
Appendix H:

Transportation Supporting Information

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H.1 - Focused Traffic Analysis

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LA SIERRA RESIDENTIAL

FOCUSED TRAFFIC ANALYSIS

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TABLE OF CONTENTS

Table of Contents	ii
Appendices.....	iv
List of Exhibits.....	v
List of Tables	vii
List of Abbreviated Terms	viii
1 Introduction.....	1
1.1 Summary of Findings	1
1.2 Project Overview	1
1.3 Analysis Scenarios.....	5
1.4 Study Area	5
1.5 Deficiencies	7
1.6 Recommendations.....	8
1.7 Queuing Analysis	11
1.8 Conceptual Plans	12
2 Methodologies	13
2.1 Level of Service.....	13
2.2 Intersection Capacity Analysis.....	13
2.3 Traffic Signal Warrant Analysis Methodology	15
2.4 Queuing Analysis	16
2.5 Minimum Acceptable Levels of Service (LOS).....	16
2.6 Deficiency Criteria.....	17
3 Area Conditions	19
3.1 Existing Circulation Network	19
3.2 City of Riverside General Plan Circulation Element.....	19
3.3 Bicycle and Pedestrian Facilities.....	19
3.4 Transit Service.....	25
3.5 Existing Traffic Counts.....	25
3.6 Intersection Operations Analysis.....	29
3.7 Traffic Signal Warrants Analysis.....	29
4 Projected Future Traffic.....	31
4.1 Project Trip Generation	31
4.2 Project Trip Distribution.....	32
4.3 Modal Split.....	32
4.4 Project Trip Assignment.....	32
4.5 Background Traffic.....	32
4.6 Cumulative Development Traffic.....	36
5 Background (Near-Term) (2028) Traffic Conditions	41
5.1 Roadway Improvements	41

5.2 Background (Near-Term) (2028) Without Cumulative Projects and Without Project Traffic Volume Forecasts 41

5.3 Background (Near-Term) (2028) With Cumulative Projects and Without Project Traffic Volume Forecasts 41

5.4 Background (Near-Term) (2028) With Project Traffic Volume Forecasts..... 41

5.5 Intersection Operations Analysis 48

5.6 Traffic Signal Warrants Analysis 48

6 References 51

APPENDICES

Appendix 1.1: Approved Traffic Study Scoping Agreement

Appendix 1.2: Queuing Analysis Worksheets

Appendix 1.3: Conceptual Plan (Alternative 1)

Appendix 1.4: Conceptual Plan (Alternative 2)

Appendix 1.5: Conceptual Plan (High Visibility Crosswalk)

Appendix 3.1: Traffic Counts

Appendix 3.2: Speed Survey

Appendix 3.3: Existing (2024) Conditions Intersection Operations Analysis Worksheets

Appendix 3.4: Existing (2024) Conditions Warrant Analysis Worksheets

Appendix 5.1: Background (Near-Term) (2028) Without Cumulative Projects and Without Project Conditions Intersection Operations Analysis Worksheets

Appendix 5.2: Background (Near-Term) (2028) With Cumulative Projects and Without Project Conditions Intersection Operations Analysis Worksheets

Appendix 5.3: Background (Near-Term) (2028) With Cumulative Projects and With Project Conditions (Alternative 1) Intersection Operations Analysis Worksheets

Appendix 5.4: Background (Near-Term) (2028) With Cumulative Projects and With Project Conditions (Alternative 2) Intersection Operations Analysis Worksheets

Appendix 5.5: Background (Near-Term) (2028) Without Cumulative Projects and Without Project Conditions Traffic Signal Warrant Analysis Worksheets

Appendix 5.6: Background (Near-Term) (2028) With Cumulative Projects and Without Project Conditions Traffic Signal Warrant Analysis Worksheets

Appendix 5.7: Background (Near-Term) (2028) With Cumulative Projects and With Project Conditions (Alternative 1) Traffic Signal Warrant Analysis Worksheets

Appendix 5.8: Background (Near-Term) (2028) With Cumulative Projects and With Project Conditions (Alternative 2) Traffic Signal Warrant Analysis Worksheets

LIST OF EXHIBITS

Exhibit 1-1: Location Map.....	2
Exhibit 1-2: Preliminary Site Plan (Alternative 1).....	3
Exhibit 1-3: Preliminary Site Plan (Alternative 2).....	4
Exhibit 1-4: Study Area.....	6
Exhibit 1-5: Site Access Recommendations (Alternative 1).....	9
Exhibit 1-6: Site Access Recommendations (Alternative 2).....	10
Exhibit 3-1: Existing Number of Through Lanes and Intersection Controls.....	20
Exhibit 3-2: City of Riverside General Plan Circulation Element.....	21
Exhibit 3-3: City of Riverside General Plan Roadway Cross-Sections.....	22
Exhibit 3-4: City of Riverside Master Plan of Trails and Bikeway.....	23
Exhibit 3-5: Existing Pedestrian Facilities.....	24
Exhibit 3-6: City of Riverside Transit Map.....	26
Exhibit 3-7: Existing (2024) AM/PM Peak Hour Traffic Volumes.....	27
Exhibit 3-8: Existing (2024) Mid-Day Peak Hour Traffic Volumes.....	28
Exhibit 4-1: Project Trip Distribution.....	33
Exhibit 4-2: Project Only AM/PM Peak Hour Traffic Volumes.....	34
Exhibit 4-3: Project Only Mid-Day Peak Hour Traffic Volumes.....	35
Exhibit 4-4: Cumulative Development Location Map.....	38
Exhibit 4-5: Cumulative Only AM/PM Peak Hour Traffic Volumes.....	39
Exhibit 4-6: Cumulative Only Mid-day Peak Hour Traffic Volumes.....	40
Exhibit 5-1: Background (Near-Term) (2028) Without Cumulative Projects and Without Project Traffic Volumes.....	42
Exhibit 5-2: Background (Near-Term) (2028) Without Cumulative Projects and Without Project Mid-Day Traffic Volumes.....	43
Exhibit 5-3: Background (Near-Term) (2028) With Cumulative Projects and Without Project Traffic Volumes.....	44
Exhibit 5-4: Background (Near-Term) (2028) With Cumulative Projects and Without Project Mid-Day Traffic Volumes.....	45
Exhibit 5-5: Background (Near-Term) (2028) With Cumulative Projects and With Project Traffic Volumes.....	46

Exhibit 5-6: Background (Near-Term) (2028) With Cumulative Projects and With Project Mid-Day
Traffic Volumes47

LIST OF TABLES

Table 1-1: Intersection Analysis Locations	7
Table 1-2: Summary of LOS by Analysis Scenario	7
Table 1-3: Summary of Project Improvements	11
Table 1-4: Queuing Analysis for Background (Near-Term) Conditions	12
Table 2-1: Signalized Intersection LOS Thresholds	14
Table 2-2: Unsignalized Intersection LOS Thresholds	15
Table 2-3: Traffic Signal Warrant Analysis Locations	16
Table 3-1: Intersection Analysis for Existing (2024) Conditions	29
Table 4-1: Project Trip Generation Summary	31
Table 4-2: Cumulative Development Land Use Summary	37
Table 5-1: Intersection Analysis for Background (Near-Term) (2028) Conditions	49

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
ITE	Institute of Transportation Engineers
LOS	Level of Service
NCHRP	National Cooperative Highway Research Program
PHF	Peak Hour Factor
Project	La Sierra Residential
RCTC	Riverside County Transportation Commission
RTA	Riverside Transit Authority
TA	Traffic Analysis
TUMF	Transportation Uniform Mitigation Fee
WRCOG	Western Riverside Council of Governments
v/c	Volume to Capacity
vphgpl	Vehicles per Hour Green per Lane

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1 INTRODUCTION

This report presents the results of the traffic analysis (TA) for the proposed La Sierra Residential development (Project), which is located west of La Sierra Avenue between Alhambra Avenue and Francisco Place in the City of Riverside, as shown on Exhibit 1-1. The purpose of this TA is to evaluate the potential traffic and circulation system deficiencies that may result from the development of the proposed Project, and to recommend improvements to resolve identified deficiencies and to achieve acceptable circulation system operational conditions in accordance with the City's General Plan. As directed by City of Riverside staff, this traffic study has been prepared in accordance with the City of Riverside Traffic Impact Analysis Guidelines for Vehicle Miles Traveled and Level of Service Assessment and consultation with City staff during the scoping process. (1) The approved Project Traffic Study Scoping Agreement is provided in Appendix 1.1 of this TA.

1.1 SUMMARY OF FINDINGS

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

- Project is to coordinate with City of Riverside Traffic Division to implement red curb parking restrictions along the inside of the horizontal curve of Alhambra Avenue approaching the first proposed residential home along with advance curve ahead warning signage and centerline striping.
- Project is to coordinate with Riverside Transit Agency (RTA) to install bus stop amenities for the existing bus stop located along the Project frontage.

Alternative 1 – right-in/right-out only driveway

- Project to construct Driveway 1 on La Sierra Avenue with stop controls for the eastbound traffic (Project egress) in order to facilitate site access.

Alternative 2 – full access driveway

- Project to construct Driveway 1 on La Sierra Avenue with stop controls for the eastbound traffic (Project egress) in order to facilitate site access.
- Project to construct a median opening at La Sierra Avenue & Driveway 1/Somervale Drive to accommodate northbound and southbound left turn lanes with 100 feet of storage length.

Additional details and intersection lane geometrics are provided in Section 1.6 *Recommendations* of this report. There are no peak hour intersection operational deficiencies anticipated for existing and future traffic conditions. As such, no off-site improvements have been identified as part of this TA.

1.2 PROJECT OVERVIEW

The Project includes the development of 4 single-family (estate) residential dwelling units located on Alhambra Avenue and 52 single-family detached residential dwelling units are proposed off La Sierra Avenue. Three of the single-family detached residential dwelling units off La Sierra Avenue consist of affordable housing (see Exhibit 1-2 for Alternative 1 and Exhibit 1-3 for Alternative 2). As indicated on Exhibit 1-2, Alternative 1 vehicular access will be provided via one right-in/right-out access driveway on La Sierra Avenue. As indicated on Exhibit 1-3, Alternative 2 vehicular access will be provided via one full access driveway on La Sierra Avenue (allowing left turns into and out of the Project).

EXHIBIT 1-1 : LOCATION MAP

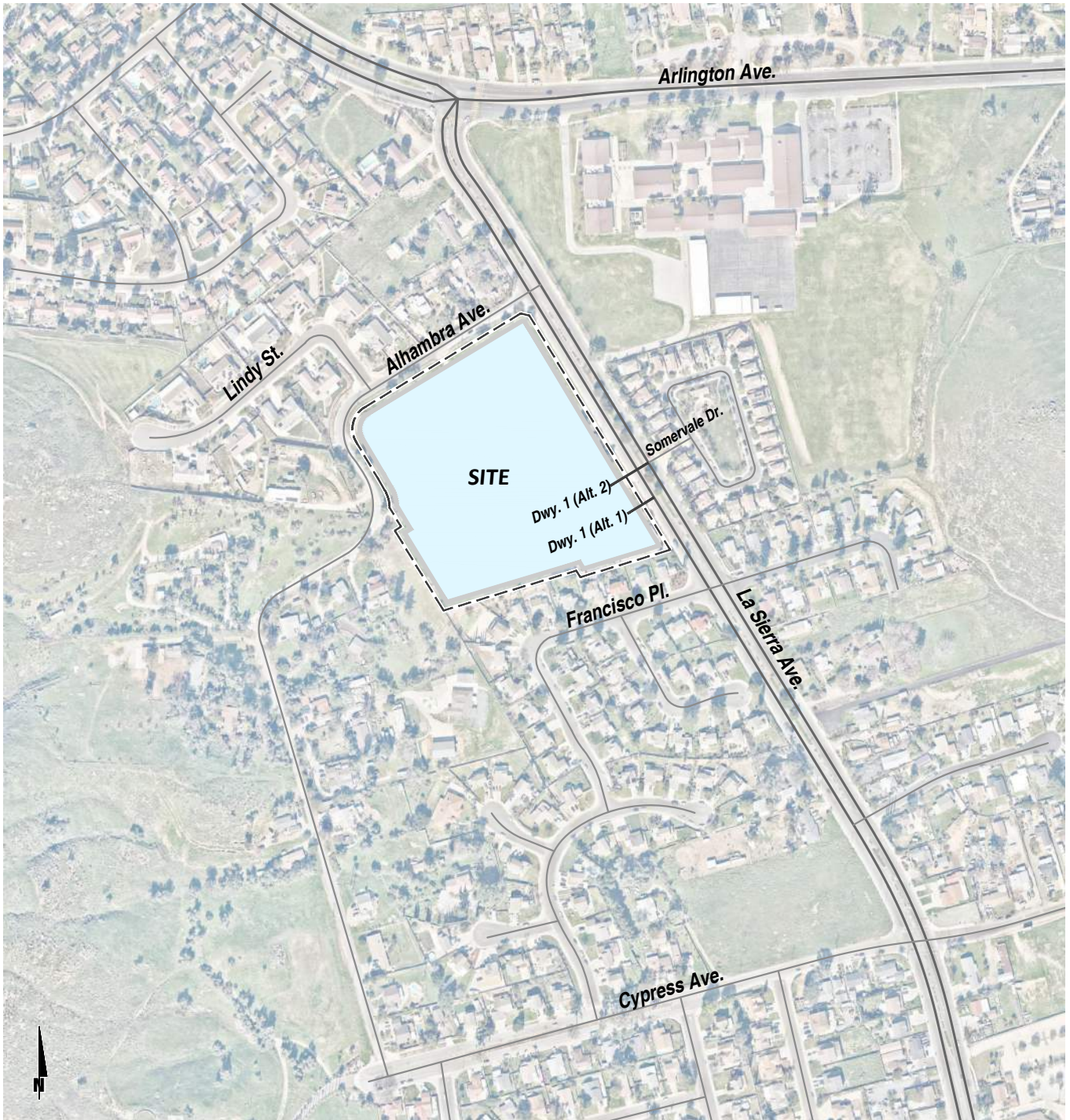


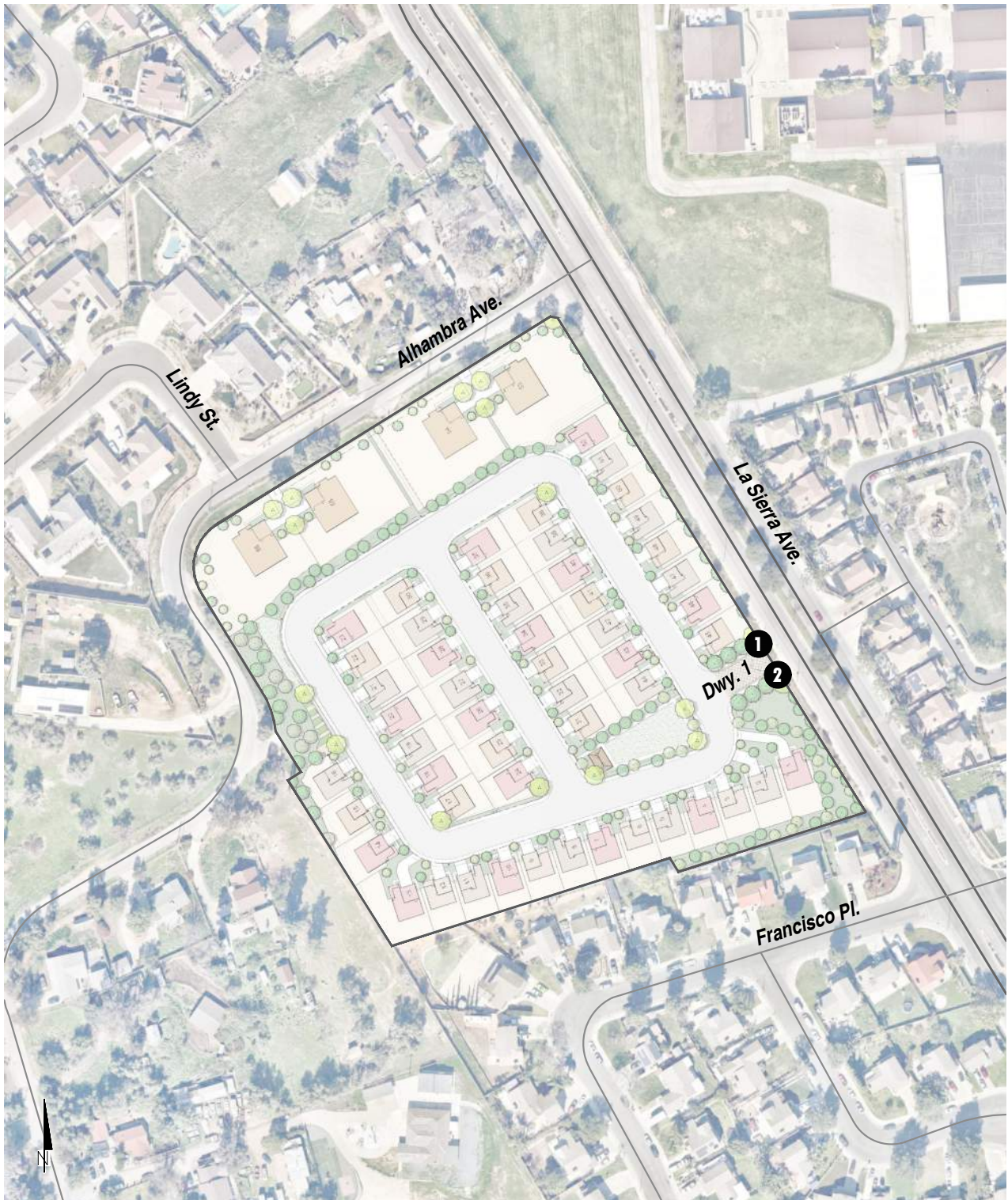
EXHIBIT 1-2 : PRELIMINARY SITE PLAN (ALTERNATIVE 1)



NOTE(S):

1 = There are no proposed gates for Driveway 1

EXHIBIT 1-2 : PRELIMINARY SITE PLAN (ALTERNATIVE 2)



NOTE(S):

- 1** = There are no proposed gates for Driveway 1
- 2** = For Alternative 2, Driveway 1 on La Sierra Avenue is proposed to accommodate full access and would require a break in the existing median and the construction of both a northbound and southbound left turn pocket.

Trips generated by the Project's proposed land uses have been estimated based on trip generation rates collected by the Institute of Transportation Engineers (ITE) Trip Generation Manual, 11th Edition, 2021. (2) The proposed Project is anticipated to generate 514 two-way trip-ends per day with 38 AM peak hour trips (7:00-9:00 AM), 38 mid-day PM peak hours trips (1:30-3:30 PM), and 51 PM peak hour trips (4:00-6:00 PM). 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 (2024) Conditions
- Background (Near-Term) Without Cumulative Projects and Without Project
- Background (Near-Term) With Cumulative Projects and Without Project
- Background (Near-Term) With Cumulative Projects and With Project – Right-in/Right-out Driveway (Alternative 1)
- Background (Near-Term) With Cumulative Projects and With Project – Full Access Driveway (Alternative 2)

1.3.1 EXISTING (2024) CONDITIONS

Information for Existing (2024) conditions is disclosed to represent the baseline traffic conditions as they existed at the time this report was prepared. Local schools were in session with in-person instruction at the time of the traffic counts. Traffic counts were conducted in April 2024.

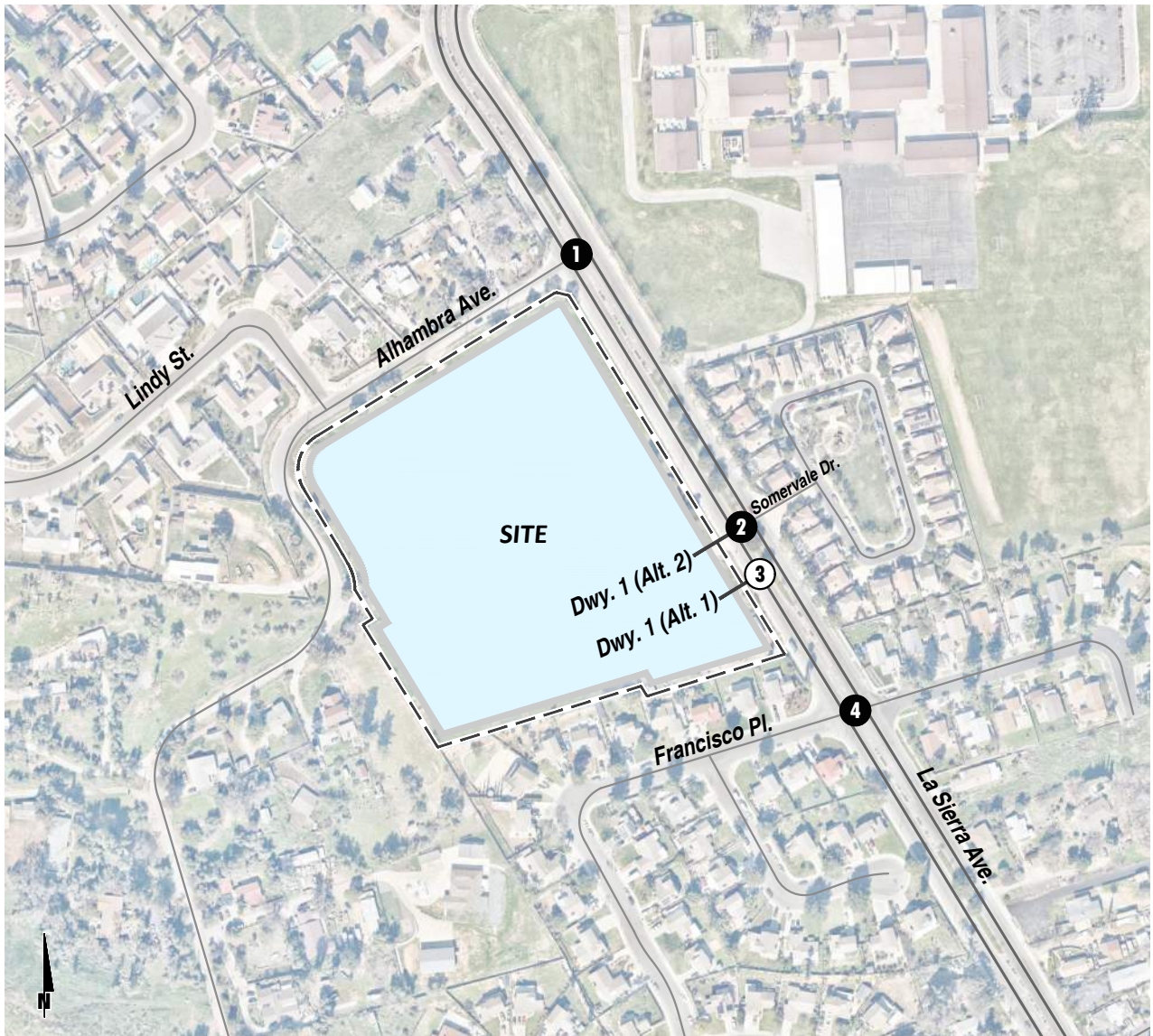
1.3.2 BACKGROUND (NEAR-TERM) (2028) CONDITIONS

The Background (Near-Term) conditions analysis determines the potential near-term cumulative circulation system deficiencies. To account for background traffic growth, traffic associated with other known cumulative development projects in conjunction with an ambient growth from Existing (2024) conditions of 8.24% is included for Background (Near-Term) (2028) traffic conditions (2.0% per year compounded annually over 4 years). A list of cumulative development projects was compiled from information provided by the City of Riverside.

1.4 STUDY AREA

To ensure that this TA satisfies the City of Riverside's traffic study requirements, Urban Crossroads, Inc. prepared a traffic study scoping package for review by City staff prior to the preparation of this report. The Agreement provides an outline of the Project study area, trip generation, trip distribution, and analysis methodology and is included in Appendix 1.1. The following 4 study area intersections shown on Exhibit 1-4 and listed in Table 1-1 were selected for this TA based on consultation with City of Riverside staff.

EXHIBIT 1-4 : STUDY AREA



LEGEND:

- 1** = Existing Intersection Analysis Location
- 0** = Future Intersection Analysis Location

TABLE 1-1: INTERSECTION ANALYSIS LOCATIONS

#	Intersection	Jursidiction	CMP?
1	La Sierra Av. & Alhambra Av.	Riverside	No
2	La Sierra Av. & Driveway 1 (Alt. 2)/Somervale Dr.	Riverside	No
3	La Sierra Av. & Driveway 1 (Alt. 1)	Riverside	No
4	La Sierra Av. & Francisco Pl.	Riverside	No

The intent of a Congestion Management Program (CMP) is to 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 2019 CMP for the County of Riverside in December 2019. (3) There are no study area intersections identified as a Riverside County CMP intersection.

1.5 DEFICIENCIES

This section provides a summary of deficiencies by analysis scenario. Section 2 *Methodologies* provides information on the methodologies used in the analysis, and Section 5 *Background (Near-Term) (2028) Traffic Conditions* includes the detailed analysis. A summary of LOS results for all analysis scenarios is presented in Table 1-2.

TABLE 1-2: SUMMARY OF LOS BY ANALYSIS SCENARIO

	Existing (2024) Level of Service			Background (2028) Level of Service			Background (2028) + Cumulatives Level of Service			Background (2028) + Cumulatives + Project (Alternative 1) Level of Service			Background (2028) + Cumulatives + Project (Alternative 2) Level of Service		
	AM	MD	PM	AM	MD	PM	AM	MD	PM	AM	MD	PM	AM	MD	PM
1 La Sierra Av. & Alhambra Av.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
2 La Sierra Av. & Driveway 1 (Alt. 2) / Somervale Dr.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
3 La Sierra Av. & Driveway 2 (Alt. 1)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	●	●	●	N/A	N/A	N/A
4 La Sierra Av. & Francisco Pl.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

LEGEND:
 ● = A-D
 ● = E
 ● = F

1.5.1 EXISTING (2024) CONDITIONS

All study area intersections are currently operating at an acceptable LOS during the peak hours under Existing (2024) traffic conditions.

1.5.2 BACKGROUND (NEAR-TERM) (2028) CONDITIONS

All study area intersections are anticipated to continue to operate at an acceptable LOS during the peak hours under Background (Near-Term) Without Project and With Project traffic conditions. **The addition of Project traffic would not trigger the City of Riverside's significance criteria.**

1.6 RECOMMENDATIONS

The following recommendations are based on the improvements needed to accommodate site access. The site adjacent recommendations are shown on Exhibit 1-4.

Recommendation 1 – Installation of Red Curb

- Project is to coordinate with City of Riverside Traffic Division to implement red curb parking restrictions along the inside of the horizontal curve of Alhambra Avenue approaching the first proposed residential home along with advance curve ahead warning signage and centerline striping.

Recommendation 2 – RTA Coordination

- Project is to coordinate with RTA to install bus stop amenities for the existing bus stop located along the Project frontage.

Recommendation 3 (Alternative 1 Only) – La Sierra Av. & Driveway 1 (#3) – The following improvements are necessary to accommodate site access:

- Project to construct Driveway 1 on La Sierra Avenue with stop controls for the eastbound traffic (Project egress) in order to facilitate site access.

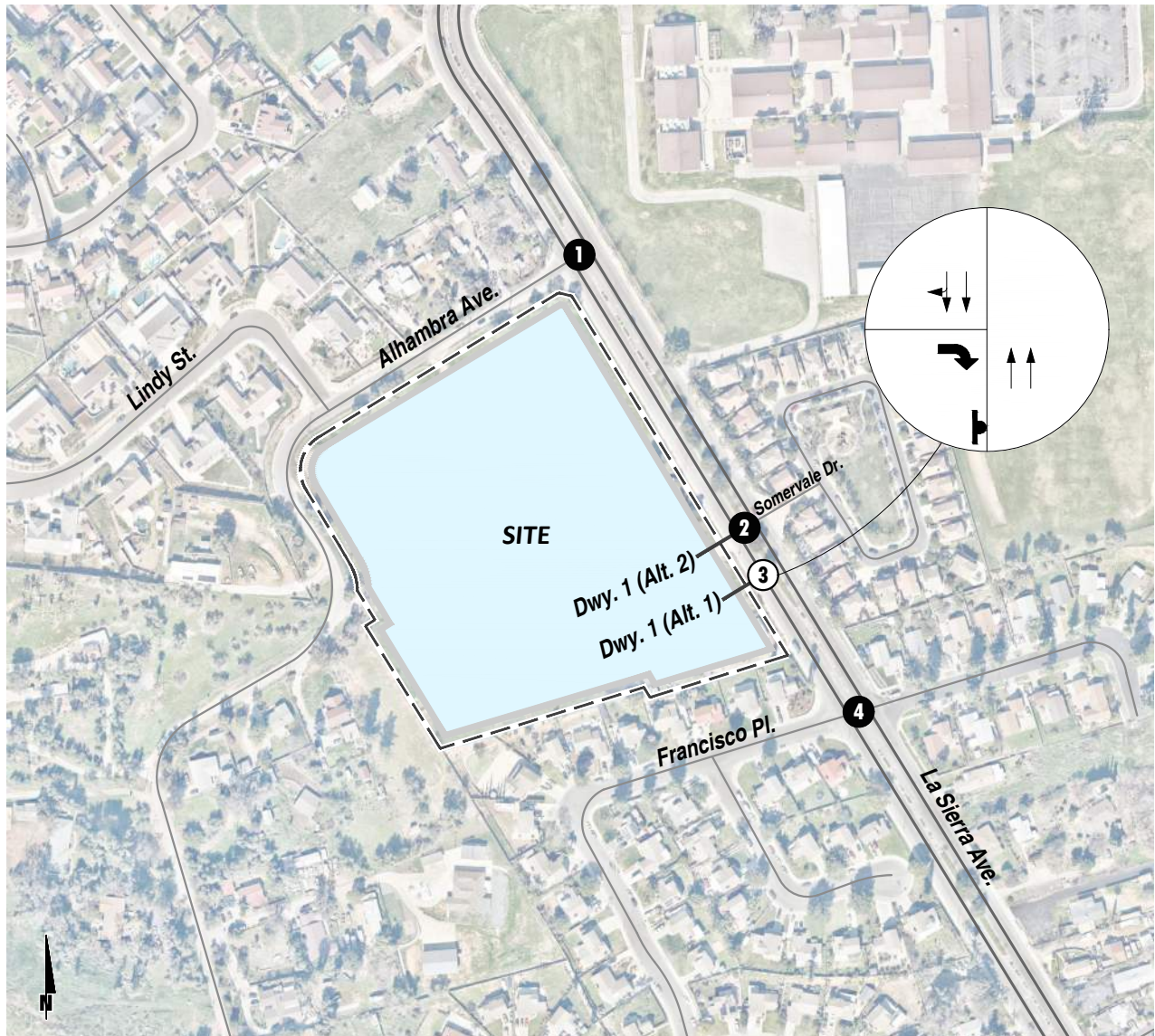
Recommendation 3 (Alternative 2 Only) – La Sierra Av. & Driveway 1/Somervale Dr. (#2) – The following improvements are necessary to accommodate site access:

- Project to construct Driveway 1 on La Sierra Avenue with stop controls for the eastbound traffic (Project egress) in order to facilitate site access.
- Project to construct a median opening at La Sierra Avenue & Driveway 1/Somervale Drive to accommodate northbound and southbound left turn lanes with 100 feet of storage length.

Recommendation 4 – Alhambra Avenue: Project to construct Alhambra Avenue to its ultimate half-section as a Local Street along the Project's frontage from the Project's western boundary to the Project's eastern boundary. Roadway improvements should also include improvements to curb and gutter, sidewalk, and landscaping as needed to accommodate site access and comply with City Standards.

La Sierra is currently constructed to its ultimate half-section width as a Special Boulevard along the Project's frontage from the Project's southern boundary to the Project's northern boundary. However, the Project should improve the curb and gutter, sidewalk, and landscaping as needed to facilitate site access.

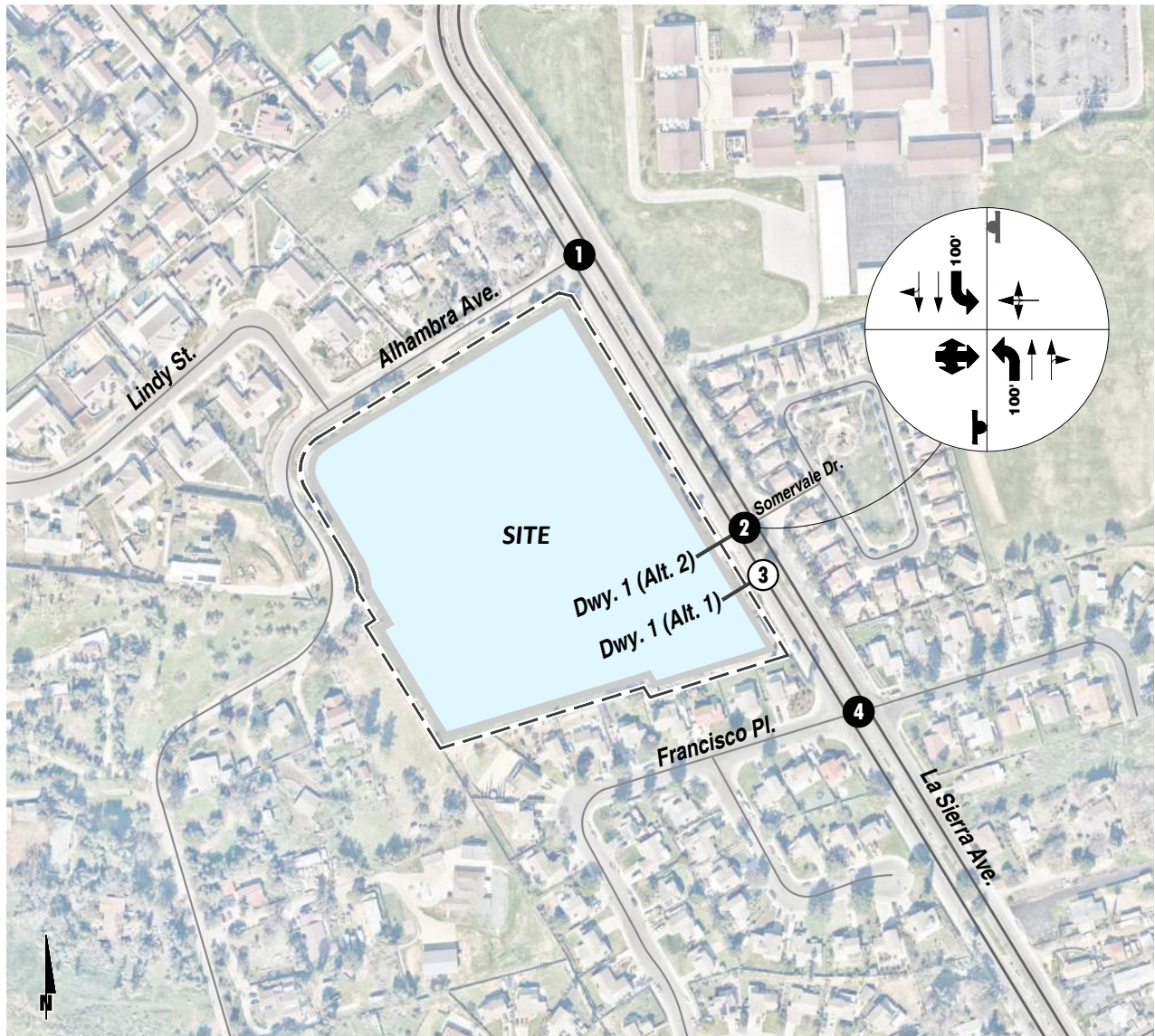
EXHIBIT 1-5 : SITE ACCESS RECOMMENDATIONS (ALTERNATIVE 1)



LEGEND:

- = Existing Intersection Analysis Location
- = Future Intersection Analysis Location
- ⏹ = Proposed Stop Sign
- ↔ = Existing Lane
- ↔ = Proposed Lane

EXHIBIT 1-6 : SITE ACCESS RECOMMENDATIONS (ALTERNATIVE 2)



LEGEND:

- 0** = Existing Intersection Analysis Location
- = Future Intersection Analysis Location
- = Proposed Stop Sign
- = Existing Stop Sign
- = Existing Lane
- = Proposed Lane
- 100'** = Left Turn Lane Storage Length

Recommendation 5 – Speed Feedback Sign: Based on the radar speed survey, the Project is to install a solar speed feedback sign for the northbound traffic of La Sierra Avenue based on the location of Loma Vista Middle School. There is currently an existing 25 MPH sign posted at the proposed location.

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

Sight distance at each Project access point should be reviewed with respect to standard California Department of Transportation (Caltrans) and City of Riverside sight distance standards at the time of preparation of final grading, landscape, and street improvement plans.

TABLE 1-3: SUMMARY OF PROJECT IMPROVEMENTS

#	Intersection Location	Jurisdiction	Improvements	Project Responsibility
Alternative 1 Only				
3	La Sierra Av. & Driveway 1 (Alt. 1)	City of Riverside	Install a stop control on the eastbound approach	Construct
Alternative 2 Only				
2	La Sierra Av. & Driveway 1 (Alt. 2) / Somervale Dr.	City of Riverside	Install a stop control on the eastbound approach	Construct
			Construct a median opening on La Sierra Avenue	Construct
			Construct northbound and southbound left turn lanes in the median with 100' of storage length	Construct

1.7 QUEUING ANALYSIS

A queuing analysis was conducted at the study area intersections for Background (Near-Term) With Cumulative Projects and With Project (Alternatives 1 and 2) traffic conditions to determine the turn pocket lengths necessary to accommodate near-term 95th percentile queues. The traffic modeling and signal timing optimization software package Synchro/SimTraffic (Version 12) has been utilized to assess queues at the Project access points. Synchro is a macroscopic traffic software program that is based on the signalized and unsignalized intersection capacity analyses as specified in the HCM. SimTraffic is designed to model networks of signalized and unsignalized intersections, with the primary purpose of checking and fine-tuning signal operations. SimTraffic uses the input parameters from Synchro to generate random simulations.

The 95th percentile queue is not necessarily ever observed; it is simply based on statistical calculations (or Average Queue plus 1.65 standard deviations). Many jurisdictions utilize the 95th percentile queues for design purposes. SimTraffic simulations have been recorded 5 times, during the weekday AM and weekday PM peak hours, and has been seeded for 15-minute periods with 60-minute recording intervals.

The results of the queuing analysis are shown in Table 1-4 for Background (Near-Term) With Cumulative Projects and With Project (Alternatives 1 and 2) traffic conditions. The minimum storage length for turn pockets to accommodate the 95th percentile queues at the site adjacent intersections and Project driveways were previously shown on Exhibits 1-5 and 1-6. Queuing worksheets are included in Appendix 1.2. There are no queuing deficiencies identified for Background (Near-Term) With Cumulative Projects and With Project (Alternatives 1 and 2) traffic conditions.

TABLE 1-4: QUEUING ANALYSIS FOR BACKGROUND (NEAR-TERM) CONDITIONS

# Intersection	Movement	Available Stacking Distance (Feet)	Alternative 1			Alternative 2			Project Deficiency ²		
			95th Percentile Queue (Feet) ¹ AM Peak Hour	95th Percentile Queue (Feet) ¹ Mid-day Peak Hour	95th Percentile Queue (Feet) ¹ PM Peak Hour	95th Percentile Queue (Feet) ¹ AM Peak Hour	95th Percentile Queue (Feet) ¹ Mid-day Peak Hour	95th Percentile Queue (Feet) ¹ PM Peak Hour	AM	MD	PM
1 La Sierra Av. & Alhambra Av.	NBL	150	46	61	39	46	50	17	No	No	No
	EBL/R	480	39	36	25	38	32	29	No	No	No
2 La Sierra Av. & Driveway 1 (Alt. 2)/Somervale Dr.	NBL	100	Not Applicable			14	26	28	No	No	No
	SBL	100	Not Applicable			13	16	9	No	No	No
	EBL	100	Not Applicable			43	36	42	No	No	No
	WBL/R	100	32	33	32	36	31	36	No	No	No
3 La Sierra Av. & Driveway 1 (Alt. 1)	EBR	100	45	38	37	Not Applicable			No	No	No
4 La Sierra Av. & Francisco Pl.	NBL	140	12	25	17	11	25	18	No	No	No
	SBL	120	18	18	17	7	13	9	No	No	No
	EBL/T/R	210	33	33	31	40	30	33	No	No	No
	WBL/T/R	410	28	23	20	26	21	21	No	No	No

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

² Project deficiency is anticipated if there is identified queuing issue under With Project conditions but not under Without Project conditions

1.8 CONCEPTUAL PLANS

At the request of City staff, the following conceptual site plans have been prepared:

- A conceptual plan to show the effect on on-street parking as a result of the right-in/right-out alternative (see Appendix 1.3). As a result of the right-in/right-out driveway, an estimated 386 feet of on-street parking (or 15 on-street spaces) will be removed.
- A conceptual plan to show the effect on on-street parking as a result of the full access and median opening alternative (see Appendix 1.4). As a result of the full access driveway and median opening, an estimated 460 feet of on-street parking (or 18 on-street spaces) will be removed.
- A conceptual plan to show a high visibility crosswalk at the west leg of Alhambra Avenue and La Sierra Avenue (see Appendix 1.5). The crosswalk shall be installed in accordance with California Vehicle Code (CVC) 21368 below:
 - *“Whenever a marked pedestrian crosswalk has been established in a roadway contiguous to a school building or the grounds thereof, it shall be painted or marked in yellow as shall be all the marked pedestrian crosswalks at an intersection in case any one of the crosswalks is required to be marked in yellow. Other established marked pedestrian crosswalks may be painted or marked in yellow if either (a) the nearest point of the crosswalk is not more than 600 feet from a school building or the grounds thereof, or (b) the nearest point of the crosswalk is not more than 2,800 feet from a school building or the grounds thereof, there are no intervening crosswalks other than those contiguous to the school grounds, and it appears that the facts and circumstances require special painting or marking of the crosswalks for the protection and safety of persons attending the school.”*

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 Riverside's Traffic Study Guidelines.

2.1 LEVEL OF SERVICE

Traffic operations of roadway facilities are described using the term "Level of Service" (LOS). LOS is a qualitative description of traffic flow based on several factors such as speed, travel time, delay, and freedom to maneuver. Six levels are typically defined ranging from LOS A, representing completely free-flow conditions, to LOS F, representing 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 the 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 City of Riverside 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 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 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 ≤ 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 failure are noticeable.	35.01 to 55.0	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

¹ Source: HCM, 7th Edition

² If V/C is greater than 1.0, then LOS F per HCM.

A saturation flow rate of 1900 has been utilized for all study area intersections located within the City of Riverside. 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., $PHF = \frac{[Hourly Volume]}{[4 \times Peak 15\text{-minute Flow Rate}]}$). 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 City of Riverside 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

¹ Source: HCM, 7th Edition

² If V/C is greater than 1.0, then LOS 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) All applicable California MUTCD traffic signal warrants (9 warrants) will be assessed for both Alhambra Avenue and Francisco Place along La Sierra Avenue for Existing traffic conditions. All future traffic conditions will evaluate either peak hour (Warrant 3) or ADT-based traffic signal warrants only.

Warrant 3 is appropriate to use for this TA because it provides specialized warrant criteria for intersections with urban characteristics (e.g., adjacent major streets operating at or below 40 miles per hour) or rural characteristics (e.g., adjacent major streets operating above 40 miles per hour). For

the purposes of this study, the speed limit was the basis for determining whether Urban or Rural warrants were used for a given intersection.

Future intersections that do not currently exist have been assessed regarding the potential need for new traffic signals based on future average daily traffic (ADT) volumes, using the Caltrans planning level ADT-based signal warrant analysis worksheets. 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 following study area intersections shown in Table 2-3:

TABLE 2-3: TRAFFIC SIGNAL WARRANT ANALYSIS LOCATIONS

#	Intersection
1	La Sierra Av. & Alhambra Av.
2	La Sierra Av. & Driveway 1 (Alt. 2)/Somervale Dr.
3	La Sierra Av. & Driveway 1 (Alt. 1)
4	La Sierra Av. & Francisco Pl.

Intersections with restricted access (right-in/right-out only) have not been evaluated for traffic signal warrant analysis (i.e., La Sierra Av. & Somervale Dr. (Alternative 2 only) or La Sierra Av. & Driveway 1 (Alternative 1 only).

The traffic signal warrant analyses for future conditions are presented in Section 5 *Background (Near-Term) (2028) 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 QUEUING ANALYSIS

The traffic modeling and signal timing optimization software package SimTraffic has been utilized to assess the queues. 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. These random simulations generated by SimTraffic have been utilized to determine the 95th percentile queue lengths observed for each applicable turn lane. A SimTraffic simulation has been recorded up to 5 times, during the weekday AM and weekday PM peak hours, and has been seeded for 15-minute periods with 60-minute recording intervals.

2.5 MINIMUM ACCEPTABLE LEVELS OF SERVICE (LOS)

The City of Riverside has established LOS D as the minimum level of service for its intersections. However, 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. This traffic analysis utilizes a minimum acceptable LOS of D.

2.6 DEFICIENCY CRITERIA

Per the City of Riverside traffic study guidelines, for Projects that are in conformance with the General Plan:

- a) LOS C is to be maintained at all street intersections
- b) LOS D is to be maintained at intersections of Collector or higher classification (see General Plan Policy CCM 2.3).

For Projects that propose uses or intensities above that contained in the General Plan, operational improvements are required when the addition of Project related trips causes either peak hour LOS to degrade from acceptable to unacceptable levels or the peak hour delay to increase as follows:

LOS	Delay Threshold
LOS A/B	By 10 Seconds
LOS C	By 8 Seconds
LOS D	By 5 Seconds
LOS E	By 2 Seconds
LOS F	By 1 Second

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3 AREA CONDITIONS

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

3.1 EXISTING CIRCULATION NETWORK

Pursuant to the agreement with City of Riverside staff (Appendix 1.1), the study area includes a total of 3 existing intersections and 1 future intersection as shown previously on Exhibit 1-4. 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 RIVERSIDE GENERAL PLAN CIRCULATION ELEMENT

As noted previously, the Project site is located within the City of Riverside. The roadway classifications and planned (ultimate) roadway cross-sections of the major roadways within the study area, as identified in the City of Riverside General Plan Circulation Element, are described subsequently. Exhibit 3-2 shows the City of Riverside General Plan Circulation Element and Exhibit 3-3 illustrates the City of Riverside General Plan Roadway Cross-Sections.

Study area roadways that are classified as a Special Boulevard have variable widths and design. The following study area roadway within the City of Riverside is classified as a Special Boulevard:

- La Sierra Avenue

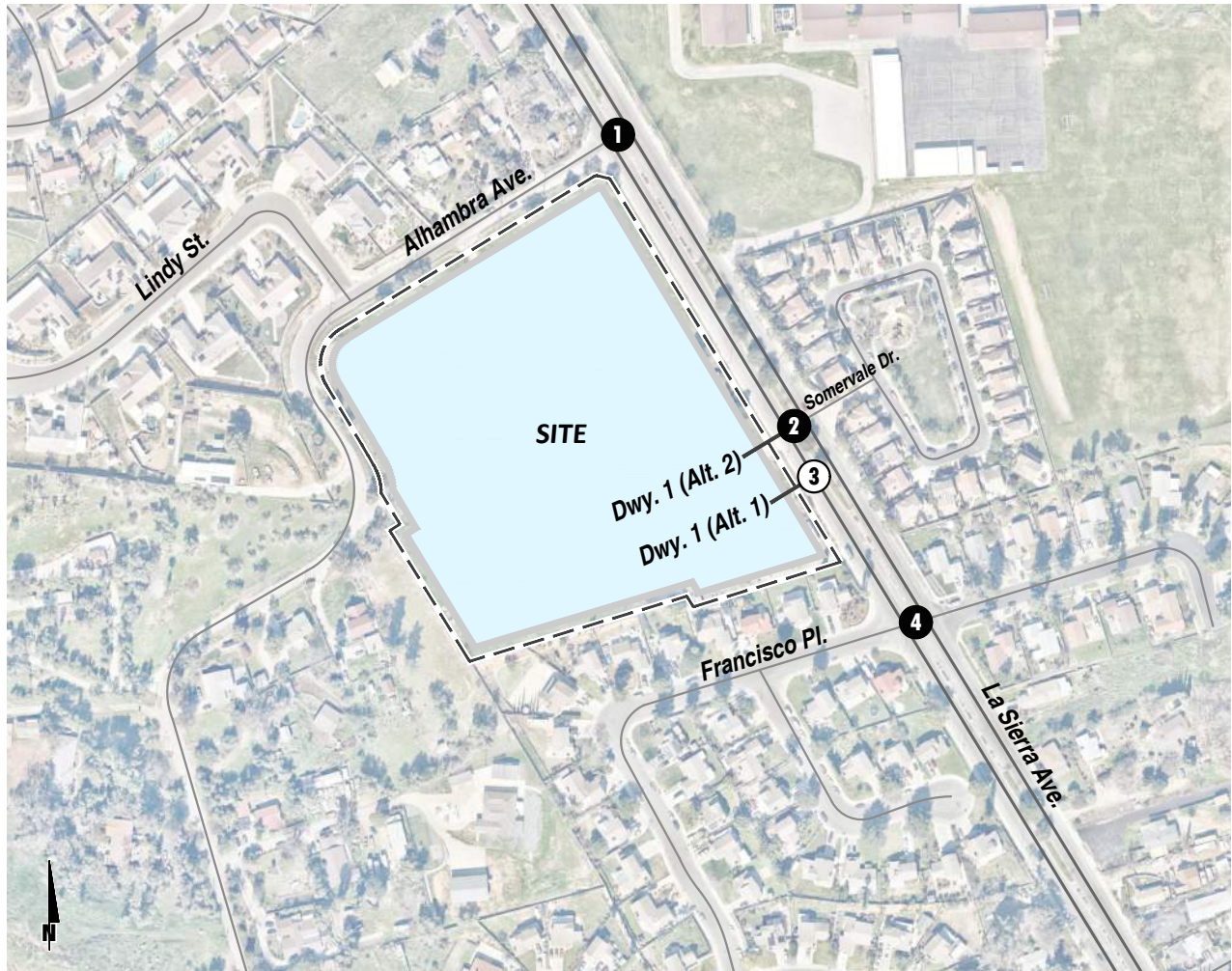
Study area roadways that are classified as a Local are identified as having two lanes of travel. The following study area roadways within the City of Riverside are classified as a Local:

- Alhambra Avenue
- Somervale Drive
- Francisco Place



3.3 BICYCLE AND PEDESTRIAN FACILITIES

The City of Riverside Master Plan of Trails and Bikeways is shown on Exhibit 3-4. There is a designated Class II bikeway that runs along La Sierra Avenue in the vicinity of the study area. Existing pedestrian facilities within the study area are shown on Exhibit 3-5. As shown on Exhibit 3-5, there are existing pedestrian facilities provided along the Project's frontage and in the vicinity of the Project site to provide pedestrian connectivity throughout the study area.

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



LEGEND:

- = Existing Intersection Analysis Location
- = Future Intersection Analysis Location
-  = Existing Stop Sign
-  = Existing Lane

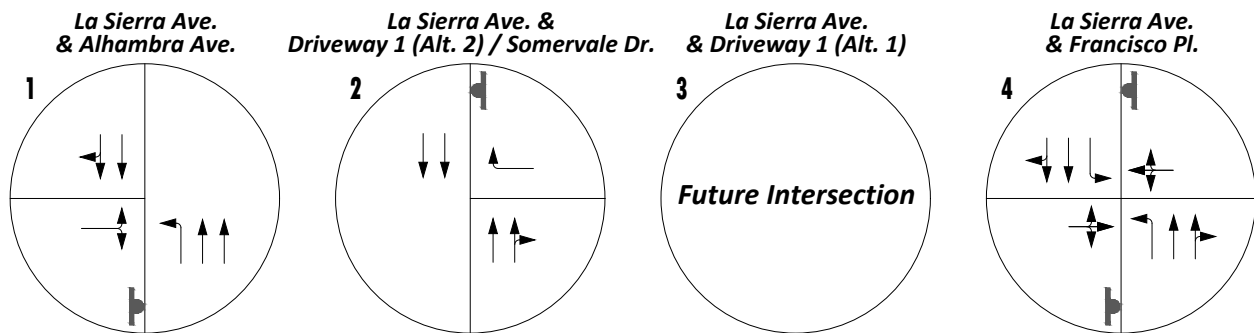


EXHIBIT 3-2 : CITY OF RIVERSIDE GENERAL PLAN CIRCULATION ELEMENT

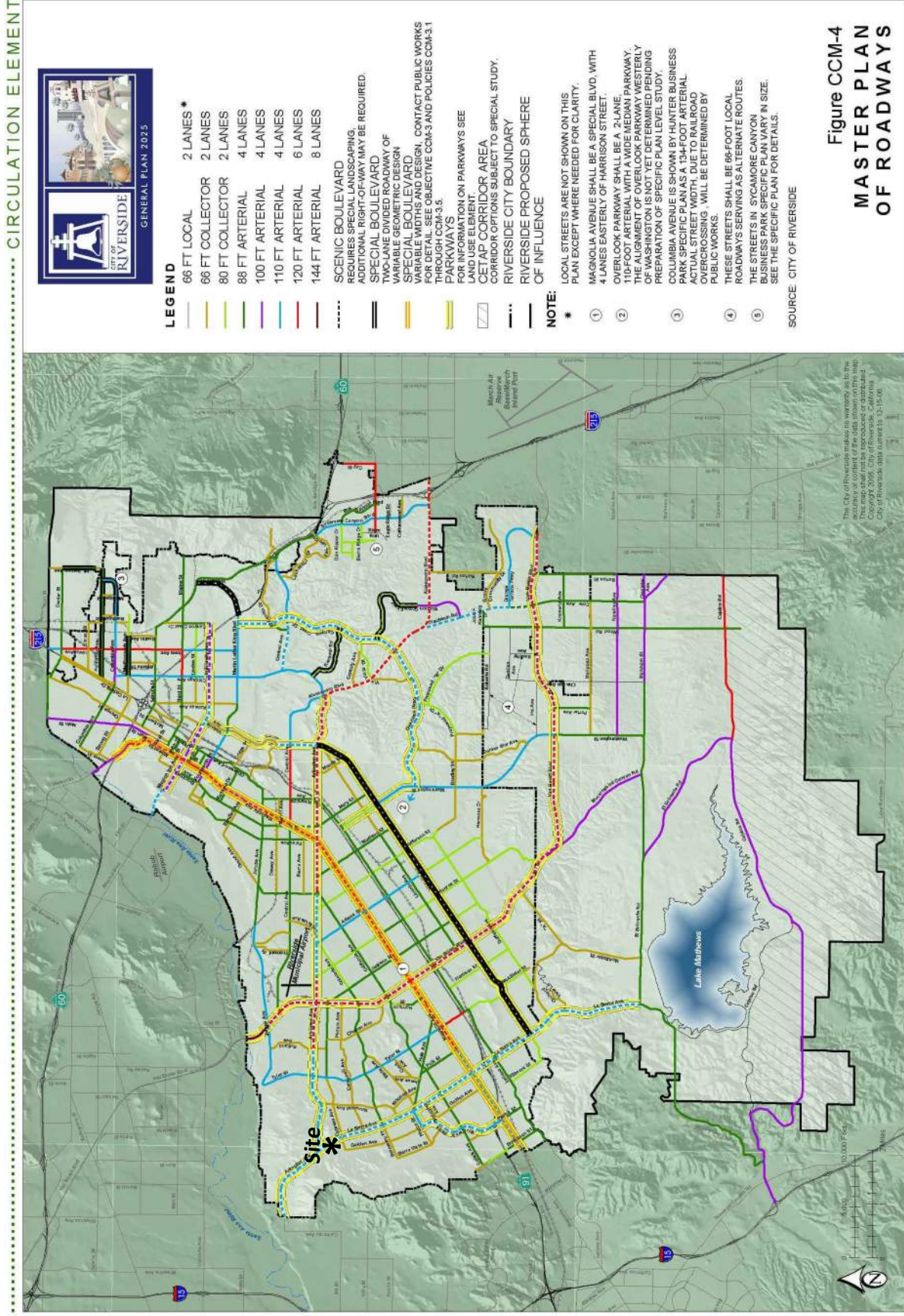


EXHIBIT 3-3 : CITY OF RIVERSIDE GENERAL PLAN ROADWAY CROSS-SECTIONS

CIRCULATION ELEMENT

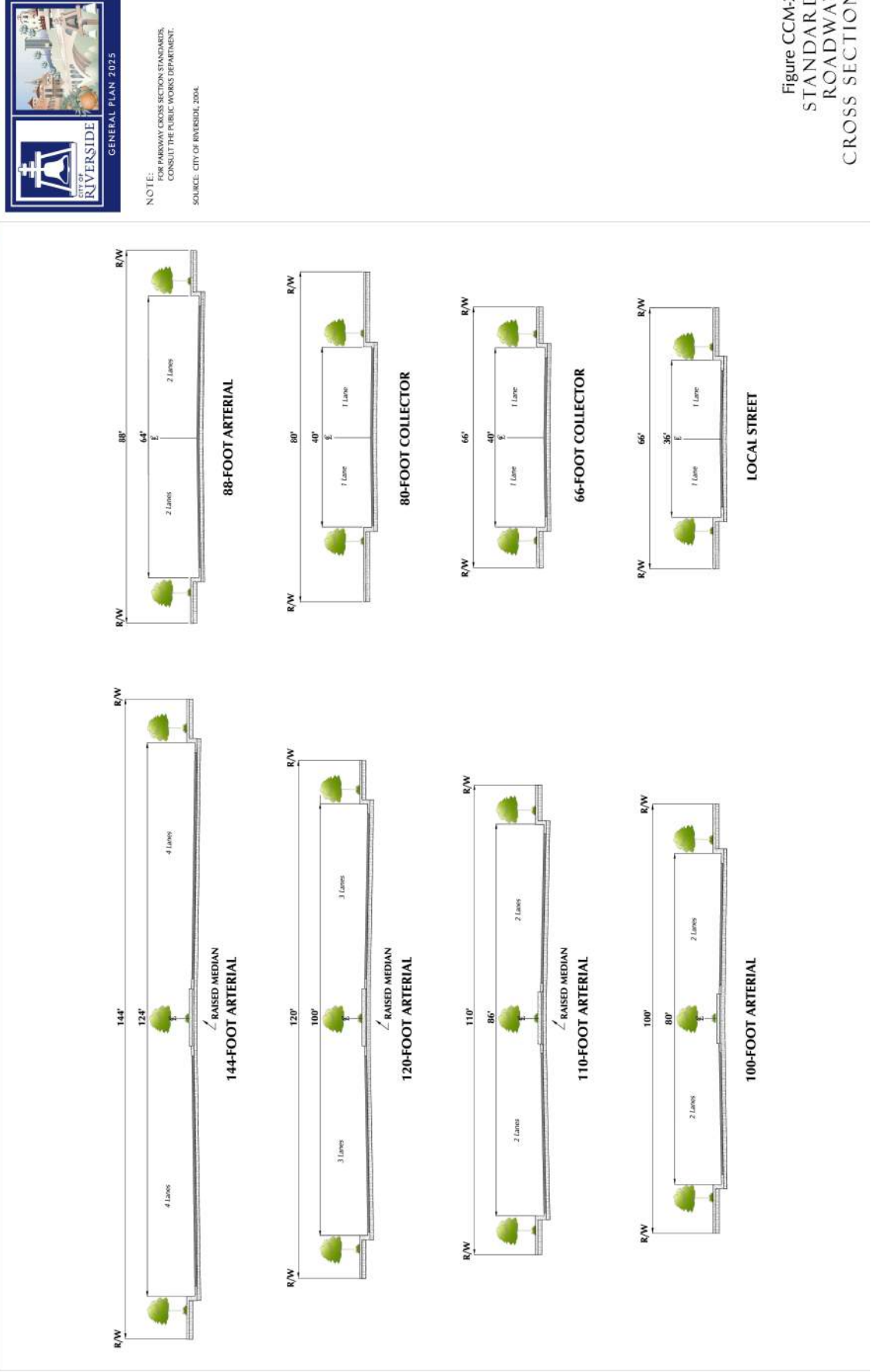


EXHIBIT 3-4 : CITY OF RIVERSIDE MASTER PLAN OF TRAILS AND BIKEWAYS

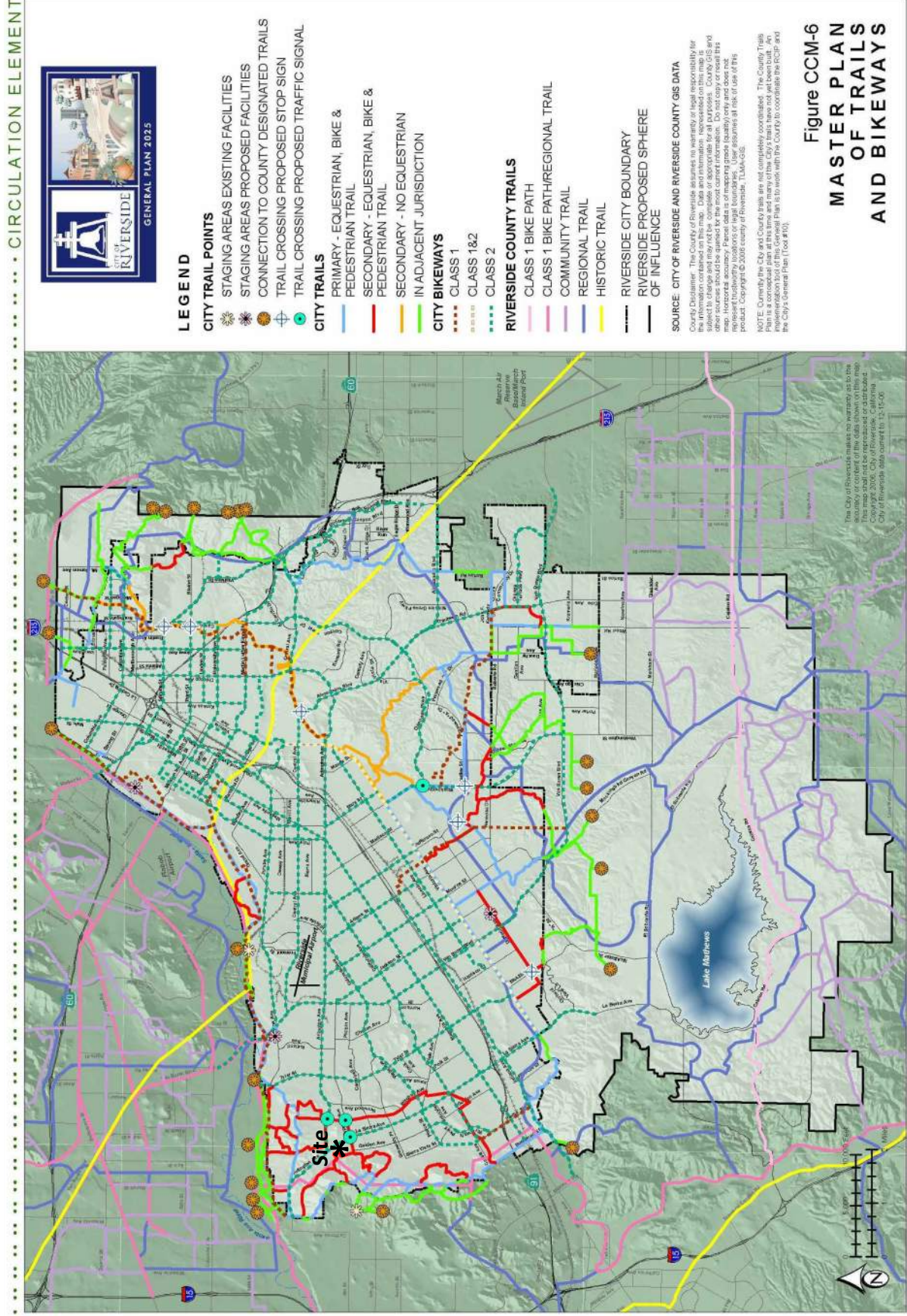
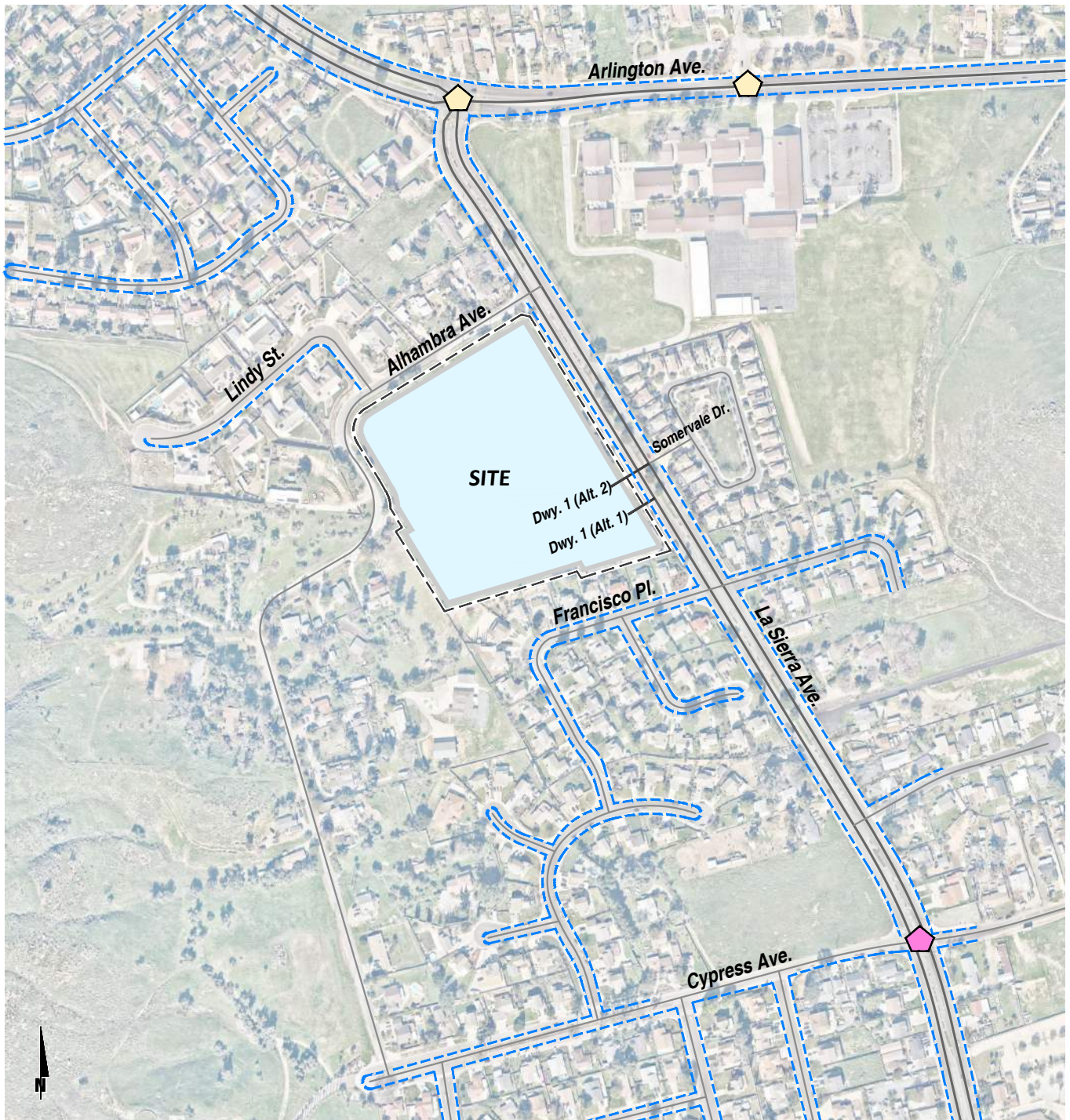





EXHIBIT 3-5 : EXISTING PEDESTRIAN FACILITIES



LEGEND:

-  = All Approaches
-  = 2 Approaches (School)
-  = Sidewalks

3.4 TRANSIT SERVICE

The Riverside Transit Authority (RTA) currently serves the City of Riverside. Transit service is reviewed and updated by RTA periodically to address ridership, budget, and community demand needs. Existing transit routes in the vicinity of the study area are illustrated on Exhibit 3-6. As shown, Route 15 provides service along La Sierra Avenue. There is an existing bus stop along the Project's frontage, approximately 70' south of the intersection of La Sierra Avenue and Alhambra Avenue.

3.5 EXISTING TRAFFIC COUNTS

The intersection LOS analysis is based on the traffic volumes observed during the peak hour conditions using traffic count data collected in April 2024. The following peak hours were selected for analysis:

- Weekday AM Peak Hour (peak hour between 7:00 AM and 9:00 AM)
- Weekday Mid-Day Peak Hour (peak hour between 1:30 PM and 3:30 PM)
- Weekday PM Peak Hour (peak hour between 4:00 PM and 6:00 PM)

Local schools were in session with in-person instruction, as such, no additional adjustments were made to the traffic counts for the purposes of establishing the existing baseline. The 2024 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 3-7. 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:

$$\text{Weekday PM Peak Hour (Approach Volume + Exit Volume)} \times 11.31 = \text{Leg Volume}$$

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 8.85 percent. As such, the above equation utilizing a factor of 11.31 estimates the ADT volumes on the study area roadway segments assuming a peak-to-daily relationship of approximately 8.85 percent (i.e., $1/0.0885 = 11.31$) and was assumed to sufficiently estimate ADT volumes for planning-level analyses. Existing weekday AM and weekday PM peak hour intersection volumes are also shown on Exhibit 3-7. Existing weekday mid-day PM peak hour intersection volumes are shown on Exhibit 3-8.

In addition to the traffic volume data, a radar speed survey was conducted on La Sierra Avenue between Arlington Avenue and Francisco Place. The survey was conducted under clear and dry weather conditions while traffic was operating under free-flow conditions (i.e., off-peak hours). A sample of 100 vehicles were determined to have an 85th-percentile speed of 50 miles per hour (MPH) with a 40 – 49 MPH pace. The posted speed limit on La Sierra Avenue is 45 MPH. The speed survey is included in Appendix 3.2.

EXHIBIT 3-6 : CITY OF RIVERSIDE TRANSIT MAP

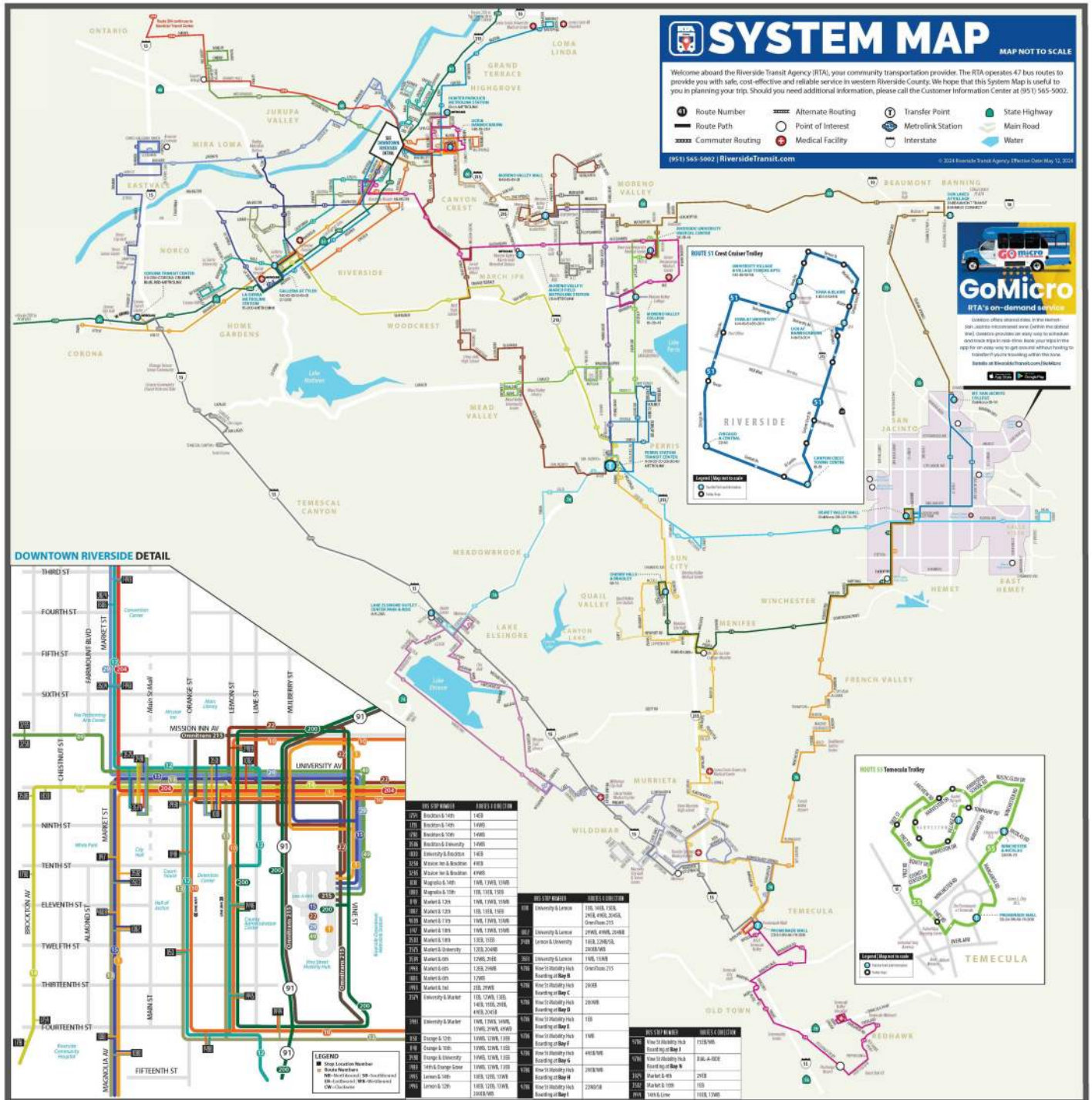
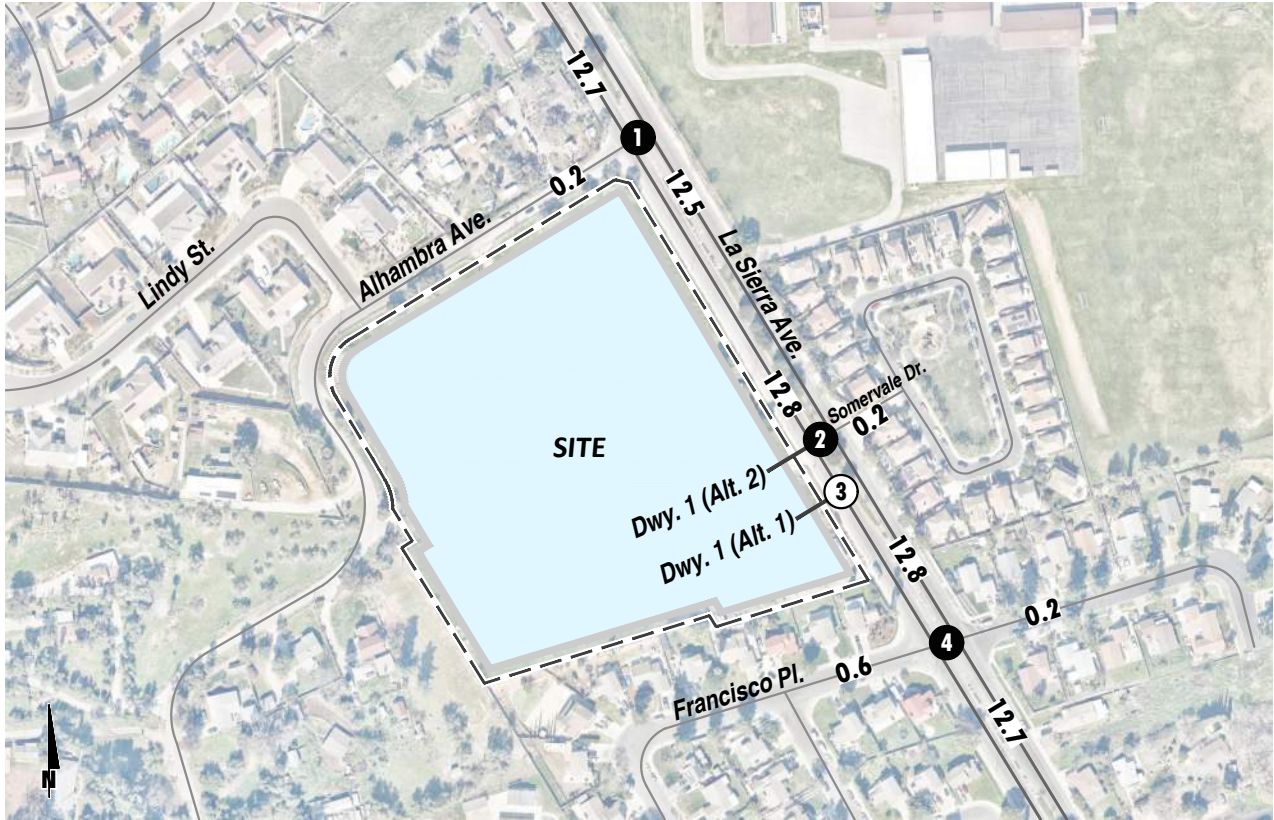


EXHIBIT 3-7 : EXISTING (2024) AM/PM PEAK HOUR TRAFFIC VOLUMES



LEGEND:

- ① = Existing Intersection Analysis Location
- ② = Future Intersection Analysis Location
- 00(00) = Peak Hour Volume AM (PM)
- 00 = Average Daily Traffic (ADT) in Thousands

