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PRAIRIE VIEW APARTMENTS (DPR20-00008)

TRAFFIC ANALYSIS

PREPARED BY: Charlene So, PE | cso@urbanxroads.com
Aric Evatt | aevatt@urbanxroads.com

Reference Number	Agency	Date
13747-03 TA Report	City of Perris	August 22, 2022

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LIST OF ABBREVIATED TERMS

(1)	Reference
ADT	Average Daily Traffic
CA MUTCD	California Manual on Uniform Traffic Control Devices
Caltrans	California Department of Transportation
CAPCOA	California Air Pollution Control Officers Association
CEQA	California Environmental Quality Act
CMP	Congestion Management Program
DIF	Development Impact Fee
DU	Dwelling Units
E+P	Existing Plus Project
HCM	Highway Capacity Manual
ITE	Institute of Transportation Engineers
LOS	Level of Service
N/A	Not Applicable
MPH	Miles per Hour
NCHRP	National Cooperative Highway Research Program
NP	No (Without) Project
OPR	Governor's Office of Planning and Research
PHF	Peak Hour Factor
Project	Prairie View Apartments
RTA	Riverside Transit Authority
SCAG	Southern California Association of Governments
TA	Traffic Analysis
TDM	Transportation Demand Management
v/c	Volume to Capacity
VMT	Vehicle Miles Traveled
vphgpl	Vehicles per Hour Green per Lane
WP	With Project
WRCOG	Western Riverside Council of Governments

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1 INTRODUCTION

This report presents the results of the Traffic Analysis (TA) for Prairie View Apartments ("Project"), which is located on the north side of Dale Street between Wilson Avenue and Murrieta Road, in the City of Perris, as shown on Exhibit 1-1. The purpose of this TA is to evaluate the potential circulation system deficiencies that may result from the development of the proposed Project, and where necessary recommend improvements to achieve acceptable operations consistent with General Plan level of service goals and policies. This traffic study has been prepared in accordance with the County of Riverside's Transportation Analysis Guidelines for Level of Service and Vehicle Miles Traveled (December 2020), and consultation with City of Perris staff during the traffic study scoping process. (1) The Project Traffic Study Scoping agreement is provided in Appendix 1.1 of this TA.

1.1 SUMMARY OF FINDINGS

The Project is to construct the following improvements as design features in conjunction with development of the site:

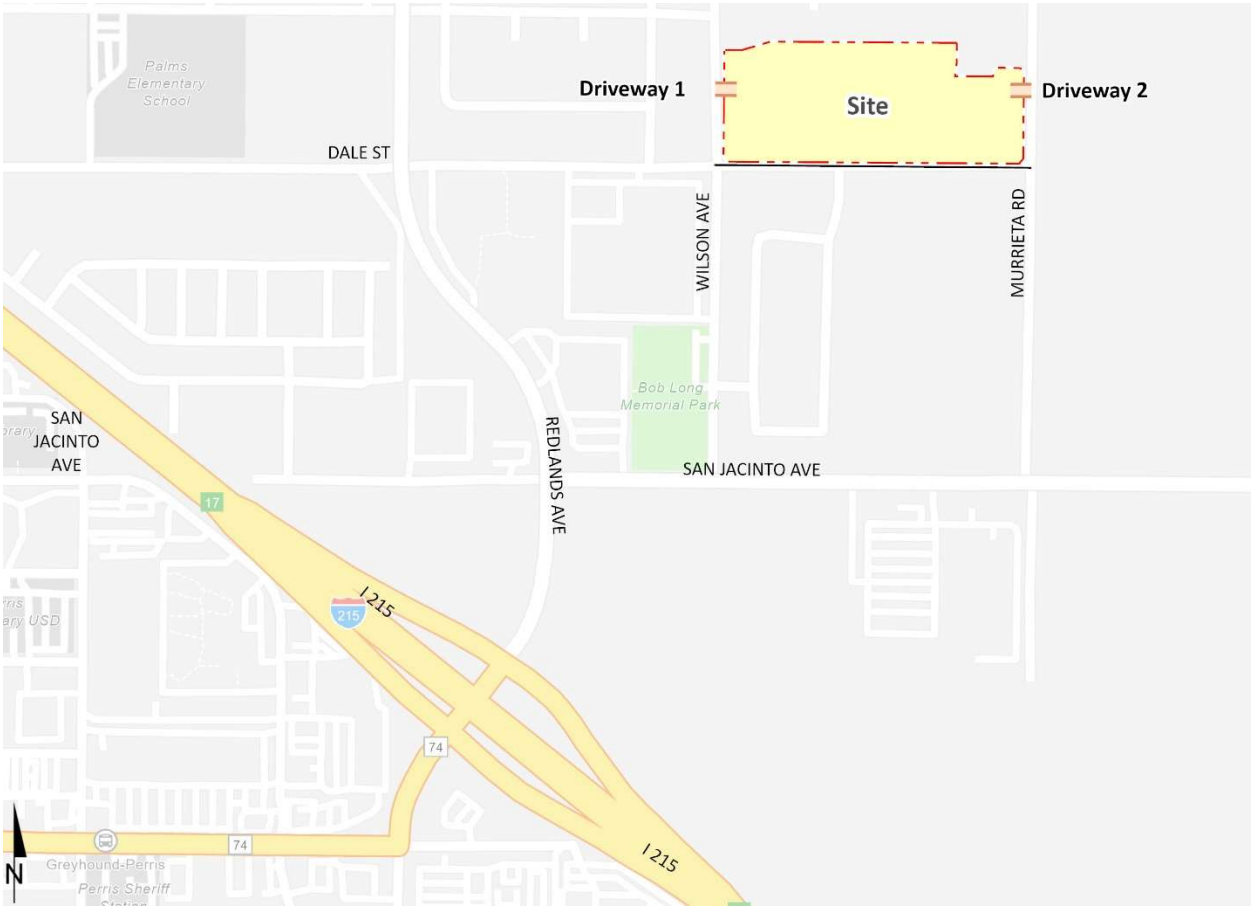
- The proposed driveway (Driveway 1) on Wilson Avenue will be gated and stop controlled for exiting (egress) traffic only.
- The proposed driveway (Driveway 2) on Murrieta Road will be gated and stop controlled.
- Project to construct Murrieta Road at its ultimate half-section-width as a Major Collector (78-foot right-of-way) from Dale Street to the northern Project boundary consistent with the City's standards
- The site adjacent roadway, Wilson Avenue, appears to be built to its ultimate General Plan curb-to-curb width. However, the Project should improve the curb-and-gutter, sidewalks, and landscape along the frontage in addition to accommodating improvements to facilitate site access at the driveway.

Additional details and intersection lane geometrics are provided in Section 1.6 *Recommendations* of this report. The proposed Project is not anticipated to require the construction of any off-site improvements. However, the Project Applicant's responsibility for the Project's contributions towards deficient off-site intersections is fulfilled through fair share contribution or payment into pre-existing fee programs (if applicable) that would be assigned to the future construction of any future local/regional improvement needs. The Project Applicant would be required to pay requisite fees consistent with the City's requirements (see Section 8 *Local and Regional Funding Mechanisms*).

1.1.1 VEHICLE MILES TRAVELED (VMT) SUMMARY

The Project was evaluated consistent with the City's VMT Guidelines and Scoping Form. The Project was not found to meet any available screening criteria and a VMT analysis was performed. The Project was found to exceed the City's adopted VMT per capita threshold for residential land uses using the City's Scoping Form and has a potentially significant impact. With inclusion of VMT reduction measures for high density residential projects, the Project's VMT per capita was reduced to a level below the City's impact threshold and the Project's VMT impact is less than significant. (Additional details can be found in Section 1.7 *Vehicle Miles Traveled (VMT)*)

EXHIBIT 1-1: LOCATION MAP



1.2 PROJECT OVERVIEW

A preliminary site plan for the proposed Project is shown on Exhibit 1-2. The Project is proposed to consist of the development of 287 three-story multi-family residential dwelling units. As indicated on Exhibit 1-2, vehicular access will be provided via a driveway on Wilson Avenue (exit only) and a driveway on Murrieta Road (full access). Regional access to the Project site is accommodated from the I-215 Freeway via Redlands Avenue. In order to develop the traffic characteristics of the proposed project, trip-generation statistics published in the Institute of Transportation Engineers (ITE) Trip Generation Manual (11th Edition, 2021). (2) The Project is anticipated to generate a net total of 1,934 two-way trips per day with 115 AM peak hour trips and 145 PM peak hour trips. The assumptions and methods used to estimate the Project's trip generation characteristics are discussed in greater detail in Section 4.1 *Project Trip Generation* of this report.

1.3 ANALYSIS SCENARIOS

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

- Existing (2022) Conditions
- Existing plus Project (E+P) Conditions
- Opening Year Cumulative (2024) Without Project Conditions
- Opening Year Cumulative (2024) With Project Conditions
- Horizon Year (2045) Without Project
- Horizon Year (2045) With Project

1.3.1 EXISTING (2022) CONDITIONS

Information for Existing (2022) conditions is disclosed to represent the baseline traffic conditions as they existed at the time this report was prepared. Local schools were in session with in-person instruction at the time of the traffic counts. Traffic counts were conducted in February 2022 based on vehicle classification.

1.3.2 EXISING PLUS PROJECT CONDITIONS

The Existing plus Project (E+P) conditions analysis determines the potential circulation system deficiencies based on a comparison of the E+P traffic conditions to Existing conditions. The roadway network is similar to Existing conditions except for new connections to be constructed by the Project. Cumulative development projects and ambient growth are not included for E+P traffic conditions.

EXHIBIT 1-2: PRELIMINARY SITE PLAN

1.3.3 OPENING YEAR CUMULATIVE (2024) CONDITIONS

The Opening Year Cumulative (2024) traffic conditions analysis determines the potential near-term cumulative circulation system deficiencies. To account for growth in traffic between Existing (2022) traffic conditions and the Project Opening Year Cumulative (2024), a growth rate of 4.04 percent was assumed (2.0 percent per year, compounded annually over 2 years). The roadway network is similar to Existing conditions except for new connections to be constructed by the Project. Conservatively, this TA adds traffic generated by other known or probable related projects to the existing baseline condition, although it may not be feasible that these projects would be completed within the year. The resulting traffic growth utilized in the TA (traffic generated by related projects) would therefore tend to overstate rather than understate background cumulative traffic deficiencies under 2022 traffic conditions.

1.3.4 HORIZON YEAR (2045) CONDITIONS

Traffic projections for Horizon Year (2045) conditions were derived from the County of Riverside refined version of the Riverside County Transportation Analysis Model (RIVCOM) using accepted procedures for model forecast refinement and smoothing. The Horizon Year conditions analysis will be utilized to determine if improvements funded through regional transportation mitigation fee programs, such as the Transportation Uniform Mitigation Fee (TUMF) program, can accommodate the long-range cumulative traffic at the target Level of Service (LOS) identified in the City of Perris (lead agency) General Plan. (3) Each of these regional transportation fee programs are discussed in more detail in Section 8 *Local and Regional Funding Mechanisms*.

1.4 STUDY AREA

To ensure that this TA 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. This agreement provides an outline of the Project study area, trip generation, trip distribution, and analysis methodology. The scoping agreement is included in Appendix 1.1 of this TA.

The 9 study area intersections shown on Exhibit 1-3 and listed in Table 1-1 were selected for evaluation in this TA based on consultation with City of Perris staff. At a minimum, the study area includes intersections where the Project is anticipated to contribute 50 or more peak hour trips per the County's traffic study guidelines. (1) The "50 peak hour trip" criterion represents a minimum number of trips at which a typical intersection would have the potential to be affected by a given development proposal. The 50 peak hour trip criterion is a traffic engineering rule of thumb that is accepted and widely used within Riverside County (including the City of Perris) for estimating a potential area of influence (i.e., study area).

The intent of a CMP is to more 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 deficiencies, and improve air quality. The County of Riverside CMP became effective with the passage of Proposition 111 in 1990 and most recently updated in 2019 as part of the Riverside County Long Range Transportation Study. The Riverside County Transportation Commission (RCTC) adopted the 2019 CMP for the County of Riverside in December 2019. (4) There are no study area intersections identified as a Riverside County CMP intersection.

EXHIBIT 1-3: STUDY AREA

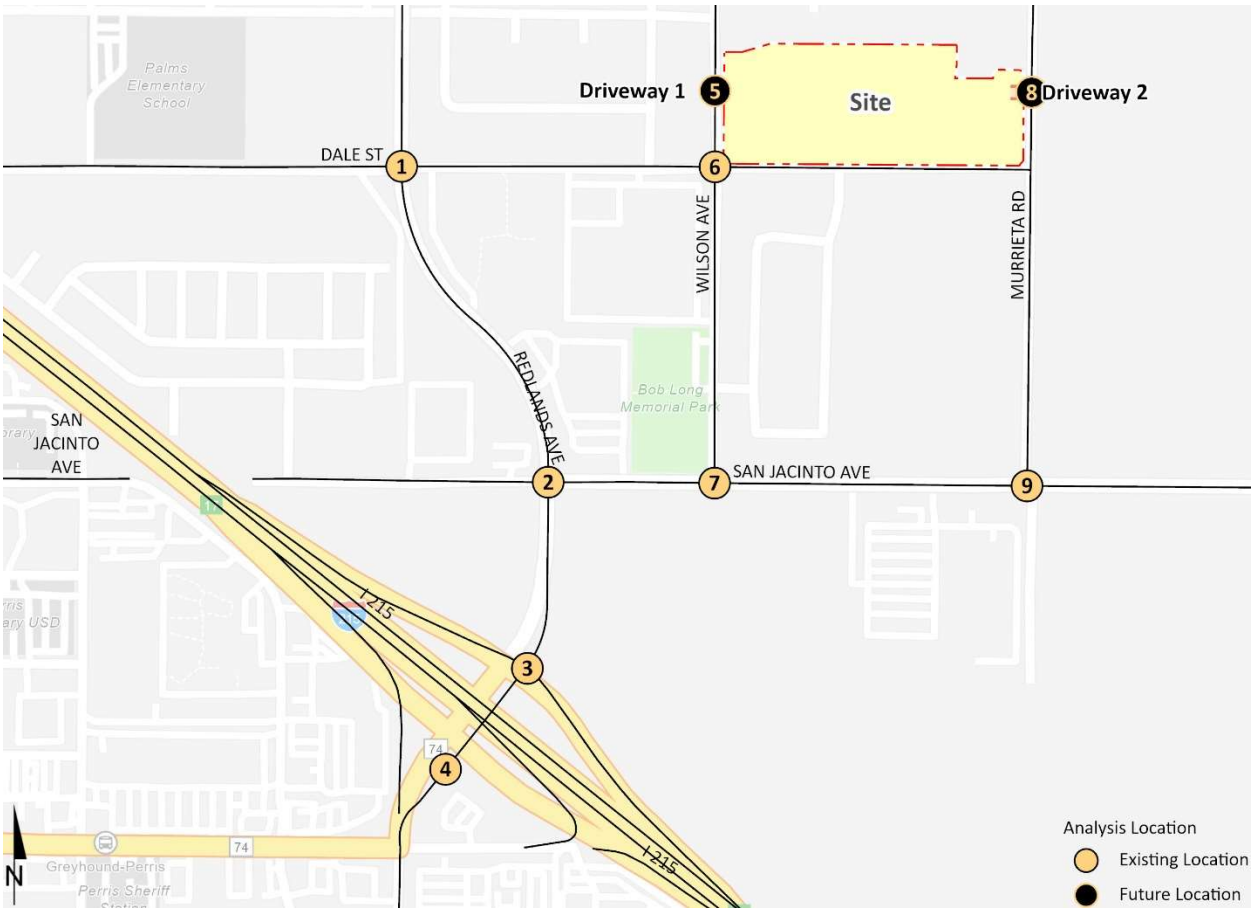


TABLE 1-1: INTERSECTION ANALYSIS LOCATIONS

#	Intersection	Jurisdiction	CMP?
1	Redlands Av. & Dale St.	City of Perris	No
2	Redlands Av. & San Jacinto Av.	City of Perris	No
3	Redlands Av. & I-215 NB Ramps	City of Perris, Caltrans	No
4	Redlands Av. & I-215 SB Ramps	City of Perris, Caltrans	No
5	Wilson Av. & Driveway 1	City of Perris	No
6	Wilson Av. & Dale St.	City of Perris	No
7	Wilson Av. & San Jacinto Av.	City of Perris	No
8	Murrieta Rd. & Driveway 2	City of Perris	No
9	Murrieta Rd. & San Jacinto Av.	City of Perris	No

1.5 DEFICIENCIES

This section provides a summary of deficiencies by analysis scenario. Section 2 *Methodologies* provides information on the methodologies used in the analysis and Section 5 *E+P Traffic Conditions,* Section 6 *Opening Year Cumulative (2024) Traffic Conditions,* and Section 7 *Horizon Year (2045) Traffic Conditions* includes the detailed analysis. A summary of LOS results for all analysis scenarios is presented on Table 1-2.

TABLE 1-2: SUMMARY OF LOS

		Existing		E+P		2022 Without Project		2024 With Project		2045 Without Project		2045 With Project	
#	Intersection	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
1	Redlands Av. & Dale St.	●	●	●	●	●	●	●	●	●	●	●	●
2	Redlands Av. & San Jacinto Av.	●	●	●	●	●	●	●	●	●	●	●	●
3	Redlands Av. & I-215 NB Ramps	●	●	●	●	●	●	●	●	●	●	●	●
4	Redlands Av. & I-215 SB Ramps	●	●	●	●	●	●	●	●	●	●	●	●
5	Wilson Av. & Driveway 1	N/A	N/A	●	●	N/A	N/A	●	●	N/A	N/A	●	●
6	Wilson Av. & Dale St.	●	●	●	●	●	●	●	●	●	●	●	●
7	Wilson Av. & San Jacinto Av.	●	●	●	●	●	●	●	●	●	●	●	●
8	Murrieta Rd. & Driveway 2	N/A	N/A	●	●	N/A	N/A	●	●	N/A	N/A	●	●
9	Murrieta Rd. & San Jacinto Av.	●	●	●	●	●	●	●	●	●	●	●	●

● = A - D ● = E ● = F

1.5.1 EXISTING (2022) CONDITIONS

Intersections

The study area intersections are currently operating at an acceptable LOS during the peak hours.

Queues

There are no movements that currently experience queuing issues during the weekday AM or weekday PM peak 95th percentile traffic flows for Existing (2022) traffic conditions.

1.5.2 E+P CONDITIONS

Intersections

The study area intersections are anticipated to continue to operate at an acceptable LOS during the peak hours with the addition of Project traffic under E+P traffic conditions.

Queues

There are no movements that are anticipated to experience queuing issues during the weekday AM or weekday PM peak 95th percentile traffic flows with the addition of Project traffic for E+P traffic conditions.

1.5.3 OPENING YEAR CUMULATIVE (2024) CONDITIONS

Intersections

The following study area intersections are anticipated to operate at an unacceptable LOS under Opening Year Cumulative (2024) Without Project traffic conditions:

- Redlands Avenue & San Jacinto Avenue (#2) – LOS F AM and PM peak hours
- Wilson Avenue & San Jacinto Avenue (#7) – LOS F AM and PM peak hours
- Murrieta Road & San Jacinto Avenue (#9) – LOS F AM and PM peak hours

The addition of Project traffic is not anticipated to result in any additional deficiencies.

Queues

There are no movements that are anticipated to experience queuing issues during the weekday AM or weekday PM peak 95th percentile traffic flows for Opening Year Cumulative (2024) traffic conditions.

1.5.4 HORIZON YEAR (2045) CONDITIONS

Intersections

The following study area intersections are anticipated to operate at an unacceptable LOS under Horizon Year (2045) Without Project traffic conditions:

- Redlands Avenue & San Jacinto Avenue (#2) – LOS F AM and PM peak hours
- Wilson Avenue & San Jacinto Avenue (#7) – LOS F AM and PM peak hours
- Murrieta Road & San Jacinto Avenue (#9) – LOS F AM and PM peak hours

The addition of Project traffic is not anticipated to result in any additional deficiencies.

Queues

There are no movements that are anticipated to experience queuing issues during the weekday AM or weekday PM peak 95th percentile traffic flows for Horizon Year (2045) traffic conditions.

1.6 RECOMMENDATIONS

1.6.1 SITE ADJACENT AND SITE ACCESS RECOMMENDATIONS

The following recommendations are based on the minimum improvements needed to accommodate site access and maintain acceptable peak hour operations for the proposed Project. The site adjacent recommendations are shown on Exhibits 1-4.

Recommendation 1 – Wilson Avenue & Driveway 1 (#5) – The following improvement is necessary to accommodate site access:

- Project to install a stop control on the westbound approach. The driveway should be restricted to exiting traffic only.

Recommendation 2 – Murrieta Road & Driveway 2 (#8) – The following improvements are necessary to accommodate site access:

- Project to install a stop control on the eastbound approach. The driveway should allow full-access movement.

Recommendation 3 **– Murrieta Road –** The following improvements are necessary to accommodate site access:

- Project to construct Murrieta Road at its ultimate width as a Major Collector (78-foot right-of-way) from Dale Street to the northern Project boundary consistent with the City's standards.

Recommendation 4 **– Wilson Avenue –** the site adjacent roadway appears to be built to its ultimate General Plan curb-to-curb width adjacent to the Project. However, the Project should improve the curb-and-gutter, sidewalks, and landscape along the frontage in addition to accommodating improvements to facilitate site access at the driveway.

On-site traffic signing and striping should be implemented agreeable with the provisions of the California Manual on Uniform Traffic Control Devices (CA MUTCD) and in conjunction with detailed construction plans for the Project site.

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

1.6.2 OFF-SITE RECOMMENDATIONS

The recommended improvements needed to address the cumulative deficiencies identified under Existing (2022), E+P, Opening Year Cumulative (2024), and Horizon Year (2045) traffic conditions are summarized in Table 1-3. For those improvements listed in Table 1-3 and not constructed as part of the Project, the Project Applicant's responsibility for the Project's contributions towards deficient intersections is fulfilled through payment of fair share and/or fees. Table 1-3 also summarizes the applicable cost associated with each of the recommended improvements. The costs have been estimated using the data provided in Appendix "G" of the CMP (2003) for preliminary construction costs. Appendix "G" of the CMP (2003) has been provided in Appendix 1.2.

EXHIBIT 1-4: SITE ACCESS RECOMMENDATIONS

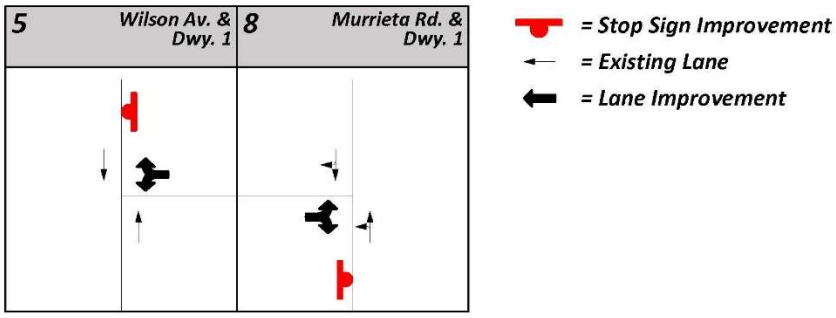


TABLE 1-3: SUMMARY OF IMPROVEMENTS AND ROUGH ORDER OF MAGNITUDE COSTS

#	Intersection	Jurisdiction	Opening Year Cumulative (2024) With Project	Horizon Year (2040) With Project	Improvements in TUMF?[1]	Project Responsibility[2]	Total Cost[4]	Fair Share %[3]	Fair Share Cost[6]
2	Redlands Av. & San Jacinto Av.	City of Perris	- Add 2nd NB right lane	- Same	No	Fair Share	$83,700	3.29%	2755.98
			- Modify the TS to implement NB/EB right turn lanes with overlap phasing	- Same	No	Fair Share	$8,370		$276
			- Modify signal timing with a 140/150-second cycle length during the peak hours	- Same	No	Fair Share	$8,370		$276
							$100,440		**$3,307**
7	Wilson Av. & San Jacinto Av.	City of Perris	- Add 2nd WB through lane by restriping	- Same	No	Fair Share	$41,850	5.02%	$2,102
			- Add EB left lane	- Same	No	Fair Share	$83,700		$4,204
				- Install a traffic signal	No	Fair Share	$600,000		$30,135
							$725,550		**$36,441**
9	Murrieta Rd. & San Jacinto Av.	City of Perris	- Install a traffic signal	- Same	No	Fair Share	$600,000	6.94%	$41,653
				- Add 2nd EB through lane by restriping	No	Fair Share	$25,000		$1,736
				- Add 2nd WB through lane	No	Fair Share	$301,320		$20,918
							$926,320		**$64,307**
				Total Project Fair Share Contribution to the City of Perris[5]			**$1,752,310**		**$104,054**

[1] Improvements included in TUMF fee program. Although identified as a TUMF facility, the improvement is not currently identified on the Central Zone 5-Year Transportation Improvement Program Amendment (2021).

[2] Identifies the Project's responsibility to construct an improvement or contribute fair share or fee payment towards the implementation of the improvements shown. If identified as a Project construct obligation, then no fair share has been identified.

[3] Program improvements constructed by Project may be eligible for fee credit, at discretion of the County. The highest peak hour fair share percentage for each intersection, as shown in Table 8-1, has been utilized.

[4] Costs have been estimated using the data provided in Appendix "G" of the CMP (2003) for preliminary construction costs. A growth factor of 1.674 has been utilized to reflect 2022 costs.

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

[6] Rough order of magnitude cost estimate.

1.6.3 QUEUING ANALYSIS AT THE PROJECT DRIVEWAYS

A queuing analysis was conducted at the study area intersections for Horizon Year (2045) With Project traffic conditions to determine the turn pocket lengths necessary to accommodate 95th percentile queues. The analysis was conducted for the weekday AM and weekday PM peak hours. The results have been provided in Appendix 1.3.

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 derived from the average queue plus 1.65 standard deviations. The 95th percentile queue is not necessarily ever observed; it is simply based on statistical calculations (or Average Queue plus 1.65 standard deviations). Many agencies utilize the 95th percentile queues for design purposes. A vehicle is considered queued whenever it is traveling at less than 10 feet/second. The random simulations generated by SimTraffic have been utilized to determine the 95th percentile queue lengths observed for each turn movement. A SimTraffic simulation has been recorded five (5) times, during the weekday AM and weekday PM peak hours, and has been seeded for 30-minute periods with 60-minute recording intervals.

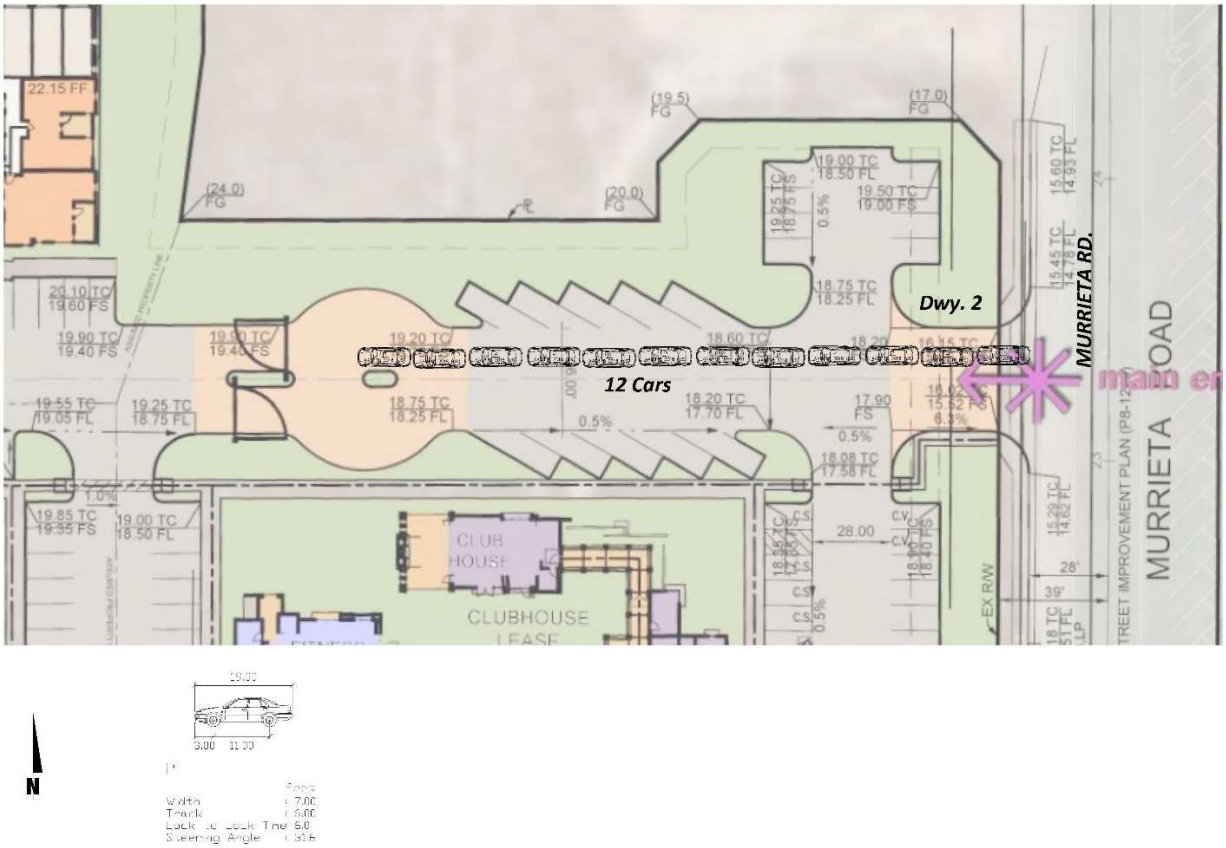
The minimum stacking distance required, based on the anticipated 95th percentile queues, is shown in Table 1-4. The highest queue length during either the AM or PM peak hour is shown in bold. The queue lengths shown in Table 1-4 represent the worst-case queuing lengths for the proposed Project Driveway 2. In other words, any stacking distance greater than the shown queue lengths should accommodate proposed Project vehicles, without backing onto the public streets. The highest queue anticipated is 59-feet which is approximately 2.5 car lengths (assuming 25-feet per vehicle). The gate stacking for Driveway 2 is shown on Exhibit 1-5, which shows Driveway 2 can sufficiently accommodate the anticipated gate queuing. Driveway 1 is restricted to serve exiting traffic only, therefore, no gate stacking queuing analysis has been conducted at this access point.

TABLE 1-4: PROJECT DRIVEWAY PEAK HOUR QUEUING SUMMARY

Intersection	Movement	95th Percentile Queue (Feet)	
		AM Peak Hour	PM Peak Hour
Murrieta Rd. & Driveway 2 (#8)	EB	**52**	44
	WB	27	**59**

BOLD = Highest queue length between AM and PM peak hours.

EXHIBIT 1-5: DRIVEWAY 2 GATE STACKING



1.7 VEHICLE MILES TRAVELED (VMT)

1.7.1 BACKGROUND

Changes to the Guidelines for Implementation of the California Environmental Quality Act (CEQA Guidelines) were adopted in December 2018, which requires all lead agencies to adopt VMT as a replacement for automobile delay-based level of service as the new measure for identifying transportation impacts for land use projects. This statewide mandate went into effect July 1, 2020. To aid in this transition, the Governor's Office of Planning and Research (OPR) released a Technical Advisory on Evaluating Transportation Impacts in CEQA (December 2018) (Technical Advisory). Based on OPR's Technical Advisory, the City of Perris adopted their Transportation Impact Analysis Guidelines for CEQA (May 2020) (City Guidelines). The adopted City Guidelines have been utilized to prepare the VMT analysis.

1.7.2 VMT SCREENING

Based on a more detailed review of the applicable VMT screening methods outlined in the City Guidelines, it is determined that the Project is not eligible for screening and further VMT Analysis is required.

1.7.3 VMT ANALYSIS

As noted in the City Guidelines, Projects that do not meet screening criteria and are above 2,500 daily vehicle trips are to utilize the City's scoping form to perform a VMT analysis and subsequent VMT mitigation (if required) to reduce the Project's VMT impact below the City's adopted thresholds. The City's scoping form contains base year data obtained from the RIVTAM base year 2012 traffic model. The RIVTAM base year traffic model was also used to derive the City's impact thresholds.

The Project resides in TAZ 3842 and the VMT per capita for TAZ 3767 is 16.30. Whereas the City of Perris citywide average is 15.05 VMT per employee. The Project's VMT impact is potentially significant. The scoping form results in a mitigation requirement of 7.67% reduction to adequately mitigate the VMT impacts of the Project's TAZ to below the City's impact threshold.

1.7.4 POTENTIAL VMT MITIGATION STRATEGIES

Mitigation may be provided in the form transportation demand management (TDM) measures or participation in a VMT fee program, which is not yet available. Therefore, VMT reduction measures focused on reducing VMT and the anticipated reduction in VMT associated with this measure have been estimated based on the research contained in the California Air Pollution Control Officers Association (CAPCOA) Quantifying Greenhouse Gas Mitigation Measures (CAPCOA, 2010) and are presented below.

LUT-1 Increase Density – Designing the Project with increased densities, where allowed by the General Plan and/or Zoning Ordinance reduces GHG emissions associated with traffic in several ways. Density is usually measured in terms of persons, jobs, or dwellings per unit area. Increased densities affect the distance people travel and provide greater options for the mode of travel they choose. This strategy also provides a foundation for implementation of many other strategies which would benefit

from increased densities. For example, transit ridership increases with density, which justifies enhanced transit service.

Mitigation Method for LUT-1:

% VMT Reduction = A * B [not to exceed 30%]

Formula:

- A: [not to exceed 500% increase]
    - If housing: (Number of housing units per acre – 7.6) / 7.6
- B: 0.07

Application to Project:

The Project is proposing a high-density residential development at 22 dwelling units per acre and based on the CAPCOA method for LUT-1. Based on the calculation method provided by CAPCOA the following calculations for the proposed Project are as follows:

(22.0 – 7.6) / 7.6 = 189%

189% x 0.07 = 13.23%

As a result, the high-density nature of the Project has an inherent effect on VMT that could not be adequately accounted for in the City's scoping form, which requires a mitigation of 7.67%. With the consideration of the higher density the Project is proposing, the VMT per capita is reduced by 13.23%, which would bring the Project VMT per capita below the City's impact threshold. The Project's VMT impact is less than significant.

2 METHODOLOGIES

This section of the report presents the methodologies used to perform the traffic analyses summarized in this report. The methodologies described are consistent with City of Perris's Traffic Study Guidelines.

2.1 LEVEL OF SERVICE

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

2.2 INTERSECTION CAPACITY ANALYSIS

The definitions of LOS for interrupted traffic flow (flow restrained by the existence of traffic signals and other traffic control devices) differ slightly depending on the type of traffic control. The LOS is typically dependent on the quality of traffic flow at the intersections along a roadway. The 6th Edition Highway Capacity Manual (HCM) methodology expresses the LOS at an intersection in terms of delay time for the various intersection approaches. (5) The HCM uses different procedures depending on the type of intersection control.

2.2.1 SIGNALIZED INTERSECTIONS

The City of Perris requires signalized intersection operations analysis based on the methodology described in the HCM. (5) 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 related to the average control delay per vehicle and is correlated to a LOS designation as described on Table 2-1.

The traffic modeling and signal timing optimization software package Synchro (Version 11) is utilized to analyze signalized intersections within the study area. 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[1]
Operations with very low delay occurring with favorable progression and/or short cycle length.	0 to 10.00	A
Operations with low delay occurring with good progression and/or short cycle lengths.	10.01 to 20.00	B
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
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
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
Operation with delays unacceptable to most drivers occurring due to over saturation, poor progression, or very long cycle lengths.	80.01 and up	F

Source: HCM, 6th Edition

[1] If V/C is greater than 1.0 then LOS is F per HCM.

The traffic modeling and signal timing optimization software package Synchro (Version 11) has been utilized to analyze signalized intersections. Synchro is a macroscopic traffic software program that is based on the signalized intersection capacity analysis as specified in the HCM. Macroscopic level models represent traffic in terms of aggregate measures for each movement at the study intersections. Equations are used to determine measures of effectiveness such as delay and queue length. The level of service and capacity analysis performed by Synchro takes into consideration optimization and coordination of signalized intersections within a network.

The peak hour traffic volumes have been adjusted using a peak hour factor (PHF) to reflect peak 15-minute volumes. Customary practice for LOS analysis is to use a peak 15-minute rate of flow. However, flow rates are typically expressed in vehicles per hour. The PHF is the relationship between the peak 15-minute flow rate and the full hourly volume (e.g., PHF = [Hourly Volume] / [4 x Peak 15-minute Flow Rate]). The use of a 15-minute PHF produces a more detailed analysis as compared to analyzing vehicles per hour. Existing PHFs have been used for all analysis scenarios. Per the HCM, PHF values over 0.95 often are indicative of high traffic volumes with capacity constraints on peak hour flows while lower PHF values are indicative of greater variability of flow during the peak hour. (5)

2.2.2 UNSIGNALIZED INTERSECTIONS

The City of Perris requires the operations of unsignalized intersections be evaluated using the methodology described in the HCM. (5) The LOS rating is based on the weighted average control delay expressed in seconds per vehicle (see Table 2-2). 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. Delay for the intersection is reported for the worst individual movement at a two-way stop-controlled intersection. For all-way stop controlled intersections, LOS is computed for the intersection as a whole (average delay).

TABLE 2-2: UNSIGNALIZED INTERSECTION LOS THRESHOLDS

Description	Average Control Delay (Seconds), V/C ≤ 1.0	Level of Service, V/C ≤ 1.0[1]
Little or no delays.	0 to 10.00	A
Short traffic delays.	10.01 to 15.00	B
Average traffic delays.	15.01 to 25.00	C
Long traffic delays.	25.01 to 35.00	D
Very long traffic delays.	35.01 to 50.00	E
Extreme traffic delays with intersection capacity exceeded.	> 50.00	F

Source: HCM, 6th Edition

[1] If V/C is greater than 1.0 then LOS is F per HCM.

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 TA uses the signal warrant criteria presented in the latest edition of the California Department of Transportation (Caltrans) California Manual on Uniform Traffic Control Devices *(CA MUTCD)* for all study area intersections. (6)

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. (6) Specifically, this TA 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 TA 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

#	Intersection	Jurisdiction
5	Wilson Av. & Driveway 1	City of Perris
6	Wilson Av. & Dale St.	City of Perris
7	Wilson Av. & San Jacinto Av.	City of Perris
8	Murrieta Rd. & Driveway 2	City of Perris
9	Murrieta Rd. & San Jacinto Av.	City of Perris

Traffic signal warrant analyses were performed for all of the full access unsignalized study area intersections. The traffic signal warrant analysis for existing (2022) conditions are presented in Section 3 *Existing (2022) Traffic Analysis.* The traffic signal warrant analyses for future conditions are presented in Section 5 *E+P Traffic Analysis,* Section 6 *Opening Year Cumulative (2024) Traffic Analysis,* and Section 6 *Horizon Year (2045) Traffic Analysis* of this report.

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

2.4 QUEUING ANALYSIS

Consistent with Caltrans requirements, the 95th percentile queuing of vehicles has been assessed at the off-ramps to determine potential queuing deficiencies at the freeway ramp intersections at the I-215 Freeway at the Redlands Avenue interchange. Specifically, the off-ramp queuing analysis is utilized to identify any potential queuing and "spill back" onto the I-215 Freeway mainline from the off-ramps. The 95th percentile queue has also been utilized to assess the queues at Redlands Avenue to identify any potential queuing.

The traffic progression analysis tool and HCM intersection analysis program, Synchro, has been used to assess the potential deficiencies/needs of the intersections with traffic added from the proposed Project. Storage (turn-pocket) length recommendations at the ramps have been based upon the 95th percentile queue resulting from the Synchro progression analysis. The footnote from the Synchro output sheets indicates if the 95th percentile cycle exceeds capacity. Traffic is simulated for two complete cycles of the 95th percentile traffic in Synchro in order to account for the effects of spillover between cycles. In practice, the 95th percentile queue shown will rarely be exceeded and the queues shown with the footnote are acceptable for the design of storage bays. The 95th percentile queue is derived from the average queue plus 1.65 standard deviations. The 95th percentile queue is not necessarily ever observed it is simply based on statistical calculations.

2.5 MINIMUM ACCEPTABLE LEVELS OF SERVICE (LOS)

The definition of an intersection deficiency has been obtained from the City of Perris' General Plan. LOS D along all City maintained roads (including intersections) and LOS D along I-215 and SR-74 (including intersections with local streets and roads). An exception to the local road standard is LOS E, at intersections of any Arterials and Expressways with SR-74, the Ramona-Cajalco Expressway, or at I-215 Freeway ramps. (7)

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.

For the purposes of this traffic impact analysis, LOS D has also been considered the acceptable threshold for all study area intersections.

2.6 DEFICIENCY CRITERIA

This section outlines the methodology used in this analysis related to identifying circulation system deficiencies. The following deficiency criteria has been utilized for the City of Perris. To determine whether the addition of project-related traffic at a study intersection would result in a deficiency, the following will be utilized:

- A project-related deficiency 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 deficiency 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 deficiency 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.

2.7 PROJECT FAIR SHARE CALCULATION METHODOLOGY

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

Project Fair Share % = Project AM/PM Traffic / (2045 With Project AM/PM Total Traffic – Existing (2022) AM/PM Traffic)

The project fair share percentage has been calculated for both the AM peak hour and PM peak hour and the highest of the two has been selected. The Project fair share contribution calculations are presented in Section 8 *Local and Regional Funding Mechanisms* of this TA.

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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 off-ramp queuing analyses.

3.1 EXISTING CIRCULATION NETWORK

Pursuant to the agreement with City of Perris staff (Appendix 1.1), the study area includes a total of 9 existing and future intersections as shown previously on Exhibit 1-3. Exhibit 3-1 illustrates the study area intersections located near the proposed Project and identifies the number of through traffic lanes for existing roadways and intersection traffic controls.

3.2 CITY OF PERRIS GENERAL PLAN CIRCULATION ELEMENT

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

Secondary Arterials are designed to accommodate four travel lanes with a raised median, within a 94-foot right of way. The following study area roadways within the City of Perris are classified as Secondary Arterials:

- Redlands Avenue
- San Jacinto Road

Major Collectors are designed to accommodate two travel lanes with a painted median, within a 78-foot right of way. The following study area roadways within the City of Perris are classified as Collectors:

- Murrieta Road

Collectors are designed to accommodate two travel lanes, within a 66-foot right of way. The following study area roadways within the City of Perris are classified as Collectors:

- Wilson Avenue

3.3 BICYCLE, EQUESTRIAN, & PEDESTRIAN FACILITIES

Field observations indicate nominal pedestrian and bicycle activity within the study area. As shown on Exhibit 3-4, pedestrian facilities are built out along Dale Street, Wilson Avenue, Redlands Avenue, and portions of San Jacinto Avenue and Murrieta Road. The City of Perris bike networks are shown on Exhibit 3-5. As shown on Exhibit 3-5, there is a Class II bike lane along portions of Wilson Avenue, a Class I path along Murrieta Road, and a Class IV bikeway along portions of San Jacinto Avenue.

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

1 Redlands Av. & Dale St.	2 Redlands Av. & San Jacinto Av.	3 Redlands Av. & I-215 NB Ramps	4 Redlands Av. & I-215 SB Ramps	5 Wilson Av. & Dwy. 1
4D, 2U, 2U, 4D	5D, 2D, 3D, 4D	4D, 4D	4D, 4D	Future Intersection

6 Wilson Av. & Dale St.	7 Wilson Av. & San Jacinto Av.	8 Murrieta Rd. & Dwy. 1	9 Murrieta Rd. & San Jacinto Av.
2D, 2U, 2U	2U, 2U, 2U	Future Intersection	2U, 2U, 2D

= Traffic Signal
= Stop Sign
4 = Number of Lanes
D = Divided
U = Undivided
= Speed Limit (MPH)
= School Speed Limit (MPH)

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

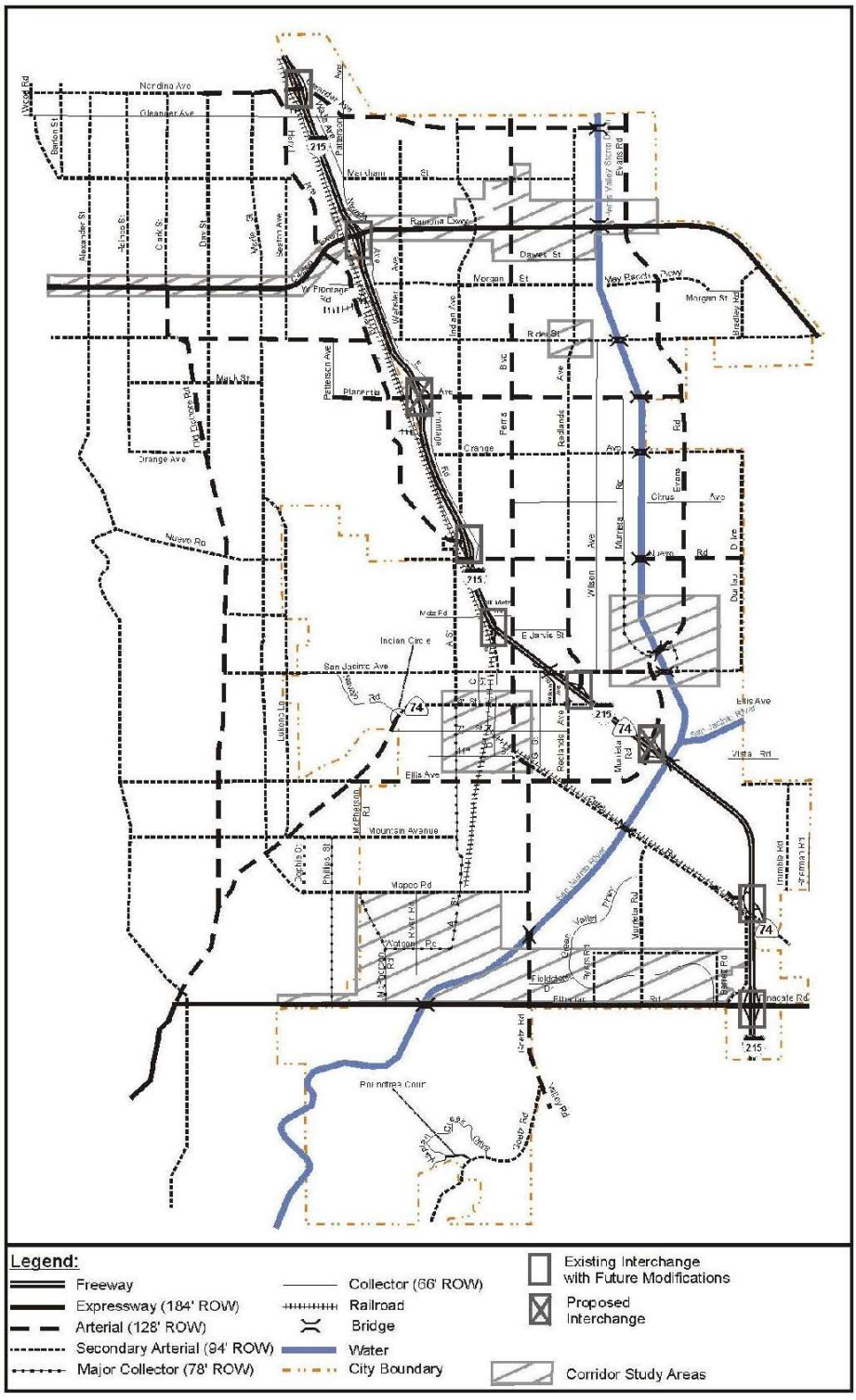
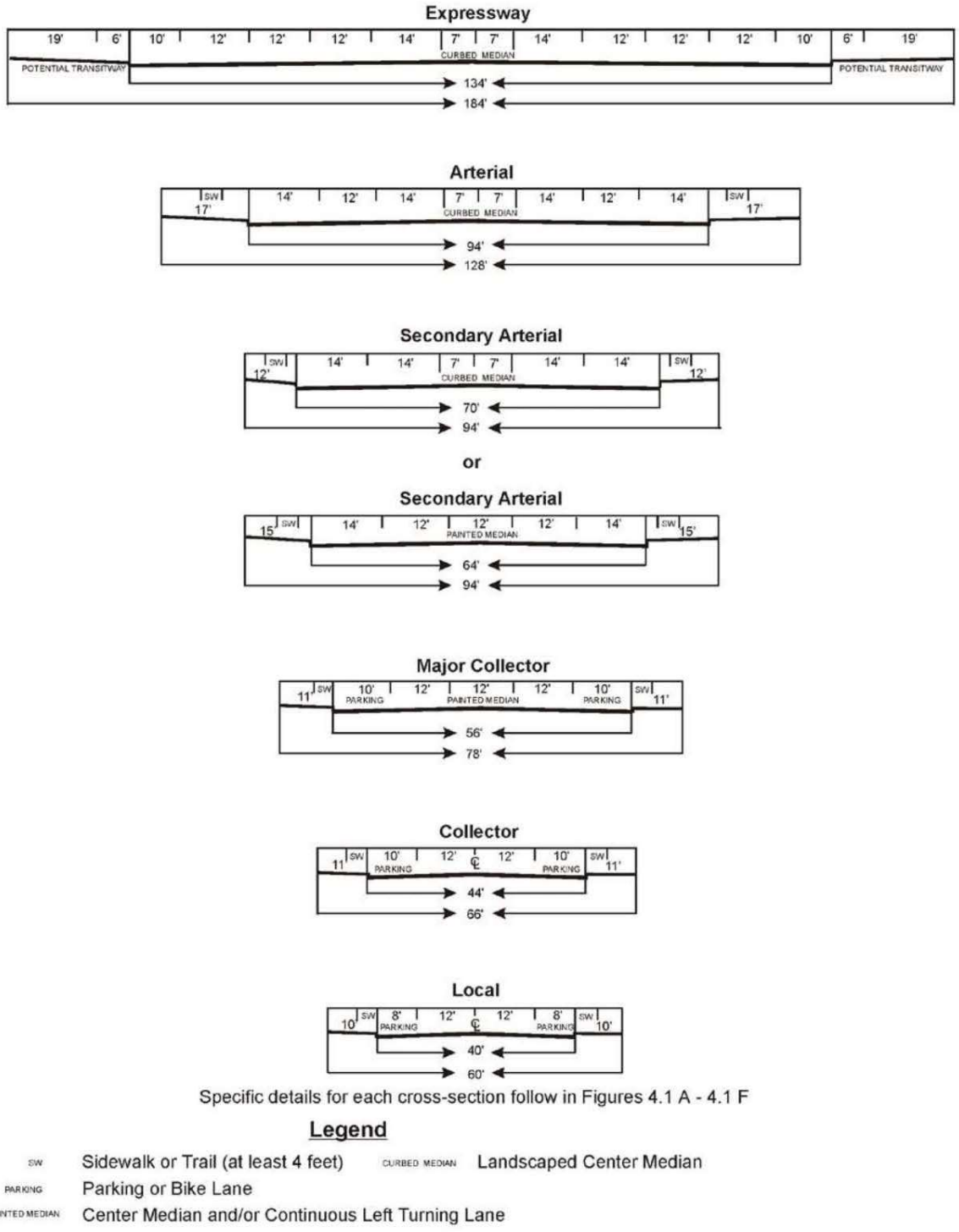


EXHIBIT 3-3: CITY OF PERRIS GENERAL PLAN ROADWAY CROSS-SECTIONS

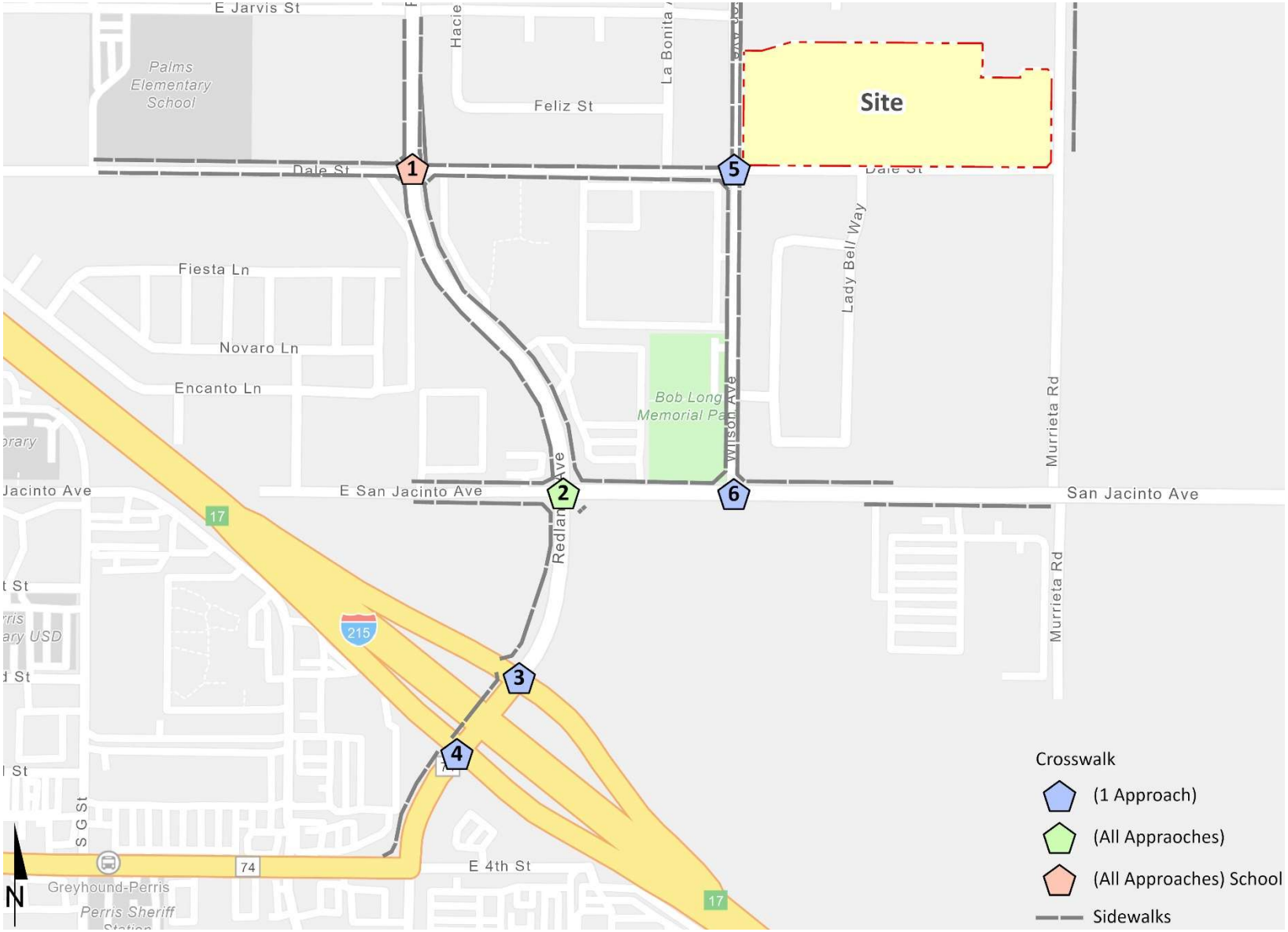


Specific details for each cross-section follow in Figures 4.1 A - 4.1 F

Legend

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

EXHIBIT 3-4: EXISTING PEDESTRIAN FACILITIES



3.4 TRANSIT SERVICE

The study area is currently served by Riverside Transit Agency (RTA). RTA Route 30 runs along Redlands Avenue. The transit route is illustrated on Exhibit 3-5. As shown, there are no existing routes that run immediately adjacent to the 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.

3.5 EXISTING (2022) TRAFFIC COUNTS

The intersection LOS analysis is based on the traffic volumes observed during the peak hour conditions using traffic count data collected in February 2022. 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)

Local schools are back in session with in-person instruction, as such, no additional adjustments were made to the traffic counts for the purposes of establishing the existing baseline. The 2022 weekday AM and weekday PM peak hour count data is representative of typical weekday peak hour traffic conditions in the study area. There were no observations made in the field that would indicate atypical traffic conditions on the count dates, such as construction activity or detour routes and near-by schools were in session and operating on normal schedules. The raw manual peak hour turning movement traffic count data sheets are included in Appendix 3.1.

Existing weekday ADT volumes are shown on Exhibit 3-6. 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 13.35 = Leg Volume

A comparison of the PM peak hour and daily traffic volumes of various roadway segments within the study area indicated that the peak-to-daily relationship is approximately 7.49 percent. As such, the above equation utilizing a factor of 13.35 estimates the ADT volumes on the study area roadway segments assuming a peak-to-daily relationship of approximately 7.49 percent (i.e., 1/0.0749 = 13.35) 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 are also shown on Exhibit 3-6.

EXHIBIT 3-5: EXISTING TRANSIT ROUTES

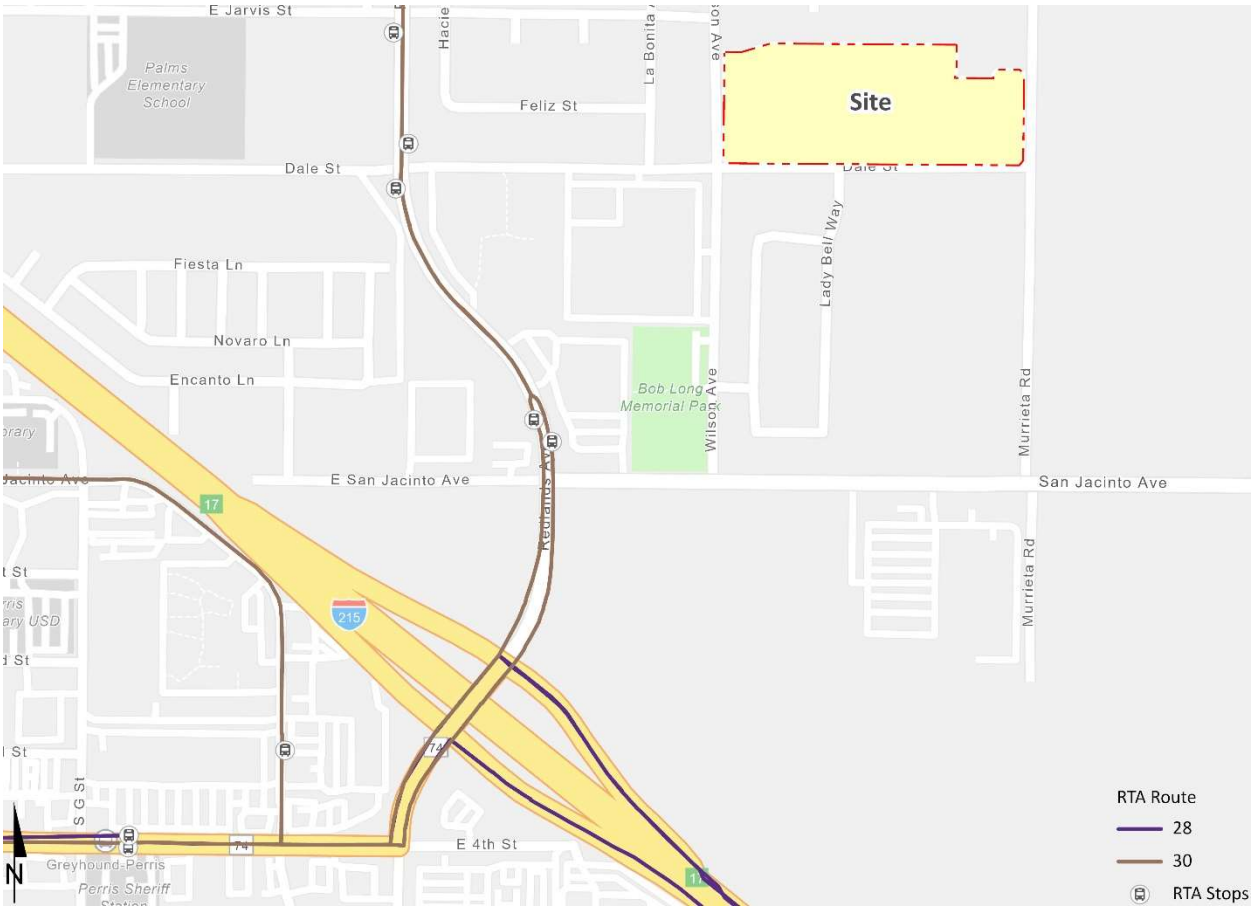
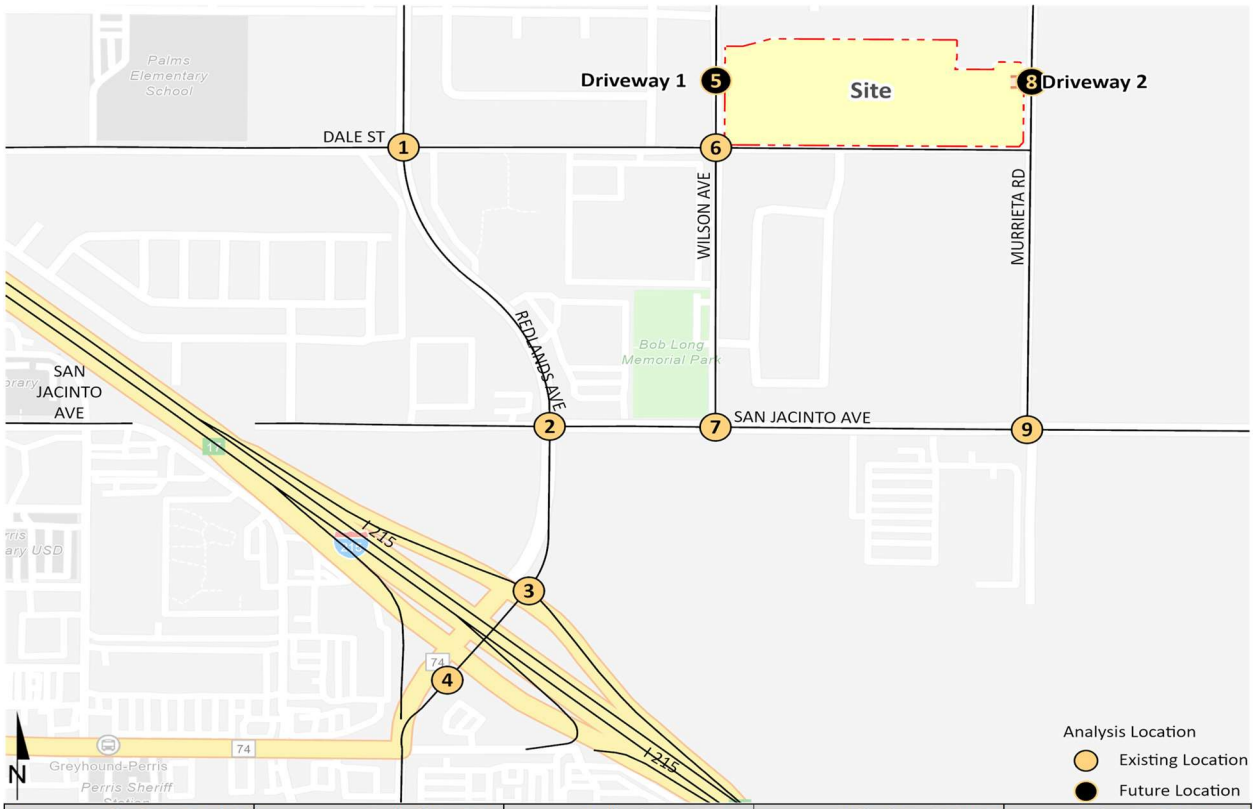


EXHIBIT 3-6: EXISTING (2022) TRAFFIC VOLUMES



1 Redlands Av. & Dale St.

12,750			1,700
142(39) ↲	449(392) ↓	29(47) ↳	51(31) ↱
			23(4) ←
			46(15) ↰
40(6) ↳			
6(3) →			
53(19) ↲			
	78(22) ↰	319(441) ↑	18(28) ↱
1,250			12,250

2 Redlands Av. & San Jacinto Av.

14,450			18,450
59(48) ↲	456(432) ↓	52(77) ↳	41(26) ↱
			61(59) ←
			616(467) ↰
77(58) ↳			
18(51) →			
108(106) ↲			
	91(130) ↰	363(443) ↑	481(703) ↱
6,050			30,450

3 Redlands Av. & I-215 NB Ramps

30,450			11,050
205(128) ↲	975(877) ←		267(493) ↱
			2(4) ←
			299(330) ↰
	142(123) ↰	668(783) ↑	
3,400			28,200

4 Redlands Av. & I-215 SB Ramps

28,200			10,800
	843(818) ←	431(389) ↳	
120(173) ↳			
0(2) →			
134(179) ↲			
		690(733) ↑	249(419) ↱
4,750			28,700

5 Wilson Av. & Driveway 1

2,450			
	71(71) ←		
		112(112) ↑	
			2,450

6 Wilson Av. & Dale St.

2,450			
11(11) ↲	60(60) ↓		
21(21) ↳			
24(24) ↲			
	25(25) ↰	91(91) ↑	
1,100			2,650

7 Wilson Av. & San Jacinto Av.

3,050			15,700
132(90) ↲	10(13) ↳		9(5) ↱
			639(473) ←
85(120) ↳			
521(685) →			
18,250			

8 Murrieta Rd. & Driveway 2

5,100			
	242(168) ←		
		210(215) ↑	
			4,350

9 Murrieta Rd. & San Jacinto Av.

5,100			11,000
222(153) ↲	20(15) ↳		30(18) ↱
			396(281) ←
180(197) ↳			
276(511) →			
15,250			

##(##) AM(PM) Peak Hour Intersection Volumes

Average Daily Trips

3.6 INTERSECTION OPERATIONS ANALYSIS

Existing peak hour traffic operations have been evaluated for the study area intersections based on the analysis methodologies presented in Section 2.2 *Intersection Capacity Analysis* of this report. The intersection operations analysis results are summarized on Table 3-1, which indicates that all of the study area intersections are currently operating at an unacceptable LOS during the peak hours. The intersection operations analysis worksheets are included in Appendix 3.2 of this TA.

TABLE 3-1: INTERSECTION ANALYSIS FOR EXISTING (2022) CONDITIONS

#	Intersection	Traffic Control[1]	Delay[2] (secs.) AM	Delay[2] (secs.) PM	Level of Service AM	Level of Service PM	Acceptable LOS
1	Redlands Av. & Dale St.	TS	11.2	8.7	B	A	D
2	Redlands Av. & San Jacinto Av.	TS	27.6	30.8	C	C	D
3	Redlands Av. & I-215 NB Ramps	TS	11.3	12.2	B	B	D
4	Redlands Av. & I-215 SB Ramps	TS	10.2	10.6	B	B	D
5	Wilson Av. & Driveway 1	CSS	Future Intersection				D
6	Wilson Av. & Dale St.	CSS	9.5	11.3	A	B	D
7	Wilson Av. & San Jacinto Av.	CSS	22.0	15.1	C	C	D
8	Murrieta Rd. & Driveway 2	CSS	Future Intersection				D
9	Murrieta Rd. & San Jacinto Av.	CSS	20.2	14.2	C	B	D

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

[1] TS = Trafic Signal; CSS = Cross-Street Stop

[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.

3.7 EXISTING (2022) TRAFFIC SIGNAL WARRANTS ANALYSIS

Traffic signal warrants for Existing traffic conditions are based on existing peak hour intersection turning volumes. The following unsignalized study area intersections currently meet a traffic signal warrant for Existing (2022) traffic conditions (see Appendix 3.3):

- Wilson Avenue & San Jacinto Avenue (#7)
- Murrieta Road & San Jacinto Avenue (#9)

3.8 EXISTING (2022) QUEUING ANALYSIS

A queuing analysis was performed for the off-ramps at the I-215 Freeway at Redlands Avenue interchange. 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 (2022) traffic conditions off-ramp queuing analysis are provided in Appendix 3.4.

TABLE 3-2: PEAK HOUR QUEUING SUMMARY FOR EXISTING (2022) CONDITIONS

Intersection	Movement	Available Stacking Distance (Feet)	95th Percentile Queue (Feet)[3]		Acceptable? [1]	
			AM Peak Hour	PM Peak Hour	AM	PM
Redlands Av. & I-215 NB Ramps (#3)	WBL	800	172	211 [2]	Yes	Yes
	WBL/T/R	1,250	153	87	Yes	Yes
	WBR	400	51	77	Yes	Yes
Redlands Av. & I-215 SB Ramps (#4)	EBL	740	78	101	Yes	Yes
	EBL/T/R	1,100	38	69	Yes	Yes
	EBR	140	33	40	Yes	Yes

[1] Stacking Distance is acceptable if the required stacking distance is less than or equal to the stacking distance provided. An additional 15 feet of stacking which is assumed to be provided in the transition for turn pockets is reflected in the stacking distance shown on this table, where applicable.
[2] 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

4 PROJECTED FUTURE TRAFFIC

The Project is proposed to consist of the development of 287 multi-family residential dwelling units. Vehicular access will be provided via a driveway on Wilson Avenue (exit only) and a driveway on Murrieta Road (full access). Regional access to the Project site is accommodated from the I-215 Freeway via Redlands Avenue.

4.1 PROJECT TRIP GENERATION

Trip generation represents the amount of traffic which is both attracted to and produced by a development. Determining traffic generation for a specific project is therefore based upon forecasting the amount of traffic that is expected to be both attracted to and produced by the specific land uses being proposed for a given development. In order to develop the traffic characteristics of the proposed project, trip-generation statistics published in the ITE Trip Generation Manual (11th Edition, 2021). (2)

Trip generation rates for the proposed uses are summarized on Table 4-1. A summary of the proposed Project trip generation is also shown on Table 4-1. As shown in Table 4-1, the proposed Project is anticipated to generate 1934 two-way trips per day with 115 AM peak hour trips and 146 PM peak hour trips.

TABLE 4-1: PROJECT TRIP GENERATION SUMMARY

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	
Trip Generation Rates:									
Multifamily (Low-Rise)	220	DU	0.096	0.304	0.400	0.321	0.189	0.510	6.740

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
Trip Generation Summary:									
DPR 20-00008	287	DU	28	87	115	92	54	146	1934

[1] Trip Generation Source: Institute of Transportation Engineers (ITE), Trip Generation Manual, Eleventh Edition (2021).

[2] DU = Dwelling Units

4.2 PROJECT TRIP DISTRIBUTION

The Project trip distribution represents the directional orientation of traffic to and from the Project site. 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 and are consistent with other similar projects that have been reviewed and approved by City of Perris staff. Exhibit 4-1 illustrates the trip distribution patterns for the Project, which is part of the TA scoping process (see Appendix 1.1).

EXHIBIT 4-1: PROJECT TRIP DISTRIBUTION

4.3 MODAL SPLIT

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

4.4 PROJECT TRIP ASSIGNMENT

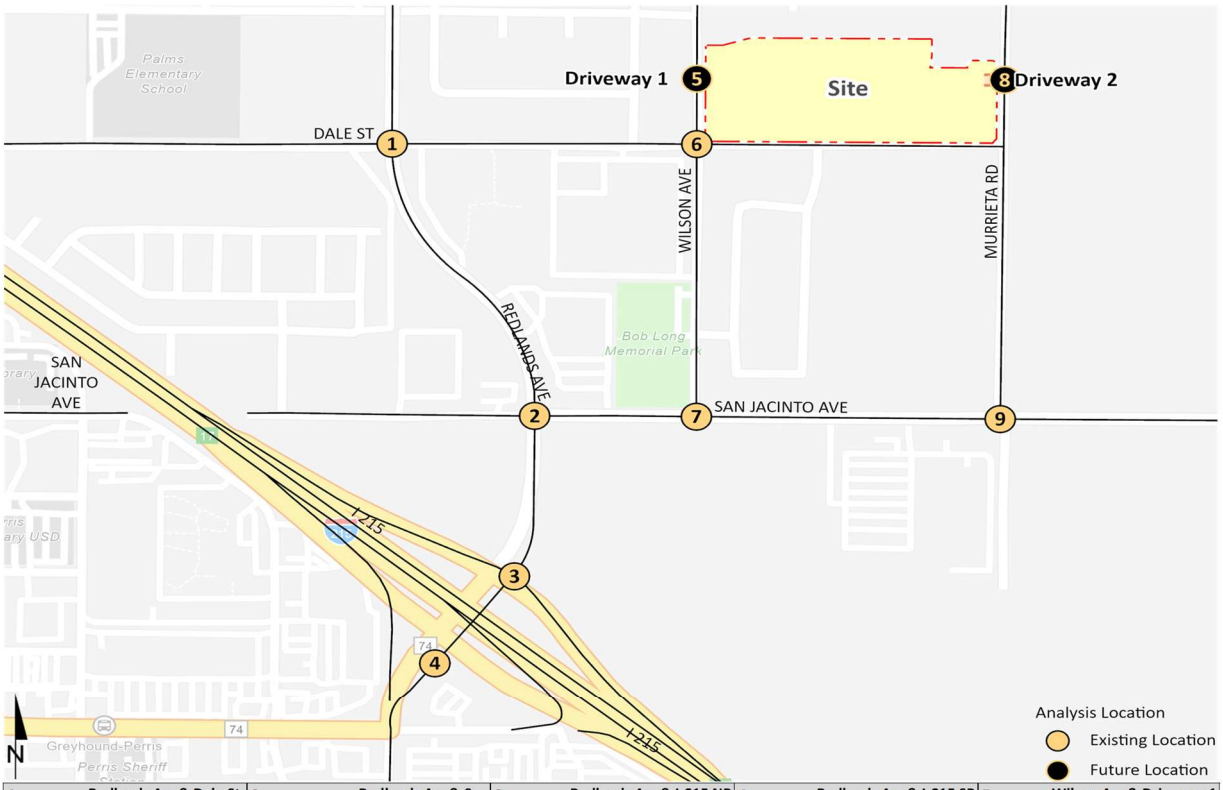
The assignment of traffic from the Project area to the adjoining roadway system is based upon the Project trip generation, trip distribution, and the arterial highway and local street system improvements that would be in place by the time of initial occupancy of the Project. Based on the identified Project traffic generation and trip distribution patterns, Project weekday ADT and weekday/weekend peak hour intersection turning movement volumes are shown on Exhibit 4-2.

4.5 BACKGROUND TRAFFIC

Future year traffic forecasts have been based upon background (ambient) growth at 3% per year, compounded annually, for 2024 conditions. The total ambient growth is 6.09% for 2024 traffic conditions (compounded growth of 3 percent per year over 2 years or $1.03^{2\ years}$). The ambient growth factor is intended to approximate regional traffic growth. This ambient growth rate is added to existing traffic volumes to account for area-wide growth not reflected by cumulative development projects. Ambient growth has been added to daily and peak hour traffic volumes on surrounding roadways, in addition to traffic generated by the development of future projects that have been approved but not yet built and/or for which development applications have been filed and are under consideration by governing agencies.

The currently adopted Southern California Association of Governments (SCAG) 2020 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS) (September 2020) growth forecasts for the City of Perris identifies projected growth in population of 74,900 in 2016 to 121,000 in 2045, or a 61.6 percent increase over the 29-year period. (9) The change in population equates to roughly a 1.67 percent growth rate, compounded annually. Similarly, growth over the same 29-year period in households is projected to increase by 96.5 percent, or 2.36 percent annual growth rate. Finally, growth in employment over the same 29-year period is projected to increase by 64.0 percent, or a 1.72 percent annual growth rate. This results in an average of 1.91 percent annual growth rate. As such, the 2.0 percent per year ambient growth rate utilized in this TA would appear to conservatively estimate annual traffic growth and overstate as opposed to understate future traffic forecasts.

EXHIBIT 4-2: PROJECT ONLY TRAFFIC VOLUMES



1 Redlands Av. & Dale St.	2 Redlands Av. & San Jacinto Av.	3 Redlands Av. & I-215 NB Ramps	4 Redlands Av. & I-215 SB Ramps	5 Wilson Av. & Driveway 1
150 / 400 ↰ 13(8) ↰ 22(14) 250	250 / 800 ← 22(14) ↰ 26(16) ↱ 15(51) 1,050	1,050 / 250 ↰ 13(8) ← 35(22) ↰ 7(23) ↑ 8(28) 150 / 700	700 / 250 ← 13(8) ↰ 22(14) 4(14) ↳ ↑ 4(14) 150 / 300	Nominal / 550 ↰ 4(3) ↰ 44(27) 500

6 Wilson Av. & Dale St.	7 Wilson Av. & San Jacinto Av.	8 Murrieta Rd. & Driveway 2	9 Murrieta Rd. & San Jacinto Av.
500 ↰ 35(22) ← 9(5) 400 / 100	100 / 750 ↰ 9(5) ← 17(11) 15(51) → 800	400 ↰ 8(28) 9(5) ↳ ↰ 30(19) ↴ 20(64) 1,400 / 1,000	1,000 / 300 ↰ 17(11) ↰ 13(8) ↰ 4(14) 15(51) ↳ 750

##(##) AM(PM) Peak Hour Intersection Volumes
Average Daily Trips

4.6 CUMULATIVE DEVELOPMENT TRAFFIC

A cumulative project list was developed for the purposes of this analysis through consultation with planning and engineering staff from the County of Riverside and City of Perris. The cumulative project list includes known and foreseeable projects that are anticipated to contribute traffic to the study area intersections.

Where applicable, cumulative projects anticipated to contribute measurable traffic (i.e., 50 or more peak hour trips) to study area intersections have been manually added to the study area network to generate Opening Year Cumulative forecasts. In other words, this list of cumulative development projects has been reviewed to determine which projects would likely contribute measurable traffic through the study area intersections (e.g., those cumulative projects in close proximity to the proposed Project). For the purposes of this analysis, the cumulative projects that were determined to affect one or more of the study area intersections are shown on Exhibit 4-3, listed in Table 4-3, and have been considered for inclusion. Any additional traffic generated by other projects not on the cumulative projects list is likely accounted for through background ambient growth factors that have been applied to the peak hour volumes at study area intersections as discussed in Section 4.5 *Background Traffic*. Cumulative development projects shown in Exhibit 4-3 and listed in Table 4-2. Cumulative Only ADT and peak hour intersection turning movement volumes are shown on Exhibit 4-4.

4.7 HORIZON YEAR (2045) CONDITIONS

"Buildout" traffic projections for Horizon Year conditions are based on traffic model forecasts and were derived from the Riverside County Transportation Analysis Model (RivCOM) using accepted procedures for model forecast refinement and smoothing for study area intersections located within the County of Riverside. The Horizon Year traffic conditions analyses was utilized to determine if improvements funded through regional transportation mitigation fee programs, such as the TUMF, can accommodate the long-range traffic at the target LOS identified in the City of Perris General Plan.

The traffic forecasts reflect the area-wide growth anticipated between Existing (2022) conditions and Horizon Year (2045) traffic conditions. In most instances the traffic model zone structure is not designed to provide accurate turning movements along arterial roadways unless refinement and reasonableness checking is performed. Therefore, the Horizon Year peak hour forecasts were refined using the model derived long range forecasts, base (validation) year model forecasts, along with existing peak hour traffic count data collected at each analysis location. The RivCOM has a base (validation) year of 2018 and a horizon (future forecast) year of 2045. The RivCOM 2045 model utilized for the purposes of this analysis assumes buildout of the City of Perris.

The refined future peak hour approach and departure volumes obtained from the model output data are then entered into a spreadsheet program consistent with the National Cooperative Highway Research Program (NCHRP Report 765), along with initial estimates of turning movement proportions. A linear programming algorithm is used to calculate individual turning movements which match the known directional roadway segment forecast volumes computed in the previous step. This program computes a likely set of intersection turning movements from intersection approach counts and the initial turning proportions from each approach leg.

The future Horizon Year (2045) Without Project peak hour turning movements were then reviewed by Urban Crossroads, Inc. for reasonableness, and in some cases, were adjusted to achieve flow conservation, reasonable growth, and reasonable diversion between parallel routes. Flow conservation checks ensure that traffic flow between two closely spaced intersections, such as two adjacent driveway locations, is verified in order to make certain that vehicles leaving one intersection are entering the adjacent intersection and that there is no unexplained loss of vehicles. The result of this traffic forecasting procedure is a series of traffic volumes which are suitable for traffic operations analysis. Post-processing worksheets for Horizon Year (2045) Without Project traffic conditions are provided in Appendix 4.1.

TABLE 4-2: CUMULATIVE DEVELOPMENT LAND USE SUMMARY

No.	Project Name / Case Number	Jurisdiction	Land Use[1]	Quantity	Units[2]
P1	Canyon Steel (CS)	Perris	Industrial	25.000	TSF
P2	Duke 2 / DPR 16-00008	Perris	High-Cube Warehouse	669.000	TSF
P3	First Perry / DPR 16-00013	Perris	High-Cube Warehouse	240.000	TSF
P4	Gateway / DPR 16-00003	Perris	High-Cube Warehouse	400.000	TSF
P5	Marijuana Manufacturing (MM)	Perris	Industrial	1.000	TSF
P6	Perris Plaza - Build-out	Perris	Commercial	173.000	TSF
P7	OLC2 / DPR 14-01-0015	Perris	High-Cube Warehouse	1,037.000	TSF
P8	Arco Expansion	Perris	Commercial	3.869	TSF
P9	Markham Industrial / DPR 16-00015	Perris	Warehousing	170.000	TSF
P10	Rados / DPR 07-0119	Perris	High-Cube Warehouse	1,200.000	TSF
P11	Rider 1 / DPR 16-0365	Perris	High-Cube Warehouse	350.000	TSF
P12	Indian/Ramona Warehouse / DPR 18-	Perris	High-Cube Warehouse	428.730	TSF
P13	Rider 3 / DPR 06-0432	Perris	High-Cube Warehouse	640.000	TSF
P14	Westcoast Textile / DPR 16-00001	Perris	Warehousing	180.000	TSF
P15	Duke at Patterson / DPR 17-00001	Perris	High-Cube Warehouse	811.000	TSF
P16	Harley Knox Commerce Park / DPR 16-004	Perris	High-Cube Warehouse	386.278	TSF
P17	Perris Marketplace / DPR 05-0341	Perris	Commercial Retail	520.000	TSF
P18	Stratford Ranch Residential / TTM 36648	Perris	SFDR	90	DU
P19	Pulte Residential / TTM 30850	Perris	SFDR	496	DU
P20	Circle Industrial III	Perris	Warehousing	211.000	TSF
P21	Duke @ Perris Blvd.	Perris	High-Cube Warehouse	1,070.000	TSF
P22	Weinerschnitzel / CUP 17-05083	Perris	Fast-Food Restaurant	2.000	TSF
P23	March Plaza / CUP16-05165	Perris	Commercial Retail	47.253	TSF
P24	Cali Express Carwash / CUP 16-05258	Perris	Carwash	5.600	TSF
P25	Wilson Industrial / DPR 19-00007	Perris	High-Cube Warehouse	303.000	TSF
P26	Integra Expansion / MMOD 17-05075	Perris	High-Cube Warehouse	273.000	TSF
P27	Western Industrial / DRP 19-00003	Perris	High-Cube Warehouse	250.000	TSF
P28	Rider 2/4	Perris	High-Cube Warehouse	1,373.449	TSF
P29	Pacific Heritage I	Perris	SFDR	82.000	DU
P30	Sunwest Enterprises	Perris	SFDR	61.000	DU
P31	Pacific Ave	Perris	PUD	131.000	DU
P32	Sunwest Enterprises	Perris	SFDR	57.000	DU
P33	Jason Keller/John Ford	Perris	SFDR	189.000	DU
P34	Jason Keller/John Ford	Perris	SFDR	122.000	DU

No.	Project Name / Case Number	Jurisdiction	Land Use[1]	Quantity	Units[2]
P35	Rastogi Family LTD / John Ford	Perris	SFDR	75.000	DU
P36	Sterling Villa Senior Housing	Perris	Senior Adult Housing - Attach	429.000	DU
P37	AAA	Perris	Industrial	2.000	TSF
P38	Pulliam Indus	Perris	Industrial	16.000	TSF
P39	Burge Indus 1	Perris	Industrial	18.000	TSF
P40	Burge Indus 2	Perris	Industrial	19.000	TSF
P41	Phelan Indus	Perris	Industrial	81.000	TSF
P42	Dedeaux Walnut Warehouse	Perris	Industrial	205.830	TSF
P43	Perris and Ramona Warehouse	Perris	Industrial	347.919	TSF
P44	Perris Valley Town Center (West Side)	Perris	Retail	28.000	TSF
			Fast-Food w/ Drive-Thru	2.200	TSF
P45	Perris Valley Town Center (East Side)	Perris	Shopping Center	644.866	TSF
			Fast-Food w/ Drive-Thru	10.500	TSF
			High Turnover Restaurant	15.120	TSF
			Gas Station	16	VFP
P46	South Perris Industrial Project	Perris	High-Cube Warehouse	7,394.048	TSF
P47	Perez Indus	Perris	Warehousing	2.500	TSF
P48	Malbert Cultivation	Perris	Cultivation	33.000	TSF
P49	Marijuana Manufacturing	Perris	Manufacturing	61.050	TSF
P50	Perris Airport Center	Perris	High-Cube Warehouse	704.480	TSF
			Truck Trailer Yard	371	Spaces
RC1	McCanna Hills / TTM 33978	County	SFDR	63	DU
RC2	Stoneridge	County	High-Cube Cold Storage	1,695.355	TSF
			High-Cube Fulfillment	2,966.872	TSF
			High-Cube Warehouse	2,966.872	TSF
			Manufacturing	847.678	TSF
			Warehousing	427.759	TSF
			Industrial Park	641.639	TSF
			Free-Standing Discount Store	100.000	TSF
			Commercial Retail	21.968	TSF
RC3	TR36712	County	Single Family Lots	74	DU
RC4	TTM37728	County	228 Lot Schedule a TTM	228	DU
RC5	TR36635	County	Residential, 6.0 Acres Park/	283	DU
RC6	TR36665	County	Residential lots	587	DU
RC7	TR37134	County	Single Family Residential	73	DU
RC8	PAR220005	County	High-Cube Fulfillment Center	1,374.688	TSF
			High-Cube Cold Storage	242.592	TSF

[1] SFDR = Single Family Detached Residential

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

EXHIBIT 4-4: CUMULATIVE DEVELOPMENT LOCATION MAP

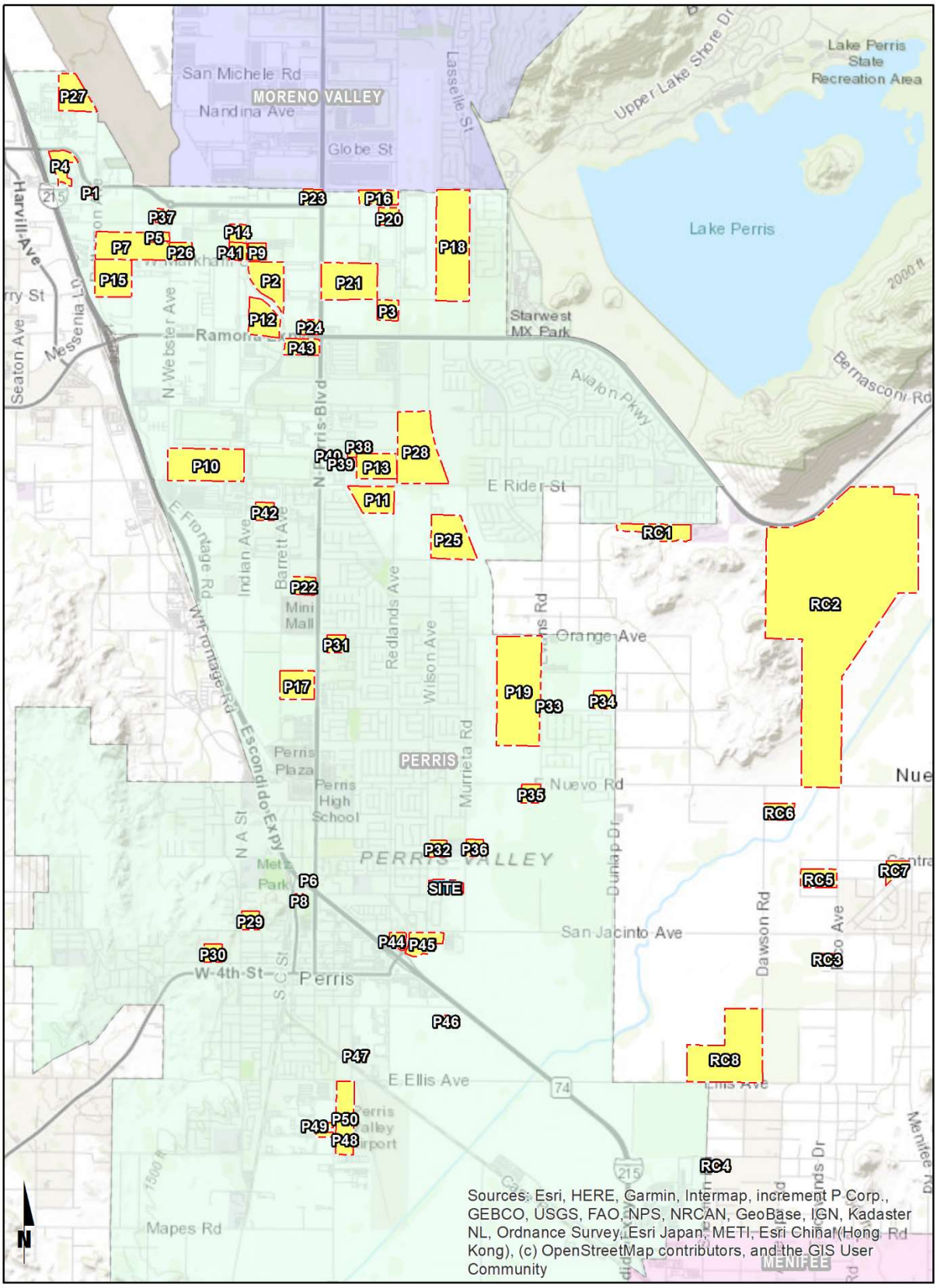
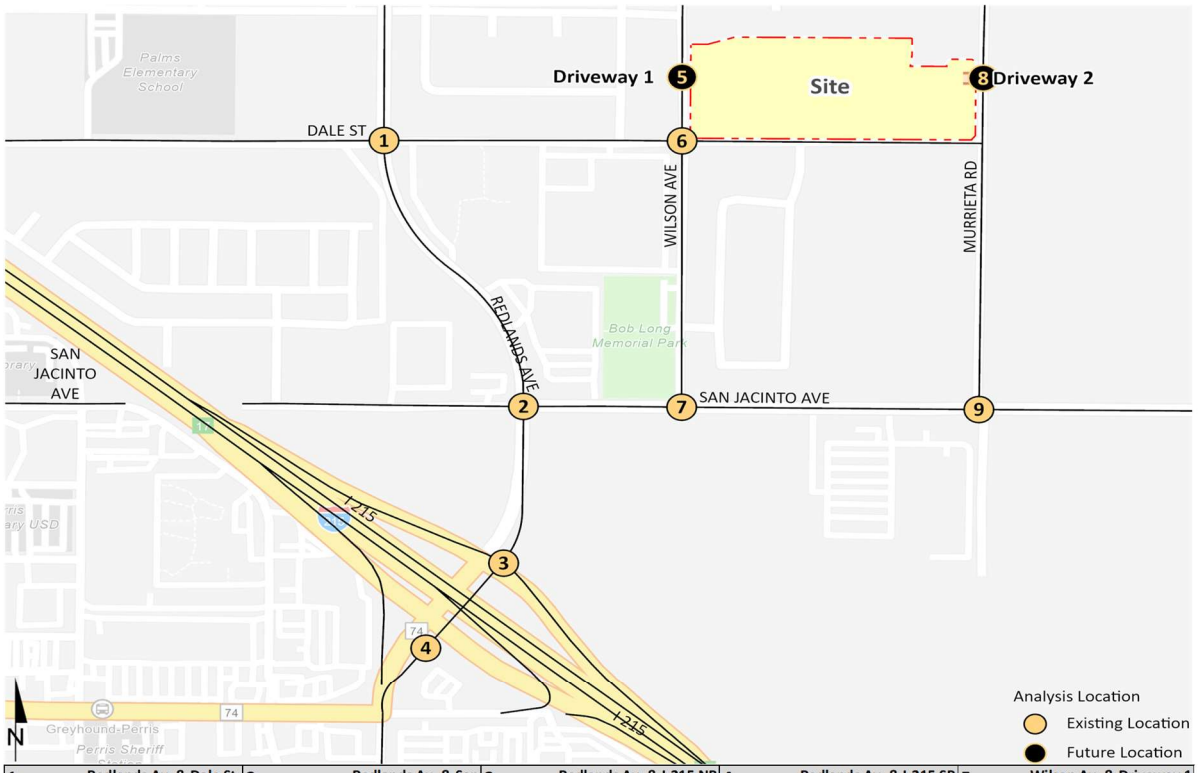
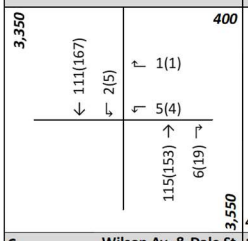


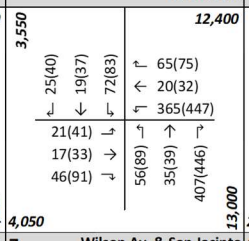
EXHIBIT 4-5: CUMULATIVE ONLY TRAFFIC VOLUMES



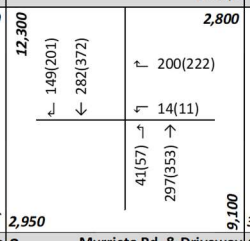
1 Redlands Av. & Dale St.



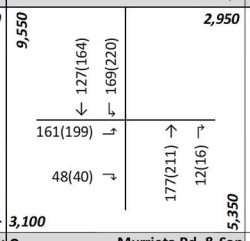
2 Redlands Av. & San Jacinto Av.



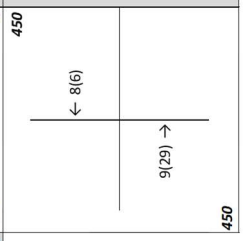
3 Redlands Av. & I-215 NB Ramps



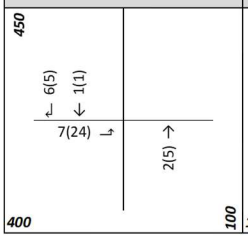
4 Redlands Av. & I-215 SB Ramps



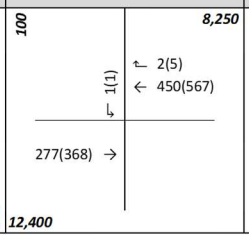
5 Wilson Av. & Driveway 1



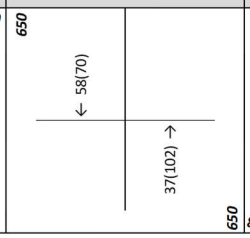
6 Wilson Av. & Dale St.



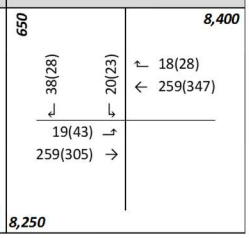
7 Wilson Av. & San Jacinto Av.



8 Murrieta Rd. & Driveway 2



9 Murrieta Rd. & San Jacinto Av.



##(##) AM(PM) Peak Hour Intersection Volumes

Average Daily Trips

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5 E+P TRAFFIC CONDITIONS

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

5.1 ROADWAY IMPROVEMENTS

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

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

5.2 EXISTING PLUS PROJECT TRAFFIC VOLUME FORECASTS

This scenario includes Existing traffic volumes plus Project traffic. The weekday ADT and weekday/weekend peak hour intersection turning movement volumes which can be expected for E+P traffic conditions are shown on Exhibit 5-1.

5.3 INTERSECTION OPERATIONS ANALYSIS

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

TABLE 5-1: INTERSECTION ANALYSIS FOR E+P CONDITIONS

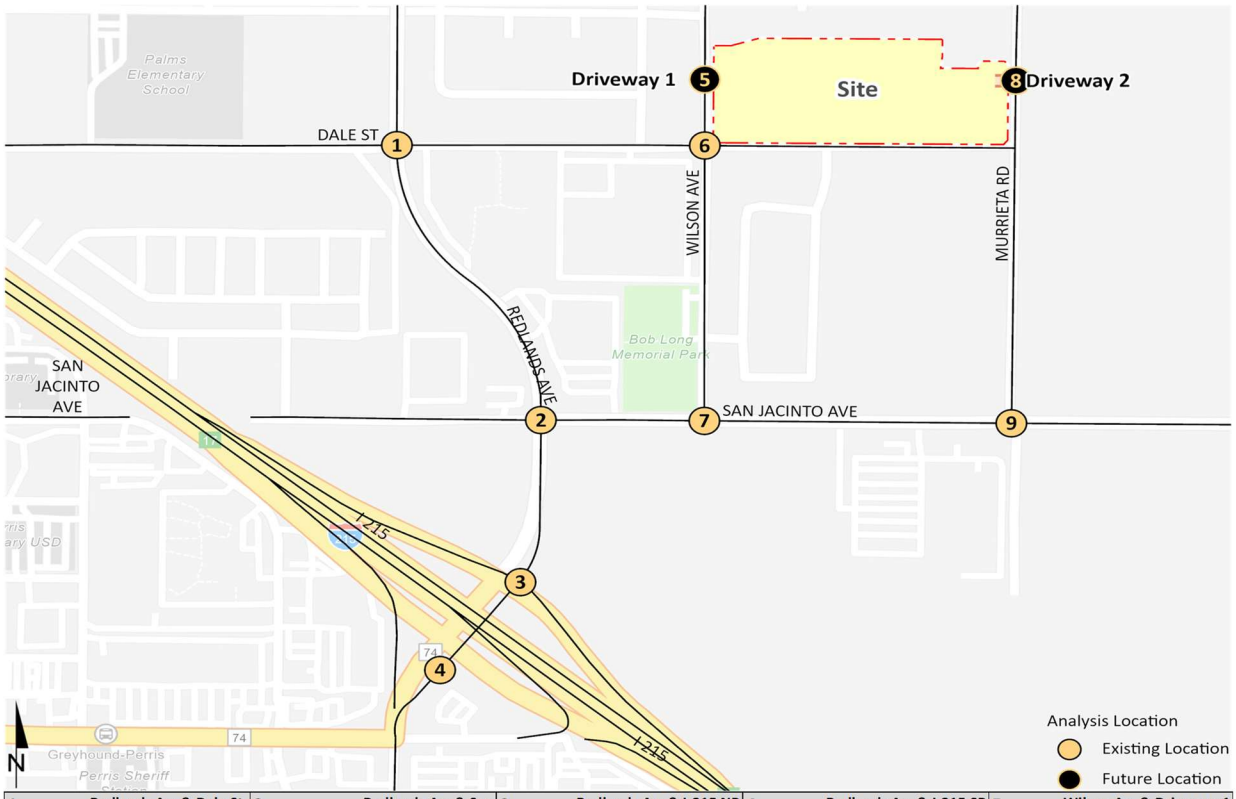
			Existing (2022)				E + P				
			Delay[1] (secs.)		Level of Service		Delay[1] (secs.)		Level of Service		
#	Intersection	Traffic Control[2]	AM	PM	AM	PM	AM	PM	AM	PM	Acceptable LOS
1	Redlands Av. & Dale St.	TS	11.2	8.7	B	A	12.0	9.0	B	A	D
2	Redlands Av. & San Jacinto Av.	TS	27.6	30.8	C	C	28.8	35.7	C	D	D
3	Redlands Av. & I-215 NB Ramps	TS	11.3	12.2	B	B	11.4	12.4	B	B	D
4	Redlands Av. & I-215 SB Ramps	TS	10.2	10.6	B	B	10.4	10.8	B	B	D
5	Wilson Av. & Driveway 1	CSS	Future Intersection				9.6	9.5	A	A	D
6	Wilson Av. & Dale St.	CSS	9.5	11.3	A	B	9.6	11.6	A	B	D
7	Wilson Av. & San Jacinto Av.	CSS	22.0	15.1	C	C	23.8	15.5	C	C	D
8	Murrieta Rd. & Driveway 2	CSS	Future Intersection				10.6	10.2	B	B	D
9	Murrieta Rd. & San Jacinto Av.	CSS	20.2	14.2	C	B	26.0	17.3	D	C	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] TS = Traffic Signal; CSS = Cross-Street Stop

EXHIBIT 5-1: E+P TRAFFIC VOLUMES



1 Redlands Av. & Dale St.

12,900 | 2,100

↲ 142(39)	↓ 449(392)	↳ 29(47)
40(6) →		↱ 64(39)
6(3) →		← 23(4)
53(19) ↴		↰ 68(29)
↱ 78(22)	↑ 319(441)	↱ 18(28)

1,250 | 12,500

2 Redlands Av. & San Jacinto Av.

14,700 | 19,300

↲ 59(48)	↓ 478(446)	↳ 52(77)
77(58) →		↱ 41(26)
18(51) →		← 61(59)
108(106) ↴		↰ 642(483)
↱ 91(130)	↑ 363(443)	↱ 496(754)

6,050 | 31,500

3 Redlands Av. & I-215 NB Ramps

31,500 | 11,300

↲ 218(136)	← 1010(899)	
		↱ 274(516)
		← 2(4)
		↰ 299(330)
↱ 142(123)	↑ 676(811)	

3,550 | 28,900

4 Redlands Av. & I-215 SB Ramps

28,900 | 11,050

	← 856(826)	↳ 453(403)
124(187) →		
0(2) →		
134(179) ↴		
↑ 694(747)	↱ 249(419)	

4,850 | 29,000

5 Wilson Av. & Driveway 1

2,500 | 550

← 71(71)		↱ 4(3)
		↰ 44(27)
	↑ 112(112)	

2,950

6 Wilson Av. & Dale St.

2,950

↲ 46(33)	↓ 69(65)	
21(21) →		
24(24) ↴		
↱ 25(25)	↑ 91(91)	

1,450 | 2,750

7 Wilson Av. & San Jacinto Av.

3,150 | 16,400

↲ 141(95)	↳ 10(13)	
85(120) →		↱ 9(5)
536(736) →		← 656(484)

19,100

8 Murrieta Rd. & Driveway 2

5,500

↲ 8(28)	↓ 242(168)	
9(5) →		
30(19) ↴		
↱ 20(64)	↑ 210(215)	

1,400 | 5,350

9 Murrieta Rd. & San Jacinto Av.

6,150 | 11,300

↲ 239(164)	↳ 33(23)	
195(248) →		↱ 34(32)
276(511) →		← 396(281)

15,950

##(##) AM(PM) Peak Hour Intersection Volumes

Average Daily Trips

5.4 TRAFFIC SIGNAL WARRANTS ANALYSIS

Traffic signal warrants have been performed for E+P traffic conditions based on peak hour intersection turning movements volumes or planning level (ADT) volumes. There are no additional unsignalized study area intersections anticipated to meet a traffic signal warrant under E+P traffic conditions, in addition to the intersections identified previously under Existing traffic conditions (see Appendices 5.2).

5.5 QUEUING ANALYSIS

Queuing analysis findings for E+P are presented on Table 5-2. As shown on Table 5-2, there are no movements that are anticipated to experience queuing issues during the weekday AM or weekday PM peak 95th percentile traffic flows with the addition of Project traffic. Worksheets for E+P traffic conditions queuing analysis are provided in Appendix 5.3.

TABLE 5-2: PEAK HOUR QUEUING SUMMARY FOR E+P CONDITIONS

			Existing (2022)				E+P			
		Available Stacking Distance	95th Percentile Queue (Feet)[3]		Acceptable? [1]		95th Percentile Queue (Feet)[3]		Acceptable? [1]	
Intersection	Movement	(Feet)[3]	AM Peak	PM Peak	AM	PM	AM Peak	PM Peak	AM	PM
Redlands Av. & I-215 NB Ramps (#3)	WBL	800	172	211 [2]	Yes	Yes	180	232 [2]	Yes	Yes
	WBL/T/R	1,250	153	87	Yes	Yes	158	98	Yes	Yes
	WBR	400	51	77	Yes	Yes	51	89	Yes	Yes
Redlands Av. & I-215 SB Ramps (#4)	EBL	740	78	101	Yes	Yes	78	104	Yes	Yes
	EBL/T/R	1,100	38	69	Yes	Yes	39	75	Yes	Yes
	EBR	140	33	40	Yes	Yes	35	41	Yes	Yes

[1] Stacking Distance is acceptable if the required stacking distance is less than or equal to the stacking distance provided. An additional 15 feet of stacking which is assumed to be provided in the transition for turn pockets is reflected in the stacking distance shown on this table, where applicable.
[2] 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

6 OPENING YEAR CUMULATIVE (2024) TRAFFIC CONDITIONS

This section discusses the methods used to develop Opening Year Cumulative (2024) Without and With Project traffic forecasts, and the resulting intersection operations, traffic signal warrant, and off-ramp queuing analyses.

6.1 ROADWAY IMPROVEMENTS

The lane configurations and traffic controls assumed to be in place for Opening Year Cumulative (2024) conditions are consistent with those shown previously on Exhibit 3-1, with the exception of the following:

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

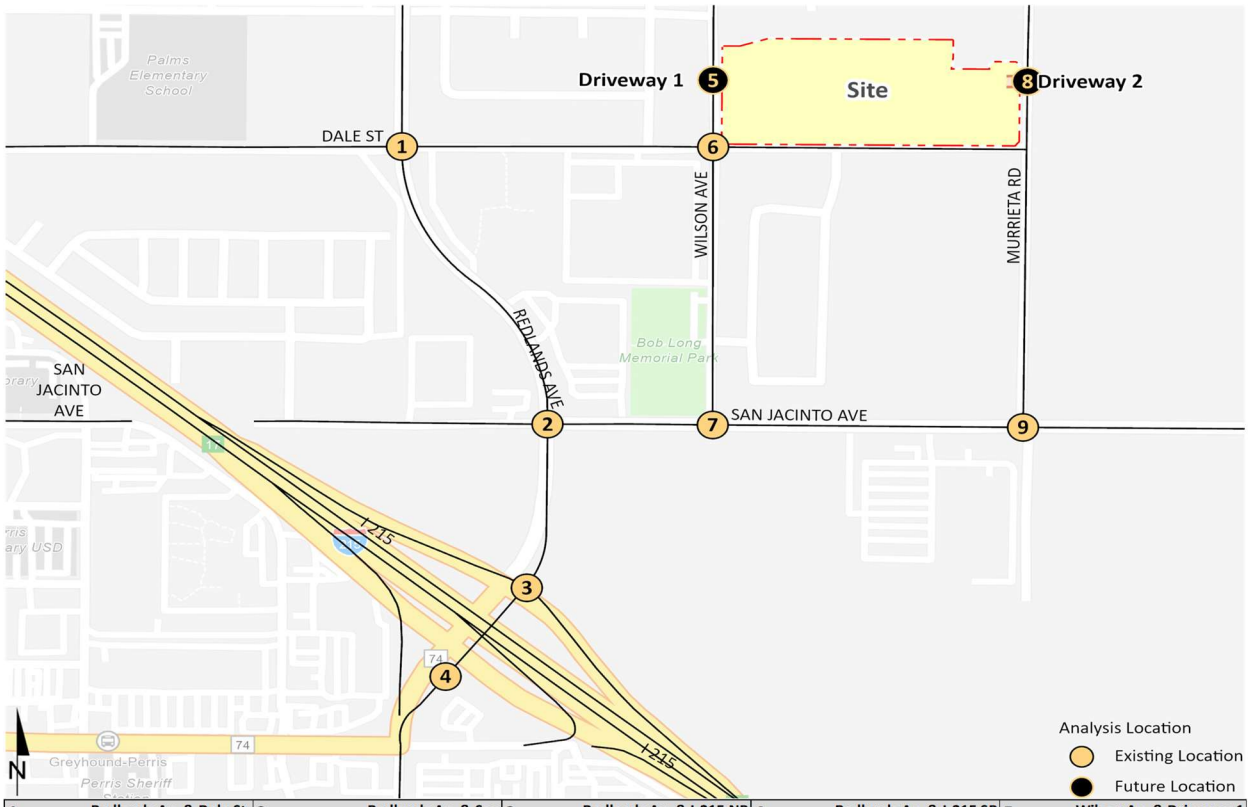
6.2 WITHOUT PROJECT TRAFFIC VOLUME FORECASTS

This scenario includes Existing traffic volumes plus traffic from pending and approved but not yet constructed known development projects in the area. The weekday ADT and weekday AM and PM peak hour volumes which can be expected for Opening Year Cumulative (2024) Without Project traffic conditions are shown on Exhibit 6-1.

6.3 WITH PROJECT TRAFFIC VOLUME FORECASTS

This scenario includes Opening Year Cumulative (2024) Without Project traffic in conjunction with the addition of Project traffic. The weekday ADT and weekday AM and PM peak hour volumes which can be expected for Opening Year Cumulative (2024) With Project traffic conditions are shown on Exhibit 6-2.

EXHIBIT 6-1: OPENING YEAR CUMULATIVE (2024) WITHOUT PROJECT TRAFFIC VOLUMES



1 Redlands Av. & Dale St.

	16,900		2,200
↲ 151(41)	↓ 587(583)	↳ 33(55)	↱ 55(34)
			← 24(4)
			↰ 54(20)
42(6) ↳			
6(3) →			
56(20) ↲			
1,300			16,550

2 Redlands Av. & San Jacinto Av.

	18,900		31,950
↲ 88(91)	↓ 503(495)	↳ 127(165)	↱ 108(103)
			← 85(95)
			↰ 1019(942)
103(103) ↳			
36(87) →			
161(203) ↲			
10,450			45,350

3 Redlands Av. & I-215 NB Ramps

	44,600		14,500
↲ 366(337)	↓ 1316(1302)		↱ 483(745)
			← 2(4)
			↰ 331(361)
		↳ 192(187)	↑ 1006(1184)
6,600			39,000

4 Redlands Av. & I-215 SB Ramps

	39,450		14,450
	↓ 1021(1032)	↳ 626(633)	
288(383) ↳			
0(2) →		↑ 909(989)	↱ 276(461)
190(230) ↲			
8,150			35,750

5 Wilson Av. & Driveway 1

	3,050		
	↓ 83(81)		
			↑ 128(148)
			3,050

6 Wilson Av. & Dale St.

	3,050		
↲ 18(17)	↓ 65(65)		
29(46) ↳			
		↑ 27(27)	↑ 99(102)
25(25) ↲			
1,500			2,900

7 Wilson Av. & San Jacinto Av.

	3,250		16,650
↲ 140(95)		↳ 12(15)	↱ 12(10)
			← 1128(1069)
90(127) ↳			
830(1095) →			
19,350			

8 Murrieta Rd. & Driveway 2

	5,400		
	↓ 315(248)		
			↑ 260(330)
			4,600

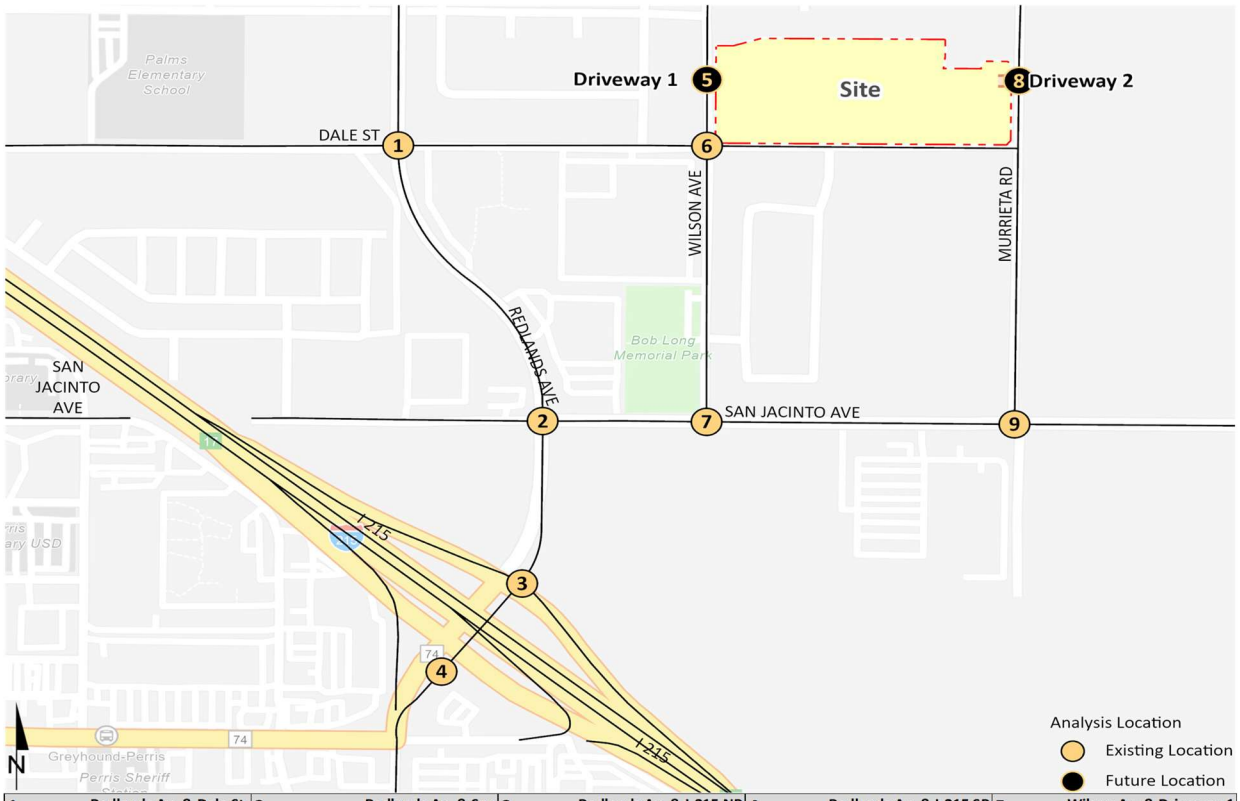
9 Murrieta Rd. & San Jacinto Av.

	5,400		11,700
↲ 274(190)		↳ 41(39)	↱ 50(47)
			← 679(645)
210(252) ↳			
552(847) →			
16,150			

##(##) AM(PM) Peak Hour Intersection Volumes

Average Daily Trips

EXHIBIT 6-2: OPENING YEAR CUMULATIVE (2024) WITH PROJECT TRAFFIC VOLUMES



1 Redlands Av. & Dale St.

17,050			2,600
← 151(41)	← 587(583)	↙ 33(55)	↱ 68(42) ← 24(4) ↰ 76(34)
42(6) ↳			
6(3) →			
56(20) ↲			
	83(23) ↑	453(621) ↑	25(49) ↱
1,300			16,800

2 Redlands Av. & San Jacinto Av.

19,150			32,800
← 88(91)	← 525(509)	↙ 127(165)	↱ 108(103) ← 85(95) ↰ 1045(958)
103(103) ↳			
36(87) →			
161(203) ↲			
	153(227) ↑	420(509) ↑	932(1243) ↱
10,450			46,400

3 Redlands Av. & I-215 NB Ramps

45,700			14,750
← 379(345)	← 1351(1324)		↱ 490(768) ← 2(4) ↰ 331(361)
	192(187) ↑	1014(1212) ↑	
6,750			39,700

4 Redlands Av. & I-215 SB Ramps

40,150			14,700
← 1034(1040)	↙ 648(647)		
292(397) ↳			
0(2) →			
190(230) ↲			
	913(1003) ↑	276(461) ↱	
8,250			36,050

5 Wilson Av. & Driveway 1

3,100			550
	← 83(81)		↰ 4(3) ↰ 44(27)
		128(148) ↑	
			3,550

6 Wilson Av. & Dale St.

3,550			
← 53(39)	← 74(70)		
29(46) ↳			
25(25) ↲			
	27(27) ↑	99(102) ↑	
1,900			3,000

7 Wilson Av. & San Jacinto Av.

3,350			17,400
← 149(100)	↙ 12(15)		↱ 12(10) ← 1145(1080)
90(127) ↳			
845(1146) →			
20,200			

8 Murrieta Rd. & Driveway 2

5,800			
← 8(28)	↙ 315(248)		
9(5) ↳			
30(19) ↲			
	20(64) ↑	260(330) ↑	
1,400			5,600

9 Murrieta Rd. & San Jacinto Av.

6,450			11,950
← 291(201)	↙ 54(47)		↱ 54(61) ← 679(645)
225(303) ↳			
552(847) →			
16,900			

##(##) AM(PM) Peak Hour Intersection Volumes

Average Daily Trips

6.4 INTERSECTION OPERATIONS ANALYSIS

6.4.1 OPENING YEAR CUMULATIVE (2024) WITHOUT PROJECT TRAFFIC CONDITIONS

LOS calculations were conducted for the study intersections to evaluate their operations under Opening Year Cumulative (2024) Without Project conditions with roadway and intersection geometrics consistent with Section 6.1 *Roadway Improvements*. As shown on Table 6-1, the following study area intersections are anticipated to operate at an unacceptable LOS under Opening Year Cumulative (2024) Without Project traffic conditions:

- Redlands Avenue & San Jacinto Avenue (#2) – LOS F AM and PM peak hours
- Wilson Avenue & San Jacinto Avenue (#7) – LOS F AM and PM peak hours
- Murrieta Road & San Jacinto Avenue (#9) – LOS F AM and PM peak hours

The intersection operations analysis worksheets for Opening Year Cumulative (2024) Without Project traffic conditions are included in Appendix 6.1 of this TA.

6.4.2 OPENING YEAR CUMULATIVE (2024) WITH PROJECT TRAFFIC CONDITIONS

As shown on Table 6-1, the addition of Project traffic is not anticipated to result in any new deficiencies from those identified under Opening Year Cumulative (2024) Without Project traffic conditions. The intersection operations analysis worksheets for Opening Year Cumulative (2024) With Project traffic conditions are included in Appendix 6.2 of this TA

TABLE 6-1: INTERSECTION ANALYSIS FOR OPENING YEAR CUMULATIVE (2024) CONDITIONS

			2024 Without Project				2024 With Project				
			Delay[1] (secs.)		Level of Service		Delay[1] (secs.)		Level of Service		
#	Intersection	Traffic Control[2]	AM	PM	AM	PM	AM	PM	AM	PM	Acceptable LOS
1	Redlands Av. & Dale St.	TS	11.9	9.0	B	A	12.8	9.3	B	A	D
2	Redlands Av. & San Jacinto Av.	TS	**150.9**	**189.4**	**F**	**F**	**158.8**	**>200.0**	**F**	**F**	D
3	Redlands Av. & I-215 NB Ramps	TS	14.7	18.0	B	B	14.9	18.7	B	B	D
4	Redlands Av. & I-215 SB Ramps	TS	14.7	15.7	B	B	15.0	16.2	B	B	D
5	Wilson Av. & Driveway 1	CSS	Future Intersection				9.7	9.7	A	A	D
6	Wilson Av. & Dale St.	CSS	9.7	13.5	A	B	9.9	14.0	A	B	D
7	Wilson Av. & San Jacinto Av.	CSS	**156.2**	**59.1**	**F**	**F**	**189.7**	**82.6**	**F**	**F**	D
8	Murrieta Rd. & Driveway 2	CSS	Future Intersection				11.5	11.3	B	B	D
9	Murrieta Rd. & San Jacinto Av.	CSS	**>200.0**	**129.0**	**F**	**F**	**>200.0**	**>200.0**	**F**	**F**	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] TS = Traffic Signal; CSS = Cross-Street Stop

6.5 TRAFFIC SIGNAL WARRANTS ANALYSIS

Traffic signal warrants have been performed for Opening Year Cumulative (2024) traffic conditions based on peak hour intersection turning movements volumes or planning level (ADT) volumes. There is no additional unsignalized study area intersection anticipated to meet a traffic signal warrant under Opening Year Cumulative (2024) Without Project or With Project traffic conditions, in addition to the intersections identified previously under previous analysis scenarios (see Appendices 6.3 and 6.4).

6.6 QUEUING ANALYSIS

Queuing analysis findings for Opening Year Cumulative (2024) are presented on Table 6-2. As shown on Table 6-2, there are no movements that are anticipated to experience queuing issues during the weekday AM or weekday PM peak 95th percentile traffic flows under Opening Year Cumulative (2024) traffic conditions. Worksheets for Opening Year Cumulative (2024) traffic conditions queuing analysis are provided in Appendices 6.5 and 6.6.

TABLE 6-2: PEAK HOUR QUEUING SUMMARY FOR OPENING YEAR CUMULATIVE (2024) CONDITIONS

			OYC (2024) Without Project				OYC (2024) With Project			
		Available Stacking Distance	95th Percentile Queue (Feet)[3]		Acceptable? [1]		95th Percentile Queue (Feet)[3]		Acceptable? [1]	
Intersection	Movement	(Feet)[3]	AM Peak	PM Peak	AM	PM	AM Peak	PM Peak	AM	PM
Redlands Av. & I-215 NB Ramps (#3)	WBL	800	320 [2]	348 [2]	Yes	Yes	330 [2]	348 [2]	Yes	Yes
	WBL/T/R	1,250	227 [2]	408 [2]	Yes	Yes	231 [2]	429 [2]	Yes	Yes
	WBR	400	210 [2]	371 [2]	Yes	Yes	210 [2]	393 [2]	Yes	Yes
Redlands Av. & I-215 SB Ramps (#4)	EBL	740	141	165	Yes	Yes	143	170	Yes	Yes
	EBL/T/R	1,100	97	167	Yes	Yes	100	171	Yes	Yes
	EBR	140	84	105	Yes	Yes	84	105	Yes	Yes

[1] Stacking Distance is acceptable if the required stacking distance is less than or equal to the stacking distance provided. An additional 15 feet of stacking which is assumed to be provided in the transition for turn pockets is reflected in the stacking distance shown on this table, where applicable.
[2] 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

6.7 DEFICIENCIES AND IMPROVEMENTS

This section provides a summary of deficiencies, based on the City of Perris's deficiency criteria discussed in Section 2.6 *Deficiency Criteria*, and improvements needed to improve operations back to acceptable levels.

6.7.1 IMPROVEMENTS TO ADDRESS DEFICIENCIES AT INTERSECTIONS

The effectiveness of the recommended improvement strategies to address Opening Year Cumulative (2024) traffic deficiencies are presented in Table 6-3. Worksheets for Opening Year Cumulative (2024) With Project conditions, with improvements, HCM calculation worksheets are provided in Appendix 6.7.

TABLE 6-3: INTERSECTION ANALYSIS FOR OPENING YEAR CUMULATIVE (2024) CONDITIONS WITH IMPROVEMENTS

#	Intersection	Traffic Control[3]	Intersection Approach Lanes[1]												OYC (2024) Delay[2] (secs.)		Level of Service	
			Northbound			Southbound			Eastbound			Westbound						
			L	T	R	L	T	R	L	T	R	L	T	R	AM	PM	AM	PM
2	Redlands Av. & San Jacinto Av.																	
	- Without Improvements	TS	1	2	1	1	2	0	2	1	1	2	1	1	**158.8**	**>200.0**	**F**	**F**
	- With Improvements	TS	1	2	**2>**	1	2	0	2	1	**1>**	2	1	1	36.2	31.7	D	C
7	Wilson Av. & San Jacinto Av.																	
	- Without Improvements	CSS	0	0	0	0	1	0	0	1	0	0	1	1	**189.7**	**103.7**	**F**	**F**
	- With Improvements	CSS	0	0	0	0	1	0	**1**	1	0	0	**2**	0	33.1	25.5	D	D
9	Murrieta Rd. & San Jacinto Av.																	
	- Without Improvements	CSS	0	1	0	0	1	0	1	1	0	0	1	0	**>200.0**	**>200.0**	**F**	**F**
	- With Improvements	**TS**	0	1	0	0	1	0	1	1	0	0	1	0	53.5	31.3	D	C

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

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

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

6.7.2 IMPROVEMENTS TO ADDRESS DEFICIENCIES ON OFF-RAMP QUEUES

As shown previously 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 for Opening Year Cumulative (2024) traffic conditions. As such, no improvements have been identified.

7 HORIZON YEAR (2045) TRAFFIC CONDITIONS

This section discusses the methods used to develop Horizon Year (2045) Without and With Project traffic forecasts, and the resulting intersection operations, traffic signal warrant, and off-ramp queuing analyses.

7.1 ROADWAY IMPROVEMENTS

The lane configurations and traffic controls assumed to be in place for Horizon Year (2045) 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 Horizon Year conditions only (e.g., intersection and roadway improvements along the Project's frontage and driveways).
- If applicable, driveways and those facilities assumed to be constructed by cumulative developments to provide site access are also assumed to be in place for Horizon Year conditions only.
- This scenario also includes other roadway infrastructure that is contemplated by the City's General Plan and are anticipated to be in place under long-range traffic conditions. Such roadways include Evans Road/Ellis Avenue and the future planned interchange at the I-215 Freeway. These roadway connections, while not evaluated for the purposes of this analysis would affect regional traffic as there may be potential volume reductions to existing study area intersections due to this (and other similar) future connections that provide alternative connections to the I-215 Freeway or other routes.

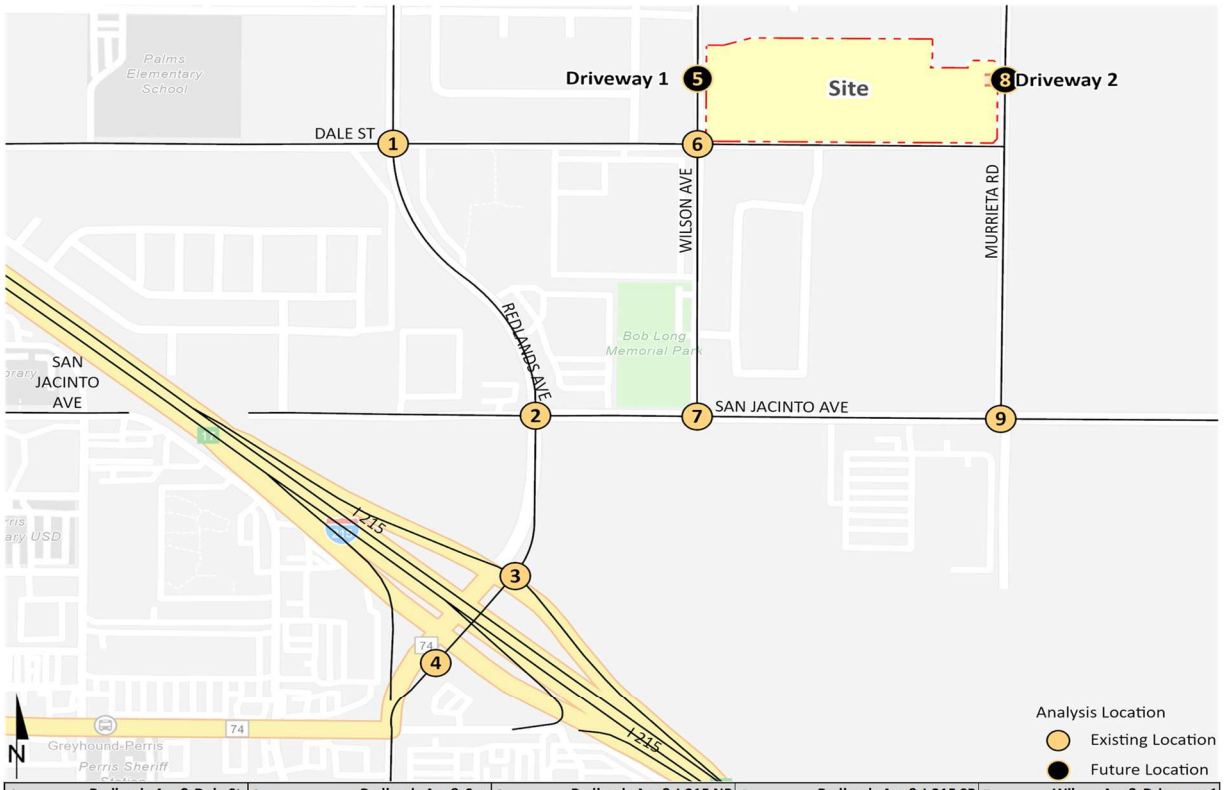
7.2 WITHOUT PROJECT TRAFFIC VOLUME FORECASTS

This scenario includes the refined post-process volumes obtained from the RivCOM (see Section 4.8 *Horizon Year (2045) Volume Development* of this TA for a detailed discussion on the post-processing methodology). The weekday ADT and weekday AM and PM peak hour volumes which can be expected for Horizon Year (2045) Without Project traffic conditions are shown on Exhibit 7-1.

7.3 WITH PROJECT TRAFFIC VOLUME FORECASTS

This scenario includes the refined post-process volumes obtained from the RivCOM, plus the traffic generated by the proposed Project (Project Buildout). The weekday ADT and weekday AM and PM peak hour volumes which can be expected for Horizon Year (2045) With Project traffic conditions are shown on Exhibit 7-2.

EXHIBIT 7-1: HORIZON YEAR (2045) WITHOUT PROJECT TRAFFIC VOLUMES



1 Redlands Av. & Dale St.

20,000 | 2,400
- ↲ 195(80) ← 646(641) ↳ 36(60)
- ↰ 61(37) ← 27(5) ↱ 59(22)
- 106(7) ↳ ↰ ↑ ↱
- 9(4) → 91(45) 499(683) 28(54)
- 105(22) ↲

2,300 | 19,100

2 Redlands Av. & San Jacinto Av.

25,900 | 35,150
- ↲ 200(120) ← 553(545) ↳ 140(181)
- ↰ 119(113) ← 350(197) ↱ 1120(1037)
- 254(175) ↳ ↰ ↑ ↱
- 109(182) → 210(284) 462(591) 1009(1311)
- 270(243) ↲

24,400 | 56,150

3 Redlands Av. & I-215 NB Ramps

54,500 | 15,950
- ↲ 403(370) ← 1448(1433)
- ↰ 532(820) ← 3(7) ↱ 394(397)
- ↳ ↰ ↑
- 595(268) 1135(1302)
- ↑

13,800 | 52,050

4 Redlands Av. & I-215 SB Ramps

52,050 | 15,900
- ← 1165(1261) ↳ 689(696)
- ↑ ↱
- 1515(1204) 324(507)
- ↑

15,600 | 56,900

5 Wilson Av. & Driveway 1

3,350
- ← 92(89)
- ↑
- 141(163)

3,350

6 Wilson Av. & Dale St.

3,350
- ↲ 19(18) ↳ 71(71)
- 32(51) ↳
- 28(28) ↲
- ↰ ↑
- 29(29) 108(112)

1,700 | 3,200

7 Wilson Av. & San Jacinto Av.

3,550 | 18,300
- ↲ 154(105) ↳ 13(16)
- ↰ 13(11) ← 1241(1176)
- 99(140) ↳
- 913(1204) →

21,300

8 Murrieta Rd. & Driveway 2

5,950
- ← 346(273)
- ↑
- 286(363) ↑

5,050

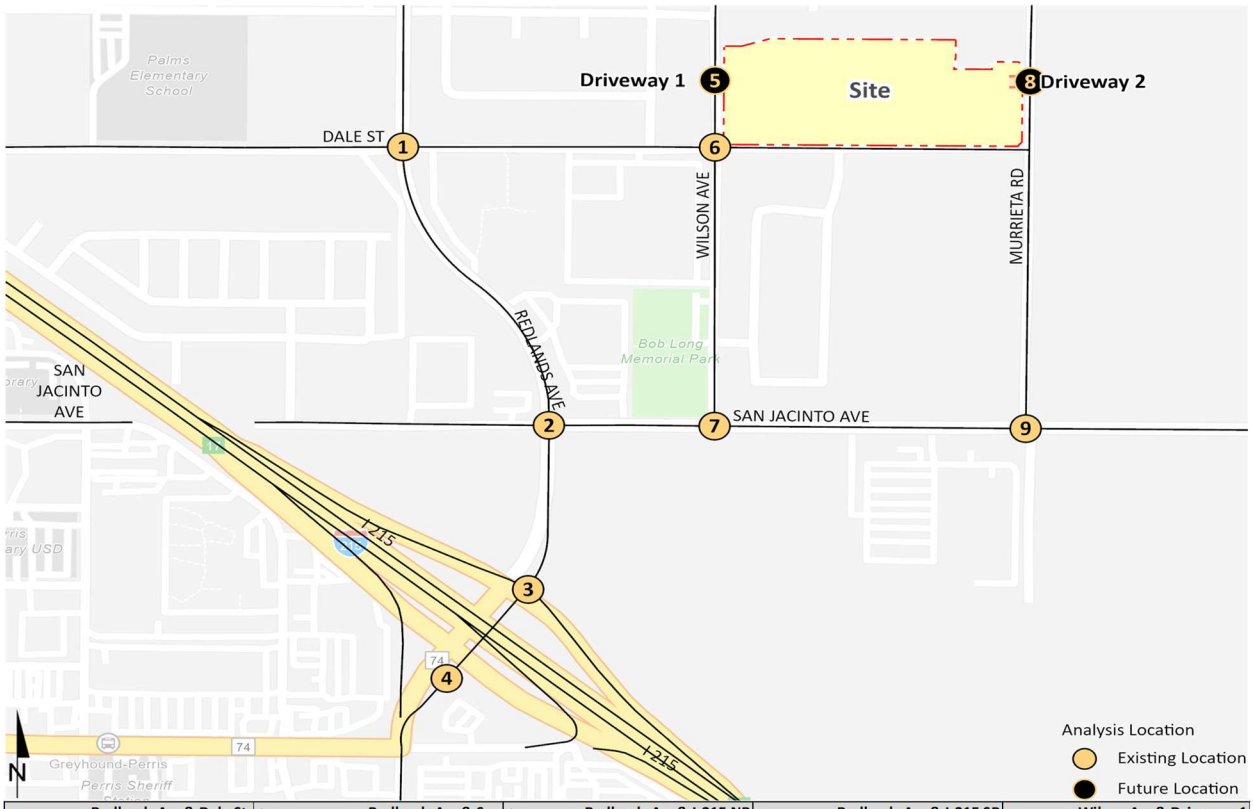
9 Murrieta Rd. & San Jacinto Av.

8,750 | 50,100
- ↲ 339(209) ↳ 84(43)
- ↰ 63(60) ← 981(710)
- 231(323) ↳
- 736(956) →

42,300

##(##) AM(PM) Peak Hour Intersection Volumes
Average Daily Trips

EXHIBIT 7-2: HORIZON YEAR (2045) WITH PROJECT TRAFFIC VOLUMES



1 Redlands Av. & Dale St.

20,150 | 2,800
195(80) ↲ 646(641) ↓ 36(60) ↳
74(45) ↱ 27(5) ← 81(36) ↰
106(7) ↳ 9(4) → 105(22) ↲
91(45) ↰ 499(683) ↑ 28(54) ↱
2,300 | 19,350

2 Redlands Av. & San Jacinto Av.

26,150 | 36,000
200(120) ↲ 575(559) ↓ 140(181) ↳
119(113) ↱ 350(197) ← 1146(1053) ↰
254(175) ↳ 109(182) → 270(243) ↲
210(284) ↰ 462(591) ↑ 1024(1362) ↱
24,400 | 57,250

3 Redlands Av. & I-215 NB Ramps

55,550 | 16,200
416(378) ↲ 1483(1455) ↓
539(843) ↱ 3(7) ← 394(397) ↰
595(268) ↰ 1143(1330) ↑
13,900 | 52,700

4 Redlands Av. & I-215 SB Ramps

52,700 | 16,100
1178(1269) ↓ 711(710) ↳
321(435) ↳ 0(3) → 209(439) ↲
1519(1218) ↑ 324(507) ↱
15,750 | 57,200

5 Wilson Av. & Driveway 1

3,400 | 550
92(89) ↓
4(3) ↱ 44(27) ↰
141(163) ↑
3,850

6 Wilson Av. & Dale St.

3,850
54(40) ↲ 80(76) ↓
32(51) ↳ 28(28) ↲
29(29) ↰ 108(112) ↑
2,050 | 3,300

7 Wilson Av. & San Jacinto Av.

3,650 | 19,050
163(110) ↲ 13(16) ↳
13(11) ↱ 1258(1187) ←
99(140) ↳ 928(1255) →
22,150

8 Murrieta Rd. & Driveway 2

6,350
8(28) ↲ 346(273) ←
9(5) ↳ 30(19) ↲
20(64) ↰ 286(363) ↑
1,400 | 6,100

9 Murrieta Rd. & San Jacinto Av.

9,750 | 50,400
356(220) ↲ 97(51) ↳
67(74) ↱ 981(710) ←
246(374) ↳ 736(956) →
43,050

##(##) AM(PM) Peak Hour Intersection Volumes
Average Daily Trips

7.4 INTERSECTION OPERATIONS ANALYSIS

7.4.1 HORIZON YEAR (2045) WITHOUT PROJECT TRAFFIC CONDITIONS

LOS calculations were conducted for the study intersections to evaluate their operations under Horizon Year (2045) Without Project conditions with roadway and intersection geometrics consistent with Section 7.1 *Roadway Improvements*. As shown on Table 7-1, the following study area intersections are anticipated to operate at an unacceptable LOS during one or more peak hours:

- Redlands Avenue & San Jacinto Avenue (#2) – LOS F AM and PM peak hours
- Wilson Avenue & San Jacinto Avenue (#7) – LOS F AM and PM peak hours
- Murrieta Road & San Jacinto Avenue (#9) – LOS F AM and PM peak hours

The intersection operations analysis worksheets for Horizon Year (2045) Without Project traffic conditions are included in Appendix 7.1 of this TA.

7.4.2 HORIZON YEAR (2045) WITH PROJECT TRAFFIC CONDITIONS

As shown on Table 7-1, the addition of Project traffic is not anticipated to result in any new deficiencies from those identified under Horizon Year (2045) Without Project traffic conditions. The intersection operations analysis worksheets for Horizon Year (2045) With Project traffic conditions are included in Appendix 7.2 of this TA.

TABLE 7-1: INTERSECTION ANALYSIS FOR HORIZON YEAR (2045) CONDITIONS

			2045 Without Project				2045 With Project				
			Delay[1] (secs.)		Level of Service		Delay[1] (secs.)		Level of Service		
#	Intersection	Traffic Control[2]	AM	PM	AM	PM	AM	PM	AM	PM	Acceptable LOS
1	Redlands Av. & Dale St.	TS	15.9	9.6	B	A	16.1	9.9	B	A	D
2	Redlands Av. & San Jacinto Av.	TS	**>200.0**	**>200.0**	**F**	**F**	**>200.0**	**>200.0**	**F**	**F**	D
3	Redlands Av. & I-215 NB Ramps	TS	25.0	25.4	C	C	25.5	27.6	C	C	D
4	Redlands Av. & I-215 SB Ramps	TS	19.2	19.7	B	B	19.9	20.2	B	C	D
5	Wilson Av. & Driveway 1	CSS	Future Intersection				9.8	9.7	A	A	D
6	Wilson Av. & Dale St.	CSS	9.8	14.5	A	B	10.0	15.1	B	C	D
7	Wilson Av. & San Jacinto Av.	CSS	**>200.0**	**53.4**	**F**	**F**	**>200.0**	**58.3**	**F**	**F**	D
8	Murrieta Rd. & Driveway 2	CSS	Future Intersection				11.9	11.7	B	B	D
9	Murrieta Rd. & San Jacinto Av.	CSS	**>200.0**	**>200.0**	**F**	**F**	**>200.0**	**>200.0**	**F**	**F**	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] CSS = Cross-Street Stop; TS = Traffic Signal

7.5 TRAFFIC SIGNAL WARRANTS ANALYSIS

Traffic signal warrants have been performed (based on CA MUTCD) for Horizon Year (2045) traffic conditions based on peak hour intersection turning movements volumes or planning level (ADT) volumes. There are no additional unsignalized study area intersections anticipated to meet a traffic signal warrant under Horizon Year (2045) Without Project or With Project traffic conditions, in addition to the intersections identified previously under previous analysis scenarios (see Appendices 7.3 and 7.4).

7.6 QUEUING ANALYSIS

Queuing analysis findings for Horizon Year (2045) are presented on Table 7-2. As shown on Table 7-2, there are no movements that are anticipated to experience queuing issues during the weekday AM or weekday PM peak 95th percentile traffic flows with the addition of Project (Project Buildout) traffic. Worksheets for Horizon Year (2045) traffic conditions queuing analysis are provided in Appendices 7.5 and 7.6.

TABLE 7-2: PEAK HOUR QUEUING SUMMARY FOR HORIZON YEAR (2045) CONDITIONS

Intersection	Movement	Available Stacking Distance (Feet)[3]	HY (2045) Without Project 95th Percentile Queue (Feet)[3]		Acceptable? [1]		HY (2045) With Project 95th Percentile Queue (Feet)[3]		Acceptable? [1]	
			AM Peak	PM Peak	AM	PM	AM Peak	PM Peak	AM	PM
Redlands Av. & I-215 NB Ramps (#3)	WBL	800	416 [2]	409 [2]	Yes	Yes	425 [2]	409 [2]	Yes	Yes
	WBL/T/R	1,250	347 [2]	498 [2]	Yes	Yes	347 [2]	532 [2]	Yes	Yes
	WBR	400	307 [2]	458 [2,3]	Yes	Yes	314 [2]	464 [2,3]	Yes	Yes
Redlands Av. & I-215 SB Ramps (#4)	EBL	740	154	232	Yes	Yes	156	236	Yes	Yes
	EBL/T/R	1,100	110	209	Yes	Yes	113	213	Yes	Yes
	EBR	140	96	167 [3]	Yes	Yes	95	170 [3]	Yes	Yes

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

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

[3] Although 95th percentile queue is anticipated to exceed the available storage for the turn lane, the adjacent through lane has sufficient storage to accommodate any spillover without spilling back and affecting the I-215 Freeway mainline.

7.7 DEFICIENCIES AND IMPROVEMENTS

This section provides a summary of deficiencies, based on the City of Perris's deficiency criteria discussed in Section 2.6 *Deficiency Criteria*, and improvements needed to improve operations back to acceptable levels.

7.7.1 IMPROVEMENTS TO ADDRESS DEFICIENCIES AT INTERSECTIONS

The effectiveness of the recommended improvement strategies to address Horizon Year (2045) traffic deficiencies are presented in Table 7-3. Worksheets for Horizon Year (2045) With Project conditions, with improvements, HCM calculation worksheets are provided in Appendix 7.7.

TABLE 7-3: INTERSECTION ANALYSIS FOR HORIZON YEAR (2045) CONDITIONS WITH IMPROVEMENTS

#	Intersection	Traffic Control[3]	Intersection Approach Lanes[1] Northbound L	T	R	Southbound L	T	R	Eastbound L	T	R	Westbound L	T	R	Horizon Year (2045) Delay[2] (secs.) AM	PM	Level of Service AM	PM
2	Redlands Av. & San Jacinto Av.																	
	- Without Improvements	TS	1	2	1	1	2	0	2	1	1	2	1	1	**>200.0**	**>200.0**	**F**	**F**
	- With Improvements	TS	1	2	**2>**	1	2	0	2	1	**1>**	2	1	1	48.1	40.0	D	D
7	Wilson Av. & San Jacinto Av.																	
	- Without Improvements	CSS	0	0	0	0	1	0	0	1	0	0	1	1	**>200.0**	**58.3**	**F**	**F**
	- With Improvements	**TS**	0	0	0	0	1	0	**1**	1	0	0	**2**	0	10.1	7.7	B	A
9	Murrieta Rd. & San Jacinto Av.																	
	- Without Improvements	CSS	0	0	0	0	1	0	1	1	0	0	1	0	**>200.0**	**>200.0**	**F**	**F**
	- With Improvements	**TS**	0	0	0	0	1	0	1	**2**	0	0	**2**	0	46.8	18.7	D	B

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

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

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

7.7.2 IMPROVEMENTS TO ADDRESS DEFICIENCIES ON OFF-RAMP QUEUES

As shown previously 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 for Horizon Year (2045) traffic conditions. As such, no improvements have been identified.

8 LOCAL AND REGIONAL FUNDING MECHANISMS

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

8.1 TRANSPORTATION UNIFORM MITIGATION FEE (TUMF) PROGRAM

The Western Riverside Council of Governments (WRCOG) is responsible for establishing and updating TUMF rates. The County may grant to developers a credit against the specific components of fees for the dedication of land or the construction of facilities identified in the list of improvements funded by each of these fee programs. Fees are based upon projected land uses and a related transportation need to address growth based upon a 2016 Nexus study.

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

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

8.2 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 roadway segments and 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 ensures that DIF improvements are constructed prior to when the LOS would otherwise fall below the City's established performance criteria.

8.3 FAIR SHARE CONTRIBUTION

Project improvements may include a combination of fee payments to established programs, construction of specific improvements, payment of a fair share contribution toward future improvements or a combination of these approaches. Improvements constructed by development may be eligible for a fee credit or reimbursement through the program where appropriate (to be determined at the City's discretion). When off-site improvements are identified with a minor share of responsibility assigned to proposed development, the approving jurisdiction may elect to collect a fair share contribution or require the development to construct improvements. Detailed fair share calculations, for each peak hour, for the applicable deficient study area intersection are provided in Table 8-1. These fees are collected 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 8-1: PROJECT FAIR SHARE CALCULATIONS FOR INTERSECTIONS

#	Intersection	Existing	Project	2045 With Project	Total New Traffic	Project % of New Traffic[1]
2	Redlands Av. & San Jacinto Av.					
	AM:	2423	63	4860	2437	2.59%
	PM:	2600	81	5060	2460	**3.29%**
7	Wilson Av. & San Jacinto Av.					
	AM:	1396	41	2473	1077	3.8%
	PM:	1386	67	2720	1334	**5.0%**
9	Murrieta Rd. & San Jacinto Av.					
	AM:	1124	49	2483	1359	3.6%
	PM:	1175	84	2385	1210	**6.9%**

[1] **BOLD =** Highest fair share percentage is highlighted.

9 REFERENCES

1. **County of Riverside Transportation Department.** *Transportation Analysis Guidelines for Level of Service and Vehicle Miles Traveled.* County of Riverside : s.n., December 2020.
2. **Institute of Transportation Engineers.** *Trip Generation Manual.* 11th Edition. 2021.
3. **Western Riverside Council of Governments.** *TUMF Nexus Study, 2016 Program Update.* July 2017.
4. **VRPA Technologies, Inc. for Riverside County Transportation Commission.** *Riverside County Long Range Transportation Study.* County of Riverside : VRPA Technologies, Inc., December 2019.
5. **Transportation Research Board.** *Highway Capacity Manual (HCM).* 6th Edition. s.l. : National Academy of Sciences, 2016.
6. **Caltrans.** California Manual on Uniform Traffic Control Devices (MUTCD). [book auth.] California Department of Transportation. *California Manual on Uniform Traffic Control Devices (CAMUTCD).* 2017.
7. **City of Perris.** *General Plan Circulation Element.* City of Perris : s.n., August 26, 2008.
8. **Southern California Association of Governments (SCAG).** *2020 Regional Transportation Plan / Sustainable Communities Strategy.* Adopted September 2020.

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