APPLE VALLEY 84

TRAFFIC ANALYSIS

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16408-05 TA Report

Agency
Town of Apple Valley

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TABLE OF CONTENTS

APPENDICES

LIST OF EXHIBITS

LIST OF TABLES

LIST OF ABBREVIATED TERMS

(1)	Reference
ADT	Average Daily Traffic
CAMUTCD	California Manual on Uniform Traffic Control Devices
Caltrans	California Department of Transportation
CMP	Congestion Management Program
DIF	Development Impact Fee
HCM	Highway Capacity Manual
HDM	Highway Design Manual
ITE	Institute of Transportation Engineers
LOS	Level of Service
NP	No (Without) Project
PCE	Passenger Car Equivalent
PHF	Peak Hour Factor
Project	Apple Valley 84
SBCTA	San Bernardino County Transportation Authority
TA	Traffic Analysis
V/C	Volume-to-Capacity Ratio
vphgpl	Vehicles per Hour Green per Lane
VVTA	Victor Valley Transit Authority
WP	With Project

1 SUMMARY OF FINDINGS

This report presents the results of the Traffic Analysis (TA) for the Apple Valley 84 (**Project**), which is located north of Stoddard Wells Road and south of Johnson Road in the Town of Apple Valley, as shown in Exhibit 1-1.

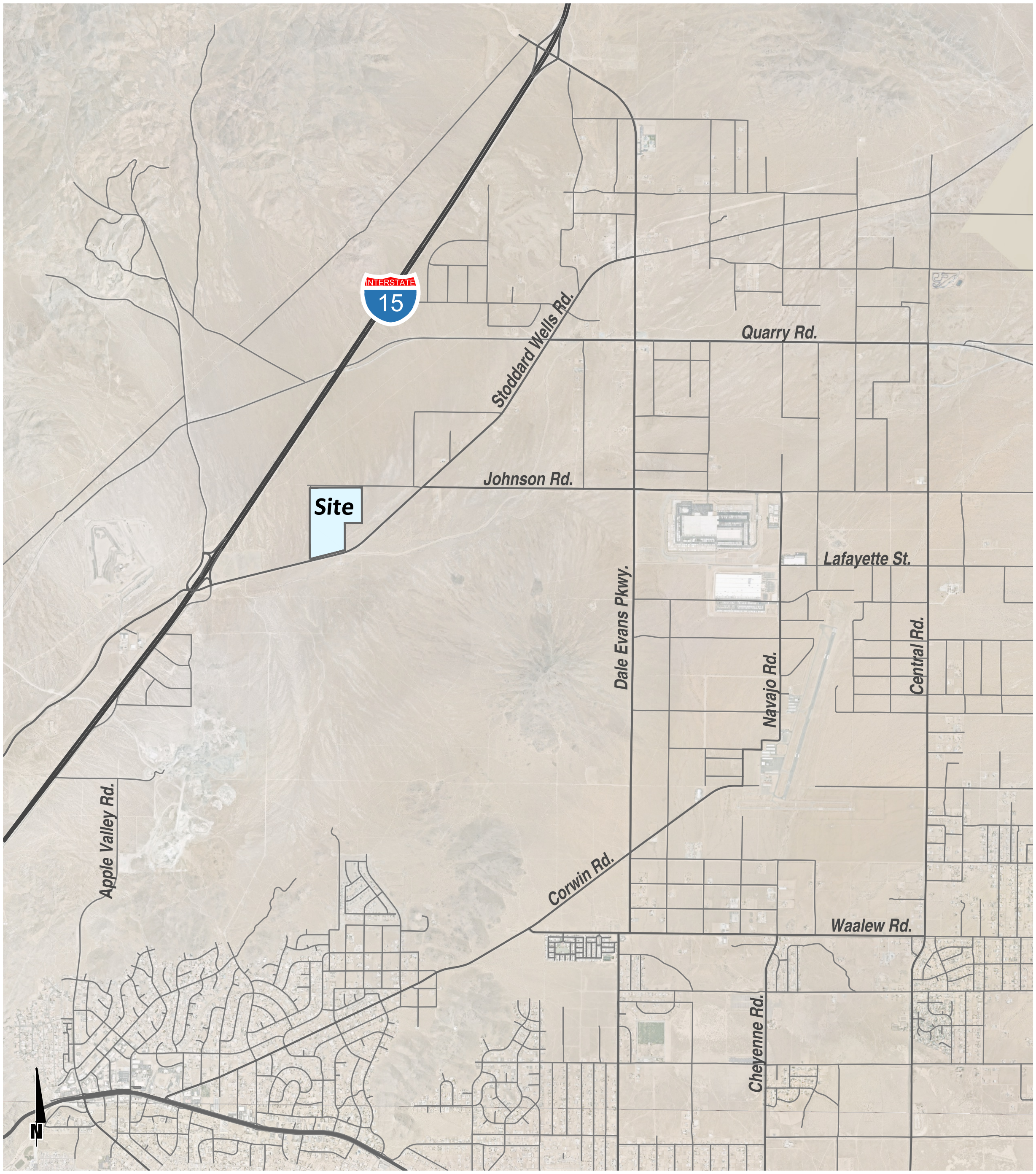
The purpose of this TA is to evaluate the potential circulation system deficiencies that may result when the Project is developed and where circulation system (intersection and/or roadway) improvements are needed to maintain acceptable levels of service consistent with General Plan level of service goals and policies. This traffic study has been prepared in accordance with the San Bernardino County Transportation Impact Study Guidelines (**County Guidelines**, dated July 9, 2019), and consultation with Town staff during the traffic study scoping process. (1) The TA Scoping Agreement is included in Appendix 1.1 and has been reviewed and approved by the Town of Apple Valley.

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

- Project to construct one driveway (Driveway 1) on Stoddard Wells Road. Driveway 1 will be stop-controlled and assume right-in/right-out access only. Other access points to be provided along Wrangler Road, north of Stoddard Wells Road.
- Project to construct Stoddard Wells Road along the Project's frontage at their interim half-section width according to the Town of Apple Valley General Plan and consistent with the Town's standards.
- Although the Project would construct its ultimate half-section, the pavement would need to be striped out in the interim until such time Stoddard Wells Road is widened to the west of Wrangler Road to accommodate the new westbound receiving lanes.

Additional details and intersection lane geometrics are provided in Section 1.5 *Recommendations*. The Project Applicant's responsibility for the Project's contributions towards deficient off-site intersections is fulfilled through payment into pre-existing fee programs (if applicable) that would be assigned to the future construction of any future local/regional improvement needs. The Project Applicant would be required to pay requisite fees consistent with the Town's requirements (see Section 6 *Local and Regional Funding Mechanisms*).

EXHIBIT 1-1 : LOCATION MAP



1.1 PROJECT OVERVIEW

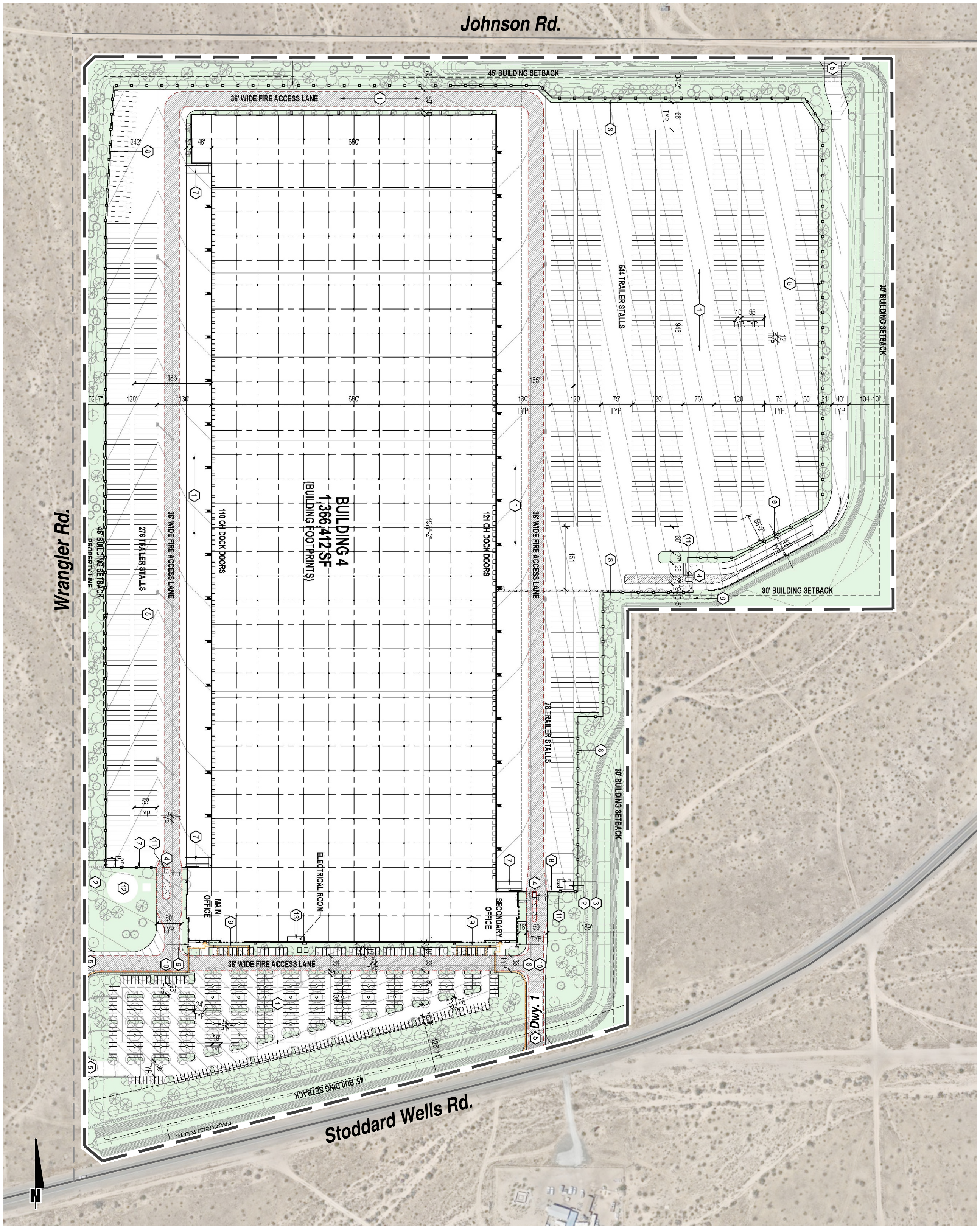
1.1.1 Land Use

A preliminary site plan for the proposed Project is shown in Exhibit 1-2. The Project is proposed to consist of the development of one industrial warehouse and distribution building totaling 1,381,412 square feet. For the purposes of the traffic study, it is proposed that the Project mix will assume 10% General Light Industrial use, 15% High-Cube Cold Storage Warehouse use, and 75% High-Cube Fulfillment (Non-Sort) Center Warehouse use. Access to the building will be accommodated via two new driveways along Wrangler Road which is a new north/south roadway connecting the future extension of Johnson Road to Stoddard Wells Road. There is one additional driveway proposed along the southern Project boundary on Stoddard Wells Road. All driveways are assumed to allow for full access (no turn restrictions) with the exception of the access point on Stoddard Wells Road which will assume right-in/right-out access only. The Project is anticipated to have an Opening Year of 2028.

1.1.2 Trip Generation

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 (12th Edition, 2025) were used to estimate the trip generation. (2) The Project is anticipated to generate a net total of 2,798 two-way trips per day with 212 AM peak hour trips and 234 PM peak hour trips (actual vehicles). 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*.

Exhibit 1-2 : Site Plan



1.2 ANALYSIS SCENARIOS

For the purposes of this TA, peak hour intersection operations have been evaluated for each of the following traffic conditions:

- Existing (2025) Conditions
- Opening Year Cumulative (2028) Without Project Conditions
- Opening Year Cumulative (2028) With Project Conditions

1.2.1 Existing (2025) Conditions

Traffic counts were conducted on April 22, 2025 (Tuesday) when local schools were in session and operating under normal bell schedules. Information for Existing (2025) conditions is disclosed to represent the baseline traffic conditions as they existed at the time this report was prepared.

1.2.2 Opening Year Cumulative (2028) Conditions

The Opening Year Cumulative (2028) traffic conditions analysis determines the potential near-term cumulative circulation system deficiencies. The roadway network is similar to Existing conditions except for new connections to be constructed by the Project. To account for background traffic growth, an ambient growth factor from Existing (2025) conditions of 6.12% (2.0 percent per year over 3 years) is included for Opening Year Cumulative (2028) traffic conditions. Conservatively, this TA estimates the 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 2028 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 2028 traffic conditions.

1.3 STUDY AREA

To ensure that this TA satisfies the Town of Apple Valley's traffic study requirements, Urban Crossroads, Inc. prepared a Project traffic study scoping package for review by Town of Apple 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 scoping agreement is included in Appendix 1.1.

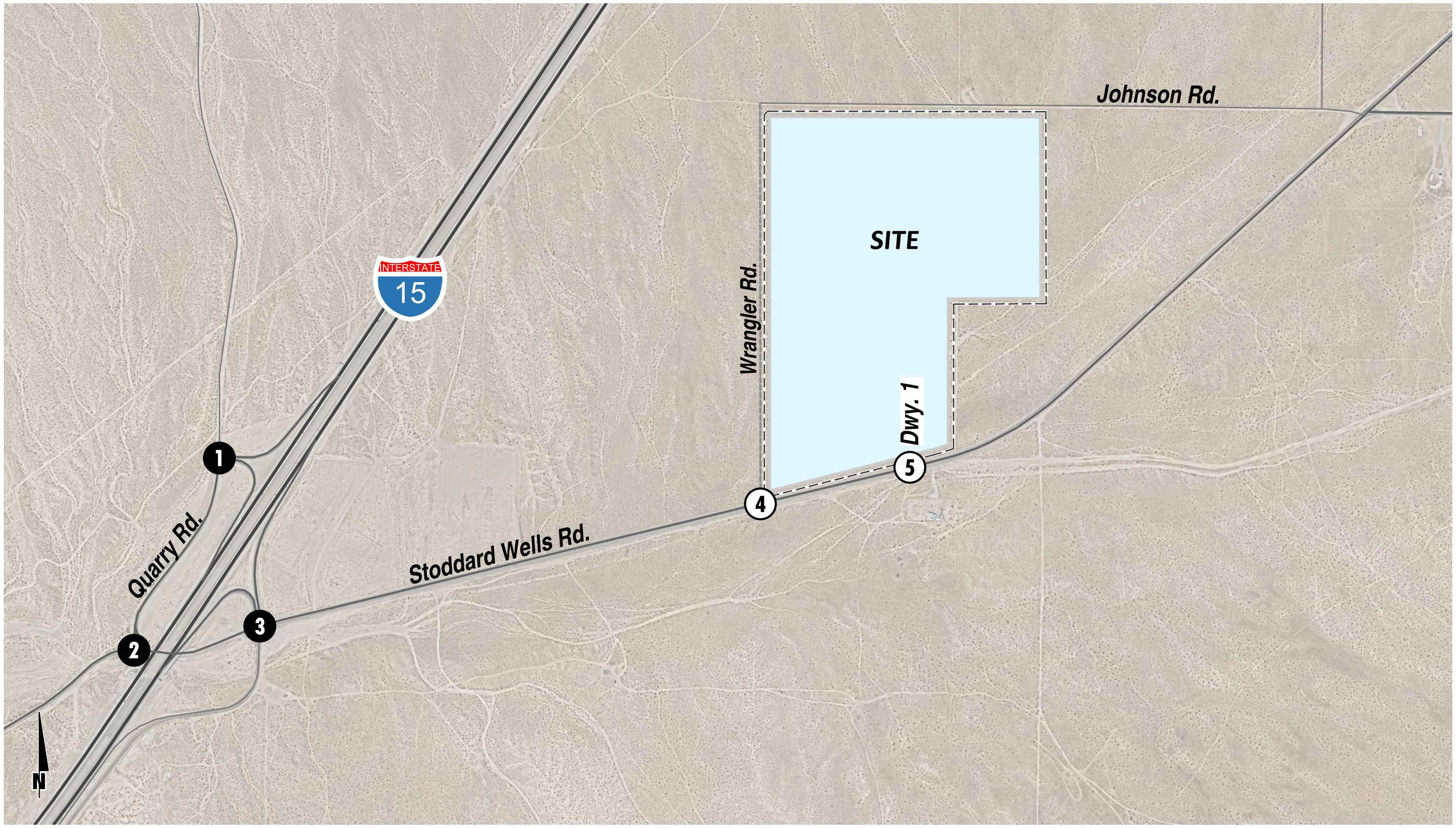
The six study area intersections shown in Exhibit 1-3 and listed in Table 1-1 were selected for evaluation in this TA based on consultation with Town of Apple Valley staff. At a minimum, the study area includes intersections where the Project is anticipated to contribute 50 or more peak hour trips per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

The intent of a Congestion Management Program (CMP) is to 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 San Bernardino CMP became effective with the passage of Proposition 111 in 1990 and was most recently updated in 2016 with an updated Nexus study completed in 2023. (3) There are no study area intersections identified as a County of San Bernardino CMP location.

TABLE 1-1: INTERSECTION ANALYSIS LOCATIONS

#	Intersection	Jurisdiction	CMP Location?
1	Quarry Rd. & I-15 SB Ramps	Caltrans, County	No
2	Quarry Rd. & Stoddard Wells Rd.	County	No
3	I-15 NB Ramps & Stoddard Wells Rd.	Caltrans, Apple Valley	No
4	Wrangler Rd. & Stoddard Wells Rd.	Apple Valley	No
5	Driveway 1 & Stoddard Wells Rd.	Apple Valley	No

EXHIBIT 1-3 : STUDY AREA



LEGEND:

0 = Existing Intersection Analysis Location

0 = Future Intersection Analysis Location

1.4 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* and Section 5 *Opening Year Cumulative (2028) Traffic Conditions* includes the detailed analysis. A summary of LOS results for all analysis scenarios is presented in Table 1-2.

1.4.1 Existing (2025) Conditions

Intersections

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

Off-Ramp Queues

There are no movements that currently experience off-ramp queuing issues during the weekday AM or weekday PM peak 95th percentile traffic flows for Existing (2025) traffic conditions.

1.4.2 Opening Year Cumulative (2028)

Intersections

The following study area intersections are anticipated to operate at an unacceptable LOS under Opening Year Cumulative (2028) Without Project traffic conditions (i.e., LOS D or better):

- Quarry Road & I-15 SB Ramps (#1) – LOS F PM peak hour only
- Quarry Road & Stoddard Wells Road (#2) – LOS F PM peak hour only
- I-15 NB Ramps & Stoddard Wells Road (#3) – LOS F AM and PM peak hours

No additional intersections are anticipated to operate at an unacceptable LOS with the addition of Project traffic under Opening Year Cumulative (2028) With Project traffic conditions.

Off-Ramp Queues

The following movement is anticipated to experience off-ramp queuing issues during the weekday AM or weekday PM 95th percentile traffic flows under Opening Year Cumulative (2028) Without Project traffic conditions:

- I-15 NB Ramps & Stoddard Wells Road (#3) Southbound shared left-through-right – AM and PM peak hours

The addition of Project traffic is not anticipated to result in any additional off-ramp queuing issues during the weekday AM or weekday PM peak 95th percentile traffic flows under Opening Year Cumulative (2028) With Project traffic conditions.

Table 1-2: Summary of LOS

		Existing	OYC (2028) NP	OYC (2028) WP
1	Quarry Rd. & I-15 SB Ramps	● (green)	◐ (green) / ◑ (red)	◐ (green) / ◑ (red)
2	Quarry Rd. & Stoddard Wells Rd.	● (green)	◐ (green) / ◑ (red)	◐ (green) / ◑ (red)
3	I-15 NB Ramps & Stoddard Wells Rd.	● (green)	● (red)	● (red)
4	Wrangler Rd. & Stoddard Wells Rd.	N/A	N/A	● (green)
5	Driveway 1 & Stoddard Wells Rd.	N/A	N/A	● (green)

LEGEND:

- ◖ = *AM Peak Hour*
- ◗ = *PM Peak Hour*
- ● (green) = *A-D*
- ● (yellow) = *E*
- ● (red) = *F*

1.5 RECOMMENDATIONS

1.5.1 Site Adjacent and Site Access Recommendations

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

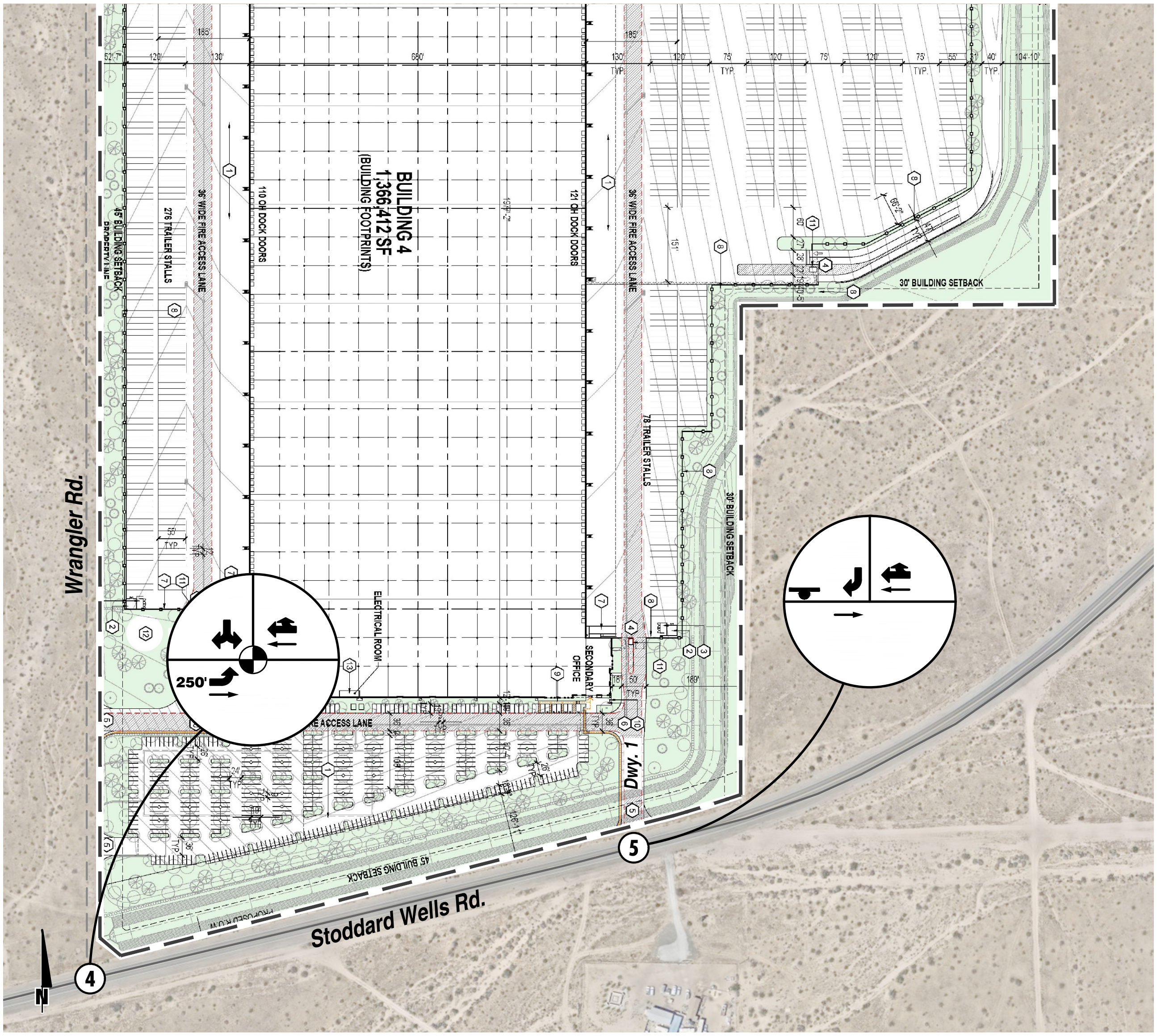
Recommendation 1 – Wrangler Road & Stoddard Wells Road (#4) – The following improvements are necessary to accommodate site access for both the proposed Project and the adjacent Apple Valley 143 development which lies north of Stoddard Wells Road and west of Wrangler Road (costs for improvements to be implemented to this location shall be shared between the projects utilizing the same point for access):

- Project to install a traffic signal.
- Project to construct a southbound shared left-right turn lane.
- Project to construct an eastbound left turn lane with protected left turn phasing.
- Project to construct a westbound shared through-right turn.

Recommendation 2 – Driveway 1 & Stoddard Wells Road (#5) – The following improvements are necessary to accommodate site access:

- Project to install a stop control on the southbound approach and construct a right turn lane (Project driveway).
- Project to construct a westbound shared through-right turn lane.

Exhibit 1-4: Site Access Recommendations



LEGEND:

- (0) = *Future Intersection Analysis Location*
- = *Future Traffic Signal*
- = *Proposed Stop Sign*
- = *Existing Lane*
- = *Proposed Lane*

1.5.2 Off-Site Recommendations

The recommended improvements needed to address the cumulative deficiencies are summarized in Table 1-3. For those improvements listed in Table 1-3 and not constructed as part of the Project, the Project Applicant's responsibility for the Project's contributions towards deficient intersections is fulfilled through payment of fees or fair share that would be assigned to construction of the identified recommended improvements.

1.5.3 Queuing Analysis at Project Driveways

A queuing analysis was conducted at the study area intersections for Opening Year Cumulative (2028) With Project traffic conditions to determine the turn pocket lengths necessary to accommodate 95th percentile queues. The analysis was conducted for the weekday AM and weekday PM peak hours. The results have been provided in Appendix 1.2 and are summarized in Table 1-4.

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

Table 1-3: Summary of Improvements

Intersection Location	Jurisdiction	Analysis Scenario: Existing (2025)	Analysis Scenario: 2028 Without Project	Analysis Scenario: 2028 With Project	Improvements included in Fee Program?[1]	Project Responsibility[2]	Fair Share %[3]
1 Quarry Rd. & I-15 SB Ramps	Caltrans, County	None	Add NB right turn lane	Same	No	Fair Share	11.7%
2 Quarry Rd. & Stoddard Wells Rd.	County	None	Add WB right turn lane	Same	No	Fair Share	11.4%
3 I-15 NB Ramps & Stoddard Wells Rd.	Caltrans, Apple Valley	None	Install a traffic signal	Same	No	Fair Share	9.3%
			Add two SB left turn lanes	Same	No	Fair Share	
			Add 2nd WB through lane	Same	No	Fair Share	
			Add EB left turn lane	Same	No	Fair Share	
			Add WB left turn lane	Same	No	Fair Share	

1 Improvements included in the Town of Apple Valley DIF 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.
3 Program improvements constructed may be eligible for fee credit, at discretion of the Town. See Table 7-1 for Fair Share Calculations.

TABLE 1-4: SUMMARY OF QUEUING ANALYSIS

Intersection	Movement	Available Stacking Distance (Feet)	2028 With Project Simtraffic: 95th Percentile Queue (Feet)		Acceptable?	
			AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
4 Wrangler Rd. & Stoddard Wells Rd.	EBL	**250**	183	86	Yes	Yes
	WBT/R	--	158	964	Yes	Yes
5 Driveway 1 & Stoddard Wells Rd.	WBT/R	--	0	325	Yes	Yes

[1] Stacking Distance is acceptable if the required stacking distance is less than or equal to the stacking distance provided for the 95th percentile queue only.

[2] **100** = Site Access Recommendations

2 METHODOLOGIES

This section of the report presents the methodologies used to perform this TA. The methodologies described are consistent with County Guidelines. (1)

2.1 LEVEL OF SERVICE

Traffic operations of roadway facilities are described using the term "Level of Service" (LOS). LOS is a qualitative description of traffic flow based on several factors, such as speed, travel time, delay, and freedom to maneuver. Six levels are typically defined ranging from LOS A, representing completely free-flow conditions, to LOS F, representing a 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 7th Edition Highway Capacity Manual (HCM) methodology expresses LOS at an intersection in terms of delay time for the various intersection approaches. (4) The HCM uses different procedures depending on the type of intersection control.

2.2.1 Signalized Intersections

The Town of Apple Valley requires signalized intersection operations analysis based on the methodology described in the HCM. (4) Intersection LOS operations are based on an intersection's average control delay. Control delays include 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 saturation flow rates utilized are consistent with the rates identified in the San Bernardino County's CMP.

The traffic modeling and signal timing optimization software package Synchro (Version 12) has been utilized to analyze signalized intersections. Synchro is a macroscopic traffic software program that is based on the signalized intersection capacity analysis as specified in the HCM. Macroscopic level models represent traffic in terms of aggregate measures for each movement at the study intersections. Equations are used to determine measures of effectiveness such as delay and queue length. The level of service and capacity analysis performed by Synchro takes into consideration optimization and coordination of signalized intersections within a network.

TABLE 2-1: SIGNALIZED INTERSECTION LOS THRESHOLDS

Description	Average Control Delay (Seconds), V/C $\leq$ 1.0	Level of Service V/C $\leq$ 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
Operations 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, 7th Edition
[1] If V/C is greater than 1.0, then LOS is F per HCM

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

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. (4)

2.2.2 Unsignalized Intersections

The Town of Apple Valley requires the operations of unsignalized intersections to be evaluated using the methodology described in the HCM. (4) 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, 7th 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 determine the potential need for installation of a traffic signal at an otherwise unsignalized intersection. This TA uses the signal warrant criteria presented in the latest edition of the Caltrans California Manual on Uniform Traffic Control Devices (CA MUTCD). (5)

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. (5) Specifically, this TA utilizes the Peak Hour Volume-based Warrant 3 as the appropriate representative traffic signal warrant analysis for existing traffic conditions and for all future analysis scenarios for existing unsignalized intersections. Warrant 3 is appropriate to use for this TA because it provides specialized warrant criteria for intersections with rural characteristics. 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. Rural warrants have been used where posted speed limits on the major roadways with unsignalized intersections are over 40 miles per hour while urban warrants have been used where speeds are 40 miles per hour or below.

Future intersections that do not currently exist have been assessed regarding the potential need for new traffic signals based on future average daily traffic (ADT) volumes, using the Caltrans planning level ADT-based signal warrant analysis worksheets. Similarly, the speed limit has been used as the basis for determining the use of Urban and Rural warrants. Traffic signal warrant analyses were performed for the study area intersections shown in Table 2-3.

Table 2-3: Traffic Signal Warrant Analysis Locations

#	Intersection
1	Quarry Rd. & Stoddard Wells Rd.
2	Quarry Rd. & Stoddard Wells Rd.
3	I-15 NB Ramps & Stoddard Wells Rd.
4	Wrangler Rd. & Stoddard Wells Rd.

Although unsignalized, the study area intersection of Driveway 1 & Stoddard Wells Road (#5) has not been evaluated for traffic signal warrants as the intersection is restricted access (right-in/right-out only).

The traffic signal warrant analyses are presented in Section 3 *Area Conditions* and Section 5 *Opening Year Cumulative (2028) Traffic Conditions*. It is important to note that a signal warrant defines the minimum condition under which the installation of a traffic signal might be warranted. Meeting this threshold condition does not require that a traffic control signal be installed at a particular location, but rather, that other traffic factors and conditions be evaluated in order to determine whether the signal is truly justified. It should also be noted that signal warrants do not necessarily correlate with LOS. An intersection may satisfy a signal warrant condition and operate at or above acceptable LOS or operate below acceptable LOS and not meet a signal warrant.

2.4 Queuing Analysis

Consistent with Caltrans requirements, the 95th percentile queuing of vehicles has been assessed at the off-ramps to determine potential queuing deficiencies at the freeway ramp intersections at the I-15 Freeway at Quarry Road, Stoddard Wells Road, and Dale Evans Parkway interchanges. Specifically, the queuing analysis is utilized to identify any potential and "spill back" onto the I-15 Freeway mainline from the off-ramps or out of the turn pockets.

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. There are two footnotes which appear on the Synchro outputs. One footnote indicates if the 95th percentile cycle exceeds capacity. Traffic is simulated for two complete cycles of the 95th percentile traffic in Synchro in order to account for the effects of spillover between cycles. In practice, the 95th percentile queue shown will rarely be exceeded and the queues shown with the footnote are acceptable for the design of storage bays. The other footnote indicates whether or not the volume for the 95th percentile queue is metered by an upstream signal. If the upstream intersection is at or near capacity, the 50th percentile queue represents the maximum queue experienced.

2.5 Minimum Acceptable Levels of Service (LOS)

According to the Town of Apple Valley's General Plan, LOS C or better is preferable, but LOS D is the minimum acceptable condition that should be maintained during the peak commute hours, where feasible. Therefore, for the purposes of this traffic analysis, LOS D has also been considered the acceptable threshold for all study area intersections.

2.6 DEFICIENCY CRITERIA

This section outlines the methodology used in this analysis related to identifying circulation system deficiencies. Per the County Guidelines: In accordance with the Town's General Plan Circulation Element, at intersections where the LOS falls below, or is expected to fall below an acceptable threshold with or without the addition of the Project, feasible measures shall be identified to mitigate the Project's impacts for all Project scenario conditions.

2.7 PROJECT FAIR SHARE CALCULATION METHODOLOGY

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

Project Fair Share % = Project AM/PM Traffic / (2028 With Project AM/PM Total Traffic – Existing AM/PM Traffic)

The project fair share percentage has been calculated for both the AM peak hour and PM peak hour and the higher of the two has been selected. The Project fair share contribution calculations are presented in Section 6 *Local and Regional Funding Mechanisms*.

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3 AREA CONDITIONS

This section provides a summary of the existing circulation network, the Town of Apple Valley General Plan Circulation Network, and a review of existing peak hour intersection operations, traffic signal warrant, and freeway off-ramp queuing analyses.

3.1 EXISTING CIRCULATION NETWORK

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

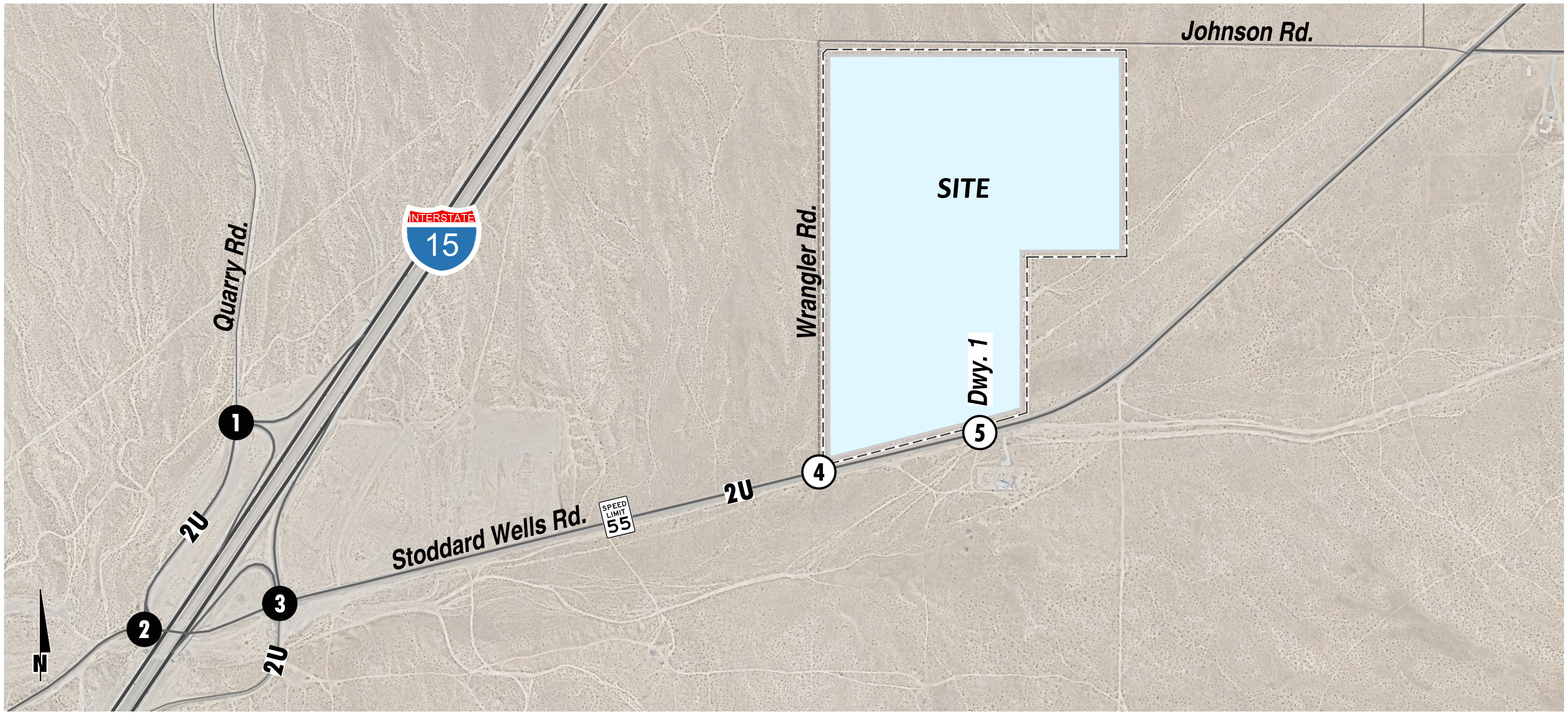
3.2 TOWN OF APPLE VALLEY GENERAL PLAN CIRCULATION ELEMENT

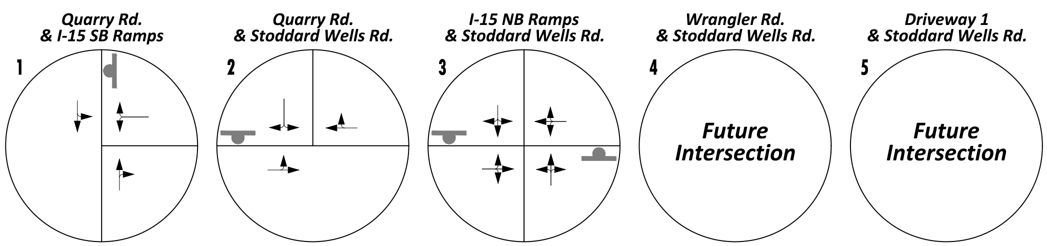
The roadway classifications and planned (ultimate) roadway cross-sections of the major roadways within the study area, as identified on the Town of Apple Valley General Plan Circulation Element, are described subsequently. Exhibit 3-2 shows the Town of Apple Valley General Plan Circulation Element.

Major Divided Arterials are designed to accommodate six travel lanes with a center turn lane or median and a 10-foot bike or parking lane on each side of the roadway, within a 128-foot right-of-way. The following study area roadways within the Town of Apple Valley are classified as Major Divided Arterials:

- Quarry Road, west of Stoddard Wells Road
- Stoddard Wells Road, south of Johnson Road

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

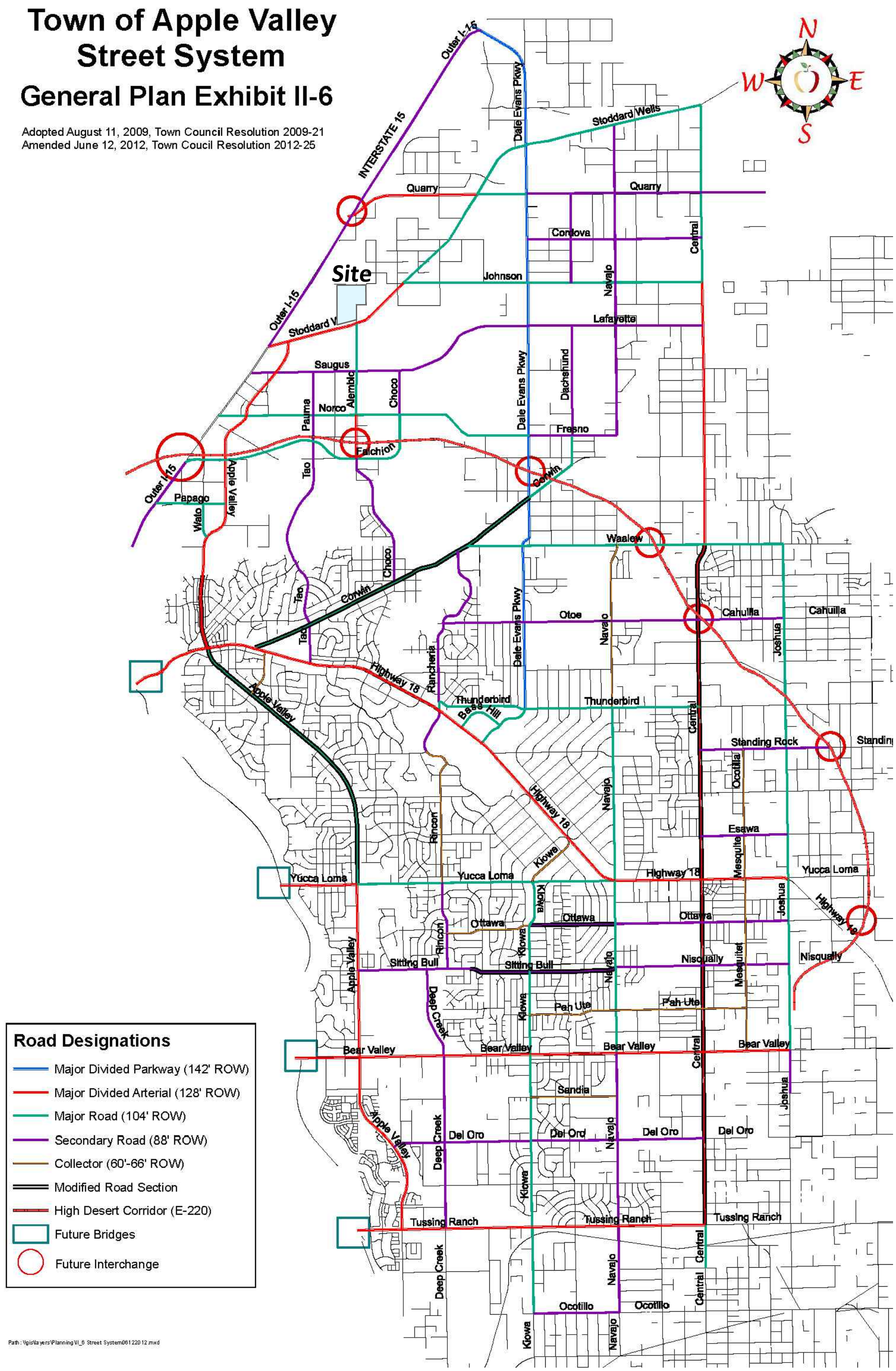




LEGEND:

- 0 = Existing Intersection Analysis Location
- 0 = Future Intersection Analysis Location
- = Existing Stop Sign
- = Existing Lane
- 6 = Number of Lanes
- U/D = Undivided / Divided

Exhibit 3-2 : Town of Apple Valley General Plan Circulation Element



3.3 BICYCLE AND PEDESTRIAN FACILITIES

Exhibit 3-3 illustrates the Town of Apple Valley bike paths. As shown in Exhibit 3-3, there are Class I bike paths along Stoddard Wells Road. There are no pedestrian facilities in close proximity to the Project. Field observations indicate nominal pedestrian and bicycle activity within the study area.

3.4 TRANSIT SERVICE

The study area is currently served by Victor Valley Transit Authority (VVTA), a public transit agency serving various jurisdictions within San Bernardino County. The existing transit routes within the study area are shown on Exhibit 3-4.

Transit service is reviewed and updated by VVTA 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. As such, it is recommended that the applicant work in conjunction with VVTA to potentially provide bus service to the site.

3.5 TRUCK ROUTES

The Town of Apple Valley truck routes are shown on Exhibit 3-5. Through truck routes are included along Outer Highway I-15 and Quarry Road, and Local truck routes are also included on Stoddard Wells Road. These designated truck routes have been utilized for both the proposed Project and future cumulative development projects for the purposes of this TA.

3.6 EXISTING (2025) TRAFFIC COUNTS

The intersection LOS analysis is based on the traffic volumes observed during the peak hour conditions using traffic count data collected in April 2025. 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 2025 weekday AM and weekday PM peak hour count data is representative of typical weekday peak hour traffic conditions in the study area. There were no observations made in the field that would indicate atypical traffic conditions on the count dates, such as construction activity or detour routes and near-by schools were in session and operating on normal schedules. The raw manual peak hour turning movement traffic count data sheets are included in Appendix 3.1. Existing weekday ADT volumes are shown on Exhibit 3-6. Where actual 24-hour tube count data was not available, Existing ADT volumes were based upon factored intersection peak hour counts collected by Urban Crossroads, Inc. using the following formula for each intersection leg:

Weekday PM Peak Hour (Approach Volume + Exit Volume) x 9.20 = 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 10.87 percent. As such, the above equation utilizing a factor of 9.20 estimates the ADT volumes on the study area roadway segments assuming a peak-to-daily relationship of 10.87 percent (i.e., 1/0.1087 = 9.20) and was assumed to sufficiently estimate ADT volumes for planning-level analyses. Existing weekday AM and weekday PM peak hour intersection volumes, in actual vehicles, are also shown on Exhibit 3-6.

To represent the effect large trucks, buses, and recreational vehicles have on traffic flow, all trucks were converted into passenger car equivalent (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 slowdown is also much longer than for passenger cars and varies depending on the type of vehicle and number of axles. For this analysis, the following PCE factors have been used to estimate each turning movement: 1.5 for 2-axle trucks, 2.0 for 3-axle trucks, and 3.0 for 4+-axle trucks. These factors are consistent with the values recommended for use in the County Guidelines.

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.* The intersection operations analysis results are summarized in Table 3-1, which indicates that all the study area intersections are currently operating at an acceptable LOS during the peak hours. The intersection analysis worksheets are included in Appendix 3.2.

3.8 Traffic Signal Warrant Analysis

Traffic signal warrants for Existing traffic conditions are based on existing peak hour intersection turning volumes. There are no unsignalized study area intersections that currently warrant a traffic signal for Existing traffic conditions. Existing conditions traffic signal warrant analysis worksheets are provided in Appendix 3.3.

3.9 Queuing Analysis

Queuing analysis findings are presented in Table 3-2. As shown in Table 3-2, there are currently no study area off-ramps experiencing queuing issues during the peak hours under Existing (2025) traffic conditions. Worksheets for Existing traffic conditions queuing analysis are provided in Appendix 3.4.

EXHIBIT 3-3 : TOWN OF APPLE VALLEY BIKE PATHS

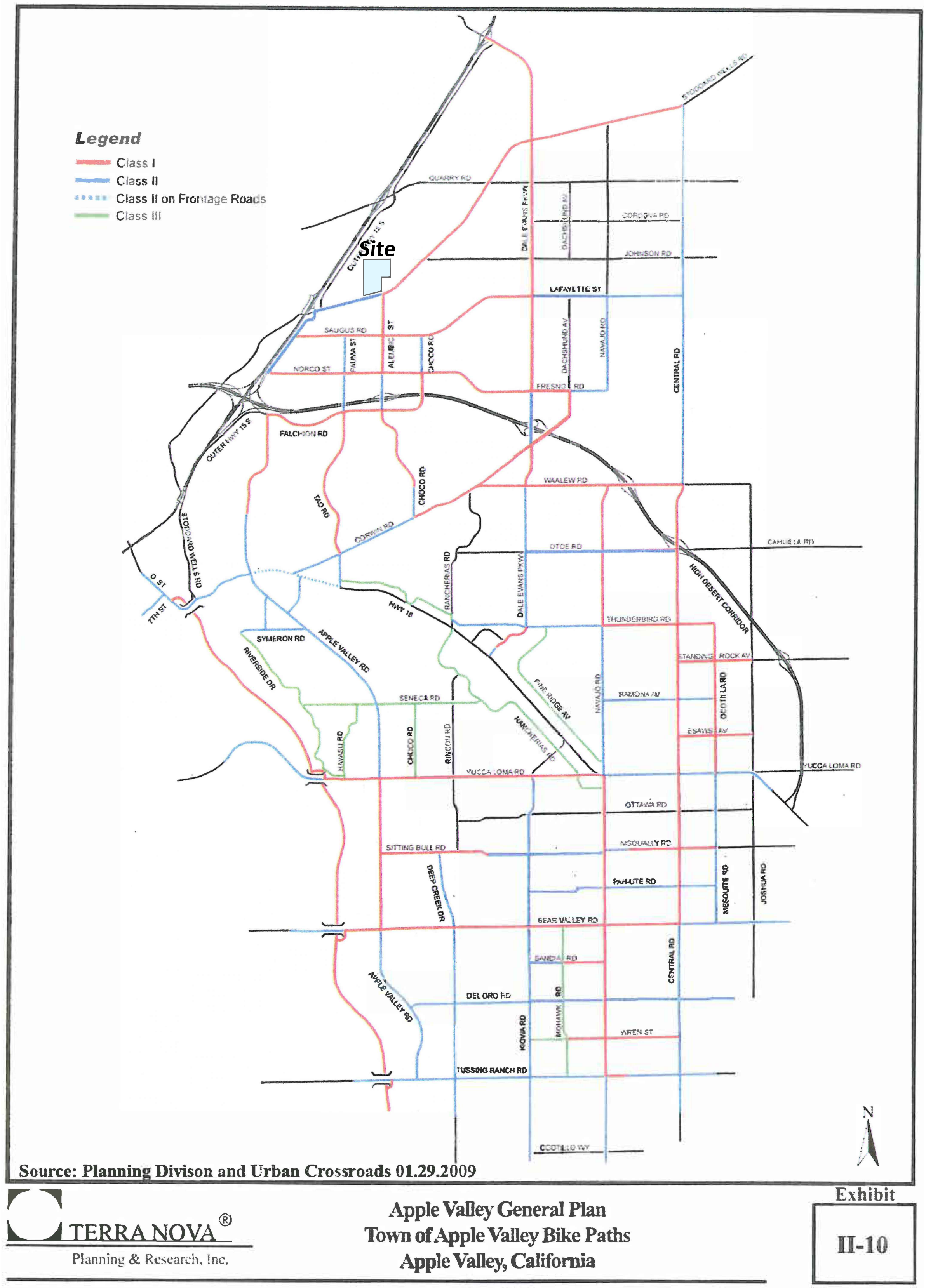
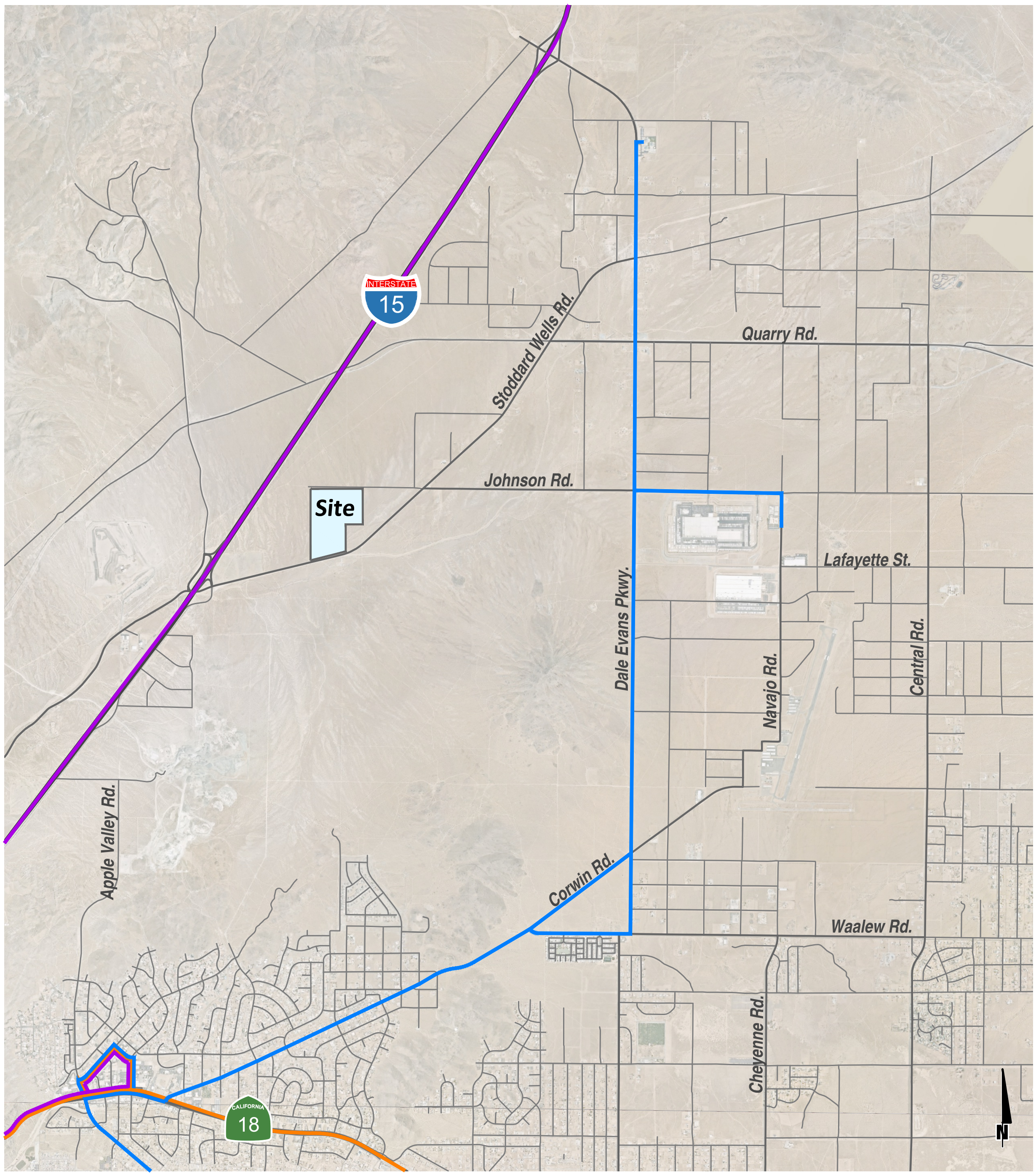


EXHIBIT 3-4 : TRANSIT ROUTES



LEGEND:

- = *Victor Valley Transit Route 15*
- = *Victor Valley Transit Route 41*
- = *Victor Valley Transit Route 42*

EXHIBIT 3-5 : TOWN OF APPLE VALLEY TRUCK ROUTES

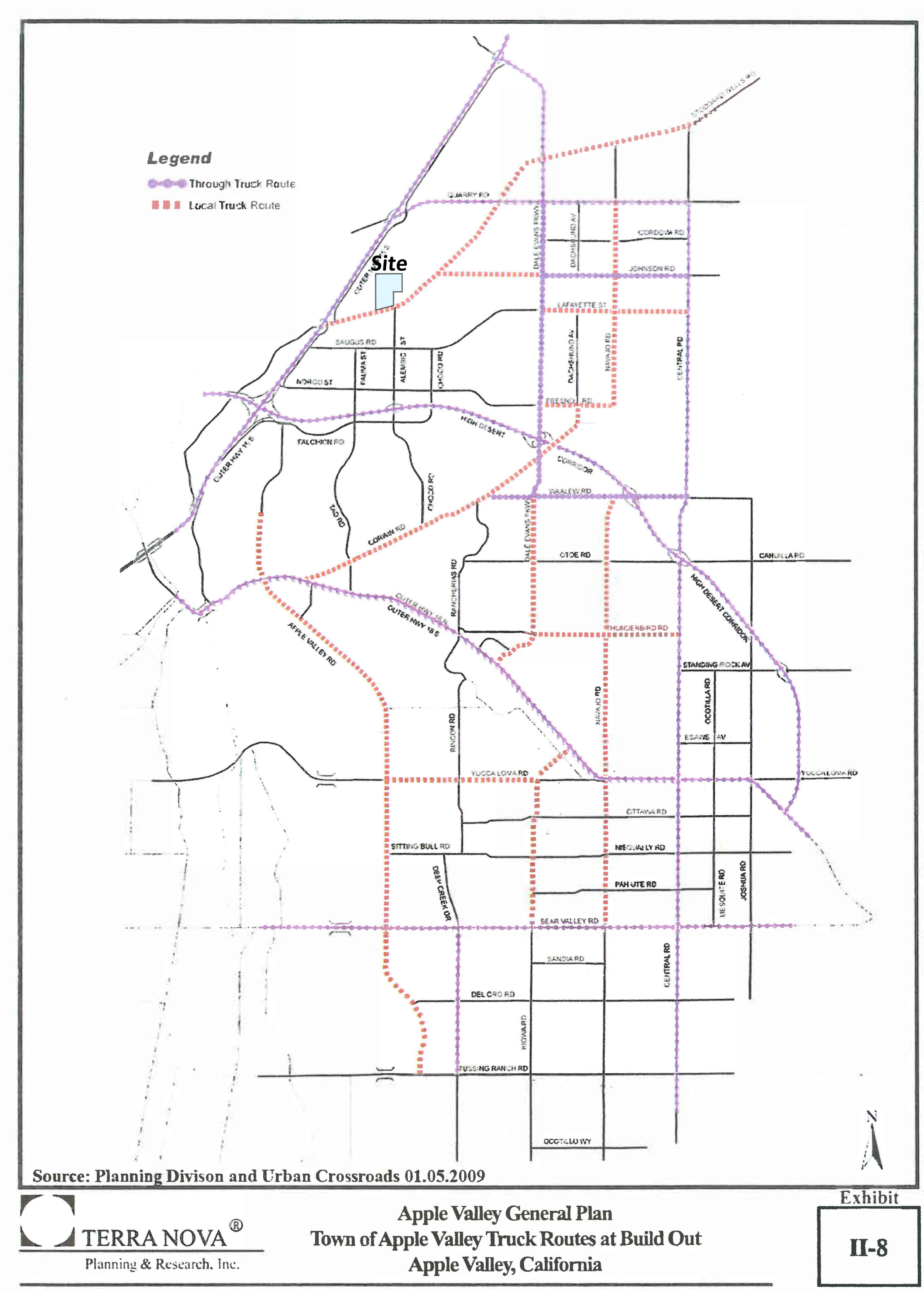
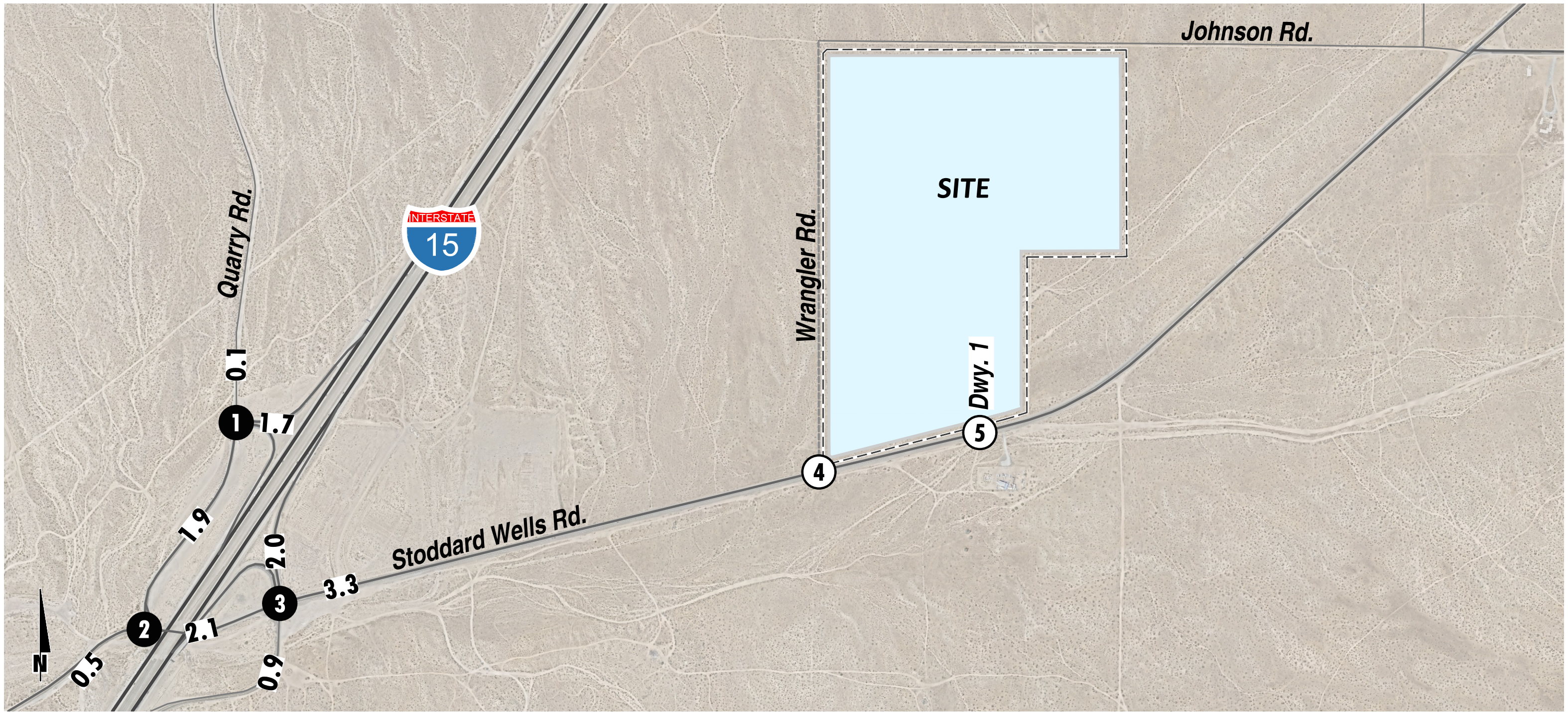
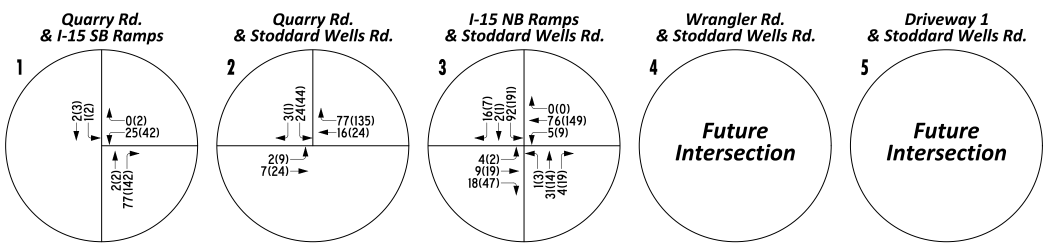


EXHIBIT 3-6 : EXISTING (2025) TRAFFIC VOLUMES (ACTUAL VOLUMES)





LEGEND:

0 = Existing Intersection Analysis Location

0 = Future Intersection Analysis Location

00(00) = Peak Hour Volume AM(PM)

00 = Average Daily Traffic (ADT) In Thousands

TABLE 3-1: EXISTING (2025) INTERSECTION ANALYSIS

#	Intersection	Traffic Control[2]	Existing (2025)			
			Delay[1] (Secs.)		Level of Service	
			AM	PM	AM	PM
1	Quarry Rd. & I-15 SB Ramps	CSS	9.1	9.5	A	A
2	Quarry Rd. & Stoddard Wells Rd.	CSS	9.6	10.8	A	B
3	I-15 NB Ramps & Stoddard Wells Rd.	CSS	12.7	16.5	B	C
4	Wrangler Rd. & Stoddard Wells Rd.	--	Future Intersection			
5	Driveway 1 & Stoddard Wells Rd.	--	Future Intersection			

[1] Per the Highway Capacity Manual (7th 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. HCM delay reported in seconds.

[2] TS = Traffic Signal; AWS = All-way Stop; CSS = Cross-street Stop

TABLE 3-2: EXISTING (2025) QUEUING SUMMARY

#	Intersection	Movement	Available Stacking Distance (Feet)	95th Percentile Queue (Feet)		Acceptable? [1]	
				AM Peak Hour	PM Peak Hour	AM	PM
1	Quarry Rd. & I-15 SB Ramps	WBL/R	1,000	3	5	Yes	Yes
3	I-15 NB Ramps & Stoddard Wells Rd.	SBL/T/T	1,000	35	68	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.

4 PROJECTED FUTURE TRAFFIC

This section presents the traffic volumes estimated to be generated by the Project, as well as the Project's trip assignment onto the study area roadway network. The Project is proposing to develop one industrial warehouse and distribution buildings totaling 1,381,412 square feet. For the purposes of the traffic study, it is proposed that the Project mix will assume 10% General Light Industrial use, 15% High-Cube Cold Storage Warehouse use, and 75% High-Cube Fulfillment (Non-Sort) Center Warehouse use. Access to the building will be accommodated via two new driveways along Wrangler Road which is a new north/south roadway connecting the future extension of Johnson Road to Stoddard Wells Road. There is one additional driveway proposed along the southern Project boundary on Stoddard Wells Road. All driveways are assumed to allow for full access (no turn restrictions) with the exception of the access point on Stoddard Wells Road which will assume right-in/right-out access only. The Project is anticipated to have an Opening Year of 2028.

4.1 PROJECT TRIP GENERATION

Trip generation represents the amount of traffic which is both attracted to, and produced by, a land use project. Determining traffic generation for a specific project is therefore based upon forecasting the amount of traffic that is expected to be both attracted to, and produced by, the specific land uses being proposed for a given development.

In order to develop the traffic characteristics of the proposed Project, trip generation statistics published in the ITE Trip Generation Manual (12th Edition, 2025) were used to estimate the trip generation. (2) The following ITE land use codes and vehicle mix will be utilized for the proposed Project (trip generation rates for the Project are shown in Table 4-1):

- ITE land use code 110 (General Light Industrial) has been used to derive site specific trip generation estimates for up to 138,141 square feet (10% of the total square footage) of the proposed Project. 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 South Coast Air Quality Management District (SCAQMD) recommended truck mix: 2-Axle = 16.7%; 3-Axle = 20.7%; 4+-Axle = 62.6%.
- High-Cube Cold Storage Warehouse (ITE Land Use Code 157) has been used to derive site-specific trip generation estimates for up to 207,212 square feet (15% of the total 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%.
- High-Cube Fulfillment Center Warehouse (ITE Land Use Code 155) has been used to derive site-specific trip generation estimates for up to 1,036,059 square feet of the proposed Project (75% of the total square footage). The ITE Trip Generation Manual has trip generation rates for high-cube fulfillment center use for both non-sort and sort facilities (ITE Land Use Code 155). As

defined by ITE, a high-cube warehouse is a building that typically has at least 200,000 gross square feet of floor area, has a ceiling height of 24 feet or more, and is used primarily for 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. A typical high-cube warehouse has a high level of on-site automation and logistics management. The automation and logistics enable highly-efficient processing of goods through the high-cube warehouse. The ITE Trip Generation Manual has two subcategories for the High-Cube Fulfillment Center use: sort and non-sort. ITE describes a sort facility as a fulfillment center that ships out smaller items, requiring extensive sorting, typically by manual means. In comparison, a non-sort facility is a fulfillment center that ships large box items that are processed primarily with automation rather than through manual means. Some limited assembly and repackaging may occur within the facility. The non-source facility sub-land use category has been assumed for the purposes of calculating trip generation for the Project consistent with other surrounding projects in the vicinity. The High-Cube Fulfillment Center 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 = 16.7%; 3-Axle = 20.7%; 4+-Axle = 62.6%.

Passenger car equivalent (PCE) factors were applied to the trip generation rates for heavy trucks (large 2-axles, 3-axles, 4+-axles). PCEs allow the typical "real-world" mix of vehicle types to be represented as a single, standardized unit, such as the passenger car, to be used for the purposes of capacity and level of service analyses. The PCE factors are consistent with the recommended PCE factors in Appendix B of the County Guidelines.

Table 4-2 shows the resulting Project trip generation summary, which shows the Project is anticipated to generate a net total of 2,798 two-way vehicle trip-ends per day with 212 AM peak hour trips and 234 PM peak hour trips (actual vehicles). As shown in Table 4-3, the Project is anticipated to generate a net total of 3,656 two-way vehicle trip-ends per day with 257 AM peak hour trips and 263 PM peak hour trips (PCE vehicles). Consistent with the County requirements, the peak hour intersection operations analysis will be conducted using the PCE volumes shown in Table 4-3.

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
General Light Industrial[3]	TSF	110	0.422	0.058	0.480	0.069	0.421	0.490	3.600
Passenger Cars			0.416	0.054	0.470	0.064	0.416	0.480	3.350
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 Fulfillment Center (Non-Sort)[3]	TSF	155	0.090	0.030	0.120	0.057	0.083	0.140	1.770
Passenger Cars			0.080	0.020	0.100	0.052	0.078	0.130	1.430
2-Axle Trucks			0.002	0.001	0.003	0.001	0.001	0.002	0.057
3-Axle Trucks			0.002	0.002	0.004	0.001	0.001	0.002	0.070
4+-Axle Trucks			0.006	0.007	0.013	0.003	0.003	0.006	0.213
High-Cube Cold Storage Warehouse[3]	TSF	157	0.069	0.041	0.110	0.050	0.060	0.110	2.230
Passenger Cars			0.060	0.020	0.080	0.035	0.045	0.080	1.430
2-Axle Trucks			0.003	0.007	0.010	0.005	0.005	0.010	0.278
3-Axle Trucks			0.001	0.002	0.003	0.002	0.001	0.003	0.088
4+-Axle Trucks			0.005	0.011	0.016	0.008	0.008	0.016	0.434
Passenger Car Equivalent (PCE):									
General Light Industrial[3]	TSF	110	0.422	0.058	0.480	0.069	0.421	0.490	3.600
Passenger Cars			0.416	0.054	0.470	0.064	0.416	0.480	3.350
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 Fulfillment Center (Non-Sort)[3]	TSF	155	0.090	0.030	0.120	0.057	0.083	0.140	1.770
Passenger Cars			0.080	0.020	0.100	0.052	0.078	0.130	1.430
2-Axle Trucks (PCE = 1.5)			0.003	0.002	0.005	0.002	0.001	0.003	0.085
3-Axle Trucks (PCE = 2.0)			0.005	0.005	0.010	0.003	0.003	0.005	0.176
4+-Axle Trucks (PCE = 3.0)			0.018	0.020	0.038	0.009	0.010	0.019	0.639
High-Cube Cold Storage Warehouse[3]	TSF	157	0.069	0.041	0.110	0.050	0.060	0.110	2.230
Passenger Cars			0.060	0.020	0.080	0.035	0.045	0.080	1.430
2-Axle Trucks (PCE = 1.5)			0.005	0.011	0.016	0.008	0.008	0.016	0.416
3-Axle Trucks (PCE = 2.0)			0.002	0.005	0.007	0.004	0.003	0.007	0.176
4+-Axle Trucks (PCE = 3.0)			0.015	0.034	0.049	0.024	0.025	0.049	1.303

[1] Trip Generation & Vehicle Mix Source: Institute of Transportation Engineers (ITE), Trip Generation Manual, 12th Edition (2025).

[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.

TABLE 4-2: PROJECT TRIP GENERATION (ACTUAL VEHICLES)

Land Use	Quantity	Units[1]	AM Peak Hour			PM Peak Hour			Daily
			In	Out	Total	In	Out	Total	
Actual Vehicles:									
General Light Industrial	138.141	TSF							
Passenger Cars:			58	7	65	9	58	67	462
2-axle Trucks:			0	0	0	0	0	0	6
3-axle Trucks:			0	0	0	0	0	0	8
4+-axle Trucks:			1	0	1	0	0	0	22
Total Truck Trips (Actual Vehicles):			1	0	1	0	0	0	36
Total Trips (Actual Vehicles)[2]			59	7	66	9	58	67	498
High-Cube Cold Storage	207.212	TSF							
Passenger Cars:			12	4	16	7	9	16	296
2-axle Trucks:			1	2	3	1	1	2	58
3-axle Trucks:			0	0	0	0	0	0	18
4+-axle Trucks:			1	2	3	2	2	4	90
Total Truck Trips (Actual Vehicles):			2	4	6	3	3	6	166
Total Trips (Actual Vehicles)[2]			14	8	22	10	12	22	462
High-Cube Fulfillment (Non-Sort)	1,036.059	TSF							
Passenger Cars:			83	21	104	54	81	135	1,482
2-axle Trucks:			2	1	3	1	1	2	60
3-axle Trucks:			2	2	4	1	1	2	74
4+-axle Trucks:			6	7	13	3	3	6	222
Total Truck Trips (Actual Vehicles):			10	10	20	5	5	10	356
Total Trips (Actual Vehicles)[2]			93	31	124	59	86	145	1,838
Passenger Cars			153	32	185	70	148	218	2,240
Trucks			13	14	27	8	8	16	558
Total Trips (Actual Vehicles)[2]			**166**	**46**	**212**	**78**	**156**	**234**	**2,798**

[1] TSF = thousand square feet

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

TABLE 4-3: PROJECT TRIP GENERATION (PCE)

Land Use	Quantity	Units[1]	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
Passenger Car Equivalent (PCE):									
General Light Industrial	138.141	TSF							
Passenger Cars:			58	7	65	9	58	66	464
2-axle Trucks:			0	0	0	0	0	0	10
3-axle Trucks:			0	0	1	0	0	1	14
4+-axle Trucks:			2	1	3	1	1	3	66
Total Truck Trips (PCE):			2	1	3	1	1	2	90
Total Trips (PCE)[2]			60	8	68	10	59	68	554
High-Cube Cold Storage	207.212	TSF							
Passenger Cars:			12	4	16	7	9	16	296
2-axle Trucks:			1	2	3	2	2	4	86
3-axle Trucks:			0	1	1	1	1	2	36
4+-axle Trucks:			3	7	10	5	5	10	270
Total Truck Trips (PCE):			4	10	14	8	8	16	392
Total Trips (PCE)[2]			16	14	30	15	17	32	688
High-Cube Fulfillment (Non-Sort)	1,036.059	TSF							
Passenger Cars:			83	21	104	54	81	135	1,482
2-axle Trucks:			3	2	5	2	1	3	88
3-axle Trucks:			5	6	11	3	3	5	182
4+-axle Trucks:			19	20	39	9	10	19	662
Total Truck Trips (PCE):			27	28	55	14	14	28	932
Total Trips (PCE)[2]			110	49	159	68	95	163	2,414
Passenger Cars			153	32	185	70	148	217	2,242
Trucks			33	39	72	23	23	46	1,414
Total Trips (PCE)[2]			**186**	**71**	**257**	**93**	**171**	**263**	**3,656**

[1] TSF = thousand square feet

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

4.2 PROJECT TRIP DISTRIBUTION

The Project trip distribution represents the directional orientation of traffic to and from the Project site. Trip distribution is the process of identifying the probable destinations, directions, or traffic routes that will be utilized by Project traffic. The potential interaction between the planned land uses and surrounding regional access routes are considered, to identify the route where the Project traffic would distribute. The Project trip distributions are shown on Exhibit 4-1 for trucks and Exhibit 4-2 for passenger cars.

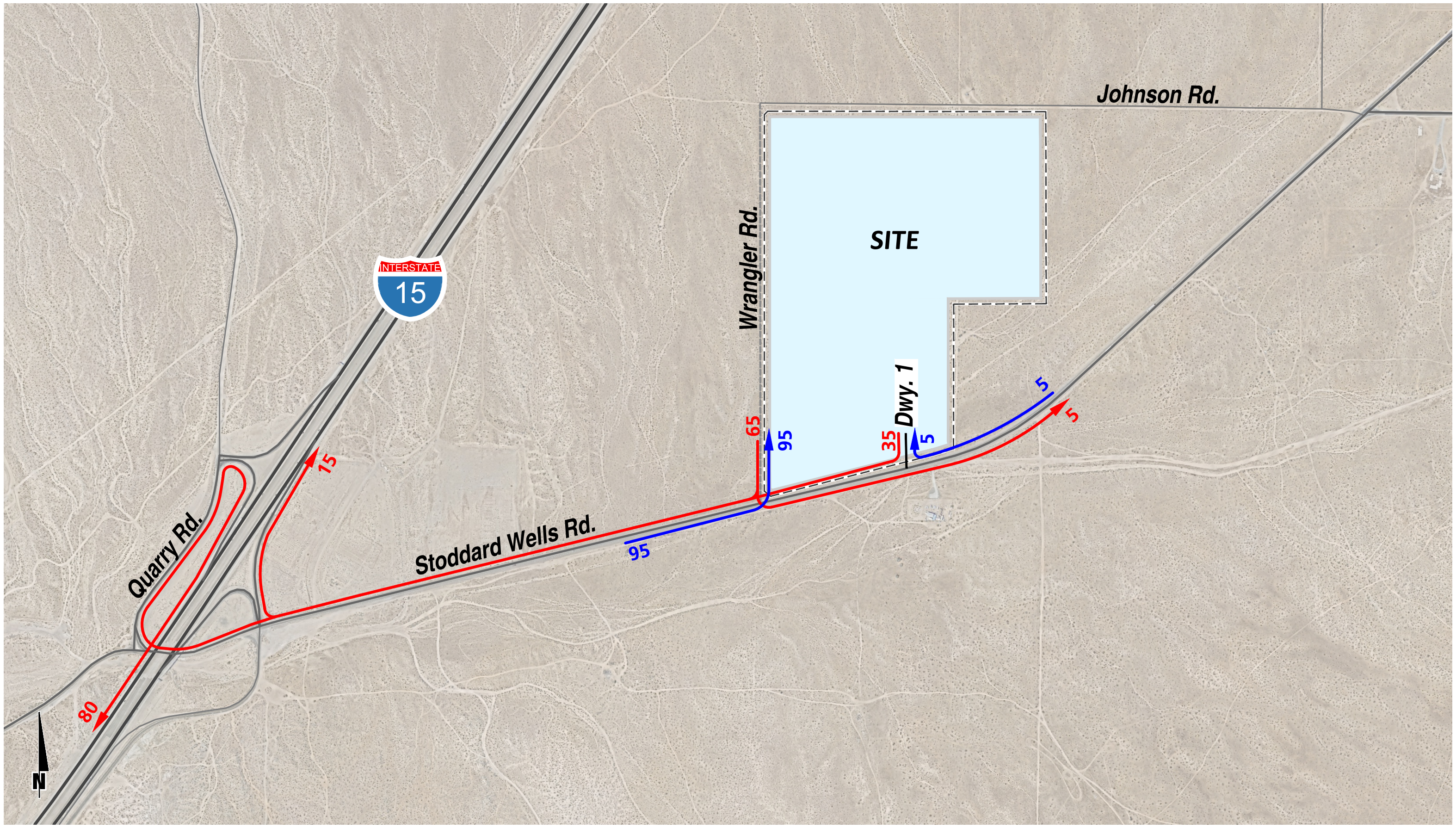
4.3 MODAL SPLIT

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

4.4 PROJECT TRIP ASSIGNMENT

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

EXHIBIT 4-1: PROJECT (TRUCK) TRIP DISTRIBUTION



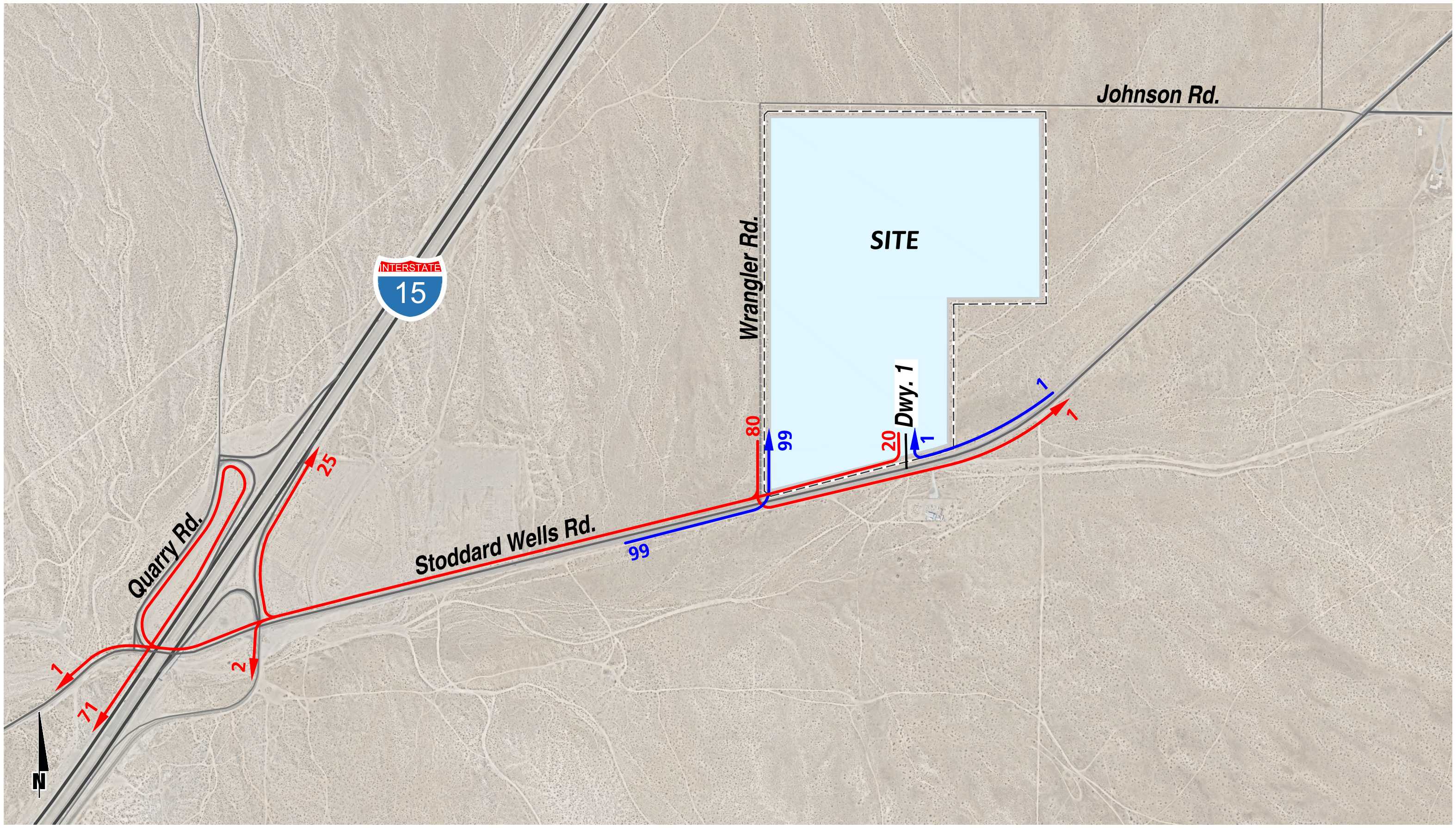
LEGEND:

10 *= Truck Percent To/From Project*

= Inbound

= Outbound

Exhibit 4-2 : Project (Passenger Car) Trip Distribution



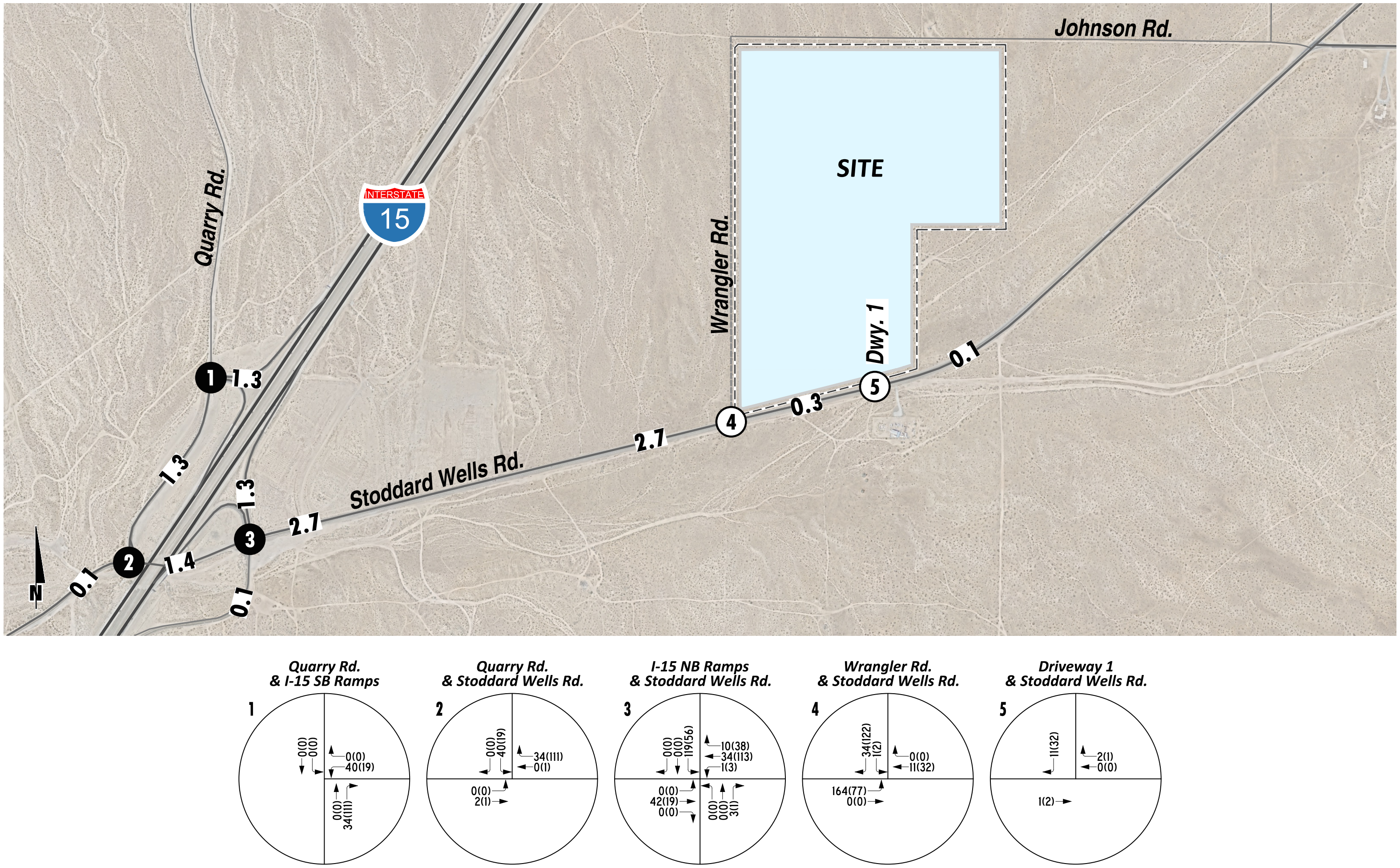
LEGEND:

10 = *Car Percent To/From Project*

= *Inbound*

= *Outbound*

Exhibit 4-3: Project Only Traffic Volumes (Actual Volumes)



LEGEND:

- **0** = *Existing Intersection Analysis Location*
- **(0)** = *Future Intersection Analysis Location*
- 00(00) = *Peak Hour Volume AM(PM)*
- **00** = *Average Daily Traffic (ADT) In Thousands*

4.5 BACKGROUND TRAFFIC

Opening year traffic forecasts have been based upon background (ambient) growth at 2.0% per year, compounded annually, for 2028 traffic conditions. The total ambient growth is 6.12% for 2028 traffic conditions. The ambient growth factor is intended to approximate regional traffic growth. This ambient growth rate is added to existing traffic volumes to account for area-wide growth not reflected by cumulative development projects. Ambient growth has been added to daily and peak hour traffic volumes on surrounding roadways, in conjunction with traffic generated by the development of future projects that have been approved but not yet built and/or for which development applications have been filed and are under consideration by governing agencies. The traffic generated by the Project is manually added to the base volume to determine Opening Year Cumulative forecasts.

The traffic analysis included the following traffic conditions, with the various traffic components:

- Opening Year Cumulative (2028) Without Project
  - Existing 2025 volumes
  - Ambient growth traffic (6.12%)
  - Cumulative development traffic
- Opening Year Cumulative (2028) With Project
  - Existing 2025 volumes
  - Ambient growth traffic (6.12%)
  - Cumulative development traffic
  - Project traffic

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 Town of Apple Valley. 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 4-4. If applicable, the traffic generated by individual cumulative projects was manually added to the Opening Year Cumulative (2028) forecasts to ensure that traffic generated by the listed cumulative development projects in Table 4-4 is 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*. Cumulative peak hour intersection turning movement volumes and ADT are shown on Exhibit 4-5.

Exhibit 4-4 : Cumulative Development Location Map

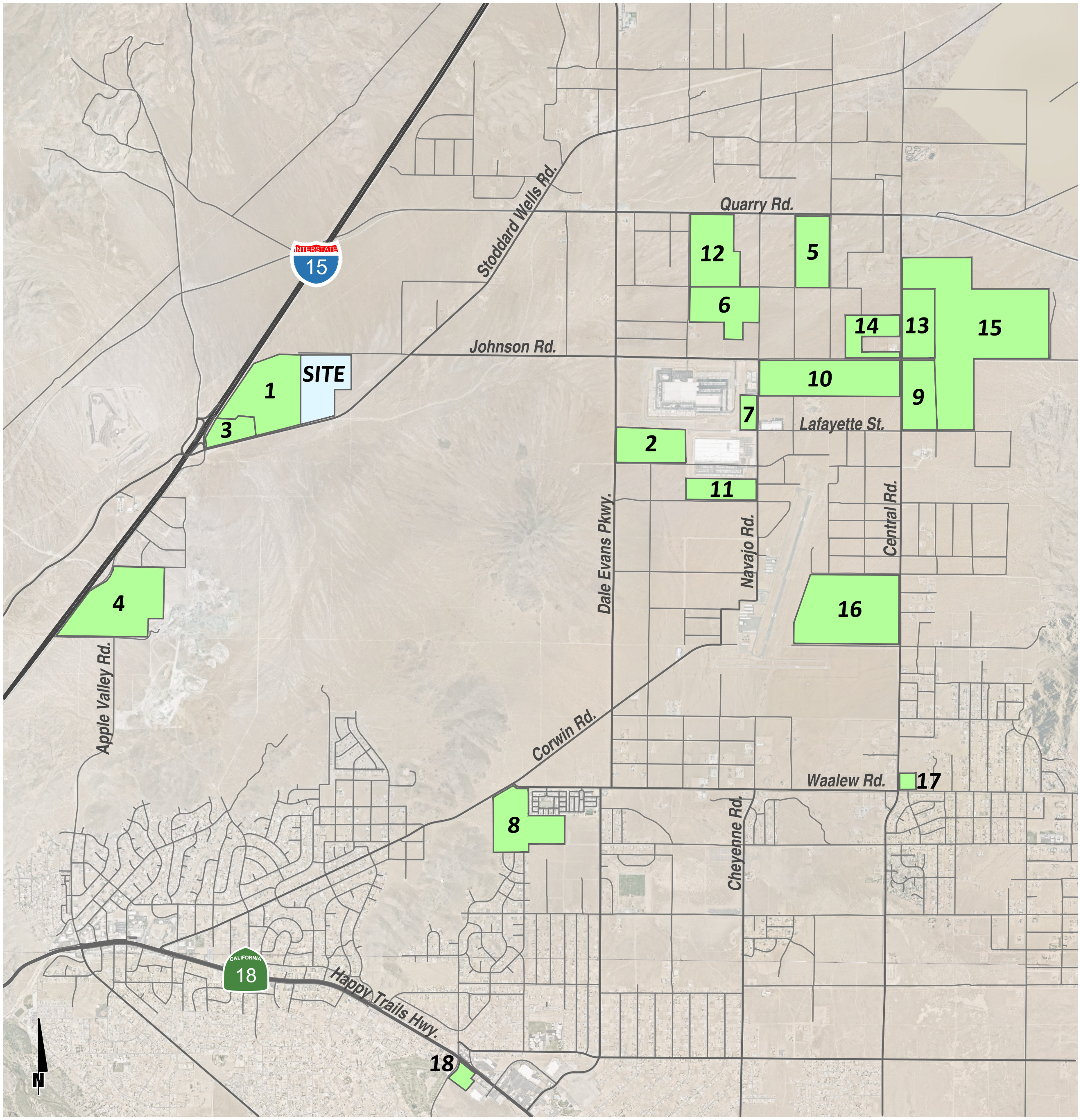
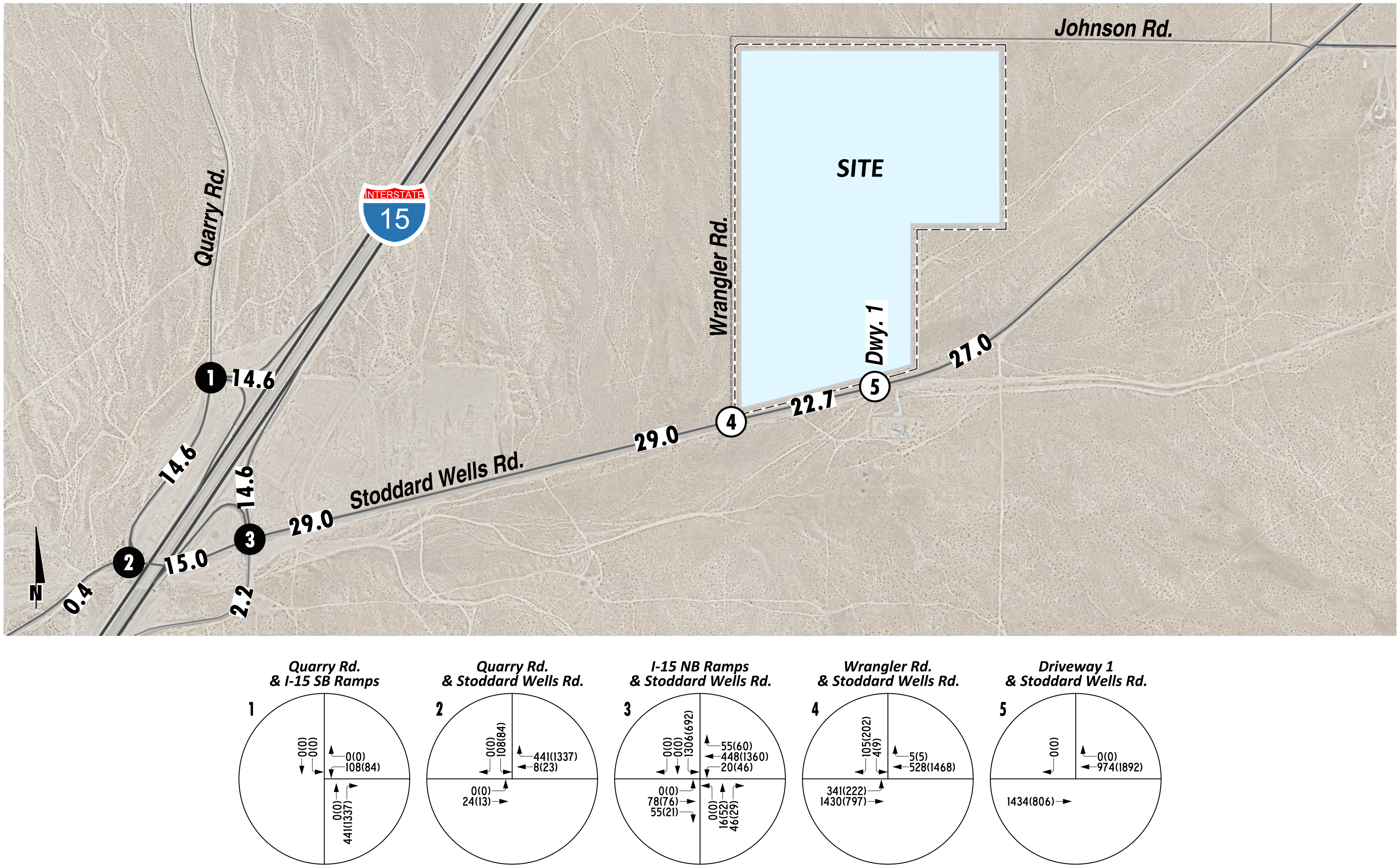


Exhibit 4-5 : Cumulative Only Traffic Volumes (Actual Volumes)



LEGEND:

0 = *Existing Intersection Analysis Location*

0 = *Future Intersection Analysis Location*

00(00) = *Peak Hour Volume AM(PM)*

00 = *Average Daily Traffic (ADT) In Thousands*

TABLE 4-4: CUMULATIVE DEVELOPMENT LAND USE SUMMARY

ID	Project Name	Land Use	Quantity	Units[1]
1	Apple Valley 143 (Covington)	High-Cube Fulfillment Center	2,518.500	TSF
2	Lafayette Street Logistics Facility (Redwood Industrial)	High-Cube Fulfillment Center	1,026.412	TSF
		High-Cube Cold Storage	181.132	TSF
3	Love's Travel Center	Travel Center	25	VFP
		Recreational Vehicle Stop	80	Spaces
4	Inland Empire Logistics Center	High-Cube Fulfillment Center	2,600.000	TSF
5	Quarry Pawnee Complex	High-Cube Fulfillment Center	1,460.000	TSF
6	Cordova Complex	High-Cube Fulfillment Center	1,560.000	TSF
7	Green Trucking Solutions Cold Storage	High-Cube Cold Storage	385.004	TSF
8	TTM No. 20306	Single Family Detached Residential	160	DU
9	1M Warehouse	High-Cube Fulfillment Center	1,080.000	TSF
10	Watson High Desert Logistics - East	High-Cube Fulfillment (Non-Sort)	2,800.000	TSF
11	Watson High Desert Logistics - West	High-Cube Fulfillment (Non-Sort)	900.000	TSF
12	Cordova Road Logistics Facility (Redwood West Cordova)	High-Cube Fulfillment Center	1,144.330	TSF
		High-Cube Cold Storage	201.940	TSF
13	Central Business Center (AV 3PL Site 1)	Warehousing	2,134.000	TSF
14	AV 3PL Site 2	Warehousing	2,134.000	TSF
15	North Apple Valley Industrial Park	Warehousing	5,821.709	TSF
16	Lake Creek Logistics	General Light Industrial	348.074	TSF
		High-Cube Cold Storage	348.074	TSF
		High-Cube Fulfillment Center	2,784.588	TSF
17	Commercial Center (APN 0437-193-26)	Gas Station With Convenience Market	12	VFP
		Retail	19.343	TSF
18	Buffalo Trading Post Plaza	Supermarket	20.599	TSF
		Tire Store	5.700	TSF
		Fast Food With Drive Thru	2.305	TSF
		Coffee Shop With Drive Thru	0.950	TSF
		Car Wash	1	Tunnel
		Gas Station	12	VFP
		Restaurant	7.650	TSF
		Strip Retail Plaza	35.000	TSF

[1] DU = Dwelling Units; TSF = Thousand Square Feet; VFP = Vehicle Fueling Positions

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5 OPENING YEAR CUMULATIVE (2028) TRAFFIC CONDITIONS

This section discusses the traffic forecasts for Opening Year Cumulative (2028) Without and With Project traffic forecasts, and the resulting intersection operations, traffic signal warrant, and freeway off-ramp queuing analyses.

5.1 ROADWAY IMPROVEMENTS

The lane configurations and traffic controls assumed to be in place for Opening Year Cumulative (2028) conditions are consistent with those shown previously in Exhibit 3-1, with the exception of the following:

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

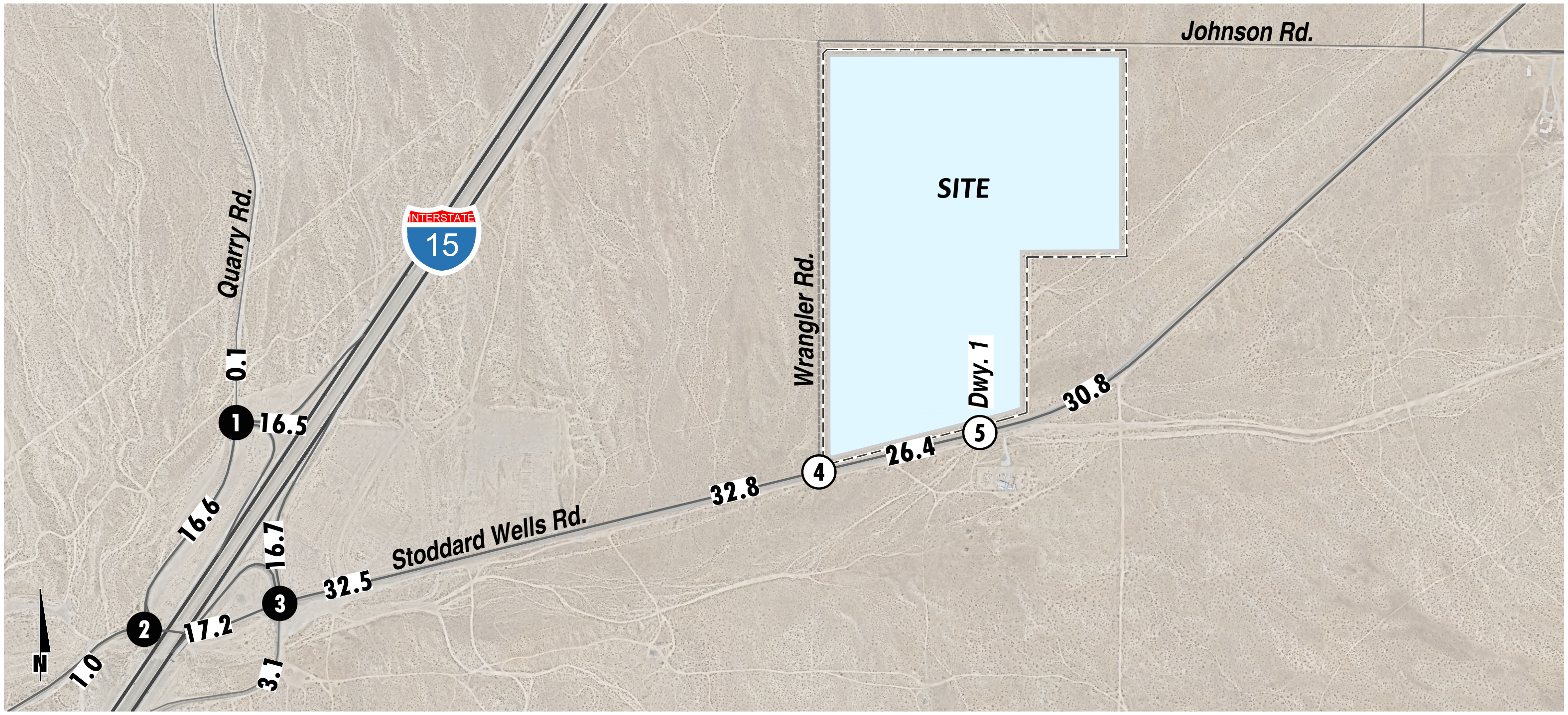
5.2 WITHOUT PROJECT GROWTH TRAFFIC VOLUME FORECASTS

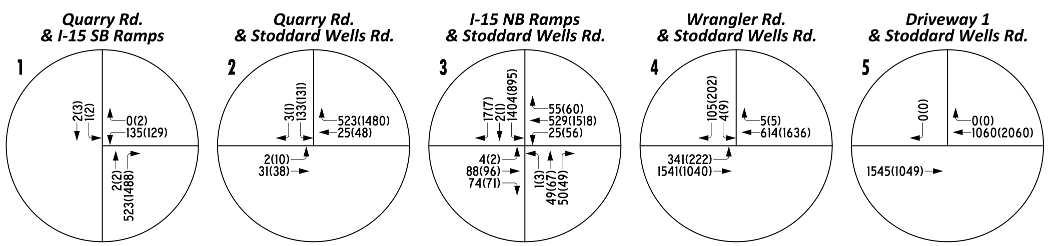
This scenario includes Existing (2025) traffic volumes plus an ambient growth rate of 6.12% and the addition of traffic generated by known cumulative development projects. The weekday AM and PM peak hour volumes which can be expected for Opening Year Cumulative (2028) Without Project traffic conditions are shown in Exhibit 5-1.

5.3 WITH PROJECT TRAFFIC VOLUME FORECASTS

This scenario includes Opening Year Cumulative (2028) Without Project traffic with the addition of Project traffic. The weekday AM and PM peak hour volumes which can be expected for Opening Year Cumulative (2028) With Project traffic conditions are shown in Exhibit 5-2.

Exhibit 5-1 : Opening Year Cumulative (2028) Without Project Traffic Volumes

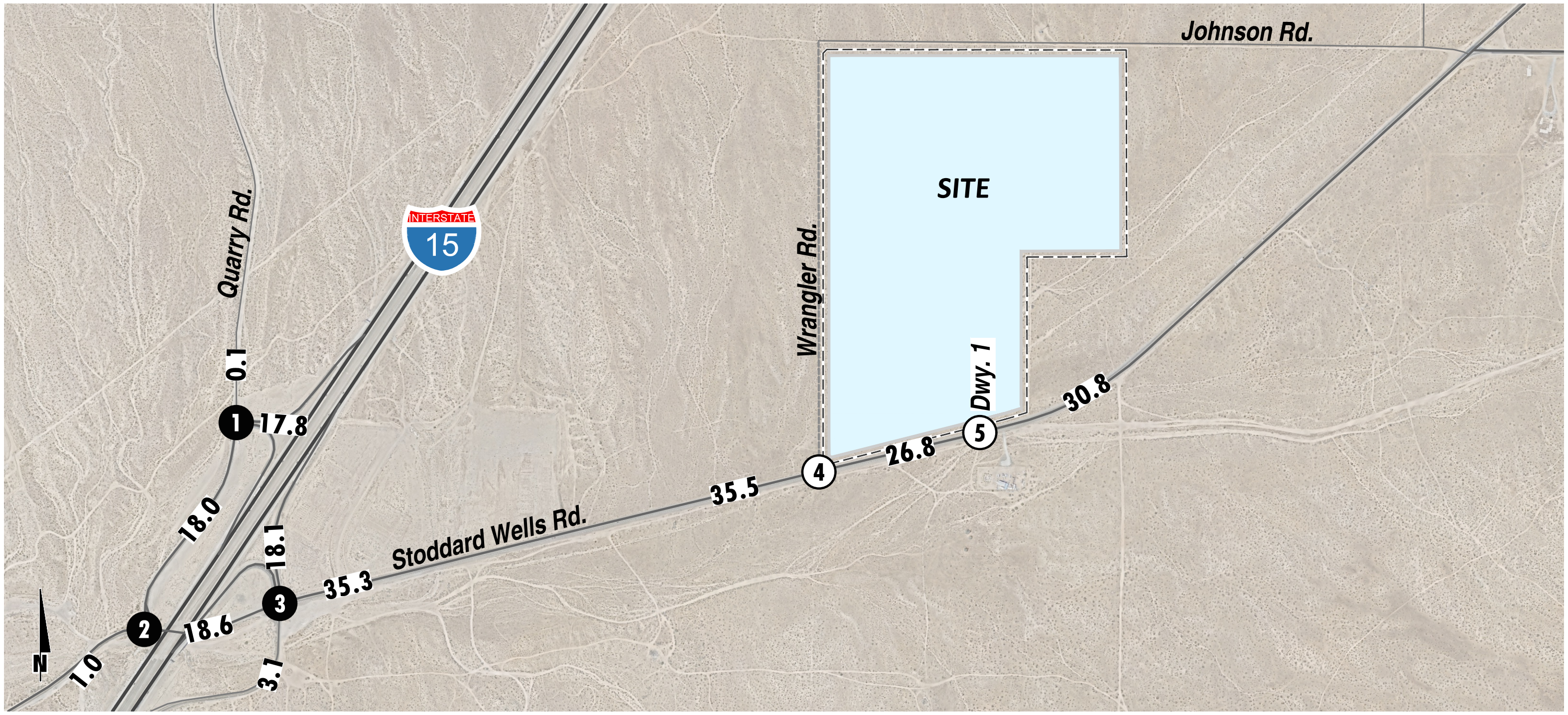


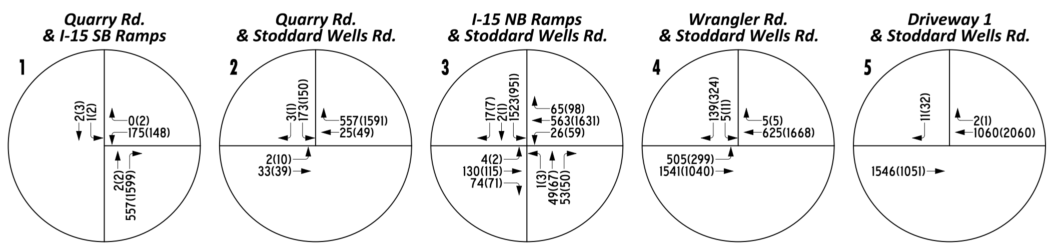


LEGEND:

- **0** = Existing Intersection Analysis Location
- **0** = Future Intersection Analysis Location
- 00(00) = Peak Hour Volume AM(PM)
- **00** = Average Daily Traffic (ADT) In Thousands

Exhibit 5-2 : Opening Year Cumulative (2028) With Project Traffic Volumes





LEGEND:

- **0** = Existing Intersection Analysis Location
- **0** = Future Intersection Analysis Location
- 00(00) = Peak Hour Volume AM(PM)
- **00** = Average Daily Traffic (ADT) In Thousands

5.4 INTERSECTION OPERATIONS ANALYSIS

Opening Year Cumulative (2028) peak hour traffic operations have been evaluated for the study area intersections based on the analysis methodologies presented in Section 2 *Methodologies*. The intersection analysis results are summarized in Table 5-1 for Opening Year Cumulative (2028) traffic conditions.

5.4.1 Opening Year Cumulative (2028) Without Project Traffic Conditions

LOS calculations were conducted for the study intersections to evaluate their operations under Opening Year Cumulative (2028) Without Project conditions with roadway and intersection geometrics consistent with Section 5.1 *Roadway Improvements*. As shown in Table 5-1, the following study area intersections are anticipated to operate at an unacceptable LOS under Opening Year Cumulative (2028) Without Project traffic conditions:

- Quarry Road & I-15 SB Ramps (#1) – LOS F PM peak hour only
- Quarry Road & Stoddard Wells Road (#2) – LOS F PM peak hour only
- I-15 NB Ramps & Stoddard Wells Road (#3) – LOS F AM and PM peak hours

The intersection operations analysis worksheets for Opening Year Cumulative (2028) Without Project traffic conditions are included in Appendix 5.1.

5.4.2 Opening Year Cumulative (2028) With Project Traffic Conditions

As shown in Table 5-1, no additional study area intersections are anticipated to operate at an unacceptable LOS with the addition of Project traffic. The intersection operations analysis worksheets for Opening Year Cumulative (2028) With Project traffic conditions are included in Appendix 5.2.

5.5 TRAFFIC SIGNAL WARRANTS ANALYSIS

Traffic signal warrants have been performed for Opening Year Cumulative (2028) traffic conditions based on peak hour intersection turning movements volumes or planning level (ADT) volumes. The following study area intersections are anticipated to meet a traffic signal warrant under Opening Year Cumulative (2029) Without Project traffic conditions:

- Quarry Road & I-15 SB Ramps (#1)
- Quarry Road & Stoddard Wells Road (#2)
- I-15 NB Ramps & Stoddard Wells Road (#3)
- Wrangler Road & Stoddard Wells Road (#4)

With the addition of Project traffic, no additional study area intersections are anticipated to meet a traffic signal warrant as they are all warranted under Opening Year Cumulative (2028) Without Project traffic conditions. The Opening Year Cumulative (2028) Without Project traffic conditions traffic signal warrant analysis worksheets are provided in Appendix 5.3.

TABLE 5-1: OYC (2028) INTERSECTION ANALYSIS

#	Intersection	Traffic Control[2]	2028 Without Project				2028 With Project			
			Delay[1] (Secs.)		Level of Service		Delay[1] (Secs.)		Level of Service	
			AM	PM	AM	PM	AM	PM	AM	PM
1	Quarry Rd. & I-15 SB Ramps	CSS	14.6	**75.5**	B	**F**	17.4	**>100**	C	**F**
2	Quarry Rd. & Stoddard Wells Rd.	CSS	20.8	**>100**	C	**F**	31.4	**>100**	D	**F**
3	I-15 NB Ramps & Stoddard Wells Rd.	CSS	**>100**	**>100**	**F**	**F**	**>100**	**>100**	**F**	**F**
4	Wrangler Rd. & Stoddard Wells Rd.	**TS**	Future Intersection				50.5	40.2	D	D
5	Driveway 1 & Stoddard Wells Rd.	**CSS**	Future Intersection				14.0	28.0	B	D

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

1 Per the Highway Capacity Manual (7th 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. HCM delay reported in seconds.

2 TS = Traffic Signal; AWS = All-way Stop; CSS = Cross-street Stop

5.6 OFF-RAMP QUEUING ANALYSIS

Queuing analysis findings for Opening Year Cumulative (2028) Without and With Project are presented in Table 5-2. As shown in Table 5-2, the following movement is anticipated to experience off-ramp queuing issues during the weekday AM or weekday PM 95th percentile traffic flows under Opening Year Cumulative (2028) Without Project traffic conditions:

- I-15 NB Ramps & Stoddard Wells Road (#3) Southbound shared left-through-right – AM and PM peak hours

With the addition of Project traffic, no additional movements are anticipated to experience off-ramp queuing issues under Opening Year Cumulative (2028) With Project traffic conditions. Worksheets for Opening Year Cumulative (2028) Without Project and With Project traffic conditions queuing analysis are provided in Appendices 5.4 and 5.5, respectively.

TABLE 5-2: OYC (2028) QUEUING SUMMARY

#	Intersection	Movement	Available Stacking Distance (Feet)	2028 Without Project				2028 With Project			
				95th Percentile Queue (Feet)[3]		Acceptable?[1]		95th Percentile Queue (Feet)[3]		Acceptable?[1]	
				AM Peak Hour	PM Peak Hour	AM	PM	AM Peak Hour	PM Peak Hour	AM	PM
1	Quarry Rd. & I-15 SB Ramps	WBL/R	1,000	38	168	Yes	Yes	63	270	Yes	Yes
3	I-15 NB Ramps & Stoddard Wells Rd.	SBL/T/R	1,000	**5,960**	**--** [3]	**No**	**No**	**6,608**	**--** [3]	**No**	**No**

[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.

[3] Overflow of vehicles, no queue reported in Synchro and assumed to exceed available storage.

5.7 PROJECT DEFICIENCIES AND RECOMMENDED IMPROVEMENTS

5.7.1 Recommended Improvements to Address Deficiencies at Intersections

The effectiveness of the recommended improvement strategies to address Opening Year Cumulative (2028) traffic deficiencies are presented in Table 5-3 to achieve LOS D or better. Worksheets for Opening Year Cumulative (2028) With Project conditions, with improvements, HCM calculation worksheets are provided in Appendix 5.6.

5.7.2 Recommended Improvements to Address Deficiencies for Off-Ramp Queues

The effectiveness of the recommended improvement strategies to address Opening Year Cumulative (2028) off-ramp deficiencies are presented in Table 5-4. The improvements are consistent with the intersection improvements identified in Table 5-3. Worksheets for Opening Year Cumulative (2028) With Project conditions, with improvements, off-ramp queuing analysis worksheets are provided in Appendix 5.7.

TABLE 5-3: OYC (2028) INTERSECTION ANALYSIS WITH IMPROVEMENTS

#	Intersection	Traffic Control[3]	Intersection Approach Lanes[1]												Delay[2] (secs.)		Level of Service	
			Northbound			Southbound			Eastbound			Westbound						
			L	T	R	L	T	R	L	T	R	L	T	R	AM	PM	AM	PM
1	Quarry Rd. & I-15 SB Ramps																	
	Without Improvements:	CSS	0	1	0	0	1	0	0	0	0	0	1	0	17.4	**>100**	C	**F**
	With Improvements:	CSS	0	1	**1**	0	1	0	0	0	0	0	1	0	10.0	23.7	A	C
2	Quarry Rd. & Stoddard Wells Rd.																	
	Without Improvements:	CSS	0	0	0	0	1	0	0	1	0	0	1	0	**31.4**	**>100**	**D**	**F**
	With Improvements:	CSS	0	0	0	0	1	0	0	1	**1**	0	1	0	11.3	33.3	B	D
3	I-15 NB Ramps & Stoddard Wells Rd.																	
	Without Improvements:	CSS	0	1	0	0	1	0	0	1	0	0	1	0	**>100**	**>100**	**F**	**F**
	With Improvements:	**TS**	**1**	1	0	**2**	1	0	**1**	1	0	**1**	**2**	0	38.9	50.2	D	D

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

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

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

[2] Per the Highway Capacity Manual 7th 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

TABLE 5-4: OYC (2028) QUEUING SUMMARY WITH IMPROVEMENTS

#	Intersection	Movement	Available Stacking Distance (Feet)	2028 With Project			
				95th Percentile Queue (Feet)[3]		Acceptable? [1]	
				AM Peak Hour	PM Peak Hour	AM	PM
1	Quarry Rd. & I-15 SB Ramps	WBL/R	1,000	25	20	Yes	Yes
3	I-15 NB Ramps & Stoddard Wells Rd.	SBL	1,000	845 [2]	606 [2]	Yes	Yes
		SBT/R	1,000	14	15	Yes	Yes

Underline = Improvement

[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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6 LOCAL AND REGIONAL FUNDING MECHANISMS

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

6.1 TOWN OF APPLE VALLEY DEVELOPMENT IMPACT FEE PROGRAM

The Town of Apple Valley has implemented a DIF program. This program collects fees from new single-family residential, multi-family residential, commercial, office use, and industrial developments. These fees serve to fund compliant regional facilities as well as local facilities such as law enforcement, storm drainage, sanitary sewer, and general government fees. Fees are also allocated to finance parks and Apple Valley Fire Protection District. Under the town's DIF program, the Town may grant developers construct certain facilities and landscaped medians identified in the list of improvements funded by the DIF program.

It is recommended that the Project Applicant coordinate with Town of Apple Valley DIF program to enter into a formal credit reimbursement agreement prior to remitting fee payments and/or initiating construction of any program facilities. Establishing such an agreement is essential to allow the Town of Apple Valley sufficient opportunity to review the proposed construction plans and implementation schedule. This review enables the agency to determine the eligibility of specific improvements for fee program credit amount in accordance with the program's guidelines.

6.2 MEASURE "I" FUNDS

In 2004, the voters of San Bernardino County approved the 30-year extension of Measure "I", a one-half of one percent sales tax on retail transactions, through the year 2040, for transportation projects including, but not limited to, infrastructure improvements, commuter rail, public transit, and other identified improvements. The Measure "I" extension requires that a regional traffic impact fee be created to ensure development is paying its fair share. A regional Nexus study was prepared by the San Bernardino County Transportation Authority (SBCTA) and concluded that each jurisdiction should include a regional fee component in their local programs in order to meet the Measure "I" requirement. The regional component assigns specific facilities and cost sharing formulas to each jurisdiction and was most recently updated in March 2019. Revenues collected through these programs are used in tandem with the Town's DIF funds to deliver projects identified in the Nexus Study. While Measure "I" is a self-executing sales tax administered by SBCTA, it bears discussion here because the funds raised through Measure "I" have funded in the past and will continue to fund new transportation facilities in San Bernardino County, including within the Town of Apple Valley.

6.3 FAIR SHARE CONTRIBUTION

Project improvements may include a combination of fee payments to established programs, construction of specific improvements, payment of a fair share contribution toward future improvements or a combination of these approaches. Improvements constructed by development may be eligible for a fee credit or reimbursement through the program where appropriate (to be determined at the Town'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, have been provided in Table 6-1 for the applicable deficient study area intersections.

TABLE 6-1: PROJECT FAIR SHARE CALCULATIONS

#	Intersection		Existing (2025)	Project	2028 With Project	Total New Traffic	Project % of New Traffic[1]
1	Quarry Rd. & I-15 SB Ramps						
		AM:	107	74	737	630	**11.7%**
		PM:	193	130	1,756	1,563	8.3%
2	Quarry Rd. & Stoddard Wells Rd.						
		AM:	129	76	794	665	**11.4%**
		PM:	237	132	1,841	1,604	8.2%
3	I-15 NB Ramps & Stoddard Wells Rd.						
		AM:	258	209	2,507	2,249	**9.3%**
		PM:	461	230	3,055	2,594	8.9%

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

7 REFERENCES

1. **County of San Bernardino.** *County of San Bernardino Transportation Impact Study Guidelines.* July 2019.
2. **Institute of Transportation Engineers.** *Trip Generation Manual.* 12th Edition. 2025.
3. **San Bernardino Associated Governments.** *Congestion Management Program for County of San Bernardino.* County of San Bernardino : s.n., Updated 2023.
4. **Transportation Research Board.** *Highway Capacity Manual (HCM).* 7th Edition. s.l. : National Academy of Sciences, 2022.
5. **California Department of Transportation.** California Manual on Uniform Traffic Control Devices (CA MUTCD). [book auth.] California Department of Transportation. *California Manual on Uniform Traffic Control Devices (CA MUTCD).* 2014, Updated March 30, 2021 (Revision 6).

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8 CERTIFICATION

The contents of this Traffic Analysis represent an accurate depiction of the transportation environment and deficiencies associated with the proposed Apple Valley 84 Project. The information contained in this Traffic Analysis is based on the best available data at the time of preparation. If you have any questions, please contact me directly at (949) 861-0177.

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