 3-13: EXISTING PEDESTRIAN FACILITIES

The weekday AM and weekday PM peak hour count data is representative of typical weekday peak hour traffic conditions in the study area. There were no observations made in the field that would indicate atypical traffic conditions on the count dates, such as construction activity or detour routes and near-by schools were in session and operating on normal schedules. It should be noted that traffic counts were conducted after the completion of the City of Perris' Harley Knox Boulevard widening project from east of Western Way to Perris Boulevard.

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 (e.g., between ramp-to-arterial intersections, etc.). The traffic counts collected in December 2015 include the vehicle classifications as shown below:

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

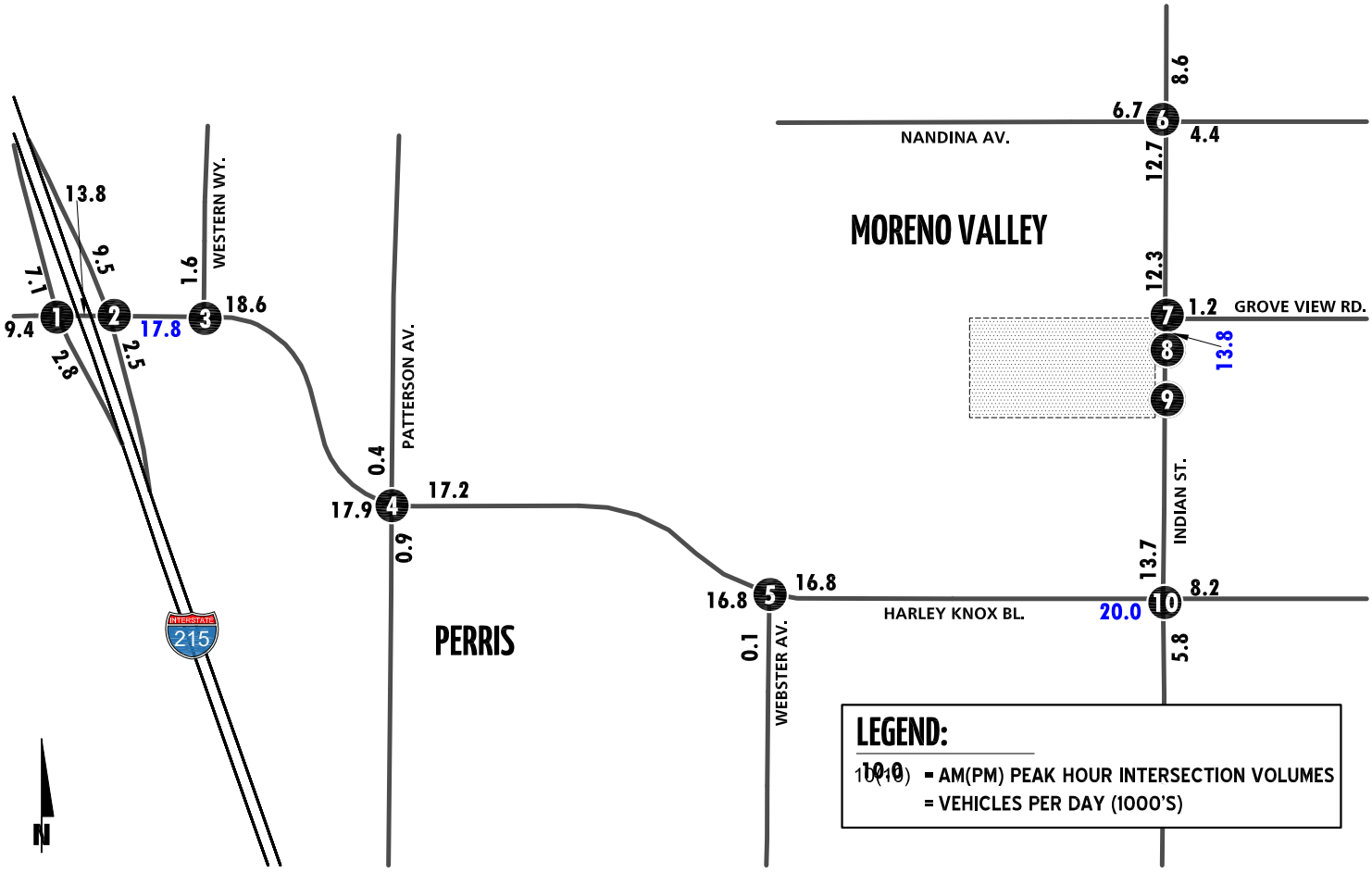
To represent the impact large trucks, buses, and recreational vehicles have on traffic flow, all trucks were converted into PCEs. By their size alone, these vehicles occupy the same space as two or more passenger cars. In addition, the time it takes for them to accelerate and slow-down is also much longer than for passenger cars and varies depending on the type of vehicle and number of axles. For the purpose of this analysis, a PCE factor of 1.5 has been applied to 2-axle trucks, 2.0 for 3-axle trucks, and 3.0 for 4+-axle trucks to estimate each turning movement. These factors are consistent with the values recommended for use in the San Bernardino County CMP and are in excess of the factor recommended for use in the County of Riverside traffic study guidelines. (10) Although the County of Riverside has a recommended PCE factor of 2.0, the San Bernardino County CMP PCE factors have been utilized in an effort to conduct a more conservative analysis.

Existing weekday average daily traffic (ADT) volumes on arterial highways throughout the study area are shown on Exhibit 3-14. Where actual 24-hour tube count data was not available, Existing ADT volumes were based upon factored intersection peak hour counts collected by Urban Crossroads, Inc. using the following formula for each intersection leg:

Weekday PM Peak Hour (Approach Volume + Exit Volume) x 12.8795 = Leg Volume

A comparison of the PM peak hour and daily traffic volumes of various roadway segments within the study area indicated that the peak-to-daily relationship is approximately 7.76 percent. As such, the above equation utilizing a factor of 12.8795 estimates the ADT volumes on the study area roadway segments assuming a peak-to-daily relationship of approximately 7.76 percent (i.e., 1/0.0776 = 12.8795) and was assumed to sufficiently estimate average daily traffic (ADT) volumes for planning-level analyses. Existing weekday AM and weekday PM peak hour intersection volumes (in PCE) are also shown on Exhibit 3-14.

EXHIBIT 3-14: EXISTING (2015) TRAFFIC VOLUMES



1 I-215 SB Ramps & Harley Knox Bl. 140(182) 3(3) 357(369) ←206(134) ←169(184) 557(385)→ 10(33)→	**2** I-215 NB Ramps & Harley Knox Bl. ←504(506) ←362(310) 315(228)→ 599(525)→ 12(8) 4(0) 105(189)	**3** Western Wy. & Harley Knox Bl. 68(85) 2(14) ←26(6) ←798(731) 68(20)→ 636(694)→	**4** Patterson Av. & Harley Knox Bl. 6(13) 4(2) 3(6) ←14(3) ←708(665) ←1(2) 9(3)→ 553(651)→ 11(24)→ 79(33) 2(4) 6(6)	**5** Webster Av. & Harley Knox Bl. ←721(654) 553(646)→ 2(2)→ 3(3)
6 Indian St. & Nandina Av. 4(56) 63(222) 6(64) ←5(33) ←15(24) ←50(94) 1(17)→ 22(80)→ 107(250)→ 71(91) 214(276) 33(51)	**7** Indian St. & Grove View Rd. 228(502) 1(15) ←5(13) ←15(33) 328(429) 30(35)	**8** Indian St. & Driveway 1 Future Intersection	**9** Indian St. & Driveway 2 Future Intersection	**10** Indian St. & Harley Knox Bl. 174(373) 61(159) 5(23) ←20(24) ←446(244) ←15(14) 216(316)→ 301(312)→ 45(50)→ 64(39) 148(171) 16(17)

3.7 INTERSECTION OPERATIONS ANALYSIS

Existing peak hour traffic operations have been evaluated for the study area intersections based on the analysis methodologies presented in Section 2.2 Intersection Capacity Analysis of this report. The intersection operations analysis results are summarized in Table 3-1 which indicates that there are no existing study area intersections currently operating at an unacceptable LOS during the peak hours (i.e., LOS C or better).

Consistent with Table 3-1, a summary of the peak hour intersection LOS for Existing conditions are shown on Exhibit 3-15. The intersection operations analysis worksheets are included in Appendix 3.2 of this TIA.

3.8 EXISTING CONDITIONS ROADWAY SEGMENT CAPACITY ANALYSIS

The City of Moreno Valley General Plan Circulation Element provides roadway volume capacity values presented previously on Table 2-3. The roadway segment capacities are approximate figures only and are used at the General Plan level to assist in determining the roadway functional classification (number of through lanes) needed to meet traffic demand. Table 3-2 provides a summary of the Existing (2015) conditions roadway segment capacity analysis based on the City of Moreno Valley and City of Perris General Plan Circulation Element Roadway Segment Capacity/ (LOS) Thresholds identified previously on Table 2-3. As shown on Table 3-2, all the study area roadway segments currently operate at an acceptable LOS based on the City's planning level daily roadway capacity thresholds (i.e., LOS C or better).

3.9 OFF-RAMP QUEUING ANALYSIS

A queuing analysis was performed for the off-ramps at the I-215 Freeway Harley Knox Boulevard interchanges to assess vehicle queues for the off ramps that may potentially result in deficient peak hour operations at the ramp-to-arterial intersections and may potentially "spill back" onto the I-215 Freeway mainline. Queuing analysis findings are presented in Table 3-3. It is important to note that off-ramp lengths are consistent with the measured distance between the intersection and the freeway mainline. As shown on Table 3-3, there are no movements that are currently experiencing queuing issues during the weekday AM or weekday PM peak 95th percentile traffic flows. Worksheets for Existing traffic conditions off-ramp queuing analysis are provided in Appendix 3.3.

Table 3-1

Intersection Analysis for Existing (2015) Conditions

#	Intersection	Traffic Control[3]	Intersection Approach Lanes[1]												Delay[2] (secs.)		Level of Service	
			Northbound			Southbound			Eastbound			Westbound						
			L	T	R	L	T	R	L	T	R	L	T	R	AM	PM	AM	PM
1	I-215 SB Ramps / Harley Knox Bl	TS	0	0	0	0	1	1	0	2	d	1	2	0	29.1	32.9	C	C
2	I-215 NB Ramps / Harley Knox Bl	TS	0	1	1	0	0	0	1	2	0	0	2	d	19.3	18.4	B	B
3	Western Wy / Harley Knox Bl	CSS	0	0	0	0	1	0	0	2	0	0	2	d	13.9	14.0	B	B
4	Patterson Av / Harley Knox Bl	TS	0	1	0	0	1	1	1	2	1	1	2	1	19.9	20.2	B	C
5	Webster Av / Harley Knox Bl	CSS	0	0	1	0	0	0	0	3	0	0	3	0	9.5	9.6	A	A
6	Indian St / Nandina Av	TS	1	2	0	1	2	0	1	1	1>	1	1	d	18.9	25.8	B	C
7	Indian St / Grove View Rd	CSS	0	1	0	1	1	0	0	0	0	1	0	1	12.0	18.6	B	C
8	Indian St / Driveway 1		Future Intersection															
9	Indian St / Driveway 2		Future Intersection															
10	Indian St / Harley Knox Bl	TS	2	2	1	1	2	0	1	3	d	1	3	0	16.8	24.2	B	C

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

CSS = Cross-street Stop; TS = Traffic Signal

[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.

[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.

Table 3-2

Roadway Volume/Capacity Analysis for Existing (2015) Conditions

#	Roadway	Segment Limits	Roadway Section	LOS[3] Capacity[1]	Existing (2015)	V/C[2]	LOS[3]	Acceptable LOS[3]
1	Harley Knox Boulevard	I-215 SB Ramps to I-215 NB Ramps	4D	35,900	13,787	0.38	A	D
2		I-215 NB Ramps to Western Way	4D	35,900	17,815	0.50	A	D
3		East of Western Way	4U	25,900	18,604	0.72	C	D
4		West of Patterson Avenue	4U	25,900	17,864	0.69	B	D
5		East of Patterson Avenue	6D	53,900	17,155	0.32	A	D
6		West of Webster Avenue	6D	53,900	16,756	0.31	A	D
7		East of Webster Avenue	6D	53,900	16,769	0.31	A	D
8		West of Indian Street	6D	53,900	20,018	0.37	A	D
9	Indian Street	South of Nandina Avenue	2D	18,750	12,654	0.67	B	D
10		North of Grove View Road	2D	18,750	12,339	0.66	B	D
11		South of Grove View Road	2D	18,750	13,803	0.74	C	D
12		North of Harley Knox Boulevard	4D	35,900	13,717	0.38	A	D

[1] These maximum roadway capacities have been extracted from the City of Moreno Valley's Transportation Division's Traffic Impact Analysis Preparation Guidelines (August 2007) and Table CE-9 of the City of Perris General Plan Circulation Element.

[2] V/C = Volume to Capacity Ratio

[3] LOS = Level of Service

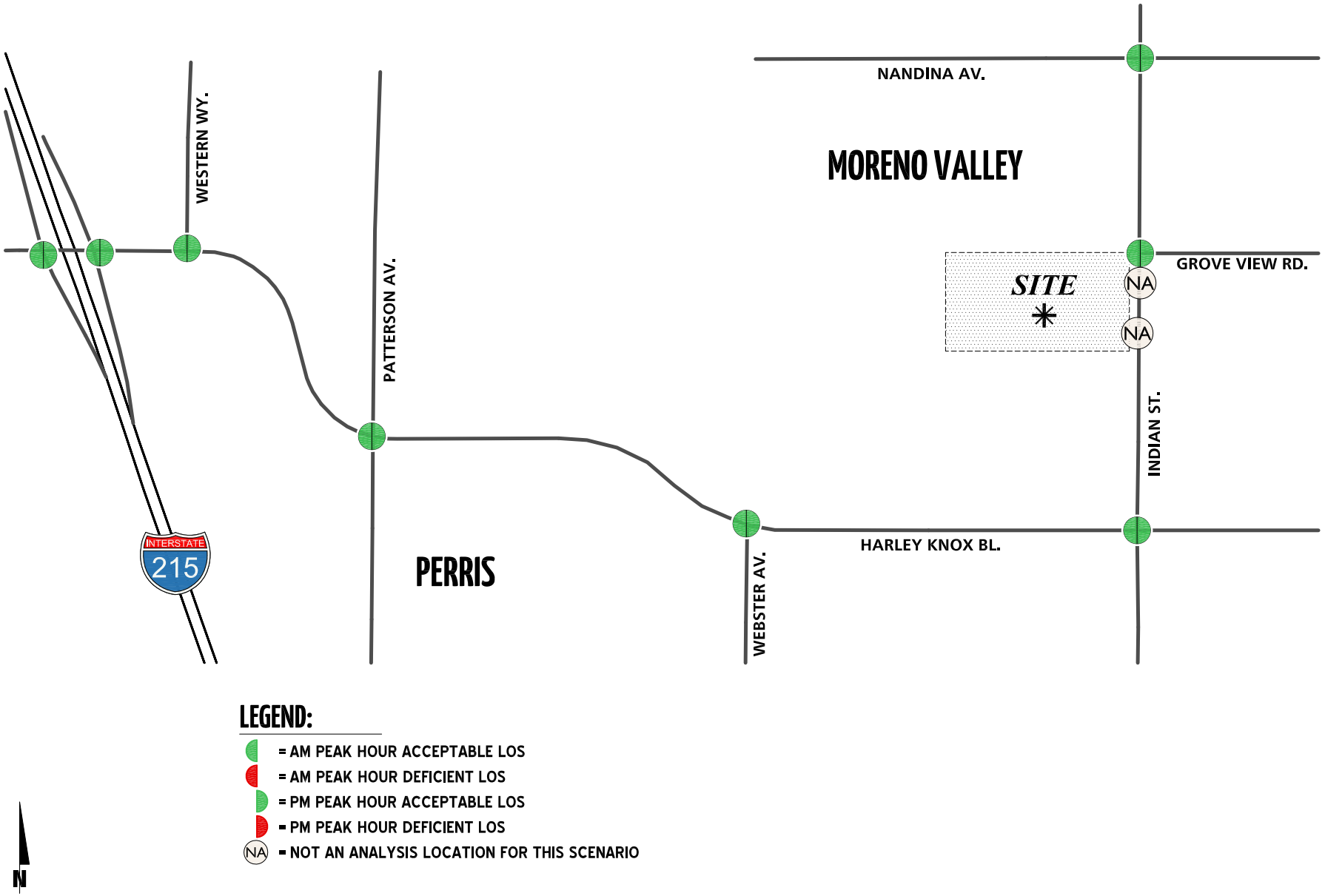
Table 3-3

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

Intersection	Movement	Stacking Distance (Feet)	95th Percentile Stacking Distance Required (Feet)		Acceptable? [1]	
			AM Peak Hour	PM Peak Hour	AM	PM
I-215 SB Ramps / Harley Knox Bl.						
	SBL/T	1,330	361	366	Yes	Yes
	SBR	270	45	46	Yes	Yes
I-215 NB Ramps / Harley Knox Bl.						
	NBL/T	1,120	35	21	Yes	Yes
	NBR	265	49	52	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.

EXHIBIT 3-15: SUMMARY OF LOS FOR EXISTING (2015) CONDITIONS



3.10 TRAFFIC SIGNAL WARRANTS ANALYSIS

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

ID	Intersection Location	Jurisdiction	CMP?
3	Western Way / Harley Knox Boulevard	Perris	No

However, this intersection is currently operating at acceptable LOS as a cross-street stop controlled intersection. Existing conditions traffic signal warrant analysis worksheets are provided in Appendix 3.4.

3.11 RECOMMENDED IMPROVEMENTS

3.11.1 RECOMMENDED IMPROVEMENTS TO ADDRESS DEFICIENCIES AT INTERSECTIONS

All study area intersections are anticipated to operate at acceptable LOS (LOS C or better) for Existing (2015) traffic conditions. As such, no intersection improvements have been recommended.

3.11.2 RECOMMENDED IMPROVEMENTS TO ADDRESS DEFICIENCIES ON ROADWAY SEGMENTS

All study area roadway segments are anticipated to operate at acceptable LOS (LOS C or better) for Existing (2015) traffic conditions. As such, no roadway improvements have been recommended.

3.11.3 RECOMMENDED IMPROVEMENTS TO ADDRESS OFF-RAMP QUEUES

As shown previously on Table 3-3, there are no peak hour queuing issues at the I-215 Freeway at Harley Knox Boulevard interchanges. As such, no improvements have been recommended.

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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 a total of 446,350 square feet, of which 357,080 square feet (sf) would be allocated to High-Cube Warehouse / Distribution Center use and 89,270 sf to Manufacturing use within a single building. Per the City's traffic study guidelines, the Opening Year will have a 5-year minimum horizon. As such, the Opening Year analysis will assess 2020 traffic conditions.

The Project is proposed to have access on Indian Street via Driveway 1 and Driveway 2. Both driveways are proposed to allow for full access. Driveway 1 is proposed to serve passenger cars, while trucks would utilize Driveway 2. Driveway 1 is proposed to align with the proposed future driveway on the east side of Indian Street. Regional access to the project site is provided via the I-215 Freeway at Harley Knox Boulevard interchanges.

4.1 PROJECT TRIP GENERATION

Trip generation represents the amount of traffic which is both attracted to and produced by a development. Determining traffic generation for a specific project is therefore based upon forecasting the amount of traffic that is expected to be both attracted to and produced by the specific land uses being proposed for a given development. The ITE Trip Generation manual is a nationally recognized source for estimating site specific trip generation. ITE's most current version of the Trip Generation manual is based on more than 4,800 trip generation studies submitted to ITE by public agencies, consulting firms, universities/colleges, developers, associations, and local sections/districts/student chapters of ITE. (3) In an effort to provide flexibility for the future development of the Project, the trip generation has been estimated assuming a mix of 80 percent high-cube warehouse/distribution center use and 20 percent manufacturing use. The trip generation is anticipated to be more conservative for this mix of uses in comparison to 100 percent high-cube warehouse/distribution center use.

4.1.1 HIGH-CUBE WAREHOUSE/DISTRIBUTION CENTER LAND USE

High-cube warehouse/distribution centers (ITE Land Use Code 152) are a unique land use type within the larger, more generalized industrial land use category. ITE's most recent edition of the Trip Generation manual (ITE 9th Edition), published in 2012, defines "high-cube warehouses" as *"…used for storage of materials, goods and merchandise prior to their distribution to retail outlets, distribution centers or other warehouses. These facilities are typically characterized by ceiling heights of at least 24 feet with small employment counts due to a high level of mechanization."* The average square footage for the sites surveyed for high-cube warehouse/distribution center (Land Use 152) use is above 500,000 square feet. The number of sites observed in the compilation of this data ranges from 57-70 sites of which more than 20 sites exceed 1,000,000 square feet in gross floor area. The weighted average daily trip generation rate for high-cube warehouse (Land Use 152) use is 1.68 trips per thousand square feet (TSF).

The ITE Trip Generation manual includes data regarding the types of vehicles that are generated (passenger cars and trucks), but provides no guidance on vehicle mix (different sizes of trucks).

While trucks, as a percentage of total traffic, has been based on the ITE Trip Generation manual, data regarding the vehicle mix has been obtained from a separate report: The South Coast Air Quality Management District's (SCAQMD) recent Warehouse Truck Trip Study. (11) (12) The SCAQMD is currently recommending the use of the ITE Trip Generation manual in conjunction with their truck mix by axle-type to better quantify trip rates associated with local warehouse and distribution projects, as truck emission represent more than 90 percent of air quality impacts from these projects. This recommended procedure has been utilized for the purposes of this analysis in effort to be consistent with other technical studies prepared for the Project.

As noted on Table 4-1, refinements to the raw trip generation estimates have been made to provide a more detailed breakdown of trips between passenger cars and trucks. The percentage of trucks has been determined from the table shown on page 267 of the ITE Trip Generation manual. As shown on page 267, the truck trip generation rate for weekday daily traffic is 0.64, or 38.1%, of the total traffic. Similarly, the truck trip generation rate for the weekday AM peak hour is 0.03 (27.3% of the total traffic) and 0.04 (or 33.3% of the total traffic) for the weekday PM peak hour.

Trip generation for heavy trucks was further broken down by truck type (or axle type). The total truck percentage is comprised of 3 different truck types: 2-axle, 3-axle, and 4+-axle trucks. For the purposes of this analysis, the percentage of trucks, by axle type, were obtained from the SCAQMD interim recommended truck mix. The SCAQMD has recently performed surveys of existing facilities and compiled the data to provide interim guidance on the mix of heavy trucks for these types of high-cube warehousing/distribution facilities. Based on this interim guidance from the SCAQMD, the following truck fleet mix was utilized for the purposes of estimating the truck trip generation for the site: 22.0% of the total trucks as 2-axle trucks, 17.7% of the total trucks as 3-axle trucks, and 60.3% of the total trucks as 4+-axle trucks. Lastly, PCE factors were applied to the trip generation rates for heavy trucks (large 2-axles, 3-axles, 4+-axles).

4.1.2 MANUFACTURING LAND USE

Manufacturing facilities (ITE Land Use Code 140) are areas where the primary activity is the conversion of raw materials or parts into finished products. Size and type of activity may vary substantially from one facility to another. In addition to the actual production of goods, manufacturing facilities generally also have office, warehouse, research and associated functions.

Table 4-1

Project Trip Generation Rates (PCE)

Land Use[1]	Units[2]	ITE LU Code	AM Peak Hour			PM Peak Hour			Daily
			In	Out	Total	In	Out	Total	
Manufacturing[3,5]	TSF	140	0.570	0.160	0.730	0.260	0.470	0.730	3.820
Passenger Cars			0.349	0.098	0.447	0.159	0.288	0.447	2.338
2-Axle Trucks			0.052	0.015	0.067	0.024	0.043	0.067	0.350
3-Axle Trucks			0.145	0.041	0.185	0.066	0.119	0.185	0.970
4-Axle+ Trucks			0.340	0.096	0.436	0.155	0.281	0.436	2.281
High-Cube Warehouse/Distribution Center[4,5]	TSF	152	0.076	0.034	0.110	0.037	0.083	0.120	1.680
Passenger Cars			0.055	0.025	0.080	0.025	0.055	0.080	1.040
2-Axle Trucks			0.007	0.003	0.010	0.004	0.009	0.013	0.211
3-Axle Trucks			0.007	0.003	0.011	0.004	0.010	0.014	0.226
4-Axle+ Trucks			0.037	0.017	0.054	0.022	0.050	0.072	1.158

Project Trip Generation Rates (Actual Vehicles)

Land Use[1]	Units[2]	ITE LU Code	AM Peak Hour			PM Peak Hour			Daily
			In	Out	Total	In	Out	Total	
Manufacturing[3]	TSF	140	0.570	0.160	0.730	0.260	0.470	0.730	3.820
Passenger Cars			0.349	0.098	0.447	0.159	0.288	0.447	2.338
2-Axle Trucks			0.035	0.010	0.045	0.016	0.029	0.045	0.233
3-Axle Trucks			0.072	0.020	0.093	0.033	0.060	0.093	0.485
4-Axle+ Trucks			0.113	0.032	0.145	0.052	0.094	0.145	0.760
High-Cube Warehouse/Distribution Center[4]	TSF	152	0.076	0.034	0.110	0.037	0.083	0.120	1.680
Passenger Cars			0.055	0.025	0.080	0.025	0.055	0.080	1.040
2-Axle Trucks			0.005	0.002	0.007	0.003	0.006	0.009	0.141
3-Axle Trucks			0.004	0.002	0.005	0.002	0.005	0.007	0.113
4-Axle+ Trucks			0.012	0.006	0.018	0.007	0.017	0.024	0.386

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

[2] TSF = thousand square feet

[3] Vehicle Mix Source: City of Fontana Truck Trip Generation Study for LU 110, Heavy Industrial, August 2003.

[4] Vehicle Mix Source: Total truck percentage source from ITE Trip Generation manual. Truck mix (by axle type) source from SCAQMD.
AM peak hour = 72.7% passenger cars, 6.01% 2-Axle trucks, 4.83% 3-Axle trucks, 16.46% 4-Axle trucks
PM peak hour = 66.7% passenger cars, 7.33% 2-Axle trucks, 5.89% 3-Axle trucks, 20.08% 4-Axle trucks
ADT = 61.9% passenger cars, 8.38% 2-Axle trucks, 6.74% 3-Axle trucks, 22.98% 4-Axle trucks

[5] PCE rates are per SANBAG.

The City of Fontana's Truck Trip Generation Study does not include vehicle mix percentages for ITE Land Use Code 140, as such, the vehicle mix for Heavy Industrial (Land Use Code 110 have been utilized. The ITE Trip Generation manual includes data regarding the types of vehicles that are generated (passenger cars and trucks), but provides no guidance on vehicle mix (different sizes of trucks). Total vehicle mix percentages were obtained from the City of Fontana's Truck Trip Generation Study for Heavy Industrial (Land Use Code 110). (13) PCE factors were applied to the trip generation rates for heavy trucks (large 2-axles, 3-axles, 4+-axles). PCE factors are consistent with the recommended PCE factors in Appendix "C" of the San Bernardino County CMP, 2005 Update.

4.1.3 PROJECT TRIP GENERATION

Trip generation rates used to estimate Project traffic are shown in Table 4-1 in both PCE and actual vehicles. A summary of the Project's trip generation based on PCE is shown in Table 4-2, while the trip generation based on actual vehicles is shown on Table 4-3 (for comparative purposes). For purposes of this analysis, ITE land use code 140 (Manufacturing) and 152 (High-Cube Warehousing) have been used to derive site specific trip generation estimates. In order to accurately reflect the impact that heavy trucks would have on the street system, Project trips have been further broken down between passenger cars and trucks for each of the peak hours and weekday daily trip generation.

As directed by the City of Moreno Valley and consistent with standard traffic engineering practice in Southern California, PCE factors have been utilized due to the expected heavy truck component for the proposed Project uses. PCEs allow the typical "real-world" mix of vehicle types to be represented as a single, standardized unit, such as the passenger car, to be used for the purposes of capacity and level of service analyses. These PCE factors are consistent with the values recommended by the San Bernardino County CMP and are accepted factors in the City of Moreno Valley. (10) Although the County of Riverside has a recommended PCE factor of 2.0, the San Bernardino County CMP PCE factors have been utilized in an effort to conduct a more conservative analysis. A PCE factor of 1.5 has been applied to 2-axle trucks, 2.0 for 3-axle trucks, and 3.0 for 4+-axle trucks.

As shown on Table 4-2, the proposed Project is anticipated to generate a net total of 1,472 PCE trip-ends per day with 157 net PCE AM peak hour trips and 166 net PCE PM peak hour trips.

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.

Table 4-2

Project Trip Generation Summary (PCE)

Land Use	Quantity	Units[1]	AM Peak Hour			PM Peak Hour			Daily
			In	Out	Total	In	Out	Total	
Manufacturing	89.270	TSF							
Passenger Cars:			31	9	40	14	26	40	209
Truck Trips:									
2-axle:			*5*	*1*	*6*	*2*	*4*	*6*	*31*
3-axle:			*13*	*4*	*17*	*6*	*11*	*17*	*87*
4+-axle:			*30*	*9*	*39*	*14*	*25*	*39*	*204*
- Net Truck Trips (PCE) [2]			*48*	*14*	*62*	*22*	*40*	*62*	*322*
High-Cube Warehouse	357.080	TSF							
Passenger Cars:			20	9	29	9	20	29	371
Truck Trips:									
2-axle:			*2*	*1*	*3*	*1*	*3*	*4*	*75*
3-axle:			*3*	*1*	*4*	*2*	*3*	*5*	*81*
4+-axle:			*13*	*6*	*19*	*8*	*18*	*26*	*414*
- Net Truck Trips (PCE) [2]			*18*	*8*	*26*	*11*	*24*	*35*	*570*
TOTAL NET TRIPS (PCE)[3]			**117**	**40**	**157**	**56**	**110**	**166**	**1,472**

[1] TSF = thousand square feet

[2] Vehicle Mix Source: Total truck percentage source from ITE Trip Generation manual. Truck mix (by axle type) source from SCAQMD.

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

Table 4-3

Project Trip Generation Summary (Actual Vehicles)

Land Use	Quantity	Units[1]	AM Peak Hour			PM Peak Hour			Daily
			In	Out	Total	In	Out	Total	
Manufacturing	89.270	TSF							
Passenger Cars:			31	9	40	14	26	40	209
Truck Trips:									
2-axle:			*3*	*1*	*4*	*1*	*3*	*4*	*21*
3-axle:			*6*	*2*	*8*	*3*	*5*	*8*	*43*
4+-axle:			*10*	*3*	*13*	*5*	*8*	*13*	*68*
- Net Truck Trips			*19*	*6*	*25*	*9*	*16*	*25*	*132*
High-Cube Warehouse	357.080	TSF							
Passenger Cars:			20	9	29	9	20	29	371
Truck Trips:									
2-axle:			*2*	*1*	*3*	*1*	*2*	*3*	*50*
3-axle:			*1*	*1*	*2*	*1*	*2*	*3*	*40*
4+-axle:			*4*	*2*	*6*	*3*	*6*	*9*	*138*
- Net Truck Trips			*7*	*4*	*11*	*5*	*10*	*15*	*228*
TOTAL NET TRIPS (ACTUAL VEHICLES)[2]			**77**	**28**	**105**	**37**	**72**	**109**	**940**

[1] TSF = thousand square feet

[2] TOTAL NET TRIPS (Actual Vehicles) = Passenger Cars + Net Truck Trips (Actual Trucks).

The Project trip distribution was developed based on anticipated travel patterns to and from the Project site for both passenger cars and truck traffic. The truck trip distribution patterns have been developed based on the anticipated travel patterns for the high-cube warehousing trucks. The Project trip distribution patterns for both passenger cars and trucks were developed based on an understanding of existing travel patterns in the area, the geographical location of the site, and the site's proximity to the regional arterial and state highway system.

The passenger car trip distributions utilized for the purposes of this analysis are shown on Exhibit 4-1, and truck trip distributions are shown on Exhibit 4-2. Majority of the inbound trucks are anticipated to be originating from the ports. As such, 95% of the inbound truck trips are expected to come via SR-60 to I-215 southbound. However, the outbound trucks are anticipated to be distributed throughout the region. Although the Project is anticipated to send both passenger car and truck traffic east on Nandina Avenue and east on Grove View Road, additional study area intersections were not identified as the Project is anticipated to contribute less than 50 peak hour trips.

4.3 MODAL SPLIT

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

4.4 PROJECT TRIP ASSIGNMENT

The assignment of traffic from the Project area to the adjoining roadway system is based upon the Project trip generation, trip distribution, and the arterial highway and local street system improvements that would be in place by the time of initial occupancy of the Project. Based on the identified Project traffic generation and trip distribution patterns, Project ADT and peak hour intersection turning movement volumes are shown on Exhibit 4-3 in PCE.

4.5 BACKGROUND TRAFFIC

To account for growth in traffic between Existing Conditions (2015) and the Project Opening Year (2020), a compounded annual traffic growth rate of 2 percent was assumed (10.41 percent aggregate growth in background traffic for the period 2015—2020). The 2 percent annual growth rate is intended to capture non-specific ambient traffic growth.

EXHIBIT 4-1: PROJECT (PASSENGER CAR) TRIP DISTRIBUTION

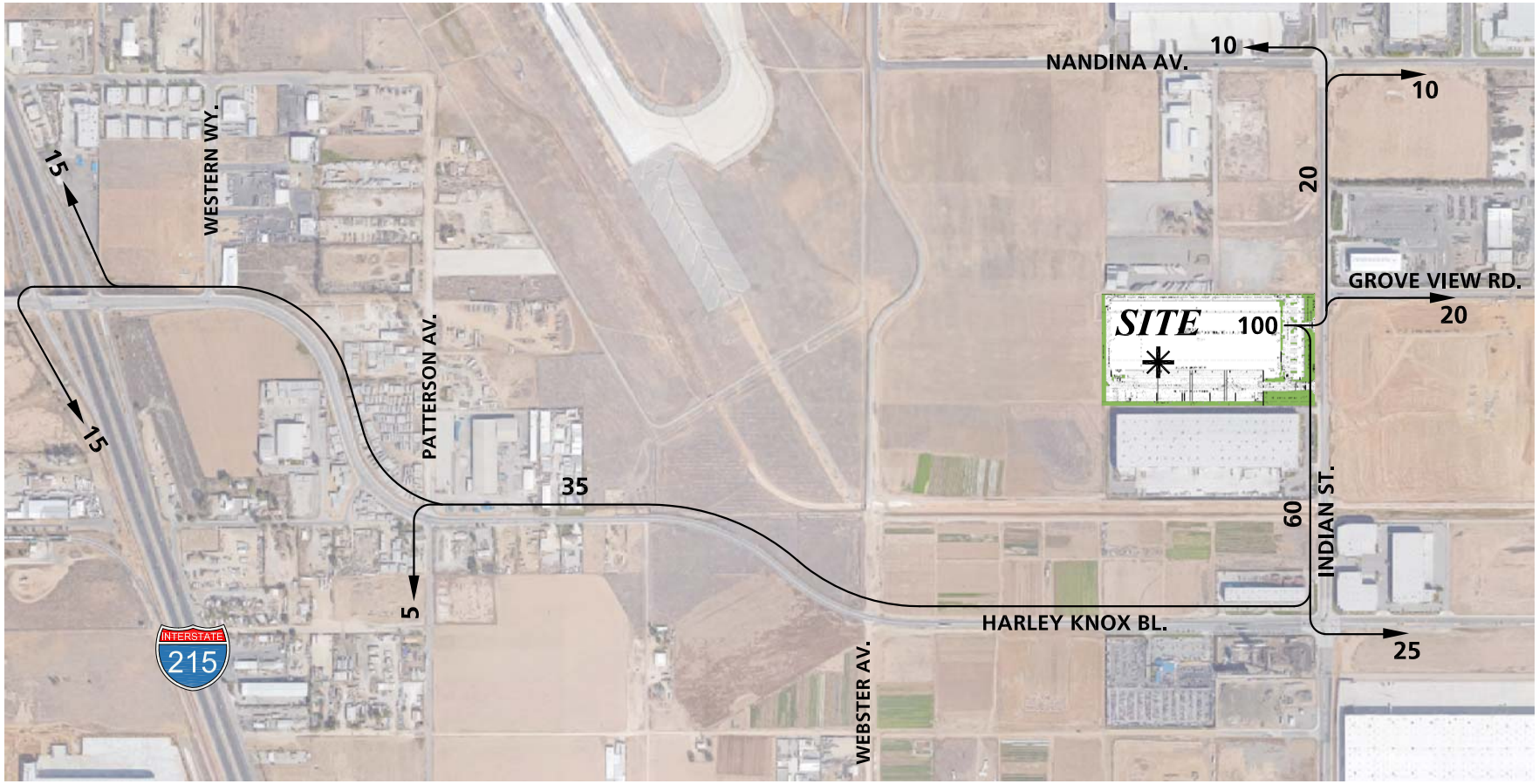
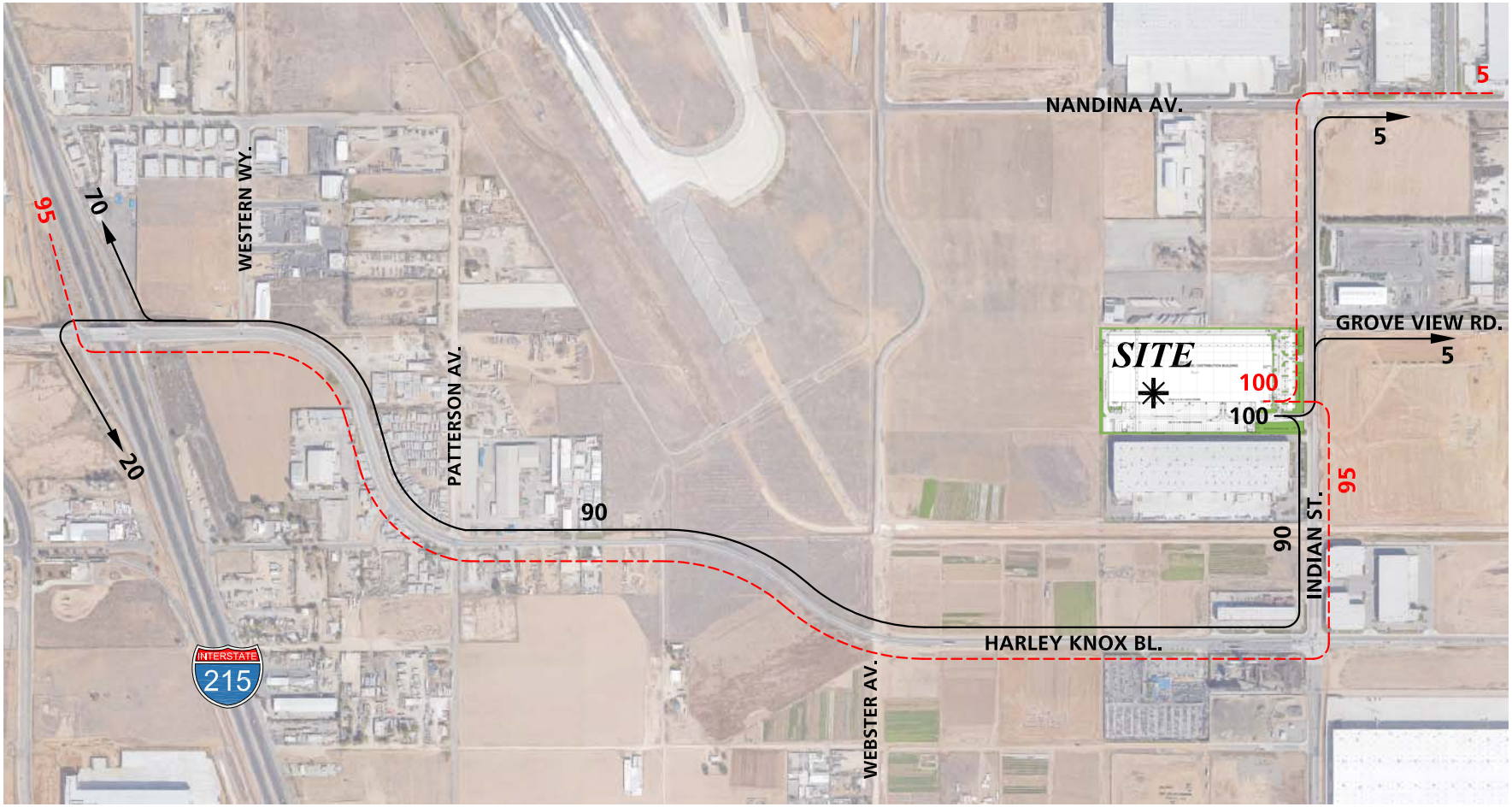


EXHIBIT 4-2: PROJECT (TRUCKS) TRIP DISTRIBUTION

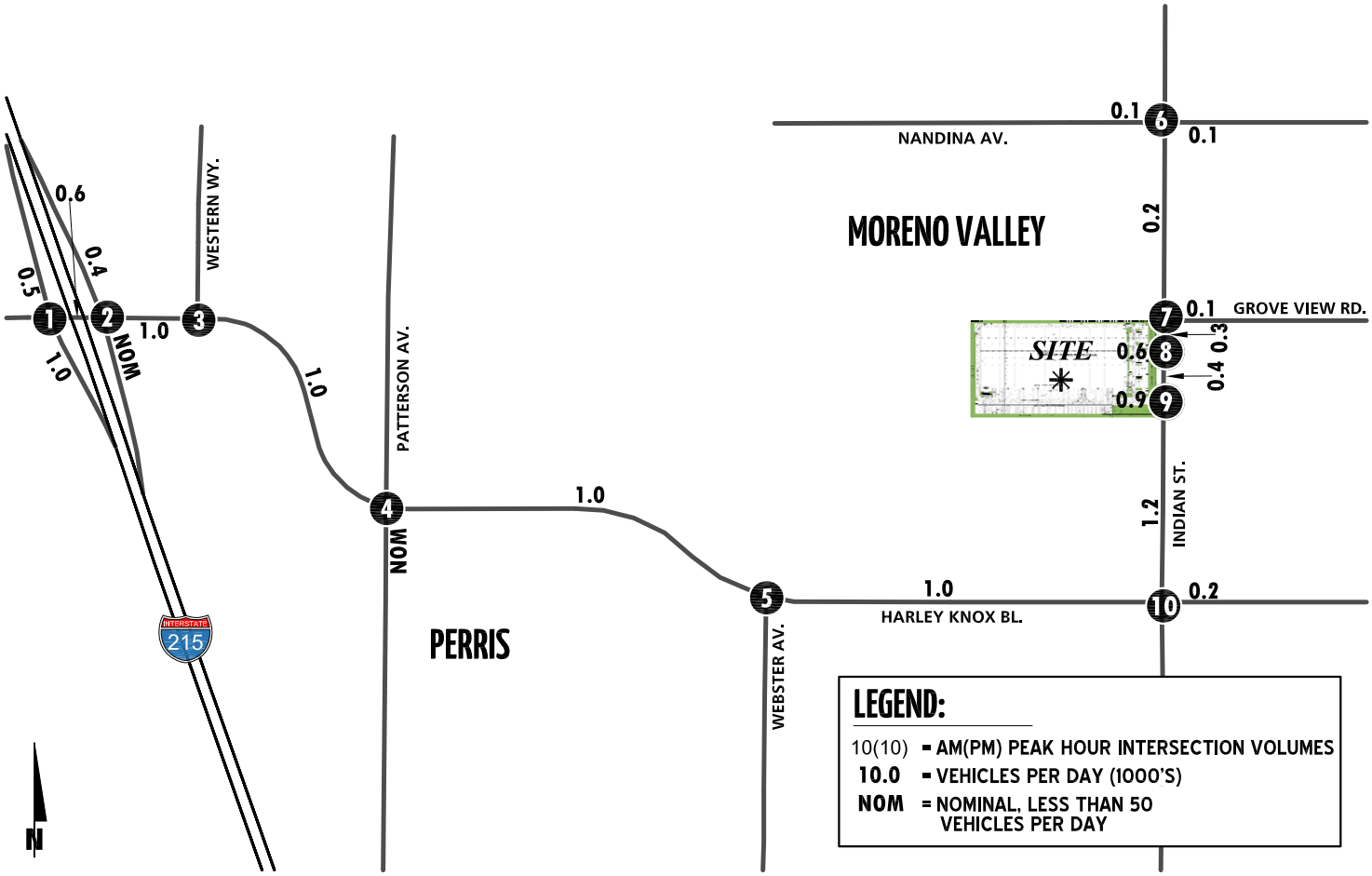


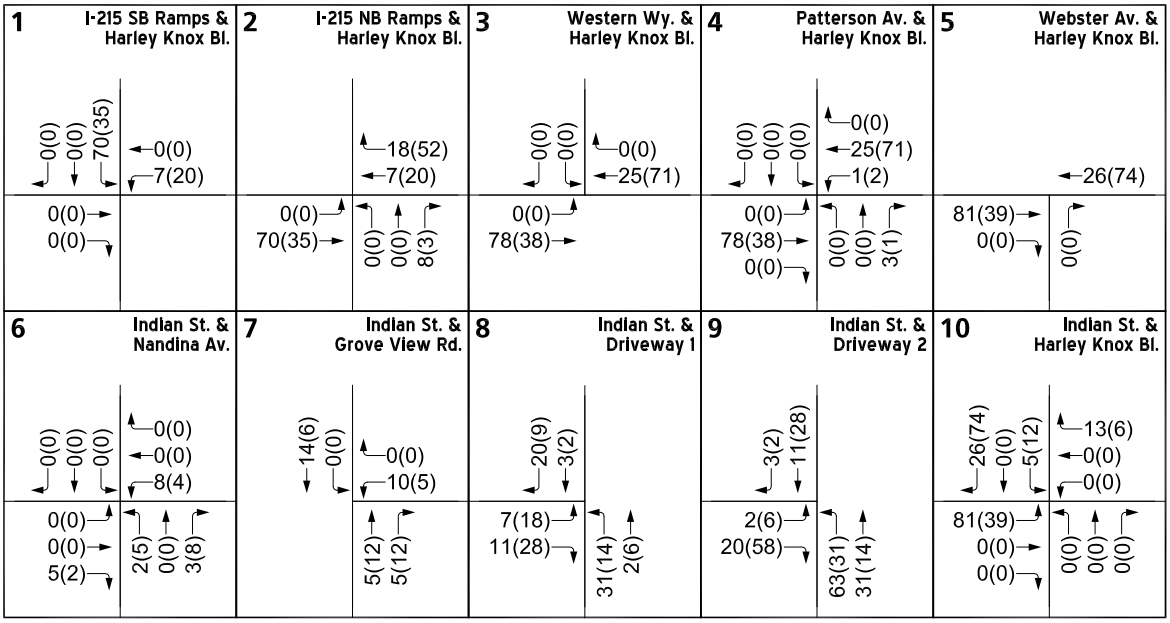
LEGEND:

10 = PERCENT TO/FROM PROJECT
= OUTBOUND
= INBOUND

N

EXHIBIT 4-3: PROJECT ONLY TRAFFIC VOLUMES





In context, the TIA's assumed 2 percent compounded annual growth rate is considered a reasonable approximation of future traffic growth when compared to demographic projections reflected in other local and regional growth modeling efforts. More specifically, the Southern California Association of Governments SCAG 2012—2035 RTP/SCS growth forecasts for the City of Moreno Valley assume the City population to increase from 187,400 in 2008 to 255,200 by the year 2035, or an approximate 1.15 percent growth rate compounded annually. The RTP/SCS assumed growth in households over the same 27- year period reflects an increase from 51,100 households to 72,800 households; a rate of 1.32 percent compounded annually. At the upper end of assumed RTP/SCS growth rates, employment over the same 27-year period is projected to increase from 32,300 jobs to 64,400 jobs; a rate of approximately 2.59 percent compounded annually. (4) The 2 percent compounded annual traffic growth rate employed in the TIA reflects the fact that not all persons comprising population growth, household growth, or employment growth would translate on a one to one basis as a new vehicle trip in the region; and establishes a judicious midrange estimate lying between the RTP/SCS assumed regional population growth rate (1.15 percent) and the RTP/SCS assumed regional employment growth rate (2.59 percent).

Conservatively, the TIA estimates of area traffic growth then add traffic generated by other known or probable related projects. These related projects are at least in part already accounted for in the assumed annual 2 percent ambient growth in traffic noted above; and in some instances these related projects would likely not be implemented and functional within the 2020 Opening Year time frame assumed for the Project. The resultant assumed traffic growth rate employed in the TIA (2 percent annual ambient growth plus traffic generated by related projects) would therefore tend to overstate rather than understate background cumulative traffic impacts under 2020 conditions.

4.6 CUMULATIVE DEVELOPMENT TRAFFIC

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 Moreno Valley. The cumulative project list includes known and foreseeable projects that are anticipated to contribute traffic to the study area intersections. Adjacent jurisdictions of the County of Riverside, March Joint Powers Authority (JPA), City of Riverside, and the City of Perris have also been contacted to obtain the most current list of cumulative projects from their respective jurisdictions. The correspondence and cumulative projects provided by each of the applicable jurisdictions are provided in Appendix 4.1.

Where applicable, cumulative projects anticipated to contribute measurable traffic (i.e. 50 or more peak hour trips) to study area intersections have been manually added to the study area network to generate Opening Year Cumulative forecasts. In other words, this list of cumulative development projects has been reviewed to determine which projects would likely contribute measurable traffic through the study area intersections (e.g., those cumulative projects in close proximity to the proposed Project). For the purposes of this analysis, the cumulative projects

that were determined to affect one or more of the study area intersections are shown on Exhibit 4-4, listed on Table 4-4, and have been considered for inclusion.

Although it is unlikely that these cumulative projects would be fully built and occupied by Year 2020, they have been included in an effort to conduct a conservative analysis and overstate as opposed to understate potential traffic impacts.

Any other cumulative projects that are not expected to contribute measurable traffic to study area intersections have not been included since the traffic would dissipate due to the distance from the Project site and study area intersections. Any additional traffic generated by other projects not on the cumulative projects list is accounted for through background ambient growth factors that have been applied to the peak hour volumes at study area intersections as discussed in Section 4.5 *Background Traffic*. Cumulative development project ADT and peak hour intersection turning movement volumes are shown on Exhibit 4-5.

EXHIBIT 4-4: CUMULATIVE DEVELOPMENT PROJECTS LOCATION MAP

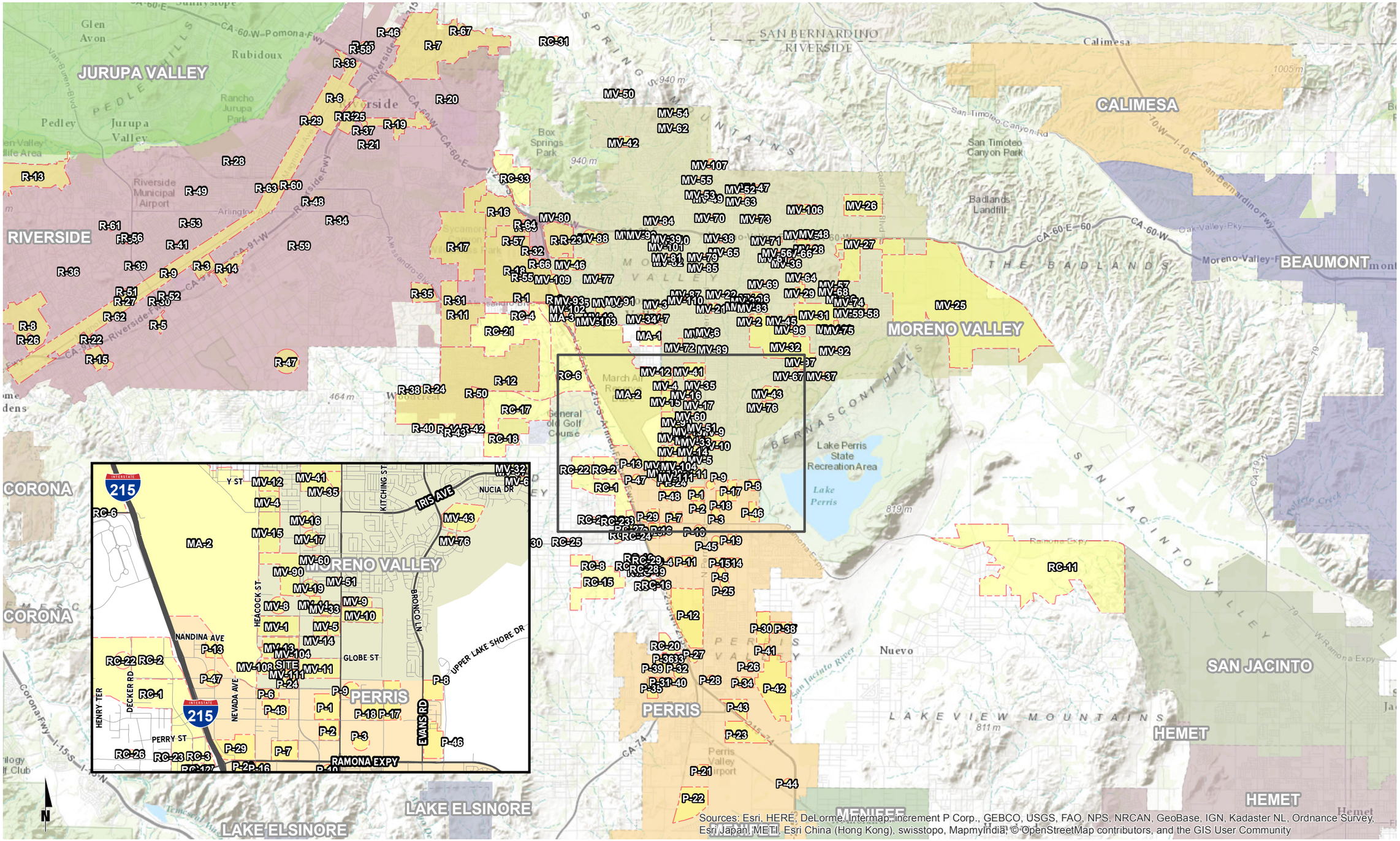


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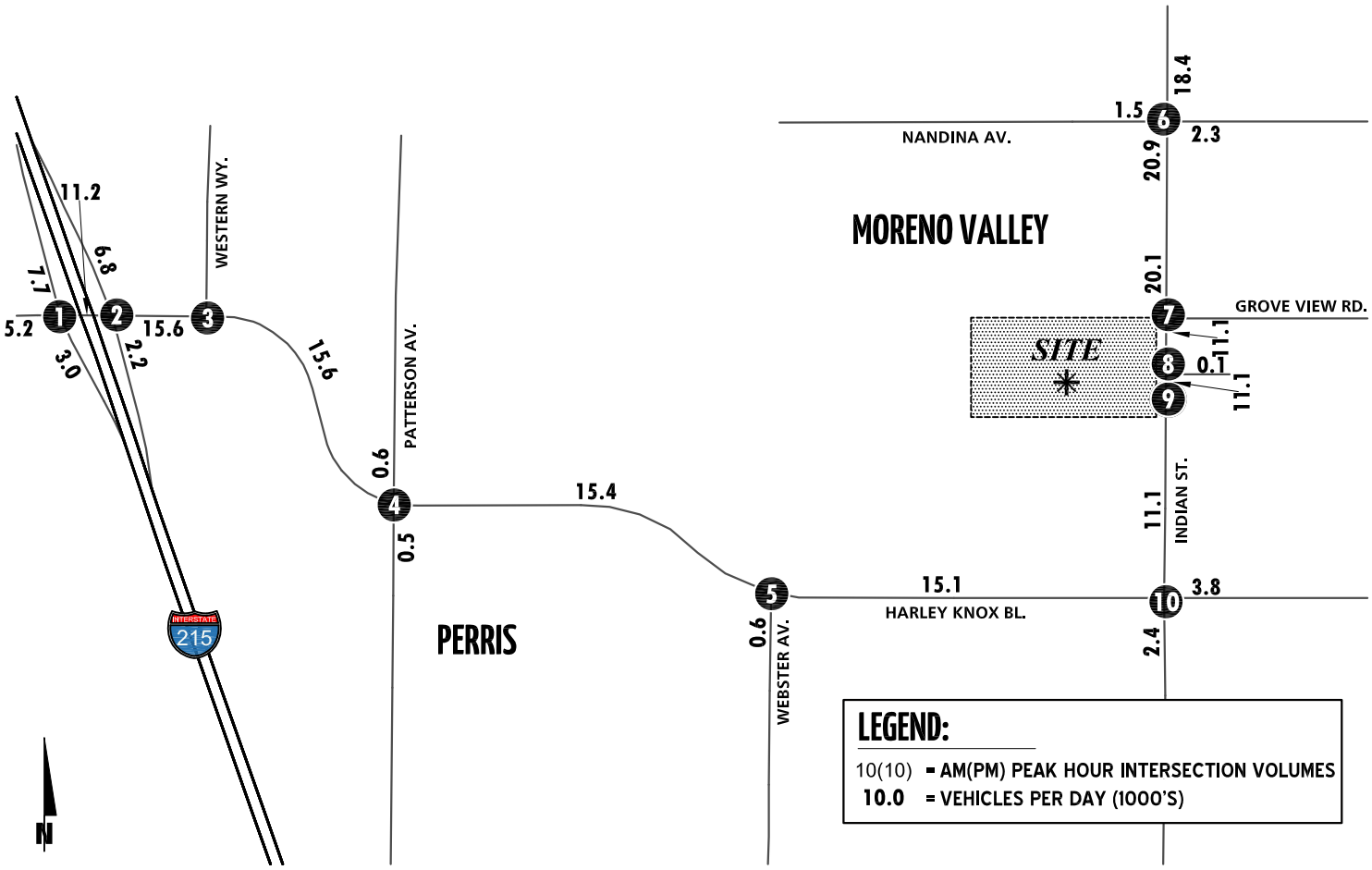
EXHIBIT 4-5: CUMULATIVE DEVELOPMENT TRAFFIC VOLUMES



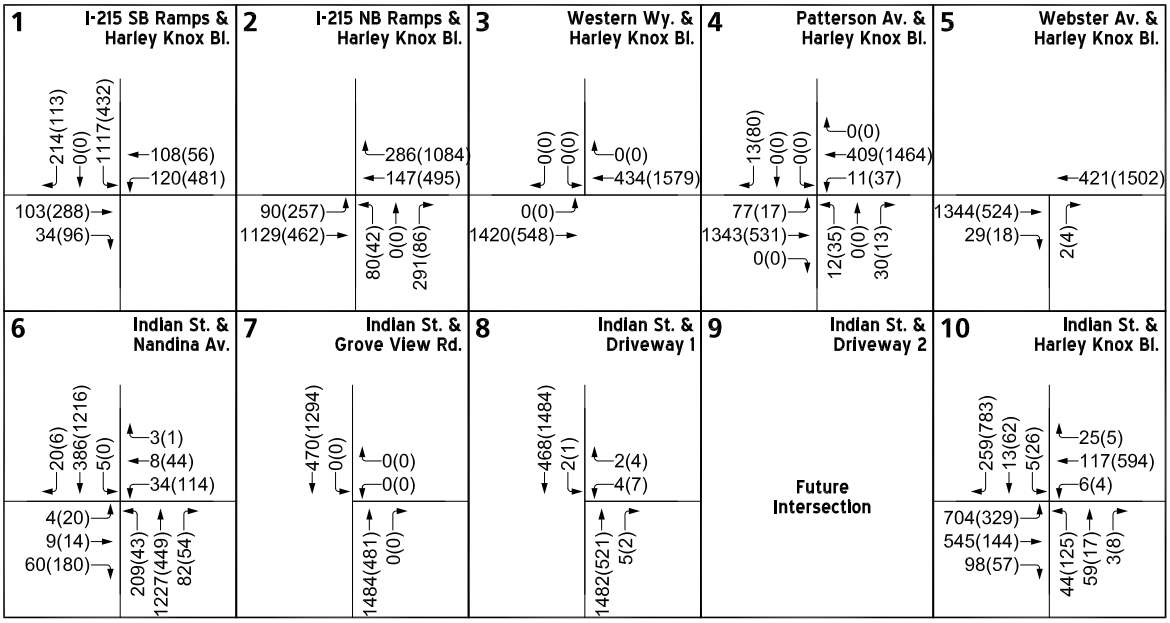


Table 4-4

Cumulative Development Land Use Summary

TAZ	Project Name	Land Use[1]	Quantity	Units[2]
CITY OF MORENO VALLEY				
MV-1	PA 06-0152 & PA 06-0153 (First Park Nandina I & II)	High-Cube Warehouse	483.767	TSF
MV-2	Bella Vista Apartments	Apartments	220.00	DU
MV-3	PA 04-0063 (Centerpointe Buildings 8 and 9)	General Light Industrial	361.384	TSF
MV-4	PA 07-0035; PA 07-0039 (Moreno Valley Industrial Park)	General Light Industrial	204.657	TSF
		High-Cube Warehouse	409.920	TSF
MV-5	First Inland Logistics Center	High-Cube Warehouse	400.130	TSF
MV-6	TM 33607	Condo/Townhomes	52	DU
MV-7	PA 08-0093 (Centerpointe Business Park II)	General Light Industrial	99.988	TSF
MV-8	PA 06-0021; PA 06-0022; PA 06-0048; PA 06-0049 (Komar Investments)	Warehousing	287.100	TSF
MV-9	PA 06-0017 (Ivan Devries)	Industrial Park	569.200	TSF
MV-10	Modular Logistics (Dorado Property)	High-Cube Warehouse	1109.378	TSF
MV-11	PA 09-0004 (Vogel)	High-Cube Warehouse	800.000	TSF
	Sares Regis	High-Cube Warehouse	1600.000	TSF
MV-12	TM 34748	SFDR	135	DU
MV-13	First Nandina Logistics Center	High-Cube Warehouse	1450.000	TSF
MV-14	First Park Nandina III	High-Cube Warehouse	691.960	TSF
	Moreno Valley Commerce Park	High-Cube Warehouse	354.321	TSF
MV-15	March Business Center	General Light Industrial	16.732	TSF
		Warehousing	87.429	TSF
		High-Cube Warehouse	1380.246	TSF
MV-16	TM 33810	SFDR	16	DU
MV-17	TM 34151	SFDR	37	DU
MV-18	373K Industrial Facility	High-Cube Warehouse	373.030	TSF
MV-19	TM 32716	SFDR	57	DU
MV-20	TM 33417	Condo/Townhomes	60	DU
MV-21	TM 34988	Condo/Townhomes	271	DU
MV-22	TM 34216	Condo/Townhomes	39	DU
MV-23	TM 34681	Condo/Townhomes	49	DU
MV-24	PA 08-0079-0081 (WinCo Foods)	Discount Supermarket	95.440	TSF
		Specialty Retail	14.800	TSF
MV-25	Moreno Beach Marketplace (Lowe's)	Commercial Retail	175.000	TSF
	Auto Mall Specific Plan (Planning Area C)	Commercial Retail	304.500	TSF
	Westridge	High-Cube Warehouse	937.260	TSF
	ProLogis	High-Cube Warehouse	1916.190	TSF
		Warehousing	328.448	TSF
	World Logistics Center	High-Cube Warehouse	41400.000	TSF
		Warehousing	200.000	TSF
		Gas Station w/ Market	12	VFP
		Existing SFDR	7	DU
MV-26	a TR 32460 (Sussex Capital)	SFDR	57	DU
	b TR 32459 (Sussex Capital)	SFDR	11	DU
	c TR 30411 (Pacific Communities)	SFDR	24	DU
	d TR 33962 (Pacific Scene Homes)	SFDR	31	DU
	e TR 30998 (Pacific Communities)	SFDR	47	DU
MV-27	a P06-158 (Gascon)	Commercial Retail	116.360	TSF
	b Auto Mall Specific Plan (PAC)	Commercial Retail	304.500	TSF
	c ProLogis	SFDR	126	DU
		High-Cube Warehouse	1529.498	TSF
	d TR 35823 (Stowe Passco)	SFDR	261	DU
		Apartments	216	DU
MV-28	TR 36340	SFDR	275	DU
MV-29	a TR 31771 (Sanchez)	SFDR	25	DU
	b TR 34397 (Winchester Associates)	SFDR	52	DU
	c TR 32645 (Winchester Associates)	SFDR	53	DU
MV-30	Lowe's (Moreno Beach Marketplace)	Home Improvement Store	175.000	TSF
MV-31	a Senior Assisted Living	Assisted Living Units	139	DU
	b TR 31590 (Winchester Associates)	SFDR	96	DU
	c TR 32548 (Gabel, Cook & Associates)	SFDR	107	DU
	d TR 32218 (Whitney)	SFDR	63	DU
	e Medical Plaza	Medical Offices	311.633	TSF
MV-32	a Moreno Medical Campus	Medical Offices	80.000	TSF
	b Aqua Bella Specific Plan	SFDR	2,922	DU
	c TR 34329 (Granite Capitol)	SFDR	90	DU
	d Cresta Bella	General Office	30.000	TSF

Cumulative Development Land Use Summary

TAZ	Project Name	Land Use[1]	Quantity	Units[2]
MV-33	Moreno Valley Industrial Center (Industrial Area SP)	General Light Industrial	354.810	TSF
MV-34	Centerpointe Business Park	General Light Industrial	356.000	TSF
MV-35	Moreno Valley Shopping Center	Free Standing Discount Store	189.520	TSF
		Gas Station w/ Market / Car Wash	16	VFP
MV-36	TR 31305 / Richmond American	Residential	87	DU
MV-37	TR 34329 / Granite Capitol	Residential	90	DU
MV-38	TR 31814 / Moreno Valley Investors	Residential	60	DU
MV-39	TR 33771 / Creative Design Associates	Residential	12	DU
MV-40	TR 35663 / Kha	Residential	12	DU
MV-41	TR 22180 / Young Homes	Residential	140	DU
MV-42	TR 32515	Residential	161	DU
MV-43	TR 32142	Residential	81	DU
MV-44	San Michele Industrial Center (Industrial Area SP)	General Light Industrial	865.960	TSF
MV-45	Commercial Medical Plaza	Medical Offices	311.633	TSF
MV-46	Edgemont Street, South of Eucalyptus Av. (PA14-0042)	Apartments	112	DU
MV-47	28860 Professor's Fun IV, LLC/Winchester Associates, Inc.	SFDR	9	DU
MV-48	20636 Pacific Communities	SFDR	67	DU
MV-49	31297 Randy McFarland	SFDR	7	DU
MV-50	31394 Pigeon Pass, Ltd.	SFDR	78	DU
MV-51	31442 SKG Pacific Enterprises Inc.	SFDR	63	DU
MV-52	31517 Professors Prop Six/Winchester Assoc.	SFDR	83	DU
MV-53	31621 Peter Sanchez	SFDR	25	DU
MV-54	32005 Red Hill Village, LLC	SFDR	214	DU
MV-55	32126 Salvador Torres	SFDR	35	DU
MV-56	32194 Arman Pezeshkifar	SFDR	32	DU
MV-57	32408 Sanstone Inc.	SFDR	80	DU
MV-58	32844 Winchester Associates	SFDR	17	DU
MV-59	32978 Focus Estates	SFDR	19	DU
MV-60	33024 Adam Wislar	SFDR	8	DU
MV-61	33275 Jose Guzman	SFDR	4	DU
MV-62	33388 SCH Development, LLC	SFDR	16	DU
MV-63	33436 Winchester Associates	SFDR	105	DU
MV-64	33963 Rance Garrett	SFDR	31	DU
MV-65	34043 RM3 Building and Development	SFDR	12	DU
MV-66	31621 Beazer Homes	SFDR	274	DU
MV-67	30268 Pacific Communities	SFDR	83	DU
MV-68	31414 GRF - Majestic Hills	SFDR	31	DU
	Tract 31618	SFDR	55	DU
MV-69	31494 Winchester Associates	SFDR	12	DU
MV-70	32715 GFR - Trinity	SFDR	30	DU
MV-71	33256 Granite Homes	SFDR	79	DU
MV-72	32711 Isaac Genah	SFDR	9	DU
MV-73	35530 Moreno Gilman 650, LLC-Quail Ranch	SFDR	1,105	DU
MV-74	35534 Leedco Engineers	SFDR	12	DU
MV-75	36436 CV Communities	SFDR	159	DU
MV-76	36401 Continental East Fund III, LLC	SFDR	92	DU
MV-77	32215 Winchester Associates "Scottish Village"	MFDR	194	DU
MV-78	32756 Jimmy Lee	MFDR	24	DU
MV-79	35369 Tason Myers Property	MFDR	12	DU
MV-80	35414 Lincoln Property Co. Southwest	MFDR	266	DU
MV-81	35769 Michael Chen	MFDR	16	DU
MV-82	PA09-0006 Jim Nydam	MFDR	15	DU
MV-83	35861 Frederick Homes	MFDR	24	DU
MV-84	36038 Alessandro Village Plaza, LLC	MFDR	96	DU
MV-85	35304 Jimmy Lee	MFDR	12	DU
MV-86	Alessandro & Lasselle	Shopping Center	140.000	TSF
MV-87	Food 4 Less - Fueling Station	Gas Station with Convenience Market	16	VFP
MV-88	El Paso (food court)	Fast Food no Drive Thru	--	TSF
MV-89	O'Reilly Automotive	Automobile Parts Sale	7.500	TSF
	PA15-004	Retail/Restaurant/Fast Food	2.973	TSF
MV-90	Moreno Valley Logistics	High-Cube Warehouse	1351.770	TSF
		Light Industrial	385.748	TSF
MV-91	Restaurant	Restaurant	9.000	TSF
MV-92	Rancho Belago Plaza - Retail	Retail	14.000	TSF
MV-93	Yum Yum Donut Shop	Coffee/Donut Shop w/o Drive-Thru	4.351	TSF

Cumulative Development Land Use Summary

TAZ	Project Name	Land Use[1]	Quantity	Units[2]
MV-94	Hawthorn Inn & Suites	Hotel	79	RMS
MV-95	Sleep Inn Suites	Hotel	66	RMS
MV-96	Integrated Care Communities	Nursing Home	44.000	TSF
MV-97	Kaiser Permanente - Emergency Room Expansion	Medical Offices	--	TSF
MV-98	Moreno Valley Professional Center	General Office	84.000	TSF
MV-99	Olivewood Plaza - Office Building	General Office	23.000	TSF
MV-100	Renaissance Village of Moreno Valley	Senior Adult Housing-Attached	44	DU
MV-101	Riverside County Office Building	General Office	52.000	TSF
MV-102	Gateway Business Park	Residential Condo/Townhouse	34	DU
MV-103	Shaw Development	High-Cube Warehouse	367.000	TSF
MV-104	IDS/Real Estate Group - Nandina Distribution Center	High-Cube Warehouse	697.000	TSF
MV-105	Stoneridge Town Centre - Vacant Restaurant	Restaurant	5700.000	TSF
MV-106	Ironwood Residential	SFDR	144	DU
MV-107	TTM 31592 (P 13-078) Covey Ranch	SFDR	115	DU
MV-108	PA 06-0014 (Pierce Hardy Limited Partnership)	Lumbar Yard	67.000	TSF
MV-109	P06-1408	Retail	75.300	TSF
MV-110	PA13-009	Gas Station	16	VFP
MV-111	Moval Assemblage	High-Cube Warehouse	459.945	TSF
MARCH JOINT POWERS AUTHORITY				
MA-1	March Lifecare Campus Specific Plan[4]	Medical Offices	190.000	TSF
		Commercial Retail	210.000	TSF
		Research & Education	200.000	TSF
		Hospital	50	Beds
		Institutional Residential	660	Beds
MA-2	Airport Master Plan	Airport Use	559.000	TSF
MA-3	Freeway Business Center (March JPA)	High-Cube Warehouse	710.083	TSF
COUNTY OF RIVERSIDE				
RC-1	SP 341; PP 21552 (Majestic Freeway Business Center)	High-Cube Warehouse	6100.715	TSF
RC-2	PP 20699 (Oleander Business Park)	Warehousing	1206.710	TSF
RC-3	Ramona Metrolink Station	Light Rail Transit Station	300	SP
RC-4	PP 22925 (Amstar/Kaliber Development)	Office (258.102 TSF)	258.102	TSF
		Warehousing	409.312	TSF
		General Light Industrial	42.222	TSF
		Retail	10.000	TSF
RC-5	Alessandro Metrolink Station	Light Rail Transit Station	300	SP
RC-6	Meridian Business Park North	Industrial Park	5985.000	TSF
RC-7	PP 18908	General Light Industrial	133.000	TSF
RC-8	Tract 33869	SFDR	39.000	DU
RC-9	PP 16976	General Light Industrial	85.000	TSF
RC-10	PP 21144	Industrial Park	190.802	TSF
RC-11	a Villages of Lakeview	SFDR	860	DU
		Condo/Townhomes	1,920	DU
		Elementary School	1,200	STU
		Commercial Retail	100.000	TSF
		Soccer Complex	12	Fields
		City Park	8.9	AC
		County Park	8.1	AC
		Regional Park	107.1	AC
	b Motte Lakeview Ranch	SFDR	847	DU
		Condo/Townhomes	686	DU
		Apartments	467	DU
		Elementary School	650	STU
		Middle School	300	STU
		Commercial Retail	120.000	TSF
		Regional Park	177.0	AC
RC-12	CUP03315	Gas Station w/ Market	17	VFP
		Fast Food w/o Drive Thru	5.600	TSF
		High-Turnover Restaurant	6.500	TSF
RC-13	PP23342	Industrial Park	180.600	TSF
RC-14	TR30592	SFDR	131	DU
RC-15	Rider Street Quarry	Quarry	2500.0	AC
RC-16	PP 20711	Manufacturing	20.0	AC
	Yocum Baldwin	Warehousing	46.8	AC

Cumulative Development Land Use Summary

TAZ	Project Name	Land Use[1]	Quantity	Units[2]
RC-17	March Business Center - South Campus	Shopping Center	108.900	TSF
		Industrial Park	1336.700	TSF
		Large Industrial Park	3269.000	TSF
		General Office Building	140.600	TSF
		Manufacturing	215.600	TSF
		Warehousing	1379.200	TSF
		Park	50.0	AC
		R&D	1611.800	TSF
RC-18	Ben Clark Training Facility	Students	5,045	STU
		Employees	354	EMP
RC-19	PP 20103	Gen. Light Industrial	290.985	TSF
RC-20	Nuevo Business Park	Gen. Light Industrial	357.156	TSF
		Warehousing	1767.618	TSF
RC-21	Meridian (March Business Park SP)	Business Park	41917.000	TSF
RC-22	Blanding Assemblage	High-Cube Warehouse	707.880	TSF
RC-23	CUP 03527	Warehousing	8.000	TSF
RC-24	CUP 03599	Hotel	52.798	TSF
RC-25	PP 24608	Retail	9.280	TSF
RC-26	PM 32699	SFDR	2.00	DU
RC-27	PP 25699	Fast-Food w/Drive Thru	2.800	TSF
		Retail	19.000	TSF
RC-28	TR 30592	SFDR	131.00	DU
RC-29	PP 25768	Manufacturing	52.450	TSF
RC-30	CUP 03620R1	Gas Station w/ Market	8.00	VFP
RC-31	TTM 33410 Box Springs	SFDR	142	DU
RC-32	Knox Logistics	High-Cube Warehouse	1,259.050	TSF
RC-33	University Highlands	SFDR	405	DU
		Condo/Townhomes	320	DU
		Apartments	1,475	DU
		Shopping Center	50.0	TSF
		Parks	42.4	AC
CITY OF RIVERSIDE				
R-1	P07-1028 (Alessandro Business Park)	General Light Industrial	662.018	TSF
	Alessandro and Gorgonio	Fast Food w/Drive Thru	4.050	TSF
R-2	Alessandro Bl. (APN 263-091-008; 263-100-019; 263-100-005; P14-0841 to 0848)	Commercial and Industrial Complex	101.580	TSF
R-3	California Baptist University Specific Plan	University	157.0	AC
R-4	Canyon Springs Specific Plan	Hospital	280	BEDS
		Medical-Dental Office	370.000	TSF
		Senior Adult Housing-Attached	234	DU
		Assisted Living	267	BEDS
R-5	Citrus Business Park Specific Plan	Industrial Business Park	49.0	AC
R-6	Downtown Specific Plan	Residential	5,000	DU
R-7	Hunter Business Park	Industrial	1300.0	AC
R-8	La Sierra University Specific Plan	Mixed-Use		
R-9	Magnolia Avenue Specific Plan	Mixed-Use/Very High Residential	1473.0	AC
R-10	Marketplace Specific Plan	Commercial Retail/Office	200.0	AC
R-11	Mission Grove Specific Plan	Business/Office Park	56.8	AC
		Commercial Retail	68.1	AC
		High Density Residential	53.8	AC
		Low Density Residential	78.4	AC
		Medium Density Residential	155.3	AC
R-12	Orangecrest Specific Plan	Rural Residential	2.1	AC
		Business/Office Park	2.7	AC
		Commercial Retail	139.0	AC
		High Density Residential	13.7	AC
		Low Density Residential	540.8	AC
		Medium Density Residential	1217.8	AC
		Public Facilities/Institutions	121.6	AC
		Public Park	59.5	AC
R-13	Rancho La Sierra Specific Plan	SFDR	598	DU
R-14	Riverside Auto Center Specific Plan	Auto Center		
R-15	Riverwalk Vista Specific Plan	Residential	402	DU

Cumulative Development Land Use Summary

TAZ	Project Name	Land Use[1]	Quantity	Units[2]
R-16	Sycamore Canyon Specific Plan	Hillside Residential	41.8	AC
		Low Density Residential	97.3	AC
		Medium Density Residential	14.8	AC
		Very Low Density Residential	884.2	AC
		Public Park	27.9	AC
R-17	Sycamore Canyon Business Park Specific Plan	Business/Office Park	847.2	AC
		Commercial Retail	10.3	AC
R-18	Sycamore-Highlands Specific Plan	Commercial Retail	14.6	AC
		High Density Residential	52.2	AC
		Medium Density Residential	99.1	AC
		Public Facilities	1.6	AC
			144.2	AC
		Very Low Density Residential	49.1	AC
R-19	University Avenue Specific Plan	Mixed-Use	Varies	
R-20	807 Blaine Street (P09-0717; P09-0718)	Apartments	55	DU
R-21	2340 Fourteenth Street (P09-0808; P08-0809)	Senior Housing	134	BEDS
R-22	Park Sierra Avenue (P14-0026; P14-0027)	Fast Food w/Drive Thru	3.500	TSF
R-23	6287 Day Street (P10-0090; P10-0091)	Gas Station	2	VFP
	2570 Canyon Springs Parkway (P08-0274; P08-0275)	Bank w/ Drive Thru	2.746	TSF
	6211 Valley Springs Parkway (Steak 'N Shake Restaurant; P14-0536)	Fast Food w/Drive Thru	3.750	TSF
R-24	N. of Van Buren Boulevard; W. of Wood Street (P10-0808; P10-0708)	Fast Food w/Drive Thru	2.361	TSF
R-25	E. of Commerce St., between Mission Inn Av. and Ninth St. (P14-0045; P14-0046; P14-0047; P14-0048; P14-0049)	Apartments	208	DU
R-26	NWC of Riverwalk Parkway and Flat Rock Drive (P12-0019; P12-0156; P12-0158)	Convenience Store	2.400	TSF
		Coffee Shop	3.946	TSF
R-27	3875 Dawes Street (P10-0438; Magnolia Garden Condominiums)	Condo/Townhomes	62	DU
R-28	5938-5944 Grand Avenue (P12-0266; P12-0267; P12-0268)	Senior Housing	37	DU
R-29	4445 Magnolia Avenue (P13-0207; P13-0208; P13-0209; P13-0210; P13-0211)	Hospital Expansion	Varies	
R-30	SR-91/Van Buren Commercial	Commercial Retail	23.565	TSF
R-31	360 Alessandro Boulevard (P12-0419; P12-0557; P12-0558; P12-0559)	Bank	3.858	TSF
R-32	6465 Sycamore Canyon Boulevard	Health Club	4.000	TSF
R-33	2450 Market Street (P13-0087; P13-0262)	Apartments	77	DU
R-34	6091 Victoria Avenue (P13-0432)	Day Care	1.831	TSF
R-35	14601 Dauchy Av. - TM 36370 (P12-0601; P12-0697; P12-0698)	SFDR	10	DU
	TM 32180 (P07-1073)	SFDR	9	DU
	18875 Moss Road	SFDR	8	DU
	South of Clarke St., west of Crystal View Terrace (PM 34583' {09-0141; P09-173)	SFDR	3	DU
R-36	4824 Jones Avenue (P13-0181; P13-0182)	Church	23.124	TSF
R-37	2586 University avenue (P13-0650; P13-0651)	Bed and Breakfast	3.618	TSF
R-38	18580 Van Buren Boulevard (P08-0402; P13-0822)	Auto Repair Shop	8.142	TSF
R-39	4247 Van Buren Boulevard (P13-0785; P13-0787)	Church Expansion	12.166	TSF
R-40	SWC of Lurin Avenue and Wood Road (P06-0900; P08-0269; P08-0270; TTM 32301)	SFDR	20	DU
R-41	8616 California Avenue (P08-0084; PM 35852)	Condo/Townhomes	21	DU
R-42	19811 Lurin Avenue (P06-1355; TM 33480)	SFDR	32	DU
R-43	APN:266140029, 030 (P06-1396; Mariposa Avenue; TM 33481)	SFDR	25	DU
R-44	APN:266140002, 021, 022 (P06-1404; Lurin Avenue; TM 33482)	SFDR	29	DU
R-45	3719 Strong Street (P05-0269; P08-0416; TM 33550)	SFDR	9	DU
R-46	1006 & 1008 Clark Street (P06-0782; TM 34908)	SFDR	15	DU
R-47	E. of Gratton St., W. of Corsica Av., N. of Van Buren Bl. (P05-1528; P09-0087; TM 34509)	SFDR	50	DU
R-48	NWC of Dominion Avenue and Division Street (P08-0396; P08-0397; P08-0398; P08-0399; TM 35620)	Condo/Townhomes	36	DU
R-49	6639 Hillside Avenue (P08-0727; PM 35901)	Industrial	5	LOTS
R-50	19985 Van Buren Boulevard (P10-0118; Gless Ranch)	Commercial Retail	425.447	TSF
R-51	3990 Reynolds Road (P12-0021; P12-0022; P12-0074; PM 36442)	Condo/Townhomes	102	DU
R-52	NEC of Martha Way & Everest Avenue (P13-0389; TM 36579)	SFDR	5	DU
R-53	4325, 4335, 4345, 4355, 4375 Adams Street (P13-0723; P13-0724; P13-0725; TM 36654)	SFDR	62	DU
R-54	5200 Van Buren Boulevard (P09-0600; P09-0601; Walmart Expansion)	Free Standing Discount Store	22.272	TSF
R-55	P06-0160	Gen. Light Industrial	316.224	TSF
	P06-1281	Warehousing	107.732	TSF

Cumulative Development Land Use Summary

TAZ	Project Name	Land Use[1]	Quantity	Units[2]
R-56	9241 & 9265 Audrey Avenue (P12-0184; P12-0185; P12-0187; Azar Plaza)	Commercial Retail	6.150	TSF
R-57	Office, Magnon & Panattoni	Office	131.000	TSF
		Warehousing	1400.000	TSF
		Warehousing	300.000	TSF
		Warehousing	216.000	TSF
R-58	1710 Main Street (P12-0717)	Family Dollar Store	8.039	TSF
R-59	2861 Mary Street (P12-0442; P12-0443; P12-0444)	Shopping Center	56.101	TSF
R-60	3545 Central Avenue (P12-0741; P12-0743)	Riverside Plaza Renovations	35.0	AC
R-61	5731, 5741, 5761 & 5797 Pickler Street (P13-0198; P13-0199; P13-0200; P13-0201)	Apartments	30	DU
R-62	3705 Tyler Street (P13-0501; P13-0502)	Restaurant	6.000	TSF
R-63	6570 Magnolia Avenue; 3739 & 3747 Central Avenue (P13-0196; P13-0197)	Fast Food w/Drive Thru	3.795	TSF
R-64	5940-5980 Sycamore Canyon Boulevard (P13-0553; P13-0554; P13-0583; P14-0065)	Apartments	275	DU
R-65	SEC Sycamore Canyon Boulevard & Box Springs Road (P13-0607; P13-0608; P0609; P13-0854)	General Light Industrial	171.616	TSF
R-66	P06-0591	Office	37.939	TSF
		Warehousing	782.188	TSF
		Manufacturing	168.294	TSF
R-67	474 Palmyrita Avenue (P13-0956; P13-0959; P13-0960; P13-0963; P13-0964; P13-0965; P13-0966)	High-Cube Warehouse	1461.449	TSF
	CITY OF PERRIS			
P-1	P 05-0113 (IDI)	High-Cube Warehouse	1750.000	TSF
P-2	P 05-0192 (Oakmont I)	High-Cube Warehouse	697.600	TSF
P-3	P 05-0477	High-Cube Warehouse	462.692	TSF
P-4	Rados Distribution Center	High-Cube Warehouse	1200.000	TSF
P-5	Investment Development Services (IDS) II	High-Cube Warehouse	350.000	TSF
P-6	P 07-09-0018	Warehousing	170.000	TSF
P-7	P 07-07-0029 (Oakmont II)	High-Cube Warehouse	1600.000	TSF
P-8	TR 32707	SFDR	137	DU
P-9	TR 34716	SFDR	318	DU
P-10	P 05-0493 (Ridge I)	High-Cube Warehouse	700.000	TSF
P-11	Ridge II	High-Cube Warehouse	2000.000	TSF
P-12	Harvest Landing Specific Plan	SFDR	717	DU
		Condo/Townhomes	1,139	DU
		Sports Park	16.7	AC
		Business Park	1233.401	TSF
		Shopping Center	73.181	TSF
	Perris Marketplace	Shopping Center	450.000	TSF
P-13	P 06-0411 (Concrete Batch Plant)	Manufacturing	2.000	TSF
P-14	Jordan Distribution	High-Cube Warehouse	378.000	TSF
P-15	Aiere	High-Cube Warehouse	642.000	TSF
P-16	P 08-11-0005; P 08-11-0006 (Starcrest)	High-Cube Warehouse	454.088	TSF
P-17	Stratford Ranch Specific Plan	High-Cube Warehouse	1725.411	TSF
P-18	Stratford Ranch Specific Plan	High-Cube Warehouse	480.000	TSF
		General Light Industrial	120.000	TSF
P-19	P05-0493	Logistics	597.370	TSF
P-20	Starcrest, P011-0005; 08-11-0006	General Light Industrial	454.088	TSF
P-21	South Perris Industrial Phase 1	Logistics	787.700	TSF
P-22	South Perris Industrial Phase 2	Logistics	3448.734	TSF
P-23	South Perris Industrial Phase 3	Logistics	3166.857	TSF
P-24	P 04-0343	Warehousing	41.650	TSF
P-25	P 06-0228	General Light Industrial	149.738	TSF
P-26	P 06-0378	Senior Housing	429	DU
P-27	P 11-09-0011	Retail	80.000	TSF
P-28	P 12-05-0013	Apartments	75	DU
P-29	P 12-10-0005	High-Cube Warehouse	1463.887	TSF
P-30	TR 30850	Residential	496	DU
P-31	TR 30973	Residential	35	DU
P-32	TR 31225	Residential	57	DU
P-33	TR 31226	Residential	82	DU
P-34	TR 31240	Residential	114	DU
P-35	TR 31407	Residential	243	DU

Cumulative Development Land Use Summary

TAZ	Project Name	Land Use[1]	Quantity	Units[2]
P-36	TR 31650	SFDR	61	DU
P-37	TR 31659	SFDR	161	DU
P-38	TR 32041	Residential	122	DU
P-39	TR 32406	SFDR	15	DU
P-40	TR 33193	Townhomes	94	DU
P-41	TR 33338	Residential	75	DU
P-42	Park West Specific Plan	SFDR	521	DU
		Elementary School	750	STU
		Neighborhood Park	5.0	AC
P-43	The Venue	Commercial Retail	642.627	TSF
	Retail on San Jacinto	Commercial Retail	217.800	TSF
	Retail on Redlands	Fast Food w/ Drive Thru	4.500	TSF
		Pharmacy w/ Drive Thru	14.000	TSF
		Specialty Retail	31.500	TSF
P-44	South Perris Metrolink Station	Light Rail Transit Station	680	SP
P-45	IDS 04-0464	High-Cube Warehouse	1686.760	TSF
P-46	TTM 32708 (50% Complete)	SFDR	238	DU
P-47	PM 34199	Gen. Light Industrial	46.500	TSF
	DPR 05-0387	Gen. Light Industrial	9.854	TSF
	DPR 05-0452	Warehousing	31.200	TSF
	TPM 34697	Gen. Light Industrial	47.400	TSF
	DPR 06-0396	Warehousing	159.823	TSF
P-48	Integra Pacific Industrial Facility	High-Cube Warehouse	880.000	TSF

[1] SFDR = Single Family Detached Residential ; MFDR = Multi-Family Detached Residential

[2] DU = Dwelling Units; TSF = Thousand Square Feet; SP = Spaces; VFP = Vehicle Fueling Positions; RMS = Rooms; AC = Acres; EMP = Employees

[3] Source: Cactus Avenue and Commerce Center Drive Commercial Center TIA, Urban Crossroads, Inc., December 9, 2008 (Revised).

[4] Source: March Lifecare Campus Specific Plan Traffic Impact Analysis, Mountain Pacific, Inc., May 2009 (Revised).

4.7 NEAR-TERM TRAFFIC FORECASTS

To provide a comprehensive assessment of potential transportation network deficiencies, the "buildup" analysis was performed in support of this work effort. The "buildup" method was used to approximate the Opening Year Cumulative traffic forecasts, and is intended to identify the cumulative impacts on both the existing and planned near-term circulation system. The Opening Year Cumulative traffic forecasts include background traffic, traffic generated by other cumulative development projects within the study area, and the traffic generated by the proposed Project.

The "buildup" approach combines existing traffic counts with a background ambient growth factor to forecast the near-term 2020 traffic conditions. An ambient growth factor of 10.41% (2020) accounts for background (area-wide) traffic increases that occur over time, up to the year 2020 from the year 2015 (compounded two percent per year growth over a 5-year period). Traffic volumes generated by the Project are then added to assess the Opening Year Cumulative traffic conditions. The 2020 roadway network is similar to the existing conditions roadway network with the exception of future roadways and intersections proposed to be developed by the Project.

As noted previously, an analysis of the proposed Project at various development tiers has been assessed for the purposes of this traffic study. The near-term traffic analysis includes the following traffic conditions, with the various traffic components:

- Opening Year Cumulative (2020)
    - Existing 2015 counts
    - Ambient growth traffic (10.41%)
    - Cumulative Development Project traffic
    - Project traffic

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5 E+P TRAFFIC CONDITIONS

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

5.1 ROADWAY IMPROVEMENTS

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

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

5.2 E+P TRAFFIC VOLUME FORECASTS

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

5.3 INTERSECTION OPERATIONS ANALYSIS

E+P peak hour traffic operations have been evaluated for the study area intersections based on the analysis methodologies presented in Section 2 *Methodologies* of this TIA. The intersection analysis results are summarized in Table 5-1, which indicate that there are no study area intersections anticipated to experience unacceptable levels of service during one or more peak hours, consistent with Existing traffic conditions.

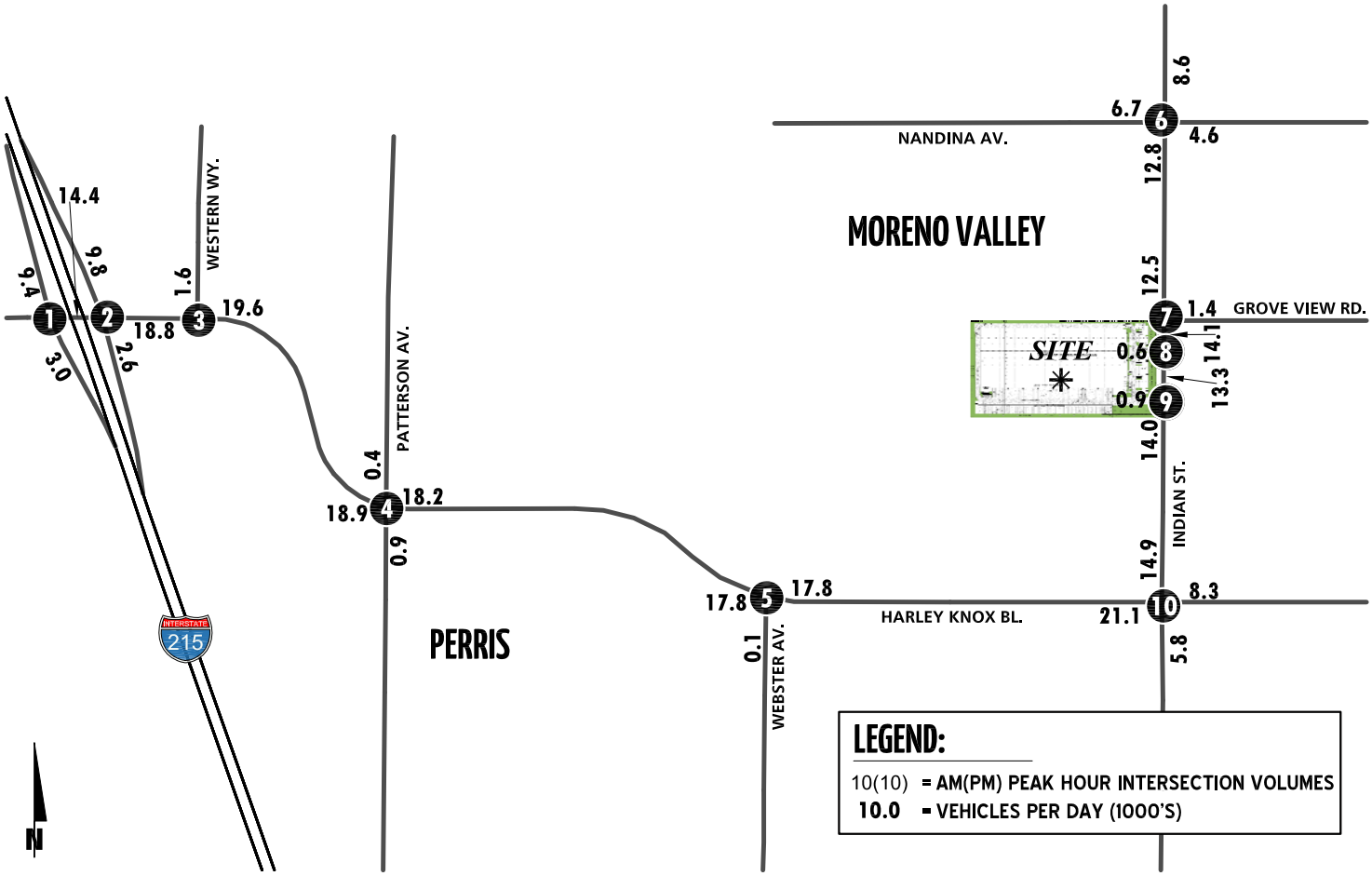
Exhibit 5-2 summarizes the weekday AM and PM peak hour study area intersection LOS under E+P traffic conditions, consistent with the summary provided in Table 5-1. The intersection operations analysis worksheets are included in Appendix 5.1 of this TIA.

5.4 ROADWAY SEGMENT CAPACITY ANALYSIS

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

Table 5-2 provides a summary of the E+P conditions roadway segment capacity analysis based on the City of Moreno Valley and City of Perris General Plan Circulation Element Roadway Segment Capacity/(LOS) Thresholds identified previously on Table 2-3. As shown on Table 5-2, there are no roadway segments that are anticipated to operate at an unacceptable LOS under E+P traffic conditions.

EXHIBIT 5-1: E+P TRAFFIC VOLUMES



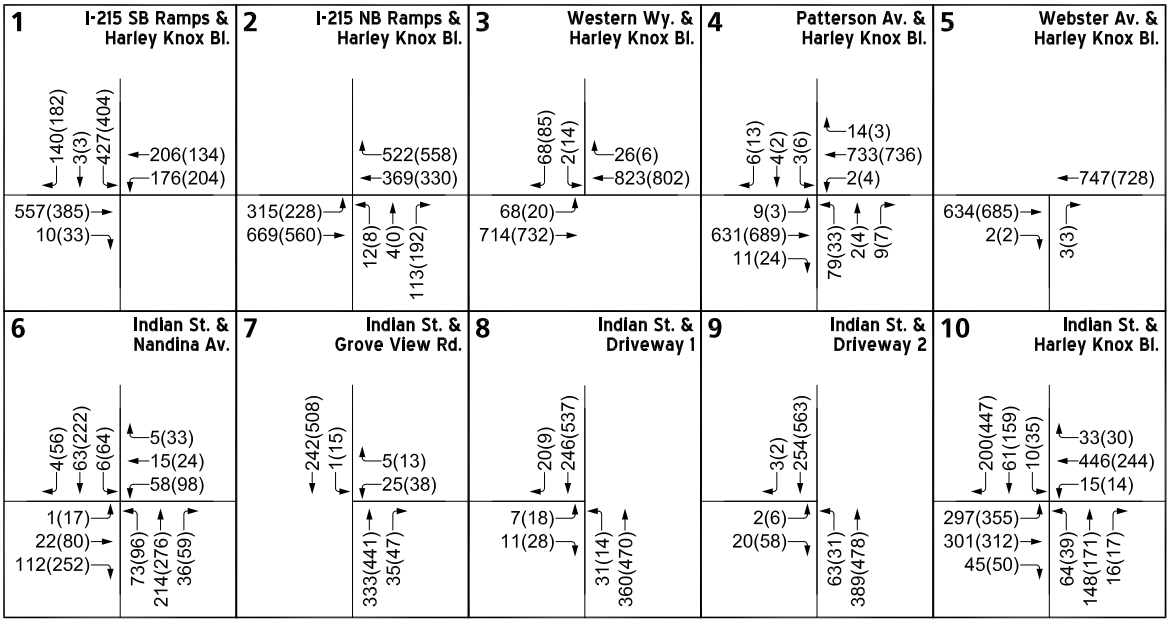


EXHIBIT 5-2: SUMMARY OF LOS FOR E+P CONDITIONS

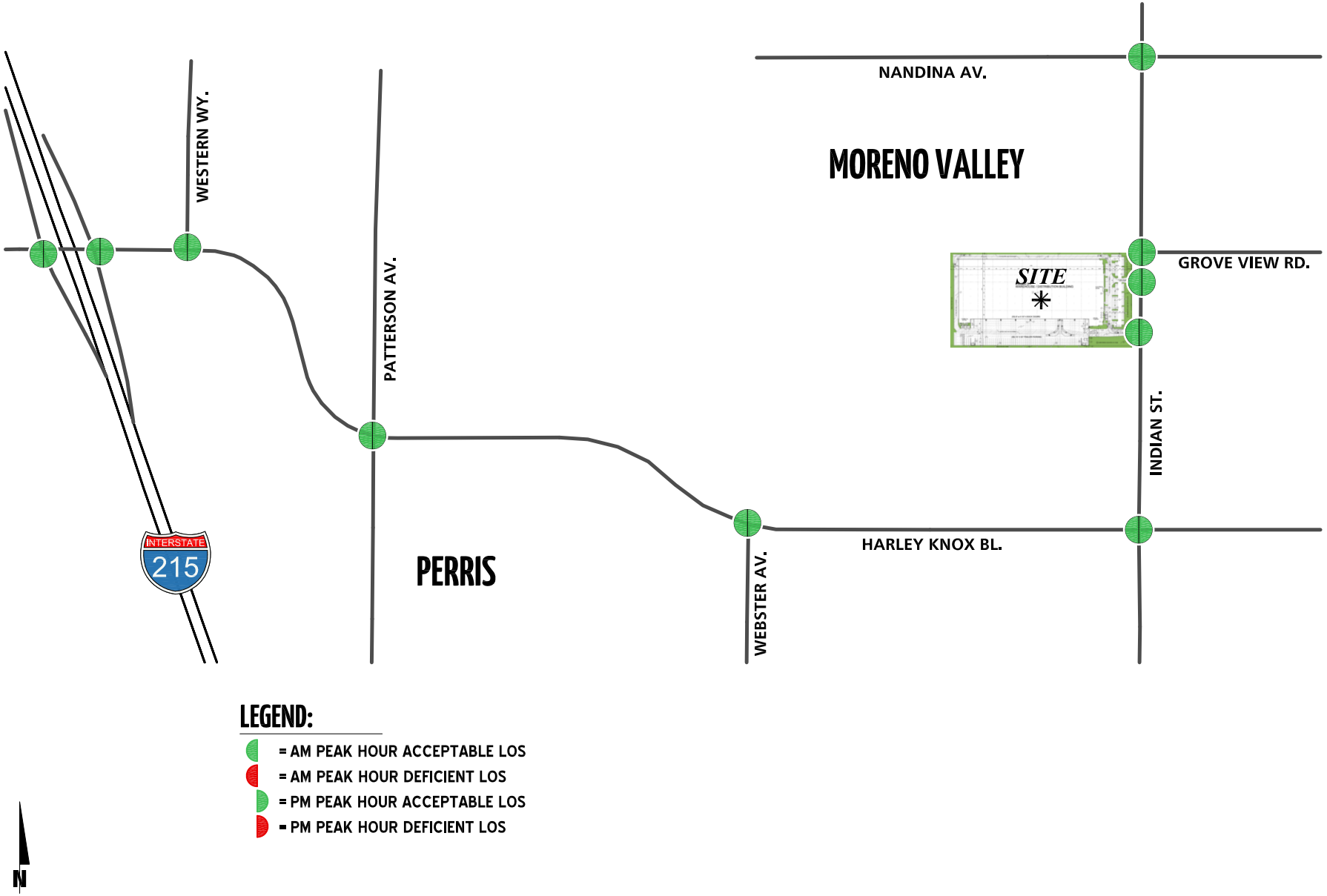


Table 5-1

Intersection Analysis for E+P Conditions

#	Intersection	Traffic Control[2]	Existing (2015)				E+P			
			Delay[1] (secs.)		LOS[3]		Delay[1] (secs.)		LOS[3]	
			AM	PM	AM	PM	AM	PM	AM	PM
1	I-215 SB Ramps / Harley Knox Bl	TS	29.1	32.9	C	C	32.0	34.8	C	C
2	I-215 NB Ramps / Harley Knox Bl	TS	19.3	18.4	B	B	19.7	19.1	B	B
3	Western Wy / Harley Knox Bl	CSS	13.9	14.0	B	B	14.3	15.2	B	C
4	Patterson Av / Harley Knox Bl	TS	19.9	20.2	B	C	20.4	21.1	C	C
5	Webster Av / Harley Knox Bl	CSS	9.5	9.6	A	A	9.5	9.6	A	A
6	Indian St / Nandina Av	TS	18.9	25.8	B	C	19.7	26.4	B	C
7	Indian St / Grove View Rd	CSS	12.0	18.6	B	C	12.4	19.4	B	C
8	Indian St / Driveway 1	**CSS**	Future Intersection				10.5	13.1	B	B
9	Indian St / Driveway 2	**CSS**	Future Intersection				9.6	12.2	A	B
10	Indian St / Harley Knox Bl	TS	16.8	24.2	B	C	22.1	28.4	C	C

[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; TS = Traffic Signal; **CSS** = Improvement

[3] LOS = Level of Service

Table 5-2

Roadway Volume/Capacity Analysis for E+P Conditions

#	Roadway	Segment Limits	Roadway Section	LOS[3] Capacity[1]	Existing (2015)	V/C[2]	LOS[3]	E+P	V/C[2]	LOS[3]	Acceptable LOS[3]
1	Harley Knox Boulevard	I-215 SB Ramps to I-215 NB Ramps	4D	35,900	13,787	0.38	A	14,388	0.40	A	D
2		I-215 NB Ramps to Western Way	4D	35,900	17,815	0.50	A	18,816	0.52	A	D
3		East of Western Way	4U	25,900	18,604	0.72	C	19,604	0.76	C	D
4		West of Patterson Avenue	4U	25,900	17,864	0.69	B	18,864	0.73	C	D
5		East of Patterson Avenue	6D	53,900	17,155	0.32	A	18,185	0.34	A	D
6		West of Webster Avenue	6D	53,900	16,756	0.31	A	17,785	0.33	A	D
7		East of Webster Avenue	6D	53,900	16,769	0.31	A	17,798	0.33	A	D
8		West of Indian Street	6D	53,900	20,018	0.37	A	21,047	0.39	A	D
9	Indian Street	South of Nandina Avenue	2D	18,750	12,654	0.67	B	12,814	0.68	B	D
10		North of Grove View Road	2D	18,750	12,339	0.66	B	12,499	0.67	B	D
11		South of Grove View Road	2D	18,750	13,803	0.74	C	14,101	0.75	C	D
12		North of Harley Knox Boulevard	4D	35,900	13,717	0.38	A	14,892	0.41	A	D

[1] These maximum roadway capacities have been extracted from the City of Moreno Valley's Transportation Division's Traffic Impact Analysis Preparation Guidelines (August 2007) and Table CE-9 of the City of Perris General Plan Circulation Element.

[2] V/C = Volume to Capacity Ratio

[3] LOS = Level of Service

5.5 OFF-RAMP QUEUING ANALYSIS

A queuing analysis was performed for the off-ramps at the I-215 Freeway and Harley Knox Boulevard interchanges to assess vehicle queues for the off ramps that may potentially result in deficient peak hour operations at the ramp-to-arterial intersections and may potentially "spill back" onto the I-215 Freeway mainline. Queuing analysis findings are presented in Table 5-3 for E+P traffic conditions. 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 5-3, 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 traffic conditions. Worksheets for E+P traffic conditions off-ramp queuing analysis are provided in Appendix 5.2.

5.6 TRAFFIC SIGNAL WARRANTS ANALYSIS

There are no additional study area intersections anticipated to meet either peak hour or planning level (ADT) volume based traffic signal warrants under E+P traffic conditions, in addition to those previously warranted under Existing traffic conditions (see Appendix 5.5).

5.7 RECOMMENDED IMPROVEMENTS

5.7.1 RECOMMENDED IMPROVEMENTS TO ADDRESS DEFICIENCIES AT INTERSECTIONS

All study area intersections are anticipated to operate at acceptable LOS (LOS D or better) for E+P traffic conditions. As such, no intersection improvements have been recommended.

5.7.2 RECOMMENDED IMPROVEMENTS TO ADDRESS DEFICIENCIES ON ROADWAY SEGMENTS

All study area roadway segments are anticipated to operate at acceptable LOS (LOS D or better) for E+P traffic conditions. As such, no roadway improvements have been recommended.

5.7.3 RECOMMENDED IMPROVEMENTS TO ADDRESS OFF-RAMP QUEUES

As shown previously on Table 5-3, there are no peak hour queuing issues at the I-215 Freeway at Harley Knox Boulevard interchanges for E+P traffic conditions. As such, no improvements have been recommended.

Table 5-3

Peak Hour Off-Ramp Queuing Analysis for E+P Conditions

Intersection	Movement	Stacking Distance (Feet)	95th Percentile Stacking Distance Required (Feet)		Acceptable? [1]	
			AM Peak Hour	PM Peak Hour	AM	PM
I-215 SB Ramps / Harley Knox Bl.						
	SBL/T	1,330	431	395	Yes	Yes
	SBR	270	43	45	Yes	Yes
I-215 NB Ramps / Harley Knox Bl.						
	NBL/T	1,120	35	21	Yes	Yes
	NBR	265	52	53	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.

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6 OPENING YEAR CUMULATIVE (2020) TRAFFIC CONDITIONS

This section discusses the methods used to develop Opening Year Cumulative (2020) traffic forecasts and the resulting intersection operations, roadway segment, and traffic signal warrant analyses.

6.1 ROADWAY IMPROVEMENTS

The lane configurations and traffic controls assumed to be in place for Opening Year Cumulative (2020) conditions are consistent with those shown previously on Exhibit 3-1, with the exception of the following:

- Project driveways and those facilities assumed to be constructed by the Project to provide site access are also assumed to be in place for Opening Year Cumulative conditions only (e.g., intersection and roadway improvements along the Project's frontage and driveways).
- Driveways and those facilities assumed to be constructed by cumulative developments to provide site access are also assumed to be in place for Opening Year Cumulative conditions only (e.g., intersection and roadway improvements along the cumulative development's frontages and driveways).

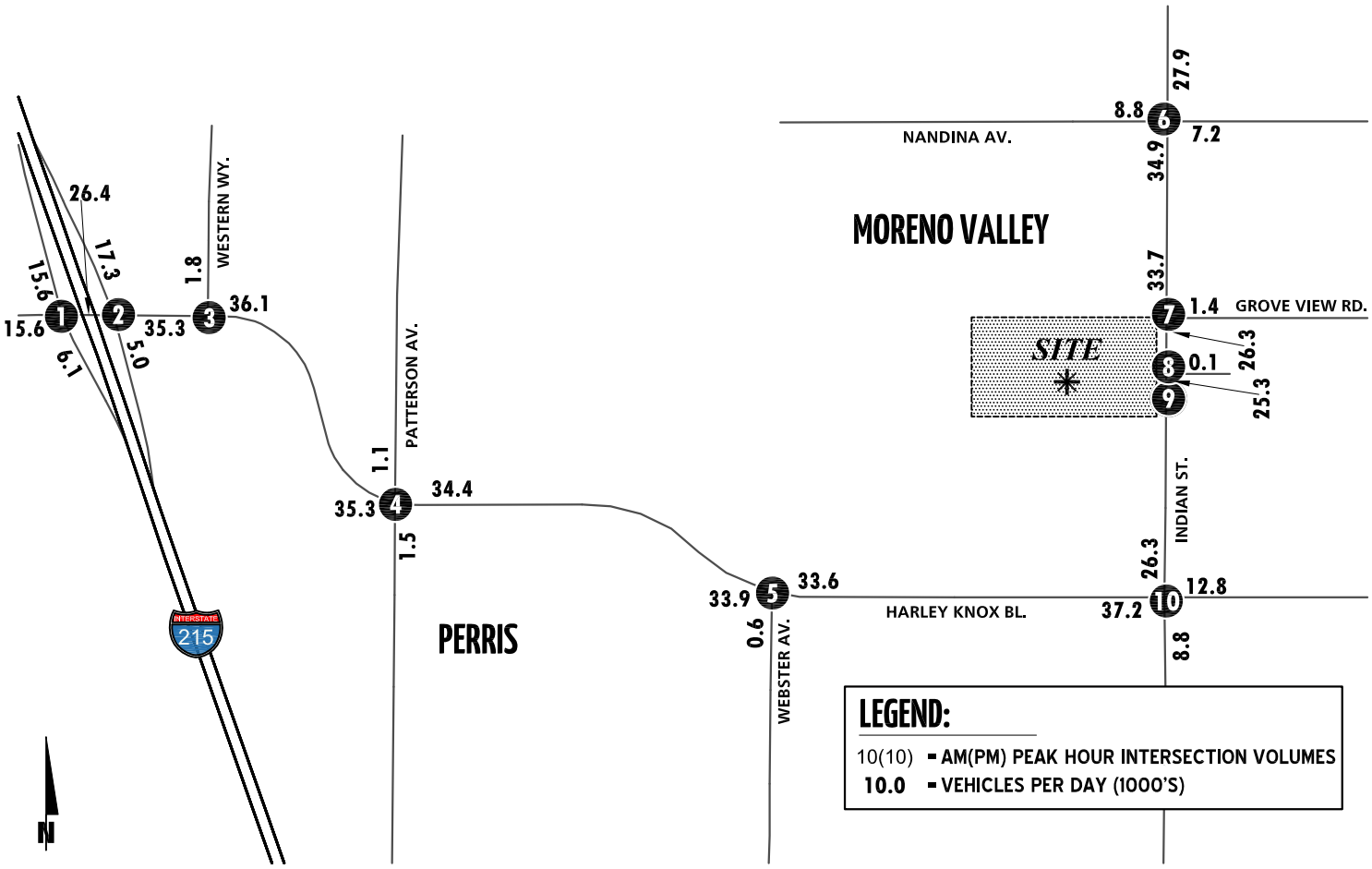
6.2 OPENING YEAR CUMULATIVE (2020) WITHOUT PROJECT TRAFFIC VOLUME FORECASTS

To account for background traffic, other known cumulative development projects in the study area were included in addition to 10.41% of ambient growth for Opening Year Cumulative traffic conditions. The weekday ADT and weekday AM and PM peak hour volumes (in PCE) which can be expected for Opening Year Cumulative (2020) Without Project traffic conditions are shown on Exhibit 6-1.

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

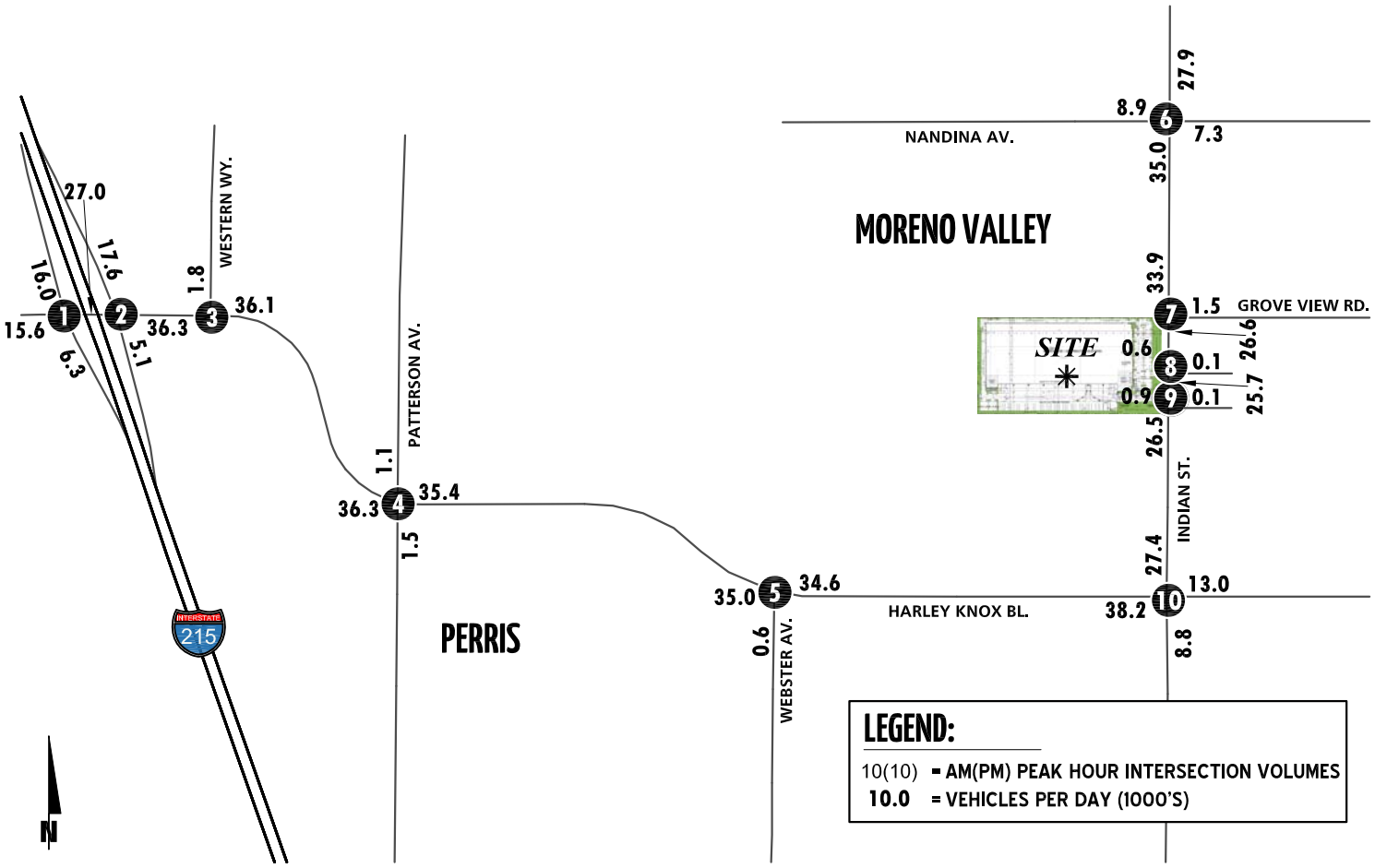
To account for background traffic, other known cumulative development projects in the study area were included in addition to 10.41% of ambient growth for Opening Year Cumulative traffic conditions in conjunction with traffic associated with the proposed Project. The weekday ADT and weekday AM and PM peak hour volumes (in PCE) which can be expected for Opening Year Cumulative (2020) With Project traffic conditions are shown on Exhibit 6-2.

EXHIBIT 6-1: OPENING YEAR CUMULATIVE (2020) WITHOUT PROJECT TRAFFIC VOLUMES



1 I-215 SB Ramps & Harley Knox Bl. 369(313), 3(3), 1511(839) → 335(203), 306(684) 717(713), 44(132) →	**2** I-215 NB Ramps & Harley Knox Bl. 842(1643), 547(837) → 438(509), 1790(1042) → 93(51), 4(0), 406(294)	**3** Western Wy. & Harley Knox Bl. 75(93), 2(15) → 29(7), 1315(2386) 75(22), 2122(1314) →	**4** Patterson Av. & Harley Knox Bl. 20(94), 4(2), 3(7) → 15(3), 1190(2198), 12(39) 87(20), 1953(1249), 12(26) → 99(71), 2(4), 37(20)	**5** Webster Av. & Harley Knox Bl. 1217(2224) → 1955(1237), 31(20) → 5(7)
6 Indian St. & Nandina Av. 24(68), 455(1461), 11(71) → 8(37), 24(71), 89(217) 5(39), 32(102), 178(456) → 287(143), 1462(754), 119(109)	**7** Indian St. & Grove View Rd. 722(2039), 1(16) → 6(14), 16(36) 1846(999), 33(39)	**8** Indian St. & Driveway 1 736(2074), 2(1) → 2(4), 4(7) 1877(1034), 5(2)	**9** Indian St. & Driveway 2 Future Intersection	**10** Indian St. & Harley Knox Bl. 451(1194), 80(238), 11(51) → 47(31), 609(863), 22(19) 942(678), 877(488), 148(112) → 114(168), 222(205), 21(27)

EXHIBIT 6-2: OPENING YEAR CUMULATIVE (2020) WITH PROJECT TRAFFIC VOLUMES



1 I-215 SB Ramps & Harley Knox Bl.	2 I-215 NB Ramps & Harley Knox Bl.	3 Western Wy. & Harley Knox Bl.	4 Patterson Av. & Harley Knox Bl.	5 Webster Av. & Harley Knox Bl.
369(313) 3(3) 1581(874) ←335(203) ←313(704)	←860(1695) ←554(857)	75(93) 2(15) ←29(7) ←1340(2457)	20(94) 4(2) 3(7) ←15(3) ←1215(2269) ←13(41)	←1243(2298)
717(713)→ 44(132)→	438(509)→ 1860(1077)→ 93(51) 4(0) 414(297)	75(22)→ 2200(1352)→	87(20)→ 2031(1287)→ 12(26)→ 99(71) 2(4) 40(21)	2036(1276)→ 31(20)→ 5(7)
6 Indian St. & Nandina Av.	**7 Indian St. & Grove View Rd.**	**8 Indian St. & Driveway 1**	**9 Indian St. & Driveway 2**	**10 Indian St. & Harley Knox Bl.**
24(68) 455(1461) 11(71) ←8(37) ←24(71) ←97(221)	736(2045) 1(16) ←6(14) ←26(41)	20(9) 739(2076) 2(1) ←2(4) ←0(0) ←4(7)	3(2) 747(2102)	477(1268) 80(238) 16(63) ←60(37) ←609(863) ←22(19)
5(39)→ 32(102)→ 183(458)→ 289(148) 1462(754) 122(117)	1851(1011) 38(51)	7(18)→ 0(0)→ 11(28)→ 31(14) 1879(1040) 5(2)	2(6)→ 20(58)→ 63(31) 1908(1048)	1023(717)→ 877(488)→ 148(112)→ 114(168) 222(205) 21(27)

6.4 INTERSECTION OPERATIONS ANALYSIS

LOS calculations were conducted for the study intersections to evaluate their operations under Opening Year Cumulative conditions with roadway and intersection geometrics consistent with Section 6.1 *Roadway Improvements*. As shown in Table 6-1, the following additional study area intersections are anticipated to operate at unacceptable LOS during the peak hours under Opening Year Cumulative (2020) without Project traffic conditions:

ID	Intersection Location
1	I-215 Southbound Ramps / Harley Knox Boulevard – LOS F AM and PM peak hours
2	I-215 Northbound Ramps / Harley Knox Boulevard – LOS E AM peak hour; LOS F PM peak hour
3	Western Way / Harley Knox Boulevard – LOS F AM and PM peak hours
4	Patterson Avenue / Harley Knox Boulevard – LOS E AM peak hour; LOS F PM peak hour
7	Indian Street / Grove View Road – LOS F PM peak hour only
10	Indian Street / Harley Knox Boulevard – LOS F PM peak hour only

There are no additional intersections anticipated to operate at unacceptable LOS with the addition of Project traffic, in addition to those previously identified for Opening Year Cumulative Without Project traffic conditions. A summary of the peak hour intersection LOS for Opening Year Cumulative (2020) Without Project conditions are shown on Exhibit 6-3 and on Exhibit 6-4 for Opening Year Cumulative (2020) With Project traffic conditions. The intersection operations analysis worksheets for Opening Year Cumulative (2020) Without and With Project traffic conditions are included in Appendix 6.1 and Appendix 6.2 of this TIA, respectively. Measures to address near-term cumulative deficiencies for Opening Year Cumulative traffic conditions are discussed in Section 6.10 *Recommended Improvements.*

6.5 ROADWAY SEGMENT CAPACITY ANALYSIS

As noted previously, the roadway segment capacities are approximate figures only, and are typically used at the General Plan level to assist in determining the roadway functional classification (number of through lanes) needed to meet future forecasted traffic demand. Table 6-2 provides a summary of the Opening Year Cumulative (2020) conditions roadway segment capacity analysis based on the City of Moreno Valley and City of Perris General Plan Circulation Element Roadway Segment Capacity/(LOS) Thresholds identified previously on Table 2-3. As shown on Table 6-2, the following roadway segments are anticipated to operate at unacceptable LOS (based on daily roadway segment capacities) under Opening Year Cumulative (2020) Without Project traffic conditions.

Table 6-1

Intersection Analysis for Opening Year Cumulative (2020) Conditions

#	Intersection	Traffic Control[2]	2020 Without Project				2020 With Project			
			Delay[1] (secs.)		LOS[3]		Delay[1] (secs.)		LOS[3]	
			AM	PM	AM	PM	AM	PM	AM	PM
1	I-215 SB Ramps / Harley Knox Bl	TS	**180.2**	**119.9**	**F**	**F**	**199.3**	**130.7**	**F**	**F**
2	I-215 NB Ramps / Harley Knox Bl	TS	**78.5**	**>200.0**	**E**	**F**	**81.9**	**>200.0**	**F**	**F**
3	Western Wy / Harley Knox Bl	CSS	**>100.0**	**>100.0**	**F**	**F**	**>100.0**	**>100.0**	**F**	**F**
4	Patterson Av / Harley Knox Bl	TS	**74.0**	**85.2**	**E**	**F**	**86.5**	**114.1**	**F**	**F**
5	Webster Av / Harley Knox Bl	CSS	12.9	10.7	B	B	13.3	10.9	B	B
6	Indian St / Nandina Av	TS	29.3	44.3	C	D	30.5	53.1	C	D
7	Indian St / Grove View Rd	CSS	**78.5**	25.6	**F**	D	**98.4**	26.3	**F**	D
8	Indian St / Driveway 1	**CSS**	34.2	10.7	D	B	31.6	31.5	D	D
9	Indian St / Driveway 2	**CSS**	Does Not Exist				10.9	33.4	B	D
10	Indian St / Harley Knox Bl	TS	29.6	**>200.0**	C	**F**	34.4	**>200.0**	C	**F**

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; TS = Traffic Signal; CSS = Improvement

[3] LOS = Level of Service

Table 6-2

Roadway Volume/Capacity Analysis for Opening Year Cumulative (2020) Conditions

#	Roadway	Segment Limits	Roadway Section	LOS[3] Capacity[1]	2020 Without Project	V/C[2]	LOS[3]	2020 With Project	V/C[2]	LOS[3]	Acceptable LOS[3]
1	Harley Knox Boulevard	I-215 SB Ramps to I-215 NB Ramps	4D	35,900	26,411	0.74	C	27,012	0.75	C	D
2		I-215 NB Ramps to Western Way	4D	35,900	35,262	**0.98**	**E**	36,263	**1.01**	**F**	D
3		East of Western Way	4U	25,900	36,133	**1.40**	**F**	37,133	**1.43**	**F**	D
4		West of Patterson Avenue	4U	25,900	35,316	**1.36**	**F**	36,316	**1.40**	**F**	D
5		East of Patterson Avenue	6D	53,900	34,358	0.64	B	35,388	0.66	B	D
6		West of Webster Avenue	6D	53,900	33,917	0.63	B	34,946	0.65	B	D
7		East of Webster Avenue	6D	53,900	33,587	0.62	B	34,616	0.64	B	D
8		West of Indian Street	6D	53,900	37,173	0.69	B	38,202	0.71	C	D
9	Indian Street	South of Nandina Avenue	2D	18,750	34,847	**1.86**	**F**	35,007	**1.87**	**F**	D
10		North of Grove View Road	2D	18,750	33,724	**1.80**	**F**	33,884	**1.81**	**F**	D
11		South of Grove View Road	2D	18,750	26,299	**1.40**	**F**	26,597	**1.42**	**F**	D
12		North of Harley Knox Boulevard	4D	35,900	26,266	0.73	C	27,441	0.76	C	D

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

[1] These maximum roadway capacities have been extracted from the City of Moreno Valley's Transportation Division's Traffic Impact Analysis Preparation Guidelines (August 2007) and Table CE-9 of the City of Perris General Plan Circulation Element.

[2] V/C = Volume to Capacity Ratio

[3] LOS = Level of Service

EXHIBIT 6-3: SUMMARY OF LOS FOR OPENING YEAR (2020) WITHOUT PROJECT CONDITIONS

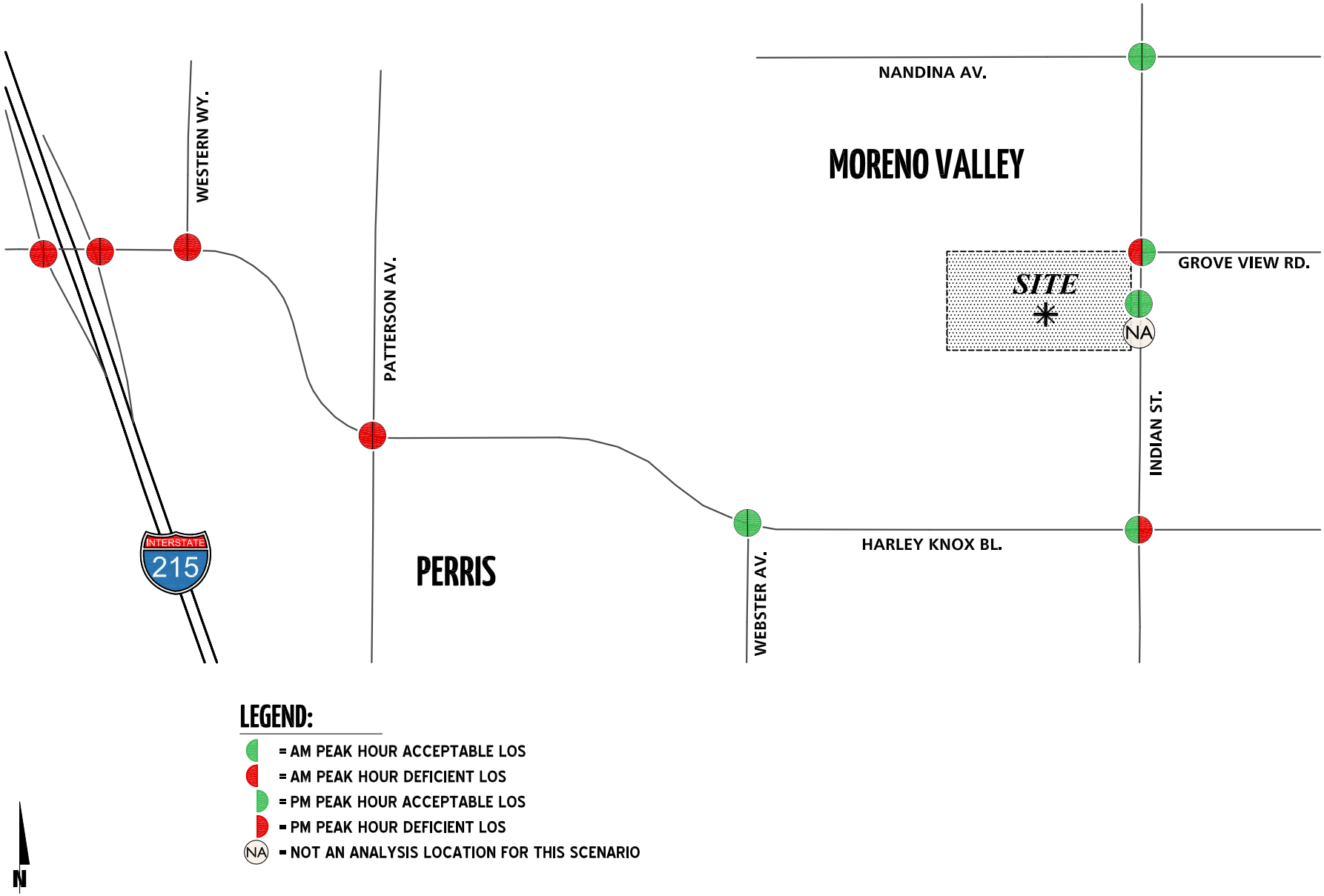
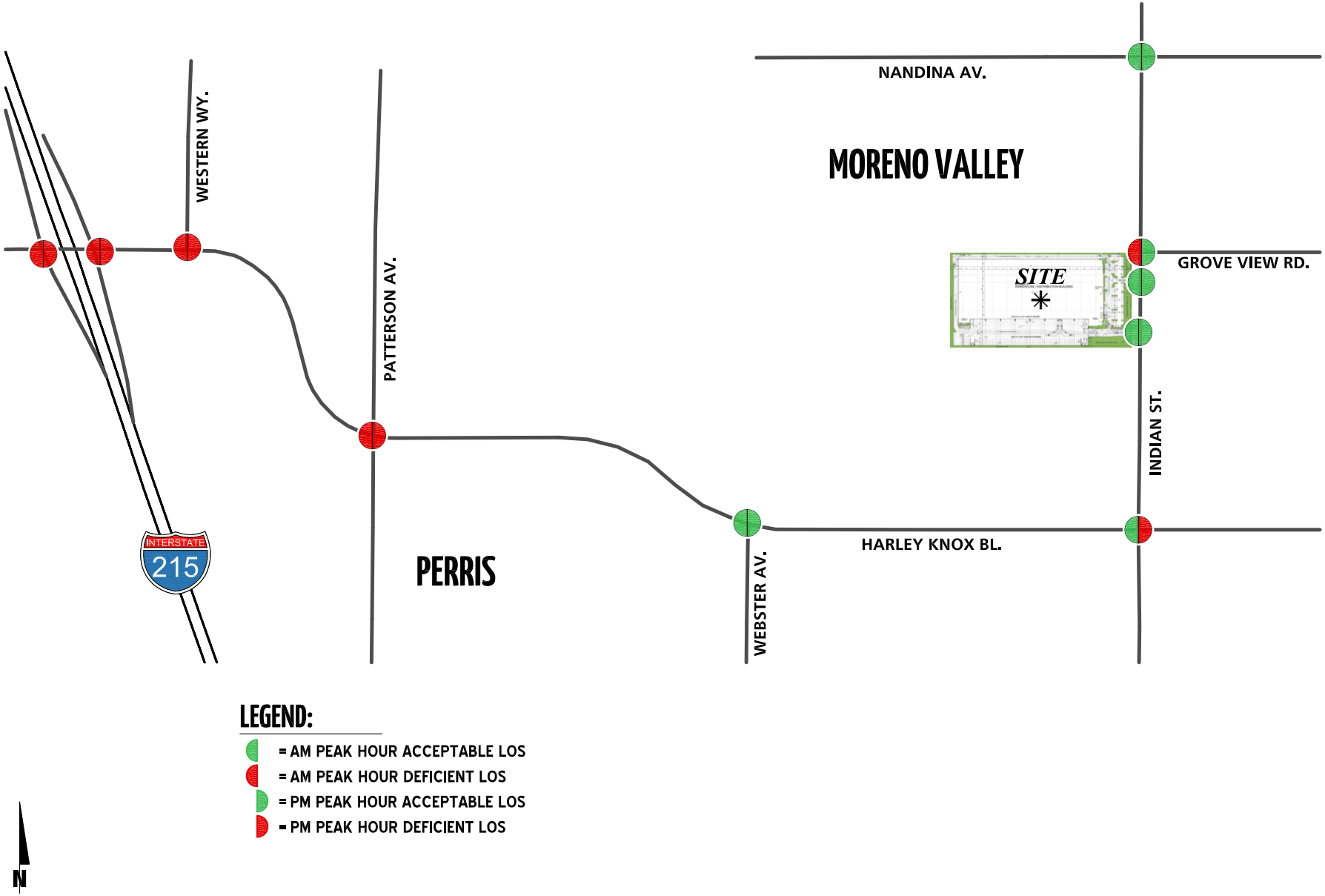


EXHIBIT 6-4: SUMMARY OF LOS FOR OPENING YEAR (2020) WITH PROJECT CONDITIONS



ID	Street	Segment
2	Harley Knox Boulevard	I-215 NB Ramps to Western Way – LOS E
3		East of Western Way – LOS F
4		West of Patterson Avenue – LOS F
9	Indian Street	South of Nandina Avenue – LOS F
10		North of Grove View Road – LOS F
11		South of Grove View Road – LOS F

There are no additional roadway segments that are anticipated to operate at a deficient LOS with the addition of Project traffic, in addition to those previously identified for Opening Year Cumulative Without Project traffic conditions.

As previously discussed in Section 3.8 *Existing Conditions Roadway Segment Capacity Analysis*, a peak hour assessment of intersections located on either side of a deficient roadway segment has been conducted to determine if peak hour traffic flows can be accommodated by the potentially deficient roadway segment. If it is determined that peak traffic flows can be accommodated at the City's stated LOS thresholds, then roadway segment widening is typically not recommended.

The traffic study is conservative in that the Opening Year (2020) Cumulative peak hour intersection operations and roadway segment analysis does not assume the planned future roadway extension of Heacock Street to Harley Knox Boulevard. With the future extension of Heacock Street in place, future year traffic on Heacock Street, Indian Street, and Perris Boulevard in the near-term cumulative scenario would have multiple alternatives in accessing Harley Knox Boulevard. It is assumed that as a result of a reduction in traffic volumes along Indian Street and Perris Boulevard due to the Heacock Street extension, potential deficiencies to intersections and roadway segments along Perris Boulevard and Indian Street towards Harley Knox Boulevard would also potentially be reduced. Moreover, as discussed subsequently at Section 6.8.2, *Recommended Improvements to Address Deficiencies on Roadway Segments,* as improved, controlling intersections along potentially affected roadway segments would operate acceptably. The fact that controlling intersections would operate acceptably obviates the requirement for intermediary lane improvements or roadway segment widening between intersections.

6.6 OFF-RAMP QUEUING ANALYSIS

A queuing analysis was performed for the off-ramps at the I-215 Freeway and Harley Knox Boulevard interchanges to assess vehicle queues for the off ramps that may potentially result in deficient peak hour operations at the ramp-to-arterial intersections and may potentially "spill back" onto the I-215 Freeway mainline. Queuing analysis findings are presented in Table 6-3 for Opening Year Cumulative traffic conditions. It is important to note that off-ramp lengths are consistent with the measured distance between the intersection and the freeway mainline.

Table 6-3

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

Intersection	Movement	Stacking Distance	2020 Without Project				2020 With Project			
			95th Percentile Stacking Distance Required (Feet)		Acceptable? [1]		95th Percentile Stacking Distance Required (Feet)		Acceptable? [1]	
			AM Peak Hour	PM Peak Hour	AM	PM	AM Peak Hour	PM Peak Hour	AM	PM
I-215 SB Ramps / Harley Knox Bl.	SBL/T	1,330	**2,131** [2]	1,205 [2]	**No**	Yes	**2,255** [2]	1,268 [2]	**No**	Yes
	SBR	270	149	157	Yes	Yes	153	163	Yes	Yes
I-215 NB Ramps / Harley Knox Bl.	NBL/T	1,120	117	81	Yes	Yes	117	81	Yes	Yes
	NBR	265	528 [2]	345 [2]	Yes[3]	Yes[3]	544 [2]	365 [2]	Yes[3]	Yes[3]

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

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

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

[3] Although the 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.

As shown on Table 6-3, the following movement may potentially experience queuing issues during the weekday AM peak 95th percentile traffic flows for Opening Year Cumulative traffic conditions:

ID	Intersection Location
1	I-215 SB Ramps / Harley Knox Boulevard – Southbound shared left-through lane (AM peak hour only)

The 95th percentile queues for Opening Year Cumulative traffic conditions indicates potential queuing for the movement and peak hour identified above. As shown, the analysis indicates that potential queues would exceed the length of the off-ramp and could potentially spillback into the adjacent through lanes on the freeway mainline during the AM peak hour only. The addition of Project traffic is not anticipated to result in any additional queuing issues.

Worksheets for Opening Year Cumulative (2020) Without and With project traffic conditions off-ramp queuing analysis are provided in Appendix 6.3 and Appendix 6.4, respectively.

6.7 TRAFFIC SIGNAL WARRANTS ANALYSIS

There are no additional study area intersections that are anticipated to meet either peak hour or planning level (ADT) volume based traffic signal warrants for Opening Year Cumulative traffic conditions (see Appendix 6.5 and Appendix 6.6).

6.8 OPENING YEAR CUMULATIVE DEFICIENCIES AND RECOMMENDED IMPROVEMENTS

6.8.1 RECOMMENDED IMPROVEMENTS TO ADDRESS DEFICIENCIES AT INTERSECTIONS

Improvement strategies have been recommended at intersections that have been identified as deficient in an effort to reduce each location's peak hour delay and improve the associated LOS grade to an acceptable LOS (LOS D or better). The effectiveness of the recommended improvement strategies discussed below to address Opening Year Cumulative traffic deficiencies is presented in Table 6-4.

Worksheets for Opening Year Cumulative (2020) Without and With Project traffic conditions, with improvements, HCM calculation worksheets are provided in Appendix 6.7 and Appendix 6.8, respectively.

6.8.2 RECOMMENDED IMPROVEMENTS TO ADDRESS DEFICIENCIES ON ROADWAY SEGMENTS

As shown on Table 6-4, the Opening Year Cumulative peak hour analysis indicates that the adjacent study area intersections on either side of the deficient roadway segments are anticipated to operate at acceptable LOS with the recommended intersection improvements shown. Table 6-5 shows the LOS for each of the applicable roadway segments with improvements consistent with those shown on Table 6-4 for the adjacent study area intersections.

Table 6-4

Intersection Analysis for Opening Year Cumulative (2020) Conditions With Improvements

#	Intersection	Traffic Control[3]	Intersection Approach Lanes[1]												Delay[2] (secs.)		Level of Service	
			Northbound			Southbound			Eastbound			Westbound						
			L	T	R	L	T	R	L	T	R	L	T	R	AM	PM	AM	PM
1	I-215 SB Ramps / Harley Knox Bl																	
	- Without Project	TS	0	0	0	**2**	1	**0**	0	2	d	**2**	2	0	39.4	45.5	D	D
	- With Project	TS	0	0	0	**2**	1	**0**	0	2	d	**2**	2	0	42.1	46.6	D	D
2	I-215 NB Ramps / Harley Knox Bl																	
	- Without Project	TS	0	1	1	0	0	0	**2**	2	0	0	2	**1>>**	30.8	20.7	C	C
	- With Project	TS	0	1	1	0	0	0	**2**	2	0	0	2	**1>>**	31.8	20.8	C	C
3	Western Wy / Harley Knox Bl																	
	- Without Project	**TS**	0	0	0	0	1	0	**1**	2	0	0	2	d	17.4	35.8	B	D
	- With Project	**TS**	0	0	0	0	1	0	**1**	2	0	0	2	d	21.3	39.6	C	D
4	Patterson Av / Harley Knox Bl																	
	- Without Project	TS	0	1	0	0	1	0	1	**3**	1	1	**3**	1	24.4	22.2	C	C
	- With Project	TS	0	1	0	0	1	0	1	**3**	1	1	**3**	1	25.3	29.0	C	C
7	Indian St / Grove View Rd																	
	- Without Project	**TS**	0	**2**	0	1	**2**	0	0	0	0	1	0	1	7.9	8.4	A	A
	- With Project	**TS**	0	**2**	0	1	**2**	0	0	0	0	1	0	1	9.1	8.7	A	A
10	Indian St / Harley Knox Bl																	
	- Without Project	TS	2	2	1	1	2	**1>**	**2**	3	d	1	3	0	18.0	53.6	B	D
	- With Project	TS	2	2	1	1	2	**1>**	**2**	3	d	1	3	0	18.9	54.3	B	D

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

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

[2] Per the 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 (o movements sharing a single lane) are shown.

[3] TS = Traffic Signal

Table 6-5

Roadway Volume/Capacity Analysis for Opening Year Cumulative (2020) Conditions With Improvements

#	Roadway	Segment Limits	Roadway Section	LOS[3] Capacity[1]	2020 Without Project	V/C[2]	LOS[3]	2020 With Project	V/C[2]	LOS[3]	Acceptable LOS[3]
2	Harley Knox Boulevard	I-215 NB Ramps to Western Way	4D	35,900	35,262	**0.98**	**E**	36,263	**1.01**	**F**	D
3		East of Western Way	**6D**	53,900	36,133	0.67	B	37,133	0.69	B	D
4		West of Patterson Avenue	**6D**	53,900	35,118	0.65	B	36,118	0.67	B	D
9	Indian Street	South of Nandina Avenue	**4D**	35,900	34,847	**0.97**	**E**	35,007	**0.98**	**E**	D
10		North of Grove View Road	**4D**	35,900	33,724	**0.94**	**E**	33,884	**0.94**	**E**	D
11		South of Grove View Road	**4D**	35,900	26,299	0.73	C	26,597	0.74	C	D
12		North of Harley Knox Boulevard	4D	35,900	26,266	0.73	C	27,441	0.76	C	D

BOLD = LOS does not meet the applicable jurisdictional requirements (i.e., unacceptable LOS); **6D** = Improvement

[1] These maximum roadway capacities have been extracted from the City of Moreno Valley's Transportation Division's Traffic Impact Analysis Preparation Guidelines (August 2007) and Table CE-9 of the City of Perris General Plan Circulation Element.

[2] V/C = Volume to Capacity Ratio

[3] LOS = Level of Service

As shown on Table 6-5, modeled traffic flows for certain Study Area roadway segments indicate potential LOS deficiencies. Notwithstanding, these roadway segments would operate acceptably given that, as improved, the controlling intersections along the affected roadways would operate acceptably. As such, roadway segment widening beyond those identified in Table 6-4 does not appear necessary and is not recommended.

6.10.3 RECOMMENDED IMPROVEMENTS TO ADDRESS OFF-RAMP QUEUES

With the implementation of the recommended intersection improvements shown on Table 6-4, which are necessary to reduce near-term cumulative impacts to less than significant levels, there are no potential queuing issues anticipated for Opening Year Cumulative traffic conditions (see Table 6-6). As such, no spill-back onto the I-215 Freeway Southbound mainline is anticipated. Worksheets for Opening Year Cumulative (2020) Without and With Project traffic conditions, with improvements, queuing analysis are provided in Appendix 6.9 and Appendix 6.10, respectively.

Table 6-6

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

Intersection	Movement	Stacking Distance	2020 Without Project				2020 With Project			
			95th Percentile Stacking Distance Required (Feet)		Acceptable? [1]		95th Percentile Stacking Distance Required (Feet)		Acceptable? [1]	
			AM Peak Hour	PM Peak Hour	AM	PM	AM Peak Hour	PM Peak Hour	AM	PM
I-215 SB Ramps / Harley Knox Bl.										
	SBL/T	1,330	721 [2]	420	Yes	Yes	828 [2]	444	Yes	Yes
	SBR	270	87	62	Yes	Yes	87	62	Yes	Yes
I-215 NB Ramps / Harley Knox Bl.										
	NBL/T	1,120	111	65	Yes	Yes	111	65	Yes	Yes
	NBR	265	503 [2]	265	Yes[3]	Yes	520 [2]	276	Yes[3]	Yes

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

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

[3] Although the 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.

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