Discovery Village

TRAFFIC ANALYSIS

CITY OF MURRIETA

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LIST OF ABBREVIATED TERMS

(1)	Reference
ADT	Average Daily Traffic
APN	Assessor's Parcel Number
CA MUTCD	California Manual on Uniform Traffic Control Devices
Caltrans	California Department of Transportation
CEQA	California Environmental Quality Act
CMP	Congestion Management Program
DIF	Development Impact Fee
OYC	Opening Year Cumulative
GHG	Greenhouse Gas
HCM	Highway Capacity Manual
ITE	Institute of Transportation Engineers
LOS	Level of Service
NP	Without Project
OPR	Office of Planning and Research
OYC	Opening Year Cumulative
PHF	Peak Hour Factor
Project	Discovery Village
RTP	Regional Transportation Plan
RCTA	Riverside County Transportation Authority
SCS	Sustainable Communities Strategy
sf	Square Feet
TA	Traffic Analysis
v/c	Volume to Capacity
VMT	Vehicle Miles Traveled
vphgpl	Vehicles per Hour Green per Lane
WP	With Project

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1 SUMMARY OF FINDINGS

This report presents the results of the traffic analysis (TA) for the proposed Discovery Village ("Project"), which is located at the southwest corner of Whitewood Road and Baxter Road in the City of Murrieta. The Project's location in relation to the surrounding area is shown on Exhibit 1-1. The purpose of this TA is to evaluate the potential circulation system deficiencies that may result from the development of the proposed Project, and where necessary recommend improvements to achieve acceptable operations consistent with General Plan level of service goals and policies. This TA has been prepared in accordance with the City of Murrieta's Traffic Impact Analysis Preparation Guidelines (May 2020). (1) The City approved Project Traffic Study Scoping agreement is provided in Appendix 1.1 of this TA.

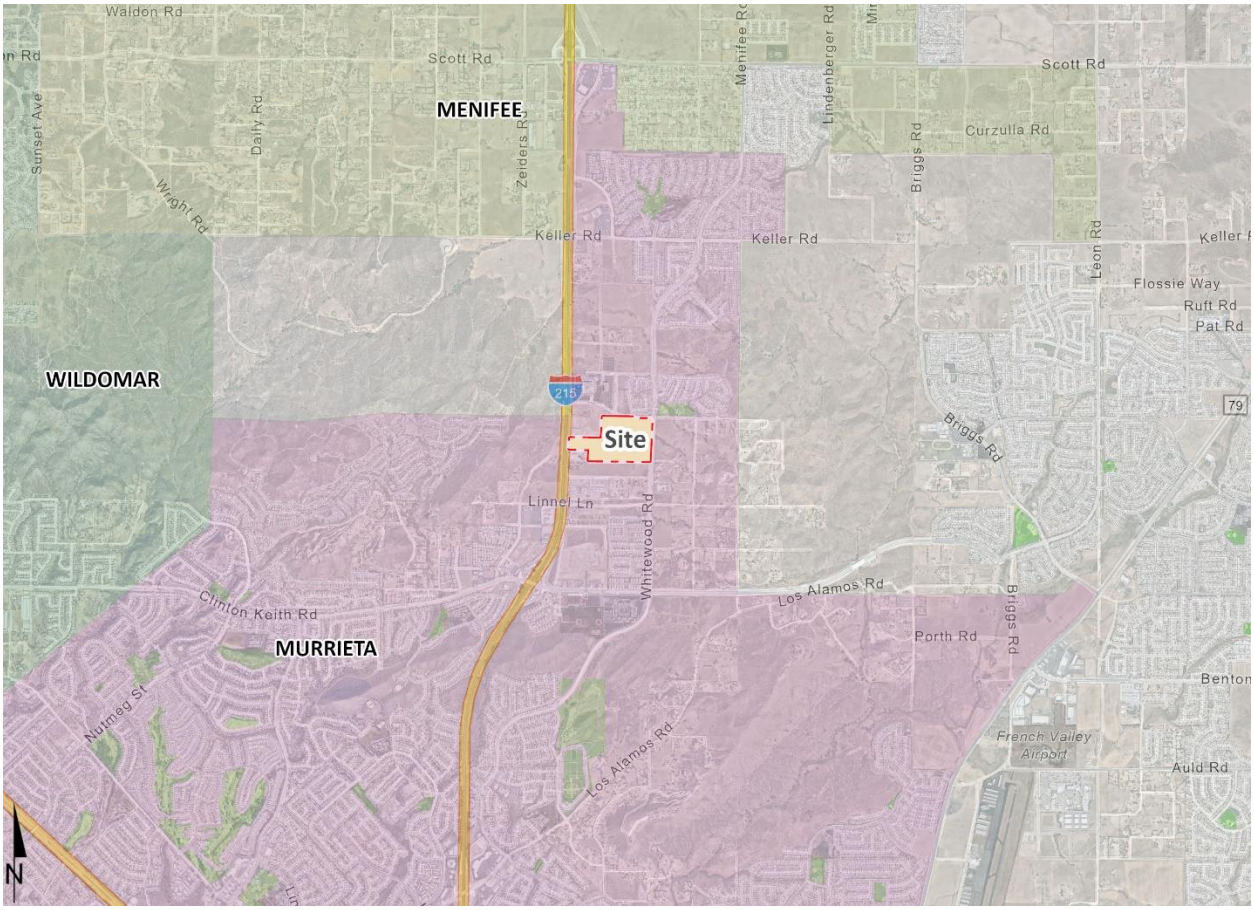
1.1 SUMMARY OF FINDINGS

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

- Project to install stop sign for egress traffic from the proposed Project at all driveways.
- Whitewood Road is currently constructed at its ultimate full-width as a Major Highway (100-foot right-of-way) from Baxter Road to Running Rabbit Road consistent with the City's standards. Project to construct a raised median with intermittent left turn access (where applicable). Project to construct sidewalk improvements along the Project boundary.
- Project to construct Warm Springs Road at its ultimate full section-width as a Major Highway (100-foot right-of-way) from Baxter Road to Running Rabbit Road consistent with the City's standards.
- Project to construct Antelope Road at its ultimate half-width as an Industrial Collector (78-foot right-of-way) from the Project's northern boundary to the Project's southern boundary consistent with the City's standards.
- Baxter Road is currently constructed at its ultimate full-width as a Secondary (88-foot right-of-way) from the Project's western boundary to Whitewood Road consistent with the City's standards. Project to construct sidewalk improvements along the Project boundary.
- Project to construct Running Rabbit Road at its ultimate half-width as a Collector (66-foot right-of-way) from the Project's western boundary to Whitewood Road consistent with the City's standards.

Additional details and intersection lane geometrics are provided in Section 1.6 *Recommendations* of this report. The development of the proposed Project is not anticipated to require the construction of any off-site improvements to mitigate Project traffic deficiencies, however, there are improvement needs identified at off-site intersections for future traffic analysis scenarios where the Project would contribute traffic (as measured by 50 or more peak hour trips). As such, the Project Applicant's responsibility for the Project's contributions towards off-site intersection deficiencies is fulfilled through payment of fair share or participation in the pre-existing fee programs that would be assigned to construction of the identified recommended improvements.

EXHIBIT 1-1: LOCATION MAP



The Project Applicant would be required to pay requisite fair share contributions and fee payments consistent with the City's requirements (see Section 7 *Local and Regional Funding Mechanisms*).

1.2 PROJECT OVERVIEW

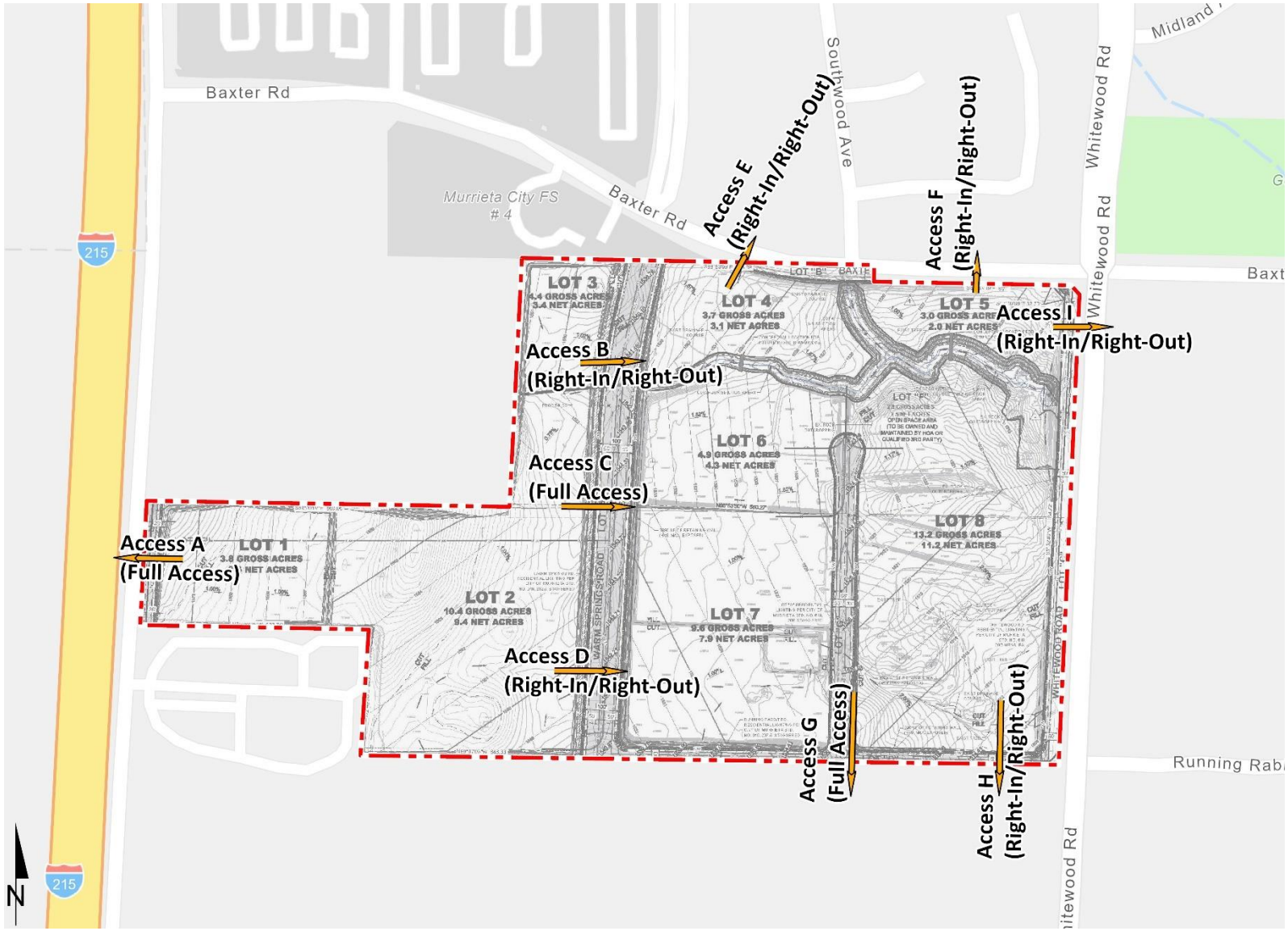
Exhibit 1-2 illustrates the preliminary Project site plan. The current Project involves a large lot Tentative Tract Map (TTM) No. 38228 (eight individual parcels) (refer to Exhibit 1-2), and associated grading and infrastructure installation. A portion of the Project site would be preserved as open space. The large pads and infrastructure would facilitate future development of the Project site compliant with current General Plan and zoning designations. The Project also includes development of 267,000 square feet (sf) of business park uses, and 5,000 sf of retail/shopping center uses on Lot 1 through Lot 3 (18.8 gross acres/16.53 net acres), consistent with the "Innovation" land use designation; and 199 multifamily (low-rise) housing units (condo) and 237 single family detached residential dwelling units for a total of 436 residential dwelling units on Lot 4 through Lot 8 (24.25 net acres), consistent with the existing zoning (MF-2, Multi-Family Residential). It is anticipated that the Project would be developed in a single phase with an anticipated Opening Year of 2027.

As shown on Exhibit 1-2, for the purpose of this analysis, the following roadways will be assumed to provide access to the Project site:

- Street A at Antelope Road – full access
- Street B at Warm Springs Road – right-in/right-out only access
- Street C at Warm Springs Road – full access
- Street D at Warm Springs Road – right-in/right-out only access
- Street E at Baxter Road – right-in/right-out only access
- Street F at Baxter Road – right-in/right-out only access
- Street G at Baxter Road – full access
- Street H at Baxter Road – right-in/right-out only access
- Street I at Whitewood Road – right-in/right-out only access

Regional access to the Project site will be provided by the I-215 Freeway via Clinton Keith Road and Scott Road.

EXHIBIT 1-2: PRELIMINARY SITE PLAN



In order to develop the traffic characteristics of the proposed Project, trip-generation statistics published in the Institute of Transportation Engineers (ITE) Trip Generation Manual (11th Edition, 2021) for the following land use codes (2):

- Single-Family Detached Housing (ITE Land Use Code 210)
- Multifamily Housing (Low-Rise) (ITE Land Use Code 220)
- Business Park (ITE Land Use Code 770)
- Shopping Center (ITE Land Use Code 820)

It should be noted, the proposed retail use is anticipated to be developed as a neighborhood commercial use. However, in order to conduct a conservative analysis and to overstate as opposed to understate potential trips, the Shopping Center land use has been utilized for estimating trips generated by the neighborhood commercial use.

The proposed Project is anticipated to generate 7,104 two-way trips per day, with 618 AM peak hour trips and 675 PM peak hour trips. The assumptions and methods used to estimate the Project's trip generation characteristics are discussed in greater detail in Section 4.1 *Project Trip Generation* of this report.

1.3 ANALYSIS SCENARIOS

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

- Existing (2021)
- Opening Year Cumulative (2027) Without Project Conditions
- Opening Year Cumulative (2027) With Project Conditions
- Horizon Year (2040) Without Project
- Horizon Year (2040) With Project

1.3.1 EXISTING (2021) CONDITIONS

Information for Existing (2021) conditions is disclosed to represent the baseline traffic conditions as they existed at the time this report was prepared. Due to the currently ongoing COVID-19 pandemic, schools and businesses within the study area may be closed or operating at less than full capacity at the time this study was prepared. Some businesses were affected by the ongoing COVID-19 pandemic but, in general, businesses and schools have returned to normal operations. As such, historic 2018 and 2019 traffic counts were utilized in conjunction with a 2% per year growth rate (compounded annually) to reflect 2021 conditions.

New traffic counts were also collected at the study area intersections as local schools are currently back in session with in-person instruction. To ensure traffic counts reflect pre-COVID traffic conditions, the City provided historic traffic counts, where available, which were reviewed and used to develop an adjustment factor to be applied to 2021 volumes in order to reflect non-COVID baseline conditions. To develop the adjustment factor, the historic traffic counts were compared to the current traffic count collected at the same location. The historic count was first

adjusted to 2021 traffic conditions through the application of a 2% per year growth rate (compounded annually).

The calculated average growth for the overall intersection (all turning movements) between the current and adjusted historic count was applied to other existing traffic counts collected (where historic data was not available) in order to reflect and evaluate pre-COVID traffic conditions.

1.3.2 OPENING YEAR CUMULATIVE (2027) CONDITIONS

The Opening Year Cumulative (OYC) conditions analysis determines the potential near-term cumulative circulation system deficiencies. To account for background traffic growth, traffic associated with other known cumulative development projects in conjunction with an ambient growth from Existing (2021) conditions of 12.62% is included for Opening Year Cumulative (2027) traffic. This list of cumulative development projects was compiled from information provided by the City of Murrieta and is consistent with other recent studies in the study area.

1.3.3 HORIZON YEAR (2040) CONDITIONS

Per requirements from the City of Murrieta, traffic projections for Horizon Year (2040) conditions were derived from the City of Murrieta refined version of the Riverside County Transportation Analysis Model (RivTAM) using accepted procedures for model forecast refinement and smoothing. The Horizon Year conditions analysis will be utilized to determine if improvements funded through regional transportation mitigation fee programs, such as the Transportation Uniform Mitigation Fee (TUMF) program or City of Murrieta Development Impact Fee (DIF) programs, can accommodate the long-range cumulative traffic at the target Level of Service (LOS) identified in the City of Murrieta (lead agency) General Plan. (3) Each of these regional transportation fee programs are discussed in more detail in Section 7 *Local and Regional Funding Mechanisms*. The Project also includes development of 267,000 square feet (sf) of business park uses, and 5,000 sf of retail/shopping center uses on Lot 1 through Lot 3 (18.8 gross acres/16.53 net acres), consistent with the "Innovation" land use designation; and 199 multifamily (low-rise) housing units (condo) and 237 single family detached residential dwelling units for a total of 436 residential dwelling units on Lot 4 through Lot 8 (24.25 net acres), consistent with the existing zoning (MF-2, Multi-Family Residential).

1.4 STUDY AREA

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

1.4.1 INTERSECTIONS

The following 24 study area intersections shown on Exhibit 1-2 and listed on Table 1-1 were selected for this TA based on consultation with City of Murrieta staff. The "50 peak hour trip" criterion generally represents a minimum number of trips at which a typical intersection would have the potential to be affected by a given development proposal. Although each intersection

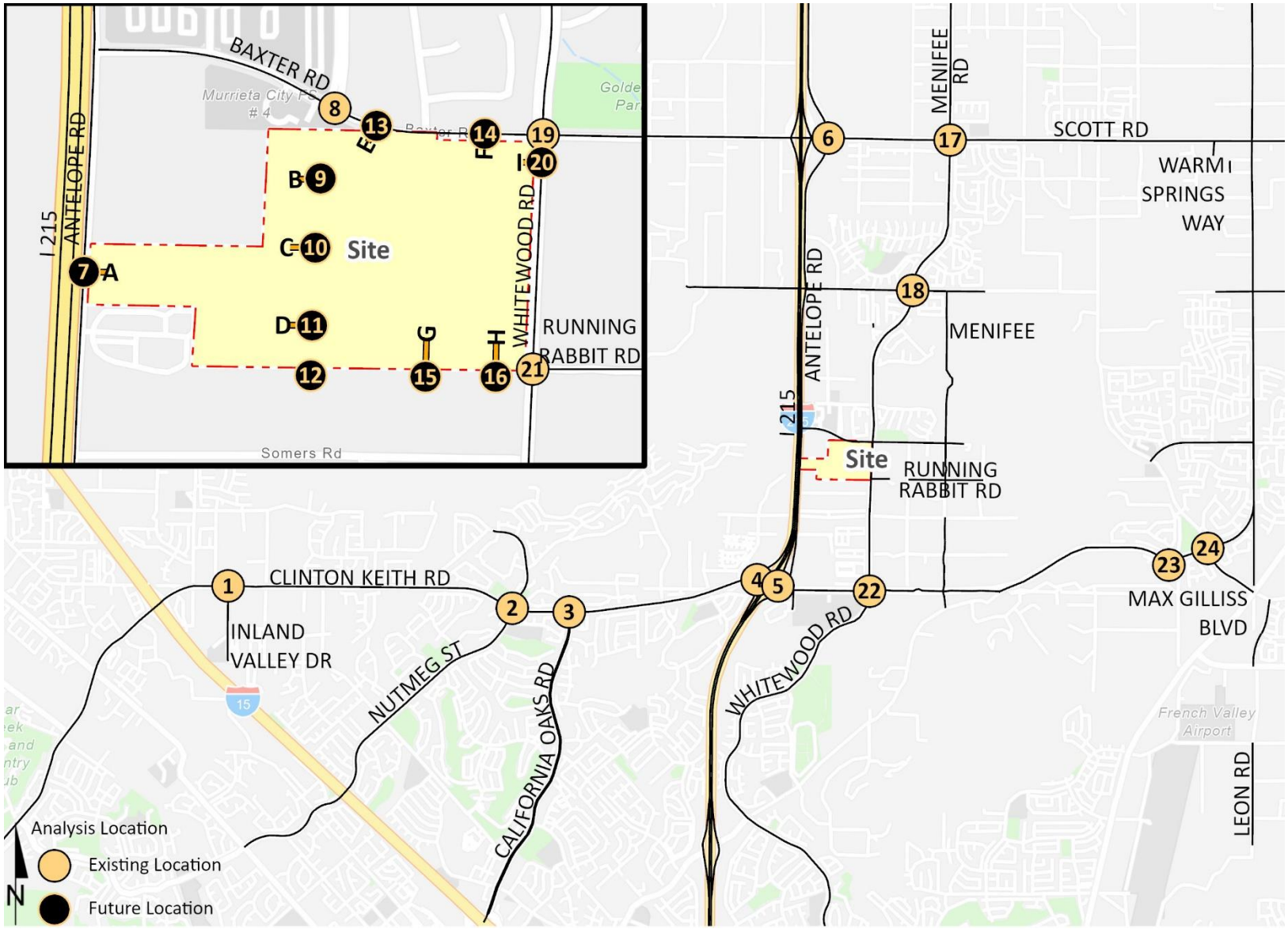
may have unique operating characteristics, this traffic engineering rule of thumb is a widely utilized tool for estimating a potential area of influence (i.e., study area).

The intent of the Congestion Management Program (CMP) is to more directly link land use, transportation, and air quality, thereby prompting reasonable growth management programs that will effectively utilize new transportation funds, alleviate traffic congestion and related deficiencies, and improve air quality. Counties within California have developed CMPs with varying methods and strategies to meet the intent of the CMP legislation. There are no study area intersections identified as a County of Riverside CMP location.

TABLE 1-1: INTERSECTION ANALYSIS LOCATIONS

ID	Intersection	Jurisdiction	CMP?
1	Inland Valley & Clinton Keith Rd.	Wildomar	No
2	Nutmeg St. & Clinton Keith Rd.	Murrieta	No
3	California Oaks Rd. & Clinton Keith Rd.	Murrieta	No
4	I-215 SB Ramps & Clinton Keith Rd.	Murrieta, Caltrans	No
5	I-215 NB Ramps & Clinton Keith Rd.	Murrieta, Caltrans	No
6	Antelope Rd. & Scott Rd.	Murrieta, Wildomar	No
7	Antelope Rd. & Street A	Murrieta	No
8	Warm Springs Rd. & Baxter Rd.	Murrieta	No
9	Warm Springs Rd. & Street B	Murrieta	No
10	Warm Springs Rd. & Street C	Murrieta	No
11	Warm Springs Rd. & Street D	Murrieta	No
12	Warm Springs Rd. & Running Rabbit Rd.	Murrieta	No
13	Street E & Baxter Rd.	Murrieta	No
14	Street F & Baxter Rd.	Murrieta	No
15	Street G & Baxter Rd.	Murrieta	No
16	Street H & Baxter Rd.	Murrieta	No
17	Menifee Rd. & Scott Rd.	Murrieta	No
18	Whitewood Rd. & Keller Rd.	Murrieta	No
19	Whitewood Rd. & Baxter Rd.	Murrieta	No
20	Whitewood Rd. & Street I	Murrieta	No
21	Whitewood Rd. & Running Rabbit Rd.	Murrieta	No
22	Whitewood Rd. & Clinton Keith Rd.	Murrieta	No
23	Clinton Keith Rd./Benton St. & Leon Rd.	County of Riverside	No
24	Briggs Rd./Max Gilliss Bl. & Leon Rd.	County of Riverside	No

EXHIBIT 1-3: STUDY AREA



1.4.2 ROADWAY SEGMENTS

The following 4 study area roadway segments listed in Table 1-2 were selected for this TA at the request of City of Murrieta staff during the scoping process.

TABLE 1-2: ROADWAY SEGMENT ANALYSIS LOCATIONS

ID	Roadway	Segment Limits
1	Baxter Rd.	West of Whitewood Rd.
2	Whitewood Rd.	South of Baxter Rd.
3	Warm Springs Rd.	Baxter Rd. to Running Rabbit Rd.
4	Running Rabbit Rd.	Warm Springs Rd. to Whitewood Rd.

1.5 DEFICIENCIES

This section provides a summary of deficiencies by analysis scenario. Section 2 *Methodologies* provides information on the methodologies used in the analysis and Section 3 *Area* Conditions, Section 5 *Opening Year Cumulative (2027) Traffic Conditions,* and Section 6 *Horizon Year (2040) Traffic Conditions* includes the detailed analysis. A summary of LOS results for all analysis scenarios is presented on Table 1-3.

TABLE 1-3: SUMMARY OF INTERSECTION LEVEL OF SERVICE BY ANALYSIS SCENARIO

#	Intersection	Existing		OYC NP		OYC WP		HY NP		HY NP	
		AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
1	Inland Valley & Clinton Keith Rd.	A-D	A-D	A-D	A-D	A-D	A-D	F	F	F	F
2	Nutmeg St. & Clinton Keith Rd.	A-D	A-D	A-D	A-D	A-D	A-D	E	F	F	F
3	California Oaks Rd. & Clinton Keith Rd.	A-D	E	E	F	F	F	F	F	F	F
4	I-215 SB Ramps & Clinton Keith Rd.	A-D	A-D	A-D	A-D	A-D	A-D	A-D	A-D	A-D	A-D
5	I-215 NB Ramps & Clinton Keith Rd.	A-D	A-D	A-D	A-D	A-D	A-D	A-D	A-D	A-D	A-D
6	Antelope Rd. & Scott Rd.	A-D	A-D	A-D	A-D	A-D	A-D	A-D	A-D	A-D	A-D
7	Antelope Rd. & Street A	N/A	N/A	N/A	N/A	A-D	A-D	N/A	N/A	A-D	A-D
8	Warm Springs Rd. & Baxter Rd.	A-D	A-D	A-D	A-D	A-D	A-D	A-D	A-D	A-D	A-D
9	Warm Springs Rd. & Street B	N/A	N/A	N/A	N/A	A-D	A-D	N/A	N/A	A-D	A-D
10	Warm Springs Rd. & Street C	N/A	N/A	N/A	N/A	A-D	A-D	N/A	N/A	A-D	A-D
11	Warm Springs Rd. & Street D	N/A	N/A	N/A	N/A	A-D	A-D	N/A	N/A	A-D	A-D
12	Warm Springs Rd. & Running Rabbit Rd.	N/A	N/A	N/A	N/A	A-D	A-D	N/A	N/A	A-D	A-D
13	Street E & Baxter Rd.	N/A	N/A	N/A	N/A	A-D	A-D	N/A	N/A	A-D	A-D
14	Street F & Baxter Rd.	N/A	N/A	N/A	N/A	A-D	A-D	N/A	N/A	A-D	A-D
15	Street G & Baxter Rd.	N/A	N/A	N/A	N/A	A-D	A-D	N/A	N/A	A-D	A-D
16	Street H & Baxter Rd.	N/A	N/A	N/A	N/A	A-D	A-D	N/A	N/A	A-D	A-D
17	Menifee Rd. & Scott Rd.	A-D	A-D	F	F	F	F	F	F	F	F
18	Whitewood Rd. & Keller Rd.	A-D	A-D	A-D	A-D	A-D	A-D	A-D	A-D	A-D	A-D
19	Whitewood Rd. & Baxter Rd.	A-D	A-D	A-D	A-D	A-D	A-D	F	F	F	F
20	Whitewood Rd. & Street I	N/A	N/A	N/A	N/A	A-D	A-D	N/A	N/A	A-D	A-D
21	Whitewood Rd. & Running Rabbit Rd.	A-D	A-D	A-D	A-D	A-D	A-D	A-D	A-D	A-D	A-D
22	Whitewood Rd. & Clinton Keith Rd.	F	F	F	F	F	F	F	F	F	F
23	Clinton Keith Rd./Benton St. & Leon Rd.	N/A	N/A	N/A	N/A	N/A	N/A	A-D	A-D	A-D	A-D
24	Briggs Rd./Max Gilliss Bl. & Leon Rd.	A-D	A-D	A-D	A-D	A-D	A-D	A-D	A-D	A-D	A-D

LOS=A-D
LOS=E
LOS=F

1.5.1 EXISTING (2021) CONDITIONS

Intersections

The following study area intersections are currently operating at an unacceptable LOS under Existing (2021) traffic conditions:

- California Oaks Rd. & Clinton Keith Rd. (#3) – LOS E PM peak hour only
- Whitewood Rd. & Clinton Keith Rd. (#22) – LOS F AM and PM peak hours

Roadway Segments

The study area roadway segments currently operate at an acceptable LOS under Existing (2021) traffic conditions based on the City's planning level daily roadway capacity thresholds and minimum LOS criteria.

Off-ramp Queues

No off-ramp movements are currently experiencing queuing issues during the weekday AM or weekday PM peak 95th percentile traffic flows for Existing (2021) traffic conditions.

1.5.2 OPENING YEAR CUMULATIVE (2027) CONDITIONS

Intersections

The following study area intersection is anticipated to operate at an unacceptable LOS during one or more peak hours under Opening Year Cumulative (2027) Without Project traffic conditions, in addition to the intersections identified under Existing (2021) traffic conditions:

- Menifee Rd. & Scott Rd. (#17) – LOS F AM and PM peak hours

There are no additional study area intersections anticipated to operate at an unacceptable LOS under Opening Year Cumulative (2027) With Project traffic conditions that wasn't already identified with deficient operations under Without Project traffic conditions.

Roadway Segments

There are no study area roadway segments anticipated to operate at an unacceptable LOS under Opening Year Cumulative (2027) Without Project and With Project traffic conditions based on the City's planning level daily roadway capacity thresholds and minimum LOS criteria.

Off-ramp Queues

No off-ramp movements are anticipated to experience queuing issues during the weekday AM or weekday PM peak 95th percentile traffic flows under Opening Year Cumulative (2027) Without Project and With Project traffic conditions.

1.5.3 HORIZON YEAR (2040) CONDITIONS

Intersections

The following additional study area intersections are anticipated to operate at an unacceptable LOS during one or more peak hours under Horizon Year (2040) Without Project traffic conditions, in addition to the intersections identified under Existing (2021) and Opening Year Cumulative (2027) Without traffic conditions:

- Inland Valley & Clinton Keith Rd. (#1) – LOS F AM and PM peak hours
- Nutmeg St. & Clinton Keith Rd. (#2) – LOS E AM peak hour; LOS F PM peak hour
- Whitewood Rd. & Baxter Rd. (#19) – LOS F AM and PM peak hours

There are no additional study area intersections anticipated to operate at an unacceptable LOS under Horizon Year (2040) With Project traffic conditions that wasn't already identified with deficient operations under Without Project traffic conditions.

Roadway Segments

There are no study area roadway segments anticipated to operate at an unacceptable LOS under Horizon Year (2040) Without Project and With Project traffic conditions based on the City's planning level daily roadway capacity thresholds and minimum LOS criteria, with the exception of Whitewood Road, south of Baxter Road. However, the addition of Project traffic is anticipated to increase the v/c by less than 0.05.

Off-ramp Queues

No off-ramp movements are anticipated to experience queuing issues during the weekday AM or weekday PM peak 95th percentile traffic flows under Horizon Year (2040) Without Project and With Project traffic conditions.

1.6 RECOMMENDATIONS

1.6.1 SITE ADJACENT AND SITE ACCESS RECOMMENDATIONS

The following recommendations are based on the improvements needed to accommodate site access. The site adjacent recommendations are shown on Exhibit 1-4 and the queuing results are summarized on Table 1-4. The site adjacent queuing analysis results for the site adjacent study area intersections are provided in Appendix 1.2.

Recommendation 1 – Antelope Road & Street A (#7) – The following improvements are necessary to accommodate site access:

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

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

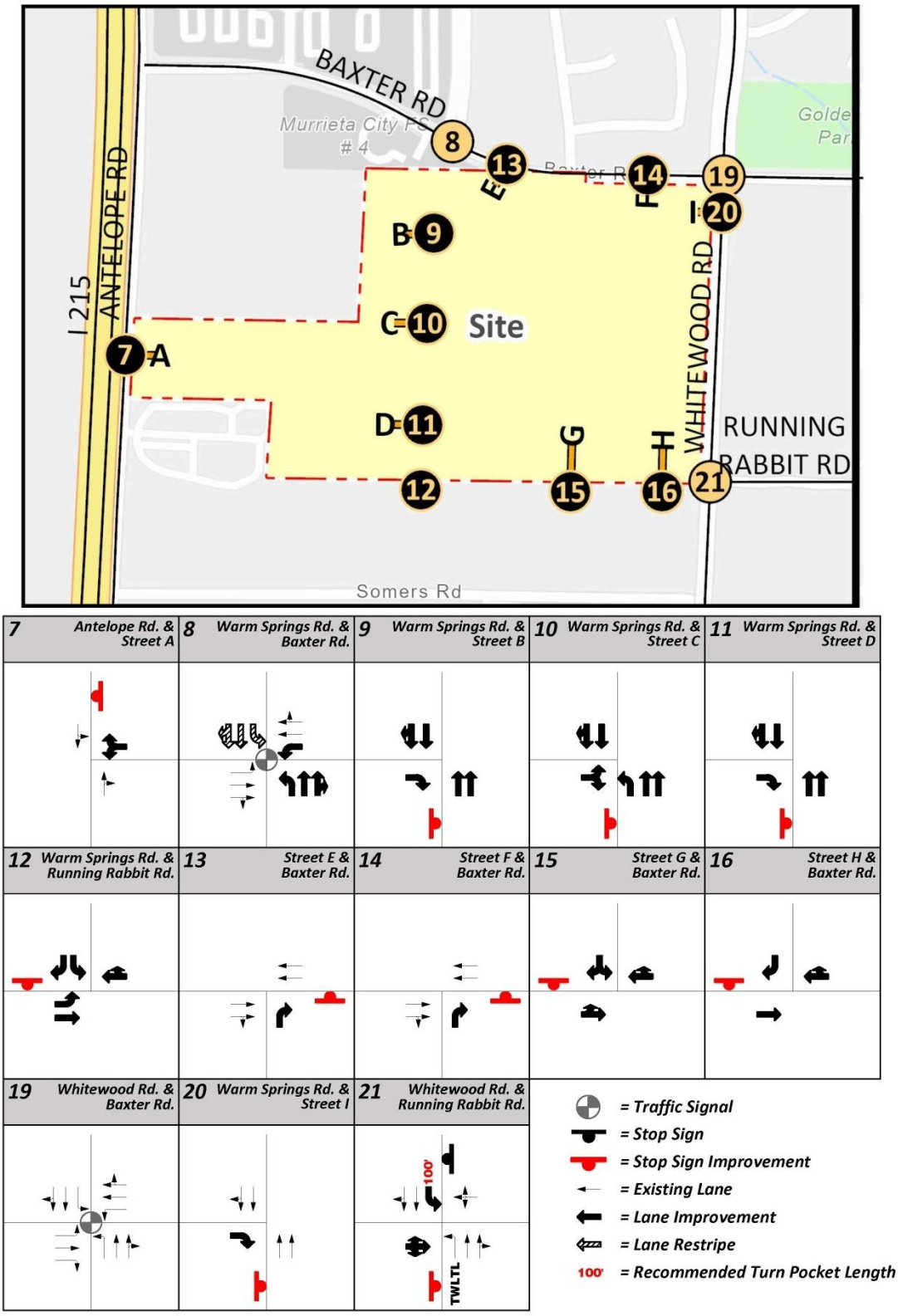


TABLE 1-4: PEAK HOUR QUEUING SUMMARY FOR HORIZON YEAR (2040) WITH PROJECT CONDITIONS

#	Intersection	Movement	Available Stacking Distance (Feet)[2]	2040 With Project			
				95th Percentile Queue (Feet)		Acceptable?[1]	
				AM Peak Hour	PM Peak Hour	AM	PM
8	Warm Springs Rd. & Baxter Rd.	**NBL**	**100**	0	0	Yes	Yes
		WBL	**100**	22	52	Yes	Yes
10	Warm Springs Rd. & Street C	**NBL**	**100**	31	19	Yes	Yes
12	Warm Springs Rd. & Running Rabbit Rd.	**SBL**	**100**	51	61	Yes	Yes
		SBR	**100**	0	0	Yes	Yes
19	Whitewood Rd. & Baxter Rd.	NBL	220	74	74	Yes	Yes
		EBL	**300**	140	300	Yes	Yes
		EBR	550	78	144	Yes	Yes
21	Whitewood Rd. & Running Rabbit Rd.	NBL	460	401	352	Yes	Yes
		SBL	**100**	7	0	Yes	Yes

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

[2] **100** = Improvement

Recommendation 2 – Warm Springs Road & Baxter Road (#8) – The following improvements are necessary to accommodate site access:

- Project to modify the traffic signal to include signalization for the south leg and westbound left movement.
- Project to construct a northbound left turn lane with a minimum of 100-feet of storage, a through lane, and a shared through-right turn lane.
- Project to restripe the southbound approach to provide one left turn lane, one through lane, and one shared through-right turn lane.
- Project to construct a westbound left turn lane with a minimum of 100-feet of storage.

Recommendation 3 – Warm Springs Road & Street B (#9) – The following improvements are necessary to accommodate site access:

- Project to install a stop control on the eastbound approach (Project Driveway). Driveway to be restricted to right-in/right-out access only.
- Project to construct two northbound through lanes.
- Project to construct a southbound through lane, and a shared through-right turn lane.

Recommendation 4 – ***Warm Springs Road & Street C (#10)*** – The following improvements are necessary to accommodate site access:

- Project to install a stop control on the eastbound approach (Project Driveway) and construct an eastbound shared left-right turn lane.
- Project to construct a northbound left turn lane with a minimum of 100-feet of storage and two through lanes.
- Project to construct a southbound through lane, and a shared through-right turn lane.

Recommendation 5 – ***Warm Springs Road & Street D (#11)*** – The following improvements are necessary to accommodate site access:

- Project to install a stop control on the eastbound approach (Project Driveway). Driveway to be restricted to right-in/right-out access only.
- Project to construct two northbound through lanes.
- Project to construct a southbound through lane, and a shared through-right turn lane.

Recommendation 6 – ***Warm Springs Road & Running Rabbit Road (#12)*** – The following improvements are necessary to accommodate site access:

- Project to install a stop control on the southbound approach.
- Project to construct an eastbound left turn lane with a minimum of 100-feet of storage and a through lane.
- Project to construct a westbound shared through-right turn lane.

Recommendation 7 – ***Street E & Baxter Road (#13)*** – The following improvements are necessary to accommodate site access:

- Project to install a stop control on the northbound approach (Project Driveway). Driveway to be restricted to right-in/right-out access only.

Recommendation 8 – ***Street F & Baxter Road (#14)*** – The following improvements are necessary to accommodate site access:

- Project to install a stop control on the northbound approach (Project Driveway). Driveway to be restricted to right-in/right-out access only.

Recommendation 9 – ***Street G & Running Rabbit Road (#15)*** – The following improvements are necessary to accommodate site access:

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

Recommendation 10 – ***Street H & Running Rabbit Road (#16)*** – The following improvements are necessary to accommodate site access:

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

Recommendation 11 – ***Whitewood Road & Baxter Road (#19)*** – The following improvements are necessary to accommodate site access:

- Project to extend the storage length of the eastbound left turn lane to 280 feet.

It should be noted, per the City of Murrieta, the Project to dedicate the necessary right-of-way for the off-site improvements necessary under Horizon Year conditions (see Table 1-5).

Recommendation 12 – ***Whitewood Road & Street I (#20)*** – The following improvements are necessary to accommodate site access:

- Project to install a stop control on the eastbound approach (Project Driveway). Driveway to be restricted to right-in/right-out access only.

Recommendation 13 – ***Whitewood Road & Running Rabbit Road (#21)*** – The following improvements are necessary to accommodate site access:

- Project to install a stop control on the eastbound approach (Project Driveway) and construct an eastbound shared left-through-right turn lane.
- Project to construct a southbound left turn lane with a minimum of 100-feet of storage.

Recommendation 14 – Whitewood Road is a north-south oriented roadway located on the Project's eastern boundary. Whitewood Road is currently constructed at its ultimate full-width as a Major Highway (100-foot right-of-way) from Baxter Road to Running Rabbit Road consistent with the City's standards. Project to construct a raised median with intermittent left turn access (where applicable). Project to construct sidewalk improvements along the Project boundary.

Recommendation 15 – Warm Springs Road is a north-south oriented roadway that bisects the Project site. Project to construct Warm Springs Road at its ultimate full section-width as a Major Highway (100-foot right-of-way) from Baxter Road to Running Rabbit Road consistent with the City's standards.

Recommendation 16 – Antelope Road is a north-south oriented roadway located on the Project's western boundary. Project to construct Antelope Road at its ultimate half-width as an Industrial Collector (78-foot right-of-way) from the Project's northern boundary to the Project's southern boundary consistent with the City's standards.

Recommendation 17 – Baxter Road is an east-west oriented roadway located on the Project's northern boundary. Baxter Road is currently constructed at its ultimate full-width as a Secondary (88-foot right-of-way) from the Project's western boundary to Whitewood Road consistent with the City's standards. Project to construct sidewalk improvements along the Project boundary.

Recommendation 18 – Running Rabbit Road is an east-west oriented roadway located on the Project's southern boundary. Project to construct Running Rabbit Road at its ultimate half-width as a Collector (66-foot right-of-way) from the Project's western boundary to Whitewood Road consistent with the City's standards.

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

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

1.6.2 OFF-SITE RECOMMENDATIONS

The recommended improvements needed to address the cumulative deficiencies are summarized in Table 1-5. For those improvements listed in Table 1-5 and not constructed as part of the Project, the Project Applicant's responsibility for the Project's contributions towards deficient intersections is fulfilled through payment of fees or fair share that would be assigned to construction of the identified recommended improvements.

TABLE 1-5: SUMMARY OF IMPROVEMENTS

#	Intersection Location	Jurisdiction	Analysis Scenarios		Improvements included in Fee Program?[1]	Project Responsibility[2]	Fair Share %[3]
			Opening Year Cumulative (2027) With Project	Horizon Year (2040) With Project			
1	Inland Valley & Clinton Keith Rd.	Wildomar	None	Add a 3rd EB through lane	Yes (TUMF)	Fees	--
				Add a 2nd and 3rd WB through lane	Yes (TUMF)	Fees	
2	Nutmeg St. & Clinton Keith Rd.	Murrieta	None	Add a 3rd EB through lane	No	None[6]	--
				Add a 3rd WB through lane	No	None[6]	
3	California Oaks Rd. & Clinton Keith Rd.	Murrieta	Modify the traffic signal to implement overlap phasing for the NB right turn lane	Same	No	Construct	--
			Restripe the NB approach to provide one left turn lane and dual right turn lanes	Same	No	Construct	
			Restripe to provide an EB shared through-right turn lane[4]	Same	No	Construct	
			Restripe the WB lanes to provide an additional WB through lane	Same	No	Construct	
17	Menifee Rd. & Scott Rd.	Menifee	Add a 2nd NB and SB through lane	Same	Yes (TUMF)	Fees	10.7%
			Modify the traffic signal to implement overlap phasing for the NB right turn lane	Same	No	Fair Share	
			Add a 3rd EB and WB through lane	Same	Yes (TUMF)	Fees	
				Add a 2nd SB left turn lane	No	Fair Share	
				Add a 2nd EB and WB left turn lane	No	Fair Share	
				Add a right turn lane	No	Fair Share	
19	Whitewood Rd. & Baxter Rd.	Murrieta	None	Add a 2nd NB left turn lane	No	Dedicate R.O.W.[5]	--
				Add a 2nd EB left turn lane	No	Dedicate R.O.W.[5]	
22	Whitewood Rd. & Clinton Keith Rd.	Murrieta	Add 2nd NB left turn lane (restripe to increase pocket storage to 400-feet)	Same	No	Construct	--
			Restripe to accommodate 2nd SB left turn lane, SB through, and SB shared through-right turn lane	Same	No	Construct	
			Modify the median on Clinton Keith Road to accommodate a 340-feet of EB left turn storage[4]	Same	No	Construct	
			Modify the median on Clinton Keith Road to accommodate a 240-feet of WB left turn storage	Same	No	Construct	

[1] Improvements included in the City of Murrieta DIF program or WRCOG TUMF program.

[2] Identifies the Project's responsibility to construct an improvement or contribute fair share or fee payment towards the implementation of the improvements shown.

[3] Program improvements constructed may be eligible for fee credit, at discretion of City. See Table 7-1 for Fair Share Calculations.

[4] It should be noted, this improvement has been completed by other another project.

[5] Per the City of Murrieta, the Project does not need to contribute fair share, however does need to dedicate right-of-way.

[6] Per the City of Murrieta, the Project does not need to contribute fair share for Horizon Year conditions.

2 METHODOLOGIES

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

2.1 LEVEL OF SERVICE

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

2.2 INTERSECTION CAPACITY ANALYSIS

The definitions of LOS for interrupted traffic flow (flow restrained by the existence of traffic signals and other traffic control devices) differ slightly depending on the type of traffic control. The LOS is typically dependent on the quality of traffic flow at the intersections along a roadway. The 6th Edition Highway Capacity Manual (HCM) methodology expresses the LOS at an intersection in terms of delay time for the various intersection approaches. (4) The HCM uses different procedures depending on the type of intersection control.

2.2.1 SIGNALIZED INTERSECTIONS

The City of Murrieta, City of Wildomar, and the County of Riverside require signalized intersection operations analysis based on the methodology described in the HCM. (4) Intersection LOS operations are based on an intersection's average control delay. Control delay includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. For signalized intersections LOS is directly related to the average control delay per vehicle and is correlated to a LOS designation as described on Table 2-1. Consistent with City of Murrieta traffic study guidelines, a saturation flow rate of 1900 in vehicles per hour green per lane (vphgpl) has been utilized in the traffic analysis for signalized intersections.

TABLE 2-1: SIGNALIZED INTERSECTION LOS THRESHOLDS

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)

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

The peak hour traffic volumes have been adjusted using a peak hour factor (PHF) to reflect peak 15-minute volumes. 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, PHF values over 0.95 often are indicative of high traffic volumes with capacity constraints on peak hour flows while lower PHF values are indicative of greater variability of flow during the peak hour. (4)

California Department of Transportation (Caltrans)

The traffic modeling and signal timing optimization software package Synchro (Version 11) has also been utilized to analyze signalized intersections under Caltrans' jurisdiction, which include interchange to arterial ramps (i.e., I-215 Freeway ramps at Clinton Keith Road). Signal timing for the freeway arterial-to-ramp intersections has been obtained from Caltrans. It should be noted that for the purposes of this analysis, no optimization of signal timing has been performed for the LOS analysis unless noted otherwise (for improvements).

2.2.2 UNSIGNALIZED INTERSECTIONS

The City of Murrieta, City of Wildomar, and the County of Riverside require the operations of unsignalized intersections be evaluated using the methodology described in the HCM. (4) The LOS rating is based on the weighted average control delay expressed in seconds per vehicle (see Table 2-2).

TABLE 2-2: UNSIGNALIZED INTERSECTION LOS THRESHOLDS

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. For two-way stop-controlled intersections, the delay is reported for the worst single movement/lane (typically occurs on the side street).

2.3 TRAFFIC SIGNAL WARRANT ANALYSIS METHODOLOGY

The term "signal warrants" refers to the list of established criteria used by Caltrans and other public agencies to quantitatively justify or ascertain the potential need for installation of a traffic signal at an otherwise unsignalized intersection. This TA uses the signal warrant criteria presented in the latest edition of the Caltrans California Manual on Uniform Traffic Control Devices (CA MUTCD). (5)

Street B at Warm Springs Road, Street D at Warm Springs Road, Street E at Baxter Road, Street F at Baxter Road, and Street I at Whitewood Road are proposed for restricted access (i.e., right-in/right-out access only). As such, traffic signal warrant analysis has not been performed for these unsignalized study area intersections since it is unlikely a traffic signal would be installed

at these locations. The traffic signal warrant for the intersection of Whitewood Road & Running Rabbit Road has been evaluated with adjusted volumes since there is a substantial amount of right turning vehicles. The right turn volumes have been reduced from the total minor road volumes for the traffic signal warrant, per the direction of the City.

2.4 ROADWAY SEGMENT CAPACITY ANALYSIS

Roadway segment operations have been evaluated using the City of Murrieta Roadway Capacity Thresholds provided in the City's Traffic Study Guidelines. (1) Per the City's Traffic Study Guidelines, roadway segments within the study area should maintain LOS C capacities along roadways. As an exception, LOS D may be allowed in the North Murrieta Business Corridor, Clinton Keith/Mitchell, Golden Triangle North (Central Murrieta), South Murrieta Business Corridor, or other Focus Areas, or other employment centers. These roadway capacities are "rule of thumb" estimates for planning purposes and are affected by such factors as intersections (spacing, configuration and control features), degree of access control, roadway grades, design geometrics (horizontal and vertical alignment standards), sight distance, vehicle mix (truck and bus traffic) and pedestrian bicycle traffic. In other words, while using average daily traffic (ADT) for planning purposes is suitable with regards to evaluating potential volume to capacity with future forecasts, it is not suitable for operational analysis because it does not account for the factors listed previously. As such, where the ADT based roadway segment analysis indicates a deficiency (unacceptable LOS), a review of the more detailed peak hour intersection analysis and progression analysis are undertaken. The more detailed peak hour intersection analysis explicitly accounts for factors that affect roadway capacity.

Any roadway segment that operates unacceptably in the Without Project scenario where the project is anticipated to add traffic in excess of 5% of the roadway capacity (e.g., a volume-to-capacity increase of more than 0.05) should identify improvements to add capacity to the segment.

2.5 QUEUING ANALYSIS

A queuing analysis has been performed for the I-215 Freeway & Clinton Keith Road interchange. The 95th percentile queuing of vehicles has been assessed at the off-ramps to determine potential queuing deficiencies at the intersection and the interchange identified above. Specifically, the queuing analysis is utilized to identify any potential queuing and "spill back" onto the I-215 Freeway mainline from the off-ramps or out of the turn pockets.

The traffic progression analysis tool and HCM intersection analysis program, Synchro, has been used to assess the potential deficiencies/needs of the intersections with traffic added from the proposed Project. Storage (turn-pocket) length recommendations at the ramps have been based upon the 95th percentile queue resulting from the Synchro progression analysis. There are two footnotes which appear on the Synchro outputs. One footnote indicates if the 95th percentile cycle exceeds capacity. Traffic is simulated for two complete cycles of the 95th percentile traffic in Synchro in order to account for the effects of spillover between cycles. In practice, the 95th percentile queue shown will rarely be exceeded and the queues shown with the footnote are acceptable for the design of storage bays. The other footnote indicates whether or not the

volume for the 95th percentile queue is metered by an upstream signal. If the upstream intersection is at or near capacity, the 50th percentile queue represents the maximum queue experienced.

A vehicle is considered queued whenever it is traveling at less than 10 feet/second. A vehicle will only become queued when it is either at the stop bar or behind another queued vehicle. The 95th percentile queue is the maximum back of queue with 95th percentile traffic volumes during the peak hour and is derived from the average (50th percentile) queue plus 1.65 standard deviations. The queue length reported is for the lane with the highest queue in the lane group. The 95th percentile queue is not necessarily ever observed it is simply based on statistical calculations.

2.6 MINIMUM ACCEPTABLE LEVELS OF SERVICE (LOS)

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

2.6.1 CITY OF MURRIETA

Per the City of Murrieta General Plan, the City of Murrieta's current LOS standard for intersections is LOS D for peak hour intersection operations, and LOS E at freeway interchanges.

2.6.2 CALTRANS

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

2.6.3 COUNTY OF RIVERSIDE

The definition of an intersection deficiency has been obtained from the County of Riverside General Plan. 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.*

The applicable minimum LOS utilized for the purposes of this analysis is LOS D per the County-wide target LOS for projects located within the Southwest area plan.

2.6.4 CITY OF WILDOMAR

The City of Wildomar defines intersection performance deficiency standards consistent with those of the County of Riverside General Plan Circulation Element. Riverside County General Plan Policy C 2.1 states that the County will maintain the following County-wide target level of service (LOS): LOS C on all County-maintained roads and conventional State Highways. As an exception, LOS D may be allowed in Community Development areas at intersections of any combination of Secondary Highways, Major Highways, Arterial Highways, Urban Arterial Highways, Expressways, or conventional State Highways. LOS E may be allowed in designated Community Centers to the extent that it would support transit-oriented development and pedestrian communities. (6)

2.6.5 RIVERSIDE COUNTY CMP

The CMP definition of deficiency is based on maintaining a level of service standard of LOS E or better, where feasible, except where an existing LOS F condition is identified in the CMP document. However, for the purposes of this analysis, LOS D has been utilized for all study area intersections.

2.7 DEFICIENCY CRITERIA

This section outlines the methodology used in this analysis related to identifying circulation system deficiencies. Consistent with the City's TIA Guidelines, the following criteria will be applied for the traffic analysis.

2.7.1 CITY OF MURRIETA

SIGNALIZED INTERSECTION OPERATING REQUIREMENTS

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

UNSIGNALIZED INTERSECTION GENERAL PLAN CONSISTENCY REQUIREMENTS

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

- a) The addition of project related traffic causes the intersection to degrade from an acceptable LOS D or better to LOS E or F.

  OR

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

  AND

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

If the conditions above are satisfied, improvements should be identified that achieve the following:

- LOS D or better for case a) above or to pre-project LOS and delay for case b) above.

ROADWAY SEGMENT GENERAL PLAN CONSISTENCY REQUIREMENTS

Consistent with the acceptable LOS for the City, the following roadway segment requirements should be considered, and improvements recommended if the project exceeds the noted operational goals:

- Any study roadway segment operating at a LOS C or better without project traffic in which the addition of project traffic causes the segment to degrade to an LOS E or F should identify improvements to achieve LOS C.
- As an exception, LOS "D" may be allowed in the North Murrieta Business Corridor, Clinton Keith/Mitchell, Golden Triangle North (Central Murrieta), South Murrieta Business Corridor, or other Focus Areas, or other employment centers
- Any roadway segment that operates unacceptably in the no project scenario where the project adds traffic in excess of 5% of the roadway capacity (e.g., a volume-to-capacity ratio increase of 0.05) should identify improvements to add capacity to the segment.

QUEUING ANALYSIS REQUIREMENTS

Consistent with the City's Guidelines:

A queuing deficiency is identified in the Without Project condition if the calculated 95th percentile queue length exceeds the storage length by more than 25 feet (the average storage length for one additional vehicle) since the bay taper can typically store at least one vehicle. A significant queuing impact is determined if the Project causes the calculated 95th percentile queue length to exceed the existing or planned storage capacity at a signalized intersection by more than 25 feet. If storage lanes that are already deficient without the Project, a significant queuing impact is determined if the Project increases the calculated 95th percentile queue length by at least 25 feet. Where left-turn lanes connect to two-way left-turn lanes, although the calculated queue may exceed the length of the painted left-turn pocket, the presence of the two-way left-turn lane provides additional storage and allows the queue to avoid spilling into through lanes. Therefore,

queues exceeding the painted storage length in these situations are not highlighted as existing deficiencies because they do not contribute to operational problems.

2.7.2 CITY OF WILDOMAR

The LOS-based traffic study will be utilized for conditions of approval and to demonstrate consistency with the General Plan goals/policies. To determine whether the addition of project-related traffic at a study intersection would result in a deficiency, the following thresholds will be utilized (see Table 2-3):

- A project-related deficiency occurs at a study intersection if the addition of project-generated trips reduces the peak hour level of service of the study intersection to change from acceptable "pre-project" operation (LOS A, B, C, or D) to deficient operation (LOS E or F);
- A project-related deficiency occurs at a study intersection if the addition of project-generated trips changes the pre-project delay by the value shown below.

TABLE 2-3: CITY OF WILDOMAR INTERSECTION LEVEL OF SERVICE STANDARD

Pre-Project LOS	Project-Related Delay Increase	Required Improvement
E or F	More than 5.0 seconds	Reduce delay increase to within 5.0 seconds

The City of Murrieta thresholds will be applied at study area intersections for the purposes of determining project-related deficiencies.

2.7.3 CALTRANS

Per Caltrans traffic study guidelines, to determine whether the addition of Project traffic to the State Highway System 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 by contributing 50 or more peak hour trips. A segment that is operating at or near capacity is deemed to be deficient.

2.7.4 COUNTY OF RIVERSIDE

To determine whether the addition of project-related 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 will occur if the Project contributes peak hour trips to pre-project traffic conditions.

2.8 PROJECT FAIR SHARE CALCULATION METHODOLOGY

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

Project Fair Share % = Project AM/PM Traffic / (Project AM/PM Traffic + Future Development Traffic)

The project fair share percentage has been calculated for both the AM peak hour and PM peak hour and the highest of the two has been selected. The Project fair share contribution calculations are presented in Section 7 *Local and Regional Funding Mechanisms* of this TA.

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3 AREA CONDITIONS

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

3.1 EXISTING CIRCULATION NETWORK

Pursuant to the agreement with City of Murrieta staff (Appendix 1.1), the study area includes a total of 24 existing and future intersections as shown previously on Exhibit 1-3. Exhibit 3-1 illustrates the study area intersections located near the proposed Project and identifies the number of through traffic lanes for existing roadways and intersection traffic controls.

3.2 CITY OF MURRIETA GENERAL PLAN CIRCULATION ELEMENT

Exhibit 3-2 shows the City of Murrieta General Plan Circulation Element, and Exhibit 3-3 illustrates the City of Murrieta General Plan roadway cross-sections.

3.3 CITY OF WILDOMAR GENERAL PLAN CIRCULATION ELEMENT

Exhibit 3-4 shows the City of Wildomar General Plan Circulation Element, and Exhibit 3-5 illustrates the City of Wildomar General Plan roadway cross-sections.

3.4 COUNTY OF RIVERSIDE GENERAL PLAN CIRCULATION ELEMENT

Exhibit 3-6 shows the County of Riverside General Plan Circulation Element, and Exhibit 3-7 illustrates the County of Riverside General Plan roadway cross-sections.

3.5 TRUCK ROUTES

The City of Murrieta's truck routes are shown on Exhibit 3-8. There are no identified truck routes in the study area.

3.6 TRANSIT SERVICE

The study area is currently served by Riverside Transit Agency (RTA) with bus service along Clinton Keith Road west of the I-215 Freeway to Whitewood Road, south of Clinton Keith Road. RTA Route 61 runs along Whitewood Road to the east of the Project. The existing transit routes within the study area are shown on Exhibit 3-9. RTA Route 61 could potentially serve the Project. An existing bus stop exists along Clinton Keith Road in front of Vista Murrieta High School and along Baxter Road in front of the Loma Linda Medical Center. A bus turnout is also located in the west die of Whitewood Road, adjacent to the proposed Project. Transit service is reviewed and updated by RTA periodically to address ridership, budget, and community demand needs. Changes in land use can affect these periodic adjustments which may lead to either enhanced or reduced service where appropriate.

EXHIBIT 3-1: EXISTING NUMBER OF THROUGH LANES AND INTERSECTION CONTROLS (PAGE 1 OF 2)

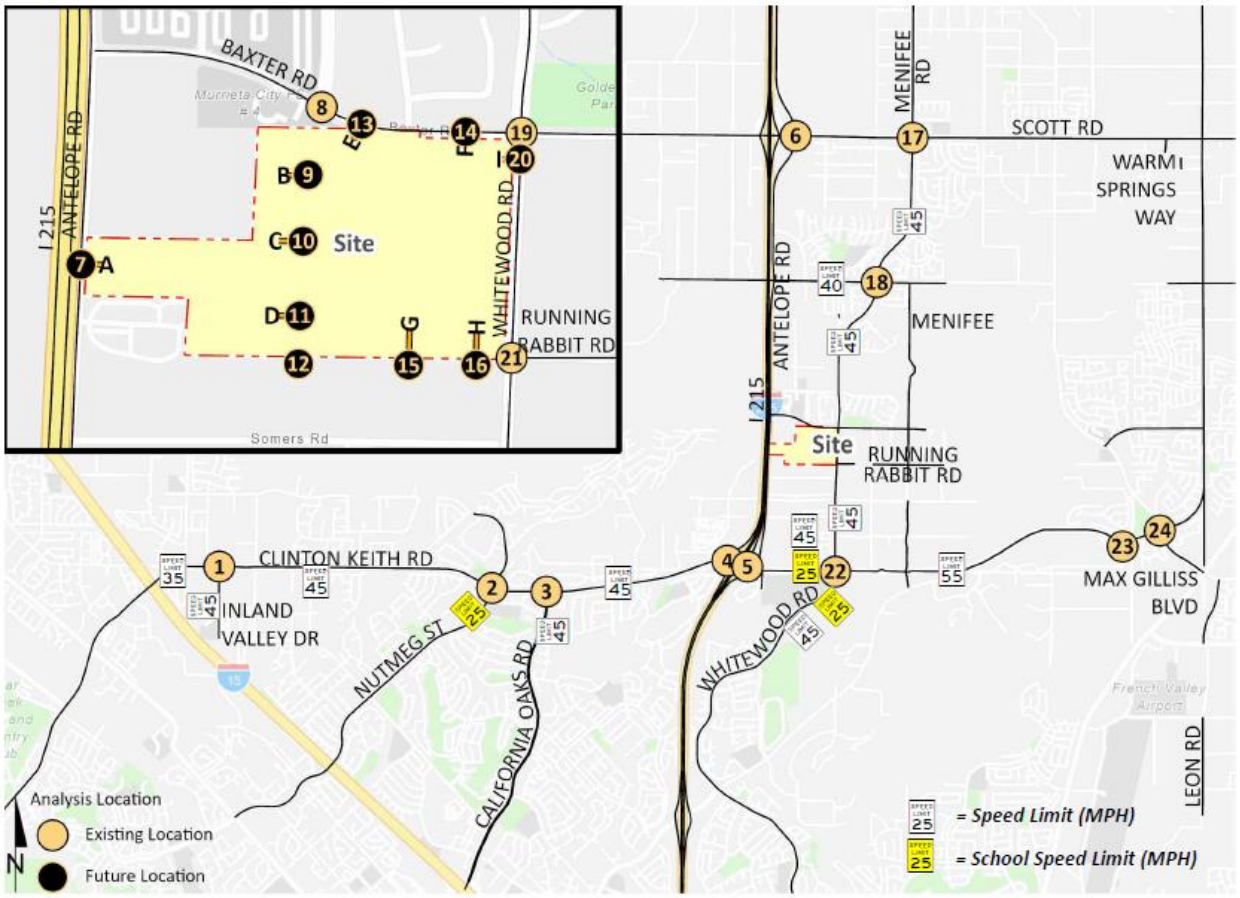


EXHIBIT 3-1: EXISTING NUMBER OF THROUGH LANES AND INTERSECTION CONTROLS (PAGE 2 OF 2)

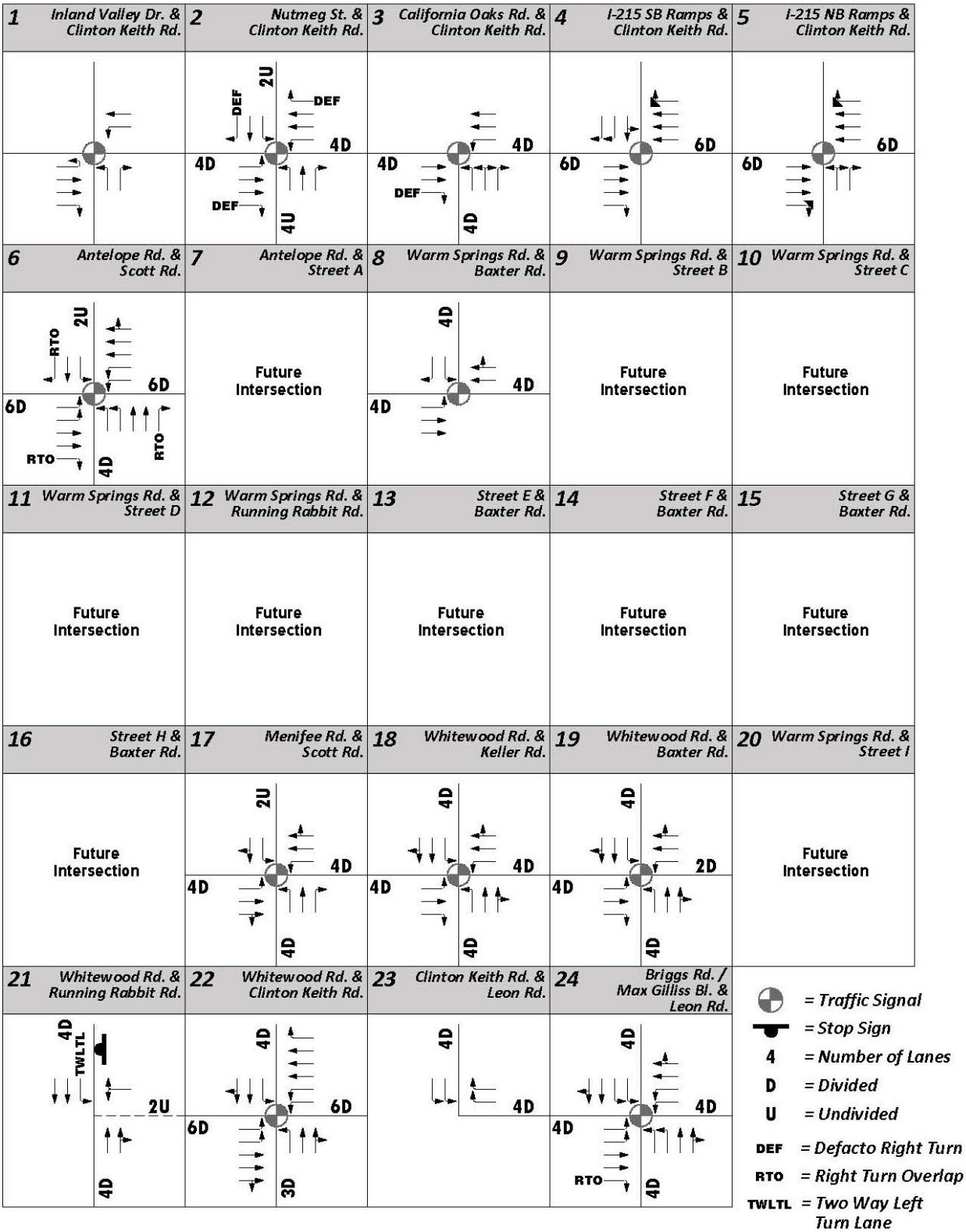


EXHIBIT 3-2: CITY OF MURRIETA GENERAL PLAN CIRCULATION ELEMENT

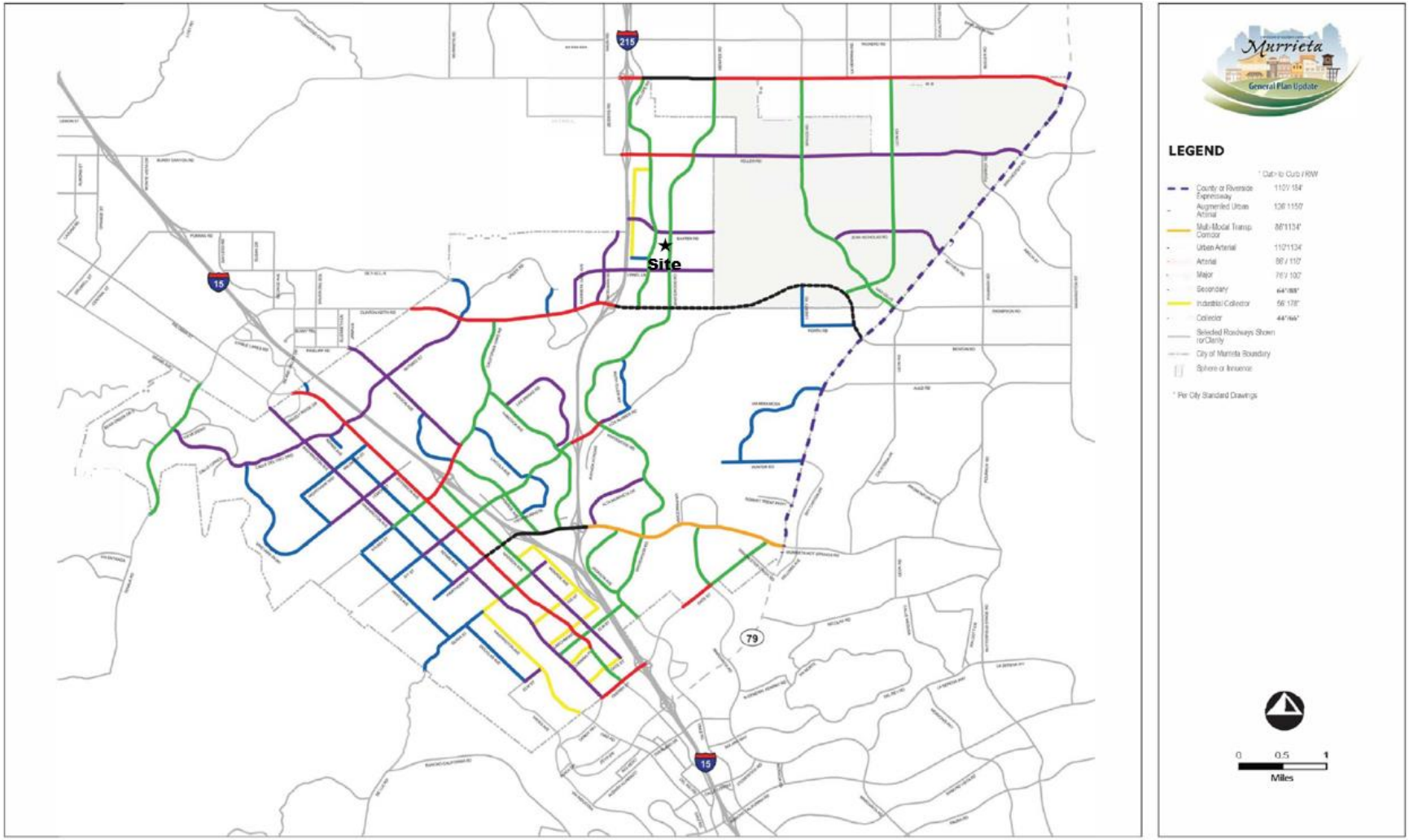
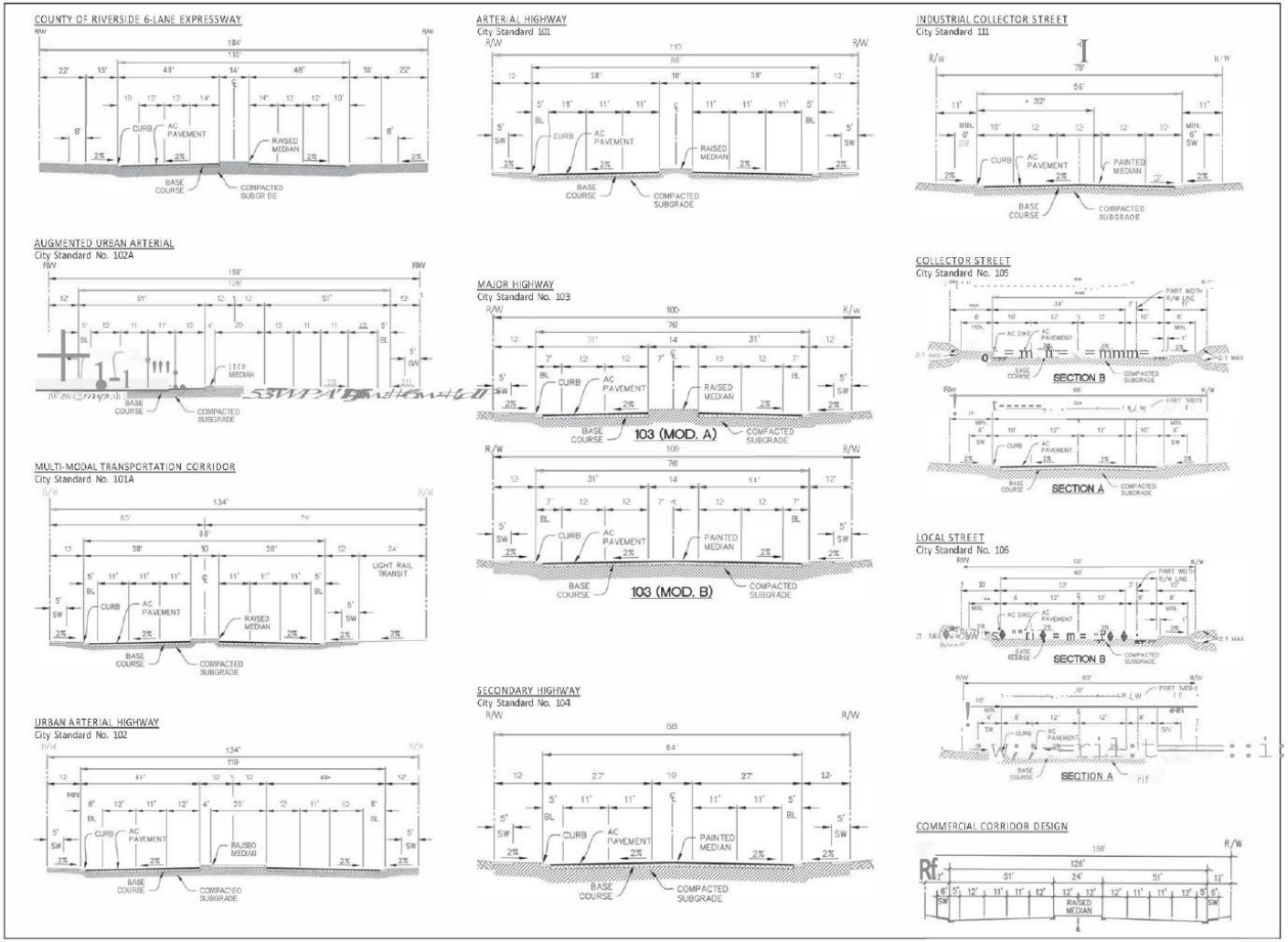


EXHIBIT 3-3: CITY OF MURRIETA ROADWAY CROSS-SECTIONS



STREET SECTIONS SHOWN

- County of Riverside 6-Lane Expressway
- Augmented Urban Arterial
- Multi-Modal Transportation Corridor
- Urban Arterial Highway
- Arterial Highway
- Major Highway
- Secondary Highway
- Industrial Collector Street
- Collector Street
- Local Street
- Commercial Corridor Design

Source: City of Murrieta, Department of Public Works, Standard Drawings, Section 100, Typical Street Sections, Ordinance No. 429-09, Effective January 14, 2010.

EXHIBIT 3-4: CITY OF WILDOMAR GENERAL PLAN CIRCULATION ELEMENT

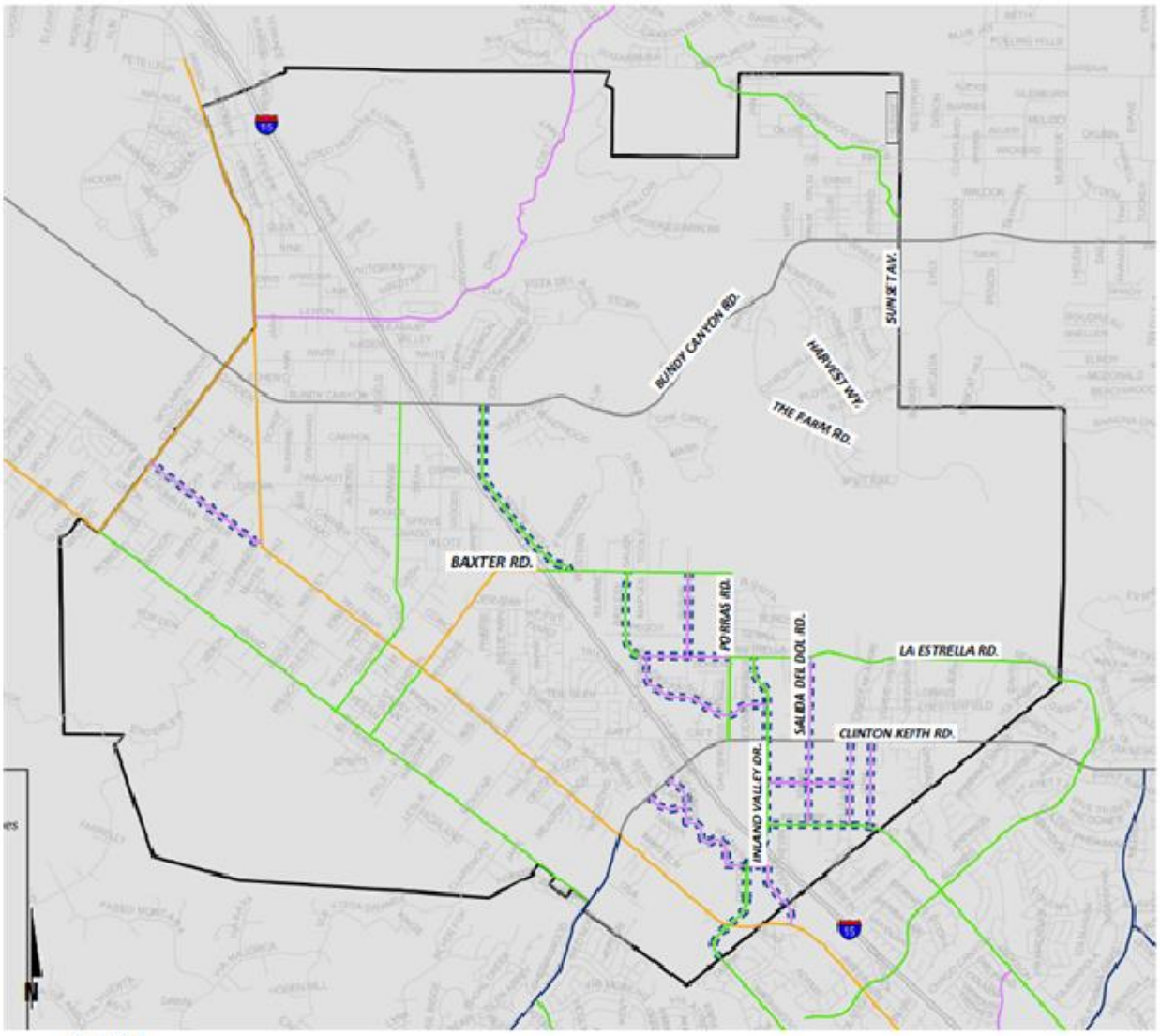
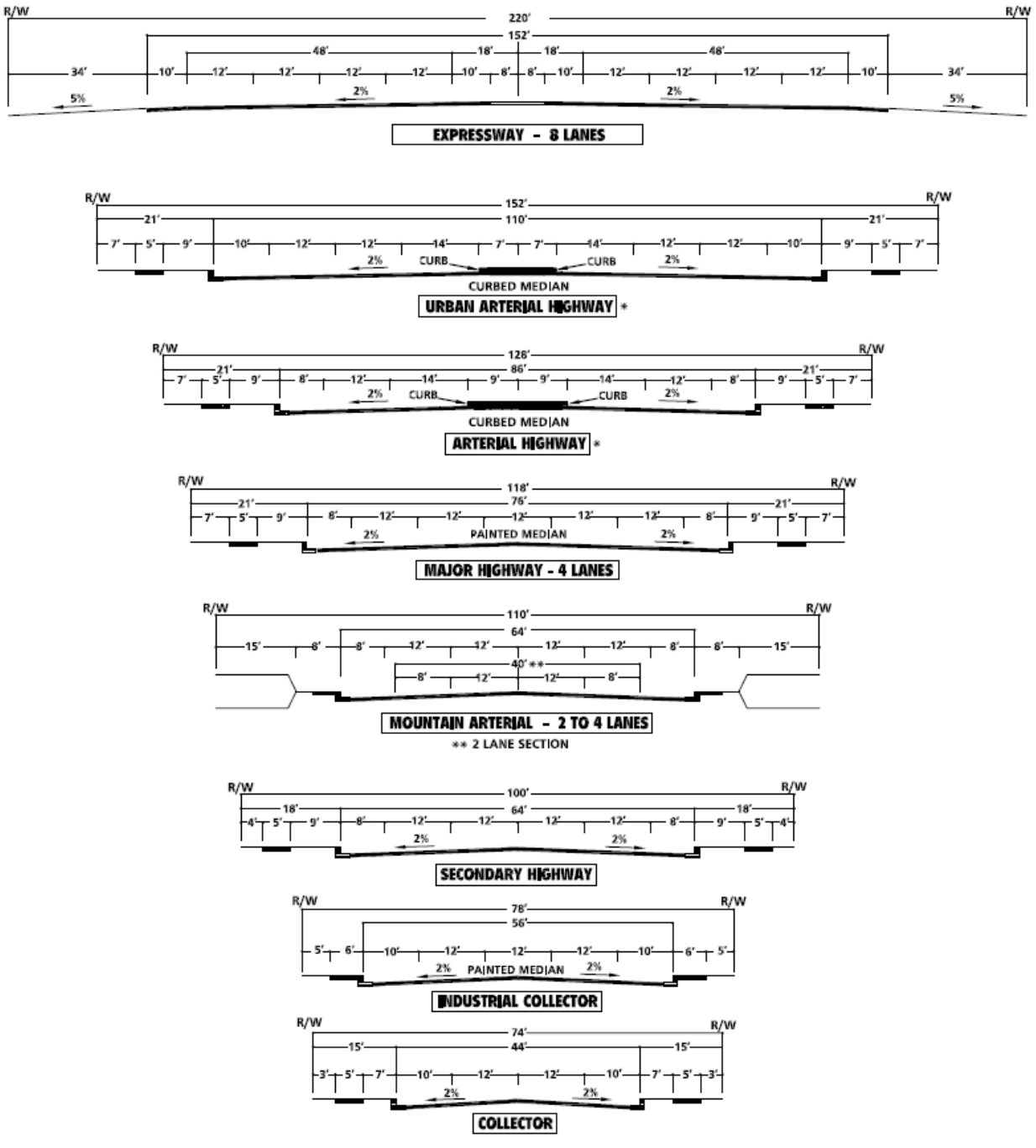


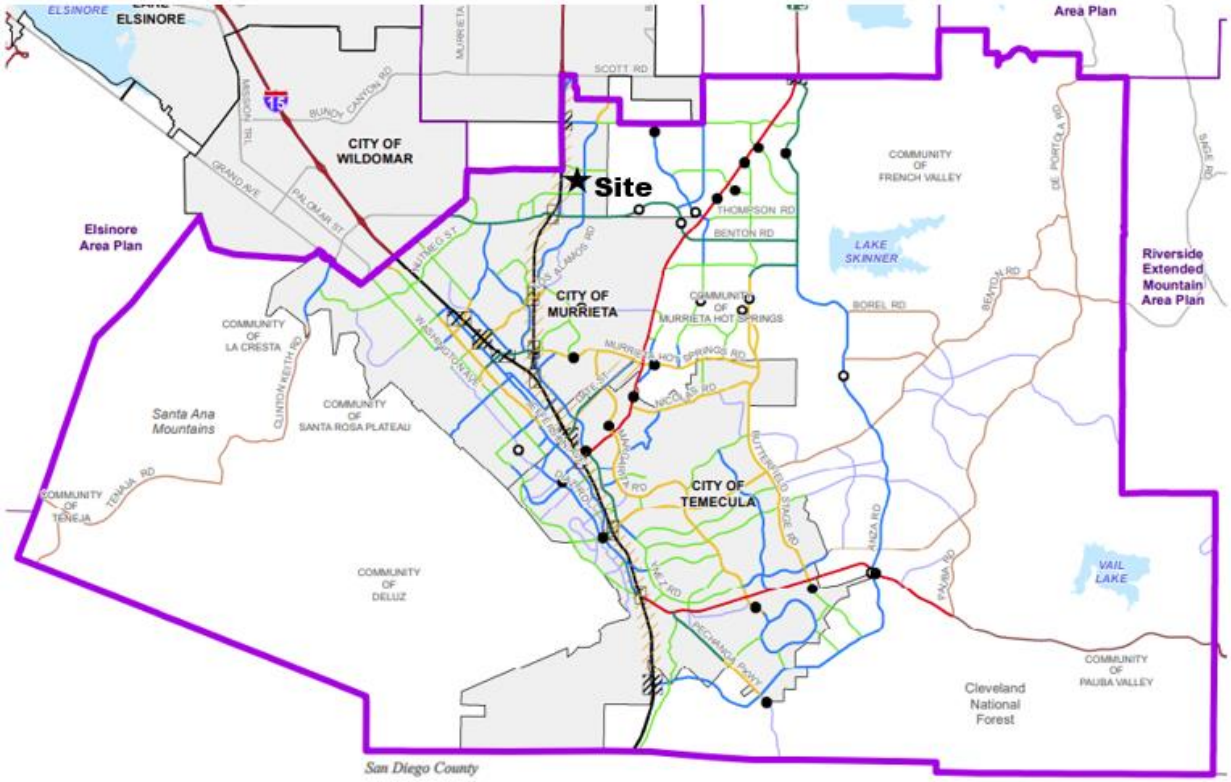
EXHIBIT 3-5: CITY OF WILDOMAR ROADWAY CROSS-SECTIONS



* *IMPROVEMENTS MAY BE RECONFIGURED TO ACCOMMODATE EXCLUSIVE TRANSIT LANES OR ALTERNATIVE LANE ARRANGEMENTS ADDITIONAL RIGHT OF WAY MAY BE REQUIRED AT INTERSECTIONS TO ACCOMMODATE ULTIMATE IMPROVEMENTS FOR STATE HIGHWAYS SHALL CONFORM TO CALTRANS DESIGN STANDARDS.*

NOTE: THE CITY OF WILDOMAR HAS ADOPTED THE COUNTY OF RIVERSIDE'S GENERAL PLAN AND STANDARDS

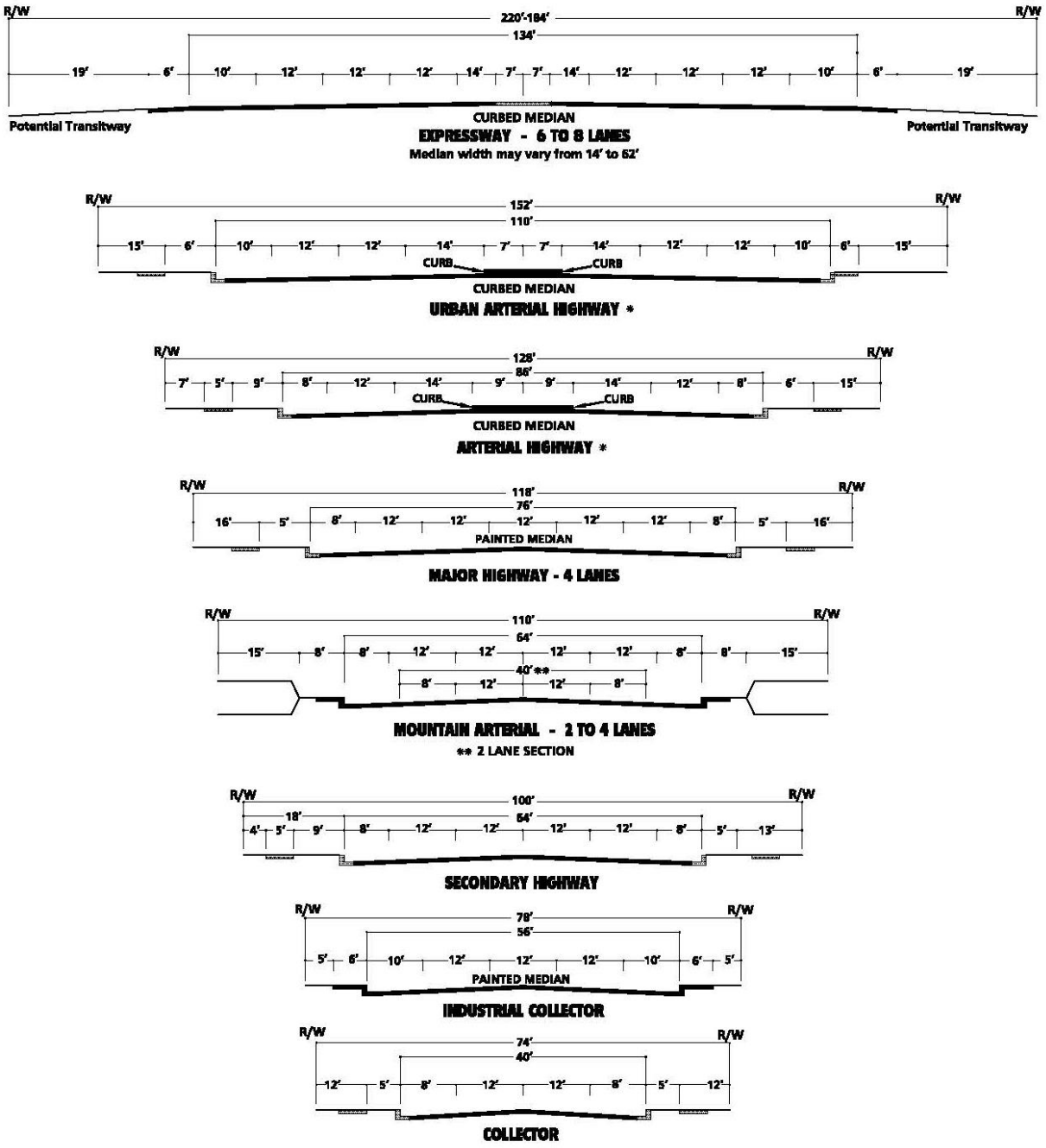
EXHIBIT 3-6: COUNTY OF RIVERSIDE GENERAL PLAN CIRCULATION ELEMENT



Data Source: Riverside County Transportation

- Freeway (Variable ROW)
- Expressway (128' to 220' ROW)
- Urban Arterial (152' ROW)
- Arterial (128' ROW)
- Major (118' ROW)
- Secondary (100' ROW)
- Mountain Arterial 4 Ln (110' ROW)
- Mountain Arterial 2 Ln (110' ROW)
- Collector (74' ROW)
- Existing Interchange
- Proposed Interchange
- Winchester to Temecula CETAP
- Existing Bridge
- Proposed Bridge
- Highways
- Area Plan Boundary
- City Boundary
- Waterbodies

EXHIBIT 3-7: COUNTY OF RIVERSIDE ROADWAY CROSS-SECTIONS



* IMPROVEMENTS MAY BE RECONFIGURED TO ACCOMMODATE EXCLUSIVE TRANSIT LANES OR ALTERNATIVE LANE ARRANGEMENTS ADDITIONAL RIGHT OF WAY MAY BE REQUIRED AT INTERSECTIONS TO ACCOMMODATE ULTIMATE IMPROVEMENTS FOR STATE HIGHWAYS SHALL CONFORM TO CALTRANS DESIGN STANDARDS.

NOT TO SCALE

SOURCE: COUNTY OF RIVERSIDE July 7, 2020

EXHIBIT 3-8: CITY OF MURRIETA TRUCK ROUTES

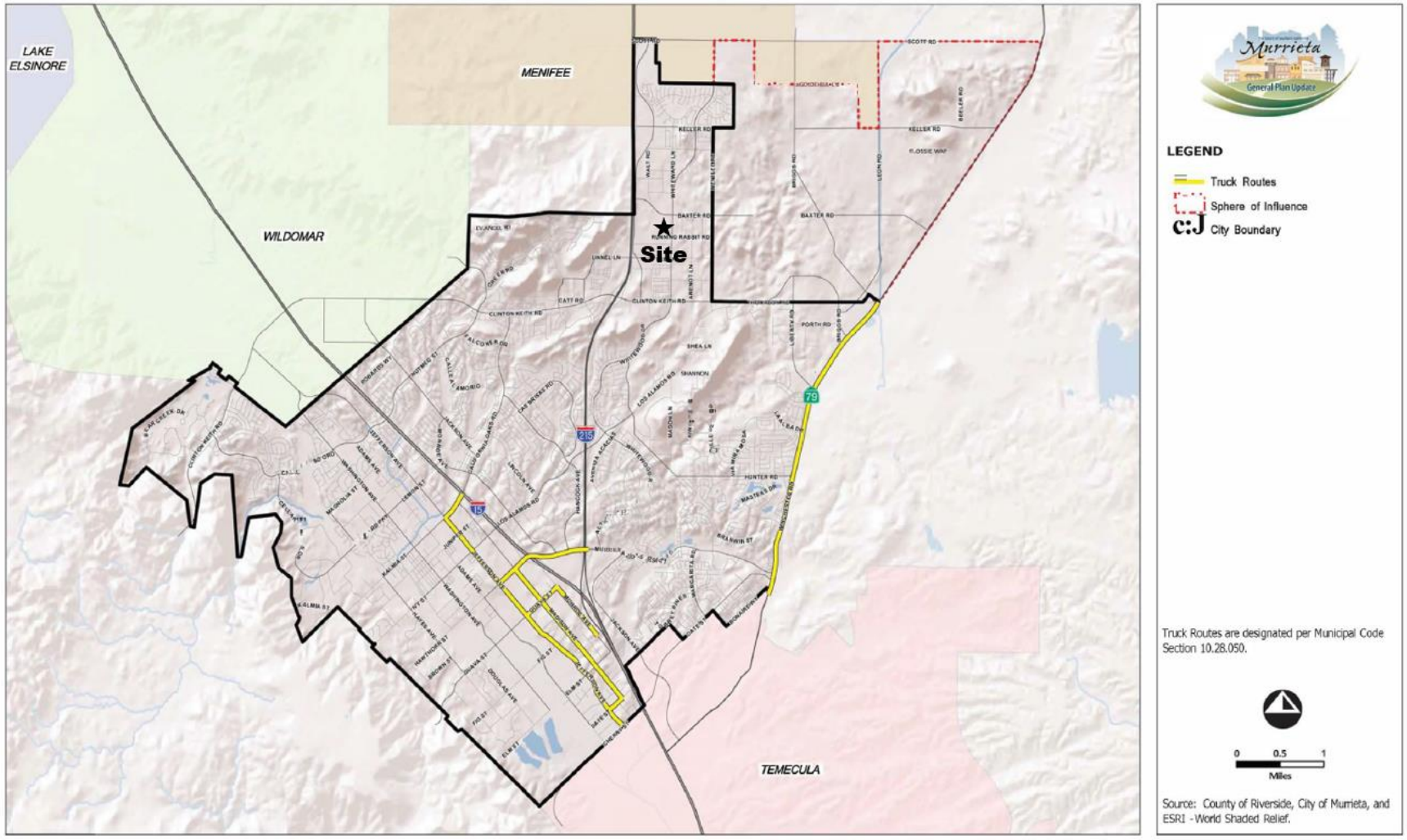


EXHIBIT 3-9: EXISTING TRANSIT ROUTES

3.5 BICYCLE & PEDESTRIAN FACILITIES

The City of Murrieta's trails and bikeways are shown on Exhibit 3-10. There are Class II (striped, on-road) bike lanes along Baxter Road, Running Rabbit Road, Warm Springs Road, and Whitewood Road proposed to be striped with Class II bike lanes in the future along the Project's frontage. As shown on Exhibit 3-11, pedestrian facilities are built out around intersections along Baxter Road and Whitewood Road. Field observations indicate nominal pedestrian and bicycle activity within the study area.

3.6 EXISTING (2021) TRAFFIC COUNTS

Due to the currently ongoing COVID-19 pandemic, schools and businesses within the study area may be closed or operating at less than full capacity at the time this study was prepared. Some businesses were affected by the ongoing COVID-19 pandemic but, in general, businesses and schools have returned to normal operations. As such, historic 2018 and 2019 traffic counts were utilized in conjunction with a 2% per year growth rate (compounded annually) to reflect 2021 conditions. The 2018 and 2019 weekday AM and weekday PM peak hour count data is representative of typical weekday peak hour traffic conditions in the study area. There were no observations made in the field that would indicate atypical traffic conditions on the count dates, such as construction activity or detour routes and near-by schools were in session and operating on normal schedules.

New traffic counts were collected at the study area intersections as local schools are back in session with in-person instruction for the following peak hours:

- 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 City also provided historic traffic counts, where available, to ensure traffic counts reflect pre-COVID traffic conditions. An adjustment factor was developed, which was applied to 2021 volumes in order to reflect non-COVID baseline conditions. To develop an adjustment factor, the historic traffic counts were compared to the current traffic count collected at the same location. The historic count was first adjusted to 2021 traffic conditions through the application of a 2% per year growth rate. The calculated average growth for the overall intersection (all turning movements) between the current and adjusted historic count was then applied to other existing traffic counts collected (where historic traffic counts were unavailable) in order to reflect and evaluate pre-COVID traffic conditions. The AM peak hour adjustment factor was approximately 1.1637 and the PM peak hour adjustment factor was approximately 1.1652. These factors were applied to locations where historic counts were not available in order adjust the volumes up (increasing the volumes from the ground counts collected in 2021).

Existing weekday ADT volumes are shown on Exhibit 3-12. Where actual 24-hour tube count data was not available, Existing ADT volumes were based upon factored intersection peak hour counts collected by Urban Crossroads, Inc. using the following formula for each intersection leg:

Weekday PM Peak Hour (Approach Volume + Exit Volume) x 12.37 = Leg Volume

EXHIBIT 3-10: CITY OF MURRIETA TRAILS AND BIKEWAYS

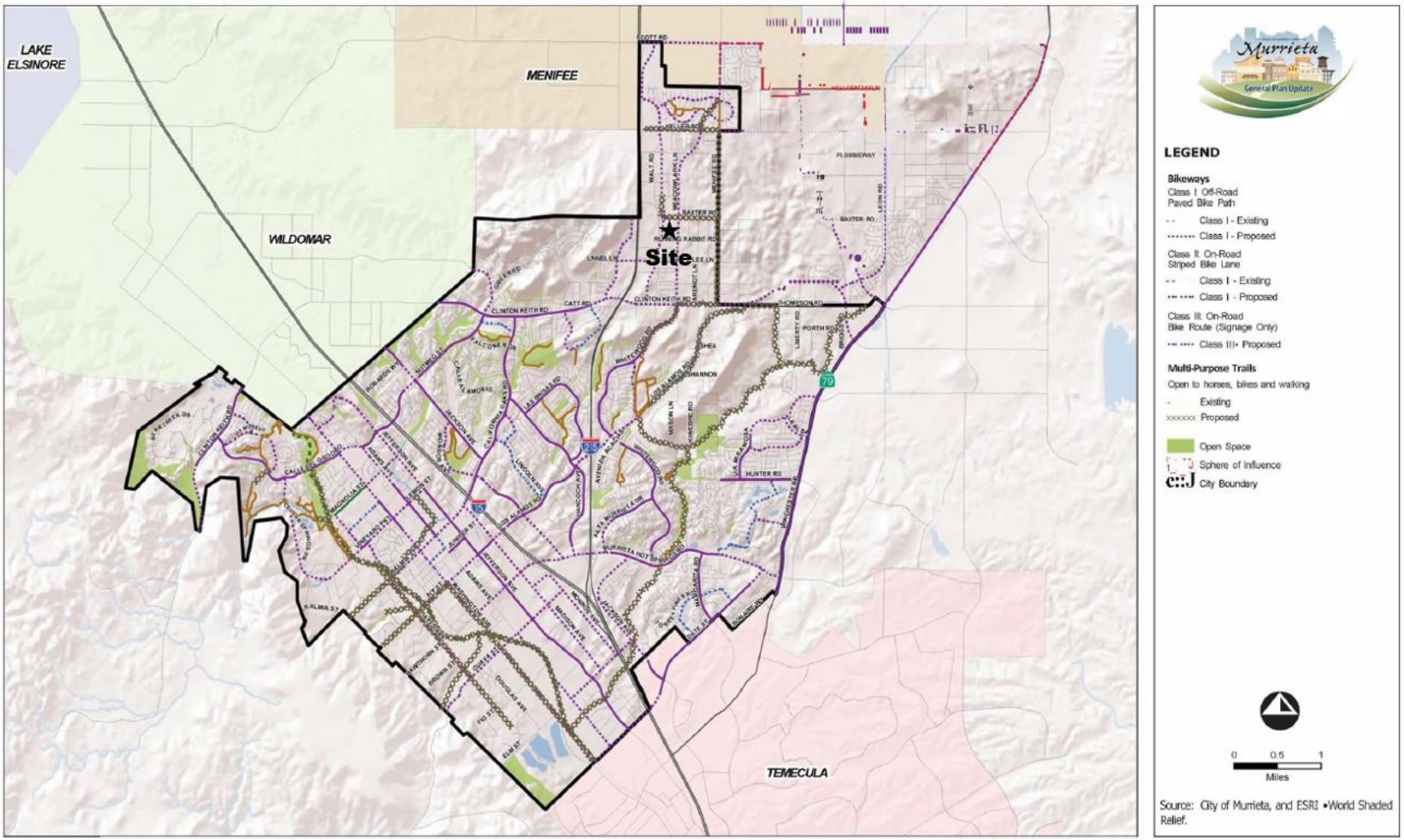


EXHIBIT 3-11: EXISTING PEDESTRIAN FACILITIES

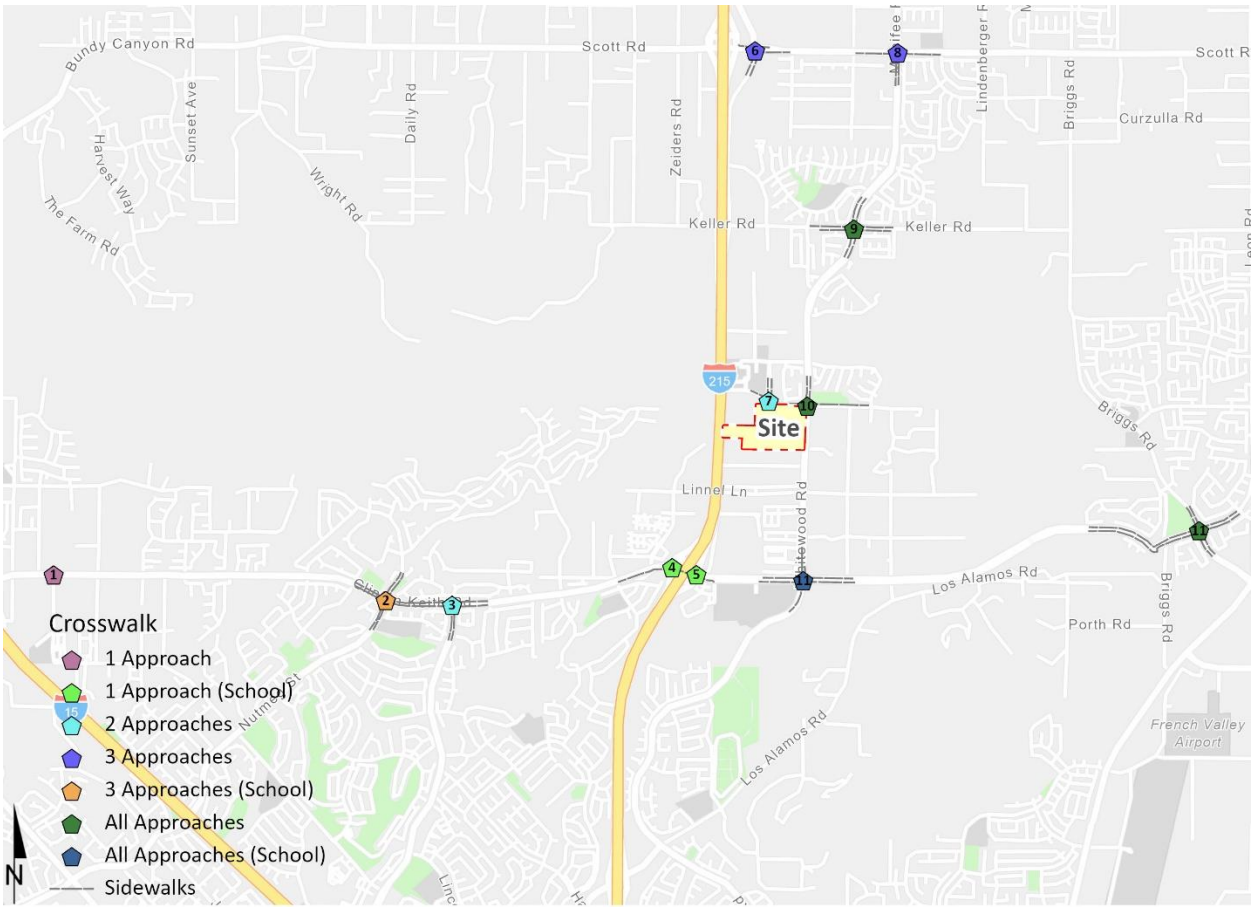
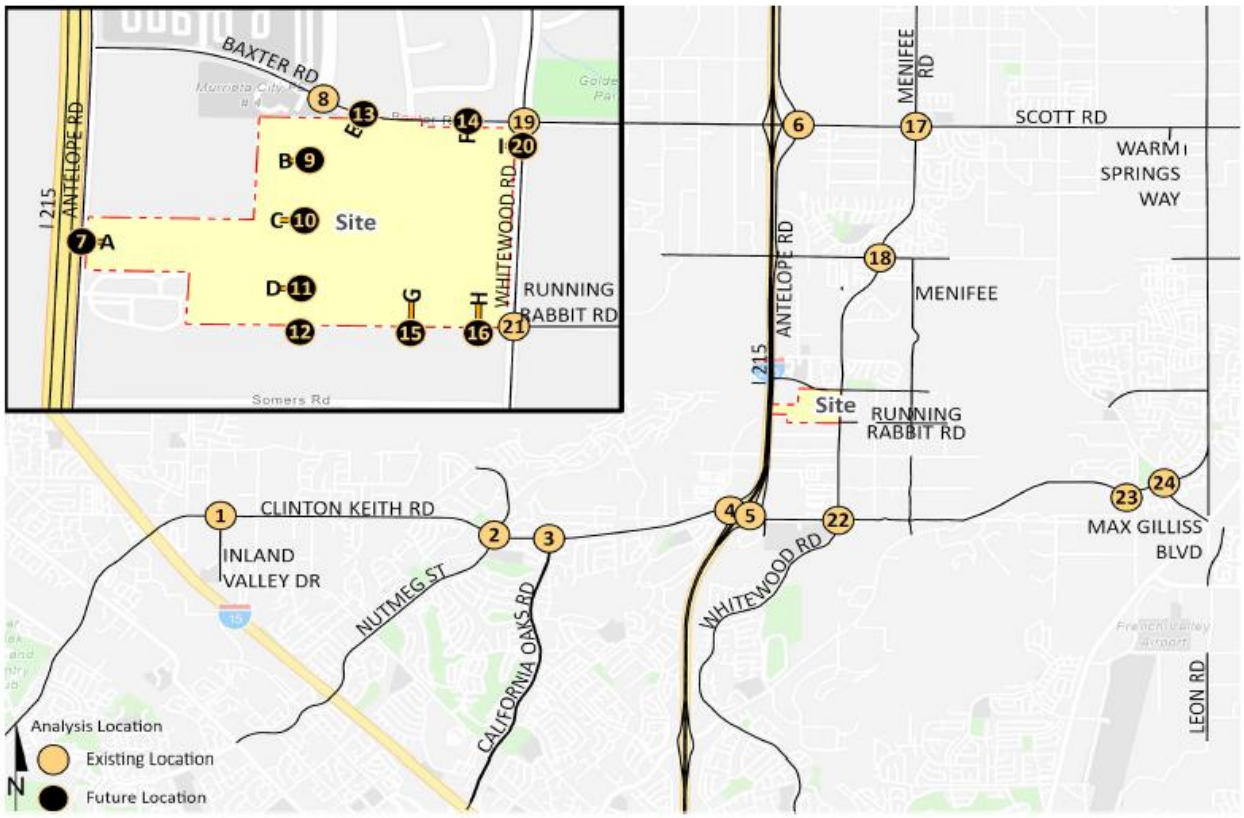


EXHIBIT 3-12: EXISTING (2021) TRAFFIC VOLUMES (PAGE 1 OF 2)

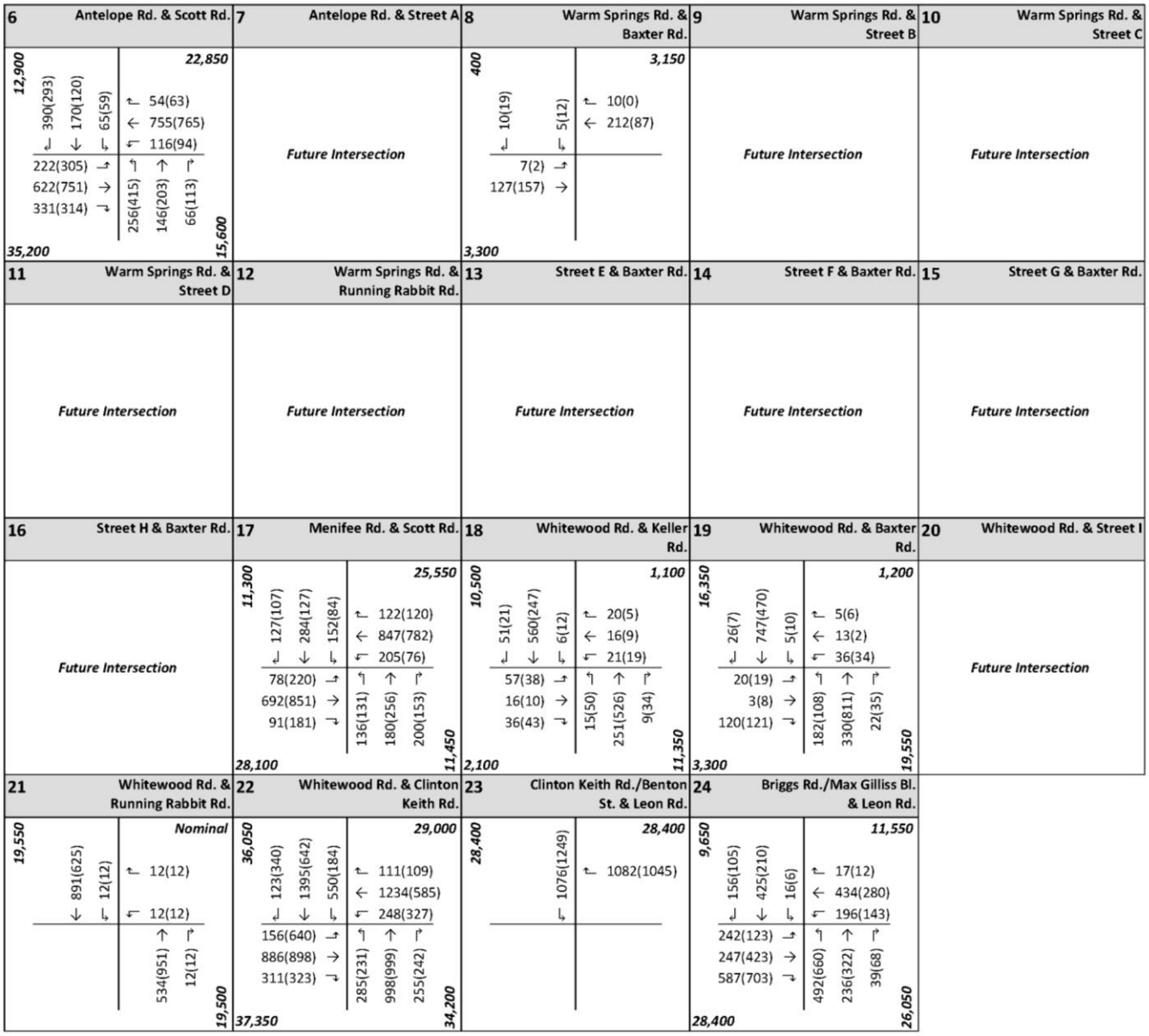


1 Inland Valley & Clinton Keith Rd.	2 Nutmeg St. & Clinton Keith Rd.	3 California Oaks Rd. & Clinton Keith Rd.	4 I-215 SB Ramps & Clinton Keith Rd.	5 I-215 NB Ramps & Clinton Keith Rd.
22,900	*5,600* / *34,800*	*46,200*	*18,100* / *45,850*	*1,650* / *39,750*
← 909(807) ↰ 109(40)	↰ 54(29) ← 61(55) ↳ 117(131) ↰ 77(109) ← 1065(834) ↰ 354(392)	← 1271(1138) ↰ 568(612)	↳ 428(655) ← 4(1) ↳ 327(335) ← 649(472) ← 830(1281)	↰ 335(134) ← 1185(982)
543(896) → 270(385) 393(246) ↴ 38(109)	30(50) ↴ 759(994) → 127(91) ↴ ↰ 117(79) ↑ 81(77) ↱ 316(353)	1162(1290) → 139(163) ↴ ↰ 118(156) ↱ 359(692)	1579(1619) → 568(516) ↴	1104(1270) → 802(684) ↴ ↰ 294(771) ↱ 767(825)
28,900 / *9,650*	*25,700* / *12,950*	*34,000* / *20,100*	*50,400* / *6,400*	*45,850* / *28,200*

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

***Average Daily Trips***

EXHIBIT 3-12: EXISTING (2021) TRAFFIC VOLUMES (PAGE 2 OF 2)



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

Average Daily Trips

A comparison of the PM peak hour and daily traffic volumes of various roadway segments within the study area indicated that the peak-to-daily relationship is approximately 8.08 percent. As such, the above equation utilizing a factor of 12.37 estimates the ADT volumes on the study area roadway segments assuming a peak-to-daily relationship of approximately 8.08 percent (i.e., 1/0.0808 = 12.37) and was assumed to sufficiently estimate average daily traffic (ADT) volumes for planning-level analyses. Existing weekday AM and weekday PM peak hour intersection volumes are also shown on Exhibit 3-12.

3.7 INTERSECTION OPERATIONS ANALYSIS

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

- California Oaks Rd. & Clinton Keith Rd. (#3) – LOS E PM peak hour only
- Whitewood Rd. & Clinton Keith Rd. (#22) – LOS F AM and PM peak hours

The intersection operations analysis worksheets are included in Appendix 3.2 of this TA.

TABLE 3-1: INTERSECTION ANALYSIS FOR EXISTING (2021) CONDITIONS

#	Intersection	Traffic Control[1]	Delay[2] (secs.) AM	Delay[2] (secs.) PM	Level of Service AM	Level of Service PM
1	Inland Valley & Clinton Keith Rd.	TS	12.6	14.5	B	B
2	Nutmeg St. & Clinton Keith Rd.	TS	20.8	28.7	C	C
3	California Oaks Rd. & Clinton Keith Rd.	TS	33.2	**78.5**	C	**E**
4	I-215 SB Ramps & Clinton Keith Rd.	TS	13.1	15.3	B	B
5	I-215 NB Ramps & Clinton Keith Rd.	TS	21.0	34.3	C	C
6	Antelope Rd. & Scott Rd.	TS	24.2	23.8	C	C
7	Antelope Rd. & Street A		Future Intersection			
8	Warm Springs Rd. & Baxter Rd.	TS	4.7	4.6	A	A
9	Warm Springs Rd. & Street B		Future Intersection			
10	Warm Springs Rd. & Street C		Future Intersection			
11	Warm Springs Rd. & Street D		Future Intersection			
12	Warm Springs Rd. & Running Rabbit Rd.		Future Intersection			
13	Street E & Baxter Rd.		Future Intersection			
14	Street F & Baxter Rd.		Future Intersection			
15	Street G & Baxter Rd.		Future Intersection			
16	Street H & Baxter Rd.		Future Intersection			
17	Menifee Rd. & Scott Rd.	TS	51.7	37.6	D	D
18	Whitewood Rd. & Keller Rd.	TS	15.5	16.6	B	B
19	Whitewood Rd. & Baxter Rd.	TS	20.5	17.3	C	B
20	Whitewood Rd. & Street I		Future Intersection			
21	Whitewood Rd. & Running Rabbit Rd.	CSS	12.5	15.6	B	C
22	Whitewood Rd. & Clinton Keith Rd.	TS	**190.7**	**109.6**	**F**	**F**
23	Clinton Keith Rd./Benton St. & Leon Rd.		Future Intersection			
24	Briggs Rd./Max Gilliss Bl. & Leon Rd.	TS	29.4	24.8	C	C

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

[1] TS = Traffic Signal; CSS = Cross-Street Stop; **CSS** = 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.

3.8 ROADWAY SEGMENT CAPACITY ANALYSIS

The City of Murrieta Traffic Study Guidelines provide roadway volume capacity values. These roadway segment capacities are approximate figures only and are used at the General Plan level to assist in determining the roadway functional classification (number of through lanes) needed to meet traffic demand. Table 3-2 provides a summary of the Existing (2021) conditions roadway segment capacity analysis based on the City of Murrieta Roadway Capacity Thresholds. As shown in Table 3-2, all study area roadway segments currently operate at an acceptable LOS based on the City's planning level daily roadway capacity thresholds and minimum LOS criteria.

TABLE 3-2: ROADWAY SEGMENT ANALYSIS FOR EXISTING (2021) CONDITIONS

#	Roadway	Segment Limits	GP Classification	Roadway Section	LOS E Capacity[1,4]	Existing 2021	V/C[2]	LOS[3]
1	Baxter Rd.	West of Whitewood Rd.	Secondary	4D	25,900	3,279	0.13	A
2	Whitewood Rd.	South of Baxter Rd.	Arterial	4D	34,100	19,539	0.57	A
3	Warm Springs Rd.	Baxter Rd. to Running Rabbit Rd.	Arterial	4D	34,100	Future Roadway		
4	Running Rabbit Rd.	Warm Springs Rd. to Whitewood Rd.	Local	2D	13,000	Future Roadway		

[1] These maximum roadway capacities have been extracted from the following source: City of Murrieta General Plan 2035 Update (Table 4.2-2)

[2] V/C = Volume to Capacity Ratio

[3] LOS = Level of Service

3.9 OFF-RAMP QUEUING ANALYSIS

Off-ramp queuing analysis findings are presented on Table 3-3. It is important to note that available stacking lengths are consistent with the measured distance between the intersection and the freeway mainline or the intersection turn pockets. As shown on Table 3-3, no off-ramp movements are currently experiencing queuing issues during the weekday AM or weekday PM peak 95th percentile traffic flows for Existing (2021) traffic conditions. Worksheets for Existing traffic conditions queuing analysis are provided in Appendix 3.3.

TABLE 3-3: PEAK HOUR FREEWAY OFF-RAMP QUEUING SUMMARY FOR EXISTING (2021) CONDITIONS

#	Intersection	Movement	Available Stacking Distance (Feet)	95th Percentile Queue (Feet)		Acceptable? [1]	
				AM Peak Hour	PM Peak Hour	AM	PM
4	I-215 SB Ramps & Clinton Keith Rd.	SBL/T	960	307	295	Yes	Yes
		SBR	1,185	103	275	Yes	Yes
5	I-215 NB Ramps & Clinton Keith Rd.	NBL/R	960	474	916 [2]	Yes	Yes
		NBR	1,525	501 [2]	869 [2]	Yes	Yes

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

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

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

3.10 EXISTING (2021) TRAFFIC SIGNAL WARRANTS ANALYSIS

Traffic signal warrants for Existing traffic conditions are based on existing peak hour intersection turning volumes. No unsignalized study area intersection currently meets a traffic signal for Existing (2021) traffic conditions (see Appendix 3.4).

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4 PROJECTED FUTURE TRAFFIC

This section presents the traffic volumes estimated to be generated by the Project, as well as the Project's trip assignment onto the study area roadway network. The Project is to consist of 199 multifamily (low-rise) housing units (condo), 237 single family detached residential dwelling units, 267,000 square feet (SF) of business park use, and 5,000 SF of commercial use. It is anticipated that the Project would be developed in a single phase with an anticipated Opening Year of 2027. Access to the Project site will be provided to by the following roadways:

- Street A at Antelope Road – full access
- Street B at Warm Springs Road – right-in/right-out only access
- Street C at Warm Springs Road – full access
- Street D at Warm Springs Road – right-in/right-out only access
- Street E at Baxter Road – right-in/right-out only access
- Street F at Baxter Road – right-in/right-out only access
- Street G at Baxter Road – full access
- Street H at Baxter Road – right-in/right-out only access
- Street I at Whitewood Road – right-in/right-out only access

Regional access to the Project site will be provided by the I-215 Freeway via Clinton Keith Road and Scott Road.

4.1 PROJECT TRIP GENERATION

4.1.1 PROPOSED PROJECT

In order to develop the traffic characteristics of the proposed Project, trip-generation statistics published in the ITE Trip Generation Manual (11th Edition, 2021) for the following land use codes (2):

- Single-Family Detached Housing (ITE Land Use Code 210)
- Multifamily Housing (Low-Rise) (ITE Land Use Code 220)
- Business Park (ITE Land Use Code 770)
- Shopping Center (ITE Land Use Code 820)

The Innovation District component allows for a variety of land uses and allows for a wide range of potential land uses, however, for the purposes of the traffic assessment, Business Park and retail land uses will be evaluated as uses of the Innovation District. It should be noted, the proposed retail use is anticipated to be developed as a neighborhood commercial use. However, in order to conduct a conservative analysis and to overstate as opposed to understate potential trips, the Shopping Center land use has been utilized for estimating trips generated by the neighborhood commercial use.

As shown in Table 4-1, the proposed Project is anticipated to generate 7,104 two-way trips per day, with 618 AM peak hour trips and 675 PM peak hour trips.

TABLE 4-1: PROJECT TRIP GENERATION SUMMARY

Land Use[1]	ITE LU Code	Units[2]	AM Peak Hour In	AM Peak Hour Out	AM Peak Hour Total	PM Peak Hour In	PM Peak Hour Out	PM Peak Hour Total	Daily
Trip Generation Rates:									
Single Family Residential Detached	210	DU	0.18	0.52	0.70	0.59	0.35	0.94	9.43
Multifamily Housing (Low-Rise)	220	DU	0.10	0.30	0.40	0.32	0.19	0.51	6.74
Business Park	770	TSF	1.15	0.20	1.35	0.32	0.90	1.22	12.44
Strip Retail Plaza	822	TSF	1.42	0.94	2.36	3.30	3.29	6.59	54.45

[1] Trip Generation Source: Institute of Transportation Engineers (ITE), Trip Generation Manual, 11th Edition (2021).

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

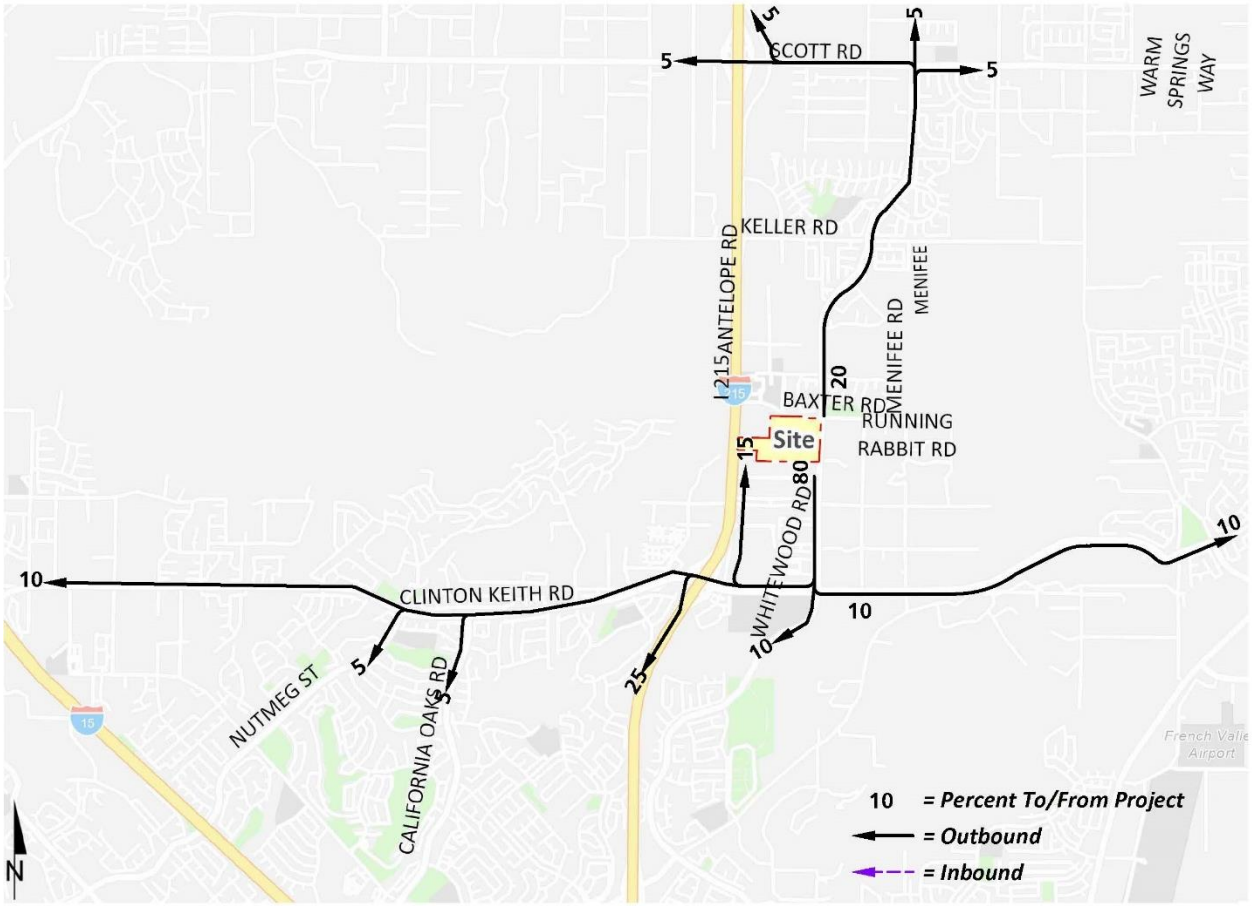
Land Use	Quantity	Units[1]	AM Peak Hour In	AM Peak Hour Out	AM Peak Hour Total	PM Peak Hour In	PM Peak Hour Out	PM Peak Hour Total	Daily
Trip Generation Summary:									
Single Family Residential Detached	237	DU	43	123	166	140	83	223	2,236
Multifamily Housing (Low-Rise)	199	DU	20	60	80	64	38	102	1,342
Residential Total			**63**	**183**	**246**	**204**	**121**	**325**	**3,578**
Business Park	267.000	TSF	307	53	360	85	240	325	3,322
Strip Retail Plaza	5.000	TSF	7	5	12	17	16	33	272
Pass-by Reduction (25% PM/Daily)			0	0	0	-4	-4	-8	-68
Innovation District Total			**314**	**58**	**372**	**98**	**252**	**350**	**3,526**
Project Total			**377**	**241**	**618**	**302**	**373**	**675**	**7,104**

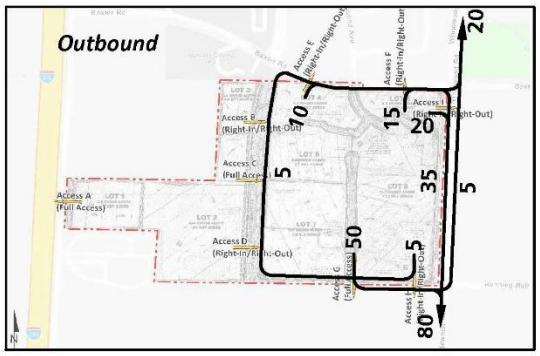
[1] DU = Dwelling Units; TSF = Thousand Square Feet

4.2 PROJECT TRIP DISTRIBUTION

The Project trip distribution represents the directional orientation of traffic to and from the Project site. Trip distribution is the process of identifying the probable destinations, directions or traffic routes that will be utilized by Project traffic. The potential interaction between the planned land uses and surrounding regional access routes are considered to identify the route where the Project traffic would distribute. Distribution patterns are based on existing and planned land uses in the area along with the planned circulation system. Exhibit 4-1 illustrates the residential trip distribution patterns for the Project and Exhibit 4-2 illustrates the Innovation District trip distribution patterns for the Project. The trip distribution patterns have been reviewed and approved by the City of Murrieta during the scoping process and are consistent with trip distribution patterns for other nearby projects recently completed within the City of Murrieta.

EXHIBIT 4-1: PROJECT (RESIDENTIAL) TRIP DISTRIBUTION





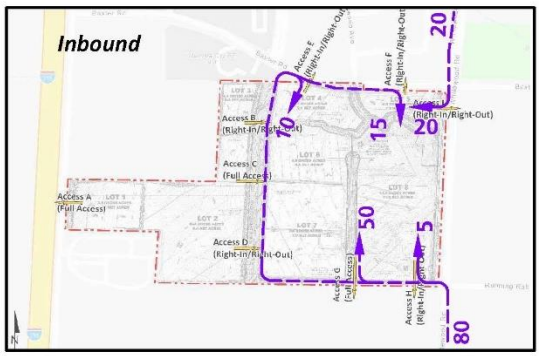
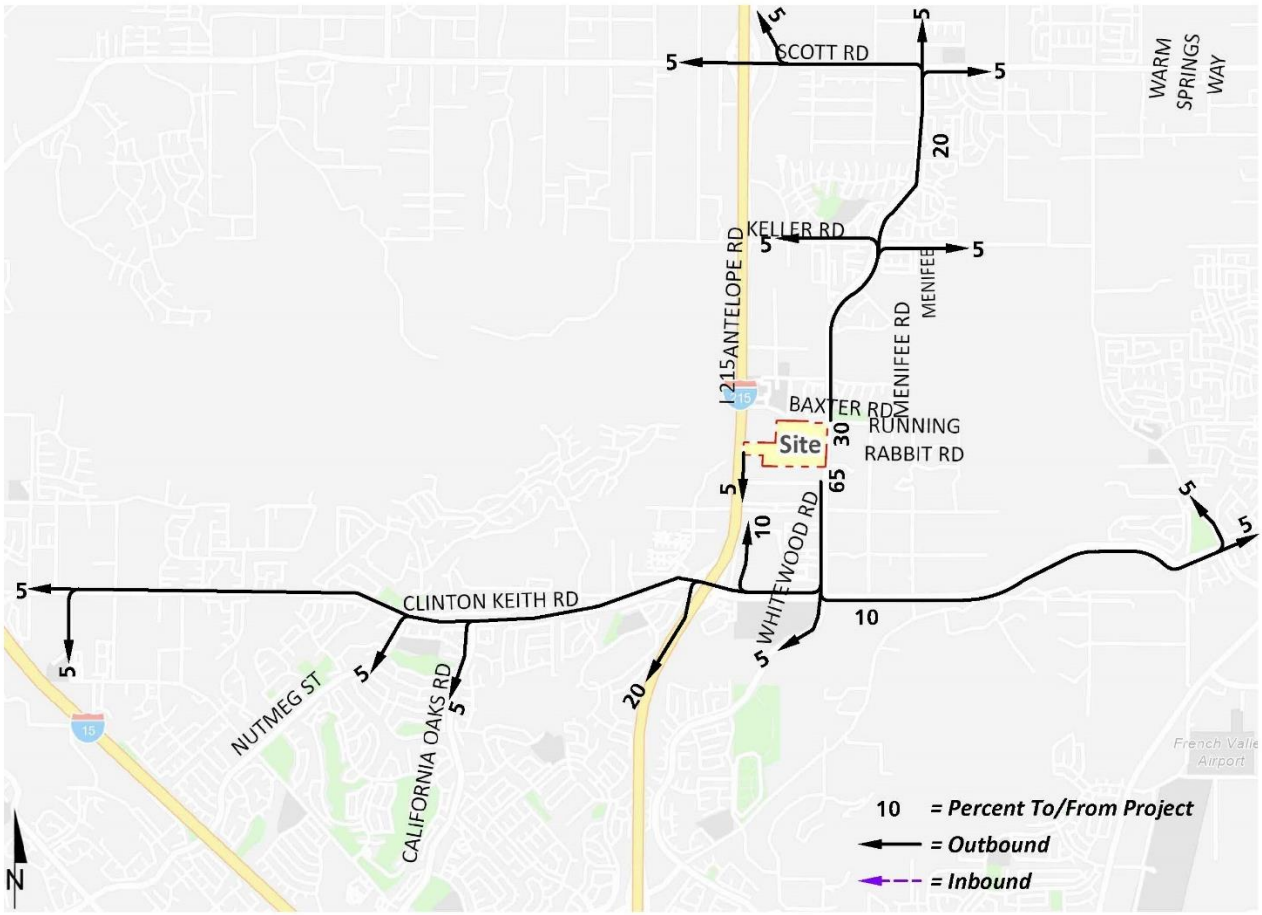
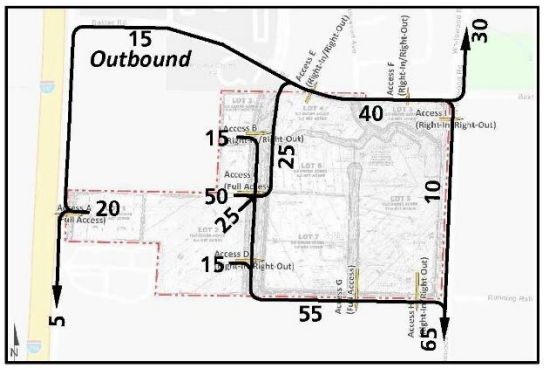
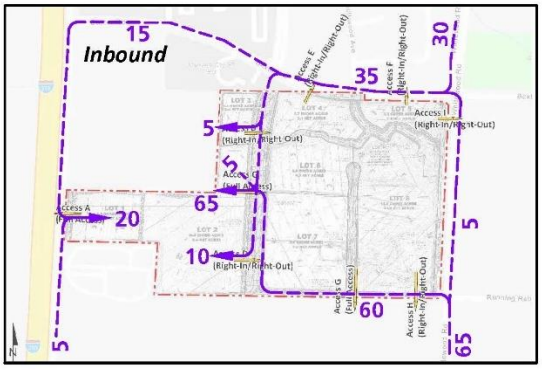


EXHIBIT 4-2: PROJECT (INNOVATION DISTRICT) TRIP DISTRIBUTION







4.3 MODAL SPLIT

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

4.4 PROJECT TRIP ASSIGNMENT

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

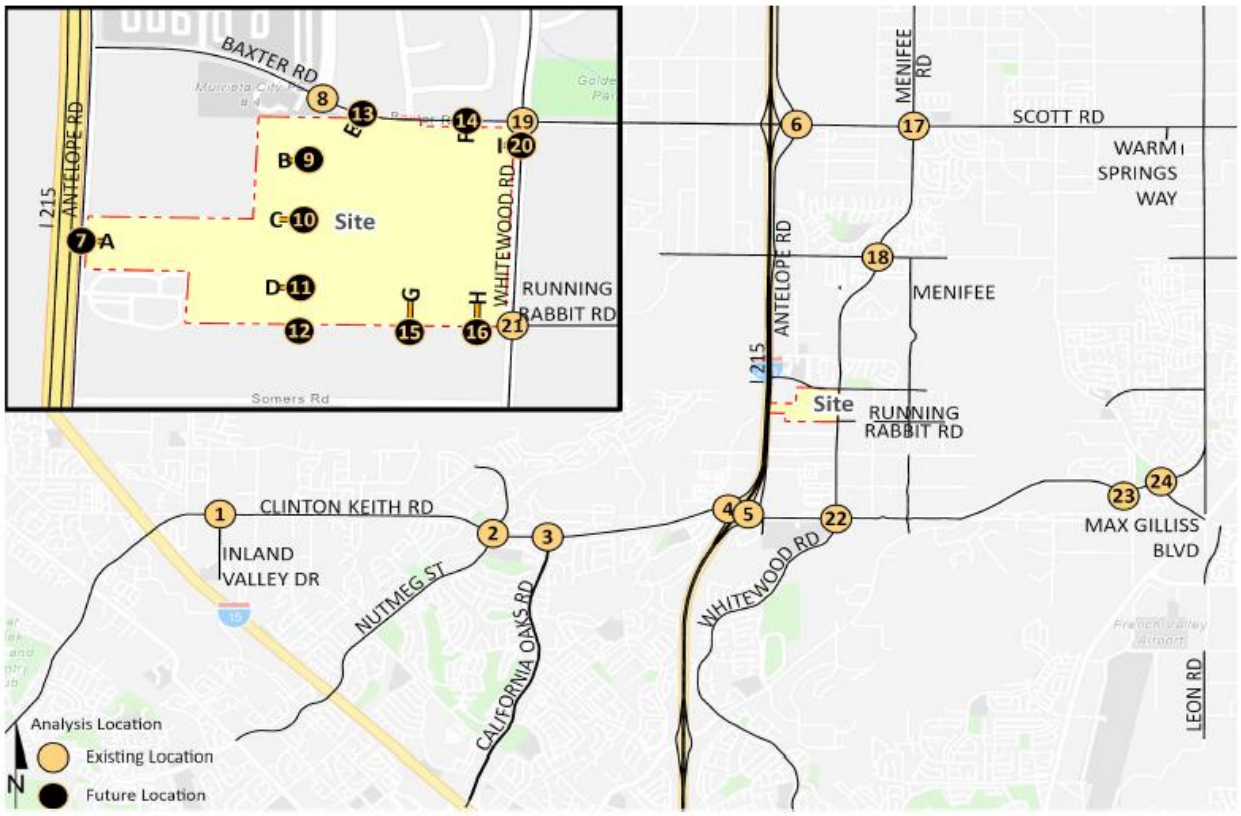
4.5 BACKGROUND TRAFFIC

Future year traffic forecasts have been based upon background (ambient) growth at 2.0% per year, compounded annually. The total ambient growth is 12.62% for 2027 traffic. The ambient growth factor is intended to approximate regional traffic growth. This ambient growth rate is added to existing traffic volumes to account for area-wide growth not reflected by cumulative development projects. Ambient growth has been added to daily and peak hour traffic volumes on surrounding roadways, in addition to traffic generated by the development of future projects that have been approved but not yet built and/or for which development applications have been filed and are under consideration by governing agencies. The traffic generated by the proposed Project is manually added to the base volume to determine Opening Year Cumulative forecasts.

The near-term traffic analysis includes the following traffic conditions, with the various traffic components:

- Opening Year Cumulative (2027) Without Project
    - Adjusted Existing 2021 volumes
    - Ambient growth traffic (12.62%)
    - Cumulative Development traffic
- Opening Year Cumulative (2027) With Project
    - Adjusted Existing 2021 volumes
    - Ambient growth traffic (12.62%)
    - Cumulative Development traffic
    - Project Traffic

EXHIBIT 4-3: PROJECT ONLY TRAFFIC VOLUMES (PAGE 1 OF 2)

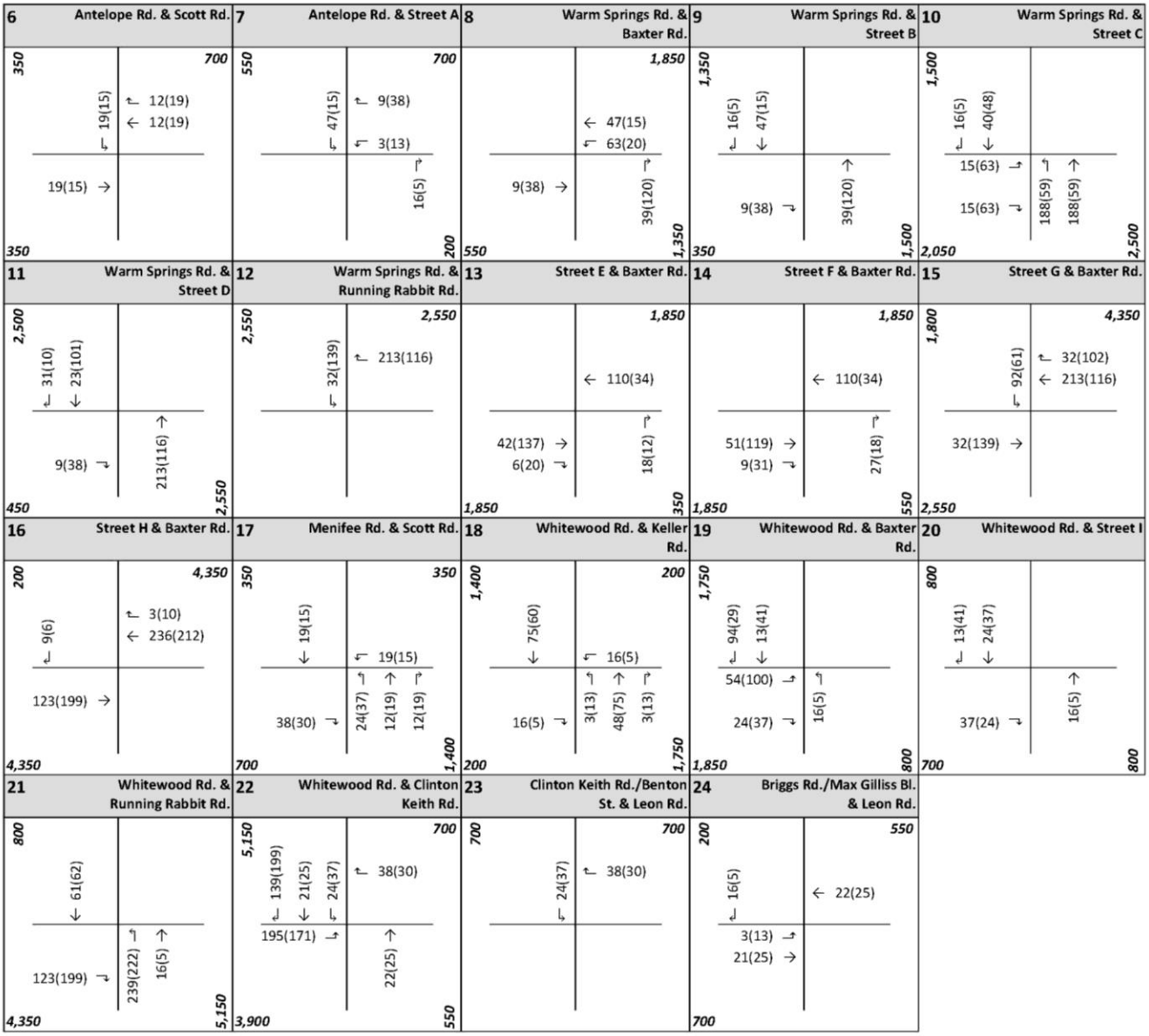


1 Inland Valley & Clinton Keith Rd.	2 Nutmeg St. & Clinton Keith Rd.	3 California Oaks Rd. & Clinton Keith Rd.	4 I-215 SB Ramps & Clinton Keith Rd.	5 I-215 NB Ramps & Clinton Keith Rd.
700	*1,050*	*1,400*	*1,250* *2,650*	*450* *3,900*
← 21(25)	← 24(37)	← 36(56)	41(40) ← 57(81)	← 33(43)
↰ 3(13)	↰ 12(19)	↰ 12(19)	← 48(75)	← 106(155)
22(25) →	38(30) →	57(45) →	75(60) →	116(101) →
16(5) ↱	19(15) ↱	19(15) ↱		79(71) ↱
550 *200*	*700* *350*	*1,050* *350*	*1,400*	*2,650* *800*

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

***Average Daily Trips***

EXHIBIT 4-3: PROJECT ONLY TRAFFIC VOLUMES (PAGE 2 OF 2)



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

Average Daily Trips

4.6 CUMULATIVE DEVELOPMENT TRAFFIC

A cumulative project list was developed for the purposes of this analysis through consultation with planning and engineering staff from the City of Murrieta. Cumulatives from the jurisdictions outside of Murrieta were obtained from other traffic analyses completed recently in the area. The cumulative projects listed are those that would generate traffic and would contribute traffic to study area intersections. Exhibit 4-4 illustrates the cumulative development location map. A summary of cumulative development projects and their proposed land uses are shown on Table 4-2. If applicable, the traffic generated by individual cumulative projects was manually added to the Opening Year Cumulative (2027) forecasts to ensure that traffic generated by the listed cumulative development projects on Table 4-2 is reflected as part of the background traffic. In an effort to conduct a conservative analysis, the cumulative projects are added in conjunction with the ambient growth identified in Section 4.5 *Background Traffic*. Cumulative ADT and peak hour intersection turning movement volumes are shown on Exhibit 4-5 for near-term traffic conditions.

4.7 NEAR-TERM CONDITIONS

The "buildup" approach has been utilized which combines existing traffic counts with a background ambient growth factor to forecast the Opening Year Cumulative (2027) traffic conditions. An ambient growth factor of 12.62% accounts for background (area-wide) traffic increases that occur over time up to the year 2027 from the year 2021 (2 percent over a 6-year period). Project traffic is added to assess Opening Year Cumulative (2027) With Project traffic conditions. Traffic volumes generated by cumulative development projects are included to assess the Opening Year Cumulative (2027) Without Project and With Project traffic conditions. The 2027 roadway networks are similar to the existing conditions roadway network with the exception of future intersections and driveways proposed to be developed by the Project.

4.8 HORIZON YEAR (2040) CONDITIONS

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

EXHIBIT 4-4: CUMULATIVE DEVELOPMENT LOCATION MAP

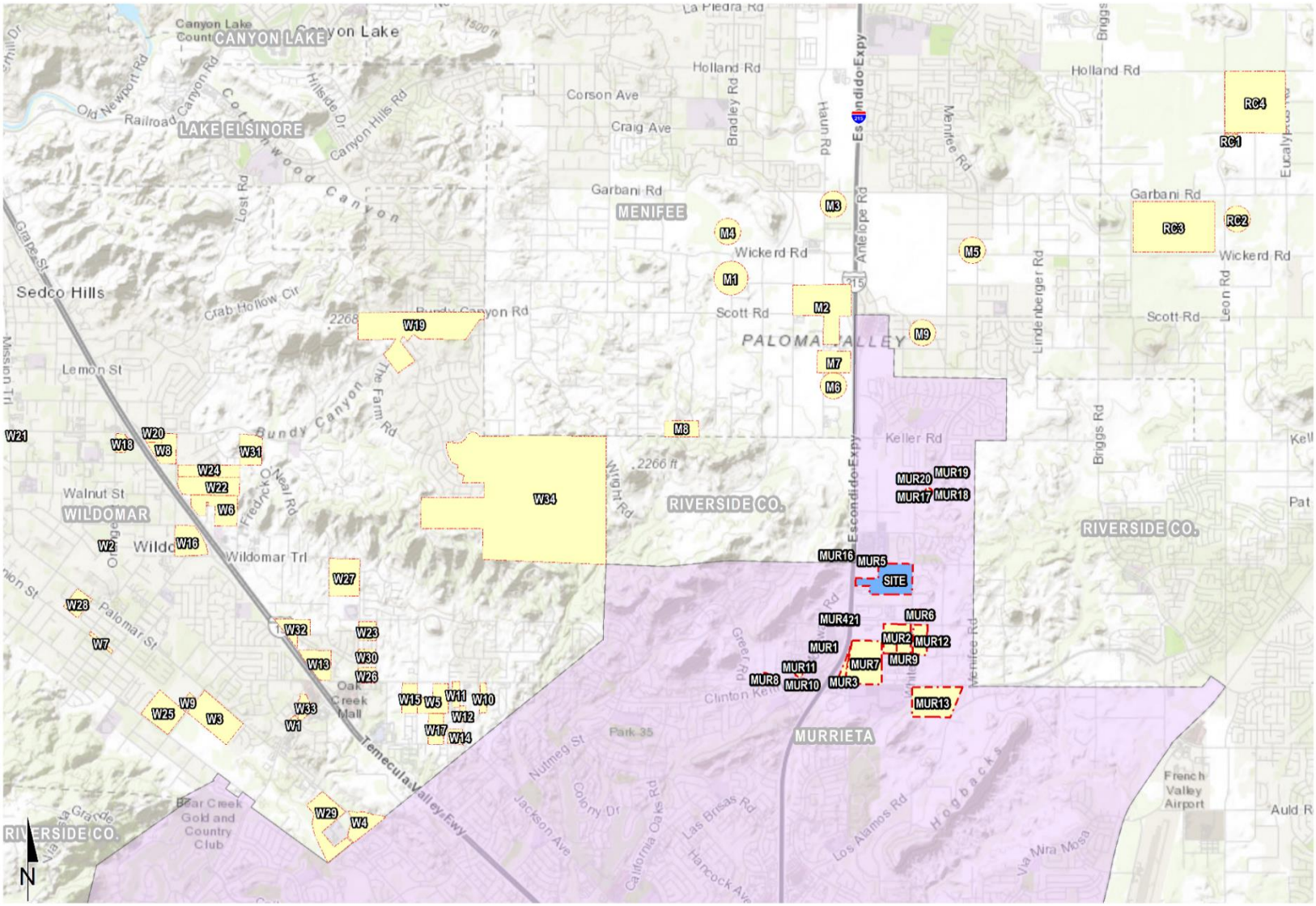
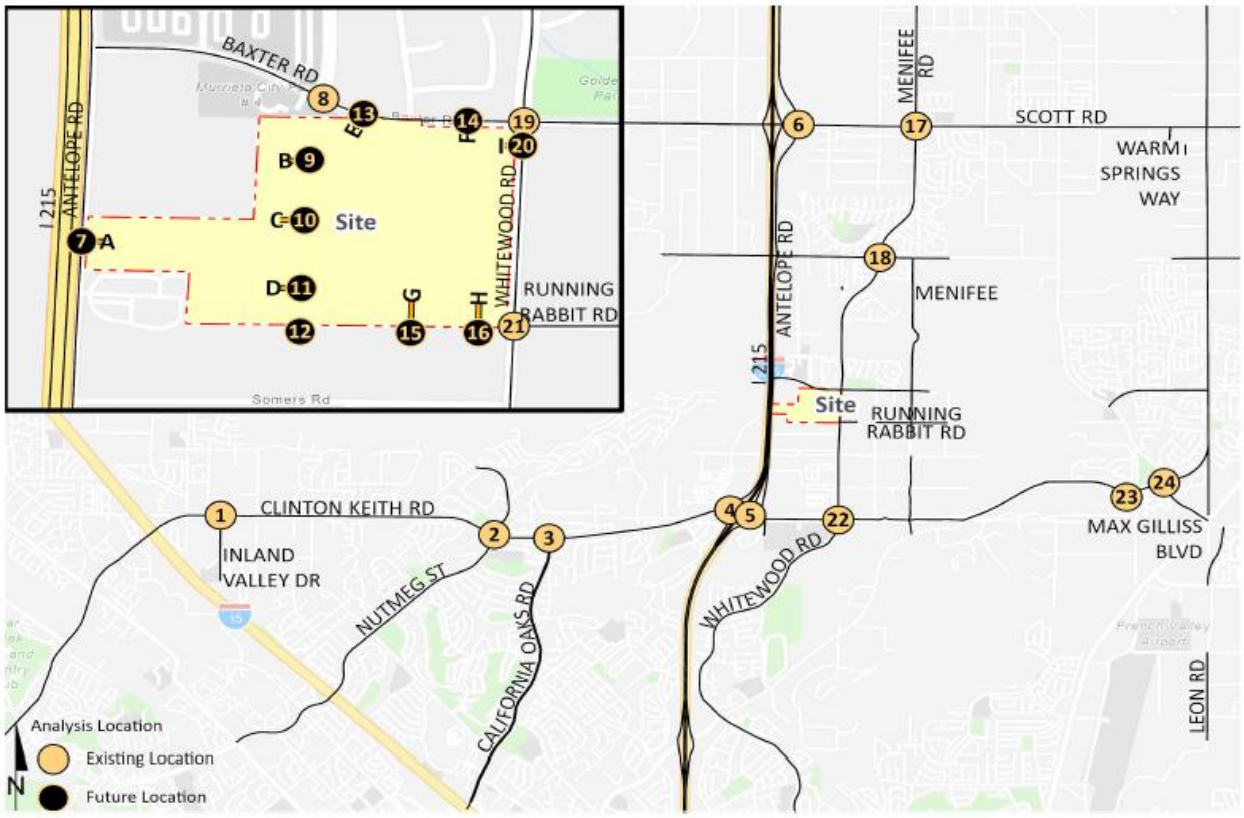
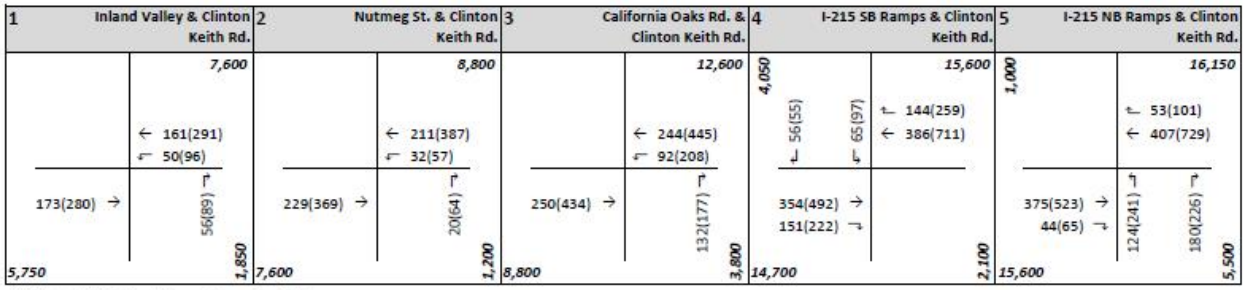


EXHIBIT 4-5: CUMULATIVE ONLY TRAFFIC VOLUMES (PAGE 1 OF 2)

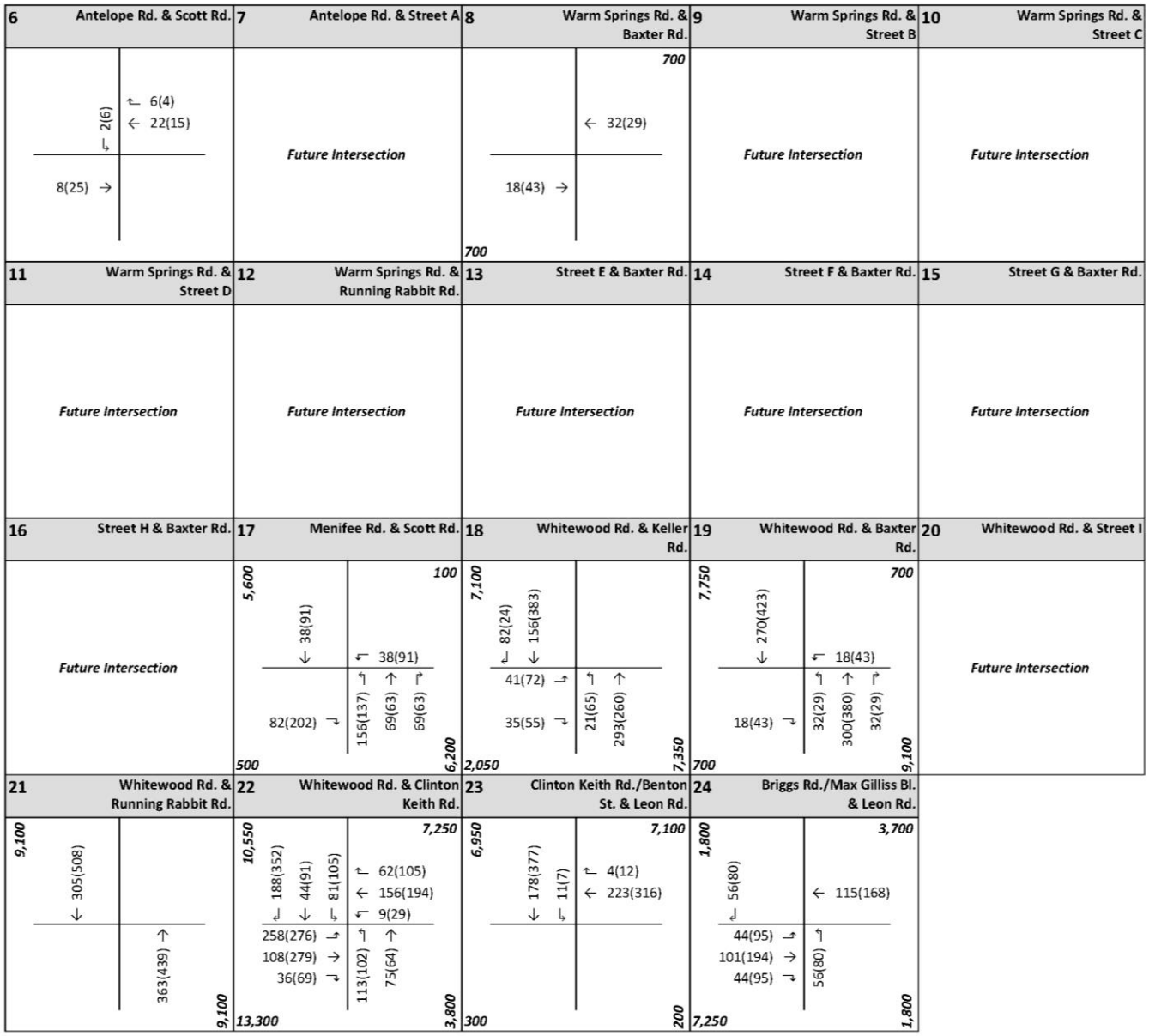




##(##) AM(PM) Peak Hour Intersection Volumes

Average Daily Trips

EXHIBIT 4-5: CUMULATIVE ONLY TRAFFIC VOLUMES (PAGE 2 OF 2)



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

Average Daily Trips

TABLE 4-2: CUMULATIVE DEVELOPMENT LAND USE SUMMARY (PAGE 1 OF 2)

#	Project Name	Land Use[1]	Quantity	Units[1]
	CITY OF MURRIETA			
MUR1	The Orchard (DPO-03-161)	Shopping Center	186.000	TSF
MUR2	Vineyard Shopping Center (DPO-2012-3260)	Shopping Center	78.489	TSF
		Hotel	91	RM
MUR3	Curci Property (DP-2018-1691)	Automobile Parts/Service Center	4.000	TSF
		Tire Store	5.000	TSF
		Shopping Center	11.650	TSF
		High Turnover (Sit-Down) Restaurant	3.000	TSF
		Fast-Food with Drive-Thru Window	5.000	TSF
		Drive-in Bank	5.000	TSF
MUR4	McElwain and Linnel (DP-2019-1846)	Hotel	120	RM
MUR5	Makena Hills (EA-2017-1315)	Medical Office	116.200	TSF
		High Turnover (Sit-Down) Restaurant	9.300	TSF
		Hotel	206	RM
MUR6	Murrieta-Whitewood Skilled Nursing Facility (DP-2015-708)	Nursing Facility	74.613	TSF
MUR7	Costco (DP-2018-1652)	Warehouse	153.362	TSF
		Gas Station/Car-Wash	32.000	FS
		Shopping Center	79.900	TSF
MUR8	Murrieta Senior Living (DP-2017-1333)	Assisted Living	97.275	TSF
MUR9	Meadowlark (DP-2018-1624)	Multi-Family Low-Rise	83	DU
MUR10	76 Gas Station/C-Store (DP-2019-1846)	Gas Station/Car-Wash	3.600	TSF
		Convenience Store	3.560	TSF
MUR11	Express Carwash and Learning Center (CUP-2020-2179)	Daycare	10.000	TSF
		Car-Wash	4.100	TSF
MUR12	Whitewood Multifamily (DP-2021-2347)	Multifamily Low Rise	324	DU
MUR13	Murrieta Apartments (DP-2021-2355)	Multifamily Low Rise	153	DU
		Multifamily Mid-Rise	330	DU
MUR14	Kaiser (MDP-2014-347, DP-2014-348, DP-2020-2155)	Medical Office	90.000	TSF
MUR15	Physicians Hospital/Loma Linda Hospital (CUP-007-	Hospital	124	Beds
MUR16	Murrieta Hills (TTM 35853)	Single Family Residential	578	DU
		Multifamily Low Rise	172	DU
		Shopping Center	346.302	TSF
MUR17	Golden Cities (VTM 28532-3/DP-2016-1253)	Single Family Residential	69	DU
MUR18	Golden Cities (VTM 28532-5/DP-2016-1253)	Single Family Residential	119	DU
MUR19	Alderwood (TTM 32718)	Single Family Residential	10	DU
MUR20	Alderwood (TTM 34445/DP-2016-1253)	Single Family Residential	13	DU
MUR21	Hotel and Conference (DP-2019-1887)	Conference Room	15.295	TSF
	CITY OF MENIFEE			
M1	TR 2014-073	Single Family Residential	30	DU
M2	Newport Menifee Retail Shopping Center	Fast-food w/ Drive-Thru	7.000	TSF
		Supermarket	45.272	TSF
		Bank w/ Drive-Thru	5.000	TSF
		Pharmacy w/ Drive-Thru	14.576	TSF
		High Turnover (Sit-Down) Restaurant	7.360	TSF
		Retail	58.883	TSF
M3	PP 18014	Mini-warehouse	191.260	TSF
M4	TR 31194	Single Family Residential	483	DU
	TR 33511	Single Family Residential	71	DU
M5	TR 32628	Single Family Residential	364	DU
	TR 28206	Single Family Residential (50% Complete	148	DU
M6	Commerce Point (PP 21452 & PP 22280)	General Light Industrial	872.350	TSF
	PP 18570	Warehousing	109.940	TSF
	PP 20021	Warehousing	4.500	TSF
M7	All Star Storage (PP 2015-156)	Storage	242.150	TSF
M8	Del Oro (Holland Road Residential)	Single Family Residential	68	DU
		Apartments	238	DU
		Senior Housing	100	DU
M9	TR 30142	Single Family Residential (113 Lots Comp	537	DU
	CITY OF WILDOMAR			
W1	Wildomar Crossings	Free Standing Discount Store	10.000	TSF
		Auto Parts Sales	7.004	TSF
		Fast-Food w/ Drive Through	2.600	TSF
		Retail	3.300	TSF
		Fast-Food w/o Drive Through	3.300	TSF
W2	Lesle Tract Map	SFDR	10	DU
W3	Richmond American	SFDR	149	DU
W4	Camelia Townhouse Project	Condo/Townhomes	163	DU

TABLE 4-2: CUMULATIVE DEVELOPMENT LAND USE SUMMARY (PAGE 2 OF 2)

#	Project Name	Land Use[1]	Quantity	Units[1]
W5	Rancon Medical & Retail Center	Retail	200.000	TSF
		Office	94.000	TSF
W6	Cornerstone Church Preschool & Admin. Building	School	170	STU
		Office	25.462	TSF
W7	Elm Street Subdivision	SFDR	14	DU
W8	Walmart Retail Project	Free-Standing Discount Superstore	193.792	TSF
W9	McVicar Residential Project	SFDR	47	DU
W10	Smith Ranch Self Storage	Self-Storage	150.000	TSF
		Office	10	TSF
W11	Life-Storage Mini Warehouse	Self-Storage	60.800	TSF
W12	Milestone RV/Boat Storage	Self-Storage	8.300	TSF
W13	Westpark Promenade Development (mixed use)	Shopping Center	118.354	TSF
		Condo/Townhomes	191	DU
W14	Villa Sienna Apartment Project	Condo/Townhomes	180	DU
W15	Grove Park Mixed Use Project	Condo/Townhomes	162	DU
		Retail	50.000	TSF
W16	Baxter Village	Shopping Center	75.000	TSF
		SFDR	67	DU
		Condo/Townhomes	204	DU
W17	Horizons/Strata Mixed Use Project	Assisted Living	86	BED
		Condo/Townhomes	138	DU
W18	Orange Bundy/Parcel Map	Retail	79.497	TSF
		Fast Food w/ Drive Through	1.500	TSF
		Gas Station w/ Market	6	VFP
W19	Oak Creek Canyon	SFDR	275	DU
W20	Bundy Canyon Plana	Shopping Center	36.990	TSF
W21	Wildomar Shooting Academy[3]	Gun Shooting Range	--	--
W22	The "Village at Monte Vista"	SFDR	80	DU
		Business Park	136.000	TSF
W23	Diversified Pacific Homes	SFDR	51	DU
W24	Pacific cove Inv.	SFDR	70	DU
W25	Beazer Homes	SFDR	108	DU
W26	Clinton Keith Village Retail Center	Shopping Center	40.000	TSF
W27	Baxter/Susan GPA/TTM	SFDR	48	DU
W28	Ione/Palomar Residential	SFDR	60	DU
W29	Rhoades Residential Project	SFDR	131	DU
W30	Nova Homes Residential	SFDR	77	DU
W31	Darling/Bundy Canyon Residential	Condo/Townhomes	140	DU
W32	Faith Bible Church	Church	45.155	TSF
W33	The Commons at Hidden Springs	Fast-Food w/ Drive Through	7.800	TSF
		Shopping Center	10.870	TSF
		Supermarket	26.500	TSF
		Pharmacy w/ Drive Through	24.700	TSF
		Coffee/Donut Shop w/ Drive Through	1.800	TSF
W34	Wildomar Meadows	Single Family Detached	2,129	DU
		Passive Park	13.50	AC
		Park (Developed; Sports Fields)	10.00	AC
COUNTY OF RIVERSIDE				
RC1	Canterwood	Single Family Residential	574	DU
		Public Park	8.2	AC
RC2	Perris Union HSD High School	High School	2800	STU
RC3	La Ventana Ranch	Single Family Housing	535	DU
		Community Park	15.0	AC
		Passive Park	2.0	AC
RC4	TR36467	SFDR	381	DU
		Multifamily Residential	92	DU

[1] DU = Dwelling Units; TSF = Thousand Square Feet; RM = Rooms

The traffic forecasts reflect the area-wide growth anticipated between Existing (2021) conditions and Horizon Year (2040) traffic conditions. In most instances the traffic model zone structure is not designed to provide accurate turning movements along arterial roadways unless refinement and reasonableness checking is performed. Therefore, the Horizon Year peak hour forecasts were refined using the model derived long range forecasts, base (validation) year model forecasts, along with existing peak hour traffic count data collected at each analysis location. The City of Murrieta traffic model has a base (validation) year of 2016 and a horizon (future forecast) year of 2040.

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

The future Horizon Year (2040) Without Project peak hour turning movements were then reviewed by Urban Crossroads, Inc. for reasonableness, and in some cases, were adjusted to achieve flow conservation, reasonable growth, and reasonable diversion between parallel routes. Flow conservation checks ensure that traffic flow between two closely spaced intersections, such as two adjacent driveway locations, is verified in order to make certain that vehicles leaving one intersection are entering the adjacent intersection and that there is no unexplained loss of vehicles. The result of this traffic forecasting procedure is a series of traffic volumes which are suitable for traffic operations analysis. Post-processing worksheets for Horizon Year (2040) Without Project traffic conditions are provided in Appendix 4.1.

5 OPENING YEAR CUMULATIVE (2027) TRAFFIC CONDITIONS

This section discusses the traffic forecasts for Opening Year Cumulative traffic conditions and the resulting intersection operations, roadway segment, queuing, and traffic signal warrant analyses.

5.1 ROADWAY IMPROVEMENTS

The lane configurations and traffic controls assumed to be in place for OYC (2027) With Project conditions are consistent with those shown previously on Exhibit 3-1, with the exception of the following:

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

5.2 TRAFFIC VOLUME FORECASTS

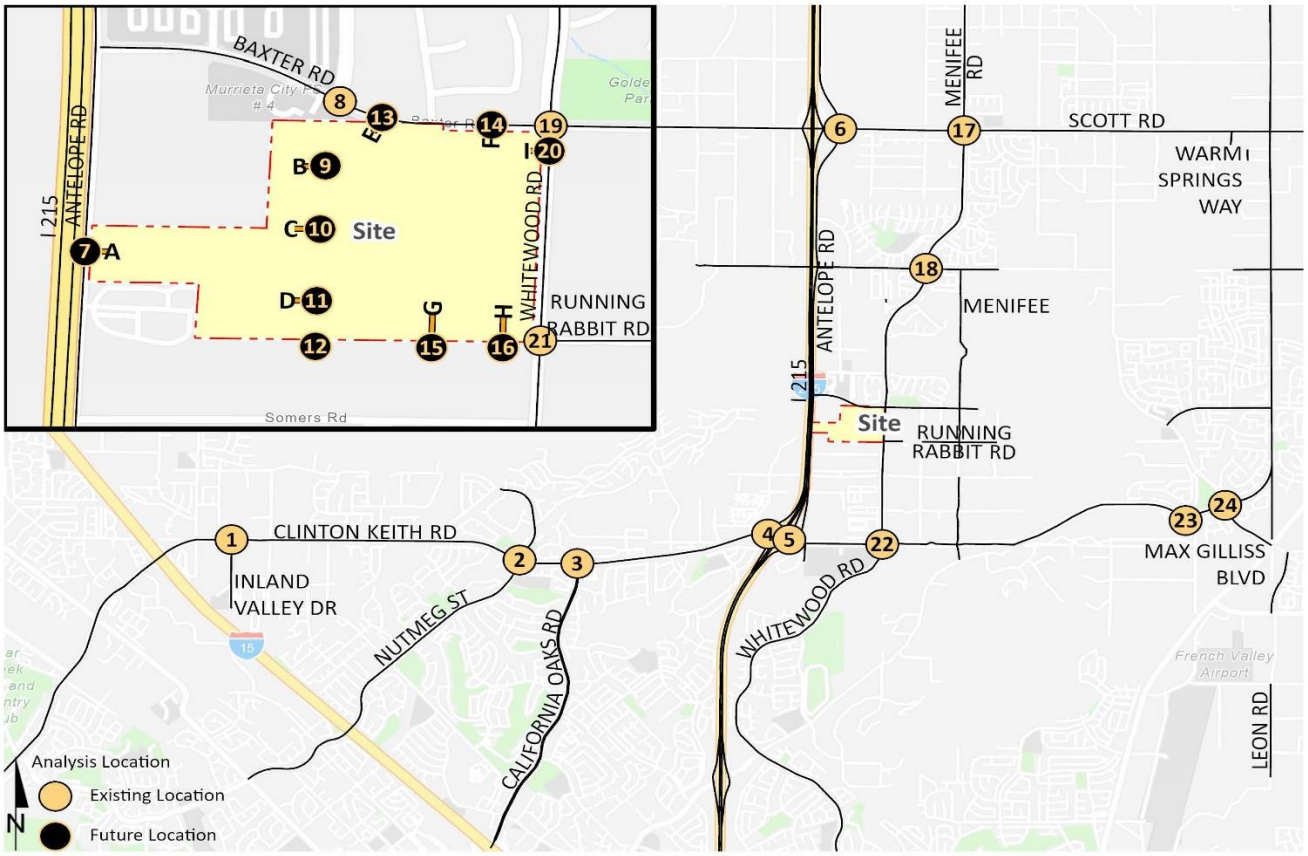
5.2.1 OPENING YEAR CUMULATIVE (2027) WITHOUT PROJECT

This scenario includes Existing traffic volumes plus an ambient growth factor of 12.62% and the addition of cumulative development traffic. The weekday ADT, weekday AM, and PM peak hour volumes which can be expected for Opening Year Cumulative (2027) Without Project traffic conditions are shown on Exhibit 5-1.

5.2.2 OPENING YEAR CUMULATIVE (2027) WITH PROJECT

This scenario includes Existing traffic volumes plus an ambient growth factor of 12.62%, the addition of cumulative development traffic, and the addition of Project traffic. The weekday ADT, weekday AM, and PM peak hour volumes which can be expected for Opening Year Cumulative (2027) With Project traffic conditions are shown on Exhibit 5-2.

EXHIBIT 5-1: OPENING YEAR CUMULATIVE (2027) WITHOUT PROJECT TRAFFIC VOLUMES (PAGE 1 OF 2)

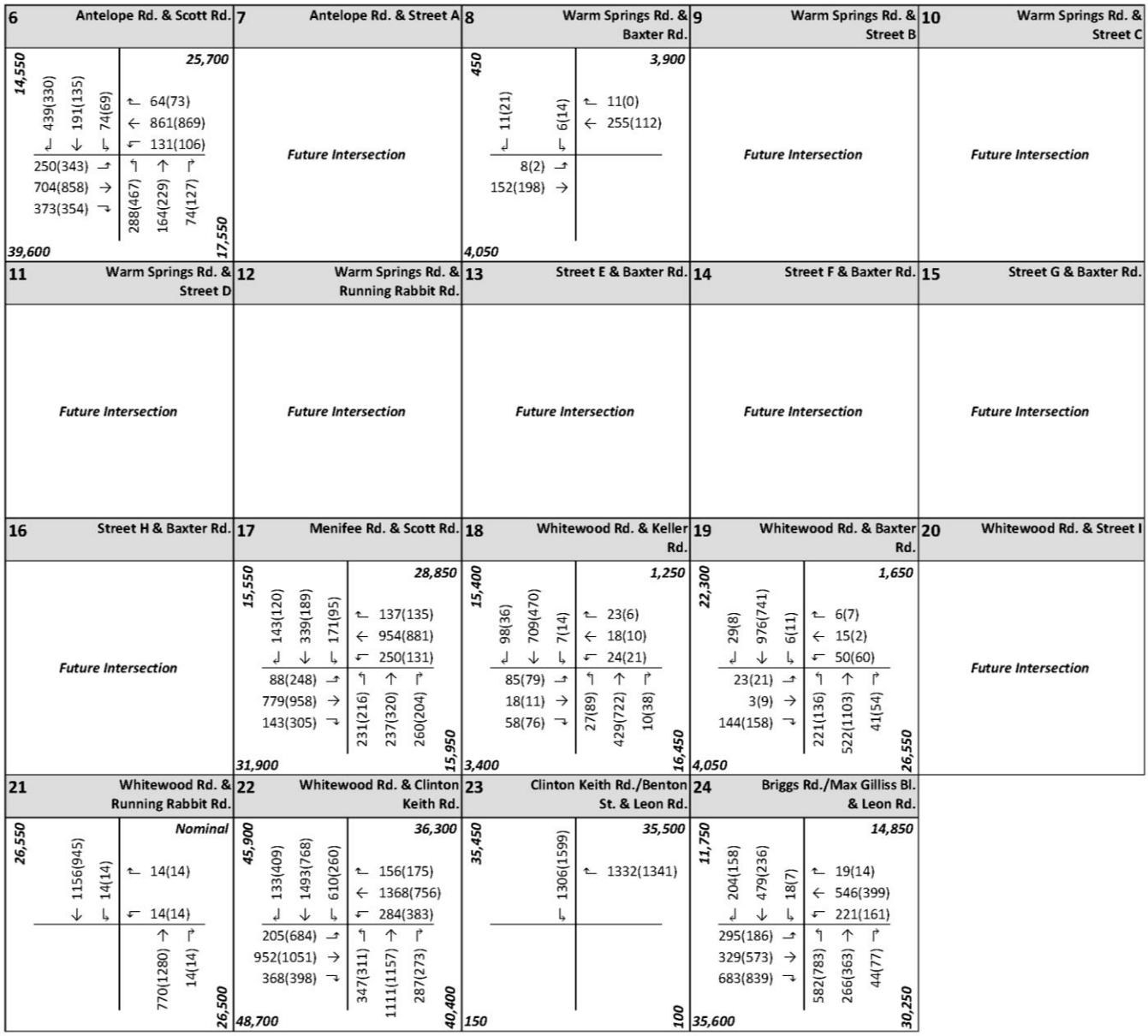


1 Inland Valley & Clinton Keith Rd.	2 Nutmeg St. & Clinton Keith Rd.	3 California Oaks Rd. & Clinton Keith Rd.	4 I-215 SB Ramps & Clinton Keith Rd.	5 I-215 NB Ramps & Clinton Keith Rd.
29,600	***6,300*** / ***43,600***	***58,300***	***22,400*** / ***59,450***	***2,350*** / ***52,800***
← 1104(1054)	61(33) ↓ 69(62) ↘ 132(148)	← 1553(1504)	510(765) ↓ 5(1) ↘ 401(426)	← 1538(1470)
↰ 148(93)	↰ 87(123) ← 1305(1133) ↰ 415(470)	↰ 686(793)	← 1128(1798) ↱ 803(661)	↱ 404(201)
↰ ↱	34(56) ⮡ ↰ ↑ ↱	↰ ↱		↰ ↱
698(1149) → 443(277) ↴	969(1304) → 143(102) ↴	1434(1670) → 157(184) ↴	1955(2069) → 715(692) ↴	1431(1692) → 925(803) ↴
304(434) 71(167) ***11,800***	132(89) 91(87) 366(430) ***15,200***	133(176) 470(868) ***24,500***	***8,250***	393(989) 954(1042) ***34,500***
35,400	***32,750***	***42,700***	***64,100***	***59,450***

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

***Average Daily Trips***

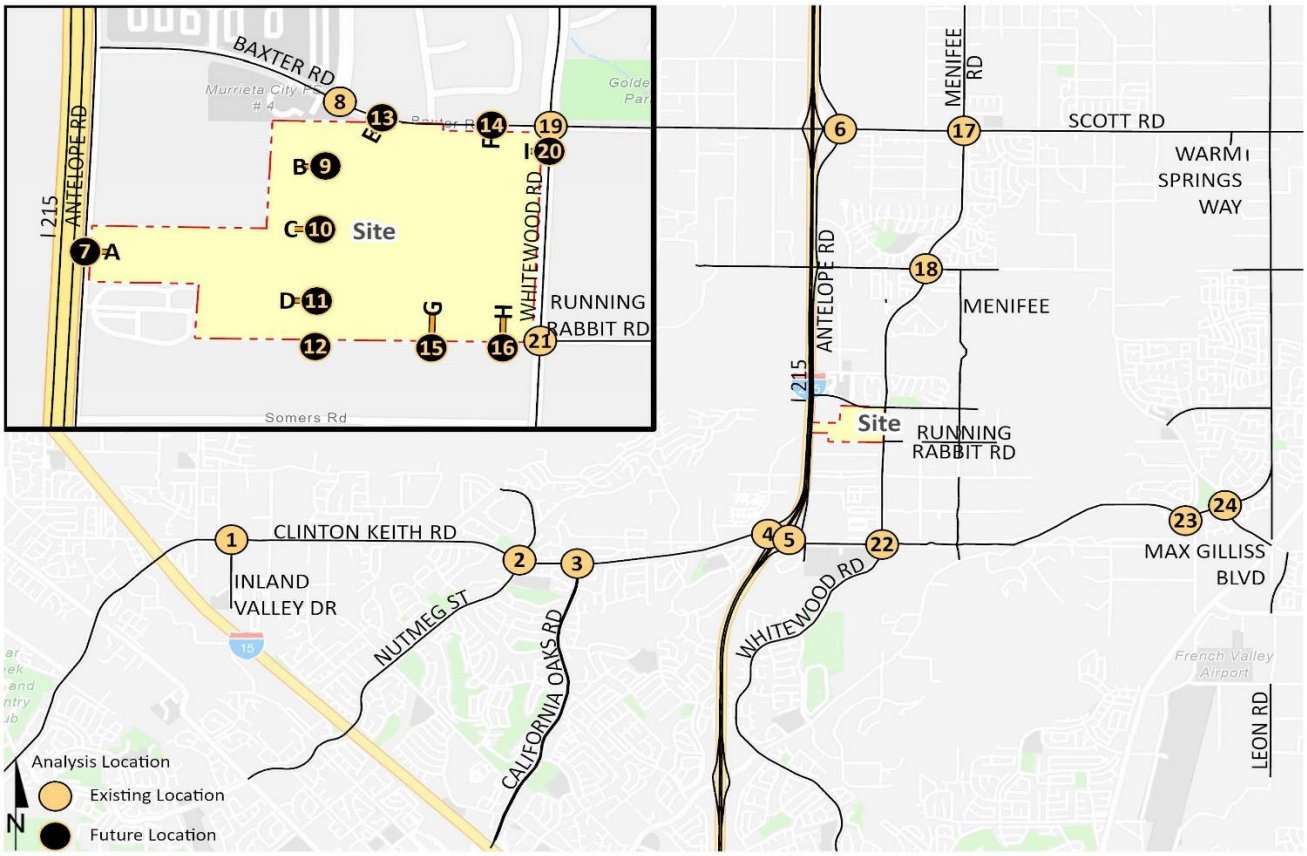
EXHIBIT 5-1: OPENING YEAR CUMULATIVE (2027) WITHOUT PROJECT TRAFFIC VOLUMES (PAGE 2 OF 2)



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

Average Daily Trips

EXHIBIT 5-2: OPENING YEAR CUMULATIVE (2027) WITH PROJECT TRAFFIC VOLUMES (PAGE 1 OF 2)

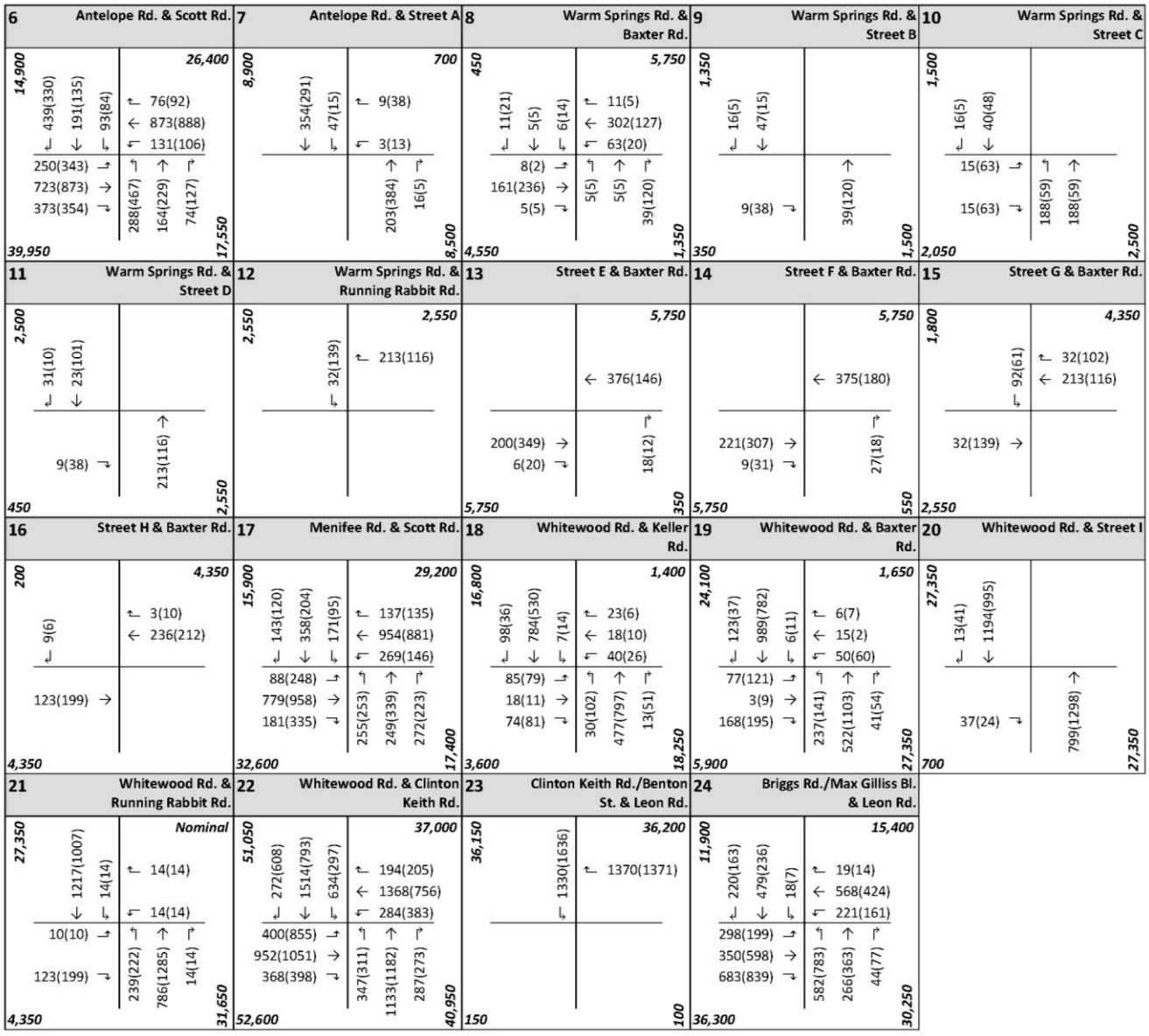


1 Inland Valley & Clinton Keith Rd.	2 Nutmeg St. & Clinton Keith Rd.	3 California Oaks Rd. & Clinton Keith Rd.	4 I-215 SB Ramps & Clinton Keith Rd.	5 I-215 NB Ramps & Clinton Keith Rd.
30,300	***6,300*** ***44,700***	***59,750***	***23,650*** ***62,100***	***2,800*** ***56,750***
← 1125(1079) ↰ 151(106)	61(33) 69(62) 132(148) ↲ ↓ ↳ ↰ ← 87(123) ↰ ← 1329(1170)	← 1589(1560) ↰ 698(812)	510(765) 5(1) 442(466) ↲ ↓ ↳ ↰ ← 860(742) ← 1176(1873)	↰ ← 437(244) ← 1644(1625)
↰ ↱	34(56) ⮡ ↰ ↑ ↱			↰ ↱
720(1174) → 304(434) 443(277) ↴ 87(172)	1007(1334) → 132(89) 143(102) ↴ 91(87) 385(445)	1491(1715) → 133(176) 157(184) ↴ 489(883)	2030(2129) → 715(692) ↴	1547(1793) → 393(989) 925(803) ↴ 1033(1113)
35,950 ***11,950***	***33,450*** ***15,550***	***43,750*** ***24,850***	***65,500*** ***8,250***	***62,100*** ***35,300***

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

Average Daily Trips

EXHIBIT 5-2: OPENING YEAR CUMULATIVE (2027) WITH PROJECT TRAFFIC VOLUMES (PAGE 2 OF 2)



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

Average Daily Trips

5.3 INTERSECTION OPERATIONS ANALYSIS

LOS calculations were conducted for the study intersections to evaluate their operations under Opening Year Cumulative (2027) traffic conditions with roadway and intersection geometrics consistent with Section 5.1 *Roadway Improvements*. The intersection analysis results are summarized on Table 5-1 for Opening Year Cumulative (2027) Without Project traffic conditions, which indicates that the following study area intersections are anticipated to operate at an unacceptable LOS during one or more peak hours:

- California Oaks Rd. & Clinton Keith Rd. (#3) – LOS E AM peak hour; LOS F PM peak hour (also deficient under Existing conditions)
- Menifee Rd. & Scott Rd. (#17) – LOS F AM and PM peak hours
- Whitewood Rd. & Clinton Keith Rd. (#22) – LOS F AM and PM peak hours (also deficient under Existing conditions)

With the addition of Project traffic, there are no additional study area intersections anticipated to operate at an unacceptable LOS during the peak hours under Opening Year Cumulative (2027) With Project traffic conditions. The intersection operations analysis worksheets for Opening Year Cumulative (2027) Without Project and With Project traffic conditions are included in Appendices 5.1 and 5.2, respectively.

TABLE 5-1: INTERSECTION ANALYSIS FOR OPENING YEAR CUMULATIVE (2027) CONDITIONS

			2027 Without Project				2027 With Project						
			Delay[2] (secs.)		Level of Service		Delay[2] (secs.)		Level of Service		Change in Delay		Project-Related
#	Intersection	Traffic Control[1]	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	Deficiency?[3]
1	Inland Valley & Clinton Keith Rd.	TS	20.0	30.3	B	C	21.2	33.4	C	C	1.2	3.1	No
2	Nutmeg St. & Clinton Keith Rd.	TS	30.3	48.5	C	D	33.9	51.8	C	D	3.6	3.3	No
3	California Oaks Rd. & Clinton Keith Rd.	TS	**73.9**	**166.2**	**E**	**F**	**83.9**	**175.9**	**F**	**F**	**10.0**	**9.7**	**Yes**
4	I-215 SB Ramps & Clinton Keith Rd.	TS	16.2	18.0	B	B	18.4	19.4	B	B	2.2	1.4	No
5	I-215 NB Ramps & Clinton Keith Rd.	TS	34.1	43.2	C	D	40.3	49.2	D	D	6.2	6.0	No
6	Antelope Rd. & Scott Rd.	TS	28.1	27.4	C	C	28.8	28.2	C	C	0.7	0.8	No
7	Antelope Rd. & Street A	--/**CSS**	Future Intersection				10.3	11.8	B	B	--	--	No
8	Warm Springs Rd. & Baxter Rd.	TS	4.8	4.6	A	A	6.4	7.5	A	A	1.6	2.9	No
9	Warm Springs Rd. & Street B	--/**CSS**	Future Intersection				8.5	8.5	A	A	--	--	No
10	Warm Springs Rd. & Street C	--/**CSS**	Future Intersection				11.0	10.0	B	B	--	--	No
11	Warm Springs Rd. & Street D	--/**CSS**	Future Intersection				8.5	8.8	A	A	--	--	No
12	Warm Springs Rd. & Running Rabbit Rd.	--/**CSS**	Future Intersection				9.3	9.5	A	A	--	--	No
13	Street E & Baxter Rd.	--/**CSS**	Future Intersection				9.0	9.5	A	A	--	--	No
14	Street F & Baxter Rd.	--/**CSS**	Future Intersection				9.1	9.5	A	A	--	--	No
15	Street G & Baxter Rd.	--/**CSS**	Future Intersection				10.9	11.0	B	B	--	--	No
16	Street H & Baxter Rd.	--/**CSS**	Future Intersection				9.7	9.5	A	A	--	--	No
17	Menifee Rd. & Scott Rd.	TS	**87.9**	**90.1**	**F**	**F**	**101.0**	**107.6**	**F**	**F**	**13.1**	**17.5**	**Yes**
18	Whitewood Rd. & Keller Rd.	TS	17.7	19.3	B	B	18.4	19.9	B	B	0.7	0.6	No
19	Whitewood Rd. & Baxter Rd.	TS	24.8	21.0	C	C	30.6	23.3	C	C	5.8	2.3	No
20	Whitewood Rd. & Street I	--/**CSS**	Future Intersection				14.8	13.1	B	B	--	--	No
21	Whitewood Rd. & Running Rabbit Rd.	CSS	15.2	21.2	C	C	26.6	32.3	D	D	11.4	11.1	No
22	Whitewood Rd. & Clinton Keith Rd.	TS	**248.1**	**166.4**	**F**	**F**	**286.1**	**218.3**	**F**	**F**	**38.0**	**51.9**	**Yes**
23	Clinton Keith Rd./Benton St. & Leon Rd.		Future Intersection				Future Intersection				--	--	No
24	Briggs Rd./Max Gilliss Bl. & Leon Rd.	TS	38.9	31.6	D	C	39.7	32.2	D	C	--	--	No

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

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

[3] Per the City of Murrieta traffic study guidelines, increase in delay is calculated for intersections to determine Project-related deficiencies.

5.4 ROADWAY SEGMENT CAPACITY ANALYSIS

The City of Murrieta Traffic Study Guidelines provide roadway volume capacity values. These roadway segment capacities are approximate figures only and are used at the General Plan level to assist in determining the roadway functional classification (number of through lanes) needed to meet traffic demand. Table 5-2 provides a summary of the Opening Year Cumulative (2027) Without Project conditions roadway segment capacity analysis based on the City of Murrieta Roadway Capacity Thresholds. As shown on Table 5-2, all study area roadway segments are anticipated to operate at an acceptable LOS.

TABLE 5-2: ROADWAY SEGMENT ANALYSIS FOR OPENING YEAR CUMULATIVE (2027) CONDITIONS

#	Roadway	Segment Limits	GP Classification	Roadway Section	LOS E Capacity[1]	2027 NP	V/C[2]	LOS[3]	2027 WP	V/C[2]	LOS[3]
1	Baxter Rd.	West of Whitewood Rd.	Secondary	4D	25,900	4,036	0.16	A	5,895	0.23	A
2	Whitewood Rd.	South of Baxter Rd.	Arterial	4D	34,100	26,563	0.78	C	27,364	0.80	C
3	Warm Springs Rd.	Baxter Rd. to Running Rabbit Rd.	Arterial	4D	34,100	Future Roadway			2,565	0.08	A
4	Running Rabbit Rd.	Warm Springs Rd. to Whitewood Rd.	Local	2D	13,000	Future Roadway			2,565	0.20	A

[1] These maximum roadway capacities have been extracted from the following source: City of Murrieta General Plan 2035 Update (Table 4.2-2)
[2] V/C = Volume to Capacity Ratio
[3] LOS = Level of Service

5.5 OFF-RAMP QUEUING ANALYSIS

Off-ramp queuing analysis findings for Opening Year Cumulative (2027) Without Project are presented on Table 5-3. As shown on Table 5-3, no off-ramp movements are anticipated to experience queuing issues during the weekday AM or weekday PM peak 95th percentile traffic flows under Opening Year Cumulative (2027) Without Project and With Project traffic conditions. Worksheets for Opening Year Cumulative (2027) Without Project and With Project traffic conditions queuing analysis are provided in Appendices 5.3 and 5.4, respectively.

TABLE 5-3: PEAK HOUR FREEWAY OFF-RAMP QUEUING SUMMARY FOR OPENING YEAR CUMULATIVE (2027) CONDITIONS

#	Intersection	Movement	Available Stacking Distance (Feet)	2027 Without Project 95th Percentile Queue (Feet) AM Peak Hour	2027 Without Project 95th Percentile Queue (Feet) PM Peak Hour	2027 Without Project Acceptable?[1] AM	2027 Without Project Acceptable?[1] PM	2027 With Project 95th Percentile Queue (Feet) AM Peak Hour	2027 With Project 95th Percentile Queue (Feet) PM Peak Hour	2027 With Project Acceptable?[1] AM	2027 With Project Acceptable?[1] PM
4	I-215 SB Ramps & Clinton Keith Rd.	SBL/T	960	426 [2]	448 [2]	Yes	Yes	495 [2]	513 [2]	Yes	Yes
		SBR	1,185	201	422 [2]	Yes	Yes	207	422 [2]	Yes	Yes
5	I-215 NB Ramps & Clinton Keith Rd.	NBL/R	960	831 [2]	1,237 [2]	Yes	Yes[3]	900 [2]	1,240 [2]	Yes	Yes[3]
		NBR	1,525	849 [2]	1,150 [2]	Yes	Yes	930 [2]	1,250 [2]	Yes	Yes

[1] Stacking Distance is acceptable if the required stacking distance is less than or equal to the stacking distance provided. An additional 15 feet of stacking which is assumed to be provided in the transition for turn pockets is reflected in the stacking distance shown on this table, where applicable.
[2] 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles
[3] Although 95th percentile queue is anticipated to exceed the available storage for the turn lane, the adjacent through lane has sufficient storage to accommodate any spillover without spilling back and affecting the I-215 Freeway mainline.

5.6 TRAFFIC SIGNAL WARRANTS ANALYSIS

Traffic signal warrants have been performed (based on CA MUTCD) for Opening Year Cumulative (2027) traffic conditions based on peak hour intersection turning movements volumes or planning level (ADT) volumes. There are no unsignalized study area intersections that are anticipated to meet a traffic signal warrant under Opening Year Cumulative (2027) Without Project and With Project traffic conditions (see Appendices 5.5 and 5.6).

It should be noted at the intersection of Whitewood Road & Running Rabbit Road, the right turn volumes along the minor street have been reduced from the total minor street volumes since the conflicting movements (left and through) are relatively low in comparison to the total volume.

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

5.7 PROJECT DEFICIENCIES AND RECOMMENDED IMPROVEMENTS

5.7.1 RECOMMENDED IMPROVEMENTS TO ADDRESS DEFICIENCIES AT INTERSECTIONS

The effectiveness of the recommended improvement strategies to address Opening Year Cumulative (2027) traffic deficiencies are presented on Table 5-4. As shown on Table 5-1, the addition of Project traffic is anticipated to result in an increase to the delay of more than 5.0 seconds to each of the intersections identified in Table 5-4. Worksheets for Opening Year Cumulative (2027) With Project conditions, with improvements, HCM calculation worksheets are provided in Appendix 5.6.

TABLE 5-4: INTERSECTION ANALYSIS FOR OPENING YEAR CUMULATIVE (2027) CONDITIONS WITH IMPROVEMENTS

			Intersection Approach Lanes[1]												Delay[2] (secs.)		Level of Service	
		Traffic	Northbound			Southbound			Eastbound			Westbound						
#	Intersection	Control[3]	L	T	R	L	T	R	L	T	R	L	T	R	AM	PM	AM	PM
3	California Oaks Rd. & Clinton Keith Rd.																	
	- Without Improvements	TS	2	0	1	0	0	0	0	2	1	1	2	0	**83.9**	**175.9**	**F**	**F**
	- With Improvements	TS	**1**	0	**2>**	0	0	0	0	**3**	**0**	1	**3**	0	44.4	54.8	D	D
17	Menifee Rd. & Scott Rd.																	
	- Without Improvements	TS	1	1	1	1	1	0	1	2	0	1	2	0	**101.0**	**107.6**	**F**	**F**
	- With Improvements	TS	1	**2**	**1>**	1	**2**	0	1	**3**	0	1	**3**	0	52.0	39.1	D	D
22	Whitewood Rd. & Clinton Keith Rd.																	
	- Without Improvements	TS	1	2	0	1	2	0	2	2	1	2	3	1	**286.1**	**218.3**	**F**	**F**
	- With Improvements	TS	**2**	**2**	**1**	**2**	2	0	2	**3**	1	2	3	1	**65.3**	**56.4**	**E**	**E**

[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

5.7.2 RECOMMENDED IMPROVEMENTS TO ADDRESS DEFICIENCIES ON ROADWAY SEGMENTS

The study area roadway segments are anticipated to operate at an acceptable LOS under Opening Year Cumulative (2027) Without Project and With Project traffic conditions. As such, study area roadway segment improvements have not been identified.

5.7.3 RECOMMENDED IMPROVEMENTS TO ADDRESS DEFICIENCIES FOR QUEUES

No LOS or queuing deficiencies have been identified at the I-215 Ramps & Clinton Keith Road interchange for Opening Year Cumulative (2027) Without and With Project traffic conditions. As such, improvements have not been identified for the interchange.

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6 HORIZON YEAR (2040) TRAFFIC CONDITIONS

This section discusses the traffic forecasts for Horizon Year traffic conditions and the resulting intersection operations, roadway segment, queuing, and traffic signal warrant analyses.

6.1 ROADWAY IMPROVEMENTS

The lane configurations and traffic controls assumed to be in place for Horizon Year (2040) conditions are consistent with those shown previously on Exhibit 3-1, with the exception of the following:

- Project driveways and those facilities assumed to be constructed by the Project to provide site access are also assumed to be in place for Horizon Year conditions only (e.g., intersection and roadway improvements along the Project's frontage and driveways).
- Driveways and those facilities assumed to be constructed by cumulative developments to provide site access are also assumed to be in place for Horizon Year conditions only (e.g., intersection and roadway improvements along the cumulative development's frontages and driveways).
- The future extension of Clinton Keith Road to Winchester Road (SR-79) is assumed to be completed.
- Other parallel facilities, that although not evaluated for the purposes of this analysis, are anticipated to be in place for Horizon Year traffic conditions and would affect the travel patterns within the study area.

6.2 TRAFFIC VOLUME FORECASTS

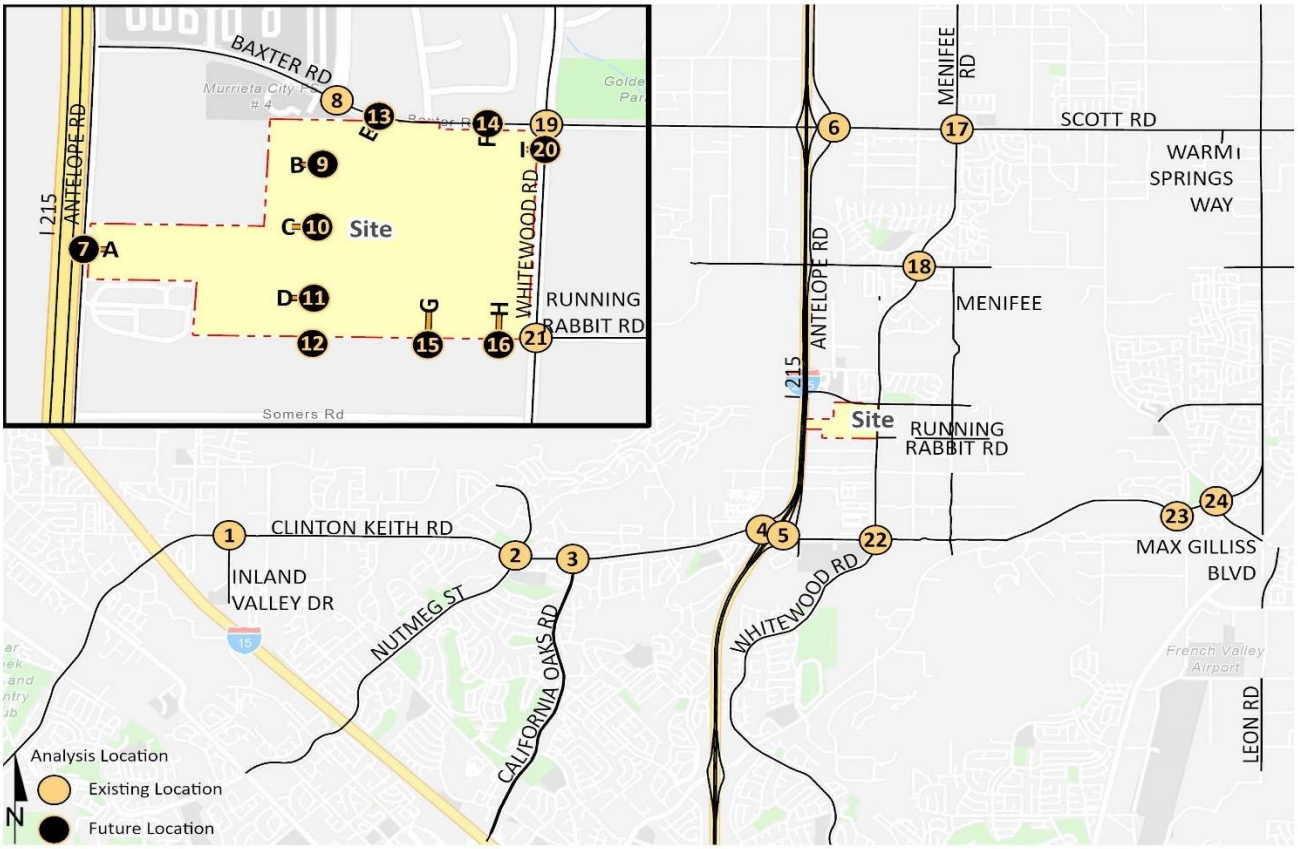
6.2.1 HORIZON YEAR (2040) WITHOUT PROJECT TRAFFIC VOLUME FORECASTS

This scenario includes the refined post-process volumes obtained from the City of Murrieta's traffic model (see Section 4.8 *Horizon Year (2040) Volume Development* of this TS for a detailed discussion on the post-processing methodology). The weekday ADT and weekday AM and PM peak hour volumes which can be expected for Horizon Year (2040) Without Project traffic conditions are shown on Exhibit 6-1.

6.2.2 HORIZON YEAR (2040) WITH PROJECT TRAFFIC VOLUME FORECASTS

This scenario includes the refined post-process volumes obtained from the City of Murrieta traffic model, plus the traffic generated by the proposed Project (Project Buildout). The weekday ADT and weekday AM and PM peak hour volumes which can be expected for Horizon Year (2040) With Project traffic conditions are shown on Exhibit 6-2.

EXHIBIT 6-1: HORIZON YEAR (2040) WITHOUT PROJECT TRAFFIC VOLUMES (PAGE 1 OF 2)

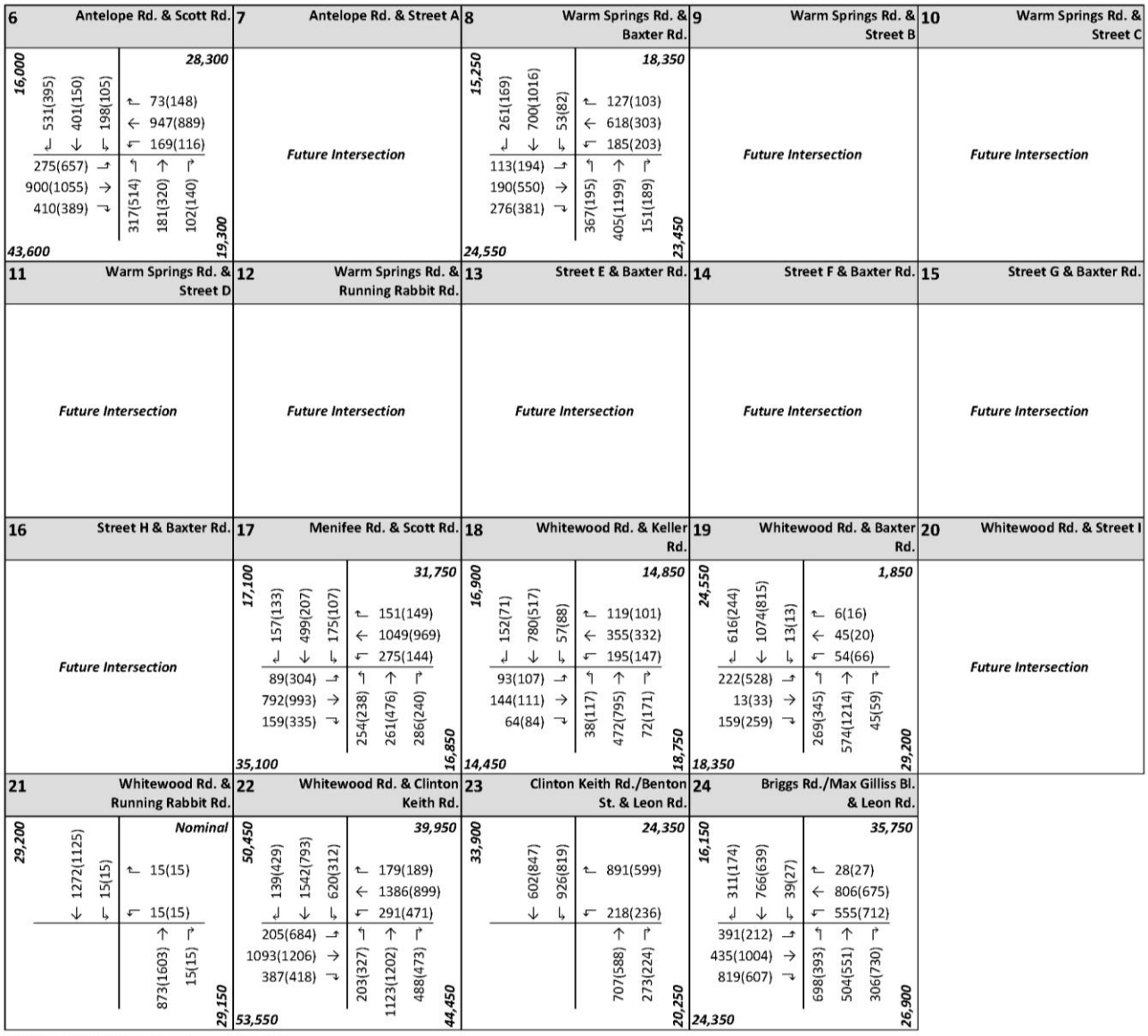


1 Inland Valley & Clinton Keith Rd.	2 Nutmeg St. & Clinton Keith Rd.	3 California Oaks Rd. & Clinton Keith Rd.	4 I-215 SB Ramps & Clinton Keith Rd.	5 I-215 NB Ramps & Clinton Keith Rd.
55,000	***12,350*** ***55,300***	***64,050***	***24,650*** ***76,350***	***2,600*** ***59,200***
← 1870(2050)	63(36) 76(78) 190(162)	← 1555(1793)	561(842) 5(1) 441(468)	← 883(727) ← 444(222)
↰ 162(102)	↲ ↓ ↳	↰ 754(1064)	↲ ↓ ↳ ← 1280(2067)	← 1686(1701)
↰ ↱	34(64) → ↰ ↑ ↱	↰ ↱		↰ ↱
1479(2475) →	1141(1417) →	1868(1893) →	2259(2225) →	1635(1767) →
626(453) ↲ 334(470) 78(184) ***12,950***	157(163) ↲ 154(132) 111(105) 579(536) ***23,950***	238(193) ↲ 235(193) 612(985) ***28,950***	856(799) ↲ ***8,950***	1018(883) ↲ 461(1099) 1027(1146) ***37,950***
65,150	***36,000***	***54,550***	***70,500***	***60,950***

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

Average Daily Trips

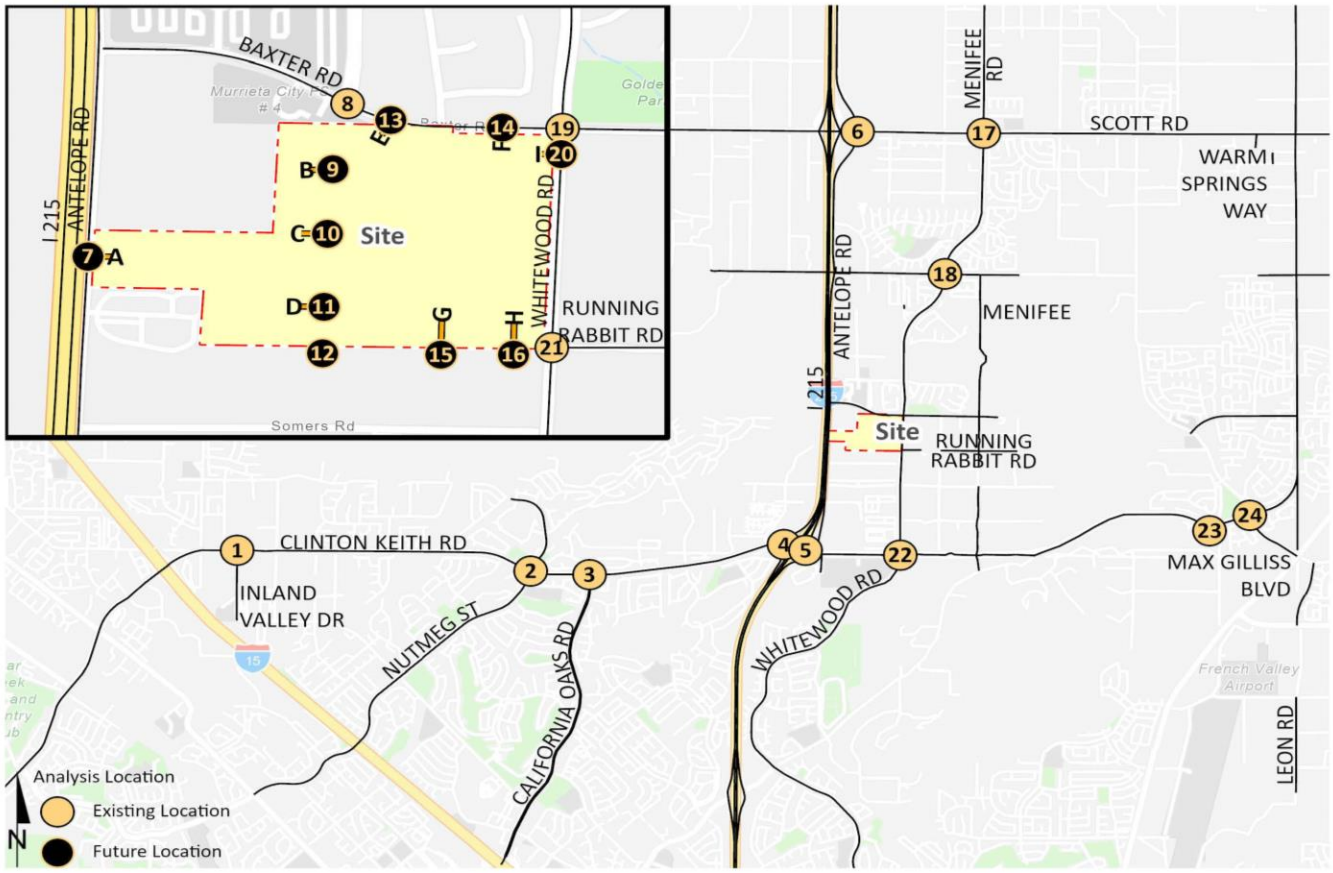
EXHIBIT 6-1: HORIZON YEAR (2040) WITHOUT PROJECT TRAFFIC VOLUMES (PAGE 2 OF 2)



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

Average Daily Trips

EXHIBIT 6-2: HORIZON YEAR (2040) WITH PROJECT TRAFFIC VOLUMES (PAGE 1 OF 2)



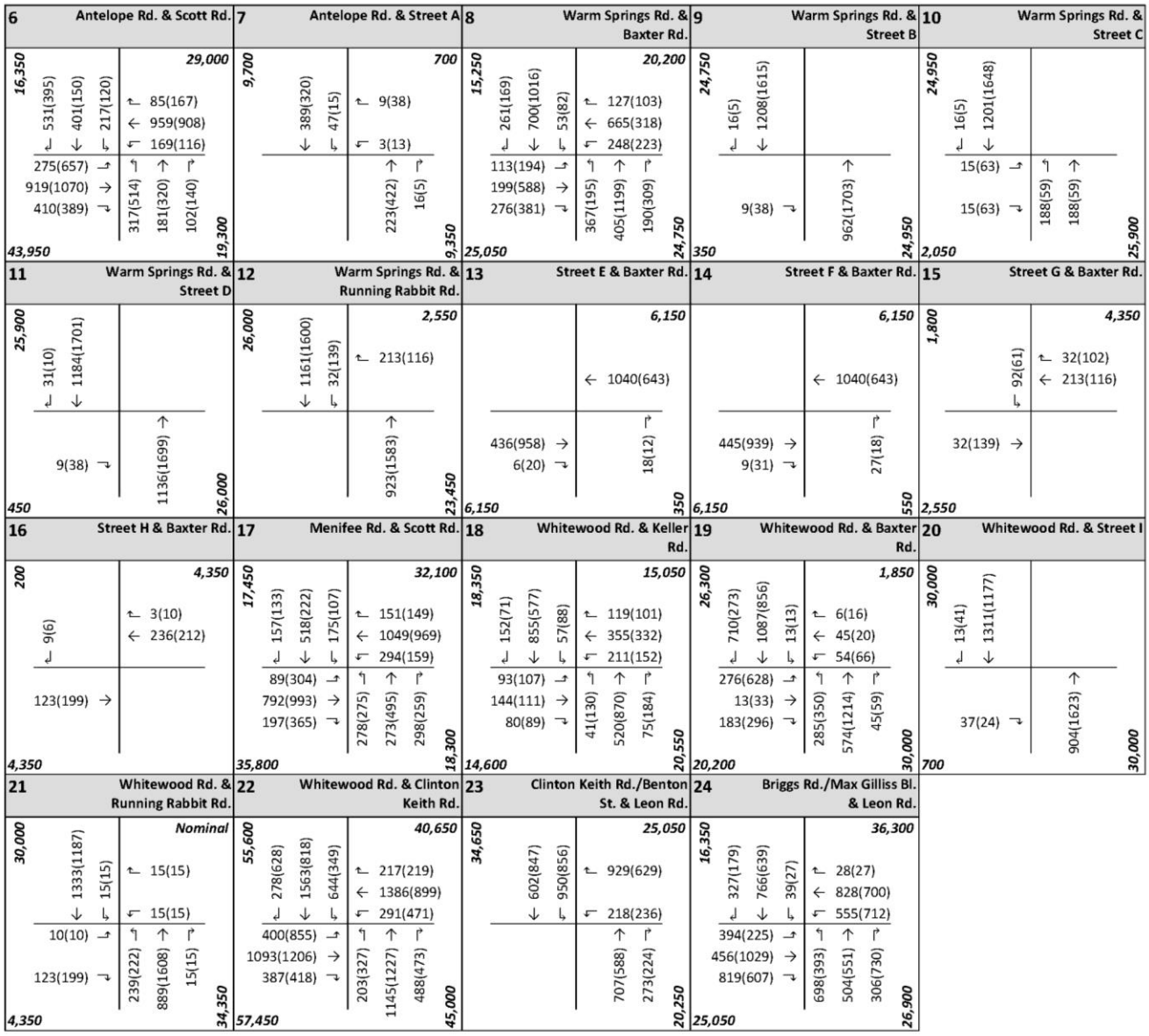
1 Inland Valley & Clinton Keith Rd.	2 Nutmeg St. & Clinton Keith Rd.	3 California Oaks Rd. & Clinton Keith Rd.	4 I-215 SB Ramps & Clinton Keith Rd.	5 I-215 NB Ramps & Clinton Keith Rd.
55,700	***56,400***	***65,500***	***79,050***	***63,100***
← 1891(2075)	↑ 106(131)	← 1591(1849)	↑ 940(808)	↑ 477(265)
↰ 165(115)	← 1437(1260)	↰ 766(1083)	← 1328(2142)	← 1792(1856)
	↰ 468(678)			
↰ ↱	↰ ↑ ↱	↰ ↱	↰ ↓ ↳	↰ ↱
1501(2500) → 334(470)	34(64) →	1925(1938) → 235(193)	561(842)	1751(1868) → 461(1099)
626(453) ↴ 94(189)	1179(1447) → 154(132)	238(193) ↴ 631(1000)	2334(2285) → 5(1)	1018(883) ↴ 1106(1217)
	157(163) ↴ 111(105)		856(799) ↴ 482(508)	
	598(551)			
65,650 ***13,150***	***36,750*** ***24,300***	***55,600*** ***29,300***	***71,900*** ***8,950***	***63,600*** ***38,750***

12,350 ***25,900*** ***3,050***

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

***Average Daily Trips***

EXHIBIT 6-2: HORIZON YEAR (2040) WITH PROJECT TRAFFIC VOLUMES (PAGE 2 OF 2)



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

Average Daily Trips

6.3 INTERSECTION OPERATIONS ANALYSIS

LOS calculations were conducted for the study intersections to evaluate their operations under Horizon Year (2040) traffic conditions with roadway and intersection geometrics consistent with Section 6.1 *Roadway Improvements*. The intersection analysis results are summarized on Table 6-1 for Horizon Year (2040) Without Project traffic conditions, which indicates that the following study area intersections are anticipated to operate at an unacceptable LOS during one or more peak hours:

- Inland Valley & Clinton Keith Rd. (#1) – LOS F AM and PM peak hours
- Nutmeg St. & Clinton Keith Rd. (#2) – LOS E AM peak hour; LOS F PM peak hour
- California Oaks Rd. & Clinton Keith Rd. (#3) – LOS F AM and PM Peak hours (also deficient under Existing conditions)
- Menifee Rd. & Scott Rd. (#17) – LOS F AM and PM peak hours
- Whitewood Rd. & Baxter Rd. (#19) – LOS F AM and PM peak hours
- Whitewood Rd. & Clinton Keith Rd. (#22) – LOS F AM and PM peak hours (also deficient under Existing conditions)

With the addition of Project traffic, there are no additional study area intersections anticipated to operate at an unacceptable LOS during the peak hours under Horizon Year (2040) With Project traffic conditions. The intersection operations analysis worksheets for Horizon Year (2040) Without Project and With Project traffic conditions are included in Appendices 6.1 and 6.2, respectively.

TABLE 6-1: INTERSECTION ANALYSIS FOR HORIZON YEAR (2040) CONDITIONS

#	Intersection	Traffic Control[1]	2040 Without Project Delay[2] (secs.) AM	2040 Without Project Delay[2] (secs.) PM	2040 Without Project Level of Service AM	2040 Without Project Level of Service PM	2040 With Project Delay[2] (secs.) AM	2040 With Project Delay[2] (secs.) PM	2040 With Project Level of Service AM	2040 With Project Level of Service PM	Change in Delay AM	Change in Delay PM	Project-Related Deficiency?[3]
1	Inland Valley & Clinton Keith Rd.	TS	**123.3**	**268.0**	**F**	**F**	**126.7**	**275.6**	**F**	**F**	3.4	**7.6**	**Yes**
2	Nutmeg St. & Clinton Keith Rd.	TS	**70.7**	**101.1**	**E**	**F**	**81.1**	**106.5**	**F**	**F**	**10.4**	**5.4**	**Yes**
3	California Oaks Rd. & Clinton Keith Rd.	TS	**156.4**	**250.2**	**F**	**F**	**167.9**	**260.1**	**F**	**F**	**11.5**	**9.9**	**Yes**
4	I-215 SB Ramps & Clinton Keith Rd.	TS	22.2	27.9	C	C	29.4	34.3	C	C	7.2	6.4	No
5	I-215 NB Ramps & Clinton Keith Rd.	TS	45.4	48.0	D	D	52.7	53.9	D	D	7.3	5.9	No
6	Antelope Rd. & Scott Rd.	TS	44.6	50.3	D	D	49.8	51.9	D	D	5.2	1.6	No
7	Antelope Rd. & Street A	--/**CSS**	Future Intersection				10.5	12.2	B	B	--	--	No
8	Warm Springs Rd. & Baxter Rd.	TS	53.0	44.4	D	D	54.7	49.1	D	D	1.7	4.7	No
9	Warm Springs Rd. & Street B	--/**CSS**	Future Intersection				11.5	15.8	B	C	--	--	No
10	Warm Springs Rd. & Street C	--/**CSS**	Future Intersection				16.5	33.3	C	D	--	--	No
11	Warm Springs Rd. & Street D	--/**CSS**	Future Intersection				11.5	16.7	B	C	--	--	No
12	Warm Springs Rd. & Running Rabbit Rd.	--/**CSS**	Future Intersection				17.6	25.5	C	D	--	--	No
13	Street E & Baxter Rd.	--/**CSS**	Future Intersection				9.8	13.6	A	B	--	--	No
14	Street F & Baxter Rd.	--/**CSS**	Future Intersection				10.0	12.6	B	B	--	--	No
15	Street G & Baxter Rd.	--/**CSS**	Future Intersection				10.9	11.0	B	B	--	--	No
16	Street H & Baxter Rd.	--/**CSS**	Future Intersection				9.7	9.5	A	A	--	--	No
17	Menifee Rd. & Scott Rd.	TS	**127.6**	**140.6**	**F**	**F**	**142.1**	**158.9**	**F**	**F**	**14.5**	**18.3**	**Yes**
18	Whitewood Rd. & Keller Rd.	TS	41.1	36.3	D	D	46.9	37.7	D	D	5.8	1.4	No
19	Whitewood Rd. & Baxter Rd.	TS	**135.5**	**278.5**	**F**	**F**	**182.3**	**366.8**	**F**	**F**	**46.8**	**88.3**	**Yes**
20	Whitewood Rd. & Street I	--/**CSS**	Future Intersection				15.9	14.5	C	B	--	--	No
21	Whitewood Rd. & Running Rabbit Rd.	CSS	16.8	30.2	C	D	34.8	34.3	D	D	18.0	4.1	No
22	Whitewood Rd. & Clinton Keith Rd.	TS	**255.0**	**215.4**	**F**	**F**	**292.5**	**262.9**	**F**	**F**	**37.5**	**47.5**	**Yes**
23	Clinton Keith Rd./Benton St. & Leon Rd.	--/**TS**	49.3	21.5	D	C	51.0	22.9	D	C	--	--	No
24	Briggs Rd./Max Gilliss Bl. & Leon Rd.	TS	52.5	53.0	D	D	54.8	54.8	D	D	--	--	No

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

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

[3] Per the City of Murrieta traffic study guidelines, increase in delay is calculated for intersections to determine Project-related deficiencies.

6.4 ROADWAY SEGMENT CAPACITY ANALYSIS

The City of Murrieta Traffic Study Guidelines provide roadway volume capacity values. These roadway segment capacities are approximate figures only and are used at the General Plan level to assist in determining the roadway functional classification (number of through lanes) needed to meet traffic demand. Table 6-2 provides a summary of the Horizon Year (2040) Without Project conditions roadway segment capacity analysis based on the City of Murrieta Roadway Capacity Thresholds. As shown on Table 6-2, the study area roadway segments are anticipated to operate at an acceptable LOS, with the exception of Whitewood Road, south of Baxter Road. However, the addition of Project traffic increases the v/c by less than 0.05.

TABLE 6-2: ROADWAY SEGMENT ANALYSIS FOR HORIZON YEAR (2040) CONDITIONS

#	Roadway	Segment Limits	GP Classification	Roadway Section	LOS E Capacity[1]	2040 NP	V/C[2]	LOS[3]	2040 WP	V/C[2]	LOS[3]	Increase in V/C
1	Baxter Rd.	West of Whitewood Rd.	Secondary	4D	25,900	18,328	0.71	C	20,187	0.78	C	--
2	Whitewood Rd.	South of Baxter Rd.	Arterial	4D	34,100	**29,219**	**0.86**	**D**	**30,020**	**0.88**	**D**	0.02
3	Warm Springs Rd.	Baxter Rd. to Running Rabbit Rd.	Arterial	4D	34,100	23,443	0.69	B	24,773	0.73	C	--
4	Running Rabbit Rd.	Warm Springs Rd. to Whitewood Rd.	Local	2D	13,000	Future Roadway			2,565	0.20	A	--

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

[1] These maximum roadway capacities have been extracted from the following source: City of Murrieta General Plan 2035 Update (Table 4.2-2)

[2] V/C = Volume to Capacity Ratio

[3] LOS = Level of Service

6.5 OFF-RAMP QUEUING ANALYSIS

Off-ramp queuing analysis findings for Horizon Year (2040) Without Project are presented on Table 6-3. As shown on Table 6-3, no off-ramp movements are anticipated to experience queuing issues during the weekday AM or weekday PM peak 95th percentile traffic flows under Horizon Year (2040) Without Project and With Project traffic conditions. Worksheets for Horizon Year (2040) Without Project and With Project traffic conditions queuing analysis are provided in Appendices 6.3 and 6.4, respectively.

TABLE 6-3: PEAK HOUR FREEWAY OFF-RAMP QUEUING SUMMARY FOR HORIZON YEAR (2040) CONDITIONS

				2040 Without Project				2040 With Project			
			Available Stacking	95th Percentile Queue (Feet)		Acceptable?[1]		95th Percentile Queue (Feet)		Acceptable?[1]	
#	Intersection	Movement	Distance (Feet)	AM Peak Hour	PM Peak Hour	AM	PM	AM Peak Hour	PM Peak Hour	AM	PM
4	I-215 SB Ramps & Clinton Keith Rd.	SBL/T	960	494 [2]	518 [2]	Yes	Yes	564 [2]	584 [2]	Yes	Yes
		SBR	1,185	245	493 [2]	Yes	Yes	249	493 [2]	Yes	Yes
5	I-215 NB Ramps & Clinton Keith Rd.	NBL/R	960	956	1,339 [2]	Yes	Yes[3]	1,019	1,343 [2]	Yes[3]	Yes[3]
		NBR	1,525	981	1,049 [2]	Yes	Yes	1,062	1,146 [2]	Yes	Yes

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

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

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

6.6 TRAFFIC SIGNAL WARRANTS ANALYSIS

Traffic signal warrants have been performed (based on CA MUTCD) for Horizon Year (2040) traffic conditions based on peak hour intersection turning movements volumes or planning level (ADT) volumes. There are no intersections anticipated to meet a traffic signal warrant under Horizon Year (2040) Without Project traffic conditions (see Appendix 6.5). Warm Springs Road & Running Rabbit Road (#12) is anticipated to meet a traffic signal warrant under Horizon Year (2040) With Project traffic conditions (see Appendix 6.6). It should be noted, a traffic signal warrant is likely warranted at this location due to the high through traffic volumes anticipated along Warm Springs Road as opposed to the proposed Project itself. According to the City of Murrieta General Plan, Warm Springs Road is anticipated to extend south to Clinton Keith Road, which would serve northbound and southbound through traffic.

It should be noted at the intersection of Whitewood Road & Running Rabbit Road, the right turn volumes along the minor street have been reduced from the total minor street volumes since the conflicting movements (left and through) are relatively low in comparison to the total volume.

6.7 PROJECT DEFICIENCIES AND RECOMMENDED IMPROVEMENTS

6.7.1 RECOMMENDED IMPROVEMENTS TO ADDRESS DEFICIENCIES AT INTERSECTIONS

The effectiveness of the recommended improvement strategies to address Horizon Year (2040) traffic deficiencies are presented on Table 6-4. As shown on Table 6-1, the addition of Project traffic is anticipated to result in an increase to the delay of more than 5.0 seconds to each of the intersections identified in Table 6-4. Worksheets for Horizon Year (2040) With Project conditions, with improvements, HCM calculation worksheets are provided in Appendix 6.7.

TABLE 6-4: INTERSECTION ANALYSIS FOR HORIZON YEAR (2040) CONDITIONS WITH IMPROVEMENTS

#	Intersection	Traffic Control[3]	Intersection Approach Lanes[1]												Delay[2] (secs.)		Level of Service	
			Northbound			Southbound			Eastbound			Westbound						
			L	T	R	L	T	R	L	T	R	L	T	R	AM	PM	AM	PM
1	Inland Valley & Clinton Keith Rd.																	
	- Without Improvements	TS	1	0	1	0	0	0	1	2	1	1	1	0	**126.7**	**275.6**	**F**	**F**
	- With Improvements	TS	1	0	1	0	0	0	1	**3**	1	1	**3**	0	15.4	36.1	B	D
2	Nutmeg St. & Clinton Keith Rd.																	
	- Without Improvements	TS	1	1	1	1	1	d	1	2	d	1	2	d	**81.1**	**106.5**	**F**	**F**
	- With Improvements	TS	1	1	1	1	1	d	1	**3**	d	1	**3**	d	49.8	53.7	D	D
3	California Oaks Rd. & Clinton Keith Rd.																	
	- Without Improvements	TS	2	0	1	0	0	0	0	2	1	1	2	0	**167.9**	**260.1**	**F**	**F**
	- With Improvements	TS	**1**	0	**2>**	0	0	0	0	**3**	**0**	1	2	0	**57.6**	**107.4**	**E**	**F**
17	Menifee Rd. & Scott Rd.																	
	- Without Improvements	TS	1	1	1	1	1	0	1	2	0	1	2	0	**142.1**	**158.9**	**F**	**F**
	- With Improvements	TS	1	**2**	**1>**	**2**	**2**	0	**2**	**3**	0	**2**	**3**	**1**	51.5	46.1	D	D
19	Whitewood Rd. & Baxter Rd.																	
	- Without Improvements	TS	1	2	0	1	2	0	1	1	1	1	2	0	**182.3**	**366.8**	**F**	**F**
	- With Improvements	TS	**2**	2	0	1	2	0	**2**	**2**	**0**	1	2	0	49.8	42.8	D	D
22	Whitewood Rd. & Clinton Keith Rd.																	
	- Without Improvements	TS	1	2	0	1	2	0	2	2	1	2	3	1	**292.5**	**262.9**	**F**	**F**
	- With Improvements	TS	**2**	**2**	**1**	**2**	2	0	2	**3**	1	2	3	1	**60.6**	**59.6**	**E**	**E**

[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

6.7.2 RECOMMENDED IMPROVEMENTS TO ADDRESS DEFICIENCIES ON ROADWAY SEGMENTS

The study area roadway segments are anticipated to operate at an acceptable LOS under Horizon Year (2040) Without Project and With Project traffic conditions. It should be noted, per the City of Murrieta General Plan Circulation Element Section 5.6, LOS D is acceptable for roadway segments within certain business corridors, which includes the proposed Project. As such, study area roadway segment improvements have not been identified.

6.7.3 RECOMMENDED IMPROVEMENTS TO ADDRESS DEFICIENCIES FOR QUEUES

No LOS or queuing deficiencies have been identified at the I-215 Ramps & Clinton Keith Road interchange for Horizon Year (2040) Without and With Project traffic conditions. As such, improvements have not been identified for the interchange.

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7 LOCAL AND REGIONAL FUNDING MECHANISMS

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

7.1 CITY OF MURRIETA DEVELOPMENT IMPACT FEE PROGRAM

In 2006, the City of Murrieta adopted their DIF program incorporating the regional component of Measure I. The fee schedule was updated in June 2020. Fees from new residential, commercial, and industrial development are collected to fund Measure I compliant regional facilities. Under the City's DIF program, the City may grant to developers a credit against specific components of fees when those developers construct certain facilities and landscaped medians identified in the list of improvements funded by the DIF program.

After the City's DIF fees are collected, they are placed in a separate interest-bearing account pursuant to the requirements of Government Code sections 66000 *et seq*. The timing to use the DIF fees is established through periodic capital improvement programs which are overseen by the City's Public Works Department. Periodic traffic counts, review of traffic accidents, and a review of traffic trends throughout the City are also periodically performed by City staff and consultants. The City uses this data to determine the timing of the improvements listed in its facilities list.

It should be noted, none of the study area intersections with identified off-site intersection improvements are included in the City's DIF program, as shown previously in Table 1-5.

7.2 MEASURE "I" FUNDS

In 2004, the voters of Riverside County approved the 30-year extension of Measure "I", a one-half of one percent sales tax on retail transactions, through the year 2040, for transportation projects including, but not limited to, infrastructure improvements, commuter rail, public transit, and other identified improvements. The Measure "I" extension requires that a regional traffic impact fee be created to ensure development is paying its fair share. A regional Nexus study was prepared by the RCTA and concluded that each jurisdiction should include a regional fee component in their local programs in order to meet the Measure "I" requirement. The regional component assigns specific facilities and cost sharing formulas to each jurisdiction and was most recently updated in November 2011. Revenues collected through these programs are used in tandem with Measure "I" funds to deliver projects identified in the Nexus Study. While Measure "I" is a self-executing sales tax administered by RCTA, it bears discussion here because the funds raised through Measure "I" have funded in the past and will continue to fund new transportation facilities in Riverside County.

7.3 FAIR SHARE CONTRIBUTION

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

When off-site improvements are identified with a minor share of responsibility assigned to proposed development, the approving jurisdiction may elect to collect a fair share contribution or require the development to construct improvements. Detailed fair share calculations, for each peak hour, has been provided on Table 7-1 for the applicable deficient study area intersections.

TABLE 7-1: PROJECT FAIR SHARE CALCULATIONS

#	Intersection		Existing	Project	2040 WP	Total New Traffic	Project % of New Traffic
17	Menifee Rd. & Scott Rd.						
		AM:	3,114	124	4,271	1,157	**10.7%**
		PM:	3,088	135	4,430	1,342	10.1%

BOLD = Denotes highest fair share percentage.

8 REFERENCES

1. **City of Murrieta.** *Traffic Impact Analysis Preparation Guidelines.* Murrieta : s.n., May 2020.

2. **Institute of Transportation Engineers.** *Trip Generation Manual.* 11th Edition. 2021.

3. **Western Riverside Council of Governments.** *TUMF Nexus Study, 2016 Program Update.* July 2017.

4. **Transportation Research Board.** *Highway Capacity Manual (HCM).* 6th Edition. s.l. : National Academy of Sciences, 2016.

5. **California Department of Transportation.** California Manual on Uniform Traffic Control Devices (CA MUTCD). [book auth.] California Department of Transportation. *California Manual on Uniform Traffic Control Devices (CA MUTCD).* 2014.

6. **City of Wildomar.** *City of Wildomar General Plan.* City of Wildomar : s.n., October 2003.

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APPENDIX 1.1:

APPROVED TRAFFIC STUDY SCOPING AGREEMENT

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APPENDIX 1.2:

SITE ADJACENT QUEUES

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APPENDIX 3.1:

EXISTING TRAFFIC COUNTS

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APPENDIX 3.2:

EXISTING (2021) CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS

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APPENDIX 3.3:

EXISTING (2021) CONDITIONS OFF-RAMP QUEUING ANALYSIS WORKSHEETS

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APPENDIX 3.4:

EXISTING (2021) CONDITIONS TRAFFIC SIGNAL WARRANT ANALYSIS

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APPENDIX 4.1:

POST PROCESSING WORKSHEETS

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APPENDIX 5.1:

OPENING YEAR CUMULATIVE (2027) WITHOUT PROJECT CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS

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APPENDIX 5.2:

OPENING YEAR CUMULATIVE (2027) WITH PROJECT CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS

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APPENDIX 5.3:

OPENING YEAR CUMULATIVE (2027) WITHOUT PROJECT CONDITIONS OFF-RAMP QUEUING ANALYSIS WORKSHEETS

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APPENDIX 5.4:

OPENING YEAR CUMULATIVE (2027) WITH PROJECT CONDITIONS OFF-RAMP QUEUING ANALYSIS WORKSHEETS

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APPENDIX 5.5:

OPENING YEAR CUMULATIVE (2027) WITHOUT PROJECT CONDITIONS TRAFFIC SIGNAL WARRANT ANALYSIS

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APPENDIX 5.6:

OPENING YEAR CUMULATIVE (2027) WITH PROJECT CONDITIONS TRAFFIC SIGNAL WARRANT ANALYSIS

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APPENDIX 5.7:

OPENING YEAR CUMULATIVE (2027) WITH PROJECT CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS WITH IMPROVEMENTS

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APPENDIX 6.1:

HORIZON YEAR (2040) WITHOUT PROJECT CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS

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APPENDIX 6.2:

HORIZON YEAR (2040) WITH PROJECT CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS

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APPENDIX 6.3:

HORIZON YEAR (2040) WITHOUT PROJECT CONDITIONS OFF-RAMP QUEUING ANALYSIS WORKSHEETS

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APPENDIX 6.4:

HORIZON YEAR (2040) WITH PROJECT CONDITIONS OFF-RAMP QUEUING ANALYSIS WORKSHEETS

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APPENDIX 6.5:

HORIZON YEAR (2040) WITHOUT PROJECT CONDITIONS TRAFFIC SIGNAL WARRANT ANALYSIS

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APPENDIX 6.6:

HORIZON YEAR (2040) WITH PROJECT CONDITIONS TRAFFIC SIGNAL WARRANT ANALYSIS

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APPENDIX 6.7:

HORIZON YEAR (2040) WITH PROJECT CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS WITH IMPROVEMENTS

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