IDI Rider 2 and 4 High Cube Warehouses and Perris Valley Storm Drain Channel Improvement Project

TRAFFIC IMPACT ANALYSIS

CITY OF PERRIS

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LIST OF ABBREVIATED TERMS

(1)	Reference
ADT	Average Daily Traffic
ALUCP	Airport Land Use Compatibility Plan
CA MUTCD	California Manual on Uniform Traffic Control Devices
Caltrans	California Department of Transportation
CEQA	California Environmental Quality Act
CMP	Congestion Management Program
CRA	Colorado River Aqueduct
DIF	Development Impact Fee
E+P	Existing Plus Project
EA	Existing Plus Ambient Growth
EAC	Existing Plus Ambient Growth Plus Cumulative
EAP	Existing Plus Ambient Growth Plus Project
EAPC	Existing Plus Ambient Growth Plus Project Plus Cumulative
EIR	Environmental Impact Report
HCM	Highway Capacity Manual
HOV	High Occupancy Vehicle
ITE	Institute of Transportation Engineers
LOS	Level of Service
MARB/IB	March Air Reserve Base/Inland Port
MM	Mitigation Measure
MWD	Metropolitan Water District
N/A	Not Applicable
NP	No Project (or Without Project)
NPRBBD	North Perris Road and Bridge Benefit District
PCE	Passenger Car Equivalents
PEMS	Performance Measure System
PHF	Peak Hour Factor
Project	IDI Rider 2 and 4 High Cube Warehouses and Perris Valley Storm Drain Channel Improvement Project
PVCC SP	Perris Valley Commerce Center Specific Plan
PVMDP	Perris Valley Master Drainage Plan
PVSD	Perris Valley Storm Drain
RCF&WCD	Riverside County Flood Control and Water Conservation District
RTA	Riverside Transit Authority

RTP/SCS	Regional Transportation Plan/Sustainable Communities Strategy
SCAG	Southern California Association of Governments
SCAQMD	South Coast Air Quality Management District
sf	Square Feet
SHS	State Highway System
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
VMT	Vehicle Miles Traveled

1 INTRODUCTION

This report presents the results of the traffic impact analysis (TIA) for the proposed IDI Rider 2 and 4 High Cube Warehouses and Perris Valley Storm Drain Channel Improvement Project ("Project"), which is located on the northeast corner of Redlands Avenue and Rider Street, within the City of Perris' *Perris Valley Commerce Center Specific Plan* (PVCC SP) as shown on Exhibit 1-1.

The purpose of this traffic impact analysis is to evaluate the potential impacts related to traffic and circulation system deficiencies that may result from the development of the proposed Project, and to recommend improvements to mitigate impacts considered significant in comparison to established regulatory thresholds and to achieve acceptable circulation system operational conditions. This report has been prepared in accordance with the Project Traffic Study Scoping agreement through consultation with the City of Perris, which is provided in Appendix 1.1 of this report.

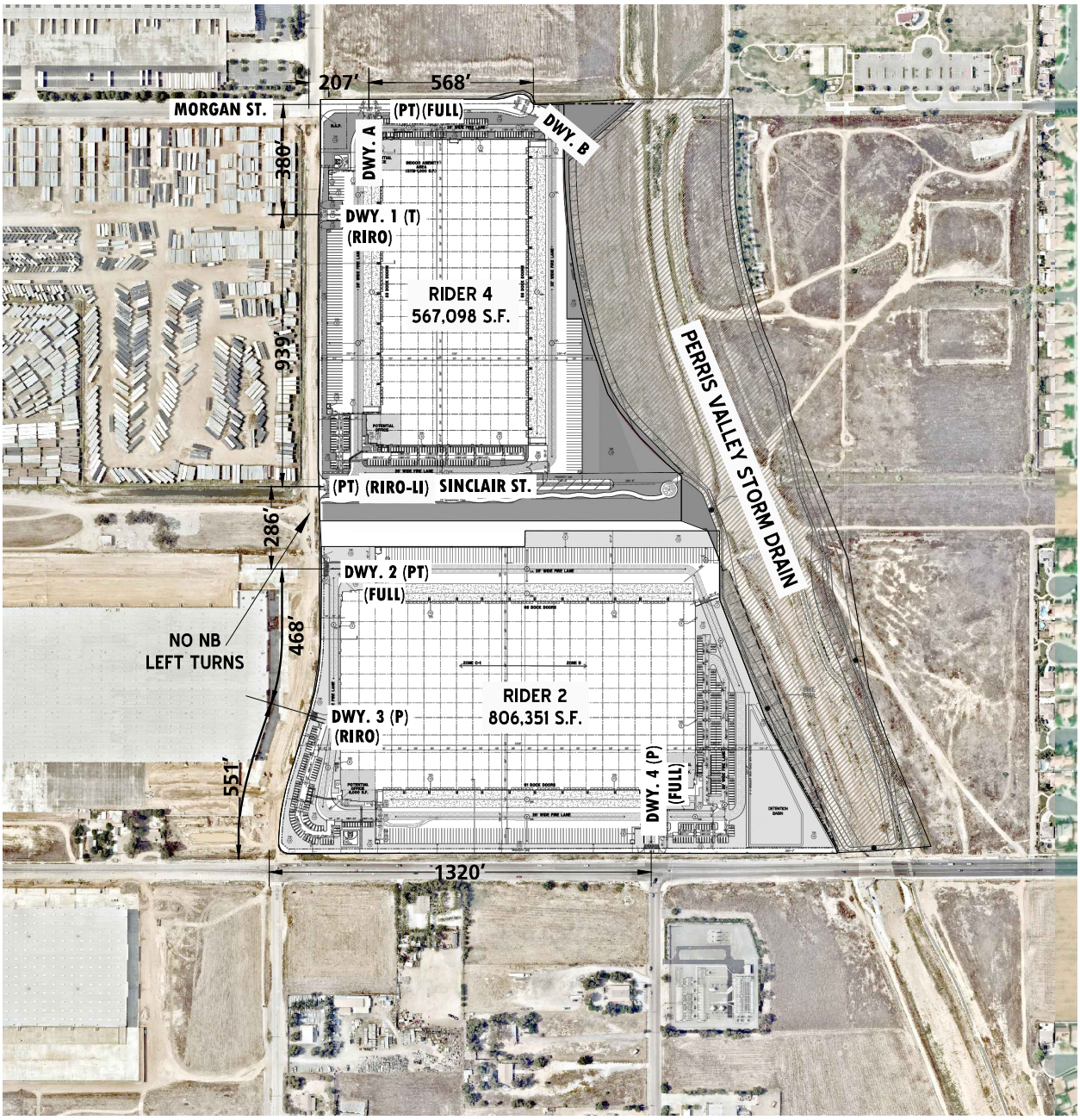
The PVCC SP Environmental Impact Report (EIR) concluded that the potential impacts related to level of service on study area roadways were less than significant, although potential impacts related to and on the I-215 Freeway would be significant and unavoidable. The PVCC SP EIR did not evaluate peak hour operations of any key study area intersections. (1)

1.1 PROJECT OVERVIEW

The Project is proposed to consist of two High-Cube Transload and Short-Term Storage Warehouse buildings totaling approximately 1,373,449 square feet (sf) (Rider 2 is to consist of approximately 806,351 sf and Rider 4 is to consist of approximately 567,098 sf) of High-Cube Transload and Short-Term Storage Warehouse use (without cold storage) and the development and subsequent operations and maintenance of improvements to the Perris Valley Storm Drain (PVSD) Channel. At the time this TIA was prepared, Rider 2 was proposed to consist of 806,351 sf and Rider 4 was proposed to consist of 567,098 sf of High-Cube Transload and Short-Term Storage Warehouse use (without cold storage). However, the current site plan shows 804,759 sf for Rider 2 and 547,977 sf for Rider 4. The higher square footages for Rider 2 and Rider 4 have been evaluated for the purposes of this TIA in order to account for any minor changes that may occur to the building area as part of the final design.

The Project is anticipated to be constructed in a single phase by Year 2021. The proposed Project land use is consistent with the PVCC SP. The designated land use and zoning within the PVCCP SP is Light Industrial. The Project site is also located approximately 2.5 miles southeast of March Air Reserve Base/Inland Port (MARB/IP) and is within the MARB/IP Airport Influence Policy Area. Specifically, the Project is within Compatibility Zone C1 and D, which have limited restrictions on uses. (2)

EXHIBIT 1-1: PRELIMINARY SITE PLAN



LEGEND:

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

N

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URBAN CROSSROADS

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

- Rider 4 will have full access along the eastern extension of Morgan Street at Redlands Avenue for both passenger cars and trucks. Although not evaluated in this TIA, there are two other full access driveways proposed along Morgan Street (see Driveway A and Driveway B on Exhibit 1-1). The driveways along Morgan Street have not been evaluated for the purposes of this TIA as these intersections are anticipated to operate at an acceptable level of service due to the low traffic along Morgan Street.
- Rider 4 will have right-in/right-out only access for trucks only via Driveway 1 on Redlands Avenue
- Rider 4 will have right-in/right-out/left-in access along the eastern extension of Sinclair Street at Redlands Avenue for both passenger cars and trucks
- Rider 2 will have full access for passenger cars and trucks via Driveway 2 on Redlands Avenue
- Rider 2 will have right-in/right-out only access for passenger cars only via Driveway 3 on Redlands Avenue
- Rider 2 will have full access for passenger cars only via Driveway 4 on Rider Street which will be the northern extension of Wilson Avenue

Per the PVCC SP, the minimum intersection spacing required on both Redlands Avenue and Rider Street (Secondary Arterial) is 660 feet. Regional access to the Project site is provided via the I-215 Freeway via Ramona Expressway for passenger cars and via Harley Knox Boulevard for heavy trucks. It should be noted that the City of Perris has restricted truck access along Ramona Expressway to and from the I-215 Freeway.

Trips generated by the Project's proposed land uses have been estimated based on trip generation rates collected by the Institute of Transportation Engineers (ITE) Trip Generation Manual, 10th Edition, 2017. (3) The Project is estimated to generate a net total of 2,879 passenger-car-equivalent (PCE) trip-ends per day on a typical weekday with approximately 165 net AM PCE peak hour trips and 189 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.

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 (2019)
- Existing Plus Project (E+P)
- Existing Plus Ambient Growth (EA) (2021)
- Existing Plus Ambient Growth Plus Project (EAP) (2021)
- Existing Plus Ambient Growth Plus Cumulative Projects (EAC) (2021)
- Existing Plus Ambient Growth Plus Project Plus Cumulative Projects (EAPC) (2021)

1.2.1 EXISTING (2019) CONDITIONS

Information for Existing (2019) conditions is disclosed to represent the baseline traffic conditions as they existed at the time this report was prepared. Traffic counts were conducted in May 2018 based on vehicle classification and were converted to PCE due to the presence of heavy trucks within the study area. Pursuant to discussions with City staff, a 2% growth rate has been applied to the 2018 traffic counts to reflect 2019 conditions.

1.2.2 EXISTING PLUS PROJECT CONDITIONS

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

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

The EA and EAP (2021) conditions analyses determines the traffic impacts based on a comparison of the EAP (2021) traffic conditions to EA (2021) conditions. To account for background traffic growth, an ambient growth factor from Existing (2019) conditions of 6.09% (3 percent per year, compounded over 2 years) is included for EA and EAP (2021) traffic conditions. As discussed below, in order to conduct a more conservative analysis, other cumulative development projects are not included as part of the EAP (2021) analysis.

1.2.4 EXISTING PLUS AMBIENT GROWTH PLUS CUMULATIVE AND EXISTING PLUS AMBIENT GROWTH PLUS PROJECT PLUS CUMULATIVE (2021) CONDITIONS

To account for growth in traffic between Existing (2019) conditions and the Project Opening Year (2021), an annual traffic growth factor of 6.09% was assumed (3 percent per year, compounded over 2 years). The 3.0 percent annual growth rate is intended to capture non-specific ambient traffic growth.

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 6.09% total ambient growth in traffic noted above; and in some instances, these related projects would likely not be implemented and operational within the 2021 Opening Year time frame assumed for the Project. The resulting traffic growth rate utilized in the TIA (6.09 percent ambient growth + traffic generated by related projects) would therefore tend to overstate rather than understate background cumulative traffic impacts under 2021 conditions.

1.3 STUDY AREA

To ensure that this TIA satisfies the City of Perris' traffic study requirements, Urban Crossroads, Inc. prepared a Project traffic study scoping package for review by City of Perris 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

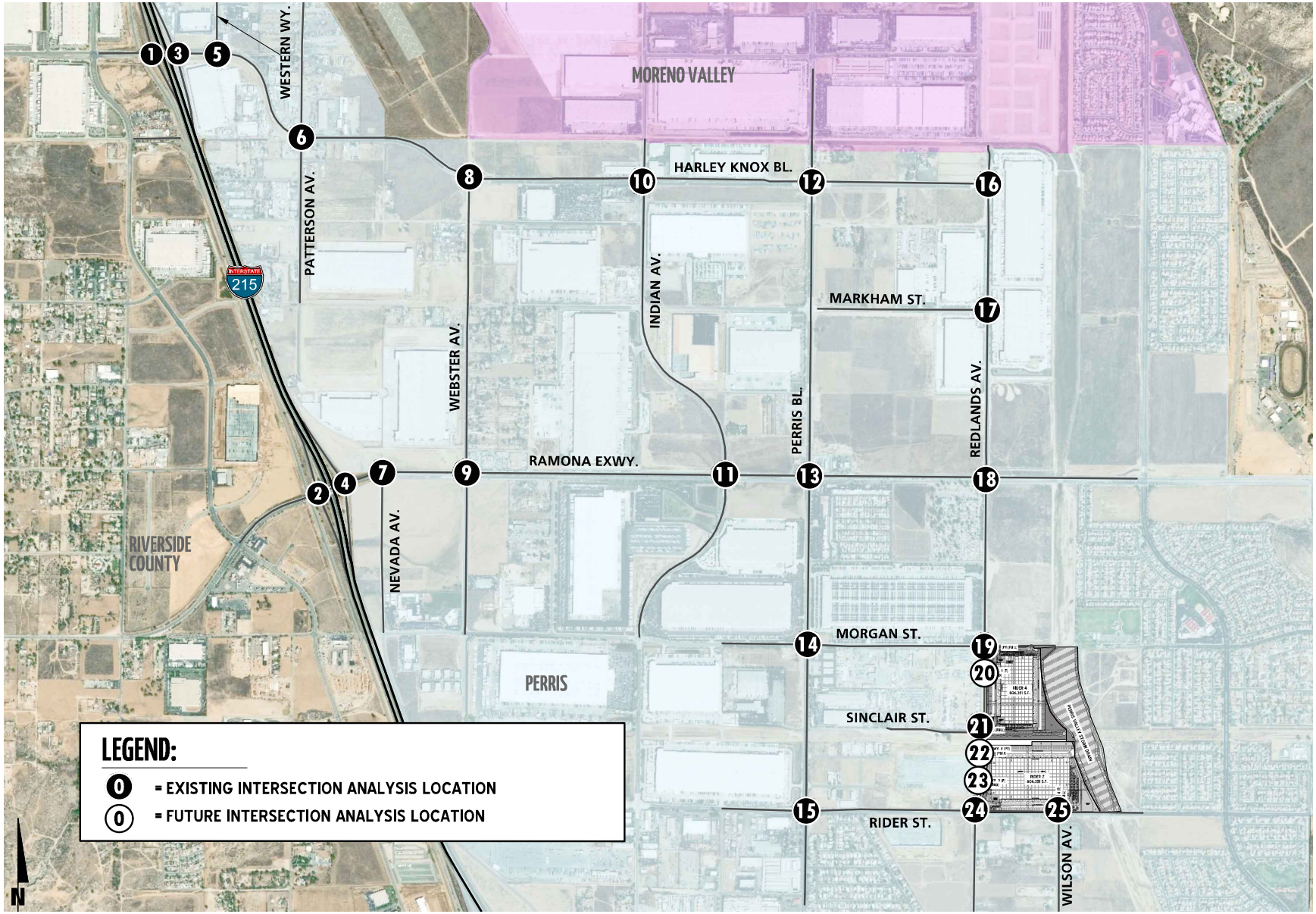
The 25 study area intersections shown on Exhibit 1-2 and listed in Table 1-1 were selected for this TIA based on the City's Traffic Study Guidelines and in consultation with City of Perris staff. Pursuant to the Traffic Study Guidelines, the City requires analysis of intersections where the Project would contribute 50 or more peak hour trips.

TABLE 1-1: INTERSECTION ANALYSIS LOCATIONS

ID	Intersection Location	Jurisdiction	CMP?
1	I-215 Southbound Ramps & Harley Knox Boulevard	Caltrans, County of Riverside	No
2	I-215 Southbound Ramps & Ramona Expressway	Caltrans, County of Riverside	No
3	I-215 Northbound Ramps & Harley Knox Boulevard	Caltrans, City of Perris	No
4	I-215 Northbound Ramps & Ramona Expressway	Caltrans, City of Perris	No
5	Western Way & Harley Knox Boulevard	City of Perris	No
6	Patterson Avenue & Harley Knox Boulevard	City of Perris	No
7	Nevada Avenue & Ramona Expressway	City of Perris	No
8	Webster Avenue & Harley Knox Boulevard	City of Perris, County of Riverside	No
9	Webster Avenue & Ramona Expressway	City of Perris	No
10	Indian Avenue & Harley Knox Boulevard	City of Perris	No
11	Indian Avenue & Ramona Expressway	City of Perris	No
12	Perris Boulevard & Harley Knox Boulevard	City of Perris	No
13	Perris Boulevard & Ramona Expressway	City of Perris	No
14	Perris Boulevard & Morgan Street	City of Perris	No
15	Perris Boulevard & Rider Street	City of Perris	No
16	Redlands Avenue & Harley Knox Boulevard	City of Perris	No
17	Redlands Avenue & Markham Street	City of Perris	No
18	Redlands Avenue & Ramona Expressway	City of Perris	No
19	Redlands Avenue & Morgan Street	City of Perris	No
20	Redlands Avenue & Driveway 1 – Future Intersection	City of Perris	No
21	Redlands Avenue & Sinclair Street – Future Intersection	City of Perris	No
22	Redlands Avenue & Driveway 2 – Future Intersection	City of Perris	No
23	Redlands Avenue & Driveway 3 – Future Intersection	City of Perris	No
24	Redlands Avenue & Rider Street	City of Perris	No
25	Driveway 4/Wilson Avenue & Rider Street – Future Intersection	City of Perris	No

* CMP = Congestion Management Program

EXHIBIT 1-2: LOCATION MAP



URBAN CROSSROADS

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

1.3.2 FREEWAY MAINLINE SEGMENTS

The freeway mainline analysis locations include the segments on either side of the I-215 Freeway and Ramona Expressway interchange. The study area freeway mainline analysis locations include four I-215 Freeway mainline segments for the northbound and southbound directions of flow as listed in Table 1-2:

TABLE 1-2: FREEWAY MAINLINE SEGMENT ANALYSIS LOCATIONS

ID	Freeway Mainline Segments
1	I-215 Freeway – Southbound, North of Harley Knox Boulevard
2	I-215 Freeway – Southbound, Harley Knox Boulevard to Ramona Expressway
3	I-215 Freeway – Southbound, South of Ramona Expressway
4	I-215 Freeway – Northbound, North of Harley Knox Boulevard
5	I-215 Freeway – Northbound, Harley Knox Boulevard to Ramona Expressway
6	I-215 Freeway – Northbound, South of Ramona Expressway

It should be noted the Project will contribute less than 50 peak hours trips to the freeway mainline at both the Harley Knox Boulevard and Ramona Expressway interchanges.

1.3.3 FREEWAY MERGE/DIVERGE RAMP JUNCTIONS

The study area freeway merge/diverge ramp junction analysis locations include four I-215 freeway ramp junctions for both northbound and southbound directions of flow as listed in Table 1-3:

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

ID	Freeway Merge/Diverge Ramp Junction Analysis Locations
1	I-215 Freeway – Southbound, Off-Ramp at Harley Knox Boulevard (Diverge)
2	I-215 Freeway – Southbound, On-Ramp at Harley Knox Boulevard (Merge)
3	I-215 Freeway – Southbound, Off-Ramp at Ramona Expressway (Diverge)
4	I-215 Freeway – Southbound, On-Ramp at Ramona Expressway (Merge)
5	I-215 Freeway – Northbound, On-Ramp at Harley Knox Boulevard (Merge)
6	I-215 Freeway – Northbound, Off-Ramp at Harley Knox Boulevard (Diverge)
7	I-215 Freeway – Northbound, On-Ramp at Ramona Expressway (Merge)
8	I-215 Freeway – Northbound, Off-Ramp at Ramona Expressway (Diverge)

It should be noted the Project will contribute less than 50 peak hours trips to the freeway ramp junctions at both the Harley Knox Boulevard and Ramona Expressway interchanges.

1.4 ANALYSIS FINDINGS

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

Existing (2019) Conditions

Intersection Operations Analysis

A summary of LOS results for Existing traffic conditions are presented on Exhibit 1-3. For Existing (2019) traffic conditions, all of the study area intersections are currently operating at an acceptable level of service (LOS) (i.e., LOS D or better) during the peak hours, with the exception of the following study area intersection:

- Redlands Av. & Rider St. (#24) – LOS E AM peak hour only

Off-Ramp Queuing Analysis

A queuing analysis was performed for the northbound and southbound off-ramps at the I-215 Freeway at the Harley Knox Boulevard and Ramona Expressway interchanges for Existing (2019) traffic conditions. The analysis indicates there are currently no queues that may potentially "spill back" onto the I-215 Freeway mainline.

Freeway Operations Analyses

For Existing (2019) traffic conditions, the study area freeway mainline segments and ramp merge/diverge junctions are currently operating at an acceptable LOS (i.e., LOS D or better) during one or both peak hours, with the exception of the following facilities:

- Basic Freeway Segment: I-215 Freeway Northbound, North of Harley Knox Boulevard (#4) – LOS F AM and PM peak hours
- Basic Freeway Segment: I-215 Freeway Northbound, Harley Knox Boulevard to Ramona Expressway (#5) – LOS F AM and PM peak hours
- Basic Freeway Segment: I-215 Freeway Northbound, South of Ramona Expressway (#6) – LOS F AM and PM peak hours
- Freeway Diverge Ramp Junction: I-215 Freeway, Southbound Off-Ramp at Harley Knox Boulevard (#1) – LOS F AM peak hour only

At this time, Caltrans has no near-term fee programs or other improvement programs in place to address the deficiencies caused by development projects on the State Highway System (SHS) freeway facilities. As such, no improvements have been recommended to address the Existing deficiencies on the SHS. There is a significant and unavoidable cumulative impact to the I-215 Freeway facilities for Existing traffic conditions as there are currently no improvements to mitigate the impacts to the SHS.

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

#	Intersection	Existing (2019)	E+P	EA (2021)	EAP (2021)	EAC (2021)	EAPC (2021)
1	I-215 SB Ramps & Harley Knox. Bl.						
2	I-215 SB Ramps & Ramona Exwy.						
3	I-215 NB Ramps & Harley Knox. Bl.						
4	I-215 NB Ramps & Ramona Exwy.						
5	Western Wy. & Harley Knox. Bl.						
6	Patterson Av. & Harley Knox. Bl.						
7	Nevada Av. & Ramona Exwy.						
8	Webster Av. & Harley Knox. Bl.						
9	Webster Av. & Ramona Exwy.						
10	Indian Av. & Harley Knox. Bl.						
11	Indian Av. & Ramona Exwy.						
12	Perris Bl. & Harley Knox. Bl.						
13	Perris Bl. & Ramona Exwy.						
14	Perris Bl. & Morgan St.						
15	Perris Bl. & Rider St.						
16	Redlands Av. & Harley Knox. Bl.						
17	Redlands Av. & Markham St.						
18	Redlands Av. & Ramona Exwy.						
19	Redlands Av. & Morgan St.						
20	Redlands Av. & Dwy. 1	NA		NA		NA	
21	Redlands Av. & Sinclair St.						
22	Redlands Av. & Dwy. 2	NA		NA			
23	Redlands Av. & Dwy. 3	NA		NA			
24	Redlands Av. & Rider St.						
25	Dwy. 4/Wilson Av. & Rider St.						

LEGEND:

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

NA = NOT AN ANALYSIS LOCATION FOR THIS SCENARIO

Improvements to Address Deficiency

The following study area intersection was found to operate at an unacceptable LOS for Existing (2019) traffic conditions:

- Redlands Av. & Rider St. (#24)

The following improvement is necessary to achieve acceptable peak hour operations:

Redlands Av. & Rider St. (#24):

- Install a traffic signal.

Project Construction Traffic

The Project Applicant would be required to develop and implement a City-approved Construction Traffic Management Plan addressing potential construction-related traffic detours and disruptions. In general, the Construction Traffic Management Plan would ensure that to the extent practical, construction traffic would access the Project site during off-peak hours; and that construction traffic would be routed to avoid travel through, or proximate to, sensitive land uses. If construction traffic (i.e., employees, vendors, etc.) were to occur during the weekday peak commute hours, these trips should be limited to less than 50 PCE peak hour trips.

E+P Conditions

Intersection Operations Analysis

As shown on Exhibit 1-3, with the addition of Project traffic and the Project site access improvements (see Section 1.8 *Site Access Improvements*), all study area intersections are anticipated to operate at an acceptable LOS during the peak hours.

Off-Ramp Queuing Analysis

A queuing analysis was performed for the northbound and southbound off-ramps at the I-215 Freeway at the Harley Knox Boulevard and Ramona Expressway interchanges. The analysis indicates there are no queues anticipated for E+P traffic conditions that may potentially "spill back" onto the I-215 Freeway mainline.

Freeway Operations Analyses

For E+P traffic conditions, the following study area freeway mainline segments and ramp merge/diverge junctions are anticipated to operate at an unacceptable LOS (i.e., LOS E or worse) during one or more peak hours, consistent with Existing (2019) conditions:

- Basic Freeway Segment: I-215 Freeway Northbound, North of Harley Knox Boulevard (#4) – LOS F AM and PM peak hours
- Basic Freeway Segment: I-215 Freeway Northbound, Harley Knox Boulevard to Ramona Expressway (#5) – LOS F AM and PM peak hours
- Basic Freeway Segment: I-215 Freeway Northbound, South of Ramona Expressway (#6) – LOS F AM and PM peak hours
- Freeway Diverge Ramp Junction: I-215 Freeway, Southbound Off-Ramp at Harley Knox Boulevard (#1) – LOS F AM peak hour only

At this time, Caltrans has no near-term fee programs or other improvement programs in place to address the deficiencies caused by development projects on the SHS freeway facilities. As such, no improvements have been recommended to address the E+P deficiencies on the SHS. There is a significant and unavoidable cumulative impact to the I-215 Freeway facilities for E+P traffic conditions as there are currently no improvements to mitigate the impacts to the SHS.

Recommended Improvements

All study area intersections are anticipated to operate at an acceptable LOS for E+P traffic conditions. As such, no improvements have been recommended.

EA (2021) Conditions

Intersection Operations Analysis

As shown on Exhibit 1-3, there is one study area intersection that is anticipated to operate at an unacceptable LOS during the AM or PM peak hour for EA (2021) traffic conditions (i.e., #24).

Off-Ramp Queuing Analysis

A queuing analysis was performed for the northbound and southbound off-ramps at the I-215 Freeway at the Harley Knox Boulevard and Ramona Expressway interchanges. The analysis indicates there are no queues anticipated for EA (2021) traffic conditions that may potentially "spill back" onto the I-215 Freeway mainline.

Freeway Operations Analyses

For EA (2021) traffic conditions, the following study area freeway mainline segments and ramp merge/diverge junctions are anticipated to operate at an unacceptable LOS (i.e., LOS E or worse) during one or both peak hours:

- Basic Freeway Segment: I-215 Freeway Southbound, North of Harley Knox Boulevard (#1) – LOS E PM peak hour only
- Basic Freeway Segment: I-215 Freeway Northbound, North of Harley Knox Boulevard (#4) – LOS F AM and PM peak hours
- Basic Freeway Segment: I-215 Freeway Northbound, Harley Knox Boulevard to Ramona Expressway (#5) – LOS F AM and PM peak hours
- Basic Freeway Segment: I-215 Freeway Northbound, South of Ramona Expressway (#6) – LOS F AM and PM peak hours
- Freeway Diverge Ramp Junction: I-215 Freeway, Southbound Off-Ramp at Harley Knox Boulevard (#1) – LOS F AM peak hour; LOS E PM peak hour
- Freeway Diverge Ramp Junction: I-215 Freeway, Northbound On-Ramp at Harley Knox Boulevard (#5) – LOS E AM peak hour only

At this time, Caltrans has no near-term fee programs or other improvement programs in place to address the deficiencies caused by development projects on the SHS freeway facilities. As such, no improvements have been recommended to address the EA (2021) deficiencies on the SHS. There is a significant and unavoidable cumulative impact to the I-215 Freeway facilities for EA (2021) traffic conditions as there are currently no improvements to mitigate the impacts to the SHS.

EAP (2021) Conditions

Intersection Operations Analysis

As shown on Exhibit 1-3, with the Project site access improvements (see Section 1.8 *Site Access Improvements*), all study area intersections are anticipated to operate at an acceptable LOS during the peak hours for EAP (2021) traffic conditions.

Off-Ramp Queuing Analysis

A queuing analysis was performed for the northbound and southbound off-ramps at the I-215 Freeway at the Harley Knox Boulevard and Ramona Expressway interchanges. The analysis indicates there are no queues anticipated for EAP (2021) traffic conditions that may potentially "spill back" onto the I-215 Freeway mainline.

Freeway Operations Analyses

For EAP (2021) traffic conditions, there are no additional study area freeway mainline segments or ramp merge/diverge junctions that would operate at an unacceptable LOS (i.e., LOS E or worse) during one or both peak hours with the addition of Project traffic, in addition to those identified for EA (2021) traffic conditions.

At this time, Caltrans has no near-term fee programs or other improvement programs in place to address the deficiencies caused by development projects on the SHS freeway facilities. As such, no improvements have been recommended to address the EAP (2021) deficiencies on the SHS. There is a significant and unavoidable cumulative impact to the I-215 Freeway facilities for EAP (2021) traffic conditions as there are currently no improvements to mitigate the impacts to the SHS.

Recommended Improvements

All study area intersections are anticipated to operate at an acceptable LOS for EAP (2021) traffic conditions. As such, no improvements have been recommended.

EAC (2021) Conditions

Intersection Operations Analysis

As shown on Exhibit 1-3, there are 7 study area intersections that are anticipated to operate at an unacceptable LOS during the AM or PM peak hours for EAC (2021) traffic conditions (i.e., #1, #2, #3, #4, #10, #24, and #25).

Off-Ramp Queuing Analysis

A queuing analysis was performed for the northbound and southbound off-ramps at the I-215 Freeway at the Harley Knox Boulevard and Ramona Expressway interchanges. The analysis indicates there are no queues anticipated for EAC (2021) traffic conditions that may potentially "spill back" onto the I-215 Freeway mainline.

Freeway Operations Analyses

For EAC (2021) traffic conditions, the study area freeway mainline segments and ramp merge/diverge junctions are anticipated to continue to operate at an acceptable LOS (i.e., LOS D or better) during one or both peak hours, with the exception of the following mainline segment and ramp diverge junction:

- Basic Freeway Segment: I-215 Freeway Southbound, North of Harley Knox Boulevard (#1) – LOS F PM peak hour only
- Basic Freeway Segment: I-215 Freeway Southbound, Harley Knox Boulevard to Ramona Expressway (#2) – LOS E PM peak hour only
- Basic Freeway Segment: I-215 Freeway Southbound, South of Ramona Expressway (#3) – LOS E PM peak hour only
- Basic Freeway Segment: I-215 Freeway Northbound, North of Harley Knox Boulevard (#4) – LOS F AM and PM peak hours
- Basic Freeway Segment: I-215 Freeway Northbound, Harley Knox Boulevard to Ramona Expressway (#5) – LOS F AM and PM peak hours
- Basic Freeway Segment: I-215 Freeway Northbound, South of Ramona Expressway (#6) – LOS F AM and PM peak hours
- Freeway Diverge Ramp Junction: I-215 Freeway, Southbound Off-Ramp at Harley Knox Boulevard (#1) – LOS F AM and PM peak hours

- Freeway Diverge Ramp Junction: I-215 Freeway, Southbound On-Ramp at Harley Knox Boulevard (#2) – LOS E PM peak hour only
- Freeway Diverge Ramp Junction: I-215 Freeway, Southbound Off-Ramp at Ramona Expressway (#3) – LOS E PM peak hour only
- Freeway Diverge Ramp Junction: I-215 Freeway, Northbound On-Ramp at Harley Knox Boulevard (#5) – LOS E AM and PM peak hours

At this time, Caltrans has no near-term fee programs or other improvement programs in place to address the deficiencies caused by development projects on the SHS freeway facilities. As such, no improvements have been recommended to address the EAC (2021) deficiencies on the SHS. There is a significant and unavoidable cumulative impact to the I-215 Freeway facilities for EAC (2021) traffic conditions as there are currently no improvements to mitigate the impacts to the SHS.

EAPC (2021) Conditions

Intersection Operations Analysis

The intersection analysis results indicate that there are no additional study area intersections anticipated to operate at an unacceptable LOS under EAPC (2021) traffic conditions, in addition to the locations previously identified under EAC (2021) traffic conditions (see Exhibit 1-3). The following study area intersections are anticipated to improve operations to acceptable levels:

- Redlands Av. & Rider St. (#24)
- Driveway 4/Wilson Av. & Rider St. (#25)

Off-Ramp Queuing Analysis

A queuing analysis was performed for the northbound and southbound off-ramps at the I-215 Freeway at the Harley Knox Boulevard and Ramona Expressway interchanges. The analysis indicates there are no queues anticipated for EAPC (2021) traffic conditions that may potentially "spill back" onto the I-215 Freeway mainline.

Freeway Operations Analyses

For EAPC (2021) traffic conditions, there are no additional study area freeway mainline segments or ramp merge/diverge junctions that are anticipated to operate at an unacceptable LOS (i.e., LOS E or worse) during one or both peak hours, in addition to the mainline segments and ramp diverge junctions identified under EAC (2021) traffic conditions.

At this time, Caltrans has no near-term fee programs or other improvement programs in place to address the deficiencies caused by development projects on the SHS freeway facilities. As such, no improvements have been recommended to address the EAPC (2021) deficiencies on the SHS. There is a significant and unavoidable cumulative impact to the I-215 Freeway facilities for EAPC (2021) traffic conditions as there are currently no improvements to mitigate the impacts to the SHS.

Recommended Improvements

The following study area intersections were found to be significantly impacted by the Project for EAPC (2021) traffic conditions as the Project is anticipated to contribute 50 or more peak hour trips to these intersections and increase the delay by 2.0 or more seconds:

- I-215 Northbound Ramps & Harley Knox Bl. (#3)
- I-215 Northbound Ramps & Ramona Exwy. (#4)
- Indian Av. & Harley Knox Bl. (#10)

The Project's impact at the intersections of I-215 Southbound Ramps at Harley Knox Boulevard (#1) and I-215 Southbound Ramps at Ramona Expressway (#2) are less than significant as the Project contributes less than 50 peak hour trips to these locations. As such, improvements have not been recommended for these two ramp locations.

The following improvements are recommended to improve each impacted intersection's LOS back to acceptable LOS, where the Project is recommended to contribute a fair share in order to reduce the cumulative impacts to less than significant levels:

I-215 Northbound Ramps & Harley Knox Bl. (#3):

- Add a 2nd eastbound left turn lane and a westbound free right turn lane.

I-215 Northbound Ramps & Ramona Exwy. (#4):

- Add a 3rd eastbound through lane and a 3rd westbound through lane

Indian Av. & Harley Knox Bl. (#10):

- Restripe the 2nd southbound shared through-right turn lane as a dedicated right turn lane and modify the traffic signal to implement overlap phasing on the southbound right turn lane.

1.5 CIRCULATION SYSTEM DEFICIENCIES AND RECOMMENDED IMPROVEMENTS

A summary of the operationally deficient study area intersections and recommended improvements required to achieve acceptable circulation system performance are described in detail within Section 3 *Area Conditions*, Section 6 *E+P Traffic Conditions*, Section 7 *EA (2021) and EAP (2021) Traffic Conditions*, and Section 8 *EAC (2021) and EAPC (2021) Traffic Conditions* of this report.

A summary of off-site improvements needed to address intersection operational deficiencies for each analysis scenario is included in Table 1-4. These recommended improvements are consistent with or less than the geometrics assumed in the City of Perris and County of Riverside General Plan Circulation Elements. Improvements found to be included in the Western Riverside Council of Governments (WRCOG) Transportation Uniform Mitigation Fee (TUMF) program, City of Perris's (lead agency) Development Impact Fee (DIF) program, or North Perris Road and Bridge Benefit District (NPRBBD) have been identified as such. The NPRBBD includes additional improvements to supplement the TUMF and DIF network. NPRBBD fees are inclusive of TUMF and DIF.

Table 1-4

Summary of Improvements by Analysis Scenario

#	Intersection Location	Jurisdiction	Recommended Improvements			Improvements in DIF, TUMF, NPRBBD, etc.[1,2]	Project Responsibility	Total Cost[7]	Project Fair Share[5]	Fair Share Cost[8]
			E+P	EAP (2021)	EAPC (2021)					
3	I-215 Northbound Ramps & Harley Knox Bl.	Caltrans, County of Riverside	- None	- None	- Add a 2nd EB left turn lane - Add a WB free-right turn lane	Yes (TUMF, NPRBBD)[3] Yes (TUMF, NPRBBD)[3]	Fees Fees		N/A[4]	
4	I-215 Northbound Ramps & Ramona Exwy.	Caltrans, City of Perris	- None	- None	- Add a 3rd EB through lane - Add a 3rd WB through lane	Yes (TUMF, NPRBBD)[3] Yes (TUMF, NPRBBD)[3]	Fees Fees		N/A[4]	
10	Indian Av. & Harley Knox Bl.	City of Perris	- None	- None	- Restripe the 2nd SB through lane as a right turn lane - Modify the traffic signal to implement overlap phasing to the SB right turn lane	No No	Fair Share Fair Share **Total**	$39,200 $117,600 **$156,800**	9.2%	$3,590 $10,770 **$14,360**
							Total Project Fair Share Contribution to the City of Perris[9]	**$156,800**		**$14,360**

[1] Improvements included in TUMF Nexus, NPRBBD, or City of Perris DIF programs have been identified as such.

[2] 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.

[3] 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 June 30, 2016).

[4] Fair share percentage is not shown as the recommended improvements at this location are included in a pre-existing fee program (i.e., fair share Not Applicable (N/A)).

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

[6] Improvements shown are Project design features as they are either site adjacent roadway improvements or needed for site access.

[7] Costs have been estimated using the data provided in Appendix "G" of the CMP (2003 Update) for preliminary construction costs. Appendix "G" costs escalated by a factor of 1.568 except Traffic Signals.
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.

[8] Rough order of magnitude cost estimate.

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

For improvements that do not appear to be in the TUMF or DIF, or NPRBBD 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. These fees (both to the City of Perris, TUMF, and as determined, to surrounding agencies as fair-share contributions) are collected as part of a funding mechanism aimed at ensuring that regional highways and arterial expansions keep pace with the projected vehicle trip increases. Additional information related to these various fee programs are contained in Section 1.6 *Local and Regional Funding Mechanisms* of this report.

Each project implementing the PVCC SP is required to incorporate applicable mitigation from the PVCC Specific Plan EIR. The relevant traffic mitigation measures from the PVCC Specific Plan EIR are identified in Section 1.5.1.

1.5.1 PVCC Specific Plan EIR Traffic Mitigation Measures

MM Trans 1 Future implementing development projects shall construct on-site roadway improvements pursuant to the general alignments and right-of-way sections set forth in the PVCC Circulation Plan, except where said improvements have previously been constructed.

MM Trans 2 Sight distance at the project entrance roadway of each implementing development project shall be reviewed with respect to standard City of Perris sight distance standards at the time of preparation of final grading, landscape and street improvement plans.

MM Trans 3 Each implementing development project shall participate in the phased construction of off-site traffic signals through payment of that project's fair share of traffic signal mitigation fees and the cost of other off-site improvements through payment of fair share mitigation fees which includes the NPRBBD (North Perris Road and Bridge Benefit District). The fees shall be collected and utilized as needed by the City of Perris to construct the improvements necessary to maintain the required level of service and build or improve roads to their build-out level.

MM Trans 4 Prior to the approval of individual implementing development projects, the Riverside Transit Agency (RTA) shall be contacted to determine if the RTA has plans for the future provision of bus routing in the project area that would require bus stops at the project access points. If the RTA has future plans for the establishment of a bus route that will serve the project area, road improvements adjacent to the project site shall be designed to accommodate future bus turnouts at locations established through consultation with the RTA. RTA shall be responsible for the construction and maintenance of the bus stop facilities. The area set aside for bus turnouts shall conform to RTA design standards, including the design of the contact between sidewalk and curb and gutter at bus stops and the use of ADA-compliant paths to the major building entrances in the project.

MM Trans 5 Bike racks shall be installed in all parking lots in compliance with City of Perris standards.

MM Trans6 Each implementing development project that is located adjacent to the MWD Trail shall coordinate with the City of Perris Parks and Recreation Department to determine the development plan for the trail.

MM Trans 7 Implementing project-level traffic impact studies shall be required for all subsequent implementing development proposals within the boundaries of the PVCC as approved by the City of Perris Engineering Department. These subsequent traffic studies shall identify specific project impacts and needed roadway improvements to be constructed in conjunction with each implementing development project. All intersection spacing for individual tracts or maps shall conform to the minimum City intersection spacing standards. All turn pocket lengths shall conform at least to the minimum City turn pocket length standards. If any of the proposed improvements are found to be infeasible, the implementing development project applicant would be required to provide alternative feasible improvements to achieve levels of service satisfactory to the City.

MM Trans 8 Proposed mitigation measures resulting from project-level traffic impact studies shall be coordinated with the North Perris Road and Bridge Benefit District (NPRBBD) to ensure that they are in conformance with the ultimate improvements planned by the NPRBBD. The applicant shall be eligible to receive proportional credits against the NPRBBD for construction of project level mitigation that is included in the NPRBBD.

1.6 LOCAL AND REGIONAL FUNDING MECHANISMS

Transportation improvements throughout the City of Perris are funded through a combination of project mitigation, fair share contributions or development impact fee programs, such as TUMF program, the City's DIF program, or the NPRBBD program.

1.6.1 TRANSPORTATION UNIFORM MITIGATION FEE (TUMF) PROGRAM

The TUMF program is administered by the WRCOG based upon a regional Nexus Study most recently updated in 2017 to address major changes in right of way acquisition and improvement cost factors. (5) This regional program was put into place to ensure that development pays its fair share and that funding is in place for construction of facilities needed to maintain the requisite level of service and critical to mobility in the region. TUMF is a truly regional mitigation fee program and is imposed and implemented in every jurisdiction in Western Riverside County.

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

1.6.2 CITY OF PERRIS DEVELOPMENT IMPACT FEE (DIF) PROGRAM

In 1991 the City of Perris created a Development Impact Fee 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. This DIF program has been successfully implemented by the City since 1991 and was updated in 2014. The City updated the DIF program to add new roadway segments and intersections necessary to accommodate future growth and to ensure that the identified street improvements would operate at or above the City's LOS performance threshold. 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.

Similar to the TUMF Program, after the City's DIF fees are collected, they are placed in a separate interest-bearing account pursuant to the requirements of Government Code sections 66000 *et seq*. The timing to use the DIF fees is established through periodic capital improvement programs which are overseen by the City's Public Works Department. 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 the improvements listed in its facilities list. The City also uses this data to ensure that the improvements listed on the facilities list are constructed before the LOS falls below the LOS performance standards adopted by the City. In this way, the improvements are constructed before the LOS falls below the City's LOS performance thresholds. The City's DIF program establishes a timeline to fund, design, and build the improvements.

The City has an established, proven track record with respect to implementing the City's DIF Program. Many of the intersections included within the study area for this Traffic Impact Analysis are at various stages of widening and improvement based on the City's collection of DIF fees. Under this Program, as a result of the City's continual monitoring of the local circulation system, the City insures that DIF improvements are constructed prior to when the LOS would otherwise fall below the City's established performance criteria.

1.6.3 NORTH PERRIS ROAD AND BRIDGE BENEFIT DISTRICT (NPRBBD)

The NPRBBD is comprised of approximately 3,500 acres of land located within the northern portion of the City of Perris. The NPRBBD boundary is consistent with the boundary of the PVCC SP. As such, the Project will be subject to the NPRBBD. The purpose of the NPRBBD is to improve the efficiency of the financing of specific regional road and bridge improvements that are determined to provide benefit to the developing properties within the NPRBBD boundary. In addition, the NPRBBD includes additional improvements to supplement the TUMF and DIF network. NPRBBD fees are inclusive of TUMF and DIF. A significant portion of the fees collected through this mechanism are earmarked for use within the boundary sufficient to fully fund the included improvements. The balance of TUMF is transmitted to WRCOG for use in addressing cumulative impacts elsewhere within Western Riverside County. The City treats the DIF component collected within the NPRBBD in a similar way to ensure the local circulation network

outside the program boundaries is adequately addressed. Table 1-5 lists each facility identified within the NPRBBD, the General Plan roadway classification and the current estimated construction cost for the facilities.

TABLE 1-5: NPRBBD FACILITES

Facility Name	General Plan Classification	Estimated Cost
Indian Avenue	Secondary Arterial	$11,343,500
Perris Boulevard	Arterial	$17,350,800
Redlands Avenue	Secondary Arterial	$14,845,000
Harley Knox Boulevard	Arterial	$31,813,700
Markham Street	Secondary Arterial	$2,132,000
Ramona Expressway	Expressway	$10,865,000
Morgan Street	Secondary Arterial	$2,899,500
Rider Street	Secondary Arterial	$3,803,000
Placentia Avenue	Arterial	$18,705,900
Indian Avenue Bridge	Secondary Arterial	$701,800
Harley Knox Boulevard Bridge	Arterial	$4,210,800
Ramona Expressway Bridge	Expressway	$2,105,800
Placentia Avenue Bridge	Arterial	$6,316,200
Harley Knox Boulevard Interchange @ I-215	Arterial	$17,371,000
Placentia Avenue Interchange @ I-215	Arterial	$8,389,000
4-Lane Intersections – Traffic Signals	4 – Signal Locations	$870,000
6-Lane Intersections – Traffic Signals	11 – Signal Locations	$3,190,000
District Totals		**$156,913,000**

The facilities identified within the NPRBBD provide additional benefit by providing alternate truck routes within the City of Perris. It should be noted that NPRBBD fees are to be paid in conjunction with TUMF and City DIF fees as a one-time fee payment to the City prior to the issuance of a building permit.

1.6.4 FAIR SHARE CONTRIBUTION

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

When off-site improvements are identified with a minor share of responsibility assigned to proposed development, the approving jurisdiction may elect to collect a fair share contribution or require the development to construct improvements. Detailed fair share calculations, for each peak hour, has been provided in Table 1-6 for the applicable deficient intersections shown previously in Table 1-4. Improvements included in a defined program and constructed by development may be eligible for a fee credit or reimbursement through the program where appropriate.

Table 1-6

Project Fair Share Calculations

#	Intersection	Existing (2019)	Project	EAPC (2021)	Total New Traffic	Project Fair Share[1]
10	Indian Av. & Harley Knox Bl.					
	AM:	1,922	87	2,872	950	**9.2%**
	PM:	1,881	81	2,932	1,051	7.7%

* Highest fair share percentage represented in **BOLD** and shown on Table 1-4.

[1] Fair share based on net new traffic which is calculated from Project traffic vlumes divided by the EAPC (2021) less Existing (2019) traffic volumes.

1.7 ON-SITE ROADWAY IMPROVEMENTS

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

Redlands Avenue – Redlands Avenue is a north-south oriented roadway located along the Project's western boundary. Construct Redlands Avenue at its ultimate half-section width as a Secondary Arterial (94-foot right-of-way) between Morgan Street and Rider Street consistent with the PVCC SP and the City of Perris General Plan Circulation Element. The Project Applicant would improve Redlands Avenue as required by the final Conditions of Approval for the Project and applicable City of Perris standards.

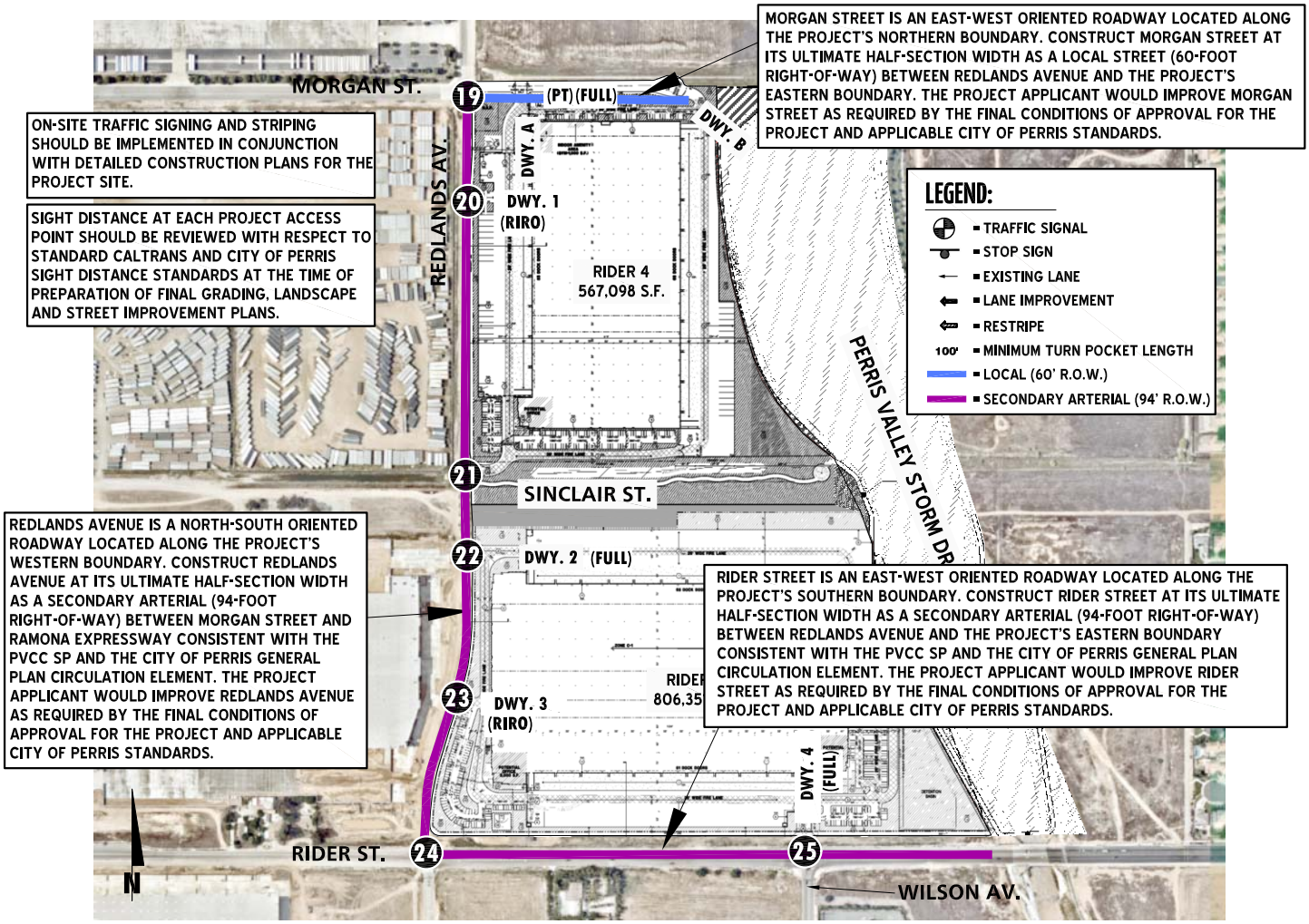
Rider Street – Rider Street is an east-west oriented roadway located along the Project's southern boundary. Construct Rider Street at its ultimate half-section width as a Secondary Arterial (94-foot right-of-way) between Redlands Avenue and the Project's eastern boundary consistent with the PVCC SP and the City of Perris General Plan Circulation Element. The Project Applicant would improve Rider Street as required by the final Conditions of Approval for the Project and applicable City of Perris standards.

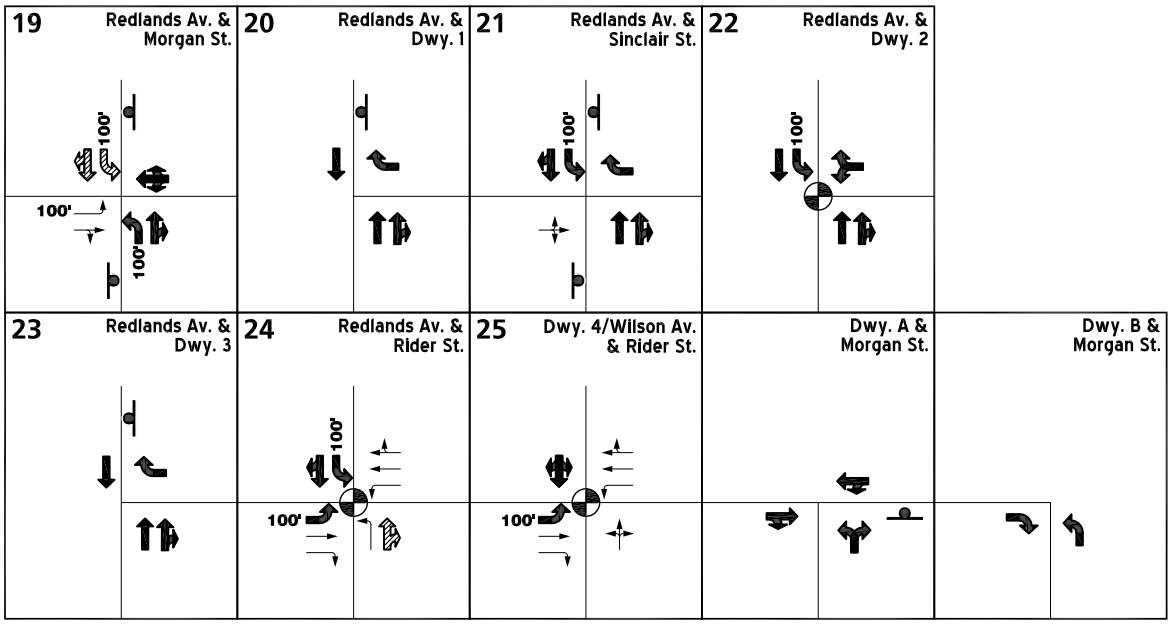
Morgan Street – Morgan Street is an east-west oriented roadway located along the Project's northern boundary. Construct Morgan Street at its ultimate half-section width as a Local Street (60-foot right-of-way) between Redlands Avenue and the Project's eastern boundary. The Project Applicant would improve Morgan Street as required by the final Conditions of Approval for the Project and applicable City of Perris standards.

South of Rider 4 (south of Sinclair Street) is an approximately 90-foot greenbelt, north of and outside of the Metropolitan Water District (MWD) right-of-way. The greenbelt includes a meandering 15-foot wide granite trail, landscaping, and a turnaround, consistent with the requirements outlined in the PVCC SP for the MWD Trail. Employee amenities and break areas will be accommodated within this area consistent with the PVCC SP EIR MM Trans 6.

Project truck traffic shall be restricted to take Harley Knox Boulevard as the one and only truck route to access the I-215 Freeway. Signage shall be posted on-site directing truck drivers to use the existing City truck route along Harley Knox Boulevard. The information on the signage will be coordinated with City Planning and the City's Traffic Engineer during the plan check process. However, additional analysis (provided under separate cover) has been prepared to evaluate potential impacts with the anticipated change in travel patterns once the I-215 Freeway and Placentia Avenue interchange is completed. The interchange project is anticipated to be completed by the end of 2021.

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





1.8 SITE ACCESS IMPROVEMENTS

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

Redlands Avenue & Morgan Street – Install a stop control on the westbound approach and construct the intersection with the following geometrics:

- Northbound Approach (Redlands Avenue): One left turn lane with a minimum of 100-feet of storage and one shared through-right turn lane.
- Southbound Approach (Redlands Avenue): One left turn lane with a minimum of 100-feet of storage and one shared through-right turn lane.
- Eastbound Approach (Morgan Street): One left turn lane with 100-feet of storage and one shared through-right turn lane.
- Westbound Approach (Morgan Street): One shared left-through-right turn lane.

Although not evaluated in this TIA, there are two other full access driveways proposed along Morgan Street (see Driveway A and Driveway B on Exhibit 1-4). Both Driveway A and Driveway B would have a stop control on the driveway (minor approach) with free flow on along Morgan Street. Each approach will accommodate a single lane in each direction to facilitate site access. These driveways along Morgan Street have not been evaluated for the purposes of this TIA as these intersections are anticipated to operate at an acceptable level of service due to the low traffic along Morgan Street.

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

- Northbound Approach (Redlands Avenue): One through lane and one shared through-right turn lane.
- Southbound Approach (Redlands Avenue): One through lane.
- Eastbound Approach: Not Applicable (N/A)
- Westbound Approach (Driveway 1): One right turn lane.

Redlands Avenue & Sinclair Street – Install a stop control on the eastbound and westbound approaches and construct the intersection with the following geometrics:

- Northbound Approach (Redlands Avenue): One through lane and one shared through-right turn lane.
- Southbound Approach (Redlands Avenue): One left turn lane with a minimum of 100-feet of storage and one shared through-right turn lane.
- Eastbound Approach (Sinclair Street): One shared left-through-right turn lane.
- Westbound Approach (Sinclair Street): One right turn lane.

Redlands Avenue & Driveway 2 – Install a traffic signal and construct the intersection with the following geometrics:

- Northbound Approach (Redlands Avenue): One through lane and one shared through-right turn lane.
- Southbound Approach (Redlands Avenue): One left turn lane with a minimum of 100-feet of storage and one through lane.
- Eastbound Approach: N/A
- Westbound Approach (Driveway 2): One shared left-right turn lane.

Redlands Avenue & Driveway 3 – Install a stop control on the westbound approach and construct the intersection with the following geometrics:

- Northbound Approach (Redlands Avenue): One through lane and one shared through-right turn lane.
- Southbound Approach (Redlands Avenue): One through lane.
- Eastbound Approach: N/A
- Westbound Approach (Driveway 3): One right turn lane.

Redlands Avenue & Rider Street – Install a traffic signal and construct the intersection with the following geometrics:

- Northbound Approach (Redlands Avenue): One left turn lane with a minimum of 100-feet of storage and one shared through-right turn lane.
- Southbound Approach (Redlands Avenue): One left turn lane with a minimum of 100-feet of storage and one shared through-right turn lane.
- Eastbound Approach (Rider Street): One left turn lane with a minimum of 100-feet of storage, one through lane, and one right turn lane.
- Westbound Approach (Rider Street): One left turn lane with a minimum of 100-feet of storage, one through lane, and one shared through-right turn lane.

Driveway 4/Wilson Avenue & Rider Street – Install a traffic signal and construct the intersection with the following geometrics:

- Northbound Approach: One shared left-through-right turn lane.
- Southbound Approach (Driveway 4): One shared left-through-right turn lane.
- Eastbound Approach (Rider Street): One left turn lane with a minimum of 100-feet of storage, one through lane, and one right turn lane.
- Westbound Approach (Rider Street): One left turn lane with a minimum of 100-feet of storage, one through lane, and one shared through-right turn lane.

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

1.9 QUEUING ANALYSIS AT THE PROJECT DRIVEWAYS

A queuing analysis was conducted along the site adjacent roadways of Redlands Avenue and Rider Street for EAPC (2021) traffic conditions to determine the turn pocket lengths necessary to accommodate near term 95th percentile queues. The analysis was conducted for the weekday AM and weekday PM peak hours. The traffic modeling and signal timing optimization software package Synchro (Version 10) has been utilized to assess queues at the Project access points. Synchro is a macroscopic traffic software program that is based on the signalized and unsignalized intersection capacity analyses as specified in the HCM. SimTraffic is designed to model networks of signalized and unsignalized intersections, with the primary purpose of checking and fine-tuning signal operations. SimTraffic uses the input parameters from Synchro to generate random simulations. The 95th percentile queue is not necessarily ever observed; it is simply based on statistical calculations (or Average Queue plus 1.65 standard deviations). However, the average queue is the average of all the two-minute maximum queues observed by SimTraffic. The maximum back of queue observed for every two-minute period is recorded by SimTraffic. Many jurisdictions utilize the 95th percentile queues for design purposes.

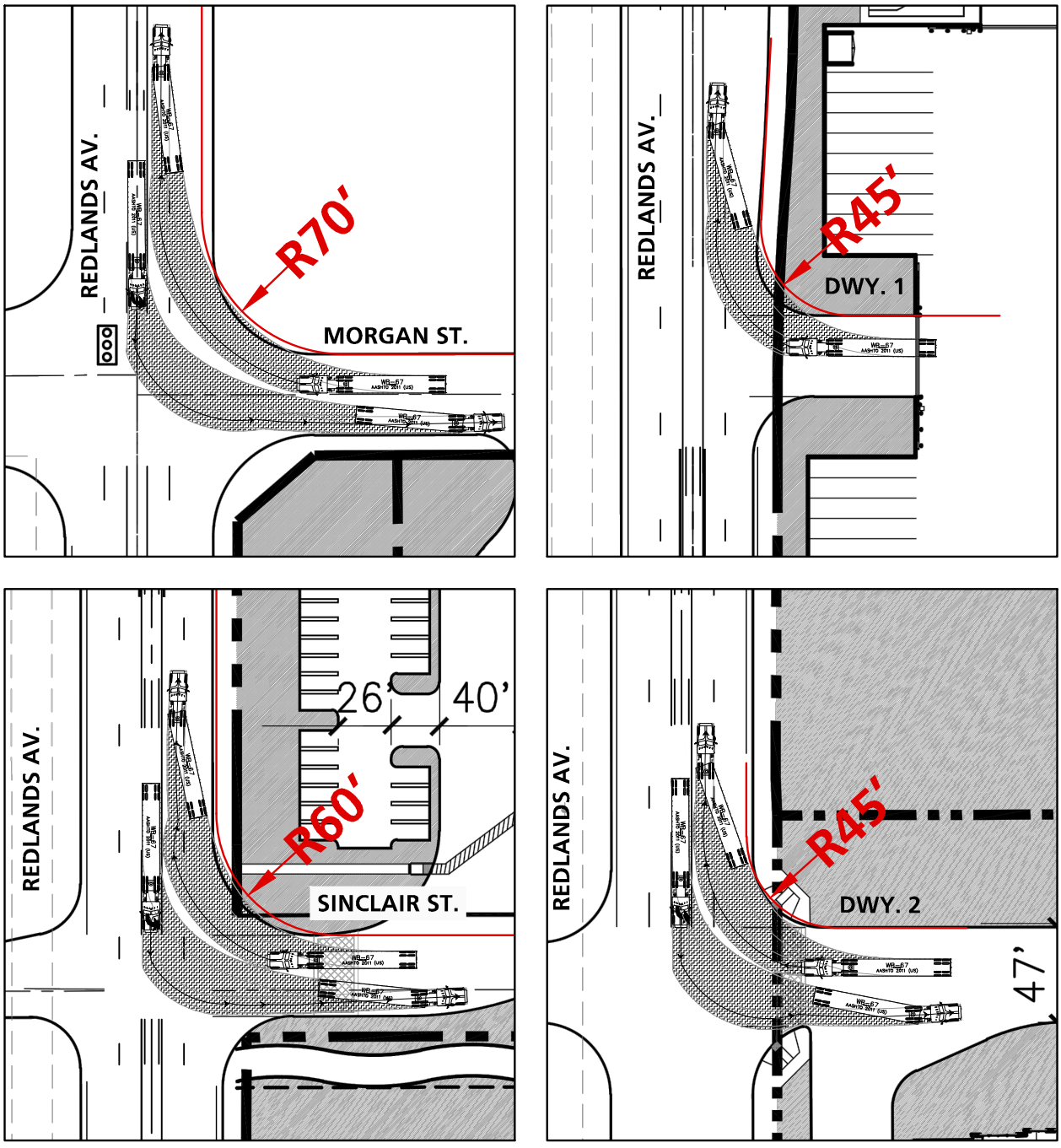
SimTraffic has been utilized to assess peak hour queuing at the site access driveways for EAPC (2021) traffic conditions. The random simulations generated by SimTraffic have been utilized to determine the 95th percentile queue lengths observed for each turn lane. A SimTraffic simulation has been recorded 5 times, during the weekday AM and weekday PM peak hours, and has been seeded for 60-minute periods with 60-minute recording intervals. Queuing results are provided in Appendix 1.2.

1.10 TRUCK ACCESS

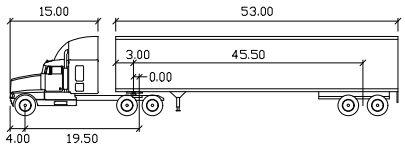
Due to the typical wide turning radius of large trucks, a truck turning template has been overlaid on the site plan at each applicable Project driveway and site adjacent intersection anticipated to be utilized by heavy trucks in order to determine appropriate curb radii and to verify that trucks will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

- Morgan Street at Redlands Avenue should be modified to provide a 70-foot radius on the northeast curb
- Driveway 1 at Redlands Avenue should be modified to provide a 45-foot radius on the northeast curb
- Sinclair Street at Redlands Avenue should be modified to provide a 60-foot radius on the northeast curb
- Driveway 2 at Redlands Avenue should be modified to provide a 45-foot radius on the northeast curb

EXHIBIT 1-5: TRUCK ACCESS



LEGEND:



WB-67 feet

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

GRAPHIC SCALE
0 40 80
1"=80'

11557 - aturn.dwg

1.11 SIGHT DISTANCE ANALYSIS

The intersection corner sight distance has been evaluated for each Project driveway on Redlands Avenue and Rider Street. Sight distance is the continuous length of highway ahead visible to the driver. At unsignalized intersections, intersection sight distance must provide a substantially clear line of sight between the driver of the vehicle waiting on the minor road (driveway) and the driver of an approaching vehicle. For the purposes of this analysis, a 7 ½ second criterion has been applied to the outside travel lanes in either direction to provide the most conservative sight distance. The 7 ½ second criterion allows waiting vehicles to either cross all lanes of through traffic by turning left or cross the near lanes by turning right without requiring through traffic to radically alter their speed.

1.11.1 SIGHT DISTANCE STANDARDS

Redlands Avenue – Redlands Avenue is an existing roadway and the sight distance at the proposed Project driveways and site adjacent intersections (Morgan Street, Driveway 1, Sinclair Street, Driveway 2, and Driveway 3) along Redlands Avenue has been assessed assuming the "object" in the road is another vehicle. Redlands Avenue has been evaluated as a Secondary Arterial with a posted speed limit of 40 miles per hour per the County of Riverside's Standard No. 821.

Rider Street – Rider Street is an existing roadway and the sight distance at the proposed Project driveway (Driveway 4) along Rider Street have been assessed assuming the "object" in the road is another vehicle. Rider Street has been evaluated as a Secondary Arterial with a posted speed limit of 45 miles per hour per the County of Riverside's Standard No. 821.

Adequate visibility for vehicular and pedestrian traffic can be provided at each Project driveway by limiting sight obstructions within the limited use area. Any landscaping/hardscape within the limited use area should not exceed 30-inches (2.5-feet) in height, including vegetation. The limited use area should be kept clear of any landscaping or any other obstructions that may impede the visibility of the driver, including on-street parking. Minimum horizontal intersection sight distance for the Project driveways is illustrated on Exhibit 1-6.

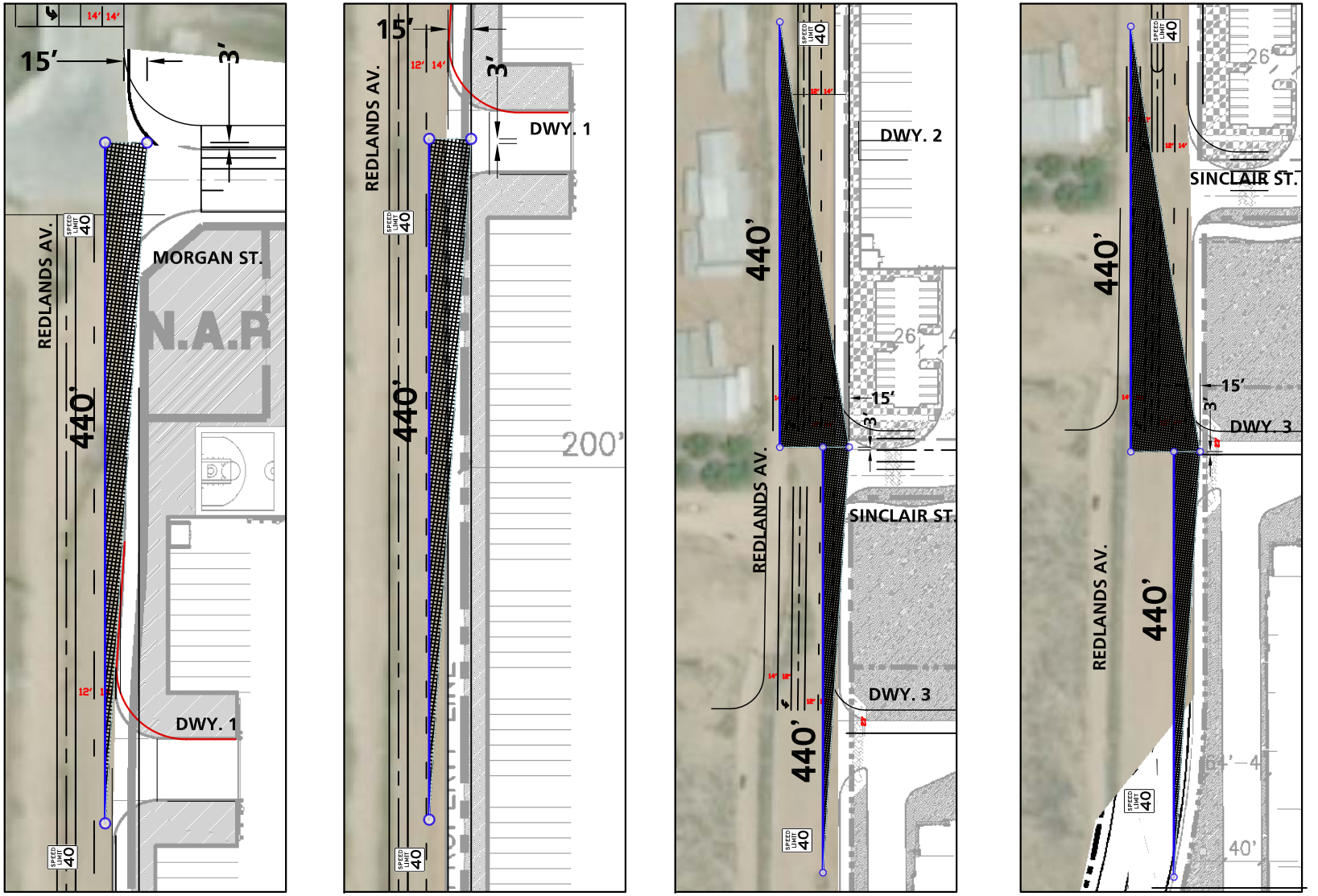
SIGHT DISTANCE AT PROJECT DRIVEWAY ALONG REDLANDS AVENUE

The County's Standard No. 821 states that the minimum intersection corner sight distance on a roadway with a speed limit of 40 miles per hour is 440-feet. As shown on Exhibit 1-6, it is anticipated that the minimum 440-foot intersection sight distance could be accommodated on Redlands Avenue in both the northbound and southbound directions.

SIGHT DISTANCE AT PROJECT DRIVEWAYS ALONG RIDER STREET

The County's Standard No. 821 states that the minimum intersection corner sight distance on a roadway with a speed limit of 45 miles per hour is 495-feet. As shown on Exhibit 1-6, it is anticipated that the minimum 495-foot intersection sight distance could be accommodated on Rider Street in both the eastbound and westbound directions.

EXHIBIT 1-6 (1OF2): SIGHT DISTANCE



LEGEND:

- MINIMUM SIGHT DISTANCE LINES
- LIMITED USE AREA
  (THERE SHALL BE NO OBSTRUCTION WITHIN THE LIMITED USE AREA. OBSTRUCTIONS INCLUDE, BUT NOT LIMITED TO, ANY SIGNS OR OBJECTS HIGHER THAN 2.5' MEASURED FROM PAVEMENT WITHIN THE AREA OF LIMITED USE.)

N

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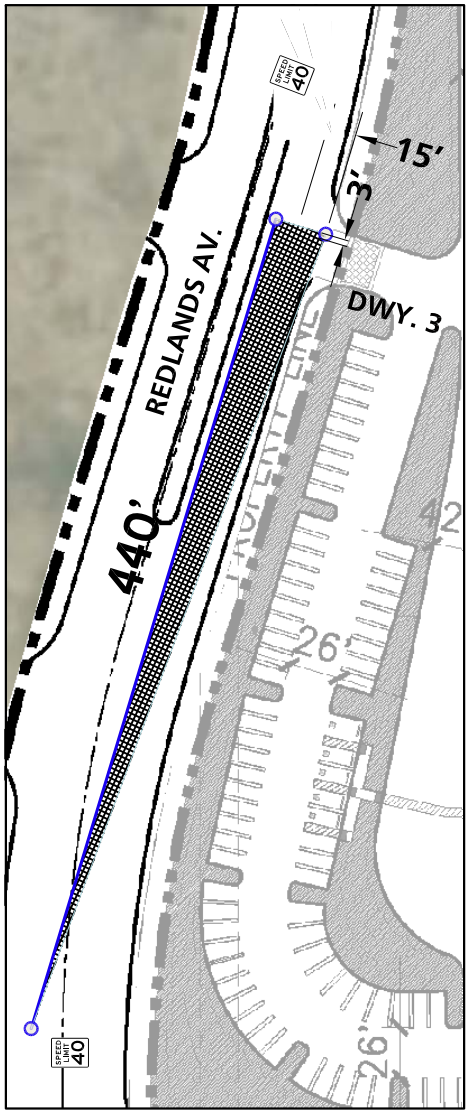
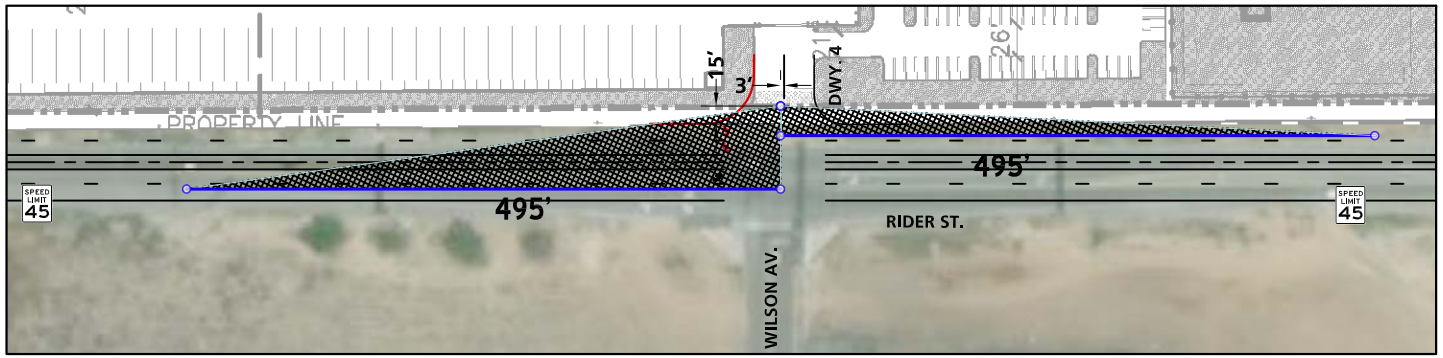
URBAN CROSSROADS

EXHIBIT 1-6 (2OF2): SIGHT DISTANCE





GRAPHIC SCALE
0 80 160
1"=160'

GRAPHIC SCALE
0 50 100
1"=100'

LEGEND:

- MINIMUM SIGHT DISTANCE LINES
- LIMITED USE AREA
  (THERE SHALL BE NO OBSTRUCTION WITHIN THE LIMITED USE AREA. OBSTRUCTIONS INCLUDE, BUT NOT LIMITED TO, ANY SIGNS OR OBJECTS HIGHER THAN 2.5' MEASURED FROM PAVEMENT WITHIN THE AREA OF LIMITED USE.)

N

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 Perris and California Department of Transportation (Caltrans) traffic study guidelines. (6)

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 Perris and County of Riverside

The City of Perris and County of Riverside require signalized intersection operations analysis based on the methodology described in the HCM 6th Edition. (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.

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

TABLE 2-1: SIGNALIZED INTERSECTION LOS THRESHOLDS

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

Source: HCM, 6th Edition

The peak hour traffic volumes 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 Existing (2019) baseline, E+P, EA (2021), EAP (2021), EAC (2021) and EAPC (2021) traffic conditions.

California Department of Transportation (Caltrans)

Per the Caltrans Guide for the Preparation of Traffic Impact Studies, the traffic modeling and signal timing optimization software package Synchro (Version 10) has also been utilized to analyze signalized intersections under Caltrans' jurisdiction, which include interchange to arterial ramps (i.e. I-215 Freeway ramps at Harley Knox Boulevard and Ramona Expressway). (6) 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

City of Perris and County of Riverside

The City of Perris and County of Riverside 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, 6th Edition

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

2.3 TRAFFIC SIGNAL WARRANT ANALYSIS METHODOLOGY

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

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

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

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

TABLE 2-3: TRAFFIC SIGNAL WARRANT ANALYSIS LOCATIONS

ID	Intersection Location	Jurisdiction
17	Redlands Avenue & Markham Street	City of Perris
19	Redlands Avenue & Morgan Street	City of Perris
22	Redlands Avenue & Sinclair Street	City of Perris
22	Redlands Avenue & Driveway 2 – Future Intersection	City of Perris
24	Redlands Avenue & Rider Street	City of Perris
25	Driveway 4/Wilson Av. & Rider Street – Future Intersection	City of Perris

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 6 *E+P Traffic Conditions,* Section 7 *EA (2021) and EAP (2021) Traffic Conditions, and* Section 8 *EAC (2021) and EAPC (2021) Traffic Conditions* of this report.

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

2.4 FREEWAY MAINLINE SEGMENT ANALYSIS METHODOLOGY

Consistent with recent Caltrans guidance, the traffic study has evaluated all freeway segments where the Project is anticipated to access the SHS, in an effort to conduct a conservative analysis and overstate as opposed to understand potential deficiencies. It should be noted that the Project will contribute less than 50 peak hour trips to both the I-215 Freeway at Harley Knox Boulevard and Ramona Expressway interchanges.

The freeway system in the study area has been broken into segments defined by the freeway-to-arterial interchange locations. The freeway segments have been evaluated in this TIA based upon peak hour directional volumes. The freeway segment analysis is based on the methodology described in the HCM and performed using HCS 7 software. The performance measure preferred by Caltrans to calculate LOS is density. Density is expressed in terms of passenger cars per mile per lane. Table 2-4 illustrates the freeway segment LOS descriptions for each density range utilized for this analysis.

TABLE 2-4: DESCRIPTION OF FREEWAY MAINLINE LOS

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

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

The number of lanes for existing baseline conditions has been obtained from field observations conducted by Urban Crossroads in May 2018. These existing freeway geometrics have been utilized for Existing, E+P, EA, EAP, EAC and EAPC conditions.

The I-215 Freeway mainline volume data was obtained from the Caltrans Performance Measurement System (PeMS) website for the segments of the I-215 Freeway interchange at Ramona Expressway. The data was obtained from May 2018 and has been increased by a 2% growth factor to reflect 2019 conditions. In an effort to conduct a conservative analysis, the maximum value observed within the 3-day period was utilized for the weekday morning (AM) and weekday evening (PM) peak hours. In addition, truck traffic, represented as a percentage of total traffic and actual vehicles (as opposed to PCE volumes) have been utilized for the purposes of the basic freeway segment analysis. (9)

2.5 FREEWAY MERGE/DIVERGE RAMP JUNCTION ANALYSIS

The freeway system in the study area has been broken into segments defined by freeway-to-arterial interchange locations resulting in 4 existing on and off ramp locations (see Table 1-3). It should be noted that the Project will contribute less than 50 peak hour trips to both the I-215 Freeway at Harley Knox Boulevard and Ramona Expressway interchanges. Although the HCM indicates the influence area for a merge/diverge junction is 1,500 feet, the analysis presented in this traffic study has been performed at all ramp locations with respect to the nearest on or off ramp at each interchange in an effort to be consistent with Caltrans guidance/comments on other projects Urban Crossroads has worked on in the region.

The merge/diverge analysis is based on the HCM Ramps and Ramp Junctions analysis method and performed using HCS 7 software. The measure of effectiveness (reported in passenger car/mile/lane) are calculated based on the existing number of travel lanes, number of lanes at the on and off ramps both at the analysis junction and at upstream and downstream locations (if applicable) and acceleration/deceleration lengths at each merge/diverge point. Table 2-5 presents the merge/diverge area level of service descriptions for each density range utilized for this analysis.

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

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

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

Similar to the basic freeway segment analysis, the I-215 Freeway mainline volume data were obtained from the Caltrans maintained PeMS website for the segments of the I-215 Freeway interchange at Ramona Expressway. The ramp data (per the count data presented in Appendix 3.1) was then utilized to flow conserve the mainline volumes to determine the remaining I-215 Freeway mainline segment volumes. Flow conservation checks ensure that traffic flows from north to south (and vice versa) of the interchange area with no unexplained loss of vehicles. The data was obtained from May 2018 and has been increased by a 2% growth factor to reflect 2019 conditions. In an effort to conduct a conservative analysis, the maximum value observed within the 3-day period was utilized for the weekday morning (AM) and weekday evening (PM) peak hours. In addition, truck traffic, represented as a percentage of total traffic and actual vehicles (as opposed to PCE volumes) have been utilized for the purposes of the freeway ramp junction (merge/diverge) analysis. (9)

2.6 MINIMUM LEVEL OF SERVICE (LOS)

The definition of an intersection deficiency has been obtained from the City of Perris' General Plan, County of Riverside's General Plan, and Caltrans Guide for the Preparation of Traffic Impact Studies.

2.6.1 CITY OF PERRIS

LOS D along all City maintained roads (including intersections) and LOS D along I-215 and SR-74 (including intersections with local streets and roads). An exception to the local road standard is LOS E, at intersections of any Arterials and Expressways with SR-74, the Ramona-Cajalco Expressway, or at I-215 Freeway ramps. (10) For the purposes of this traffic impact analysis, LOS D has also been considered the acceptable threshold for freeway facilities within the study area, consistent with Caltrans guidelines.

LOS E may be allowed within the boundaries of the Downtown Specific Plan Area to the extent that it would support transit-oriented development and walkable communities. Increased congestion in this area will facilitate an increase in transit ridership and encourage development of a complementary mix of land uses within a comfortable walking distance from light rail stations. In an effort to provide a conservative analysis, LOS D has been considered the acceptable threshold for all study area intersections, with the exception of Perris Boulevard and Ramona Expressway (which is assumed to have a minimum acceptable LOS of E).

2.6.2 COUNTY OF RIVERSIDE

Riverside County General Plan Policy C 2.1 states that the County will maintain the following County-wide target LOS:

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

- *LOS C shall apply to all development proposals in any area of the Riverside County not located within the boundaries of an Area Plan, as well as those areas located within the following Area Plans: REMAP, Eastern Coachella Valley, Desert Center, Palo Verde Valley, and those non-Community Development areas of the Elsinore, Lake Mathews/Woodcrest, Mead Valley and Temescal Canyon Area Plans.*
- *LOS D shall apply to all development proposals located within any of the following Area Plans: Eastvale, Jurupa, Highgrove, Reche Canyon/Badlands, Lakeview/Nuevo, Sun City/Menifee Valley, Harvest Valley/Winchester, Southwest Area, The Pass, San Jacinto Valley, Western Coachella Valley and those Community Development Areas of the Elsinore, Lake Mathews/Woodcrest, Mead Valley and Temescal Canyon Area Plans.*
- *LOS E may be allowed by the Board of Supervisors within designated areas where transit-oriented development and walkable communities are proposed.*

Notwithstanding the forgoing minimum LOS targets, the Board of Supervisors may, on occasion by virtue of their discretionary powers, approve a project that fails to meet these LOS targets in order to balance congestion management considerations in relation to benefits, environmental impacts and costs, provided an Environmental Impact Report, or equivalent, has been completed to fully evaluate the impacts of such approval. Any such approval must incorporate all feasible mitigation measures, make specific findings to support the decision, and adopt a statement of overriding considerations.

2.6.3 CALTRANS

Caltrans endeavors to maintain a target LOS at the transition between LOS C and LOS D on the 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 Caltrans 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.

2.7 CEQA COMPLIANCE AND DOCUMENTATION

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

For purposes of analyzing California Environmental Quality Act (CEQA) impacts, the analysis shall evaluate significant impacts based on the following criteria to determine whether the addition of project-generated trips (or alternative-generated trips) results in a significant impact, and thus requires mitigation:

- A project-related impact is considered direct and significant when a study intersection operates at an acceptable LOS for existing conditions (without the Project) and the addition of 50 or more AM or PM peak hour project trips causes the intersection to operate at an unacceptable LOS for Existing Plus Project (E+P) traffic conditions.
- A project-related impact is considered direct and significant when a study intersection operates at an unacceptable LOS for existing conditions (without the Project) and the addition of 50 or more AM or PM peak hour project trips causes the intersection delay to increase by 2 seconds or more.
- A cumulative impact is considered significant when a study intersection is forecast to operate at an unacceptable LOS with the addition of cumulative/background traffic and 50 or more AM or PM peak hour project trips.

2.8 PROJECT FAIR SHARE CALCULATION METHODOLOGY

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

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

2021 Project Fair Share % = Project Traffic / (EAPC (2021) Total Traffic – Existing Traffic)

2.9 SB 743 REQUIREMENTS

In the fall of 2013, Senate Bill 743 (SB 743) was passed by the legislature and signed into law by the governor. This legislation will eventually change the way that transportation studies are conducted for environmental documents. The State is currently in an opt in period until July 1, 2020, by when all State agencies must adhere to SB 743. In the areas where SB 743 has already been implemented, delay-based metrics such as roadway capacity and level of service are no longer the performance measures used for the determination of the transportation impacts of projects in studies conducted under CEQA. Instead, new performance measures such as vehicle miles travelled (VMT) or other similar measures are used.

During the preparation of this traffic impact study, the City has not yet adopted the use of SB 743. Therefore, this traffic impact study follows current practice regarding state and local guidance as of the date of preparation. State-wide implementation of SB 743 is July 1, 2020. It should be noted that the Project is not subject to SB 743 as of the date of preparation of this traffic study.

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3 AREA CONDITIONS

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

3.1 EXISTING CIRCULATION NETWORK

Pursuant to the scoping agreement with City of Perris staff (Appendix 1.1), the study area includes a total of 25 existing and future intersections as shown previously on Exhibit 1-2 where the Project is anticipated to contribute 50 or more peak hour trips, or has been added at the direction of City staff. Exhibit 3-1 illustrates the study area intersections located near the proposed Project and identifies the number of through traffic lanes for existing roadways and intersection traffic controls.

3.2 GENERAL PLAN CIRCULATION ELEMENTS

As noted previously, the Project site is located within PVCC SP in the City of Perris. Exhibit 3-2 shows the City of Perris General Plan Circulation Element, and Exhibit 3-3 illustrates the City of Perris General Plan roadway cross-sections. Exhibit 3-4 illustrates the PVCC SP Circulation Plan and Exhibit 3-5 shows the corresponding PVCC SP roadway cross-sections.

3.3 TRUCK ROUTES

The City of Perris designated truck route map is shown on Exhibit 3-6. Harley Knox Boulevard, Indian Avenue, Perris Boulevard, Redlands Avenue, Morgan Street, and portions of Rider Street are identified as designated truck routes. Although the City's truck route map identifies Ramona Expressway as a designated truck route, the PVCC SP truck route plan and the City's current direction is to prohibit truck access along Ramona Expressway. The PVCC SP truck route plan is shown on Exhibit 3-7. Consistent with the City of Perris designated truck route map, Harley Knox Boulevard, Indian Avenue, Perris Boulevard, Redlands Avenue, Morgan Street, and portions of Rider Street are identified as designated truck routes within the PVCC SP. These designated truck route maps have been utilized to route truck traffic from future cumulative development projects throughout the study area. It should be noted that the City of Perris City Council's policy is for trucks to utilize the Harley Knox Boulevard interchange at the I-215 Freeway within this study area and not have any trucks on Ramona Expressway. As such, Project truck traffic will also be routed to the north to the Harley Knox Boulevard via Redlands Avenue.

An additional analysis (under separate cover) has been prepared that evaluates the changes to the Project's travel patterns and potential traffic impacts once the I-215 Freeway/Placentia Avenue interchange is completed (anticipated completion end of 2021); this analysis is available under separate cover. Under this scenario, Project truck traffic will utilize Redlands Avenue to Morgan Street to Indian Street to access the Placentia Avenue interchange.

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

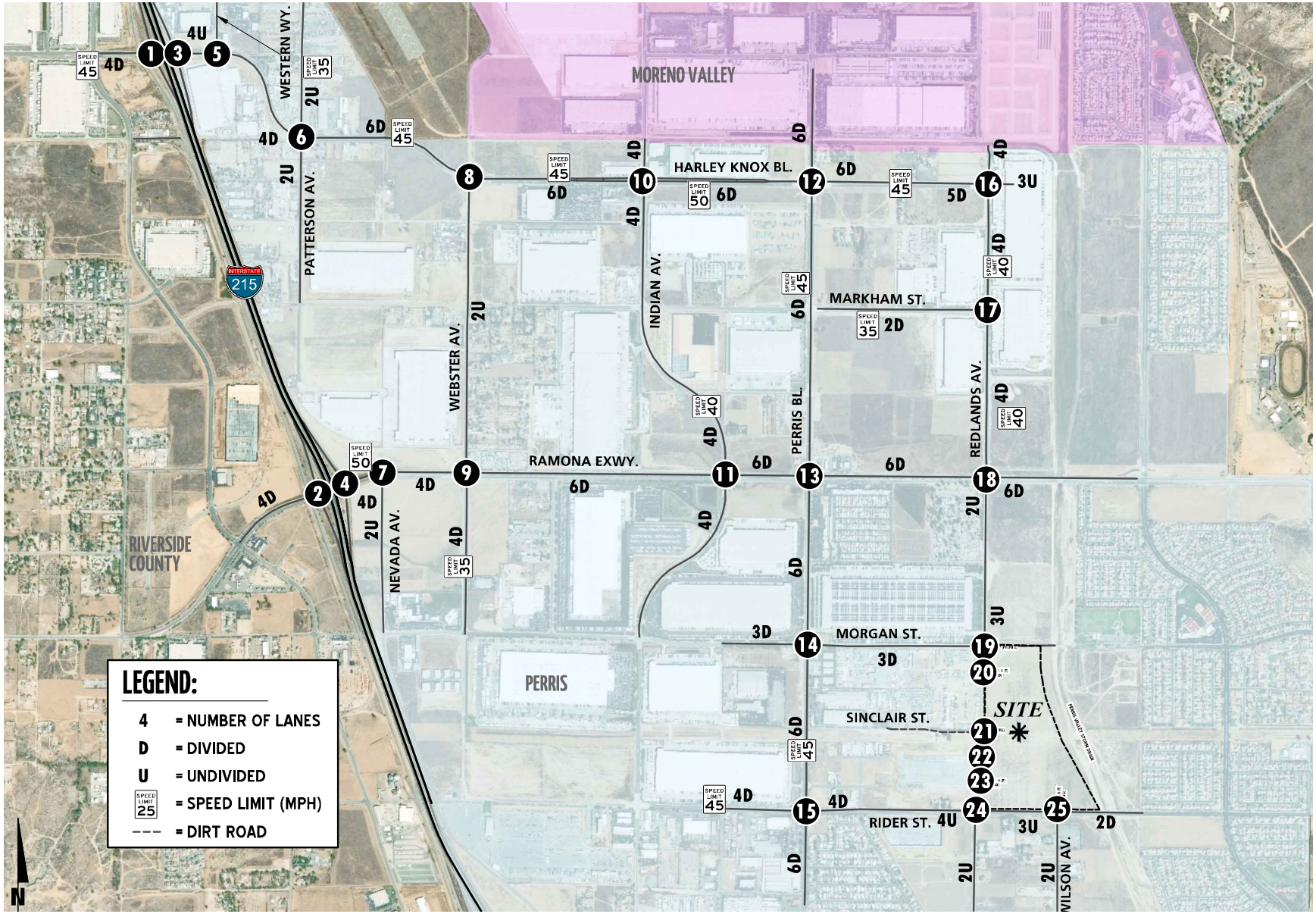

EXHIBIT 3-1 (2OF2): EXISTING NUMBER OF THROUGH LANES AND INTERSECTION CONTROLS

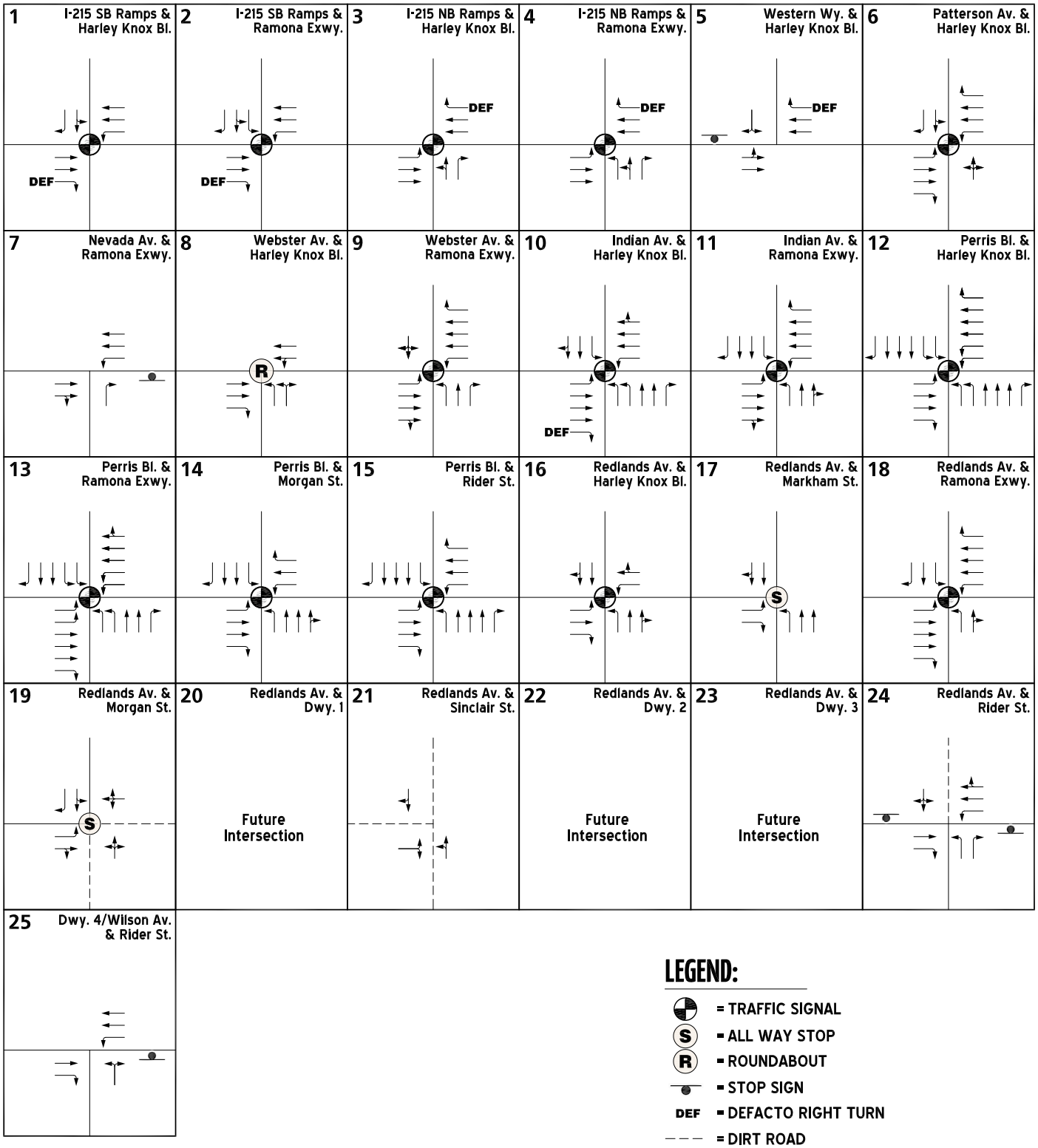

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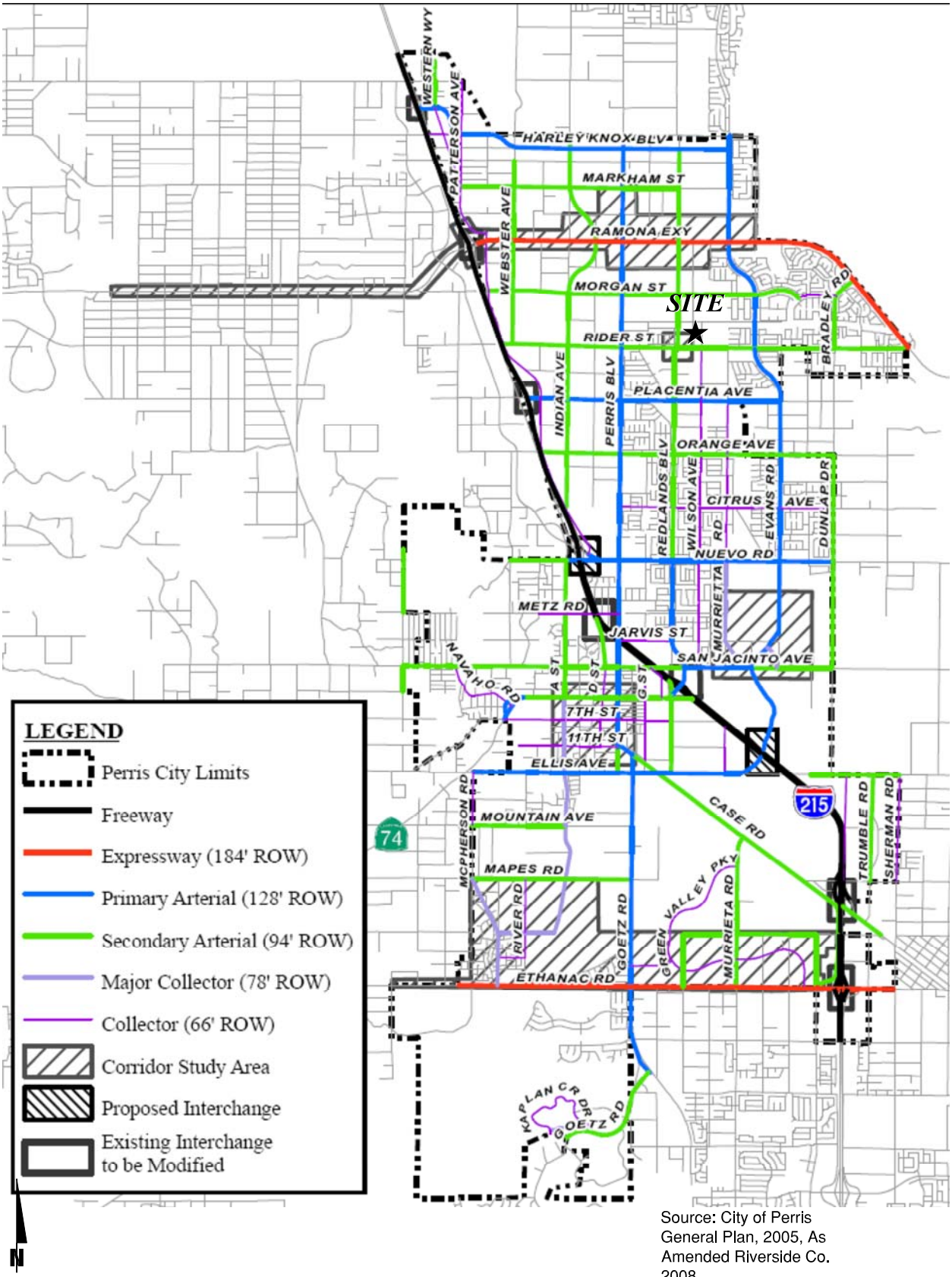
EXHIBIT 3-2: CITY OF PERRIS GENERAL PLAN CIRCULATION ELEMENT



Source: City of Perris General Plan, 2005, As Amended Riverside Co. 2008

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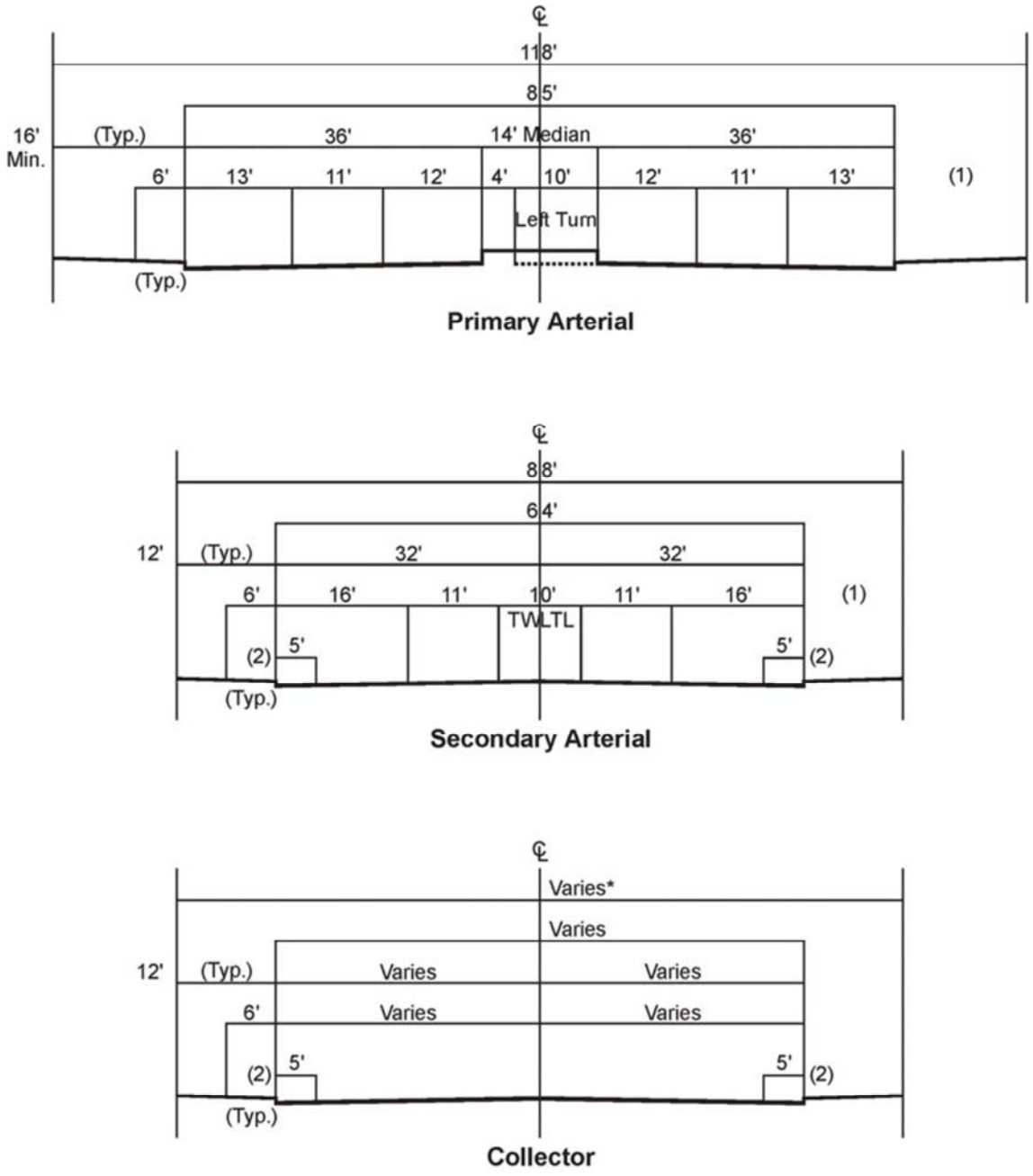
EXHIBIT 3-3: CITY OF PERRIS GENERAL PLAN ROADWAY CROSS-SECTIONS



Legend

(1) No stopping any time both sides.

(2) Bike lane where designated.

* The width of the collector street can range from 40 feet to 64 feet curb-to-curb.

TWLTL = Two Way Left Turn Lane

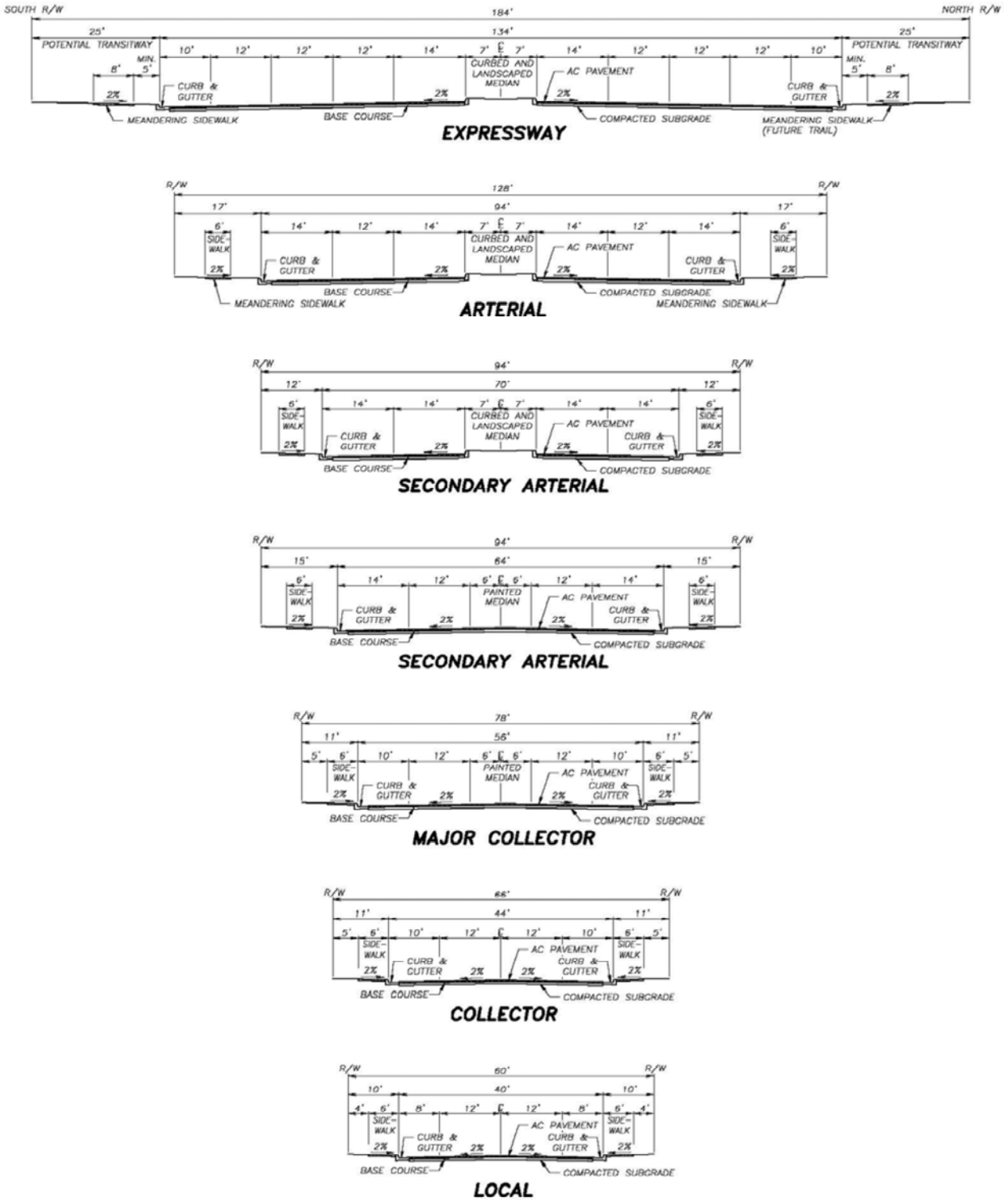
Source: City of Perris General Plan 8-2008

EXHIBIT 3-4: PERRIS VALLEY COMMERCE CENTER SPECIFIC PLAN CIRCULATION PLAN



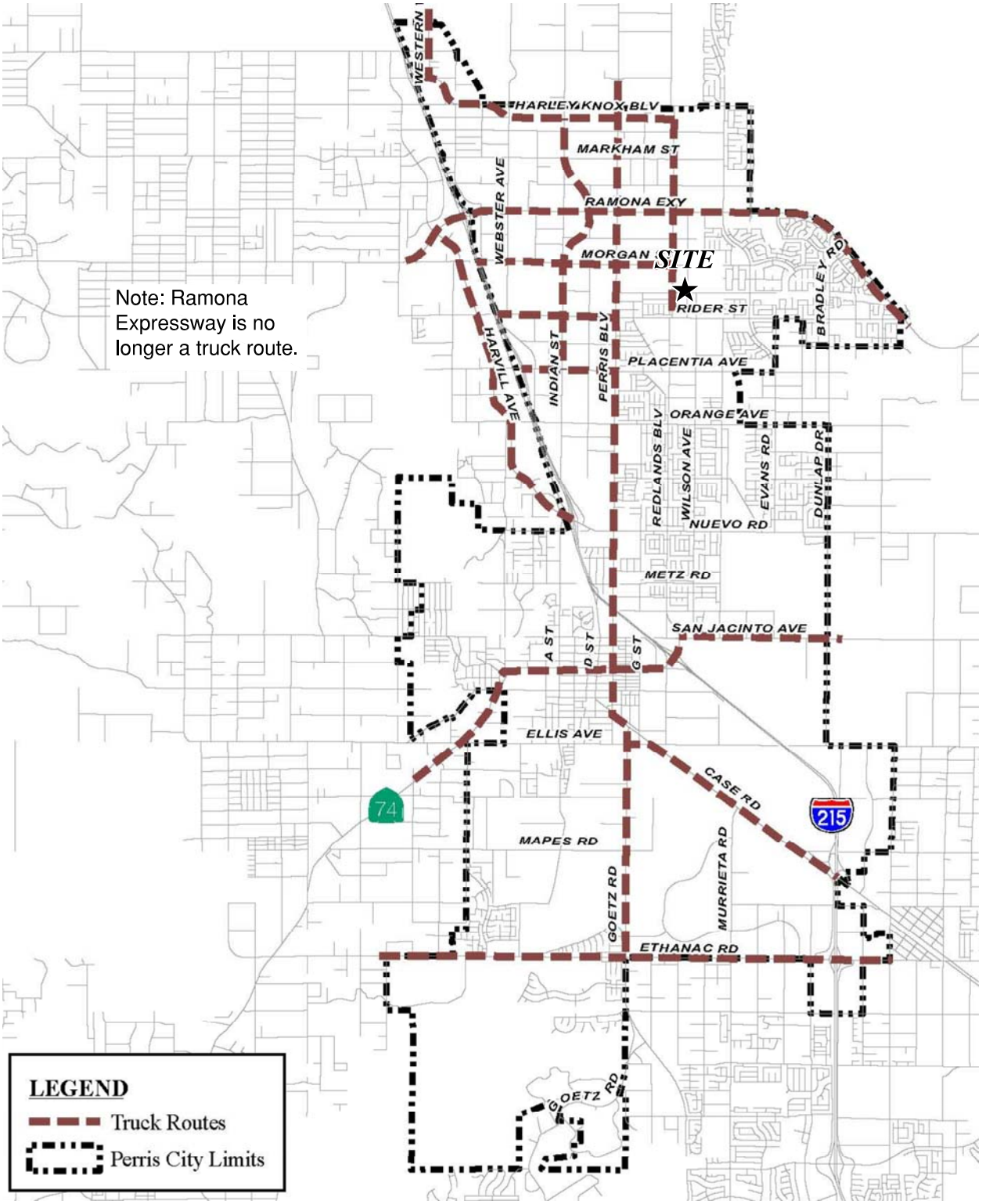
Source: PVCC SP
City of Perris 05-2018

EXHIBIT 3-5: PERRIS VALLEY COMMERCE CENTER SPECIFIC PLAN CROSS-SECTIONS



Source: PVCC SP
City of Perris 05-2018

EXHIBIT 3-6: CITY OF PERRIS TRUCK ROUTES



Source: City of Perris Truck Routes, Approved 8-26-2008

EXHIBIT 3-7: PERRIS VALLEY COMMERCE CENTER SPECIFIC PLAN TRUCK ROUTE PLAN



Source: PVCC SP
City of Perris 05-2018

3.4 TRANSIT SERVICE

Mass transit routes within the PVCC SP are shown on Exhibit 3-8. Exhibit 3-8 also shows future potential routes along Ramona Expressway. The study area is currently served by the Riverside Transit Authority (RTA), a public transit agency serving the Riverside County region (see Exhibit 3-9). As shown on Exhibit 3-8 and Exhibit 3-9, the existing RTA Route 41 could potentially serve the proposed Project.

Transit service is reviewed and updated by RTA periodically to address ridership, budget and community demand needs. Changes in land use can affect these periodic adjustments which may lead to either enhanced or reduced service where appropriate. Consistent with MM Trans 4 of the PVCC SP EIR, the Project has coordinated with RTA with respect to the bus routes and bus stops. RTA has confirmed that there are no other RTA routes anticipated to serve the Project aside from the existing Route 41. New bus stops requested by RTA along the existing route are being completed by the Rider 1 and Rider 3 projects.

3.5 BICYCLE & PEDESTRIAN FACILITIES

In an effort to promote alternative modes of transportation, the City of Perris also includes a proposed bikeways and trail system. The City of Perris proposed bikeways and trail system is shown on Exhibit 3-10. Harley Knox Boulevard, Markham Street, Ramona Expressway, Morgan Street, Rider Street, Patterson Avenue, Nevada Road, Webster Avenue, Indian Avenue, Perris Avenue, and Redlands Avenue are proposed to have Class II bike lanes. PVCC SP Trail System is shown on Exhibit 3-11. As shown, there is a regional trail planned along Ramona Expressway, and a planned Class II bike lane along Perris Boulevard, Morgan Street, and Rider Street. Field observations conducted in May 2018 indicate nominal pedestrian and bicycle activity within the study area. Exhibit 3-12 illustrates the existing bicycle and pedestrian facilities, including bike lanes, sidewalks and crosswalk locations.

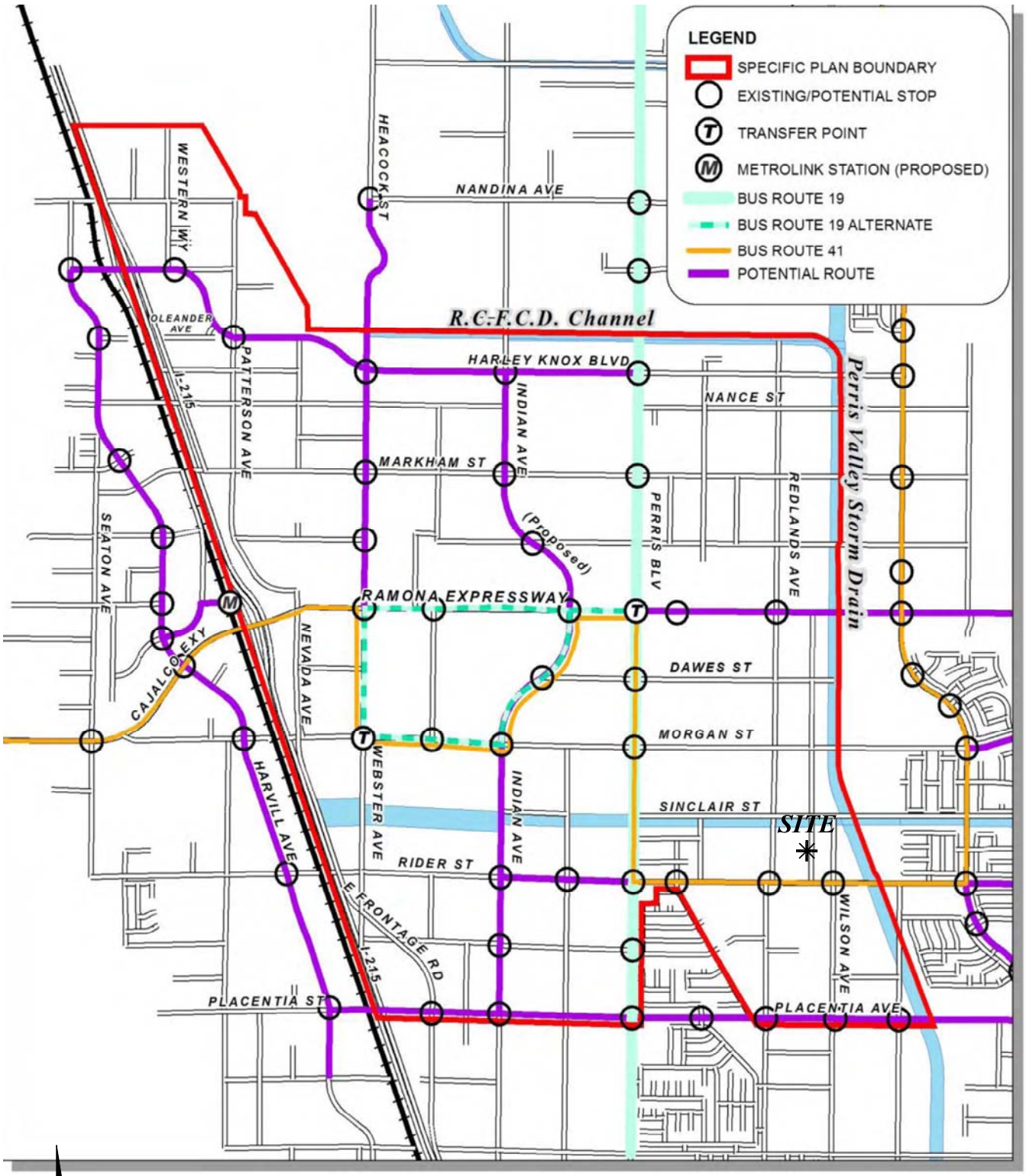
3.6 EXISTING TRAFFIC COUNTS

The intersection LOS analysis is based on the traffic volumes observed during the peak hour conditions using traffic count data collected in May 2018, while schools were in session. The following peak hours were selected for analysis:

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

In order to reflect 2019 conditions, a 2% growth factor has been applied to the 2018 traffic count data. 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.

EXHIBIT 3-8: PERRIS VALLEY COMMERCE CENTER SPECIFIC PLAN MASS TRANSIT ROUTES



Source: PVCC SP
City of Perris 05-2018

EXHIBIT 3-9: EXISTING TRANSIT ROUTES

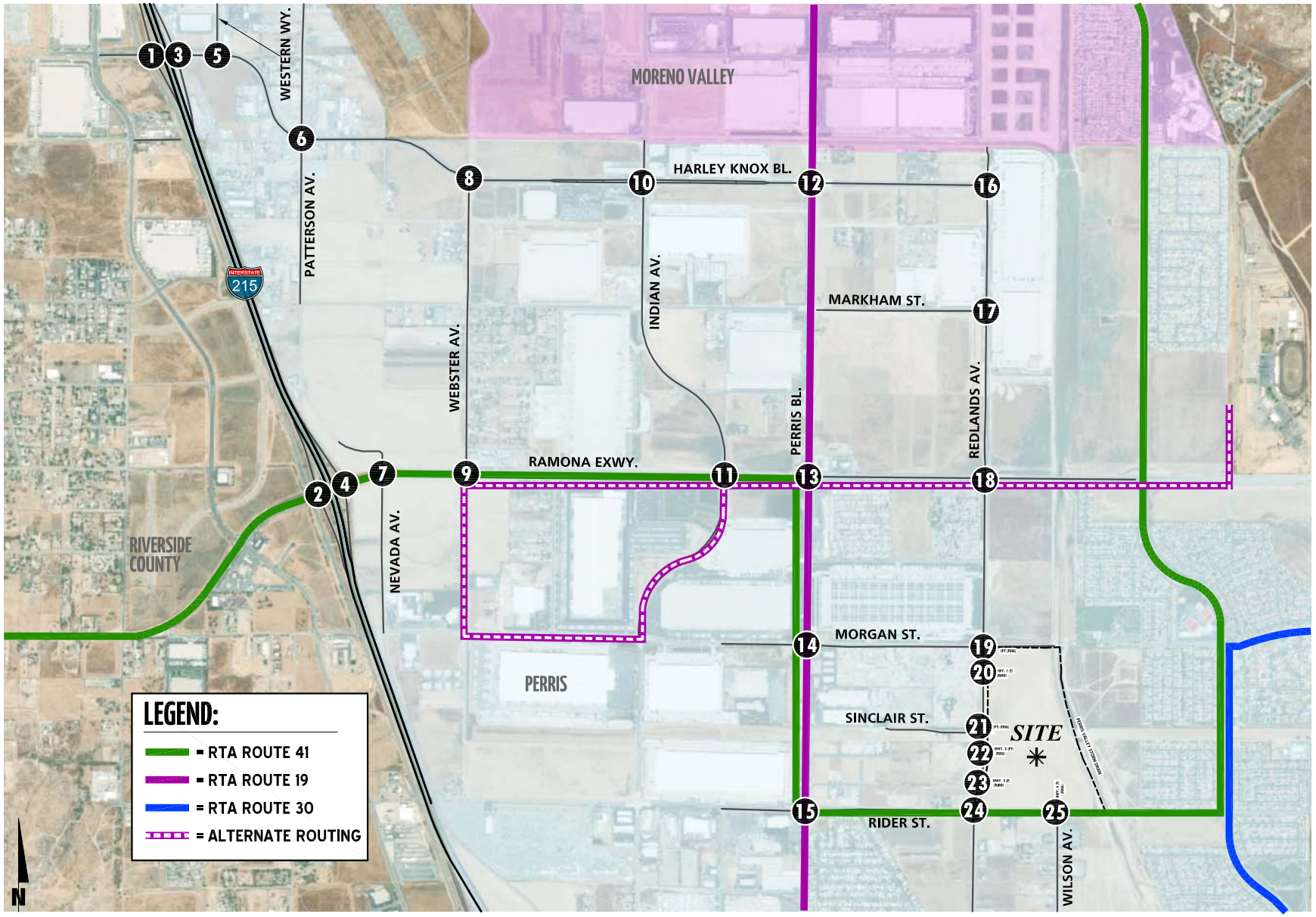
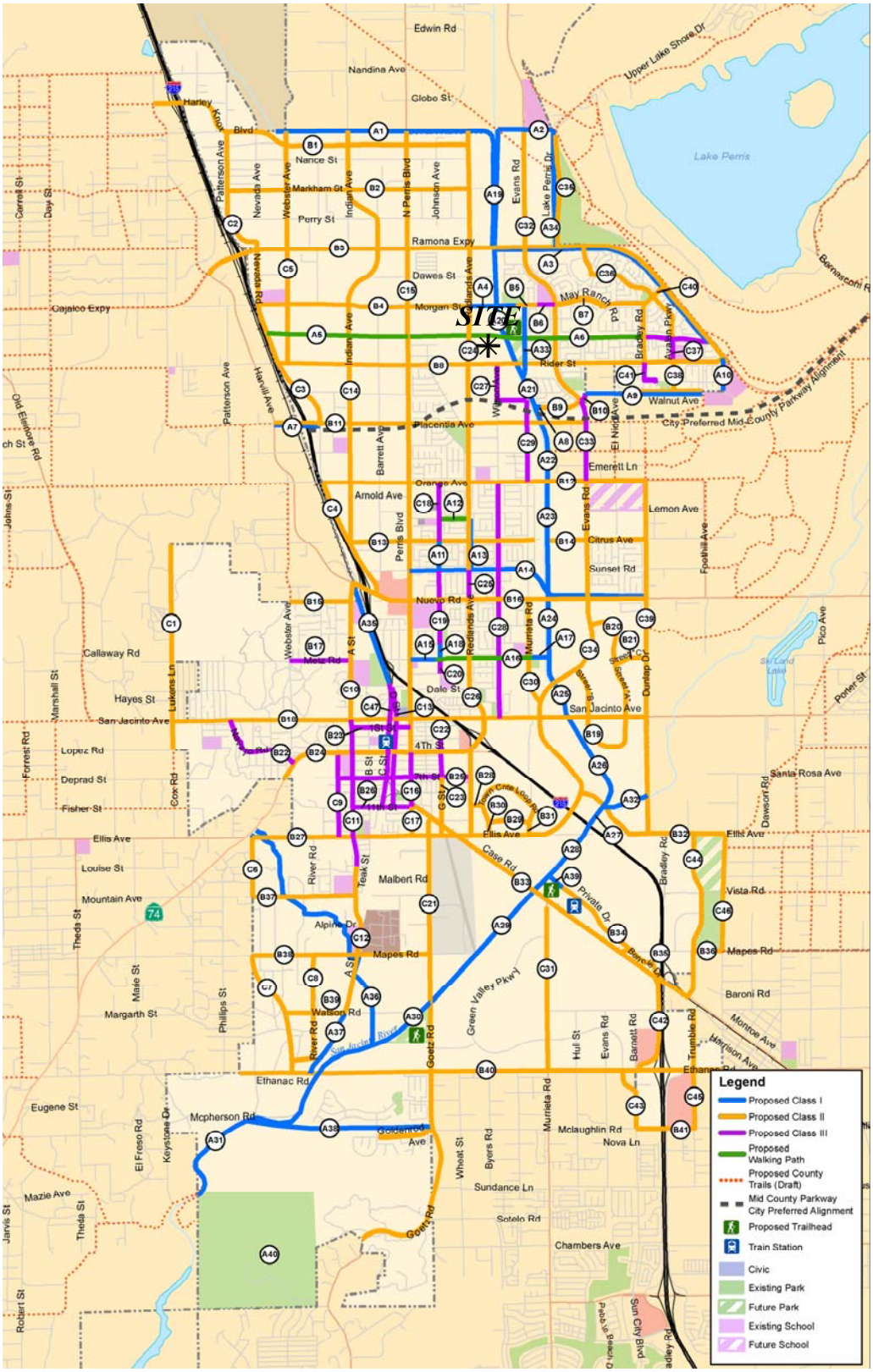


EXHIBIT 3-10: CITY OF PERRIS PROPOSED BIKEWAYS AND TRAIL IMPROVEMENTS



SOURCE: CITY OF PERRIS (FEBRUARY 20, 2015)

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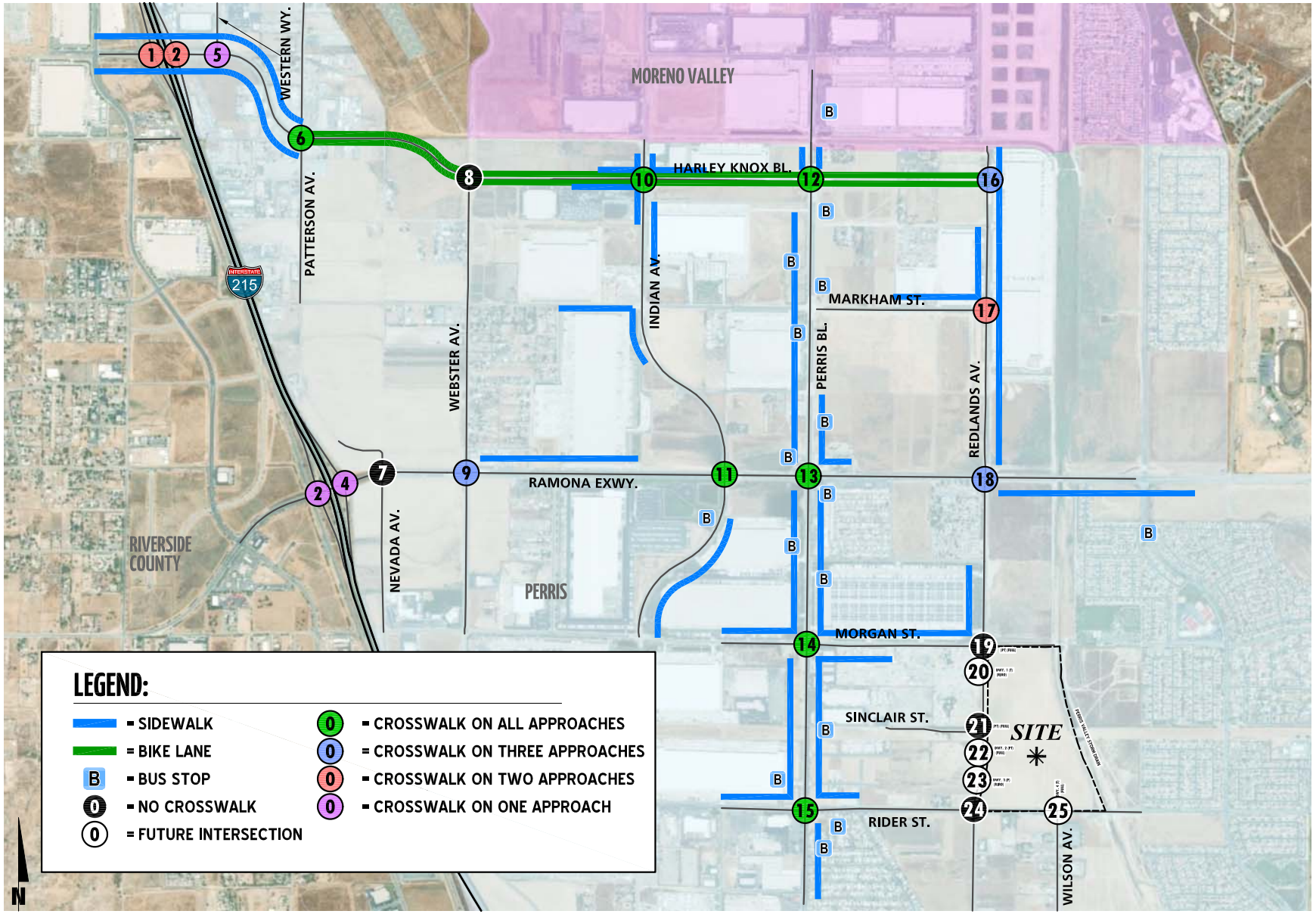
EXHIBIT 3-11: PERRIS VALLEY COMMERCE CENTER SPECIFIC PLAN TRAIL SYSTEM



Source: PVCC SP
City of Perris 05-2018

EXHIBIT 3-12: EXISTING PEDESTRIAN FACILITIES



The raw manual peak hour turning movement traffic count data sheets are included in Appendix 3.1. These raw turning volumes have been flow conserved between intersections with limited access, no access, and where there are currently no uses generating traffic. The traffic counts collected in May 2018 include the vehicle classifications as shown below:

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

To represent the impact large trucks, buses, and recreational vehicles have on traffic flow, all trucks were converted into PCEs. By their size alone, these vehicles occupy the same space as two or more passenger cars. In addition, the time it takes for them to accelerate and slow-down is also much longer than for passenger cars and varies depending on the type of vehicle and number of axles. For this analysis, a PCE factor of 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. (11) Although the County of Riverside has a recommended PCE factor of 2.0, the San Bernardino County CMP PCE factors have been utilized in an effort to conduct a more conservative analysis.

Existing weekday ADT volumes on arterial highways throughout the study area are shown on Exhibit 3-13. 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 14.6294 = Leg Volume

A comparison of the PM peak hour and daily traffic volumes of various roadway segments within the study area indicated that the peak-to-daily relationship is approximately 6.83 percent. As such, the above equation utilizing a factor of 14.6294 estimates the ADT volumes on the study area roadway segments assuming a peak-to-daily relationship of approximately 6.83 percent (i.e., 1/0.0683 = 14.6294) and was assumed to sufficiently estimate average daily traffic (ADT) volumes for planning-level analyses. Existing weekday AM and weekday PM peak hour intersection volumes (in PCE) are shown on Exhibit 3-14.

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 the study area intersections are currently operating at an acceptable LOS during the peak hours (i.e., LOS D or better), with the exception of the following intersection:

- Redlands Av. & Rider St. (#24) – LOS E AM peak hour only

EXHIBIT 3-13: EXISTING (2019) AVERAGE DAILY TRAFFIC (ADT) (IN PCE)

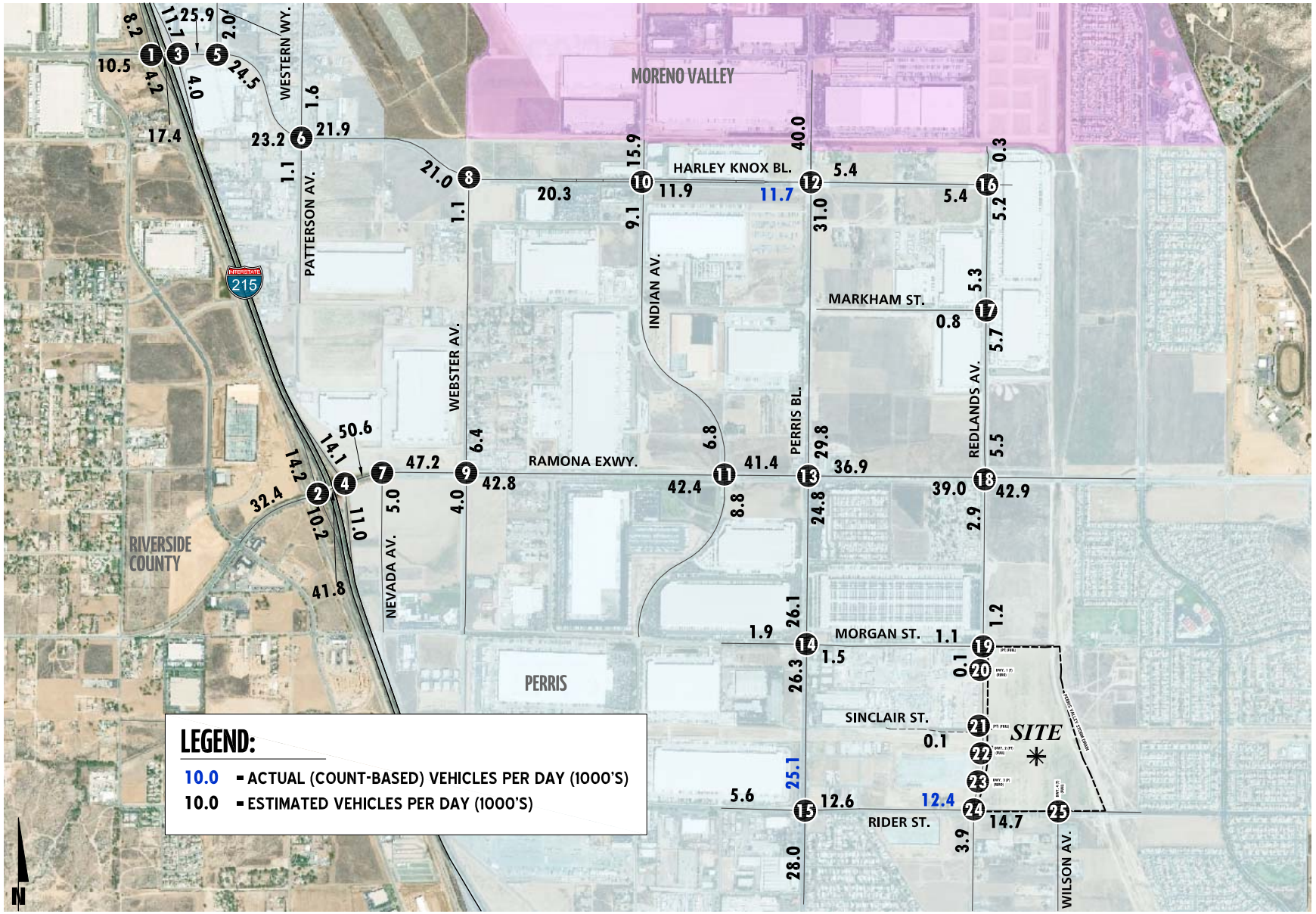


EXHIBIT 3-14: EXISTING (2019) TRAFFIC VOLUMES (IN PCE)

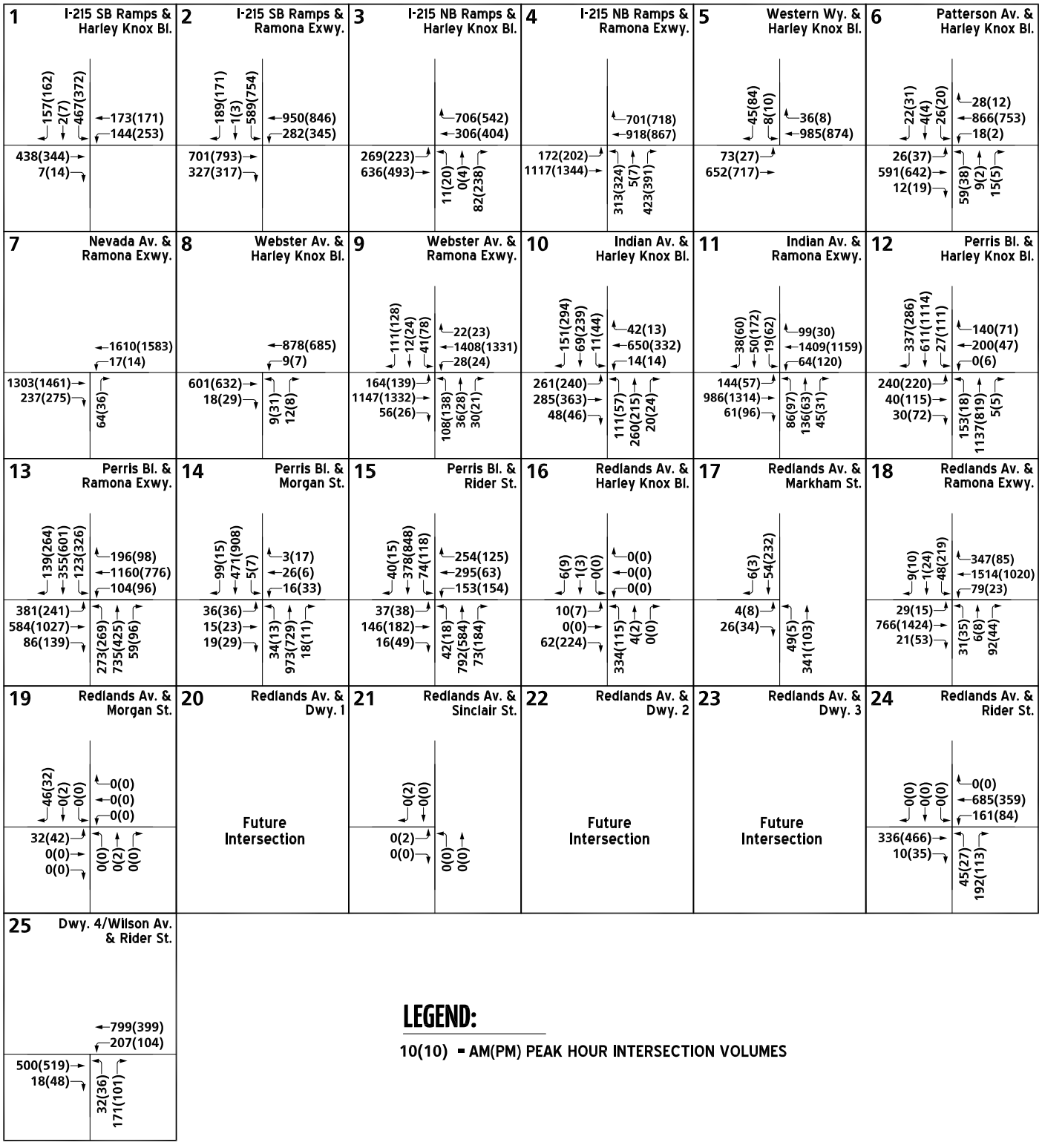
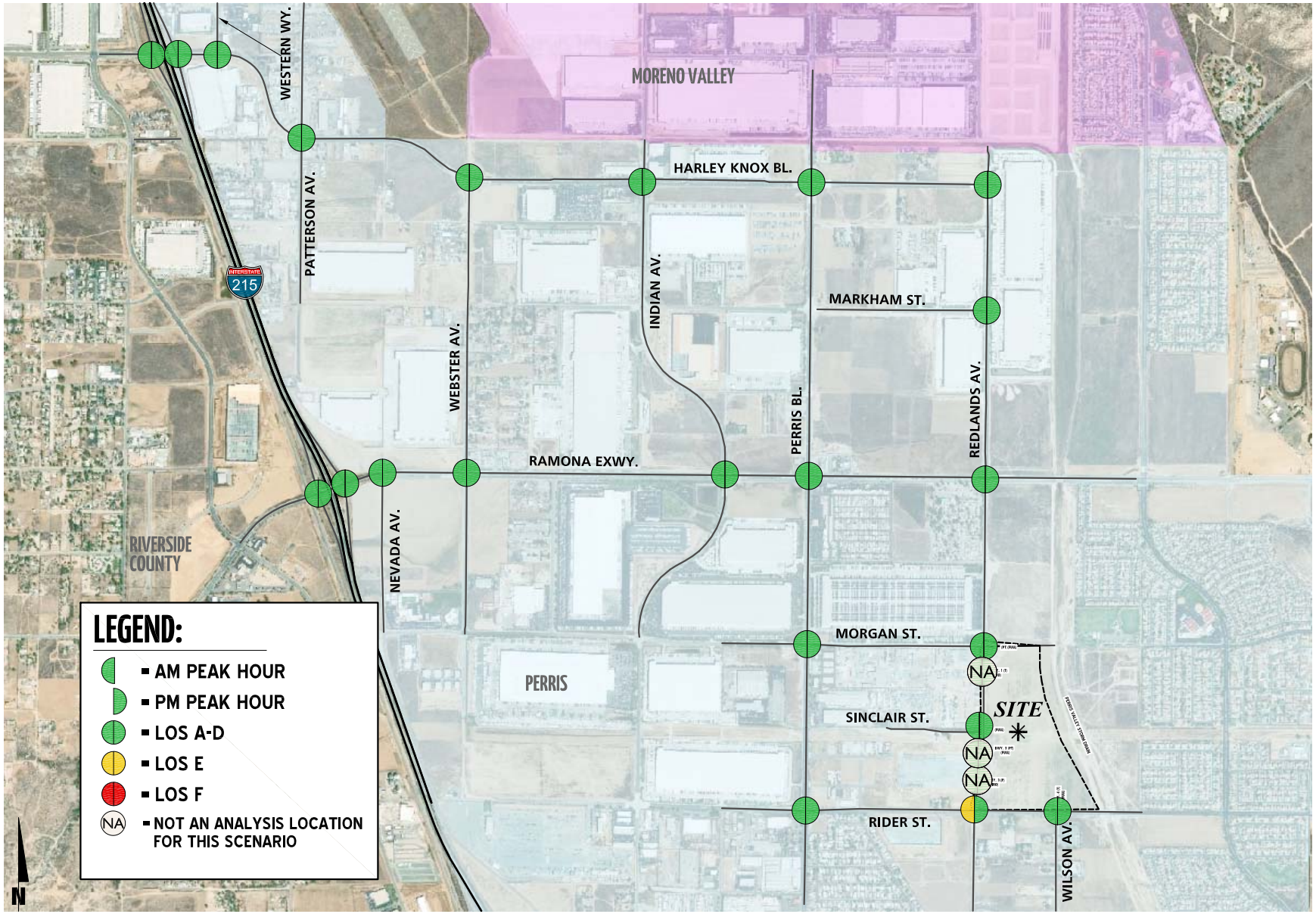


EXHIBIT 3-15: EXISTING (2019) SUMMARY OF LOS



URBAN CROSSROADS

Table 3-1

Intersection Analysis for Existing (2019) Conditions

#	Intersection	Traffic Control[3]	Intersection Approach Lanes[1]												Delay[2] (secs.)		Level of Service		Acceptable LOS
			Northbound			Southbound			Eastbound			Westbound							
			L	T	R	L	T	R	L	T	R	L	T	R	AM	PM	AM	PM	
1	I-215 Southbound Ramps & Harley Knox Bl.	TS	0	0	0	0	1	1	0	2	d	1	2	0	31.8	39.5	C	D	D
2	I-215 Southbound Ramps & Ramona Exwy.	TS	0	0	0	1	1	1	0	2	d	1	2	0	31.1	34.3	C	C	D
3	I-215 Northbound Ramps & Harley Knox Bl.	TS	0	1	1	0	0	0	1	2	0	0	2	d	24.5	16.0	C	B	D
4	I-215 Northbound Ramps & Ramona Exwy.	TS	1	1	1	0	0	0	1	2	0	0	2	d	18.5	18.9	B	B	D
5	Western Wy. & Harley Knox Bl.																		
	-*Without Improvements*	CSS	0	0	0	0	1	0	0	2	0	0	2	d	18.1	17.6	C	C	D
	-*With Improvements*	TS	1	1	0	1	1	0	1	3	1	1	3	0	7.4	7.9	A	A	D
6	Patterson Av. & Harley Knox Bl.																		
	-*Without Improvements*	TS	0	1	0	0	1	1	1	2	1	1	2	1	10.4	10.0	B	A	D
	-*With Improvements*	TS	0	1	0	0	1	1	1	3	1	1	2	1	10.2	9.7	B	A	D
7	Nevada Av. & Ramona Exwy.	CSS	0	0	1	0	0	0	0	2	0	1	2	0	18.8	19.1	C	C	D
8	Webster Av. & Harley Knox Bl.	RA	1	1	0	0	0	0	0	2	1	0	2	0	11.4	10.3	B	B	D
9	Webster Av. & Ramona Exwy.	TS	1	1	1	0	1	0	1	3	0	1	3	1	19.9	20.1	B	C	D
10	Indian Av. & Harley Knox Bl.	TS	2	2	1	1	2	0	1	3	d	1	3	0	21.3	21.7	C	C	D
11	Indian Av. & Ramona Exwy.	TS	1	2	0	1	2	1	1	3	0	1	3	1	20.2	20.1	C	C	D
12	Perris Bl. & Harley Knox Bl.	TS	2	3	1	2	3	1	1	2	1	2	3	1	31.5	28.2	C	C	D
13	Perris Bl. & Ramona Exwy.	TS	2	2	1	2	2	1	2	3	1	2	3	0	37.7	27.8	D	C	E
14	Perris Bl. & Morgan St.	TS	1	3	0	1	2	1	1	2	1	1	1	1	12.1	12.6	B	B	D
15	Perris Bl. & Rider St.	TS	1	3	1	1	3	1	1	2	1	1	2	1	19.4	18.6	B	B	D
16	Redlands Av. & Harley Knox Bl.	TS	1	2	0	0	2	0	1	1	1	1	1	0	11.0	10.8	B	B	D
17	Redlands Av. & Markham St.	AWS	1	2	0	0	2	0	1	0	1	0	0	0	7.9	8.2	A	A	D
18	Redlands Av. & Ramona Exwy.	TS	1	1	0	1	1	1	1	3	1	1	3	1	13.8	19.1	B	B	D
19	Redlands Av. & Morgan St.	AWS	0	1	0	0	1	1	1	1	0	0	1	0	7.3	7.5	A	A	D
20	Redlands Av. & Dwy. 1		Future Intersection																D
21	Redlands Av. & Sinclair St.	UC	0	1	0	0	1	0	0	1	0	0	0	0	0.0	8.5	A	A	D
22	Redlands Av. & Dwy. 2		Future Intersection																D
23	Redlands Av. & Dwy. 3		Future Intersection																D
24	Redlands Av. & Rider St.	CSS	1	0	1	0	1	0	0	1	1	1	2	0	**36.3**	22.2	**E**	C	D
25	Driveway 4/Wilson Av. & Rider St.	CSS	0	1	0	0	0	0	0	1	1	1	2	0	25.8	16.2	D	C	D

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

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

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

[3] UC = Uncontrolled; AWS = All-way Stop; CSS = Cross-street Stop; RA = Roundabout; TS = Traffic Signal

Since the time traffic counts were conducted in May 2018, improvements have been completed along Harley Knox Boulevard, between the I-215 Freeway and Patterson Avenue. Since the improvements were not in place at the time traffic counts were conducted, both the 2018 intersection lane geometrics and the improved 2019 lane geometrics were evaluated under Existing (2019) traffic conditions for the intersections of Western Way and Harley Knox Boulevard, and Patterson Avenue and Harley Knox Boulevard (see Table 3-1). As shown in Table 3-1, the two intersections are currently operating at an acceptable LOS during the peak hours for without and with the Harley Knox Boulevard improvements. For the purposes of this analysis, E+P, EA (2021), EAP (2021), EAC (2021), and EAPC (2021) traffic conditions lane geometrics reflect the recently completed 2019 improvements.

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 TRAFFIC SIGNAL WARRANTS ANALYSIS

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

- Redlands Av. & Rider St. (#24)
- Wilson Av. & Rider St. (#25)

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

3.9 OFF-RAMP QUEUING ANALYSIS

A queuing analysis was performed for the off-ramps at the I-215 Freeway Harley Knox Boulevard and Ramona Expressway 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 3-2. It is important to note that off-ramp lengths are consistent with the measured distance between the intersection and the freeway mainline. As shown in Table 3-2, there are no movements that are currently experiencing queuing issues during the weekday AM or weekday PM peak 95th percentile traffic flows. Worksheets for Existing traffic conditions off-ramp queuing analysis are provided in Appendix 3.4.

Table 3-2

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

Intersection	Movement	Available Stacking Distance (Feet)	95th Percentile Queue (Feet)		Acceptable? [1]	
			AM Peak Hour	PM Peak Hour	AM	PM
I-215 Southbound Ramps & Harley Knox Bl.	SBL/T	1,330	359 [2]	278 [2]	Yes	Yes
	SBR	270	37	38	Yes	Yes
I-215 Southbound Ramps & Ramona Exwy.	SBL	530	293	375	Yes	Yes
	SBL/T	1,100	294	380	Yes	Yes
	SBR	530	103	57	Yes	Yes
I-215 Northbound Ramps & Harley Knox Bl.	NBL/T	1,120	18	30	Yes	Yes
	NBR	265	25	68 [2]	Yes	Yes
I-215 Northbound Ramps & Ramona Exwy.	NBL	520	152	154	Yes	Yes
	NBL/T	1,120	151	154	Yes	Yes
	NBR	520	370 [2]	316	Yes	Yes

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

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

3.10 EXISTING CONDITIONS BASIC FREEWAY SEGMENT ANALYSIS

Existing (2019) mainline directional volumes for the AM and PM peak hours are provided on Exhibit 3-16. As shown in Table 3-3, the I-215 Freeway segments analyzed for this study were found to operate at an acceptable LOS (i.e., LOS D or better) during the peak hours for Existing (2019) traffic conditions, with the exception of the following locations:

- I-215 Freeway Northbound, North of Harley Knox Boulevard (#4) – LOS F AM and PM peak hours
- I-215 Freeway Northbound, Harley Knox Boulevard to Ramona Expressway (#5) – LOS F AM and PM peak hours
- I-215 Freeway Northbound, South of Ramona Expressway (#6) – LOS F AM and PM peak hours

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

It should be noted that although the I-215 Freeway is found to operate at an acceptable LOS based on the HCS analysis, field observations indicate constrained flow conditions during the peak hours in the northbound direction. According to the Caltrans PeMS data, the I-215 Freeway Northbound experiences speeds as low as 25 miles per hour during the morning and evening peak hours. The freeway is slow moving, therefore, fewer vehicles are being captured and reflected in the PeMS data. The LOS for the I-215 Freeway mainline analyses is based on the PeMS data and HCS software. Due to limitations of the software, such as limiting the speed limit input to no lower than 45 miles per hour, HCS is unable to replicate constrained flow conditions. As a result, the LOS is reported as acceptable although the freeway is considered at capacity during the peak hours for the freeway segments and ramp junctions, as observed in the field, at the following freeway facilities:

- I-215 Freeway Northbound, North of Harley Knox Boulevard (#4) – LOS F AM and PM peak hours
- I-215 Freeway Northbound, Harley Knox Boulevard to Ramona Expressway (#5) – LOS F AM and PM peak hours
- I-215 Freeway Northbound, South of Ramona Expressway (#6) – LOS F AM and PM peak hours

For the purposes of this analysis, the applicable locations have been identified with LOS F operations and denoted with a footnote in the analysis summary tables.

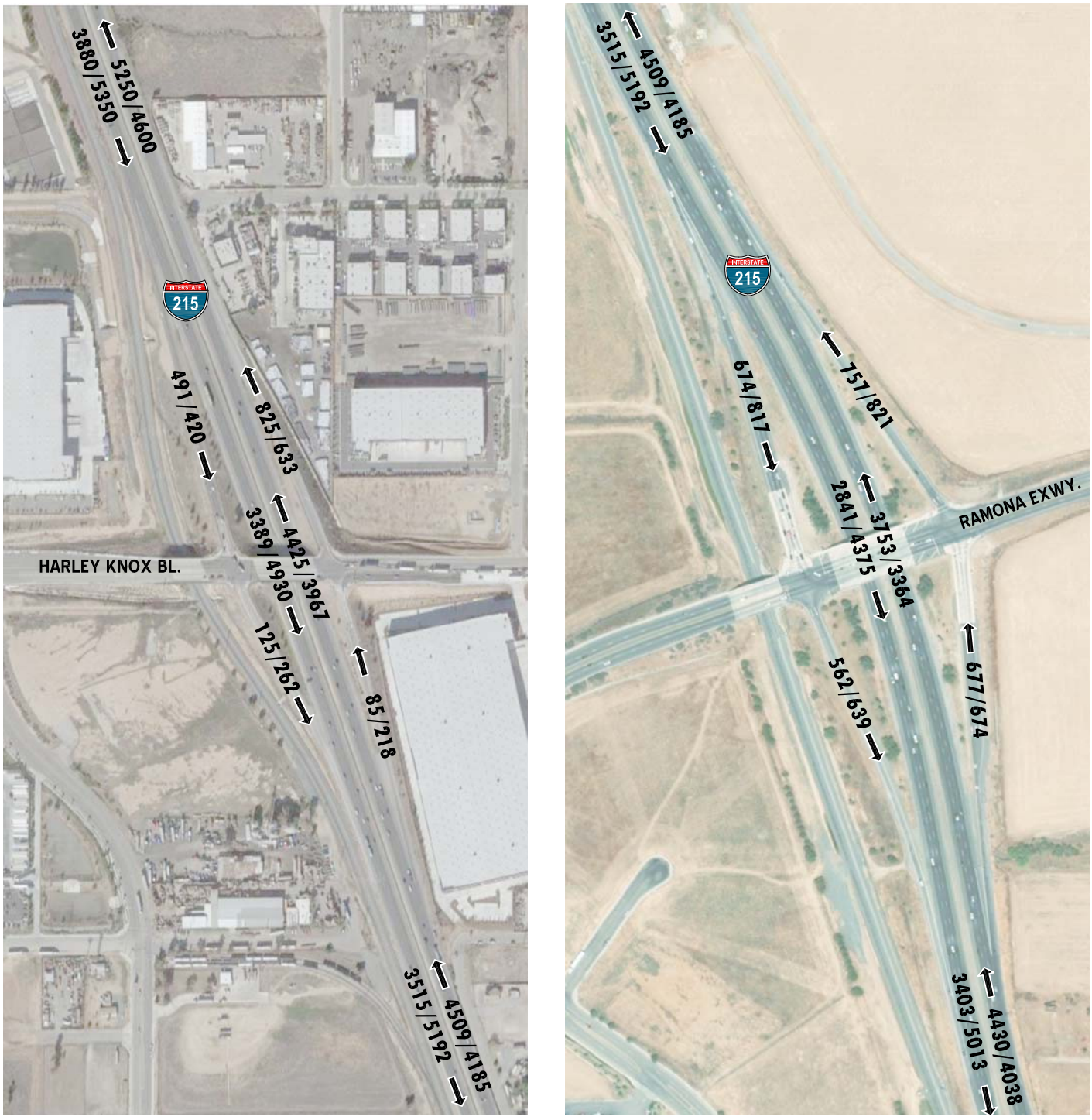
3.11 EXISTING CONDITIONS FREEWAY MERGE/DIVERGE ANALYSIS

Ramp merge and diverge operations were also evaluated for Existing (2019) conditions and the results of this analysis are presented in Table 3-4. As shown in Table 3-4, the I-215 Freeway ramp merge and diverge areas at Harley Knox Boulevard and Ramona Expressway currently operate at LOS D or better during the peak hours under Existing (2019) traffic conditions, with the exception of the following location:

- I-215 Freeway, Southbound Off-Ramp at Harley Knox Boulevard (#1) – LOS F AM peak hour only

Existing (2019) freeway ramp junction operations analysis worksheets are provided in Appendix 3.6.

EXHIBIT 3-16: EXISTING (2019) FREEWAY MAINLINE VOLUMES



LEGEND:

⟵ 100/200 = AM/PM PEAK HOUR VOLUMES

NOTE: VOLUMES IN ACTUAL VEHICLES (NOT PCE)

N

Table 3-3

Basic Freeway Segment Analysis for Existing (2019) Conditions

Freeway	Direction	Mainline Segment	Lanes[1]	Volume[2]		Density[3]		LOS[4]	
				AM	PM	AM	PM	AM	PM
I-215 Freeway	Southbound	North of Harley Knox Bl.	3	3,880	5,350	21.4	31.8	C	D
		Harley Knox Bl. to Ramona Exwy.	3	3,515	5,192	18.8	29.1	C	D
		South of Ramona Exwy.	3	3,403	5,013	18.0	27.3	B	D
	Northbound	North of Harley Knox Bl.	3	5,250	4,600	--[5]	--[5]	**F**	**F**
		Harley Knox Bl. to Ramona Exwy.	3	4,509	4,185	--[5]	--[5]	**F**	**F**
		South of Ramona Exwy.	3	4,430	4,038	--[5]	--[5]	**F**	**F**

BOLD = LOS does not meet Caltrans requirements (i.e., unacceptable LOS or LOS E/F).

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

[2] Directional volumes based on current PeMS data.

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

[4] LOS = Level of Service

[5] Analysis with constrained flow results in acceptable LOS, however, field observations indicate congestion during the peak hour. As such, the freeway is considered at capacity.

Table 3-4

Freeway Ramp Merge/Diverge Analysis for Existing (2019) Conditions

Freeway	Direction	Ramp Junction	Lanes on Freeway	AM Peak Hour		PM Peak Hour	
				Density[1]	LOS[2]	Density[1]	LOS[2]
I-215 Freeway	Southbound	Off-Ramp at Harley Knox Bl.	3	--[3]	**F**	34.6	D
		On-Ramp at Harley Knox Bl.	3	22.4	C	31.0	D
		Off-Ramp at Ramona Exwy.	3	24.2	C	32.2	D
		On-Ramp at Ramona Exwy.	3	20.1	C	28.6	D
	Northbound	On-Ramp at Harley Knox Bl.	3	34.0	D	29.3	D
		Off-Ramp at Harley Knox Bl.	3	29.6	D	27.8	C
		On-Ramp at Ramona Exwy.	3	27.7	C	25.7	C
		Off-Ramp at Ramona Exwy.	3	27.7	C	25.4	C

BOLD = LOS does not meet Caltrans requirements (i.e., unacceptable LOS or LOS E/F).

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

[2] LOS = Level of Service

[3] Analysis with constrained flow results in acceptable LOS, however, field observations indicate congestion during the peak hour. As such, the ramp junction is considered at capacity.

3.12 IMPROVEMENTS

Improvement strategies needed to achieve acceptable LOS (i.e., LOS D or better) at intersections and freeway facilities that have been identified as deficient under Existing (2019) traffic conditions are discussed below.

3.12.1 IMPROVEMENTS TO ADDRESS DEFICIENCIES AT INTERSECTIONS

As shown previously in Table 3-1, there is one intersection that is currently operating at an unacceptable LOS (LOS E or worse) for Existing (2019) traffic conditions. The effectiveness of the improvement strategy discussed below to address the Existing (2019) traffic deficiency is presented in Table 3-5.

The following study area intersection was found to operate at an unacceptable LOS during the AM peak hour under Existing (2019) traffic conditions:

- Redlands Av. & Rider St. (#24)

The following improvement is necessary to achieve acceptable LOS:

Redlands Av. & Rider St. (#24):

- Install a traffic signal.

3.12.2 IMPROVEMENTS TO ADDRESS OFF-RAMP QUEUES

As shown previously in Table 3-2, there are no peak hour queuing issues at the I-215 Freeway at Harley Knox Boulevard and Ramona Expressway interchanges. As such, no improvements have been recommended.

3.12.3 IMPROVEMENTS TO ADDRESS DEFICIENCIES ON FREEWAY FACILITIES

The Project Study Report/Project Development Support in Riverside County on I-215 and SR-60 between Nuevo Road (I-215) & I-215/SR-60 Junction and Box Springs Road (I-215) & Day Street (SR-60), also known as the I-215 North Project, includes the construction of an high-occupancy vehicle (HOV) lane in each direction of the I-215 Freeway between Nuevo Road and Box Springs Road within the existing median. (16) (17)

At this time, the I-215 North Project has no anticipated start or completion date. As such, no improvements have been recommended to address the Existing deficiencies on the State Highway System (SHS), because the improvement to the I-215 Freeway is assumed to be completed after the Project buildout year of 2021. There is a significant and unavoidable impact to the I-215 Freeway facilities for Existing traffic conditions as there are currently no improvements to mitigate the impacts to the SHS.

Table 3-5

Intersection Analysis for Existing (2019) Conditions With Improvements

#	Intersection	Traffic Control[3]	Intersection Approach Lanes[1]												Delay[2] (secs.)		Level of Service	
			Northbound			Southbound			Eastbound			Westbound						
			L	T	R	L	T	R	L	T	R	L	T	R	AM	PM	AM	PM
24	Redlands Av. & Rider St.																	
	- Without Improvement	CSS	1	0	1	0	1	0	0	1	1	1	2	0	**36.3**	22.2	**E**	C
	- With Improvements	**TS**	1	0	1	0	1	0	0	1	1	1	2	0	18.9	13.9	B	B

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

L = Left; T = Through; R = Right

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

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

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 two High-Cube Transload and Short-Term Storage Warehouse buildings (without cold storage) totaling approximately 1,373,449 sf. As previously discussed in Section 1.1 *Project Overview*, at the time this TIA was prepared, Rider 2 was proposed to consist of 806,351 sf and Rider 4 was proposed to consist of 567,098 sf of High-Cube Transload and Short-Term Storage Warehouse use (without cold storage). However, the current site plan shows 804,759 sf for Rider 2 and 547,977 sf for Rider 4. The higher square footages for Rider 2 and Rider 4 have been evaluated for the purposes of this TIA in order to account for any minor changes that may occur to the building area as part of the final design.

The Project is anticipated to be constructed in a single phase by the year 2021. The proposed Project land use is consistent with the PVCC SP. The designated land use and zoning within the PVCCP SP is Light Industrial. The Project also consists of the construction and subsequent operations and maintenance of improvements to the PVSD Channel (Phase 1). The trip generation associated with the PVSD development is discussed in Section 5 *Perris Valley Storm Drain Assessment* of this TIA.

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

- Rider 4 will have full access along the eastern extension of Morgan Street at Redlands Avenue for both passenger cars and trucks
- Rider 4 will have right-in/right-out only access for trucks only via Driveway 1 on Redlands Avenue
- Rider 4 will have right-in/right-out/left-in access along the eastern extension of Sinclair Street at Redlands Avenue for both passenger cars and trucks
- Rider 2 will have full access for passenger cars and trucks via Driveway 2 on Redlands Avenue
- Rider 2 will have right-in/right-out only access for passenger cars only via Driveway 3 on Redlands Avenue
- Rider 2 will have full access for passenger cars only via Driveway 4 on Rider Street which will be the northern extension of Wilson Avenue

Regional access to the Project site is provided via the I-215 Freeway and Ramona Expressway for passenger cars and at Harley Knox Boulevard for heavy trucks.

4.1 PROJECT TRIP GENERATION

Trip generation represents the amount of traffic that is attracted and produced by a development, and is based upon the specific land uses planned for a given project. Trip generation rates (actual vehicles) for the Project are shown in Table 4-1 and trip generation rates (PCE) for the Project are shown in Table 4-2 illustrating daily and peak hour trip generation estimates based on the Institute of Transportation Engineers (ITE) Trip Generation Manual, 10th Edition, 2017, for High-Cube Transload and Short-Term Storage Warehouse (ITE Land Use Code 154). (3)

Table 4-1

Project Trip Generation Summary (Actual Vehicles)

Project Trip Generation Rates									
Land Use[1]	ITE LU Code	Units[2]	AM Peak Hour			PM Peak Hour			Daily
			In	Out	Total	In	Out	Total	
High-Cube Transload Short-Term Warehouse without Cold Storage[3,4]	154	TSF	0.062	0.018	0.080	0.028	0.072	0.100	1.400
Passenger Cars (69.2% AM, 78.3% PM, 67.8% Daily)			0.043	0.013	0.056	0.022	0.056	0.078	0.949
2-Axle Trucks (5.14% AM, 3.62% PM, 5.38% Daily)			0.003	0.001	0.004	0.001	0.003	0.004	0.076
3-Axle Trucks (6.38% AM, 4.49% PM, 6.66% Daily)			0.004	0.001	0.005	0.001	0.003	0.004	0.093
4-Axle+ Trucks (19.28% AM, 13.59% PM, 20.16% Daily)			0.012	0.003	0.015	0.004	0.010	0.014	0.282

Project Trip Generation									
Project	Quantity	Units[2]	AM Peak Hour			PM Peak Hour			Daily
			In	Out	Total	In	Out	Total	
High-Cube Transload Short-Term Warehouse without Cold Storage	1,373.449	TSF							
Passenger Cars:			60	18	78	31	77	108	1,304
Truck Trips:									
2-axle:			5	2	7	2	5	7	106
3-axle:			6	2	8	2	5	7	128
4+-axle:			17	5	22	6	14	20	388
- Net Truck Trips (Actual Vehicles)			*28*	*9*	*37*	*10*	*24*	*34*	*622*
TOTAL NET TRIPS (Actual Vehicles)			***88***	***27***	***115***	***41***	***101***	***142***	***1,926***

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

[2] TSF = thousand square feet

[3] Vehicle Mix Source: Institute of Transportation Engineers (ITE), High-Cube Warehouse Vehicle Trip Generation Analysis (October 2016).

[4] Truck Mix Source: SCAQMD Warehouse Truck Trip Study Data Results and Usage (2014).

Normalized % - Without Cold Storage:

16.7% 2-Axle trucks, 20.7% 3-Axle trucks, 62.6% 4-Axle trucks

Table 4-2

Project Trip Generation Summary (PCE)

Project Trip Generation Rates									
Land Use[1]	ITE LU Code	Units[2]	AM Peak Hour In	AM Peak Hour Out	AM Peak Hour Total	PM Peak Hour In	PM Peak Hour Out	PM Peak Hour Total	Daily
High-Cube Transload Short-Term Warehouse without Cold Storage[3,4]	154	TSF	0.062	0.018	0.080	0.028	0.072	0.100	1.400
Passenger Cars (69.2% AM, 78.3% PM, 67.8% Daily)			0.043	0.013	0.056	0.022	0.056	0.078	0.949
2-Axle Trucks (5.14% AM, 3.62% PM, 5.38% Daily, PCE = 1.5)[5]			0.005	0.002	0.007	0.002	0.005	0.007	0.114
3-Axle Trucks (6.38% AM, 4.49% PM, 6.66% Daily, PCE = 2.0)[5]			0.008	0.002	0.010	0.002	0.006	0.008	0.186
4-Axle+ Trucks (19.28% AM, 13.59% PM, 20.16% Daily, PCE = 3.0)[5]			0.036	0.009	0.045	0.012	0.030	0.042	0.846

Project Trip Generation									
Project	Quantity	Units[2]	AM Peak Hour In	AM Peak Hour Out	AM Peak Hour Total	PM Peak Hour In	PM Peak Hour Out	PM Peak Hour Total	Daily
High-Cube Transload Short-Term Warehouse without Cold Storage	1,373.449	TSF							
Passenger Cars:			60	18	78	31	77	108	1,304
Truck Trips:									
2-axle:			7	3	10	3	7	10	158
3-axle:			11	3	14	3	9	12	256
4+-axle:			50	13	63	17	42	59	1,162
- Net Truck Trips (PCE)			*68*	*19*	*87*	*23*	*58*	*81*	*1,576*
TOTAL NET TRIPS (PCE)			***128***	***37***	***165***	***54***	***135***	***189***	***2,880***

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

[2] TSF = thousand square feet

[3] Vehicle Mix Source: Institute of Transportation Engineers (ITE), High-Cube Warehouse Vehicle Trip Generation Analysis (October 2016).

[4] Truck Mix Source: SCAQMD Warehouse Truck Trip Study Data Results and Usage (2014).

Normalized % - Without Cold Storage:

16.7% 2-Axle trucks, 20.7% 3-Axle trucks, 62.6% 4-Axle trucks

[5] PCE rates are per San Bernardino County Transportation Authority (SBCTA).

Data regarding the truck percentage and vehicle mix has been obtained from High Cube Warehouse Vehicle Trip Generation Analysis (October 2016). (12) The High Cube Warehouse Vehicle Trip Generation Analysis provides vehicle mix for Short-Term Storage, Transload & Non-Cold Storage, which consists of 32.2% trucks for daily trips, 30.8% trucks for AM peak hour trips and 21.7% trucks for PM peak hour trips. The South Coast Air Quality Management District's (SCAQMD) recommended truck mix, by axle type for high-cube warehouses has been utilized for the 2-axle, 3-axle, and 4+-axle trucks. (13)

As noted in Table 4-1 and Table 4-2, refinements to the raw trip generation estimates have been made to provide a more detailed breakdown of trips between passenger cars and trucks. Trip generation for heavy trucks was further broken down by truck type (or axle type). The total truck percentage is comprised of 3 different truck types: 2-axle, 3-axle, and 4+-axle trucks. PCE factors were applied to the trip generation rates for heavy trucks (large 2-axles, 3-axles, 4+-axles). PCEs allow the typical "real-world" mix of vehicle types to be represented as a single, standardized unit, such as the passenger car, to be used for the purposes of capacity and level of service analyses. The PCE factors are consistent with the recommended PCE factors in Appendix B of the San Bernardino County Congestion Management Program (CMP), 2016 Update. (11) Note that these procedures are consistent with those adopted by the County of Riverside for warehouse projects, with the exception of the PCE factors, where the San Bernardino County CMP factors have been utilized in an effort to conduct a conservative analysis.

The Project is estimated to generate a net total of 2,879 PCE trip-ends per day on a typical weekday with approximately 165 net AM PCE peak hour trips and 189 net PM PCE peak hour trips, as shown in Table 4-2. The proposed Project's trip generation, based on actual vehicles, has also been included in Table 4-1 for informational purposes only.

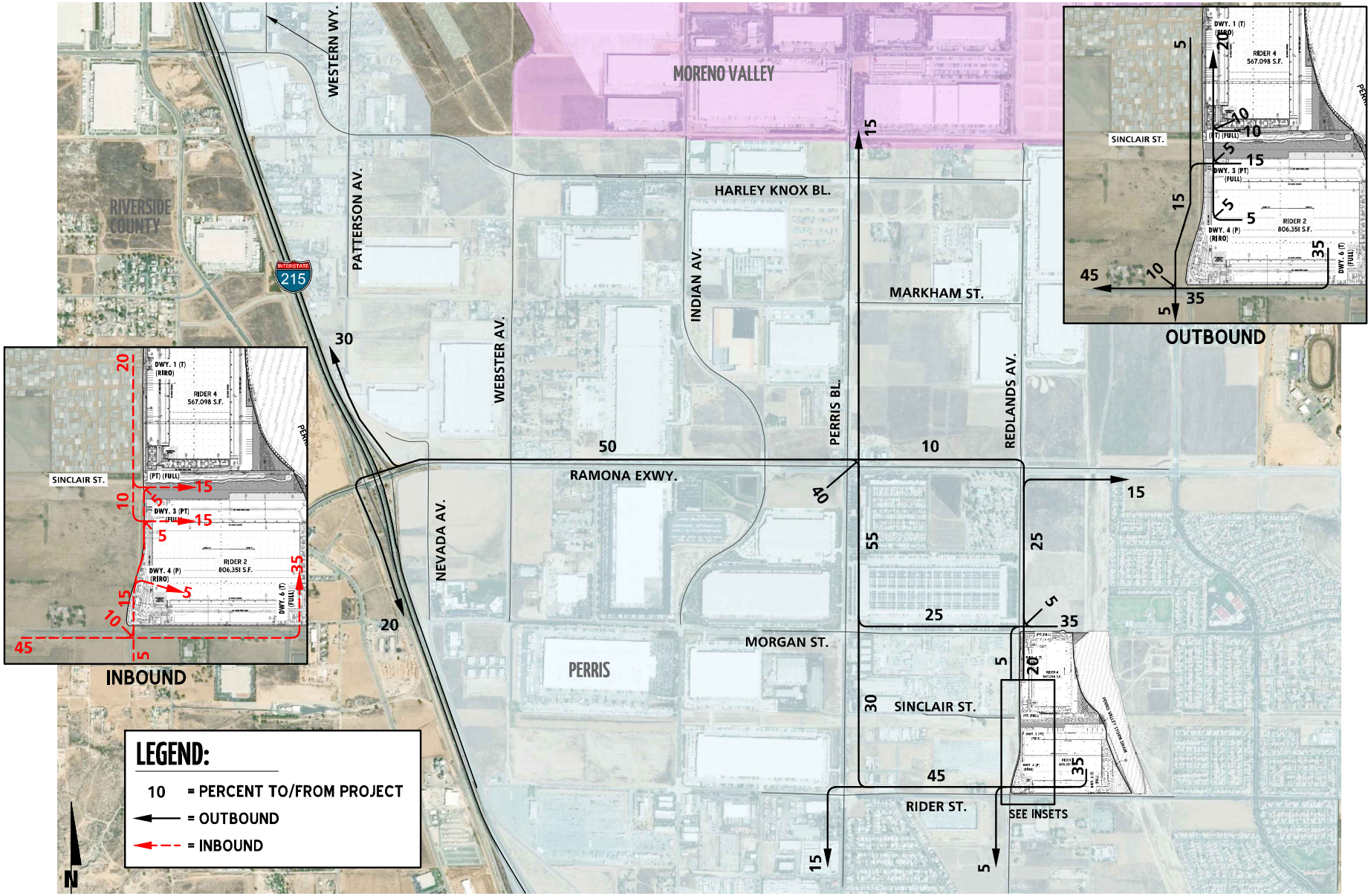
4.2 PROJECT TRIP DISTRIBUTION

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

The Project trip distribution was developed based on anticipated travel patterns to and from the Project site for both passenger cars and truck traffic, and are consistent with other similar projects that have been reviewed and approved by City of Perris staff. The truck trip distribution patterns have been developed based on the anticipated travel patterns for the 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.

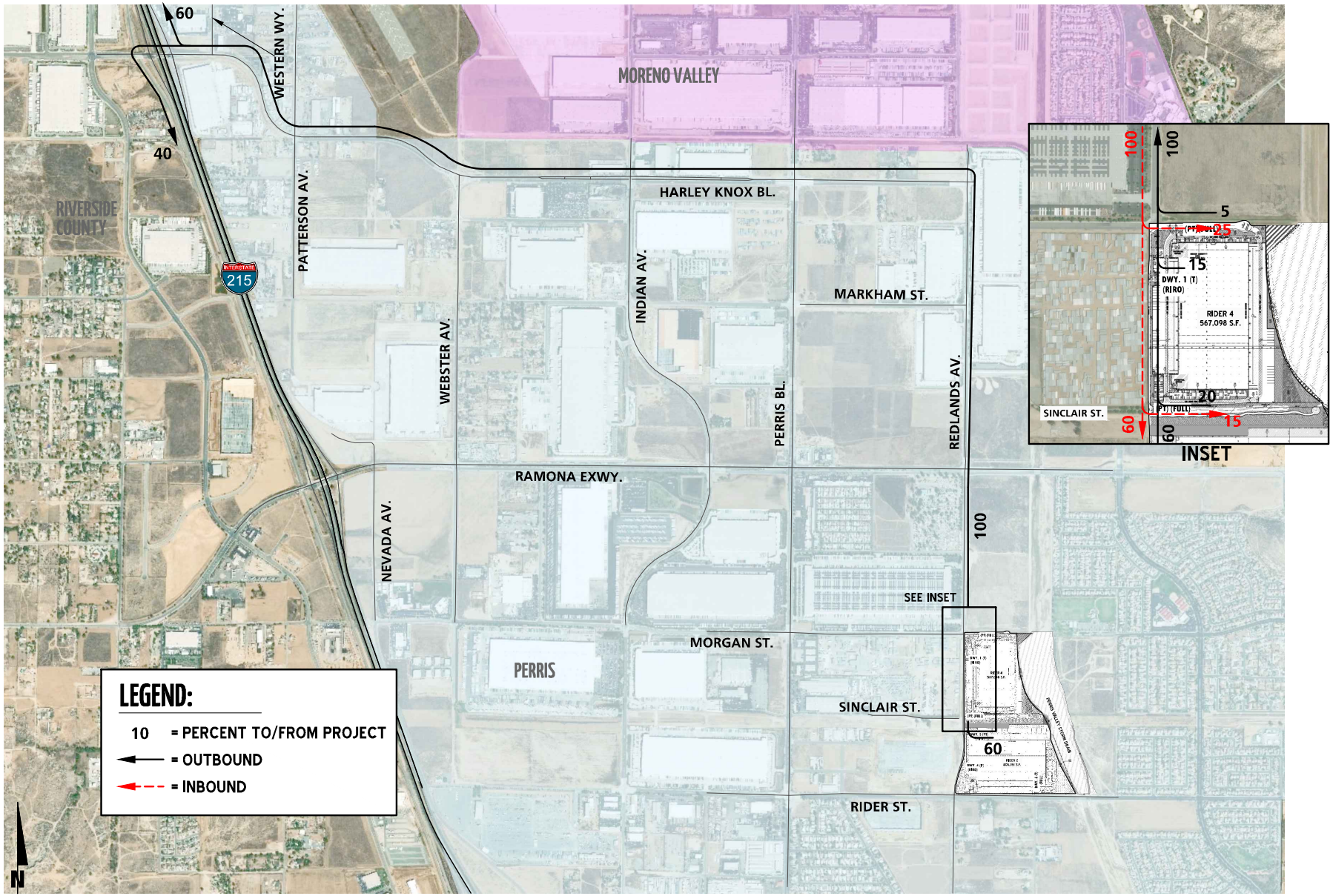
The Project passenger car trip distribution pattern is graphically depicted on Exhibit 4-1. The Project truck trip distribution pattern is graphically depicted on Exhibit 4-2. Each of these distribution patterns was reviewed by the City of Perris as part of the traffic study scoping process (see Appendix 1.1).

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



URBAN CROSSROADS

EXHIBIT 4-2: PROJECT (TRUCK) TRIP DISTRIBUTION



URBAN CROSSROADS

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 are shown on Exhibit 4-3 and peak hour intersection turning movement volumes are shown on Exhibit 4-4 in PCE.

4.5 BACKGROUND TRAFFIC

Future year traffic forecasts have been based upon two years of background (ambient) growth at 3% per year for 2021 traffic conditions. The total ambient growth is 6.09% for 2021 traffic conditions (growth of 3 percent per year, compounded over two years or $1.03^{2\ years}$). This ambient growth factor is added to existing traffic volumes to account for area-wide growth not reflected by cumulative development projects. Ambient growth has been added to daily and peak hour traffic volumes on surrounding roadways, in addition to traffic generated by the development of future projects that have been approved but not yet built and/or for which development applications have been filed and are under consideration by governing agencies.

The Southern California Association of Governments (SCAG) 2016—2040 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS) growth forecasts for the City of Perris assume the City population to increase from 70,700 in 2012 to 116,700 by the year 2040, or an approximate 1.81 percent growth rate compounded annually. The RTP/SCS assumed growth in households over the same 28-year period reflects an increase from 16,600 households to 32,700 households; a rate of 2.45 percent compounded annually. At the upper end of assumed RTP/SCS growth rates, employment over the same 28-year period is projected to increase from 15,100 jobs to 32,200 jobs; a rate of approximately 2.74 percent compounded annually. (14)

Therefore, the use of an annual growth rate of 3.0 percent would appear to conservatively approximate the anticipated regional growth in traffic volumes in the City of Perris, especially when considered along with the addition of Project-related traffic and traffic generated by other known development projects. As such, the growth in traffic volumes assumed in this traffic impact analysis would tend to overstate as opposed to understate the potential impacts to traffic and circulation.

EXHIBIT 4-3: PROJECT ONLY AVERAGE DAILY TRAFFIC (ADT) (IN PCE)

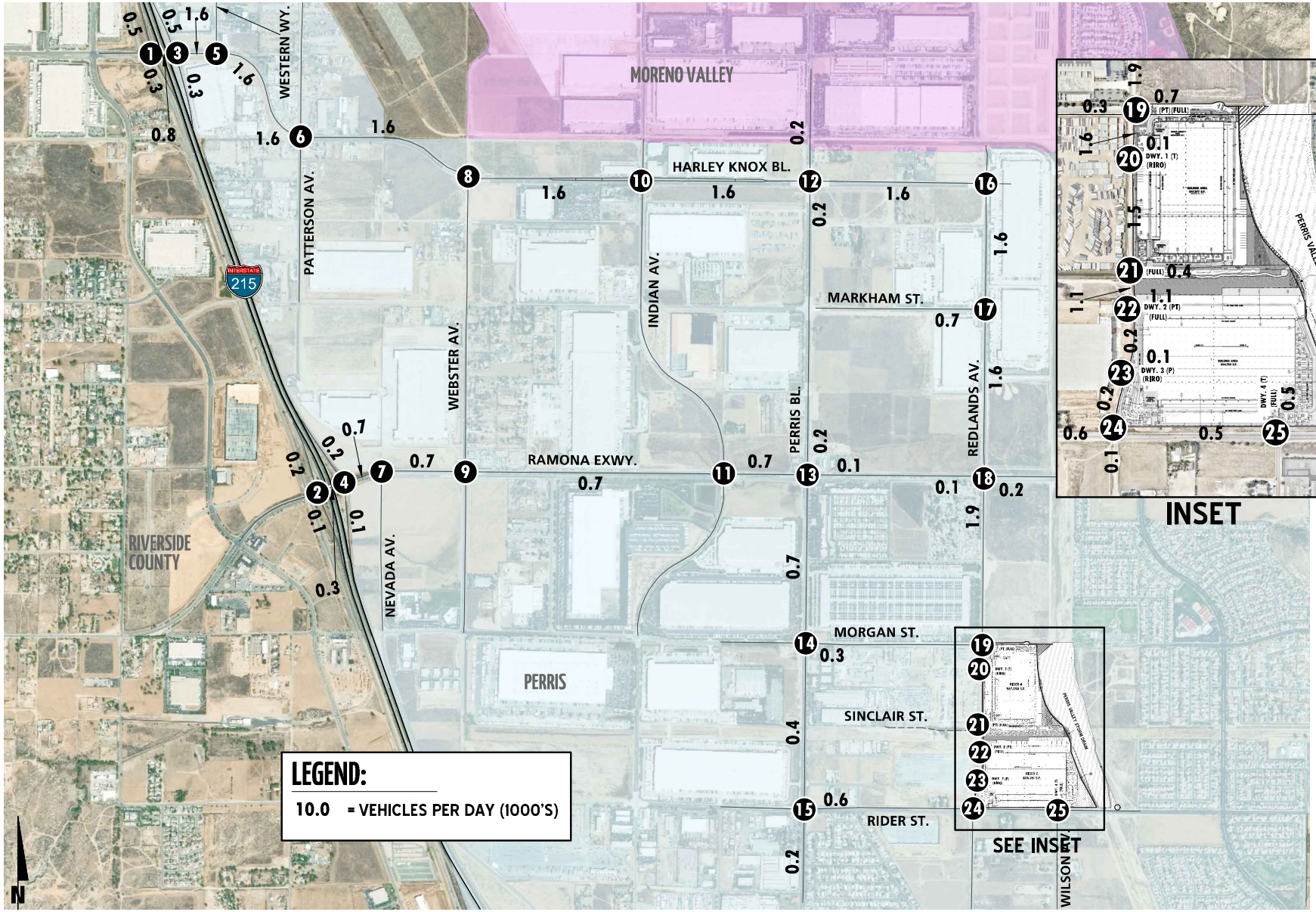
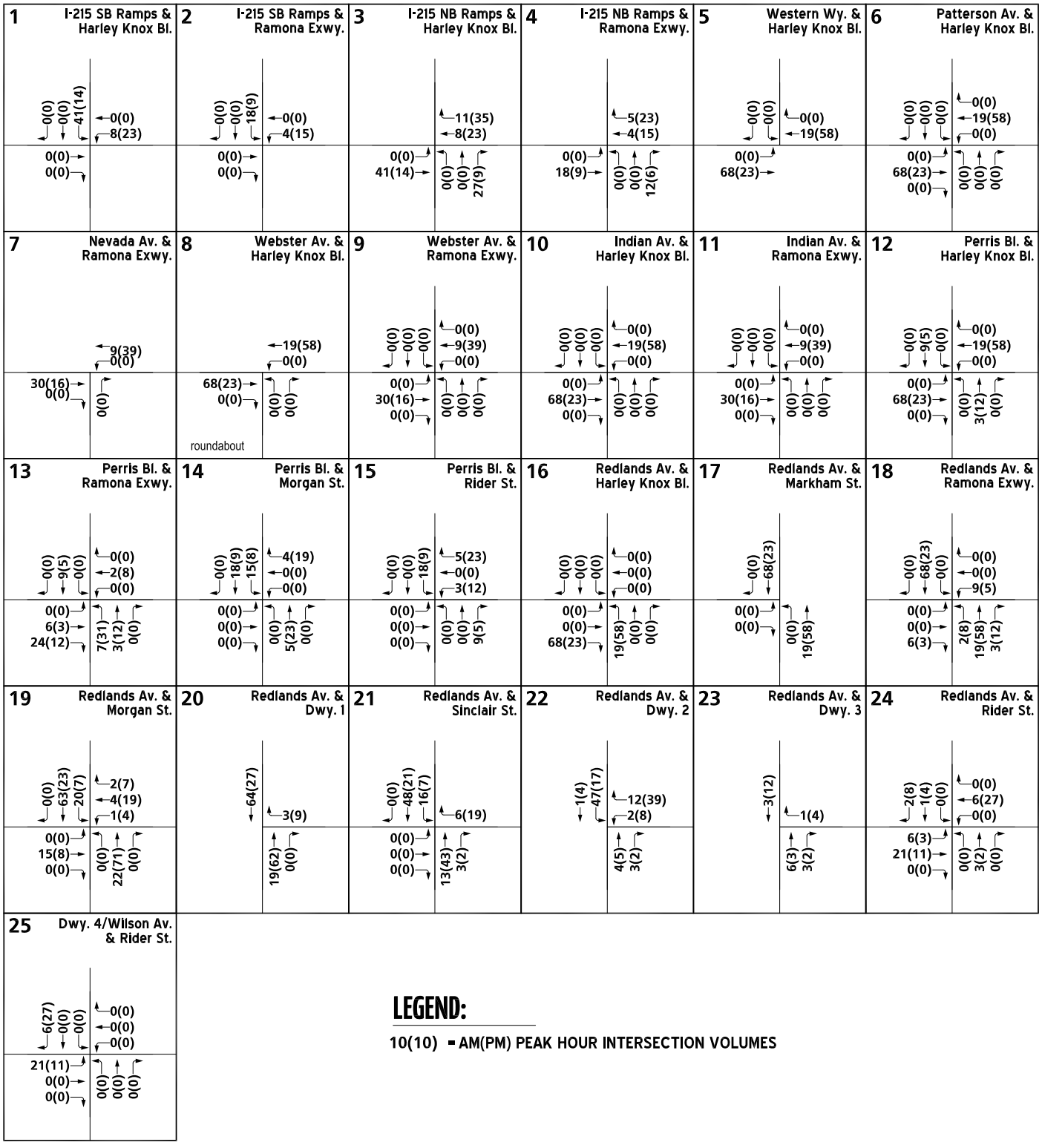


EXHIBIT 4-4: PROJECT ONLY TRAFFIC VOLUMES (IN PCE)



4.6 CUMULATIVE DEVELOPMENT TRAFFIC

California Environmental Quality Act (CEQA) guidelines require that other reasonably foreseeable development projects which are either approved or being processed concurrently in the study area also be included as part of a cumulative analysis scenario. A cumulative project list was developed for the purposes of this analysis through consultation with planning and engineering staff from the City of Perris. 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 and the City of Moreno Valley have also been contacted to obtain the most current list of cumulative projects from their respective jurisdictions.

Where applicable, cumulative projects anticipated to contribute measurable traffic (i.e. 50 or more peak hour trips) to study area intersections have been manually added to the study area network to generate EAC and EAPC forecasts. In other words, this list of cumulative development projects has been reviewed to determine which projects would likely contribute measurable traffic through the study area intersections (e.g., those cumulative projects in close proximity to the proposed Project). For the purposes of this analysis, the cumulative projects that were determined to affect one or more of the study area intersections are shown on Exhibit 4-5, listed in Table 4-3, and have been considered for inclusion.

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

Any other cumulative projects that are not expected to contribute measurable traffic to study area intersections have not been included since the traffic would dissipate due to the distance from the Project site and study area intersections. Any additional traffic generated by other projects not on the cumulative projects list is accounted for through background ambient growth factors that have been applied to the peak hour volumes at study area intersections as discussed in Section 4.5 *Background Traffic*. Cumulative Only ADT are shown on Exhibit 4-6 and peak hour intersection turning movement volumes are shown on Exhibit 4-7 in PCE.

EXHIBIT 4-5: CUMULATIVE DEVELOPMENT LOCATION MAP

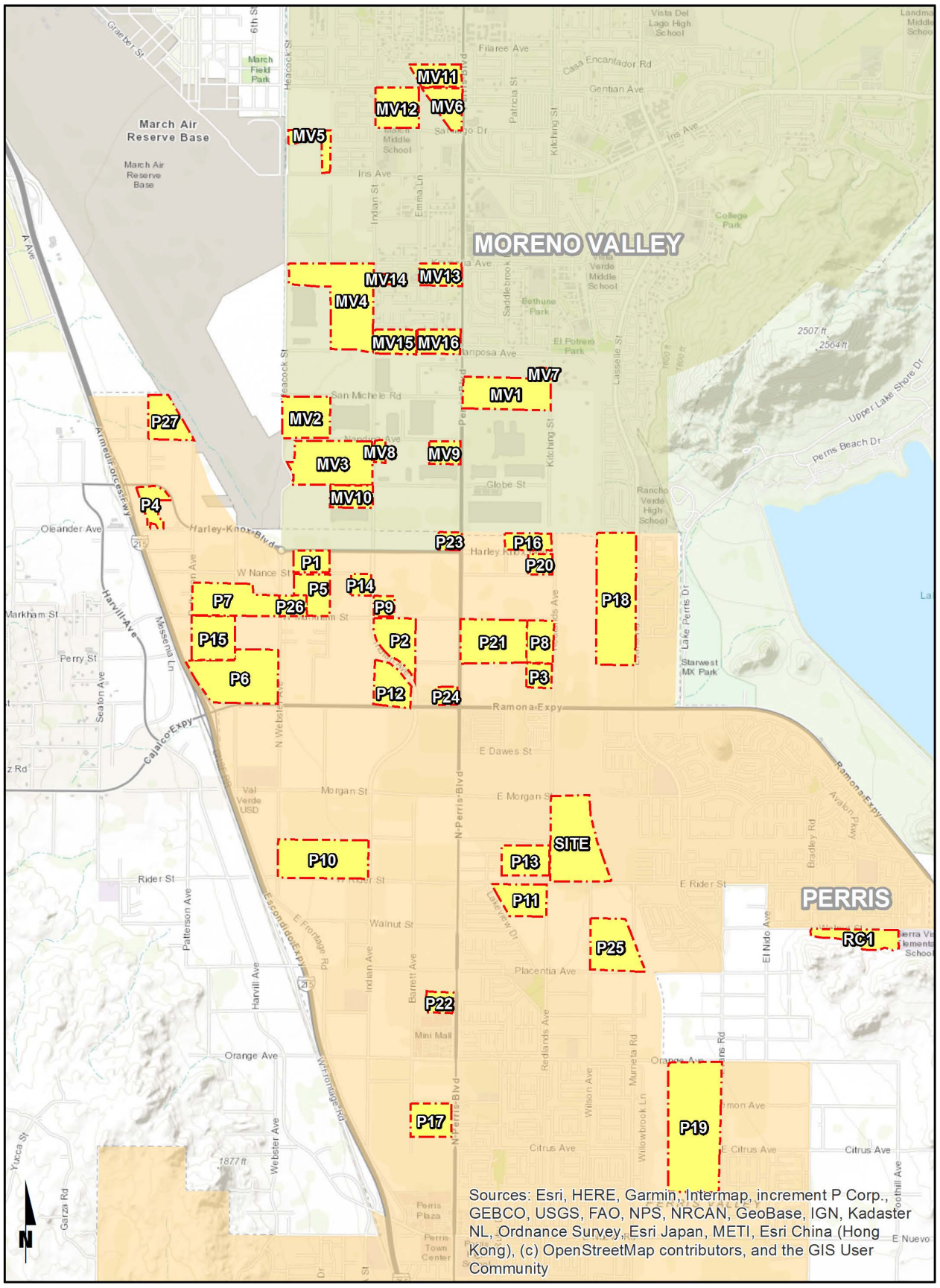


EXHIBIT 4-6: CUMULATIVE ONLY AVERAGE DAILY TRAFFIC (ADT) (IN PCE)

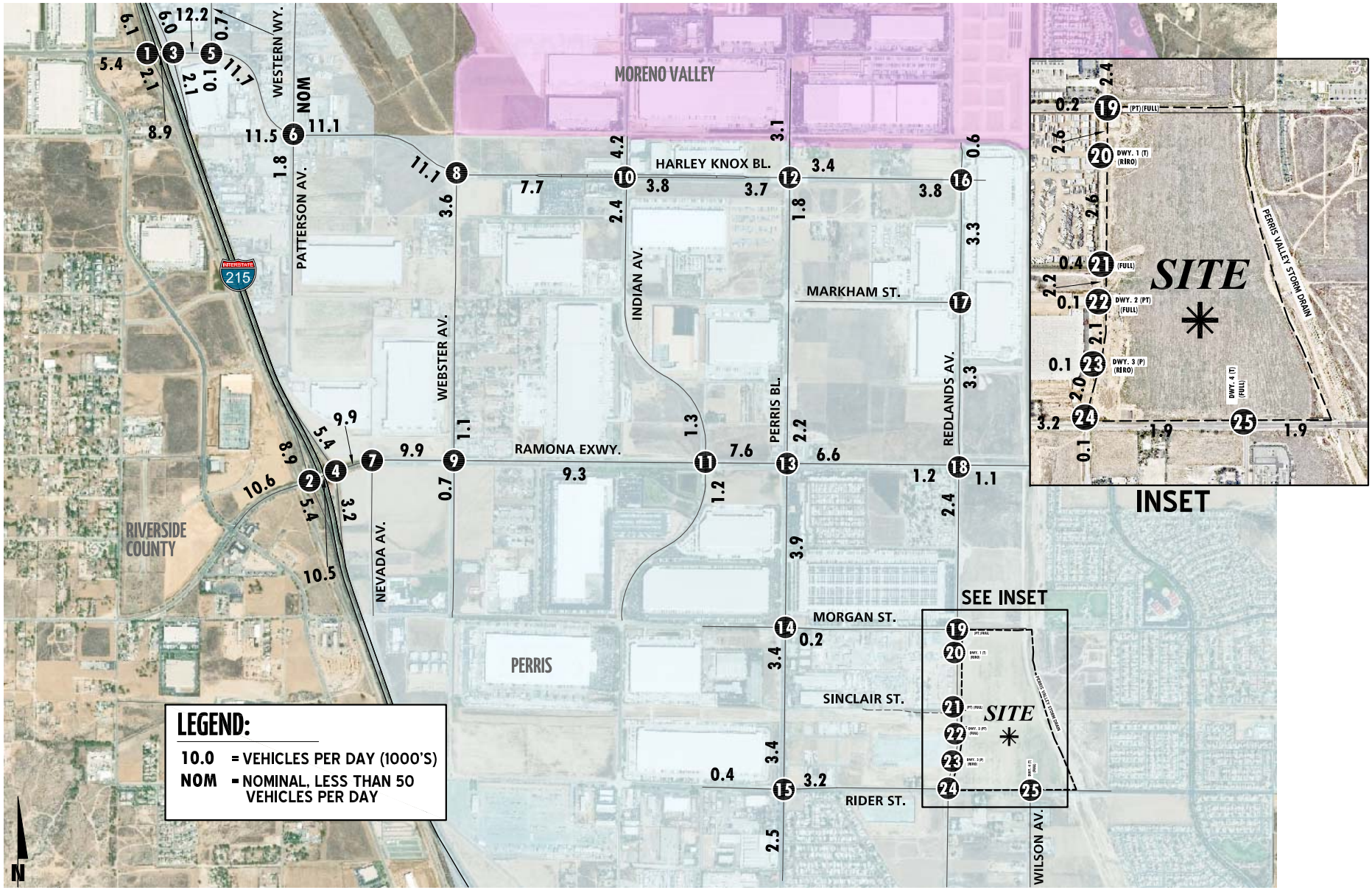


EXHIBIT 4-7: CUMULATIVE ONLY TRAFFIC VOLUMES (IN PCE)

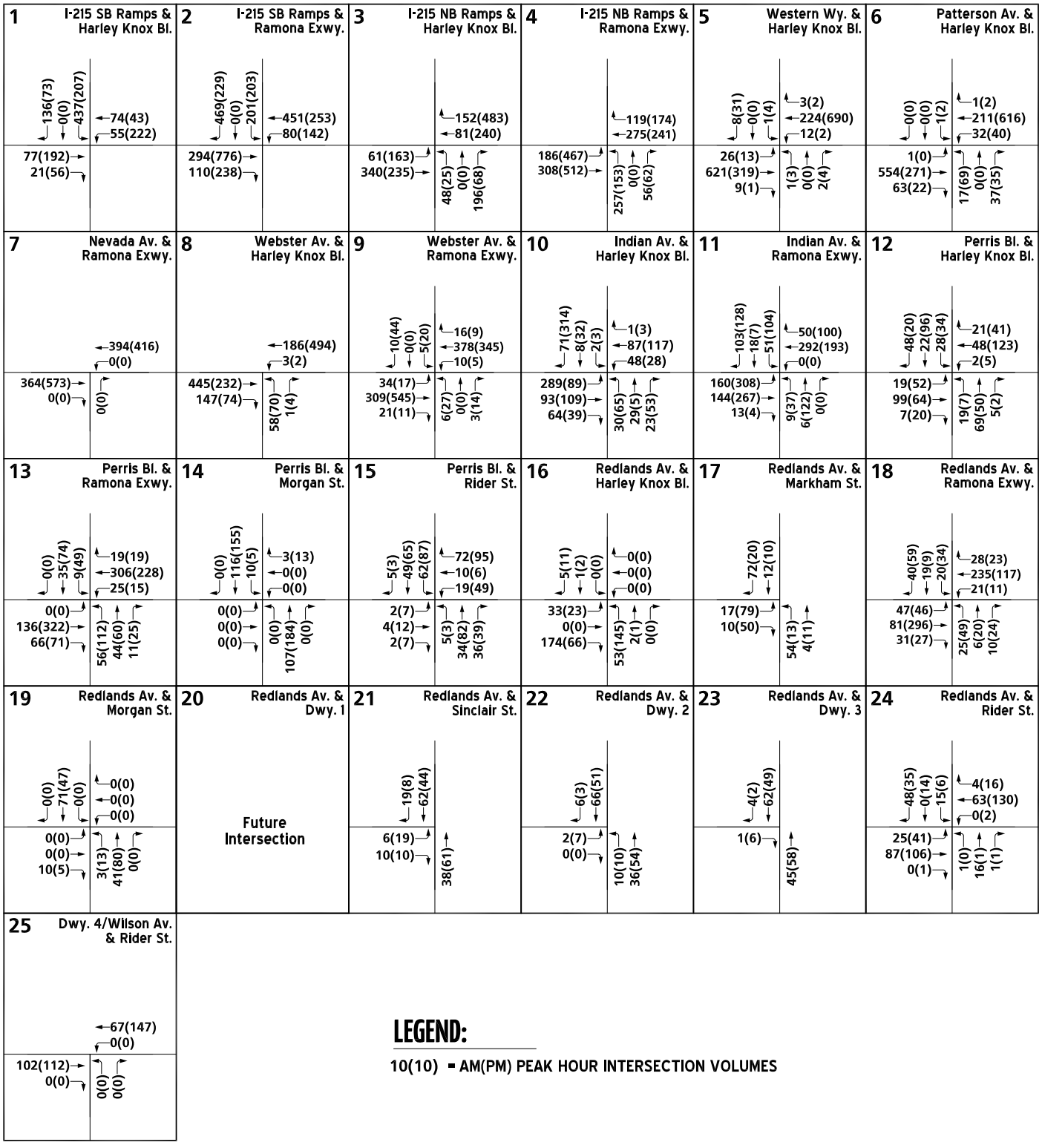


Table 4-3

Cumulative Development Land Use Summary

No.	Project Name / Case Number	Jurisdiction	Land Use[1]	Quantity	Units[2]	Location
P1	Bargemann / DPR 07-09-0018	Perris	Warehousing	173.000	TSF	NEC OF WEBSTER AVE. & NANCE AVE.
P2	Duke 2 / DPR 16-00008	Perris	High-Cube Warehouse	669.000	TSF	NEC OF INDIAN AVE. & MARKHAM ST.
P3	First Perry / DPR 16-00013	Perris	High-Cube Warehouse	240.000	TSF	SWC OF REDLANDS AVE. & PERRY ST.
P4	Gateway / DPR 16-00003	Perris	High-Cube Warehouse	400.000	TSF	SOUTH OF HARLEY KNOX BLVD. EAST OF HWY. 215
P5	Integra / DPR 14-02-0014	Perris	High-Cube Warehouse	864.000	TSF	EAST OF WEBSTER AVE. SOUTH OF NANCE ST.
P6	OLC 1 / DPR 12-10-0005	Perris	High-Cube Warehouse	1,455.000	TSF	WEST OF WEBSTER AVE. NORTH OF RAMONA EXWY
P7	OLC2 / DPR 14-01-0015	Perris	High-Cube Warehouse	1,037.000	TSF	WEST OF WEBSTER AVE. NORTH OF MARKHAM ST.
P8	Markham East / DPR 05-0477	Perris	High-Cube Warehouse	460.000	TSF	SWC OF REDLANDS AVE. & MARKHAM ST.
P9	Markham Industrial / DPR 16-00015	Perris	Warehousing	170.000	TSF	NEC OF INDIAN AVE. & MARKHAM ST.
P10	Rados / DPR 07-0119	Perris	High-Cube Warehouse	1,200.000	TSF	NWC OF INDIAN AVE. & RIDER ST.
P11	Rider 1 / DPR 16-0365	Perris	High-Cube Warehouse	350.000	TSF	SWC OF REDLANDS AVE. & RIDER ST.
P12	Indian/Ramona Warehouse / DPR 18-00002	Perris	High-Cube Warehouse	428.730	TSF	NORTH OF RAMONA EXWY. WEST OF INDIAN AVE.
P13	Rider 3 / DPR 06-0432	Perris	High-Cube Warehouse	640.000	TSF	NORTH OF RIDER ST. WEST OF REDLANDS AVE.
P14	Westcoast Textile / DPR 16-00001	Perris	Warehousing	180.000	TSF	SWC OF INDIAN ST. & NANCE ST.
P15	Duke at Patterson / DPR 17-00001	Perris	High-Cube Warehouse	811.000	TSF	SEC OF PATTERSON AVE. & MARKHAM ST.
P16	Harley Knox Commerce Park / DPR 16-004	Perris	High-Cube Warehouse	386.278	TSF	NWC OF HARLEY KNOX BLVD. & REDLANDS AVE.
P17	Perris Marketplace / DPR 05-0341	Perris	Commercial Retail	520.000	TSF	WEST OF PERRIS BLVD. AT AVOCADO AVE.
P18	Stratford Ranch Residential / TTM 36648	Perris	SFDR	270	DU	WEST OF EVANS RD. AT MARKHAM ST.
P19	Pulte Residential / TTM 30850	Perris	SFDR	496	DU	WEST OF EVANS RD. AT CITRUS AVE.
P20	Perris Circle 3	Perris	Warehousing	210.900	TSF	NWC OF REDLANDS AVE. AND NANCE AVE.
P21	Duke Realty - Perris & Markham	Perris	High-Cube Warehouse	1,189.860	TSF	SEC OF PERRIS BL. AND MARKHAM ST.
P22	Weinerschnitzel / CUP 17-05083	Perris	Fast-Food Restaurant	2.000	TSF	WEST OF PERRIS BL., SOUTH OF PLACENTIA AVE.
P23	March Plaza / CUP16-05165	Perris	Commercial Retail	47.253	TSF	NWC OF PERRIS BL. AND HARLEY KNOX BL.
P24	Cali Express Carwash / CUP 16-05258	Perris	Carwash	5.600	TSF	NWC OF PERRIS BL. AND RAMONA EXWY.
P25	Wilson Industrial / DPR 19-00007	Perris	High-Cube Warehouse	303.000	TSF	SEC OF WILSON AVE. AND RIDER ST.
P26	Integra Expansion / MMOD 17-05075	Perris	High-Cube Warehouse	273.000	TSF	NCE OF MARKHAM ST. AND WEBSTER AVE.
P27	Western Industrial / DRP 19-00003	Perris	High-Cube Warehouse	250.000	TSF	NEC or WESTERN WY. AND NANDINA AVE.

Table 4-3

Cumulative Development Land Use Summary

No.	Project Name / Case Number	Jurisdiction	Land Use[1]	Quantity	Units[2]	Location
MV1	Kearney	Moreno Valley	High-Cube Warehouse	1100.000	TSF	EAST OF PERRIS BLVD. AT SAN MICHEL RD.
MV2	IDS	Moreno Valley	High-Cube Warehouse	701.000	TSF	SEC OF HEACOCK ST. & SAN MICHELE RD.
MV3	First Industrial	Moreno Valley	High-Cube Warehouse	1380.000	TSF	SWC OF INDIAN AVE. & NANDINA AVE.
MV4	Prologis 1	Moreno Valley	High-Cube Warehouse	1000.000	TSF	NEC OF INDIAN AVE. & MARIPOSA AVE.
MV5	Moreno Valley Industrial Park	Moreno Valley	High-Cube Warehouse	207.684	TSF	NEC OF HEACOCK ST. & IRIS AVE.
MV6	Moreno Valley Walmart	Moreno Valley	Retail	193.000	TSF	SWC OF PERRIS BLVD. & GENTIAN AVE.
MV7	Moreno Valley Utility Substation	Moreno Valley	High-Cube Warehouse	PUBLIC	TSF	NWC OF EDWIN RD. & KITCHING ST.
MV8	Phelan Development	Moreno Valley	High-Cube Warehouse	98.210	TSF	SEC OF INDIAN ST. & NANDINA AVE.
MV9	Nandina Industrial Center	Moreno Valley	High-Cube Warehouse	335.966	TSF	SOUTH OF NANDINA AVE. WEST OF PERRIS BLVD.
MV10	Indian Street Commerce Center	Moreno Valley	High-Cube Warehouse	433.918	TSF	SWC OF INDIAN ST. & GROVEVIEW RD.
MV11	Tract 22180	Moreno Valley	SFDR	140	DU	NORTH OF GENTIAN AVE. EAST OF INDIAN ST.
MV12	Tract 36760	Moreno Valley	SFDR	221	DU	SEC OF INDIAN ST. & GENTIAN AVE.
MV13	PEN18-0042	Moreno Valley	SFDR	2	DU	SEC OF INDIAN ST. & KRAMERIA AVE.
MV14	Tract 33024	Moreno Valley	SFDR	8	DU	SEC OF INDIAN ST. & KRAMERIA AVE.
MV15	Tract 32716	Moreno Valley	SFDR	57	DU	NEC OF INDIAN ST. & MARIPOSA AVE.
MV16	Tract 31442	Moreno Valley	SFDR	63	DU	NWC OF PERRIS BLVD. & MARIPOSA AVE.
RC1	McCanna Hills / TTM 33978	County of Riverside	SFDR	63	DU	SWC OF SHERMAN AVE. & WALNUT AVE.

[1] SFDR = Single Family Detached Residential

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

4.7 TRAFFIC FORECASTS

An E+P analysis scenario has been included to address a recent CEQA case ruling, which asserts that impacts of a proposed project must be measured against the current existing physical conditions.

To provide a comprehensive assessment of potential transportation network deficiencies, two types of analyses, "buildup" and "buildout", were performed in support of this work effort. The buildup method was utilized to approximate the EA/EAP and EAC/EAPC conditions for the analysis year of 2021, and is intended to identify the near-term cumulative impacts on both the existing and planned near-term circulation system. The EA/EAP traffic condition includes background traffic and the traffic generated by the proposed Project. The EAC/EAPC traffic condition includes traffic generated by other cumulative development projects within the study area in addition to the background traffic and traffic generated by the proposed Project.

4.8 NEAR-TERM TRAFFIC CONDITIONS

The "buildup" approach combines existing traffic counts with a background ambient growth factor to forecast EA (2021), EAP (2021), EAC (2021), and EAPC (2021) traffic conditions. An ambient growth factor of 3.0% per year account for background (area-wide) traffic increases that occur over time up to the year 2021 from the year 2019 (3.0 percent per year growth rate, compounded over a 2-year period). Traffic volumes generated by the Project are then added to assess the near-term traffic conditions. The 2021 roadway networks are similar to the Existing conditions roadway network, with the exception of future driveways proposed to be developed by the Project.

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

- Existing Plus Ambient Growth (2021)
  - Existing 2019 counts
  - Ambient growth traffic (6.09%)
- Existing Plus Ambient Growth Plus Project (2021)
  - Existing 2019 counts
  - Ambient growth traffic (6.09%)
  - Project traffic
- Existing Plus Ambient Growth Plus Cumulative (2021)
  - Existing 2019 counts
  - Ambient growth traffic (6.09%)
  - Cumulative Development traffic

- Existing Plus Ambient Growth Plus Project Plus Cumulative (2021)
  - Existing 2019 counts
  - Ambient growth traffic (6.09%)
  - Cumulative Development traffic
  - Project traffic

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5 CONSTRUCTION TRAFFIC ASSESSMENT

This section discusses the findings of the potential construction traffic impacts associated with the Project.

5.1 PERRIS VALLEY STORM DRAIN AND PROJECT SITE DEVELOPMENT (RIDER 2 AND 4)

The proposed storm drain development involves the construction and subsequent operations and maintenance of improvements to the PVSD Channel and bridge at Rider Street to the ultimate conditions across the PVSD as shown on Exhibit 5-1. The PVSD Channel is currently maintained by the Riverside County Flood Control and Water Conservation District (RCF&WCD). The Project currently crosses over the Colorado River Aqueduct (CRA) located within Metropolitan Water District (MWD) property between Morgan Street and Rider Street.

The proposed Rider 2 building would be 806,351 sf and the proposed Rider 4 building would be 567,098 sf, where each building would accommodate high-cube, non-refrigerated warehouse/distribution uses. The buildings would be up to 44-feet and 10-inches high.

5.1.1 PVSD CHANNEL IMPROVEMENTS

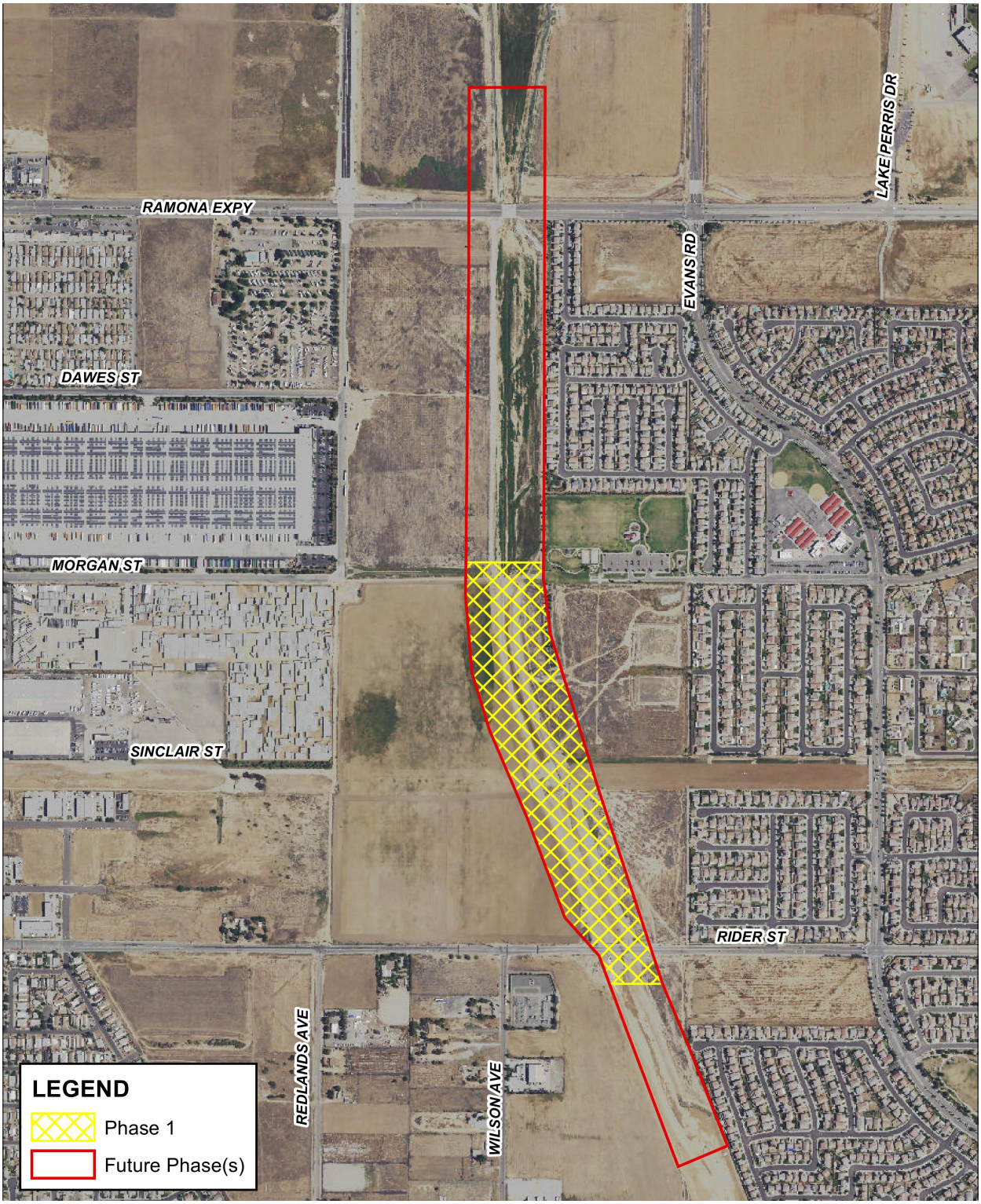
The proposed improvements to the PVSD Channel entail Phase 1 of a larger channel improvement project, which would ultimately extend north to just past Ramona Expressway and south of Rider Street. Phase 1 of the proposed PVSD Channel improvements begins approximately 100 feet north of Morgan Street. The PVSD Channel in this area would transition to a 550-foot-wide channel. The proposed PVSD Channel right-of-way would be up to 580-feet-wide and would include 15-foot wide access roads on each side until it reaches the CRA.

The Project has been designed to protect the CRA and associated existing MWD manholes in place. Downstream of the CRA, the PVSD Channel would be deepened and would transition with an engineered drop structure at the MWD easement to a 440-foot-wide channel with a 56-foot-wide by 5-foot-deep low flow channel. In this area, the proposed PVSD Channel right-of-way would be 495-feet-wide and would also include 15-foot wide access roads on each side. The PVSD Channel would be earthen except in the vicinity of the engineered drop structure and Rider Street bridge, where it would have concrete side slopes. Erosion protection features would be installed, and existing storm drain inlets that tie into the PVSD would be reconstructed as part of the Project.

5.1.2 BRIDGE IMPROVEMENTS

The existing Rider Street crossing over the PVSD Channel includes one travel lane in each direction, with a painted median and shoulders, and is supported by a reinforced concrete box (RCB) culvert. The existing crossing would be replaced and widened to allow for two travel lanes and a sidewalk in each direction, in conjunction with a median, consistent with its designation as a Secondary Arterial. The proposed bridge span is approximately 235 feet long by 74 feet wide. The PVSD Channel would be soft-bottomed, and the bridge would be supported by concrete piers spaced at 30-foot intervals (on center).

EXHIBIT 5-1: PERRIS VALLEY STORM DRAIN SITE PLAN



5.1.3 SOIL EXPORT

Construction of the proposed Project would involve grading of the Project site (Rider 2 and 4) and will require approximately 180,000 cubic yards of soil import (from PVSD). The soil will be imported from PVSD to the adjacent vacant land area for Rider 2 and 4 using scrapers, which eliminates the need for dump trucks to haul the soil.

5.1.4 CONSTRUCTION TIMELINE

Project construction is expected to commence in October 2020 and be completed by December 2021.

5.2 CONSTRUCTION TRAFFIC

Traffic operations during the proposed construction phase of the project may potentially result in temporary and transient traffic impacts related to construction employees, export of soil, heavy equipment, etc. It is anticipated that the following construction-related activities would generate traffic and may potentially result in construction-related traffic impacts:

- Employee trips
- Heavy Equipment
- Overlap of Construction-related Activities

Each of the traffic generating activities listed above is discussed thoroughly in the subsequent sections. It has been assumed that construction activity will occur during the hours of 6:30 AM and 4:00 PM.

5.2.1 EMPLOYEE TRIPS

Employee trips are estimated based on the number of employees estimated to be on-site throughout the various stages of construction. It has been assumed that employees will arrive up to 30 minutes prior to the workday and will leave up to 30 minutes after the workday ends. Parking for employees and non-employee vehicles can be accommodated through the construction of a portion of the proposed parking lot for the project.

It is anticipated that construction employees would arrive to the site prior to the morning peak period (before 7:00 AM) and most will depart before the evening peak period (before 4:00 PM). Each employee is assumed to drive to and from the site alone each day. As such, the impacts of construction-related employee traffic are considered less-than-significant since they occur outside the typical commute peak hours.

5.2.2 HEAVY EQUIPMENT

Heavy equipment to be utilized on-site during construction include, but is not limited to scrapers, graders, tractors, water trucks, pavers, and rollers. Heavy equipment will be delivered and removed from the site throughout the construction phase. As most heavy equipment is typically not an authorized vehicle to be driven on a public roadway, most of the equipment will be delivered and removed from the site via large flatbed trucks. It is anticipated that delivery of

heavy equipment would not occur on a daily basis, but rather periodically throughout the construction phase based on need.

The delivery and removal of heavy equipment is recommended to occur outside of the morning and evening peak hours in order to have nominal impacts to traffic and circulation near the vicinity of the Project. If this measure is applied, it is anticipated that traffic impacts associated with the delivery and removal of heavy equipment are less-than-significant.

5.2.3 OVERLAP OF CONSTRUCTION-RELATED ACTIVITIES

Based on information provided by the project's engineer and the construction schedule summarized in the IDI Rider 2 and 4 High Cube Warehouse and Perris Valley Storm Drain Channel Improvement Project Air Quality Impact Analysis (Urban Crossroads, Inc. 2019), Channel excavation activities have the potential to overlap with Rider Bridge grubbing/land clearing activities and IDI Rider 2 and 4 site preparation activities. (15) For purposes of analysis, Channel construction activities are assumed to overlap with Rider 2 and 4 construction activities. The overlapping construction activity is the basis for the maximum peak daily trips.

5.2.4 TRIP GENERATION

Table 5-1 illustrates the construction trips resulting from each phase of construction. It should be noted that the daily trips presented in Table 5-1 do not account for the potential overlap of construction activities.

TABLE 5-1: DAILY TRIPS BASED ON CONSTRUCTION ACTIVITIES

Activity	Activity Type	Number of Employees	Employee (2-Way) Trips
Channel Excavation	Excavation	7	14
Channel Construction	Grubbing/Land Clearing	7	14
	Grading/Excavation	29	58
	Drainage/Utilities/Sub-Grade	19	38
	Paving	9	18
Rider 2 and 4 Construction	Site Preparation	4	8
	Grading	4	8
	Building Construction	5	10
	Paving	1	2
	Architectural Coating	3	6

Table 5-2 presents peak daily trips based on overlapping construction activity for the proposed Project. As indicated at Table 5-2, the maximum trips the Project could generate would be approximately 82 trips during the overlap in activities during Channel excavation, grubbing/land clearing activities during Channel construction, and grading activities during Rider 2 and 4 construction.

TABLE 5-2: DAILY TRIPS BASED ON OVERLAPPING ACTIVITIES

Overlapping Activities			Employee (2-Way) Trips
Occurrence	**Activity**	**Activity Type**	
1	Channel Excavation	Excavation	14
	Channel Construction	Grubbing/Land Clearing	14
	Rider 2 and 4 Construction	Site Preparation	8
Total Maximum Daily Trips (Overlap Occurrence 1)			**36**
2	Channel Construction	Grading/Excavation	58
	Rider 2 and 4 Construction	Grading	8
	Rider 2 and 4 Construction	Building Construction	10
	Rider 2 and 4 Construction	Paving	2
	Rider 2 and 4 Construction	Architectural Coating	6
Total Maximum Daily Trips (Overlap Occurrence 2)			**84**
3	Channel Construction	Drainage/Utilities/Sub-Grade	38
	Rider 2 and 4 Construction	Building Construction	10
	Rider 2 and 4 Construction	Paving	2
	Rider 2 and 4 Construction	Architectural Coating	6
Total Maximum Daily Trips (Overlap Occurrence 3)			**56**
4	Channel Construction	Paving	2
	Rider 2 and 4 Construction	Building Construction	10
	Rider 2 and 4 Construction	Paving	2
	Rider 2 and 4 Construction	Architectural Coating	6
Total Maximum Daily Trips (Overlap Occurrence 4)			**20**
5	Rider 2 and 4 Construction	Building Construction	10
	Rider 2 and 4 Construction	Paving	2
	Rider 2 and 4 Construction	Architectural Coating	6
Total Maximum Daily Trips (Overlap Occurrence 5)			**18**

As noted above, it is anticipated that construction employees would arrive to the site prior to the morning peak period (before 7:00 AM) and most would depart before the evening peak period (before 4:00 PM). As a conservative measure, it is assumed that 25% of maximum of 84 daily trips (identified in Table 5-2) could occur during either peak hour. As such, the construction worker vehicles are forecast to generate approximately 22 peak hour trips. No additional analysis is necessary as the Project is anticipated to generate fewer than 50 peak hour trips. Heavy truck trips during the construction period that are associated with vendor trips or material delivery are anticipated to occur during the off-peak hours and would not exceed 50 peak hour trips.

Consistent with the PVCC SP EIR mitigation measures for Air (see below), the Project Applicant would be required to develop and implement a City-approved Construction Traffic Management Plan addressing potential construction-related traffic detours and disruptions. In general, the Construction Traffic Management Plan would ensure that to the extent practical, construction traffic would access the Project site during off-peak hours; and that construction traffic would be routed to avoid travel through, or proximate to, sensitive land uses.

MM Air 2 Each individual implementing development project shall submit a traffic control plan prior to the issuance of a grading permit. The traffic control plan shall describe in detail safe detours and provide temporary traffic control during construction activities for that project. To reduce traffic congestion, the plan shall include, as necessary, appropriate, and practicable, the following: temporary traffic controls such as a flag person during all phases of construction to maintain smooth traffic flow, dedicated turn lanes for movement of construction trucks and equipment on- and off-site, scheduling of construction activities that affect traffic flow on the arterial system to off-peak hour, consolidating truck deliveries, rerouting of construction trucks away from congested streets or sensitive receptors, and/or signal synchronization to improve traffic flow.

6 E+P TRAFFIC CONDITIONS

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

6.1 ROADWAY IMPROVEMENTS

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

- Project driveways and those facilities assumed to be constructed by the Project to provide site access are also assumed to be in place for E+P conditions only (e.g., intersection and roadway improvements at the Project's frontage and driveways).
- The Harley Knox Boulevard improvements, from the I-215 Freeway to Patterson Avenue, are completed and in place.

6.2 E+P TRAFFIC VOLUME FORECASTS

This scenario includes Existing traffic volumes plus Project traffic. Exhibit 6-1 shows the ADT volumes and Exhibit 6-2 peak hour intersection turning movement volumes (in PCE), which can be expected for E+P traffic conditions.

6.3 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 6-1, which indicates that with the addition of Project traffic and the roadway improvements identified in Section 6.1 *Roadway Improvements*, all study area intersections are anticipated to operate at an acceptable LOS during the peak hours for E+P traffic conditions.

Exhibit 6-3 summarizes the weekday AM and PM peak hour study area intersection LOS under E+P traffic conditions, consistent with the summary provided in Table 6-1. The intersection operations analysis worksheets are included in Appendix 6.1 of this TIA.

6.4 TRAFFIC SIGNAL WARRANTS ANALYSIS

There are no additional study area intersections anticipated to meet planning level (ADT) or peak hour volume-based traffic signal warrants under E+P traffic conditions, in addition to the intersections previously identified under Existing (2019) traffic conditions (see Appendix 6.2).

EXHIBIT 6-1: E+P AVERAGE DAILY TRAFFIC (ADT) (IN PCE)

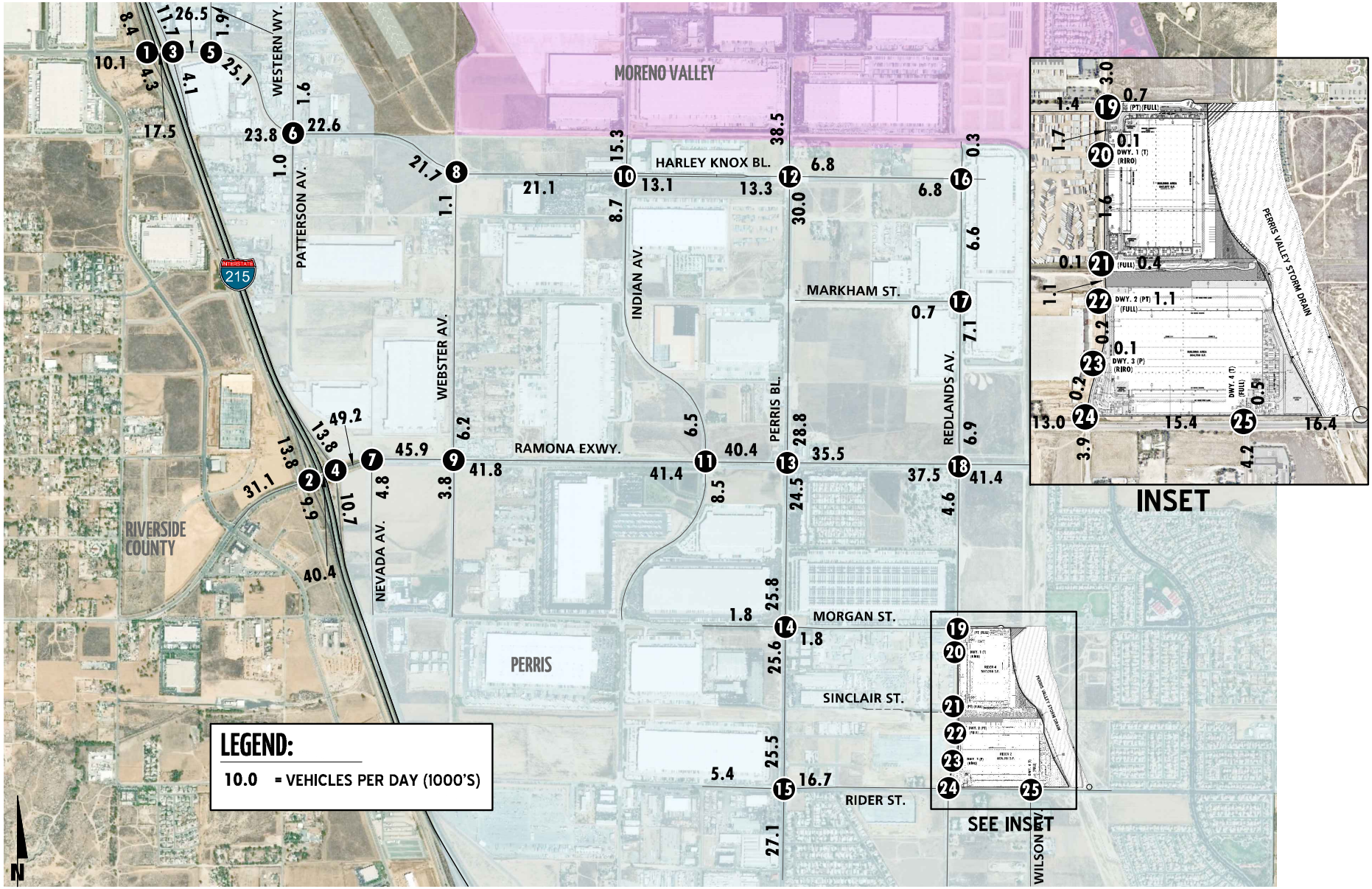


EXHIBIT 6-2: E+P TRAFFIC VOLUMES (IN PCE)

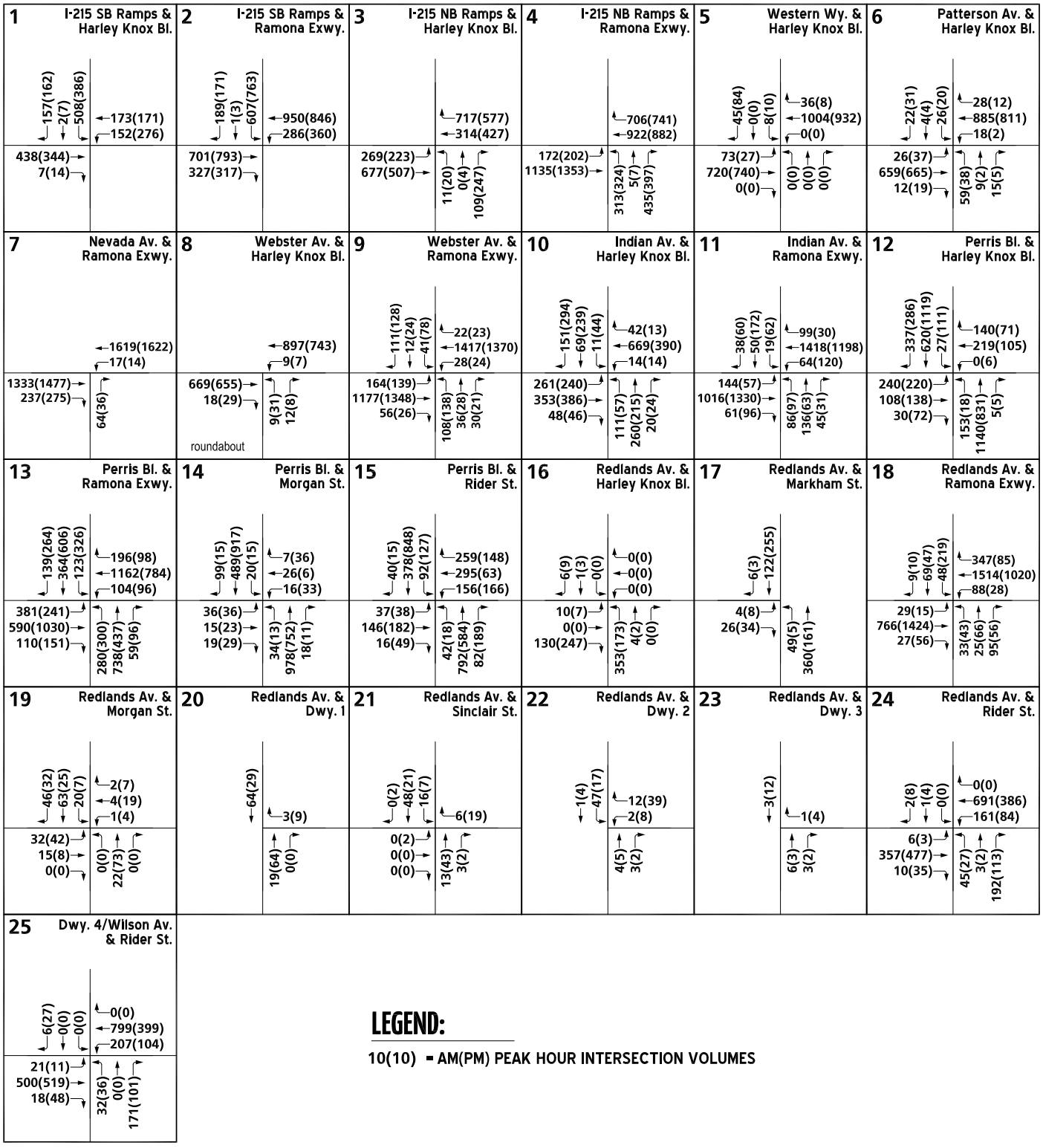


EXHIBIT 6-3: E+P SUMMARY OF LOS

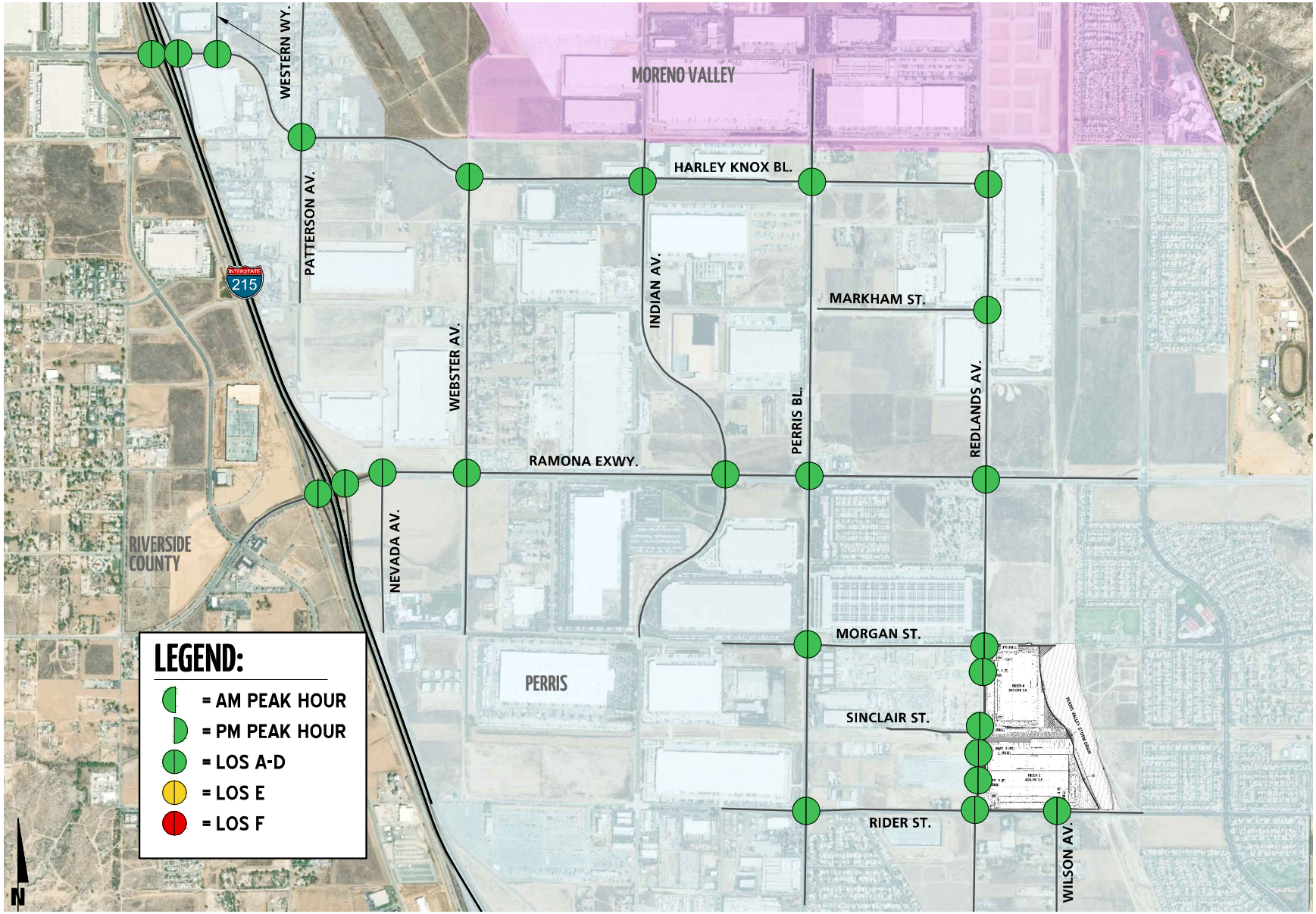


Table 6-1

Intersection Analysis for E+P Conditions

#	Intersection	Traffic Control[2]	Existing (2019) Delay[1] (secs.) AM	Existing (2019) Delay[1] (secs.) PM	Existing (2019) Level of Service AM	Existing (2019) Level of Service PM	E+P Delay[1] (secs.) AM	E+P Delay[1] (secs.) PM	E+P Level of Service AM	E+P Level of Service PM	Acceptable LOS
1	I-215 Southbound Ramps & Harley Knox Bl.	TS	31.8	39.5	C	D	42.0	48.9	D	D	D
2	I-215 Southbound Ramps & Ramona Exwy.	TS	31.1	34.3	C	C	31.4	35.0	C	C	D
3	I-215 Northbound Ramps & Harley Knox Bl.	TS	24.5	16.0	C	B	25.3	17.0	C	B	D
4	I-215 Northbound Ramps & Ramona Exwy.	TS	18.5	18.9	B	B	18.8	19.2	B	B	D
5	Western Wy. & Harley Knox Bl.	TS[3]	7.4	7.9	A	A	7.4	7.9	A	A	D
6	Patterson Av. & Harley Knox Bl.	TS[3]	10.2	9.7	B	A	10.2	9.7	B	A	D
7	Nevada Av. & Ramona Exwy.	CSS	18.8	19.1	C	C	19.3	19.3	C	C	D
8	Webster Av. & Harley Knox Bl.	RA	11.4	10.3	B	B	11.9	11.8	B	B	D
9	Webster Av. & Ramona Exwy.	TS	19.9	20.1	B	C	19.9	20.2	B	C	D
10	Indian Av. & Harley Knox Bl.	TS	21.3	21.7	C	C	21.4	21.8	C	C	D
11	Indian Av. & Ramona Exwy.	TS	20.2	20.1	C	C	20.2	20.2	C	C	D
12	Perris Bl. & Harley Knox Bl.	TS	31.5	28.2	C	C	31.7	28.2	C	C	D
13	Perris Bl. & Ramona Exwy.	TS	37.7	27.8	D	C	37.8	28.5	D	C	E
14	Perris Bl. & Morgan St.	TS	12.1	12.6	B	B	12.7	13.2	B	B	D
15	Perris Bl. & Rider St.	TS	19.4	18.6	B	B	19.8	19.0	B	B	D
16	Redlands Av. & Harley Knox Bl.	TS	11.0	10.8	B	B	12.6	11.9	B	B	D
17	Redlands Av. & Markham St.	AWS	7.9	8.2	A	A	8.3	8.5	A	A	D
18	Redlands Av. & Ramona Exwy.	TS	13.8	19.1	B	B	15.1	20.3	B	C	D
19	Redlands Av. & Morgan St.	AWS/**CSS**	7.3	7.5	A	A	10.1	9.9	B	A	D
20	Redlands Av. & Dwy. 1	--/**CSS**	Future Intersection				8.4	8.5	A	A	D
21	Redlands Av. & Sinclair St.	UC/**CSS**	0.0	8.5	A	A	8.4	9.0	A	A	D
22	Redlands Av. & Dwy. 2	--/**TS**	Future Intersection				30.6	30.5	C	C	D
23	Redlands Av. & Dwy. 3	--/**CSS**	Future Intersection				8.3	8.3	A	A	D
24	Redlands Av. & Rider St.	CSS/**TS**	**36.3**	22.2	**E**	C	19.3	16.4	B	B	D
25	Driveway 4/Wilson Av. & Rider St.	CSS/**TS**	25.8	16.2	D	C	23.0	16.7	C	B	D

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

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

[2] UC = Uncontrolled; AWS = All-way Stop; CSS = Cross-street Stop; RA = Roundabout; TS = Traffic Signal;**TS** = Improvement

[3] Includes the completion of the Harley Knox Boulevard improvements.

6.5 OFF-RAMP QUEUING ANALYSIS

A queuing analysis was performed for the off-ramps at the I-215 Freeway Harley Knox Boulevard and Ramona Expressway 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 6-2. It is important to note that off-ramp lengths are consistent with the measured distance between the intersection and the freeway mainline. As shown in Table 6-2, there are no movements that are anticipated to experience queuing issues during the weekday AM or weekday PM peak 95th percentile traffic flows. Worksheets for E+P traffic conditions off-ramp queuing analysis are provided in Appendix 6.3.

6.6 BASIC FREEWAY SEGMENT ANALYSIS

E+P mainline directional volumes for the AM and PM peak hours are provided on Exhibit 6-4. As shown in Table 6-3, the following I-215 Freeway segments analyzed for this study were found to operate at an unacceptable LOS (i.e., LOS E or worse) during the peak hours for E+P traffic conditions, consistent with Existing (2019) traffic conditions:

- I-215 Freeway Northbound, North of Harley Knox Boulevard (#4) – LOS F AM and PM peak hours
- I-215 Freeway Northbound, Harley Knox Boulevard to Ramona Expressway (#5) – LOS F AM and PM peak hours
- I-215 Freeway Northbound, South of Ramona Expressway (#6) – LOS F AM and PM peak hours

E+P basic freeway segment analysis worksheets are provided in Appendix 6.4.

6.7 FREEWAY MERGE/DIVERGE ANALYSIS

Ramp merge and diverge operations were also evaluated for E+P conditions and the results of this analysis are presented in Table 6-4. As shown in Table 6-4, the following I-215 Freeway ramp merge and diverge area at Harley Knox Boulevard is anticipated to operate at LOS E or worse during the peak hours under E+P traffic conditions, consistent with Existing (2019) traffic conditions:

- I-215 Freeway, Southbound Off-Ramp at Harley Knox Boulevard (#1) – LOS F AM peak hour only

E+P freeway ramp junction operations analysis worksheets are provided in Appendix 6.5.

Table 6-2

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

Intersection	Movement	Available Stacking Distance (Feet)	Existing (2019)				E+P			
			95th Percentile Queue (Feet)		Acceptable? [1]		95th Percentile Queue (Feet)		Acceptable? [1]	
			AM Peak Hour	PM Peak Hour	AM	PM	AM Peak Hour	PM Peak Hour	AM	PM
I-215 Southbound Ramps & Harley Knox Bl.	SBL/T	1,330	359 [2]	278 [2]	Yes	Yes	399 [2]	293 [2]	Yes	Yes
	SBR	270	37	38	Yes	Yes	37	38	Yes	Yes
I-215 Southbound Ramps & Ramona Exwy.	SBL	530	293	375	Yes	Yes	303	383	Yes	Yes
	SBL/T	1,100	294	380	Yes	Yes	306	386	Yes	Yes
	SBR	530	103	57	Yes	Yes	103	57	Yes	Yes
I-215 Northbound Ramps & Harley Knox Bl.	NBL/T	1,120	18	30	Yes	Yes	18	30	Yes	Yes
	NBR	265	25	68 [2]	Yes	Yes	41	70 [2]	Yes	Yes
I-215 Northbound Ramps & Ramona Exwy.	NBL	520	152	154	Yes	Yes	152	154	Yes	Yes
	NBL/T	1,120	151	154	Yes	Yes	151	154	Yes	Yes
	NBR	520	370 [2]	316	Yes	Yes	408 [2]	324	Yes	Yes

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

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

Table 6-3

Basic Freeway Segment Analysis for E+P Conditions

Freeway	Direction	Mainline Segment	Lanes[1]	Existing (2019)				E+P			
				Density[2]		LOS[3]		Density[2]		LOS[3]	
				AM	PM	AM	PM	AM	PM	AM	PM
I-215 Freeway	Southbound	North of Harley Knox Bl.	3	21.4	31.8	C	D	21.8	32.0	C	D
		Harley Knox Bl. to Ramona Exwy.	3	18.8	29.1	C	D	19.1	30.2	C	D
		South of Ramona Exwy.	3	18.0	27.3	B	D	18.0	28.3	B	D
	Northbound	North of Harley Knox Bl.	3	--[4]	--[4]	**F**	**F**	--[4]	--[4]	**F**	**F**
		Harley Knox Bl. to Ramona Exwy.	3	--[4]	--[4]	**F**	**F**	--[4]	--[4]	**F**	**F**
		South of Ramona Exwy.	3	--[4]	--[4]	**F**	**F**	--[4]	--[4]	**F**	**F**

BOLD = LOS does not meet Caltrans requirements (i.e., unacceptable LOS or LOS E/F).

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

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

[3] LOS = Level of Service

[4] Analysis with constrained flow results in acceptable LOS, however, field observations indicate congestion during the peak hour. As such, the freeway is considered at capacity.

Table 6-4

Freeway Ramp Merge/Diverge Analysis for E+P Conditions

Freeway	Direction	Ramp Junction	Lanes on Freeway	Existing (2019)				E+P			
				AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
				Density[1]	LOS[2]	Density[1]	LOS[2]	Density[1]	LOS[2]	Density[1]	LOS[2]
I-215 Freeway	Southbound	Off-Ramp at Harley Knox Bl.	3	--[3]	**F**	34.6	D	--[3]	**F**	34.7	D
		On-Ramp at Harley Knox Bl.	3	22.4	C	31.0	D	22.0	C	31.3	D
		Off-Ramp at Ramona Exwy.	3	24.2	C	32.2	D	24.5	C	32.4	D
		On-Ramp at Ramona Exwy.	3	20.1	C	28.6	D	20.2	C	28.8	D
	Northbound	On-Ramp at Harley Knox Bl.	3	34.0	D	29.3	D	34.1	D	29.7	D
		Off-Ramp at Harley Knox Bl.	3	29.6	D	27.8	C	29.9	D	28.0	D
		On-Ramp at Ramona Exwy.	3	27.7	C	25.7	C	27.9	C	26.0	C
		Off-Ramp at Ramona Exwy.	3	27.7	C	25.4	C	27.9	C	25.5	C

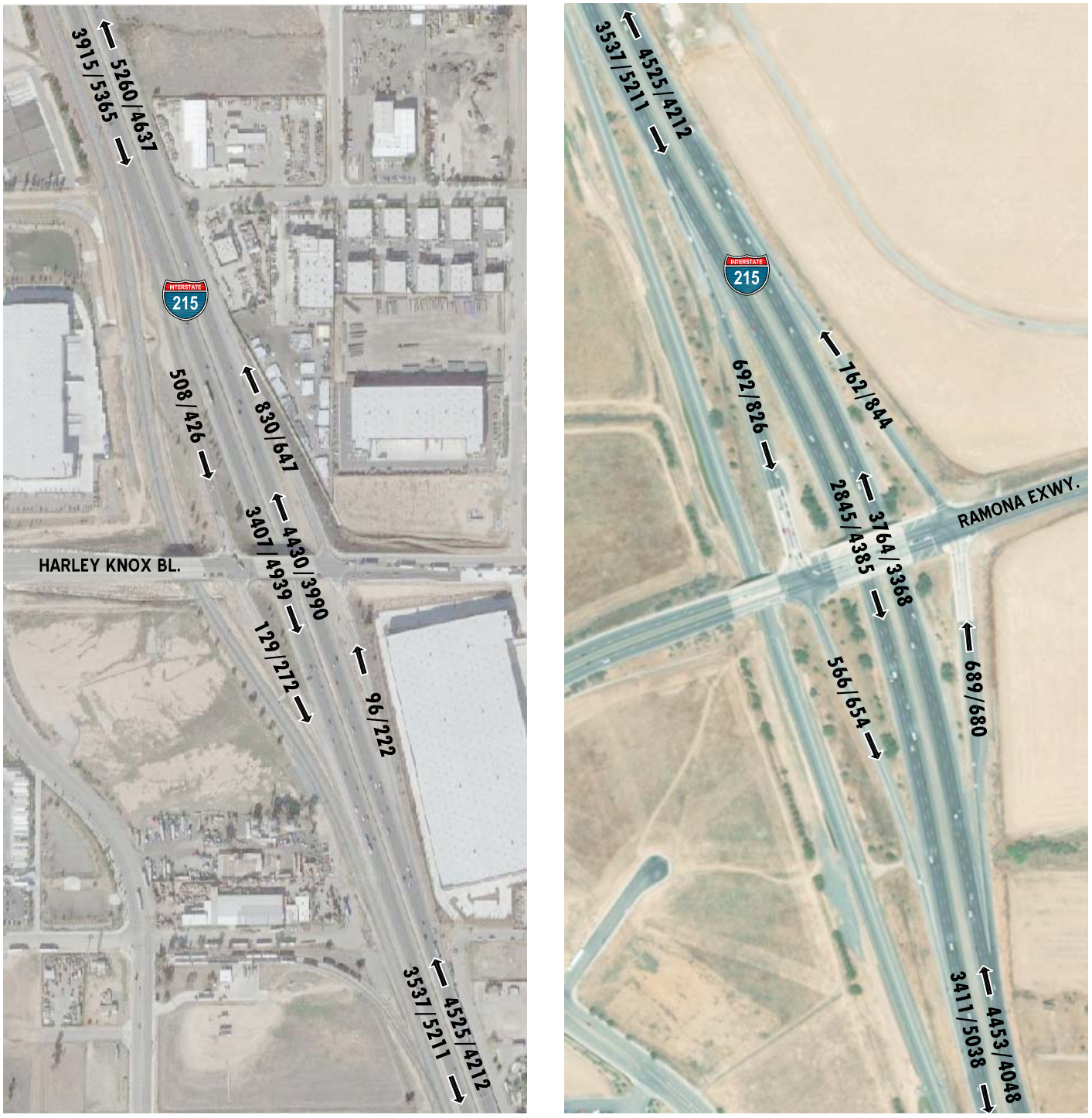
BOLD = LOS does not meet Caltrans requirements (i.e., unacceptable LOS or LOS E/F).

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

[2] LOS = Level of Service

[3] Analysis with constrained flow results in acceptable LOS, however, field observations indicate congestion during the peak hour. As such, the ramp junction is considered at capacity.

EXHIBIT 6-4: E+P FREEWAY MAINLINE VOLUMES



LEGEND:

⟵ 100/200 = AM/PM PEAK HOUR VOLUMES

NOTE: VOLUMES IN ACTUAL VEHICLES (NOT PCE)

N

6.8 RECOMMENDED IMPROVEMENTS

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

6.8.1 RECOMMENDED IMPROVEMENTS TO ADDRESS DEFICIENCIES AT INTERSECTIONS

All study area intersections are anticipated to operate at an acceptable LOS for E+P traffic conditions. As such, no improvements have been recommended.

6.8.2 RECOMMENDED IMPROVEMENTS TO ADDRESS OFF-RAMP QUEUES

As shown previously in Table 6-2, there are no anticipated peak hour queuing issues at the I-215 Freeway at Harley Knox Boulevard and Ramona Expressway interchanges for E+P traffic conditions, consistent with Existing (2019) traffic conditions. As such, no improvements have been recommended.

6.8.3 RECOMMENDED IMPROVEMENTS TO ADDRESS DEFICIENCIES ON FREEWAY FACILITIES

At this time, the I-215 North Project has no anticipated start or completion date. As such, no improvements have been recommended to address the E+P deficiencies on the SHS, because the improvement to the I-215 Freeway is assumed to be completed after the Project buildout year of 2021. There is a significant and unavoidable cumulative impact to the I-215 Freeway facilities for E+P traffic conditions as there are currently no improvements to mitigate the impacts to the SHS.

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7 EA (2021) AND EAP (2021) TRAFFIC CONDITIONS

This section discusses the methods used to develop EA and EAP (2021) traffic forecasts, and the resulting intersection operations, traffic signal warrant, and freeway facility operations analyses.

7.1 ROADWAY IMPROVEMENTS

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

- Project driveways and those facilities assumed to be constructed by the Project to provide site access are also assumed to be in place for EAP conditions only (e.g., intersection and roadway improvements at the Project's frontage and driveways).
- The Harley Knox Boulevard improvements, from the I-215 Freeway to Patterson Avenue, are completed and in place.

7.2 EA (2021) TRAFFIC VOLUME FORECASTS

This scenario includes Existing (2019) traffic volumes plus an ambient growth factor of 6.09%. Exhibit 7-1 shows the weekday ADT volumes and Exhibit 7-2 shows the peak hour volumes which can be expected for EA (2021) traffic conditions.

7.3 EAP (2021) TRAFFIC VOLUME FORECASTS

This scenario includes Existing (2019) traffic volumes plus an ambient growth factor of 6.09% and the addition of Project traffic. Exhibit 7-3 shows the weekday ADT volumes and Exhibit 7-4 shows the peak hour volumes which can be expected for EAP (2021) traffic conditions (in PCE).

7.4 INTERSECTION OPERATIONS ANALYSIS

Level of service calculations were conducted for the study intersections to evaluate their operations under EA and EAP (2021) conditions with existing roadway and intersection geometrics consistent with those described under Section 7.1 *Roadway Improvements*. As shown in Table 7-1 and illustrated on Exhibits 7-5 and 7-6, the following study area intersection is anticipated to operate at an unacceptable LOS under EA (2021) traffic conditions:

- Redlands Av. & Rider St. (#24) – LOS E AM peak hour only

With the addition of Project traffic and the roadway improvements identified in Section 7.1 *Roadway Improvements*, all study area intersections are anticipated to operate at an acceptable LOS during the peak hours for EAP (2021) traffic conditions.

The intersection operations analysis worksheets for EA and EAP (2021) conditions are included in Appendices 7.1 and 7.2 of this report, respectively.

EXHIBIT 7-1: EA (2021) AVERAGE DAILY TRAFFIC (ADT) (IN PCE)

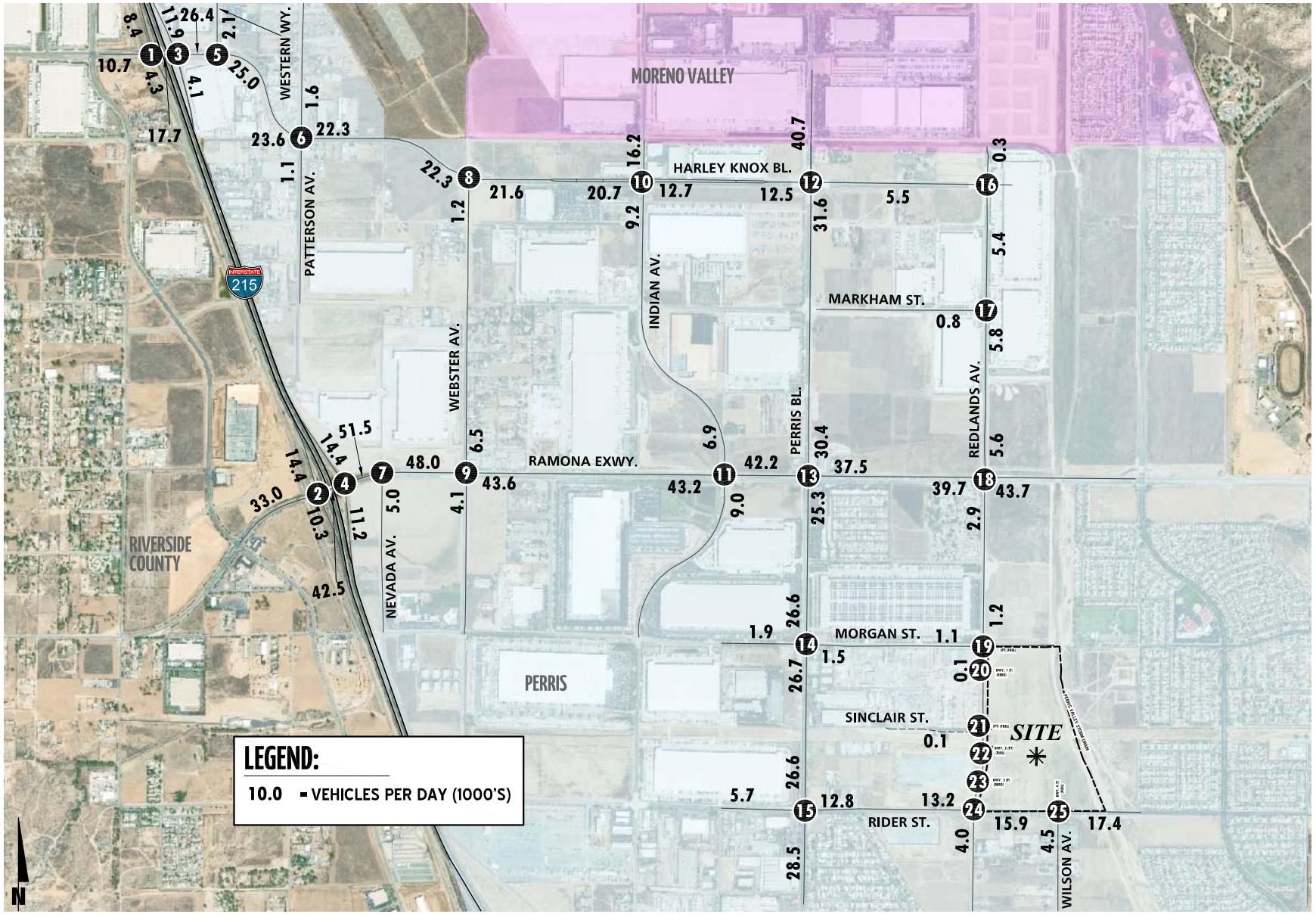

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EXHIBIT 7-2: EA (2021) TRAFFIC VOLUMES (IN PCE)

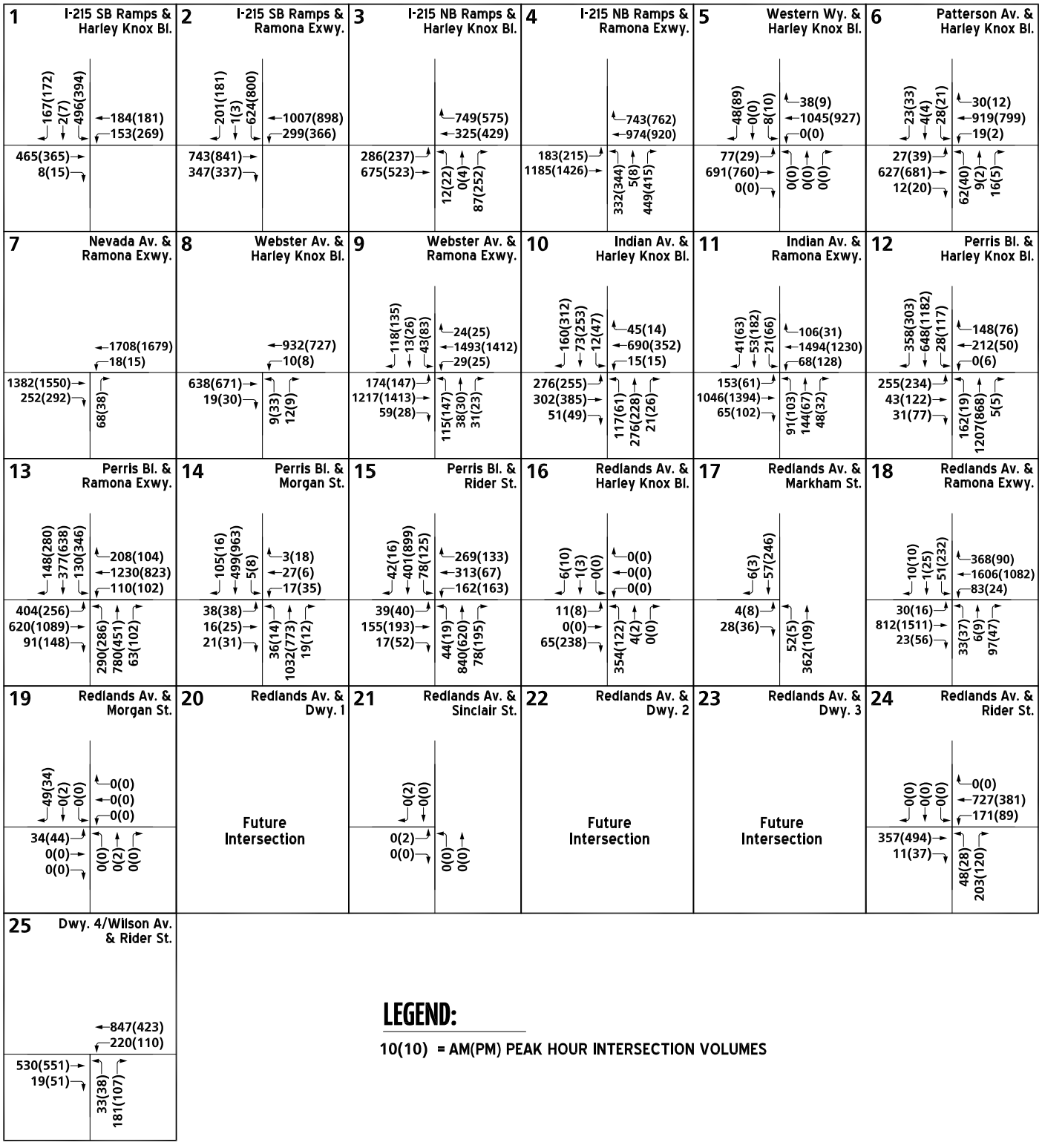

EXHIBIT 7-3: EAP (2021) AVERAGE DAILY TRAFFIC (ADT) (IN PCE)

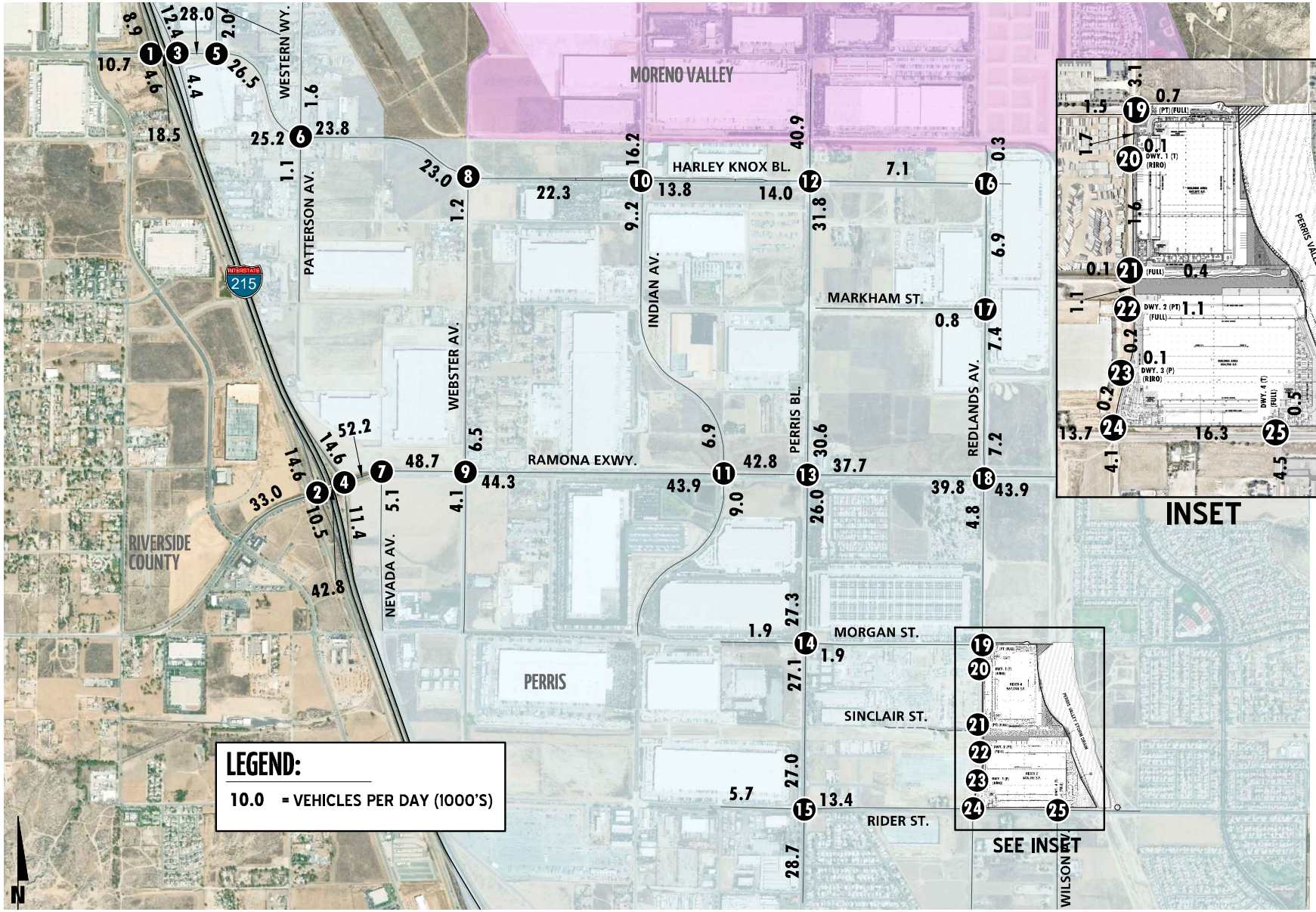

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EXHIBIT 7-4: EAP (2021) TRAFFIC VOLUMES (IN PCE)

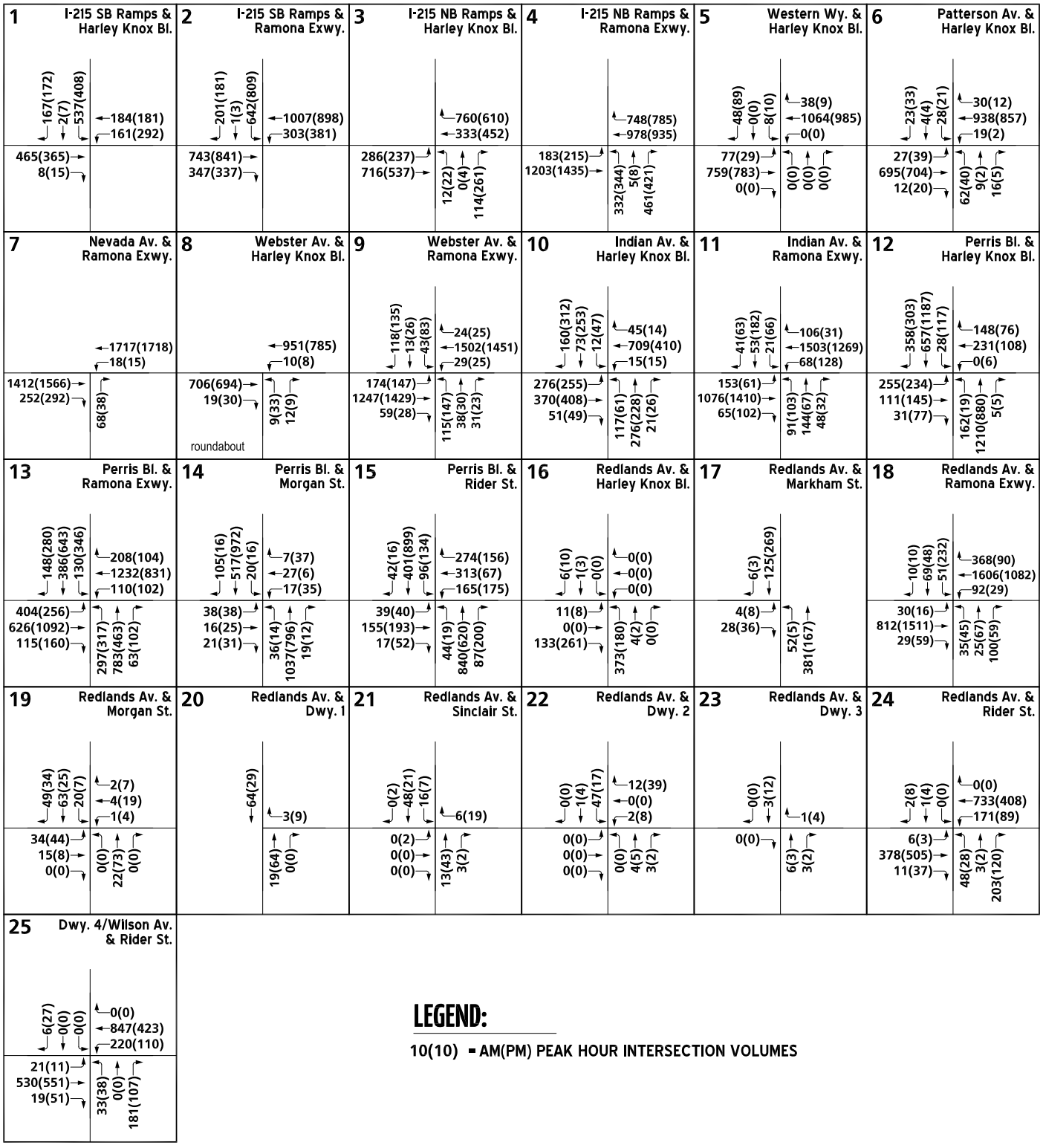

EXHIBIT 7-5: EA (2021) SUMMARY OF LOS

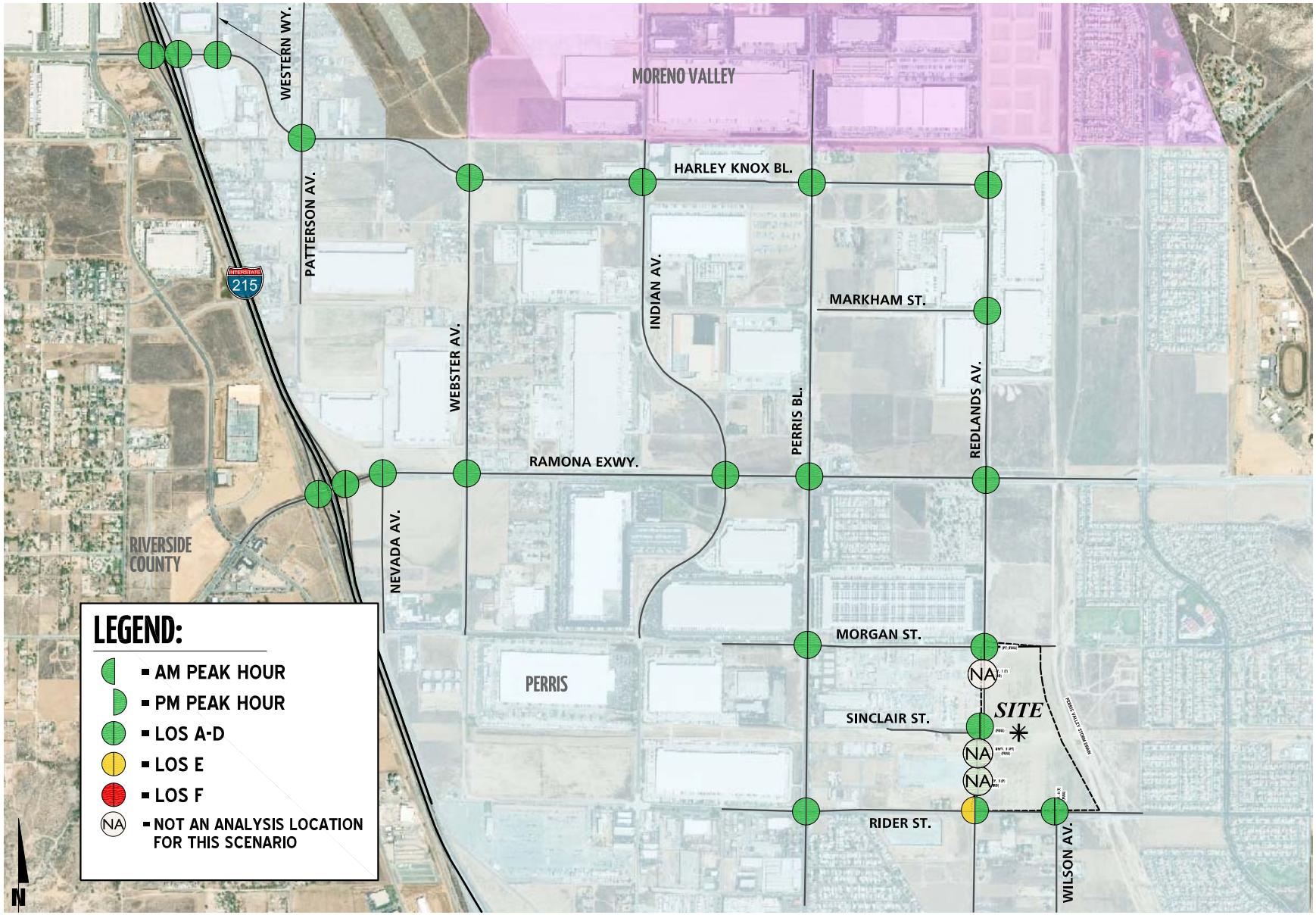

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EXHIBIT 7-6: EAP (2021) SUMMARY OF LOS

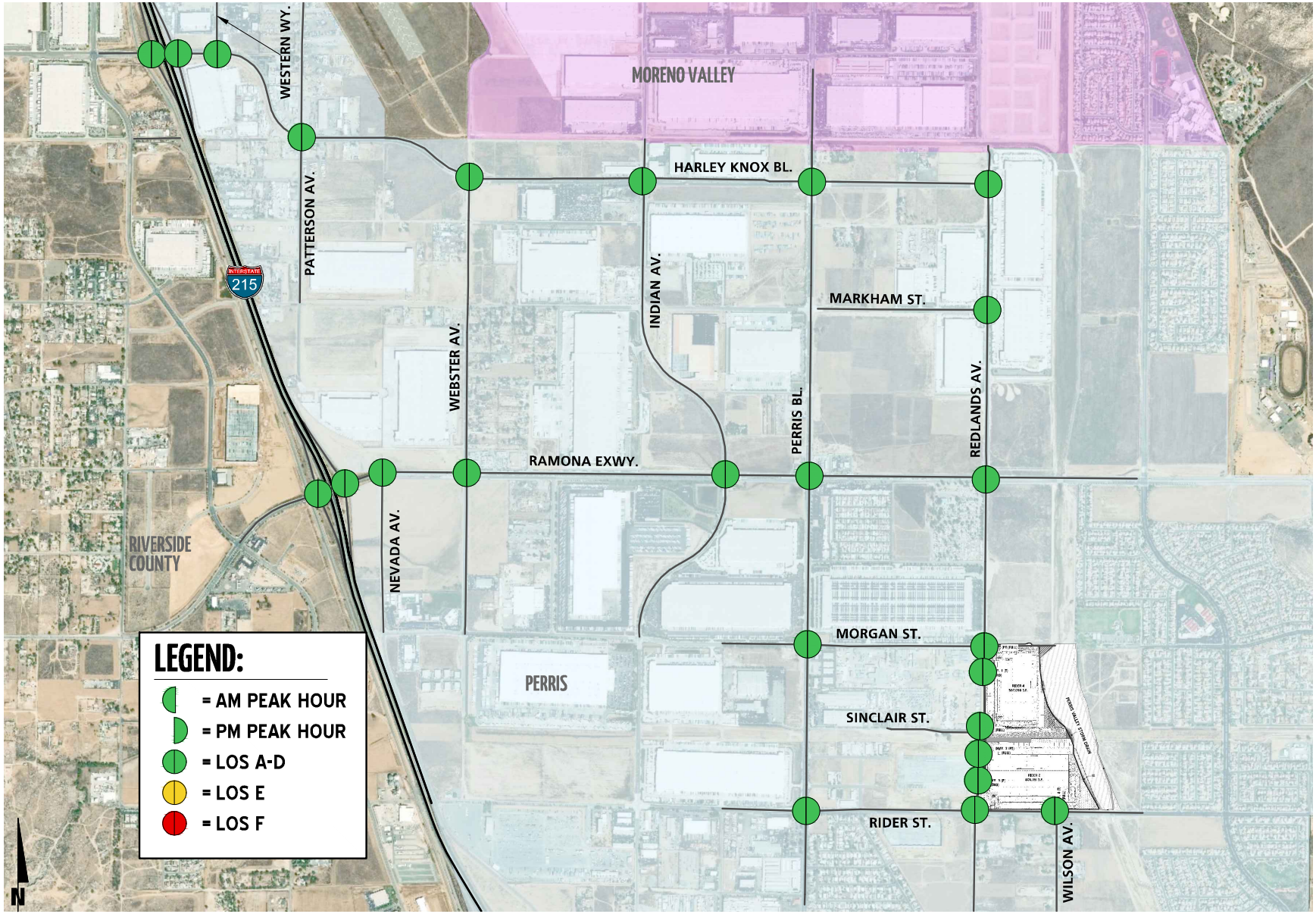


Table 7-1

Intersection Analysis for EA and EAP (2021) Conditions

#	Intersection	Traffic Control[2]	EA (2021) Delay[1] (secs.) AM	EA (2021) Delay[1] (secs.) PM	EA (2021) Level of Service AM	EA (2021) Level of Service PM	EAP (2021) Delay[1] (secs.) AM	EAP (2021) Delay[1] (secs.) PM	EAP (2021) Level of Service AM	EAP (2021) Level of Service PM	Acceptable LOS
1	I-215 Southbound Ramps & Harley Knox Bl.	TS	36.8	43.9	D	D	49.3	53.8	D	D	D
2	I-215 Southbound Ramps & Ramona Exwy.	TS	31.5	36.3	C	D	31.7	37.9	D	D	D
3	I-215 Northbound Ramps & Harley Knox Bl.	TS	30.8	17.7	C	B	32.5	19.4	C	B	D
4	I-215 Northbound Ramps & Ramona Exwy.	TS	20.0	20.4	B	C	20.3	20.8	C	C	D
5	Western Wy. & Harley Knox Bl.	TS[3]	7.6	8.1	A	A	7.6	8.1	A	A	D
6	Patterson Av. & Harley Knox Bl.	TS[3]	10.3	9.8	B	A	10.3	9.8	B	A	D
7	Nevada Av. & Ramona Exwy.	CSS	20.5	20.6	C	C	21.0	20.9	C	C	D
8	Webster Av. & Harley Knox Bl.	RA	12.8	11.4	B	B	13.4	13.2	B	B	D
9	Webster Av. & Ramona Exwy.	TS	21.0	21.1	C	C	21.0	21.3	C	C	D
10	Indian Av. & Harley Knox Bl.	TS	21.9	22.6	C	C	21.9	23.0	C	C	D
11	Indian Av. & Ramona Exwy.	TS	21.0	20.9	C	C	21.0	21.0	C	C	D
12	Perris Bl. & Harley Knox Bl.	TS	35.7	31.8	D	C	36.5	33.9	D	C	D
13	Perris Bl. & Ramona Exwy.	TS	42.6	29.5	D	C	42.8	30.2	D	C	E
14	Perris Bl. & Morgan St.	TS	12.3	12.9	B	B	12.9	13.4	B	B	D
15	Perris Bl. & Rider St.	TS	20.0	19.0	C	B	20.5	19.4	C	B	D
16	Redlands Av. & Harley Knox Bl.	TS	11.2	11.0	B	B	12.8	12.1	B	B	D
17	Redlands Av. & Markham St.	AWS	8.0	8.4	A	A	8.4	8.6	A	A	D
18	Redlands Av. & Ramona Exwy.	TS	14.1	20.0	B	B	15.2	21.1	B	C	D
19	Redlands Av. & Morgan St.	AWS/**CSS**	7.3	7.6	A	A	10.1	9.9	B	A	D
20	Redlands Av. & Dwy. 1	--/**CSS**	Future Intersection				8.4	8.5	A	A	D
21	Redlands Av. & Sinclair St.	UC/**CSS**	0.0	8.5	A	A	8.4	9.0	A	A	D
22	Redlands Av. & Dwy. 2	--/**TS**	Future Intersection				32.2	30.5	C	C	D
23	Redlands Av. & Dwy. 3	--/**CSS**	Future Intersection				8.3	8.3	A	A	D
24	Redlands Av. & Rider St.	CSS/**TS**	**43.2**	24.3	**E**	C	19.7	16.8	B	B	D
25	Driveway 4/Wilson Av. & Rider St.	CSS/**TS**	30.9	17.4	D	C	24.4	17.1	C	B	D

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

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

[2] UC = Uncontrolled; AWS = All-way Stop; CSS = Cross-street Stop; RA = Roundabout; TS = Traffic Signal; **TS** = Improvement

[3] Includes the completion of the Harley Knox Boulevard improvements.

7.5 TRAFFIC SIGNAL WARRANTS ANALYSIS

Traffic signal warrants have been performed (based on CA MUTCD) for EA (2021) traffic conditions based on daily volumes. For EA (2021) traffic conditions, no additional study area intersections are anticipated to meet planning level (ADT and peak hour) volume-based traffic signal warrants under EA (2021) traffic conditions, in addition to the intersections previously identified under Existing (2019) traffic conditions (see Appendix 7.3).

With the addition of Project traffic, there are no additional study area intersections anticipated to meet planning level (ADT and peak hour) volume-based traffic signal warrants under EAP (2021) traffic conditions, in addition to the intersections previously identified under Existing (2019) traffic conditions (see Appendix 7.4).

7.6 OFF-RAMP QUEUING ANALYSIS

A queuing analysis was performed for the off-ramps at the I-215 Freeway Harley Knox Boulevard and Ramona Expressway 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 7-2. It is important to note that off-ramp lengths are consistent with the measured distance between the intersection and the freeway mainline. As shown in Table 7-2, there are no movements that are anticipated to experience queuing issues during the weekday AM or weekday PM peak 95th percentile traffic flows. Worksheets for EA and EAP (2021) traffic conditions off-ramp queuing analysis are provided in Appendices 7.5 and 7.6 of this report, respectively.

7.7 BASIC FREEWAY SEGMENT ANALYSIS

EA and EAP (2021) mainline directional volumes for the AM and PM peak hours are provided on Exhibits 7-7 and 7-8, respectively. As shown in Table 7-3, the following I-215 Freeway segments analyzed for this study were found to operate at an unacceptable LOS (i.e., LOS E or worse) during the peak hours for EA and EAP (2021) traffic conditions:

- I-215 Freeway Southbound, North of Harley Knox Boulevard (#1) – LOS E PM peak hour only
- I-215 Freeway Northbound, North of Harley Knox Boulevard (#4) – LOS F AM and PM peak hours
- I-215 Freeway Northbound, Harley Knox Boulevard to Ramona Expressway (#5) – LOS F AM and PM peak hours
- I-215 Freeway Northbound, South of Ramona Expressway (#6) – LOS F AM and PM peak hours

EA and EAP (2021) basic freeway segment analysis worksheets are provided in Appendix 7.7 and 6.8 of this report, respectively.

Table 7-2

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

Intersection	Movement	Available Stacking Distance (Feet)	EA (2021)				EAP (2021)			
			95th Percentile Queue (Feet)		Acceptable? [1]		95th Percentile Queue (Feet)		Acceptable? [1]	
			AM Peak Hour	PM Peak Hour	AM	PM	AM Peak Hour	PM Peak Hour	AM	PM
I-215 Southbound Ramps & Harley Knox Bl.	SBL/T	1,330	386 [2]	302 [2]	Yes	Yes	427 [2]	316 [2]	Yes	Yes
	SBR	270	39	39	Yes	Yes	39	39	Yes	Yes
I-215 Southbound Ramps & Ramona Exwy.	SBL	530	312	441 [2]	Yes	Yes	324	450 [2]	Yes	Yes
	SBL/T	1,100	314	446 [2]	Yes	Yes	324	453 [2]	Yes	Yes
	SBR	530	124	75	Yes	Yes	124	75	Yes	Yes
I-215 Northbound Ramps & Harley Knox Bl.	NBL/T	1,120	19	31	Yes	Yes	19	31	Yes	Yes
	NBR	265	28	71 [2]	Yes	Yes	42	73 [2]	Yes	Yes
I-215 Northbound Ramps & Ramona Exwy.	NBL	520	161	164	Yes	Yes	161	164	Yes	Yes
	NBL/T	1,120	160	164	Yes	Yes	160	164	Yes	Yes
	NBR	520	433 [2]	344	Yes	Yes	451 [2]	352	Yes	Yes

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

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

Table 7-3

Basic Freeway Segment Analysis for EA and EAP (2021) Conditions

Freeway	Direction	Mainline Segment	Lanes[1]	EA (2021)				EAP (2021)			
				Density[2]		LOS[3]		Density[2]		LOS[3]	
				AM	PM	AM	PM	AM	PM	AM	PM
I-215 Freeway	Southbound	North of Harley Knox Bl.	3	22.9	**35.2**	C	**E**	23.4	**35.3**	C	**E**
		Harley Knox Bl. to Ramona Exwy.	3	20.0	32.9	C	D	20.3	33.1	C	D
		South of Ramona Exwy.	3	19.1	30.7	C	D	19.2	30.9	C	D
	Northbound	North of Harley Knox Bl.	3	--[4]	--[4]	**F**	**F**	--[4]	--[4]	**F**	**F**
		Harley Knox Bl. to Ramona Exwy.	3	--[4]	--[4]	**F**	**F**	--[4]	--[4]	**F**	**F**
		South of Ramona Exwy.	3	--[4]	--[4]	**F**	**F**	--[4]	--[4]	**F**	**F**

BOLD = LOS does not meet Caltrans requirements (i.e., unacceptable LOS or LOS E/F).

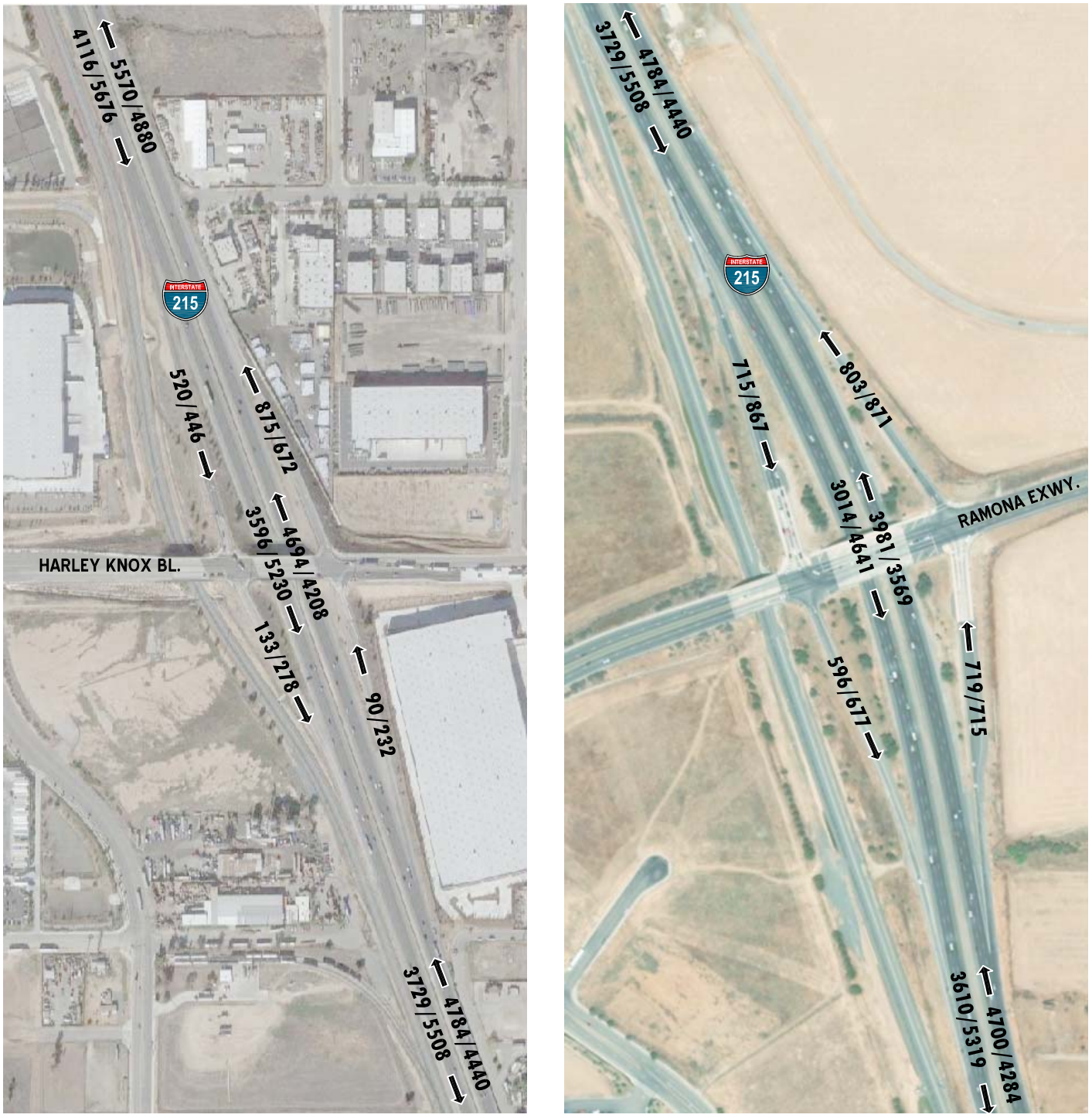
[1] Number of lanes are in the specified direction and is based on existing conditions.

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

[3] LOS = Level of Service

[4] Analysis with constrained flow results in acceptable LOS, however, field observations indicate congestion during the peak hour. As such, the freeway is considered at capacity.

EXHIBIT 7-7: EA (2021) FREEWAY MAINLINE VOLUMES



LEGEND:

⟵ 100/200 = AM/PM PEAK HOUR VOLUMES

NOTE: VOLUMES IN ACTUAL VEHICLES (NOT PCE)

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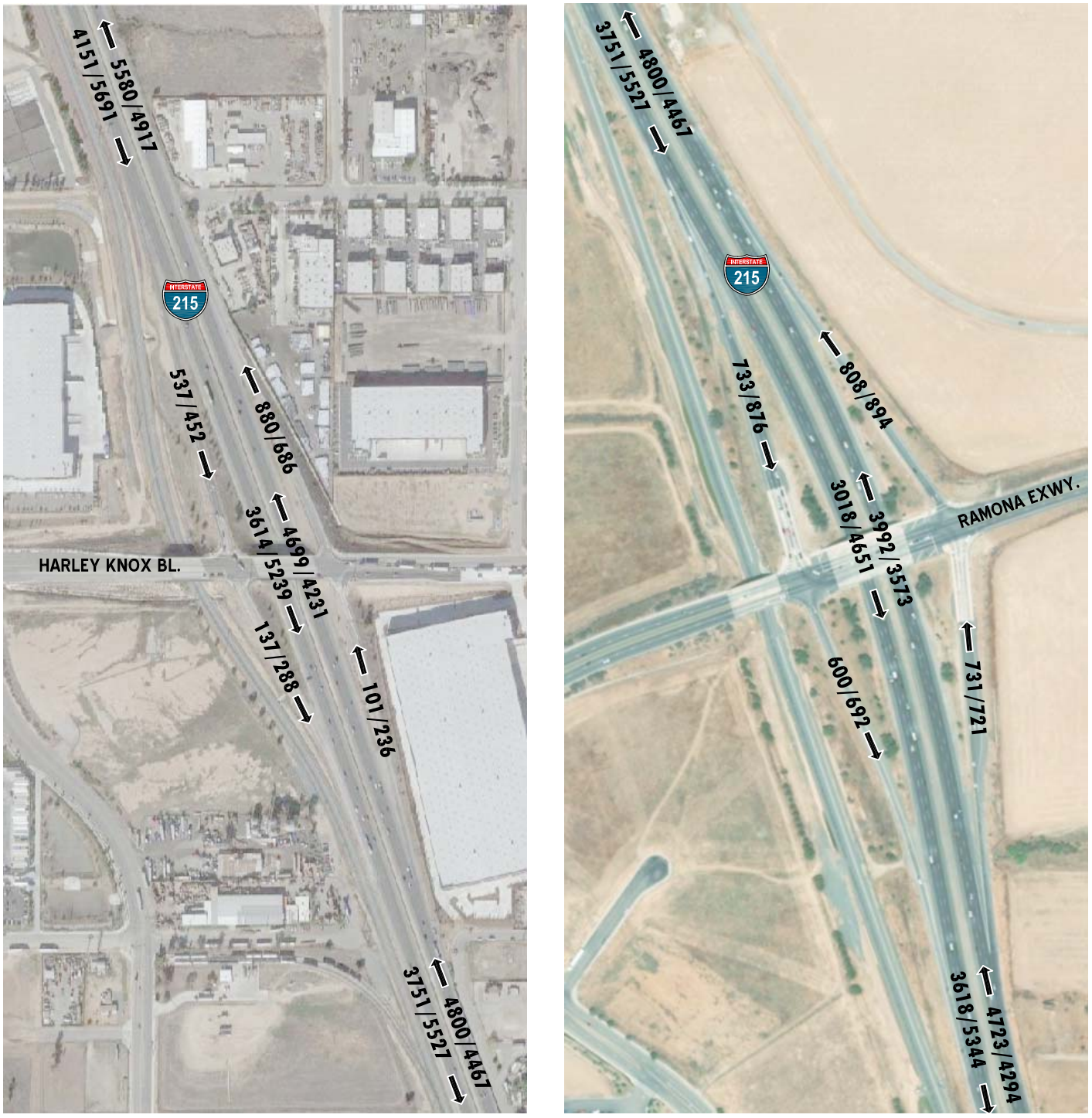
EXHIBIT 7-8: EAP (2021) FREEWAY MAINLINE VOLUMES



LEGEND:

⟵ 100/200 = AM/PM PEAK HOUR VOLUMES

NOTE: VOLUMES IN ACTUAL VEHICLES (NOT PCE)

N

7.8 FREEWAY MERGE/DIVERGE ANALYSIS

Ramp merge and diverge operations were also evaluated for EA and EAP (2021) conditions and the results of this analysis are presented in Table 7-4. As shown in Table 7-4, the following I-215 Freeway ramp merge and diverge areas at Harley Knox Boulevard are anticipated to operate at LOS E or worse during the peak hours under EA and EAP (2021) traffic conditions:

- I-215 Freeway, Southbound Off-Ramp at Harley Knox Boulevard (#1) – LOS F AM peak hour; LOS E PM peak hour
- I-215 Freeway, Northbound On-Ramp at Harley Knox Boulevard (#5) – LOS E AM peak hour only

EA and EAP (2021) freeway ramp junction operations analysis worksheets are provided in Appendix 7.9 and 7.10 of this report, respectively.

7.9 RECOMMENDED IMPROVEMENTS

Improvement strategies have been recommended at intersections and freeway facilities that have been identified as deficient under EA and EAP (2021) traffic conditions in an effort to achieve an acceptable LOS (i.e., LOS D or better).

7.9.1 RECOMMENDED IMPROVEMENTS TO ADDRESS DEFICIENCIES AT INTERSECTIONS

All study area intersections are anticipated to operate at an acceptable LOS for EAP (2021) traffic conditions. As such, no improvements have been recommended.

7.9.2 RECOMMENDED IMPROVEMENTS TO ADDRESS OFF-RAMP QUEUES

As shown previously in Table 7-2, there are no anticipated peak hour queuing issues at the I-215 Freeway at Harley Knox Boulevard and Ramona Expressway interchanges for EA and EAP (2021) traffic conditions, consistent with Existing (2019) traffic conditions. As such, no improvements have been recommended.

7.9.3 RECOMMENDED IMPROVEMENTS TO ADDRESS DEFICIENCIES ON FREEWAY FACILITIES

At this time, the I-215 North Project has no anticipated start or completion date. As such, no improvements have been recommended to address the EA (2021) and EAP (2021) deficiencies on the SHS, because the improvement to the I-215 Freeway is assumed to be completed after the Project buildout year of 2021. There is a significant and unavoidable cumulative impact to the I-215 Freeway facilities for EAP (2021) traffic conditions as there are currently no improvements to mitigate the impacts to the SHS.

Table 7-4

Freeway Ramp Merge/Diverge Analysis for EA and EAP (2021) Conditions

Freeway	Direction	Ramp Junction	Lanes on Freeway	EA (2021)				EAP (2021)			
				AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
				Density[1]	LOS[2]	Density[1]	LOS[2]	Density[1]	LOS[2]	Density[1]	LOS[2]
I-215 Freeway	Southbound	Off-Ramp at Harley Knox Bl.	3	--[3]	**F**	**36.0**	**E**	--[3]	**F**	**36.1**	**E**
		On-Ramp at Harley Knox Bl.	3	23.5	C	32.7	D	23.7	C	32.9	D
		Off-Ramp at Ramona Exwy.	3	25.4	C	33.7	D	25.7	C	33.8	D
		On-Ramp at Ramona Exwy.	3	21.4	C	30.3	D	21.4	C	30.4	D
	Northbound	On-Ramp at Harley Knox Bl.	3	**35.6**	**E**	30.9	D	**35.7**	**E**	31.2	D
		Off-Ramp at Harley Knox Bl.	3	30.9	D	29.1	D	31.2	D	29.3	D
		On-Ramp at Ramona Exwy.	3	29.4	D	27.3	C	29.5	D	27.6	C
		Off-Ramp at Ramona Exwy.	3	29.1	D	26.7	C	29.2	D	26.8	C

BOLD = LOS does not meet Caltrans requirements (i.e., unacceptable LOS or LOS E/F).

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

[2] LOS = Level of Service

[3] Analysis with constrained flow results in acceptable LOS, however, field observations indicate congestion during the peak hour. As such, the ramp junction is considered at capacity.

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8 EAC (2021) AND EAPC (2021) TRAFFIC CONDITIONS

This section discusses the methods used to develop EAC and EAPC (2021) traffic forecasts and the resulting intersection operations, traffic signal warrant, and freeway facility operations analyses.

8.1 ROADWAY IMPROVEMENTS

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

- Project driveways and those facilities assumed to be constructed by the Project to provide site access are also assumed to be in place for EAPC conditions only (e.g., intersection and roadway improvements along the Project's frontage and driveways).
- Driveways and those facilities assumed to be constructed by cumulative developments to provide site access are also assumed to be in place for EAC and EAPC (2021) conditions only (e.g., intersection and roadway improvements along the cumulative development's frontages).
- The Harley Knox Boulevard improvements, from the I-215 Freeway to Patterson Avenue, are completed and in place.

8.2 EAC (2021) TRAFFIC VOLUME FORECASTS

To account for background traffic, other known cumulative development projects in the study area were included in addition to 6.09% of ambient growth for EAC (2021) traffic conditions. The weekday ADT and weekday AM and PM peak hour volumes (in PCE) which can be expected for EAC (2021) Without Project traffic conditions are shown on Exhibit 8-1.

8.3 EAPC (2021) TRAFFIC VOLUME FORECASTS

To account for background traffic, other known cumulative development projects in the study area were included in addition to 6.09% of ambient growth for EAPC (2021) traffic conditions in conjunction with traffic associated with the proposed Project. The weekday ADT and weekday AM and PM peak hour volumes (in PCE) which can be expected for EAPC (2021) traffic conditions are shown on Exhibit 8-2.

EXHIBIT 8-1: EAC (2021) AVERAGE DAILY TRAFFIC (ADT) (IN PCE)

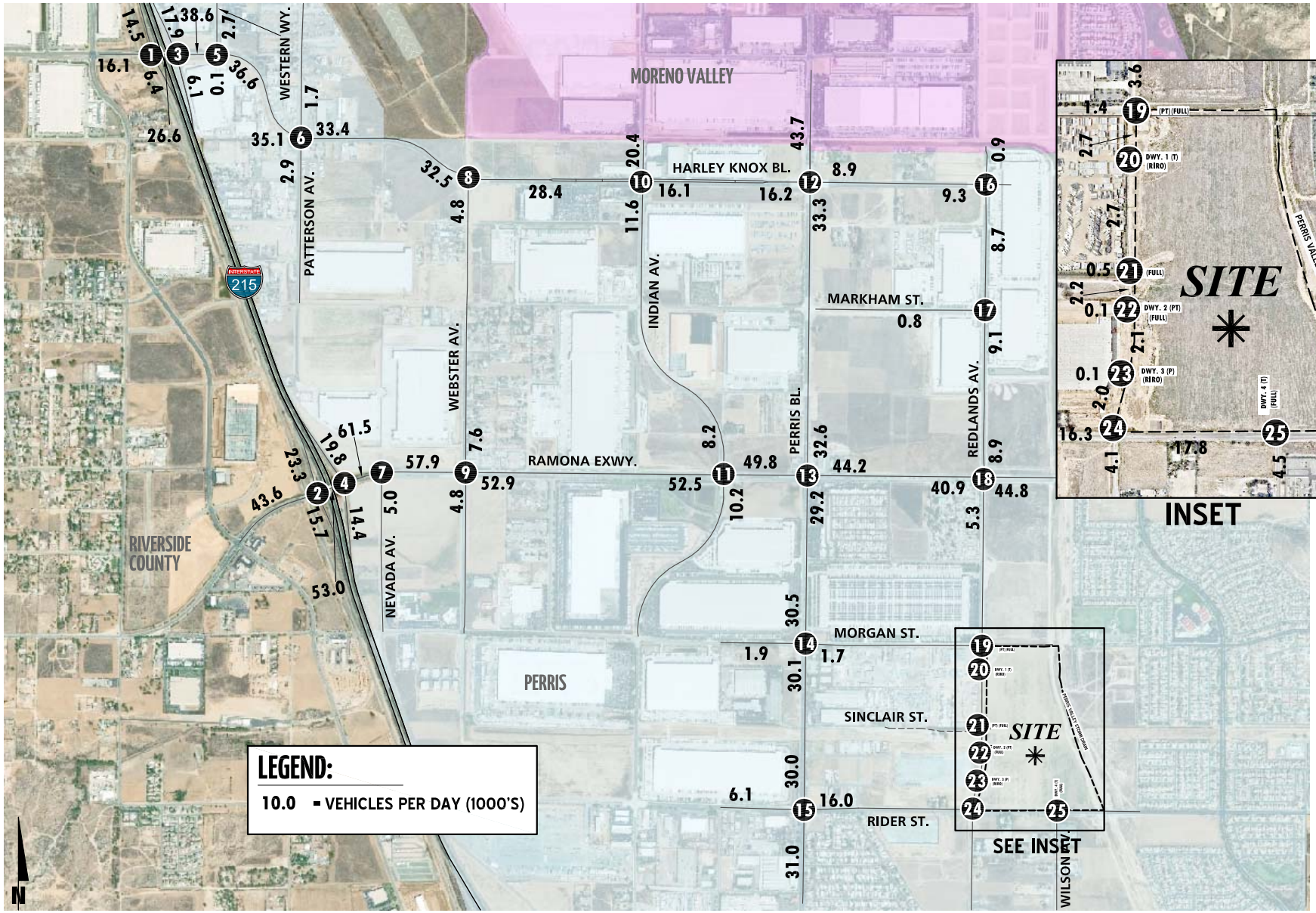


EXHIBIT 8-2: EAC (2021) TRAFFIC VOLUMES (IN PCE)

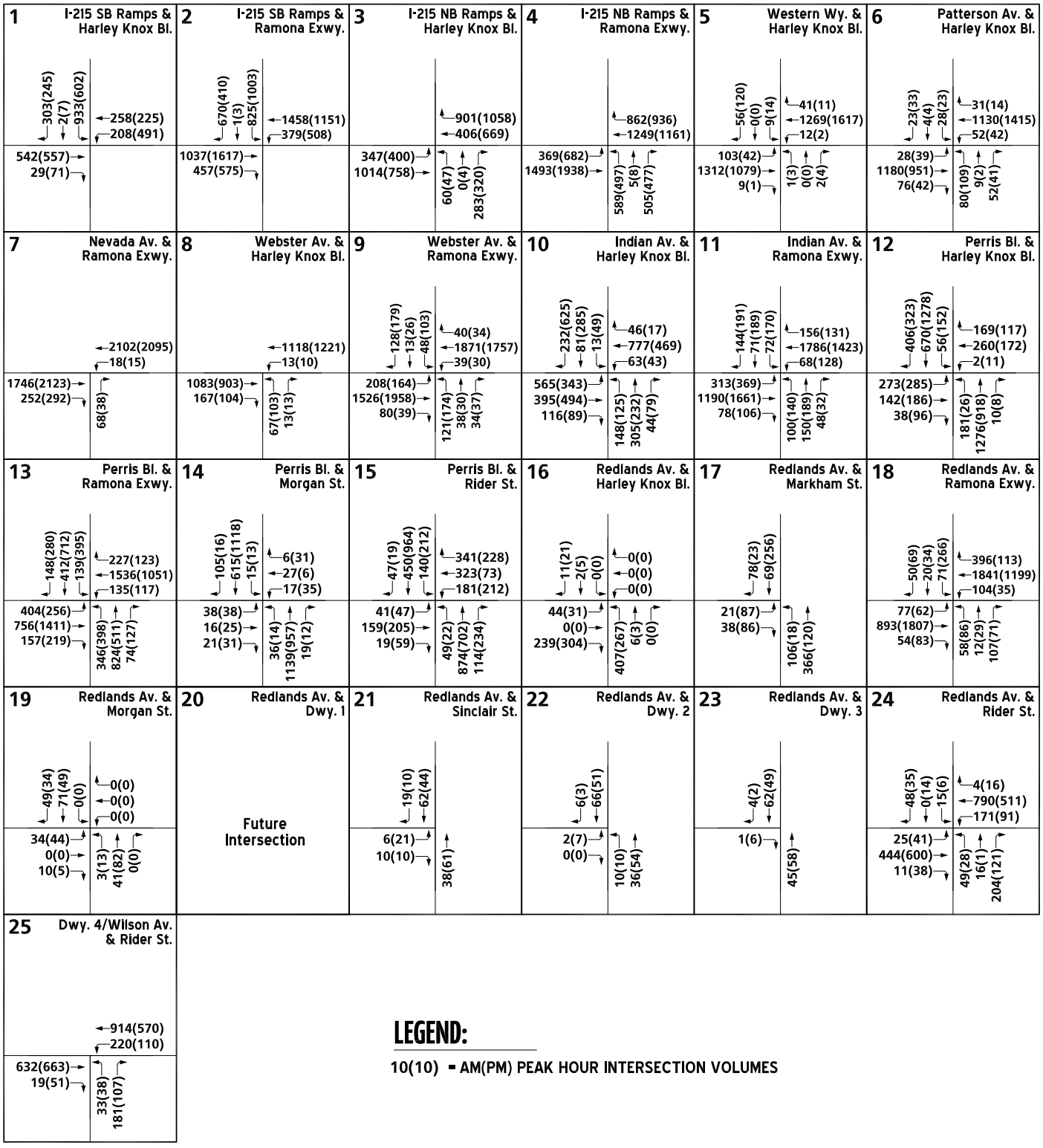


EXHIBIT 8-3: EAPC (2021) AVERAGE DAILY TRAFFIC (ADT) (IN PCE)

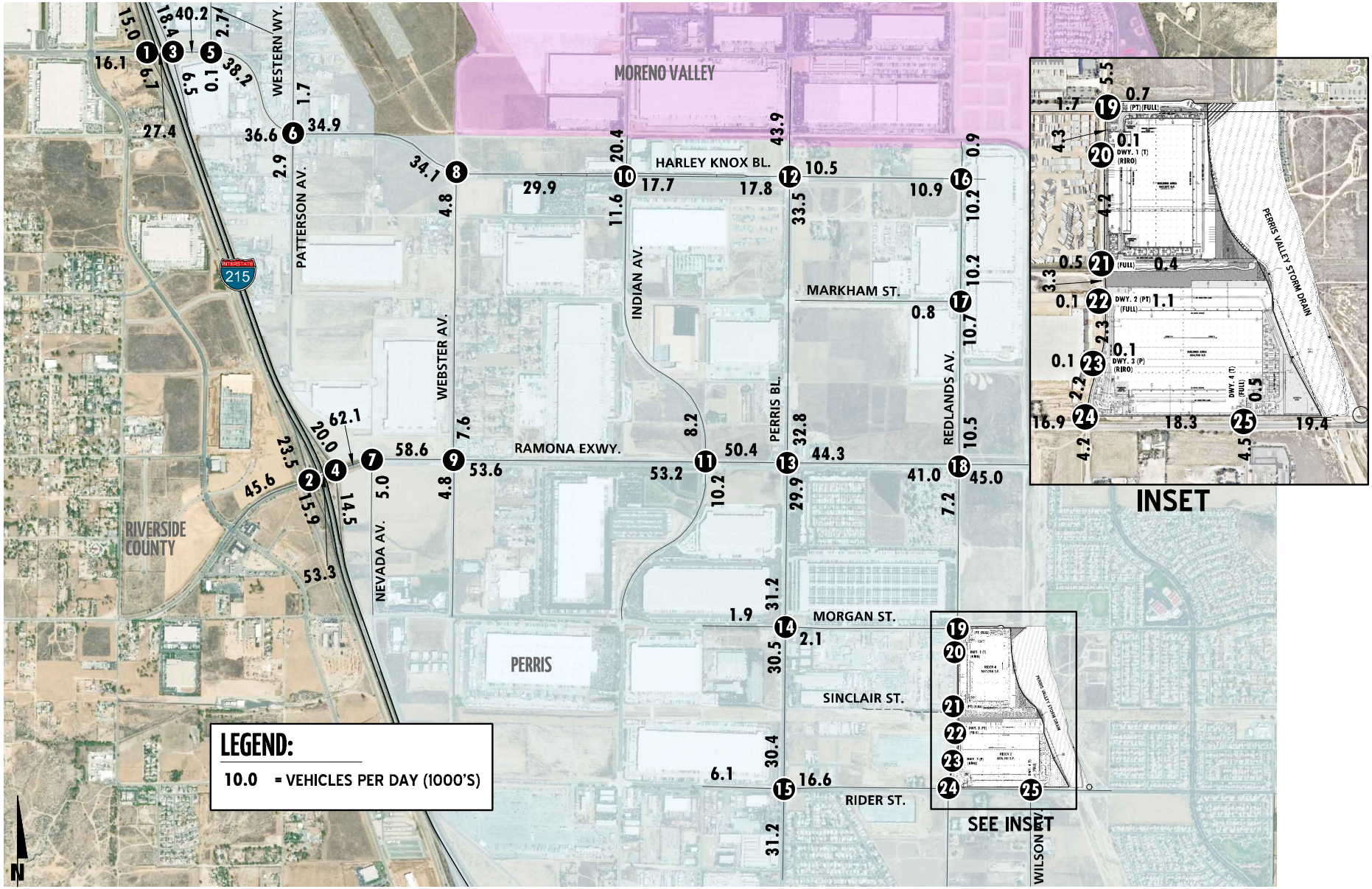
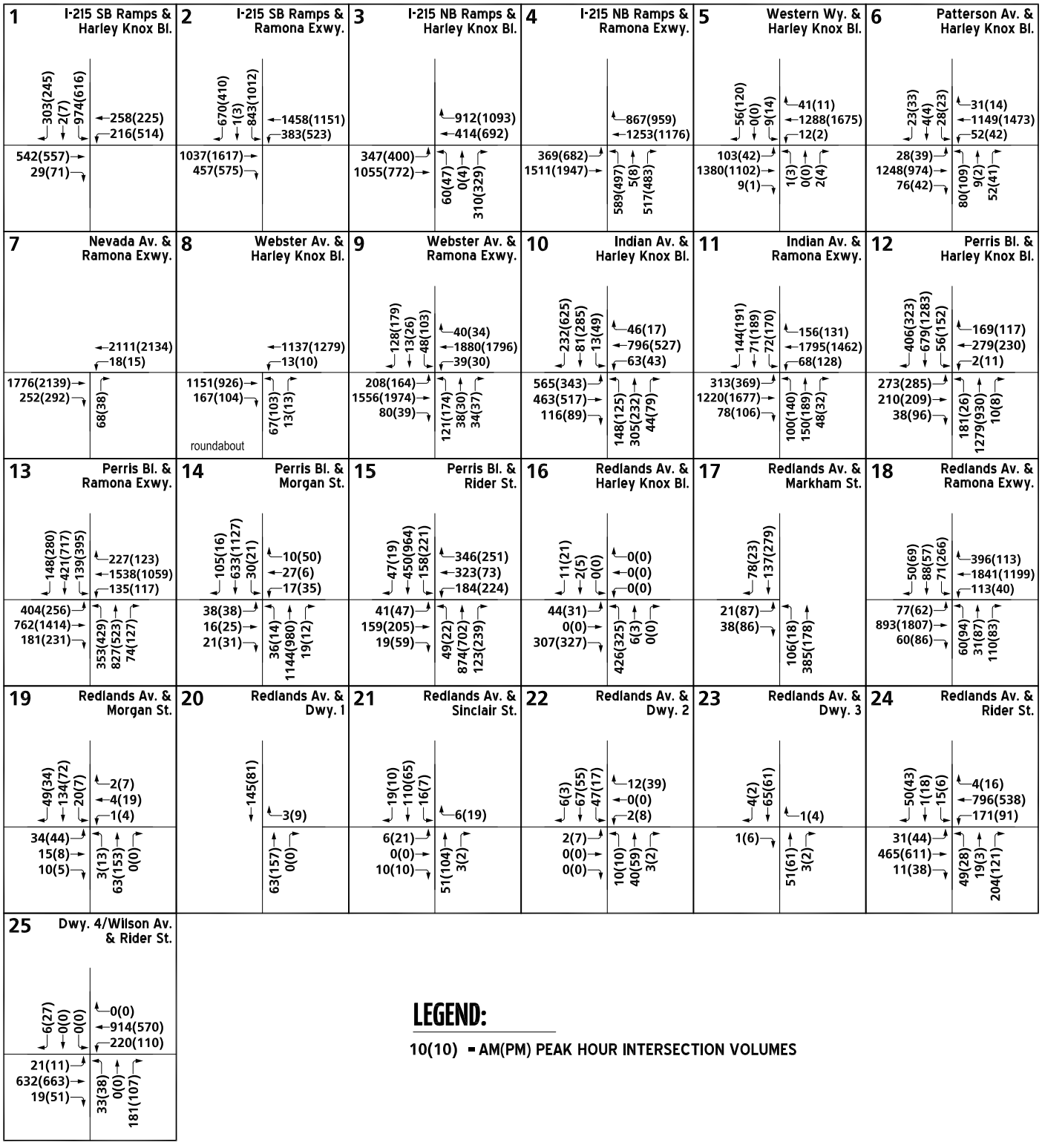


EXHIBIT 8-4: EAPC (2021) TRAFFIC VOLUMES (IN PCE)



LEGEND:

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

8.4 INTERSECTION OPERATIONS ANALYSIS

Level of service calculations were conducted for the study intersections to evaluate their operations under EAC and EAPC (2021) conditions with existing roadway and intersection geometrics consistent with those described under Section 8.1 *Roadway Improvements*. As shown in Table 8-1 and illustrated on Exhibits 8-5 and 8-6, the following study area intersections are anticipated to operate at an unacceptable LOS under EAC (2021) traffic conditions:

- I-215 Southbound Ramps & Harley Knox Bl. (#1) – LOS F AM and PM peak hours
- I-215 Southbound Ramps & Ramona Exwy. (#2) – LOS E AM peak hour; LOS F PM peak hour
- I-215 Northbound Ramps & Harley Knox Bl. (#3) – LOS F AM and PM peak hours
- I-215 Northbound Ramps & Ramona Exwy. (#4) – LOS F PM peak hour only
- Indian Av. & Harley Knox Bl. (#10) – LOS E PM peak hour only
- Redlands Av. & Rider St. (#24) – LOS F AM and PM peak hours
- Driveway 4/Wilson Av. (#25) – LOS E AM peak hour only

With the addition of Project traffic and the Project site access improvements (see Section 1.8 *Site Access Improvements*), there are no additional study area intersections anticipated to operate at an unacceptable LOS during the peak hours. The following study area intersections are anticipated to improve operations to acceptable levels with the improvements proposed by the Project:

- Redlands Av. & Rider St. (#24)
- Driveway 4/Wilson Av. (#25)

The intersection operations analysis worksheets for EAC and EAPC (2021) conditions are included in Appendices 8.1 and 8.2 of this report, respectively.

8.5 TRAFFIC SIGNAL WARRANTS ANALYSIS

Traffic signal warrants have been performed (based on CA MUTCD) for EAC (2021) traffic conditions based on daily volumes. For EAC (2021) traffic conditions, no additional study area intersections anticipated to meet planning level (ADT) and peak hour volume-based traffic signal warrants under EAC (2021) traffic conditions, in addition to the intersections previously identified under Existing (2019) traffic conditions (see Appendix 8.3).

With the addition of Project traffic, there are no additional study area intersections anticipated to meet planning level (ADT) and peak hour volume-based traffic signal warrants under EAPC (2021) traffic conditions, in addition to the intersections previously identified under Existing (2019) traffic conditions (see Appendix 8.4).

Table 8-1

Intersection Analysis for EAC and EAPC (2021) Conditions

#	Intersection	Traffic Control[2]	EAC (2021) Delay[1] (secs.) AM	EAC (2021) Delay[1] (secs.) PM	EAC (2021) Level of Service AM	EAC (2021) Level of Service PM	EAPC (2021) Delay[1] (secs.) AM	EAPC (2021) Delay[1] (secs.) PM	EAPC (2021) Level of Service AM	EAPC (2021) Level of Service PM	Acceptable LOS
1	I-215 Southbound Ramps & Harley Knox Bl.	TS	**>200.0**	**183.1**	**F**	**F**	**>200.0**	**>200.0**	**F**	**F**	D
2	I-215 Southbound Ramps & Ramona Exwy.	TS	**60.7**	**100.2**	**E**	**F**	**61.3**	**103.6**	**E**	**F**	D
3	I-215 Northbound Ramps & Harley Knox Bl.	TS	**95.8**	**167.8**	**F**	**F**	**107.5**	**180.8**	**F**	**F**	D
4	I-215 Northbound Ramps & Ramona Exwy.	TS	42.7	**110.7**	D	**F**	44.0	**112.4**	D	**F**	D
5	Western Wy. & Harley Knox Bl.	TS[3]	12.4	14.9	B	B	12.4	15.8	B	B	D
6	Patterson Av. & Harley Knox Bl.	TS[3]	11.2	15.2	B	B	11.2	15.8	B	B	D
7	Nevada Av. & Ramona Exwy.	CSS	28.1	31.9	D	D	28.9	32.5	D	D	D
8	Webster Av. & Harley Knox Bl.	RA	26.8	25.7	D	D	29.1	32.9	D	D	D
9	Webster Av. & Ramona Exwy.	TS	25.8	29.5	C	C	25.9	30.0	C	C	D
10	Indian Av. & Harley Knox Bl.	TS	46.8	**64.8**	D	**E**	46.8	**67.5**	D	**E**	D
11	Indian Av. & Ramona Exwy.	TS	34.0	43.2	C	D	34.1	43.8	C	D	D
12	Perris Bl. & Harley Knox Bl.	TS	41.4	39.8	D	D	42.4	40.0	D	D	D
13	Perris Bl. & Ramona Exwy.	TS	67.6	35.5	E	D	68.2	36.8	E	D	E
14	Perris Bl. & Morgan St.	TS	12.7	11.9	B	B	13.2	12.4	B	B	D
15	Perris Bl. & Rider St.	TS	22.6	20.5	C	C	23.2	21.2	C	C	D
16	Redlands Av. & Harley Knox Bl.	TS	15.1	12.7	B	B	16.9	13.8	B	B	D
17	Redlands Av. & Markham St.	AWS	8.7	9.3	A	A	9.2	9.7	A	A	D
18	Redlands Av. & Ramona Exwy.	TS	17.4	23.2	B	C	18.2	24.4	B	C	D
19	Redlands Av. & Morgan St.	AWS/**CSS**	9.4	9.8	A	A	10.9	11.4	B	B	D
20	Redlands Av. & Dwy. 1	--/**CSS**	Future Intersection				8.5	8.8	A	A	D
21	Redlands Av. & Sinclair St.	UC/**CSS**	8.9	9.1	A	A	9.3	9.4	A	A	D
22	Redlands Av. & Dwy. 2	**CSS/TS**	9.3	9.3	A	A	14.7	14.2	B	B	D
23	Redlands Av. & Dwy. 3	**CSS**	8.5	8.5	A	A	8.5	8.5	A	A	D
24	Redlands Av. & Rider St.	CSS/**TS**	**>100.0**	**85.7**	**F**	**F**	25.5	19.8	C	B	D
25	Driveway 4/Wilson Av. & Rider St.	CSS/**TS**	**43.8**	21.0	**E**	C	25.1	16.3	C	B	D

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

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

[2] UC = Uncontrolled; AWS = All-way Stop; CSS = Cross-street Stop; RA = Roundabout; TS = Traffic Signal;**TS** = Improvement

[3] Includes the completion of the Harley Knox Boulevard improvements.

EXHIBIT 8-5: EAC (2021) SUMMARY OF LOS

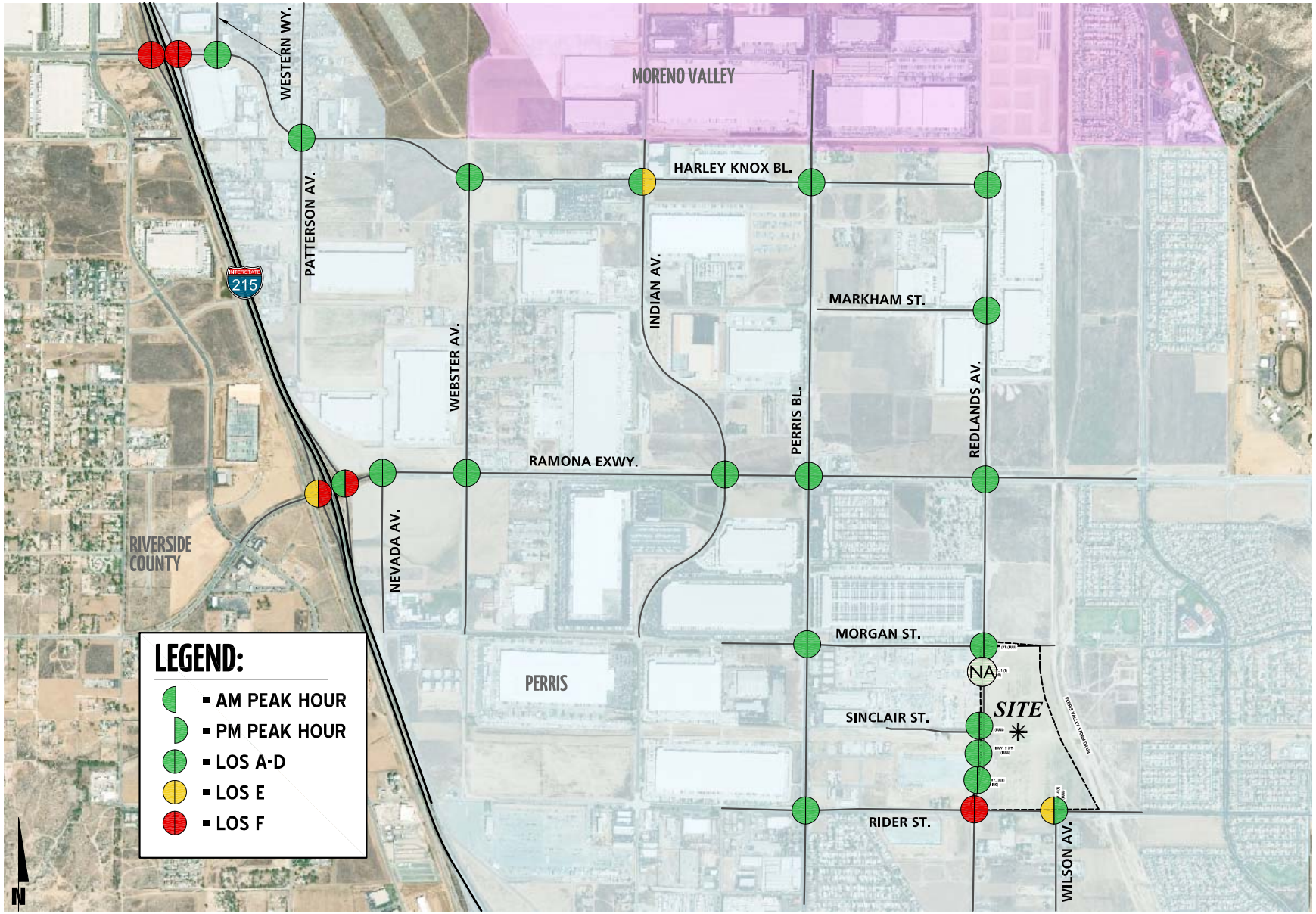
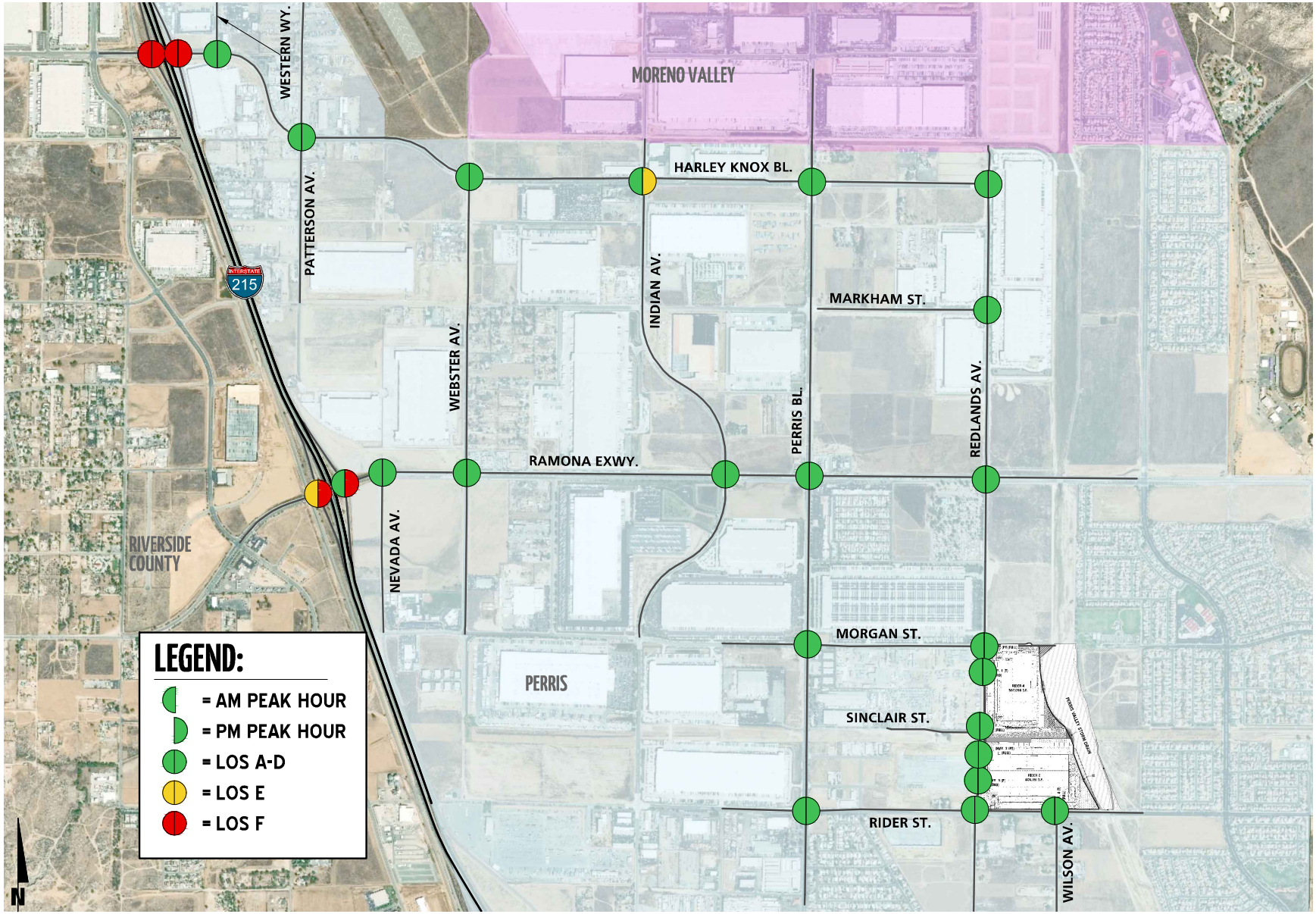


EXHIBIT 8-6: EAPC (2021) SUMMARY OF LOS



URBAN CROSSROADS

8.6 OFF-RAMP QUEUING ANALYSIS

A queuing analysis was performed for the off-ramps at the I-215 Freeway Harley Knox Boulevard and Ramona Expressway 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 8-2. It is important to note that off-ramp lengths are consistent with the measured distance between the intersection and the freeway mainline. As shown in Table 8-2, there are no movements that are anticipated to experience queuing issues during the weekday AM or weekday PM peak 95th percentile traffic flows. Worksheets for EAC and EAPC (2021) traffic conditions off-ramp queuing analysis are provided in Appendices 8.5 and 8.6 of this report, respectively.

8.7 BASIC FREEWAY SEGMENT ANALYSIS

EAC and EAPC (2021) mainline directional volumes for the AM and PM peak hours are provided on Exhibits 8-7 and 8-8, respectively. As shown in Table 8-3, the following I-215 Freeway segments are anticipated to operate at an unacceptable LOS (i.e., LOS E or worse) during the peak hours for EAC (2021) traffic conditions:

- I-215 Freeway Southbound, North of Harley Knox Boulevard (#1) – LOS F PM peak hour only
- I-215 Freeway Southbound, Harley Knox Boulevard to Ramona Expressway (#2) – LOS E PM peak hour only
- I-215 Freeway Southbound, South of Ramona Expressway (#3) – LOS E PM peak hour only
- I-215 Freeway Northbound, North of Harley Knox Boulevard (#4) – LOS F AM and PM peak hours
- I-215 Freeway Northbound, Harley Knox Boulevard to Ramona Expressway (#5) – LOS F AM and PM peak hours
- I-215 Freeway Northbound, South of Ramona Expressway (#6) – LOS F AM and PM peak hours

As shown in Table 8-3, the addition of Project traffic is not anticipated to result in any additional LOS deficiencies on freeway segments for EAPC (2021) traffic conditions. EAC and EAPC (2021) basic freeway segment analysis worksheets are provided in Appendix 8.7 and 8.8 of this report, respectively.

Table 8-2

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

Intersection	Movement	Available Stacking Distance (Feet)	EAC (2021)				EAPC (2021)			
			95th Percentile Queue (Feet)		Acceptable? [1]		95th Percentile Queue (Feet)		Acceptable? [1]	
			AM Peak Hour	PM Peak Hour	AM	PM	AM Peak Hour	PM Peak Hour	AM	PM
I-215 Southbound Ramps & Harley Knox Bl.	SBL/T	1,330	797 [2]	507 [2]	Yes	Yes	834 [2]	520 [2]	Yes	Yes
	SBR	270	55	46	Yes	Yes	60	46	Yes	Yes
I-215 Southbound Ramps & Ramona Exwy.	SBL	530	474 [2]	606 [2]	Yes	Yes[3]	489 [2]	613 [2]	Yes	Yes[3]
	SBL/T	1,100	474 [2]	610 [2]	Yes	Yes	493 [2]	620 [2]	Yes	Yes
	SBR	530	836 [2]	350	Yes[3]	Yes	836 [2]	350	Yes[3]	Yes
I-215 Northbound Ramps & Harley Knox Bl.	NBL/T	1,120	56 [2]	50	Yes	Yes	56 [2]	50	Yes	Yes
	NBR	265	202 [2]	195 [2]	Yes	Yes	240 [2]	210 [2]	Yes	Yes
I-215 Northbound Ramps & Ramona Exwy.	NBL	520	287	238	Yes	Yes	287	238	Yes	Yes
	NBL/T	1,120	291	235	Yes	Yes	291	235	Yes	Yes
	NBR	520	538 [2]	475 [2]	Yes[3]	Yes	557 [2]	484 [2]	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 95th percentile queue is anticipated to exceed the available storage for the turn lane, the adjacent through lane has sufficient storage to accommodate any spillover without spilling back and affecting the I-215 Freeway mainline.

Table 8-3

Basic Freeway Segment Analysis for EAC and EAPC (2021) Conditions

Freeway	Direction	Mainline Segment	Lanes[1]	EAC (2021)				EAPC (2021)			
				Density[2]		LOS[3]		Density[2]		LOS[3]	
				AM	PM	AM	PM	AM	PM	AM	PM
I-215 Freeway	Southbound	North of Harley Knox Bl.	3	28.3	--[4]	D	**F**	29.0	--[4]	D	**F**
		Harley Knox Bl. to Ramona Exwy.	3	24.9	**41.8**	C	**E**	25.0	**42.0**	C	**E**
		South of Ramona Exwy.	3	20.4	**37.9**	C	**E**	20.5	**38.1**	C	**E**
	Northbound	North of Harley Knox Bl.	3	--[5]	--[5]	**F**	**F**	--[5]	--[5]	**F**	**F**
		Harley Knox Bl. to Ramona Exwy.	3	--[5]	--[5]	**F**	**F**	--[5]	--[5]	**F**	**F**
		South of Ramona Exwy.	3	--[5]	--[5]	**F**	**F**	--[5]	--[5]	**F**	**F**

BOLD = LOS does not meet Caltrans requirements (i.e., unacceptable LOS or LOS E/F).

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

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

[3] LOS = Level of Service

[4] HCS7 does not report density for freeway facilities operating at LOS F.

[5] Analysis with constrained flow results in acceptable LOS, however, field observations indicate congestion during the peak hour. As such, the freeway is considered at capacity.

EXHIBIT 8-7: EAC (2021) FREEWAY MAINLINE VOLUMES

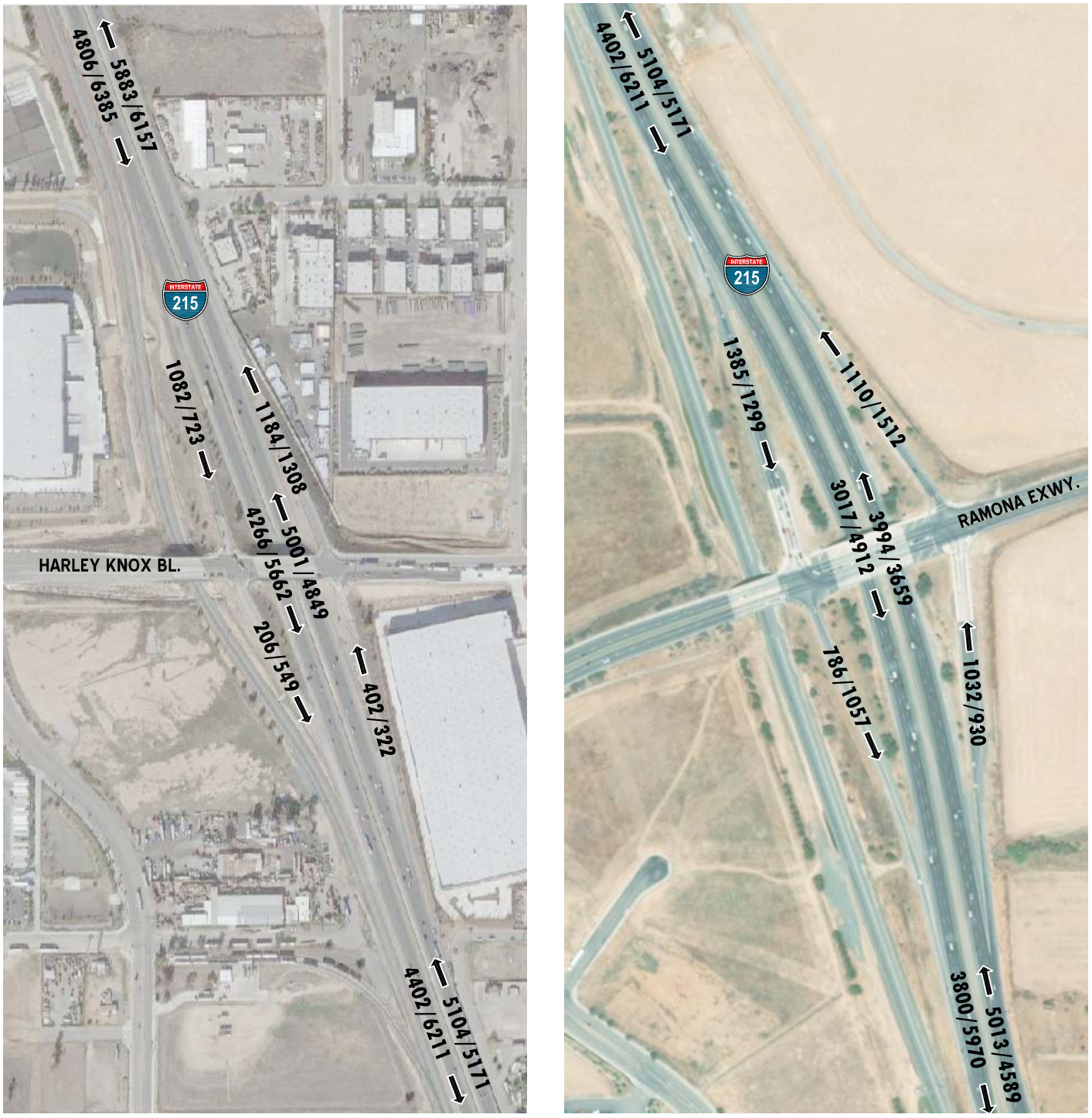
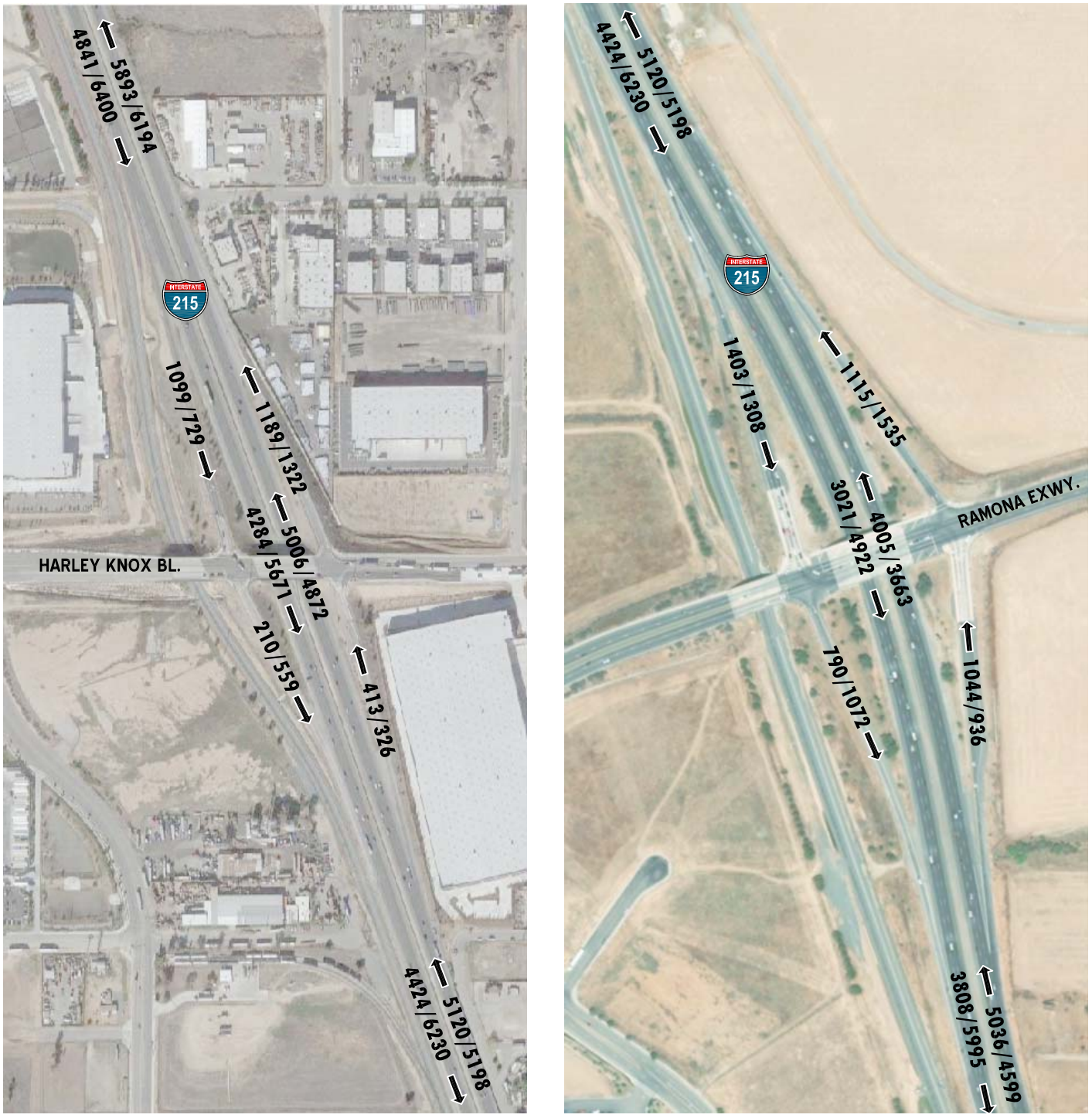


EXHIBIT 8-8: EAPC (2021) FREEWAY MAINLINE VOLUMES



8.8 FREEWAY MERGE/DIVERGE ANALYSIS

Ramp merge and diverge operations were also evaluated for EAC and EAPC (2021) conditions and the results of this analysis are presented in Table 8-4. As shown in Table 8-4, the following ramp diverge areas are anticipated to operate at LOS E or worse during the peak hours under EAC (2021) traffic conditions:

- I-215 Freeway, Southbound Off-Ramp at Harley Knox Boulevard (#1) – LOS F AM and PM peak hours
- I-215 Freeway, Southbound On-Ramp at Harley Knox Boulevard (#2) – LOS E PM peak hour only
- I-215 Freeway, Southbound Off-Ramp at Ramona Expressway (#3) – LOS E PM peak hour only
- I-215 Freeway, Northbound On-Ramp at Harley Knox Boulevard (#5) – LOS E AM and PM peak hours

As shown in Table 8-4, the addition of Project traffic is not anticipated to result in any addition LOS deficiencies for freeway merge and diverge operations. EAC and EAPC (2021) freeway ramp junction operations analysis worksheets are provided in Appendix 8.9 and 8.10 of this report, respectively.

8.9 RECOMMENDED IMPROVEMENTS

Improvement strategies have been recommended at intersections and freeway facilities that have been identified as deficient under EAC and EAPC (2021) traffic conditions in an effort to achieve an acceptable LOS (i.e., LOS D or better).

8.9.1 RECOMMENDED IMPROVEMENTS TO ADDRESS DEFICIENCIES AT INTERSECTIONS

As shown previously in Table 8-1, there are seven intersections anticipated to operate at an unacceptable LOS (LOS E or worse) for EAC and EAPC (2021) traffic conditions. The effectiveness of the recommended improvement strategies to address EAC and EAPC (2021) traffic deficiencies is presented in Table 8-5.

The Project Applicant shall participate in the funding of off-site improvements, including traffic signals that are needed to serve cumulative traffic conditions through the payment of NPRBBD fees (if the improvements are included in the NPRBBD fee program) or on a fair share basis (if the improvements are not included in the NPRBBD fee program). These fees shall be collected by the City of Perris, with the proceeds solely used as part of a funding mechanism aimed at ensuring that regional highways and arterial expansions keep pace with the projected population increases.

Table 8-4

Freeway Ramp Merge/Diverge Analysis for EAC and EAPC (2021) Conditions

Freeway	Direction	Ramp Junction	Lanes on Freeway	EAC (2021)				EAPC (2021)			
				AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
				Density[1]	LOS[2]	Density[1]	LOS[2]	Density[1]	LOS[2]	Density[1]	LOS[2]
I-215 Freeway	Southbound	Off-Ramp at Harley Knox Bl.	3	--[3]	F	**42.0**	F	--[3]	F	**42.1**	F
		On-Ramp at Harley Knox Bl.	3	27.8	C	**37.0**	E	28.0	C	**37.2**	E
		Off-Ramp at Ramona Exwy.	3	30.9	D	**37.7**	E	31.1	D	**37.7**	E
		On-Ramp at Ramona Exwy.	3	23.0	C	34.8	D	23.1	C	35.0	D
	Northbound	On-Ramp at Harley Knox Bl.	3	**39.8**	E	**39.7**	E	**39.9**	E	**39.9**	E
		Off-Ramp at Harley Knox Bl.	3	33.1	D	32.9	D	33.2	D	33.0	D
		On-Ramp at Ramona Exwy.	3	32.2	D	27.5	C	32.3	D	33.5	D
		Off-Ramp at Ramona Exwy.	3	31.2	D	28.8	D	31.3	D	28.9	D

BOLD = LOS does not meet Caltrans requirements (i.e., unacceptable LOS or LOS E/F).

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

[2] LOS = Level of Service

[3] Analysis with constrained flow results in acceptable LOS, however, field observations indicate congestion during the peak hour. As such, the ramp junction is considered at capacity.

Table 8-5

Intersection Analysis for EAC and EAPC (2021) 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
3	I-215 Northbound Ramps & Harley Knox Bl.																	
	- Without Project	TS	0	1	1	0	0	0	**2**	2	0	0	2	**1>>**	33.4	20.6	C	C
	- With Project	TS	0	1	1	0	0	0	**2**	2	0	0	2	**1>>**	39.6	22.0	D	C
4	I-215 Northbound Ramps & Ramona Exwy.																	
	- Without Project	TS	1	1	1	0	0	0	1	**3**	0	0	**3**	d	28.2	28.9	C	D
	- With Project	TS	1	1	1	0	0	0	1	**3**	0	0	**3**	d	28.5	40.1	C	D
10	Indian Av. & Harley Knox Bl.																	
	- Without Project	TS	2	2	1	1	**1**	**1>**	1	3	d	1	3	0	34.0	26.1	C	C
	- With Project	TS	2	2	1	1	**1**	**1>**	1	3	d	1	3	0	34.4	27.3	C	C

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

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

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

[3] TS = Traffic Signal; **TS** = Improvements

The following study area intersections were found to be significantly impacted by the Project for EAPC (2021) traffic conditions as the Project is anticipated to contribute 50 or more peak hour trips to these intersections and increase the delay by 2.0 or more seconds:

- I-215 Northbound Ramps & Harley Knox Bl. (#3)
- I-215 Northbound Ramps & Ramona Exwy. (#4)
- Indian Av. & Harley Knox Bl. (#10)
- Redlands Av. & Rider St. (#24)
- Driveway 4/Wilson Av. & Rider St. (#25)

The Project's impact at the intersections of I-215 Southbound Ramps at Harley Knox Boulevard (#1) and I-215 Southbound Ramps at Ramona Expressway (#2) are less than significant as the Project contributes less than 50 peak hour trips to these locations. As such, improvements have not been recommended for these two ramp locations.

The following improvements are recommended to improve each impacted intersection's LOS back to acceptable LOS, where the Project is recommended to either, construct, pay fees, or contribute a fair share in order to reduce the cumulative impacts to less than significant levels:

I-215 Northbound Ramps & Harley Knox Bl. (#3):

- Add a 2nd eastbound left turn lane and a westbound free right turn lane.

I-215 Northbound Ramps & Ramona Exwy. (#4):

- Add a 3rd eastbound through lane and a 3rd westbound through lane

It should be noted, the recommended improvements for I-215 Northbound Ramps and Harley Knox Boulevard (#3) and I-215 Northbound Ramps and Harley Knox Boulevard (#4) are included in both the WRCOG TUMF and the NPRBBD.

Indian Av. & Harley Knox Bl. (#10):

- Restripe the 2nd southbound shared through-right turn lane as a dedicated right turn lane and modify the traffic signal to implement overlap phasing on the southbound right turn lane.

Redlands Av. & Rider St. (#24):

- Install a traffic signal, restripe the northbound right turn lane as a shared through-right turn lane, add a southbound left turn lane, add a southbound shared through-right turn lane, and add an eastbound left turn lane (all Project design features, see Section 1.8 *Site Access Improvements*).

Driveway 4/Wilson Av. & Rider St. (#25):

- Install a traffic signal, restripe the northbound shared left-right turn lane as a shared left-through-right turn lane, add a southbound shared left-through-right turn lane, and add an eastbound left turn lane (all Project design features, see Section 1.8 *Site Access Improvements*).

Worksheets for EAC and EAPC (2021) conditions, with improvements, HCM calculation worksheets are provided in Appendices 8.11 and 8.12, respectively.

Improvements constructed by development may be eligible for a fee credit or reimbursement through the program where appropriate (to be determined at the City of Perris's discretion). When off-site improvements are identified with a minor share of responsibility assigned to proposed development, the approving jurisdiction may elect to collect a fair share contribution or require the development to construct improvements.

8.9.2 Recommended Improvements to Address Off-Ramp Queues

As shown previously in Table 8-2, there are no anticipated peak hour queuing issues at the I-215 Freeway at Harley Knox Boulevard and Ramona Expressway interchanges for EAC and EAPC (2021) traffic conditions, consistent with Existing (2019) traffic conditions. As such, no improvements have been recommended.

8.9.3 Recommended Improvements to Address Deficiencies on Freeway Facilities

At this time, the I-215 North Project has no anticipated start or completion date. As such, no improvements have been recommended to address the EAC and EAPC (2021) deficiencies on the SHS, because the improvement to the I-215 Freeway is assumed to be completed after the Project buildout year of 2021. There is a significant and unavoidable cumulative impact to the I-215 Freeway facilities for EAPC (2021) traffic conditions as there are currently no improvements to mitigate the impacts to the SHS.

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9 RIDER STREET BRIDGE CONSTRUCTION

As part of the proposed improvements to the Perris Valley Storm Drain Channel (PVSDC), the existing Rider Street Bridge, which consists of a box culvert over the PVSDC, will be removed in conjunction with the construction of a new bridge. The detour analysis of the Rider Street Bridge closure is included in Appendix 9.1 (prepared by Albert A. Webb Associates).

Based on the estimated construction schedule, if the new bridge were to be constructed in one stage (with full closure), the bridge construction would be completed prior to operation of the proposed Rider 2 and Rider 4 buildings. However, if the new bridge were to be constructed in two stages (half-by-half), the bridge construction would extend approximately four months after the buildings are operational. Even if the Rider 2&4 development were to open prior to the completion of the bridge construction, the roadway closure (either partial or full closure) and the proposed detour as presented in Appendix 9.1 would not change the findings and recommendations of this TIA as all Project traffic is anticipated to head west. Additionally, the proposed Rider 2 Project access points (driveways) that front Rider Street between Redlands Avenue and Wilson Avenue are a sufficient distance west of the proposed new bridge, that it is not anticipated there would be a. However, access could temporarily be limited to the westernmost driveway (closest to Redlands Avenue), if needed.

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