URBAN | CROSSROADS

COTTONWOOD & EDGEMONT WAREHOUSES (PEN21-0325)

TRAFFIC ANALYSIS

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Reference Number	Agency	Date
14555-06 TA Report	City of Moreno Valley	January 6, 2023

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LIST OF ABBREVIATED TERMS

(1)	Reference
ADT	Average Daily Traffic
CA MUTCD	California Manual on Uniform Traffic Control Devices
Caltrans	California Department of Transportation
CEQA	California Environmental Quality Act
CMP	Congestion Management Program
DIF	Development Impact Fee
HCM	Highway Capacity Manual
ITE	Institute of Transportation Engineers
LOS	Level of Service
NCHRP	National Cooperative Highway Research Program
OPR	Office of Planning and Research
PCE	Passenger Car Equivalent
PHF	Peak Hour Factor
Project	Cottonwood & Edgemont Warehouses
RCTC	Riverside County Transportation Commission
RTA	Riverside Transit Agency
SB	Senate Bill
SCAQMD	South Coast Air Quality Management District
SHS	State Highway System
SR	State Route
TA	Traffic Analysis
TUMF	Transportation Uniform Mitigation Fee
v/c	Volume to Capacity
VMT	Vehicle Miles Traveled
vphgpl	Vehicles per Hour Green per Lane
WRCOG	Western Riverside Council of Governments

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1 INTRODUCTION

This report presents the results of the Traffic Analysis (TA) for Cottonwood & Edgemont Warehouses ("Project"), which is located south of Cottonwood Avenue and between Old 215 Frontage Road and Edgemont Street in the City of Moreno Valley, 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 City of Moreno Valley's Transportation Impact Analysis Preparation Guide Vehicle Miles Traveled and Level of Service Assessment (June 2020) and through consultation with City of Moreno Valley staff during the scoping process. (1) The Project traffic study scoping agreement is provided in Appendix 1.1 of this TA, which has been reviewed and approved by the City of Moreno Valley.

1.1 SUMMARY OF FINDINGS

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

- Project to construct Old 215 Frontage Road at its ultimate half-section width as a divided arterial (110-foot right-of-way) from the Project's northern boundary to its southern boundary consistent with the City's standards. This includes, but is not limited to, any curb and gutter and sidewalk modifications to accommodate site access and landscaping improvements along its frontage on Old 215 Frontage Road as required by City standards. In addition, the Project will construct a raised median.
- Project to construct Edgemont Street at its ultimate half-section width as a Local Street (64-foot right-of-way) from the Project's northern boundary to it southern boundary consistent with the City's standards. This includes, but is not limited to, any curb and gutter and sidewalk modifications to accommodate site access and landscaping improvements along its frontage on Edgemont Street as required by City standards.
- Project to install stop controls for egress traffic at all driveways. Access to all Project driveways on Old 215 Frontage Road will be limited to right-in/right-out access only (to be controlled via the future raised median).

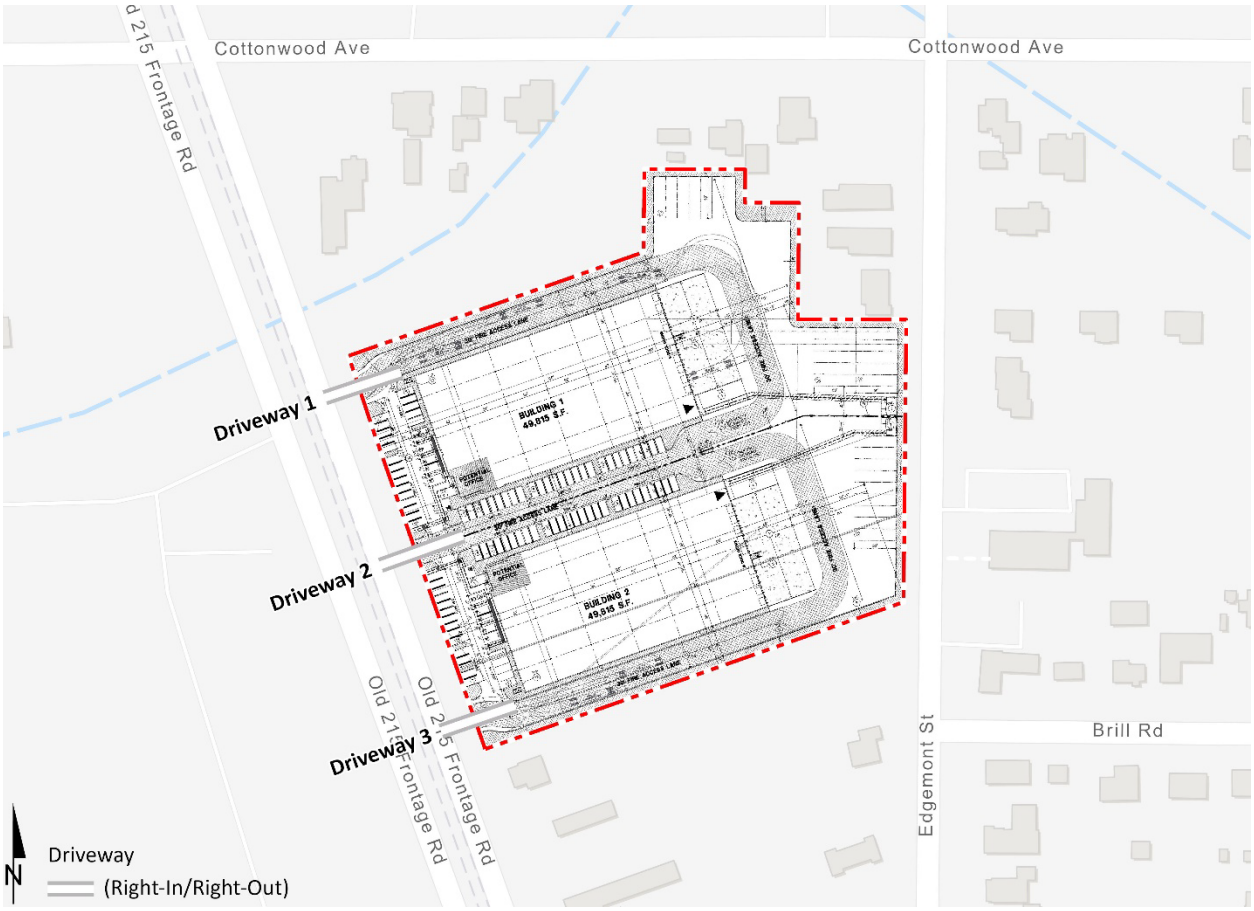
Additional details and intersection lane geometrics are provided in Section 1.6 Recommendations of this report.

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 two 49,815 square foot warehouse buildings for a total of 99,630 square feet. For the purposes of this assessment, the trip generation will evaluate 9,963 square feet of high-cube cold storage warehouse use (10% of the total square footage) and 89,667 square feet of general light industrial use. Access to the Project site will be accommodated via three driveways along Old 215 Frontage Road (all of which will be restricted to right-in/right-out only due to the future raised median). Regional access is accommodated via the I-215 Freeway via either Eucalyptus Avenue or Alessandro Boulevard. For the purposes of the traffic analysis, it is assumed that the Project would be developed in a single phase with an anticipated Opening Year of 2025 (City's Guidelines requires a minimum of 2 years).

EXHIBIT 1-1: LOCATION MAP

EXHIBIT 1-2: PRELIMINARY SITE PLAN



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 462 vehicle trip-ends per day with 67 AM peak hour trips and 59 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
- Opening Year Cumulative (2025) Without Project Conditions
- Opening Year Cumulative (2025) With Project Conditions

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.

1.3.2 OPENING YEAR CUMULATIVE (2025) CONDITIONS

The Opening Year Cumulative (2025) traffic conditions analyses determine the potential near-term cumulative circulation system deficiencies. The roadway network is similar to Existing conditions except for new connections to be constructed by other known cumulative projects or the Project. To account for background traffic growth, an ambient growth factor from Existing (2022) conditions of 6.12% (2 percent per year, compounded over 3 years) is included for Opening Year Cumulative (2025) traffic conditions.

Conservatively, this TA estimates the area ambient traffic growth and then adds traffic generated by other known or probable related projects. These related projects are at least in part already accounted for in the assumed ambient growth rates; and some of these related projects may not be implemented and operational within the 2025 Opening Year time frame assumed for the Project. The resulting traffic growth utilized in the TA (ambient growth factor plus traffic generated by related projects) would therefore tend to overstate rather than understate background cumulative traffic deficiencies under 2025 conditions.

The Opening Year Cumulative conditions analysis will be utilized to determine if improvements funded through regional transportation mitigation fee programs, such as the City's Development Impact Fee (DIF) and County's Transportation Uniform Mitigation Fee (TUMF) programs, can accommodate the near-term cumulative traffic at the target Level of Service (LOS) identified in the City of Moreno Valley (lead agency) General Plan. (3) Each of these transportation fee programs are discussed in more detail in Section 6 Local and Regional Funding Mechanisms.

1.4 STUDY AREA

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

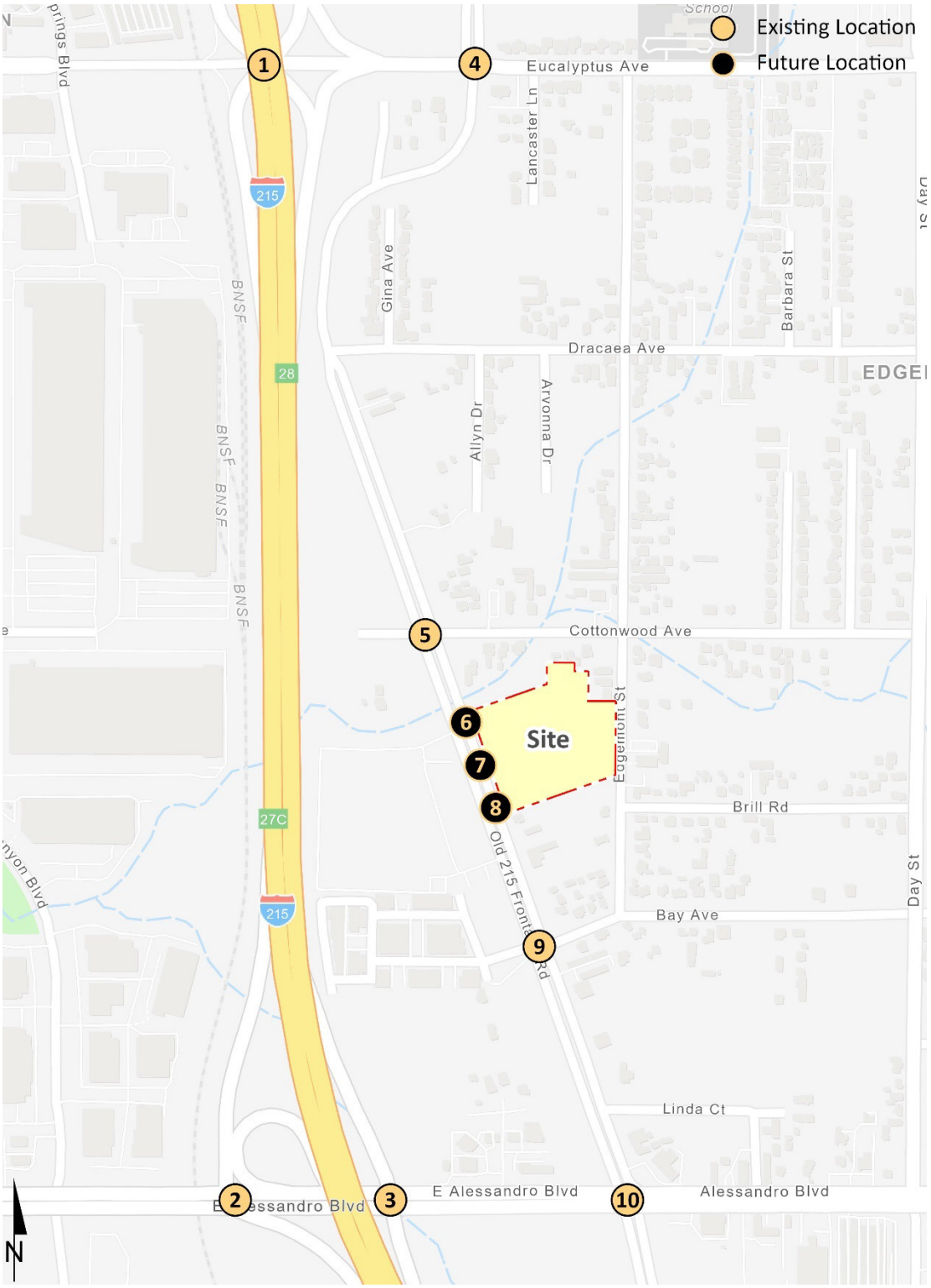
The 10 study area intersections shown on Exhibit 1-3 and listed in Table 1-1 were selected for evaluation in this TA based on consultation with City of Moreno Valley staff. The study area includes intersections where the Project is anticipated to contribute 50 or more peak hour trips per the City's Guidelines. (1) The "50 peak hour trip" criterion represents a minimum number of trips at which a typical intersection would have the potential to be substantively 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 for estimating a potential area of influence (i.e., study area).

The intent of a Congestion Management Program (CMP) is to more directly link land use, transportation, and air quality, thereby prompting reasonable growth management programs that will effectively utilize new transportation funds, alleviate traffic congestion and related 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 2011 CMP for the County of Riverside in December 2019. (4) There are no study area intersections identified as a Riverside County CMP intersection.

TABLE 1-1: INTERSECTION ANALYSIS LOCATIONS

#	Intersection	Jurisdiction	CMP?
1	I-215 Ramps & Eucalyptus Avenue	Caltrans, Moreno Valley, Riverside	No
2	I-215 SB Ramps & Alessandro Bl.	Caltrans, Riverside, March JPA	No
3	I-215 NB Ramps & Alessandro Bl.	Caltrans, Riverside, March JPA	No
4	Old 215 Frontage Rd. & Eucalyptus Av.	Riverside, Moreno Valley	No
5	Old 215 Frontage Rd. & Cottonwood Av.	Riverside, Moreno Valley	No
6	Old 215 Frontage Rd. & Driveway 1	Riverside, Moreno Valley	No
7	Old 215 Frontage Rd. & Driveway 2	Riverside, Moreno Valley	No
8	Old 215 Frontage Rd. & Driveway 3	Riverside, Moreno Valley	No
9	Old 215 Frontage Rd. & Bay Av.	Riverside, Moreno Valley	No
10	Old 215 Frontage Rd. & Alessandro Bl.	Riverside, Moreno Valley, March JPA	No

EXHIBIT 1-3: STUDY AREA



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 3 Area Conditions, Section 5 Opening Year Cumulative (2025) Traffic Conditions includes the detailed analysis. A summary of Level of Service (LOS) results for all analysis scenarios is presented in Table 1-2.

TABLE 1-2: SUMMARY OF LOS

#	Intersection	Existing (2022)		2025 Without Project		2025 With Project	
		AM	PM	AM	PM	AM	PM
1	I-215 Ramps & Eucalyptus Av.	A - D	A - D	F	E	F	E
2	I-215 SB Ramps & Alessandro Bl.	A - D	A - D	A - D	A - D	A - D	A - D
3	I-215 NB Ramps & Alessandro Bl.	A - D	A - D	A - D	A - D	A - D	A - D
4	Old 215 Frontage Rd. & Eucalyptus Av.	A - D	A - D	F	F	F	F
5	Old 215 Frontage Rd. & Cottonwood Av.	A - D	A - D	A - D	A - D	A - D	A - D
6	Old 215 Frontage Rd. & Driveway 1	N/A	N/A	N/A	N/A	A - D	A - D
7	Old 215 Frontage Rd. & Driveway 2	N/A	N/A	N/A	N/A	A - D	A - D
8	Old 215 Frontage Rd. & Driveway 3	N/A	N/A	N/A	N/A	A - D	A - D
9	Old 215 Frontage Rd. & Bay Av.	A - D	A - D	A - D	A - D	A - D	A - D
10	Old 215 Frontage Rd. & Alessandro Bl.	A - D	A - D	A - D	A - D	A - D	A - D

A - D = A - D E = E F = F

1.5.1 EXISTING (2022) CONDITIONS

Intersections

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

Off-Ramp and Intersection Queues

The following movement currently experiences queuing issues during the weekday AM peak 95th percentile traffic flows under Existing (2022) traffic conditions:

- Old 215 Frontage Rd. & Eucalyptus Av., northbound left turn lane – AM peak hour only

1.5.2 OPENING YEAR CUMULATIVE (2025) CONDITIONS

Intersections

The following study area intersections are anticipated to operate at an unacceptable LOS during the peak hours under Opening Year Cumulative (2025) Without Project traffic conditions:

- I-215 Ramps & Eucalyptus Av. (#1) – LOS F AM peak hour; LOS E PM peak hour
- Old 215 Frontage Rd. & Eucalyptus Av. (#4) – LOS F AM and PM peak hours

There are no additional study area intersections anticipated to operate at an unacceptable LOS during the peak hours with the addition of Project traffic, in addition to the locations identified for Opening Year Cumulative (2025) Without Project traffic conditions.

Off-Ramp Queues

The following movements are anticipated to experience queuing issues during the weekday AM or weekday PM peak 95th percentile traffic flows under Opening Year Cumulative (2025) Without Project traffic conditions:

- Old 215 Frontage Rd. & Eucalyptus Av., northbound left turn lane – AM and PM peak hours
- Old 215 Frontage Rd. & Eucalyptus Av., southbound left turn lane – AM peak hour only

There are no additional study area intersections or movements anticipated to experience queuing issues during the peak hours with the addition of Project traffic, in addition to the lanes identified for Opening Year Cumulative (2025) Without Project 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 driveway intersection recommendations are shown on Exhibit 1-4 and roadway improvements are summarized below.

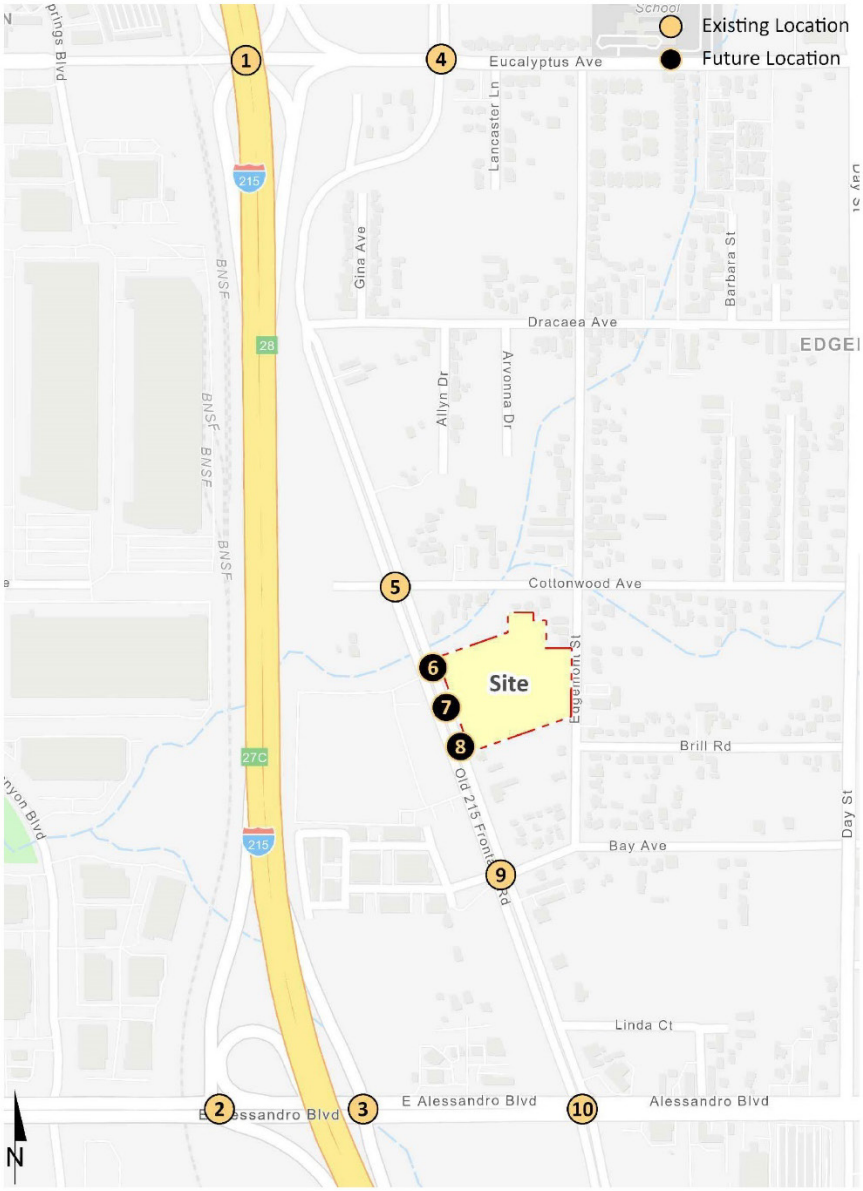
Old 215 Frontage Road – Old 215 Frontage Road is a north-south oriented roadway located along the Project's western boundary. Project to construct Old 215 Frontage Road at its ultimate half-section width as a divided arterial (110-foot right-of-way) from the Project's northern boundary to its southern boundary consistent with the City's standards. This includes, but is not limited to, any curb and gutter and sidewalk modifications to accommodate site access and landscaping improvements along its frontage on Old 215 Frontage Road as required by City standards. In addition, Project will construct the raised median along Old 215 Frontage Road where currently an earthen median exists.

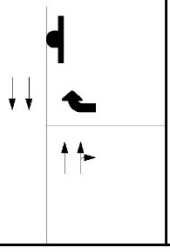
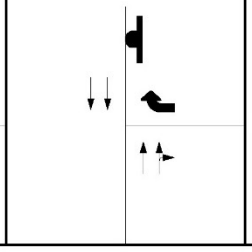
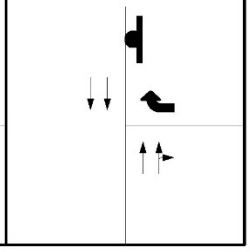
Edgemont Street – Edgemont Street is a north-south oriented roadway. Project to construct Edgemont Street at its ultimate half-section width as a Local Street (64-foot right-of-way) from the Project's northern boundary to it southern boundary consistent with the City's standards. This includes, but is not limited to, any curb and gutter and sidewalk modifications to accommodate site access and landscaping improvements along its frontage on Edgemont Street as required by City standards.

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

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

EXHIBIT 1-4: SITE ACCESS RECOMMENDATIONS



6 Old 215 Frontage Rd. & Dwy. 1	7 Old 215 Frontage Rd. & Dwy. 2	8 Old 215 Frontage Rd. & Dwy. 3
		

= Stop Sign Improvement
= Existing Lane
= Lane Improvement

1.6.2 OFF-SITE RECOMMENDATIONS

The recommended improvements needed to address the cumulative deficiencies identified under Opening Year Cumulative (2025) traffic conditions are shown in Table 1-3. For those improvements listed in Table 1-3, the Project Applicant's responsibility for the Project's contributions towards deficient intersections is fulfilled through payment of fair share that would be assigned to construction of the identified recommended improvements. The Project Applicant would be required to pay fair share fees consistent with the City's requirements (see Section 6 Local and Regional Funding Mechanisms).

TABLE 1-3: SUMMARY OF INTERSECTION IMPROVEMENTS

#	Intersection Location	Jurisdiction	Analysis Scenarios Opening Year Cumulative (2025) With Project	Improvements included in Fee Program?[1]	Mechanism for Mitigation[2]	Fair Share %[3]
1	I-215 Ramps & Eucalyptus Av.	Caltrans, Moreno Valley, Riverside	Modify traffic signal timing only (no physical improvements)	N/A	--	--
4	Old 215 Frontage Rd. & Eucalyptus Av.	Riverside, Moreno Valley	Modify the traffic signal to implement overlap phasing on the SB right turn lanes	No	Fair Share	2.7%

[1] Improvements are included in the City's DIF program (per the 2021-2023 CIP) or WRCOG TUMF program.

[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 percentage has been identified.

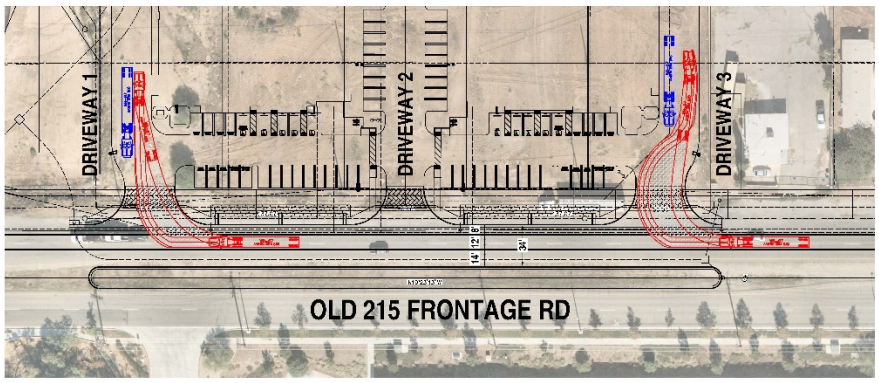
[3] Program improvements constructed may be eligible for fee credit, at discretion of City. See Table 6-1 for Fair Share Calculations.

1.7 TRUCK ACCESS AND CIRCULATION

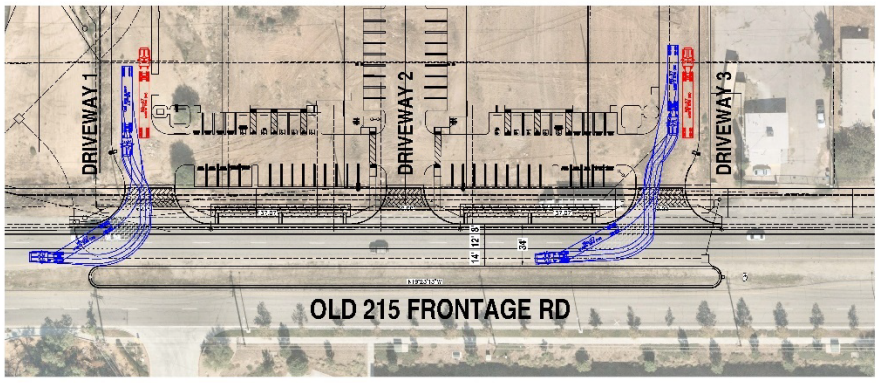
Due to the typical wide turning radius of large trucks, a truck turning template has been overlaid on the site plan at each applicable Project driveway anticipated to be utilized by heavy trucks in order to determine appropriate curb radii and to verify that trucks will have sufficient space to execute turning maneuvers (see Exhibit 1-5). A WB-67 (53-foot trailer) has been utilized at all applicable driveways that are anticipated to be accessed by heavy trucks. As shown on Exhibit 1-5, there are no modifications necessary to the current design of the driveways to accommodate site access for trucks.

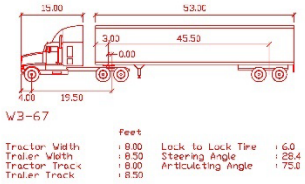
EXHIBIT 1-5: TRUCK ACCESS

INBOUND WB-67 TRUCKS TURNS



OUTBOUND WB-67 TRUCKS TURNS





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2 METHODOLOGIES

This section of the report presents the methodologies used to perform the traffic analyses summarized in this report. The methodologies described are consistent with City of Moreno Valley's 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 Moreno Valley, City of Riverside, and March Joint Powers Authority (March JPA) require 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 in Table 2-1.

The traffic modeling and signal timing optimization software package Synchro (Version 11) has been utilized to analyze signalized intersections. Synchro is a microscopic 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 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 Moreno Valley, City of Riverside, and March JPA require 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 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 update uses the signal warrant criteria presented in the latest edition of the Caltrans' California Manual on Uniform Traffic Control Devices (CA MUTCD), for all study area intersections. (6)

The signal warrant criteria for Existing study area intersections are based upon several factors, including volume of vehicular and pedestrian traffic, frequency of accidents, and location of school areas. The 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 update utilizes the Peak Hour Volume-based Warrant 3 as the appropriate representative traffic signal warrant analysis for existing traffic conditions. Rural warrants have been utilized for intersections located in communities with populations of less than 10,000 persons or with adjacent major streets operating above 40 miles per hour and urban warrants have been utilized for those that operate at less than 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.

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

TABLE 2-3: TRAFFIC SIGNAL WARRANT ANALYSIS LOCATIONS

#	Intersection
5	Old 215 Frontage Rd. & Cottonwood Av.
9	Old 215 Frontage Rd. & Bay Av.

The Existing conditions traffic signal warrant analysis is presented in the subsequent section, Section 3 Area Conditions of this report. The traffic signal warrant analyses for future conditions are presented in Section 5 Opening Year Cumulative (2025) Traffic Conditions of this report.

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

2.4 FREEWAY OFF-RAMP AND INTERSECTION QUEUING ANALYSIS

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 Eucalyptus Avenue and the I-215 Freeway at Alessandro Boulevard interchanges as well as the left turn pocket storage at all other study area intersections. Specifically, the queuing analysis is utilized to identify any potential queuing and "spill back" onto the I-215 Freeway mainline from the off-ramps or into the adjacent through lane from the left turn pocket.

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)

Minimum Acceptable LOS and associated definitions of intersection deficiencies has been obtained from each of the applicable surrounding jurisdictions.

2.5.1 CITY OF MORENO VALLEY

The definition of an intersection deficiency has been obtained from the City of Moreno Valley General Plan. The City's General Plan policies states that the City will maintain the following City-wide target LOS:

- Policy C.3-1: Strive to maintain Level of Service (LOS) C on roadway links, wherever possible, and LOS D in the vicinity of SR-60 Freeway and high employment centers. Strive to maintain LOS D at intersection during peak hours.
- Policy C.3-2: Allow for a list of locations to be exempt from the LOS policy based on right-of-way constraints and goals and values of the community. The City Engineer shall update the excepted intersections and roadway segments list periodically to be included with the traffic impact study guidelines and adopted by ordinance.

- Policy C.3-3: Where new developments would increase traffic flows beyond the LOS C (or LOS D, where applicable), require appropriate and feasible improvement measures as a condition of approval. Such measures may include extra right-of-way and improvements to accommodate additional left-turn and right-turn lanes at intersections, or other improvements.

2.5.2 CITY OF RIVERSIDE

Consistent with City's General Plan Circulation Element, the City of Riverside will endeavor to maintain LOS D or better on Arterial Streets wherever possible. At key locations, such as City Arterials that are used by regional freeway bypass traffic and at heavily traveled freeway interchanges, allow LOS E at peak hours as the acceptable standard on a case-by-case basis. Locations that may warrant the LOS E standard include portions of Arlington Avenue/Alessandro Boulevard, Van Buren Boulevard throughout the City, portions of La Sierra Avenue and selected freeway interchanges. A higher standard such as LOS C or better, may be adopted for Local and Collector streets in residential areas. The City also recognizes that LOS F may be expected along key freeway-feeder segments during peak commute hours due to regional travel patterns. As such, all study area intersections located within the City of Riverside utilize the minimum LOS threshold of LOS D for the purposes of this analysis.

2.5.3 CALTRANS

Senate Bill 743 (SB 743), approved in 2013, endeavors to change the way transportation impacts will be determined according to the California Environmental Quality Act (CEQA). The Office of Planning and Research (OPR) has recommended the use of vehicle miles traveled (VMT) as the replacement for automobile delay-based LOS. Caltrans acknowledges automobile delay will no longer be considered a CEQA impact for development projects and will use VMT as the metric for determining impacts on the State Highway System (SHS). However, LOS D has been utilized as the target LOS for Caltrans facilities, consistent with the City.

2.6 DEFICIENCY CRITERIA

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

2.6.1 CITY OF MORENO VALLEY

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

- Any signalized intersection operating at an acceptable LOS without project traffic in which the addition of project traffic causes the intersection to degrade to unacceptable LOS shall identify improvements to provide acceptable LOS.
- Any signalized study intersection that is operating at an unacceptable LOS without project traffic where the project increases delay by 5.0 or more seconds shall identify improvements to offset the increase in delay.

An operational improvement would be required if the study determines that either section a) or both sections b) and c) occur for unsignalized intersections:

a) The addition of project related traffic causes the intersection to degrade from an acceptable LOS to unacceptable LOS.

OR

b) The project adds 5.0 seconds or more of delay to an intersection that is already projected to operate without project traffic at unacceptable LOS,

c) The intersection meets the peak hour traffic signal warrant after the addition of project traffic.

If the conditions above are satisfied, improvement should be identified to achieve LOS D or better for conditions a) above and pre-project LOS and delay for case b) above.

2.6.2 CITY OF RIVERSIDE

For the intersections that lie within the City of Riverside, determination of project-specific traffic deficiencies will be based on a comparison of without and with project levels of service for each analysis year. A traffic deficiency occurs if project traffic increases the average delay at an intersection by more than the thresholds identified on the table below (see Table 2-4). The thresholds for LOS A, B, and C do not apply to projects consistent with the General Plan.

TABLE 2-4: THRESHOLDS OF TRAFFIC DEFICIENCIES

Pre-Project LOS	Significant Impact Threshold[1]
A/B	10.0 seconds
C	8.0 seconds
D	5.0 seconds
E	2.0 seconds
F	1.0 seconds

[1] Increase in delay

2.6.3 CALTRANS FACILITIES

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

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

2.7 PROJECT FAIR SHARE CALCULATION METHODOLOGY

Improvements found to be included in the County TUMF and/or City DIF programs will be identified as such. For improvements that do not appear to be in either of the pre-existing fee programs, a fair share contribution based on the Project's proportional share may be imposed in order to address the Project's share of deficiencies in lieu of construction. It should be noted that fair share calculations are for informational purposes only and the City's Traffic Engineer will determine the appropriate improvements to be implemented by a project (to be identified in the conditions of approval). The Project's fair share cost of improvements would be determined based on the following equation, which is the ratio of Project traffic to new traffic, where new traffic is total future traffic less existing baseline traffic:

Project Fair Share % = Project Traffic / (Opening Year Cumulative (2025) With Project Total Traffic – Existing (2022) Traffic)

The detailed Project fair share contribution calculations are presented in Section 6 Local and Regional Funding Mechanisms of this TA (see Table 6-1).

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3 AREA CONDITIONS

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

3.1 EXISTING CIRCULATION NETWORK

Pursuant to the scoping agreement with City of Moreno Valley staff (Appendix 1.1), the study area includes a total of 10 existing and future intersections as shown previously on Exhibit 1-3, where the Project is anticipated to contribute 50 or more peak hour trips (or added at the City's request during the scoping process). Exhibit 3-1 illustrates the study area intersections located near the proposed Project and identifies the number of through traffic lanes for existing roadways and intersection traffic controls.

3.2 CITY OF MORENO VALLEY GENERAL PLAN CIRCULATION ELEMENT

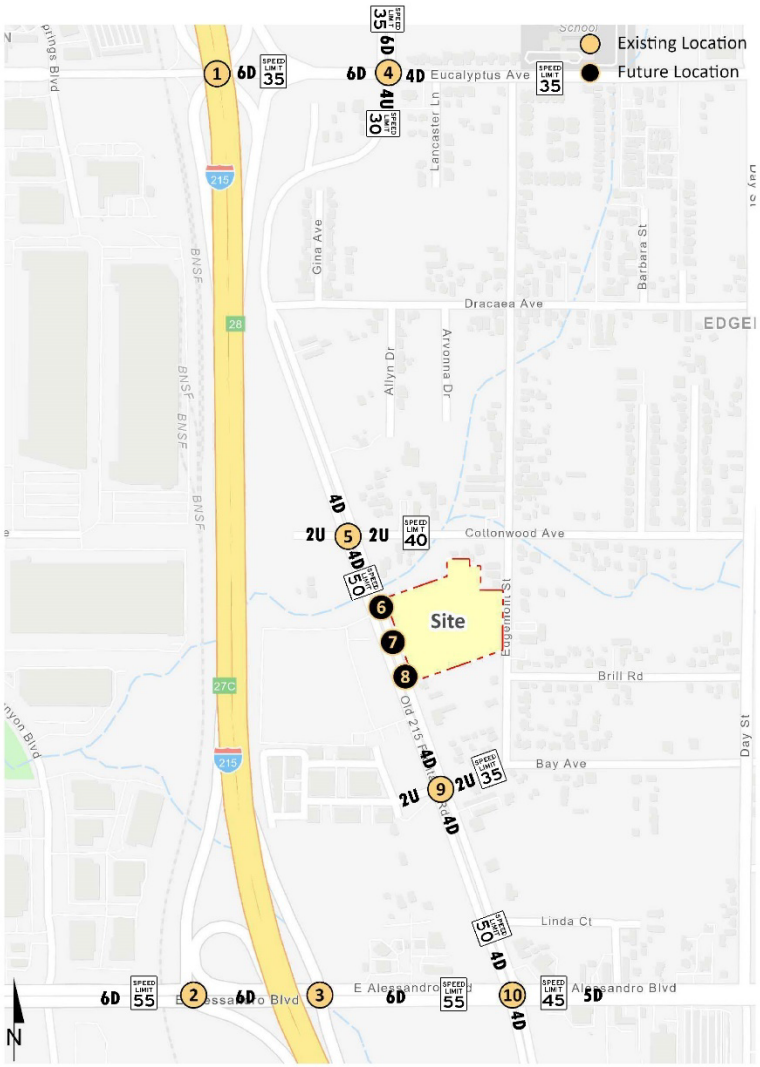
As noted previously, the Project site is located within the City of Moreno Valley. The roadway classifications and planned (ultimate) roadway cross-sections of the major roadways within the study area, as identified on City of Moreno Valley General Plan Circulation Element, are described subsequently. Exhibit 3-2 shows the City of Moreno Valley General Plan Circulation Element and Below is a summary of the major study area roadways and their General Plan classifications:

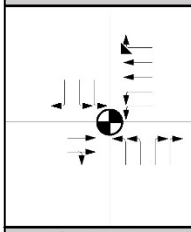
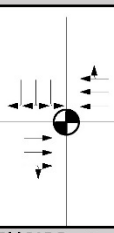
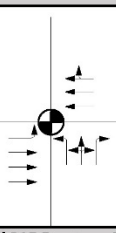
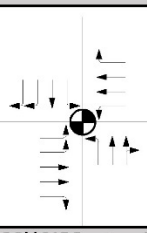
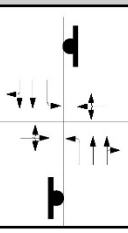
- Divided Major Arterial: Alessandro Boulevard and Eucalyptus Avenue
- Divided Arterial: Old 215 Frontage Road
- Minor Arterial: Cottonwood Avenue
- Industrial Collector: Bay Avenue
- Local Street: Edgemont Street

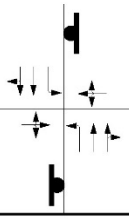
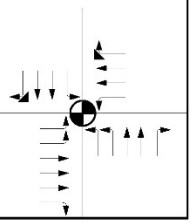
3.3 BICYCLE & PEDESTRIAN FACILITIES

The City's existing and planned bicycle and pedestrian network is shown on Exhibit 3-3. Alessandro Boulevard is currently a Class 2 bike route. Class 2 bike lanes are on-road, striped bike lanes. Eucalyptus Avenue and Old 215 Frontage Road are future Class 2 bike routes. Bay Avenue is a Class 4 bike boulevard. Exhibit 3-4 illustrates the existing crosswalks and existing sidewalks throughout the study area. As shown on Exhibit 3-4, there are limited pedestrian facilities along Cottonwood Avenue and along the west side of Old 215 Frontage Road.

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



1 I-215 Ramps & Eucalyptus Av.	2 I-215 SB Ramps & Alessandro Bl.	3 I-215 NB Ramps & Alessandro Bl.	4 Old 215 Frontage Rd. & Eucalyptus Av.	5 Old 215 Frontage Rd. & Cottonwood Av.	6 Old 215 Frontage Rd. & Dwy. 1
					Future Intersection

7 Old 215 Frontage Rd. & Dwy. 2	8 Old 215 Frontage Rd. & Dwy. 3	9 Old 215 Frontage Rd. & Bay Av.	10 Old 215 Frontage Rd. & Alessandro Bl.
Future Intersection	Future Intersection		

4 = Number of Lanes
D = Divided
U = Undivided
55 = Speed Limit (MPH)
= Traffic Signal
= Stop Sign
= Existing Lane
= Free Right Turn Lane

EXHIBIT 3-2: CITY OF MORENO VALLEY CIRCULATION ELEMENT

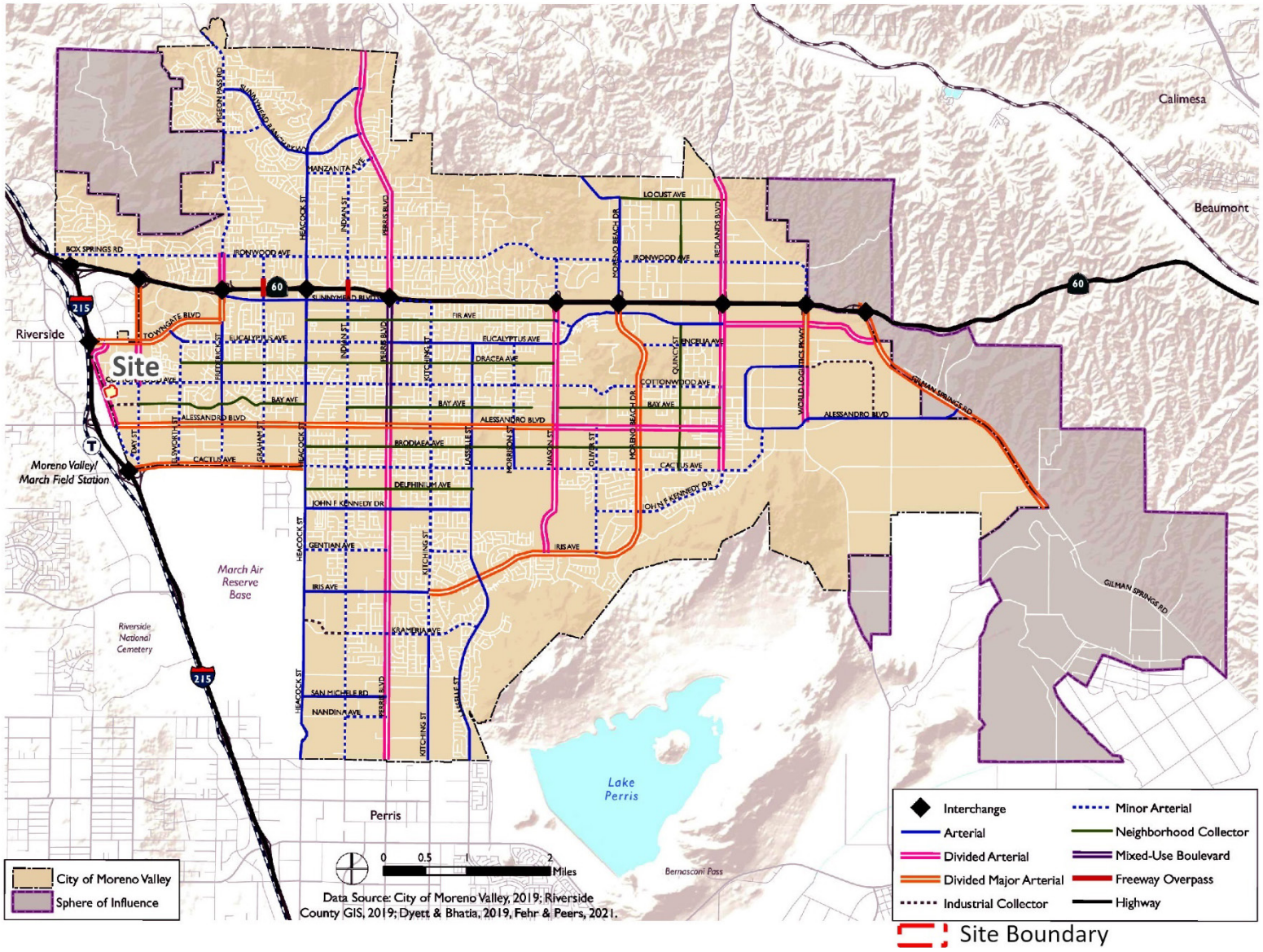


EXHIBIT 3-3: CITY OF MORENO VALLEY EXISTING AND PLANNED BICYCLE AND PEDESTRIAN NETWORK

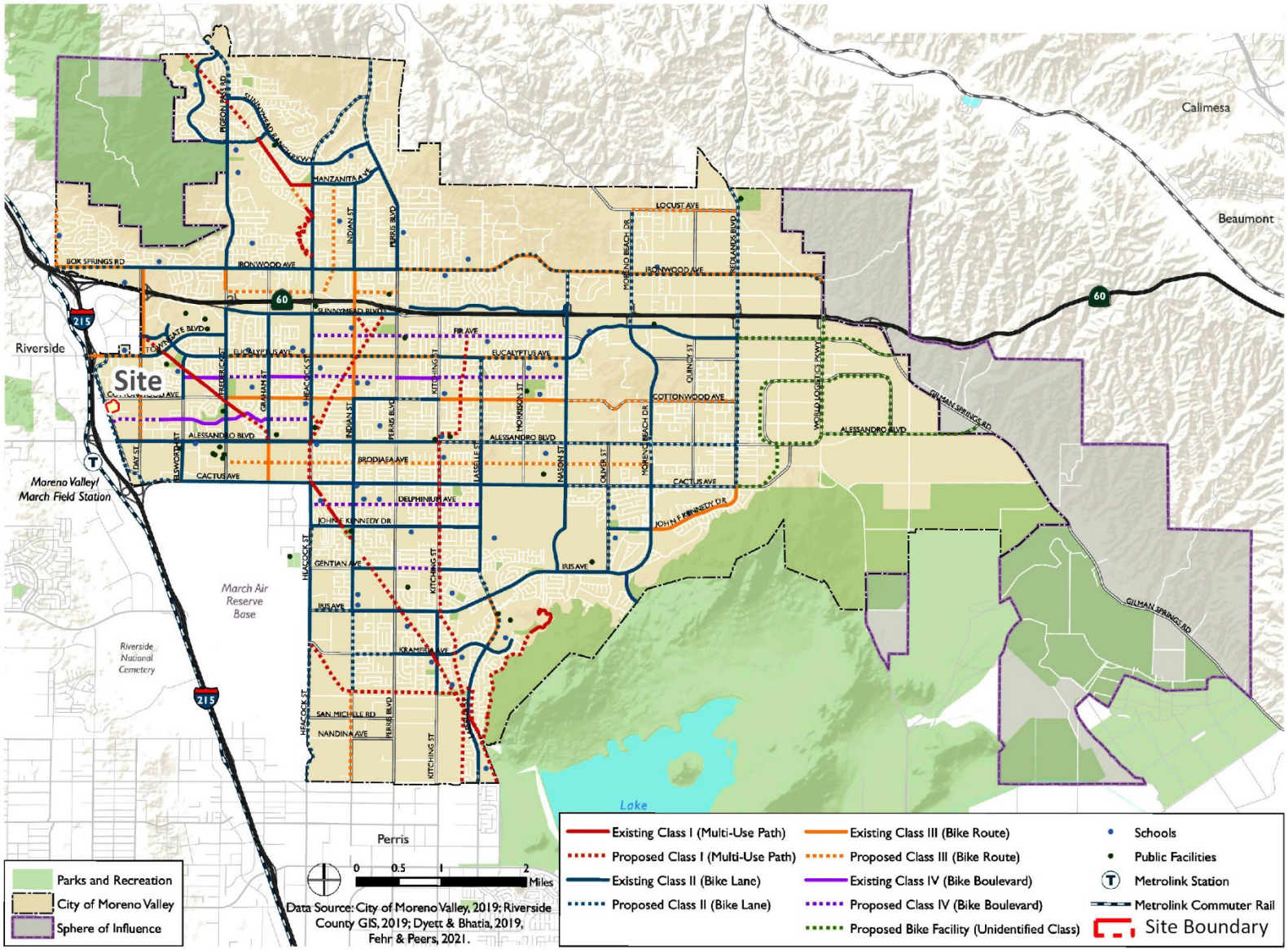


EXHIBIT 3-4: EXISTING PEDESTRIAN FACILITIES

3.4 TRANSIT SERVICE

The study area is currently served by Riverside Transit Agency (RTA) with bus service along Alessandro Boulevard. RTA Route 20 runs along Alessandro Boulevard with bus stops along this route near the Project. There are existing bus stops along Alessandro Boulevard on either side of Old 215 Frontage Road The existing transit services are illustrated on Exhibit 3-5. These RTA routes could serve 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 TRUCK ROUTES

The City's truck routes are shown on Exhibit 3-6. Truck routes for the proposed Project have been determined based on discussions with City staff. These truck routes have been utilized in terms of routing proposed Project traffic throughout the study area.

3.6 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 November 2022. The following peak hours were selected for analysis:

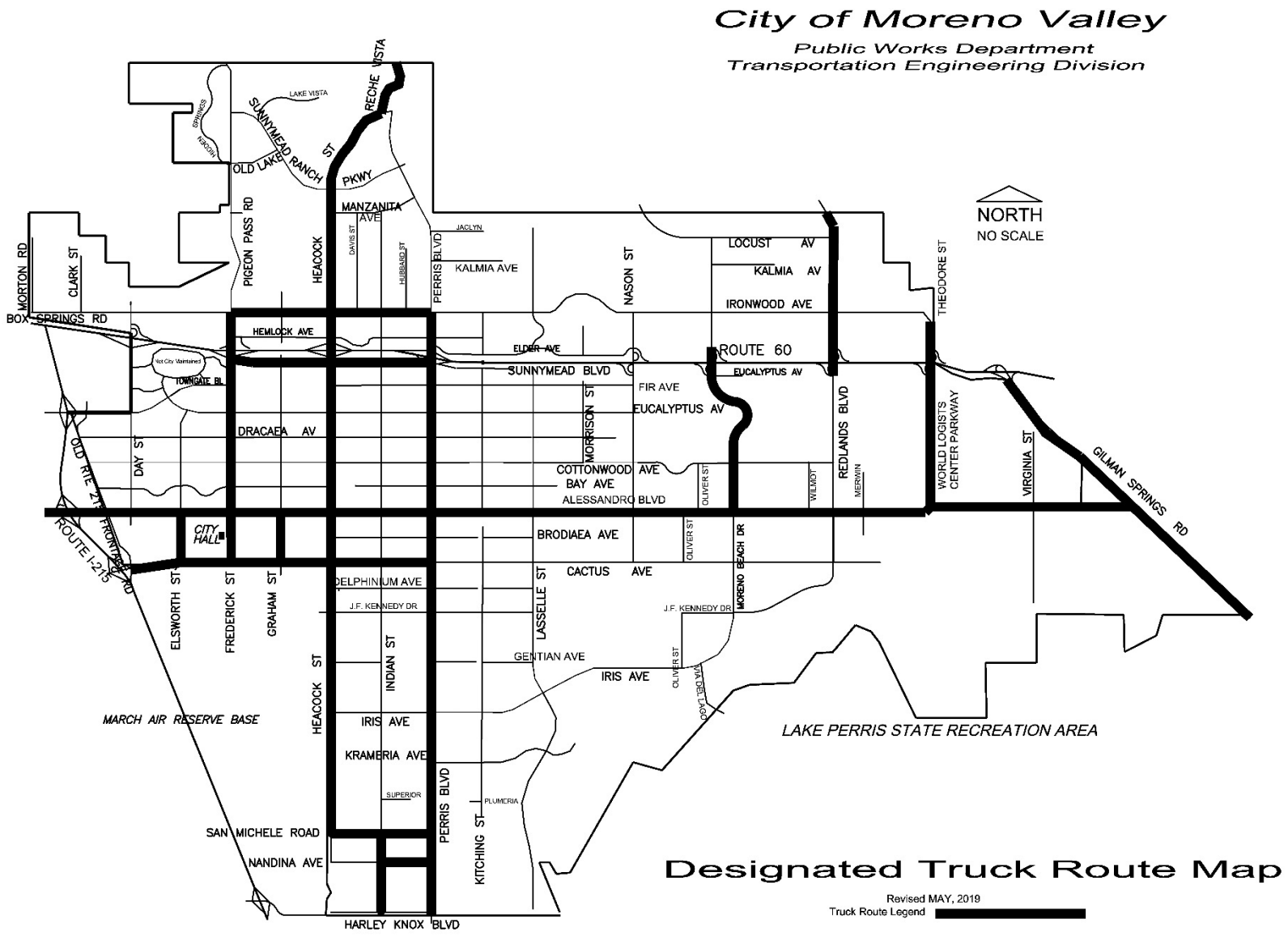
- Weekday AM Peak Hour (peak hour between 7:00 AM and 9:00 AM)
- Weekday PM Peak Hour (peak hour between 4:00 PM and 6:00 PM)

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. As such, no additional adjustments were made to the traffic counts to establish the baseline condition. The raw manual peak hour turning movement traffic count data sheets are included in Appendix 3.1.

The traffic counts collected include the following vehicle classifications: Passenger Cars, 2-Axle Trucks, 3-Axle Trucks, and 4 or more Axle Trucks. To represent the impact large trucks, buses and recreational vehicles have on traffic flow, all trucks were converted into PCE. By their size alone, these vehicles occupy the same space as two or more passenger cars. In addition, the time it takes for them to accelerate and slow-down is much longer than for passenger cars and varies depending on the type of vehicle and number of axles. For the purpose of this analysis, a PCE factor of 1.5 has been applied to 2-axle trucks, 2.0 for 3-axle trucks, and 3.0 for 4+-axle trucks to estimate each turning movement.

EXHIBIT 3-5: TRANSIT ROUTES

EXHIBIT 3-6: TRUCK ROUTES



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

Weekday PM Peak Hour (Approach Volume + Exit Volume) x 13.29 = 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 7.53 percent. As such, the above equation utilizing a factor of 13.29 estimates the ADT volumes on the study area roadway segments assuming a peak-to-daily relationship of approximately 7.53 percent (i.e., 1/0.0753 = 13.29) and was assumed to sufficiently estimate ADT volumes for planning-level analyses. Existing weekday AM and weekday PM peak hour intersection volumes are shown on Exhibit 3-7. ADTs and peak hour volumes are expressed in actual vehicles. PCE volumes utilized for the analysis are provided in the technical appendices for each applicable analysis scenario.

3.7 INTERSECTION OPERATIONS ANALYSIS

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

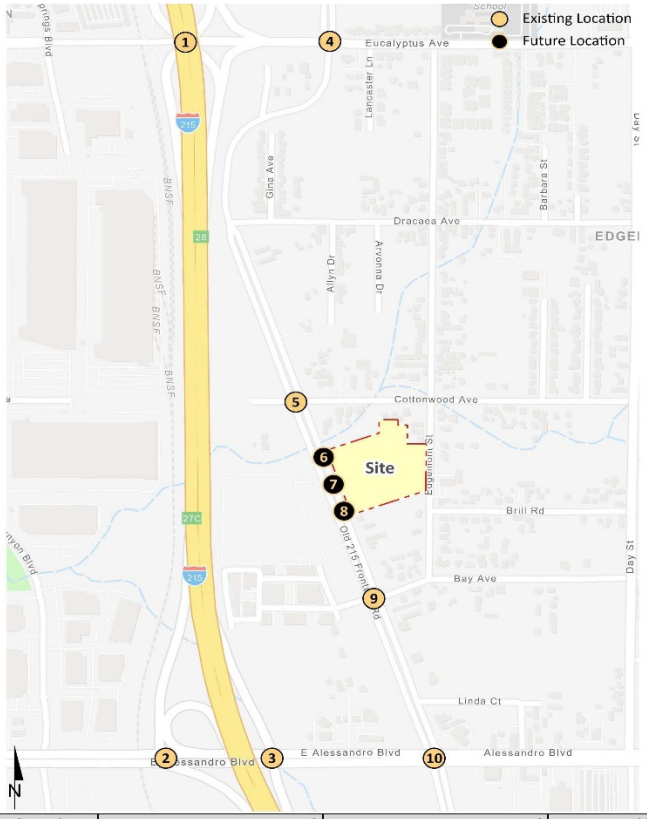
TABLE 3-1: INTERSECTION ANALYSIS FOR EXISTING (2022) CONDITIONS

#	Intersection	Traffic Control[2]	Delay[1] (secs.) AM	Delay[1] (secs.) PM	Level of Service AM	Level of Service PM
1	I-215 Ramps & Eucalyptus Av.	TS	17.6	30.1	B	C
2	I-215 SB Ramps & Alessandro Bl.	TS	11.3	6.8	B	A
3	I-215 NB Ramps & Alessandro Bl.	TS	22.0	11.6	C	B
4	Old 215 Frontage Rd. & Eucalyptus Av.	TS	28.9	20.1	C	C
5	Old 215 Frontage Rd. & Cottonwood Av.	CSS	21.8	14.1	C	B
6	Old 215 Frontage Rd. & Driveway 1		Future Intersection			
7	Old 215 Frontage Rd. & Driveway 2		Future Intersection			
8	Old 215 Frontage Rd. & Driveway 3		Future Intersection			
9	Old 215 Frontage Rd. & Bay Av.	CSS	17.6	11.9	C	B
10	Old 215 Frontage Rd. & Alessandro Bl.	TS	21.7	17.5	C	B

[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

EXHIBIT 3-7: EXISTING (2022) TRAFFIC VOLUMES



1 I-215 Ramps & Eucalpytus Av. — *29,950*

11,350	116(117)	220(410)	*13,950*
	32(68) →	↰ 286(259)	
	124(393) →	← 731(372)	
	66(94) ↴	↱ 506(418)	
		398(136)	103(400)
15,700			

2 I-215 SB Ramps & Alessandro Bl. — *38,150*

7,700	248(320)	142(158)	*4,750*
	644(1370) →	↰ 149(101)	
	301(356) ↴	← 1977(1242)	
43,700			

3 I-215 NB Ramps & Alessandro Bl. — *33,450*

3,950			*8,100*
	39(152) →	↰ 45(144)	
	747(1376) →	← 1375(867)	
		751(476)	0(3) 198(130)
38,150			

4 Old 215 Frontage Rd. & Eucalyptus Av. — *17,050*

19,850	425(578)	76(220) 26(49)	*10,300*
	208(369) →	↰ 53(58)	
	197(688) →	← 814(384)	
	42(146) ↴	↱ 41(35)	
		284(87)	307(220) 81(68)
29,950			

5 Old 215 Frontage Rd. & Cottonwood Av. — *2,950*

10,700	8(1)	149(331) 19(70)	*11,200*
	4(5) →	↰ 62(42)	
	3(1) →	← 3(0)	
	3(11) ↴	↱ 87(52)	
		13(10)	606(356) 26(56)
350			

6 Old 215 Frontage Rd. & Driveway 1

11,200	239(394)		*11,200*
			645(422) →

7 Old 215 Frontage Rd. & Driveway 2

11,200	239(394)		*11,200*
			645(422) →

8 Old 215 Frontage Rd. & Driveway 3

11,200	239(394)		*11,200*
			645(422) →

9 Old 215 Frontage Rd. & Bay Av. — *1,250*

10,850	10(3)	225(358) 9(40)	*10,600*
	5(12) →	↰ 26(22)	
	1(0) →	← 3(0)	
	6(15) ↴	↱ 35(14)	
		21(12)	625(380) 13(17)
550			

10 Old 215 Frontage Rd. & Alessandro Bl. — *28,500*

10,800	226(205)	25(115) 21(74)	*3,450*
	268(244) →	↰ 98(87)	
	633(1217) →	← 1063(752)	
	15(30) ↴	↱ 16(7)	
		86(15)	86(15) 10(8)
31,750			

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

***Average Daily Trips***

3.8 TRAFFIC SIGNAL WARRANTS ANALYSIS

Traffic signal warrants for Existing (2022) traffic conditions are based on existing peak hour intersection turning volumes. The intersection of Old 215 Frontage Road and Cottonwood Avenue currently warrants a traffic signal under Existing (2022) traffic conditions. Existing (2022) conditions traffic signal warrant analysis worksheets are provided in Appendix 3.3.

3.9 FREEWAY OFF-RAMP & INTERSECTION QUEUING ANALYSIS

A queuing analysis was performed for the freeway off-ramps at the I-215 Freeway at Eucalyptus Avenue and Alessandro Boulevard interchanges in order to assess vehicle queues for the off ramps that may potentially result in deficient peak hour operations at the ramp-to-arterial intersections and may potentially "spill back" onto the I-215 Freeway mainline. Queuing analysis has also been performed at other study area intersections to determine if any peak hour queues would spill out of the left turn pockets into the adjacent through lanes. Queuing analysis findings are presented in Table 3-2 for the freeway off-ramps and on Table 3-3 for the remaining study area intersections. It is important to note that off-ramp lengths are consistent with the measured distance between the intersection and the freeway mainline and turn pocket measurements reflect the storage length (without consideration of transition areas).

As shown in Table 3-2, all of the movements on the off-ramps at the two study area intersections do not currently experience a queuing issue during the weekday AM or weekday PM peak 95th percentile traffic flows. As shown in Table 3-3, the following movements currently experience a queuing issue during the weekday AM or weekday PM peak 95th percentile traffic flows at the study area intersection of Old 215 Frontage Road and Eucalyptus Avenue:

- Old 215 Frontage Rd. & Eucalyptus Av., northbound left turn lane – AM peak hour only

Worksheets for Existing (2022) traffic conditions queuing analysis are provided in Appendix 3.4.

TABLE 3-2: FREEWAY OFF-RAMP QUEUING SUMMARY FOR EXISTING (2022) CONDITIONS

#	Intersection	Movement	Available Stacking Distance (Feet)	Existing (2022) 95th Percentile Queue (Feet)[3] AM Peak Hour	PM Peak Hour	Acceptable?[1] AM	PM
1	I-215 Ramps & Eucalyptus Av.	NBL	1,240	136	72	Yes	Yes
		NBR	570	5	44	Yes	Yes
		SBL	1,450	81	170	Yes	Yes
		SBR	1,450	51	48	Yes	Yes
2	I-215 SB Ramps & Alessandro Bl.	SBL	500	117	115	Yes	Yes
		SBL/R	1,550	94	108	Yes	Yes
		SBR	500	86	101	Yes	Yes
3	I-215 NB Ramps & Alessandro Bl.	NBL	780	316 [2]	183	Yes	Yes
		NBL/T/R	1,260	235 [2]	190	Yes	Yes
		NBR	250	71	36	Yes	Yes

[1] Stacking Distance is acceptable if the required stacking distance is less than or equal to the stacking distance provided. An additional 25 feet of stacking which is assumed to be provided in the transition for turn pockets is reflected in the stacking distance shown on this table, where applicable.

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

TABLE 3-3: INTERSECTION QUEUING SUMMARY FOR EXISTING (2022) CONDITIONS

#	Intersection	Movement	Available Stacking Distance (Feet)	Existing (2022) 95th Percentile Queue (Feet)[3] AM Peak Hour	PM Peak Hour	Acceptable?[1] AM	PM
4	Old 215 Frontage Rd. & Eucalyptus Av.	NBL	150	**355** [2]	117	**No**	Yes
		SBL	180	49	88 [2]	Yes	Yes
		EBL	600	141 [2]	274 [2]	Yes	Yes
		WBL	100	61	55	Yes	Yes
5	Old 215 Frontage Rd. & Cottonwood Av.	NBL	240	0	0	Yes	Yes
		SBL	450	25	5	Yes	Yes
9	Old 215 Frontage Rd. & Bay Av.	NBL	225	3	0	Yes	Yes
		SBL	460	0	3	Yes	Yes
10	Old 215 Frontage Rd. & Alessandro Bl.	NBL	300	53	17	Yes	Yes
		SBL	460	36	98 [2]	Yes	Yes
		EBL	490	126 [2]	98	Yes	Yes
		WBL	200	43	16	Yes	Yes

[1] Stacking Distance is acceptable if the required stacking distance is less than or equal to the stacking distance provided. An additional 25 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.

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4 PROJECTED FUTURE TRAFFIC

The Project is proposed to consist of two 49,815 square foot warehouse buildings for a total of 99,630 square feet. For the purposes of this assessment, the trip generation will evaluate 9,963 square feet of high-cube cold storage warehouse use (10% of the total square footage) and 89,667 square feet of general light industrial use. Access to the Project site will be accommodated via three driveways along Old 215 Frontage Road (all of which will be restricted to right-in/right-out only due to the future raised median). Regional access is accommodated via the I-215 Freeway via either Eucalyptus Avenue or Alessandro Boulevard. For the purposes of the traffic analysis, it is assumed that the Project would be developed in a single phase with an anticipated Opening Year of 2025.

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.

Trip generation rates used to estimate Project traffic are shown in Table 4-1. The trip generation rates used for this analysis are based upon information collected by the ITE as provided in their Trip Generation Manual, 11th Edition, 2021. (2) For purposes of this analysis, the following ITE land use codes and vehicle mixes have been utilized for the proposed Project:

- ITE land use code 110 (General Light Industrial) has been used to derive site specific trip generation estimates for up to 89,667 square feet of the proposed Project (90% of the overall square footage). A light industrial facility is a free-standing facility devoted to a single use that has an emphasis on activities other than manufacturing. Typically, there is minimum office space. The vehicle mix has been obtained from the ITE's Trip Generation Manual. The truck percentages were further broken down by axle type per the following SCAQMD recommended truck mix: 2-Axle = 16.7%; 3-Axle = 20.7%; 4+-Axle = 62.6%. (7)
- ITE land use code 157 (High-Cube Cold Storage Warehouse) has been used to derive site specific trip generation estimates for up to 9,963 square feet (10% of the overall square footage). High-cube cold storage warehouses include warehouses characterized by the storage and/or consolidation of manufactured goods (and to a lesser extent, raw materials) prior to their distribution to retail locations or other warehouses. High-cube cold storage warehouses are facilities typified by temperature-controlled environments for frozen food or other perishable products. The High-Cube Cold Storage Warehouse vehicle mix (passenger cars versus trucks) has been obtained from the ITE's Trip Generation Manual. The truck percentages were further broken down by axle type per the following SCAQMD recommended truck mix: 2-Axle = 34.7%; 3-Axle = 11.0%; 4+-Axle = 54.3%. (7)

TABLE 4-1: TRIP GENERATION RATES

Land Use[1]	Units[2]	ITE LU Code	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
Actual Vehicle Trip Generation Rates									
General Light Industrial[3]	TSF	110	0.651	0.089	0.740	0.091	0.559	0.650	4.870
Passenger Cars			0.645	0.085	0.730	0.086	0.554	0.640	4.620
2-Axle Trucks			0.001	0.001	0.002	0.001	0.001	0.002	0.042
3-Axle Trucks			0.001	0.001	0.002	0.001	0.001	0.002	0.052
4+-Axle Trucks			0.004	0.002	0.006	0.003	0.003	0.006	0.157
High-Cube Cold Storage Warehouse[3]	TSF	157	0.085	0.025	0.110	0.034	0.086	0.120	2.120
Passenger Cars			0.076	0.004	0.080	0.019	0.071	0.090	1.370
2-Axle Trucks			0.003	0.007	0.010	0.005	0.005	0.010	0.260
3-Axle Trucks			0.001	0.002	0.003	0.002	0.001	0.003	0.083
4+-Axle Trucks			0.005	0.011	0.016	0.008	0.008	0.016	0.407
Passenger Car Equivalent (PCE) Trip Generation Rates[4]									
General Light Industrial[3]	TSF	110	0.651	0.089	0.740	0.091	0.559	0.650	4.870
Passenger Cars			0.645	0.085	0.730	0.086	0.554	0.640	4.620
2-Axle Trucks (PCE = 1.5)			0.002	0.001	0.003	0.002	0.001	0.003	0.063
3-Axle Trucks (PCE = 2.0)			0.002	0.002	0.004	0.002	0.002	0.004	0.104
4+-Axle Trucks (PCE = 3.0)			0.012	0.007	0.019	0.009	0.010	0.019	0.470
High-Cube Cold Storage Warehouse[3]	TSF	157	0.085	0.025	0.110	0.034	0.086	0.120	2.120
Passenger Cars			0.076	0.004	0.080	0.019	0.071	0.090	1.370
2-Axle Trucks (PCE = 1.5)			0.005	0.011	0.016	0.008	0.008	0.016	0.390
3-Axle Trucks (PCE = 2.0)			0.002	0.005	0.007	0.004	0.003	0.007	0.165
4+-Axle Trucks (PCE = 3.0)			0.015	0.034	0.049	0.024	0.025	0.049	1.222

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

[2] TSF = thousand square feet

[3] Truck Mix: South Coast Air Quality Management District's (SCAQMD) recommended truck mix, by axle type.

Normalized % - Without Cold Storage: 16.7% 2-Axle trucks, 20.7% 3-Axle trucks, 62.6% 4-Axle trucks.

Normalized % - With Cold Storage: 34.7% 2-Axle trucks, 11.0% 3-Axle trucks, 54.3% 4-Axle trucks.

[4] PCE factors: 2-axle = 1.5; 3-axle = 2.0; 4+-axle = 3.0.

Trip generation for heavy trucks was further broken down by truck type (or axle type). The total truck percentage is comprised of 3 different truck types: 2-axle, 3-axle, and 4+-axle trucks. PCE factors were applied to the trip generation rates for heavy trucks (large 2-axles, 3-axles, 4+-axles). PCEs allow the typical "real-world" mix of vehicle types to be represented as a single, standardized unit, such as the passenger car, to be used for the purposes of capacity and level of service analyses. The PCE factors are consistent with the recommended PCE factors in the City's Guidelines. A summary of the Project's trip generation based on actual vehicles and in PCE is shown in Table 4-2. As shown in Table 4-2, the proposed Project is anticipated to generate a total of 504 PCE trip-ends per day, 69 PCE AM peak hour

trips and 61 PCE PM peak hour trips (utilized for the operations analysis). The proposed Project is anticipated to generate a total of 462 actual vehicle trip-ends per day with 67 AM peak hour trips and 59 PM peak hour trips (see Table 4-2).

TABLE 4-2: PROJECT TRIP GENERATION SUMMARY

			AM Peak Hour			PM Peak Hour			
Land Use	Quantity	Units[1]	In	Out	Total	In	Out	Total	Daily
Actual Vehicles:									
General Light Industrial (90%)	89.667	TSF							
Passenger Cars:			58	8	66	8	50	58	414
2-axle Trucks:			0	0	0	0	0	0	4
3-axle Trucks:			0	0	0	0	0	0	6
4+-axle Trucks:			0	0	0	0	0	0	14
Total Truck Trips (Actual Vehicles):			0	0	0	0	0	0	24
Total Trips (Actual Vehicles)[2]			58	8	66	8	50	58	438
High-Cube Cold Storage (10%)	9.963	TSF							
Passenger Cars:			1	0	1	0	1	1	14
2-axle Trucks:			0	0	0	0	0	0	4
3-axle Trucks:			0	0	0	0	0	0	2
4+-axle Trucks:			0	0	0	0	0	0	4
Total Truck Trips (Actual Vehicles):			0	0	0	0	0	0	10
Total Trips (Actual Vehicles)[2]			1	0	1	0	1	1	24
Passenger Cars			59	8	67	8	51	59	428
Trucks (Actual Vehicles)			0	0	0	0	0	0	34
Total Trips (Actual Vehicles)[2]			**59**	**8**	**67**	**8**	**51**	**59**	**462**
Passenger Car Equivalent (PCE):									
General Light Industrial (90%)	89.667	TSF							
2-axle Trucks:			0	0	0	0	0	0	6
3-axle Trucks:			0	0	0	0	0	0	10
4+-axle Trucks:			1	1	2	1	1	2	42
Total Truck Trips (PCE):			1	1	2	1	1	2	58
High-Cube Cold Storage (10%)	9.963	TSF							
2-axle Trucks:			0	0	0	0	0	0	4
3-axle Trucks:			0	0	0	0	0	0	2
4+-axle Trucks:			0	0	0	0	0	0	12
Total Truck Trips (PCE):			0	0	0	0	0	0	18
Passenger Cars			59	8	67	8	51	59	428
Trucks (PCE)			1	1	2	1	1	2	76
Total Trips (PCE)[2]			**60**	**9**	**69**	**9**	**52**	**61**	**504**

[1] TSF = thousand square feet

[2] Total Trips = Passenger Cars + Truck Trips.

4.2 PROJECT TRIP DISTRIBUTION

The Project trip distribution and assignment process represents the directional orientation of traffic to and from the Project site. The trip distribution pattern of passenger cars is heavily influenced by the geographical location of the site, the location of surrounding uses, and the proximity to the regional freeway system. The trip distribution pattern for truck traffic is also influenced by the local truck routes approved by the City of Moreno Valley and other surrounding agencies. Given these differences, separate trip distributions were generated for both passenger cars and truck trips. The Project truck trip distribution pattern is graphically depicted on Exhibit 4-1. Note that the Project trucks will utilize Driveway 1 and Driveway 3 only as the center drive aisle (Driveway 2) is denoted as emergency access only for trucks (gate to be closed at all times). The Project passenger car trip distribution pattern is graphically depicted on Exhibit 4-2. Each of these distribution patterns was reviewed by the City of Moreno Valley as part of the traffic study scoping process (see Appendix 1.1).

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 (non-truck trips only).

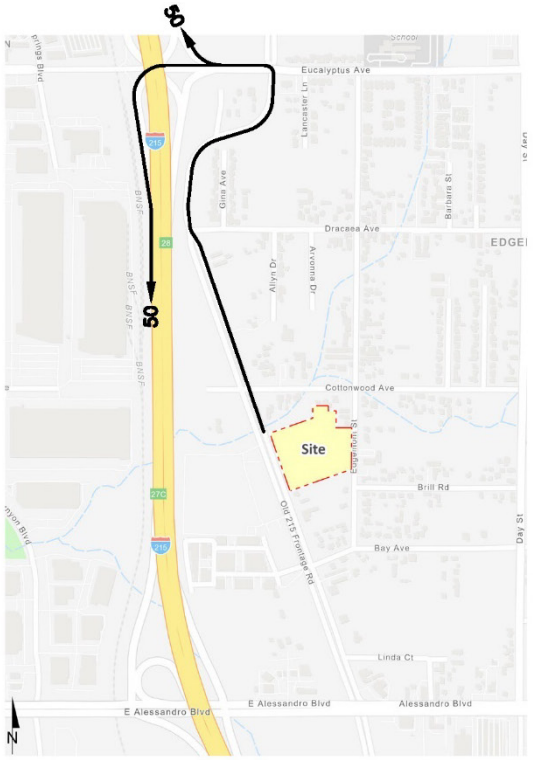
4.4 PROJECT TRIP ASSIGNMENT

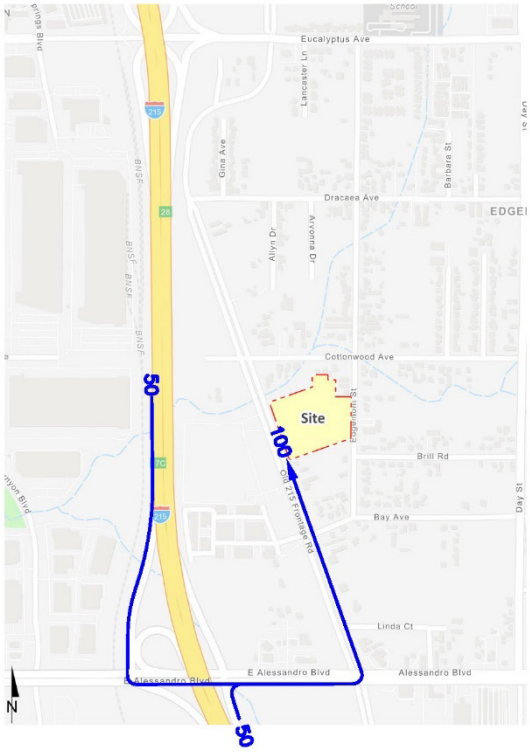
The assignment of traffic from the Project area to the adjoining roadway system is based upon the Project trip generation, trip distribution, and the arterial highway and local street system improvements that would be in place by the time of initial occupancy of the Project. Based on the identified Project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

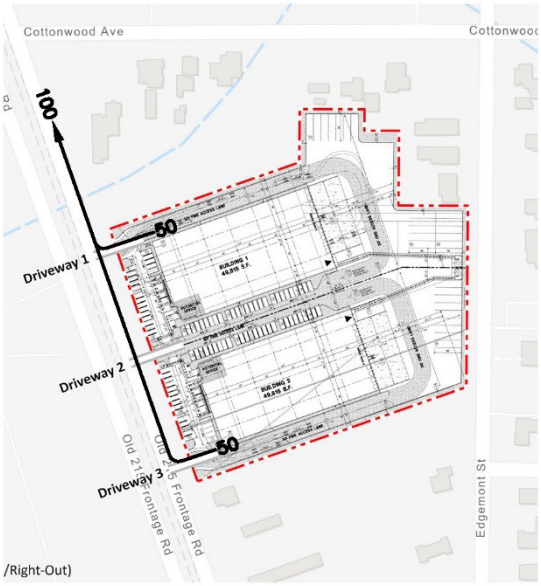
4.5 BACKGROUND TRAFFIC

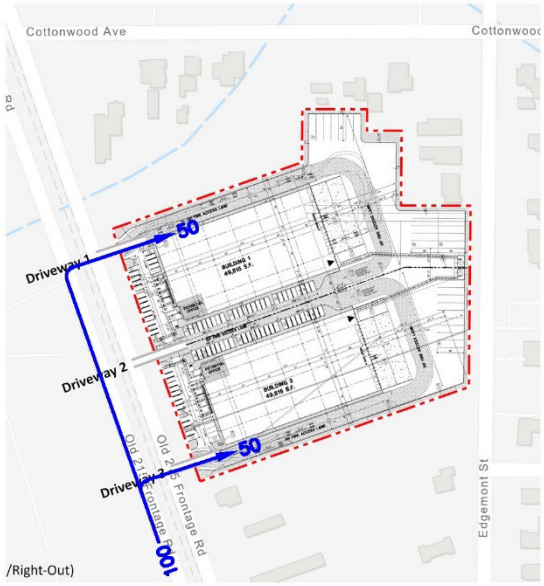
Future year traffic forecasts have been based upon background (ambient) growth at 2.0% per year for 2025 traffic conditions. The ambient growth factor is intended to approximate regional traffic growth. The total ambient growth is 6.12% for 2025 traffic conditions (growth of 2.0 percent per year over 3 years). This ambient growth rate is added to existing traffic volumes to account for area-wide growth not reflected by cumulative development projects. Ambient growth has been added to daily and peak hour traffic volumes on surrounding roadways, in addition to traffic generated by the development of future projects that have been approved but not yet built and/or for which development applications have been filed and are under consideration by governing agencies. Opening Year Cumulative (2025) traffic volumes are provided in Section 6 of this report.

EXHIBIT 4-1: PROJECT (TRUCK) TRIP DISTRIBUTION







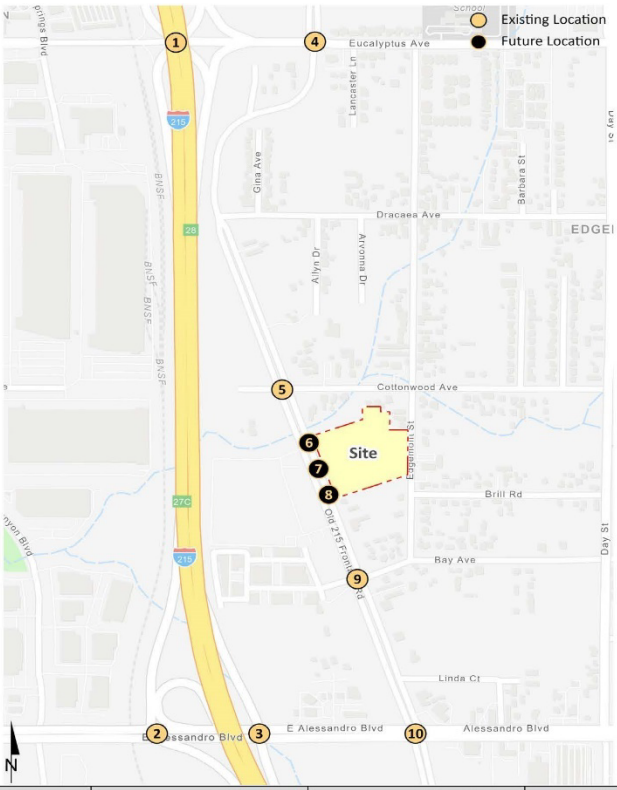


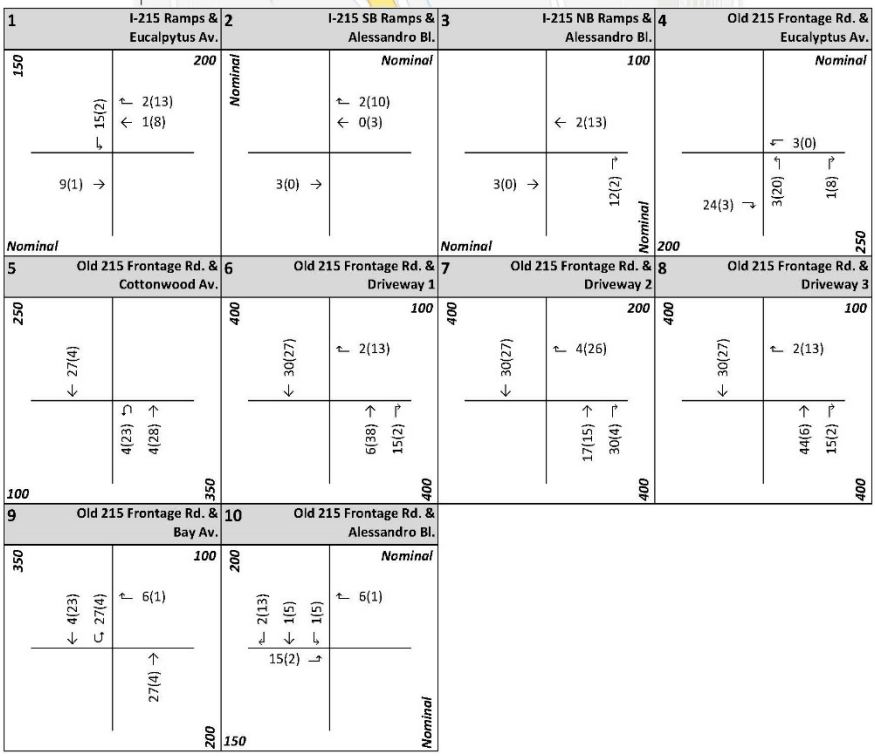
10 ***= Percent To/From Project***

EXHIBIT 4-2: PROJECT (PASSENGER CAR) TRIP DISTRIBUTION

10 ***= Percent To/From Project***

EXHIBIT 4-3: PROJECT ONLY TRAFFIC VOLUMES





##(##) AM(PM) Peak Hour Intersection Volumes
Average Daily Trips
Note: Volumes are reflected in PCE.

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 City of Moreno Valley. The neighboring jurisdiction of the City of Riverside has also been contacted to include key projects in their respective cities. The cumulative projects listed are those that would generate traffic and would contribute traffic to study area intersections. Exhibit 4-4 illustrates the cumulative development location map. A summary of cumulative development projects and their proposed land uses are shown in Table 4-3. If applicable, the traffic generated by individual cumulative projects were manually added to the Opening Year Cumulative forecasts to ensure that traffic generated by the listed cumulative development projects in Table 4-3 are reflected as part of the background traffic. In an effort to conduct a conservative analysis, the cumulative projects are added in conjunction with the ambient growth identified in Section 4.5 Background Traffic. The Cumulative ADT and peak hour intersection turning movement volumes for all cumulative development projects are shown on Exhibit 4-5. ADTs and peak hour volumes are expressed in actual vehicles.

TABLE 4-3: CUMULATIVE DEVELOPMENT LAND USE SUMMARY

No.	Project Name / Case Number	Land Use	Quantity	Units[1]
MV1	Old 215 Frontage Road Business Park (PEN21-0105)	Warehousing	94.022	TSF
		General Light Industrial	102.974	TSF
MV2	Rev Wheel Industrial Park	General Light Industrial	176.000	TSF
MV3	Edgemont Commerce Center	Warehousing	142.345	TSF
MV4	Moreno Valley Mall Redevelopment	Hotel	270	Rooms
		Multifamily Residential	1,627	DU
		Retail	24.000	TSF
		General Office	60.000	TSF
MV5	Canyon Springs Healthcare Campus & Senior Living	Medical Office	370.000	TSF
		Senior Housing (Attached)	234	DU
		Assisted Living Facility	267	Beds
MV6	Valley Springs Car Wash	Car Wash	4.340	TSF
R1	Alessandro Corporate Center	Manufacturing	115.526	TSF
R2	Old 215 Business Park	General Light Industrial	130	Emp

[1] TSF = Thousand Square Feet; EMP = Employees; DU = Dwelling Units

TABLE 4-4: CUMULATIVE DEVELOPMENT TRIP GENERATION SUMMARY

	AM Peak Hour			PM Peak Hour			
Cumulative Project	In	Out	Total	In	Out	Total	Daily
Old 215 Frontage Road Business Park	76	13	89	14	70	84	675
Rev Wheel Industrial Park	53	12	65	18	53	71	794
Edgemont Commerce Center	16	6	22	7	15	22	266
Moreno Valley Mall Redevelopment	292	528	820	469	394	863	9,968
Canyon Springs Healthcare Campus & Senior Living	1,013	335	1,348	572	1,282	1,854	18,528
Valley Springs Car Wash	0	0	0	31	31	62	620
Alessandro Corporate Center	64	21	85	29	63	92	632
Old 215 Business Park	55	11	66	14	50	64	400
Total	**1,569**	**926**	**2,495**	**1,154**	**1,958**	**3,112**	**31,883**

EXHIBIT 4-4: CUMULATIVE DEVELOPMENT LOCATION MAP

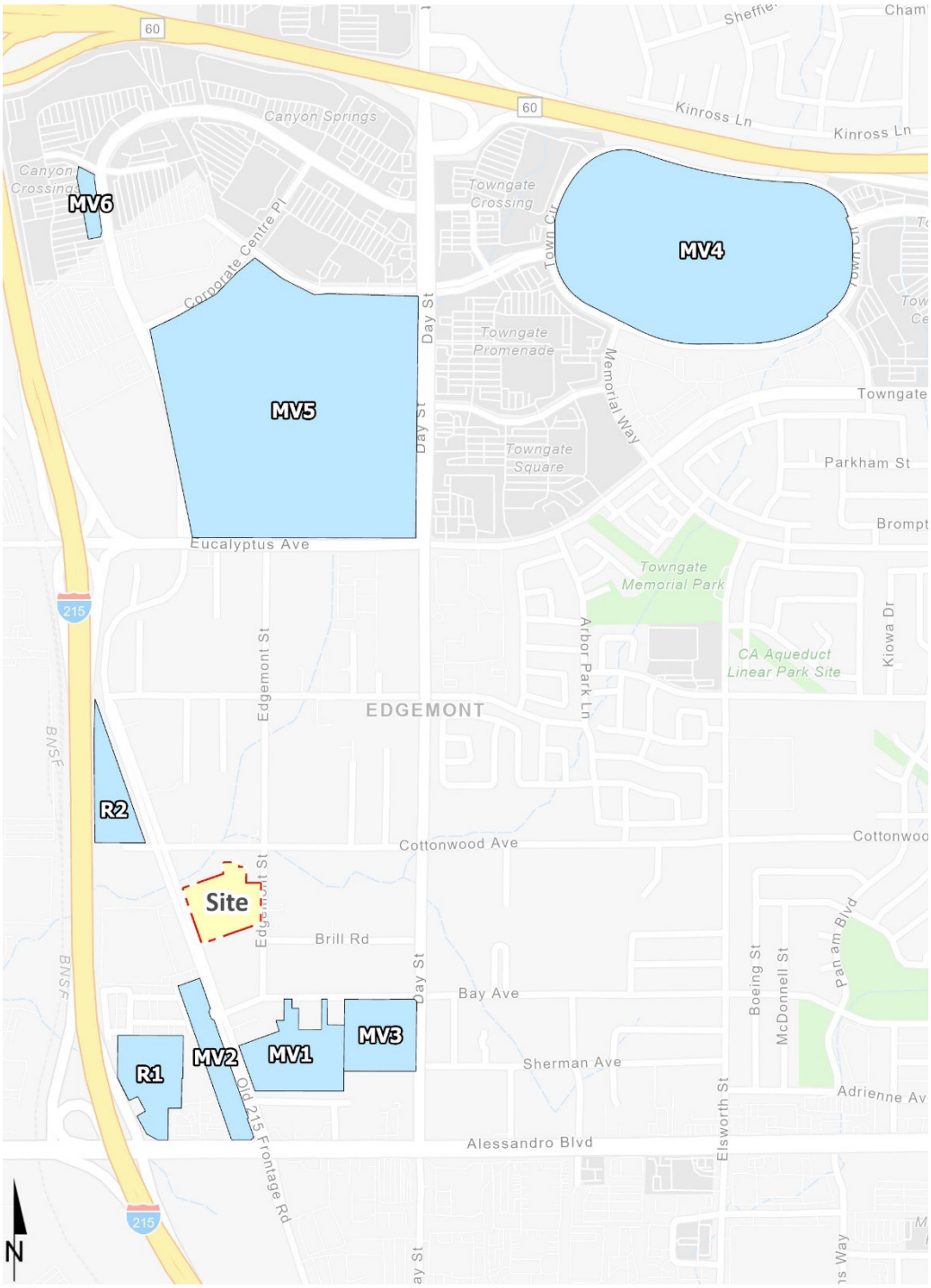
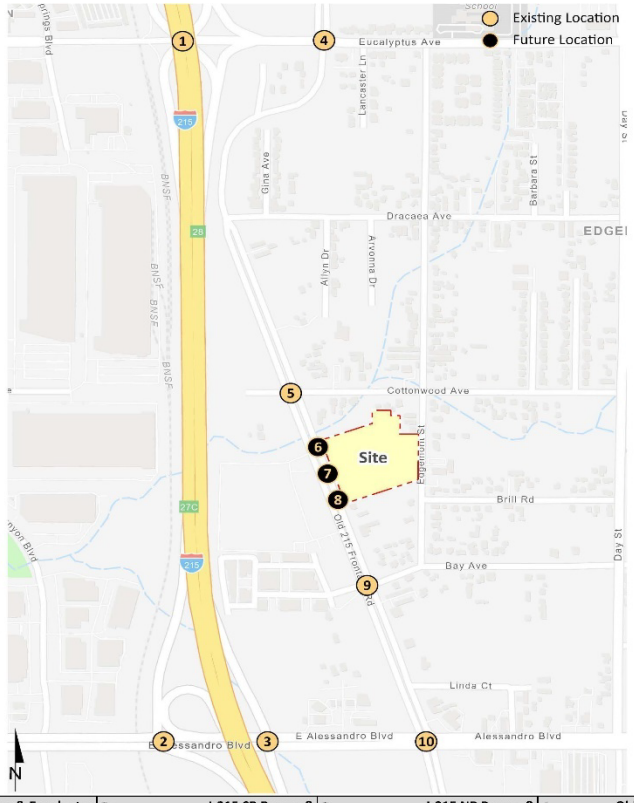


EXHIBIT 4-5: CUMULATIVE ONLY TRAFFIC VOLUMES



1 I-215 Ramps & Eucalpytus Av.

3,850			10,200
	218(117) ↳	↰ 86(303) ← 49(109) ↰ 126(310)	
	85(62) →	↱	244(168)
1,750			4,600

2 I-215 SB Ramps & Alessandro Bl.

300			650
	60(18) ↳	← 2(8) ↰ 14(52)	
	8(3) →		
100			300

3 I-215 NB Ramps & Alessandro Bl.

100			1,100
		↰ 8(25) ← 16(60)	
	68(20) →	↱	64(21)
650			350

4 Old 215 Frontage Rd. & Eucalyptus Av.

9,050			4,250
	130(495) 20(59) 31(82) ↳ ↓ ↳	↰ 67(43) ← 113(141) ↰ 8(6)	
	393(216) → 105(119) → 50(14) ↴	↴ → ↱	18(86) 47(26) 4(7)
10,200			1,900

5 Old 215 Frontage Rd. & Cottonwood Av.

750			200
	18(4) 23(17) 4(17) ↳ ↓ ↳	← 5(1) ↰ 5(2)	
	3(15) ↳ 1(5) → 1(3) ↴	↰ → ↱	15(4) 13(61) 3(13)
250			750

6 Old 215 Frontage Rd. & Driveway 1

750			
	28(21) ↓		
			30(77) →
750			

7 Old 215 Frontage Rd. & Driveway 2

750			
	28(21) ↓		
			30(77) →
750			

8 Old 215 Frontage Rd. & Driveway 3

750			
	28(21) ↓		
			30(77) →
750			

9 Old 215 Frontage Rd. & Bay Av.

750			100
	20(7) 8(14) ↳ ↓	← 3(1)	
	6(25) ↳ 1(3) → 0(2) ↴	↰ → ↱	18(22) 24(52) 1(5)
600			600

10 Old 215 Frontage Rd. & Alessandro Bl.

750			350
	7(33) 1(2) 2(9) ↳ ↓ ↳	← 24(5) ← 13(8)	
	79(17) ↳ 7(13) →		
750			

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

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5 OPENING YEAR CUMULATIVE (2025) TRAFFIC CONDITIONS

This section discusses the traffic forecasts for Opening Year Cumulative (2025) conditions and the resulting intersection operations, traffic signal warrant, and freeway off-ramp and intersection queuing analyses.

5.1 ROADWAY IMPROVEMENTS

The lane configurations and traffic controls assumed to be in place for Opening Year Cumulative conditions are consistent with those shown previously on Exhibit 3-1, with the exception of the 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 (e.g., intersection and roadway improvements at the Project's frontage and driveways).
- Driveways and those facilities assumed to be constructed by cumulative developments to provide site access are also assumed to be in place for Opening Year Cumulative conditions (e.g., intersection and roadway improvements along the cumulative development's frontages and driveways).

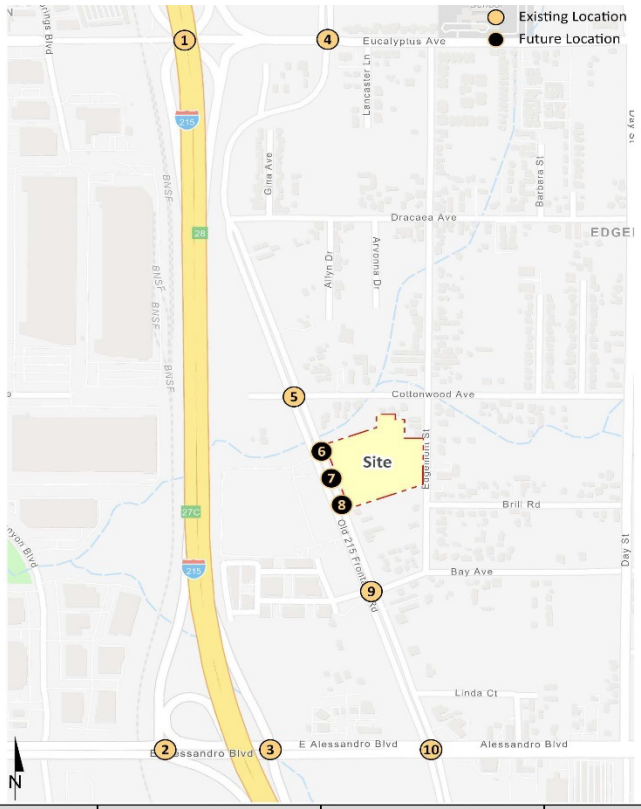
5.2 WITHOUT PROJECT TRAFFIC VOLUME FORECASTS

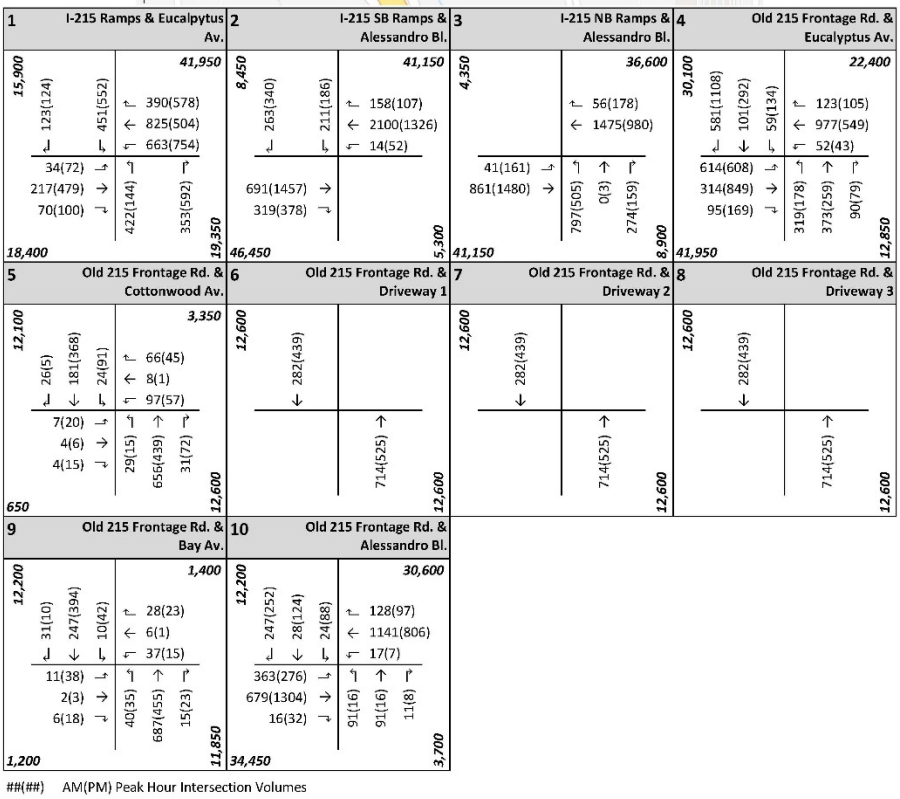
This scenario includes Existing traffic volumes plus an ambient growth factor of 6.12% plus traffic from pending and approved but not yet constructed known development projects in the area. The weekday ADT and weekday AM and PM peak hour volumes which can be expected for Opening Year Cumulative (2025) Without Project traffic conditions are shown on Exhibit 5-1. ADTs and peak hour volumes are expressed in actual vehicles. PCE volumes utilized for the analysis are provided in the technical appendices for each applicable analysis scenario.

5.3 WITH PROJECT TRAFFIC VOLUME FORECASTS

This scenario includes Existing traffic volumes plus an ambient growth factor of 6.12% plus traffic from pending and approved but not yet constructed known development projects in the area, plus Project traffic. The weekday ADT and weekday AM and PM peak hour volumes which can be expected for Opening Year Cumulative (2025) With Project traffic conditions are shown on Exhibit 5-2. ADTs and peak hour volumes are expressed in actual vehicles. PCE volumes utilized for the analysis are provided in the technical appendices for each applicable analysis scenario.

EXHIBIT 5-1: OPENING YEAR CUMULATIVE (2025) WITHOUT PROJECT TRAFFIC VOLUMES

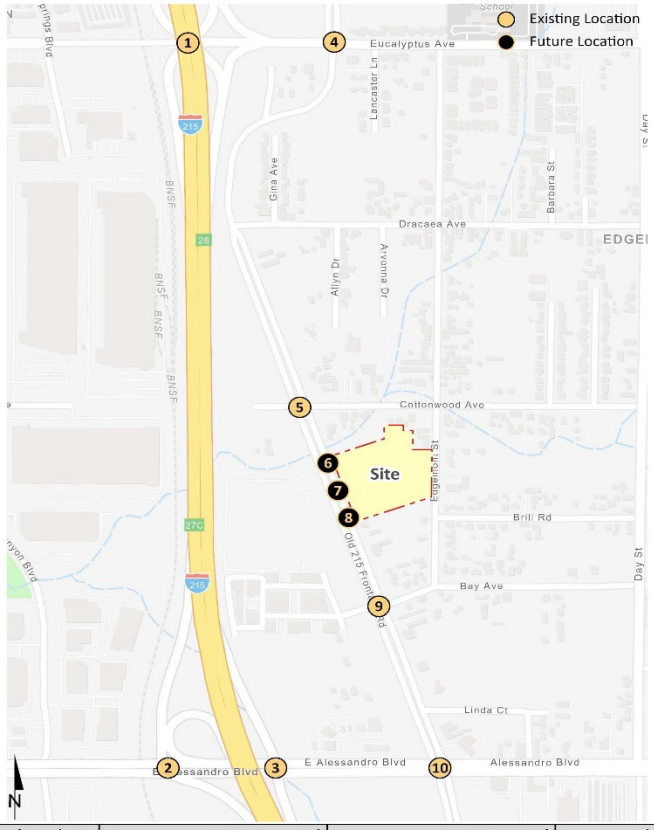


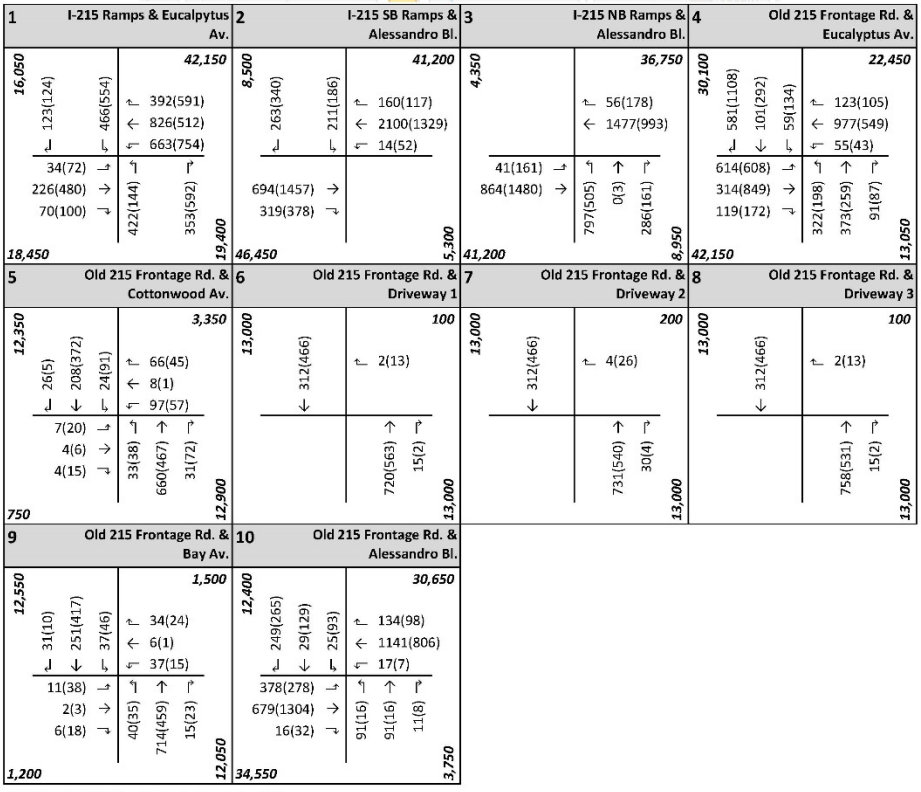


##(##) AM(PM) Peak Hour Intersection Volumes

Average Daily Trips

EXHIBIT 5-2: OPENING YEAR CUMULATIVE (2025) WITH PROJECT TRAFFIC VOLUMES





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

Average Daily Trips

5.4 INTERSECTION OPERATIONS ANALYSIS

Opening Year Cumulative 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 in Table 5-1 for Opening Year Cumulative traffic conditions, which indicates that the following study area intersections are anticipated to operate at an unacceptable LOS for Opening Year Cumulative (2025) Without Project traffic conditions:

- I-215 Ramps & Eucalyptus Av. (#1) – LOS F AM peak hour; LOS E PM peak hour
- Old 215 Frontage Rd. & Eucalyptus Av. (#4) – LOS F AM and PM peak hours

The intersection operations analysis worksheets for Opening Year Cumulative (2025) Without Project traffic conditions are included in Appendix 5.1 of this TA.

There are no additional study area intersections anticipated to operate at an unacceptable LOS during the peak hours with the addition of Project traffic, in addition to the locations identified for Opening Year Cumulative (2025) Without Project traffic conditions. The intersection operations analysis worksheets for Opening Year Cumulative (2025) With Project traffic conditions are included in Appendix 5.2 of this TA.

TABLE 5-1: INTERSECTION ANALYSIS FOR OPENING YEAR CUMULATIVE (2025) CONDITIONS

			2025 Without Project				2025 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
1	I-215 Ramps & Eucalyptus Av.	TS	**>200.0**	**58.3**	**F**	**E**	**>200.0**	**58.3**	**F**	**E**
2	I-215 SB Ramps & Alessandro Bl.	TS	13.1	7.4	B	A	13.1	7.4	B	A
3	I-215 NB Ramps & Alessandro Bl.	TS	24.1	12.5	C	B	24.2	12.5	C	B
4	Old 215 Frontage Rd. & Eucalyptus Av.	TS	**148.1**	**132.4**	**F**	**F**	**150.2**	**133.2**	**F**	**F**
5	Old 215 Frontage Rd. & Cottonwood Av.	CSS	30.1	17.2	D	C	31.5	19.0	D	C
6	Old 215 Frontage Rd. & Driveway 1	**CSS**	Future Intersection				11.4	10.5	B	B
7	Old 215 Frontage Rd. & Driveway 2	**CSS**	Future Intersection				11.6	10.5	B	B
8	Old 215 Frontage Rd. & Driveway 3	**CSS**	Future Intersection				11.6	10.3	A	B
9	Old 215 Frontage Rd. & Bay Av.	CSS	21.3	16.0	C	C	22.6	16.5	C	C
10	Old 215 Frontage Rd. & Alessandro Bl.	TS	28.4	18.5	C	B	30.2	18.7	C	B

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

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

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

5.5 TRAFFIC SIGNAL WARRANTS ANALYSIS

There are no study area intersections anticipated to warrant a peak hour or planning-level (ADT) based warrant under Opening Year Cumulative (2025) Without Project traffic conditions (see Appendix 5.3). The following study area intersection is anticipated to meet a peak hour volume-based traffic signal warrant under Opening Year Cumulative (2025) With Project traffic conditions (see Appendix 5.4):

- Old 215 Frontage Rd. & Bay Av. (#9)

5.6 OFF-RAMP & INTERSECTION QUEUING ANALYSIS

A queuing analysis was performed for the off-ramps at the I-215 Freeway at Eucalyptus Avenue and Alessandro Boulevard interchanges to assess vehicle queues for the off ramps that may potentially result in deficient peak hour operations at the ramp-to-arterial intersections and may potentially "spill back" onto the I-215 Freeway mainline. Queuing analysis has also been performed at other study area intersections to determine if any peak hour queues would spill out of the left turn pockets into the adjacent through lanes.

Queuing analysis findings are presented in Table 5-2 for the freeway off-ramps and on Table 5-3 for the remaining study area intersections. It is important to note that off-ramp lengths are consistent with the measured distance between the intersection and the freeway mainline and turn pocket measurements reflect the storage length (without consideration of transition areas). As shown in Table 5-2, all of the movements on the off-ramps at the two study area intersections do not currently experience a queuing issue during the weekday AM or weekday PM peak 95th percentile traffic flows. As shown in Table 5-3, the following movements are anticipated to experience queuing issues during the weekday AM or weekday PM peak 95th percentile traffic flows under Opening Year Cumulative (2025) Without Project traffic conditions:

- Old 215 Frontage Rd. & Eucalyptus Av., northbound left turn lane – AM and PM peak hours
- Old 215 Frontage Rd. & Eucalyptus Av., southbound left turn lane – AM peak hour only

There are no additional study area intersections or movements anticipated to experience queuing issues during the peak hours with the addition of Project traffic, in addition to the lanes identified for Opening Year Cumulative (2025) Without Project traffic conditions. Worksheets for Opening Year Cumulative (2025) Without and With Project traffic conditions queuing analyses are provided in Appendix 5.5 and Appendix 5.6, respectively.

TABLE 5-2: FREEWAY OFF-RAMP QUEUING SUMMARY FOR OPENING YEAR CUMULATIVE (2025) CONDITIONS

#	Intersection	Movement[3]	Available Stacking Distance	2025 Without Project 95th Percentile Queue (Feet) AM Peak Hour	2025 Without Project 95th Percentile Queue (Feet) PM Peak Hour	2025 Without Project Acceptable?[1] AM	2025 Without Project Acceptable?[1] PM	2025 With Project 95th Percentile Queue (Feet) AM Peak Hour	2025 With Project 95th Percentile Queue (Feet) PM Peak Hour	2025 With Project Acceptable?[1] AM	2025 With Project Acceptable?[1] PM
1	I-215 Ramps & Eucalyptus Av.	NBL	1,240	187 [2]	76	Yes	Yes	187 [2]	76	Yes	Yes
		NBR	570	37	59	Yes	Yes	37	59	Yes	Yes
		SBL	1,450	205 [2]	266 [2]	Yes	Yes	213 [2]	268 [2]	Yes	Yes
		SBR	1,450	58	53			58	53	Yes	Yes
2	I-215 SB Ramps & Alessandro Bl.	SBL	500	141	130	Yes	Yes	141	130	Yes	Yes
		SBL/R	1,550	117	113	Yes	Yes	117	113	Yes	Yes
		SBR	500	108	107	Yes	Yes	108	107	Yes	Yes
3	I-215 NB Ramps & Alessandro Bl.	NBL	780	354 [2]	195	Yes	Yes	354 [2]	195	Yes	Yes
		NBL/T/R	1,260	291 [2]	209 [2]	Yes	Yes	292 [2]	209 [2]	Yes	Yes
		NBR	250	125	53	Yes	Yes	133	55	Yes	Yes

[1] Stacking Distance is acceptable if the required stacking distance is less than or equal to the stacking distance provided. An additional 25 feet of stacking which is assumed to be provided in the transition for turn pockets is reflected in the stacking distance shown on this table, where applicable.

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

TABLE 5-3: INTERSECTION QUEUING SUMMARY FOR OPENING YEAR CUMULATIVE (2025) CONDITIONS

#	Intersection	Movement[3]	Available Stacking Distance	2025 Without Project 95th Percentile Queue (Feet) AM Peak Hour	2025 Without Project 95th Percentile Queue (Feet) PM Peak Hour	2025 Without Project Acceptable?[1] AM	2025 Without Project Acceptable?[1] PM	2025 With Project 95th Percentile Queue (Feet) AM Peak Hour	2025 With Project 95th Percentile Queue (Feet) PM Peak Hour	2025 With Project Acceptable?[1] AM	2025 With Project Acceptable?[1] PM
4	Old 215 Frontage Rd. & Eucalyptus Av.	NBL	150	**420** [2]	**300** [2]	**No**	**No**	**425** [2]	**335** [2]	**No**	**No**
		SBL	180	109 [2]	**249** [2]	Yes	**No**	109 [2]	**249** [2]	Yes	**No**
		EBL	600	458 [2]	462 [2]	Yes	Yes	458 [2]	462 [2]	Yes	Yes
		WBL	100	72	65	Yes	Yes	75	65	Yes	Yes
5	Old 215 Frontage Rd. & Cottonwood Av.	NBL	240	3	0	Yes	Yes	3	3	Yes	Yes
		SBL	450	3	8	Yes	Yes	3	8	Yes	Yes
9	Old 215 Frontage Rd. & Bay Av.	NBL	225	3	3	Yes	Yes	3	3	Yes	Yes
		SBL	460	0	3	Yes	Yes	8	5	Yes	Yes
10	Old 215 Frontage Rd. & Alessandro Bl.	NBL	300	55	17	Yes	Yes	55	17	Yes	Yes
		SBL	460	39	120 [2]	Yes	Yes	40	127 [2]	Yes	Yes
		EBL	490	207 [2]	112	Yes	Yes	217 [2]	113	Yes	Yes
		WBL	200	45	16	Yes	Yes	45	16	Yes	Yes

[1] Stacking Distance is acceptable if the required stacking distance is less than or equal to the stacking distance provided. An additional 25 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.

5.7 DEFICIENCIES AND RECOMMENDED IMPROVEMENTS

This section provides a summary of deficiencies and recommended improvements for Opening Year Cumulative (2025) traffic conditions. Based on deficiency criteria discussed in Section 2.6 Deficiency Criteria, the following intersections were found to be deficient.

5.7.1 RECOMMENDED IMPROVEMENTS TO ADDRESS DEFICIENCIES AT INTERSECTIONS

Improvements necessary to improve these traffic deficiencies back to acceptable levels are also discussed below. The intersection operations analysis worksheets for Opening Year Cumulative (2025) traffic conditions, with improvements, are included in Appendix 5.7 of this TA.

TABLE 5-4: INTERSECTION ANALYSIS FOR OPENING YEAR CUMULATIVE (2025) CONDITIONS WITH IMPROVEMENTS

			Intersection Approach Lanes[1]												Delay[2] (secs.)		Level of Service	
		Traffic	Northbound			Southbound			Eastbound			Westbound						
#	Intersection	Control[3]	L	T	R	L	T	R	L	T	R	L	T	R	AM	PM	AM	PM
1	I-215 Ramps & Eucalyptus Av.																	
	- Without Improvements	TS	2	0	2	2	0	1	1	2	0	2	2	1	**>200.0**	**58.3**	**F**	**E**
	- With Improvements[4]	TS	2	0	2	2	0	1	1	2	0	2	2	1	28.8	43.6	C	D
4	Old 215 Frontage Rd. & Eucalyptus Av.																	
	- Without Improvements	TS	1	2	0	1	1	2	2	2	1	1	2	1	**150.2**	**133.2**	**F**	**F**
	- With Improvements	TS	1	2	0	1	1	**2>**	2	2	1	1	2	1	48.4	37.8	D	D

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

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

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

[3] TS = Traffic Signal

[4] Modifications to signal timing only - no physical improvements.

5.7.2 RECOMMENDED IMPROVEMENTS TO ADDRESS DEFICIENCIES ON OFF-RAMP QUEUES

Table 5-3 shows the intersection queuing analysis results for the study area intersections and potential queuing issues. The following is a summary of potential improvements that could resolve the queuing issues. Note that the improvements to address queuing are not needed to address peak hour intersection operations as demonstrated in Table 5-4.

- Old 215 Frontage Rd. & Eucalyptus Av., northbound left turn lane – could potentially be improved by providing a 2nd northbound left turn lane and potentially lengthening the storage length. This would require widening of the existing pavement and modifications to the corners and existing signal equipment.
- Old 215 Frontage Rd. & Eucalyptus Av., southbound left turn lane – it is not feasible to modifying the length of the southbound left turn storage without shortening the northbound left turn storage for the driveway immediately to the north. An alternative could be to accommodate a 2nd southbound left turn lane which would require modifying the existing pavement and intersection layout including corners and existing signal equipment.
- Old 215 Frontage Rd. & Eucalyptus Av., eastbound left turn lane – it is not feasible to modify the length of the eastbound left turn storage due to the westbound left turn storage at the I-215 Freeway and Eucalyptus Avenue intersection.

The improvements recommended above are to address cumulative queuing deficiencies and would therefore not be constructed by the Project.

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6 LOCAL AND REGIONAL FUNDING MECHANISMS

Transportation improvements within the City of Moreno Valley are funded through a combination of improvements constructed by the Project, development impact fee programs or fair share contributions. Fee programs applicable to the Project are described below.

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

The City of Moreno Valley has created its own local DIF program to impose and collect fees from new residential, commercial, and industrial development for the purpose of funding roadways and intersections necessary to accommodate City growth as identified in the City's General Plan Circulation Element. The City's DIF program includes facilities that are not part of, or which may exceed improvements identified and covered by the TUMF program. As a result, the pairing of the regional and local fee programs provides a more comprehensive funding and implementation plan to ensure an adequate and interconnected transportation system. Under the City's DIF program, the City may grant to developers a credit against specific components of fees when those developers construct certain facilities and landscaped medians identified in the list of improvements funded by the DIF program.

The timing to use the DIF fees is established through periodic capital improvement programs which are overseen by the City's Public Works Department. Periodic traffic counts, review of traffic accidents, and a review of traffic trends throughout the City are also periodically performed by City staff and consultants. The City uses this data to determine the timing of implementing the improvements listed in its facilities list. The Project Applicant would pay requisite DIF pursuant to incumbent City ordinance requirements.

6.2 TRANSPORTATION UNIFORM MITIGATION FEE (TUMF) PROGRAM

The TUMF program is administered by the WRCOG based upon a regional Nexus Study most recently updated in 2016 to address major changes in right of way acquisition and improvement cost factors. (8) This regional program was put into place to ensure that development pays its fair share and that funding is in place for construction of facilities needed to maintain the requisite level of service and critical to mobility in the region. TUMF is a truly regional mitigation fee program and is imposed and implemented in every jurisdiction in Western Riverside County.

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

6.3 FAIR SHARE CONTRIBUTION

Project improvement 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, has been provided in Table 6-1 for the applicable deficient study area intersections. 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 6-1: PROJECT FAIR SHARE CALCULATIONS

#	Intersection	Existing 2022	Project Only	2025 With Project	Total New Traffic	Project % of New Traffic
4	Old 215 Frontage Rd. & Eucalyptus Av.					
	AM:	2,775	32	3,969	1,194	**2.7%**
	PM:	2,966	32	4,496	1,530	2.1%

BOLD = Highest fair share percentage is highlighted.

7 REFERENCES

1. **City of Moreno Valley Transportaiton Engineering Division.** Transportation Impact Analysis Preparation Guide for Vehicle Miles Traveled and Level of Service. City of Moreno Valley : s.n., June 2020.
2. **Institute of Transportation Engineers.** Trip Generation Manual. 11th Edition. 2021.
3. **City of Moreno Valley.** Genearl Plan 2040. Moreno Valley : s.n., Adopted August 31, 2021.
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.** Manual on Uniform Traffic Control Devices (MUTCD). [book auth.] California Department of Transportation. California Manual on Uniform Traffic Control Devices (CAMUTCD). 2014.
7. **South Coast Air Quality Managment District (SCAQMD).** Warehouse Truck Trip Study Data Results and Usage. June 2014.
8. **Western Riverside Council of Governments.** TUMF Nexus Study, 2016 Program Update. July 2017.

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