APPENDIX 9a

Jefferson Avenue Apartments

FOCUSED TRAFFIC IMPACT ANALYSIS

CITY OF MURRIETA

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SEPTEMBER 2, 2020

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LIST OF ABBREVIATED TERMS

(1)	Reference
ADT	Average Daily Traffic
CA MUTCD	California Manual on Uniform Traffic Control Devices
Caltrans	California Department of Transportation
CEQA	California Environmental Quality Act
CMP	Congestion Management Program
DIF	Development Impact Fee
EAP	Existing Plus Ambient Growth Plus Project
EAPC	Existing Plus Ambient Growth Plus Project Plus Cumulative
HCM	Highway Capacity Manual
ITE	Institute of Transportation Engineers
LOS	Level of Service
OPR	Office of Planning & Research
PHF	Peak Hour Factor
Project	Jefferson Avenue Apartments
RTA	Riverside Transit Authority
SHS	State Highway System
TIA	Traffic Impact Analysis
TUMF	Transportation Uniform Mitigation Fee Program
v/c	Volume to Capacity
VMT	Vehicle Miles Traveled
Vphg	Vehicles Per Hour Green
WRCOG	Western Riverside Council of Governments

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1 INTRODUCTION

This report presents the results of the traffic impact analysis (TIA) for the proposed Jefferson Avenue Apartments development ("Project"), which is located east of Jefferson Avenue and south of Ivy Street/Los Alamos Road in the City of Murrieta as shown on Exhibit 1-1.

The purpose of this focused TIA is to evaluate the potential deficiencies related to traffic and circulation system deficiencies that may result from the development of the proposed Project, and to recommend improvements to achieve acceptable circulation system operational conditions. This traffic study has been prepared in accordance with the City of Murrieta's General Plan Update (February 2020) and through consultation with City of Murrieta staff during the scoping process. (1) The approved Project Traffic Study Scoping agreement is provided in Appendix 1.1 of this TIA.

1.1 SUMMARY OF FINDINGS

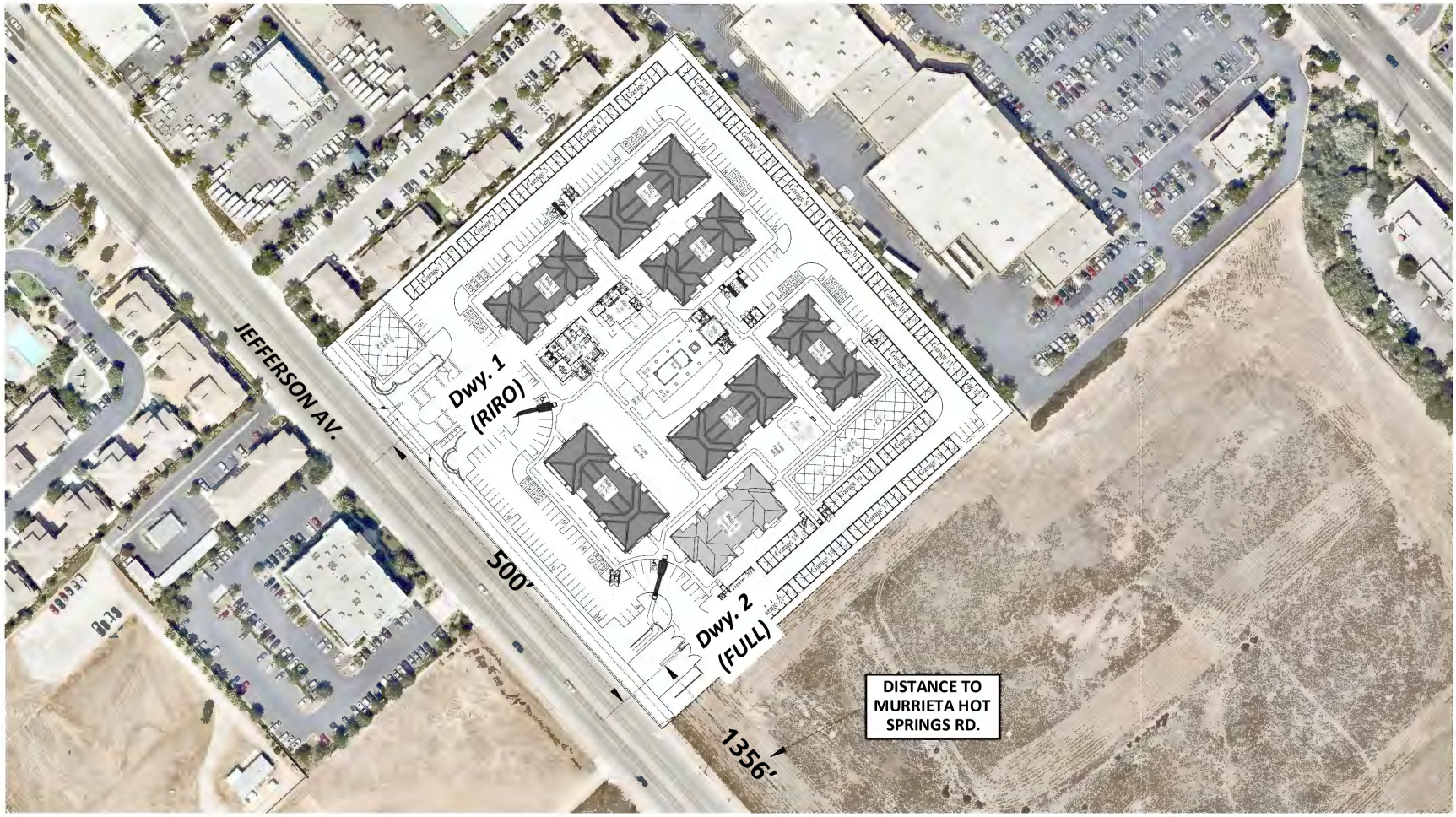
The Project is proposing to construct the following improvements as design features in conjunction with development of the site:

- Jefferson Avenue is constructed to its ultimate half-section width as an Arterial Highway (110-foot right-of-way) between the Project's northern and southern boundaries. However, the Project will construct curb, gutter, sidewalk, and landscaping improvements along the Project's frontage and implement improvements needed to accommodate site access.
- Construct Driveway 1 on Jefferson Avenue and Driveway 2 on Jefferson Avenue as cross-street stop-controlled intersections. Driveway 1 will be restricted to right-in/right-out access only while Driveway 2 would allow for full access (no turn restrictions). Left turn storage into Driveway 2 is to be accommodated within the existing painted two-way-left-turn lane.

Additional details are provided in Section 1.7 *Recommendations* of this report.

Recommendation 1.1: Prior to the issuance of building permits, the Project Applicant shall participate in the City's Development Impact Fee (DIF) and the County's Transportation Uniform Mitigation Fee (TUMF) programs by paying the requisite DIF and TUMF fees.

EXHIBIT 1-1: PRELIMINARY SITE PLAN



LEGEND:

RIRO *= RIGHT-IN/RIGHT-OUT ONLY ACCESS*
FULL *= FULL ACCESS*

N

1.2 PROJECT OVERVIEW

An area plan for the proposed Project is shown on Exhibit 1-1. The Project is to consist of 160 market rate apartments. It is anticipated that the Project would be developed in a single phase with an anticipated Opening Year of 2023. For the purpose of this analysis, the following driveways will be assumed to provide access to the Project site:

- Driveway 1 on Jefferson Avenue – Right-in/Right-out Access Only
- Driveway 2 on Jefferson Avenue – Full Access

Regional access to the Project site is available from the I-15 Freeway via Murrieta Hot Springs Road.

Trips generated by the Project's proposed land uses have been estimated based on the Institute of Transportation Engineers (ITE) Trip Generation Manual (10th Edition, 2017) for Multifamily Housing (ITE Land Use Code 220). (2) The Project generates a total of 1,172 trip-ends per day on a typical weekday with approximately 74 AM peak hour trips and 90 PM peak hour trips. The assumptions and methods used to estimate the Project's trip generation characteristics are discussed in greater detail in Section 4.1 *Project Trip Generation* of this report.

1.3 ANALYSIS SCENARIOS

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

- Existing (2020)
- Existing Plus Ambient Growth Plus Project (EAP) (2023)
- Existing Plus Ambient Growth Plus Project Plus Cumulative Projects (EAPC) (2023)

1.3.1 EXISTING (2020) CONDITIONS

Information for Existing (2020) conditions is disclosed to represent the baseline traffic conditions as they existed at the time this report was prepared.

1.3.2 EXISTING PLUS AMBIENT GROWTH PLUS PROJECT (2023) CONDITIONS

The EAP (2023) conditions analysis determines the traffic deficiencies based on a comparison of the EAP (2023) traffic conditions to Existing conditions. To account for background traffic growth, an ambient growth factor from Existing (2020) conditions of 6.12% (2 percent per year, compounded over 3 years) is included for EAP (2023) traffic conditions.

1.3.3 EXISTING PLUS AMBIENT GROWTH PLUS PROJECT PLUS CUMULATIVE (2023) CONDITIONS

The EAPC (2023) traffic conditions analysis determines the potential near-term cumulative circulation system deficiencies. To account for background traffic growth, an ambient growth factor of 6.12% from Existing conditions are included for EAPC traffic conditions (2 percent per year, compounded over 3 years). Conservatively, the TIA estimates of area traffic growth then add traffic generated by other known or probable related projects. These related projects are at

least in part already accounted for in the assumed 6.12% total ambient growth in traffic noted above; some of these related projects would likely not be implemented and operational within the 2023 Opening Year time frame assumed for the Project. The resulting traffic growth rate utilized in the TIA (6.12 percent ambient growth + traffic generated by related projects) would therefore tend to overstate rather than understate background cumulative traffic deficiencies under 2023 conditions. The list of cumulative projects is comprised of projects from the City of Murrieta, the City of Wildomar, and City of Lake Elsinore.

1.4 STUDY AREA

To ensure that this TIA satisfies the City of Murrieta traffic study requirements, Urban Crossroads, Inc. prepared a project traffic study scoping package for review by City of Murrieta staff prior to the preparation of this report.

1.4.1 INTERSECTIONS

The following 3 study area intersections shown on Exhibit 1-2 and listed in Table 1-1 were selected for this TIA based on consultation with City of Murrieta staff. The study area includes intersections where the Project is anticipated to contribute 50 or more peak hour trips. The "50 peak hour trip" criteria generally represents a minimum number of trips at which a typical intersection would have the potential to cause a deficiency by a given development proposal. Although each intersection may have unique operating characteristics, this traffic engineering rule of thumb is a widely utilized tool for estimating a potential area (i.e., study area) and has been utilized for other City of Murrieta projects.

The intent of a Congestion Management Program (CMP) is to more directly link land use, transportation, and air quality, thereby prompting reasonable growth management programs that will effectively utilize new transportation funds, alleviate traffic congestion and related deficiencies, and improve air quality. Counties within California have developed CMPs with varying methods and strategies to meet the intent of the CMP legislation. None of the study area intersections are identified as CMP facilities in the Riverside County CMP. (3)

TABLE 1-1: INTERSECTION ANALYSIS LOCATIONS

ID	Intersection Location	Jurisdiction	CMP?
1	Jefferson Avenue & Driveway 1 – Future Intersection	City of Murrieta	No
2	Jefferson Avenue & Driveway 2 – Future Intersection	City of Murrieta	No
3	Jefferson Avenue & Murrieta Hot Springs Road	City of Murrieta	No

EXHIBIT 1-2: LOCATION MAP

LEGEND:

- (0) = *EXISTING INTERSECTION ANALYSIS LOCATION*
- (0) = *FUTURE INTERSECTION ANALYSIS LOCATION*
- [00] = *ROADWAY SEGMENT ANALYSIS LOCATION*

N

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1.4.2 ROADWAY SEGMENTS

The roadway segment study area utilized for this analysis is based on a review of the key roadway segments. The study area identifies a total of 1 existing roadway segment. The roadway segment is listed in Table 1-2.

TABLE 1-2: ROADWAY SEGMENT ANALYSIS LOCATIONS

ID	Roadway Segment	Jurisdiction
1	Jefferson Avenue, north of Murrieta Hot Springs Road	City of Murrieta

1.5 SENATE BILL 743 – VEHICLE MILES TRAVELED (VMT)

Senate Bill 743 (SB 743), approved in 2013, endeavors to change the way transportation impacts will be determined according to the California Environmental Quality Act (CEQA). The Office of Planning and Research (OPR) has recommended the use of vehicle miles traveled (VMT) as the replacement for automobile delay-based LOS. In December 2018, the Natural Resources Agency finalized updates to CEQA Guidelines to incorporate SB 743 (i.e., VMT). While a lead agency has the option to immediately apply the new VMT based analysis methodology and thresholds for the purposes of evaluating transportation impacts, statewide application of the new guidelines is required July 1, 2020.

The revised Caltrans traffic impact analysis guidelines are set to be available in Spring/Summer 2020, however, Caltrans acknowledges automobile delay will no longer be considered a CEQA impact for development projects and will use VMT as the metric for determining impacts on the State Highway System (SHS). VMT analysis for the Project has been prepared under separate cover. As such, the LOS operations included in this TIA for study area intersections are informational and are not anticipated to support the environmental document with respect to discerning traffic impact and mitigation measures.

1.6 ANALYSIS FINDINGS

This section provides a summary of analysis results for Existing (2020), EAP (2023), and EAPC (2023) traffic conditions. A summary of level of service (LOS) results for all analysis scenarios is presented on Exhibit 1-3.

1.6.1 EXISTING (2020) CONDITIONS

The existing intersection of Jefferson Avenue and Murrieta Hot Springs Road is currently operating at an acceptable LOS during the peak hours for Existing (2020) traffic conditions. Similarly, the study area roadway segment of Jefferson Road, north of Murrieta Hot Springs Road is currently operating at an acceptable LOS (i.e., LOS C or better).

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

#	Intersection	Existing (2020)	EAP (2023)	EAPC (2023)
1	Jefferson Av. & Dwy. 1	NA		
2	Jefferson Av. & Dwy. 2	NA		
3	Jefferson Av. & Muerrita Hot Springs Rd.			

LEGEND:

 = AM PEAK HOUR

 = PM PEAK HOUR

 = LOS A-D

 = LOS E

 = LOS F

NA = NOT AN ANALYSIS LOCATION FOR THIS SCENARIO

1.6.2 EAP (2023) CONDITIONS

All study area intersections are anticipated to operate at an acceptable LOS under EAP (2023) traffic conditions. The study area roadway segment is also anticipated to continue to operate at acceptable LOS under EAP (2023) traffic conditions.

1.6.3 EAPC (2023) CONDITIONS

All study area intersections and the study area roadway segment are anticipated to operate at an acceptable LOS under EAPC (2023) traffic conditions.

1.7 RECOMMENDATIONS

The following recommendations identify improvements necessary to facilitate site access. Exhibit 1-4 shows the site adjacent recommendations.

A queuing analysis was conducted along the site adjacent roadway of Jefferson Avenue at the Project driveways for EAPC traffic conditions to determine the turn pocket lengths needed to accommodate near-term 95th percentile queues. The analysis was conducted for the weekday AM and weekday PM peak hours. The storage length recommendations for the turning movements at the Project driveways were shown previously on Exhibit 1-4. The queuing analysis worksheets from the Synchro software are included in Appendix 1.2.

Recommendation 1.1: Prior to the issuance of building permits, the Project Applicant shall participate in the City's DIF and County's TUMF programs by paying the requisite DIF and TUMF fees. See Section 7 *Local and Regional Funding Mechanisms* for details on applicable fee-programs.

Recommendation 2.1: ***Jefferson Avenue & Driveway 1 (#1)*** – The following improvements are necessary to accommodate site access:

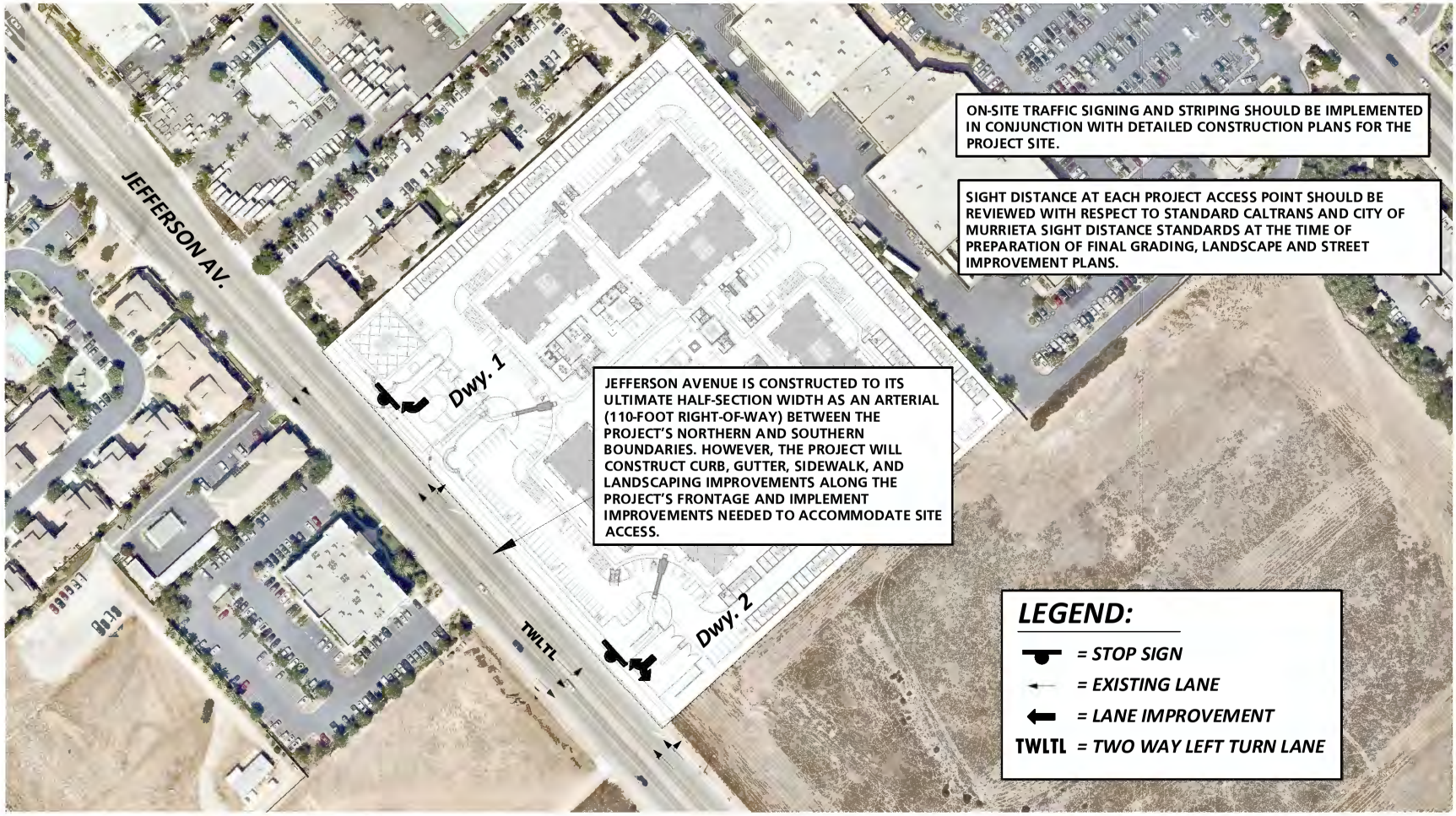
- Project to install a stop control on the westbound approach and construct a westbound right turn lane. The Project is to install a raised median or construct a raised, pork-chop island in order to prohibit left turns into and out of Driveway 1, restricting access to right-in/right-out only.

Recommendation 3.1: Jefferson Avenue & Driveway 2 (#2) – The following improvements are necessary to accommodate site access:

- Install a stop control on the westbound approach and construct a westbound shared left-right turn lane and accommodate a southbound left turn lane within the existing painted two-way-left-turn lane.

Recommendation 4.1: Jefferson Avenue is constructed to its ultimate half-section width as an Arterial Highway (110-foot right-of-way) between the Project's northern and southern boundaries. However, the Project will construct curb, gutter, sidewalk, and landscaping improvements along the Project's frontage and implement improvements needed to accommodate site access.

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



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

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

2 METHODOLOGIES

This section of the report presents the methodologies used to perform the traffic analyses summarized in this report. The methodologies described are consistent with City of Murrieta General Plan Update. (1)

2.1 LEVEL OF SERVICE

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

2.2 INTERSECTION CAPACITY ANALYSIS

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

2.2.1 SIGNALIZED INTERSECTIONS

The City of Murrieta requires signalized intersection operations analysis based on the methodology described in the HCM. Intersection LOS operations are based on an intersection's average control delay. Control delay includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. For signalized intersections LOS is directly related to the average control delay per vehicle and is correlated to a LOS designation as described in Table 2-1. Study area intersections have been evaluated using the Synchro (Version 10) analysis software package.

TABLE 2-1: SIGNALIZED INTERSECTION LOS THRESHOLDS

Description	Average Control Delay (Seconds), V/C ≤ 1.0	Level of Service, V/C ≤ 1.0	Level of Service, V/C > 1.0
Operations with very low delay occurring with favorable progression and/or short cycle length.	0 to 10.00	A	F
Operations with low delay occurring with good progression and/or short cycle lengths.	10.01 to 20.00	B	F

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

Source: HCM, 6th Edition

The traffic modeling and signal timing optimization software package Synchro (Version 10) has been utilized to analyze signalized intersections within the study area. Synchro is a macroscopic traffic software program that is based on the signalized intersection capacity analysis as specified in the HCM (6th Edition). (4) Macroscopic level models represent traffic in terms of aggregate measures for each movement at the study intersections. Equations are used to determine measures of effectiveness such as delay and queue length. The LOS and capacity analysis performed by Synchro takes into consideration optimization and coordination of signalized intersections within a network.

The LOS analysis for signalized intersections has been performed using existing signal timing for Existing, EAP (2023), and EAPC (2023) traffic conditions. Appropriate time for pedestrian crossings has also been considered in the signalized intersection analysis.

The peak hour traffic volumes have been adjusted using a peak hour factor (PHF) to reflect peak 15-minute volumes. Common practice for LOS analysis is to use a peak 15-minute rate of flow. However, flow rates are typically expressed in vehicles per hour. The PHF is the relationship between the peak 15-minute flow rate and the full hourly volume (e.g. PHF = [Hourly Volume] / [4 x Peak 15-minute Flow Rate]). The use of a 15-minute PHF produces a more detailed analysis as compared to analyzing vehicles per hour. Existing PHFs have been used for all analysis scenarios. Per the HCM (6th Edition), PHF values over 0.95 often are indicative of high traffic volumes with capacity constraints on peak hour flows while lower PHF values are indicative of greater variability of flow during the peak hour. (4)

Saturation flow rates of 1,900 vehicles per hour of green (vphg) has been utilized, consistent with the recommended values in the City's traffic study guidelines. (1)

2.2.2 UNSIGNALIZED INTERSECTIONS

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

TABLE 2-2: UNSIGNALIZED INTERSECTION LOS THRESHOLDS

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

Source: HCM, 6th Edition

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

2.3 ROADWAY SEGMENT CAPACITY ANALYSIS METHODOLOGY

Roadway segment operations have been evaluated using the applicable average daily traffic (ADT) roadway capacity values provided in Table 4.2-2 of the Traffic and Circulation section of the Murrieta General Plan Update. (1) The roadway capacities utilized for the purposes of this analysis are considered "rule of thumb" estimates for planning purposes and are affected by such factors as intersections (spacing, configuration and control features), degree of access control, roadway grades, design geometrics (horizontal and vertical alignment standards), sight distance, vehicle mix (truck and bus traffic) and pedestrian bicycle traffic.

While using ADT for planning purposes is suitable with regards to evaluating potential volume to capacity with future forecasts, it is not suitable for operational analysis because it does not account for the factors listed previously. As such, where the ADT based roadway segment analysis indicates a deficiency (unacceptable LOS), a review of the more detailed peak hour intersection analysis and progression analysis are undertaken. The more detailed peak hour intersection analysis explicitly accounts for factors that affect roadway capacity. Therefore, roadway segment widening is typically only recommended if the peak hour intersection analysis indicates the need for additional through lanes.

2.4 TRAFFIC SIGNAL WARRANT ANALYSIS METHODOLOGY

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

The signal warrant criteria for Existing study area intersections are based upon several factors, including volume of vehicular and pedestrian traffic, frequency of accidents, and location of school areas. The CA MUTCD indicates that the installation of a traffic signal should be considered if one or more of the signal warrants are met. (5) Specifically, this TIA utilizes the Peak Hour Volume-based Warrant 3 as the appropriate representative traffic signal warrant analysis for existing traffic conditions. Warrant 3 is appropriate to use for this TIA because it provides specialized warrant criteria for intersections with rural characteristics (e.g. located in communities with populations of less than 10,000 persons or with adjacent major streets operating above 40 miles per hour). For the purposes of this study, the speed limit was the basis for determining whether Urban or Rural warrants were used for a given intersection.

As shown in Table 2-3, traffic signal warrant analyses were performed for the following unsignalized study area intersections during the peak weekday conditions wherein the Project is anticipated to contribute the highest trips:

TABLE 2-3: TRAFFIC SIGNAL WARRANT ANALYSIS LOCATIONS

ID	Intersection Location	Jurisdiction
2	Jefferson Avenue & Driveway 2	City of Murrieta

Traffic signal warrant analysis has not been performed for Driveway 1 on Jefferson Avenue since the intersection is proposed to be restricted to right-in/right-out only. There are no existing unsignalized intersections, as such, no traffic signal warrant analysis has been performed for Existing (2020) traffic conditions. The traffic signal warrant analyses for future conditions are presented in Section 5 *EAP (2023) Traffic Analysis* and Section 6 *EAPC (2023) Traffic Analysis*.

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

2.5 MINIMUM LEVEL OF SERVICE (LOS)

The City of Murrieta defines intersection performance deficiency standards consistent with those of the City of Murrieta General Plan Circulation Element. The City's LOS standards, as published in the City's General Plan, Chapter IV: Circulation Element, is LOS C for roadway segments and LOS D for peak hour intersection operations.

2.6 THRESHOLDS OF SIGNIFICANCE

Signalized Intersections

A traffic impact occurs when the additional or redistributed ADT generated by the proposed Project will significantly increase congestion on a signalized intersection operating at LOS E or LOS F as identified in Table 4.2-5 of the City's General Plan Update, or will cause a signalized intersection operating at LOS D or better to operate at LOS E or LOS F.

Unsignalized Intersections

Traffic volume increases from public or private projects that result in one or more of the following criteria will have a traffic impact to an unsignalized intersection as listed in Table 4.2-5 of the City's General Plan Update and described in text below:

- The additional or redistributed traffic generated by the proposed Project will add 21 or more peak hour trips to a critical movement of an unsignalized intersection, and cause an unsignalized intersection to operate below LOS D, or
- The additional or redistributed traffic generated by the proposed Project will add 21 or more peak hour trips to a critical movement of an unsignalized intersection currently operating at LOS E, or
- The additional or redistributed traffic generated by the proposed Project will add 6 or more peak hour trips to a critical movement of an unsignalized intersection, and cause the unsignalized intersection to operate at LOS F, or
- The additional or redistributed traffic generated by the proposed Project will add 6 or more peak hour trips to a critical movement of an unsignalized intersection currently operating at LOS F, or
- Based upon an evaluation of existing accident rates, the signal prioritization list, intersection geometrics, proximity of adjacent driveways, sight distance or other factors, the project would significantly impact the operations of the intersection.

Table 4.2-5: Measures of Significant Project Impacts to Congestion on Intersections

Level of Service	Allowable Increases on Congested Intersections	
	Signalized	Unsignalized
LOS E	Delay of 2 seconds or less	20 or less peak hour trips on a critical movement
LOS F	Either a delay of 1 second, or 5 peak hour trips or less on a critical movement	5 or less peak hour trips on a critical movement

Notes:
1. A critical movement is an intersection movement (left-turn, through movement, right-turn) that experiences excessive queues, which typically operate at LOS F. Also, if a project adds significant volume to a minor roadway approach, a gap study should be provided that details the headways between vehicles on the major roadway.
2. By adding proposed project trips to all other trips from a list of projects, these same tables are used to determine if total cumulative impacts are significant. If cumulative impacts are found to be significant, each project is responsible for mitigating its share of the cumulative impact.
3. The City may also determine impacts have occurred at intersections even when a project's direct or cumulative impacts do not trigger an unacceptable level of service, when such traffic uses a significant amount of remaining intersection capacity.
4. For determining significance at signalized intersections with LOS F conditions, the analysis must evaluate both the delay and the number of trips on a critical movement. Exceedance of either criteria results in a significant impact.

Roadway Segments

A traffic impact occurs when traffic volume increases from public or private projects that result in the following criteria will have a significant traffic volume or level of service traffic operations impact on a roadway segment:

- The additional or redistributed ADT generated by the proposed Project will significantly increase congestion on a roadway segment currently operating at LOS E or F, or will cause a roadway segment to operate at LOS E or LOS F as a result of the proposed Project as identified in Table 4.2-4 of the City's General Plan Update.

Table 4.2-4: Measures of Significant Project Impacts to Congestion on Roadway Segments

Level of Service	Volume-to-Capacity Ratio		
	Two-lane Road	Two-lane Road	Six-lane Road
LOS E	200 ADT	400 ADT	600 ADT
LOS F	100 ADT	200 ADT	300 ADT

Notes:
1. By adding proposed project trips to all other trips from a list of projects, this same table must be used to determine if total cumulative impacts are significant. If cumulative impacts are found to be significant, each project that contributes additional trips must mitigate a share of the cumulative impacts.
2. The City may also determine impacts have occurred on roads even where a project's traffic or cumulative impacts do not trigger an unacceptable level of service, when such traffic uses a significant amount of remaining roadway capacity.

3 AREA CONDITIONS

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

3.1 EXISTING CIRCULATION NETWORK

Pursuant to the agreement with City of Murrieta staff (Appendix 1.1), the study area includes a total of 3 existing and future intersections as shown previously on Exhibit 1-2. Exhibit 3-1 illustrates the study area intersections located near the proposed Project and identifies the number of through traffic lanes for existing roadways and intersection traffic controls.

3.2 CITY OF MURRIETA GENERAL PLAN CIRCULATION ELEMENT

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

Arterial Highways are 6-lane divided roadways. An example of an Arterial Highway within the study area includes:

- Jefferson Avenue (ultimate condition)

Urban Arterials are 6-lane divided roadways. An example of an Urban Arterial Highway within the study area includes:

- Murrieta Hot Springs Road

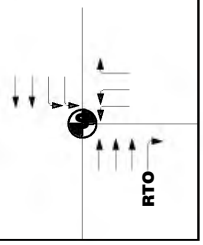
3.3 BICYCLE & PEDESTRIAN FACILITIES

Exhibit 3-4 illustrates the City of Murrieta General Plan trails and bikeways. There are Class II bike lanes that currently exist along Jefferson Avenue and proposed Class II bike lanes along Murrieta Hot Springs Road. Class II bike lanes are striped on-street bike lanes. Existing pedestrian facilities within the study area are shown on Exhibit 3-5.

3.4 TRANSIT SERVICE

The study area is currently served by Riverside Transit Authority (RTA), a public transit agency serving various jurisdictions within Riverside County. The existing bus routes provided within the area by RTA are shown on Exhibit 3-6. The study area currently served by RTA Route 205/206, which operates along Madison Avenue, Murrieta Hot Springs Road and the I-15 Freeway. There are currently no existing bus routes near the Project along Jefferson Avenue. Transit service is reviewed and updated by RTA periodically to address ridership, budget and community demand needs. Changes in land use can affect these periodic adjustments which may lead to either enhanced or reduced service where appropriate.

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

1 Jefferson Av. & Dwy. 1	2 Jefferson Av. & Dwy. 2	3 Jefferson Av. & Murrieta Hot Springs Rd.
Future Intersection	Future Intersection	

LEGEND:

- = TRAFFIC SIGNAL
- 4 = NUMBER OF LANES
- D = DIVIDED
- U = UNDIVIDED
- RTO = RIGHT TURN OVERLAP
- SPEED LIMIT 25 = SPEED LIMIT (MPH)

N

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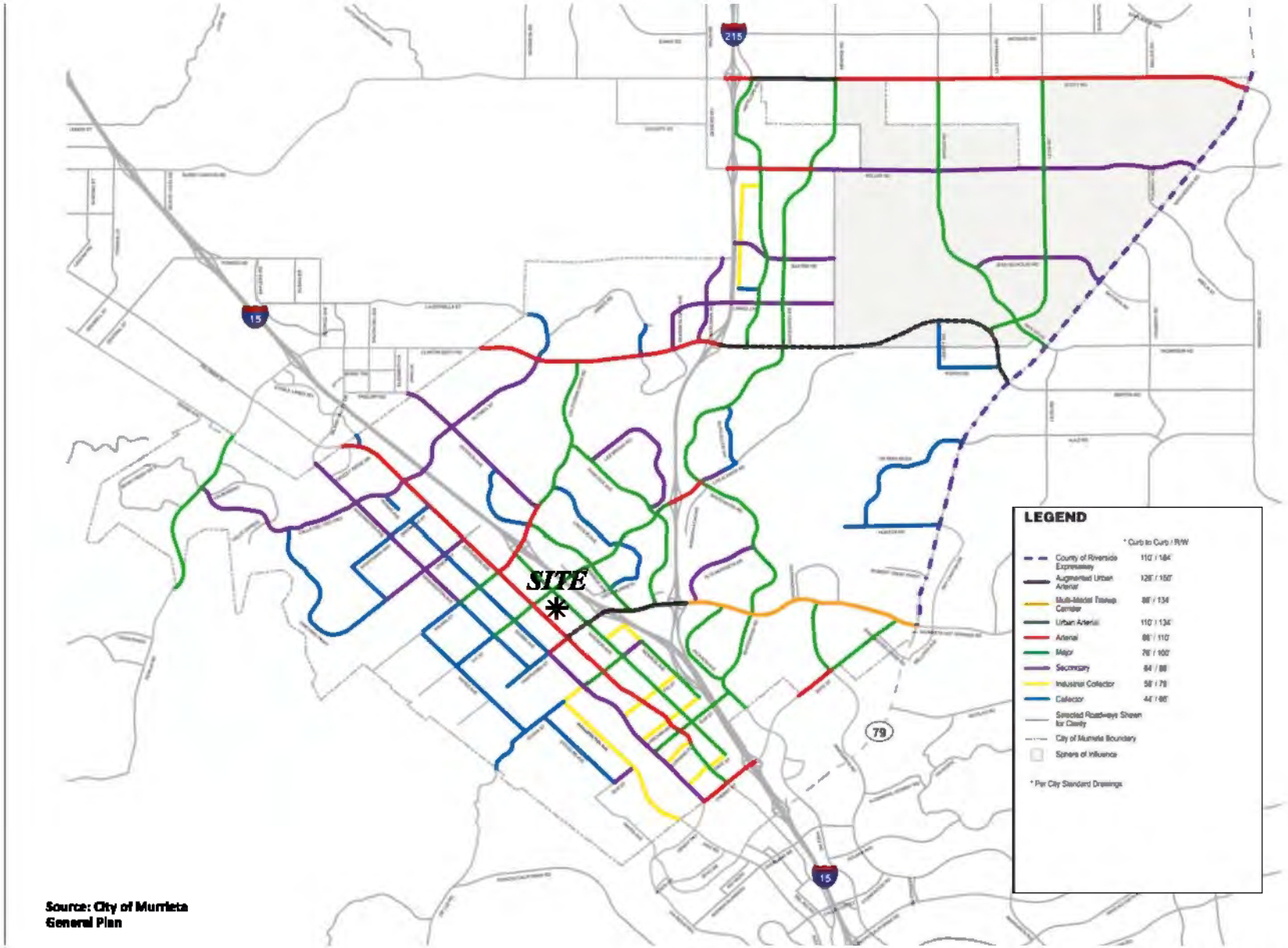
EXHIBIT 3-2: CITY OF MURRIETA GENERAL PLAN CIRCULATION ELEMENT

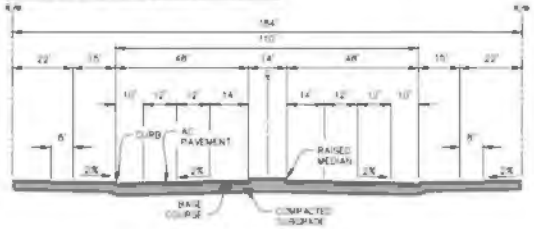


Source: City of Murrieta General Plan

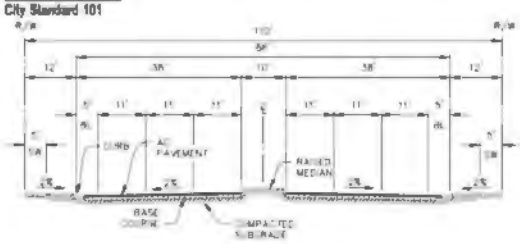
URBAN CROSSROADS

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

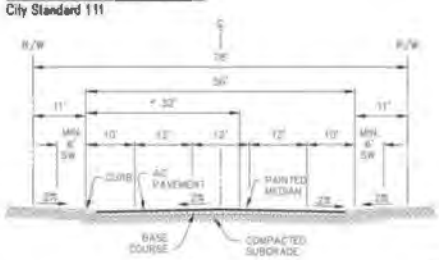
COUNTY OF RIVERSIDE 6-LANE EXPRESSWAY



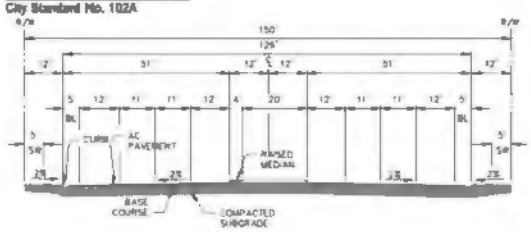
ARTERIAL HIGHWAY
City Standard 101



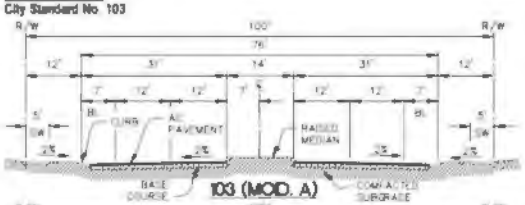
INDUSTRIAL COLLECTOR STREET
City Standard 111

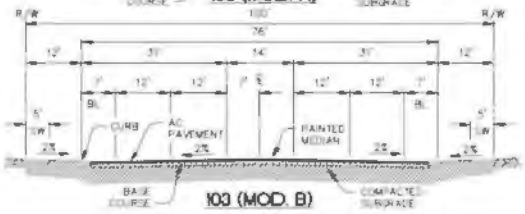


AUGMENTED URBAN ARTERIAL
City Standard No. 102A

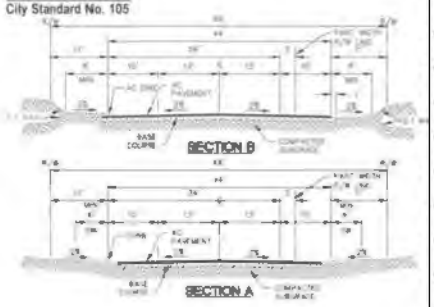


MAJOR HIGHWAY
City Standard No. 103

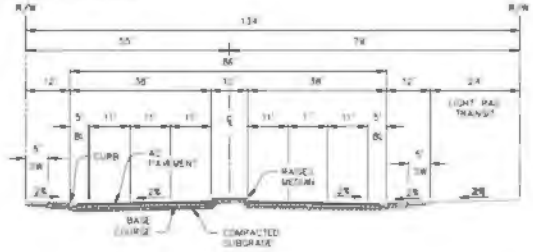




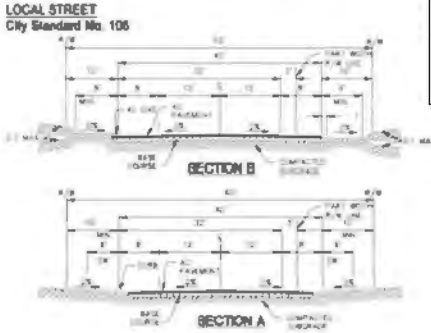
COLLECTOR STREET
City Standard No. 105



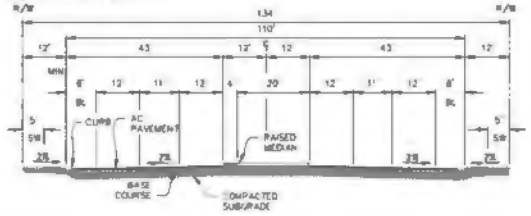
MULTI-MODAL TRANSPORTATION CORRIDOR
City Standard No. 101A



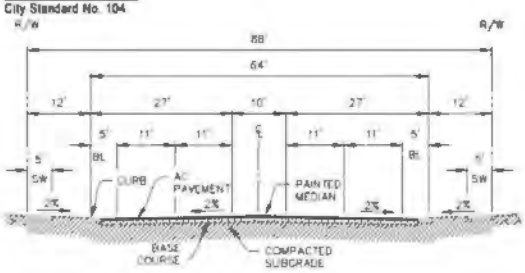
LOCAL STREET
City Standard No. 106



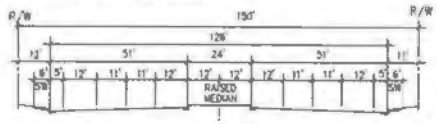
URBAN ARTERIAL HIGHWAY
City Standard No. 102



SECONDARY HIGHWAY
City Standard No. 104



COMMERCIAL CORRIDOR DESIGN

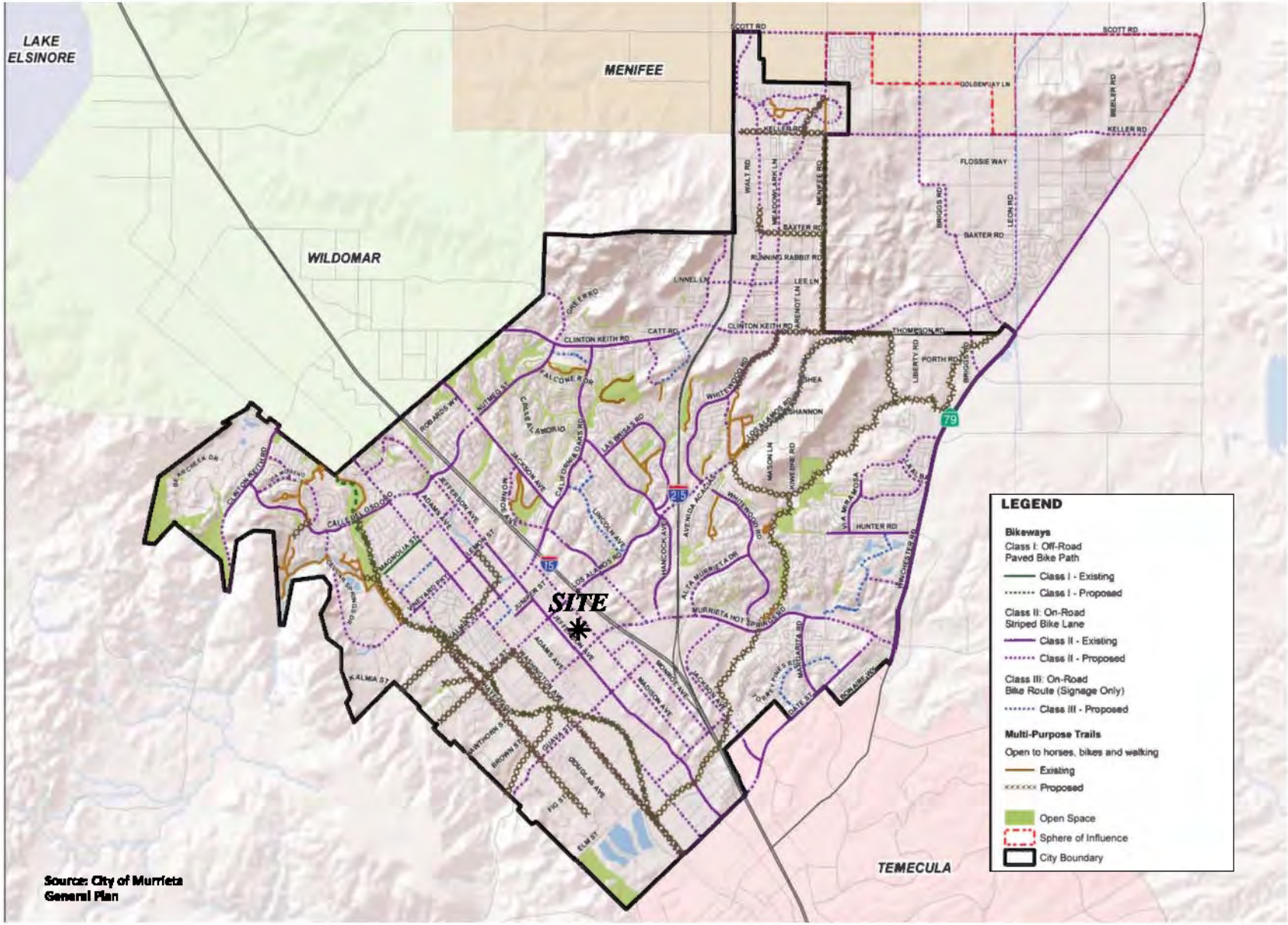


STREET SECTIONS SHOWN

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

Source: City of Murrieta General Plan

EXHIBIT 3-4: CITY OF MURRIETA GENERAL PLAN TRAILS AND BIKEWAYS



Source: City of Murrieta General Plan

EXHIBIT 3-5: EXISTING PEDESTRIAN FACILITIES

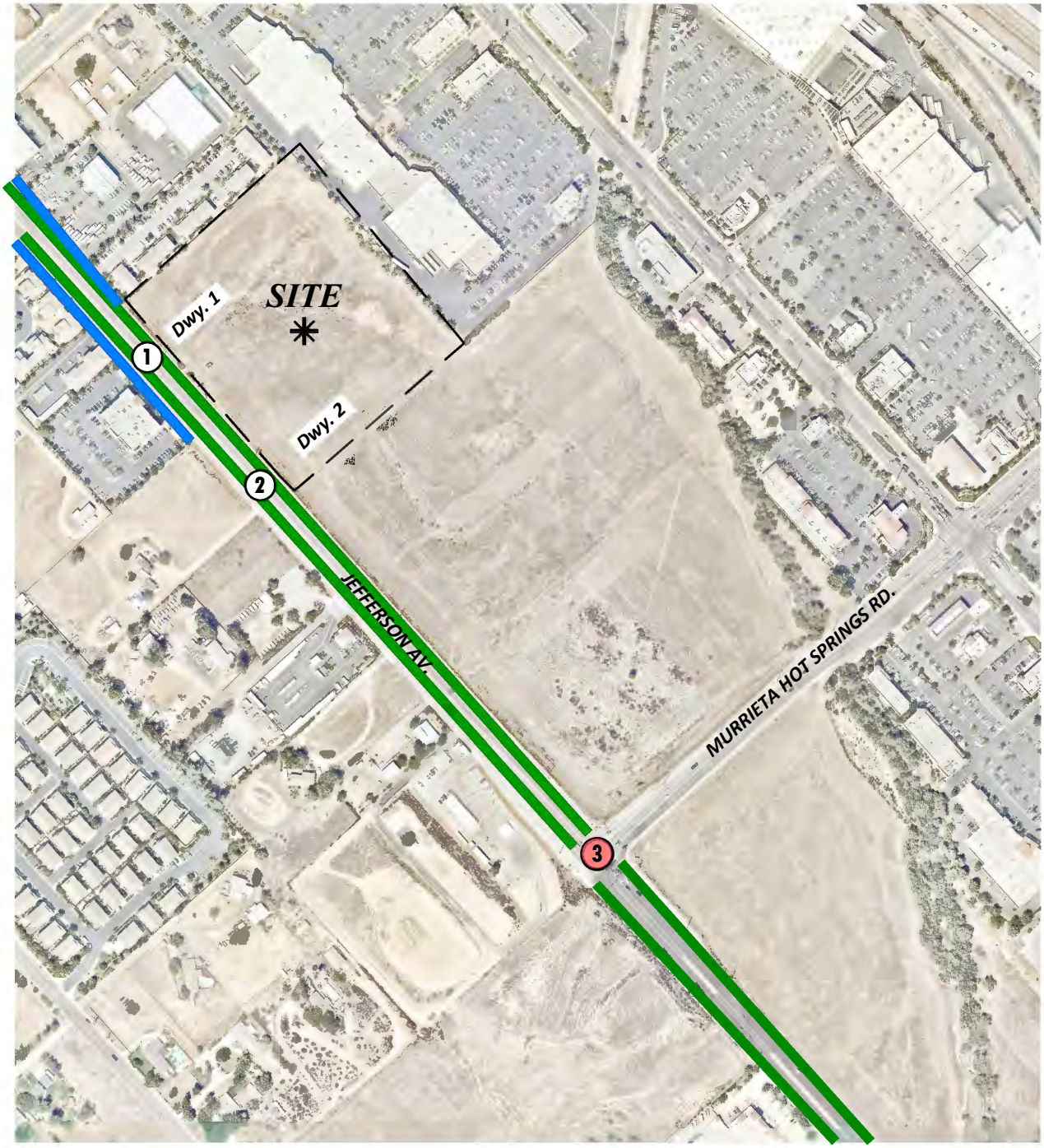
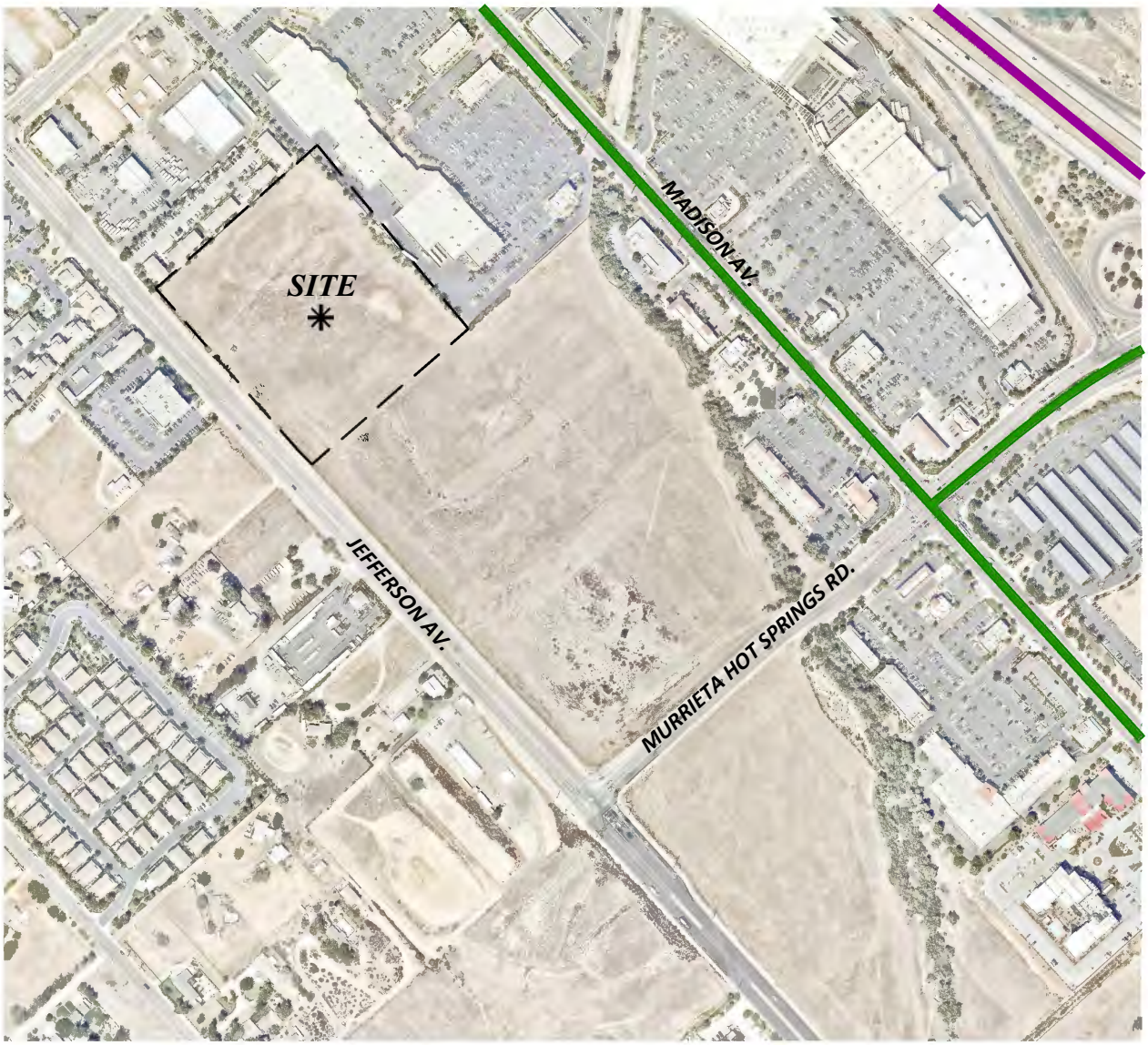


EXHIBIT 3-6: EXISTING TRANSIT ROUTES



LEGEND:

= RTA ROUTE 23

= RTA ROUTE 205/206

N

3.5 EXISTING (2020) TRAFFIC COUNTS

The intersection LOS analysis is based on the traffic volumes observed during the peak hour conditions using traffic count data collected in August 2019. The following peak hours were selected for analysis:

- Weekday AM Peak Hour (peak hour between 7:00 AM and 9:00 AM)
- Weekday PM Peak Hour (peak hour between 4:00 PM and 6:00 PM)

Traffic counts collected in August 2019 were utilized in lieu of conducting current traffic counts due to the coronavirus (COVID-19) pandemic and the effects to local traffic patterns. While most uses related to goods movement are considered essential and are likely not affected by the closures, through traffic along major roadways (such as Jefferson Avenue, Murrieta Hot Springs Road and the near-by I-15 Freeway) could reflect traffic forecasts that are not indicative of historic travel patterns. Pursuant to discussions with City staff, a 2 percent adjustment factor was applied to the August 2019 traffic counts in order to establish a 2020 baseline condition.

The weekday AM and weekday PM peak hour count data is representative of typical weekday peak hour traffic conditions in the study area. The raw manual peak hour turning movement traffic count data sheets are included in Appendix 3.1 and were provided by City staff. The traffic count was used as part of the City's recent General Plan Update.

Existing AM and PM peak hour turning movement volumes and average daily traffic (ADT) volumes on arterial highways throughout the study area are shown on Exhibit 3-7. Existing ADT volumes are based upon factored intersection peak hour counts collected by Urban Crossroads, Inc. using the following formula for each intersection leg:

Weekday PM Peak Hour (Approach Volume + Exit Volume) x 11.52 = Leg Volume

Based on historical roadway segment 24-hour tube count data available in close proximity to the study area, a comparison between the PM peak hour and daily traffic volumes indicated that the peak-to-daily relationship of approximately 8.68 percent would sufficiently estimate ADT volumes for planning-level analyses. As such, the above equation utilizing a factor of 11.52 estimates the ADT volumes on the study area roadway segments assuming a peak-to-daily relationship of approximately 8.68 percent (i.e., 1/0.0868 = 11.52). Existing weekday AM and weekday PM peak hour intersection volumes are also shown on Exhibit 3-7.

3.6 EXISTING (2020) CONDITIONS INTERSECTION OPERATIONS ANALYSIS

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

Consistent with Table 3-1, a summary of the peak hour intersection LOS for Existing conditions are shown on Exhibit 3-8. The intersection operations analysis worksheets are included in Appendix 3.2 of this TIA.

EXHIBIT 3-7: EXISTING (2020) TRAFFIC VOLUMES

1 Jefferson Av. & Dwy. 1	2 Jefferson Av. & Dwy. 2	3 Jefferson Av. & Murrieta Hot Springs Rd.
Future Intersection	Future Intersection	594(251) 199(247) 217(220) 638(240) 145(1027) 244(982)

LEGEND:

10(10) ***= AM(PM) PEAK HOUR INTERSECTION VOLUMES***

10.0 ***= VEHICLES PER DAY (1000'S)***

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EXHIBIT 3-8: EXISTING (2020) SUMMARY OF LOS

Table 3-1

Intersection Analysis for Existing (2020) Conditions

#	Intersection	Traffic Control[3]	Intersection Approach Lanes[1]												Delay[2] (secs.)		Level of Service	
			Northbound			Southbound			Eastbound			Westbound						
			L	T	R	L	T	R	L	T	R	L	T	R	AM	PM	AM	PM
1	Jefferson Av. & Driveway 1		Intersection Does Not Exist															
2	Jefferson Av. & Driveway 2		Intersection Does Not Exist															
3	Jefferson Av. & Murrieta Hot Springs Rd.	TS	0	3	1>	2	2	0	0	0	0	2	0	1	21.9	22.6	C	C

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

L = Left; T = Through; R = Right; > = Right Turn Overlap Phasing

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

[3] TS = Traffic Signal

3.7 ROADWAY SEGMENT ANALYSIS

The roadway segment capacities utilized for the purposes of this analysis are approximate figures only and are used at the General Plan level to assist in determining the roadway functional classification (number of through lanes) needed to meet traffic demand. Table 3-2 provides a summary of the Existing (2020) conditions roadway segment capacity analysis based on the applicable roadway segment capacities. As shown in Table 3-2, the study area roadway segment is currently operating at an acceptable LOS based on the applicable planning level daily roadway capacity thresholds.

3.8 EXISTING (2020) CONDITIONS TRAFFIC SIGNAL WARRANTS ANALYSIS

Traffic signal warrant analysis has not been performed as all of the existing study area intersections are currently signalized.

Table 3-2

Roadway Segment Capacity Analysis for Existing (2020) Conditions

#	Roadway	Segment Limits	Roadway Section	LOS Capacity[1]	Existing (2020)	V/C[2]	LOS[3]	Acceptable LOS	General Plan Classification
1	Jefferson Av.	North of Murrieta Hot Springs Rd	5D	44,875	20,112	0.45	A	C	Arterial

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

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

[2] v/c = Volume to Capacity ratio

[3] LOS = Level of Service

[4] There is no roadway capacity for a 5-lane divided roadway. As such, capacity has been estimated by dividing the capacity for a 4-lane Major Arterial by number of lanes and adding the capacity to the capacity for a 4-lane roadway.

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4 PROJECTED FUTURE TRAFFIC

This section presents the traffic volumes estimated to be generated by the Project, as well as the Project's trip assignment onto the study area roadway network. The Project is to consist of 160 market rate apartments. It is anticipated that the Project would be developed in a single phase with an anticipated Opening Year of 2023. For the purpose of this analysis, the following driveways will be assumed to provide access to the Project site:

- Driveway 1 on Jefferson Avenue – Right-in/Right-out Access Only
- Driveway 2 on Jefferson Avenue – Full Access

Regional access to the Project site is available from the I-15 Freeway via Murrieta Hot Springs Road.

4.1 PROJECT TRIP GENERATION

Trip generation represents the amount of traffic which is both attracted to and produced by a development. Determining traffic generation for a specific project is therefore based upon forecasting the amount of traffic that is expected to be both attracted to and produced by the specific land uses being proposed for a given development. Trip generation rates used to estimate Project traffic are shown in Table 4-1. The trip generation rates used for this analysis are based upon information collected by the ITE as provided in their Trip Generation Manual, 10th Edition, 2017, for Multifamily Housing (ITE Land Use Code 220). (2) As shown in Table 4-1, the proposed Project is anticipated to generate a net total of 1,172 trip-ends per day with 74 AM peak hour trips and 90 PM peak hour trips.

4.2 PROJECT TRIP DISTRIBUTION

The Project trip distribution and assignment process represents the directional orientation of traffic to and from the Project site. The trip distribution pattern is heavily influenced by the geographical location of the site, the location of surrounding uses, and the proximity to the regional freeway system. The Project trip distribution patterns are graphically depicted on Exhibit 4-1.

4.3 MODAL SPLIT

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

Table 4-1

Project Trip Generation Summary

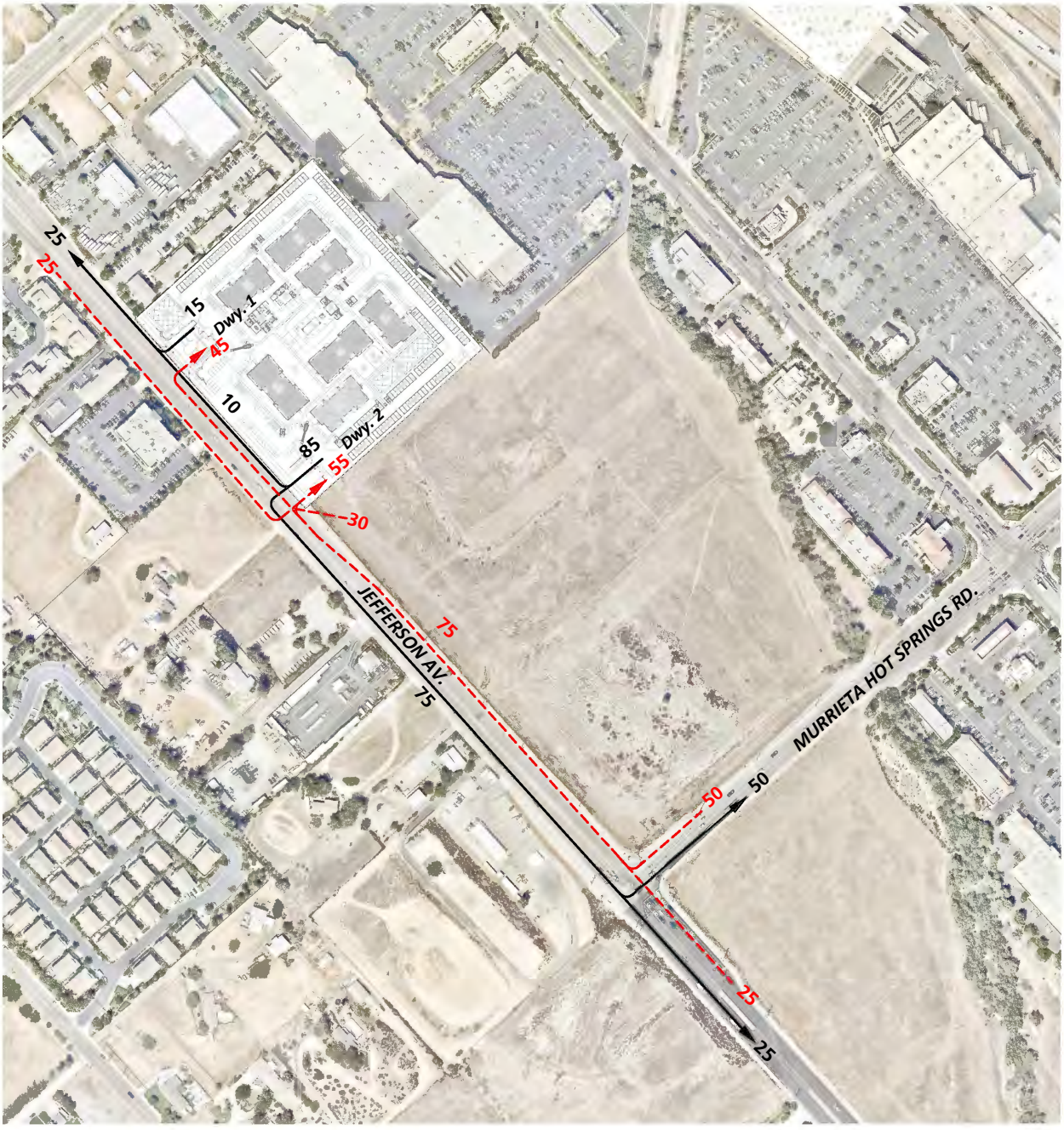
Land Use	Units[2]	ITE LU Code	AM Peak Hour			PM Peak Hour			Daily
			In	Out	Total	In	Out	Total	
Trip Generation Rates[1]									
Multifamily Housing (Low-Rise) (2-floors)	DU	220	0.11	0.35	0.46	0.35	0.21	0.56	7.32

Land Use	Quantity	Units[2]	AM Peak Hour			PM Peak Hour			Daily
			In	Out	Total	In	Out	Total	
Trip Generation Summary									
Jefferson Residential	160	DU	17	57	74	56	33	90	1,172

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

[2] DU = Dwelling Units

EXHIBIT 4-1: PROJECT TRIP DISTRIBUTION



LEGEND:

10 = *PERCENT TO/FROM PROJECT*

= *OUTBOUND*

= *INBOUND*

4.4 PROJECT TRIP ASSIGNMENT

The assignment of traffic from the Project area to the adjoining roadway system is based upon the Project trip generation, trip distribution, and the arterial highway and local street system improvements that would be in place by the time of initial occupancy of the Project. Based on the identified Project traffic generation and trip distribution patterns, Project only ADT and peak hour intersection turning movement volumes are shown on Exhibit 4-2.

4.5 BACKGROUND TRAFFIC

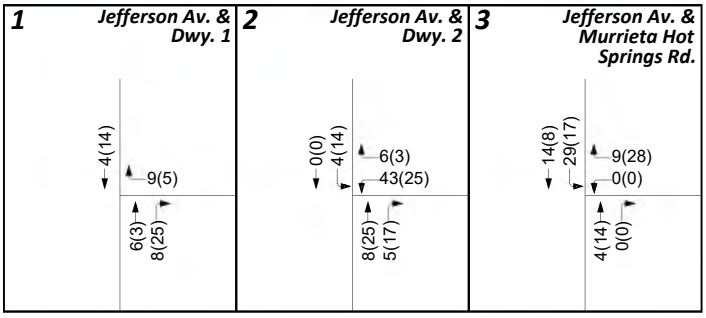
Future year traffic forecasts have been based upon a background (ambient) growth factor of 2% per year, compounded annually. The ambient growth factor is intended to approximate traffic growth. The total ambient growth is 6.12% for 2023 traffic conditions (compounded growth of 2 percent per year over 3 years). This ambient growth rate is added to existing traffic volumes to account for area-wide growth not reflected by cumulative development projects. Ambient growth has been added to daily and peak hour traffic volumes on surrounding roadways, in addition to traffic generated by the development of future projects that have been approved but not yet built and/or for which development applications have been filed and are under consideration by governing agencies.

Ambient growth has been added to daily and peak hour traffic volumes on surrounding roadways, in addition to traffic generated by the development of future projects that have been approved but not yet built and/or for which development applications have been filed and are under consideration by governing agencies.

4.6 CUMULATIVE DEVELOPMENT TRAFFIC

A cumulative project list was developed from consultation with the City of Murrieta, City of Wildomar, and City of Lake Elsinore staff. Exhibit 4-3 illustrates the cumulative development location map. A summary of cumulative development projects and their proposed land uses are provided in Table 4-2. If applicable, the traffic generated by individual cumulative projects was manually added to EAPC (2023) traffic conditions forecasts to ensure that traffic generated by the listed cumulative development projects in Table 4-2 are reflected as part of the background traffic. The ADT and peak hour intersection turning movement volumes generated by the cumulative development projects are shown in Exhibit 4-4.

EXHIBIT 4-2: PROJECT ONLY TRAFFIC VOLUMES



LEGEND:

10(10) ***= AM(PM) PEAK HOUR INTERSECTION VOLUMES***

10.0 ***= VEHICLES PER DAY (1000'S)***

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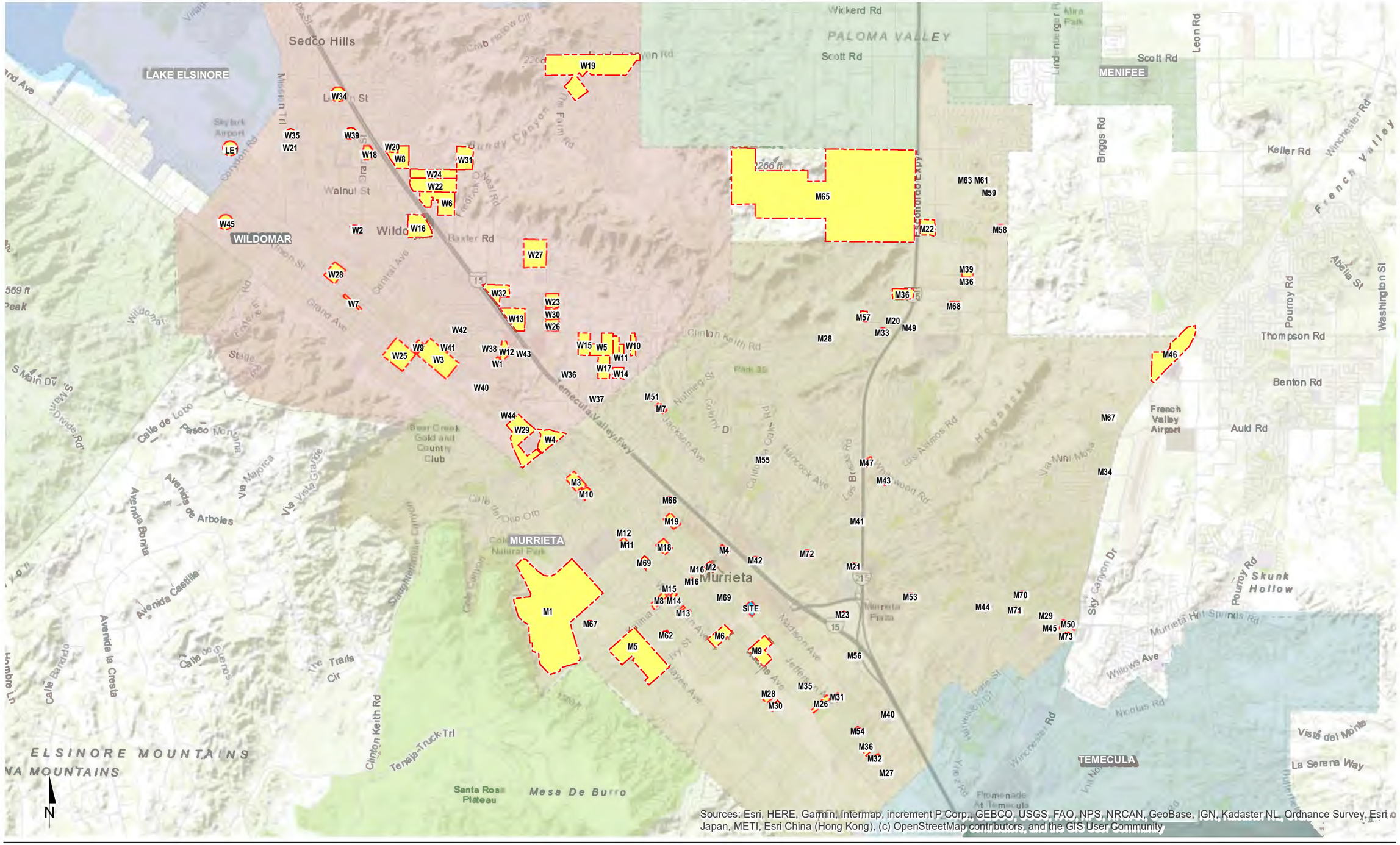
EXHIBIT 4-3: CUMULATIVE DEVELOPMENT PROJECTS LOCATION MAP



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URBAN CROSSROADS

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EXHIBIT 4-4: CUMULATIVE ONLY TRAFFIC VOLUMES

1 Jefferson Av. & Dwy. 1	2 Jefferson Av. & Dwy. 2	3 Jefferson Av. & Murrieta Hot Springs Rd.
Future Intersection	Future Intersection	0(0) 34(38) 0(0) → 0(0) 54(21) 49(45) 9(10) 31(71) 0(0) → 24(26) 24(26) 23(27)

LEGEND:

10(10) ***= AM(PM) PEAK HOUR INTERSECTION VOLUMES***

10.0 ***= VEHICLES PER DAY (1000'S)***

N

Table 4-2

Cumulative Development Land Use Summary

TAZ	Project Name	Land Use[1]	Quantity	Units[2]
CITY OF MURRIETA				
M1	The Vineyards (VTTM 28903) (EXT-2019-1864)	SFDR	1012	DU
M2	Fast 5 Car Wash (DP-2019-1857)	Car Wash	4.975	TSF
M3	TPM 30394	Apartments	156	DU
		Senior Apartments	54	DU
M4	Raising Cane's (DP-2018-1782)	Fast-Food w/ Drive Through	2.796	TSF
M5	TTM 37621 (TTM-2018-1780)	SFDR	25	DU
M6	25190 Washington Av. (TTM 36848) (TTM-2018-1744)	SFDR	86	DU
M7	Pars Global (DP-2018-1657)	Self-Storage	113.395	TSF
M8	Wyndham Timeshare - WorldMark (DP-2018-1593)	Timeshare	161	DU
M9	Murrieta Gateway Business Park (DP-2017-1391)	Industrial Park	285.270	TSF
		Hotel	150	ROOMS
		Retail with Gas Station	43.400	TSF
M10	Pinnacle Senior Living (DP-2016-992)	Assisted Living	108	BED
M11	TTM 31467 (DP-2013-255)	Condo/Townhomes	64	DU
M12	TTM 30953 (DP-2014-275)	Condo/Townhomes	141	DU
M13	Dollins Mixed Use (DP-2013-118)	Apartments	2	DU
		Commercial	6.212	TSF
M14	Downtown Market Place (DP-2018-118)	Commercial & Office	51.455	TSF
M15	Able Self Storage (DP-2017-1299)	Self-Storage	191.898	TSF
M16	Fresnius (DP-2017-1359)	Medical Center	13.100	TSF
M17	The Village Patio (DP-201-470)	Outdoor Beer & Wine Garden	1.244	TSF
M18	Lemon & Adams (TTM 37430)	SFDR	12	DU
M19	Santa Rosa Highlands (DP-201-1480) (50% occupied)	SFDR (remaining)	135	DU
M20	The Orchard at Stonecreek	Commercial	460.000	TSF
M21	Corporate Crossroads Office Complex	Office	273.112	TSF
M22	Loma Linda Hospital	Hospital	266	BED
M23	The Triangle	Office	600.000	TSF
		Retail	800.000	TSF
M24	Kaiser Permanente Murrieta Medical Center	Hospital	254.000	BED
M25	Jimmy's Express Car Wash	Car Wash	2.000	TSF
M26	Caprock Business Park	Steel Fabrication Building	39.000	TSF
M27	Date and Jefferson Service Center	Retail	12.629	TSF
M28	Murrieta Senior Living	Assisted Living	87.000	BED
		Memory Care	22.000	BED
M29	Murrieta Hot Springs	Commercial	10.068	TSF
		Gas Station	12.000	VFP
M30	Contractor's Storage Yard	Storage Yard	5.215	TSF
		Office	8.659	TSF
M31	Mar Vista Business Development Park	Business Park	37.783	TSF
M32	Eastman Mart	Gas Station and Convenience Mart	12.000	VFP
M33	76 Gas Station Clinton Keith	Gas Station and Convenience Mart	3.500	TSF
M34	Food Mart and Gas Station	Gas Station and Convenience Mart	8.000	VFP
M35	Murrieta Creek Business Park	Office	18.180	TSF

Cumulative Development Land Use Summary

TAZ	Project Name	Land Use[1]	Quantity	Units[2]
M36	Hotel and Conference Building	Hotel and Conference Center	120.000	ROOMS
M37	HealthSouth Rehabilitation Hospital	Hospital	50.000	BED
M38	Premiere Rehabilitation & Wellness	Nursing Facility	170.000	BED
M39	Murrieta-Whitehead Skilled Nursing Facility	Nursing Facility	59.000	BED
M40	Elm Street Industrial	Industrial Building	13.844	TSF
M41	Sial Medical Plaza	Medical Office Building	19.800	TSF
M42	Murrieta Hospitality Commons	Hotel	104.000	ROOMS
M43	American Tire Depot	Automobile Parts & Service Center	4.640	TSF
M44	Certified Tires & Service	Automobile Parts & Service Center	6.760	TSF
M45	Hot Spring Center	Retail	24.000	TSF
M46	Murrieta Marketplace	Retail	518.817	TSF
M47	Elm Self Storage/Cubesmart	Self-Storage	83.600	TSF
M48	Prestige Golf Cars	Retail	22.660	TSF
M49	The Insurance Store	Office	2.000	TSF
M50	Aldi	Grocery Store	19.043	TSF
M51	Larchmont Industrial	Industrial	22.000	TSF
M52	Costco	Retail	152.650	TSF
		Gas Station	12.000	VFP
M53	Gas Station on MHSR	Gas Station with Convenience Store	20.000	VFP
M54	Gas Station - Fig and Jefferson	Gas Station with Convenience Store	6.000	VFP
M55	Cal Oaks Multi Tenant Commercial	Car Wash	3.700	TSF
		Bank	4.560	TSF
M56	Hotel Murrieta	Hotel	257.000	ROOMS
M57	Dakota (Tract 28532-2)	SFDR	90.000	DU
M58	Alderwood/Taylor Morrison	SFDR	115.000	DU
M59	Dakota (Tract 28532-4)	SFDR	120.000	DU
M60	Pasha Inv. LLC	SFDR	25.000	DU
M61	Alderwood/Taylor Morrison (Tract 32718)	SFDR	10.000	DU
M62	City of Murrieta (Tract 34439)	SFDR	62.000	DU
M63	Alderwood/Taylor Morrison (Tract 34445)	SFDR	13.000	DU
M64	Sauer Living Trust	SFDR	53.000	DU
M65	Murrieta Hills, LLC	SFDR	532.000	DU
M66	DP-2017-1480	SFDR	193.000	DU
M67	Adobe Springs	Condo/Townhomes	283.000	DU
M68	Meadowlark	Condo/Townhomes	83.000	DU
M69	Poppy Lane Legacy Homes	Condo/Townhomes	50.000	DU
M70	Golden Eagle Multi-family Prop, LLC	Apartments	112.000	DU
M71	Murrieta 196, LLC	Apartments	196.000	DU
M72	Los Alamos Community	Apartments	542.000	DU
M73	Murrieta Hot Springs Road Apartments	Apartments	234.000	DU
M74	Nutmeg Apartments	Apartments	210.000	DU

Cumulative Development Land Use Summary

TAZ	Project Name	Land Use[1]	Quantity	Units[2]
CITY OF WILDOMAR				
W1	Wildomar Crossings	Free Standing Discount Store	10.000	TSF
		Auto Parts Sales	7.004	TSF
		Fast-Food w/ Drive Through	2.600	TSF
		Retail	3.300	TSF
		Fast-Food w/o Drive Through	3.300	TSF
W2	Leslie Tract Map	SFDR	10	DU
W3	Richmond American	SFDR	149	DU
W4	Camelia Townhouse Project	Condo/Townhomes	163	DU
W5	Rancon Medical & Retail Center	Retail	200.000	TSF
		Office	94.000	TSF
W6	Cornerstone Church Preschool & Admin. Building	School	170	STU
		Office	25.462	TSF
W7	Elm Street Subdivision	SFDR	14	DU
W8	Walmart Retail Project	Free-Standing Discount Superstore	193.792	TSF
W9	McVicar Residential Project	SFDR	48	DU
W10	Smith Ranch Self Storage	Self-Storage	150.000	TSF
		Office	10	TSF
W11	Life-Storage Mini Warehouse	Self-Storage	60.800	TSF
W12	Commons at Hidden Springs	Fast-Food w/ Drive Through	7.800	TSF
		Shopping Center	7.890	TSF
		Supermarket	26.500	TSF
		Pharmacy w/ Drive Through	24.700	TSF
		Coffee/Donut Shop w/ Drive Through	1.800	TSF
W13	Westpark Promenade Development (mixed use)	Shopping Center	118.354	TSF
		Condo/Townhomes	191	DU
W14	Villa Sienna Apartment Project	Condo/Townhomes	180	DU
W15	Grove Park Mixed Use Project	Condo/Townhomes	162	DU
		Retail	50.000	TSF
W16	Baxter Village	Shopping Center	75.000	TSF
		SFDR	67	DU
		Condo/Townhomes	204	DU
W17	Horizons/Strata Mixed Use Project	Assisted Living	86	BED
		Condo/Townhomes	138	DU
W18	Orange Bundy/Parcel Map	Retail	79.497	TSF
		Fast Food w/ Drive Through	1.500	TSF
		Gas Station w/ Market	6	VFP
W19	Oak Creek Canyon	SFDR	275	DU
W20	Bundy Canyon Plaza	Shopping Center	36.990	TSF
W21	Wildomar Shooting Academy[3]	Gun Shooting Range	--	--
W22	The "Village at Monte Vista"	SFDR	80	DU
		Business Park	136.000	TSF
W23	Diversified Pacific Homes	SFDR	51	DU
W24	Pacific cove Inv.	SFDR	70	DU

Table 4-2

Cumulative Development Land Use Summary

TAZ	Project Name	Land Use[1]	Quantity	Units[2]
W25	Beazer Homes	SFDR	108	DU
W26	Clinton Keith Village Retail Center	Shopping Center	40.000	TSF
W27	Baxter/Susan GPA/TTM	SFDR	48	DU
W28	Ione/Palomar Residential	SFDR	60	DU
W29	Rhoades Residential Project	SFDR	131	DU
W30	Nova Homes Residential (Wildomar Ridge)	SFDR	77	DU
W31	Darling/Bundy Canyon Residential	Condo/Townhomes	140	DU
W32	Faith Bible Church	Church	45.155	TSF
W33	Milestone RV/Boat Storage	Self-Storage	8.300	TSF
W34	St. Francis of Rome Church	Church	26.596	TSF
W35	Store America Self-Storage	Mini Warehouse	79.207	TSF
W36	Oak Springs Ranch Phase 2/Residential	SFDR	103	DU
W37	Briarwood Community	SFDR	67	DU
W38	Lennar North Ranch	SFDR	84	DU
W39	Subway Commercial Project	Fast Casual Restaurant	10.500	TSF
W40	Andalusia I	SFDR	55	DU
W41	Meritage Homes	SFDR	74	DU
W42	Andalusia II	SFDR	44	DU
W43	Wildomar Square Retail Center	Shopping Center	46.600	TSF
W44	Sycamore Academy Charter School	Private School (K-8)	401	STU
W45	Won Meditation and Retreat Center	All Suites Motel	12	ROOMS
CITY OF LAKE ELSINORE				
LE1	Lakeland Village	General Light Industrial	3.795	TSF
		SFDR	829	DU
		Shopping Center	15.318	TSF

[1] SFDR = Single Family Detached Residential

[2] DU = Dwelling Unit; TSF = Thousand Square Feet; BED = Beds; VFP = Vehicle Fueling Positions

[3] Source: Gun Shooting Range/Tactical Training Facility Traffic Impact Analysis (Revised), Urban Crossroads, Inc., July 2019.

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

- EAP (2023)
    - Existing 2020 volumes
    - Ambient growth traffic (6.12%)
    - Project Traffic
- EAPC (2023)
    - Existing 2020 volumes
    - Ambient growth traffic (6.12%)
    - Cumulative Development traffic
    - Project Traffic

4.7 NEAR-TERM CONDITIONS

The "buildup" approach has been utilized which combines existing traffic counts with a background ambient growth factor to forecast the EAP (2023) and EAPC (2023) traffic conditions. An ambient growth factor of 6.12% accounts for background (area-wide) traffic increases that occur over time up to the year 2023 from the year 2020 (compounded 2 percent per year growth over a 3-year period). Project traffic is added to assess EAP (2023) and EAPC (2023) traffic conditions, respectively. Traffic volumes generated by cumulative development projects are then added to assess the EAPC (2023) traffic conditions. The 2023 roadway networks are similar to the existing conditions roadway network with the exception of future roadways and intersections proposed to be developed by the Project.

5 EAP (2023) TRAFFIC CONDITIONS

This section discusses the traffic forecasts for EAP (2023) conditions and the resulting intersection operations, roadway segment operations and traffic signal warrant analyses.

5.1 ROADWAY IMPROVEMENTS

The lane configurations and traffic controls assumed to be in place for EAP (2023) conditions are consistent with those shown previously on Exhibit 3-1, with the exception of the Project driveways and those facilities assumed to be in place prior to or constructed by the Project to provide site access are also assumed to be in place for EAP (2023) conditions. This includes the Project site adjacent roadway and site access intersection improvements.

5.2 EAP (2023) TRAFFIC VOLUME FORECASTS

This scenario includes Existing traffic volumes plus an ambient growth factor of 6.12% and the addition of Project traffic. The weekday ADT, weekday AM, and PM peak hour volumes which can be expected for EAP (2023) traffic conditions are shown on Exhibit 5-1.

5.3 INTERSECTION OPERATIONS ANALYSIS

EAP (2023) peak hour traffic operations have been evaluated for the study area intersections based on the analysis methodologies presented in Section 2 *Methodologies* of this TIA. The intersection analysis results are summarized in Table 5-1 and shown on Exhibit 5-2, which indicates that the study area intersections are anticipated to operate at an acceptable LOS under EAP (2023) traffic conditions. The intersection operations analysis worksheets for EAP (2023) traffic conditions are included in Appendix 5.1 of this TIA.

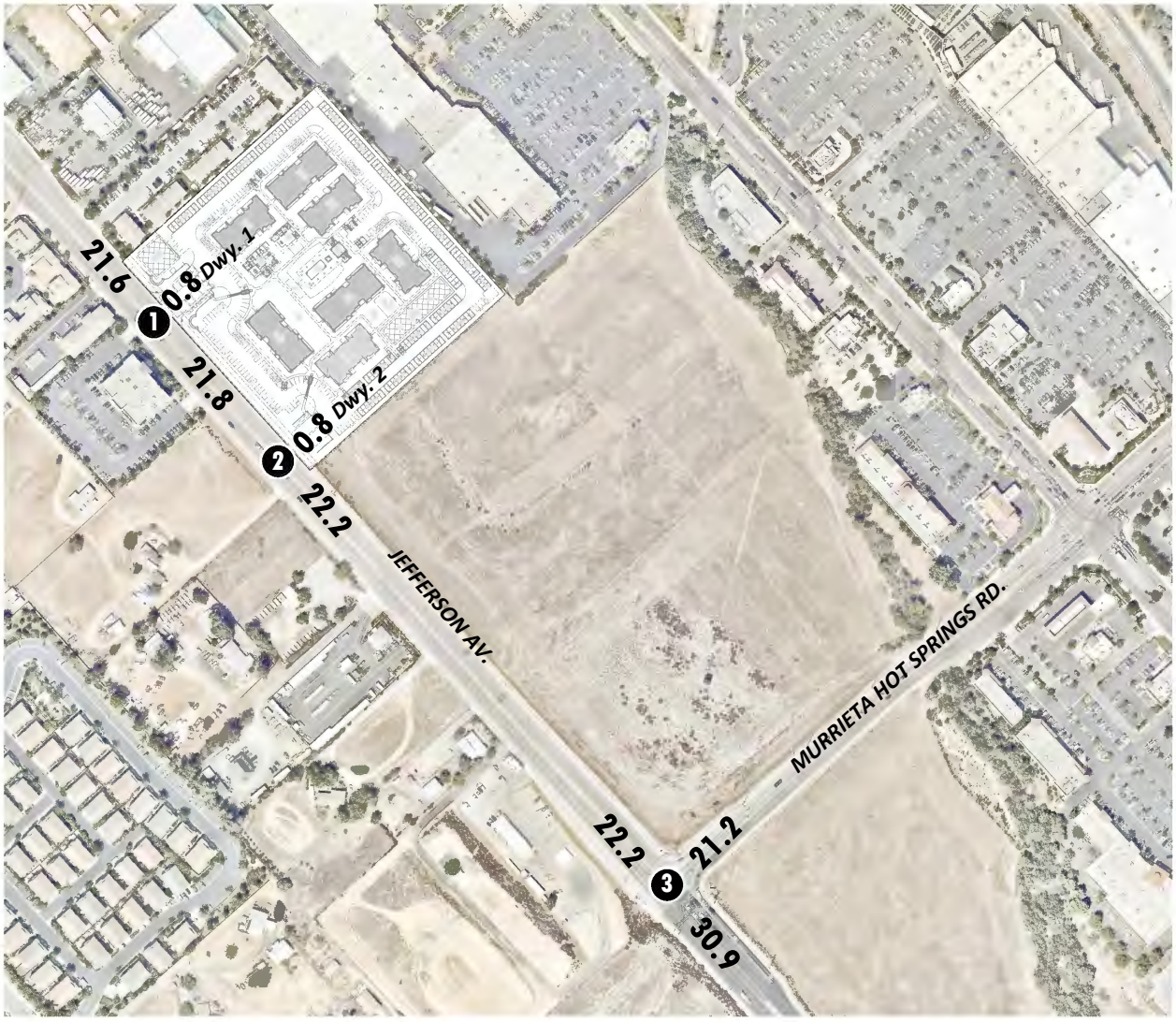
5.4 ROADWAY SEGMENT ANALYSIS

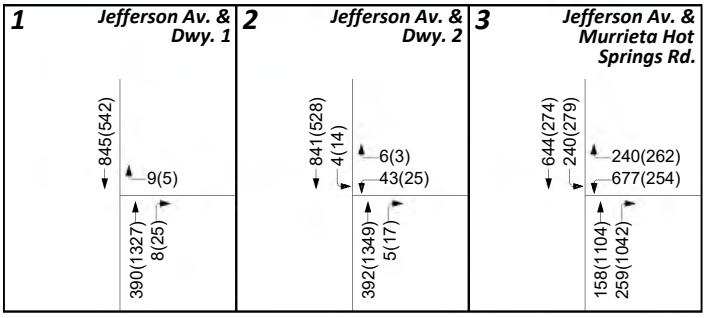
The roadway segment capacities utilized for the purposes of this analysis are approximate figures only, and are used at the General Plan level to assist in determining the roadway functional classification (number of through lanes) needed to meet traffic demand. Table 5-2 provides a summary of the EAP (2023) traffic conditions roadway segment capacity analysis based on the applicable roadway segment capacity. As shown in Table 5-2, the study area roadway segment is anticipated to operate at an acceptable LOS under EAP (2023) traffic conditions.

5.5 TRAFFIC SIGNAL WARRANTS ANALYSIS

There are no traffic signals anticipated to meet planning level (daily volume) based traffic signal warrants with the addition of Project traffic for EAP (2023) traffic conditions (see Appendix 5.2).

EXHIBIT 5-1: EAP (2023) TRAFFIC VOLUMES





LEGEND:

10(10) ***= AM(PM) PEAK HOUR INTERSECTION VOLUMES***

10.0 ***= VEHICLES PER DAY (1000'S)***

N

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EXHIBIT 5-2: EAP (2023) SUMMARY OF LOS

Table 5-1

Intersection Analysis for EAP (2023) Conditions

#	Intersection	Traffic Control[2]	Existing (2020)				EAP (2023)			
			Delay[1] (secs.)		Level of Service		Delay[1] (secs.)		Level of Service	
			AM	PM	AM	PM	AM	PM	AM	PM
1	Jefferson Av. & Driveway 1	**CSS**	Future Intersection				9.6	15.1	A	C
2	Jefferson Av. & Driveway 2	**CSS**	Future Intersection				14.5	29.5	B	D
3	Jefferson Av. & Murrieta Hot Springs Rd.	TS	21.9	22.6	C	C	22.5	28.2	C	C

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

[2] CSS = Cross-street Stop; TS = Traffic Signal; **CSS** = Improvement

Table 5-2

Roadway Segment Capacity Analysis for EAP (2023) Conditions

#	Roadway	Segment Limits	Roadway Section	LOS Capacity[1]	Existing (2020)	V/C[2]	LOS[3]	EAP (2023)	V/C[2]	LOS[3]	Acceptable LOS	General Plan Classification
1	Jefferson Av.	North of Murrieta Hot Springs Rd	5D	44,875	20,112	0.45	A	22,223	0.50	A	C	Arterial

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

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

[2] v/c = Volume to Capacity ratio

[3] LOS = Level of Service

[4] There is no roadway capacity for a 5-lane divided roadway. As such, capacity has been estimated by dividing the capacity for a 4-lane Major Arterial by number of lanes and adding the capacity to the capacity for a 4-lane roadway.

5.6 RECOMMENDED OFF-SITE IMPROVEMENTS

The study area intersections and roadway segments are anticipated to operate at an acceptable LOS for EAP (2023) traffic conditions, as such, no off-site improvements have been recommended. For on-site Project design features, see Section 1.7 *Recommendations*.

6 EAPC (2023) TRAFFIC CONDITIONS

This section discusses the traffic forecasts for EAPC (2023) conditions and the resulting intersection operations, roadway segment operations and traffic signal warrant analyses.

6.1 ROADWAY IMPROVEMENTS

The lane configurations and traffic controls assumed to be in place for EAPC (2023) conditions are consistent with those shown previously on Exhibit 3-1, with the exception of the following:

- Driveways and those facilities assumed to be constructed by cumulative developments to provide site access are also assumed to be in place for EAPC (2023) (e.g., intersection and roadway improvements along the cumulative development's frontages and driveways). This includes restriping and roadway improvements that would be implemented by the adjacent Pinnacle Senior Living project.
- Project driveways and those facilities assumed to be in place prior to or constructed by the Project to provide site access are also assumed to be in place for EAPC (2023) conditions. This includes the Project site adjacent roadway and site access intersection improvements.

6.2 EAPC (2023) TRAFFIC VOLUME FORECASTS

This scenario includes Existing traffic volumes plus an ambient growth factor of 6.12% in conjunction with the addition of cumulative project development and the addition of Project traffic. The weekday ADT, weekday AM, and PM peak hour volumes which can be expected for EAPC (2023) traffic conditions are shown on Exhibit 6-1.

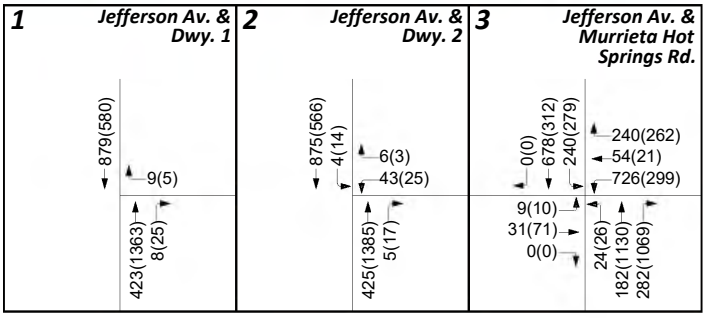
6.3 INTERSECTION OPERATIONS ANALYSIS

EAPC (2023) peak hour traffic operations have been evaluated for the study area intersections based on the analysis methodologies presented in Section 2 *Methodologies* of this TIA. The intersection analysis results are summarized in Table 6-1 and shown on Exhibit 6-2, which indicates that the study area intersections are anticipated to operate at an acceptable LOS under EAPC (2023) traffic conditions. The intersection operations analysis worksheets for EAPC (2023) traffic conditions are included in Appendix 6.1 of this TIA.

6.4 ROADWAY SEGMENT ANALYSIS

The roadway segment capacities utilized for the purposes of this analysis are approximate figures only and are used at the General Plan level to assist in determining the roadway functional classification (number of through lanes) needed to meet traffic demand. Table 6-2 provides a summary of the EAPC (2023) traffic conditions roadway segment capacity analysis based on the applicable roadway segment capacity. As shown in Table 6-2, the study area roadway segment is anticipated to operate at an acceptable LOS under EAPC (2023) traffic conditions.

EXHIBIT 6-1: EAPC (2023) TRAFFIC VOLUMES



LEGEND:

10(10) ***= AM(PM) PEAK HOUR INTERSECTION VOLUMES***

10.0 ***= VEHICLES PER DAY (1000'S)***

N

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EXHIBIT 6-2: EAPC (2023) SUMMARY OF LOS

Table 6-1

Intersection Analysis for EAPC (2023) Conditions

#	Intersection	Traffic Control[3]	Intersection Approach Lanes[1]												Delay[2] (secs.)		Level of Service	
			Northbound			Southbound			Eastbound			Westbound						
			L	T	R	L	T	R	L	T	R	L	T	R	AM	PM	AM	PM
1	Jefferson Av. & Driveway 1	**CSS**	0	2	0	0	2	0	0	0	0	0	0	**1**	9.8	15.4	A	C
2	Jefferson Av. & Driveway 2	**CSS**	0	2	0	**1**	2	0	0	0	0	0	**1**	0	15.0	30.9	C	D
3	Jefferson Av. & Murrieta Hot Springs Rd.	TS	0	3	1>	2	2	0	0	0	0	2	0	1	29.2	49.4	C	D

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

L = Left; T = Through; R = Right; **1** = Improvement

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

[3] CSS = Cross-street Stop; TS = Traffic Signal; **CSS** = Improvement

Table 6-2

Roadway Segment Capacity Analysis for EAPC (2023) Conditions

#	Roadway	Segment Limits	Roadway Section	LOS Capacity[1]	EAPC (2023)	V/C[2]	LOS[3]	Acceptable LOS	General Plan Classification
1	Jefferson Av.	North of Murrieta Hot Springs Rd	5D	44,875	23,300	0.52	A	C	Arterial

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

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

[2] v/c = Volume to Capacity ratio

[3] LOS = Level of Service

[4] There is no roadway capacity for a 5-lane divided roadway. As such, capacity has been estimated by dividing the capacity for a 4-lane Major Arterial by number of lanes and adding the capacity to the capacity for a 4-lane roadway.

6.5 TRAFFIC SIGNAL WARRANTS ANALYSIS

There are no traffic signals anticipated to meet planning level (daily volume) based traffic signal warrants with the addition of Project traffic for EAPC (2023) traffic conditions (see Appendix 6.2).

6.6 RECOMMENDED OFF-SITE IMPROVEMENTS

The study area intersections and roadway segments are anticipated to operate at an acceptable LOS for EAPC (2023) traffic conditions, as such, no off-site improvements have been recommended. For on-site Project design features, see Section 1.7 *Recommendations*.

7 LOCAL AND REGIONAL FUNDING MECHANISMS

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

7.1 CITY OF MURRIETA DEVELOPMENT IMPACT FEE PROGRAM

The City's current Development Impact Fee (DIF) program is based on the Master Facilities Plan and Development Impact Fee Calculation Report prepared in 2016. The most current fee schedule is available for the 2019-2020 fiscal year. Fees from new residential, commercial and industrial development are collected to fund local facilities. Under the City's DIF program, the City may grant to developers a credit against specific components of fees when those developers construct certain facilities and landscaped medians identified in the list of improvements funded by the DIF program.

After the City's DIF fees are collected, they are placed in a separate restricted use account pursuant to the requirements of Government Code sections 66000 et seq. The timing to use the DIF fees is established through periodic capital improvement programs which are overseen by the City's Engineering Department. Periodic traffic counts, review of traffic accidents, and a review of traffic trends throughout the City are also periodically performed by City staff and consultants. The City uses this data to determine the timing of the improvements listed in its facilities list. The City also uses this data to ensure that the improvements listed on the facilities list are constructed before the LOS falls below the LOS performance standards adopted by the City. In this way, the improvements are constructed before the LOS falls below the City's LOS performance thresholds. The City's DIF program establishes a timeline to fund, design, and build the improvements.

7.2 TRANSPORTATION UNIFORM MITIGATION FEE PROGRAM

Transportation improvements within the City of Murrieta are funded through a combination of construction of specific improvements by a project and participation in fee programs (i.e., payment of fees), such as the TUMF. Identification and timing of needed improvements is generally determined through local jurisdictions based upon a variety of factors.

The TUMF program is administered by the Western Riverside Council of Governments (WRCOG) based upon a regional Nexus Study, most recently updated in 2016, to address major changes in right of way acquisition and improvement cost factors. This regional program was put into place to ensure that development pays its fair share and that funding is in place for construction of facilities needed to maintain the requisite level of service and critical to mobility in the region. TUMF is a truly regional mitigation fee program and is imposed and implemented in every jurisdiction in Western Riverside County.

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

8 REFERENCES

1. **City of Murrieta.** *General Plan Update.* Murrieta : s.n., February 2020.

2. **Institute of Transportation Engineers.** *Trip Generation Manual.* 10th Edition. 2017.

3. **Riverside County Transportation Commission.** *2011 Riverside County Congestion Management Program.* County of Riverside : s.n., December 14, 2011.

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

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

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APPENDIX 1.1:

APPROVED TRAFFIC STUDY SCOPING AGREEMENT

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EXHIBIT B

SCOPING AGREEMENT FOR TRAFFIC IMPACT ANALYSIS

This letter acknowledges the City of Murrieta Engineering Department requirements for traffic impact analysis of the following project. The analysis must follow the City of Murrieta Public Works Department Traffic Study Guidelines dated October 2013.

Case No.
Related Cases-
SP No.
EIR No.
GPA No.
CZ No.
Project Name: Jefferson Residential
Project Address: East of Jefferson Avenue, north of Murrieta Hot Springs Road
Project Description: 160 market rate apartments

	Consultant	Developer Representative
Name:	Charlene So, Urban Crossroads Inc.	Tom Dodson, Tom Dodson & Associates
Address:	260 E. Baker Street, Suite 200	P.O. Box 2307
	Costa Mesa, CA 92626	San Bernardino, CA 92406-2307
Telephone:	(949) 336-5982	(909) 882-3612
Fax:		(909) 882-7015

A. Trip Generation Source: ITE 10th Edition (2017) (See Table 1)

Current GP Land Use: Multiple Family Residential - 2 — Proposed Land Use: Multiple Family Residential - 2
Current Zoning: MF-2 — Proposed Zoning: MF-2

	Current Trip Generation			Proposed Trip Generation		
	In	Out	Total	In	Out	Total
AM Trips	0	0	0	17	57	74
PM Trips	0	0	0	56	33	90

Internal Trip Allowance ☐ Yes ■ No (0 % Trip Discount)
Pass-By Trip Allowance ☐ Yes ■ No (0 % Trip Discount)

The passby trips at adjacent study area intersections and project driveways shall be indicated on a report figure.

B. Trip Geographic Distribution: (See attached Exhibit 3 for detailed assignment)

N 25 % S 25 % E 50 % W 0 %

C. Background Traffic

Project Build-out Year: 2023 — Annual Ambient Growth Rate: 2.0 %
Phase Year(s) No Phasing

Other area Projects to be analyzed: Current Planning Division Project List, plus additional projects provided by the City
Model/Forecast Methodology: Not Applicable

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D. Study Intersections: *(NOTE: Subject to revision after other projects, trip generation and distribution are determined, or comments from other agencies).* (See Exhibit 2)

1. Jefferson Av. & Driveway 1
2. Jefferson Av. & Driveway 2
3. Jefferson Av. & Murrieta Hot Springs Rd.
4.
5.
6.
7.
8.
9.
10.

E. Study Roadway Segments: *(NOTE: Subject to revision after other projects, trip generation and distribution are determined, or comments form other agencies).*

1. Jefferson Av., north of Murrieta Hot Springs Rd.
2.
3.

F. Site Plan (please attach reduced copy) (see Exhibit 1)

G. Specific issues to be addressed in the Study (in addition to the standard analysis described in the Guideline) (To be filled out by Engineering Department)

H. Existing Conditions

Traffic count data must be new or recent. Provide traffic count dates if using other than new counts.

Date of counts

Recommended by:

Charlene So — 4/3/2020

Consultant's Representative — Date

Approved Scoping Agreement:

B. R. — 4/9/20

City of Murrieta Engineering Department — Date

Scoping Agreement Revised on

URBAN CROSSROADS

URBAN CROSSROADS

260 E. Baker St. | Suite 200 | Costa Mesa, CA 92626 | (949) 660-1994
urbanxroads.com

April 3, 2020

Mr. Brian Stephenson
City of Murrieta
1 Town Square
Murrieta, CA 92562

SUBJECT: JEFFERSON RESIDENTIAL FOCUSED TRAFFIC IMPACT ANALYSIS

Dear Mr. Brian Stephenson:

Urban Crossroads, Inc. is pleased to submit this scoping letter to City of Murrieta regarding the Focused Traffic Impact Analysis for the proposed Jefferson Residential development ("Project"), which is located east of Jefferson Avenue and north of Murrieta Hot Springs Road in the City of Murrieta. The Project is to consist of 160 market rate apartments.

A preliminary site plan for the proposed Project is shown on Exhibit 1. Exhibit 2 depicts the location of the proposed Project in relation to the existing roadway network. For purposes of the traffic impact analysis the Project's opening year is anticipated to be 2023. Access to the Project site will be provided via the following:

- Driveway 1 on Jefferson Avenue – Right-in/right-out access only
- Driveway 2 on Jefferson Avenue – Full access

TRIP GENERATION

In order to estimate the traffic characteristics of the proposed Project, trip-generation statistics published in the Institute of Transportation Engineers (ITE) Trip Generation Manual (10th Edition, 2017) were used for the proposed land use. Multifamily Housing (Low-Rise, 2 floors) (ITE Land Use Code 220) has been used for the purposes of estimating the Project's trip generation. Table 1 presents the trip generation rates and resulting trips generated by the proposed Project. As shown in Table 1, the proposed Project is anticipated to generate a net total of approximately 1,172 trip-ends per day, with 74 trips-ends during the weekday AM peak hour and 90 trip-ends during the weekday PM peak hour.

TRIP DISTRIBUTION

Exhibit 3 illustrates the Project trip distribution patterns.

ANALYSIS SCENARIOS

Consistent with the City of Murrieta General Plan Update (February 2020) and the Western Riverside Council of Government's (WRCOG) Recommended Traffic Impact Analysis Guidelines for Vehicles Miles Traveled and Level of Service Assessment (January 2020), intersection analysis will be provided for the following scenarios:

- Existing (2020) Conditions
- Existing plus Ambient Growth plus Project (EAP) (2023) Conditions
- Existing Plus Ambient Growth Plus Project Plus Cumulative (EAPC) (2023) Conditions

STUDY AREA INTERSECTIONS

Based on the Project's anticipated travel patterns and trip generation characteristics, the following study area intersection locations shown on Exhibit 2 and listed below were selected for analysis:

1. Jefferson Av. & Driveway 1 – Future Intersection
2. Jefferson Av. & Driveway 2 – Future Intersection
3. Jefferson Av. & Murrieta Hot Springs Rd.

STUDY AREA ROADWAY SEGMENTS

The following study area roadway segment listed below is selected for analysis:

- Jefferson Avenue, north of Murrieta Hot Springs Road

LOS CRITERIA

The City's LOS standards, as published in the City's General Plan Update, Chapter IV, of LOS D for peak hour intersection operations will be utilized for the purposes of this analysis.

THRESHOLDS

Signalized Intersections

A traffic impact occurs when the additional or redistributed ADT generated by the proposed Project will significantly increase congestion on a signalized intersection operating at LOS E or LOS F as identified in Table 4.2-5 of the City's General Plan Update, or will cause a signalized intersection operating at LOS D or better to operate at LOS E or LOS F.

Unsignalized Intersections

Traffic volume increases from public or private projects that result in one or more of the following criteria will have a traffic impact to an unsignalized intersection as listed in Table 4.2-5 of the City's General Plan Update and described in text below:

- The additional or redistributed traffic generated by the proposed Project will add 21 or more peak hour trips to a critical movement of an unsignalized intersection, and cause an unsignalized intersection to operate below LOS D, or
- The additional or redistributed traffic generated by the proposed Project will add 21 or more peak hour trips to a critical movement of an unsignalized intersection currently operating at LOS E, or
- The additional or redistributed traffic generated by the proposed Project will add 6 or more peak hour trips to a critical movement of an unsignalized intersection, and cause the unsignalized intersection to operate at LOS F, or
- The additional or redistributed traffic generated by the proposed Project will add 6 or more peak hour trips to a critical movement of an unsignalized intersection currently operating at LOS F, or
- Based upon an evaluation of existing accident rates, the signal prioritization list, intersection geometrics, proximity of adjacent driveways, sight distance or other factors, the project would significantly impact the operations of the intersection.

Table 4.2-5: Measures of Significant Project Impacts to Congestion on Intersections

Level of Service	Allowable Increases on Congested Intersections	
	Signalized	Unsignalized
LOS E	Delay of 2 seconds or less	20 or less peak hour trips on a critical movement
LOS F	Either a delay of 1 second, or 5 peak hour trips or less on a critical movement	5 or less peak hour trips on a critical movement

Notes:
1. A critical movement is an intersection movement (left-turn, through movement, right-turn) that experiences excessive queues, which typically operate at LOS F. Also, if a project adds significant volume to a minor roadway approach, a gap study should be provided that details the headways between vehicles on the major roadway.
2. By adding proposed project trips to all other trips from a list of projects, these same tables are used to determine if total cumulative impacts are significant. If cumulative impacts are found to be significant, each project is responsible for mitigating its share of the cumulative impact.
3. The City may also determine impacts have occurred at intersections even when a project's direct or cumulative impacts do not trigger an unacceptable level of service, when such traffic uses a significant amount of remaining intersection capacity.
4. For determining significance at signalized intersections with LOS F conditions, the analysis must evaluate both the delay and the number of trips on a critical movement. Exceedance of either criteria results in a significant impact.

Roadway Segments

A traffic impact occurs when traffic volume increases from public or private projects that result in the following criteria will have a significant traffic volume or level of service traffic operations impact on a roadway segment:

- The additional or redistributed ADT generated by the proposed Project will significantly increase congestion on a roadway segment currently operating at LOS E or F, or will cause a roadway segment to operate at LOS E or LOS F as a result of the proposed Project as identified in Table 4.2-4 of the City's General Plan Update.

Table 4.2-4: Measures of Significant Project Impacts to Congestion on Roadway Segments

Level of Service	Volume-to-Capacity Ratio		
	Two-lane Road	Two-lane Road	Six-lane Road
LOS E	200 ADT	400 ADT	600 ADT
LOS F	100 ADT	200 ADT	300 ADT

Notes:
1. By adding proposed project trips to all other trips from a list of projects, this same table must be used to determine if total cumulative impacts are significant. If cumulative impacts are found to be significant, each project that contributes additional trips must mitigate a share of the cumulative impacts.
2. The City may also determine impacts have occurred on roads even where a project's traffic or cumulative impacts do not trigger an unacceptable level of service, when such traffic uses a significant amount of remaining roadway capacity.

EXISTING COUNT DATA

Traffic counts at the existing study area intersection have been provided by City staff and were collected in August 2019, when schools were in session and operating on normal bell schedule. A 2 percent growth factor will be applied to the 2019 traffic counts to reflect 2020 baseline conditions.

CUMULATIVE DEVELOPMENT PROJECTS

A list of cumulative development provides is provided on Exhibit 4 and listed on Table 2. Please provide any additional cumulative projects that should be included in our analysis

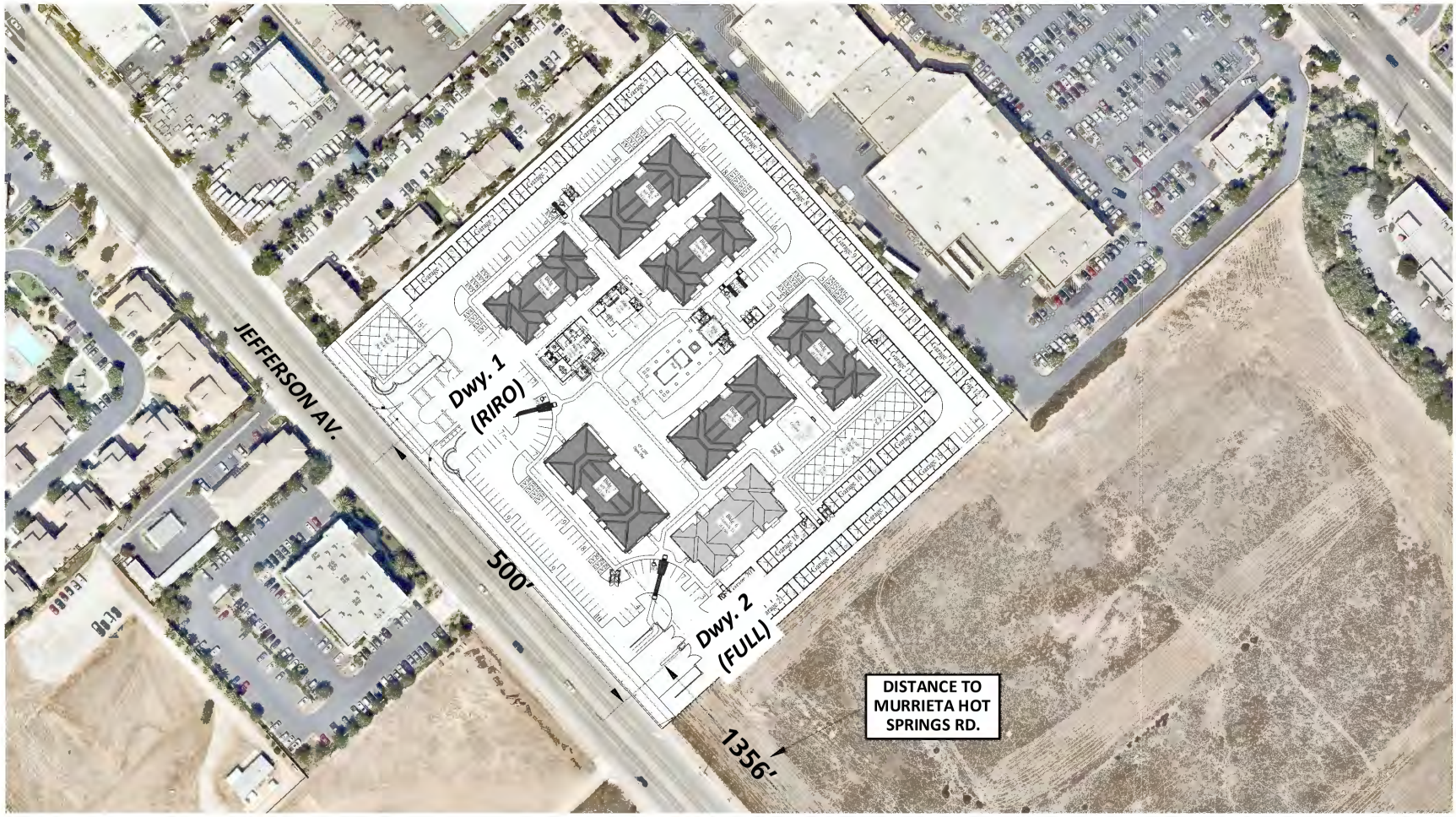
If you have any questions, please contact me directly at (949) 336-5982.

Respectfully submitted,

URBAN CROSSROADS, INC.

Charlene So, PE
Associate Principal

EXHIBIT 1: PRELIMINARY SITE PLAN



LEGEND:

RIRO *= RIGHT-IN/RIGHT-OUT ONLY ACCESS*
FULL *= FULL ACCESS*

N

1.1-8

EXHIBIT 2: LOCATION MAP

LEGEND:

- ⓪ = EXISTING INTERSECTION ANALYSIS LOCATION
- (0) = FUTURE INTERSECTION ANALYSIS LOCATION
- 00 = ROADWAY SEGMENT ANALYSIS LOCATION

N

12889 - locmap.dwg

URBAN CROSSROADS

EXHIBIT 3: PROJECT TRIP DISTRIBUTION

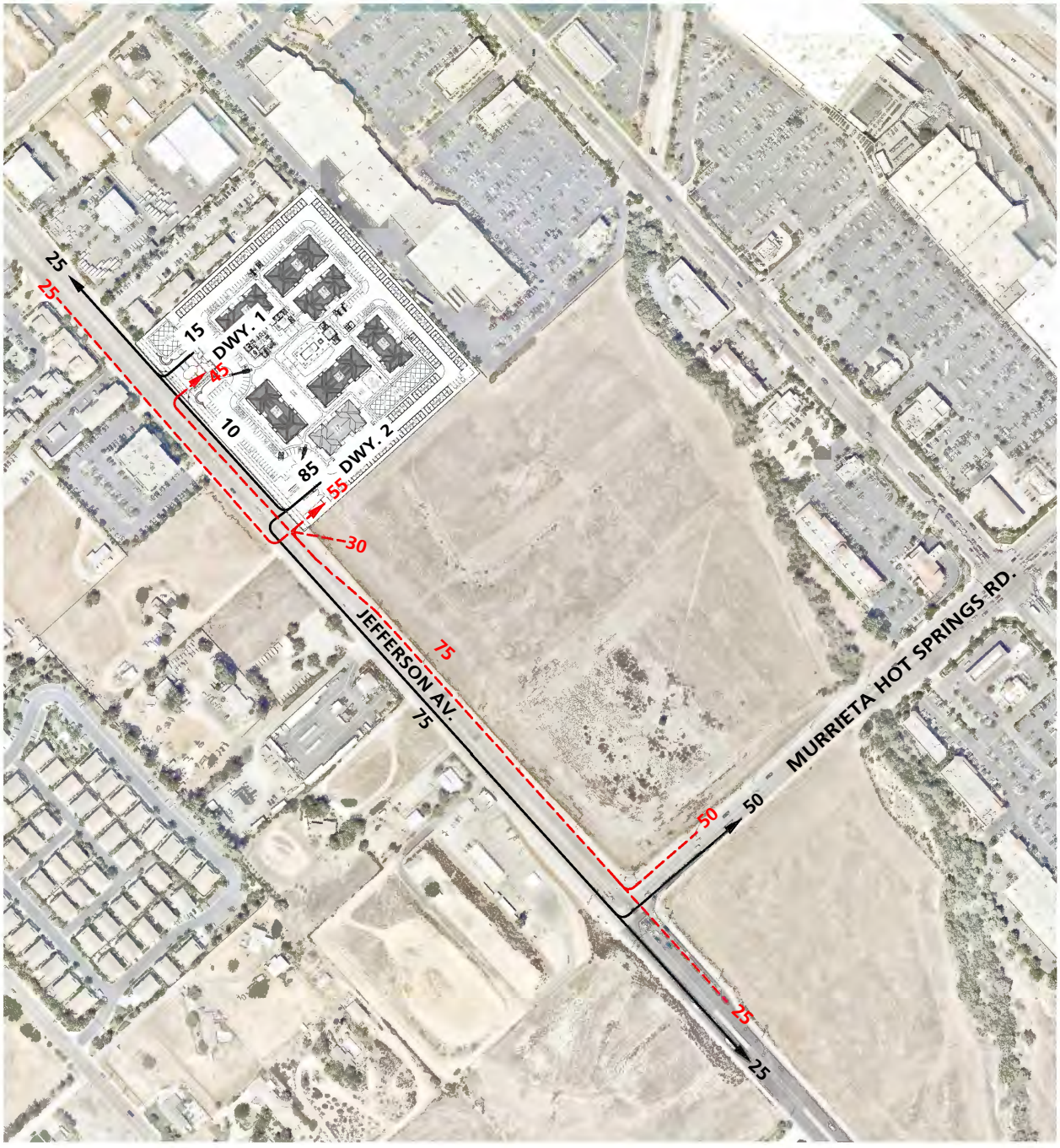


EXHIBIT 4: CUMULATIVE DEVELOPMENT PROJECT LOCATION MAP

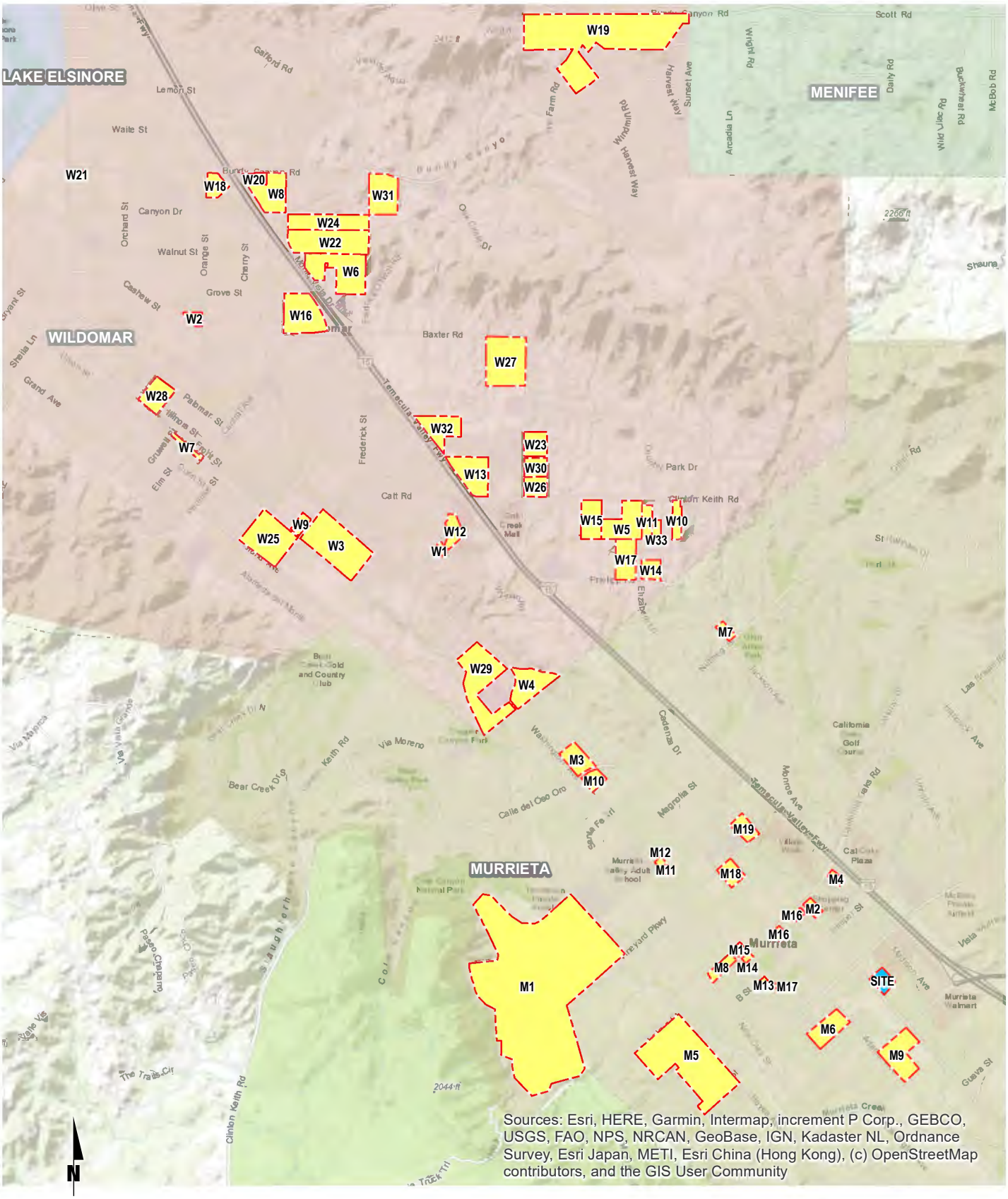


Table 1

Project Trip Generation Summary

Land Use	Units[2]	ITE LU Code	AM Peak Hour			PM Peak Hour			Daily
			In	Out	Total	In	Out	Total	
Trip Generation Rates[1]									
Multifamily Housing (Low-Rise) (2-floors)	DU	220	0.11	0.35	0.46	0.35	0.21	0.56	7.32

Land Use	Quantity	Units[2]	AM Peak Hour			PM Peak Hour			Daily
			In	Out	Total	In	Out	Total	
Trip Generation Summary									
Jefferson Residential	160	DU	17	57	74	56	33	90	1,172

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

[2] DU = Dwelling Units

Table 2

Cumulative Development Land Use Summary

TAZ	Project Name	Land Use[1]	Quantity	Units[2]
CITY OF MURRIETA				
M1	The Vineyards (VTTM 28903) (EXT-2019-1864)	SFDR	1012	DU
M2	Fast 5 Car Wash (DP-2019-1857)	Car Wash	4.975	TSF
M3	TPM 30394	Apartments	156	DU
		Senior Apartments	54	DU
M4	Raising Cane's (DP-2018-1782)	Fast-Food w/ Drive Through	2.796	TSF
M5	TTM 37621 (TTM-2018-1780)	SFDR	25	DU
M6	25190 Washington Av. (TTM 36848) (TTM-2018-1744)	SFDR	86	DU
M7	Pars Global (DP-2018-1657)	Self-Storage	113.395	TSF
M8	Wyndham Timeshare - WorldMark (DP-2018-1593)	Timeshare	161	DU
M9	Murrieta Gateway Business Park (DP-2017-1391)	Industrial Park	285.270	TSF
		Hotel	150	ROOMS
		Retail with Gas Station	43.400	TSF
M10	Pinnacle Senior Living (DP-2016-992)	Assisted Living	108	BED
M11	TTM 31467 (DP-2013-255)	Condo/Townhomes	64	DU
M12	TTM 30953 (DP-2014-275)	Condo/Townhomes	141	DU
M13	Dollins Mixed Use (DP-2013-118)	Apartments	2	DU
		Commercial	6.212	TSF
M14	Downtown Market Place (DP-2018-118)	Commercial & Office	51.455	TSF
M15	Able Self Storage (DP-2017-1299)	Self-Storage	191.898	TSF
M16	Fresnius (DP-2017-1359)	Medical Center	13.100	TSF
M17	The Village Patio (DP-201-470)	Outdoor Beer & Wine Garden	1.244	TSF
M18	Lemon & Adams (TTM 37430)	SFDR	12	DU
M19	Santa Rosa Highlands (DP-201-1480) (50% occupied)	SFDR (remaining)	135	DU
CITY OF WILDOMAR				
W1	Wildomar Crossings	Free Standing Discount Store	10.000	TSF
		Auto Parts Sales	7.004	TSF
		Fast-Food w/ Drive Through	2.600	TSF
		Retail	3.300	TSF
		Fast-Food w/o Drive Through	3.300	TSF
W2	Lesle Tract Map	SFDR	10	DU
W3	Richmond American	SFDR	149	DU
W4	Camelia Townhouse Project	Condo/Townhomes	163	DU
W5	Rancon Medical & Retail Center	Retail	200.000	TSF
		Office	94.000	TSF
W6	Cornerstone Church Preschool & Admin. Building	School	170	STU
		Office	25.462	TSF
W7	Elm Street Subdivision	SFDR	14	DU
W8	Walmart Retail Project	Free-Standing Discount Superstore	193.792	TSF
W9	McVicar Residential Project	SFDR	47	DU
W10	Smith Ranch Self Storage	Self-Storage	150.000	TSF
		Office	10	TSF
W11	Life-Storage Mini Warehouse	Self-Storage	60.800	TSF

Table 2

Cumulative Development Land Use Summary

TAZ	Project Name	Land Use[1]	Quantity	Units[2]
W12	Commons at Hidden Springs	Fast-Food w/ Drive Through	7.800	TSF
		Shopping Center	7.890	TSF
		Supermarket	26.500	TSF
		Pharmacy w/ Drive Through	24.700	TSF
		Coffee/Donut Shop w/ Drive Through	1.800	TSF
W13	Westpark Promenade Development (mixed use)	Shopping Center	118.354	TSF
		Condo/Townhomes	191	DU
W14	Villa Sienna Apartment Project	Condo/Townhomes	180	DU
W15	Grove Park Mixed Use Project	Condo/Townhomes	162	DU
		Retail	50.000	TSF
W16	Baxter Village	Shopping Center	75.000	TSF
		SFDR	67	DU
		Condo/Townhomes	204	DU
W17	Horizons/Strata Mixed Use Project	Assisted Living	86	BED
		Condo/Townhomes	138	DU
W18	Orange Bundy/Parcel Map	Retail	79.497	TSF
		Fast Food w/ Drive Through	1.500	TSF
		Gas Station w/ Market	6	VFP
W19	Oak Creek Canyon	SFDR	275	DU
W20	Bundy Canyon Plana	Shopping Center	36.990	TSF
W21	Wildomar Shooting Academy[3]	Gun Shooting Range	--	--
W22	The "Village at Monte Vista"	SFDR	80	DU
		Business Park	136.000	TSF
W23	Diversified Pacific Homes	SFDR	51	DU
W24	Pacific cove Inv.	SFDR	70	DU
W25	Beazer Homes	SFDR	108	DU
W26	Clinton Keith Village Retail Center	Shopping Center	40.000	TSF
W27	Baxter/Susan GPA/TTM	SFDR	48	DU
W28	Ione/Palomar Residential	SFDR	60	DU
W29	Rhoades Residential Project	SFDR	131	DU
W30	Nova Homes Residential	SFDR	77	DU
W31	Darling/Bundy Canyon Residential	Condo/Townhomes	140	DU
W32	Faith Bible Church	Church	45.155	TSF
W33	Milestone RV/Boat Storage	Self-Storage	8.300	TSF

[1] SFDR = Single Family Detached Residential

[2] DU = Dwelling Unit; TSF = Thousand Square Feet; BED = Beds; VFP = Vehicle Fueling Positions

[3] Source: Gun Shooting Range/Tactical Training Facility Traffic Impact Analysis (Revised), Urban Crossroads, Inc., July 2019.

APPENDIX 1.2:

QUEUING ANALYSIS WORKSHEETS

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Intersection: 1: Jefferson Av. & Driveway 1

Movement	WB
Directions Served	R
Maximum Queue (ft)	35
Average Queue (ft)	8
95th Queue (ft)	31
Link Distance (ft)	290
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 2: Jefferson Av. & Driveway 2

Movement	WB	SB
Directions Served	LR	L
Maximum Queue (ft)	56	23
Average Queue (ft)	25	1
95th Queue (ft)	52	12
Link Distance (ft)	349	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		100
Storage Blk Time (%)		
Queuing Penalty (veh)		

Zone Summary

Zone wide Queuing Penalty: 0

Intersection: 1: Jefferson Av. & Driveway 1

Movement	WB
Directions Served	R
Maximum Queue (ft)	31
Average Queue (ft)	5
95th Queue (ft)	23
Link Distance (ft)	290
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 2: Jefferson Av. & Driveway 2

Movement	WB	B9	B9	SB
Directions Served	LR	T	T	L
Maximum Queue (ft)	67	167	165	34
Average Queue (ft)	22	6	6	6
95th Queue (ft)	53	118	117	26
Link Distance (ft)	349	861	861	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				100
Storage Blk Time (%)				
Queuing Penalty (veh)				

Zone Summary

Zone wide Queuing Penalty: 0

APPENDIX 3.1:

EXISTING TRAFFIC COUNTS

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Volume Development
AM Peak Hour

1: Jefferson Av. & Driveway 1

PHF: Count Date: 1/0/1900

	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	TOTAL
Historical (2019):													
2020:	**0**	**362**	**0**	**0**	**793**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1,155**

2: Jefferson Av. & Driveway 2

PHF: Count Date: 1/0/1900

	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	TOTAL
Historical (2019):													
2020:	**0**	**362**	**0**	**0**	**793**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1,155**

3: Jefferson Av. & Murrieta Hot Springs Rd.

PHF: 0.923 **7:30 AM** Count Date: 8/20/2019

	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	TOTAL
Historical (2019):	0	142	239	195	582	0	0	0	0	625	0	213	1,996
2020:	**0**	**145**	**244**	**199**	**594**	**0**	**0**	**0**	**0**	**638**	**0**	**217**	**2,036**

Volume Development
PM Peak Hour

1: Jefferson Av. & Driveway 1

PHF: 0.920 Count Date:

	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	TOTAL
Historical (2019):													
2020:	**0**	**1,247**	**0**	**0**	**498**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1,745**

2: Jefferson Av. & Driveway 2

PHF: 0.920 **4:15 PM** Count Date:

	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	TOTAL
Historical (2019):													
2020:	**0**	**1,247**	**0**	**0**	**498**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1,745**

3: Jefferson Av. & Murrieta Hot Springs Rd.

PHF: 0.940 **4:30 PM** Count Date: 8/20/2019

	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	TOTAL
Historical (2019):	0	1007	963	242	246	0	0	0	0	235	0	216	2,909
2020:	**0**	**1,027**	**982**	**247**	**251**	**0**	**0**	**0**	**0**	**240**	**0**	**220**	**2,967**

National Data & Surveying Services

Intersection Turning Movement Count

Location: Jefferson Ave & Murrieta Hot Springs Rd
City: Murrieta
Control: Signalizd

Project ID: 19-06111-005
Date: 8/20/2019

Total

NS/EW Streets:	Jefferson Ave				Jefferson Ave				Murrieta Hot Springs Rd				Murrieta Hot Springs Rd				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0 NL	2 NT	1 NR	0 NU	2 SL	2 ST	0 SR	0 SU	0 EL	0 ET	0 ER	0 EU	2 WL	0 WT	1 WR	0 WU	TOTAL
7:00 AM	0	33	45	0	29	91	0	0	0	0	0	0	112	0	46	0	356
7:15 AM	0	22	29	0	38	108	0	1	0	0	0	0	147	0	38	0	383
7:30 AM	0	35	63	0	51	148	0	0	0	0	0	0	186	0	58	0	541
7:45 AM	0	19	49	0	33	159	0	1	0	0	0	0	187	0	54	0	502
8:00 AM	0	42	58	0	44	136	0	0	0	0	0	0	135	0	48	0	463
8:15 AM	0	46	69	0	67	139	0	0	0	0	0	0	117	0	53	0	491
8:30 AM	0	49	69	0	69	142	0	0	0	0	0	0	143	0	47	0	519
8:45 AM	0	53	94	0	52	123	0	0	0	0	0	0	129	0	63	0	514
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	299	476	0	383	1046	0	2	0	0	0	0	1156	0	407	0	3769
APPROACH %'s :	0.00%	38.58%	61.42%	0.00%	26.76%	73.10%	0.00%	0.14%					73.96%	0.00%	26.04%	0.00%	
PEAK HR :	07:30 AM - 08:30 AM																TOTAL
PEAK HR VOL :	0	142	239	0	195	582	0	1	0	0	0	0	625	0	213	0	1997
PEAK HR FACTOR :	0.000	0.772	0.866	0.000	0.728	0.915	0.000	0.250	0.000	0.000	0.000	0.000	0.836	0.000	0.918	0.000	0.923
		0.828				0.944								0.859			

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0 NL	2 NT	1 NR	0 NU	2 SL	2 ST	0 SR	0 SU	0 EL	0 ET	0 ER	0 EU	2 WL	0 WT	1 WR	0 WU	TOTAL
4:00 PM	0	242	209	0	76	49	0	2	0	0	0	0	61	0	62	0	701
4:15 PM	0	206	197	0	57	65	0	2	0	0	0	0	79	0	46	0	652
4:30 PM	0	265	241	0	65	76	0	2	0	0	0	0	65	0	60	0	774
4:45 PM	0	212	213	0	56	62	0	0	0	0	0	0	56	0	63	0	662
5:00 PM	0	274	272	0	74	46	0	0	0	0	0	0	56	0	45	0	767
5:15 PM	0	256	237	0	47	62	0	0	0	0	0	0	58	0	48	0	708
5:30 PM	0	292	233	0	55	69	0	0	0	0	0	0	44	0	65	0	758
5:45 PM	0	217	212	0	60	58	0	1	0	0	0	0	49	0	67	0	664
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	1964	1814	0	490	487	0	7	0	0	0	0	468	0	456	0	5686
APPROACH %'s :	0.00%	51.99%	48.01%	0.00%	49.80%	49.49%	0.00%	0.71%					50.65%	0.00%	49.35%	0.00%	
PEAK HR :	04:30 PM - 05:30 PM																TOTAL
PEAK HR VOL :	0	1007	963	0	242	246	0	2	0	0	0	0	235	0	216	0	2911
PEAK HR FACTOR :	0.000	0.919	0.885	0.000	0.818	0.809	0.000	0.250	0.000	0.000	0.000	0.000	0.904	0.000	0.857	0.000	0.940
		0.902				0.857								0.902			

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APPENDIX 3.2:

EXISTING (2020) CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS

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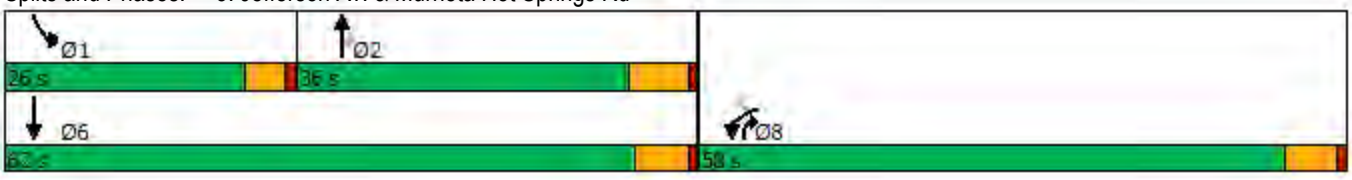
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	638	217	145	244	199	594
Future Volume (vph)	638	217	145	244	199	594
Turn Type	Prot	Perm	NA	pm+ov	Prot	NA
Protected Phases	8		2	8	1	6
Permitted Phases		8		2		
Detector Phase	8	8	2	8	1	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	10.0	5.0	5.0	10.0
Minimum Split (s)	39.8	39.8	31.2	39.8	9.6	39.8
Total Split (s)	58.0	58.0	36.0	58.0	26.0	62.0
Total Split (%)	48.3%	48.3%	30.0%	48.3%	21.7%	51.7%
Yellow Time (s)	4.8	4.8	5.2	4.8	3.6	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.8	5.8	6.2	5.8	4.6	5.8
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Recall Mode	None	None	Max	None	None	Max
Act Effct Green (s)	25.5	25.5	41.2	72.9	10.1	56.4
Actuated g/C Ratio	0.27	0.27	0.44	0.78	0.11	0.60
v/c Ratio	0.74	0.39	0.07	0.21	0.58	0.30
Control Delay	36.1	5.4	17.1	1.0	46.7	10.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.1	5.4	17.1	1.0	46.7	10.2
LOS	D	A	B	A	D	B
Approach Delay	28.3		7.0			19.3
Approach LOS	C		A			B

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 93.5	
Natural Cycle: 85	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.74	
Intersection Signal Delay: 20.7	Intersection LOS: C
Intersection Capacity Utilization 46.0%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 3: Jefferson Av. & Murrieta Hot Springs Rd



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	638	217	145	244	199	594
Future Volume (veh/h)	638	217	145	244	199	594
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	693	236	158	265	216	646
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	861	395	2463	1159	297	2199
Arrive On Green	0.25	0.25	0.48	0.48	0.09	0.62
Sat Flow, veh/h	3456	1585	5274	1585	3456	3647
Grp Volume(v), veh/h	693	236	158	265	216	646
Grp Sat Flow(s),veh/h/ln	1728	1585	1702	1585	1728	1777
Q Serve(g_s), s	17.1	11.9	1.5	4.9	5.5	7.7
Cycle Q Clear(g_c), s	17.1	11.9	1.5	4.9	5.5	7.7
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	861	395	2463	1159	297	2199
V/C Ratio(X)	0.81	0.60	0.06	0.23	0.73	0.29
Avail Cap(c_a), veh/h	1986	911	2463	1159	814	2199
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.0	30.1	12.6	3.9	40.5	8.1
Incr Delay (d2), s/veh	1.8	1.5	0.1	0.5	1.3	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.9	4.4	0.5	3.1	2.3	2.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	33.9	31.5	12.6	4.4	41.8	8.4
LnGrp LOS	C	C	B	A	D	A
Approach Vol, veh/h	929		423			862
Approach Delay, s/veh	33.3		7.5			16.8
Approach LOS	C		A			B

Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	12.4	50.0			62.4	28.4
Change Period (Y+Rc), s	4.6	6.2			* 6.2	5.8
Max Green Setting (Gmax), s	21.4	29.8			* 56	52.2
Max Q Clear Time (g_c+I1), s	7.5	6.9			9.7	19.1
Green Ext Time (p_c), s	0.3	1.7			4.5	3.5

Intersection Summary	
HCM 6th Ctrl Delay	21.9
HCM 6th LOS	C

Notes

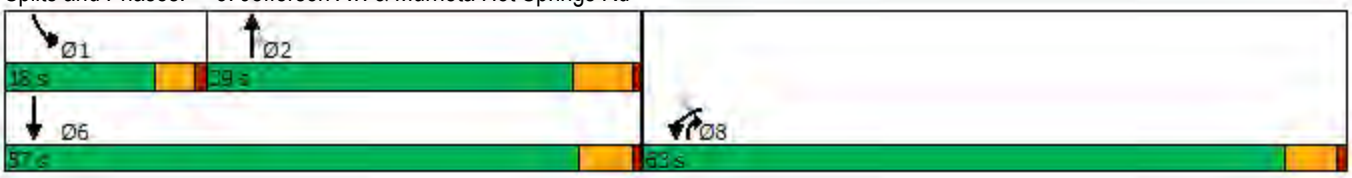
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	240	220	1027	982	247	251
Future Volume (vph)	240	220	1027	982	247	251
Turn Type	Prot	Perm	NA	pm+ov	Prot	NA
Protected Phases	8		2	8	1	6
Permitted Phases		8		2		
Detector Phase	8	8	2	8	1	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	10.0	5.0	5.0	10.0
Minimum Split (s)	39.8	39.8	31.2	39.8	9.6	39.8
Total Split (s)	63.0	63.0	39.0	63.0	18.0	57.0
Total Split (%)	52.5%	52.5%	32.5%	52.5%	15.0%	47.5%
Yellow Time (s)	4.8	4.8	5.2	4.8	3.6	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.8	5.8	6.2	5.8	4.6	5.8
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Recall Mode	None	None	Max	None	None	Max
Act Effct Green (s)	32.5	32.5	36.8	75.8	11.1	53.1
Actuated g/C Ratio	0.33	0.33	0.38	0.78	0.11	0.54
v/c Ratio	0.22	0.34	0.57	0.84	0.67	0.14
Control Delay	21.7	3.7	29.8	14.7	53.5	15.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.7	3.7	29.8	14.7	53.5	15.2
LOS	C	A	C	B	D	B
Approach Delay	13.1		22.4			34.2
Approach LOS	B		C			C

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 97.7
Natural Cycle: 85
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.84
Intersection Signal Delay: 23.0 — Intersection LOS: C
Intersection Capacity Utilization 76.5% — ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 3: Jefferson Av. & Murrieta Hot Springs Rd



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	240	220	1027	982	247	251
Future Volume (veh/h)	240	220	1027	982	247	251
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	255	234	1093	1045	263	267
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	649	298	2535	1085	354	2338
Arrive On Green	0.19	0.19	0.50	0.50	0.10	0.66
Sat Flow, veh/h	3456	1585	5274	1585	3456	3647
Grp Volume(v), veh/h	255	234	1093	1045	263	267
Grp Sat Flow(s),veh/h/ln	1728	1585	1702	1585	1728	1777
Q Serve(g_s), s	5.0	10.9	10.7	38.6	5.8	2.2
Cycle Q Clear(g_c), s	5.0	10.9	10.7	38.6	5.8	2.2
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	649	298	2535	1085	354	2338
V/C Ratio(X)	0.39	0.79	0.43	0.96	0.74	0.11
Avail Cap(c_a), veh/h	2540	1165	2535	1085	595	2338
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.7	30.1	12.6	10.0	33.9	4.9
Incr Delay (d2), s/veh	0.4	4.6	0.5	19.8	1.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	4.2	3.4	24.5	2.3	0.6
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	28.1	34.7	13.1	29.8	35.1	5.0
LnGrp LOS	C	C	B	C	D	A
Approach Vol, veh/h	489		2138			530
Approach Delay, s/veh	31.2		21.3			20.0
Approach LOS	C		C			B

Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	12.6	44.8			57.4	20.4
Change Period (Y+Rc), s	4.6	6.2			* 6.2	5.8
Max Green Setting (Gmax), s	13.4	32.8			* 51	57.2
Max Q Clear Time (g_c+I1), s	7.8	40.6			4.2	12.9
Green Ext Time (p_c), s	0.2	0.0			1.7	1.7

Intersection Summary	
HCM 6th Ctrl Delay	22.6
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

APPENDIX 5.1:

EAP (2023) CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS

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Intersection	
Int Delay, s/veh	0.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	9	390	8	0	845
Future Vol, veh/h	0	9	390	8	0	845
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	10	424	9	0	918

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	217	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-	-
Pot Cap-1 Maneuver	0	787	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	787	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.6	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	787	-
HCM Lane V/C Ratio	-	-	0.012	-
HCM Control Delay (s)	-	-	9.6	-
HCM Lane LOS	-	-	A	-
HCM 95th %tile Q(veh)	-	-	0	-

Intersection	
Int Delay, s/veh	0.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	43	6	392	5	4	841
Future Vol, veh/h	43	6	392	5	4	841
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	100	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	47	7	426	5	4	914

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	894	216	0	0	431	0
Stage 1	429	-	-	-	-	-
Stage 2	465	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	281	789	-	-	1125	-
Stage 1	624	-	-	-	-	-
Stage 2	599	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	280	789	-	-	1125	-
Mov Cap-2 Maneuver	406	-	-	-	-	-
Stage 1	624	-	-	-	-	-
Stage 2	597	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	14.5	0	0
HCM LOS	B		

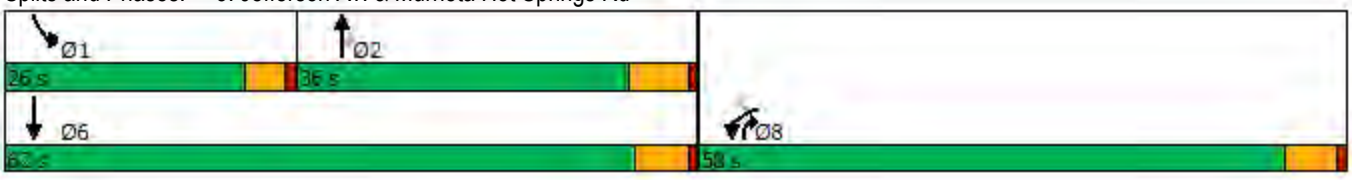
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	432	1125	-
HCM Lane V/C Ratio	-	-	0.123	0.004	-
HCM Control Delay (s)	-	-	14.5	8.2	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.4	0	-

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	677	240	158	259	240	644
Future Volume (vph)	677	240	158	259	240	644
Turn Type	Prot	Perm	NA	pm+ov	Prot	NA
Protected Phases	8		2	8	1	6
Permitted Phases		8		2		
Detector Phase	8	8	2	8	1	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	10.0	5.0	5.0	10.0
Minimum Split (s)	39.8	39.8	31.2	39.8	9.6	39.8
Total Split (s)	58.0	58.0	36.0	58.0	26.0	62.0
Total Split (%)	48.3%	48.3%	30.0%	48.3%	21.7%	51.7%
Yellow Time (s)	4.8	4.8	5.2	4.8	3.6	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.8	5.8	6.2	5.8	4.6	5.8
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Recall Mode	None	None	Max	None	None	Max
Act Effct Green (s)	27.2	27.2	39.9	73.3	11.5	56.4
Actuated g/C Ratio	0.29	0.29	0.42	0.77	0.12	0.59
v/c Ratio	0.75	0.41	0.08	0.22	0.63	0.33
Control Delay	36.0	5.2	18.8	1.9	47.6	11.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.0	5.2	18.8	1.9	47.6	11.2
LOS	D	A	B	A	D	B
Approach Delay	28.0		8.3			21.1
Approach LOS	C		A			C

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 95.2
Natural Cycle: 85
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.75
Intersection Signal Delay: 21.5 — Intersection LOS: C
Intersection Capacity Utilization 48.3% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 3: Jefferson Av. & Murrieta Hot Springs Rd



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	677	240	158	259	240	644
Future Volume (veh/h)	677	240	158	259	240	644
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	736	261	172	282	261	700
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	907	416	2343	1144	342	2160
Arrive On Green	0.26	0.26	0.46	0.46	0.10	0.61
Sat Flow, veh/h	3456	1585	5274	1585	3456	3647
Grp Volume(v), veh/h	736	261	172	282	261	700
Grp Sat Flow(s),veh/h/ln	1728	1585	1702	1585	1728	1777
Q Serve(g_s), s	18.5	13.4	1.7	5.6	6.8	8.9
Cycle Q Clear(g_c), s	18.5	13.4	1.7	5.6	6.8	8.9
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	907	416	2343	1144	342	2160
V/C Ratio(X)	0.81	0.63	0.07	0.25	0.76	0.32
Avail Cap(c_a), veh/h	1951	895	2343	1144	800	2160
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.0	30.1	14.0	4.4	40.6	8.9
Incr Delay (d2), s/veh	1.8	1.6	0.1	0.5	1.3	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.4	5.0	0.6	3.6	2.8	3.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	33.8	31.7	14.1	4.9	41.9	9.3
LnGrp LOS	C	C	B	A	D	A
Approach Vol, veh/h	997		454			961
Approach Delay, s/veh	33.2		8.4			18.1
Approach LOS	C		A			B

Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	13.8	48.6			62.4	30.1
Change Period (Y+Rc), s	4.6	6.2			* 6.2	5.8
Max Green Setting (Gmax), s	21.4	29.8			* 56	52.2
Max Q Clear Time (g_c+I1), s	8.8	7.6			10.9	20.5
Green Ext Time (p_c), s	0.4	1.9			5.0	3.8

Intersection Summary	
HCM 6th Ctrl Delay	22.5
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	5	1327	25	0	542
Future Vol, veh/h	0	5	1327	25	0	542
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	5	1442	27	0	589

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	735	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-	-
Pot Cap-1 Maneuver	0	362	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	362	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	15.1	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	362	-
HCM Lane V/C Ratio	-	-	0.015	-
HCM Control Delay (s)	-	-	15.1	-
HCM Lane LOS	-	-	C	-
HCM 95th %tile Q(veh)	-	-	0	-

Intersection	
Int Delay, s/veh	0.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	25	3	1349	17	14	528
Future Vol, veh/h	25	3	1349	17	14	528
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	100	-
Veh in Median Storage, #	2	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	27	3	1466	18	15	574

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1792	742	0	0	1484	0
Stage 1	1475	-	-	-	-	-
Stage 2	317	-	-	-	-	-
Critical Hdwy	6.5	6.5	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	85	392	-	-	449	-
Stage 1	177	-	-	-	-	-
Stage 2	711	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	82	392	-	-	449	-
Mov Cap-2 Maneuver	166	-	-	-	-	-
Stage 1	177	-	-	-	-	-
Stage 2	688	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	29.5	0	0.3
HCM LOS	D		

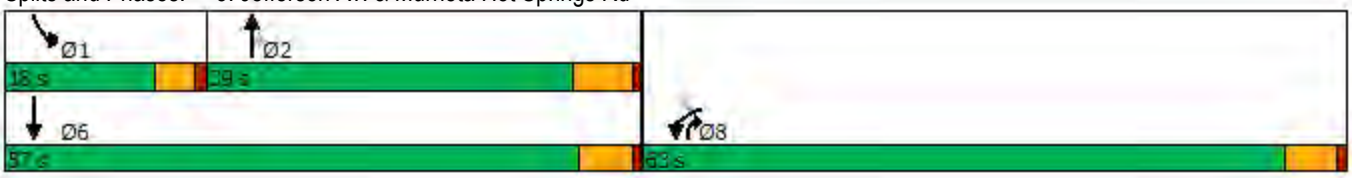
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	177	449	-
HCM Lane V/C Ratio	-	-	0.172	0.034	-
HCM Control Delay (s)	-	-	29.5	13.3	-
HCM Lane LOS	-	-	D	B	-
HCM 95th %tile Q(veh)	-	-	0.6	0.1	-

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	254	262	1104	1042	279	274
Future Volume (vph)	254	262	1104	1042	279	274
Turn Type	Prot	Perm	NA	pm+ov	Prot	NA
Protected Phases	8		2	8	1	6
Permitted Phases		8		2		
Detector Phase	8	8	2	8	1	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	10.0	5.0	5.0	10.0
Minimum Split (s)	39.8	39.8	31.2	39.8	9.6	39.8
Total Split (s)	63.0	63.0	39.0	63.0	18.0	57.0
Total Split (%)	52.5%	52.5%	32.5%	52.5%	15.0%	47.5%
Yellow Time (s)	4.8	4.8	5.2	4.8	3.6	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.8	5.8	6.2	5.8	4.6	5.8
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Recall Mode	None	None	Max	None	None	Max
Act Effct Green (s)	41.2	41.2	35.4	82.9	12.1	52.6
Actuated g/C Ratio	0.39	0.39	0.33	0.78	0.11	0.50
v/c Ratio	0.20	0.35	0.69	0.89	0.76	0.17
Control Delay	20.1	3.4	36.4	18.7	60.8	18.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.1	3.4	36.4	18.7	60.8	18.1
LOS	C	A	D	B	E	B
Approach Delay	11.6		27.8			39.7
Approach LOS	B		C			D

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 105.7
Natural Cycle: 85
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.89
Intersection Signal Delay: 27.2 — Intersection LOS: C
Intersection Capacity Utilization 81.1% — ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 3: Jefferson Av. & Murrieta Hot Springs Rd



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	254	262	1104	1042	279	274
Future Volume (veh/h)	254	262	1104	1042	279	274
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	270	279	1174	1109	297	291
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	746	342	2384	1082	385	2257
Arrive On Green	0.22	0.22	0.47	0.47	0.11	0.64
Sat Flow, veh/h	3456	1585	5274	1585	3456	3647
Grp Volume(v), veh/h	270	279	1174	1109	297	291
Grp Sat Flow(s),veh/h/ln	1728	1585	1702	1585	1728	1777
Q Serve(g_s), s	5.4	13.5	12.8	37.6	6.7	2.6
Cycle Q Clear(g_c), s	5.4	13.5	12.8	37.6	6.7	2.6
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	746	342	2384	1082	385	2257
V/C Ratio(X)	0.36	0.82	0.49	1.02	0.77	0.13
Avail Cap(c_a), veh/h	2452	1125	2384	1082	574	2257
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.9	30.1	14.9	10.0	34.8	5.8
Incr Delay (d2), s/veh	0.3	4.7	0.7	33.8	1.7	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	5.2	4.3	30.2	2.7	0.8
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	27.2	34.8	15.6	43.8	36.6	6.0
LnGrp LOS	C	C	B	F	D	A
Approach Vol, veh/h	549		2283			588
Approach Delay, s/veh	31.1		29.3			21.4
Approach LOS	C		C			C

Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	13.6	43.8			57.4	23.2
Change Period (Y+Rc), s	4.6	6.2			* 6.2	5.8
Max Green Setting (Gmax), s	13.4	32.8			* 51	57.2
Max Q Clear Time (g_c+I1), s	8.7	39.6			4.6	15.5
Green Ext Time (p_c), s	0.2	0.0			1.8	1.9

Intersection Summary	
HCM 6th Ctrl Delay	28.2
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

APPENDIX 5.2:

EAP (2023) CONDITIONS TRAFFIC SIGNAL WARRANT ANALYSIS WORKSHEETS

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Figure 4C-103 (CA). Traffic Signal Warrants Worksheet
(Average Traffic Estimate Form)

DIST	CO	RTE	PM	TRAFFIC CONDITIONS	EAP
				CALC CM	DATE 04/30/20
Jurisdiction: **City of Murrieta**				CHK CH	DATE 04/30/20
Major Street: **Jefferson Avenue**				Critical Approach Speed (Major)	45 mph
Minor Street: **Driveway 2**				Critical Approach Speed (Minor)	25 mph

Major Street Approach Lanes = **2** lane Minor Street Approach Lanes = **1** lane

Major Street Future ADT = **22,017** vpd Minor Street Future ADT = **411** vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph); …….. √

or

In built up area of isolated community of < 10,000 population ……..

RURAL (R)

(Based on Estimated Average Daily Traffic - See Note)

URBAN / RURAL	Minimum Requirements EADT			
CONDITION A - Minimum Vehicular Volume	Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied / Not Satisfied: XX / XX	Urban	Rural	Urban	Rural
Number of lanes for moving traffic on each approach: Major Street / Minor Street				
1 / *1*	8,000	5,600	2,400	1,680
2 + **22,017** / *1* **411**	9,600	6,720 *	2,400	1,680
2 + / *2* +	9,600	6,720	3,200	2,240
1 / *2* +	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic	Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied / Not Satisfied: XX	Urban	Rural	Urban	Rural
Number of lanes for moving traffic on each approach: Major Street / Minor Street				
1 / *1*	12,000	8,400	1,200	850
2 + **22,017** / *1* **411**	14,400	10,080 *	1,200	850
2 + / *2* +	14,400	10,080	1,600	1,120
1 / *2* +	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B				
Satisfied / Not Satisfied: XX	2 CONDITIONS 80%		2 CONDITIONS 80%	
No one condition satisfied, but following conditions fulfilled 80% of more ….. A: 24% / B: 48%				

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

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APPENDIX 6.1:

EAPC (2023) CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS

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Intersection	
Int Delay, s/veh	0.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	9	423	8	0	879
Future Vol, veh/h	0	9	423	8	0	879
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	10	460	9	0	955

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	235	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-	-
Pot Cap-1 Maneuver	0	767	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	767	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.8	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	767	-
HCM Lane V/C Ratio	-	-	0.013	-
HCM Control Delay (s)	-	-	9.8	-
HCM Lane LOS	-	-	A	-
HCM 95th %tile Q(veh)	-	-	0	-

Intersection	
Int Delay, s/veh	0.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	43	6	425	5	4	875
Future Vol, veh/h	43	6	425	5	4	875
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	100	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	47	7	462	5	4	951

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	949	234	0	0	467	0
Stage 1	465	-	-	-	-	-
Stage 2	484	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	259	768	-	-	1091	-
Stage 1	599	-	-	-	-	-
Stage 2	585	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	258	768	-	-	1091	-
Mov Cap-2 Maneuver	387	-	-	-	-	-
Stage 1	599	-	-	-	-	-
Stage 2	583	-	-	-	-	-

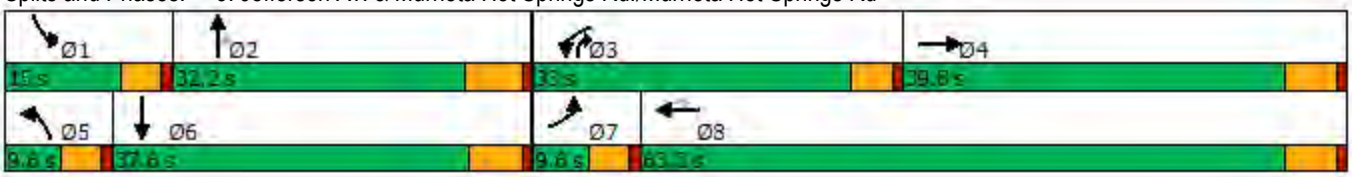
Approach	WB	NB	SB
HCM Control Delay, s	15	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	412	1091	-
HCM Lane V/C Ratio	-	-	0.129	0.004	-
HCM Control Delay (s)	-	-	15	8.3	-
HCM Lane LOS	-	-	C	A	-
HCM 95th %tile Q(veh)	-	-	0.4	0	-

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	9	31	726	54	240	24	182	282	240	678
Future Volume (vph)	9	31	726	54	240	24	182	282	240	678
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA
Protected Phases	7	4	3	8		5	2	3	1	6
Permitted Phases					8			2		
Detector Phase	7	4	3	8	8	5	2	3	1	6
Switch Phase										
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	5.0	10.0	5.0	5.0	10.0
Minimum Split (s)	9.6	39.8	9.6	39.8	39.8	9.6	31.2	9.6	9.6	30.8
Total Split (s)	9.6	39.8	33.0	63.2	63.2	9.6	32.2	33.0	15.0	37.6
Total Split (%)	8.0%	33.2%	27.5%	52.7%	52.7%	8.0%	26.8%	27.5%	12.5%	31.3%
Yellow Time (s)	3.6	4.8	3.6	4.8	4.8	3.6	5.2	3.6	3.6	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.8	4.6	5.8	5.8	4.6	6.2	4.6	4.6	5.8
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	None	None	Max
Act Effct Green (s)	5.2	14.0	26.1	35.5	35.5	5.2	27.0	59.5	10.4	39.3
Actuated g/C Ratio	0.06	0.15	0.29	0.39	0.39	0.06	0.30	0.65	0.11	0.43
v/c Ratio	0.10	0.12	0.81	0.08	0.34	0.26	0.13	0.27	0.67	0.49
Control Delay	52.0	36.3	39.8	16.7	3.4	55.5	28.2	2.2	51.6	25.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.0	36.3	39.8	16.7	3.4	55.5	28.2	2.2	51.6	25.4
LOS	D	D	D	B	A	E	C	A	D	C
Approach Delay		39.9		30.0			14.5			32.3
Approach LOS		D		C			B			C

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 91.5	
Natural Cycle: 115	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.81	
Intersection Signal Delay: 27.9	Intersection LOS: C
Intersection Capacity Utilization 63.8%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 3: Jefferson Av. & Murrieta Hot Springs Rd./Murrieta Hot Springs Rd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	31	0	726	54	240	24	182	282	240	678	0
Future Volume (veh/h)	9	31	0	726	54	240	24	182	282	240	678	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	10	34	0	789	59	261	26	198	307	261	737	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	22	212	0	882	666	564	48	1503	871	336	1297	0
Arrive On Green	0.01	0.11	0.00	0.26	0.36	0.36	0.03	0.29	0.29	0.10	0.36	0.00
Sat Flow, veh/h	1781	1870	0	3456	1870	1585	1781	5106	1585	3456	3647	0
Grp Volume(v), veh/h	10	34	0	789	59	261	26	198	307	261	737	0
Grp Sat Flow(s),veh/h/ln	1781	1870	0	1728	1870	1585	1781	1702	1585	1728	1777	0
Q Serve(g_s), s	0.5	1.5	0.0	19.5	1.9	11.2	1.3	2.5	9.6	6.5	14.7	0.0
Cycle Q Clear(g_c), s	0.5	1.5	0.0	19.5	1.9	11.2	1.3	2.5	9.6	6.5	14.7	0.0
Prop In Lane	1.00		0.00	1.00		1.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	22	212	0	882	666	564	48	1503	871	336	1297	0
V/C Ratio(X)	0.46	0.16	0.00	0.89	0.09	0.46	0.55	0.13	0.35	0.78	0.57	0.00
Avail Cap(c_a), veh/h	101	720	0	1111	1215	1030	101	1503	871	407	1297	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	43.3	35.4	0.0	31.7	18.9	21.9	42.5	22.9	11.1	38.9	22.5	0.0
Incr Delay (d2), s/veh	5.4	0.4	0.0	7.0	0.1	0.6	3.6	0.2	1.1	6.0	1.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.7	0.0	8.4	0.8	3.9	0.6	1.0	3.1	2.9	5.9	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	48.7	35.7	0.0	38.8	19.0	22.5	46.1	23.1	12.2	44.9	24.3	0.0
LnGrp LOS	D	D	A	D	B	C	D	C	B	D	C	A
Approach Vol, veh/h		44			1109			531			998	
Approach Delay, s/veh		38.7			33.9			17.9			29.7	
Approach LOS		D			C			B			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.2	32.2	27.2	15.8	7.0	38.4	5.7	37.3
Change Period (Y+Rc), s	4.6	6.2	4.6	5.8	4.6	* 6.2	4.6	5.8
Max Green Setting (Gmax), s	10.4	26.0	28.4	34.0	5.0	* 32	5.0	57.4
Max Q Clear Time (g_c+I1), s	8.5	11.6	21.5	3.5	3.3	16.7	2.5	13.2
Green Ext Time (p_c), s	0.1	1.9	1.1	0.1	0.0	4.1	0.0	1.2

Intersection Summary	
HCM 6th Ctrl Delay	29.2
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	5	1363	25	0	580
Future Vol, veh/h	0	5	1363	25	0	580
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	5	1482	27	0	630

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	755	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-	-
Pot Cap-1 Maneuver	0	351	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	351	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	15.4	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	351	-
HCM Lane V/C Ratio	-	-	0.015	-
HCM Control Delay (s)	-	-	15.4	-
HCM Lane LOS	-	-	C	-
HCM 95th %tile Q(veh)	-	-	0	-

Intersection	
Int Delay, s/veh	0.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	25	3	1385	17	14	566
Future Vol, veh/h	25	3	1385	17	14	566
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	100	-
Veh in Median Storage, #	2	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	27	3	1505	18	15	615

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1852	762	0	0	1523	0
Stage 1	1514	-	-	-	-	-
Stage 2	338	-	-	-	-	-
Critical Hdwy	6.5	6.5	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	78	381	-	-	434	-
Stage 1	168	-	-	-	-	-
Stage 2	694	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	75	381	-	-	434	-
Mov Cap-2 Maneuver	158	-	-	-	-	-
Stage 1	168	-	-	-	-	-
Stage 2	670	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	30.9	0	0.3
HCM LOS	D		

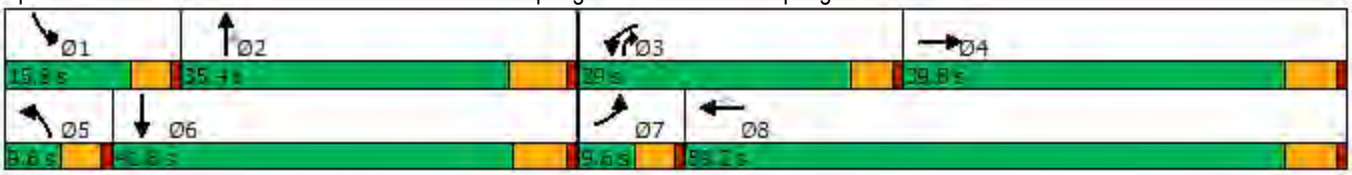
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	169	434	-
HCM Lane V/C Ratio	-	-	0.18	0.035	-
HCM Control Delay (s)	-	-	30.9	13.6	-
HCM Lane LOS	-	-	D	B	-
HCM 95th %tile Q(veh)	-	-	0.6	0.1	-

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	10	71	299	21	262	26	1130	1069	279	312
Future Volume (vph)	10	71	299	21	262	26	1130	1069	279	312
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA
Protected Phases	7	4	3	8		5	2	3	1	6
Permitted Phases					8			2		
Detector Phase	7	4	3	8	8	5	2	3	1	6
Switch Phase										
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	5.0	10.0	5.0	5.0	10.0
Minimum Split (s)	9.6	39.8	9.6	39.8	39.8	9.6	31.2	9.6	9.6	30.8
Total Split (s)	9.6	39.8	29.0	59.2	59.2	9.6	35.4	29.0	15.8	41.6
Total Split (%)	8.0%	33.2%	24.2%	49.3%	49.3%	8.0%	29.5%	24.2%	13.2%	34.7%
Yellow Time (s)	3.6	4.8	3.6	4.8	4.8	3.6	5.2	3.6	3.6	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.8	4.6	5.8	5.8	4.6	6.2	4.6	4.6	5.8
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	None	None	Max

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 97.6
Natural Cycle: 105
Control Type: Actuated-Uncoordinated

Splits and Phases: 3: Jefferson Av. & Murrieta Hot Springs Rd./Murrieta Hot Springs Rd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	71	0	299	21	262	26	1130	1069	279	312	0
Future Volume (veh/h)	10	71	0	299	21	262	26	1130	1069	279	312	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	11	77	0	318	23	279	28	1202	924	297	332	0
Peak Hour Factor	0.92	0.92	0.92	0.94	0.92	0.94	0.92	0.94	0.94	0.94	0.94	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	24	237	0	417	438	371	52	1902	782	383	1614	0
Arrive On Green	0.01	0.13	0.00	0.12	0.23	0.23	0.03	0.37	0.37	0.11	0.45	0.00
Sat Flow, veh/h	1781	1870	0	3456	1870	1585	1781	5106	1585	3456	3647	0
Grp Volume(v), veh/h	11	77	0	318	23	279	28	1202	924	297	332	0
Grp Sat Flow(s),veh/h/ln	1781	1870	0	1728	1870	1585	1781	1702	1585	1728	1777	0
Q Serve(g_s), s	0.5	3.0	0.0	7.0	0.8	12.9	1.2	15.2	29.4	6.6	4.4	0.0
Cycle Q Clear(g_c), s	0.5	3.0	0.0	7.0	0.8	12.9	1.2	15.2	29.4	6.6	4.4	0.0
Prop In Lane	1.00		0.00	1.00		1.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	24	237	0	417	438	371	52	1902	782	383	1614	0
V/C Ratio(X)	0.45	0.32	0.00	0.76	0.05	0.75	0.54	0.63	1.18	0.78	0.21	0.00
Avail Cap(c_a), veh/h	113	807	0	1070	1267	1074	113	1902	782	491	1614	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	38.6	31.3	0.0	33.5	23.4	28.1	37.7	20.3	20.0	34.1	12.9	0.0
Incr Delay (d2), s/veh	4.9	0.8	0.0	1.1	0.0	3.1	3.2	1.6	94.7	4.3	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	1.3	0.0	2.8	0.3	4.8	0.5	5.5	32.2	2.8	1.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.5	32.1	0.0	34.6	23.5	31.1	41.0	21.9	114.7	38.3	13.2	0.0
LnGrp LOS	D	C	A	C	C	C	D	C	F	D	B	A
Approach Vol, veh/h		88			620			2154			629	
Approach Delay, s/veh		33.5			32.7			61.9			25.1	
Approach LOS		C			C			E			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.3	35.6	14.1	15.8	6.9	42.0	5.7	24.2
Change Period (Y+Rc), s	4.6	6.2	4.6	5.8	4.6	* 6.2	4.6	5.8
Max Green Setting (Gmax), s	11.2	29.2	24.4	34.0	5.0	* 36	5.0	53.4
Max Q Clear Time (g_c+I1), s	8.6	31.4	9.0	5.0	3.2	6.4	2.5	14.9
Green Ext Time (p_c), s	0.2	0.0	0.5	0.3	0.0	2.0	0.0	1.0

Intersection Summary	
HCM 6th Ctrl Delay	49.4
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

APPENDIX 6.2:

EAPC (2023) CONDITIONS TRAFFIC SIGNAL WARRANT ANALYSIS WORKSHEETS

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Figure 4C-103 (CA). Traffic Signal Warrants Worksheet
(Average Traffic Estimate Form)

DIST	CO	RTE	PM	TRAFFIC CONDITIONS	EAPC
				CALC CM	DATE 04/30/20
Jurisdiction: City of Murrieta				CHK CH	DATE 04/30/20
Major Street: Jefferson Avenue				Critical Approach Speed (Major)	45 mph
Minor Street: Driveway 2				Critical Approach Speed (Minor)	25 mph

Major Street Approach Lanes = **2** lane Minor Street Approach Lanes = **1** lane

Major Street Future ADT = **23,095** vpd Minor Street Future ADT = **411** vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph); …….. √

or

In built up area of isolated community of < 10,000 population ……..

RURAL (R)

(Based on Estimated Average Daily Traffic - See Note)

URBAN	RURAL	Minimum Requirements EADT			
	XX				
CONDITION A - Minimum Vehicular Volume		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied	Urban	Rural	Urban	Rural
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street				
1	*1*	8,000	5,600	2,400	1,680
2 + **23,095**	*1* **411**	9,600	6,720 *	2,400	1,680
2 +	*2* +	9,600	6,720	3,200	2,240
1	*2* +	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied	Urban	Rural	Urban	Rural
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street				
1	*1*	12,000	8,400	1,200	850
2 + **23,095**	*1* **411**	14,400	10,080 *	1,200	850
2 +	*2* +	14,400	10,080	1,600	1,120
1	*2* +	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B					
Satisfied	Not Satisfied				
	XX				
No one condition satisfied, but following conditions fulfilled 80% of more …..	**A** 24% **B** 48%	2 CONDITIONS 80%		2 CONDITIONS 80%	

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

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