KTM French Valley

TRAFFIC IMPACT ANALYSIS

COUNTY OF RIVERSIDE

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LIST OF ABBREVIATED TERMS

(1)	Reference
ADT	Average Daily Traffic
Caltrans	California Department of Transportation
CEQA	California Environmental Quality Act
CMP	Congestion Management Program
DIF	Development Impact Fee
E+P	Existing Plus Project
EAP	Existing Plus Ambient Growth Plus Project
EAPC	Existing Plus Ambient Growth Plus Project Plus Cumulative
HCM	Highway Capacity Manual
ITE	Institute of Transportation Engineers
LOS	Level of Service
MUTCD	Manual on Uniform Traffic Control Devices
N/A	Not Applicable
PHF	Peak Hour Factor
Project	KTM French Valley
RBBD	Road and Bridge Benefit District
RCIP	Riverside County Integrated Project
RCTC	Riverside County Transportation Commission
RivTAM	Riverside County Transportation Analysis Model
RTA	Riverside Transit Authority
RTP	Regional Transportation Plan
SCAG	Southern California Association of Governments
SCS	Sustainable Communities Strategy
SHS	State Highway System
TIA	Traffic Impact Analysis
TUMF	Transportation Uniform Mitigation Fee
WRCOG	Western Riverside Council of Governments

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1 INTRODUCTION

This report presents the results of the traffic impact analysis (TIA) for the proposed KTM French Valley development ("Project"), which is located on the northeast corner of Winchester Road and Hunter Road in unincorporated County of Riverside as shown on Exhibit 1-1.

The purpose of this TIA is to evaluate the potential circulation system deficiencies that may result from the development of the proposed Project, and recommend improvements to achieve acceptable circulation system operational conditions. This TIA has been prepared in accordance with the *County of Riverside Transportation Department Traffic Impact Analysis Preparation Guide* (April 2008), the California Department of Transportation (Caltrans) *Guide for the Preparation of Traffic Impact Studies* (December 2002), and consultation with County of Riverside staff during the scoping process. (1) (2) The approved Project Traffic Study Scoping agreement is provided in Appendix 1.1 of this TIA.

1.1 PROJECT OVERVIEW

The Project is proposed to consist of the development of 32,292 square feet of warehouse use, 65,100 square feet of office use, and a 66,306 square foot research and development center.

The Project is proposed to have access via 1 Driveway on Winchester Road (SR-79) and 2 driveways along Sky Canyon Drive. All 2 driveways on Sky Canyon Drive are proposed for full access and the single driveway on Winchester Road (SR-79) is proposed for right-in-right-out access only.

For the purposes of this analysis, it is assumed that the Project will be constructed within a single phase of development, and is anticipated to be fully built and operational by Year 2020.

Trips generated by the Project's proposed land uses have been estimated based on trip generation rates collected by the Institute of Transportation Engineers (ITE) *Trip Generation Manual*, 10th Edition, 2017. (3) The Project is anticipated to generate a net total of 1,487 PCE trip-ends per day with 100 PCE AM peak hour trips and 111 PCE PM peak hour trips. In comparison, the Project is anticipated to generate a net total of 1,469 trip-ends per day with 99 AM peak hour trips and 109 PM peak hour trips in terms of 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* of this report.

EXHIBIT 1-1: PRELIMINARY SITE PLAN

1.2 ANALYSIS SCENARIOS

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

- Existing (2018)
- Existing plus Project (E+P)
- Existing plus Ambient Growth Plus Project (EAP) (2020)
- Existing plus Ambient Growth Plus Project Plus Cumulative (EAPC) (2020)

All study area intersections will be evaluated using the Highway Capacity Manual (HCM) Version 6 analysis methodology.

1.2.1 EXISTING CONDITIONS

Information for Existing (2018) conditions is disclosed to represent the baseline traffic conditions as they existed at the time of the preparation of the traffic study.

1.2.2 E+P CONDITIONS

The Existing plus Project (E+P) analysis determines circulation system deficiencies that would occur on the existing roadway system in the scenario of the Project being placed upon Existing conditions. The E+P scenario has been provided for information purposes.

1.2.3 EAP CONDITIONS

The Existing plus Ambient Growth plus Project (EAP) (2020) conditions analysis determines the significant traffic impacts based on a comparison of the EAP traffic conditions to Existing conditions (i.e., baseline conditions). An ambient growth of 4.04% (2 percent per year over two years) has conservatively been included for EAP traffic conditions to account for background traffic growth for the purposes of this analysis. Cumulative development projects are not included as part of the EAP analysis. For the purposes of this traffic analysis, the EAP scenario has been utilized to discern significant Project impacts consistent with the County of Riverside traffic study guidelines.

1.2.4 EAPC CONDITIONS

The Existing plus Ambient Growth plus Project plus Cumulative (2020) (EAPC) conditions analysis will be utilized to determine if improvements funded through regional transportation mitigation fee programs, such as the Transportation Uniform Mitigation Fee (TUMF) and County Development Impact Fee (DIF) programs, or other approved funding mechanism can accommodate the near-term cumulative traffic at the target level of service (LOS) identified in the County of Riverside General Plan. (4) If the "funded" improvements can provide the target LOS, then the Project's payment into TUMF and/or DIF will be considered as near-term cumulative mitigation through the conditions of approval. Other improvements needed beyond the "funded" improvements (such as localized improvements to non-TUMF facilities) are identified as such. To account for background traffic, other known cumulative development projects in the study area were included in addition to 2% per year of ambient growth for EAPC traffic conditions in conjunction with traffic associated with the proposed Project. Although it is unlikely that these cumulative projects would be fully built and occupied by 2020, they have been included in an effort to conduct a conservative analysis and overstate and opposed to understate potential traffic impacts.

The currently adopted Southern California Association of Governments (SCAG) 2016 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS) (April 2016) growth forecasts for the unincorporated areas of the County of Riverside identifies projected growth in population of 359,000 in 2012 to 499,200 in 2040, or a 39.1 percent increase over the 28-year period. (5) The change in population equates to roughly a 1.18 percent growth rate compounded annually. Similarly, growth over the same 28-year period in households is projected to increase by 1.34 percent annual growth rate. Finally, growth in employment over the same 28-year period is projected to increase by a 2.89 percent annual growth rate.

Based on a comparison of Existing traffic volumes to the EAPC (2020) forecasts, the average growth rate is estimated at approximately 15.36 percent compounded annually between Existing and EAPC (2020) traffic conditions. The annual growth rate at each individual intersection is not lower than 12.03 percent compounded annually to as high as 21.80 percent compounded annually over the same period. Therefore, the annual growth rate utilized for the purposes of this analysis would appear to conservatively approximate the anticipated regional growth in traffic volumes in the County of Riverside for EAPC traffic conditions, especially when considered along with the addition of project-related traffic. As such, the growth in traffic volumes assumed in this traffic impact analysis would tend to overstate as opposed to understate the potential impacts to traffic and circulation.

1.3 STUDY AREA

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

1.3.1 INTERSECTIONS

The Project study area was defined in coordination with the County of Riverside. Consistent with County of Riverside traffic study guidelines, the study area includes any intersection of "Collector" or higher classification street, with "Collector" or higher classification streets, at which the proposed project will add 50 or more peak hour trips. Exhibit 1-2 and Table 1-1 presents the study area and intersection analysis locations.

EXHIBIT 1-2: LOCATION MAP

LEGEND:

0 = EXISTING INTERSECTION ANALYSIS LOCATION

0 = FUTURE INTERSECTION ANALYSIS LOCATION

N

The "50 peak hour trip" criteria generally represents a minimum number of trips at which a typical intersection would have the potential to be substantively impacted by a given development proposal. Although each intersection may have unique operating characteristics, this traffic engineering rule of thumb is a widely utilized tool for estimating a potential area of impact (i.e., study area).

To ensure that this TIA satisfies the needs of the County of Riverside, Urban Crossroads, Inc. prepared a Project specific traffic study scoping agreement for review by County staff prior to the preparation of this TIA. The agreement provides an outline of the study area, trip generation, trip distribution, and analysis methodology. The agreement approved by the County of Riverside is included in Appendix 1.1.

TABLE 1-1: INTERSECTION ANALYSIS LOCATIONS

ID	Intersection Location	Jurisdiction	CMP?
1	Winchester Rd. (SR-79) & Via Mira Mosa/Auld Rd.	Caltrans, RivCo, Murrieta	No
2	Winchester Rd. (SR-79) & La Alba Dr./Sparkman Wy.	Caltrans, RivCo, Murrieta	No
3	Winchester Rd. (SR-79) & Driveway 1	Caltrans, RivCo, Murrieta	No
4	Winchester Rd. (SR-79) & Hunter Rd.	Caltrans, RivCo, Murrieta	No
5	Winchester Rd. (SR-79) & Robert Trent Jones Pkwy./Technology Dr.	Caltrans, RivCo, Murrieta	No
6	Winchester Rd. (SR-79) & Murrieta Hot Springs Rd.	Caltrans, RivCo, Murrieta	No
7	Sky Canyon Dr. & Sparkman Wy.	Riverside County	No
8	Sky Canyon Dr. & Driveway 2	Riverside County	No
9	Sky Canyon Dr. & Driveway 3	Riverside County	No

1.4 ANALYSIS FINDINGS

This section provides a summary of the analysis results for Existing (2018), E+P, EAP (2020), and EAPC (2020).

Existing (2018) Conditions

A summary of LOS results for Existing traffic conditions are presented in Exhibit 1-3. For Existing (2018) traffic conditions, the study area intersections are currently operating at an acceptable level of service (LOS) (i.e., LOS D or better) during one or both of the peak hours, with the exception of the following intersection:

- Winchester Rd. (SR-79) & Murrieta Hot Springs Rd. (#6) – LOS E AM peak hour; LOS F PM peak hour

E+P Conditions

The intersection analysis results indicate that the addition of Project traffic is not anticipated to result in any additional LOS deficiencies, in addition to those previously identified under Existing (2018) traffic conditions (see Exhibit 1-3).

EAP (2020) Conditions

The intersection analysis results indicate that there are no additional study area intersections anticipated to operate at an unacceptable LOS under EAP (2020) traffic conditions, in addition to the location previously identified under Existing (2018) and E+P traffic conditions (see Exhibit 1-3).

EAPC (2020) Conditions

The intersection analysis results indicate that the following study area intersection is anticipated to operate at an unacceptable LOS under EAPC (2020) traffic conditions, in addition to the location previously identified under Existing (2018), E+P, and EAP (2018) traffic conditions (see Exhibit 1-3):

- Winchester Rd. (SR-79) & Via Mira Mosa/Auld Rd. (#1) – LOS F AM and PM peak hours
- Winchester Rd. (SR-79) & La Alba Dr./Sparkman Wy. (#2) – LOS E AM peak hour; LOS F PM peak hour
- Winchester Rd. (SR-79) & Hunter Rd. (#4) – LOS E AM peak hour; LOS F PM peak hour

1.5 CIRCULATION SYSTEM DEFICIENCIES AND RECOMMENDED IMPROVEMENTS

A summary of the operationally deficient study area intersections and recommended improvements required to achieve acceptable circulation system performance are described in detail within Section 3 *Existing Conditions*, Section 5 *E+P Traffic Analysis*, Section 6 *EAP Traffic Analysis*, and Section 7 *EAPC Traffic Analysis* of this report.

A summary of off-site improvements needed to address intersection operational deficiencies for each analysis scenario is included in Table 1-2. These recommended improvements are consistent with or less than the geometrics assumed in the County of Riverside and City of Murrieta General Plan Circulation Elements. Improvements found to be included in the Western Riverside Council of Governments (WRCOG) TUMF and County of Riverside's (lead agency) DIF fee program have been identified as such. For improvements that do not appear to be in the TUMF or DIF, or Southwest RBBD programs, a fair share financial contribution based on the Project's fair share impact may be imposed in order to mitigate the Project's share of impacts in lieu of construction. These fees (both to the County of Riverside, TUMF, and as determined, to surrounding agencies as fair-share contributions) are collected as part of a funding mechanism aimed at ensuring that regional highways and arterial expansions keep pace with the projected vehicle trip increases. Additional information related to these various fee programs are contained in Section 1.6 *Local and Regional Funding Mechanisms* of this report.

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

#	Intersection	Existing (2018)	E+P	EAP (2020)	EAPC (2020)
1	Winchester Rd. (SR-79) & Via Mira Mosa/Auld Rd.	🟢🟢	🟢🟢	🟢🟢	🔴🔴
2	Winchester Rd. (SR-79) & La Alba DR./Sparkman Wy.	🟢🟢	🟢🟢	🟢🟢	🟡🔴
3	Winchester Rd. (SR-79) & Dwy. 1	NA	🟢🟢	🟢🟢	🟢🟢
4	Winchester Rd. (SR-79) & Hunter Rd.	🟢🟢	🟢🟢	🟢🟢	🟡🔴
5	Winchester Rd. (SR-79) & Robert Trent Jones Pkwy./Technology Dr.	🟢🟢	🟢🟢	🟢🟢	🟢🟢
6	Winchester Rd. (SR-79) & Murrieta Hot Springs Rd.	🟡🔴	🟡🔴	🟡🔴	🔴🔴
7	Sky Canyon Dr. & Sparkman Wy.	🟢🟢	🟢🟢	🟢🟢	🟢🟢
8	Sky Canyon Dr. & Dwy. 1	NA	🟢🟢	🟢🟢	🟢🟢
9	Sky Canyon Dr. & Dwy. 2	NA	🟢🟢	🟢🟢	🟢🟢

LEGEND:

◖ = AM PEAK HOUR
◗ = PM PEAK HOUR
🟢 = LOS A-D
🟡 = LOS E
🔴 = LOS F
NA = NOT AN ANALYSIS LOCATION FOR THIS SCENARIO

Table 1-2

Summary of Improvements by Analysis Scenario

#	Intersection Location	Jurisdiction	Recommended Improvements[1]				Improvements in TUMF, RBBD or DIF[2]?	Fair Share %[3]
			Existing (2018)	E+P	EAP 2020	EAPC 2020		
1	Winchester Rd. (SR-79) & Via Mira Mosa/Auld Rd.	Caltrans, Riverside County, Murrieta	None	None	None	- 3rd NB through lane - 2nd SB left turn lane - 3rd SB though lane - 2nd WB left turn lane - WB right turn lane	Yes (TUMF) No Yes (TUMF) No No	3.9%
2	Winchester Rd. (SR-79) & La Alba Dr./Sparkman Wy.	Caltrans, Riverside County, Murrieta	None	None	None	- 3rd NB through lane - 3rd SB though lane - WB left turn lane	Yes (TUMF) Yes (TUMF) No	6.8%
4	Winchester Rd. (SR-79) & Hunter Rd.	Caltrans, Riverside County, Murrieta	None	None	None	- 3rd NB through lane - 3rd SB though lane	Yes (TUMF) Yes (TUMF)	5.7%
6	Winchester Rd. (SR-79) & Murrieta Hot Springs Rd.	Caltrans, Riverside County, Murrieta	- Modify traffic signal to provide overlap phasing on the SB right turn lane - Eliminate pedestrian crosswalk on the north leg	Same Same	Same Same	Same Same - Overlap phasing on NB, EB, and WB right turn lanes - 3rd WB through lane	No No No No	4.5%

[1] All recommended improvements are consistent with the general plan designations of the respective jurisdictions in which they are located.

[2] Improvements are identified as being included in the Western Riverside Council of Governments (WRCOG) Transportation Uniform Mitigation Fee (TUMF) program, Southwest RBBD and/or County of Riverside DIF.

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

1.6 LOCAL AND REGIONAL FUNDING MECHANISMS

1.6.1 TRANSPORTATION UNIFORM MITIGATION FEE (TUMF) PROGRAM

The TUMF program is administered by the WRCOG based upon a regional Nexus Study most recently updated in 2017 to address major changes in right of way acquisition and improvement cost factors. (4) This regional program was put into place to ensure that development pays its fair share and that funding is in place for construction of facilities needed to maintain the requisite level of service and critical to mobility in the region. TUMF is a truly regional mitigation fee program and is imposed and implemented in every jurisdiction in Western Riverside County, except the City of Beaumont.

TUMF fees are imposed on new residential, industrial, and commercial development through application of the TUMF fee ordinance and fees are collected at the building or occupancy permit stage. In addition, an annual inflation adjustment is considered each year in February. In this way, TUMF fees are adjusted upwards on a regular basis to ensure that the development impact fees collected keep pace with construction and labor costs, etc.

1.6.2 DEVELOPMENT IMPACT FEE (DIF) PROGRAM

The Project is located within the County's Southwest Area Plan and therefore will be subject to County of Riverside DIF in an effort by the County to address development throughout its unincorporated area. The DIF program consists of two separate transportation components: Roads, Bridges and Major Improvements component and the Traffic Signals component. Eligible facilities for funding by the County DIF program are identified on the County's Public Needs List, which currently extends through the year 2010. (6) A comprehensive review of the DIF program is now planned in order to update the nexus study. This will result in development of a revised "needs list" extending the program time horizon from 2010 to 2030.

The cost of signalizing DIF network intersections is identified under the Traffic Signals component of the DIF program. County staff generally defines DIF eligible intersections as those consisting of two intersecting general plan roadways. If the intersection meets this requirement, it is potentially eligible for up to $250,000 of credit, which is subject to negotiations with the County.

1.6.3 SOUTHWEST ROAD AND BRIDGE BENEFIT DISTRICT (RBBD)

The County of Riverside is anticipated to experience substantial growth. Extensive improvements are necessitated by new development within the region. In particular, Riverside County recognized the impact of this growth on the vicinity of the study area when it formed the Southwest RBBD. The proposed Project lies within Zone D of the Southwest RBBD. Zone D is generally bounded by Keller Road to the north, Menifee Road to the west, Washington Road to the east, and Murrieta Hot Springs Road to the south. As discussed above, the facilities improvements that will be ultimately constructed as a result of the collection of these fees and assessments are significant. They include:

Southwest Road and Bridge Benefits District (Zone D):

- Benton Road improvements between Winchester Road (SR-79) to Washington Road (Budget: $2,850,000)
- Clinton Keith Road improvements between Menifee Road to Winchester Road (SR-79) (Budget: $21,660,000). Cost also includes Clinton Keith Road bridge at Warm Springs Creek (east and west).
- Keller Road improvements between Winchester Road (SR-79) to Washington Road (Budget: $3,194,554)
- Winchester Road (SR-79) improvements and raised median, between Auld Road and Keller Road (Budget: $10,047,200)
- Washington Street bridge at French Valley Stream (Budget: $2,850,000)
- Benton Road landscaped median between Winchester Road (SR-79) and Washington Road (Budget: $991,383)

1.6.4 FAIR SHARE CONTRIBUTION

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

When off-site improvements are identified with a minor share of responsibility assigned to proposed development, the approving jurisdiction may elect to collect a fair share contribution or require the development to construct improvements. Detailed fair share calculations, for each peak hour, has been provided on Table 1-3 for the applicable deficient intersections shown previously on Table 1-2. Improvements included in a defined program and constructed by development may be eligible for a fee credit or reimbursement through the program where appropriate.

1.7 ON-SITE ROADWAY AND SITE ACCESS IMPROVEMENTS

The Project is proposed to have access via 1 Driveway on Winchester Road (SR-79) and 2 driveways along Sky Canyon Drive. All 2 driveways on Sky Canyon Drive are proposed for full access and the single driveway on Winchester Road (SR-79) is proposed for right-in-right-out access only.

As part of the development, the Project will construct improvements on the site adjacent roadways of Winchester Road (SR-79) and Sky Canyon Drive. Regional access to the Project site will be provided by Winchester Road (SR-79). Roadway improvements necessary to provide site access and on-site circulation are assumed to be constructed in conjunction with site development and are described below. These improvements should be in place prior to occupancy.

Table 1-3

Project Fair Share Calculations

#	Intersection	Existing (2018)	Project	EAPC 2020	Total New Traffic	Project % of New Traffic[1]
1	Winchester Rd. (SR-79) & Via Mira Mosa/Auld Rd.					
	AM:	3,890	45	5,049	1,159	**3.9%**
	PM:	4,024	50	5,812	1,788	2.8%
2	Winchester Rd. (SR-79) & La Alba Dr./Sparkman Wy.					
	AM:	3,745	56	4,716	971	5.8%
	PM:	4,102	102	5,609	1,507	**6.8%**
4	Winchester Rd. (SR-79) & Hunter Rd.					
	AM:	4,065	55	5,035	970	**5.7%**
	PM:	4,545	62	5,986	1,441	4.3%
6	Winchester Rd. (SR-79) & Murrieta Hot Springs Rd.					
	AM:	5,721	51	6,857	1,136	**4.5%**
	PM:	6,690	58	8,349	1,659	3.5%

[1] Project percentage of new traffic between Existing (2018) and EAPC (2020) traffic conditions. Highest fair share percentage for the deficient peak hours is highlighted.

1.7.1 SITE ADJACENT ROADWAY IMPROVEMENTS

The recommended site-adjacent roadway improvements for the Project are described below. These improvements need to be incorporated into the Project description prior to Project approval or imposed as conditions of approval as part of the Project approval. Exhibit 1-4 illustrates the site-adjacent roadway improvement recommendations.

Winchester Road (SR-79) – Winchester Road (SR-79) is a north-south oriented roadway located along the Project's western boundary. Construct Winchester Road (SR-79) from Hunter Road to the Project's northern boundary at its ultimate half-section width as an Expressway (184-foot right-of-way) in compliance with the applicable County of Riverside standards. It appears that Winchester Road (SR-79) is currently built to its ultimate half section width adjacent to the Project, but striped to allow two through travel lanes only.

Sky Canyon Drive – Sky Canyon Drive is a north-south oriented roadway that would provide access to the Project. Construct Sky Canyon Drive from the Project's northern boundary to the Project's southern boundary at its ultimate half-section width as a modified Secondary Highway (88-foot right-of-way) in compliance with the applicable County of Riverside standards. The Project will be responsible for constructing the half-section width, plus additional 12 feet on Sky Canyon Drive. This includes 32 feet of pavement on project side, plus an additional 12 feet for the northbound lane.

Hunter Road – Hunter Road has been vacated east of Winchester Road (SR-79). No roadway improvements on Hunter Road as the right-of-way does not exist.

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

1.7.2 SITE ACCESS IMPROVEMENTS

The recommended site access driveway improvements for the Project are described below. Exhibit 1-4 illustrates the on-site and site adjacent recommended roadway lane improvements. Construction of on-site and site adjacent improvements are recommended to occur in conjunction with adjacent Project development activity or as needed for Project access purposes. The site adjacent roadways will be improved consistent with Section 1.7.1 *Site Adjacent Roadway Improvements* of this report.

Winchester Road (SR-79) at Driveway 1 (#3) – Install a stop control on the westbound approach and construct the intersection with the following geometrics:

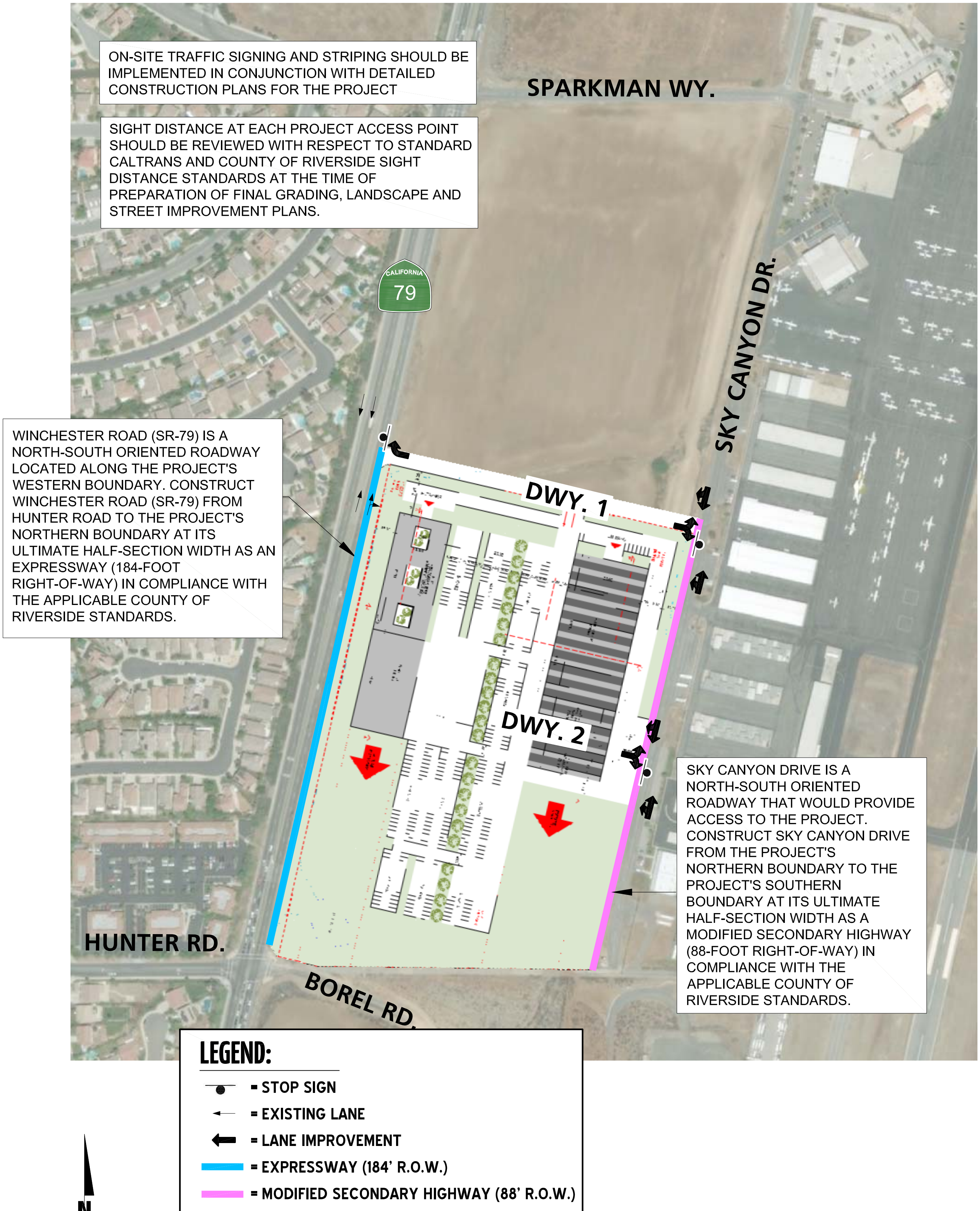
Northbound Approach: One through lane and one shared through right turn lane.

Southbound Approach: Two through lanes.

Eastbound Approach: N/A

Westbound Approach: One right turn lane.

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



Sky Canyon Drive at Driveway 2 (#8) – Install a stop control on the eastbound approach and construct the intersection with the following geometrics:

Northbound Approach: One shared left-through lane.

Southbound Approach: One shared through-right turn lane.

Eastbound Approach: One shared left-right turn lane.

Westbound Approach: N/A

Sky Canyon Drive at Driveway 3 (#9) – Install a stop control on the eastbound approach and construct the intersection with the following geometrics:

Northbound Approach: One shared left-through lane.

Southbound Approach: One shared through-right turn lane.

Eastbound Approach: One shared left-right turn lane.

Westbound Approach: N/A

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

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

1.7.3 QUEUING ANALYSIS AT THE PROJECT DRIVEWAYS AND SITE ADJACENT INTERSECTIONS

A queuing analysis was conducted at the Project driveways and site adjacent intersections to determine the turn pocket length necessary to accommodate long-range 95th percentile peak hour volumes. The analysis was conducted for the weekday AM and weekday PM peak hours.

Queuing analysis worksheets are provided in Appendix 1.2.

The traffic modeling and signal timing optimization software package Synchro (Version 10) has been utilized to assess queues at the Project driveways and site adjacent intersections. Synchro is a macroscopic traffic software program that is based on the signalized and unsignalized intersection capacity analyses 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 in Synchro. The LOS and capacity analysis performed by Synchro takes into consideration optimization and coordination of signalized intersections within a network.

SimTraffic is designed to model networks of signalized and unsignalized intersections, with the primary purpose of checking and fine tuning signal operations. SimTraffic uses the input parameters from Synchro to generate random simulations. The 95th percentile queue is not necessarily ever observed; it is simply based on statistical calculations (or Average Queue plus 1.65 standard deviations). However, the average queue is the average of all the two-minute maximum queues observed by SimTraffic. The maximum back of queue observed for every two-minute period is recorded by SimTraffic.

The random simulations generated by SimTraffic have been utilized to determine the 50th and 95th percentile queue lengths observed for each 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 60-minute periods with 60-minute recording intervals.

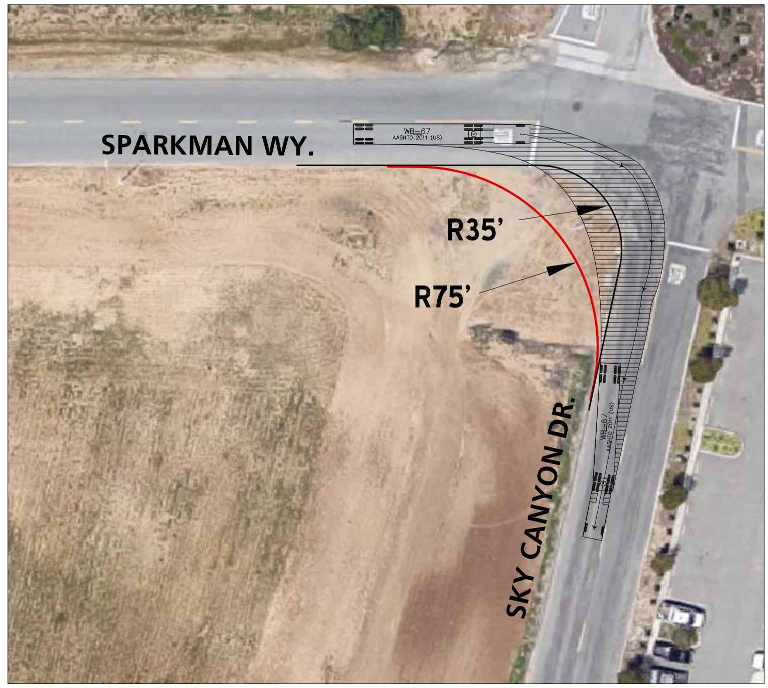
1.8 TRUCK ACCESS AND CIRCULATION

A truck turning template has been overlaid on the study area at Winchester Road (SR-79) on Sparkman Way and Sky Canyon Drive on Sparkman Way, which are anticipated to be utilized by heavy trucks, in order to determine the appropriate curb radii and to verify that trucks will have sufficient space to execute turning maneuvers. For the purposes of this evaluation, the WB-67 class truck template has been utilized. WB-67 class trucks are approximately 73.5 feet in length.

Exhibit 1-5 illustrates the proposed truck access for the site and circulation for Winchester Road (SR-79) and Sky Canyon Drive at Sparkman Way. The recommended curb radii as shown on Exhibit 1-5 are anticipated to accommodate the ingress and egress of trucks.

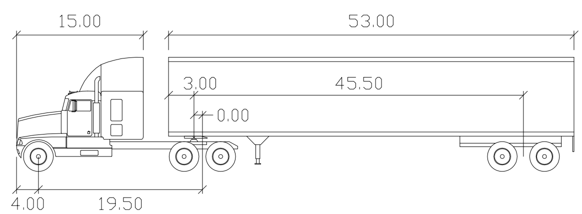
Exhibit 1-5: Truck Access

INBOUND



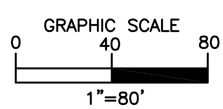
OUTBOUND

LEGEND:



WB-67 feet

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



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2 METHODOLOGIES

This section documents the methodologies and assumptions used to perform this traffic assessment.

2.1 LEVEL OF SERVICE

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

2.2 INTERSECTION CAPACITY ANALYSIS

The definitions of LOS for interrupted traffic flow (flow restrained by the existence of traffic signals and other traffic control devices) differ slightly depending on the type of traffic control. The LOS is typically dependent on the quality of traffic flow at the intersections along a roadway. The *Highway Capacity Manual* (HCM) methodology expresses the LOS at an intersection in terms of delay time for the various intersection approaches. (7) The HCM uses different procedures depending on the type of intersection control.

2.2.1 SIGNALIZED INTERSECTIONS

County of Riverside, City of Murrieta

The County of Riverside require signalized intersection operations analysis based on the methodology described in the HCM 6th Edition (7). Intersection LOS operations are based on an intersection's average control delay. Control delay includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. For signalized intersections LOS is directly related to the average control delay per vehicle and is correlated to a LOS designation as described in Table 2-1.

California Department of Transportation (Caltrans)

Per the Caltrans Guide for the Preparation of Traffic Impact Studies, the traffic modeling and signal timing optimization software package Synchro (Version 10) has been utilized to analyze signalized intersections under Caltrans' jurisdiction, which include Winchester Road (SR-79). (2) Synchro is a macroscopic traffic software program that is based on the signalized intersection capacity analysis as specified in the HCM 6th Edition. Macroscopic level models represent traffic in terms of aggregate measures for each movement at the study intersections.

TABLE 2-1: SIGNALIZED INTERSECTION DESCRIPTION OF LOS

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

Source: HCM 6th Edition

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. Signal timing for the freeway arterial-to-ramp intersections have been obtained from Caltrans District 8 and were utilized for the purposes of this analysis. All signalized study area intersections with the County of Riverside, and City of Murrieta have also utilized the Synchro software.

The peak hour traffic volumes have been adjusted using a peak hour factor (PHF) to reflect peak 15-minute volumes. Common practice for LOS analysis is to use a peak 15-minute rate of flow. However, flow rates are typically expressed in vehicles per hour. The PHF is the relationship between the peak 15-minute flow rate and the full hourly volume (e.g. PHF = [Hourly Volume] / [4 x Peak 15-minute Flow Rate]). The use of a 15-minute PHF produces a more detailed analysis as compared to analyzing vehicles per hour. Existing PHFs have been used for all analysis scenarios. Per the HCM 6th Edition, 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. (7)

2.2.2 UNSIGNALIZED INTERSECTIONS

The County of Riverside and City of Murrieta require the operations of unsignalized intersections be evaluated using the methodology described the HCM. (7) The LOS rating is based on the weighted average control delay expressed in seconds per vehicle (see Table 2-2).

TABLE 2-2: UNSIGNALIZED INTERSECTION DESCRIPTION OF LOS

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

Source: HCM 6th Edition

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

2.3 TRAFFIC SIGNAL WARRANT ANALYSIS METHODOLOGY

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

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

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

Traffic signal warrant analyses were performed for all of the study area intersections, with the exception of the following locations as shown on Table 2-3, which are currently signalized:

TABLE 2-3: TRAFFIC SIGNAL WARRANT ANALYSIS LOCATIONS

ID	Intersection Location	Jurisdiction	CMP?
7	Sky Canyon Dr. & Sparkman Wy.	County of Riverside	No
8	Sky Canyon Dr. & Driveway 1	County of Riverside	No
9	Sky Canyon Dr. & Driveway 2	County of Riverside	No

The Existing conditions traffic signal warrant analysis is presented in the subsequent section, Section 3 *Existing Conditions* of this report. The traffic signal warrant analysis for future conditions is presented in Section 5 *E+P Traffic Conditions*, Section 6 *EAP (2018) Traffic Conditions*, and Section 7 *EAPC (2018) 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 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 MINIMUM LEVEL OF SERVICE (LOS)

The definition of an intersection deficiency has been obtained from each of the applicable surrounding jurisdictions.

2.4.1 COUNTY OF RIVERSIDE

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

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

- *LOS C shall apply to all development proposals in any area of the Riverside County not located within the boundaries of an Area Plan, as well as those areas located within the following Area Plans: REMAP, Eastern Coachella Valley, Desert Center, Palo Verde Valley, and those non-Community Development areas of the Elsinore, Lake Mathews/Woodcrest, Mead Valley and Temescal Canyon Area Plans.*

- *LOS D shall apply to all development proposals located within any of the following Area Plans: Eastvale, Jurupa, Highgrove, Reche Canyon/Badlands, Lakeview/Nuevo, Sun City/Menifee Valley, Harvest Valley/Winchester, Southwest Area, The Pass, San Jacinto Valley, Western Coachella Valley and those Community Development Areas of the Elsinore, Lake Mathews/Woodcrest, Mead Valley and Temescal Canyon Area Plans.*
- *LOS E may be allowed by the Board of Supervisors within designated areas where transit-oriented development and walkable communities are proposed.*

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

2.4.2 CITY OF MURRIETA

The City of Murrieta General Plan has established a LOS standard of D for intersections. Therefore, LOS D is acceptable at any intersection wholly or partially within the City of Murrieta.

2.4.3 CALTRANS

Caltrans endeavors to maintain a target LOS at the transition between LOS C and LOS D on State Highway System (SHS) facilities, however, Caltrans acknowledges that this may not always be feasible and recommends that the lead agency consult with Caltrans to determine the appropriate target LOS. Consistent with the County of Riverside minimum LOS of LOS D, LOS D will be used as the target LOS for both arterial-to-freeway ramps and freeway mainline segments and ramp junctions.

2.5 DEFICIENCY CRITERIA

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

2.5.1 INTERSECTIONS

To determine whether the addition of project traffic at a study intersection would result in a deficiency, the following will be utilized:

- A deficiency occurs at study area intersections if the pre-Project condition is at or better than LOS D (i.e., acceptable LOS), and the addition of project trips causes the peak hour LOS of the study area intersection to operate at unacceptable LOS (i.e., LOS E or F). Per the County of Riverside traffic study guidelines, for intersections currently operating at unacceptable LOS (LOS E or F), a deficiency would occur if the Project contributes 50 or more peak hour trips to pre-project traffic conditions.

2.5.2 CALTRANS FACILITIES

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

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

2.6 PROJECT FAIR SHARE CALCULATION METHODOLOGY

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

Project Fair Share % = Project Traffic / (EAPC 2020 Total Traffic – Existing Traffic)

The Project fair share contribution calculations are presented in Section 1.6 *Local and Regional Funding Mechanisms* of this TIA.

3 EXISTING CONDITIONS

This section provides a summary of the existing circulation network, the County 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 County of Riverside staff (Appendix 1.1), the study area includes a total of 9 existing and future intersections as shown previously on Exhibit 1-2. Exhibit 3-1 illustrates the study area intersections located near the proposed Project and identifies the number of through traffic lanes for existing roadways and intersection traffic controls.

3.2 GENERAL PLAN CIRCULATION ELEMENT

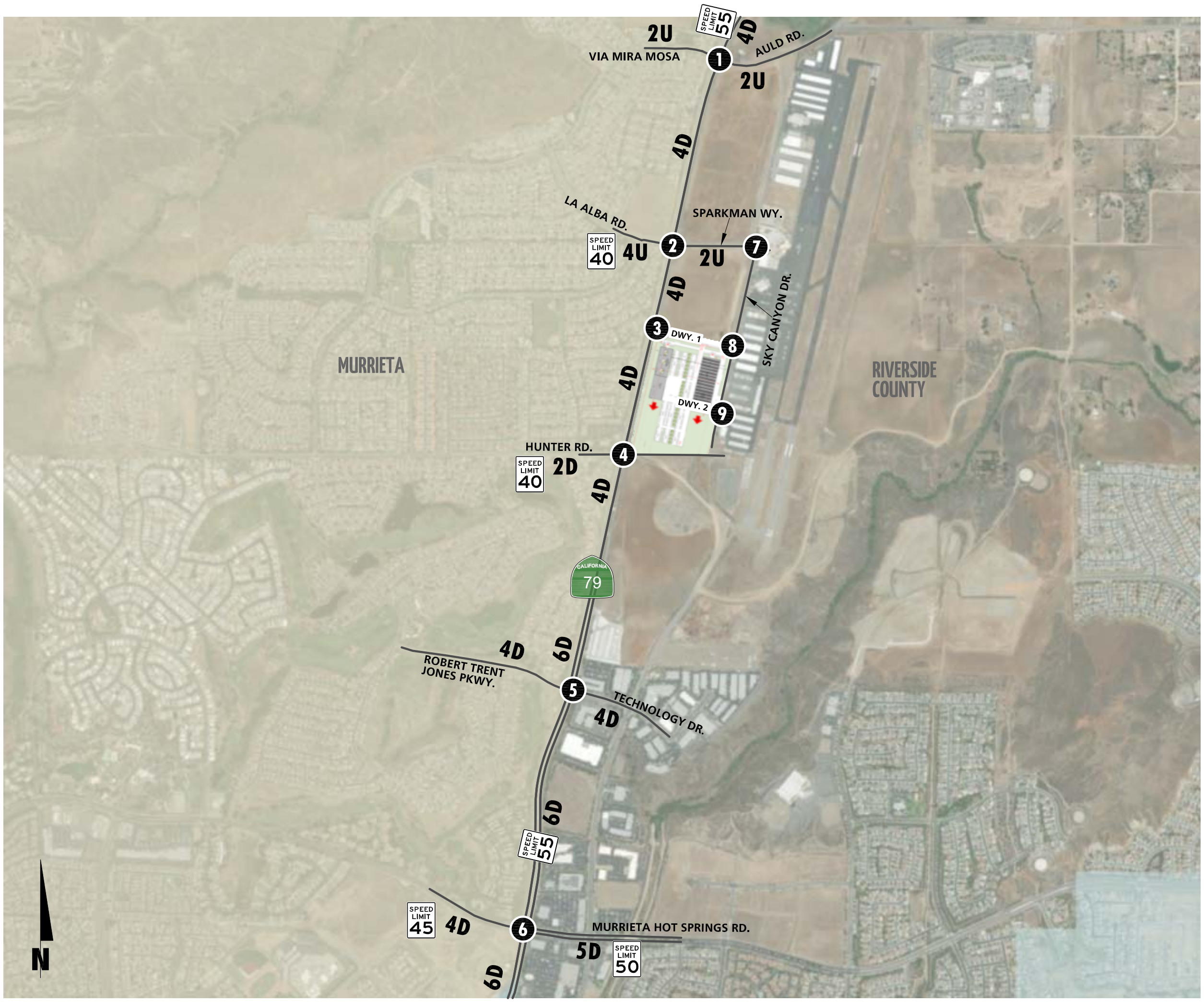
3.2.1 COUNTY OF RIVERSIDE

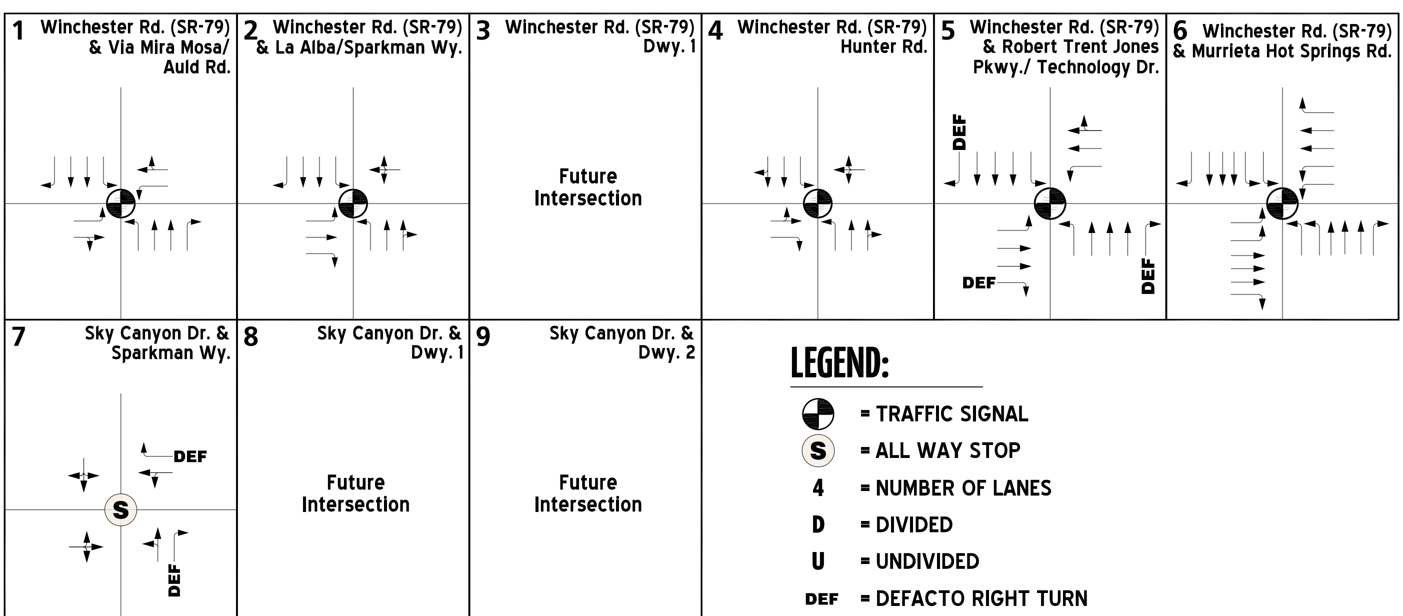
Exhibit 3-2 shows the adopted County of Riverside General Plan Circulation Element and Exhibit 3-3 illustrates the Circulation Element per General Plan Amendment (GPA) No. 960. In 2008, Riverside County embarked on its first General Plan review cycle since the adoption of the 2003 General Plan. GPA No. 960 was adopted by the Riverside County Board of Supervisors on December 8, 2015. Exhibit 3-4 illustrates the adopted County of Riverside General Plan roadway cross-sections.

3.2.2 CITY OF MURRIETA

Exhibit 3-5 shows the City of Murrieta General Plan Circulation Element, and Exhibit 3-6 illustrates the City of Murrieta General Plan roadway cross-sections.

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





LEGEND:

- = TRAFFIC SIGNAL
- S = ALL WAY STOP
- 4 = NUMBER OF LANES
- D = DIVIDED
- U = UNDIVIDED
- DEF = DEFACTO RIGHT TURN
- SPEED LIMIT 25 = SPEED LIMIT (MPH)

EXHIBIT 3-2: RIVERSIDE COUNTY GENERAL PLAN CIRCULATION ELEMENT

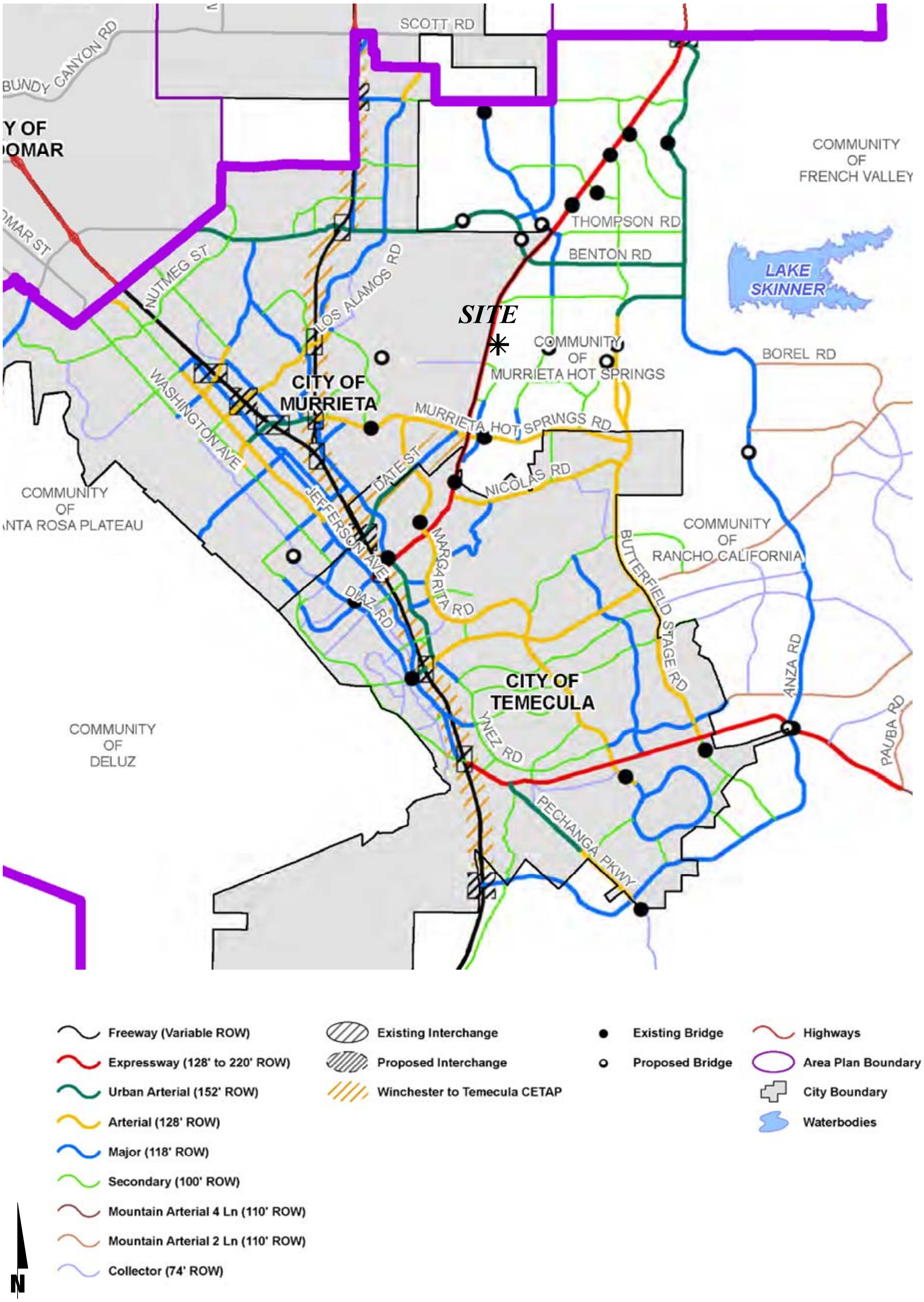


EXHIBIT 3-3: RIVERSIDE COUNTY GENERAL PLAN CIRCULATION ELEMENT (GPA 960)

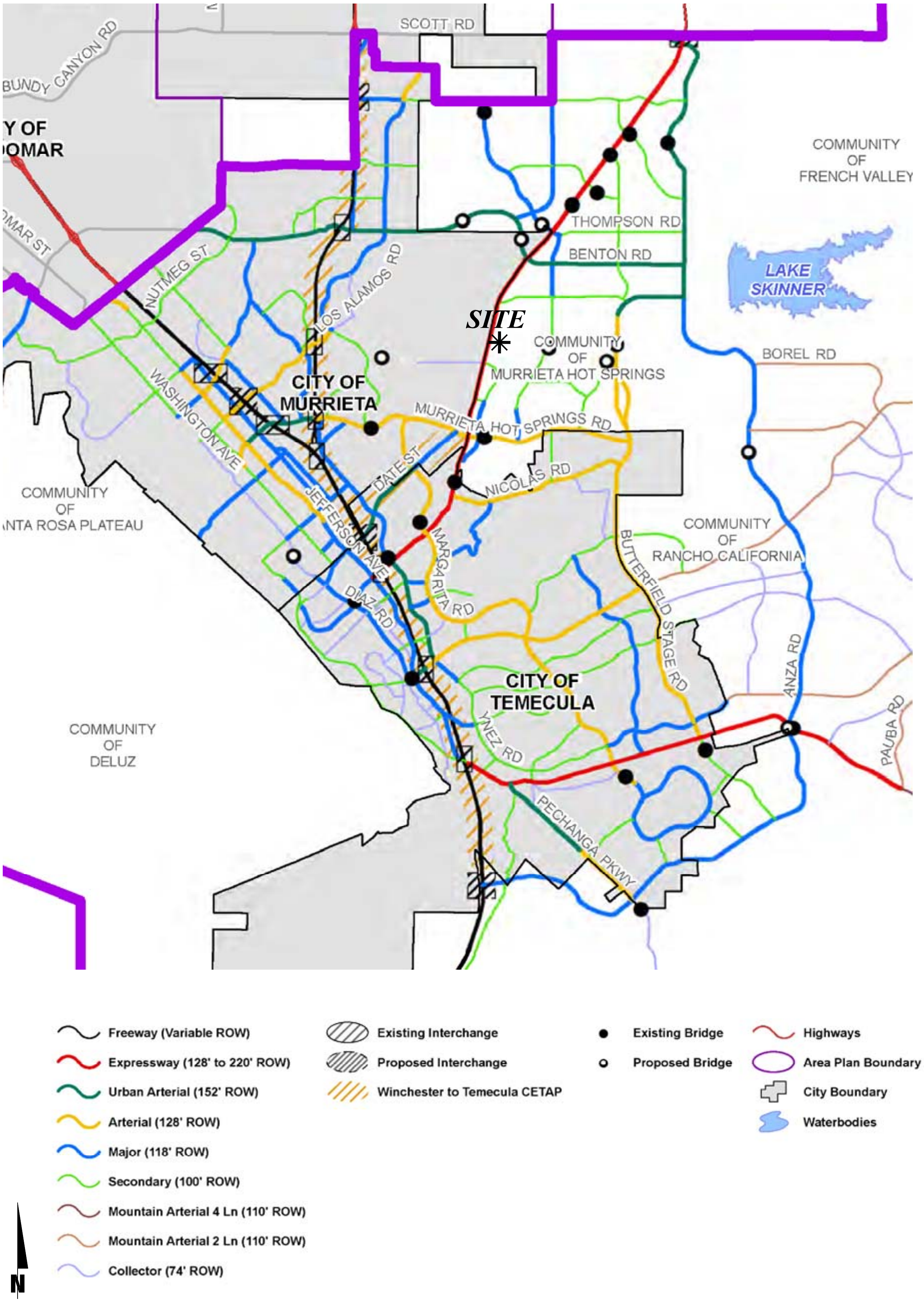
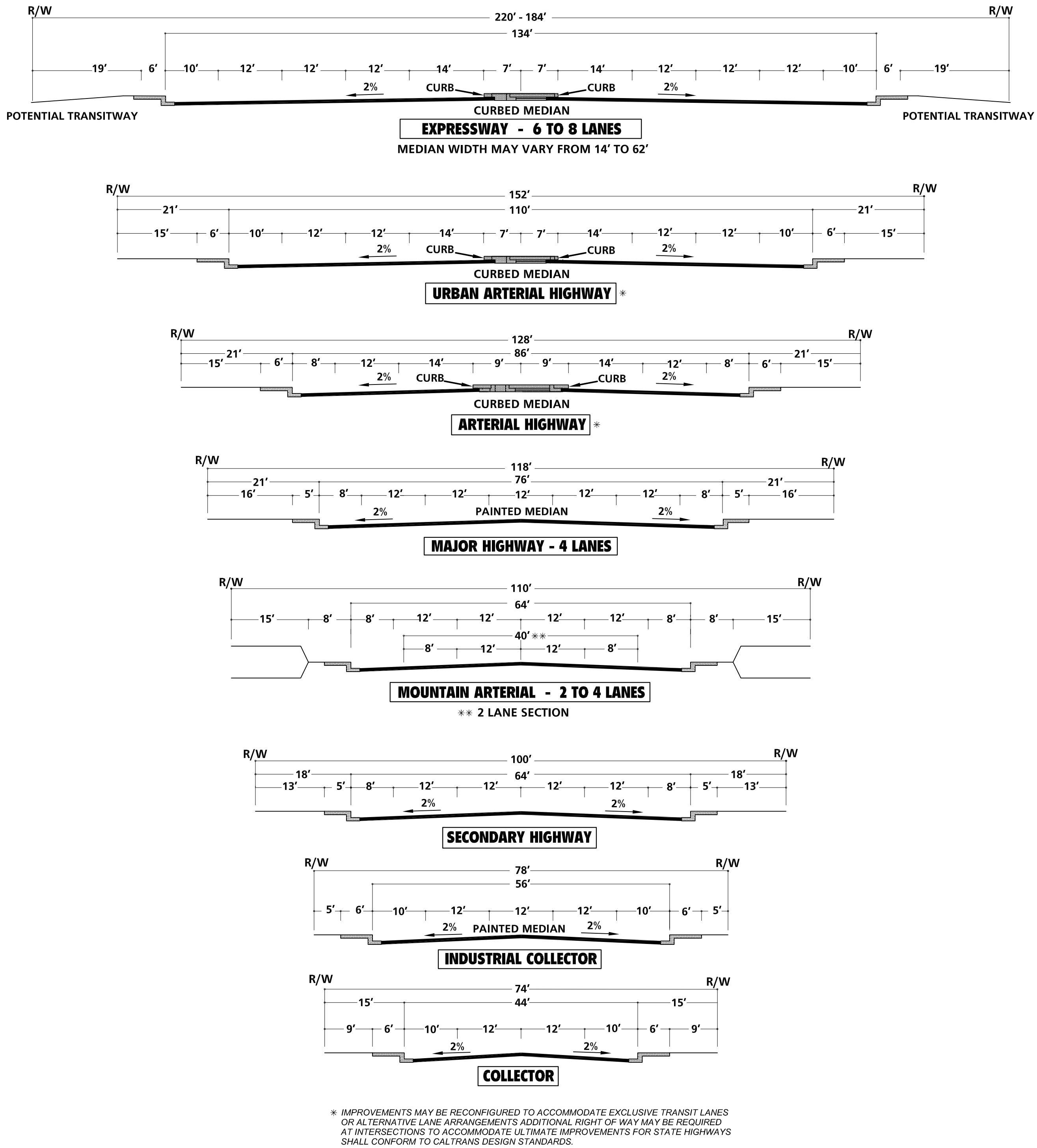


EXHIBIT 3-4: RIVERSIDE COUNTY GENERAL PLAN ROADWAY CROSS-SECTIONS



SOURCE: COUNTY OF RIVERSIDE

Exhibit 3-5: City of Murrieta General Plan Circulation Element

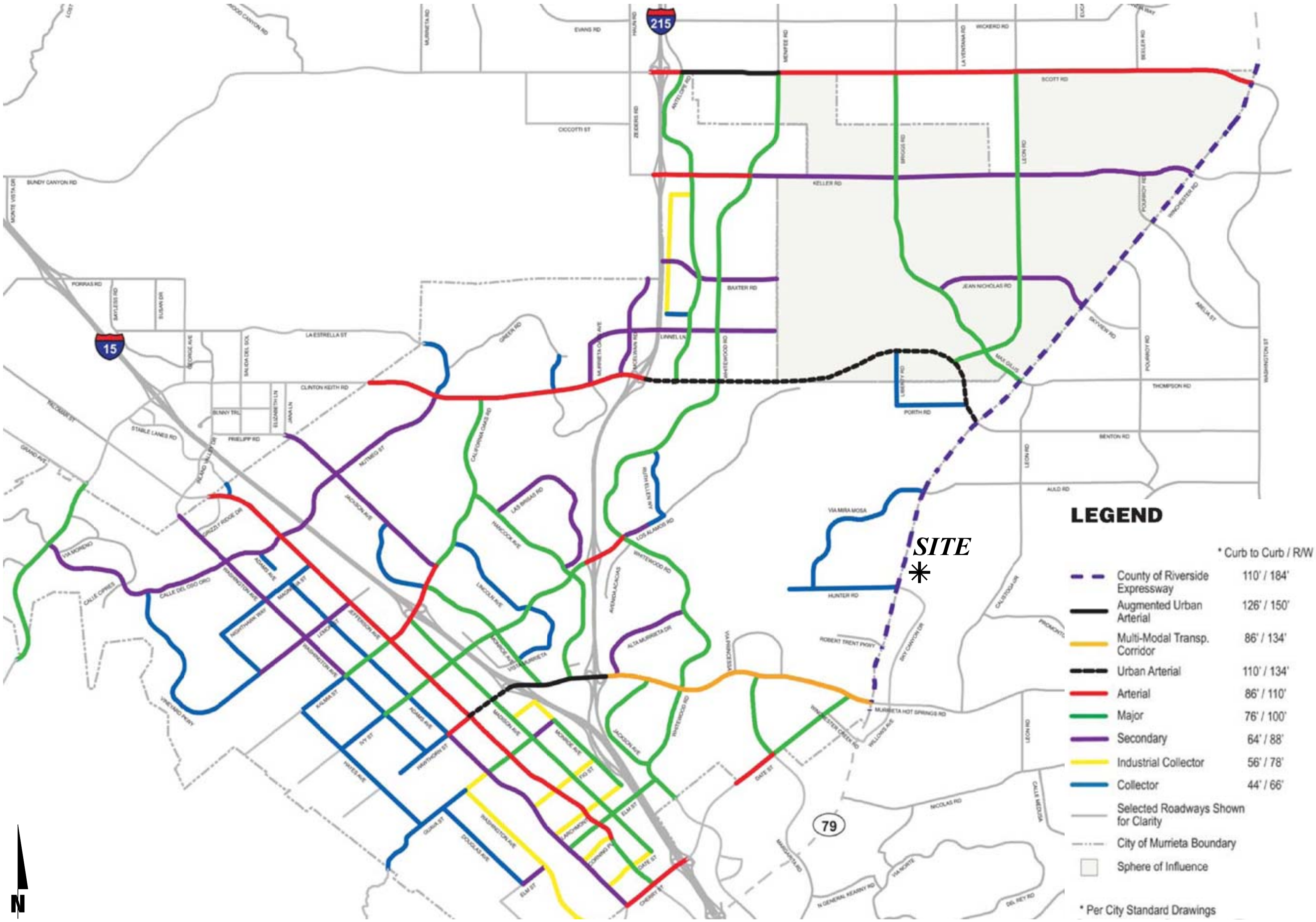


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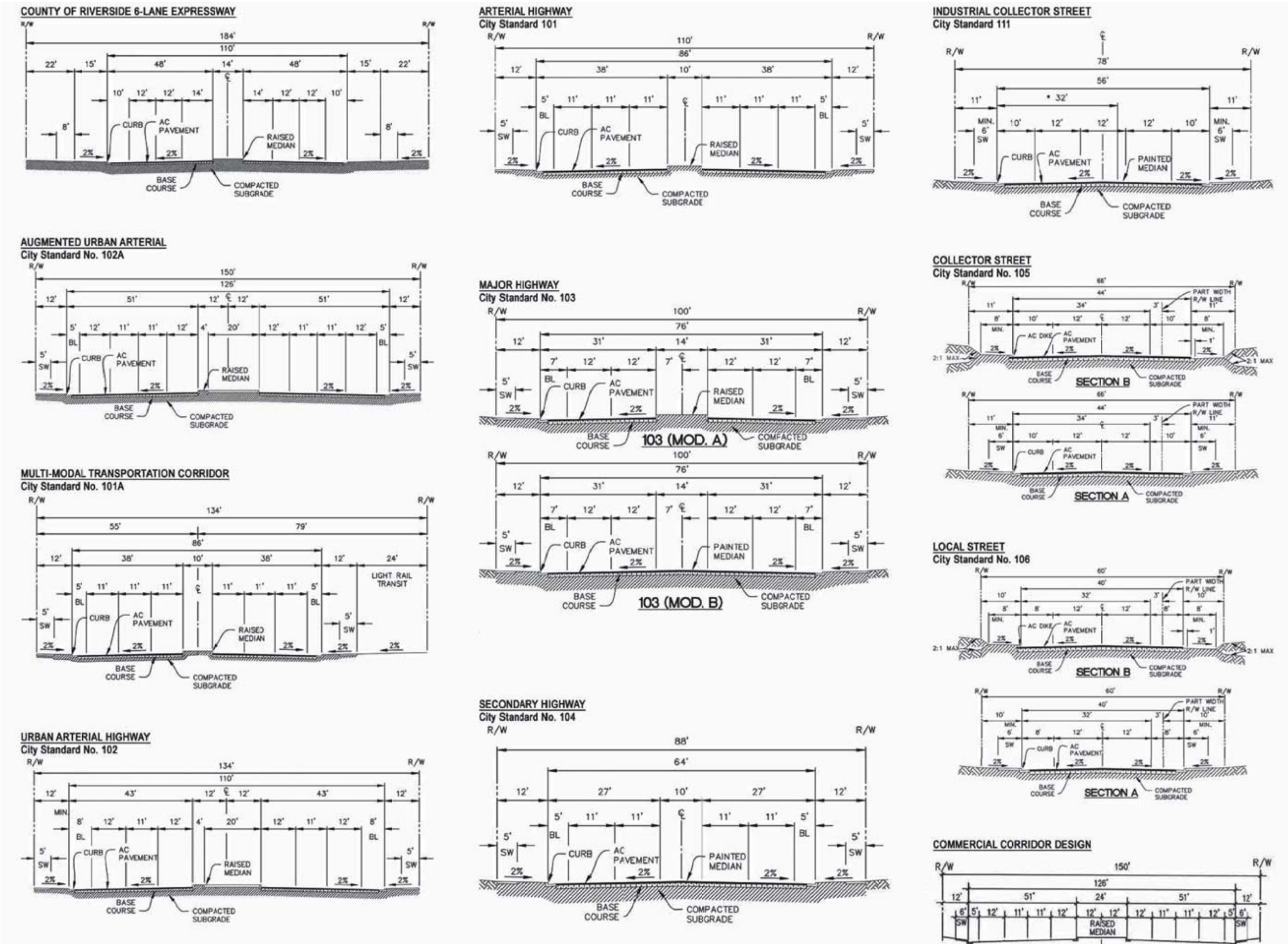
EXHIBIT 3-6: CITY OF MURRIETA GENERAL PLAN ROADWAY CROSS-SECTIONS



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3.4 TRANSIT SERVICE

The study area is currently served by the Riverside Transit Agency (RTA) with bus services along Winchester Road (SR-79) Scott Road via Route 79 and Route 217. The transit services are illustrated on Exhibit 3-7. Both existing routes could potentially serve the proposed Project. Transit service is reviewed and updated by the RTA periodically to address ridership, budget and community demand needs. Changes in land use can affect these periodic adjustments which may lead to either enhanced or reduced service where appropriate.

3.5 PEDESTRIAN AND BICYCLE FACILITIES

Field observations conducted in May 2018 indicate nominal pedestrian and bicycle activity within the study area. Existing pedestrian facilities currently exist along portions of Murrieta Hot Springs Road and Winchester Road (SR-79). The existing pedestrian facilities within the study area are shown on Exhibit 3-8. The Riverside County Integrated Project (RCIP) Southwest Area Trails and Bikeways are shown on Exhibit 3-9 per the 2003 Circulation Element and Exhibit 3-10 for the GPA No. 960 Circulation Element. Exhibit 3-11 shows the City of Murrieta General Plan Trails and Bikeways.

3.6 EXISTING TRAFFIC COUNTS

The intersection LOS analysis is based on the traffic volumes observed during the peak hour conditions using traffic count data collected in May 2018. 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 raw manual peak hour turning movement traffic count data sheets are included in Appendix 3.1. These raw turning volumes have been flow conserved between intersections with limited access, no access and where there are currently no uses generating traffic.

The weekday AM and PM and Saturday mid-day peak hour count data is representative of typical 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 that would prevent or limit roadway access and detour routes. The raw manual peak hour turning movement traffic count data sheets are included in Appendix 3.1. These raw turning volumes have been flow conserved between intersections with limited access, no access and where there are currently no uses generating traffic.

Existing weekday ADT volumes on arterial highways throughout the study area are shown on Exhibit 3-12. Existing ADT volumes are based upon factored intersection peak hour counts collected by Urban Crossroads, Inc. using the following formula for each intersection leg:

Weekday PM Peak Hour (Approach Volume + Exit Volume) x 13.65 = Leg Volume

EXHIBIT 3-7: EXISTING TRANSIT ROUTES

EXHIBIT 3-8: EXISTING PEDESTRIAN FACILITIES

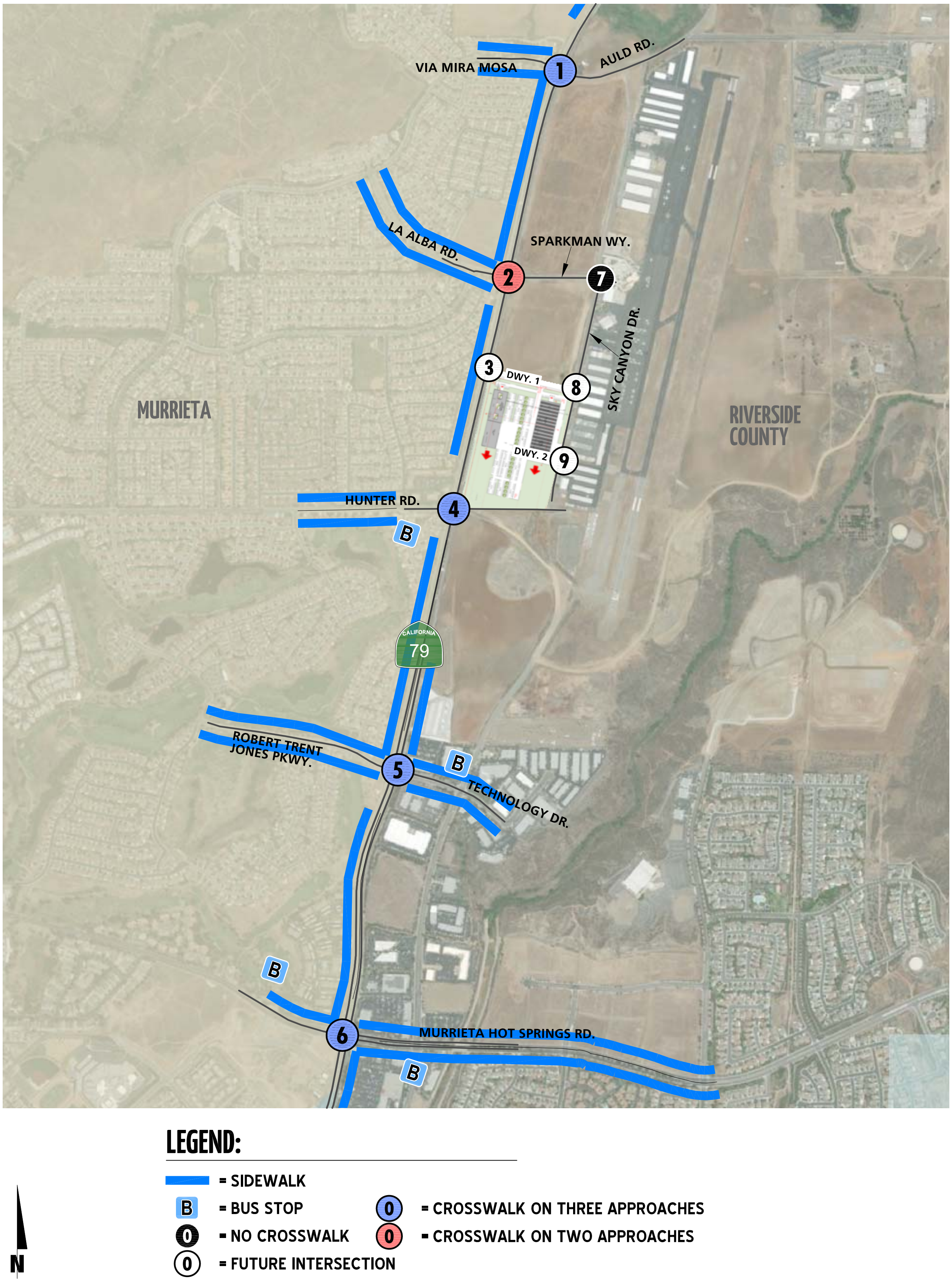
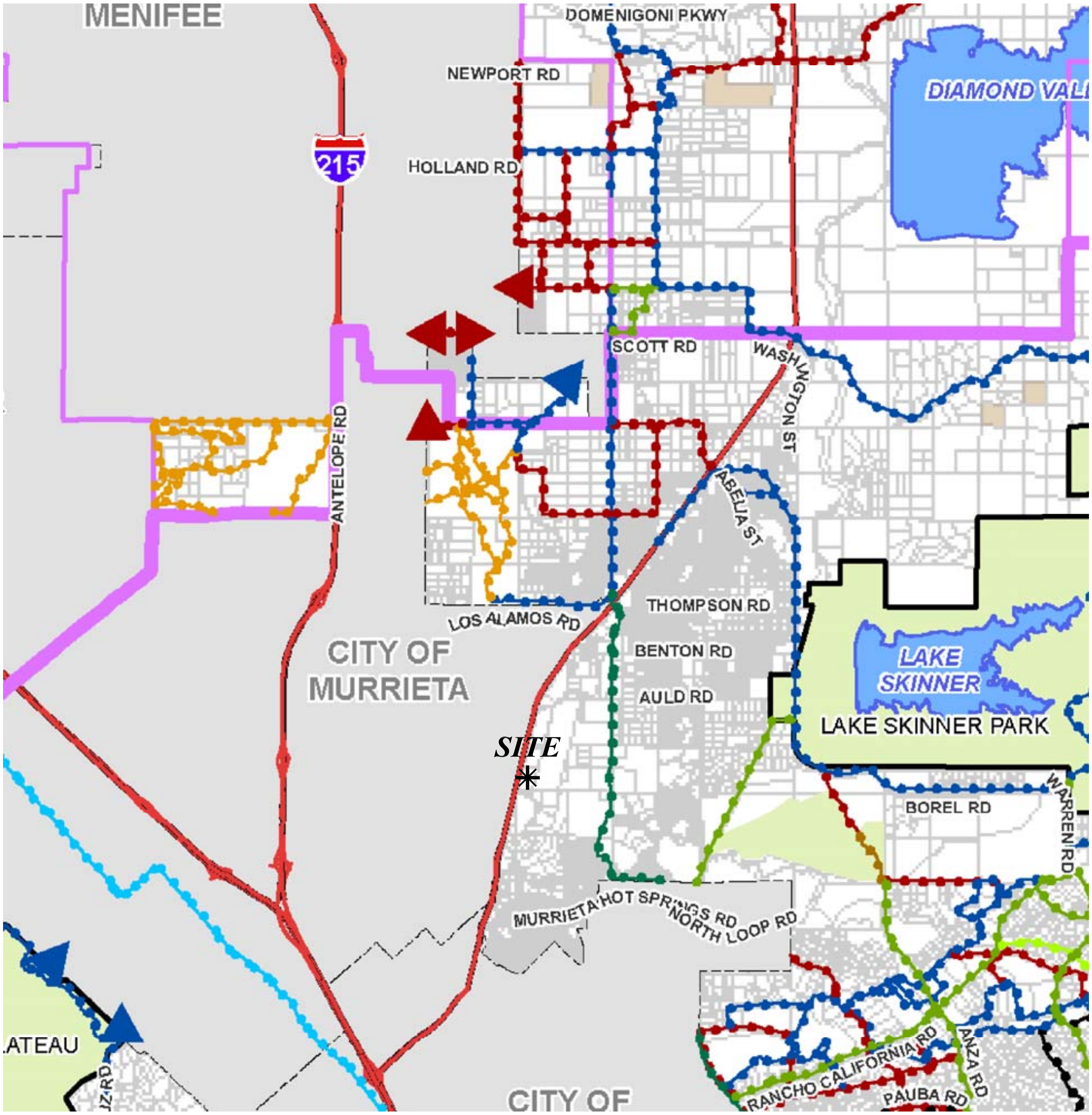


EXHIBIT 3-9: RCIP SOUTHWEST AREA TRAILS AND BIKEWAYS



Regional Trail
Community Trail
Combination Trail (Regional / Class 1 Bike Path)
Class 1 Bike Path
Class 2 Bike Path
Open Space Trail
Design Guidelines Trail
Historic Trail
Non-County Public and Quasi-Public Lands Trails
California Riding & Hiking Trail
RCHA Trail
Private Trails

City Boundary
Area Plan Boundary
Bureau of Land Management (BLM) Lands
Miscellaneous Public Parks and Forest Lands
Waterbodies
Highways

Data Source: Primarily Riverside County Regional Park and Open Space District, with assistance from Riverside County TLMA/Transportation and Planning Departments, Riverside County Economic Development Agency, and other local, state, and federal recreational services agencies.

N

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EXHIBIT 3-10: RCIP SOUTHWEST AREA TRAILS AND BIKEWAYS (GPA 960)

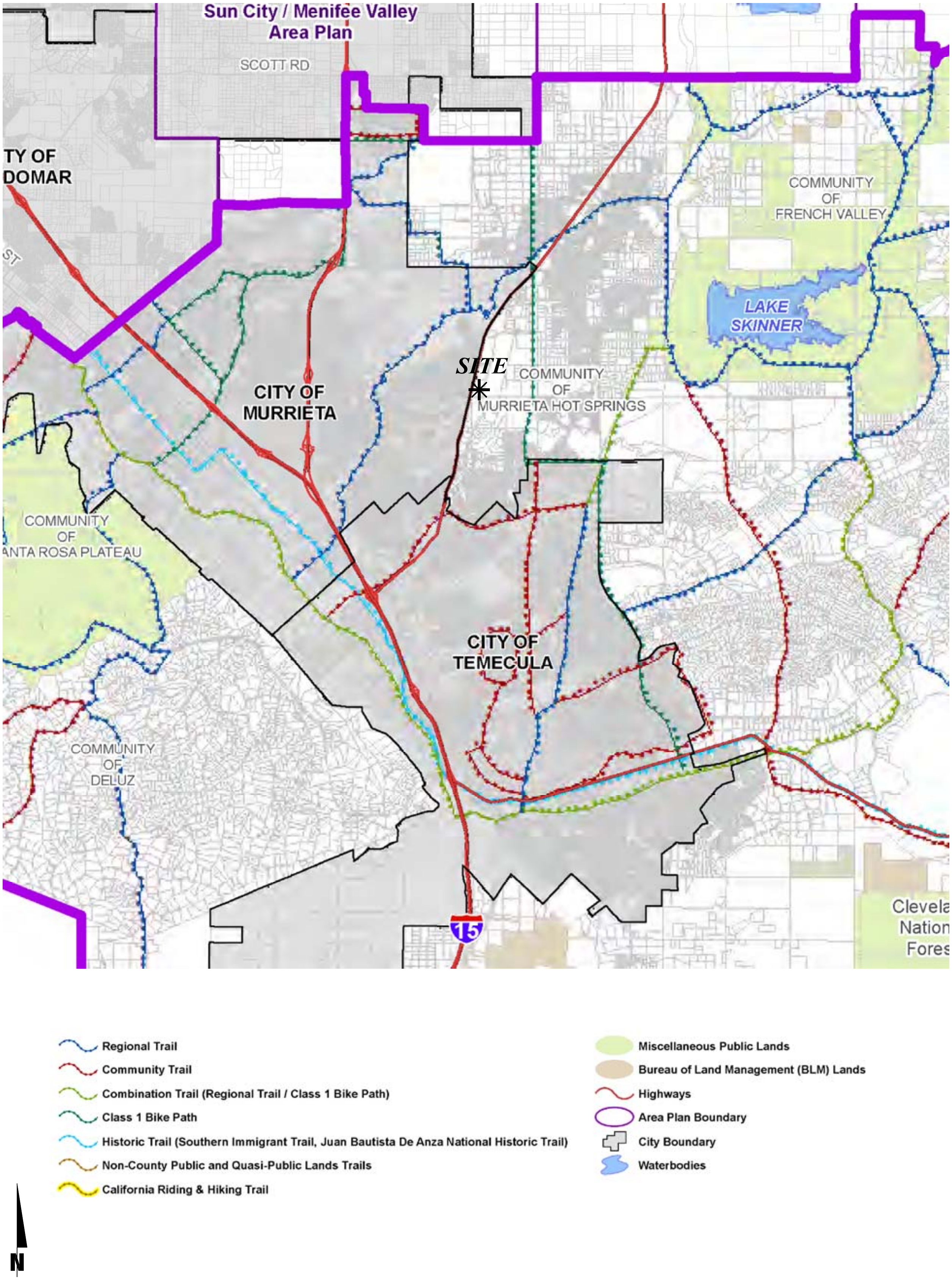
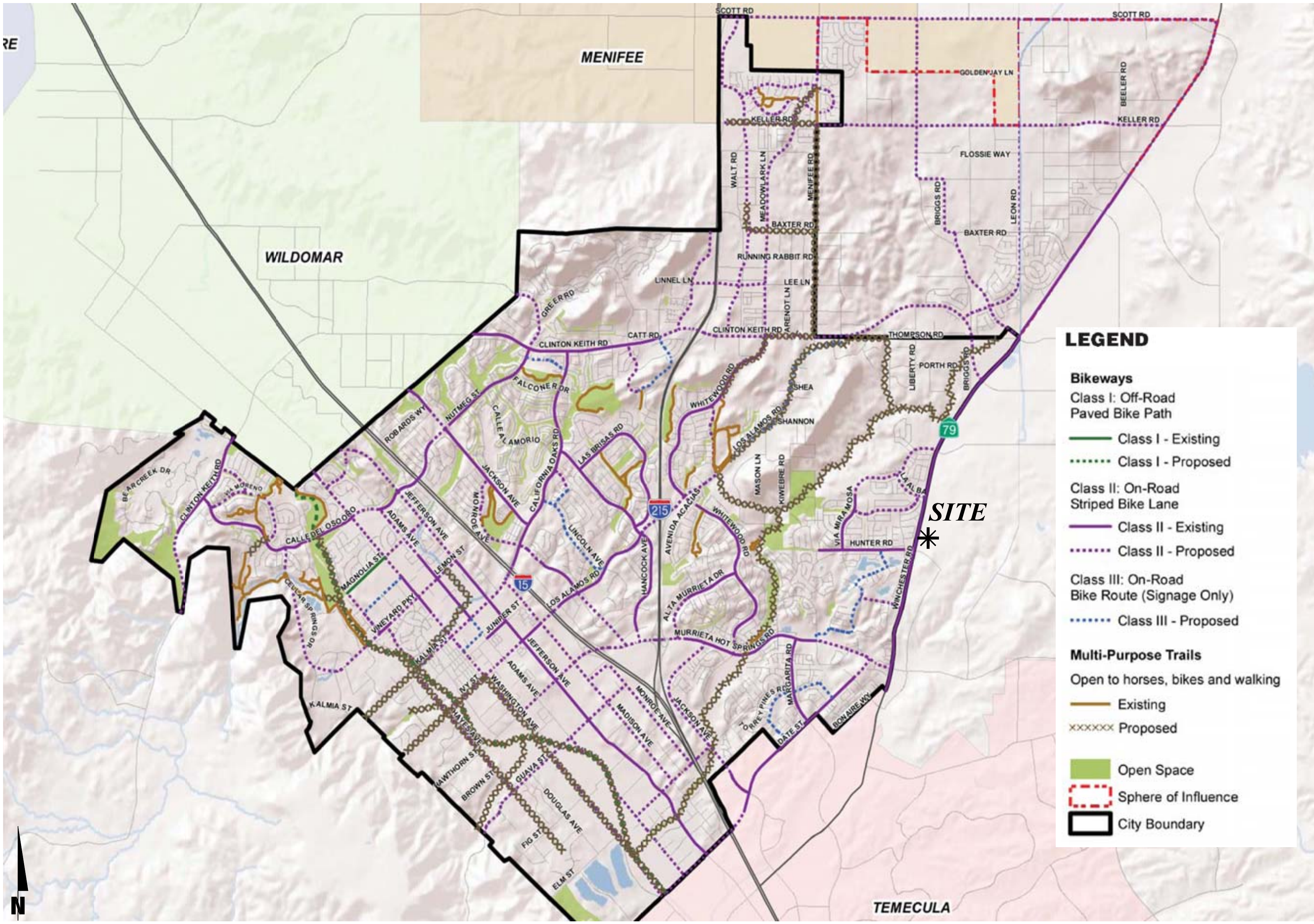


EXHIBIT 3-11: CITY OF MURRIETA GENERAL PLAN TRAILS AND BIKEWAYS



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For those roadway segments, which have 24-hour tube count data available in close proximity to the study area, a comparison between the PM peak hour and daily traffic volumes indicated that the peak-to-daily relationship of approximately 7.33 percent would sufficiently estimate ADT volumes for planning-level analyses. As such, the above equation utilizing a factor of 13.64 estimates the ADT volumes on the study area roadway segments assuming a peak-to-daily relationship of approximately 7.33 percent (i.e., 1/0.0733 = 13.64). Existing weekday AM and PM peak hour intersection volumes are also shown on Exhibit 3-12.

3.7 EXISTING CONDITIONS INTERSECTION OPERATIONS ANALYSIS

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

- Winchester Rd. (SR-79) & Murrieta Hot Springs Rd. (#6) – LOS E AM peak hour; LOS F PM hour

Consistent with Table 3-1, a summary of the peak hour intersection LOS for Existing conditions are shown on Exhibit 3-13. The intersection operations analysis worksheets are included in Appendix 3.2 of this TIA.

3.8 EXISTING CONDITIONS TRAFFIC SIGNAL WARRANTS ANALYSIS

Traffic signal warrants for Existing traffic conditions are based on existing peak hour intersection turning volumes. For Existing traffic conditions, no traffic signals appear to currently be warranted at any unsignalized study area intersections (see Appendix 3.3).

3.9 RECOMMENDED IMPROVEMENTS

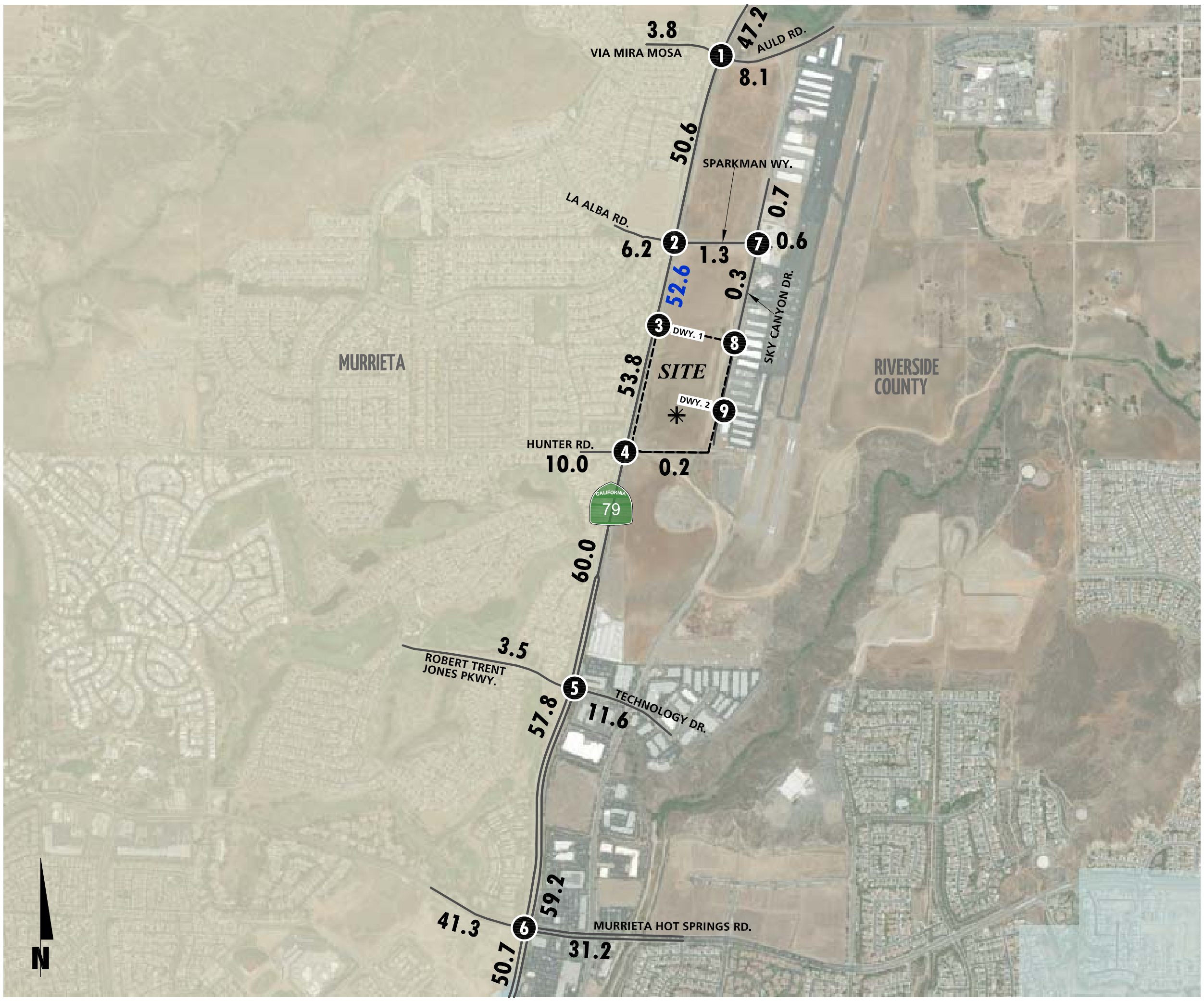
Improvement strategies have been recommended at intersections that have been identified as deficient to reduce each location's peak hour delay and improve the associated LOS grade to an acceptable LOS (LOS D or better). The effectiveness of the proposed recommended improvements is presented in Table 3-2 for Existing traffic conditions. Recommended improvements to address deficiencies for Existing traffic conditions are described below.

Recommended Improvement – Winchester Road (SR-79) & Murrieta Hot Springs Road (#6)

- Modify the existing traffic signal to implement overlap phasing on the southbound right turn lane and eliminate the cross-walk on the north leg.

The intersection operations analysis worksheets, with improvements, are included in Appendix 3.4 of this TIA.

EXHIBIT 3-12: EXISTING (2018) TRAFFIC VOLUMES (IN PCE)



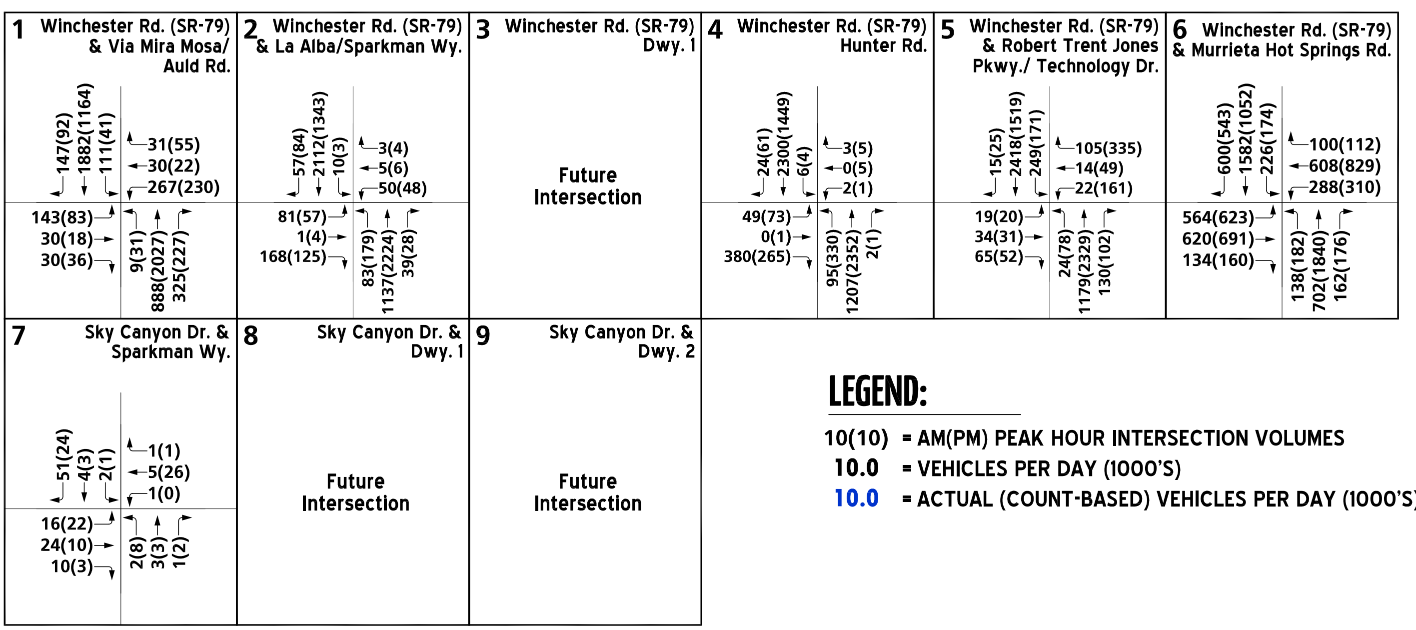


EXHIBIT 3-13: EXISTING (2018) SUMMARY OF LOS

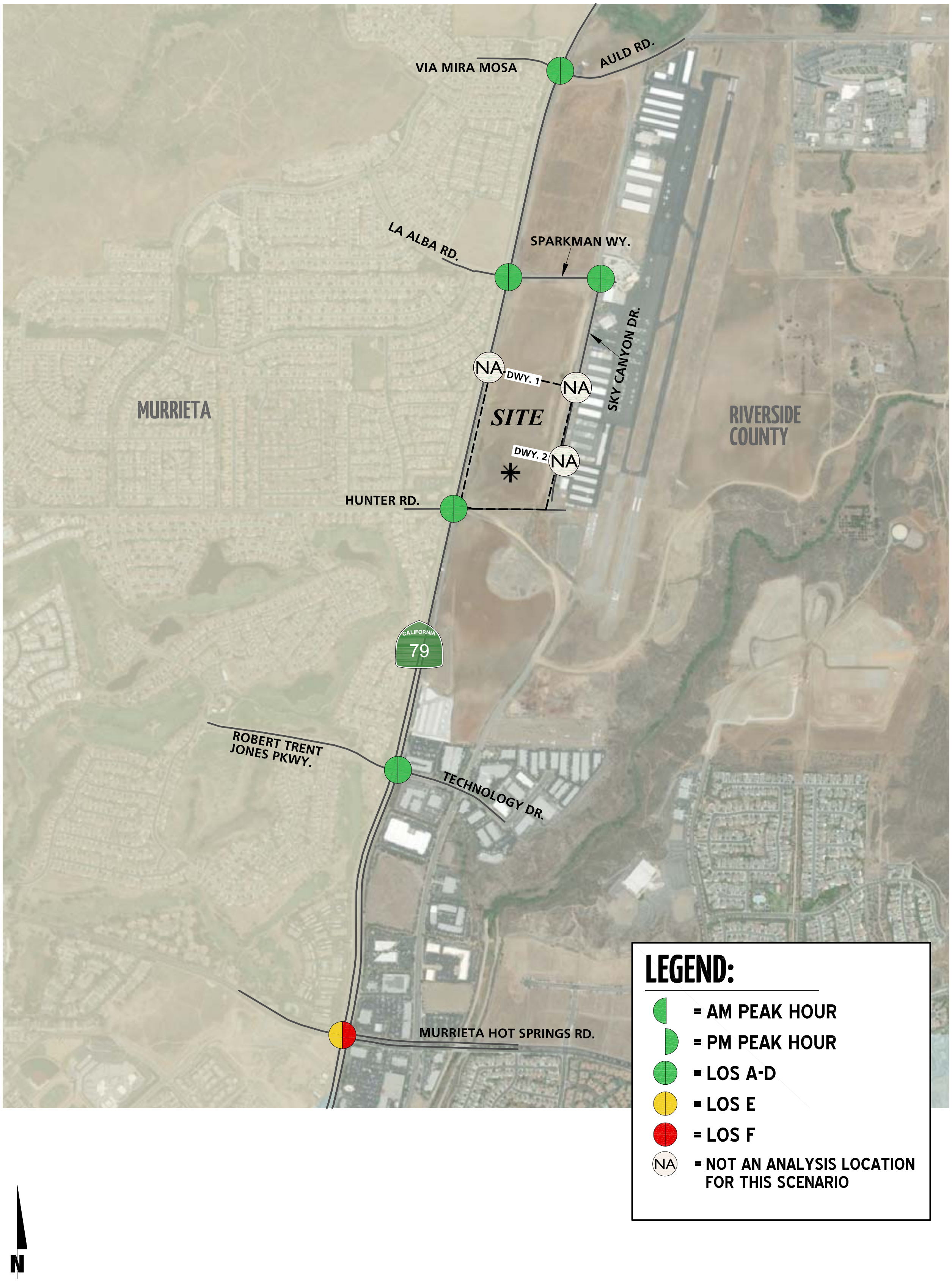


Table 3-1

Intersection Analysis for Existing (2018) Conditions

#	Intersection	Traffic Control[3]	Northbound L	Northbound T	Northbound R	Southbound L	Southbound T	Southbound R	Eastbound L	Eastbound T	Eastbound R	Westbound L	Westbound T	Westbound R	Delay[2] (secs.) AM	Delay[2] (secs.) PM	LOS AM	LOS PM	Acceptable LOS
1	Winchester Rd. (SR-79) & Via Mira Mosa/Auld Rd.	TS	1	2	1	1	2	d	1	1	0	1	1	0	27.3	34.6	C	C	D
2	Winchester Rd. (SR-79) & La Alba Dr./Sparkman Wy.	TS	1	2	0	1	2	1	1	1	1	0	1	0	21.8	18.1	C	B	D
3	Winchester Rd. (SR-79) & Driveway 1		Future Intersection																D
4	Winchester Rd. (SR-79) & Hunter Rd.	TS	1	2	0	1	2	0	0	1	1>	0	1	0	27.0	18.7	C	B	D
5	Winchester Rd. (SR-79) & Robert Trent Jones Pkwy./Technology Dr.	TS	1	3	d	1	3	d	1	2	d	1	2	0	11.7	27.6	B	C	D
6	Winchester Rd. (SR-79) & Murrieta Hot Springs Rd.	TS	2	3	1	2	3	1	2	3	1	2	2	1	**58.2**	**82.4**	**E**	**F**	D
7	Sky Canyon Dr. & Sparkman Wy.	AWS	0	1	d	0	1	0	0	1	0	0	1	d	7.7	7.7	A	A	D
8	Sky Canyon Dr. & Driveway 1		Future Intersection																D
9	Sky Canyon Dr. & Driveway 2		Future Intersection																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; d= Defacto Right Turn Lane; > = Right-Turn Overlap Phasing

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

3 AWS = All-Way Stop; TS = Traffic Signal

Table 3-2

Intersection Analysis for Existing (2018) Conditions With Improvements

#	Intersection	Traffic Control[3]	Intersection Approach Lanes[1] Northbound L	T	R	Southbound L	T	R	Eastbound L	T	R	Westbound L	T	R	Delay[2] (secs.) AM	PM	LOS AM	PM
6	Winchester Rd. (SR-79) & Murrieta Hot Springs Rd.																	
	- Without Improvements	TS	2	3	1	2	3	1	2	3	1	2	2	1	**58.2**	**82.4**	**E**	**F**
	- With Improvements[4]	TS	2	3	1	2	3	**1>**	2	3	1	2	2	1	38.5	51.0	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; > = Right-Turn Overlap Phasing; **1** = Improvement

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

[3] TS = Traffic Signal

[4] Recommended improvement includes the elimination of the pedestrian crosswalk on the north leg.

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. For the purposes of this analysis, the Project is proposed to consist of the development of 32,292 square feet of warehouse use, 65,100 square feet of office use, and a 66,306 square foot research and development center. It is assumed that the Project will be constructed within a single phase of development, and is anticipated to be fully built and operational by Year 2020.

The Project is proposed to have access via 1 Driveway on Winchester Road (SR-79) and 2 driveways along Sky Canyon Drive. All 2 driveways on Sky Canyon Drive are proposed for full access and the single driveway on Winchester Road (SR-79) is proposed for right-in-right-out access only. Regional access to the Project site will be provided by Winchester Road (SR-79).

4.1 PROJECT TRIP GENERATION

Trip generation represents the amount of traffic which is both attracted to and produced by a development. Determining traffic generation for a specific project is therefore based upon forecasting the amount of traffic that is expected to be both attracted to and produced by the specific land uses being proposed for a given development. The ITE Trip Generation Manual is a nationally recognized source for estimating site specific trip generation. ITE recently released an updated edition of the Trip Generation Manual (10th Edition) in September 2017. (3)

The trip generation rates are based upon data collected by the Institute of Transportation Engineers (ITE) for Warehousing Without Cold Storage (ITE Land Use Code 150), General Office (ITE Land Use Code 710), and Research and Development Center (ITE Land Use Code 760). Table 4-1 presents the trip generation rates in passenger car equivalent (PCE) for the proposed Project. As shown in Table 4-1, the Project is anticipated to generate a net total of 1,487 PCE trip-ends per day with 100 PCE AM peak hour trips and 111 PCE PM peak hour trips. Table 4-2 presents the trip generation rates in actual vehicles for the proposed Project. In comparison, the Project is anticipated to generate a net total of 1,469 trip-ends per day with 99 AM peak hour trips and 109 PM peak hour trips in actual vehicles.

4.2 PROJECT TRIP DISTRIBUTION

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

The Project trip distribution and assignment process represents the directional orientation of traffic to and from the Project site. The trip distribution pattern of passenger cars is heavily influenced by the geographical location of the site, the location of surrounding land uses, and the proximity to the regional freeway system.

Table 4-1

Project Trip Generation Summary (PCE)

Land Use	ITE LU Code	Units[2]	AM Peak Hour In	AM Peak Hour Out	AM Peak Hour Total	PM Peak Hour In	PM Peak Hour Out	PM Peak Hour Total	Daily
Project Trip Generation Rates[1]									
Warehousing Without Cold Storage[3,4]	150	TSF	0.131	0.039	0.170	0.051	0.139	0.190	1.740
Passenger Cars (80.00%)			0.105	0.031	0.136	0.041	0.111	0.152	1.392
2-Axle Trucks (3.34%) (PCE = 1.5)[5]			0.007	0.002	0.009	0.003	0.007	0.010	0.087
3-Axle Trucks (4.14%) (PCE = 2.0)[5]			0.011	0.003	0.014	0.004	0.011	0.016	0.144
4-Axle+ Trucks (12.52%) (PCE = 3.0)[5]			0.049	0.015	0.064	0.019	0.052	0.071	0.654
General Office	710	TSF	0.88	0.14	1.02	0.17	0.90	1.07	10.23
Research and Development Center	760	TSF	0.32	0.10	0.42	0.07	0.42	0.49	11.26

Project	Quantity	Units[2]	AM Peak Hour In	AM Peak Hour Out	AM Peak Hour Total	PM Peak Hour In	PM Peak Hour Out	PM Peak Hour Total	Daily
Project Trip Generation Summary									
Warehouse	32.292	TSF							
Passenger Cars:			3	1	4	1	4	5	45
Truck Trips:									
2-axle:			0	0	0	0	0	0	3
3-axle:			0	0	0	0	0	0	5
4+-axle:			2	0	2	1	2	3	21
- Net Truck Trips			*2*	*0*	*2*	*1*	*2*	*3*	*29*
Subtotal Warehouse Net Trips			***5***	***1***	***6***	***2***	***6***	***8***	***74***
KTM Headquarters Office	65.100	TSF	57	9	66	11	59	70	666
Motorsport	66.306	TSF	21	7	28	5	28	33	747
TOTAL TRIPS			***83***	***17***	***100***	***18***	***93***	***111***	***1,487***

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

[2] TSF = Thousand Square Feet

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

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

Normalized % - Without Cold Storage:

16.7% 2-Axle trucks, 20.7% 3-Axle trucks, 62.5% 4-Axle trucks

[5] PCE rates are per SBCTA

Table 4-2

Project Trip Generation Summary (Actual Vehicles)

Land Use	ITE LU Code	Units[2]	AM Peak Hour In	AM Peak Hour Out	AM Peak Hour Total	PM Peak Hour In	PM Peak Hour Out	PM Peak Hour Total	Daily
Project Trip Generation Rates[1]									
Warehousing Without Cold Storage[3,4]	150	TSF	0.131	0.039	0.170	0.051	0.139	0.190	1.740
Passenger Cars (80.00%)			0.105	0.031	0.136	0.041	0.111	0.152	1.392
2-Axle Trucks (3.34%)			0.004	0.001	0.006	0.002	0.005	0.006	0.058
3-Axle Trucks (4.14%)			0.005	0.002	0.007	0.002	0.006	0.008	0.072
4-Axle+ Trucks (12.52%)			0.016	0.005	0.021	0.006	0.017	0.024	0.218
General Office	710	TSF	0.88	0.14	1.02	0.17	0.90	1.07	10.23
Research and Development Center	760	TSF	0.32	0.10	0.42	0.07	0.42	0.49	11.26

Project	Quantity	Units[2]	AM Peak Hour In	AM Peak Hour Out	AM Peak Hour Total	PM Peak Hour In	PM Peak Hour Out	PM Peak Hour Total	Daily
Project Trip Generation Summary									
Warehouse	32.292	TSF							
Passenger Cars:			3	1	4	1	4	5	45
Truck Trips:									
2-axle:			0	0	0	0	0	0	2
3-axle:			0	0	0	0	0	0	2
4+-axle:			1	0	1	0	1	1	7
- Net Truck Trips			*1*	*0*	*1*	*0*	*1*	*1*	*11*
Subtotal Warehouse Net Trips			*4*	*1*	*5*	*1*	*5*	*6*	*56*
KTM Headquarters Office	65.100	TSF	57	9	66	11	59	70	666
Motorsport	66.306	TSF	21	7	28	5	28	33	747
TOTAL TRIPS			***82***	***17***	***99***	***17***	***92***	***109***	***1,469***

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

[2] TSF = Thousand Square Feet

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

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

Normalized % - Without Cold Storage:

16.7% 2-Axle trucks, 20.7% 3-Axle trucks, 62.5% 4-Axle trucks

The trip distribution pattern for truck traffic is also influenced by the local truck routes approved by the County of Riverside, City of Murrieta, and Caltrans. Given these differences, separate trip distributions were generated for both passenger cars and truck trips. The Project passenger car trip distribution patterns is graphically depicted on Exhibit 4-1 and the Project truck trip distribution patterns is graphically depicted on Exhibit 4-2.

4.3 MODAL SPLIT

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

4.4 PROJECT TRIP ASSIGNMENT

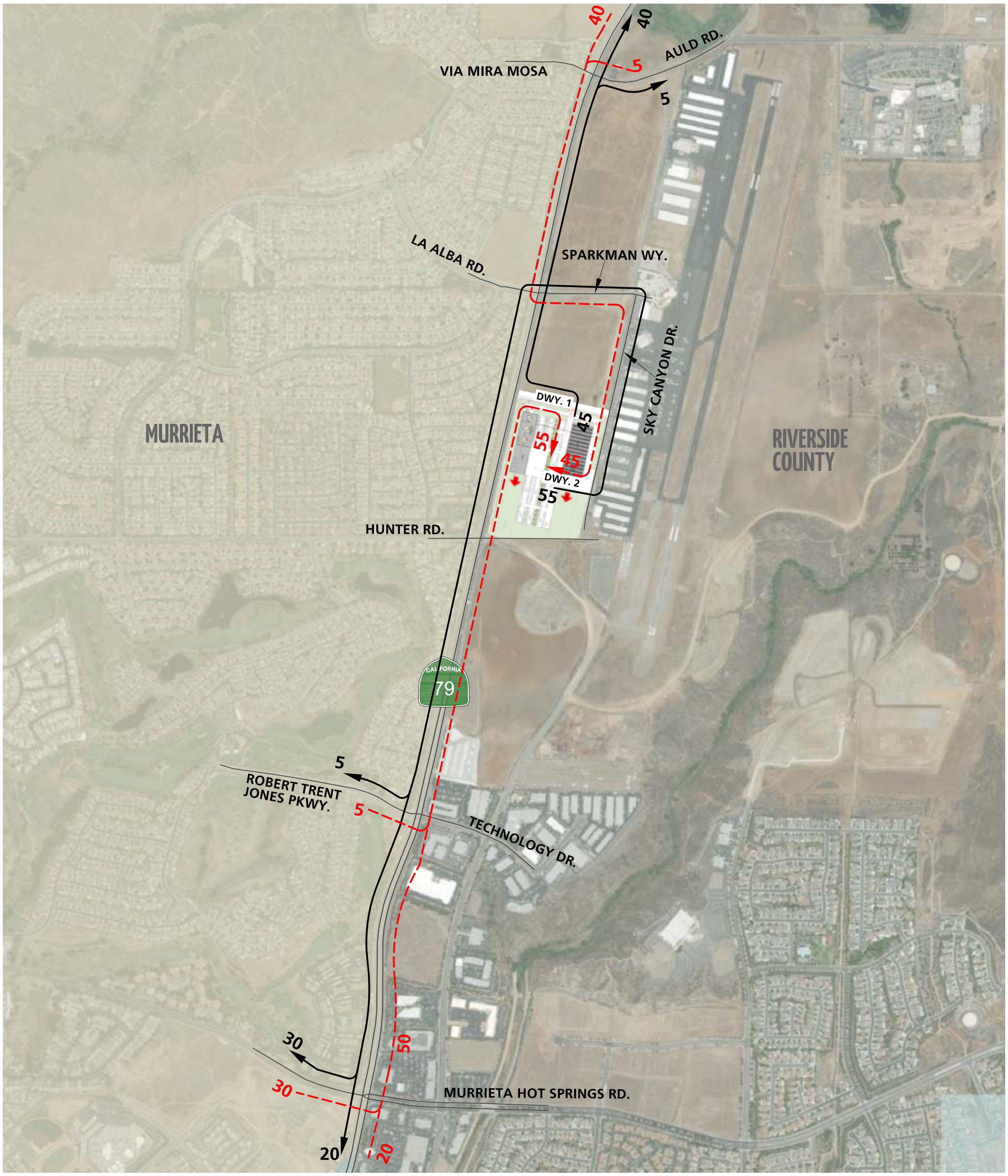
The assignment of traffic from the Project area to the adjoining roadway system is based upon the Project trip generation, trip distribution, and the arterial highway and local street system improvements that would be in place by the time of initial occupancy of the Project. Based on the identified Project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

4.5 BACKGROUND TRAFFIC

Future year traffic forecasts have been based upon a background (ambient) growth factor of 2% per year. The ambient growth factor is intended to approximate traffic growth. The total ambient growth is 4.04% for 2020 traffic conditions (compounded growth of two percent per year over 2 years). This ambient growth rate is added to existing traffic volumes to account for area-wide growth not reflected by cumulative development projects. Ambient growth has been added to daily and peak hour traffic volumes on surrounding roadways, in addition to traffic generated by the development of future projects that have been approved but not yet built and/or for which development applications have been filed and are under consideration by governing agencies.

The currently adopted Southern California Association of Governments (SCAG) 2016 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS) (April 2016) growth forecasts for the unincorporated areas of the County of Riverside identifies projected growth in population of 359,000 in 2012 to 499,200 in 2040, or a 39.05 percent increase over the 28-year period. (10) The change in population equates to roughly a 1.18 percent growth rate per year, compounded annually. Similarly, growth over the same 28-year period in households is projected to increase by 45.06 percent, or a 1.34 percent growth rate per year, compounded annually. Finally, growth in employment over the same 28-year period is projected to increase by 122.13 percent, or a 2.89 percent growth rate per year, compounded annually.

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



LEGEND:

10 = PERCENT TO/FROM PROJECT

= OUTBOUND

= INBOUND

N

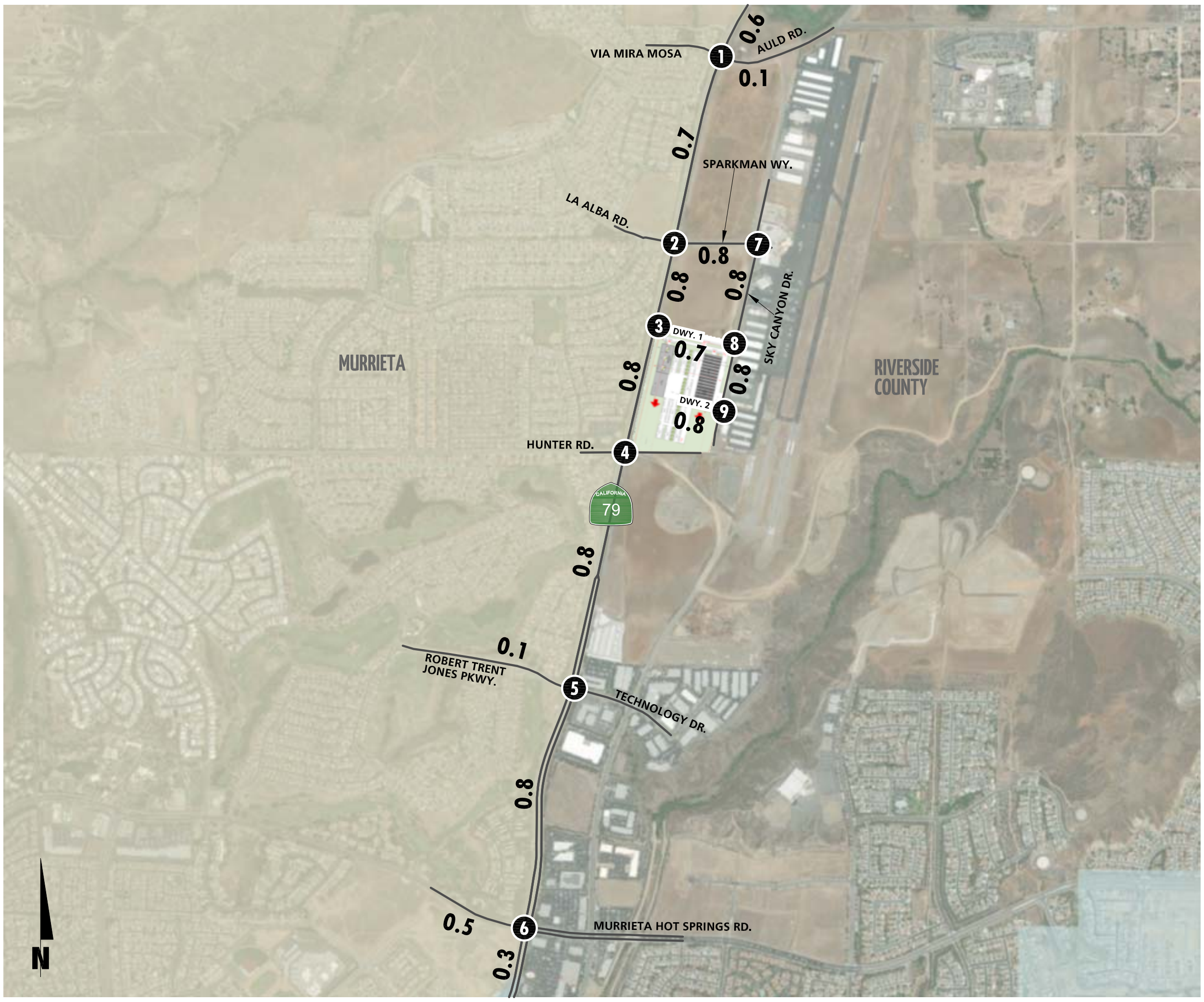
EXHIBIT 4-2: PROJECT TRIP (TRUCKS) DISTRIBUTION

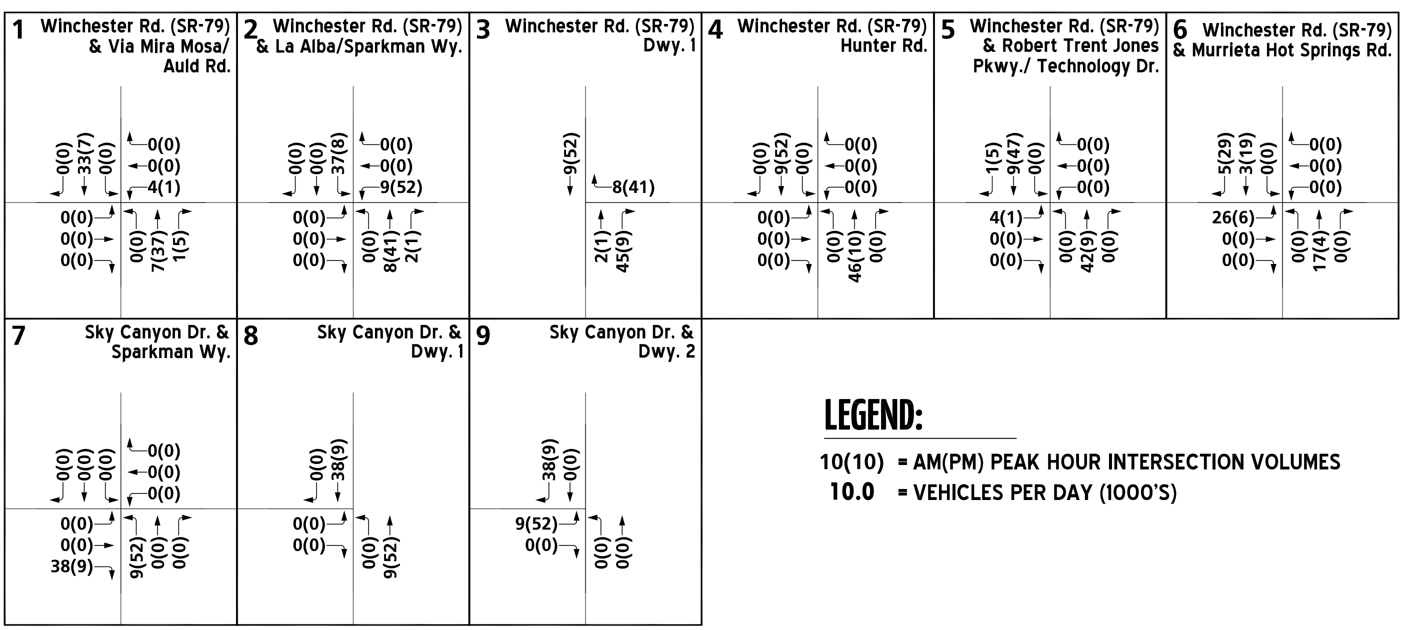
LEGEND:

10 = PERCENT TO/FROM PROJECT

N

EXHIBIT 4-3: PROJECT ONLY TRAFFIC VOLUMES (IN PCE)





Based on a comparison of Existing traffic volumes to the EAPC (2020) forecasts, the average growth rate is estimated at approximately 15.36 percent compounded annually between Existing and EAPC (2020) traffic conditions. The annual growth rate at each individual intersection is not lower than 12.03 percent compounded annually to as high as 21.80 percent compounded annually over the same period. Therefore, the annual growth rate utilized for the purposes of this analysis would appear to conservatively approximate the anticipated regional growth in traffic volumes in the County of Riverside for EAPC traffic conditions, especially when considered along with the addition of project-related traffic. As such, the growth in traffic volumes assumed in this traffic impact analysis would tend to overstate as opposed to understate the potential impacts to traffic and circulation.

California Environmental Quality Act (CEQA) guidelines require that other reasonably foreseeable development projects which are either approved or being processed concurrently in the study area also be included as part of a cumulative analysis scenario. A cumulative project list was developed for the purposes of this analysis through consultation with planning and engineering staff from the County of Riverside. The neighboring jurisdiction of Murrieta have also been contacted to include key projects in the City.

Exhibit 4-4 illustrates the cumulative development location map. A summary of cumulative development projects and their proposed land uses are shown on Table 4-3. Where applicable, the traffic generated by individual cumulative projects has been manually added to the EAPC (2020), forecasts to ensure that traffic generated by the listed cumulative development projects in Table 4-3 are reflected as part of the background traffic.

Due to the comprehensive nature of the list of cumulative projects, Urban Crossroads has consulted with County staff to determine a reasonable absorption percentage to be applied to the cumulative development projects for each analysis phase. Based on these discussions, an absorption of 50-100 percent has been assumed for EAPC (2020) traffic conditions.

4.7 TRAFFIC FORECASTS

To provide a comprehensive assessment of potential transportation network deficiencies, a "buildup" analysis was performed in support of this work effort. The "buildup" method was used to approximate the EAP traffic forecasts includes background traffic, and is intended to identify the significant impacts on both the existing and planned near-term circulation system. The "buildup" method was also utilized to approximate the EAPC traffic forecasts, and is intended to identify the cumulative impacts on both the existing and planned near-term circulation system. The EAPC traffic forecasts include background traffic, traffic generated by other cumulative development projects within the study area, and the traffic generated by the proposed Project.

The "buildup" approach combines existing traffic counts with a background ambient growth factor to forecast the near-term 2020 traffic conditions. An ambient growth factor of 2% per year accounts for background (area-wide) traffic increases that occur over time, up to the year 2020 from the year 2018 (compounded two percent per year growth over a two-year period). Traffic volumes generated by the Project are then added to assess the EAP and EAPC traffic conditions. The 2020 roadway network is similar to the existing conditions roadway network.

EXHIBIT 4-4: CUMULATIVE DEVELOPMENT LOCATION MAP

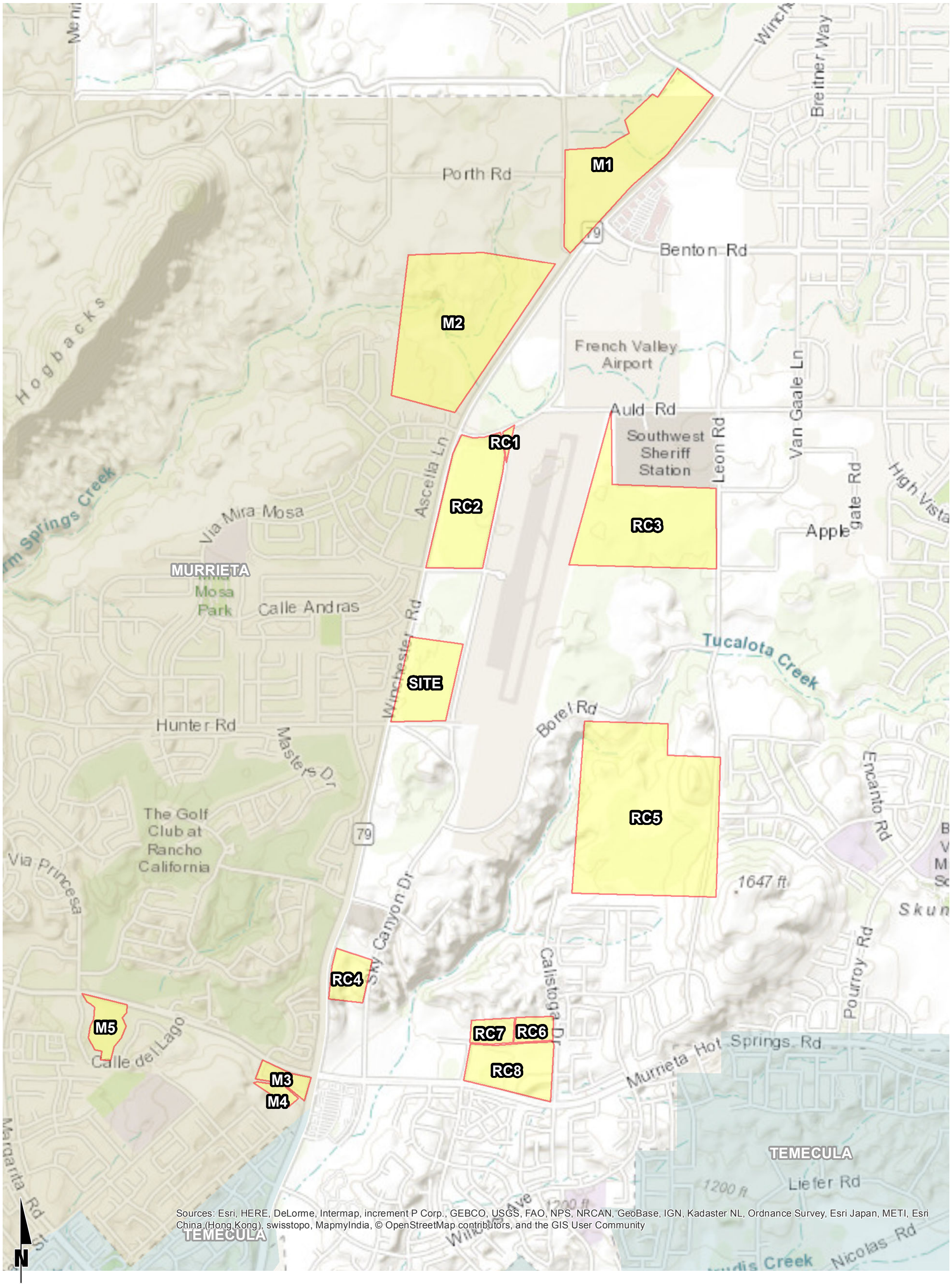


Table 4-3

Cumulative Development Land Use Summary

#	Project	Land Use	Quantity[1]	
County of Riverside				
RC1	PP26047	Office	7.850	TSF
RC2	PP26084	Free-Standing Discount Store	200.000	TSF
		High-Turnover (Sit-Down) Restaurant	16.000	TSF
		Shopping Center	108.600	TSF
		Medical Office	16.000	TSF
RC3	PP25183	Office	331.003	TSF
RC4	PP22147	Medical Office	10.750	TSF
	PP22352	Business Park	177.742	TSF
RC5	TR36546	Multifamily Housing (Low-Rise)	253	DU
RC6	CUP03742	Mini-Warehouse	136.411	TSF
RC7	PP26340-43	Office	112.741	TSF
RC8	PP22278	Office	630.000	TSF
City of Murrieta				
M1	Murrieta Marketplace	Shopping Center	584.309	TSF
		Gasoline/Service Station	8	VFP
		Gasoline/Service Station with Convience Market	28	VFP
M2	Adobe Springs	Single Family Detached Units	287	DU
		Business Park	208.500	TSF
M3	ALDI Food Market	Supermarket	19.056	TSF
M4	Date Street Shopping Center	Shopping Center	24.874	TSF
M5	Murrieta 180	Multifamily Housing (Mid-Rise)	196	DU

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

5 E+P TRAFFIC ANALYSIS

In an effort to satisfy the CEQA Guideline Section 15125(a), an analysis of existing traffic volumes plus traffic generated by the proposed Project (E+P) has been included in this report. This section discusses the traffic forecasts for Existing plus Project (E+P) conditions and the resulting intersection operations and traffic signal warrant analyses. This analysis scenario has been provided for informational purposes only as Project impacts have been discerned from a comparison of Existing (2018) to EAP (2020) traffic conditions (per the County's traffic study guidelines).

5.1 ROADWAY IMPROVEMENTS

The lane configurations and traffic controls assumed to be in place for E+P conditions consist of the following:

- Project driveways and those facilities assumed to be constructed by the Project to provide site access are also assumed to be in place for E+P conditions only (e.g., intersection and roadway improvements at the Project's frontage and driveways). These include the Project site adjacent roadways of Winchester Road (SR-79) and Sky Canyon Drive.

5.2 E+P TRAFFIC VOLUME FORECASTS

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

5.3 INTERSECTION OPERATIONS ANALYSIS

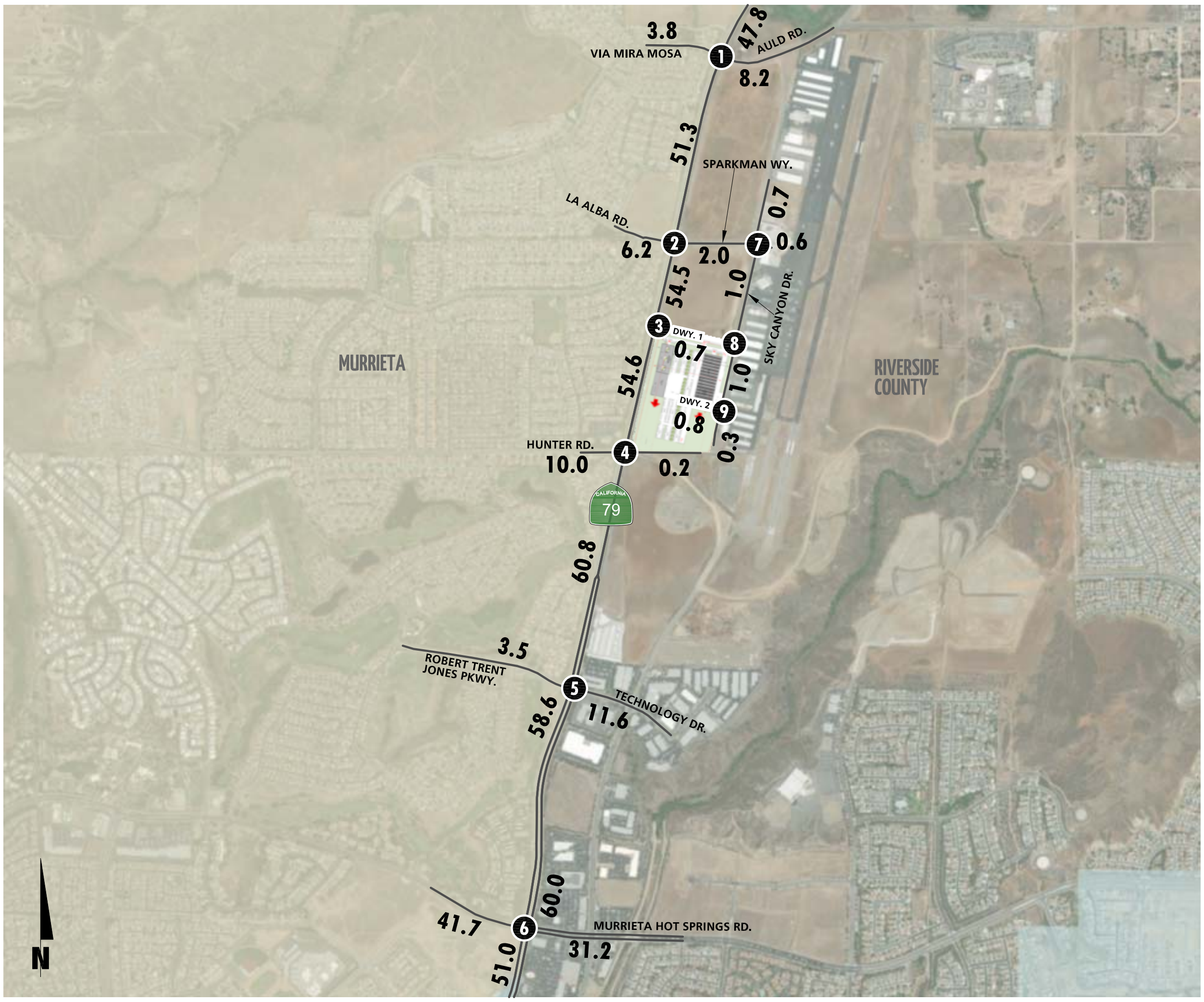
E+P peak hour traffic operations have been evaluated for the study area intersections based on the analysis methodologies presented in Section 2 *Methodologies* of this TIA. The intersection analysis results are summarized in Table 5-1, which indicates that there are no additional study area intersections anticipated to operate at an unacceptable LOS during one or more peak hours in addition to the locations previously identified for Existing (2018) traffic conditions.

Consistent with Table 5-1, a summary of the peak hour intersection LOS for E+P conditions is shown on Exhibit 5-2. The intersection operations analysis worksheets for E+P traffic conditions are included in Appendix 5.1 of this TIA.

5.4 TRAFFIC SIGNAL WARRANTS ANALYSIS

Traffic signal warrants have been performed on unsignalized intersections for E+P traffic conditions, however, there are no study area intersections anticipated to warrant a traffic signal for E+P traffic conditions. Worksheets for E+P traffic conditions signal warrants are provided in Appendix 5.2.

EXHIBIT 5-1: E+P TRAFFIC VOLUMES (IN PCE)



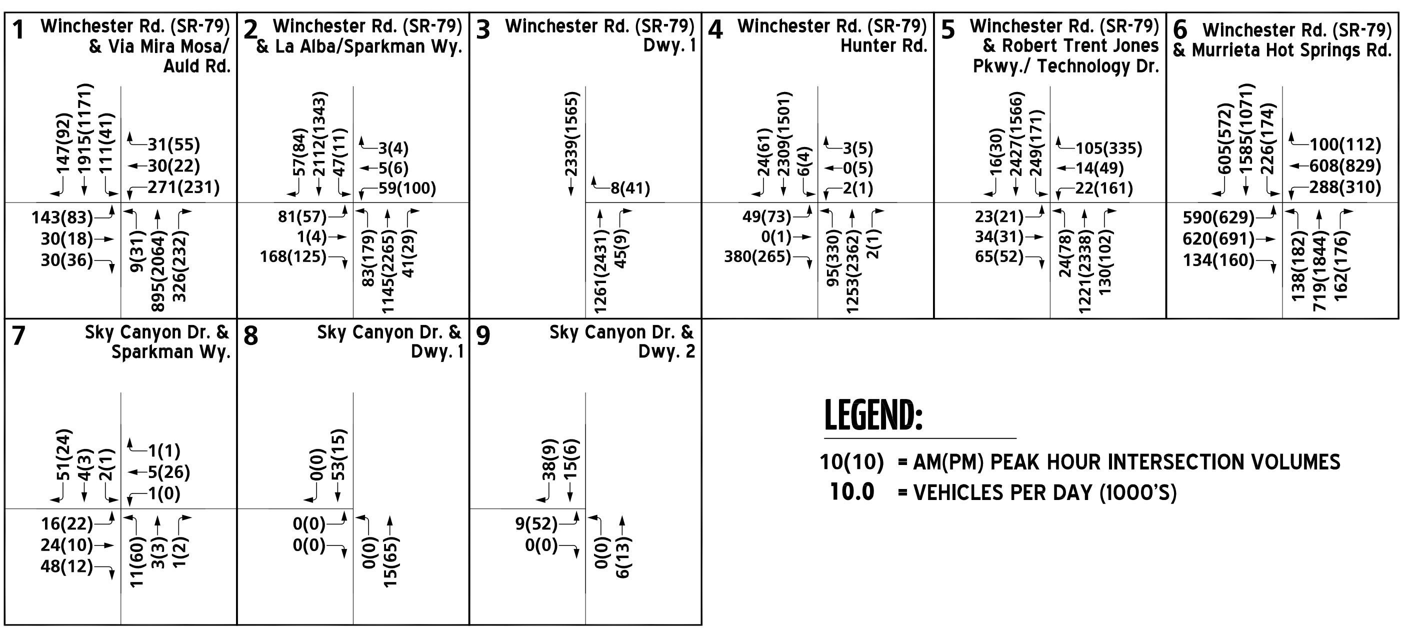


EXHIBIT 5-2: E+P SUMMARY OF LOS

Table 5-1

Intersection Analysis for E+P Conditions

#	Intersection	Traffic Control[2]	Existing (2018) Delay[1] (secs.) AM	Existing (2018) Delay[1] (secs.) PM	Existing (2018) LOS AM	Existing (2018) LOS PM	E+P Delay[1] (secs.) AM	E+P Delay[1] (secs.) PM	E+P LOS AM	E+P LOS PM	Acceptable LOS
1	Winchester Rd. (SR-79) & Via Mira Mosa/Auld Rd.	TS	27.3	34.6	C	C	29.2	38.1	C	D	D
2	Winchester Rd. (SR-79) & La Alba Dr./Sparkman Wy.	TS	21.8	18.1	C	B	22.4	26.2	C	C	D
3	Winchester Rd. (SR-79) & Driveway 1	**<u>CSS</u>**	Future Intersection				13.1	27.1	B	D	D
4	Winchester Rd. (SR-79) & Hunter Rd.	TS	27.0	18.7	C	B	27.3	19.2	C	B	D
5	Winchester Rd. (SR-79) & Robert Trent Jones Pkwy./Technology Dr.	TS	11.7	27.6	B	C	11.8	27.8	B	C	D
6	Winchester Rd. (SR-79) & Murrieta Hot Springs Rd.	TS	**58.2**	**82.4**	**E**	**F**	**62.1**	**83.3**	**E**	**F**	D
7	Sky Canyon Dr. & Sparkman Wy.	AWS	7.7	7.7	A	A	7.8	8.1	A	A	D
8	Sky Canyon Dr. & Driveway 1	**<u>CSS</u>**	Future Intersection				0.0	0.0	A	A	D
9	Sky Canyon Dr. & Driveway 2	**<u>CSS</u>**	Future Intersection				8.7	8.8	A	A	D

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

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

[2] CSS = Cross-street Stop; AWS = All-Way Stop; TS = Traffic Signal; **<u>CSS</u>** = Improvement

5.5 DEFICIENCIES AND RECOMMENDED IMPROVEMENTS

Improvement strategies have been recommended at intersections that have been identified as deficient to reduce each location's peak hour delay and improve the associated LOS grade to an acceptable LOS (LOS D or better). The effectiveness of the proposed recommended improvements is presented in Table 5-2 for E+P traffic conditions. Recommended improvements to address deficiencies for E+P traffic conditions are described below.

Recommended Improvement – Winchester Road (SR-79) & Murrieta Hot Springs Road (#6)

- Modify the existing traffic signal to implement overlap phasing on the southbound right turn lane and eliminate the cross-walk on the north leg.

Worksheets for E+P conditions, with improvements, HCM calculations are provided in Appendix 5.3.

Table 5-2

Intersection Analysis for E+P Conditions With Improvements

#	Intersection	Traffic Control[3]	Intersection Approach Lanes[1] Northbound L	T	R	Southbound L	T	R	Eastbound L	T	R	Westbound L	T	R	Delay[2] (secs.) AM	PM	LOS AM	PM
6	Winchester Rd. (SR-79) & Murrieta Hot Springs Rd.																	
	- Without Improvements	TS	2	3	1	2	3	1	2	3	1	2	2	1	**62.1**	**83.3**	**E**	**F**
	- With Improvements[4]	TS	2	3	1	2	3	**1>**	2	3	1	2	2	1	39.5	51.2	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; > = Right-Turn Overlap Phasing; **1** = Improvement

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

3 TS = Traffic Signal

4 Recommended improvement includes the elimination of the pedestrian crosswalk on the north leg.

6 EAP TRAFFIC ANALYSIS

This section discusses the methods used to develop Existing plus Ambient Growth plus Project (EAP) (2020) traffic forecasts, and the resulting intersection operations and traffic signal warrant analyses.

6.1 ROADWAY IMPROVEMENTS

The lane configurations and traffic controls assumed to be in place for EAP (2020) conditions consist of the following:

- Project driveways and those facilities assumed to be constructed by the Project to provide site access are also assumed to be in place for EAP (2020) conditions only (e.g., intersection and roadway improvements at the Project's frontage and driveways). These include the Project site adjacent roadways of Winchester Road (SR-79) and Sky Canyon Drive.

6.2 EAP (2020) TRAFFIC VOLUME FORECASTS

To account for background traffic growth, an ambient growth from Existing conditions of 4.04% (2 percent per year over two years) is included for EAP traffic conditions. Cumulative development projects are not included as part of the EAP analysis. The weekday ADT and weekday AM and PM peak hour volumes which can be expected for EAP traffic conditions are shown on Exhibit 6-1.

6.3 INTERSECTION OPERATIONS ANALYSIS

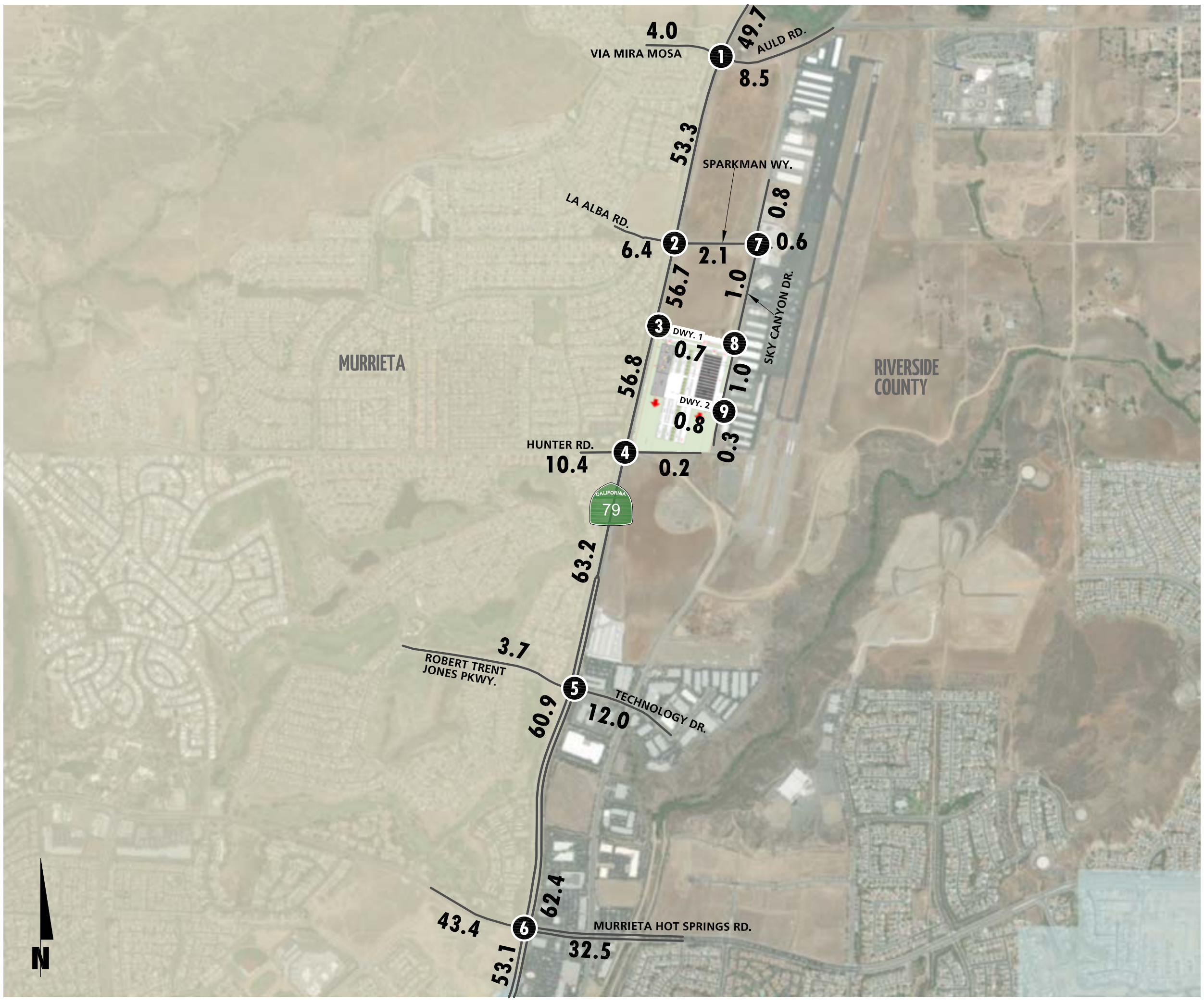
LOS calculations were conducted for the study intersections to evaluate their operations under EAP conditions with roadway and intersection geometrics consistent with Section 6.1 *Roadway Improvements*. As shown in Table 6-1, there are no additional study area intersections anticipated to operate at unacceptable LOS under EAP traffic conditions, in addition to the locations previously identified under Existing traffic conditions.

A summary of the peak hour intersection LOS for EAP traffic conditions are shown on Exhibit 6-2. The intersection operations analysis worksheets for EAP traffic conditions are included in Appendix 6.1 of this TIA.

6.4 TRAFFIC SIGNAL WARRANTS ANALYSIS

Traffic signal warrants have been performed on unsignalized intersections for EAP (2020) traffic conditions, however, there are no study area intersections anticipated to warrant a traffic signal for EAP (2020) traffic conditions. Worksheets for EAP (2020) traffic conditions signal warrants are provided in Appendix 6.2.

EXHIBIT 6-1: EAP (2020) TRAFFIC VOLUMES (IN PCE)



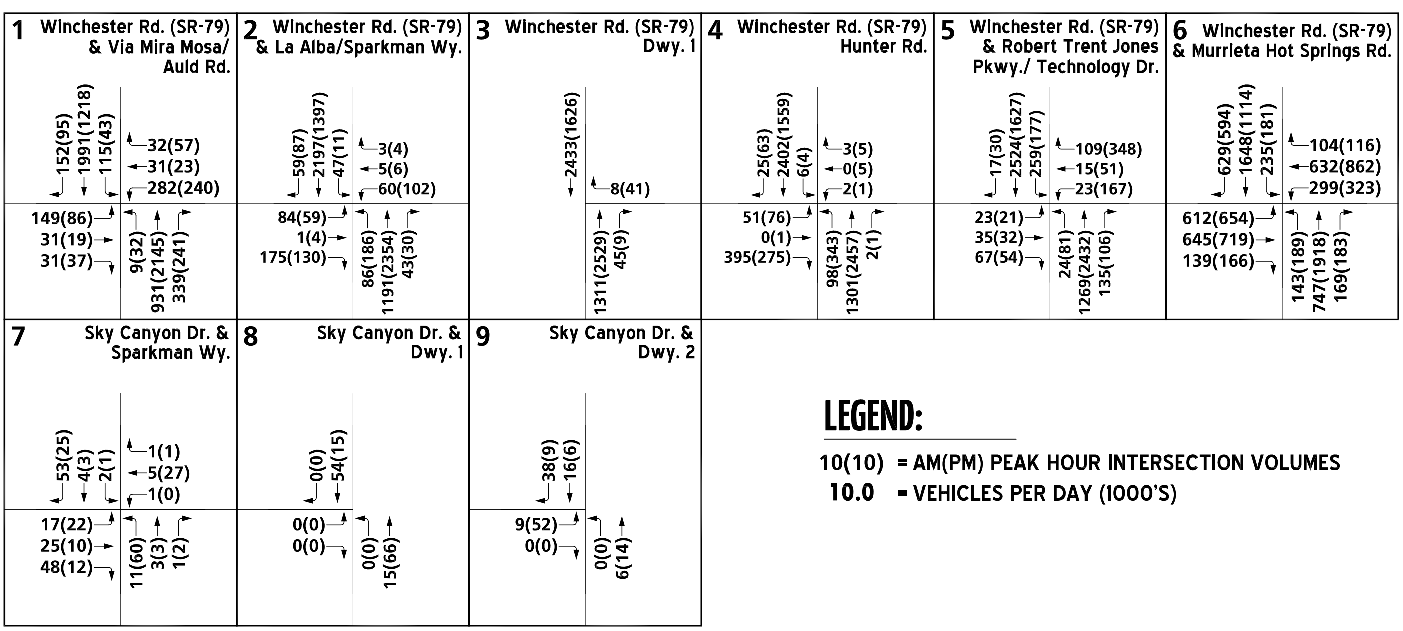


EXHIBIT 6-2: EAP (2020) SUMMARY OF LOS

Table 6-1

Intersection Analysis for EAP (2020) Conditions

#	Intersection	Traffic Control[2]	Existing (2018) Delay[1] (secs.) AM	Existing (2018) Delay[1] (secs.) PM	Existing (2018) LOS AM	Existing (2018) LOS PM	EAP (2020) Delay[1] (secs.) AM	EAP (2020) Delay[1] (secs.) PM	EAP (2020) LOS AM	EAP (2020) LOS PM	Acceptable LOS
1	Winchester Rd. (SR-79) & Via Mira Mosa/Auld Rd.	TS	27.3	34.6	C	C	36.2	49.0	D	D	D
2	Winchester Rd. (SR-79) & La Alba Dr./Sparkman Wy.	TS	21.8	18.1	C	B	28.0	31.2	C	C	D
3	Winchester Rd. (SR-79) & Driveway 1	**CSS**	Future Intersection				13.4	29.2	B	D	D
4	Winchester Rd. (SR-79) & Hunter Rd.	TS	27.0	18.7	C	B	48.9	22.7	D	C	D
5	Winchester Rd. (SR-79) & Robert Trent Jones Pkwy./Technology Dr.	TS	11.7	27.6	B	C	12.1	33.1	B	C	D
6	Winchester Rd. (SR-79) & Murrieta Hot Springs Rd.	TS	**58.2**	**82.4**	**E**	**F**	**68.7**	**93.2**	**E**	**F**	D
7	Sky Canyon Dr. & Sparkman Wy.	AWS	7.7	7.7	A	A	7.9	8.1	A	A	D
8	Sky Canyon Dr. & Driveway 1	**CSS**	Future Intersection				0.0	0.0	A	A	D
9	Sky Canyon Dr. & Driveway 2	**CSS**	Future Intersection				8.7	8.8	A	A	D

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

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

2 CSS = Cross-street Stop; AWS = All-Way Stop; TS = Traffic Signal; **CSS** = Improvement

6.5 EAP Deficiencies and Recommended Improvements

Improvement strategies have been recommended at intersections that have been identified as deficient in an effort to reduce each location's peak hour delay and improve the associated LOS grade to an acceptable LOS (LOS D or better). The effectiveness of the recommended improvement strategies discussed below to address EAP (2020) traffic deficiencies is presented in Table 6-2. The improvements that were previously required to address LOS deficiencies for Existing and E+P traffic conditions are shown in *italics*. No new improvements are required for EAP (2020) traffic conditions.

Recommended Improvement – Winchester Road (SR-79) & Murrieta Hot Springs Road (#6)

- *Modify the existing traffic signal to implement overlap phasing on the southbound right turn lane and eliminate the cross-walk on the north leg. (Consistent with Existing and E+P traffic conditions)*

Worksheets for EAP (2020) conditions, with improvements, HCM calculations are provided in Appendix 6.3.

Table 6-2

Intersection Analysis for EAP (2020) Conditions With Improvements

#	Intersection	Traffic Control[3]	Intersection Approach Lanes[1]												Delay[2] (secs.)		LOS	
			Northbound			Southbound			Eastbound			Westbound						
			L	T	R	L	T	R	L	T	R	L	T	R	AM	PM	AM	PM
6	Winchester Rd. (SR-79) & Murrieta Hot Springs Rd.																	
	- Without Improvements	TS	2	3	1	2	3	1	2	3	1	2	2	1	**68.7**	**93.2**	**E**	**F**
	- With Improvements[4]	TS	2	3	1	2	3	**<u>1></u>**	2	3	1	2	2	1	41.6	54.5	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; > = Right-Turn Overlap Phasing; **1** = Improvement

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

[3] TS = Traffic Signal

[4] Recommended improvement includes the elimination of the pedestrian crosswalk on the north leg.

7 EAPC TRAFFIC ANALYSIS

This section discusses the methods used to develop Existing plus Ambient Growth plus Project plus Cumulative (EAPC) (2020) traffic forecasts, and the resulting intersection operations and traffic signal warrant analyses.

7.1 ROADWAY IMPROVEMENTS

The lane configurations and traffic controls assumed to be in place for EAPC (2020) conditions consist of the following:

- Project driveways and those facilities assumed to be constructed by the Project to provide site access are also assumed to be in place for EAPC (2020) conditions only (e.g., intersection and roadway improvements at the Project's frontage and driveways). These include the Project site adjacent roadways of Winchester Road (SR-79) and Sky Canyon Drive.

7.2 EAPC (2020) TRAFFIC VOLUME FORECASTS

To account for background traffic, other known cumulative development projects in the study area were included in addition to 4.04% of ambient growth (2 percent per year over two years) for EAPC traffic conditions in conjunction with traffic associated with the proposed Project. The weekday ADT and weekday AM and PM peak hour volumes which can be expected for EAPC (2020) traffic conditions are shown on Exhibit 7-1.

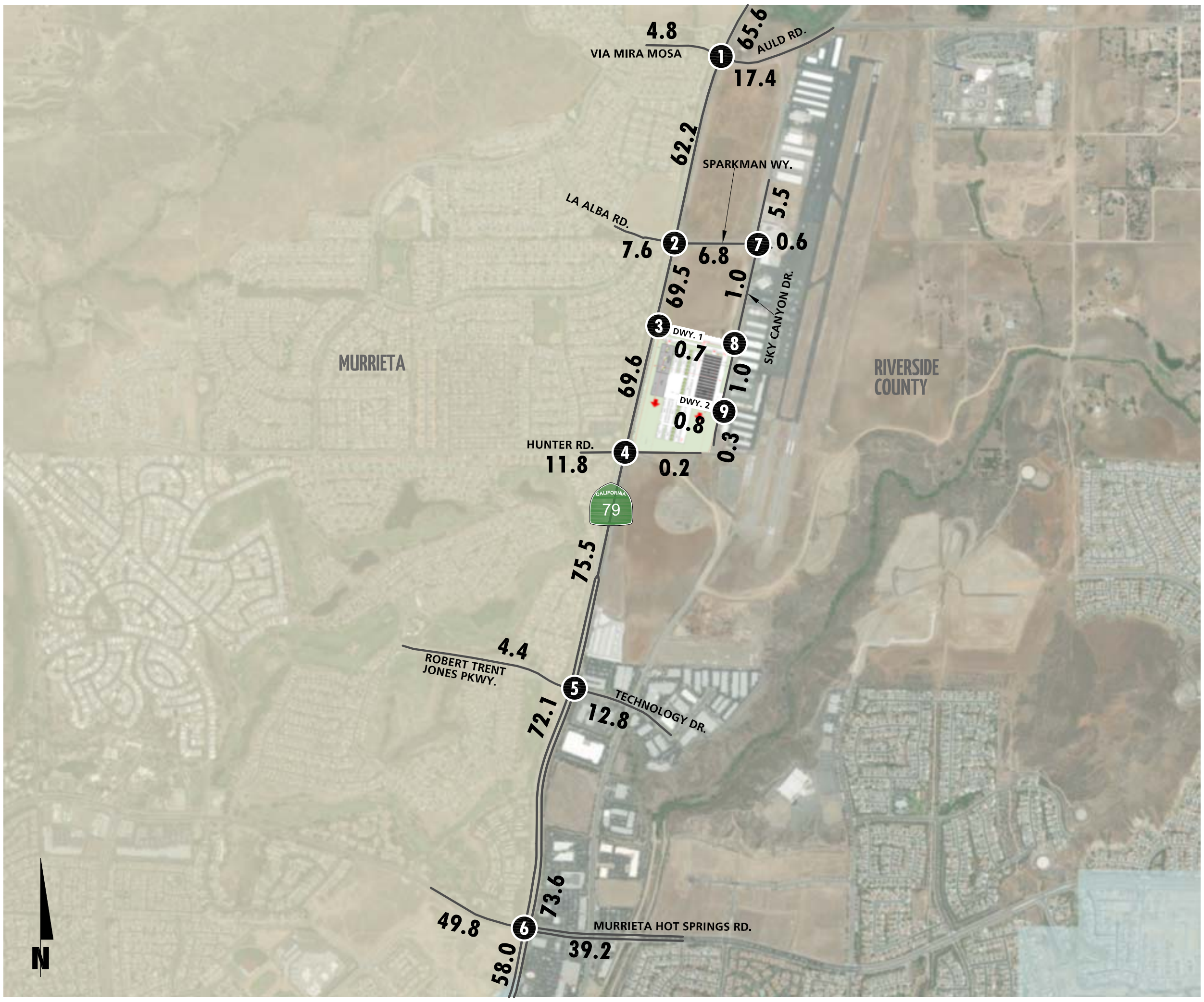
7.3 INTERSECTION OPERATIONS ANALYSIS

LOS calculations were conducted for the study intersections to evaluate their operations under EAPC conditions with roadway and intersection geometrics consistent with Section 7.1 *Roadway Improvements*. As shown in Table 7-1, the following additional study area intersections are anticipated to operate at unacceptable LOS under EAPC traffic conditions, in addition to the locations previously identified under Existing traffic conditions:

- Winchester Rd. (SR-79) & Via Mira Mosa/Auld Rd. (#1) – LOS F AM and PM peak hours
- Winchester Rd. (SR-79) & La Alba Dr./Sparkman Wy. (#2) – LOS E AM peak hour; LOS F PM peak hour
- Winchester Rd. (SR-79) & Hunter Rd. (#4) – LOS E AM peak hour; LOS F PM peak hour

A summary of the peak hour intersection LOS for EAPC traffic conditions are shown on Exhibit 7-2. The intersection operations analysis worksheets for EAPC traffic conditions are included in Appendix 7.1 of this TIA.

EXHIBIT 7-1: EAPC (2020) TRAFFIC VOLUMES (IN PCE)



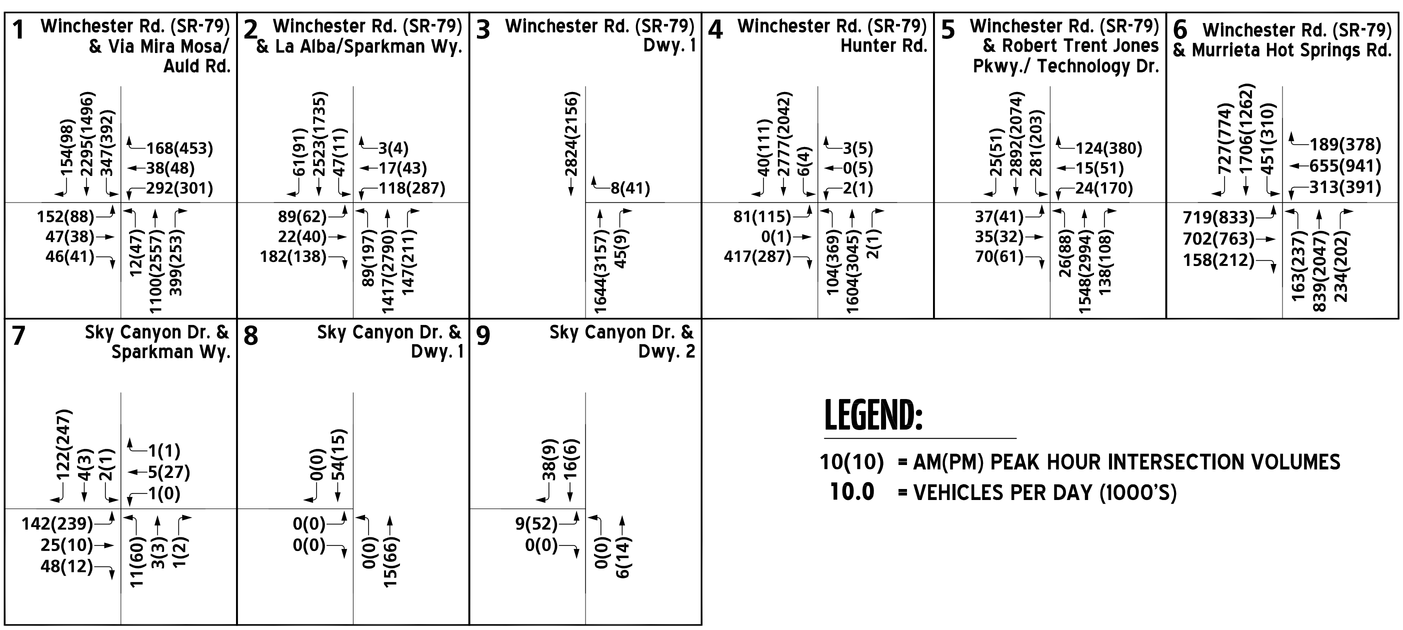


EXHIBIT 7-2: EAPC (2020) SUMMARY OF LOS

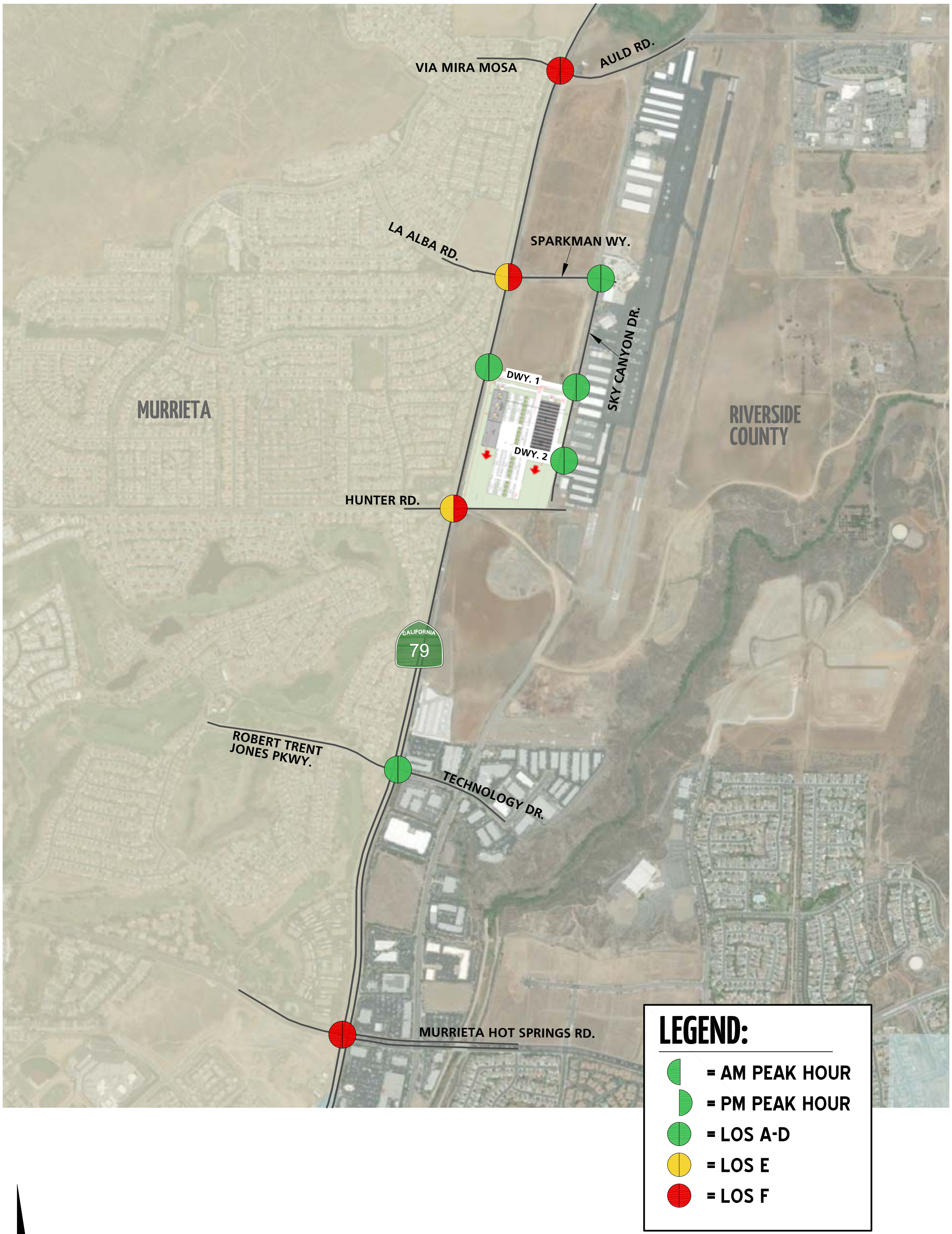


Table 7-1

Intersection Analysis for EAPC (2020) Conditions

#	Intersection	Traffic Control[2]	Existing (2018) Delay[1] (secs.) AM	Existing (2018) Delay[1] (secs.) PM	Existing (2018) LOS AM	Existing (2018) LOS PM	EAPC (2020) Delay[1] (secs.) AM	EAPC (2020) Delay[1] (secs.) PM	EAPC (2020) LOS AM	EAPC (2020) LOS PM	Acceptable LOS
1	Winchester Rd. (SR-79) & Via Mira Mosa/Auld Rd.	TS	27.3	34.6	C	C	**83.7**	**>200.0**	**F**	**F**	D
2	Winchester Rd. (SR-79) & La Alba Dr./Sparkman Wy.	TS	21.8	18.1	C	B	**66.5**	**>200.0**	**E**	**F**	D
3	Winchester Rd. (SR-79) & Driveway 1	**<u>CSS</u>**	Future Intersection				15.6	34.9	C	D	D
4	Winchester Rd. (SR-79) & Hunter Rd.	TS	27.0	18.7	C	B	**77.1**	**87.1**	**E**	**F**	D
5	Winchester Rd. (SR-79) & Robert Trent Jones Pkwy./Technology Dr.	TS	11.7	27.6	B	C	15.4	54.4	B	D	D
6	Winchester Rd. (SR-79) & Murrieta Hot Springs Rd.	TS	**58.2**	**82.4**	**E**	**F**	**109.9**	**163.9**	**F**	**F**	D
7	Sky Canyon Dr. & Sparkman Wy.	AWS	7.7	7.7	A	A	9.8	13.1	A	B	D
8	Sky Canyon Dr. & Driveway 1	**<u>CSS</u>**	Future Intersection				0.0	0.0	A	A	D
9	Sky Canyon Dr. & Driveway 2	**<u>CSS</u>**	Future Intersection				8.7	8.8	A	A	D

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

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

2 CSS = Cross-street Stop; AWS = All-Way Stop; TS = Traffic Signal; **<u>CSS</u>** = Improvement

7.4 TRAFFIC SIGNAL WARRANTS ANALYSIS

Traffic signal warrants have been performed on unsignalized intersections for EAPC (2020) traffic conditions, however, there are no study area intersections anticipated to warrant a traffic signal for EAPC (2020) traffic conditions. Worksheets for EAPC (2020) traffic conditions signal warrants are provided in Appendix 7.2.

7.5 EAPC DEFICIENCIES AND RECOMMENDED IMPROVEMENTS

Improvement strategies have been recommended at intersections that have been identified as deficient in an effort to reduce each location's peak hour delay and improve the associated LOS grade to an acceptable LOS (LOS D or better). The effectiveness of the recommended improvement strategies necessary to address EAPC traffic deficiencies are presented in Table 7-2. Worksheets for EAPC (2020) conditions, with improvements, HCM calculations are provided in Appendix 7.3.

The applicant shall participate in the funding of off-site improvements, including traffic signals that are needed to serve cumulative traffic conditions through the payment of Western Riverside County TUMF, DIF, RBBD, or a fair share contribution as directed by the County. These fees are collected as part of a funding mechanism aimed at ensuring that regional highways and arterial expansions keep pace with the projected population increases. Each of the improvements discussed above have been identified as being included as part of TUMF fee program, DIF fee program, RBBD fee program, or fair share contribution in Section 1.6 *Local and Regional Funding Mechanisms* of this TIA.

Table 7-2

Intersection Analysis for EAPC (2020) Conditions With Improvements

#	Intersection	Traffic Control[3]	Intersection Approach Lanes[1]												Delay[2] (secs.)		LOS	
			Northbound			Southbound			Eastbound			Westbound						
			L	T	R	L	T	R	L	T	R	L	T	R	AM	PM	AM	PM
1	Winchester Rd. (SR-79) & Via Mira Mosa/Auld Rd.																	
	- Without Improvements	TS	1	2	1	1	2	d	1	1	0	1	1	0	**83.7**	**>200.0**	**F**	**F**
	- With Improvements	TS	1	**3**	1	**2**	**3**	d	1	1	0	**2**	1	**1**	23.3	45.1	C	D
2	Winchester Rd. (SR-79) & La Alba Dr./Sparkman Wy.																	
	- Without Improvements	TS	1	2	0	1	2	1	1	1	1	0	1	0	**66.5**	**>200.0**	**E**	**F**
	- With Improvements	TS	1	**3**	0	1	**3**	1	1	1	1	**1**	1	0	24.4	50.9	C	D
4	Winchester Rd. (SR-79) & Hunter Rd.																	
	- Without Improvements	TS	1	2	0	1	2	0	0	1	1>	0	1	0	**77.1**	**87.1**	**E**	**F**
	- With Improvements	TS	1	**3**	0	1	**3**	0	0	1	1>	0	1	0	16.1	18.2	B	B
6	Winchester Rd. (SR-79) & Murrieta Hot Springs Rd.																	
	- Without Improvements	TS	2	3	1	2	3	1	2	3	1	2	2	1	**68.7**	**93.2**	**E**	**F**
	- With Improvements[4]	TS	2	3	**1>**	2	3	**1>**	2	3	**1>**	2	**3**	**1>**	34.2	54.9	C	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; > = Right-Turn Overlap Phasing; **1** = Improvement

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

[3] TS = Traffic Signal

[4] Recommended improvement includes the elimination of the pedestrian crosswalk on the north leg.

8 REFERENCES

1. **Riverside County Transportation Department.** *Traffic Impact Analysis Preparation Guide.* County of Riverside : s.n., Updated April 2008.
2. **California Department of Transportation.** *Guide for the Preparation of Traffic Impact Studies.* December 2002.
3. **Institute of Transportation Engineers.** *Trip Generation.* 10th Edition. 2017.
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5. **Southern California Association of Governments.** *2016 Regional Transportation Plan.* April 2016.
6. **David Taussig & Associates, Inc.** *County of Riverside DIF Update - Updated Public Facilities Needs List through the year 2010.* County of Riverside : s.n., 2006.
7. **Transportation Research Board.** *Highway Capacity Manual (HCM).* 6th Edition. s.l. : National Academy of Sciences, 2016.
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9. **Institute of Transportation Engineers.** *Trip Generation Handbook.* August 2014.
10. **Southern California Association of Governments.** *2016 Regional Transportation Plan.* April 2016.

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