LINSCOTT LAW & GREENSPAN engineers

TRANSPORTATION IMPACT ANALYSIS

THE TERRACES AT MURRIETA

Murrieta, California
June 1, 2023

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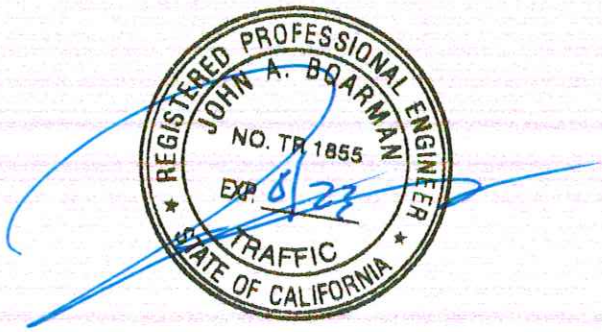

Prepared by:
Narasimha Prasad
Senior Transportation Engineer

Under the Supervision of:
John Boarman, P. E.
Principal

Linscott, Law & Greenspan, Engineers
4542 Ruffner Street
Suite 100
San Diego, CA 92111
858.300.8800 T
858.300.8810 F
www.llgengineers.com

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TRANSPORTATION IMPACT ANALYSIS

THE TERRACES AT MURRIETA

Murrieta, California
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1.0 INTRODUCTION

The Terraces at Murrieta Project is a proposed residential development consisting of 899 multi-family residential units. The Project Site is located north of Murrieta Hot Springs Road between I-15 and Sparkman Court, in the City of Murrieta.

Various intersections and segments within the study area were analyzed to determine potential project related transportation impacts, as set forth in the following sections.

- Project Description
- Methodology and Impact Thresholds
- Existing Conditions Description
- Project Trip Generation / Distribution / Assignment
- Near-Term Opening Year Conditions including Ambient Growth and Cumulative Projects
- Analysis of Near-Term Scenarios
- Analysis of Horizon Year Scenarios
- Site Access and Circulation
- Improvements and Recommendations
- Vehicle Miles Traveled Analysis
- Active Transportation Review and Public Transit Analysis
- Conclusions

1.1 Purpose of Study

This study has been prepared to evaluate the effects of the Project on mobility, access, circulation, and related safety elements in the proximate area of the Project per the City of Murrieta's *Traffic Impact Analysis Preparation Guidelines*, March 2020. In addition to the vehicular analyses, the multi-modal network in the influence of the Project study area was also reviewed. This included Pedestrian, Bicycle, and Transit mobility. Collectively, vehicular mobility combined with multi-modal networks were reviewed to help promote local and regional mobility without auto-dependency. In addition, a CEQA Vehicle Miles Travelled (VMT) analysis is provided.

1.2 Project Description

The Project includes the construction of 899 multi-family units in two phases. Phase 1 includes the development of 652 dwelling units and Phase 2 includes the remaining 247 dwelling units.

Figure 1-1 depicts the Project Area, while ***Figure 1-2*** depicts the conceptual Site Plan.

1.2.1 *Project Location*

The Project is located north of Murrieta Hot Springs Road between I-15 and Sparkman Court in the City of Murrieta.

1.2.2 *Zoning*

The current Zoning for the site is Transit Oriented District (TOD) Overlay and the current General Plan Land Use is TOD Overlay, Office, and Regional Commercial. The Proposed Zoning is Residential, consistent with TOD Overlay, and the Proposed Land Use is Multi-Family Residential.

1.2.3 *Project Phasing*

The Project will be built in two phases as follows:

- **Phase 1** construction will commence in the Year 2023. The first units will be delivered in **2025** and Phase 1 construction will be completed in 2026.

- **Phase 2** construction will commence in the Year 2027. The first units will be delivered in **2028** and Phase 2 construction will be completed in 2029.

1.2.4 *Project Access*

Two access points will be provided for Phase 1 and a third will be added for Phase 2. In addition to these day-to-day access points, an emergency access will be provided via Murrieta Hot Springs Road:

Phase 1

- A full access driveway at Sparkman Court opposite Walsh Center Drive. Most of the Project traffic will use this driveway.
- A full access driveway on Vista Murrieta, along the northern boundary of the site. Vista Murrieta is currently an unpaved dirt road. The Project will pave Vista Murrieta along its Project frontage.

- An emergency access driveway at the eastern boundary of the site on Murrieta Hot Springs Road. This access will be gated and kept locked and will be opened by emergency personnel for access by emergency vehicles only.

Phase 2

- An additional driveway will be provided on Sparkman Court north of Walsh Center Drive in Phase 2.

1.3 Study Area

The following Project Study Area was determined based on the proximity of intersections and segments to the Project site and discussions with City Staff:

INTERSECTIONS

1. Sparkman Court / Walsh Center Drive / Project Driveway #1
3. Hancock Avenue / Walsh Center Drive
4. Hancock Avenue / Medical Center Drive
5. Sparkman Court / Medical Center Drive
6. Murrieta Hot Springs Rd / Madison Avenue
7. I-15 SB Ramps / Murrieta Hot Springs Road
8. 1-15 NB Ramps / Murrieta Hot Springs Road
9. Murrieta Hot Springs Rd / Sparkman Court
10. Murrieta Hot Springs Rd / Hancock Avenue
11. I-215 SB Ramps / Murrieta Hot Springs Road
12. I-215 NB Ramps / Murrieta Hot Springs Road
13. Murrieta Hot Springs Rd / Alta Murrieta Drive
14. Project Driveway #2 / Vista Murrieta
15. Monroe Avenue / Project Driveway #3

SEGMENTS

1. **Vista Murrieta:** South of Los Alamos
2. **Medical Center Drive:** Sparkman Court to Hancock Avenue
3. **Murrieta Hot Springs Rd:** Madison Avenue to I-15 Ramps
4. **Murrieta Hot Springs Rd:** I-15 Ramps to Sparkman Court
5. **Murrieta Hot Springs Rd:** Sparkman Court to Hancock Avenue
6. **Murrieta Hot Springs Rd:** Hancock Avenue to I-215 Ramps
7. **Murrieta Hot Springs Rd:** I-215 Ramps to Alta Murrieta Drive
8. **Sparkman Court:** Vista Murrieta Road to Walsh Center Drive
9. **Sparkman Court:** Walsh Center Drive to Medical Center Drive
10. **Sparkman Court:** Medical Center Drive to Murrieta Hot Springs Road
11. **Hancock Avenue:** Los Alamos Road to Parkcrest Drive
12. **Hancock Avenue:** Parkcrest Drive to Walsh Center Drive
13. **Hancock Avenue:** Walsh Center Drive to Medical Center Drive
14. **Hancock Avenue:** Medical Center Drive to Murrieta Hot Springs Road

1.4 Analysis Scenarios

The following scenarios are included in this report:

a). Existing Conditions

b). Opening Year 2025 Conditions – Defined as Opening **Year 2025** Conditions with traffic from approved projects in the area plus an ambient growth of 2% for 4 years from existing traffic volumes,

c). Opening Year 2025 Plus **Project Phase 1** Conditions – Defined as Opening Year 2025 conditions **plus traffic from the proposed project Phase 1**,

d). Year 2028 Conditions – Defined as **Year 2028** Conditions with traffic from approved projects in the area plus an ambient growth of 2% for 7 years from existing traffic volumes,

e). Opening Year 2028 Plus **Entire Project** Conditions – Defined as Year 2028 conditions **plus traffic from the proposed Entire Project**,

f). Cumulative No Project Conditions (Horizon Year 2040) – Defined as ambient growth to the Cumulative Horizon (typically coinciding with the forecast horizon **Year 2040** of the RIVTAM/RIVCOM travel demand forecasting model) that includes traffic from approved and pending projects in the area but no Project traffic, and

g). Cumulative Plus Project Conditions (Horizon Year 2040 + Project) – Defined as Cumulative No Project **Year 2040** conditions **plus traffic from the proposed Project**.

The approved Scoping Agreement is included in ***Appendix A***.

1.5 Project History

The Terraces at Murrieta Transportation Impact Analysis report dated February 27, 2023, was approved by the City of Murrieta in March 2023. However, comments were received by neighbors that the Triangle Project was not included as a Cumulative Project. Other comments were also made including that a queuing analysis was not included. The Triangle Project and other cumulative projects identified by the City of Murrieta are now included in the cumulative analysis. The report has now been revised addressing these comments as appropriate with updated figures, text and tables. One new cumulative impact was determined, and appropriate improvements are recommended.

The responses to neighborhood comments are included in ***Appendix A***.

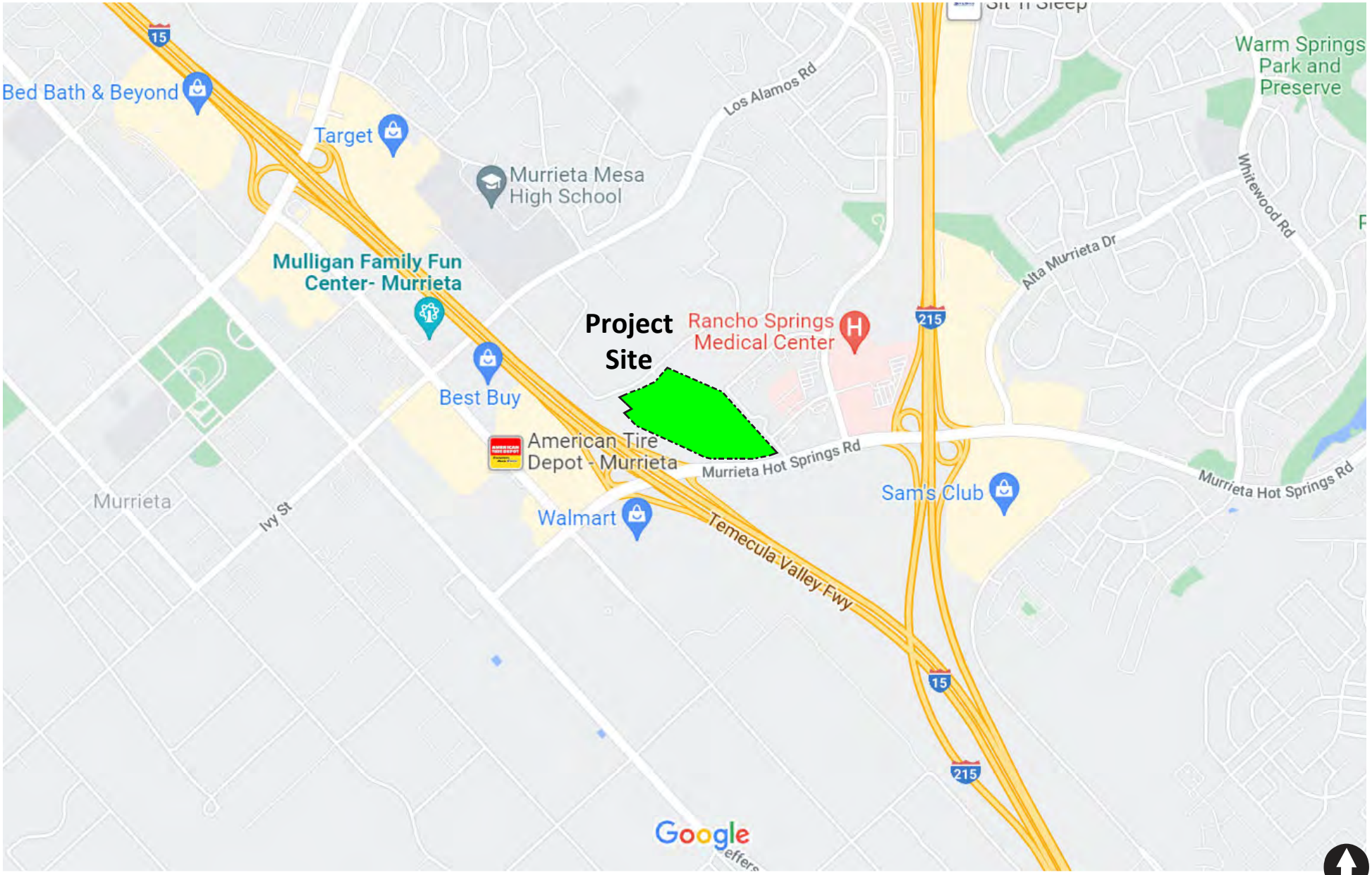

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Figure 1-1

Project Area Map

The Terraces at Murrieta

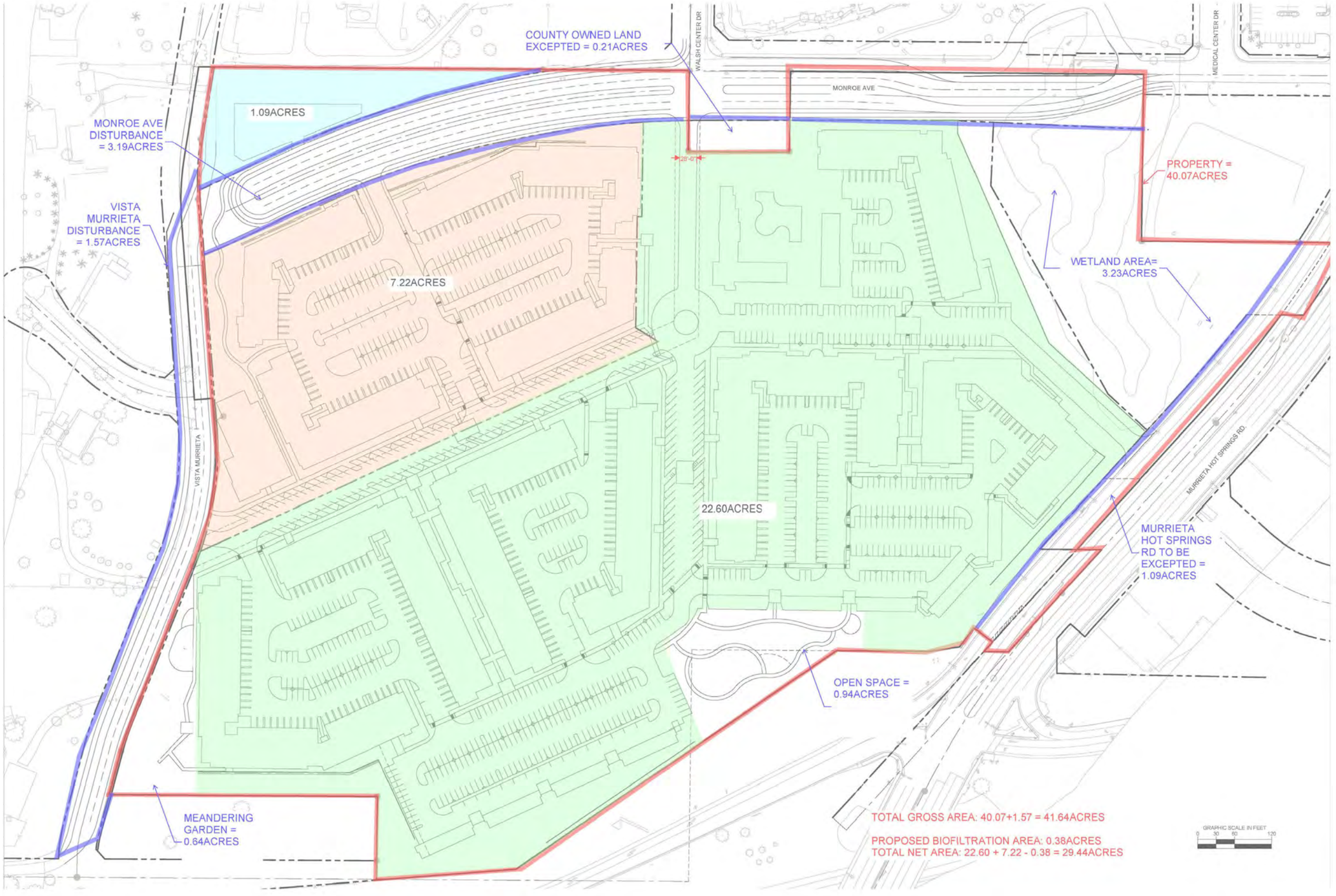

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Figure 1-2

Site Plan

THE TERRACES AT MURRIETA

2.0 METHODOLOGY AND IMPACT THRESHOLDS

2.1 Highway Capacity Manual (HCM) Method of Analysis (Signalized Intersections)

Based on the HCM operations method of analysis, level of service for signalized intersections is defined in terms of control delay, which is a measure of driver discomfort, frustration, fuel consumption, and lost travel time. The delay experienced by a motorist is made up of a number of factors that relate to control, geometry, traffic, and incidents. Total delay is the difference between the travel time actually experienced and the reference travel time that would result during ideal conditions: in the absence of traffic control, in the absence of geometric delay, in the absence of any incidents, and when there are no other vehicles on the road. In Chapter 19 of the HCM, only the portion of total delay attributed to the control facility is quantified. This delay is called *control delay*. Control delays include initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. In contrast, in previous versions of the HCM (1994 and earlier), delay included only stopped delay. Specifically, LOS criteria for traffic signals are stated in terms of the average control delay per vehicle. The six qualitative categories of Level of Service that have been defined along with the corresponding HCM control delay value range for signalized intersections are shown in ***Table 2-1***.

2.2 HCM Method of Analysis (Unsignalized Intersections)

The HCM unsignalized methodology for stop-controlled intersections was utilized for the analysis of the unsignalized intersections. LOS criteria for unsignalized intersections differ from LOS criteria for signalized intersections as signalized intersections are designed for heavier traffic and therefore a greater delay.

2.2.1 *Two-Way Stop-Controlled Intersections*

Two-way stop-controlled intersections are comprised of a major street, which is uncontrolled, and a minor street, which is controlled by stop signs. Level of service for a two-way stop-controlled intersection is determined by the computed or measured control delay. The control delay by movement, by approach, and for the intersection as a whole is estimated by the computed capacity for each movement. LOS is determined for each minor-street movement (or shared movement) as well as major-street left turns. The worst side street approach delay is reported. LOS is not defined for the intersection as a whole or for major-street approaches, as it is assumed that major-street through vehicles experience zero delay. The HCM control delay value range for two-way stop-controlled intersections is shown in ***Table 2-2.***

2.2.2 *All-Way Stop-Controlled Intersections*

All-way stop-controlled intersections require every vehicle to stop at the intersection before proceeding. Because each driver must stop, the decision to proceed into the intersection is a function of traffic conditions on the other approaches. The time between subsequent vehicle departures depends on the degree of conflict that results between the vehicles and vehicles on the other approaches. This methodology determines the control delay for each lane on the approach, computes a weighted average for the whole approach, and computes a weighted average for the intersection as a whole. Level of service (LOS) at the approach and intersection levels is based solely on control delay. The HCM control delay value range for all-way stop-controlled intersections is shown in *Table 2-2*.

TABLE 2-1
LEVEL OF SERVICE CRITERIA FOR SIGNALIZED INTERSECTIONS (HCM)

Level of Service (LOS)	Control Delay Per Vehicle (seconds/vehicle)	Level of Service Description
A	$\leq$ 10.0	This level of service occurs when progression is extremely favorable, and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.
B	> 10.0 and $\leq$ 20.0	This level generally occurs with good progression, short cycle lengths, or both. More vehicles stop than with LOS A, causing higher levels of average delay.
C	> 20.0 and $\leq$ 35.0	Average traffic delays. These higher delays may result from fair progression, longer cycle lengths, or both. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant at this level, though many still pass through the intersection without stopping.
D	> 35.0 and $\leq$ 55.0	Long traffic delays At level D, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high *v/c* ratios. Many vehicles stop and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.
E	> 55.0 and $\leq$ 80.0	Very long traffic delays This level is considered by many agencies to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths and high *v/c* ratios. Individual cycle failures are frequent occurrences.
F	$\geq$ 80.0	Severe congestion This level, considered to be unacceptable to most drivers, often occurs with over saturation, that is, when arrival flow rates exceed the capacity of the intersection. It may also occur at high *v/c* ratios below 1.0 with many individual cycle failures. Poor progression and long cycle lengths may also be major contributing factors to such delay levels.

TABLE 2-2
LEVEL OF SERVICE CRITERIA FOR UNSIGNALIZED INTERSECTIONS (HCM)

Level of Service (LOS)	Highway Capacity Manual (HCM) Delay Value (sec/veh)	Level of Service Description
A	$\leq$ 10.0	Little or no delay
B	> 10.0 and $\leq$ 15.0	Short traffic delays
C	> 15.0 and $\leq$ 25.0	Average traffic delays
D	> 25.0 and $\leq$ 35.0	Long traffic delays
E	> 35.0 and $\leq$ 50.0	Very long traffic delays
F	> 50.0	Severe congestion

2.3 Volume to Capacity (V/C) Ratio Method of Analysis (Roadway Segments)

In conformance with *City of Murrieta Traffic Impact Analysis Preparation Guidelines*, daily operating conditions for the key study roadway segments have been investigated according to the Volume to Capacity (V/C) ratio of each roadway segment. The V/C relationship is used to estimate the LOS of the roadway segment with the volume based on the 24-hour traffic volumes and the capacity based on the City's classification of each roadway. The daily roadway link capacity of each street classification according to the *Murrieta General Plan 2035; Chapter 5 – Circulation Element; Table 5-2 - Daily Roadway Capacity Values* are presented in ***Table 2-3***. The six qualitative categories of Level of Service have been defined along with the corresponding Volume to Capacity (V/C) value range and are shown in ***Table 2-4***.

2.4 Queuing Deficiency Analysis

A queuing deficiency is identified in the no-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 queuing effect 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 are already deficient without the Project, a queuing effect 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.

2.5 Analysis Thresholds

According to City of Murrieta guidelines, LOS D is the minimum acceptable condition that should be maintained during the morning and evening peak commute hours on all intersections and LOS C is the minimum acceptable condition that should be maintained on a daily basis on all roadway segments.

TABLE 2–3
CITY OF MURRIETA DAILY ROADWAY CAPACITY VALUES

Facility	Number of Lanes	Maximum Two-Way Volume (ADT)				
		LOS A	LOS B	LOS C	LOS D	LOS E
Freeway	4	45,900	53,550	61,200	68,900	76,500
Freeway	6	70,500	82,250	94,000	105,800	117,500
Freeway	8	96,300	112,350	128,400	144,500	160,500
Freeway	10	120,360	140,420	160,500	180,500	200,600
Expressway	4	24,540	28,630	32,700	36,800	40,900
Expressway	6	36,780	42,910	49,000	55,200	61,300
Multi-Modal Corridor	4	21,540	25,130	28,700	32,300	35,900
Multi-Modal Corridor	6	32,340	37,730	43,100	48,500	53,900
Augmented Urban Arterial	8	43,080	50,260	57,400	64,600	71,800
Augmented Urban Arterial	7	37,700	44,000	50,250	56,550	62,850
Urban Arterial	6	32,340	37,730	43,100	48,500	53,900
Arterial	4	21,540	25,130	28,700	32,300	35,900
Arterial	6	32,340	37,730	43,100	48,500	53,900
Major	4	20,460	23,870	27,300	30,700	34,100
Secondary	4	15,540	18,130	20,700	23,300	25,900
Collector	2	7,800	9,100	10,400	11,700	13,000

Notes:

1. All capacity figures are based on optimum conditions and are intended as guidelines for planning purposes only.
2. Maximum two-way ADT values are based on the 1999 Modified Highway Capacity Manual Level of Service tables, as defined in the Riverside County Congestion Management Program.
3. LOS A and LOS B capacities are estimated.
4. Capacities for *7-Lane Urban Arterial* estimated by averaging the capacities of *8-Lane Augmented Urban Arterial* and *6-Lane Urban Arterial.*.

TABLE 2-4
LEVEL OF SERVICE CRITERIA FOR ROADWAY SEGMENTS (V/C METHODOLOGY)

Level of Service (LOS)	Volume to Capacity Ratio (V/C)	Level of Service Description
A	≤ 0.600	**EXCELLENT**. Describes primarily free flow operations at average travel speeds, usually about 90% of the free flow speed for the arterial class. Vehicles are completely unimpeded in their ability to maneuver within the traffic stream. Stopped delay at signalized intersections is minimal.
B	0.601 – 0.700	**VERY GOOD**. Represents reasonably unimpeded operations at average travel speeds, usually about 70% of the free flow speed for the arterial class. The ability to maneuver within the traffic stream is only slightly restricted and stopped delays are not bothersome. Drivers are not generally subjected to appreciable tension.
C	0.701 – 0.800	**GOOD**. Represents stable conditions; however, ability to maneuver and change lanes in mid-block location may be more restricted than in LOS B, and longer queues and/or adverse signal coordination may contribute to lower average travel speeds of about 50% of the average free flow speed for the arterial class. Motorists will experience appreciable tension while driving.
D	0.801 – 0.900	**FAIR**. Borders on a range in which small increases in flow may cause substantial increases in approach delay and, hence, decreases in arterial speed. This may be due to adverse signal progression, inappropriate signal timing, high volumes, or some combination of these. Average travel speeds are about 40% of free flow speed.
E	0.901 – 1.000	**POOR**. Characterized by significant approach delays and average travel speeds of one-third the free flow speed or lower. Such operations are caused by some combination of adverse progression, high signal density, extensive queuing at critical intersections, and inappropriate signal timing.
F	> 1.000	**FAILURE**. Characterizes arterial flow at extremely low speeds below one-third to one-quarter of the free flow speed. Intersection congestion is likely at critical signalized locations, with resultant high approach delays. Adverse progression is frequently a contributor to this condition.

3.0 EXISTING CONDITIONS

Effective evaluation of the traffic impacts associated with the proposed Project requires an understanding of the existing transportation system within the project area.

3.1 Existing Roadway Network

The following is a description of the existing street network in the study area.

Murrieta Hot Springs Road

Murrieta Hot Springs Road is classified as a 6-Lane Urban Arterial between Madison Avenue and I-15 Freeway and an 8-Lane Augmented urban Arterial between the I-15 freeway and the I-215 freeway. It is classified as a 6-Lane Multi Modal Transportation Corridor, east of the I-215 freeway. in the City of Murrieta Circulation Element. It is along a truck route. Currently, it is built as follows:

- Magnolia Avenue to and the I-15 Freeway: Eight-Lane divided road with a raised median. The curb lane in both directions is a right-turn only lane.
- I-15 SB Ramps to I-15 NB Ramps: Six-Lane undivided road.
- I-15 Northbound Ramps to Sparkman Court: Eight-Lane divided road. The curb lane in both directions is a right-turn only lane.
- Sparkman Court to the I-215 freeway: Seven-Lane divided road with 3 lanes in the WB direction and 4 lanes in the EB direction. The curb lane in the eastbound direction is a right-turn only lane.
- I-215 SB Ramps to I-215 NB Ramps: Six-Lane divided road.
- I-215 NB Ramps to Alta Murrieta Drive: Seven-Lane divided road with 4 lanes in the westbound direction and 3 lanes in the eastbound direction. The curb lane in westbound direction is a right-turn only lane.

Curb, gutter and sidewalks are provided along both curbs. The posted speed limit is 45 mph. Bike lanes are not provided.

Vista Murrieta Road

Vista Murrieta Road is classified as a Two-Lane Collector in the City of Murrieta Circulation Element. This road is partially paved south of Los Alamos for a distance of approximately 1,300 feet. Curb, gutter and sidewalks are provided along the paved portion of this road, just south of Los Alamos Road, where the posted speed limit is 30 mph. Bike lanes are not provided. Parking is generally permitted along both curbs. The remaining portion of Vista Murrieta including the section along the Project frontage is unpaved.

Walsh Center Drive

Walsh Center Drive is an unclassified Two-Lane Road in the City of Murrieta. Curb, gutter and sidewalks are provided along the south curb of this road. There is no posted speed limit and bike lanes are not provided. Parking is generally permitted along both curbs.

Sparkman Court

Sparkman Court is an unclassified Two-Lane Road in the City of Murrieta. Curb, gutter and sidewalks are provided along the east curb of this road. Nor curb, gutter or sidewalk are provided along the west curb. There is no posted speed limit and bike lanes are not provided. Curbside parking is not prohibited. Sparkman Court will be realigned, improved and renamed Monroe Avenue as described below.

The Precise Alignment Study Monroe Avenue Between Los Alamos Road & Murrieta Hot Springs Road, City of Murrieta was conducted in 2007 and updated in 2008. This road would replace Sparkman Court and connect Murrieta Hot Springs Road and Los Alamos Road along a new alignment. Three alternative alignments were studied and *Alternative 1* described below was approved for implementation. Monroe Avenue will be constructed to City of Murrieta 4-Lane Collector standards.

Monroe Avenue will be aligned to intersect at grade with existing Walsh Center Drive and Medical Center Drive. However, portions of existing Vista Murrieta Road, Jackson Avenue, and Sparkman drive would need to be vacated with possible realignment or cul-de-sac construction. The modifications to these local streets should be considered through further study during the design phase of the roadway and through review of future development proposals.

The Project will implement half-width improvements along the Project frontage of Monroe Avenue. The portion of Monroe Avenue built by the Project will terminate in a cul-de-sac just south of Vista Murrieta due to a significant grade difference.

Hancock Avenue

Hancock Avenue is classified as a 4-Lane Major Road in the City of Murrieta. It is currently built as a four-lane road with a center two-way-left-turn-lane (TWLTL). Curb, gutter and sidewalks are provided along both curbs, except along a portion of the west curb between Park Crest Drive and Walsh Center Drive. Bike lanes are provided north of Medical Center Drive. The posted speed limit is 45 mph.

Figure 3–1 depicts the existing conditions diagram, including existing intersection geometry and traffic control.

3.2 Existing Traffic Volumes

AM & PM peak hour and segment volume counts including bicycle and pedestrian counts were conducted at the study area intersections and segments respectively on November 9, 2021, when area schools were in session.

LLG previously conducted counts at most of these intersections and segments in December 2019, when area schools were in session, for another project. ***Table 3–1*** summarizes and compares the Year 2019 and 2021 segment counts. As seen in *Table 3-1*, Year 2021 segment counts were similar to or higher than the Pre-Covid Year 2019 counts. Therefore, after discussions with City staff, it was decided to use the 2021 counts without applying any "Covid factor". A similar trend was also observed when intersections counts were compared.

TABLE 3–1
EXISTING TRAFFIC VOLUMES

Street Segment	Pre Covid (Dec 2019) ADT[a]	Nov 2021 (During Covid) ADT
Vista Murrieta Road		
South of Los Alamos Rd	NC	850
Medical Center Drive		
Sparkman Ct to Hancock Ave	NC	2,470
Murrieta Hot Springs Road		
Madison Ave to I-15 Ramps	NC	41,310
I-15 Ramps to Sparkman Ct	48,700	52,610
Sparkman Ct to Hancock Ave	43,200	50,200
Hancock Ave to I-215 Ramps	45,800	57,830
I-215 Ramps to Alta Murrieta Dr	NC	61,570
Sparkman Court		
Walsh Center Dr to Medical Center Dr	NC	340
Medical Center Dr to Murrieta Hot Springs Rd	3,000	2,760
Hancock Avenue		
Los Alamos Rd to Parkcrest Dr	NC	11,690
Parkcrest Dr to Walsh Center Dr	12,900	12,910
Walsh Center Dr to Medical Center Dr	13,200	13,470
Medical Center Dr to Murrieta Hot Springs Rd	11,700	12,830 [b]

Footnotes:

a. Average Daily Traffic Volumes.

b. Estimated based on peak hour volumes at the Murrieta Hot Springs Road / Hancock Avenue being 10% of the daily segment volume.

General Note:

NC – No Count

DNE – Does Not Exist

Figure 3–2 depicts the Existing Traffic Volumes. *Appendix A* contains the Year 2021 manual count sheets. *Appendix A* also contains a comparison of the Year 2020 and 2021 peak hour intersection turning movement counts.

Signal timing plans were obtained from the City for all the signalized intersections in the study area. Copies of the signal timing plans are included in *Appendix A.*

3.3 Existing Intersection Conditions

In conformance with *City of Murrieta Traffic Impact Analysis Preparation Guidelines,* existing AM peak hour and PM peak hour operating conditions were evaluated using the methodology outlined in the *Highway Capacity Manual 6th Edition (HCM 6)* for signalized and unsignalized intersections. Daily operating conditions for the key study roadway segments were analyzed using the *Volume to Capacity (V/C) ratio.*

Table 3-2 summarizes the results of the Existing intersection analysis. As seen in *Table 3-2*, all intersections are calculated to operate at LOS D or better except the following:

- Signalized Alta Murrieta Drive / Murrieta Hot Springs Road (LOS E during the PM peak hour)

Appendix B contains the Existing peak hour intersection analysis worksheets.

3.4 Existing Segment Conditions

In conformance with *City of Murrieta Traffic Impact Analysis Preparation Guidelines,* existing segment operations were evaluated using the *Volume to Capacity (V/C) ratio.*

Table 3-3 summarizes the results of the Existing segment analysis. As seen in *Table 3-3*, all segments are calculated to operate at LOS Cor better except the following:

- Murrieta Hot Springs Road: Between Hancock Avenue and I-215 – LOS D
- Murrieta Hot Springs Road: Between I-215 and Alta Murrieta Drive – LOS F

3.5 Queuing Deficiency Analysis

Table 3-4 summarizes the available turn lane storage and the calculated queue at all study area intersections. The queues reported are the worst of the AM and PM calculated queues. ***Appendix C*** contains the Existing queuing report worksheets. As seen in *Table 3-4*, existing queuing deficiencies occur as follows:

- Hancock Avenue / Medical Center Drive –EB & WB left-turn movements,
- Murrieta Hot Springs Road / Madison Avenue – SB left-turn movement,
- Murrieta Hot Springs Road / Alta Murrieta Road – SB right-turn and left-turn movements.

TABLE 3–2
EXISTING INTERSECTION OPERATIONS

Intersection	Control Type	Peak Hour	Delay[a]	LOS[b]
1. Sparkman Ct / Walsh Center Dr	DNE	AM	DNE	DNE
		PM	DNE	DNE
3. Hancock Ave / Walsh Center Dr	TWSC	AM	18.8	C
		PM	18.8	C
4. Hancock Ave / Medical Center Dr	Signal	AM	15.3	B
		PM	16.0	B
5. Sparkman Ct / Medical Center Dr	TWSC	AM	9.8	A
		PM	9.7	A
6. Madison Ave / Murrieta Hot Springs Rd	Signal	AM	43.1	D
		PM	47.1	D
7. I-15 SB Ramps / Murrieta Hot Springs Rd	Signal	AM	19.8	B
		PM	17.1	B
8. 1-15 NB Ramps / Murrieta Hot Springs Rd	Signal	AM	15.1	B
		PM	17.6	B
9. Murrieta Hot Springs Rd / Sparkman Ct	TWSC	AM	12.9	B
		PM	15.2	C
10. Murrieta Hot Springs Rd / Hancock Ave	Signal	AM	15.8	B
		PM	14.4	B
11. I-215 SB Ramps / Murrieta Hot Springs Rd	Signal	AM	12.2	B
		PM	17.5	B
12. I-215 NB Ramps / Murrieta Hot Springs Rd	Signal	AM	7.0	A
		PM	11.3	B
13. Alta Murrieta Dr / Murrieta Hot Springs Rd	Signal	AM	47.4	D
		PM	**65.4**	**E**

Continued on the Next Page

TABLE 3–2 (CONTINUED)
EXISTING INTERSECTION OPERATIONS

Intersection	Control Type	Peak Hour	Delay[a]	LOS[b]
Continued From the Previous Page				
14. Vista Murrieta Rd / Project Driveway #2	DNE	AM	DNE	DNE
		PM	DNE	DNE
15. Monroe Ave / Project Driveway #3	DNE	AM	DNE	DNE
		PM	DNE	DNE

Footnotes:
a. Average delay expressed in seconds per vehicle.
b. Level of Service.
c. This is currently not an intersection, but a turn in the road.
d. TWSC – Two-Way Stop Controlled intersection. Minor street left turn delay is reported.

General Note:
DNE – Does Not Exist
Bold indicates LOS E or F operations.

SIGNALIZED		UNSIGNALIZED	
Delay	LOS	Delay	LOS
0.0 ≤ 10.0	A	0.0 ≤ 10.0	A
10.1 to 20.0	B	10.1 to 15.0	B
20.1 to 35.0	C	15.1 to 25.0	C
35.1 to 55.0	D	25.1 to 35.0	D
55.1 to 80.0	E	35.1 to 50.0	E
≥ 80.1	F	≥ 50.1	F

TABLE 3–3
EXISTING SEGMENT OPERATIONS

Segment	General Plan Classification [a]	Functional Classification [b]	LOS E [c] Capacity	Volume [d]	LOS [e]	V/C [f]
Vista Murrieta						
South of Los Alamos	Collector	2-Ln Collector	13,000	100	A	0.008
Medical Center Drive						
Sparkman Ct to Hancock Ave	Unclassified 2-Ln Road	2-Ln Collector	13,000	2,470	A	0.190
Murrieta Hot Springs Rd						
Madison Ave to I-15 Ramps	Augmented Urban Arterial	6-Ln Urban Arterial	53,900	41,310	C	0.766
I-15 Ramps to Sparkman Ct	Augmented Urban Arterial	8-Ln Aug Urban Art	71,800	52,610	C	0.733
Sparkman Ct to Hancock Ave	Augmented Urban Arterial	7-Ln Aug Urban Arterial	62,850	50,200	B	0.699
Hancock Ave to I-215 Ramps	Augmented Urban Arterial	7-Ln Aug Urban Arterial	62,850	57,830	D	0.805
I-215 Ramps to Alta Murrieta Dr	Multi Modal Transportation Cor	6-Ln Multi Modal Transp Cor	53,900	**61,570**	**F**	1.142
Sparkman Court						
Vista Murrieta Rd to Walsh Center Dr	Major Road	2-Ln Collector	13,000	0	A	0.000
Walsh Center Dr to Medical Center Dr	Major Road	2-Ln Collector	13,000	340	A	0.026
Medical Center Dr to Murrieta Hot Springs Rd	Major Road	2-Ln Collector	13,000	2,760	A	0.212

Continued on the Next Page

TABLE 3–3
EXISTING SEGMENT OPERATIONS

Segment	General Plan Classification [a]	Functional Classification [b]	LOS E [c] Capacity	Volume [d]	LOS [e]	V/C [f]
Continued from the Previous Page						
Hancock Avenue						
Los Alamos Rd to Parkcrest Dr	Major Road	4-Ln Major Road	34,100	11,690	A	0.343
Parkcrest Dr to Walsh Center Dr	Major Road	4-Ln Major Road	34,100	12,910	A	0.379
Walsh Center Dr to Medical Center Dr	Major Road	4-Ln Major Road	34,100	13,470	A	0.395
Medical Center Dr to Murrieta Hot Springs Rd	Major Road	4-Ln Major Road	34,100	12,830	A	0.376

Footnotes:

a. The City of Murrieta roadway General Plan classification.
b. The City of Murrieta roadway classification at which the roadway currently functions.
c. The capacity of the roadway at Level of Service E.
d. Existing daily segment volumes from *Table 3-1*.
e. Level of Service.
f. The Volume to Capacity ratio.

General Notes:

Daily Roadway Capacity Values that were not provided by the *City of Murrieta* were calculated by LLG
Bold indicates LOS E or F operations.

TABLE 3-4
EXISTING 95TH PERCENTILE QUEUE

Intersection	Control Type	Southbound				Westbound				Northbound				Eastbound			
		Right		Left		Right		Left		Right		Left		Right		Left	
		Store	Queue	Store	Queue	Store	Queue	Store	Queue	Store	Queue	Store	Queue	Store	Queue	Store	Queue
1. Sparkman Ct / Walsh Center Dr	TWSC	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[b]	[b]	[a]	[a]	[a]	[a]	[a]	[a]
3. Hancock Ave / Walsh Center Dr	TWSC	[b]	[b]	[a]	[a]	[a]	[a]	>200	[a]	[a]	[a]	230	1	[c]	[c]	[c]	[c]
4. Hancock Ave / Medical Center Dr	Signal	100	53	150	90	145	0	100	**115**	[b]	[b]	120	111	[e]	[e]	140	**162**
5. Sparkman Ct / Medical Center Dr	TWSC	[a]	[a]	>250[d]	0	[e]	[e]	[e]	[e]	[b]	[b]	[a]	[a]	[a]	[a]	[a]	[a]
6. Murrieta Hot Springs Rd / Madison Ave	Signal	[b]	[b]	170[f]	**265**	580	226	250[f]	218	170	112	100[f]	34	[b]	[b]	100[f]	88
7. I-15 SB Ramps / Murrieta Hot Springs Rd	Signal	>500	162	>900	421	>500	0	[a]	[a]	[a]	[a]	[a]	[a]	>500	0	[a]	[a]
8. I-15 NB Ramps / Murrieta Hot Springs Rd	Signal	[a]	[a]	[a]	[a]	1900	1048	[a]	[a]	>500	58	>600	168	[a]	[a]	500	430
9. Murrieta Hot Springs Rd / Monroe Ave	Signal	150	16	[a]	[a]	[b]	[b]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	200	50
10. Murrieta Hot Springs Rd / Hancock Ave	Signal	370[g]	21	120[f]	245[h]	150	76	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	200[f]	123

Continued on the Next page

TABLE 3-4 (CONTINUED)
EXISTING 95TH PERCENTILE QUEUE

Intersection	Control Type	Southbound				Westbound				Northbound				Eastbound			
		Right		Left		Right		Left		Right		Left		Right		Left	
		Store	Queue	Store	Queue	Store	Queue	Store	Queue	Store	Queue	Store	Queue	Store	Queue	Store	Queue
Continued from the previous page																	
11. I-215 SB Ramps / Murrieta Hot Springs Rd	Signal	>600	296	>700	342	>500	0	[a]	[a]	[a]	[a]	[a]	[a]	>500	0	[a]	[a]
12. I-215 NB Ramps / Murrieta Hot Springs Rd	Signal	[a]	[a]	[a]	[a]	>500	8	[a]	[a]	>500	160	>500	85	>500	0	[a]	[a]
13. Murrieta Hot Springs Rd / Alta Murrieta Dr	Signal	220	**297**	100[f]	**157**	250	67	225[f]	86	400	0	330[e]	226	[b]	[b]	290[f]	287
14. Vista Murrieta Rd / Project Driveway #2	TWSC [d]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]
15. Monroe Ave / Project Driveway #3	TWSC [d]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]

Footnotes:

a. Movement does not exist.
b. Shared through/right movement.
c. Shared left/through/right movement.
d. Shared left/through movement.
e. Shared left/right movement.
f. Dual left-turn lanes.
g. Dual right-turn lanes.
h. Not a deficiency since there is a center two-way-left-turn lane.

General Notes:

Longer of AM and PM queue reported.
Green highlight indicates existing queuing deficiency.

3.6 Existing Bicycle Facilities

Currently, there is a Class II bike lane on Hancock Avenue from Medical Center Drive to Los Alamos Road. South of Medical Center Drive, there are no bike lanes approaching Murrieta Hot Springs Road. No bike lanes are provided on Murrieta Hot Springs Road, Sparkman Court, Vista Murrieta or Walsh Center Drive.

Per the City of Murrieta General Plan, Class II bike lanes are planned for the entirety of Hancock Avenue. Additionally, a Class II bike lane is planned for Murrieta Hot Springs Road.

3.7 Transit Facilities

The Riverside Transit Agency (RTA) operates within the study area. A description of the transit services within the Project vicinity are as follows:

Riverside Transit Agency (RTA)

Bus stops providing route signage and benches are located near the intersection of Hancock Avenue and Medical Center Drive on both sides of the street. Based on information provided by the Riverside Transit Authority (RTA), ridership at these stops is low with a daily average of five boardings/ five alightings northbound along the route and six boardings/ six alightings in the southerly direction.

City Route 61:

- Route 61 provides service from Perris to Temecula via Promenade Mall, Hancock Avenue & Los Alamos Road, McElwain at Super Target, Mt. San Jacinto College Menifee, Cherry Hills & Bradley, Encanto & McCall, and Perris Station Transit Center. The route traverses the cities of Perris, Menifee, Murrieta, and Temecula.
- During the weekday AM and PM peak hours, Route 61 has approximate headways of 80 minutes in the northbound and southbound directions.

City Route 23:

- Route 23 provides service from Temecula to Wildomar via Winchester Road, Murrieta Hot Springs Road, and Hancock Avenue. Route 23 travels along other roads outside of the project area as well. The route traverses the cities of Wildomar, Murrieta, and Temecula.
- During the weekday AM and PM peak hours, Route 23 has approximate headways of 70 minutes in the northbound and southbound directions.

Appendix D contains the most current public transit route schedules and maps for the aforementioned bus routes. It should be noted that the bus stops nearest to the Project site are located along Hancock Avenue, just north of Murrieta Hot Springs Road.

3.8 Pedestrian Facilities

Continuous sidewalks are provided along both sides of Hancock Avenue, Medical Center Drive, and Murrieta Hot Springs Road. A continuous sidewalk is on the south curb of Walsh Center Drive.

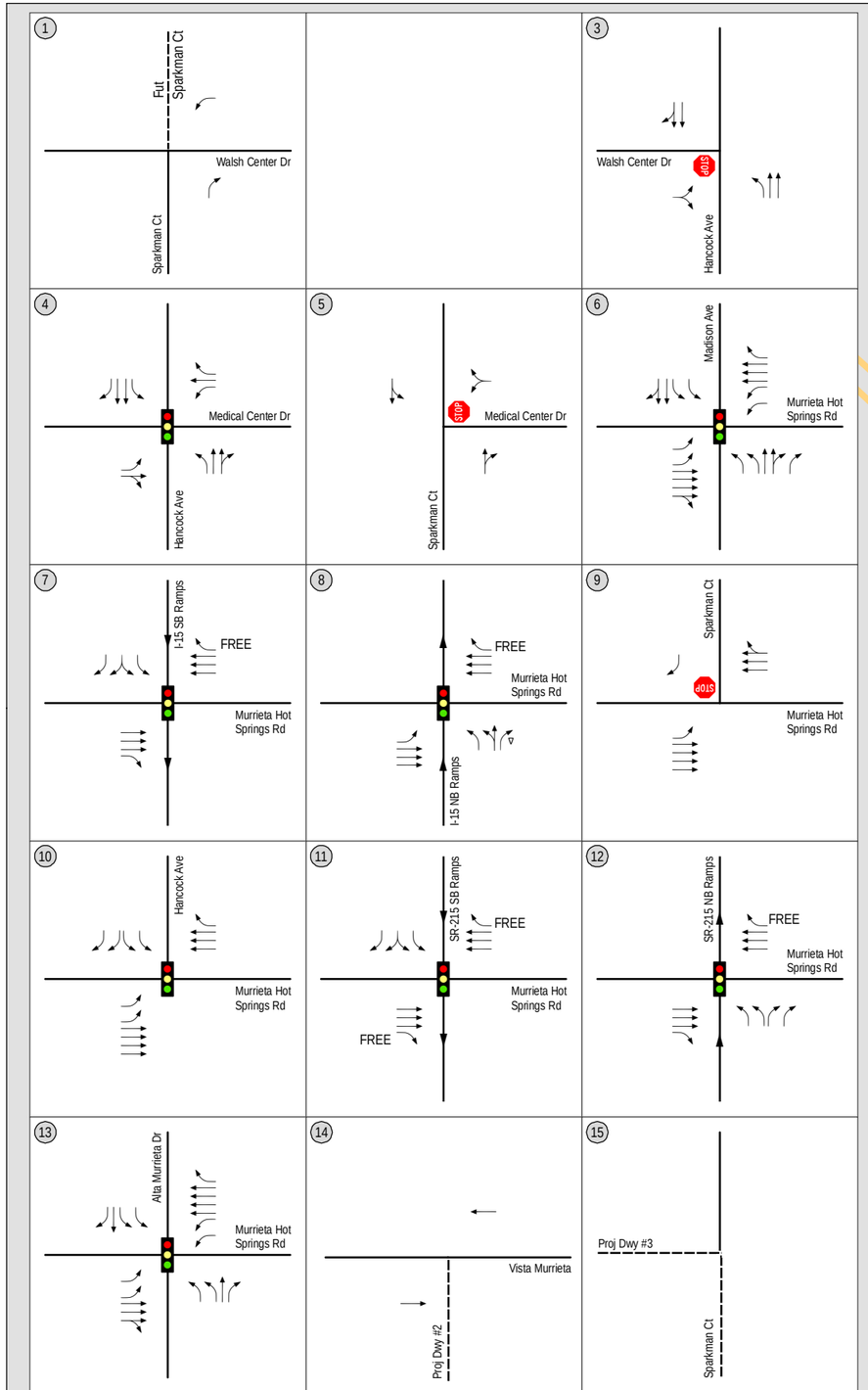
No sidewalks are provided on the following study are roadways as described below:

- The west curb of Sparkman Court
- North curb of Walsh Center Drive except for a portion 300 feet west of Hancock Avenue
- Both sides of Vista Murrieta, except for a portion 1,300 feet south of Los Alamos

ADA compliant curb ramps are provided at the signalized intersections of Murrieta Hot Springs Road/ Hancock Avenue and Medical Center Drive/ Hancock Avenue.

The signalized intersection of Murrieta Hot Springs Road/ Hancock Avenue allows pedestrian crossing along the north leg of the intersection. There are no land uses on the south side of Murrieta Springs Road that pedestrians are currently destined to or oriented from that would necessitate a crossing along Murrieta Hot Springs Road. A flashing pedestrian signal is provided for the existing striped crosswalk.

The signalized intersection of Medical Center Drive/ Hancock Avenue provides striped pedestrian crossings on all four legs of the intersection controlled by pedestrian signals.



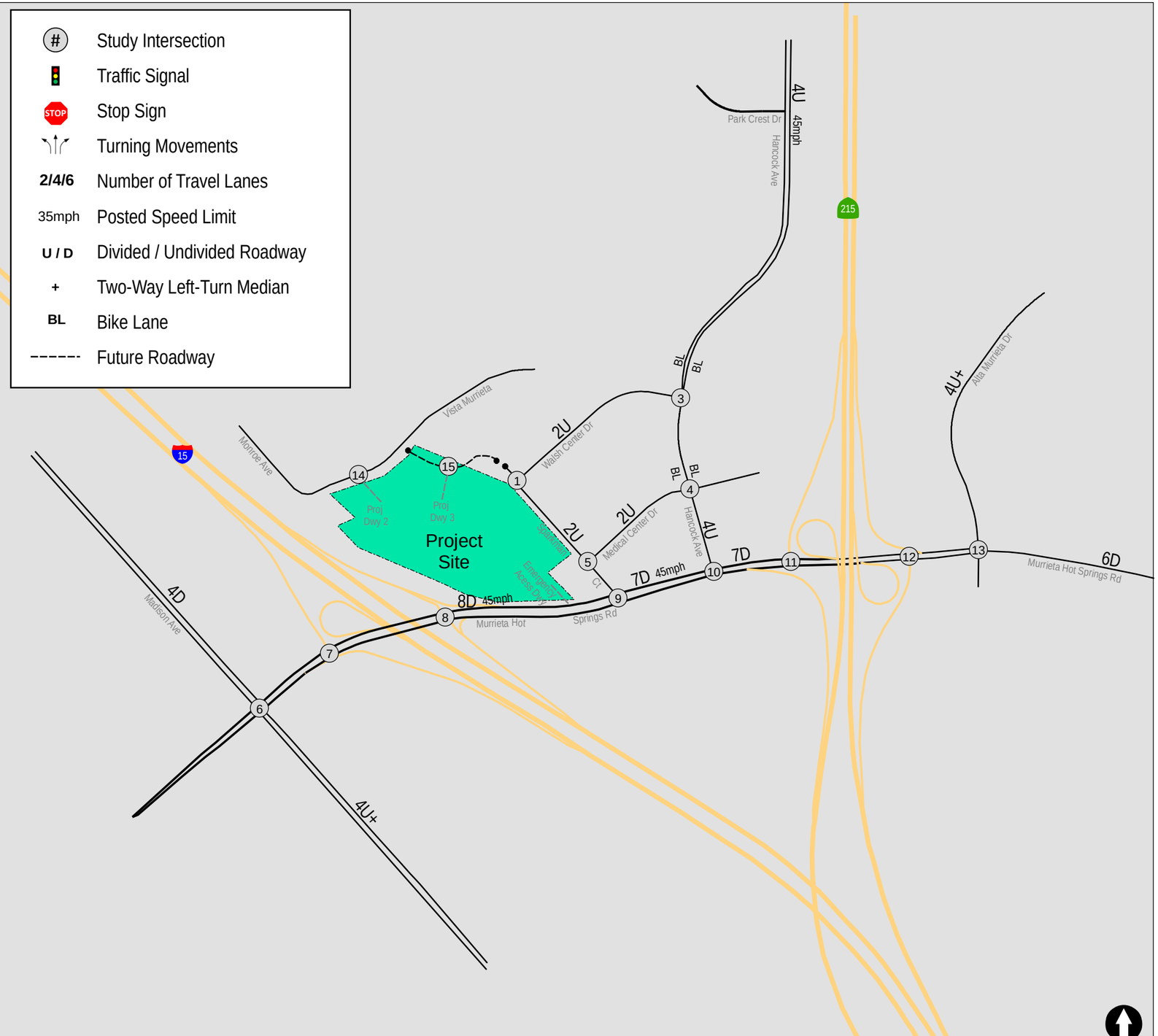


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Figure 3-1

Existing Conditions Diagram

The Terraces at Murrieta

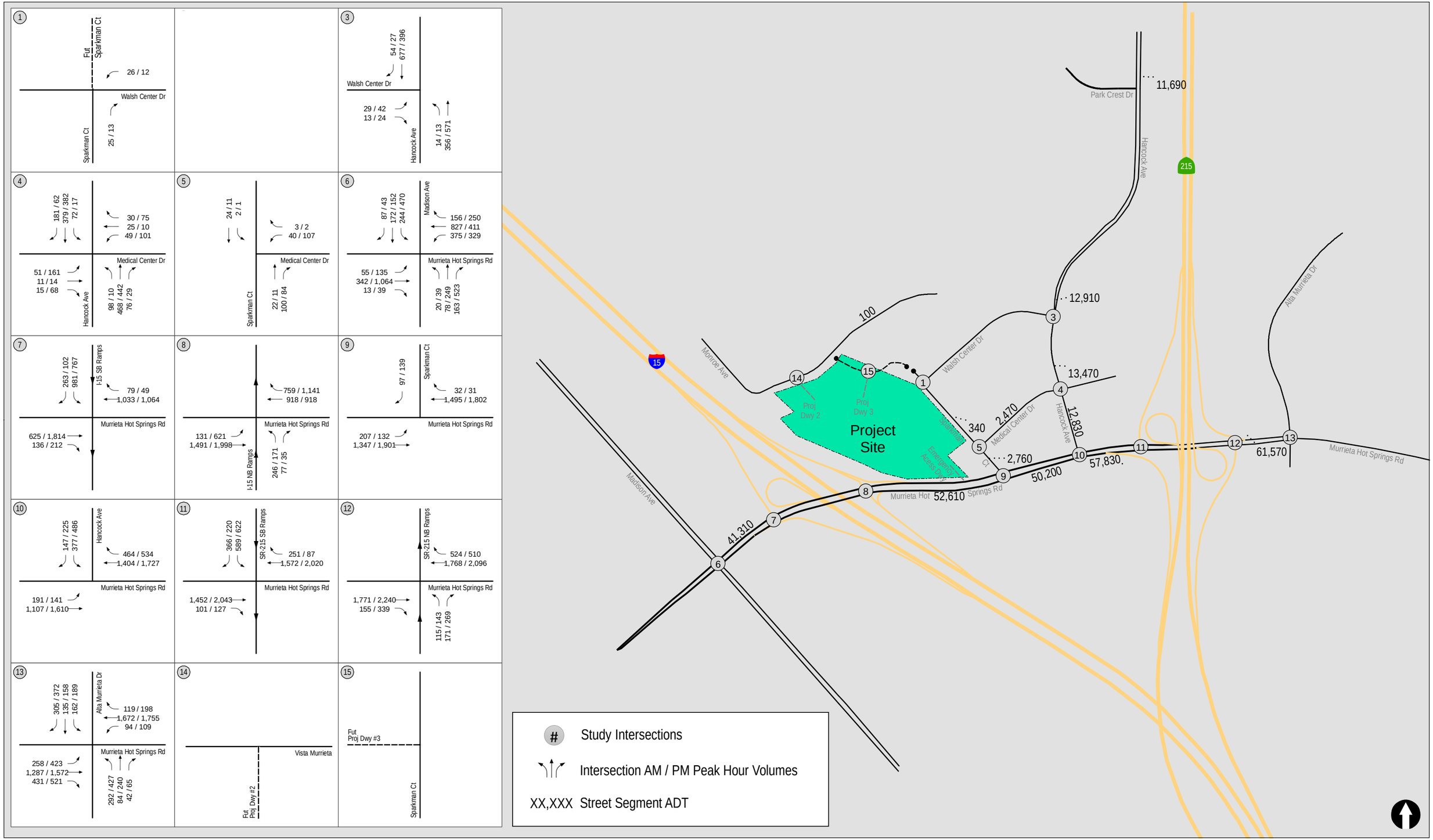

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Figure 3-2

Existing Traffic Volumes

The Terraces at Murrieta

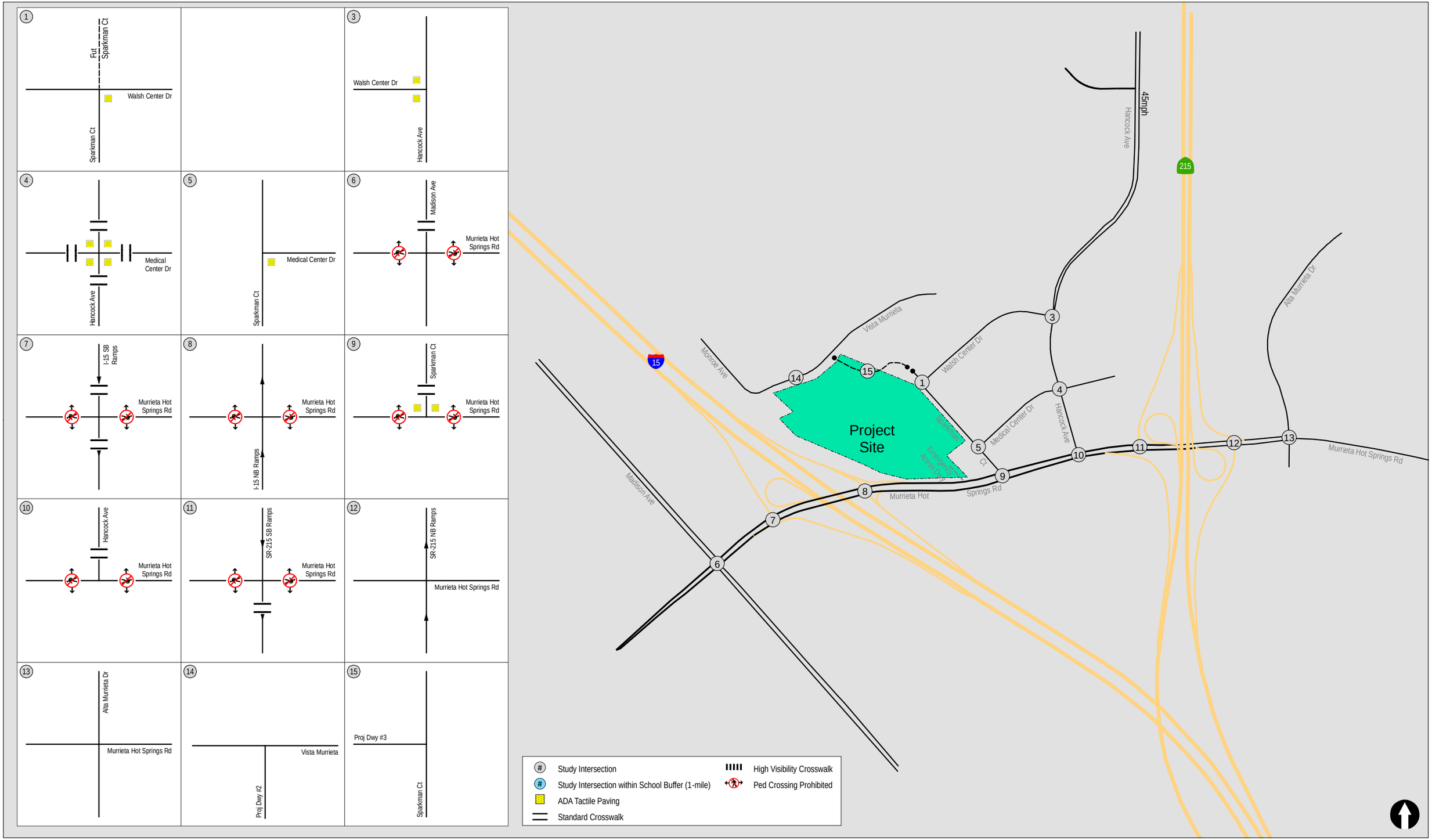

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Figure 3-3

Existing Pedestrian Conditions

The Terraces at Murrieta

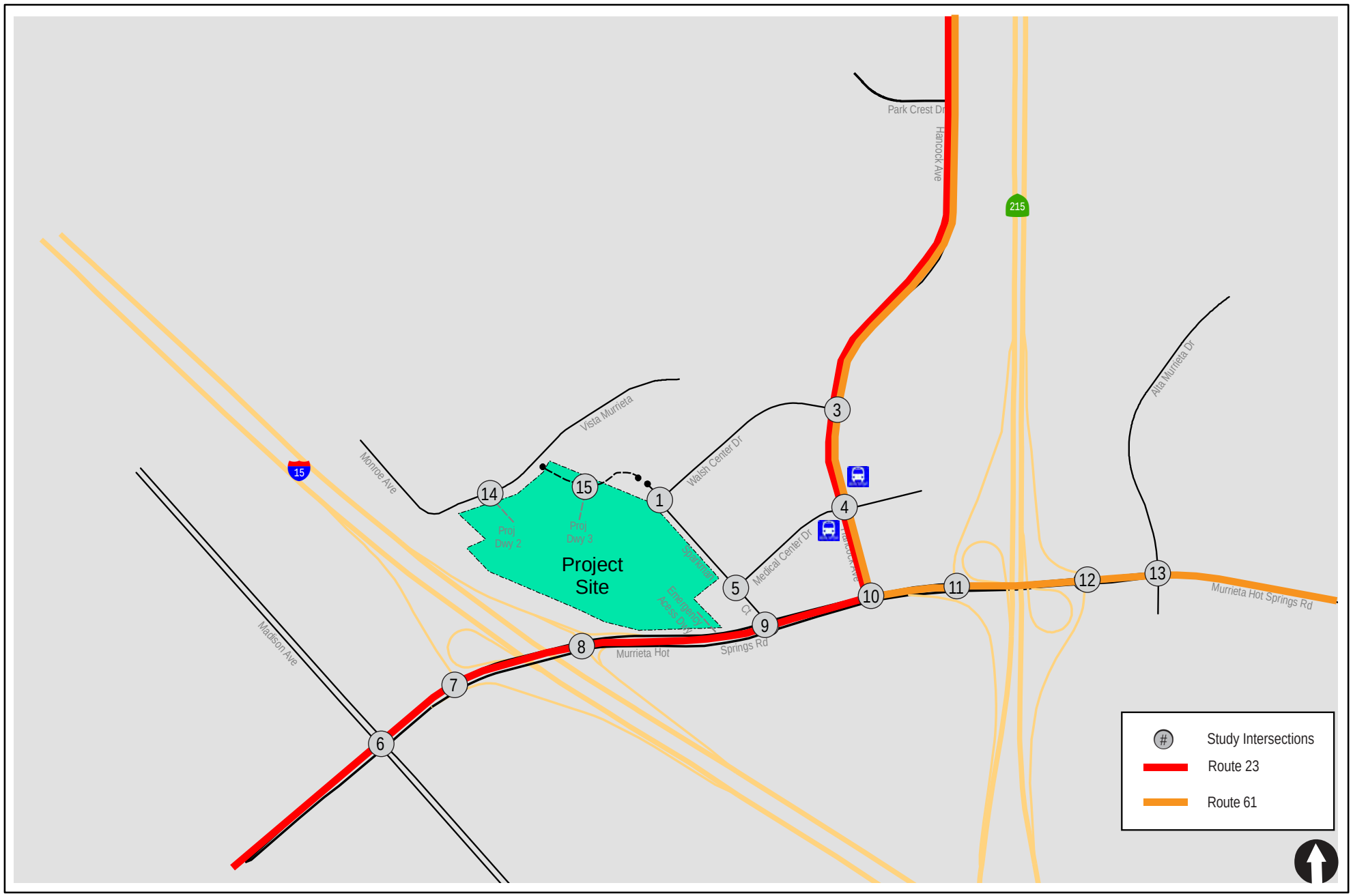

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Figure 3-4

Transit Conditions

THE TERRACES AT MURRIETA

4.0 PROJECT TRIP GENERATION/DISTRIBUTION/ASSIGNMENT

4.1 Trip Generation

Traffic generation is expressed as vehicle trip ends, defined as one-way vehicular movements, either entering or exiting the generating land use. Generation equations and/or rates used in the traffic forecasting procedure are found in the 11th Edition of *Trip Generation*, published by the Institute of Transportation Engineers (ITE). Land Use 221: Multifamily Housing Mid-Rise trip rates were used to estimate the trip generation for the Proposed Project.

Table 4-1 summarizes the trip generation rates used in forecasting the vehicular trips generated by the proposed Project and presents the forecast daily and peak hour project traffic volumes for a "typical" weekday.

Project Phase 1 – Year 2025

As shown in *Table 4-1*, in the Year 2025, Project Phase 1 is estimated to generate 3,064 daily trips, with 275 trips (63 inbound, 212 outbound) in the AM peak hour and 254 trips (155 inbound, 99 outbound) in the PM peak hour.

Project Phase 2 – Year 2028

As shown in *Table 4-1*, in the Year 2028, Project Phase 2 is estimated to generate 1,132 daily trips, with 97 trips (22 inbound, 75 outbound) in the AM peak hour and 97 trips (59 inbound, 38 outbound) in the PM peak hour.

It should be noted that the trip generation methodology and forecasts were approved by City of Murrieta staff prior to proceeding with further analysis.

Entire Project – Year 2028

The Entire Project is estimated to generate a total of approximately 4,196 daily trips, with 372 trips (85 inbound, 287 outbound) in the AM peak hour and 351 trips (214 inbound, 137 outbound) in the PM peak hour on a "typical" weekday.

It should be noted that the trip generation methodology and forecasts were approved by City of Murrieta staff prior to proceeding with further analysis.

4.2 Project Traffic Distribution and Assignment

Figure 4-1 and ***Figure 4-2*** depict the general directional traffic distribution patterns for Project Phase 1 and the Entire Project, respectively. The trip distribution was approved by City of Murrieta staff prior to proceeding with further analysis. Project traffic volumes both entering and exiting the project site have been distributed and assigned to the adjacent street system based on the following considerations:

- Directional flows on the freeways in the immediate vicinity of the project site (i.e. I-15 and I-215 Freeways),

- The site's proximity to major traffic carriers (i.e. Murrieta Hot Springs Road and Hancock Road, etc.),
- Expected localized traffic flow patterns based on adjacent street channelization and presence of traffic signals, and
- Ingress/egress availability at the project site.
- Sparkman Court will be a cul-de-sac just south of Vista Murrieta and will not connect to Vista Murrieta.

Project Phase 1 traffic volumes are presented in ***Figure 4-3***, while ***Figure 4-4*** depicts the Entire Project traffic volumes.

4.3 Grading / Soil Importation Trips

The project would require approximately 4,300 cubic yards of imported material. Assuming 16 cubic yards per truck, a total of 538 one-way truck trips would be required. The site preparation and grading phases, during which fill material will be delivered to the site, is projected to occur over 105 days. Assuming truck trips occur at the same rate each day, approximately 5 daily trips would be required to deliver the fill material. The likely route of travel will be Murrieta Hot Springs Road to either I-5 or I-215. The temporary addition of 5 daily truck trips to Murrieta Hot Springs Road and Sparkman Court is not expected to affect the intersections and segments along the route significantly.

TABLE 4-1
TRIP GENERATION - TERRACES

Land Use	Size	Daily Trip Ends (ADTs)		AM Peak Hour					PM Peak Hour				
		Rate [a]	Volume	Rate	In:Out Split [a]	Volume			Rate	In:Out Split	Volume		
						In	Out	Total			In	Out	Total
Phase 1													
Apartments	652 DU	[b]	3,064	[b]	23 : 77	63	212	275	[b]	61 : 39	155	99	254
Phase 2													
Apartments	247 DU	[b]	1,132	[b]	23 : 77	22	75	97	[b]	61 : 39	59	38	97
Entire Project (Phases 1 & 2)	**899 DU**		**4,196**			**85**	**287**	**372**			**214**	**137**	**351**

Footnotes:

a. Trip Generation rates are based on the 11th Edition of the Trip Generation Manual, Institute of Transportation Engineers.
b. Rates for Land Use 221, Multifamily Housing (Mid-Rise). Daily: T = 4.77(X) – 46.46; AM: T = 0.44(X) – 11.61; and PM: T = 0.39(X) + 0.34.

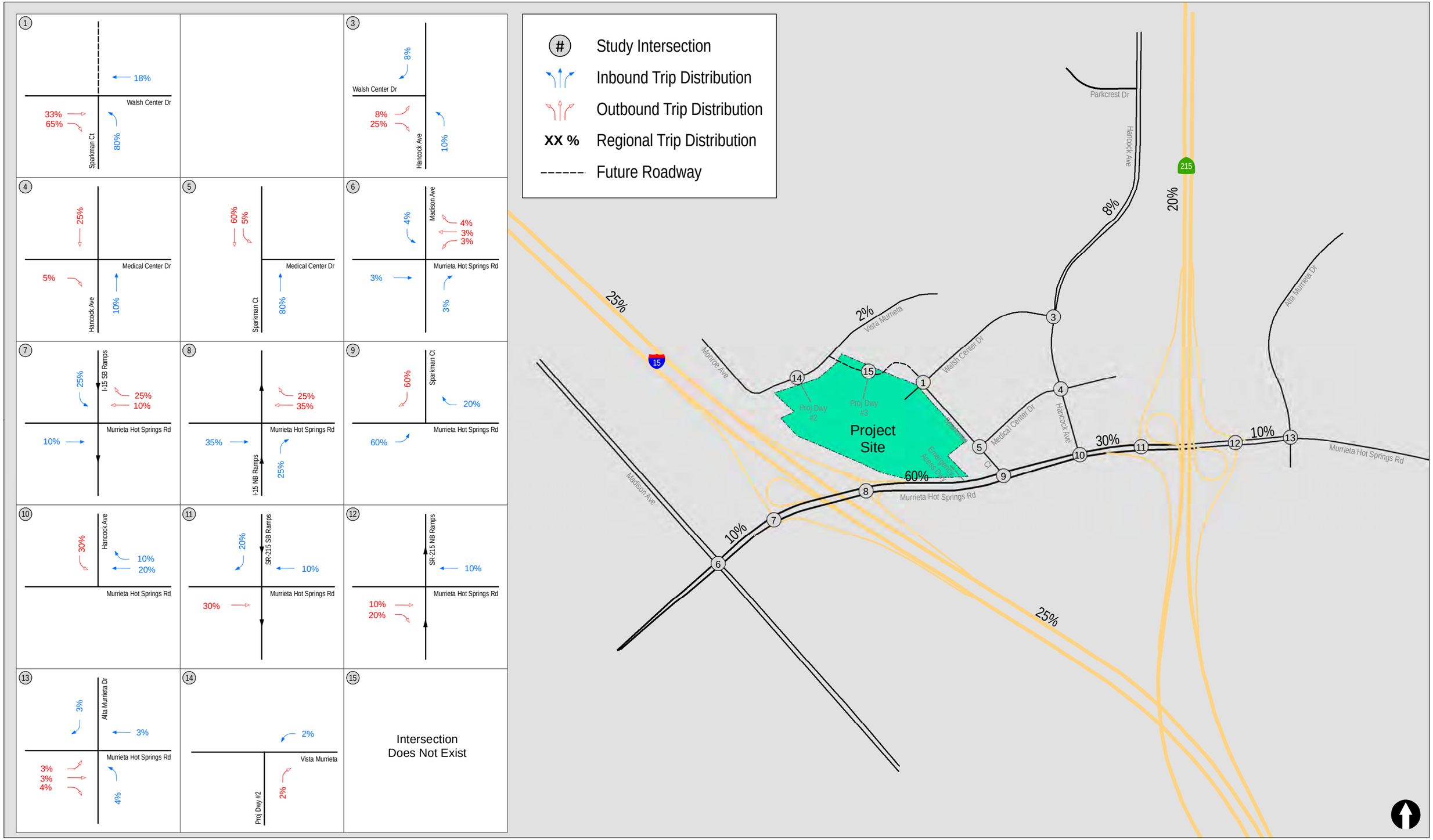

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Figure 4-1

Project Phase I Distribution

The Terraces Murrieta

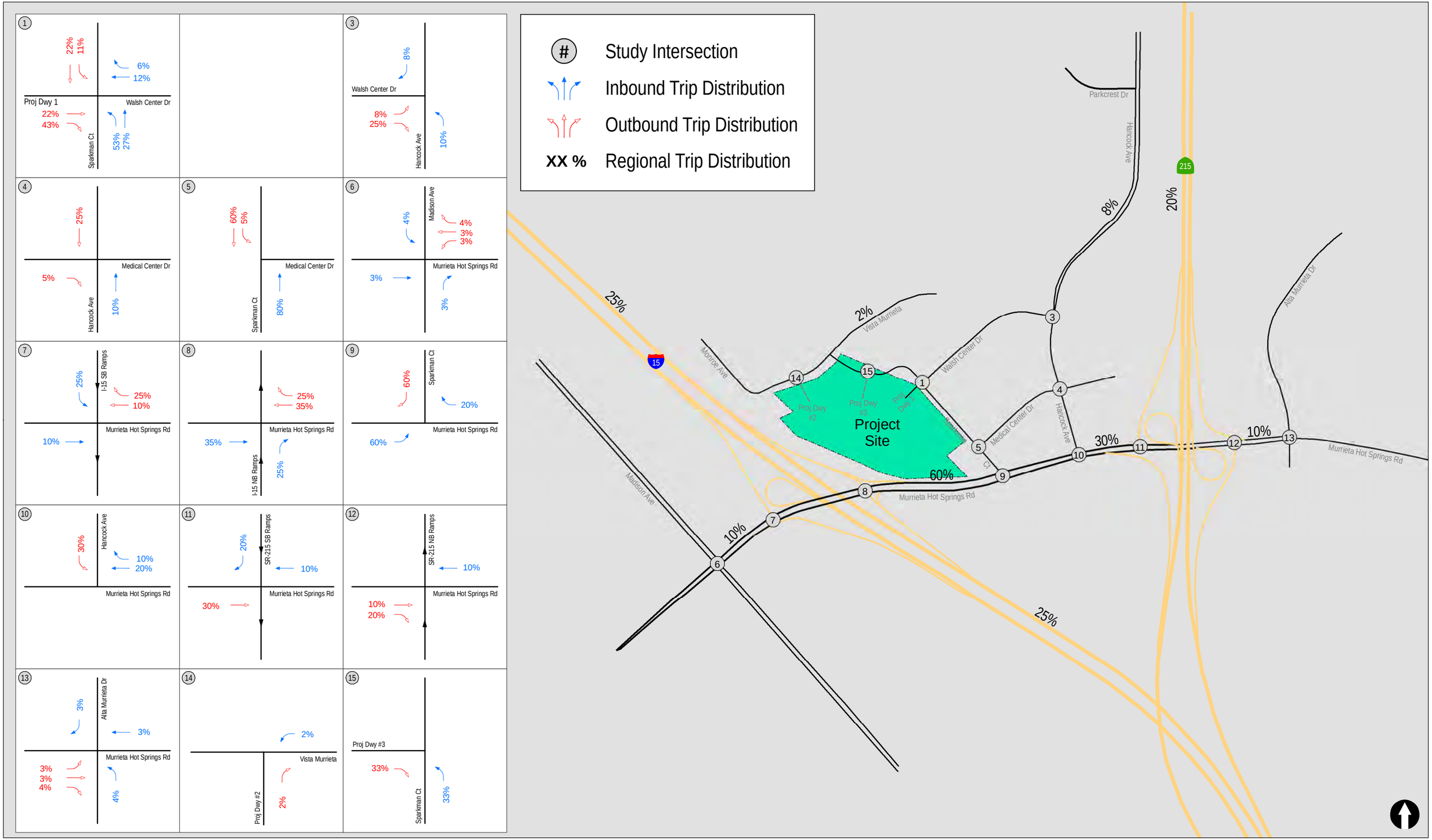

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Figure 4-2

Entire Project Distribution

The Terraces Murrieta

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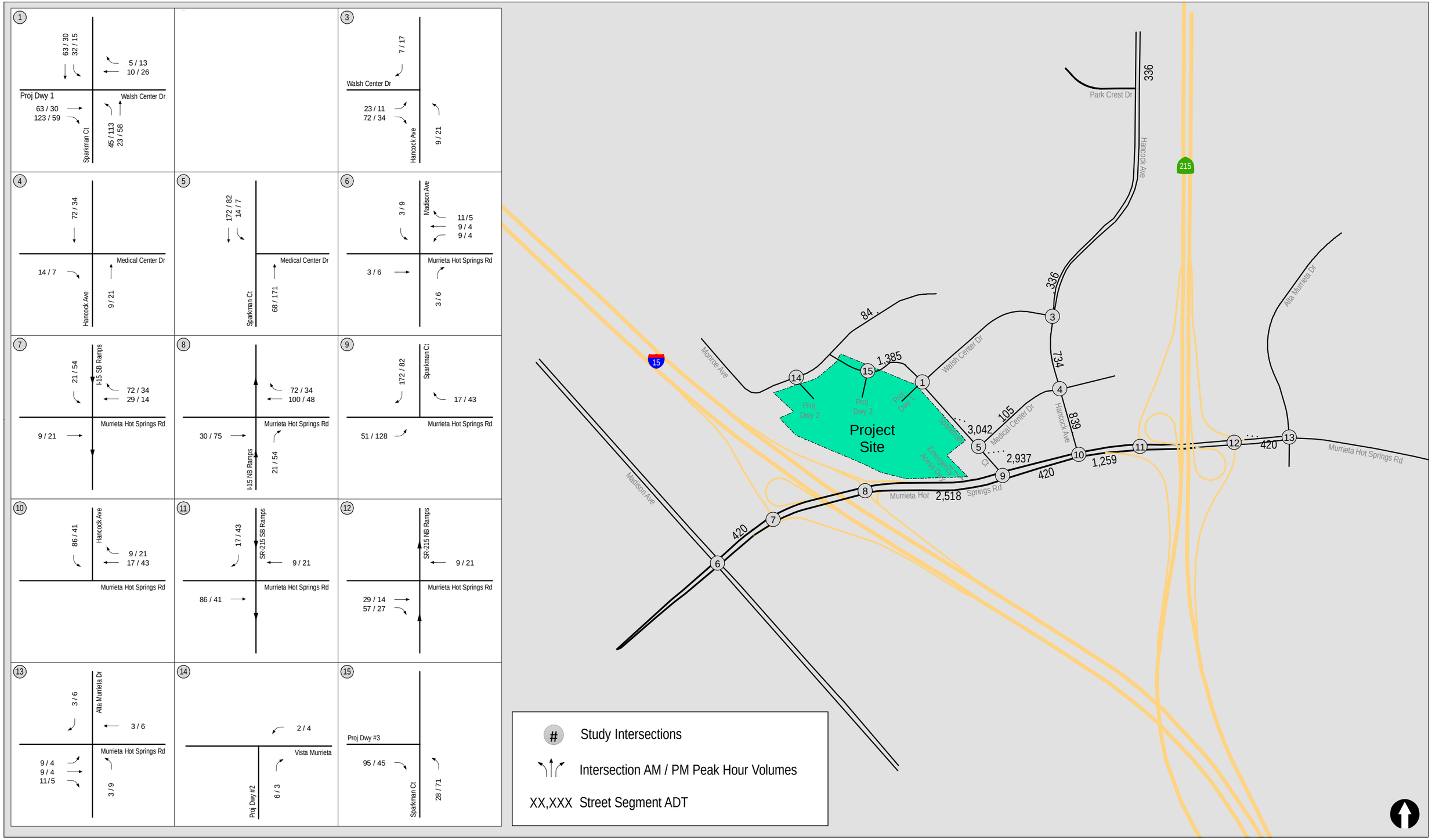
Figure 4-3

Project Phase I Traffic Volumes

The Terraces at Murrieta



LINSCOTT LAW & GREENSPAN engineers

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Figure 4-4

Entire Project Traffic Volumes

The Terraces at Murrieta

5.0 NEAR-TERM (OPENING YEAR 2025) TRAFFIC VOLUMES

5.1 Approved (Cumulative) Projects Trip Generation

The list of cumulative projects in the Project vicinity, that would contribute traffic to the Project study area intersections and segments was obtained from the City of Murrieta. Following are brief descriptions of the cumulative projects.

1. Los Alamos Community (DP-2014-490)

The proposed Los Alamos Community Project includes the development of approximately 542 multi-family residential dwelling units. The site is located south of Los Alamos Road and east of Monroe Avenue in the City of Murrieta. The Project is estimated to generate 3,604 daily trips with 276 AM peak hour trips (54 inbound and 222 outbound) and 336 PM peak hour trips (217 inbound and 119 outbound).

2. Sial Medical Plaza (DP-2016-785)

The Sial Medical Plaza Project is proposed to consist of a 2-story 20,826 square feet of Medical Office use. The Project is located at 25142 Hancock Avenue, in the City of Murrieta. The Project is estimated to generate 725 daily trips with 58 AM peak hour trips (45 inbound and 13 outbound) and 72 PM peak hour trips (20 inbound and 52 outbound).

3. Corporate Crossroads/Whittaker Office Complex (DP-02-474/RPO-007-2570)

The proposed Corporate Crossroad/Whittaker Office Complex Project includes the development of four buildings with a total of 273,120 sq. ft. Two of the four buildings are currently constructed and occupied. Therefore, only 50% of the traffic generated by this project has been included in the analysis. The site is located on a vacant parcel between Hancock Avenue and Interstate 215 (I-215) Freeway, in the "Golden Triangle" area of the City of Murrieta. The Project is estimated to generate 1,436 daily trips with 208 AM peak hour trips (183 inbound and 25 outbound) and 193 PM peak hour trips (33 inbound and 160 outbound).

4. Jefferson & Ivy (DP-2017-1397)

The Ranch Project is proposed to be developed with approximately 333 multi-family residential dwelling units by 2021. The site is located at the northwest corner of Jefferson Avenue / Ivy Street intersection in the City of Murrieta. The Project is estimated to generate 2,214 daily trips with 170 AM peak hour trips (33 inbound and 137 outbound) and 206 PM peak hour trips (133 inbound and 73 outbound).

5. Downtown Market Place (DP-2018-1741)

The Downtown Marketplace Project proposes a 51,455 square foot three-story commercial and office building. The site is located on the southeast corner of Washington Avenue and Ivy Street in the City of Murrieta, California. The Project is estimated to generate 704 daily trips with 74 AM peak hour trips (61 inbound and 13 outbound) and 75 PM peak hour trips (19 inbound and 56 outbound).

6. Mar Vista Business Park Development (DP-2018-1792)

The Mar Vista Business Park Development Project is proposed to develop 5 individual warehouse buildings. The site is located at the intersection of Jefferson Avenue and Fig Avenue in the southwest corner on a vacant lot in the City of Murrieta, California. The Project is estimated to generate a maximum of 187 daily trips with 26 AM peak hour trips (23 inbound and 3 outbound) and 24 PM peak hour trips (3 inbound and 21 outbound).

7. Murrieta Town Shopping Center Expansion (DP-2018-1802)

The Murrieta Town Shopping Center Expansion Project is proposed to construct an additional two new buildings (10,000 square feet and 5,000 square feet) to the existing Murrieta Town Shopping Center. The site is located on the northwest quadrant of Murrieta Hot Springs Road and Alta Murrieta Drive in the City of Murrieta, California. The Project is estimated to generate 566 daily trips with 45 AM peak hour trips (22 inbound and 23 outbound) and 64 PM peak hour trips (32 inbound and 32 outbound).

8. Jefferson & Fig (DP-2019-1919)

The Jefferson & Fig Project is proposed to develop a Multi-Use Fueling Station with a carwash. The proposed site includes a 3,592 square foot convenience store with 12 fueling stations and a 960 square foot carwash. The site is located at the southwest corner of Jefferson Avenue / Fig Street intersection in the City of Murrieta. The Project is estimated to generate 2,355 daily trips c with 238 AM peak hour trips (118 inbound and 120 outbound) and 197 PM peak hour trips (98 inbound and 99 outbound).

9. Hotel Murrieta (DP-2019-2031)

The Hotel Murrieta Project is proposed to develop a 257-room hotel. The site is generally located between Monroe Avenue and the I-15/I-215 interchange between Newton Azrak and Fig Street in the City of Murrieta. The Project is estimated to generate 2,149 daily trips with 121 AM peak hour trips (71 inbound and 50 outbound) and 155 PM peak hour trips (79 inbound and 76 outbound).

10. Hancock Children's Clinic (DP-2020-2206)

The Hancock Children’s Clinic Project is proposed to develop a 3,76o square foot Children’s Medical Office Building. The site is located along Hancock Avenue, between Avenida Venida and Parkcrest Drive. The Project is estimated to generate 131 daily trips with 13 AM peak hour trips (8 inbound and 5 outbound) and 15 PM peak hour trips (6 inbound and 9 outbound).

11. Rancho Springs Medical Center (DP-2020-2199)

The Rancho Spring Medical Center Project is proposed to expand the existing 170,995 square foot hospital/medical center by an additional 36,000 square feet. The site is generally bordered to the south by Murrieta Hot Springs Road, to the east by Interstate 215, Hancock Avenue to the west, and to the north by undeveloped parcels. The Project is estimated to generate 461 daily trips with 38 AM peak hour trips (26 inbound and 12 outbound) and 42 PM peak hour trips (13 inbound and 29 outbound).

12. Jefferson Apartments (DP-2020-2170)

The Jefferson Apartments Project is proposed to develop 160 dwelling units of market rate apartments. The site is located along Jefferson Avenue and is slightly north of Murrieta Hot Springs Road in the City of Murrieta. The Project is estimated to generate 1,172 daily trips with 74 AM peak hour trips (17 inbound and 57 outbound) and 90 PM peak hour trips (56 inbound and 33 outbound).

13. Beyond Food Mart (DP-2020-2171)

The Beyond Foot Mart Project is proposed to develop a 7,274 square foot super convenience store/gas station with a drive through window, 16 fueling positions, and an 1,893 square foot automated car wash. The site is located at the northeast corner of Jackson Avenue and Murrieta Hot Springs Road in the City of Murrieta. The Project is estimated to generate 2,766 daily trips (including a 25% pass-by reduction) with 337 AM peak hour trips (169 inbound and 168 outbound) and 275 PM peak hour trips (138 inbound and 137 outbound).

14. U-Haul (DP-2020-2359)

The U-Haul Project is proposed to develop an 11,609 square foot U-Haul Warehouse Building. The site is located at 41458 Los Alamos Road in the City of Murrieta, California. The Project is estimated to generate 21 daily trips with 2 AM peak hour trips (1 inbound and 1 outbound) and 2 PM peak hour trips (1 inbound and 1 outbound).

15. Triangle Project

The Triangle Specific Plan bounded by I-15 to the west, 1-215 to the east and Murrieta Hot Springs Road to the north was first approved by City Council back in 2008, and then subsequently again in 2013. This project has not begun construction on any of the five phases of development. New development plans were submitted to the City in 2023. The Project consists of 268,464 SF retail uses and is calculated to generate 6,158 daily trips with 292 AM peak hour trips (181 inbound and 111 outbound) and 1,149 PM peak hour trips (552 inbound and 597 outbound). The Triangle Project is assumed to be open after the Year 2025 and is therefore included in the Year 2028 cumulative projects traffic.

16. QMC Murrieta Multi-Family Project

The QMC Murrieta Multi-Family Project proposes the construction of 390 apartment units. The site is located at the southeast corner of the Murrieta Hot Springs Road / Jefferson Avenue intersection in the City of Murrieta. The Project is estimated to generate 2,629 daily trips with 156 AM peak hour trips (37 inbound and 119 outbound) and 199 PM peak hour trips (125 inbound and 74 outbound).

17. Jefferson Multi-Family Project

The Jefferson Multi-Family Project proposes the construction of 851 apartment units. The site is located at the northeast corner of the Murrieta Hot Springs Road / Jefferson Avenue intersection in the City of Murrieta. The Project is estimated to generate 3,863 daily trips with 314 AM peak hour trips (72 inbound and 242 outbound) and 333 PM peak hour trips (203 inbound and 130 outbound).

18. Makena Hancock II Project

The Makena Hancock Project proposes the construction of a 31,600 SF medical Office Building at northwest corner of the Hancock Avenue and Walsh Center Drive in the City of Murrieta. The Project is estimated to generate 1,138 daily trips with 98 AM peak hour trips (77 inbound and 21 outbound) and 124 PM peak hour trips (37 inbound and 87 outbound).

19. Los Alamos / Vista Murrieta Apartments

The Los Alamos / Vista Murrieta Apartments Project proposes the construction of 120 apartment units. The site is located at the southwest corner of the Los Alamos Road / Vista Murrieta intersection, in the City of Murrieta. The Project is estimated to generate 809 daily trips with 48 AM peak hour trips (12 inbound and 36 outbound) and 61 PM peak hour trips (38 inbound and 23 outbound).

20. Vista Murrieta Apartments

The Vista Murrieta Apartments Project proposes the construction of 214 low-income apartment units. The site is located east of the future Monroe Avenue, between Vista Murrieta and Walsh Center Drive, in the City of Murrieta. The Project is estimated to generate 1,442 daily trips with 86 AM peak hour trips (21 inbound and 65 outbound) and 109 PM peak hour trips (69 inbound and 40 outbound).

21. Los Alamos SS and Retail

The Los Alamos SS and Retail Project proposes the construction of a mini warehouse, a variety store and a fast-food restaurant. The site is located at the northwest corner of the Los Alamos Road / Hospitality Place intersection in the City of Murrieta. The Project is estimated to generate 1607 daily trips with 111 AM peak hour trips (69 inbound and 42 outbound) and 145 PM peak hour trips (72 inbound and 73 outbound).

22. Monamos Apartments

The Monamos Apartments Project proposes the construction of 140 apartment units. The site is located at the southeast corner of the Monroe Avenue /Los Alamos Road intersection in the City of Murrieta. The Project is estimated to generate 1,025 daily trips with 65 AM peak hour trips (15 inbound and 50 outbound) and 79 PM peak hour trips (50 inbound and 29 outbound).

23. Jefferson South Multi-Family Project

The Jefferson South Apartments Project proposes the construction of 68 apartment units. The site is located southwest of Jefferson Avenue and north of Murrieta Hot Springs Road in the City of Murrieta. The Project is estimated to generate 446 daily trips with 28 AM peak hour trips (7 inbound and 21 outbound) and 35 PM peak hour trips (22 inbound and 13 outbound).

24. 24960 Adams Avenue Apartments Project

The 24960 Adams Avenue Apartments Project proposes the construction of 200 apartment units. The site is located at 24960 Adams Avenue in the City of Murrieta. The Project is estimated to generate

947 daily trips with 59 AM peak hour trips (17 inbound and 42 outbound) and 73 PM peak hour trips (44 inbound and 29 outbound).

25. Ivy House Residential Project

The Ivy House Residential Project proposes the construction of 62 single family units. The Project is estimated to generate 585 daily trips with 43 AM peak hour trips (11 inbound and 32 outbound) and 58 PM peak hour trips (37 inbound and 21 outbound).

26. 41705 Hawthorn Housing Project

The 41705 Hawthorn Housing Project proposes the construction of 96 apartment units. The site is located at 41705 Hawthorn Street in the City of Murrieta. The Project is estimated to generate 462 daily trips with 35 AM peak hour trips (10 inbound and 25 outbound) and 44 PM peak hour trips (26 inbound and 18 outbound).

27. Gierson Ranch Apartment Project

The Gierson Ranch Apartment Project proposes the construction of 107 apartment units. The site is located on the east side of Adams Avenue, north of Murrieta Hot Springs Road in the City of Murrieta. The Project is estimated to generate 721 daily trips with 43 AM peak hour trips (10 inbound and 33 outbound) and 55 PM peak hour trips (35 inbound and 20 outbound).

5.2 Summary of Cumulative Projects Trips

Table 5-1 summarizes the trip generation for the cumulative projects. As seen in *Table 5-1*, the 27 cumulative projects are estimated to generate a total of 40,322 daily trips with 3,058 AM peak hour trips (1,371 inbound and 1,688 outbound) and 4,342 PM peak hour trips (2,158 inbound and 2,185 outbound).

5.3 Ambient Growth

A portion of the increase in traffic on roadways includes vehicles that either originate or terminate from outside the study area and pass through the study area. In order to account for this traffic, an ambient growth of 2% per Year was applied to the existing traffic. This rate of ambient growth has been reviewed and approved by the City of Murrieta Transportation Department staff.

5.3.1 *Opening Year 2025 Volumes*

Year 2025 volumes were developed as follows:

1. The ambient growth of 8% (2% per Year from 2021 to 2025) was added to the existing (Year 2021) traffic as described above.

2. The trips generated by the cumulative projects were assigned to the Project study area intersections and segments.

3. The ambient growth and the cumulative projects traffic volumes were then added to the existing volumes to obtain the Year 2025 volumes without Project traffic.

4. The Project Phase 1 traffic volumes were then added to obtain the Year 2025 volumes with Project Phase 1 traffic volumes.

5.3.2 *Year 2028 Volumes*

Year 2028 volumes were developed as follows:

1. The ambient growth of 14% (2% per Year from 2021 to 2028) was added to the existing (Year 2021) traffic as described above.

2. The cumulative projects traffic volumes were then added to obtain the Year 2028 volumes without Project traffic.

3. The traffic volumes generated by the Entire Project were added to the above to obtain the Year 2028 volumes with Entire Project traffic volumes.

Figure 5-1 depicts the Cumulative Projects traffic volumes. ***Figure 5-2*** depicts the Near-Term (Opening Year 2025) without Project (with Ambient Growth and Cumulative Projects) traffic volumes while ***Figure 5-3*** depicts the Near-Term (Opening Year 2025) + Project Phase 1 traffic volumes. ***Figure 5-4*** depicts the Near-Term (Opening Year 2028) without Project (with Ambient Growth and Cumulative Projects) traffic volumes while ***Figure 5-5*** depicts the Near-Term (Opening Year 2025) + Entire Project traffic volumes.

TABLE 5–1
CUMULATIVE PROJECTS TRIP GENERATION SUMMARY

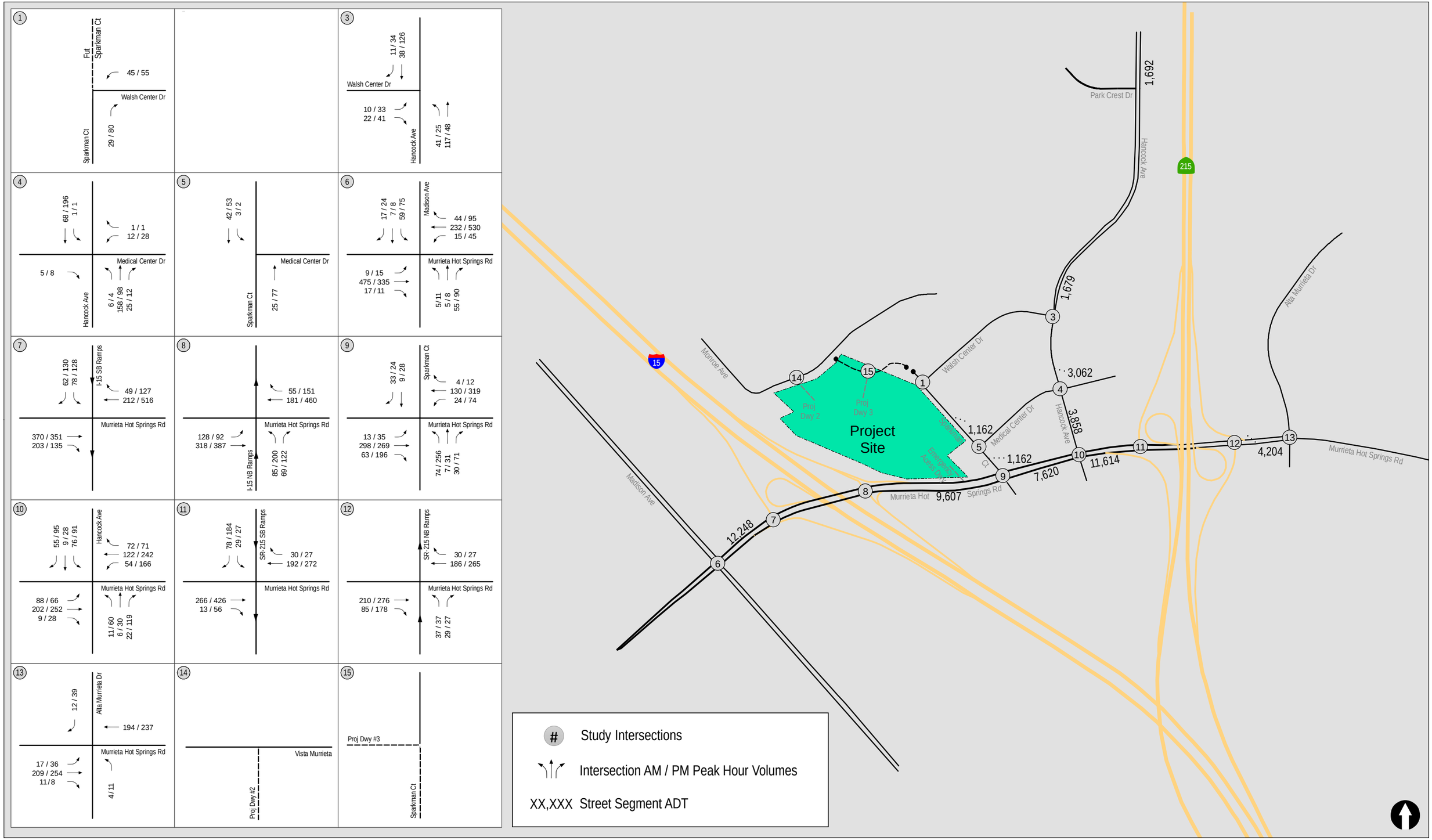
Project	Land Use	Size	Daily Volume	AM Peak Hour Volume			PM Peak Hour Volume		
				In	Out	Total	In	Out	Total
1. Los Alamos Community Plan (DP-2014-490)	Apartment	542 DU	3604	54	222	276	217	119	336
2. Sial Medical Plaza (DP-2016-785)	Medical Office	20.826 KSF	725	45	13	58	20	52	72
3. Whittaker Office Complex (DP-02-474/RPO-007-2570)	Office	118.56 KSF	1,436	183	25	208	33	160	193
4. Jefferson & Ivy (DP-2017-1397)	Apartment	333 DU	2214	33	137	170	133	206	339
5. Downtown Market Place (DP-2018-1741)	Commercial Office	51.455 KSF	704	61	13	74	19	56	75
6. Mar Vista Business Park (DP-2018-1792)	General Light Industrial	37.783 KSF	187	23	3	26	3	21	24
7. Murrieta Town Shopping Center Exp (DP-2018-1802)	Shopping Center	15 KSF	566	22	23	45	32	32	64
8. Jefferson & Fig (DP-2019-1919)	Super Convenience Market / Gas Stn	3.009 KSF	3009	149	149	298	124	125	249
	Automated Car Wash	0.131 KSF	131	9	5	14	7	7	14
	(Pass-by reduction)		-785	-40	-38		-33	-33	
	Subtotal		*2355*	*118*	*120*	*238*	*98*	*99*	*197*
9. Hotel Murrieta (DP-2019-2031)	Hotel	257 Rooms	2,149	71	50	121	79	76	155
10. Hancock Children's Clinic (DP-2020-2206)	Medical Office Bldg	3.76 KSF	131	8	5	13	6	9	15
11. Rancho Springs Medical Center (DP-2020-2199)	Hospital	43 KSF	461	26	12	38	13	29	42
12. Jefferson Apartments (DP-2020-2170)	Residential	160 DU	1171	17	57	74	56	33	90
13. Beyond Food Mart (DP-2020-2171)	Con Mkt / Gas Stn	16 Pumps	3688	225	224	449	184	183	367
	(Pass-by reduction)		-922	-56	-56		-46	-46	
	Subtotal		2766	169	168	337	138	137	275

Continued on the Next Page

TABLE 5–1 (CONTINUED)
CUMULATIVE PROJECTS TRIP GENERATION SUMMARY [a]

Project	Land Use	Size	Daily Volume	AM Peak Hour Volume			PM Peak Hour Volume		
				In	Out	Total	In	Out	Total
Continued from the Previous Page									
14. U-Haul (DP-2021-2359)	Warehouse	11.608 KSF	21	1	1	2	1	1	2
15. The Triangle [b] DP-2022-2705 / TTM-2022-2706	Retail	268.464 KSF	6,158	181	111	292	552	597	1,149
16. QMC Murrieta Multi-Family Project (DP-2022-2605)	Multi-Family Housing	390 DU	2,629	37	119	156	125	74	199
17. Jefferson Multi-Family Project (DP-2022-2685)	Multi-Family Housing	851 DU	3,863	72	242	314	203	130	333
18. Makena Hancock II Project (DP-2022-2744)	Medical Office Building	31.6 KSF	1,138	77	21	98	37	87	124
19. Los Alamos / Vista Murrieta Apartments (DP-2023-2786)	Multi-Family Housing	120 DU	809	12	36	48	38	23	61
20. Vista Murrieta (DP-2022-2562)	Multi-Family Housing	214 DU	1,442	21	65	86	69	40	109
21. Los Alamos SS & Retail (DP-2022-2700)	Mini Warehouse /Variety Store/FF	Various	1,607	69	42	111	72	73	145
22. Monamos Apartments (DP-2021-2385)	Multifamily	140 DU	1,025	15	50	65	50	29	79
23. Jefferson South Apartments (DP-2022-2480)	Multifamily	68 DU	446	7	21	28	22	13	35
24. 24960 Adams Avenue (DP-2022-2562)	Multifamily	200 DU	947	17	42	59	44	29	73
25. Ivy House Residential (DP-2021-2311)	Single Family	62 DU	585	11	32	43	37	21	58
26. 41705 Hawthorn Housing (DP-2022-2601)	Multifamily	96 DU	462	10	25	35	26	18	44
27. Gierson Ranch (DP-2022-2551)	Multifamily	107 DU	721	10	33	43	35	20	55
Total Cumulative Trips			**40,322**	**1,371**	**1,688**	**3,058**	**2,158**	**2,185**	**4,342**

General Note:
1. Trip generation obtained from City of Murrieta traffic studies.
2. This Project is expected to be open in the Year 2028 and is only included in the cumulative projects for the Year 2028.



LINSCOTT LAW & GREENSPAN engineers

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Figure 5-1

Cumulative Projects Traffic Volumes

(Entire Project)

The Terraces at Murrieta

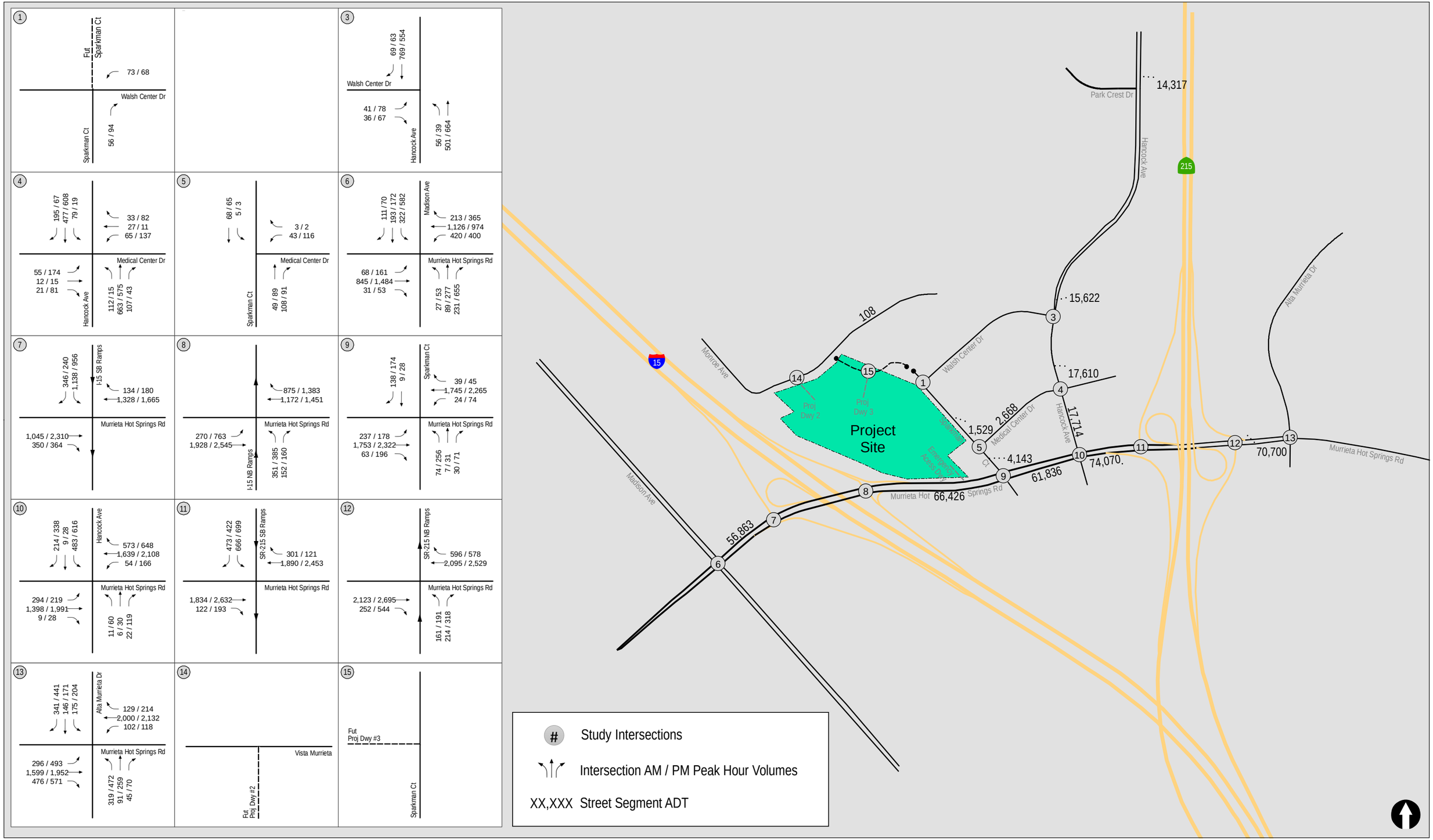

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Figure 5-2

Year 2025 without Project Traffic Volumes

The Terraces at Murrieta

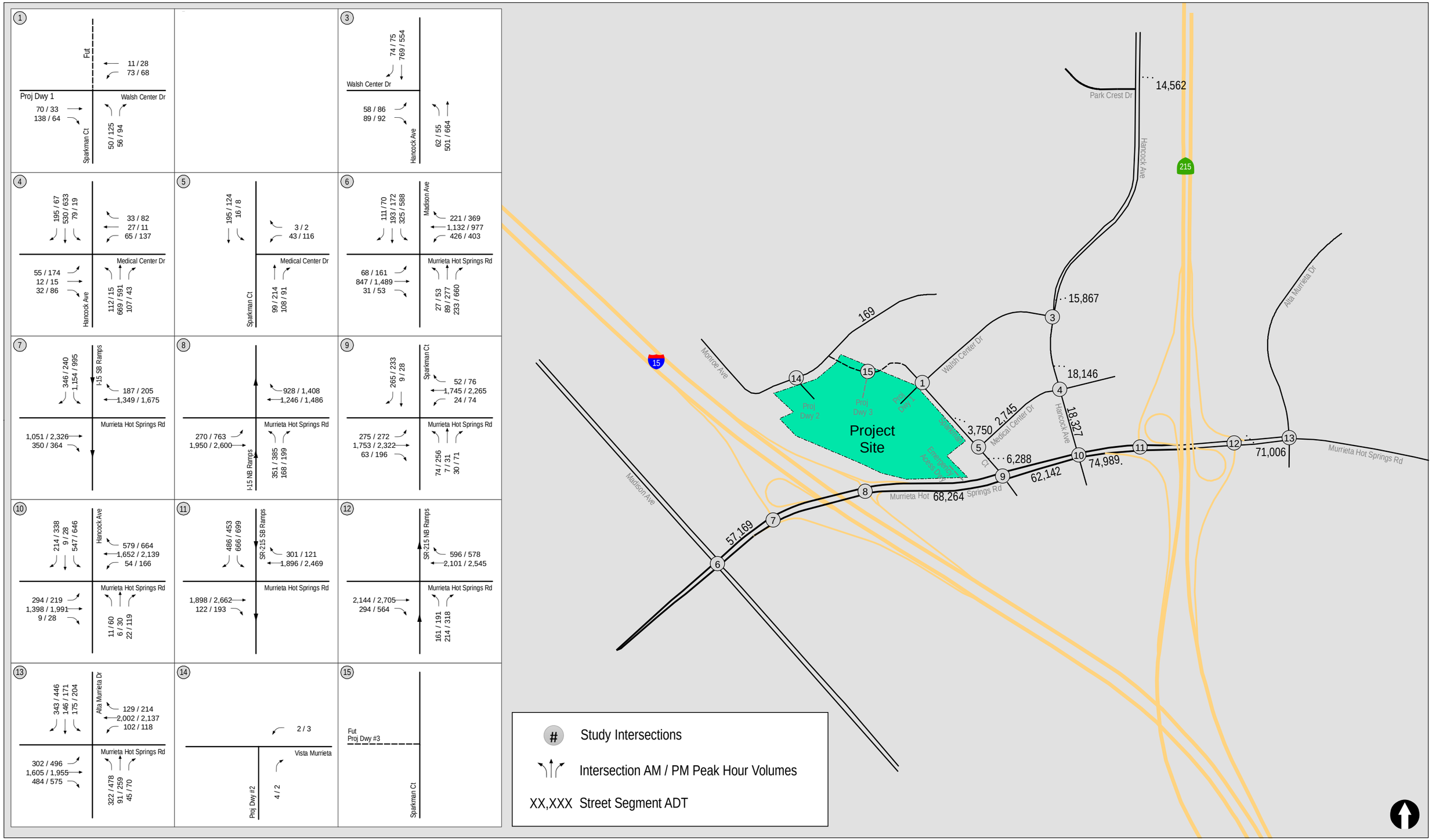

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Figure 5-3

Year 2025 + Project Traffic Volumes

The Terraces at Murrieta

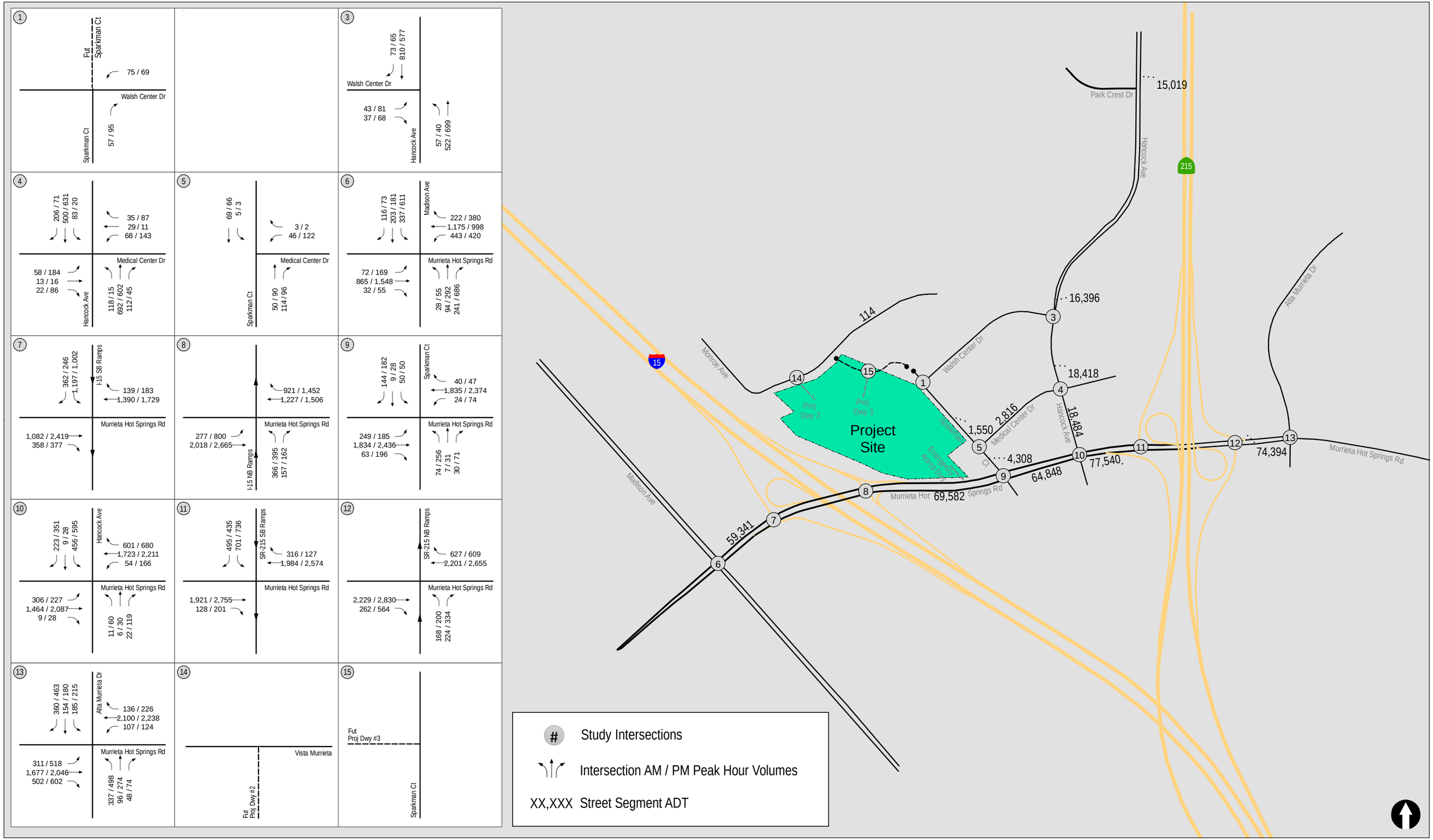

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Figure 5-4

Year 2028 without Project Traffic Volumes

The Terraces at Murrieta

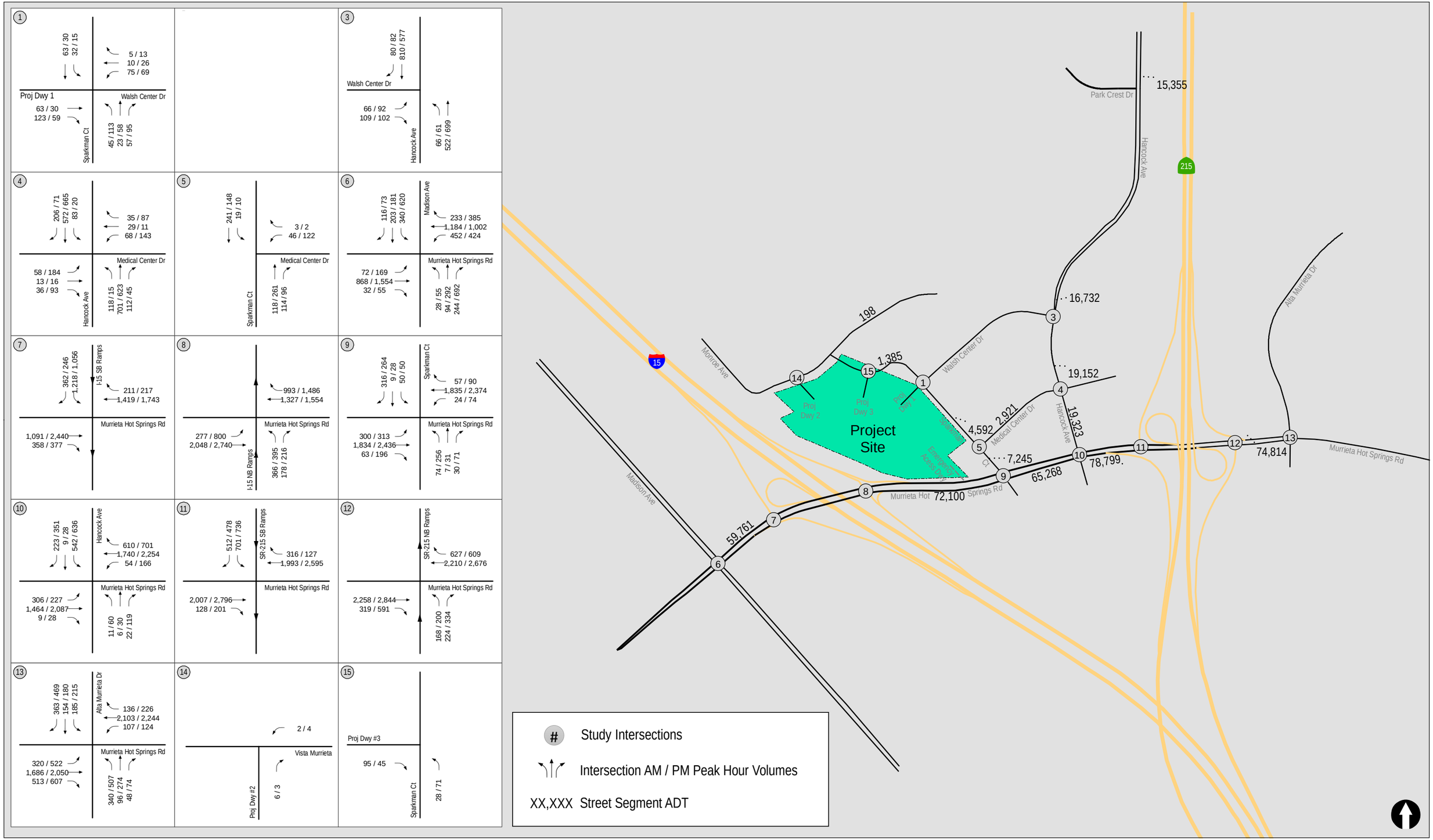

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Figure 5-5

Year 2028 + Project Traffic Volumes

The Terraces at Murrieta

6.0 ANALYSIS OF NEAR-TERM SCENARIOS

6.1 Opening Year 2025 without Project Analysis

6.1.1 *Intersection Analysis*

In the Year 2025, it is assumed that the Triangle Project bounded by Murrieta Hot Springs Road to the north, I-15 to the west and I-215 to the east is built and the access to The Triangle project is to via Murrieta Hot Springs Road at Monroe Avenue and Hancock Avenue. Since the Triangle Project is assumed to be in place by 2025, the Murrieta Hot Springs Road / Monroe Avenue intersection is assumed to be signalized in the Year 2025 analysis time frame.

The following changes to intersection geometry and traffic control are assumed and are shown on ***Figure 6-1***.

- Monroe Avenue / Murrieta Hot Springs Road intersection – Intersection is signalized with the following geometry:
  - Southbound: One shared through/right lane, one through lane and two left-turn lanes
  - Westbound: One shared through/right lane, three through lanes and two left-turn lanes
  - Northbound: One shared through/right lane, one through lane and two left-turn lanes
  - Eastbound: One right-turn lane, four through lanes and two left-turn lanes
- Hancock Avenue / Murrieta Hot Springs Road intersection – Modify signal to accommodate the south (fourth) leg with the following geometry:
  - Southbound: One right-turn lane, one shared through/right lane, and two left-turn lanes
  - Westbound: One right-turn lane, three through lanes and two left-turn lanes
  - Northbound: One right lane, one shared through/right lane, one through lane and two left-turn lanes
  - Eastbound: One right-turn lane, four through lanes and two left-turn lanes

Table 6-1 summarizes the Opening Year 2025 without Project peak hour intersection operations. As seen in *Table 6-1*, with the addition of the ambient growth and anticipated cumulative projects, all study area intersections are calculated to operate at LOS D or better except the following:

- Unsignalized Hancock Avenue / Walsh Center Drive intersection (Minor Street approach - LOS F during the PM peak hour)
- Madison Avenue/ Murrieta Hot Springs Road – LOS E during the PM peak hour
- Signalized Alta Murrieta Drive / Murrieta Hot Springs Road (LOS E during the AM peak hour and LOS F during the PM peak hour)

Appendix E contains the Opening Year 2025 without Project peak hour intersection analysis worksheets.

6.1.2 *Segment Operations*

By 2025, Murrieta Hot Springs Road will be improved between Monroe Avenue and I-215 ramps to an 8-Lane, Augmented Urban Arterial. Therefore, the segments between Hancock Avenue and I215 are analyzed as 8-Lane, Augmented Urban Arterial.

Table 6-2 summarizes the Opening Year 2025 No Project segment operations. As seen in *Table 6-2*, with the addition of the Ambient Growth, all study area segments are calculated to operate at LOS C or better except the following:

- Murrieta Hot Springs Road: Madison Ave to I-15 Ramps – LOS F
- Murrieta Hot Springs Road: I-15 Ramps to Monroe Avenue – LOS E
- Murrieta Hot Springs Road: Monroe Avenue to Hancock Avenue – LOS D
- Murrieta Hot Springs Road: Hancock Avenue to I-215 – LOS F
- Murrieta Hot Springs Road: I-215 and Alta Murrieta Drive – LOS F

6.1.3 *Queuing Deficiency Analysis*

Table 6-3 summarizes the available turn lane storage and the calculated queue on Opening Day Without Project at all study area intersections. The queues reported are the worst of the AM and PM calculated queues. As seen in *Table 6-3*, queuing deficiencies are forecasted on the Project Opening Day (Year 2025) without Project as follows:

- Hancock Avenue / Medical Center Drive – WB, NB and EB left-turn movements,
- Murrieta Hot Springs Road / Madison Avenue – SB, WB and EB left-turn and NB right-turn movements,
- Murrieta Hot Springs Road / I-15 NB Ramps – EB left-turn movement,
- Murrieta Hot Springs Road / Hancock Avenue –WB right-turn movement, and
- Murrieta Hot Springs Road / Alta Murrieta Road – SB right-turn and SB and EB left-turn movements.

Appendix F contains the Opening Day Without Project queuing report worksheets.

6.2 Opening Year 2025 Plus Project Phase 1 Analysis

6.2.1 *Intersection Analysis*

Table 6-1 summarizes the Opening Year 2025 Plus Project Phase 1 peak hour intersection operations. As seen in *Table 6-1*, with the addition of the Project traffic, all intersections are calculated to continue to operate at LOS D or better except the minor street approach at the following unsignalized intersections, which are calculated to continue to operate at LOS F:

- Unsignalized Hancock Avenue / Walsh Center Drive intersection (Minor Street approach – LOS F during the PM peak hour)
- Madison Avenue/ Murrieta Hot Springs Road – LOS E during the PM peak hour

- Signalized Alta Murrieta Drive/ Murrieta Hot Springs Road (LOS E during the AM peak hour and LOS F during the PM peak hour)

Improvement Not Required

The increase in delay due to the Project at the signalized Madison Avenue/ Murrieta Hot Springs Road and Alta Murrieta Drive / Murrieta Hot Springs Road intersections are less than 5 seconds each and therefore, the Project is not required to make improvements at these intersections.

Improvement Required

The increase in delay due to the Project at the unsignalized Hancock Avenue / Walsh Center Drive intersection is more than 5 seconds and the Project is required to make improvements at this intersection to improve the operations to LOS D or better. The recommended improvements are described in detail in Section 11.1 Proposed Improvements.

Appendix G contains the Opening Year 2025 with Project peak hour intersection analysis worksheets.

6.2.2 *Segment Operations*

Table 6-2 summarizes the Opening Year 2025 Plus Project Phase 1 segment operations. As seen in *Table 6-2*, with the addition of the Project traffic the following all study area segments are calculated to operate at LOS C or better except the following:

- Murrieta Hot Springs Road: Madison Ave to I-15 Ramps – LOS F
- Murrieta Hot Springs Road: I-15 Ramps to Monroe Avenue – LOS E
- Murrieta Hot Springs Road: Monroe Avenue to Hancock Avenue – LOS D
- Murrieta Hot Springs Road: Hancock Avenue to I-215 – LOS F
- Murrieta Hot Springs Road: I-215 and Alta Murrieta Drive – LOS F

However, the increase in V/C ratio on the above segments due to the Project traffic is less than the City of Murrieta threshold of 0.05 (5%) and therefore no improvements are necessary.

6.2.3 *Queuing Deficiency Analysis*

Table 6-4 summarizes the available turn lane storage and the calculated queue on Opening Day With Project Phase 1 at all study area intersections. The queues reported are the worst of the AM and PM calculated queues. As seen in *Table 6-4*, the increase in the calculated queue due to Project Phase 1 traffic is less than the allowable threshold of 25 feet in the movements with existing deficiencies (see section 6.1.3) except one. Therefore, based on the impact thresholds described in section 2.4 Queuing Deficiency Analysis, the Project does not have a queuing effect at these intersections.

There is queuing effect in the WB right-turn movement at the Murrieta Hot Springs Road / Hancock Avenue intersection.

Appendix H contains the Opening Day With Project Phase 1 queuing report worksheets.

TABLE 6–1
NEAR-TERM (OPENING YEAR 2025) INTERSECTION OPERATIONS

Intersection	Control Type	Peak Hour	Near-Term (Opening Year 2025) No Project		Near-Term (Opening Year 2025) + Project Phase 1		Δ Delay [c]	Improvement Required?
			Delay [a]	LOS [b]	Delay	LOS		
1. Sparkman Ct / Walsh Center Dr	TWSC [d]	AM	DNE	DNE	13.2	B	NA	No
		PM	DNE	DNE	14.6	B	NA	No
3. Hancock Ave / Walsh Center Dr	TWSC [d]	AM	27.4	D	33.4	D	6.0	No
		PM	**59.4**	**F**	**95.8**	**F**	**36.4**	**Yes**
4. Hancock Ave / Medical Center Dr	Signal	AM	16.2	B	16.2	B	0.0	No
		PM	17.4	B	17.5	B	0.1	No
5. Sparkman Ct / Medical Center Dr	TWSC [d]	AM	10.6	B	13.6	B	3.0	No
		PM	11.2	B	14.1	B	2.9	No
6. Madison Ave / Murrieta Hot Springs Rd	Signal	AM	45.9	D	46.1	D	0.2	No
		PM	62.4	E	63.1	E	0.7	No
7. I-15 SB Ramps / Murrieta Hot Springs Rd	Signal	AM	20.2	C	20.2	C	0.0	No
		PM	20.6	C	21.4	C	0.8	No
8. 1-15 NB Ramps / Murrieta Hot Springs Rd	Signal	AM	14.1	B	14.1	B	0.0	No
		PM	24.2	C	24.6	C	0.4	No
9. Murrieta Hot Springs Rd / Sparkman Ct	Signal [e]	AM	17.2	C	23.6	C	6.4	No
		PM	24.5	C	32.4	C	7.9	No
10. Murrieta Hot Springs Rd / Hancock Ave	Signal	AM	26.2	C	30.4	C	4.2	No
		PM	35.7	D	37.1	D	1.4	No
11. I-215 SB Ramps / Murrieta Hot Springs Rd	Signal	AM	21.2	C	21.5	C	0.3	No
		PM	24.1	C	24.7	C	0.6	No

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TABLE 6–1 (CONTINUED)
NEAR-TERM (OPENING YEAR 2025) INTERSECTION OPERATIONS

Intersection	Control Type	Peak Hour	Near-Term (Opening Year 2025) No Project		Near-Term (Opening Year 2025) + Project Phase 1		Δ Delay [c]	Improvement Required?
			Delay [a]	LOS [b]	Delay	LOS		
CONTINUED FROM THE PREVIOUS PAGE								
12. I-215 NB Ramps / Murrieta Hot Springs Rd	Signal	AM	8.2	A	8.2	A	0.0	No
		PM	11.8	B	11.9	B	0.1	No
13. Murrieta Hot Springs Rd / Alta Murrieta Dr	Signal	AM	61.2	E	62.3	E	1.1	No
		PM	113.4	F	114.7	F	1.3	No
14. Vista Murrieta Rd / Project Driveway #2	TWSC [d]	AM	DNE	DNE	8.5	A	NA	No
		PM	DNE	DNE	8.5	A	NA	No
			8.2	A	8.2	A	0.0	
15. Monroe Ave / Project Driveway #3	DNE	AM	11.8	B	11.9	B	0.1	No
		PM						No

Footnotes:

a. Average delay expressed in seconds per vehicle.
b. Level of Service.
c. Increase in delay due to Project Traffic
d. TWSC – Two-Way Stop Controlled intersection. Minor street left turn delay is reported.
e. This intersection is assumed to be signalized in 2025.

General Note:

DNE – Does Not Exist
NA – Not Applicable
Bold indicates Improvements potentially required.

SIGNALIZED		UNSIGNALIZED	
Delay	LOS	Delay	LOS
0.0 ≤ 10.0	A	0.0 ≤ 10.0	A
10.1 to 20.0	B	10.1 to 15.0	B
20.1 to 35.0	C	15.1 to 25.0	C
35.1 to 55.0	D	25.1 to 35.0	D
55.1 to 80.0	E	35.1 to 50.0	E
≥ 80.1	F	≥ 50.1	F

TABLE 6–2
NEAR-TERM (OPENING YEAR 2025) STREET SEGMENT OPERATIONS

Street Segment	General Plan Classification [a]	Functional Classification [a]	Capacity (LOS E) [c]	Near-Term (Opening Year 2025) No Project			Near-Term (Opening Year 2025) + Project Phase 1			Δ [f] V/C	Improvement Required?
				ADT	LOS [d]	V/C [e]	ADT	LOS	V/C		
Vista Murrieta											
South of Los Alamos	Collector	2-Ln Collector	13,000	108	A	0.008	169	A	0.013	0.005	None
Medical Center Drive											
Sparkman Ct to Hancock Ave	Unclassified Road	2-Ln Collector	13,000	2,668	A	0.205	2,745	A	0.211	0.006	None
Murrieta Hot Springs Rd											
Madison Ave to I-15 Ramps	Aug Urban Art	6-Ln Urban Art	53,900	56,863	F	1.055	57,169	F	1.061	0.006	None
I-15 Ramps to Sparkman Ct	Aug Urban Art	8-Ln Aug Urban Art	71,800	66,426	E	0.925	68,264	E	0.951	0.026	None
Sparkman Ct to Hancock Ave	Aug Urban Art	8-Ln Aug Urban Art	71,800	61,836	D	0.861	62,142	D	0.865	0.004	None
Hancock Ave to I-215 Ramps	Aug Urban Art	8-Ln Aug Urban Art	71,800	74,070	F	1.032	74,989	F	1.044	0.012	None
I-215 Ramps to Alta Murrieta Dr	Multi Modal Transp Corridor	6-Ln Multi Modal Transp Corridor	53,900	70,700	F	1.312	71,006	F	1.317	0.005	None
Sparkman Court											
Vista Murrieta Rd to Walsh Center Dr	Major Road	2-Ln Collector	13,000	0	A	0.000	0	A	0.000	0.000	None
Walsh Center Dr to Medical Center Dr	Major Road	2-Ln Collector	13,000	1,529	A	0.118	3,750	A	0.288	0.170	None
Medical Center Dr to Murrieta Hot Springs Rd	Major Road	2-Ln Collector	13,000	4,143	A	0.319	6,288	A	0.484	0.165	None

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TABLE 6–2 (CONTINUED)
NEAR-TERM (OPENING YEAR 2025) STREET SEGMENT OPERATIONS

Street Segment	General Plan Classification [a]	Functional Classification [b]	Capacity (LOS E) [c]	Near-Term (Opening Year 2025) No Project			Near-Term (Opening Year 2025) + Project Phase 1			Δ [f] V/C	Improvement Required?
				ADT	LOS [d]	V/C [e]	ADT	LOS	V/C		
CONTINUED FROM THE PREVIOUS PAGE											
Hancock Avenue											
Los Alamos Rd to Parkcrest Dr	Major Road	4-Ln Major Road	34,100	14,317	A	0.420	14,562	A	0.427	0.007	None
Parkcrest Dr to Walsh Center Dr	Major Road	4-Ln Major Road	34,100	15,622	A	0.458	15,867	A	0.465	0.007	None
Walsh Center Dr to Medical Center Dr	Major Road	4-Ln Major Road	34,100	17,610	A	0.516	18,146	A	0.532	0.016	None
Medical Center Dr to Murrieta Hot Springs Rd	Major Road	4-Ln Major Road	34,100	17,714	A	0.519	18,327	A	0.537	0.018	None

Footnotes:

a. The City of Murrieta roadway General Plan classification.
b. The City of Murrieta roadway classification at which the roadway currently functions.
c. The capacity of the roadway at Level of Service E.
d. Level of Service.
e. The Volume to Capacity ratio.
f. Increase in V/C ratio due to the addition of project traffic.

TABLE 6–3
NEAR-TERM (OPENING YEAR 2025) WITHOUT PROJECT 95TH PERCENTILE QUEUE

Intersection	Control Type	Southbound				Westbound				Northbound				Eastbound			
		Right		Left		Right		Left		Right		Left		Right		Left	
		Store	Queue	Store	Queue	Store	Queue	Store	Queue	Store	Queue	Store	Queue	Store	Queue	Store	Queue
1. Sparkman Ct / Walsh Center Dr	TWSC	c	c	c	c	c	c	c	c	b	b	a	a	a	a	a	a
3. Hancock Ave / Walsh Center Dr	TWSC	b	b	a	a	a	a	a	a	a	a	230	6	c	c	c	c
4. Hancock Ave / Medical Center Dr	Signal	100	57	150	108	145	16	100	**150**	b	b	120	**127**	e	e	140	**185**
5. Sparkman Ct / Medical Center Dr	TWSC	a	a	d	d	e	e	e	e	b	b	a	a	a	a	a	a
6. Murrieta Hot Springs Rd / Madison Ave	Signal	b	b	170[f]	**369**	580	229	250[f]	**274**	170	**206**	100[f]	43	b	b	100[f]	**101**
7. I-15 SB Ramps / Murrieta Hot Springs Rd	Signal	>500	229	>900	577	>500	0	a	a	a	a	a	a	>500	16	a	a
8. I-15 NB Ramps / Murrieta Hot Springs Rd	Signal	a	a	a	a	1900	108	a	a	>500	170	>600	325	a	a	500	**780**
9. Murrieta Hot Springs Rd / Monroe Ave	Signal	b	b	100[f]	0	b	b	150[f]	37	b	b	150[f]	118	200	46	200[f]	85
10. Murrieta Hot Springs Rd / Hancock Ave	Signal	370	96	120[f]	365[h]	150	**556**	150[f]	123	150	23	150[f]	56	170	0	200[f]	197

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TABLE 6–3 (CONTINUED)
NEAR-TERM (OPENING YEAR 2025) WITHOUT PROJECT 95TH PERCENTILE QUEUE

Intersection	Control Type	Southbound				Westbound				Northbound				Eastbound			
		Right		Left		Right		Left		Right		Left		Right		Left	
		Store	Queue	Store	Queue	Store	Queue	Store	Queue	Store	Queue	Store	Queue	Store	Queue	Store	Queue
Continued from the previous page																	
11. I-215 SB Ramps / Murrieta Hot Springs Rd	Signal	>600	375	>700	413	>500	0	a	a	a	a	a	a	>500	0	a	a
12. I-215 NB Ramps / Murrieta Hot Springs Rd	Signal	a	a	a	a	>500	0	a	a	>500	187	>500	107	>500	0	a	a
13. Murrieta Hot Springs Rd / Alta Murrieta Dr	Signal	220	**367**	100[f]	**173**	250	82	225[f]	97	400	0	330[e]	281	b	b	290[f]	**341**
14. Vista Murrieta Rd / Project Driveway #2	TWSC [d]	a	a	a	a	a	a	a	a	a	a	a	a	a	a	a	a
15. Monroe Ave / Project Driveway #3	TWSC [d]	a	a	a	a	a	a	a	a	a	a	a	a	a	a	a	a

Footnotes:

a. Movement does not exist.
b. Shared through/right movement.
c. Shared left/through/right movement.
d. Shared left/through movement.
e. Shared left/right movement.
f. Dual left-turn lanes.
g. Dual right-turn lanes.
h. Not a queuing deficiency since there is a center two-way-left-turn lane.

General Notes:

Green highlight indicates existing deficiency.

TABLE 6–4
NEAR-TERM (OPENING YEAR 2025) + PROJECT PHASE 1 95TH PERCENTILE QUEUE

Intersection	Control Type	Southbound				Westbound				Northbound				Eastbound			
		Right		Left		Right		Left		Right		Left		Right		Left	
		Store	Queue	Store	Queue	Store	Queue	Store	Queue	Store	Queue	Store	Queue	Store	Queue	Store	Queue
1. Sparkman Ct / Walsh Center Dr	TWSC	c	c	c	c	c	c	c	c	b	b	a	a	a	a	a	a
3. Hancock Ave / Walsh Center Dr	TWSC	b	b	a	a	a	a	a	a	a	a	230	7	c	c	c	c
4. Hancock Ave / Medical Center Dr	Signal	100	68	150	108	145	16	100	**150**	b	b	120	**127**	e	e	140	**185**
5. Sparkman Ct / Medical Center Dr	TWSC	a	a	d	d	e	e	e	e	b	b	a	a	a	a	a	a
6. Murrieta Hot Springs Rd / Madison Ave	Signal	b	b	170[f]	**374**	580	226	250[f]	**276**	170	**210**	100[f]	43	b	b	100[f]	**101**
7. I-15 SB Ramps / Murrieta Hot Springs Rd	Signal	>500	229	>900	617	>500	0	a	a	a	a	a	a	>500	14	a	a
8. I-15 NB Ramps / Murrieta Hot Springs Rd	Signal	a	a	a	a	1900	150	a	a	>500	248	>600	325	a	a	500	**745**
9. Murrieta Hot Springs Rd / Monroe Ave	Signal	b	b	100[f]	0	b	b	150[f]	38	b	b	150[f]	123	200	48	200[f]	146
10. Murrieta Hot Springs Rd / Hancock Ave	Signal	370	96	120[f]	386[h]	150	**587**	150[f]	123	150	23	150[f]	56	170	0	200[f]	197

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TABLE 6–4 (CONTINUED)
NEAR-TERM (OPENING YEAR 2025) + PROJECT PHASE 1 95TH PERCENTILE QUEUE

Intersection	Control Type	Southbound				Westbound				Northbound				Eastbound			
		Right		Left		Right		Left		Right		Left		Right		Left	
		Store	Queue	Store	Queue	Store	Queue	Store	Queue	Store	Queue	Store	Queue	Store	Queue	Store	Queue
Continued from the previous page																	
11. I-215 SB Ramps / Murrieta Hot Springs Rd	Signal	>600	394	>700	433	>500	0	a	a	a	a	a	a	>500	0	a	a
12. I-215 NB Ramps / Murrieta Hot Springs Rd	Signal	a	a	a	a	>500	0	a	a	>500	187	>500	107	>500	0	a	a
13. Murrieta Hot Springs Rd / Alta Murrieta Dr	Signal	220	**375**	100[f]	**173**	250	82	225[f]	97	400	0	330[e]	287	b	b	290[f]	**345**
14. Vista Murrieta Rd / Project Driveway #2	TWSC [d]	a	a	a	a	d	0	d	0	e		e		b	0	b	0
15. Monroe Ave / Project Driveway #3	TWSC [d]	a	a	a	a	a	a	a	a	a	a	a	a	a	a	a	a

Footnotes:

a. Movement does not exist.
b. Shared through/right movement.
c. Shared left/through/right movement.
d. Shared left/through movement.
e. Shared left/right movement.
f. Dual left-turn lanes.
g. Dual right-turn lanes.
h. Not a deficiency since there is a center two-way-left-turn lane.

General Notes:

Longer of AM and PM queue reported.
Yellow highlight indicates Queuing effect.

6.3 Year 2028 No Project Analysis

6.3.1 *Intersection Analysis*

Table 6-3 summarizes the Year 2028 No Project peak hour intersection operations. As seen in *Table 6-3*, with the addition of the Ambient Growth, all intersections are calculated to operate at LOS D or better except the minor street approach at the following unsignalized intersections:

- Unsignalized Hancock Avenue / Walsh Center Drive intersection (Minor Street approach – LOS F during the PM peak hour)
- Signalized Madison Avenue / Murrieta Hot Springs Road (LOS E during the PM peak hour)
- Signalized Alta Murrieta Drive / Murrieta Hot Springs Road (LOS E during the AM peak hour and LOS F during the PM peak hour)

Appendix I contains the Year 2028 without Project peak hour intersection analysis worksheets.

6.3.2 ***Segment Operations***

Table 6-4 summarizes the Year 2028 No Project segment operations. As seen in *Table 6-4*, with the addition of the Ambient Growth, all study area segments are calculated to operate at LOS C or better except the following:

- Murrieta Hot Springs Road: Madison Avenue to I-15 Ramps – LOS F
- Murrieta Hot Springs Road: I-15 Ramps to Sparkman Court – LOS F
- Murrieta Hot Springs Road: Sparkman Court to Hancock Avenue – LOS E
- Murrieta Hot Springs Road: Hancock Avenue to I-215 Ramps – LOS F
- Murrieta Hot Springs Road: I-215 Ramps to Alta Murrieta Drive – LOS F

6.3.3 *Queuing Deficiency Analysis*

Table 6-7 summarizes the available turn lane storage and the calculated queue on Year 2028 Without Project at all study area intersections. The queues reported are the worst of the AM and PM calculated queues. As seen in *Table 6-7*, queuing deficiencies exist as follows:

- Hancock Avenue / Medical Center Drive – WB, NB and EB left-turn movements,
- Murrieta Hot Springs Road / Madison Avenue – SB, WB and EB left-turn and WB and NB right-turn movements,
- Murrieta Hot Springs Road / I-15 NB Ramps – EB left-turn movement,
-
- Murrieta Hot Springs Road / Hancock Avenue – EB left-turn and WB right-turn movements,
- Murrieta Hot Springs Road / Alta Murrieta Road – SB right-turn and SB and EB left-turn movements.

Appendix J contains the Year 2028 Without Project queuing report worksheets.

6.4 Year 2028 Plus Entire Project Analysis

6.4.1 *Intersection Analysis*

Table 6-3 summarizes the Year 2028 Plus Entire Project peak hour intersection operations. As seen in *Table 6-3*, with the addition of the Ambient Growth + Cumulative Projects + Entire Project traffic, all intersections are calculated to operate at LOS D or better except the minor street approach at the following unsignalized intersections:

- Unsignalized Hancock Avenue / Walsh Center Drive intersection (Minor Street approach – LOS E during the AM peak hour and LOS F during the PM peak hour)
- Signalized Madison Avenue / Murrieta Hot Springs Road (LOS E during the PM peak hour)
- Signalized Alta Murrieta Drive / Murrieta Hot Springs Road (LOS E during the AM peak hour and LOS F during the PM peak hour)

Though the intersections are calculated to operate below City standards the increase in delay at most of them is less than 5 seconds and hence no improvements are required at these intersections. The following is a description of improvements that are required or not required per City standards.

Improvement not Required

The increase in delay due to the Project at the signalized Madison Avenue / Murrieta Hot Springs Road intersection is less than 5 seconds and therefore, the Project is not required to make improvements at this intersection.

Improvements Required

With the addition of entire Project traffic, the Hancock Avenue / Walsh Center Drive and the Alta Murrieta Drive / Murrieta Hot Springs Road intersections are calculated to operate a LOS F without and with the Project traffic with an increase in delay due to Project traffic of more than 5 seconds, the acceptable threshold. Hence the project has a cumulative effect at these intersections. The recommended improvements are described in detail in Section 11.1 Proposed Improvements.

Appendix K contains the Year 2028 with Project peak hour intersection analysis worksheets.

6.4.2 ***Segment Operations***

Table 6-4 summarizes the Year 2028 Plus Project segment operations. As seen in *Table 6-4*, with the addition of the Ambient Growth + Cumulative Projects + Entire Project traffic, all study area segments are calculated to operate at LOS C or better, except the following:

- Murrieta Hot Springs Road: Madison Avenue to I-15 Ramps – LOS F
- Murrieta Hot Springs Road: I-15 Ramps to Sparkman Court – LOS F
- Murrieta Hot Springs Road: Sparkman Court to Hancock Avenue – LOS E

- Murrieta Hot Springs Road: Hancock Avenue to I-215 Ramps – LOS F
- Murrieta Hot Springs Road: I-215 Ramps to Alta Murrieta Drive – LOS F

However, the increase in V/C ratio on the above segments due to the Project traffic is less than the City of Murrieta threshold of 0.05 (5%) and therefore no improvements are necessary.

6.4.3 *Queuing Deficiency Analysis*

Table 6-8 summarizes the available turn lane storage and the calculated queue on Year 2028 With Entire Project at all study area intersections. The queues reported are the worst of the AM and PM calculated queues. As seen in *Table 6-8*, the increase in the calculated queue due to Entire Project traffic is less than the allowable threshold of 25 feet in most the movements with existing deficiencies (see section 6.1.3). Therefore, based on the impact thresholds described in section 2.4 Queuing Deficiency Analysis, the Project does not have a queuing effect in these movements. However, queuing effect will occur in the following movements:

- Murrieta Hot Springs Road / Hancock Avenue –WB right-turn movement

Improvements to mitigate the queuing impacts are described in Section 11.1.

Appendix L contains the Year 2028 With Entire Project queuing report worksheets.

TABLE 6–5
YEAR 2028 INTERSECTION OPERATIONS

Intersection	Control Type	Peak Hour	Year 2028 No Project		Year 2028 + Entire Project		Δ Delay [c]	Improvement Required?
			Delay [a]	LOS [b]	Delay	LOS		
1. Sparkman Ct / Walsh Center Dr	TWSC [d]	AM	DNE	DNE	15.8	C	NA	No
		PM	DNE	DNE	16.2	C	NA	No
3. Hancock Ave / Walsh Center Dr	TWSC [d]	AM	31.1	D	**46.1**	**E**	**15.0**	**Yes**
		PM	**76.9**	**F**	**154.9**	**F**	**78.0**	**Yes**
4. Hancock Ave / Medical Center Dr	Signal	AM	16.6	B	16.7	B	0.1	No
		PM	17.9	B	18.1	B	0.2	No
5. Sparkman Ct / Medical Center Dr	TWSC [d]	AM	10.7	B	15.2	C	4.5	No
		PM	11.3	B	15.9	C	4.6	No
6. Madison Ave / Murrieta Hot Springs Rd	TWSC [d]	AM	46.9	D	47.2	D	0.3	No
		PM	68.6	E	69.8	E	1.2	No
7. I-15 SB Ramps / Murrieta Hot Springs Rd	Signal	AM	20.8	C	21.0	C	0.2	No
		PM	21.8	C	23.1	C	1.3	No
8. 1-15 NB Ramps / Murrieta Hot Springs Rd	Signal	AM	14.3	B	14.4	B	0.1	No
		PM	37.2	D	41.1	D	3.9	No
9. Murrieta Hot Springs Rd / Sparkman Ct	Signal [e]	AM	18.5	C	30.0	C	11.5	No
		PM	27.0	C	43.1	D	16.1	No
10. Murrieta Hot Springs Rd / Hancock Ave	Signal	AM	26.2	C	30.8	C	4.6	No
		PM	35.6	D	37.3	D	1.7	No
11. I-215 SB Ramps / Murrieta Hot Springs Rd	Signal	AM	26.4	C	26.7	C	0.3	No
		PM	26.8	C	28.0	C	1.2	No

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TABLE 6–5 (CONTINUED)
YEAR 2028 INTERSECTION OPERATIONS

Intersection	Control Type	Peak Hour	Year 2028 No Project		Year 2028 + Entire Project		Δ Delay [c]	Improvement Required?
			Delay [a]	LOS [b]	Delay	LOS		
CONTINUED FROM THE PREVIOUS PAGE								
12. I-215 NB Ramps / Murrieta Hot Springs Rd	Signal	AM	8.4	A	8.4	A	0.0	No
		PM	12.7	B	12.7	B	0.0	No
13. Murrieta Hot Springs Rd / Alta Murrieta Dr	Signal	AM	70.4	E	72.4	E	2.0	No
		PM	**132.4**	**F**	**137.8**	**F**	**5.4**	**Yes**
14. Vista Murrieta Rd / Project Driveway #2	TWSC [d]	AM	DNE	DNE	8.5	A	NA	No
		PM	DNE	DNE	8.5	A	NA	No
15. Monroe Ave / Project Driveway #3	TWSC [d]	AM	DNE	DNE	8.9	A	NA	No
		PM	DNE	DNE	8.6	A	NA	No

Footnotes:
a. Average delay expressed in seconds per vehicle.
b. Level of Service.
c. Increase in delay due to Project Traffic
d. TWSC – Two-Way Stop Controlled intersection. Minor street left turn delay is reported.
e. This intersection is assumed to be signalized in 2025.

General Note:
DNE – Does Not Exist
NA – Not Applicable
Bold indicates improvements potentially required.

SIGNALIZED		UNSIGNALIZED	
Delay	LOS	Delay	LOS
0.0 ≤ 10.0	A	0.0 ≤ 10.0	A
10.1 to 20.0	B	10.1 to 15.0	B
20.1 to 35.0	C	15.1 to 25.0	C
35.1 to 55.0	D	25.1 to 35.0	D
55.1 to 80.0	E	35.1 to 50.0	E
≥ 80.1	F	≥ 50.1	F

TABLE 6–6
YEAR 2028 STREET SEGMENT OPERATIONS

Street Segment	General Plan Classification [a]	Functional Classification [b]	Capacity (LOS E) [c]	Year 2028 No Project			Year 2028 No Project + Entire Project			Δ [f] V/C	Improvement Required?
				ADT	LOS [d]	V/C [e]	ADT	LOS	V/C		
Vista Murrieta											
South of Los Alamos	Collector	2-Ln Collector	13,000	114	A	0.009	198	A	0.015	0.006	None
Medical Center Drive											
Sparkman Ct to Hancock Ave	Unclassified Road	2-Ln Collector	13,000	2,816	A	0.217	2,921	A	0.225	0.008	None
Murrieta Hot Springs Rd											
Madison Ave to I-15 Ramps	Aug Urban Art	6-Ln Urban Art	53,900	59,341	F	1.101	59,761	F	1.109	0.008	None
I-15 Ramps to Sparkman Ct	Aug Urban Art	8-Ln Aug Urban Art	71,800	69,582	E	0.969	72,100	F	1.004	0.035	None
Sparkman Ct to Hancock Ave	Aug Urban Art	8-Ln Aug Urban Art	71,800	64,848	E	0.903	65,268	E	0.909	0.006	None
Hancock Ave to I-215 Ramps	Aug Urban Art	8-Ln Aug Urban Art	71,800	77,540	F	1.080	78,799	F	1.097	0.018	None
I-215 Ramps to Alta Murrieta Dr	Multi Modal Transp Corridor	6-Ln Multi Modal Transp Corridor	53,900	74,394	F	1.380	74,814	F	1.388	0.008	None
Sparkman Court											
Vista Murrieta Rd to Walsh Center Dr	Major Road	2-Ln Collector	13,000	0	A	0.000	1,385	A	0.107	0.107	None
Walsh Center Dr to Medical Center Dr	Major Road	2-Ln Collector	13,000	1,550	A	0.119	4,592	A	0.353	0.234	None
Medical Center Dr to Murrieta Hot Springs Rd	Major Road	2-Ln Collector	13,000	4,308	A	0.331	7,245	A	0.557	0.226	None

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TABLE 6–6 (CONTINUED)
YEAR 2028 STREET SEGMENT OPERATIONS

Street Segment	General Plan Classification [a]	Functional Classification [b]	Capacity (LOS E) [c]	Year 2028 No Project			Year 2028 No Project + Entire Project			Δ [f] V/C	Improvement Required?
				ADT	LOS [d]	V/C [e]	ADT	LOS	V/C		
CONTINUED FROM THE PREVIOUS PAGE											
Hancock Avenue											
Los Alamos Rd to Parkcrest Dr	Major Road	4-Ln Major Road	34,100	15,019	A	0.440	15,355	A	0.450	0.010	None
Parkcrest Dr to Walsh Center Dr	Major Road	4-Ln Major Road	34,100	16,396	A	0.481	16,732	A	0.491	0.010	None
Walsh Center Dr to Medical Center Dr	Major Road	4-Ln Major Road	34,100	18,418	A	0.540	19,152	A	0.562	0.022	None
Medical Center Dr to Murrieta Hot Springs Rd	Major Road	4-Ln Major Road	34,100	18,484	A	0.542	19,323	A	0.567	0.025	None

Footnotes:

a. The City of Murrieta roadway General Plan classification.
b. The City of Murrieta roadway classification at which the roadway currently functions.
c. The capacity of the roadway at Level of Service E.
d. Level of Service.
e. The Volume to Capacity ratio.
f. Increase in V/C ratio due to the addition of project traffic.

TABLE 6–7
YEAR 2028 WITHOUT PROJECT 95TH PERCENTILE QUEUE

Intersection	Control Type	Southbound				Westbound				Northbound				Eastbound			
		Right		Left		Right		Left		Right		Left		Right		Left	
		Store	Queue	Store	Queue	Store	Queue	Store	Queue	Store	Queue	Store	Queue	Store	Queue	Store	Queue
1. Sparkman Ct / Walsh Center Dr	TWSC	c	c	c	c	c	c	c	c	b	b	a	a	a	a	a	a
3. Hancock Ave / Walsh Center Dr	TWSC	b	b	a	a	a	a	a	a	a	a	230	6	c	c	c	c
4. Hancock Ave / Medical Center Dr	Signal	100	64	150	116	145	19	100	**155**	b	b	120	**134**	e	e	140	**208**
5. Sparkman Ct / Medical Center Dr	TWSC	a	a	d	d	e	e	e	e	b	b	a	a	a	a	a	a
6. Murrieta Hot Springs Rd / Madison Ave	Signal	b	b	170[f]	**394**	580	**224**	250[f]	**292**	170	**227**	100[f]	45	b	b	100[f]	**106**
7. I-15 SB Ramps / Murrieta Hot Springs Rd	Signal	>500	242	>900	623	>500	0	a	a	a	a	a	a	>500	12	a	a
8. I-15 NB Ramps / Murrieta Hot Springs Rd	Signal	a	a	a	a	1900	224	a	a	>500	173	>600	336	a	a	500	**766**
9. Murrieta Hot Springs Rd / Monroe Ave	Signal	b	b	100[f]	27	b	b	150[f]	38	b	b	150[f]	119	200	48	200[f]	**92**
10. Murrieta Hot Springs Rd / Hancock Ave	Signal	370[g]	105	120[f]	352[h]	150	**647**	150[f]	123	150	23	150[f]	56	170	0	200[f]	**207**

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TABLE 6–7 (CONTINUED)
YEAR 2028 WITHOUT PROJECT 95TH PERCENTILE QUEUE

Intersection	Control Type	Southbound				Westbound				Northbound				Eastbound			
		Right		Left		Right		Left		Right		Left		Right		Left	
		Store	Queue	Store	Queue	Store	Queue	Store	Queue	Store	Queue	Store	Queue	Store	Queue	Store	Queue
Continued from the previous page																	
11. I-215 SB Ramps / Murrieta Hot Springs Rd	Signal	>600	397	>700	442	>500	0	a	a	a	a	a	a	>500	0	a	a
12. I-215 NB Ramps / Murrieta Hot Springs Rd	Signal	a	a	a	a	>500	0	a	a	>500	197	>500	111	>500	0	a	a
13. Murrieta Hot Springs Rd / Alta Murrieta Dr	Signal	220	**429**	100[f]	**185**	250	93	225[f]	104	400	0	330[e]	306	b	b	290[f]	**365**
14. Vista Murrieta Rd / Project Driveway #2	TWSC [d]	a	a	a	a	a	a	a	a	a	a	a	a	a	a	a	a
15. Monroe Ave / Project Driveway #3	TWSC [d]	a	a	a	a	a	a	a	a	a	a	a	a	a	a	a	a

Footnotes:

a. Movement does not exist.
b. Shared through/right movement.
c. Shared left/through/right movement.
d. Shared left/through movement.
e. Shared left/right movement.
f. Dual left-turn lanes.
g. Dual right-turn lanes.
h. Not a deficiency since there is a center two-way-left-turn lane.

General Notes:

Longer of AM and PM queue reported.
Green highlight indicates Queuing deficiency.

TABLE 6–8
YEAR 2028 + PROJECT 95TH PERCENTILE QUEUE

Intersection	Control Type	Southbound				Westbound				Northbound				Eastbound			
		Right		Left		Right		Left		Right		Left		Right		Left	
		Store	Queue	Store	Queue	Store	Queue	Store	Queue	Store	Queue	Store	Queue	Store	Queue	Store	Queue
1. Sparkman Ct / Walsh Center Dr	TWSC	[c]	[c]	[c]	[c]	[c]	[c]	[c]	[c]	[b]	[b]	[a]	[a]	[a]	[a]	[a]	[a]
3. Hancock Ave / Walsh Center Dr	TWSC	[b]	[b]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	230	8	[c]	[c]	[c]	[c]
4. Hancock Ave / Medical Center Dr	Signal	100	79	150	116	145	19	100	**155**	[b]	[b]	120	**134**	[e]	[e]	140	**208**
5. Sparkman Ct / Medical Center Dr	TWSC	[a]	[a]	[d]	[d]	[e]	[e]	[e]	[e]	[b]	[b]	[a]	[a]	[a]	[a]	[a]	[a]
6. Murrieta Hot Springs Rd / Madison Ave	Signal	[b]	[b]	170[f]	**403**	580	228	250[f]	**296**	170	**231**	100[f]	45	[b]	[b]	100[f]	**106**
7. I-15 SB Ramps / Murrieta Hot Springs Rd	Signal	>500	242	>900	677	>500	0	[a]	[a]	[a]	[a]	[a]	[a]	>500	11	[a]	[a]
8. I-15 NB Ramps / Murrieta Hot Springs Rd	Signal	[a]	[a]	[a]	[a]	1900	280	[a]	[a]	>500	283	>600	336	[a]	[a]	500	**723**
9. Murrieta Hot Springs Rd / Monroe Ave	Signal	[b]	[b]	100[f]	28	[b]	[b]	150[f]	39	[b]	[b]	150[f]	126	200	51	200[f]	174
10. Murrieta Hot Springs Rd / Hancock Ave	Signal	370[g]	106	120[f]	379[h]	150	**726**	150[f]	123	150	23	150[f]	56	170	0	200[f]	**207**

Continued on the Next page

TABLE 6–8 (CONTINUED)
YEAR 2028 + PROJECT 95TH PERCENTILE QUEUE

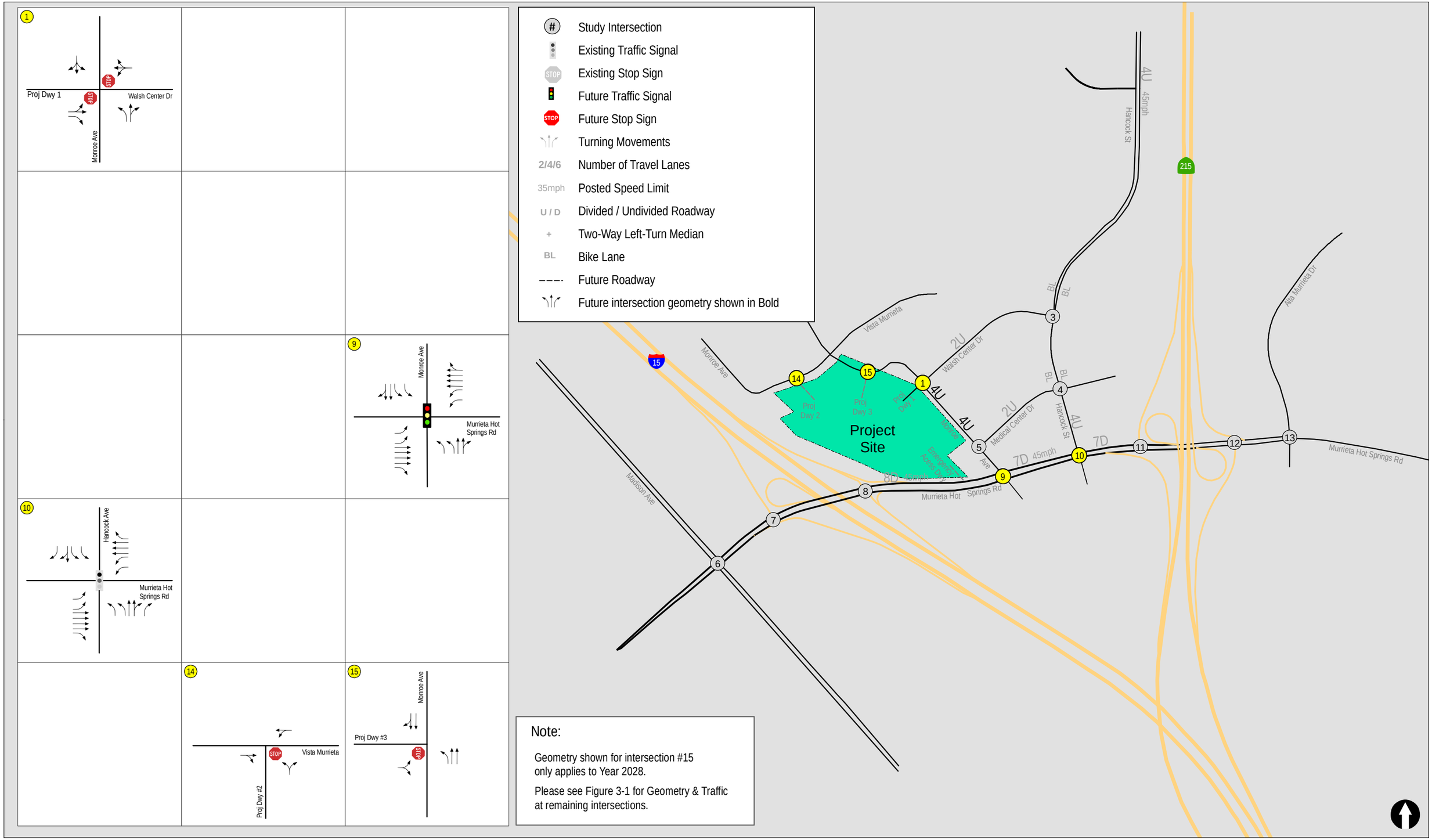
Intersection	Control Type	Southbound				Westbound				Northbound				Eastbound			
		Right		Left		Right		Left		Right		Left		Right		Left	
		Store	Queue	Store	Queue	Store	Queue	Store	Queue	Store	Queue	Store	Queue	Store	Queue	Store	Queue
Continued from the previous page																	
11. I-215 SB Ramps / Murrieta Hot Springs Rd	Signal	>600	449	>700	461	>500	0	[a]	[a]	[a]	[a]	[a]	[a]	>500	0	[a]	[a]
12. I-215 NB Ramps / Murrieta Hot Springs Rd	Signal	[a]	[a]	[a]	[a]	>500	0	[a]	[a]	>500	197	>500	111	>500	0	[a]	[a]
13. Murrieta Hot Springs Rd / Alta Murrieta Dr	Signal	220	**444**	100[f]	**197**	250	93	225[f]	84	400	0	330[e]	314	[b]	[b]	290[f]	**369**
14. Vista Murrieta Rd / Project Driveway #2	TWSC [d]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]
15. Monroe Ave / Project Driveway #3	TWSC [d]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]

Footnotes:

a. Movement does not exist.
b. Shared through/right movement.
c. Shared left/through/right movement.
d. Shared left/through movement.
e. Shared left/right movement.
f. Dual left-turn lanes.
g. Dual right-turn lanes.
h. Not a deficiency since there is a center two-way-left-turn lane.

General Notes:

Longer of AM and PM queue reported.
Yellow highlight indicates queuing impact.



Note:

Geometry shown for intersection #15 only applies to Year 2028.

Please see Figure 3-1 for Geometry & Traffic at remaining intersections.

LINSCOTT LAW & GREENSPAN engineers

N:\3480\Figures
Date: 5/31/2023
Time: 3:21 PM

Figure 6-1

Year 2025 & Year 2028 Conditions Diagram

The Terraces at Murrieta

7.0 ANALYSIS OF HORIZON YEAR (2040) SCENARIOS

7.1 Horizon Year 2040 Conditions

7.1.1 *Network Conditions*

In the Horizon Year, it is assumed that Sparkman Court will be renamed Monroe Avenue, be built to City of Murrieta 4-Lane Major standards and connect Murrieta Hot Springs Road with Vista Murrieta and Los Alamos Road. As a result, the geometry at the study area intersections along this road between Walsh Center Drive and Murrieta Hot Springs Road will be modified and the capacity of Monroe Avenue (Sparkman Court) at LOS E will increase to 34,100 ADT.

Figure 7-1 depicts the assumed geometry and traffic control at the study area intersections. Only intersections where modified geometry is assumed are shown on *Figure 7-1*.

7.1.2 *Traffic Volumes*

The Horizon Year 2040 ADT volumes for the Project study area segments were obtained from the City of Murrieta Transportation Analysis Model (MTAM). Year 2040 peak hour turning movement volumes were estimated using a template in EXCEL developed by LLG to determine peak hour traffic at an intersection from future ADT volumes using the relationship between existing peak hour turn movements and the existing ADT volumes. This same relationship can be assumed to generally continue in the future. For example, if the segment ADT on the roadway is forecast to double by the Year 2030, it is reasonable to assume that the peak hour intersection turning movement volumes will generally double.

Figure 7-2 depicts the Horizon Year 2040 without Project traffic volumes and ***Figure 7-3*** depicts the Horizon Year 2040 with Project traffic volumes.

7.2 Horizon Year 2040 No Project Analysis

The Long-Term volumes are based on the Model and General Plan assumptions. The analysis assumes that Monroe Avenue is built to City of Murrieta 4-Lane Major standards and a connection between Murrieta Hot Springs Road, Vista Murrieta and Los Alamos Road is made. With the implementation of this connection, traffic volumes on Monroe Avenue will increase, resulting in the lowering of LOS at Monroe Avenue intersections and segments. The Murrieta Hot Springs Road / Monroe Avenue intersection is signalized.

7.2.1 *Intersection Analysis*

Table 7-1 summarizes the Year 2040 No Project peak hour intersection operations. As seen in *Table 7-1*, the following intersections are calculated to operate at LOS E or F:

- Unsignalized Monroe Avenue / Walsh Center Drive intersection – Minor Street approach LOS F in the AM and PM peak hours
- Unsignalized Hancock Avenue / Walsh Center Drive intersection – Minor Street approach LOS F in the AM and PM peak hours

- Unsignalized Monroe Avenue / Medical Center Drive intersection – Minor Street approach LOS F in the AM and PM peak hours
- Signalized Madison Avenue / Murrieta Hot Springs Road (LOS F in the AM and PM peak hours)
- Signalized Murrieta Hot Springs Road / Monroe Avenue intersection – LOS F in the AM and PM peak hours
- Signalized Murrieta Hot Springs Road / Hancock Avenue intersection – LOS F in the AM and PM peak hours
- Signalized Alta Murrieta Drive / Murrieta Hot Springs Road (LOS F in the AM and PM peak hours)

Appendix M contains the Horizon Year 2040 peak hour intersection analysis worksheets.

7.2.2 *Segment Operations*

As described above in Section 7.1.1, Monroe Avenue (Sparkman Court) is analyzed with a LOS E capacity of 34,100 ADT. ***Table 7-2*** summarizes the Year 2040 No Project segment operations. As seen in *Table 7-2*, all study area segments except the segments of Medical Center Drive and Monroe Avenue are calculated to operate at LOS C or worse.

7.2.3 *Queuing Deficiency Analysis*

Table 7-3 summarizes the available turn lane storage and the calculated queue on Horizon Year 2040 Without Project at all study area intersections. The queues reported are the worst of the AM and PM calculated queues. As seen in *Table 7-3*, the calculated queues are within the available storage except at the following locations:

- Hancock Avenue / Medical Center Drive – WB, NB and EB left-turn and SB right-turn movements,
- Murrieta Hot Springs Road / Madison Avenue – SB, WB and EB left-turn and WB and NB right-turn movements,
- Murrieta Hot Springs Road / Sparkman Court – EB left-turn movements,
- Murrieta Hot Springs Road / Hancock Avenue – EB left-turn and WB right-turn movements, and
- Murrieta Hot Springs Road / Alta Murrieta Road – SB right-turn and SB and EB left-turn movements.

Appendix N contains the Horizon Year 2040 Without Project queuing report worksheets.

7.3 Horizon Year 2040 Plus Entire Project Analysis

7.3.1 *Intersection Analysis*

Table 7-1 summarizes the Year 2040 Plus Entire Project peak hour intersection operations. As seen in *Table 7-1*, with the addition of Project traffic, the following intersections are calculated to operate at LOS E or F:

- Unsignalized Monroe Avenue / Walsh Center Drive intersection – Minor Street approach LOS F in the AM and PM peak hours
- Unsignalized Hancock Avenue / Walsh Center Drive intersection – Minor Street approach LOS F in the AM and PM peak hours
- Unsignalized Monroe Avenue / Medical Center Drive intersection – Minor Street approach LOS F in the AM and PM peak hours
- Signalized Madison Avenue / Murrieta Hot Springs Road (LOS F in the AM and PM peak hours)
- Signalized Murrieta Hot Springs Road / Monroe Avenue intersection – LOS F in the AM and PM peak hours
- Signalized Murrieta Hot Springs Road / Hancock Avenue intersection – LOS F in the AM and PM peak hours
- Signalized Alta Murrieta Drive / Murrieta Hot Springs Road (LOS F in the AM and PM peak hours)

Appendix O contains the Horizon Year 2040 peak hour intersection analysis worksheets.

As seen above, several intersections are calculated to operate below City standards but the increase in delay at most of them is less than 5 seconds and hence no improvements are required at those intersections. Following is a description of improvements that are required or not required per City standards.

Improvements Not Required

The increase in delay due to Project traffic at the following signalized intersections is less than the City of Murrieta allowable threshold of 5 seconds. Therefore, no improvements are required at these intersections:

- Madison Avenue / Murrieta Hot Springs Road,
- Monroe Avenue / Murrieta Hot Springs Road,
- Murrieta Hot Springs Road / Hancock Avenue and

Improvements Required

The increase in delay due to Project traffic at the following intersections is more than the City of Murrieta allowable threshold of 5 seconds. Hence improvements should be made at these intersections. The recommended improvements are described in detail in Section 11.1 Proposed Improvements.

- Monroe Avenue / Walsh Center Drive Intersection
- Hancock Avenue / Walsh Center Drive Intersection
- Monroe Avenue / Medical Center Drive
- Alta Murrieta Drive / Murrieta Hot Springs Road

7.3.2 *Segment Operations*

Table 7-2 summarizes the Year 2040 Plus Project segment operations. As seen in *Table 7-2*, with the addition of Project traffic, all study area segments except the segments of Medical Center Drive and Monroe Avenue are calculated to operate at LOS D or worse.

The increase in v/c ratio due to project traffic on the segments operating at LOS D or worse is within the allowable threshold of 0.05 and hence, no improvements are required.

7.3.3 *Queuing Deficiency Analysis*

Table 7-4 summarizes the available turn lane storage and the calculated queue on Horizon Year 2040 With Entire Project at all study area intersections. The queues reported are the worst of the AM and PM calculated queues. As seen in *Table 7-4*, the increase in the calculated queue due to Entire Project traffic is less than the allowable threshold of 25 feet in most the movements with existing deficiencies (see section 6.1.3). Therefore, based on the impact thresholds described in section 2.4 Queuing Deficiency Analysis, the Project does not have a queuing effect in these movements. However, queuing effects will occur in the following movements:

- Murrieta Hot Springs Road / Sparkman Court – EB left-turn movements, and
- Murrieta Hot Springs Road / Hancock Avenue – EB left-turn movement.

Improvements to mitigate the queuing impacts are described in Section 11.1. ***Appendix P*** contains the Horizon Year 2040 With Entire Project queuing report worksheets.

TABLE 7–1
HORIZON YEAR 2040 INTERSECTION OPERATIONS

Intersection	Control Type	Peak Hour	Year 2040 No Project		Year 2040 + Project		Δ Delay [c]	Improvement Required?
			Delay [a]	LOS [b]	Delay	LOS		
1. Sparkman Ct / Walsh Center Dr	TWSC	AM	**>100.0**	**F**	**>100.0**	**F**	**>10.0**	**Yes**
		PM	**>100.0**	**F**	**>100.0**	**F**	**>10.0**	**Yes**
3. Hancock Ave / Walsh Center Dr	TWSC	AM	**76.1**	**F**	**>100.0**	**F**	**>10.0**	**Yes**
		PM	**>100.0**	**F**	**>100.0**	**F**	**>10.0**	**Yes**
4. Hancock Ave / Medical Center Dr	Signal	AM	18.0	B	18.2	B	0.2	No
		PM	19.3	B	19.6	B	0.3	No
5. Sparkman Ct / Medical Center Dr	TWSC	AM	**>100.0**	**F**	**>100.0**	**F**	**>10.0**	**Yes**
		PM	**>100.0**	**F**	**>100.0**	**F**	**>10.0**	**Yes**
6. Murrieta Hot Springs Rd / Madison Ave	Signal	AM	132.2	F	133.8	F	1.6	No
		PM	320.4	F	323.1	F	2.7	No
7. I-15 SB Ramps / Murrieta Hot Springs Rd	Signal	AM	20.2	C	20.4	C	0.2	No
		PM	32.7	C	40.5	D	7.8	No
8. I-15 NB Ramps / Murrieta Hot Springs Rd	Signal	AM	19.9	B	20.1	C	0.2	No
		PM	28.3	C	31.4	C	3.1	No
9. Murrieta Hot Springs Rd / Monroe Ave	Signal	AM	102.4	F	105.0	F	2.6	No
		PM	110.3	F	114.4	F	4.1	No
10. Murrieta Hot Springs Rd / Hancock Ave	Signal	AM	94.8	F	99.2	F	4.4	No
		PM	99.0	F	104.7	F	5.7	No
11. I-215 SB Ramps / Murrieta Hot Springs Rd	Signal	AM	30.7	C	31.0	C	0.3	No
		PM	38.0	D	47.5	D	9.5	No

CONTINUED ON THE NEXT PAGE

7–1 (CONTINUED)
HORIZON YEAR 2040 INTERSECTION OPERATIONS

Intersection	Control Type	Peak Hour	Year 2040 No Project		Year 2040 + Project		Δ Delay [c]	Improvement Required?
			Delay [a]	LOS [b]	Delay	LOS		
CONTINUED FROM THE PREVIOUS PAGE								
12. I-215 NB Ramps / Murrieta Hot Springs Rd	Signal	AM	7.5	A	7.5	A	0.0	No
		PM	7.8	A	8.0	A	0.2	No
13. Murrieta Hot Springs Rd / Alta Murrieta Dr	Signal	AM	91.7	F	94.7	F	3.0	No
		PM	**164.0**	**F**	**170.3**	**F**	**6.3**	**Yes**
14. Vista Murrieta Rd / Project Driveway #2	TWSC [d]	AM	DNE	DNE	8.6	A	NA	No
		PM	DNE	DNE	8.7	A	NA	No
15. Monroe Ave / Project Driveway #3	TWSC [d]	AM	DNE	DNE	12.8	B	NA	No
		PM	DNE	DNE	11.0	B	NA	No

Footnotes:
a. Average delay expressed in seconds per vehicle.
b. Level of Service.
c. Increase in delay due to Project Traffic
a. TWSC – Two-Way Stop Controlled intersection. Minor street left turn delay is reported.

General Note:
DNE – Does Not Exist
NA – Not Applicable
Bold indicates Improvements potentially required.

SIGNALIZED		UNSIGNALIZED	
Delay	LOS	Delay	LOS
0.0 ≤ 10.0	A	0.0 ≤ 10.0	A
10.1 to 20.0	B	10.1 to 15.0	B
20.1 to 35.0	C	15.1 to 25.0	C
35.1 to 55.0	D	25.1 to 35.0	D
55.1 to 80.0	E	35.1 to 50.0	E
≥ 80.1	F	≥ 50.1	F

TABLE 7–2
YEAR 2040 STREET SEGMENT OPERATIONS

Street Segment	General Plan Classification [a]	Functional Classification [b]	Capacity (LOS E) [c]	Year 2040 No Project			Year 2040 + Project			Δ [f] V/C	Improvement Required?
				ADT	LOS [d]	V/C [e]	ADT	LOS	V/C		
Vista Murrieta											
South of Los Alamos	Collector	2-Ln Collector	13,000	17,200	F	1.323	17,284	F	1.330	0.006	None
Medical Center Drive											
Sparkman Ct to Hancock Ave	Unclassified Road	2-Ln Collector	13,000	5,100	A	0.392	5,205	A	0.400	0.008	None
Murrieta Hot Springs Rd											
Madison Ave to I-15 Ramps	Aug Urban Art	6-Ln Urban Art	53,900	73,000	F	1.354	73,420	F	1.362	0.008	None
I-15 Ramps to Sparkman Ct	Aug Urban Art	8-Ln Aug Urban Art	71,800	86,700	F	1.208	89,218	F	1.243	0.035	None
Sparkman Ct to Hancock Ave	Aug Urban Art	8-Ln Aug Urban Art	71,800	103,000	F	1.435	103,420	F	1.440	0.006	None
Hancock Ave to I-215 Ramps	Aug Urban Art	8-Ln Aug Urban Art	71,800	96,700	F	1.347	97,959	F	1.364	0.018	None
I-215 Ramps to Alta Murrieta Dr	Multi Modal Transp Corridor	6-Ln Multi Modal Transp Corridor	53,900	92,700	F	1.720	93,120	F	1.728	0.008	None
Monroe Avenue											
Vista Murrieta Rd to Walsh Center Dr	Major Road	4-Ln Major Road [g]	34,100	23,700	B	0.695	25,085	C	0.736	0.041	None
Walsh Center Dr to Medical Center Dr	Major Road	4-Ln Major Road [g]	34,100	21,400	B	0.628	24,442	C	0.717	0.089	None
Medical Center Dr to Murrieta Hot Springs Rd	Major Road	4-Ln Major Road [g]	34,100	19,200	A	0.563	22,137	B	0.649	0.086	None

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TABLE 7–2 (CONTINUED)
YEAR 2040 STREET SEGMENT OPERATIONS

Street Segment	General Plan Classification [a]	Functional Classification [b]	Capacity (LOS E) [c]	Year 2040 No Project			Year 2040 + Project			Δ [f] V/C	Improvement Required?
				ADT	LOS [d]	V/C [e]	ADT	LOS	V/C		
CONTINUED FROM THE PREVIOUS PAGE											
Hancock Avenue											
Los Alamos Rd to Parkcrest Dr	Major Road	4-Ln Major Road	34,100	29,800	D	0.874	30,136	D	0.884	0.010	None
Parkcrest Dr to Walsh Center Dr	Major Road	4-Ln Major Road	34,100	29,800	D	0.874	30,136	D	0.884	0.010	None
Walsh Center Dr to Medical Center Dr	Major Road	4-Ln Major Road	34,100	33,100	E	0.971	33,834	E	0.992	0.022	None
Medical Center Dr to Murrieta Hot Springs Rd	Major Road	4-Ln Major Road	34,100	35,600	F	1.044	36,439	F	1.069	0.025	None

Footnotes:

a. The City of Murrieta roadway General Plan classification.
b. The City of Murrieta roadway classification at which the roadway currently functions.
c. The capacity of the roadway at Level of Service E.
d. Level of Service.
e. The Volume to Capacity ratio.
f. Increase in V/C ratio due to the addition of project traffic.
g. Monroe Avenue will be improved to a 4-Lane Major Road and connected to Los Alamos Road.

TABLE 7–3
HORIZON YEAR 2040 WITHOUT PROJECT 95TH PERCENTILE QUEUE

Intersection	Control Type	Southbound				Westbound				Northbound				Eastbound			
		Right		Left		Right		Left		Right		Left		Right		Left	
		Store	Queue	Store	Queue	Store	Queue	Store	Queue	Store	Queue	Store	Queue	Store	Queue	Store	Queue
1. Sparkman Ct / Walsh Center Dr	TWSC	c	c	c	c	c	c	c	c	b	b	a	a	a	a	a	a
3. Hancock Ave / Walsh Center Dr	TWSC	b	b	a	a	a	a	a	a	a	a	230	17	c	c	c	c
4. Hancock Ave / Medical Center Dr	Signal	100	**110**	150	130	145	21	100	**153**	b	b	120	**167**	e	e	e	e
5. Sparkman Ct / Medical Center Dr	TWSC	a	a	90	38	>150	20	150	0	b	b	a	a	a	a	a	a
6. Murrieta Hot Springs Rd / Madison Ave	Signal	b	b	170[f]	**890**	580	**621**	250[f]	**777**	170	**897**	100[f]	74	b	b	100[f]	**265**
7. I-15 SB Ramps / Murrieta Hot Springs Rd	Signal	>500	275	>900	642	>500	0	a	a	a	a	a	a	>500	0	a	a
8. I-15 NB Ramps / Murrieta Hot Springs Rd	Signal	a	a	a	a	1,900	0	a	a	>500	218	>600	550	a	a	500	386
9. Murrieta Hot Springs Rd / Monroe Ave	Signal	b	b	100[f]	256	b	b	150[f]	56	b	b	150[f]	217	200	48	200[f]	**437**
10. Murrieta Hot Springs Rd / Hancock Ave	Signal	370[g]	282	120[f]	698[h]	150	**1,419**	150[f]	169	150	29	150[f]	58	170	0	200[f]	**356**

Continued on the Next page

TABLE 7–3 (CONTINUED)
HORIZON YEAR 2040 WITHOUT PROJECT 95TH PERCENTILE QUEUE

Intersection	Control Type	Southbound				Westbound				Northbound				Eastbound			
		Right		Left		Right		Left		Right		Left		Right		Left	
		Store	Queue	Store	Queue	Store	Queue	Store	Queue	Store	Queue	Store	Queue	Store	Queue	Store	Queue
Continued from the previous page																	
11. I-215 SB Ramps / Murrieta Hot Springs Rd	Signal	>600	484	>700	530	>500	0	a	a	a	a	a	a	>500	0	a	a
12. I-215 NB Ramps / Murrieta Hot Springs Rd	Signal	a	a	a	a	>500	105	a	a	>500	176	>500	106	>500	0	a	a
13. Murrieta Hot Springs Rd / Alta Murrieta Dr	Signal	220	**340**	100[f]	**200**	250	105	225[f]	111	400	0	330[e]	298	b	b	290[f]	**328**
14. Vista Murrieta Rd / Project Driveway #2	TWSC [d]	a	a	a	a	a	a	a	a	a	a	a	a	a	a	a	a
15. Monroe Ave / Project Driveway #3	TWSC [d]	a	a	a	a	a	a	a	a	a	a	a	a	a	a	a	a

Footnotes:

a. Movement does not exist.
b. Shared through/right movement.
c. Shared left/through/right movement.
d. Shared left/through movement.
e. Shared left/right movement.
f. Dual left-turn lanes.
g. Dual right-turn lanes.
h. Not a deficiency since there is a center two-way-left-turn lane.

General Notes:

Longer of AM and PM queue reported.
Green highlight indicates queuing deficiency.

TABLE 7–4
HORIZON YEAR 2040 + PROJECT 95TH PERCENTILE QUEUE

Intersection	Control Type	Southbound				Westbound				Northbound				Eastbound			
		Right		Left		Right		Left		Right		Left		Right		Left	
		Store	Queue	Store	Queue	Store	Queue	Store	Queue	Store	Queue	Store	Queue	Store	Queue	Store	Queue
1. Sparkman Ct / Walsh Center Dr	TWSC	[c]	[c]	[c]	[c]	[c]	[c]	[c]	[c]	[b]	[b]	[a]	[a]	[a]	[a]	[a]	[a]
3. Hancock Ave / Walsh Center Dr	TWSC	[b]	[b]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	230	21	[c]	[c]	[c]	[c]
4. Hancock Ave / Medical Center Dr	Signal	100	110	150	130	145	21	100	**153**	[b]	[b]	120	**167**	[e]	[e]	[e]	[e]
5. Sparkman Ct / Medical Center Dr	TWSC	[a]	[a]	90	52	>150	24	150	0	[b]	[b]	[a]	[a]	[a]	[a]	[a]	[a]
6. Murrieta Hot Springs Rd / Madison Ave	Signal	[b]	[b]	170[f]	**898**	580	**631**	250[f]	**786**	170	**903**	100[f]	74	[b]	[b]	100[f]	**265**
7. I-15 SB Ramps / Murrieta Hot Springs Rd	Signal	>500	275	>900	677	>500	0	[a]	[a]	[a]	[a]	[a]	[a]	>500	0	[a]	[a]
8. I-15 NB Ramps / Murrieta Hot Springs Rd	Signal	[a]	[a]	[a]	[a]	1900	0	[a]	[a]	>500	330	>600	550	[a]	[a]	500	379
9. Murrieta Hot Springs Rd / Monroe Ave	Signal	[b]	[b]	100[f]	212	[b]	[b]	150[f]	56	[b]	[b]	150[f]	240	200	54	200[f]	**774**
10. Murrieta Hot Springs Rd / Hancock Ave	Signal	370[g]	287	120[f]	747[h]	150	**1,430**	150[f]	169	150	29	150[f]	58	170	0	200[f]	**392**

Continued on the Next page

TABLE 7–4 (CONTINUED)
HORIZON YEAR 2040 + PROJECT 95TH PERCENTILE QUEUE

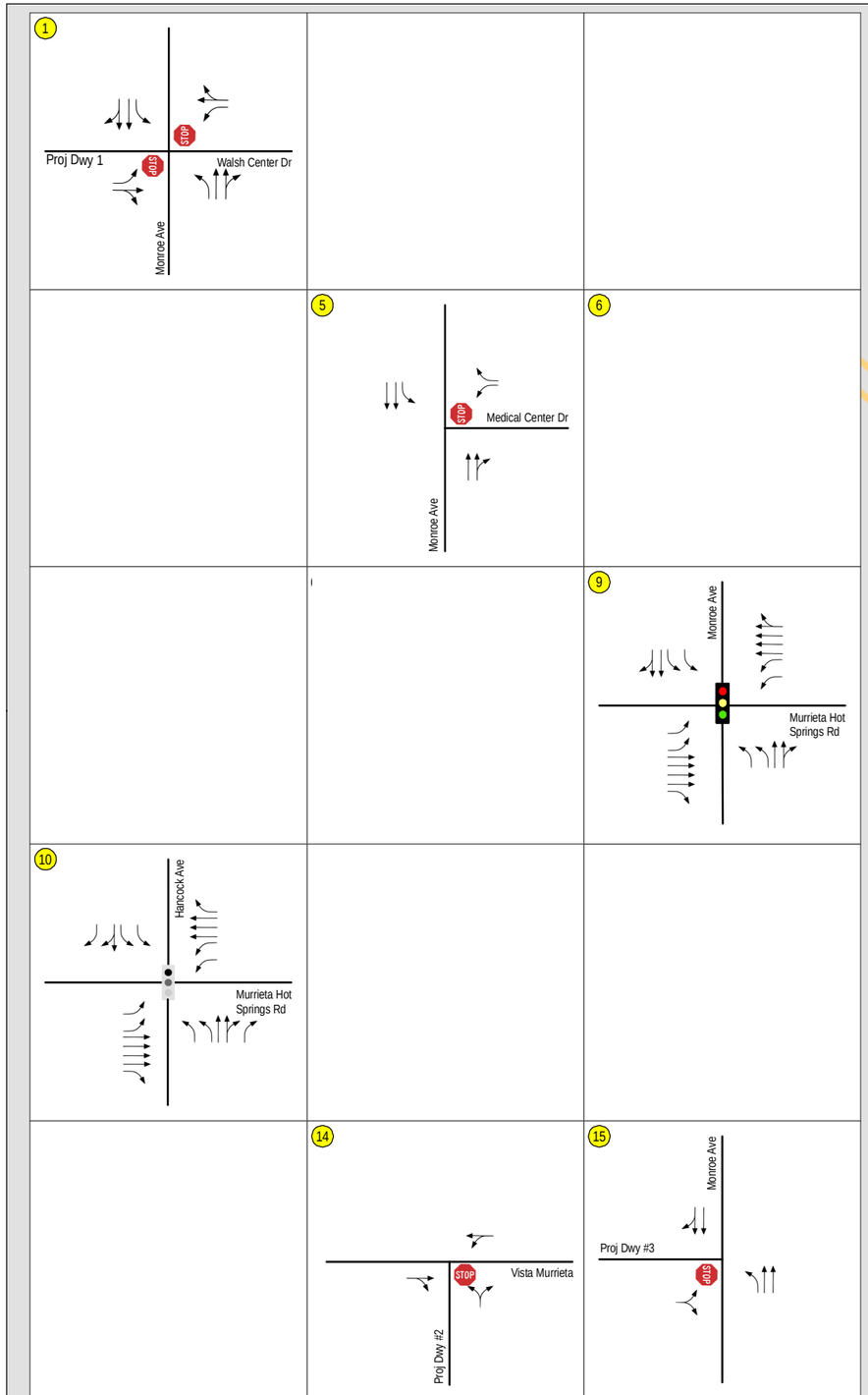
Intersection	Control Type	Southbound				Westbound				Northbound				Eastbound			
		Right		Left		Right		Left		Right		Left		Right		Left	
		Store	Queue	Store	Queue	Store	Queue	Store	Queue	Store	Queue	Store	Queue	Store	Queue	Store	Queue
Continued from the previous page																	
11. I-215 SB Ramps / Murrieta Hot Springs Rd	Signal	>600	522	>700	575	>500	0	a	a	a	a	a	a	>500	0	a	a
12. I-215 NB Ramps / Murrieta Hot Springs Rd	Signal	a	a	a	a	>500	103	a	a	>500	177	>500	106	>500	0	a	a
13. Murrieta Hot Springs Rd / Alta Murrieta Dr	Signal	220	**337**	100[f]	**200**	250	128	225[f]	87	400	23	330[e]	**334**	b	b	290[f]	**330**
14. Vista Murrieta Rd / Project Driveway #2	TWSC [d]	a	a	a	a	a	a	a	a	a	a	a	a	a	a	a	a
15. Monroe Ave / Project Driveway #3	TWSC [d]	a	a	a	a	a	a	a	a	a	a	a	a	a	a	a	a

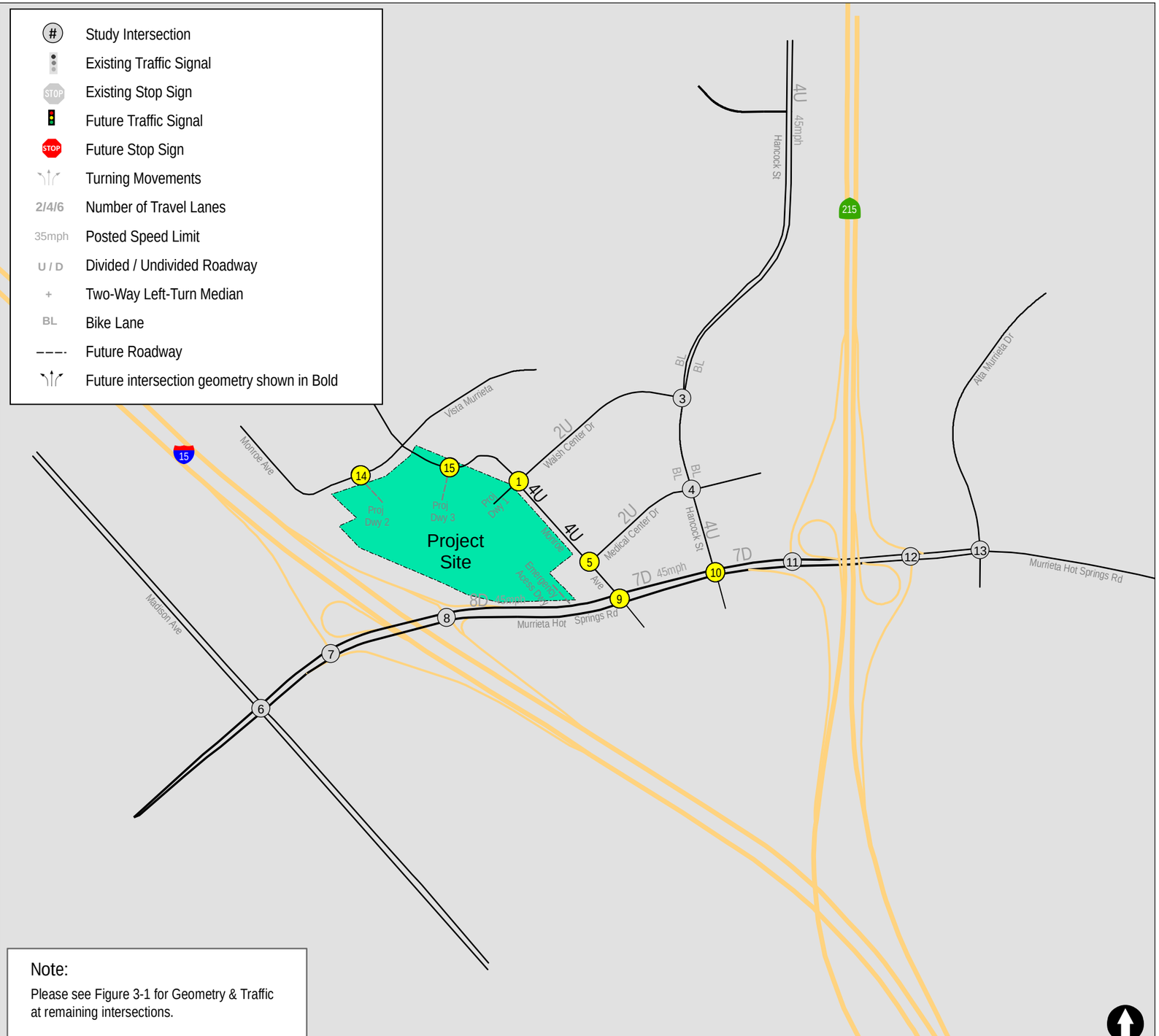
Footnotes:

a. Movement does not exist.
b. Shared through/right movement.
c. Shared left/through/right movement.
d. Shared left/through movement.
e. Shared left/right movement.
f. Dual left-turn lanes.
g. Dual right-turn lanes.
h. Not a deficiency since there is a center two-way-left-turn lane.

General Notes:

Longer of AM and PM queue reported.
Yellow highlight indicates queuing impact.





Note:

Please see Figure 3-1 for Geometry & Traffic at remaining intersections.

LINSCOTT LAW & GREENSPAN engineers

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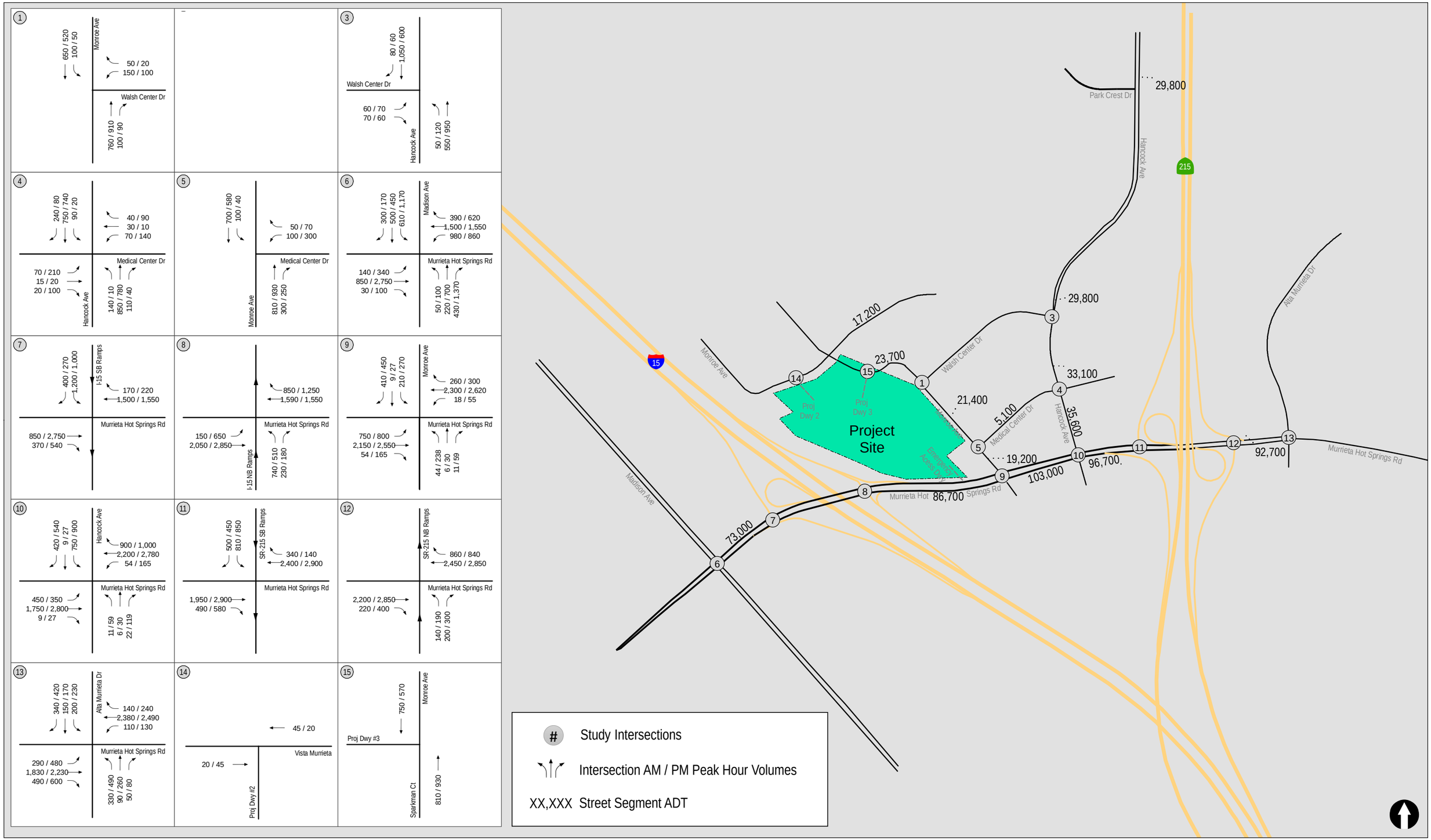
Figure 7-1

Horizon Year 2040 Conditions Diagram

The Terraces at Murrieta



LINSCOTT LAW & GREENSPAN engineers

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Figure 7-2

Horizon Year 2040 without Project Traffic Volumes

The Terraces at Murrieta

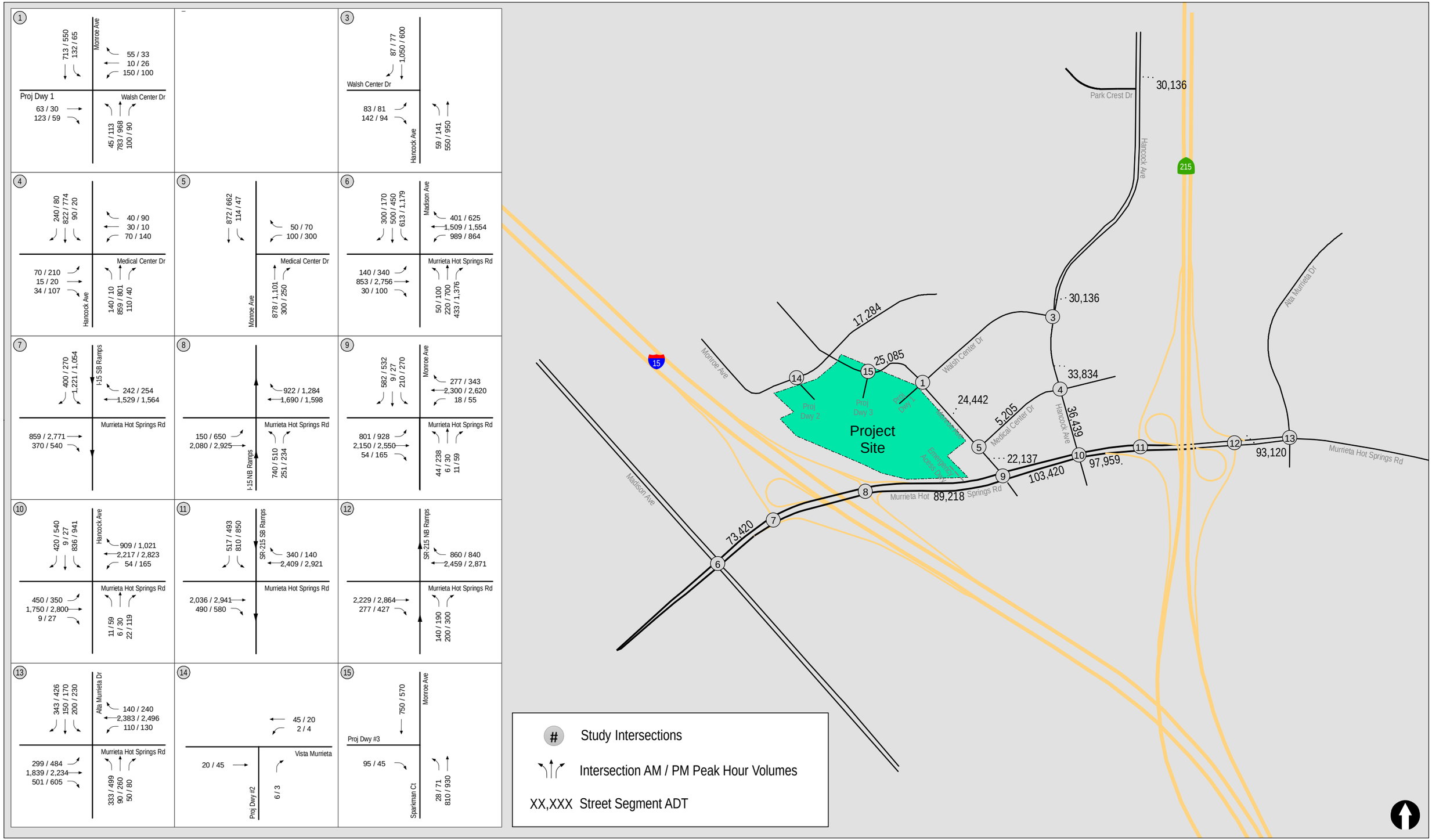

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Figure 7-3

Horizon Year 2040 + Project Traffic Volumes

The Terraces at Murrieta

8.0 SITE ACCESS AND CIRCULATION

8.1 Site Access

Two access points will be provided for Phase 1 and a third will be added for Phase 2. In addition to these day-to-day access points, an emergency access will be provided via Murrieta Hot Springs Road:

Phase 1

- A full access driveway at Sparkman Court opposite Walsh Center Drive. Most of the Project traffic will use this driveway.
- A full access driveway on Vista Murrieta, along the northern boundary of the site. Vista Murrieta is currently an unpaved dirt road. The Project will pave Vista Murrieta along its Project frontage.
- An emergency access driveway at the eastern boundary of the site on Murrieta Hot Springs Road. This access will be gated and kept locked and will be opened by emergency personnel for access by emergency vehicles only.

Phase 2

- An additional driveway will be provided on Sparkman Court north of Walsh Center Drive in Phase 2.

All three access driveway intersections are analyzed under all analysis scenarios. Two of these driveways (#2 and #3 are calculated to operate adequately. In the long-term the Project Driveway #1 / Walsh Center Drive / Monroe Avenue intersection is calculated to operate at LOS F. Improvements to the intersection geometry and signalization will result in acceptable operations.

Based on the above discussion, adequate site access is planned. Adequate regional access (I-15 and I-215) and local access (Hancock Avenue) is provided to the Project site.

8.2 Onsite Circulation

The Project site is well served by a roadway network internally. All onsite buildings are connected to each other by this internal road with external connection to Sparkman Court and Vista Murrieta.

9.0 SIGNAL WARRANTS

This section includes signal warrants for the following three intersections where traffic signals are recommended:

- Hancock Avenue / Walsh Center Drive
- Murrieta Hot Springs Road / Monroe Avenue
- Walsh Center Drive / Monroe Avenue

9.1 Hancock Avenue / Walsh Center Drive

This is a T-intersection with Walsh Center Drive as the west leg and Hancock Avenue as the north and south legs. The Hancock Avenue / Walsh Center Drive intersection is calculated to operate at LOS D on Opening Day without Project. With the addition of Project Phase 1 traffic this intersection is calculated to operate at LOS E. A traffic signal is recommended at this intersection. Following is the peak hour signal warrant analysis:

The following assumptions apply at this intersection:

Hancock Avenue (major street) is a four-lane road with a dedicated NB left-turn lane on Hancock Avenue. Walsh Center Drive (minor street) is two-lane road. The major street approach will function as a two-lane approach and the minor street approach will function as a one-lane approach. and is analyzed as a One-Lane approach.

Chart 1 on the next page, depicts the Peak hour warrant plot at this intersection on Opening Day without Project traffic. As seen in *Chart 1*, the warrant is not met at this intersection.

Chart 2 on the next page, depicts the Peak hour warrant plot at this intersection on Opening Day with Project Phase 1 traffic. As seen in *Chart 1*, the warrant is met at this intersection during the AM peak hour since the plot point falls above the curve.

CHART 1

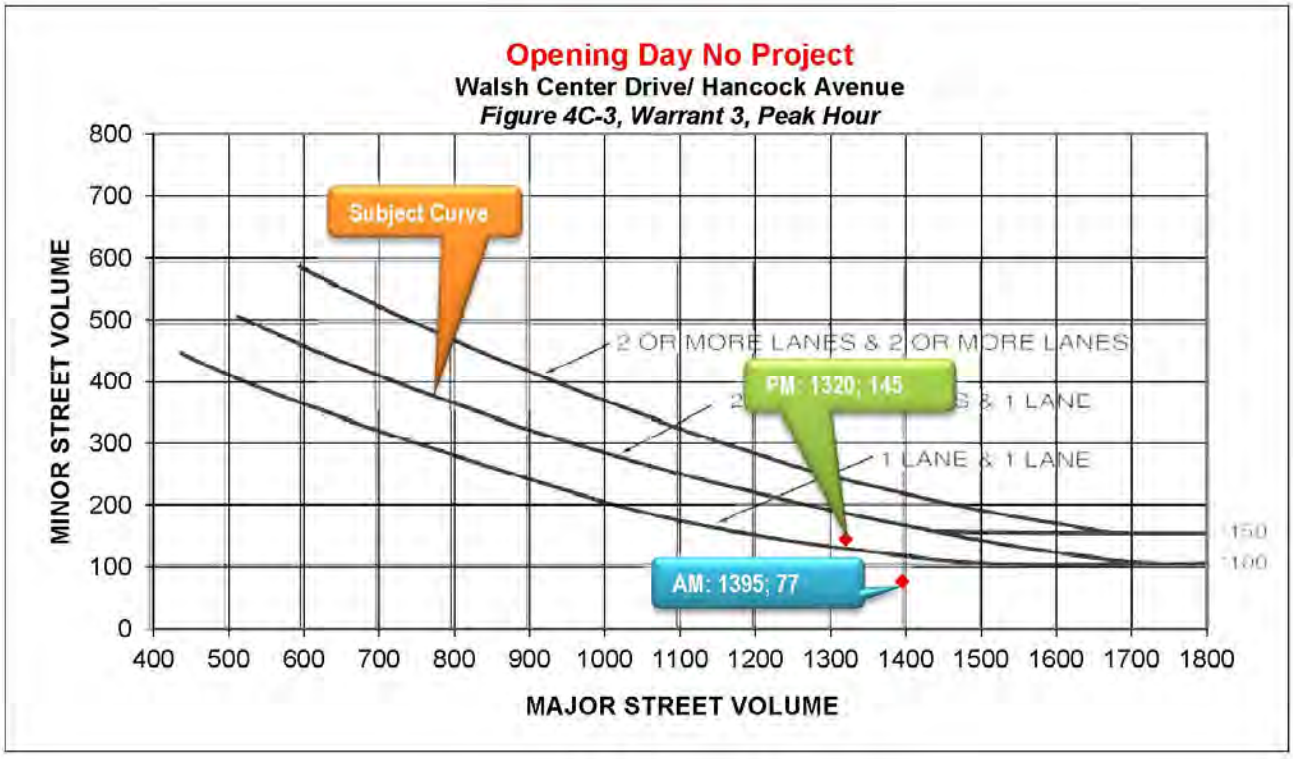
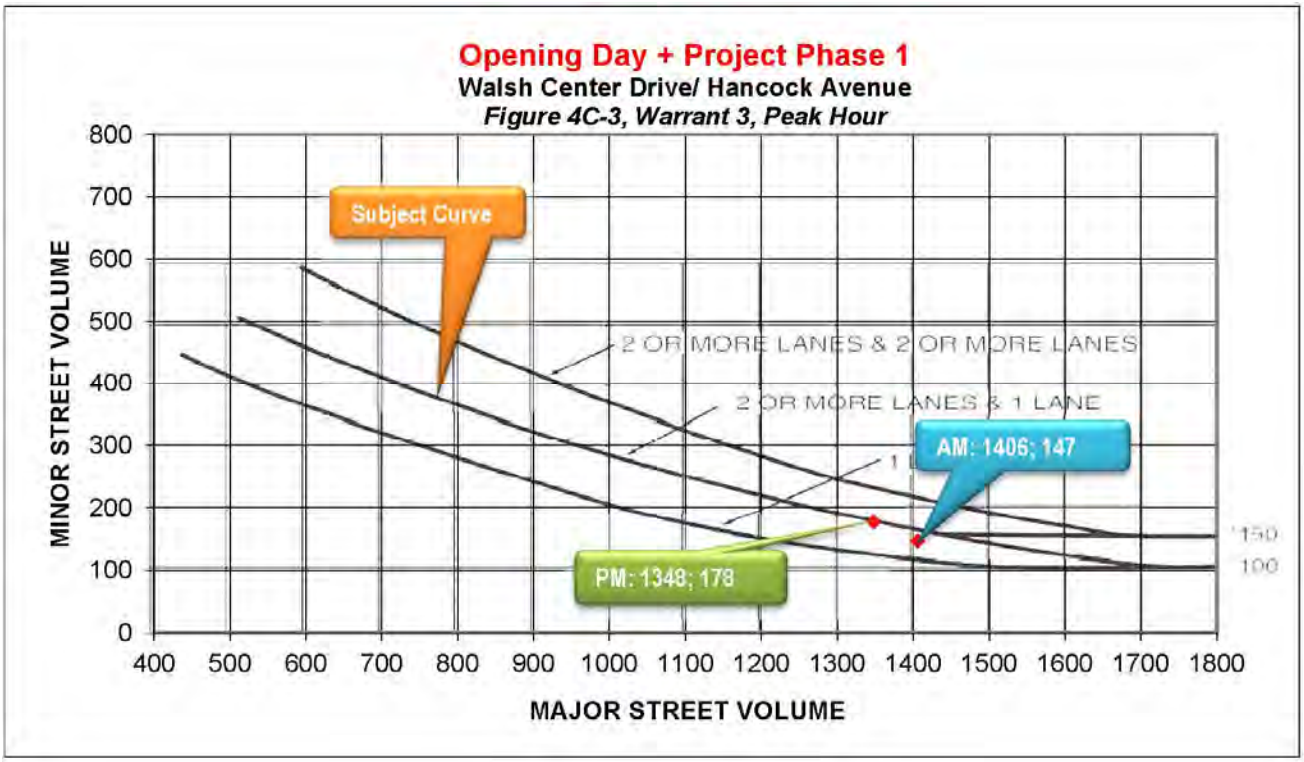


CHART 2



9.2 Murrieta Hot Springs Road / Monroe Avenue

The Murrieta Hot Springs Road / Sparkman Court (Monroe Avenue) intersection is a T-intersection with Sparkman Court as the north leg and Murrieta Hot Springs Road as the east and west legs. This intersection is calculated to operate at LOS F in the Year 2028 with Project traffic. A traffic signal is recommended at this intersection. Following is the peak hour signal warrant analysis:

The following assumptions apply at this intersection:

Murrieta Hot Springs Road (major street) is a 7-lane road with a dedicated EB left-turn and Sparkman Court (minor street) is two-lane road with a dedicated SB right-turn lane. The major street approach will function as a two-lanes or more approach and the minor street approach will function as a one-lane approach.

In the Opening Day without and with Project, it is assumed that the Triangle Project will be built. As a result, there will be two approach lanes on Monroe Avenue in the southbound and northbound approaches. Therefore, the "2 or more lanes and 2 or more lanes" curve applies.

Chart 3 below, depicts the Peak hour warrant plot at this intersection on Opening Day without Project traffic. As seen in *Chart 3*, the warrant is met at this intersection during the PM peak hour since the plot points falls above the subject curve.

Chart 4 on the next page, depicts the Peak hour warrant plot at this intersection on Opening Day with Project Phase 2 traffic. As seen in *Chart 3*, the warrant is met at this intersection during the AM and PM peak hours since the plot points falls above the subject curve.

CHART 3

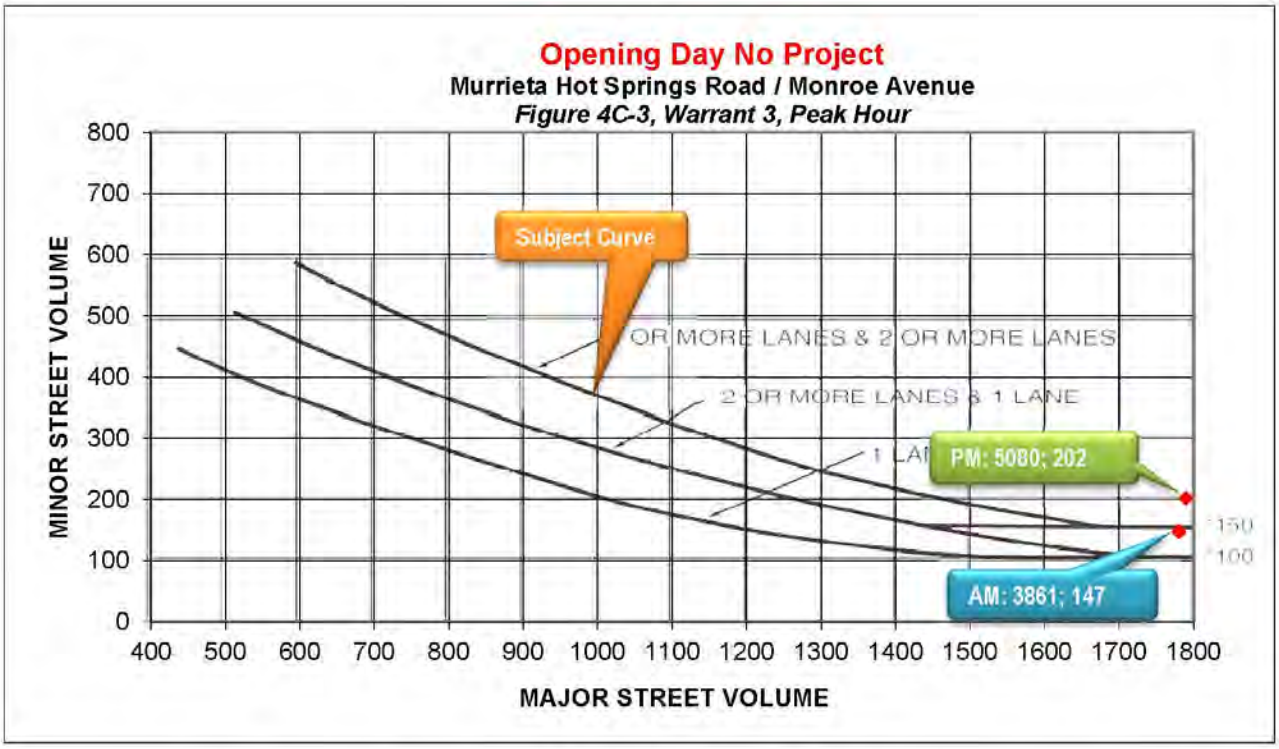
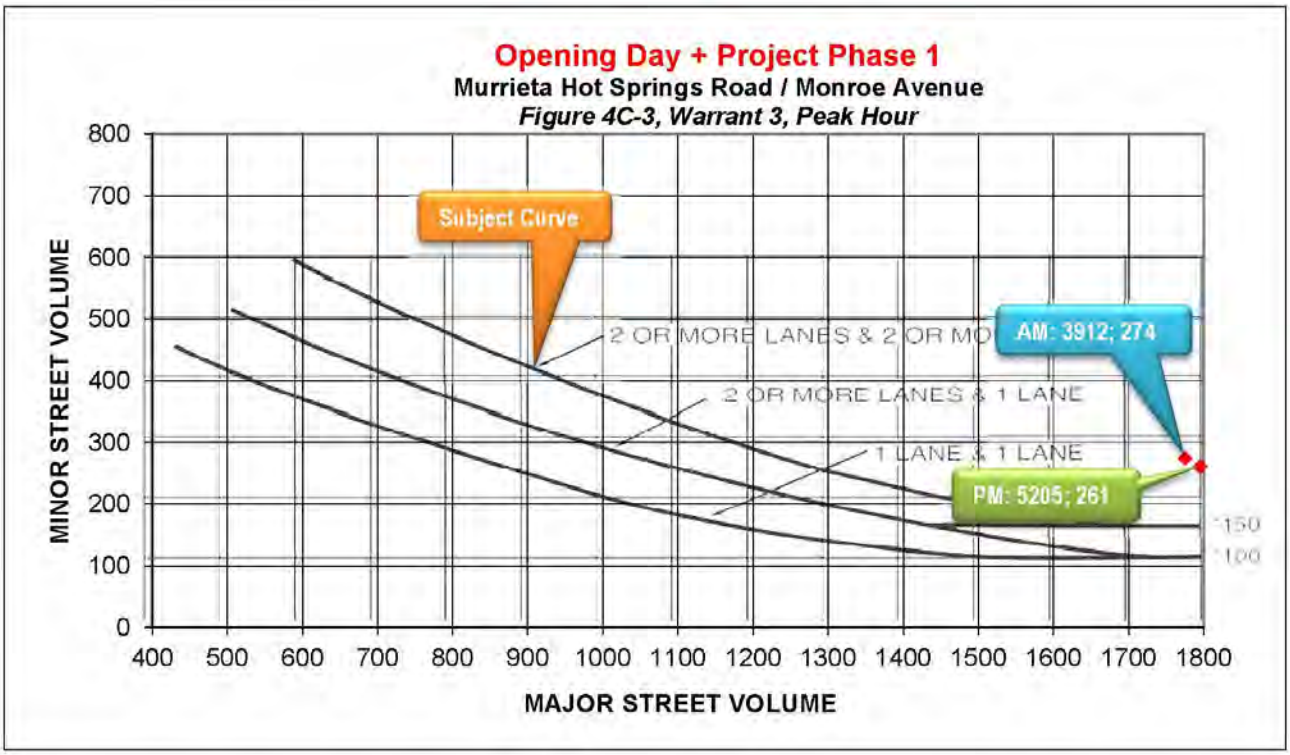


CHART 4



9.3 Walsh Center Drive / Monroe Avenue

A signal warrant analysis was conducted at the future Monroe Avenue / Walsh Center Drive intersection in the Long-Term Year 2040 without the Terraces Project traffic. This is to determine if a signal is warranted at this intersection without the Project traffic. Warrant 1, Eight-Hour Vehicular Volume and Warrant 3, Peak hour intersection Volume analyses were conducted. Following are the results of this analysis.

9.3.1 *Volume Forecast*

The Year 2040 northbound and southbound daily ADT volumes on the future Monroe Avenue are available from the Murrieta Transportation Analysis Model (MTAM) model. Hourly volumes are not available from the Model. Therefore, the hourly distribution of traffic was obtained from the existing 24-hour volume counts on Hancock Avenue, which is parallel to, and within a quarter mile from, Monroe Avenue. It is likely that the hourly traffic flow pattern on Monroe Avenue will be similar to that on Hancock Avenue.

The hourly approach volumes forecast on Monroe Avenue and Walsh Center Drive are included in ***Appendix Q***

The Year 2040 daily volumes are not available on Walsh Center Drive and therefore, these volumes were estimated based on the existing volumes on Walsh Center Drive. The hourly distribution (percentage to the daily volume) on Hancock Avenue was applied to the daily volumes on Monroe Avenue to obtain the Year 2040 hourly volumes for a 24-hour period on Monroe Avenue and Walsh Center Street. These volumes were used for the 8-Hour Warrant analysis (*Table 2*).

9.3.2 *Warrant 1 – Eight-Hour Vehicular Volume*

Methodology

The need for a traffic signal shall be considered if an engineering study finds that one of the following conditions exist for each of 8 hours of an average day. In applying each condition, the major-street and minor-street volumes shall be for the same 8 hours. On the minor street, the higher volume shall not be required to be on the same approach during each of these 8 hours.

If the posted or statutory speed limit or the 85th percentile speed on the major street exceeds 40 mph, or if the intersection lies within the built-up area of an isolated community having a population of less than 10,000, the traffic volumes in the 70 percent columns in Table 4C-1 may be used in place of the 100 percent columns.

The 70% criterion applies in this study, since the speed limit on Monroe Avenue, a 4-Lane Major Road within the City of Murrieta General Plan will be 45 miles per hour. If the 70% factor applies, the thresholds corresponding to the 70% factor (***Table 1***) should be used:

A. The vehicles per hour given in both of the 100 percent columns of Condition A in Table 4C-2 exist on the major-street (420 vehicles per hour) and the higher-volume minor-street (105 vehicles per hour) approaches, respectively, to the intersection; or

B. The vehicles per hour given in both 100 percent columns of Condition B in Table 4C-1 exist on the major-street (630 vehicles per hour) and the higher-volume minor-street (53 vehicles per hour) approaches, respectively, to the intersection.

TABLE 9-1
WARRANT 1: EIGHT – HOUR VEHICULAR VOLUME
70% CRITERIA

Warrant 1	**Vehicles per hour on major street (Total of both approaches)**	**Vehicles per hour on higher-volume minor-street approach (One direction only)**
Condition A	420	105
Condition B	630	53

Calculations

Table 1 summarizes the volume thresholds for two lanes or more approach on the major street and one-lane approach on the minor street for conditions A and B for the 70% factor.

Table 2 compares the actual hourly volumes for 24 hours in a day to the minimum volumes (Table B) required to satisfy this warrant. As seen in Table B, the Condition A warrant volumes are satisfied during one (1) hour in a day and the Condition B warrant volumes are satisfied for nine (9) hours on

TABLE 9-2
YEAR 2040 WITHOUT PROJECT
WARRANT 1: EIGHT - HOUR VEHICULAR VOLUME
MONROE AVENUE / WALSH CENTER DRIVE

Hour Begin	Hourly Percentage		Monroe Avenue			Walsh Center Drive	Condition 1-A	Condition 1-B
	NB/WB	SB/EB	NB	SB	Total	WB		
0	0%	0%	52	30	82	4	N	N
1	0%	0%	39	13	52	2	N	N
2	0%	0%	16	19	35	3	N	N
3	0%	0%	20	36	56	5	N	N
4	0%	1%	39	94	133	13	N	N
5	0%	2%	41	240	281	33	N	N
6	1%	5%	163	594	757	81	N	N
7	4%	11%	485	1,266	1,751	173	N	**Y**
8	5%	10%	587	1,204	1,791	164	N	**Y**
9	5%	7%	585	766	1,351	105	N	**Y**
10	5%	7%	601	764	1,365	104	**Y**	**Y**
11	6%	7%	678	766	1,444	105	N	**Y**
12	6%	7%	766	862	1,628	118	N	**Y**
13	7%	6%	867	753	1,620	103	N	**Y**
14	7%	8%	858	883	1,741	121	N	**Y**
15	8%	6%	987	756	1,743	103	N	**Y**
16	11%	6%	1,341	726	2,067	99	N	N
17	14%	6%	1,639	647	2,286	88	N	N
18	9%	4%	1,140	426	1,566	58	N	N
19	4%	3%	434	324	758	44	N	N
20	2%	2%	300	268	568	37	N	N
21	2%	1%	188	125	313	17	N	N
22	1%	1%	117	89	206	12	N	N
23	1%	1%	77	68	145	9	N	N
Total	**100%**	**100%**	**12,020**	**11,719**	**23,739**	**1,600**	**1**	**9**

9.3.3 *Warrant 3 – Peak Hour*

Methodology

The need for a traffic control signal shall be considered if an engineering study finds that the criteria in either of the following two categories are met:

A. If all of the three conditions exist for the same 1 hour (any four consecutive 15-minute periods) of an average day:

   1. The total stopped time delay experienced by the traffic on one minor-street approach (one direction only) controlled by a STOP sign equals to or exceeds 4 Vehicles-hours for a one-lane approach; or 5 vehicle-hours for a two-lane approach, and
   2. The volume on the same-minor street approach (one direction only) equals or exceeds 100 vehicles per hour for one moving lane of traffic or 150 vehicles per hour for two moving lanes, and

The total entering volume serviced during the hour equals or exceeds 650 vehicles per hour for the intersections with three approaches or 800 vehicles per hour for intersections with four or more approaches.

B. The plotted point representing the vehicles per hour on the major street (total of both approaches) and the corresponding vehicles per hour on the higher-volume on the minor – street approach (one direction only) for 1 hour (or any four consecutive 15-minute periods) of an average day falls above the applicable curve in Figure 4C-3 for the existing combination of approach lanes.

If the posted or statutory speed limit or the 85th percentile speed on the major street exceeds 40 mph, or if the intersection lies within the built-up area of an isolated community having a population of less than 10,000, Figure 4C-4 may be used in place of Figure 4C-3 to satisfy the criteria in the second category.

Calculations

The posted speed limit on Monroe Avenue will be 45 mph. Therefore, Figure 4C-4 is the proper figure to utilize. ***Table 3*** summarizes Warrant 3 calculations. As seen in *Table 3*, all three parts are satisfied. Hence Part A is satisfied.

Part A-1

Peak hour analysis of this intersection with a signal indicates LOS A with delays of 61.2 seconds (LOS F) and 161.3 seconds (LOS F) during the AM and PM peak hours respectively. Therefore, Part A-1 is met.

Part A-2

The volume the Walsh Street WB approach equals 150 vph for two moving lanes. Therefore, Part A-2 is met.

Part A-3

The entering volume serviced is 1,810 and 1690 during the AM and PM peak hours respectively, and therefore exceeds 650 vehicles per hour for this intersection with three approaches. Therefore, Part A-3 is met.

Thus, since all three parts of Part A are met, Part A is satisfied.

Part B

The PM peak hour (4:00 pm to 6:00 pm) traffic volumes fall above the curve for the appropriate number of lanes when plotted on Figure 4C-4 of the California MUTCD. Hence Part B is satisfied.

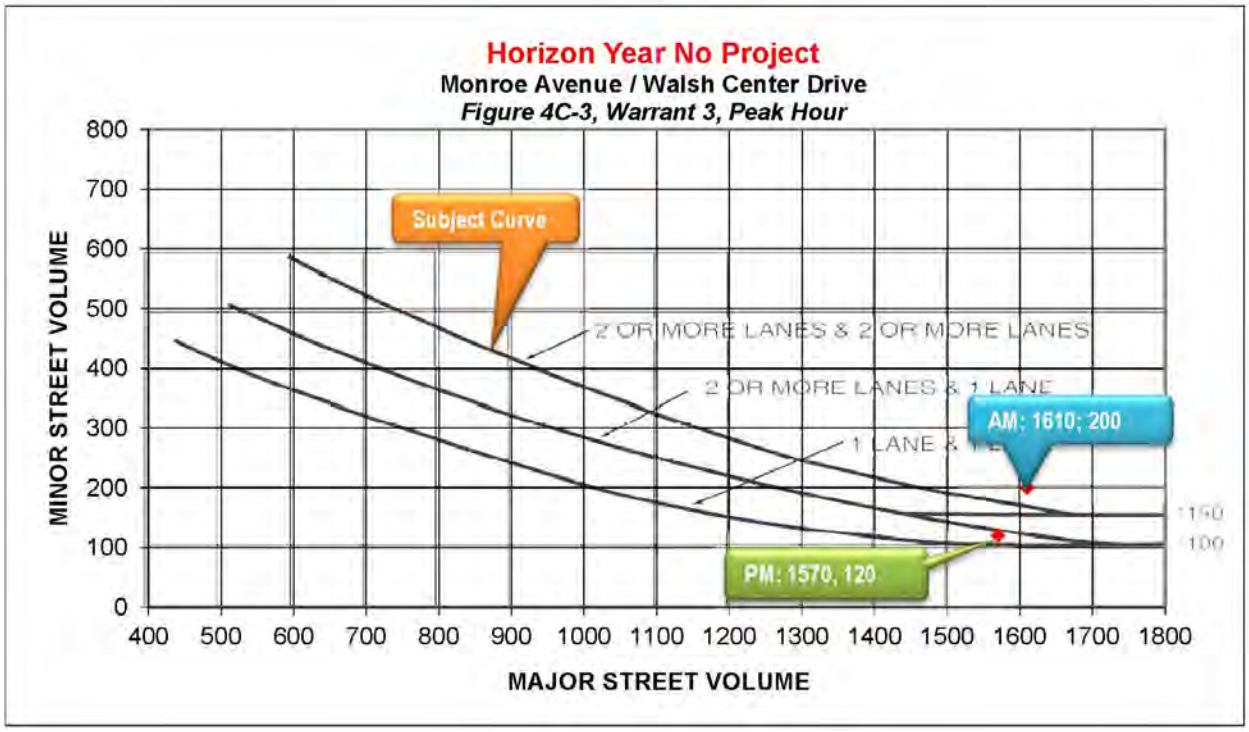
Based on the methodology above, one of the categories, Part A and part B should be satisfied. Since both Part A and Part B are met, ***Warrant 3 is satisfied.***

TABLE 9-3
WARRANT 3: PEAK - HOUR: BASE

Warrant 3 – Peak Hour	Part A or Part B Satisfied	**Yes** ✓	**No**
Part A (All Parts 1, 2, and 3 below must be satisfied)	Satisfied	**Yes** ✓	**No**
1. The total delay experienced for traffic on one minor-street approach controlled by a STOP sign equals or exceeds four vehicle-hours for a one-lane approach and five vehicle-hours for a two-lane approach; AND		**Yes** ✓	**No**
2. The volume on the same-minor street approach equals or exceeds 100 vph for one moving lane of traffic or 150 vph for two moving lanes; AND		**Yes** ✓	**No**
3. The entering volume serviced during the hour equals or exceeds 800 vph for the intersections with four or more approaches or 650 vehicles per hour for intersections with three approaches.		**Yes** ✓	**No**
Part B	Satisfied	**Yes** ✓	**No**

Approach Lanes	One	2 or More	AM	PM
Both Approaches -Major Street		X	Yes	No
Highest Approaches -Minor Street	X		Yes	No

The plotted points for vehicles per hour on Major streets (both approaches) and the corresponding per hour higher volume vehicle minor street approach (one direction only) for one hour (any consecutive 15-minute period) fall above the applicable curves in MUTCD Figure 4C-3 or 4C-4.



9.4 Conclusion

Based on the above Warrant analyses, the following is concluded:

- **Hancock Avenue / Walsh Center Drive intersection**

  This intersection is calculated to operate at LOS F with the Project traffic in the Opening Year 2025.Without the Project, Warrant 3, Peak Hour Warrant is not met. However, with the addition of Project Phase 1 traffic, warrant 3 is met during the AM peak hour.

- **Murrieta Hot Springs Road / Monroe Avenue intersection**

  This intersection is calculated to operate at LOS F with the Project traffic in the Year 2028.Without and with Project Phase 2 traffic, Warrant 3, Peak Hour Warrant is met during the AM and PM peak hours.

- **Monroe Avenue / Walsh Center Drive intersection**

  This intersection is calculated to operate at LOS F without Project traffic in the Horizon Year 2040. Without Project traffic, Warrant 1, 8-Hour and Warrant 3 Peak hour warrants are met in the Long-Term Year 2040.

10.0 VEHICLE MILES TRAVELLED ANALYSIS

This section includes the Vehicle Miles Travelled (VMT) screening criteria, analysis methodology, impact thresholds and VMT analysis. The approach and methodology outlined in this Technical Memorandum is consistent with the City of Murrieta *Traffic Impact Analysis Preparation Guidelines* (Guidelines) dated March 2021, which provides additional detail on the language and analysis procedure described in this Technical Memorandum.

10.1 Project Type Screening Criteria

Under the VMT methodology, screening is used to determine if a project will be required to conduct a detailed VMT analysis. The Guidelines outline the screening methods to determine whether the proposed Project will screen-out, either in its entirety, or partially based on individual land uses. The City's Project Type Screening criteria and its determination are listed below:

- Local serving retail projects less than 50,000 square feet may be presumed to have a less than significant impact absent substantial evidence to the contrary. Local serving retail generally improves the convenience of shopping close to home and has the effect of reducing vehicle travel.
- Projects generating less than 110 daily vehicle trips regardless of whether consistent with the General Plan or not. This generally corresponds to the following "typical" development potentials:
  - A Residential Parcel Map
  - 11 Single Family Housing Units
  - 16 Multi-Family, Condominiums or Townhouse Housing Units
  - 10,000 SF of Office
  - 15,000 SF of Light Industrial
  - 63,000 SF of Warehouse
- Local-serving retail that primarily serves the City and/or adjacent cities.
- Office and other employment-related land uses reducing commutes outside the local area.
- Local-serving day care centers, pre-K and K-12 schools.
- Local parks and civic uses.
- Local-serving gas stations, banks and hotels (e.g. non-destination hotels).
- Local serving community colleges that are consistent with SCAG RTP/SCS assumptions.
- Student housing projects.

As stated previously, the proposed Project consists of a 899-unit multi-family apartment complex and therefore does not satisfy any of the aforementioned City's Project Type Screening criteria.

10.2 VMT Limited Analysis

Per the City's guidelines, projects not satisfying the Project Type Screening criteria are required to prepare a limited analysis of the VMT expected to be generated by the project and compare that to the VMT expected to be generated by the land use assumed in the General Plan.

Based on coordination with City of Murrieta Traffic Engineering staff, the VMT Limited Analysis confirms whether or not the Project is consistent with the General Plan (i.e. land use and zoning) and whether or not the Project exceeds the development envelope assumed in the 2040 General Plan for the Traffic Analysis Zone (TAZ) that the project site is located within. If the proposed Project is consistent with the assumptions in the 2040 General Plan Buildout condition and is within the 2040 General Plan development envelope, no further VMT analysis is required.

It should be noted that the Project is located in TAZ 43413201. ***Figure 10-1*** presents the TAZ Map from the City of Murrieta Transportation Analysis Model (MTAM).

Based on information provided by the City of Murrieta Traffic Engineering staff, 3 households are the total households development envelope assumed in the 2040 General Plan for TAZ 43413201. Given that TAZ 43413201 currently already has 3 existing households, and the proposed Project will consist of a 899-unit multi-family apartment complex, the 3-household development envelope assumed within the 2040 General Plan will be exceeded.

Since the proposed Project is inconsistent with the land use and zoning assumptions in the 2040 General Plan and the Project development tabulation is exceeded within the permitted 2040 General Plan development envelope, a detailed VMT analysis is required per the City's guidelines.

10.3 VMT Analysis Methodology

According to the Guidelines and direction given by the City Staff, if a Project VMT is more than the land use assumed in the General Plan, a complete VMT analysis and forecasting must be done using the City of Murrieta Transportation Analysis Model (MTAM) to determine if the Project will have a significant VMT impact. This analysis includes "Project Generated VMT" and "Project Effect on VMT" estimates for the Project TAZ under the following scenarios:

- Baseline Conditions
- Baseline Plus Project
- Cumulative No Project
- Cumulative Plus Project

Based on the above, a full VMT analysis utilizing MTAM has been conducted to determine the VMT for Project and for the City of Murrieta average and will provide the following:

- Project-Generated VMT per Service Population
- Link-Level Boundary VMT per Service Population

10.4 VMT Impact Thresholds

As previously discussed, a project that does not meet the screening criteria will require preparation of a detailed transportation analysis. The Project VMT will be evaluated in order to determine if the Project is expected to cause a significant transportation impact. The VMT significance criteria as stated in the Guidelines is detailed in the section below.

10.4.1 *Project-Generated VMT Impacts*

A project would result in a significant project generated VMT impact if either of the following conditions are satisfied:

1. The baseline project generated VMT per service population exceeds the City's baseline VMT per service population, or
2. The cumulative project generated VMT per service population exceeds the City's baseline VMT per service population.

10.4.2 *Project's Effect on VMT Impacts*

The Project's effect on VMT would be considered significant if it resulted in either of the following conditions to be satisfied:

1. The baseline link-level boundary VMT per service population (City or subregional boundary) to increase under the plus project condition compared to the no project condition, or
2. The cumulative link-level boundary VMT per service population (City or subregional boundary) increases under the plus project condition compared to the no project condition.

Please note that the cumulative no project condition shall reflect the adopted Regional Transportation Plan Sustainable Communities Strategy (RTP/SCS); as such, if a project is consistent with the regional RTP/SCS, then the cumulative impacts shall be considered less than significant subject to consideration of other substantial evidence.

The Project is consistent with the adopted Regional Transportation Plan Sustainable Communities Strategy (RTP/SCS) thus the cumulative impacts are considered to be less than significant. Further, it should be noted that the cumulative analysis is provided for informational purposes only.

10.5 VMT Mitigation Measures

If a significant VMT impact is identified, measures to reduce the Project's VMT impact should be identified to reduce the VMT levels to a level at or below the City's thresholds. To mitigate VMT impacts, various options can be considered, the following choices are some of those available to the applicant:

1. Changing the Project - Modify the project's-built environment characteristics to reduce VMT generated by the project.
2. TDM - Implement Transportation Demand Management (TDM) measures to reduce VMT generated by the project. TDM measures need ongoing monitoring and performance metrices to be implemented, this must be a required condition of a project that selects this measure.
3. Impact Fee or Exchange - Participate in a VMT fee program and/or VMT mitigation exchange/banking program (if they exist) to reduce VMT from the project or other land uses to achieve acceptable levels.

Additional TDM measures appropriate to the region are identified in the WRCOG Implementation Pathway Study.

10.6 VMT Analysis

Summarized in the following section are the average VMT per Service Population values utilizing MTAM for the City of Murrieta and the proposed Project. The Project development totals were converted into Socio-Economic Data (SED) and inputted into MTAM.

10.6.1 *Project-Generated VMT Thresholds*

Table 10-1 summarizes the Project Generated VMT per service population. As shown in *Table 10-1*, the proposed Project baseline Project-generated VMT per Service Population is ***42.25%*** below the City average VMT per Service Population threshold and the cumulative Project-generated VMT per Service Population is ***34.05%*** below the City average VMT per Service Population threshold. Based on the criteria outlined in this report, the proposed Project will not exceed the City of Murrieta baseline VMT per Service Population of 38.91 and thus will not have a significant Project-generated VMT impact.

TABLE 10-1
PROJECT-GENERATED VMT PER SERVICE POPULATION

Description	Project	City of Murrieta	Compared to Thresholds (City of Murrieta)
Baseline	22.47	38.91	***42.25% Lower***
Cumulative	25.66	38.91	***34.05% Lower***

10.6.2 *Project's Effect on VMT Thresholds*

Table 10-2 summarizes the Link-Level Boundary per service population. As shown in *Table 9-2*, the proposed Project baseline link-level boundary VMT per Service Population is ***0.85%*** below the "no Project" scenario link-level boundary VMT per Service Population threshold and the proposed Project cumulative link-level boundary VMT per Service Population is ***1.48%*** below the "no Project" Scenario VMT pe Service Population threshold. Based on the criteria outlined in this

report, the proposed Project link-level boundary VMT per Service Population will not increase under the "plus Project" condition when compared to the "no Project" condition and thus the Project's effect on VMT will not be significant.

TABLE 10-2
LINK-LEVEL BOUNDARY PER SERVICE POPULATION

Description	Project	City of Murrieta	Compared to Thresholds (City of Murrieta)
Baseline	16.31	16.45	***0.85% Lower***
Cumulative	16.68	16.93	***1.48% Lower***

It should be noted that as previously mentioned and according to the Guidelines, if a project is consistent with the Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS), then the cumulative impacts shall be considered less than significant. Since, the proposed Project is consistent with the RTP/SCS, the cumulative impacts are considered to be less than significant, and the cumulative analysis is provided for informational purpose only.

10.7 Active Transportation and Public Transit Analysis

According to the Guidelines potential impacts to public transit, pedestrian facilities and travel, and bicycle facilities and travel can be evaluated using the following criteria:

- A significant impact occurs if the project conflicts with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decreases the performance or safety of such facilities.

It should be noted that the proposed Project is consistent with the adopted policies, plans, or programs regarding active transportation or public transit facilities. Further, the proposed Project will not decrease the performance or safety of such facilities and does not have the potential to conflict with existing or proposed facilities supporting these travel modes.

Thus, based on the above, the proposed Project will not have a significant impact on the active transportation nor the public transit.

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Figure 10-1

TAZ Map

The Terraces at Murrieta

11.0 CONCLUSION AND RECOMMENDATIONS

Consistent with the City of Murrieta *Traffic Impact Analysis Preparation Guidelines* dated March 2021 and based on the VMT methodology, criteria, guidelines, thresholds and results outlined in this Technical Memorandum, the proposed Project will not have a significant Project generated VMT impact nor will the Project's effect on VMT be significant for either the baseline or cumulative conditions.

Based on the intersection and segment analyses provided in this report, LOS impact thresholds were exceeded with the addition of project traffic at the following unsignalized intersections:

Near-Term and Horizon Year

- Hancock Avenue / Walsh Center Drive intersection
- Murrieta Hot Springs Road / Sparkman Court (Monroe Avenue) intersection
- Alta Murrieta Drive / Murrieta Hot Springs Road intersection

Horizon Year Only

- Monroe Avenue / Walsh Center Drive /Project Driveway #1 intersection
- Monroe Avenue / Medical Center Drive intersection

11.1 Proposed Improvements

11.1.1 *Project Phase 1 (Year 2025)*

The following Phase 1 improvements are recommended:

- **Hancock Avenue / Walsh Center Drive Intersection**

  It is understood from discussions with the City that there is a CIP project to widen Hancock Avenue and improve intersections along Hancock Avenue including the installation of a traffic signal at the Hancock Avenue / Walsh Center Drive intersection.

  The CIP project will not add extra lanes on Hancock Avenue which will be built to a 76 ft curb-to-curb Major Road per the City Standard Drawing. Walsh Center Drive will remain as is (56 ft curb-to-curb), which allows for separate left and right-turn lanes.

  Without the Project traffic, signal warrants are not met at this intersection. However, this intersection is calculated to operate at LOS F without and with Project traffic. Hence, the Project should pay a fair share towards the improvements at this intersection including signalization.

- **Monroe Avenue / Walsh Center Drive (Project Driveway #1)**

  The project should build the north and west leg of this intersection and provide a Two-Way Stop Control (TWSC) with traffic on Walsh Center Drive and the Project driveway stopping. The following interim intersection geometry should be provided prior to the occupancy of the first unit of Project Phase 1:

  – **Southbound:** One left-turn lane, one through lane and one shared through/right lane
  – **Westbound:** One shared right/through/ left lane
  – **Northbound:** One left-turn lane, one through lane and one shared through/right lane
  – **Eastbound:** One shared through/ left lane and one right-turn lane

- **Murrieta Hot Springs Road / Monroe Avenue intersection**

  The Triangle Specific Plan located on the south curb of Murrieta Hot Springs Road was approved by the City Council in 2008, and then again in 2013. A traffic signal is to be installed by that project at this intersection. However, construction on that project has not commenced. In order to accommodate just Project traffic, a signal would need to be installed and the southbound approach (Monroe Avenue) reconfigured to provide a dedicated right-turn lane and a left-turn lane. No other geometric improvements are needed.

11.1.2 *Project Phase 2 (Year 2028)*

- **Murrieta Hot Springs Road / Alta Murrieta Drive intersection**

  This intersection is calculated to operate at LOS F without and with Project traffic. Hence, the Project should contribute a fair share towards providing an exclusive right-turn lane in the EB direction on Murrieta Hot Springs Road.

11.1.3 *Horizon Year 2040*

- **Monroe Avenue / Walsh Center Drive (Project Driveway #1)**

  The following improvements are needed at this intersection (in addition to the 2025 improvements) to improve operations to acceptable levels:

  – Signalizing the intersection
  – Provide **o**ne shared through/ left lane and one exclusive right-turn lane in the westbound direction.

- **Monroe Avenue / Medical Center Drive**

  The improvements needed at this intersection to improve operations to acceptable levels include prohibiting the westbound left-turn movement, permitting southbound left-turn movement and providing the following intersection geometry:

  – Southbound: One left-turn lane and two through lanes
  – Westbound: One right-turn lane

– Northbound: One through lane and one shared through/right lane.

- **Murrieta Hot Springs Road / Alta Murrieta Drive intersection**

  The Phase 2 (Year 2028) improvements at this intersection would improve operations at this intersection to acceptable levels.

11.1.4 *Queuing Effects*

In order to provide adequate queuing storage in excess of the forecasted queue, the following improvements would be necessary:

- **Murrieta Hot Springs Road / Sparkman Court**

  A raised median currently exists on Murrieta Hot Springs Road. Extending the EB left-turn lane to a total of 400 feet within this median will accommodate the forecasted queue.

- **Murrieta Hot Springs Road / Hancock Avenue**

  The existing pavement on WB Murrieta Hot Springs Road between Hancock Avenue and the I-215 SB Ramp intersection is currently wide enough to accommodate the WB right-turn lane. Extending the existing westbound right-turn lane striping to the I-215 SB Ramp intersection will accommodate the forecasted queue.

  A raised median currently exists on Murrieta Hot Springs Road. Extending the EB left-turn lanes to a total of 400 feet within this median will accommodate the forecasted queue.

11.1.5 *Additional Improvements*

In addition to the above, the following improvements should be implemented.

- Build Vista Murrieta to City of Murrieta half-width 2-Lane Collector standards along the Project's frontage.
- Build half width improvement along Monroe Avenue to City of Murrieta 4-Lane Major Road standards along the Project frontage.
- Provide emergency only access on Murrieta Hot Springs Road as shown in the site plan. This access should be kept gated and locked, to be used only in an emergency.

Figure 11-1 depicts the ultimate recommended geometry and traffic control at the above-mentioned intersections.

11.2 Intersection Operations with Improvements

Table 11-1 summarizes the intersections with the recommended improvements described in Section 11.1. As seen in *Table 11-1*, with the implementation of the recommended improvements, all intersections are calculated to operate at less delay than without Project traffic.

Appendix R includes the Post-Improvement peak hour intersection analysis worksheets with the recommended improvements.

11.3 Fair Share Calculations

The Project's fair share contribution was calculated using the formula on page 13 of the City of Murrieta *Traffic Impact Analysis Preparation Guideline*, May 2020.

$$\text{Fair share} = \frac{\text{Project trips}}{(\text{Project trips} + \text{Future development trips})}$$

The fair share calculations were done based on the AM and PM peak hour entering volumes at the three intersections. ***Table 11-2*** summarizes the results of fair share contribution calculations. As seen in *Table 11-2*, the fair share contribution by the Project for the following intersections is summarized below:

3. Hancock Avenue / Walsh Center Drive –20%
13. Murrieta Hot Springs Road / Alta Murrieta Drive –3%

TABLE 11-1
LONG-TERM WITH PROJECT INTERSECTION ANALYSIS

Intersection	Control Type [a]	Peak Hour	Year 2040 Without Project		Year 2040 With Project				
					Without Improvements		With Improvements [d]		
			Delay [b]	LOS [c]	Delay	LOS	Control Type	Delay	LOS
1. Monroe Ave / Walsh Center Dr	TWSC	AM	>100.0	F	>100.0	F	Signal	7.7	A
		PM	>100.0	F	>100.0	F		6.0	A
3. Hancock Ave / Walsh Center Dr	TWSC	AM	76.1	F	>100.0	F	Signal	5.7	A
		PM	>100.0	F	>100.0	F		5.1	A
5. Monroe Ave / Medical Center Dr	TWSC	AM	>100.0	F	>100.0	F	TWSC	20.8	C
		PM	>100.0	F	>100.0	F		19.8	C
13. Murrieta Hot Springs Rd / Alta Murrieta Dr	Signal	PM	79.4	E	81.5	F	Signal	58.5	E
			>100.0	F	>100.0	F		89.0	F

Footnotes:

a. All intersections are two-way Stop controlled prior to improvements. Delay reported is for the worst-case minor street left-turn movement.
b. Average delay expressed in seconds per vehicle.
c. Level of Service.
d. Improvements needed to achieve LOS D or better conditions in the Long-Term.
e. Westbound left-turn not permitted.

SIGNALIZED		UNSIGNALIZED	
Delay	LOS	Delay	LOS
0.0 ≤ 10.0	A	0.0 ≤ 10.0	A
10.1 to 20.0	B	10.1 to 15.0	B
20.1 to 35.0	C	15.1 to 25.0	C
35.1 to 55.0	D	25.1 to 35.0	D
55.1 to 80.0	E	35.1 to 50.0	E
≥ 80.1	F	≥ 50.1	F

TABLE 11-2
FAIR SHARE CALCULATIONS

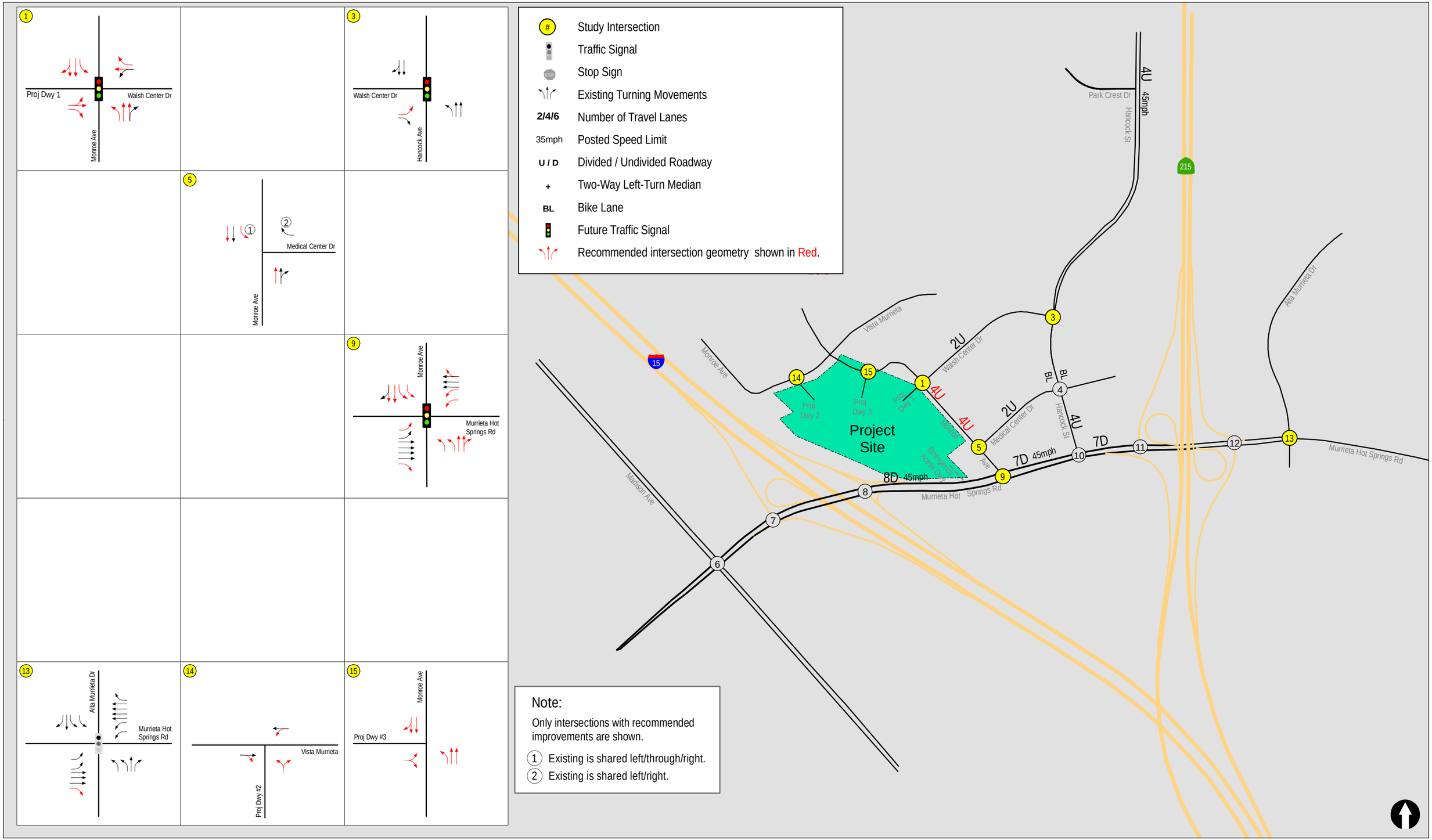
Intersection	Existing		With Project		Project + Future Development Trips		Total Project Trips		Fair Share (%)		Project's Fair Share [a] (%)
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	
A	B		C		D = C-B		E		F=E/D		G
3. Hancock Ave / Walsh Center Dr [b]	1,143	1,073	1,553	1,526	410	453	81	61	20%	13%	20%
13. Murrieta Hot Springs Rd / Alta Murrieta Dr [C]	4,881	6,029	6,051	7,492	1,170	1,463	38	34	3%	2%	3%

Footnote:

a. Higher of the AM and PM peak hour fair share (Column F).

b. Impact is in Phase 1. Fair Share calculated using Phase 1 volumes.

c. Impact is in Phase 2 under the PM peak hour only. Fair Share calculated using Phase 2 volumes.



LINSCOTT LAW & GREENSPAN engineers

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Figure 11-1

Recommended Intersection Improvemenrts

The Terraces at Murrieta