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TENTATIVE TRACT MAP NO. 20280

VICTORVILLE, CALIFORNIA

Prepared by:

DAVID EVANS AND ASSOCIATES INC.

REPORT
February 26, 2020

DAVID EVANS
AND ASSOCIATES INC.

February 26, 2020 Job No. LANSVV88-0001

Mr. Casey Malone
Victorville 88 Estate Partners, LLC
12671 High Bluff Dr. #150
San Diego, CA 92130

RE: TRAFFIC IMPACT ANALYSIS – TENTATIVE TRACT MAP NO. 20280 – VICTORVILLE, CALIFORNIA

Dear Mr. Malone,

David Evans and Associates, Inc. is pleased to submit this Traffic Impact Analysis report for your proposed commercial development project in the City of Victorville for the proposed Tentative Tract Map No. 20280. The proposed project is to be constructed on an approximate 20.6 acre lot, consisting of 74 unit Single-Family Detached Housing. The project is located on the southeast corner of Hopland Street and Cahuenga Road in the City of Victorville, California.

The report examines the traffic impacts specifically for the project and presents recommended traffic improvements. The report also evaluates the impacts of overall growth within the area to assure that cumulative traffic mitigations can be addressed. The report has been prepared in coordination with the City of Victorville Engineering Department requirements and scope of work approved prior to this report.

We are pleased to have been of assistance to you in processing and obtaining approval for the project. If you have any questions or comments, please feel free to contact me at 909-912-7304.

Respectfully submitted,

David Evans and Associates, Inc.

James M. Daisa, P.E.
Senior Project Manager

DAVID EVANS AND ASSOCIATES INC.

TABLE OF CONTENTS

TABLE OF FIGURES

DAVID EVANS AND ASSOCIATES INC.

TABLE OF TABLES

DAVID EVANS AND ASSOCIATES INC.

1 EXECUTIVE SUMMARY

This Executive Summary presents a concise summary of Section 9 of this report which describes the required mitigation measures and recommendations for project-specific improvements that may be integrated into the project's Conditions of Approval. Section 9 of this report provides figures that visually portray the improvements described below.

1.1 Required Mitigation Measures and Other Recommended Improvements

This section summarizes any required measures to mitigate significant impacts identified in the traffic analysis and recommendations for project-specific improvements that may be integrated into the project's Conditions of Approval.

1.2 Required Mitigation Measures

1. **Off-Site Mitigation Measures**. The project does not cause any significant traffic impact under the existing, background (cumulative), or Future (2031) scenarios. **No off-site mitigation measures are required.**
2. **Traffic Control at Hopland Street and Cahuenga Road**. Traffic signal warrants (1, 2 and 5) from the California Manual on Uniform Traffic Control Devices were not met under any scenario with or without the project. Neither were the warrants met for multi-way stop control. Therefore, the intersection of Hopland Street and Cahuenga Road will remain a side-street stop-controlled intersection with Hopland Street being the major uncontrolled street. **No change in intersection traffic control is required.**

1.3 Other Recommended Improvements

1. **Frontage Improvements on Cahuenga Road.** The project will be conditioned to improve its frontage with Cahuenga Road. Within the right-of-way the following improvements are recommended:
    a. Dedicate the necessary property to provide a 67-foot right-of-way (from back of sidewalk to back of sidewalk plus required utility easements behind the sidewalks that are not included in the width).
    b. Within this right-of-way construct the east side of Cahuenga Road (about 1,800 feet in length) with a mid-block cross-section comprised of a 47-foot traveled way (face of curb to face of curb) with a 17.5-foot wide northbound travel lane, a 12-foot continuous two-way turn lane, a 14.5-foot wide southbound travel lane, an 18-inch wide gutter and 6-inch curb, and a 10-foot wide sidewalk on the east side of the street.
    c. Construct intersection corners and curb returns, ADA ramps, drainage facilities, safety lighting, and crosswalks at:
        i. Southeast corner of Hopland Street and Cahuenga Road, including restriping of the school crosswalks on the north side of Hopland Street, the south side of Hopland Street, and on the west side of Cahuenga Street.
        ii. Northeast and southeast corners of Cahuenga Road and Gloria Lane including a school crosswalk across Gloria Lane on the east side of Cahuenga Road.
        iii. Northeast corner of Cahuenga Road and Tawny Ridge Lane.

   d. On Cahuenga Road approaching Hopland Street, construct a northbound right-turn bay 115-feet in length from the southeast corner curb return and taper the right turn bay curbing to align with the new Cahuenga Road curbing using a 50-foot long a 50-foot long transition.

3. **Striping Improvements on Cahuenga Road's Approach to Hopland Street.** Provide the following lane delineation for the northbound approach:

   a. A left turn lane, a through lane, and a right turn lane all approximately 115-feet in length.

   b. A 12-foot wide Continuous Left-Turn Lane (CTWLTL) extending south from the northbound left turn lane described above to terminate north of Gloria Lane where it serves as a left-turn lane into Gloria Lane.

4. Continue the CTWLTL south of Gloria Lane and immediately taper the lane to the centerline terminating approximately 790-feet north of Tawny Ridge Lane.

5. **Frontage Improvements on Hopland Street.** The project will be conditioned to improve its frontage on Hopland Street. Within the right-of-way the following improvements are recommended:

   a. Construct sidewalk, curb and gutter on**:**

      i. Hopland Street from Cahuenga Road to current terminus of existing sidewalk approximately 130-feet east of Cahuenga Road. These improvements are shown in *Figure 2* (Site Plan) in Section 2 of this report.

6. **Frontage Improvements on Tawny Ridge Lane.** The project will be conditioned to improve its frontage on Tawny Ridge Lane. Within the right-of-way the following improvements are recommended:

   a. Construct curb, gutter and sidewalk on Tawny Ridge Lane from Cahuenga Road to end of project property, approximately 300-feet in length.

   b. Construct a westbound right turn lane approximately 130-feet in length with a 50-foot long transition.

7. **Install a Rectangular Rapid Flashing Beacon (RRFB) at the School Crosswalk on Hopland St west of Cahuenga Road.** An RRFB is an approved traffic control device that significantly increases driver yielding behavior at uncontrolled crossings when supplementing standard pedestrian crossing warning signs and markings. This device is being recommended because the project adds traffic to the school crossing during school peak and off-peak times when crossing guards are not present and creates conflicts with pedestrians, many who are children. An RFBB can be designed to be triggered manually or automatically when pedestrians are detected. RRFBs typically receive power by standalone solar panel units but may also be wired to a traditional power source.

8. Install road closure barricades at the southern terminus of Cahuenga Rd, south of Tawney Ridge Ln.

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2 INTRODUCTION

This report identifies traffic impacts and recommends traffic mitigation for the proposed development project located on the southeast corner of Hopland Street and Cahuenga Road. The project identified as Tentative Tract Map No. 20280, consists of 74 single family detached housing units, located in the City of Victorville.

Figure 1 illustrates the vicinity map, and Figure 2 illustrates the proposed project site plan.

The intent of this report is to evaluate potentially significant traffic impacts caused by the proposed development in accordance with the City of Victorville's traffic impact study requirements and under the following scenarios as outlined in the traffic scope approved by the City's Department of Public Works:

- Existing Conditions
- Existing plus Project Conditions
- Background (Cumulative) Conditions (Year 2021)
- Background plus Project Conditions (Year 2021)
- Future Conditions (Year 2031)
- Future plus Project Conditions (Year 2031)

2.1 Scenario Definitions

Existing Conditions. This scenario represents existing transportation conditions at the time this report was prepared. Data includes traffic counts collected in January 2020 and current roadway and intersection geometries. This scenario is used as the baseline condition from which to measure project-specific impacts.

Existing Plus Project Conditions. This scenario represents transportation conditions as if the project were built and occupied today. This scenario is intended to identify potentially significant impact (requiring mitigation) when compared to existing conditions without any unrelated transportation system improvements or other development. Impacts identified in this scenario are considered "project-specific" impacts—impacts that are the sole responsibility of the project to mitigate.

Background (Cumulative) Conditions (Year 2021). This scenario represents conditions at the time the project is anticipated to be fully constructed and occupied (known as buildout which is the year 2010 for this project) but without traffic generated by the project. This scenario is comprised of two components of cumulative traffic growth:

1) Ambient growth—a general rate of growth in traffic from overall regional growth but not specific to any nearby development (assumed to be 3% annually for this study).
2) Traffic generated by other nearby development that is planned and/or approved for construction in the very near future, but not yet built.

Project Conditions (Year 2021). This scenario adds the project's estimated traffic generation at buildout (2021) to the Background (Cumulative) Conditions scenario described above. Impacts identified in this near-term scenario are considered "cumulative" impacts—impacts that the project contributes to, but does not solely cause, and may be responsible for a fair-share of the cost to implement any mitigation measures.

Future Conditions (Year 2031). This long-term scenario addresses impacts due to overall regional ambient growth in traffic (assumed to be 3% annually for this study). This scenario may represent a long-range planning horizon that typically coincides with buildout of the City's General Plan or other long-term period in order to identify the need for major transportation facility improvements.

Future Plus Project Conditions (Year 2031). This scenario adds the project's estimated traffic generation to the Future Conditions scenario described above. Impacts identified in this long-rang scenario are those that the project contributes to, but does not solely cause, are cumulative by definition and the project may be responsible for a fair-share of the cost to implement any mitigation measures.

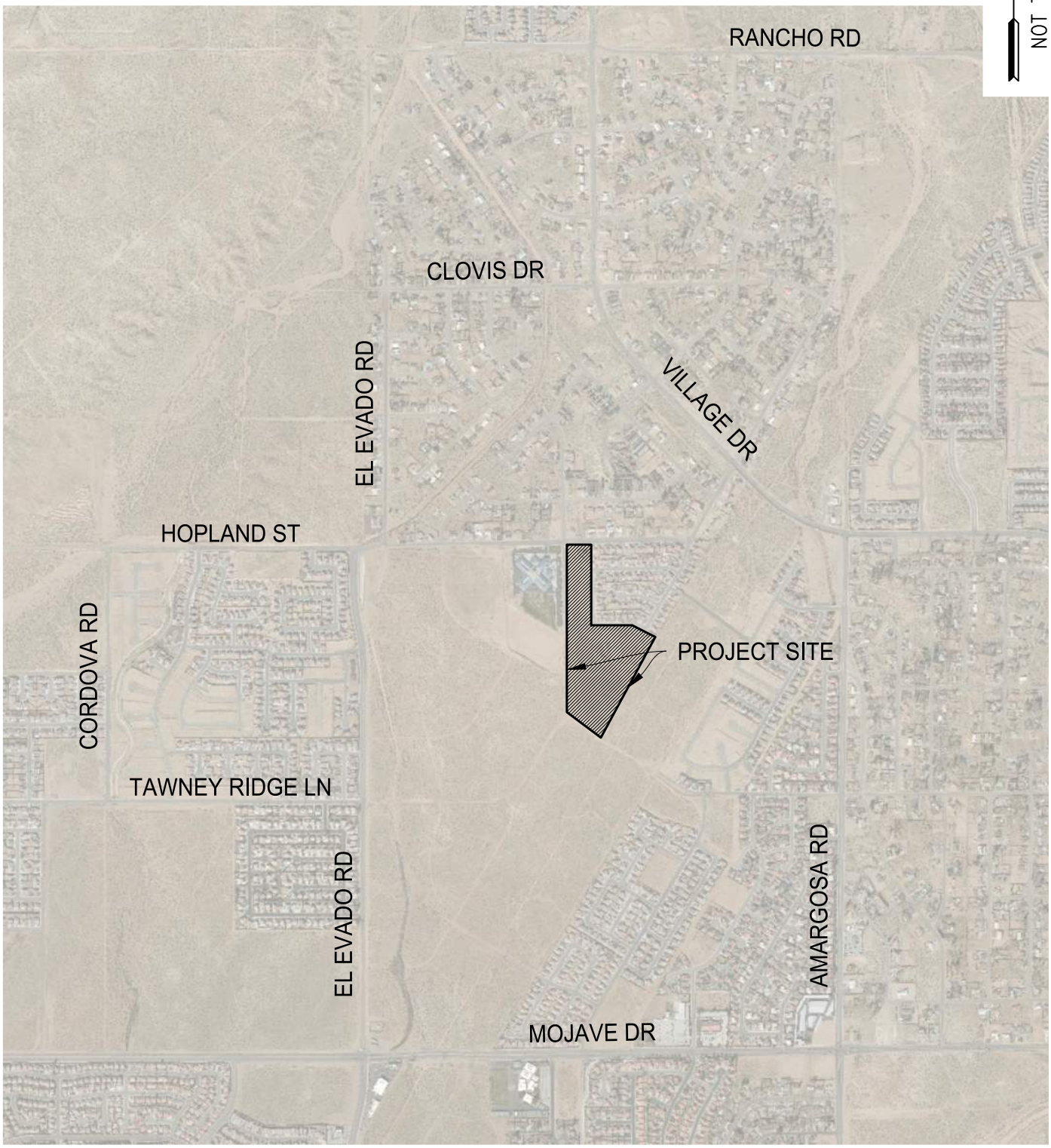

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FIGURE 1: VICINITY MAP
TENTATIVE TRACT MAP NO. 20280
VICTORVILLE, CALIFORNIA

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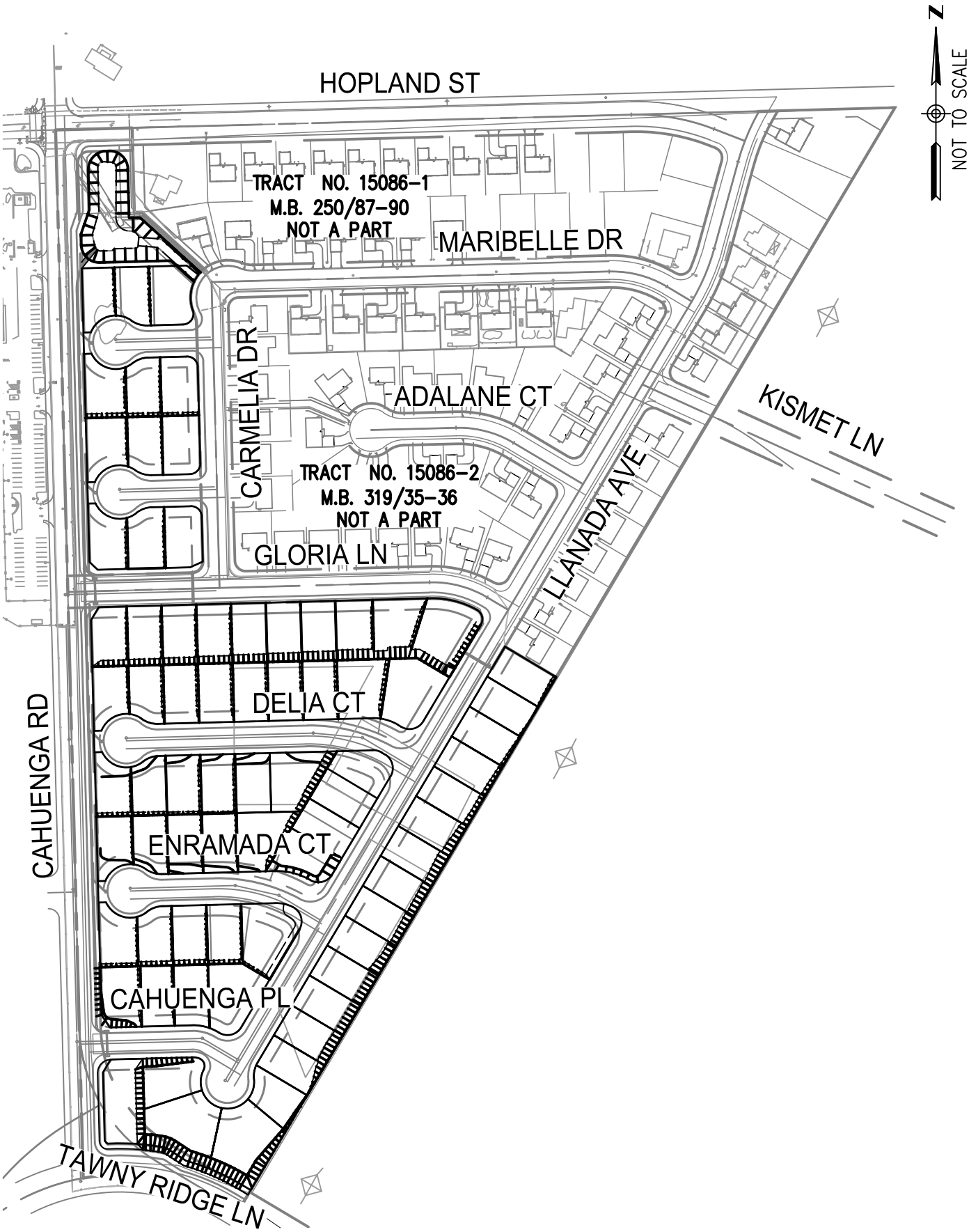

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FIGURE 2: SITE PLAN
TENTATIVE TRACT MAP NO. 20280
VICTORVILLE, CALIFORNIA

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3 EXISTING CONDITIONS

The project site is currently vacant and undeveloped property. It is bounded to the north by Hopland Street and Gloria Lane, to the west by Cahuenga Road and Challenger Elementary School, to the south by undeveloped land, and to the east by Llanada Avenue and undeveloped land.

3.1 Existing Street System

All Streets fronting the project property are paved. The roads range in pavement width between 30 to 40 feet and the pavement of each street is in good to fair condition.

The following roadways provide local and regional access to the project within the study area:

Cahuenga Road is identified as a collector street on the City of Victorville circulation map. Is a north-south two-lane road (one in each direction) in the project study area. Cahuenga Road provides direct access to the project site.

Hopland Street is identified as a collector street on the City of Victorville circulation map. It is an east-west two-lane road (one in each direction, with turn pockets at key intersections) in the project area study area.

El Evado Road is identified as a major arterial on the City of Victorville circulation map. It is a north-south five-lane road (two lanes in each direction, with a two-way-left-turn lane, and turn pockets at key intersections) in the project study area.

3.2 Site Access and Study Intersections

Access to the project site is from Gloria Lane, Delia Court, Enramada Court, Cahuenga Road and Llanada Avenue.

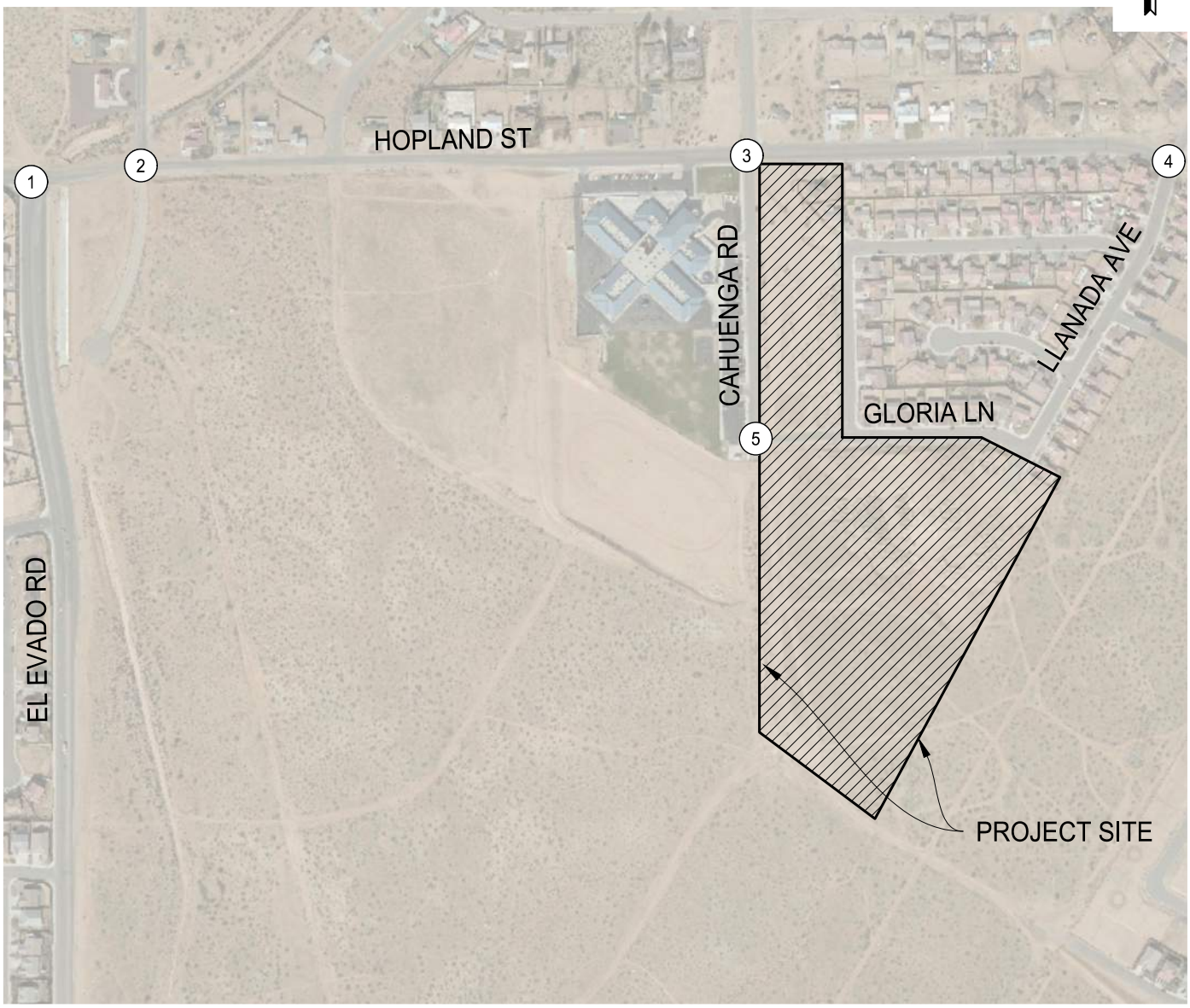
The project study area includes four existing intersections and one future intersection. The intersections are:

1. Hopland Street and S. El Evado Road
2. Hopland Street and N. El Evado Road
3. Hopland Street and Cahuenga Road[1]
4. Hopland Street and Llanada Avenue
5. Cahuenga Road and Gloria Lane (future intersection)

3.3 Existing Traffic Volumes

Figure 3 illustrates the existing peak hour traffic volumes in the study area. Turn movement counts were conducted in January 2020 by Newport Traffic Studies, an independent traffic data collection company. These counts were collected during the AM (7:00-9:00 AM) and PM (4:00-6:00 PM) peak periods. The raw turning movement counts are included in *Appendix A* of this study.

1 The intersection of Hopland Street and Cahuenga Road is the junction of two collector streets and has two school crosswalks. Because of the importance this intersection as a multimodal connection between neighborhoods and the school, this study includes a traffic signal warrant analysis conforming to the requirements of the California MUTCD.



LEGEND

XX/XX - AM/PM PROJECT TRIP

(#) - STUDY INTERSECTIONS

- SIGNALIZED INTERSECTION

- STOP CONTROLLED APPROACH

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FIGURE 3: EXISTING CONDITION TRAFFIC VOLUMES TENTATIVE TRACT MAP NO. 20280 VICTORVILLE, CALIFORNIA

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3.4 Capacity Analysis Methodology

Intersection capacity analyses were conducted using Synchro software[2], which implements the methods of the Highway Capacity Manual, 6th Edition (HCM 6)[3] used in this report. The intersection capacity analyses utilize existing intersection geometrics and existing and forecasted traffic volumes in analyzing AM and PM peak hour intersection operating conditions. The traffic analysis methodology concepts presented in Chapter 20 of the Highway Capacity Manual (HCM 6) were utilized to calculate intersection Level of Service (LOS) based on the average control delay (in seconds per vehicle) of vehicles utilizing the intersections.

The LOS for a Two-Way Stop Controlled (TWSC) intersection is determined by the computed or measured control delay. The LOS is determined for each minor street movement (or shared movement) by using the criteria provided in *Table 3-1* referenced from HCM 6 Chapter 20.

Table 3-1: HCM 6 – LOS Criteria for TWSC

Control Delay (seconds/vehicle)	LOS by Volume-to-Capacity Ratio	
	Volume / Capacity Ratio ≤ 0.99	Volume / Capacity Ratio < 1.0
0 - 10	A	F
> 10 -15	B	F
> 15 - 25	C	F
> 25 - 35	D	F
> 35 - 50	E	F
> 50	F	F

Note: The LOS criteria apply to each lane on each approach of the stop-controlled minor street. LOS is not calculated for major-street approaches or for the intersection as a whole.

Source: Highway Capacity Manual 6th Edition, Exhibit 20-2.

3.5 Current City Policy on Intersection Performance

The City of Victorville's General Plan adopts policies that define an acceptable level of intersection performance and criteria for identifying deficient intersection operations requiring mitigation. The criteria is described below:

The City's peak hour level of service standard is LOS D. An intersection found to operate at a LOS E with an Intersection Capacity Utilization (ICU) value greater than 0.95 or Highway Capacity Manual (HCM) delay worse than LOS D (i.e., LOS E or F) is considered deficient.

If a development project would worsen an intersection peak hour LOS to E or worse, it is considered a significant impact that must be mitigated. If a development project would worsen an already deficient intersection by two percent or more, it is considered a significant impact that must be mitigated.

2 Trafficware Ltd, Version 10.
3 Transportation Research Board, Washington D.C., 2010.

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3.6 Existing Traffic Analysis

Existing intersection capacity and LOS analyses are based on the existing intersection geometrics and the AM and PM peak hour traffic volumes discussed earlier. The results of the analysis are shown in *Table 3-2* and provided in *Appendix A.*

Table 3-2: Intersection Capacity Analysis – Existing Conditions

Intersection		AM		PM	
		Delay (1)	LOS (2)	Delay (1)	LOS (2)
1	Hopland St and S. El Evado Rd (3)	10.5	B	10.8	B
2	Hopland St and N. El Evado Rd (3)	9.9	A	8.8	A
3	Hopland St and Cahuenga Rd (3)	16.6	C	9.5	A
4	Hopland St and Llanada Ave (3)	15.1	C	9.2	A
5	Cahuenga Rd and Gloria Ln (3)	n/a	n/a	n/a	n/a

n/a = future intersection.

(1) Delay – seconds per vehicle

(2) LOS – Level of Service

(3) Stop controlled intersection.

Source: David Evans and Associates, Inc.

As shown in *Table 3-2* under Existing Conditions, the study intersections operate at LOS D or better with the existing geometrics illustrated in *Figure 4*.

3.6.1 Existing Traffic Signal Warrant Analysis at Hopland St and Cahuenga Rd

A traffic signal warrant analysis was completed for the stop-controlled intersection of Hopland Street and Cahuenga Road. This study reviewed three of the eleven signal warrants included in the most recent California Manual on Uniform Traffic Control Manual (CA MUTCD, 2014). These warrants are Warrant 1 (Eight Hour Vehicular Volume); Warrant 2 (Four Hour Vehicular Volume); and Warrant 5 (School Crossing Warrant).

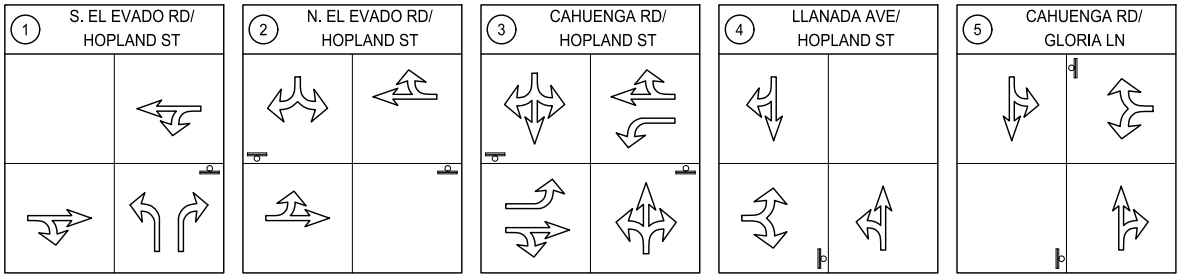
The intersection of Hopland Street and Cahuenga Road did not meet Warrant 1 (Eight Hour Vehicular Volume) and Warrant 2 (Four Hour Vehicular Volume). Warrant 5 (School Crossing) was deemed inapplicable because of the existence of a crossing guard during school arrival and departure times. To compute the school crossing warrant, the frequency and adequacy of gaps in the vehicular traffic stream on the major street at an established school crossing is required.

However, the existence of the crossing guards makes Warrant 5 inapplicable because, regardless of the number gaps in the traffic stream, crossing guards can interrupt the flow of traffic and guide children safely across the major and minor street. The traffic signal warrant analysis is provided in *Appendix C.*

3.6.2 Alternative Measures to Traffic Signals

Although a traffic signal was not warranted at the intersection of Hopland Street and Cahuenga Road, a warrant analysis was also conducted for all-way stop control[4]. The all-way stop control warrant analysis is provided in *Appendix D.*

4 California MUTCD Section 2B.07: Multi-Way Stop Applications, 2014 Edition.



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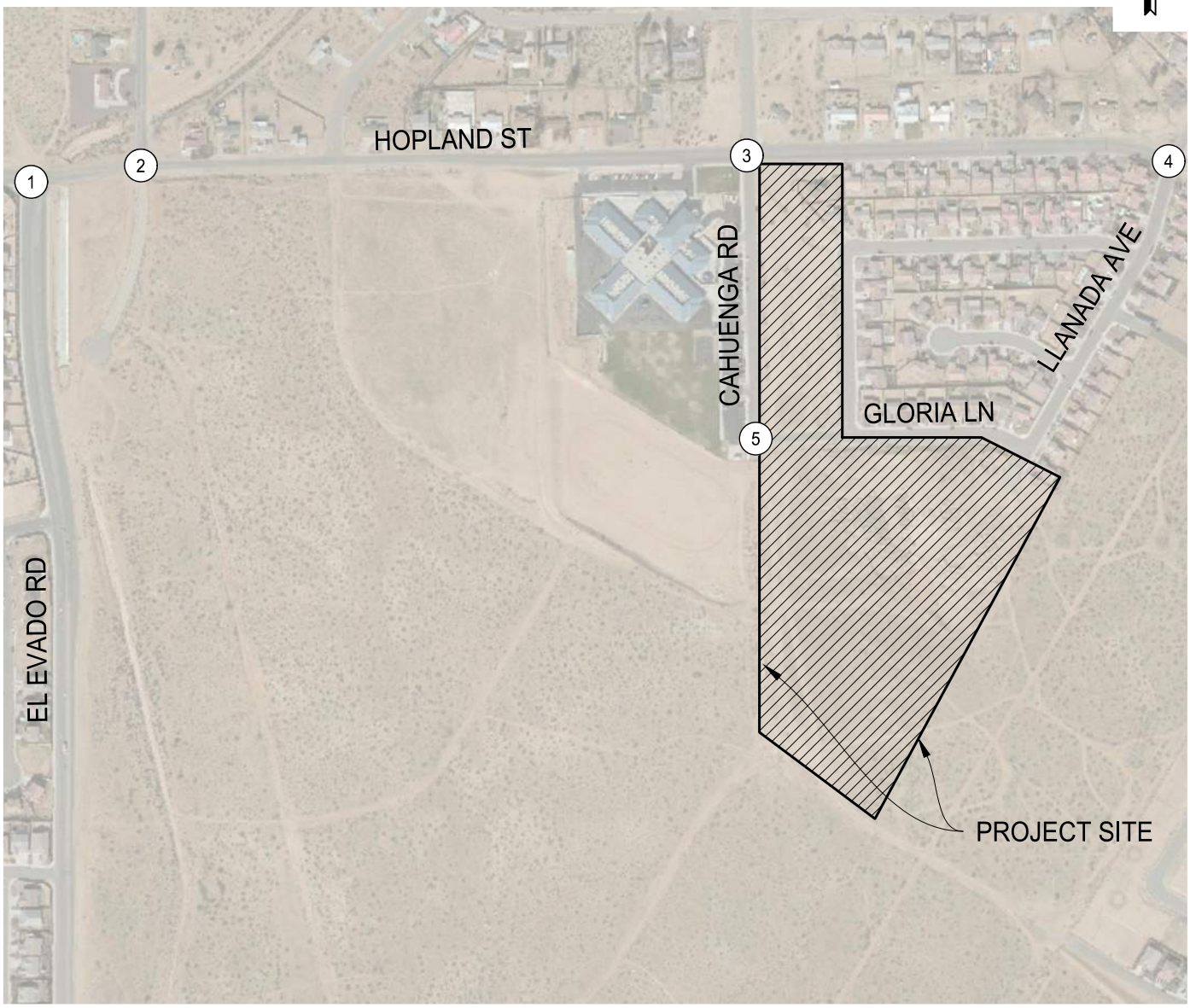

LEGEND

XX/XX - AM/PM PROJECT TRIP

(#) - STUDY INTERSECTIONS

- SIGNALIZED INTERSECTION

- STOP CONTROLLED APPROACH

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FIGURE 4: EXISTING CONDITION INTERSECTION GEOMETRICS TENTATIVE TRACT MAP NO. 20280 VICTORVILLE, CALIFORNIA

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4 EXISTING PLUS PROJECT CONDITIONS

The Existing Plus Project Conditions evaluates potential impacts as if the project were built and occupied today. This scenario is intended to identify potentially significant impact (requiring mitigation) when compared to existing conditions without any unrelated transportation system improvements or other development. Impacts identified in this scenario are considered "project-specific" impacts—impacts that are the sole responsibility of the project to mitigate.

4.1 Project Trip Generation

The trip generation rates for the proposed Single-Family Detached Housing (ITE 210) was obtained from the Institute of Transportation Engineers (ITE) Trip Generation manual, 10th Edition. *Table 4-1* summarizes the estimated trip generation for the project during the AM (7-9 AM) peak and PM (4-6 PM) peak hours.

Table 4-1: Project Trip Generation

Land Use		AM Peak Hour			PM Peak Hour		
	Daily	In	Out	Total	In	Out	Total
Single-Family Detached Housing (ITE 210)							
Trip rates: Trips Per Dwelling Unit	9.44	0.19	0.56	0.74	0.62	0.37	0.99
Trips: 74 Dwelling Units	699	14	41	55	46	27	73

Source: "Trip Generation Manual, Institute of Transportation Engineers", 10th Edition

As presented in *Table 4-1* the project is estimated to generate 699 daily trips, 55 AM peak hour trips, and 73 PM peak hour trips.

4.2 Project Trip Distribution and Assignment

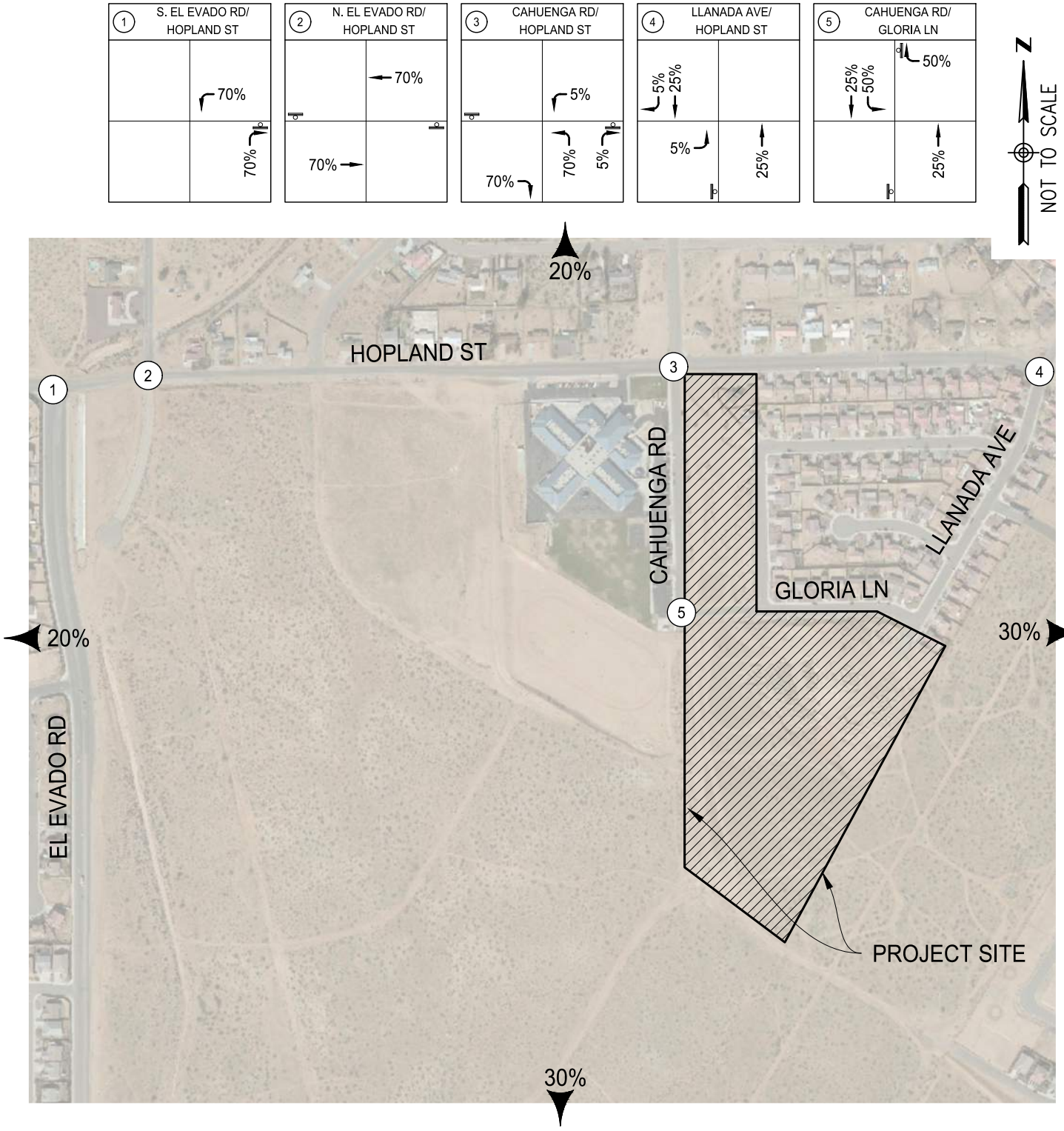
The estimated project trips are distributed by direction and assigned to the local network of streets. *Figure 5* illustrates the distribution of the project trips. *Figure 6* illustrates the total trips for the project.

4.3 Existing Plus Project Traffic Analysis

The project trip generation, traffic distribution and assignment patterns were used in the intersection capacity analyses to assess potential project impacts. The project trips were added to the existing conditions traffic volumes to derive existing plus project conditions. This scenario's traffic volumes are illustrated in *Figure 7*.

The results of the analysis are shown in *Table 4-2* and provided in *Appendix A*.

As presented in *Table 4-2,* under Existing plus Project Conditions, the study intersections would operate at LOS C or better. Therefore, there are no project-specific impacts under the existing plus project conditions scenario.



LEGEND

- XX% — GENERAL PROJECT TRIP DISTRIBUTION
- XX% — SPECIFIC PROJECT TRIP PERCENTAGE
- (#) - STUDY INTERSECTIONS
- SIGNALIZED INTERSECTION
- STOP CONTROLLED APPROACH

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FIGURE 5: PROJECT TRIP DISTRIBUTION
TENTATIVE TRACT MAP NO. 20280
VICTORVILLE, CALIFORNIA

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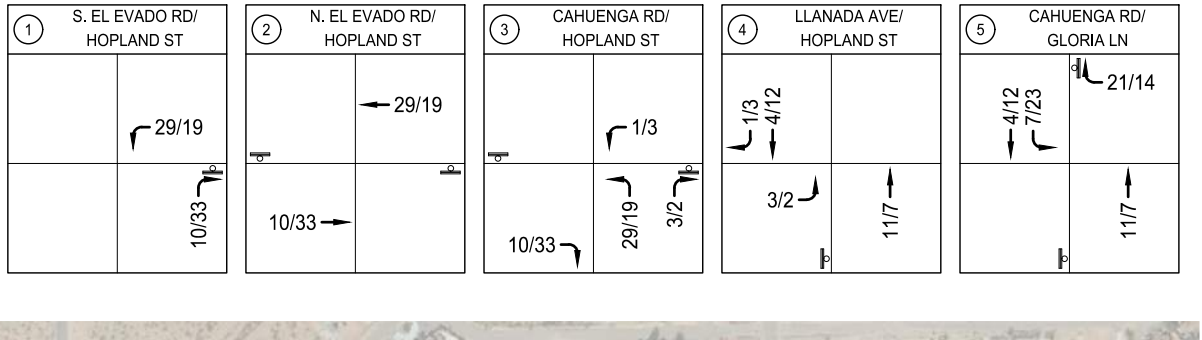

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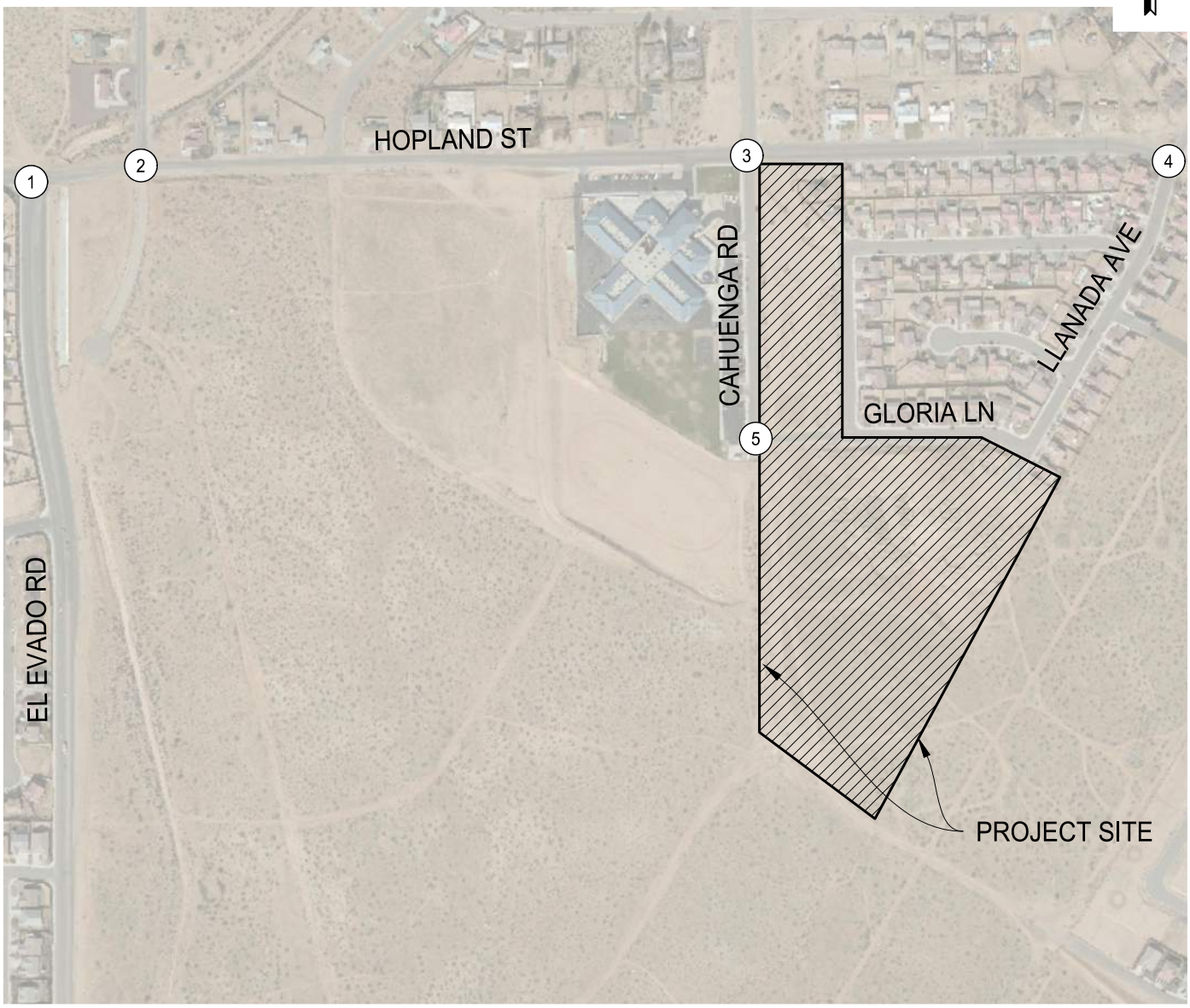

PRIMARY TRIPS

AM PEAK PERIOD - 14 IN / 41 OUT
PM PEAK PERIOD - 46 IN / 27 OUT

LEGEND

XX/XX - AM/PM PROJECT TRIP
(#) - STUDY INTERSECTIONS
- SIGNALIZED INTERSECTION
- STOP CONTROLLED APPROACH

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FIGURE 6: PROJECT TRIPS
TENTATIVE TRACT MAP NO. 20280
VICTORVILLE, CALIFORNIA

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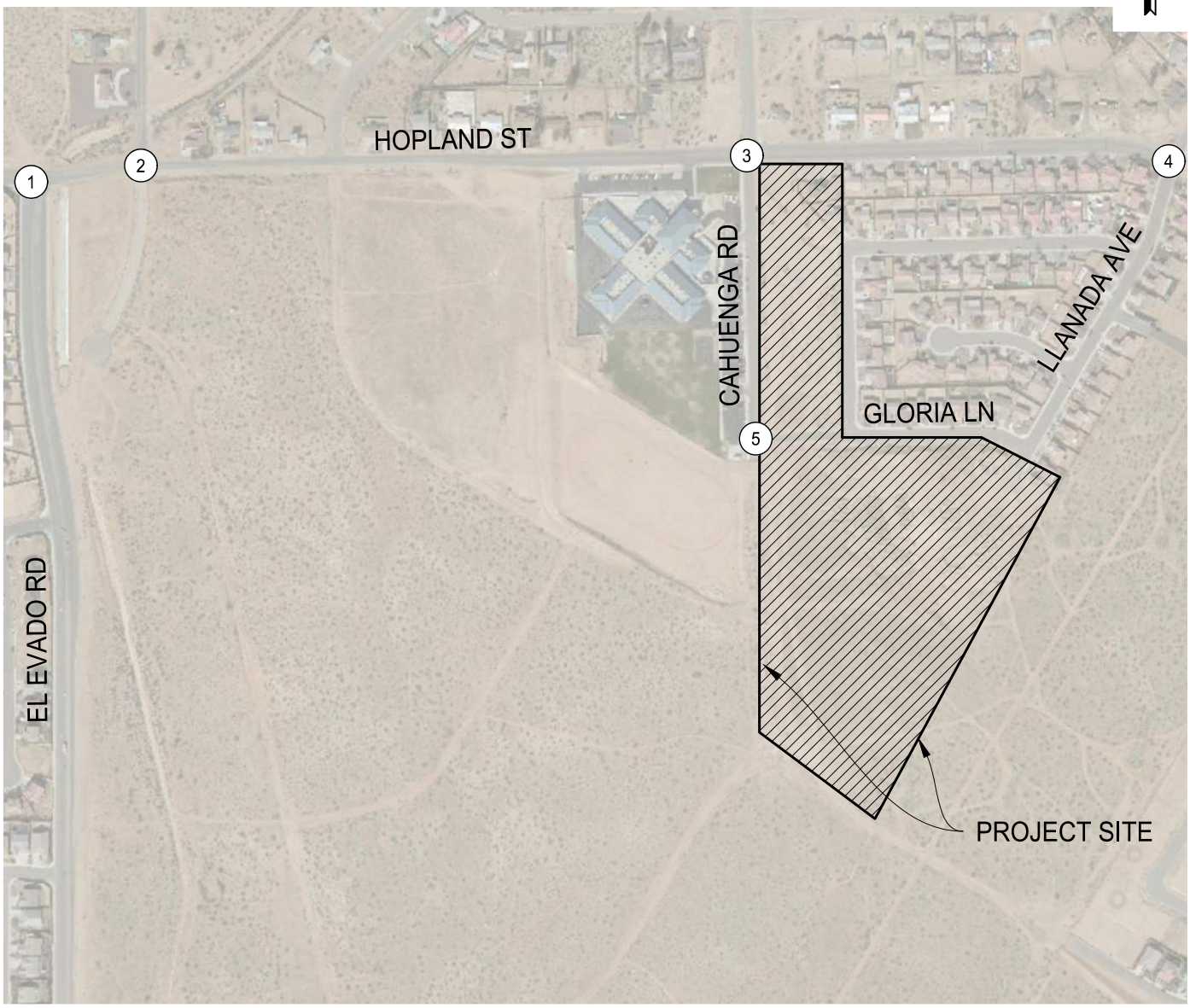

LEGEND

XX/XX - AM/PM PROJECT TRIP

(#) - STUDY INTERSECTIONS

- SIGNALIZED INTERSECTION

- STOP CONTROLLED APPROACH

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FIGURE 7: EXISTING PLUS PROJECT CONDITION TRAFFIC VOLUMES TENTATIVE TRACT MAP NO. 20280 VICTORVILLE, CALIFORNIA

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Table 4-2: Intersection Capacity Analysis – Existing plus Project Conditions

	Intersection	AM		PM	
		Delay (1)	LOS (2)	Delay (1)	LOS (2)
1	Hopland St and S. El Evado Rd (3)	11.1	B	11.3	B
2	Hopland St and N. El Evado Rd (3)	10.2	B	8.9	A
3	Hopland St and Cahuenga Rd (3)	20.9	C	9.8	A
4	Hopland St and Llanada Ave (3)	15.8	C	9.3	A
5	Cahuenga Rd and Gloria Ln (3)	8.6	A	8.5	A

(1) Delay – In Seconds

(2) LOS – Level of Service

(3) Stop controlled intersection

Source: David Evans and Associates, Inc.

4.3.1 Existing Plus Project Traffic Signal Warrant Analysis at Hopland St and Cahuenga Rd

Similar to the traffic signal warrant analysis conducted for the Existing Conditions scenario, the Existing Plus Project Scenario does not meet the eight-hour (Warrant 1) and four-hour (Warrant 2) warrants, and the school crossing warrant (Warrant 5) remains inapplicable due to the existence of crossing guards at two of the intersection's approaches. The Traffic Signal Warrant Analysis (TSW) is provided in *Appendix C.*

The intersection also did not meet the California MUTCD's warrants for all-way stop control (Section 2B.07: Multi-Way Stop Applications, 2014 Edition). The all-way stop control warrant analysis is provided in Appendix D*.*

4.3.2 Traffic Condition Observations

As part of the traffic signal warrant analysis, transportation conditions were observed at the Challenger School of Sports and Fitness located at the southwest corner of Hopland Street and Cahuenga Road. The resulting qualitative assessment documented issues such as long vehicle queues, surges in school-related traffic, areas where parents parked their vehicles and walked children to school, and street and intersection operations.

Observations were conducted during the morning drop-off period (8:00 AM to 9:00 AM), the early release pick-up period (12:30 to 1:00 pm), and the afternoon release pick-up period (2:00 to 2:55 pm). Specifically, the following was observed:

- Vehicular ingress and egress at school entrances.
- Vehicle queuing on-street and on school property, particularly for vehicles waiting to enter the school's drop-off zone.
- School bus activity.
- On-street curbside activity for pick-up and drop-off and on-street parking utilization.
- Student travel by walking and bicycling and observed conflicts with vehicles.

4.3.2.1 Documented Observations:

Morning Drop Off (8:00 AM to 9:00 AM)

The morning drop-off observation began at 7:53 AM stationed at the vacant lot northwest of the intersection of Hopland Street and Cahuenga Road.

- At 8:00 AM, a crossing guard began directing pedestrian traffic at the intersection of Hopland Street and Cahuenga Road assisting pedestrians/students crossing the north and south crosswalks of Hopland Street and the west crosswalk of Cahuenga Road.
- Parents park along Cahuenga Road to drop-off students onto the sidewalk or to walk students to their classes.
- Parents also parked in the vacant lot in the northwest corner of the intersection. Students dropped-off in the vacant lot crossed Hopland Street (either by jay-walking or using the crossing guard manned crosswalk. Most students using the crosswalks crossing Hopland Street approached from the east or north.
- The maximum vehicle queuing at the Hopland Street and Cahuenga Road intersection occurred at 8:30 AM waiting to complete a northbound left turn, from the stop controlled Cahuenga Road minor leg. The maximum queue was observed to consist of 6 to 8 vehicles, and observed to clear after about 60 seconds.
- During the 8:00 AM to 9:00 AM time period, a combined 60 pedestrians were observed using the north and south crosswalks on Hopland Street and/or the west crosswalk of Cahuenga Road.
- The crossing guard concluded directing pedestrian traffic at the intersection of Hopland Street and Cahuenga Road at 8:40 AM. The morning drop-off observation concluded at 9:05 AM.

Early Release Pick-Up (12:30 to 1:00 PM)

The early release pick-up observation began at 12:28 PM stationed at the vacant lot northwest of the intersection of Hopland Street and Cahuenga Road.

- No crossing guard was observed during this period at the intersection of Hopland Street and Cahuenga Road. Traffic was free flowing with no observed queuing.
- During the 12:30 PM to 1:00 PM time period, 5 pedestrians were observed using the north and south crosswalks of Hopland Street and/or the west crosswalk of Cahuenga Road.
- The early release pick-up observation concluded at 1:08 PM.

Afternoon Release Pick-Up (2:00 to 3:00 PM)

The afternoon release pick-up observation began at 1:56 PM stationed at the vacant lot northwest of the intersection of Hopland Street and Cahuenga Road.

- Two crossing guards began directing pedestrian traffic at the intersection of Hopland Street and Cahuenga Road at 2:55 PM. The crossing guards shared responsibility assisting pedestrians/students crossing the north and south crosswalks of Hopland Street and the west crosswalk of Cahuenga Road.
- Similar to morning drop-off period, parents park along Cahuenga Road to pick-up students from sidewalk or to walk students from their classes.
- Parents also park in the vacant lot in the northwest corner of the intersection and either waited

for students to cross Hopland Road and locate parent, or escorted their younger children from the school to the lot.

- The peak surge in traffic occurred for a 10-minute period between 2:55 PM to 3:05 PM. Queuing at the intersection of Hopland Street and Cahuenga Road occurred in the southbound lanes of Cahuenga Road (for traffic waiting to enter the school's pick-up area), the northbound left turn movement (for traffic exiting the school and turning left onto Hopland Street), and the westbound left turn lane on Hopland Street (primarily parents accessing the school pick-up zone).
- The northbound left turn maximum queue cleared after 60 to 90 seconds.
- During the 2:00 to 3:15 PM period 205 pedestrians used the north and south crosswalks on Hopland Street and/or the west crosswalk on Cahuenga Road.
- The crossing guard concluded directing pedestrian traffic at 3:15 PM, the intersection of Hopland Street and Cahuenga Road. The afternoon release pick-up observation concluded at 3:20 PM.

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5 BACKGROUND (CUMULATIVE) CONDITIONS (YEAR 2021)

This scenario represents conditions at the time the project is anticipated to be fully constructed and occupied (known as buildout which is the year 2010 for this project) but without traffic generated by the project. This scenario is comprised of two components of cumulative traffic growth:

1) Ambient growth—a general rate of growth in traffic from overall regional growth but not specific to any nearby development.

2) Traffic generated by other area development that is planned and/or approved for construction in the very near future, but not yet built.

5.1 Ambient Growth Projections

The proposed project is anticipated to be constructed and occupied in the year 2021. As stated earlier in this report near-term growth in traffic is comprised of regional ambient growth and other area projects expected to be completed within the same timeframe. Ambient growth is estimated as a 3% annual increase.

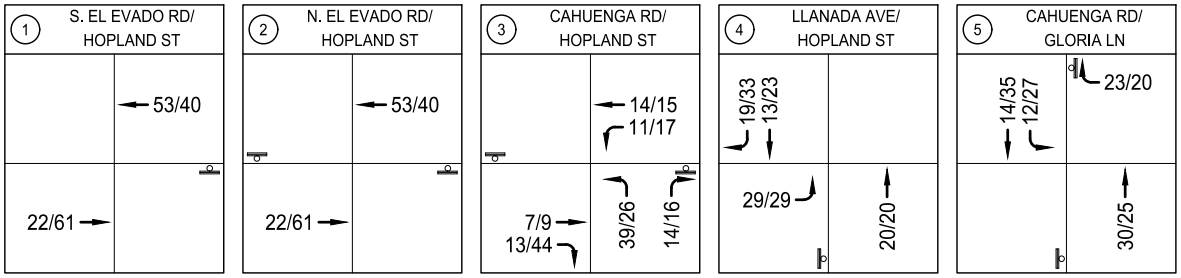
5.2 Other Area Development

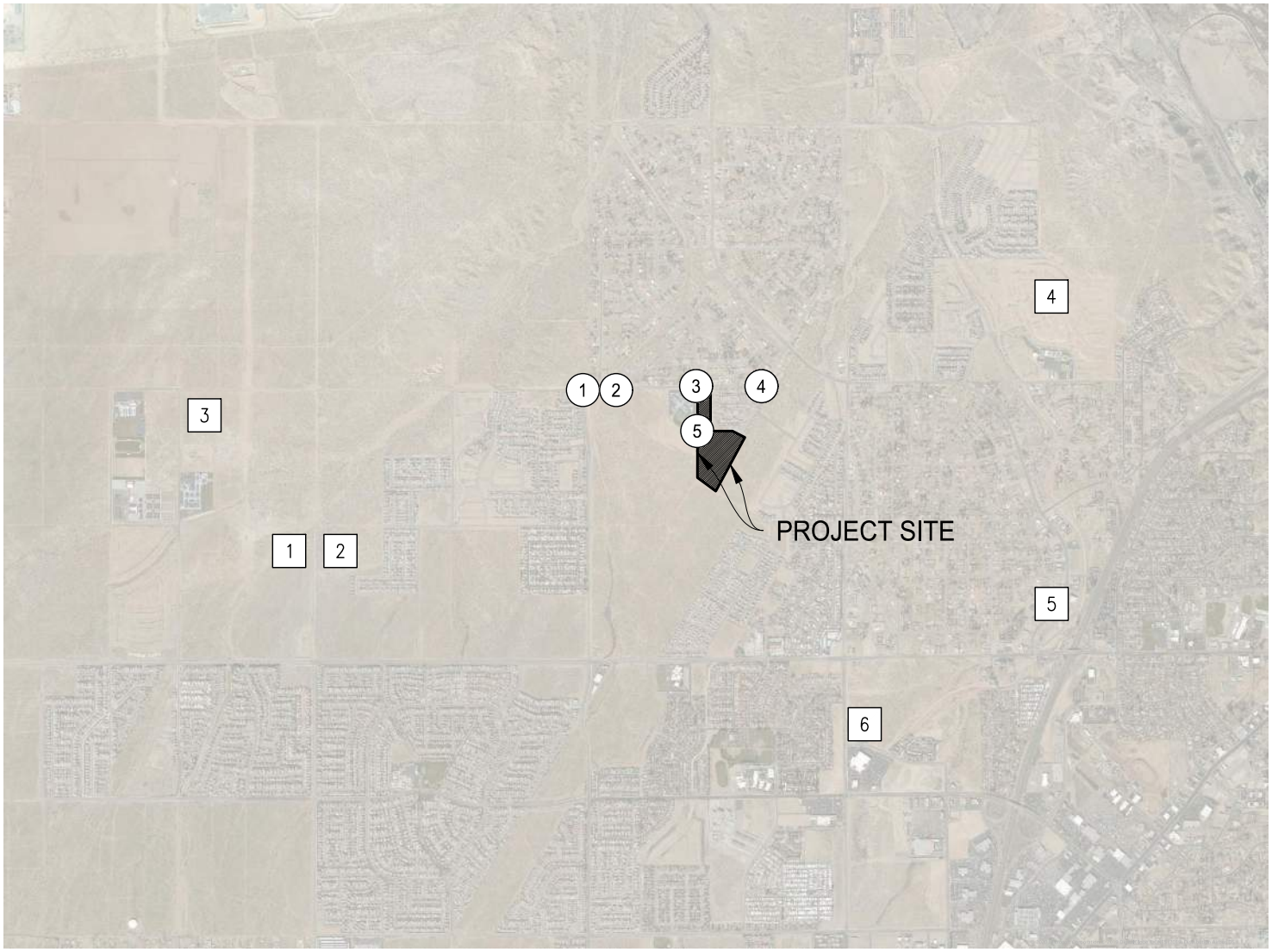
The City of Victorville provided information on other area development projects which included single-family detached housing, warehousing, gasoline/service station with convenience market, and a medical-dental office building. The trips generated from the other area projects are shown in *Table 5-1*. The total trips generated by the other area project are summarized in *Figure 8* and provided in *Appendix B.*

Table 5-1: Other Area Development Trips

	Land Use		AM Peak Hour			PM Peak Hour		
		Daily	In	Out	Total	In	Out	Total
1	**Single-Family Detached Housing** (ITE 210)							
	Trip Rates: Trips Per Dwelling Unit	9.44	0.19	0.56	0.74	0.62	0.37	0.99
	Trips: 73 Dwelling Units	689	14	41	54	46	27	72
2	**Single-Family Detached Housing** (ITE 210)							
	Trip Rates: Trips Per Dwelling Unit	9.44	0.19	0.56	0.74	0.62	0.37	0.99
	107 Dwelling Units	1,010	20	59	79	67	39	106
3	**Single-Family Detached Housing** (ITE 210)							
	Trip Rates: Trips Per Dwelling Unit	9.44	0.19	0.56	0.74	0.62	0.37	0.99
	Trips: 96 Dwelling Units	906	18	53	71	60	35	95
4	**Single-Family Detached Housing** (ITE 210)							
	Trip Rates: Trips Per Dwelling Unit	9.44	0.19	0.56	0.74	0.62	0.37	0.99
	Trips: 210 Dwelling Units	1,982	39	117	155	131	77	208
5	**Warehousing (**ITE 150)							
	Trip Rates: Trips Per 1000 Sq. Ft. GFA	1.74	0.13	0.04	0.17	0.05	0.14	0.19
	Trips: 5,000 Sq. Ft. GFA	9	1	0	1	0	1	1
6	**Medical-Dental Office Building** (ITE 270)							
	Trip Rates: Trips Per 1000 Sq. Ft. GFA	34.80	2.17	0.61	2.78	0.97	2.49	3.46
	Trips: 25,000 Sq. Ft. GFA	870	54	15	70	24	62	87
	TOTAL TRIPS	**5,466**	**146**	**285**	**431**	**328**	**241**	**569**

Source: "Trip Generation Manual, Institute of Transportation Engineers", 10th Edition





LEGEND

XX/XX - SPECIFIC PROJECT TRIPS

(#) - STUDY INTERSECTIONS

[#] - OTHER AREA PROJECTS

- SIGNALIZED INTERSECTION

- STOP CONTROLLED APPROACH

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FIGURE 8: OTHER AREA PROJECT TRIPS
TENTATIVE TRACT MAP NO. 20280
VICTORVILLE, CALIFORNIA

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5.3 Background (Cumulative) Conditions (Year 2031) Traffic Analysis

The background condition traffic volumes are illustrated in *Figure 9*. Intersection capacity analysis for the study intersections assumed existing lane geometries and planned improvements within the study area by the year 2031, if any. *Table 5-2* represents the LOS for each study intersection.

Table 5-2: Intersection Capacity Analysis – Background Condition

Intersection		AM		PM	
		Delay (1)	LOS (2)	Delay (1)	LOS (2)
1	Hopland St and S. El Evado Rd (3)	11.3	B	12.1	B
2	Hopland St and N. El Evado Rd (3)	10.3	B	9.0	A
3	Hopland St and Cahuenga Rd (3)	15.6	C	10.5	B
4	Hopland St and Llanada Ave (3)	13.1	B	10.1	B
5	Cahuenga Rd and Gloria Ln (3)	8.6	A	10.6	B

(1) Delay – In Seconds

(2) LOS – Level of Service

(3) Stop Controlled Intersection

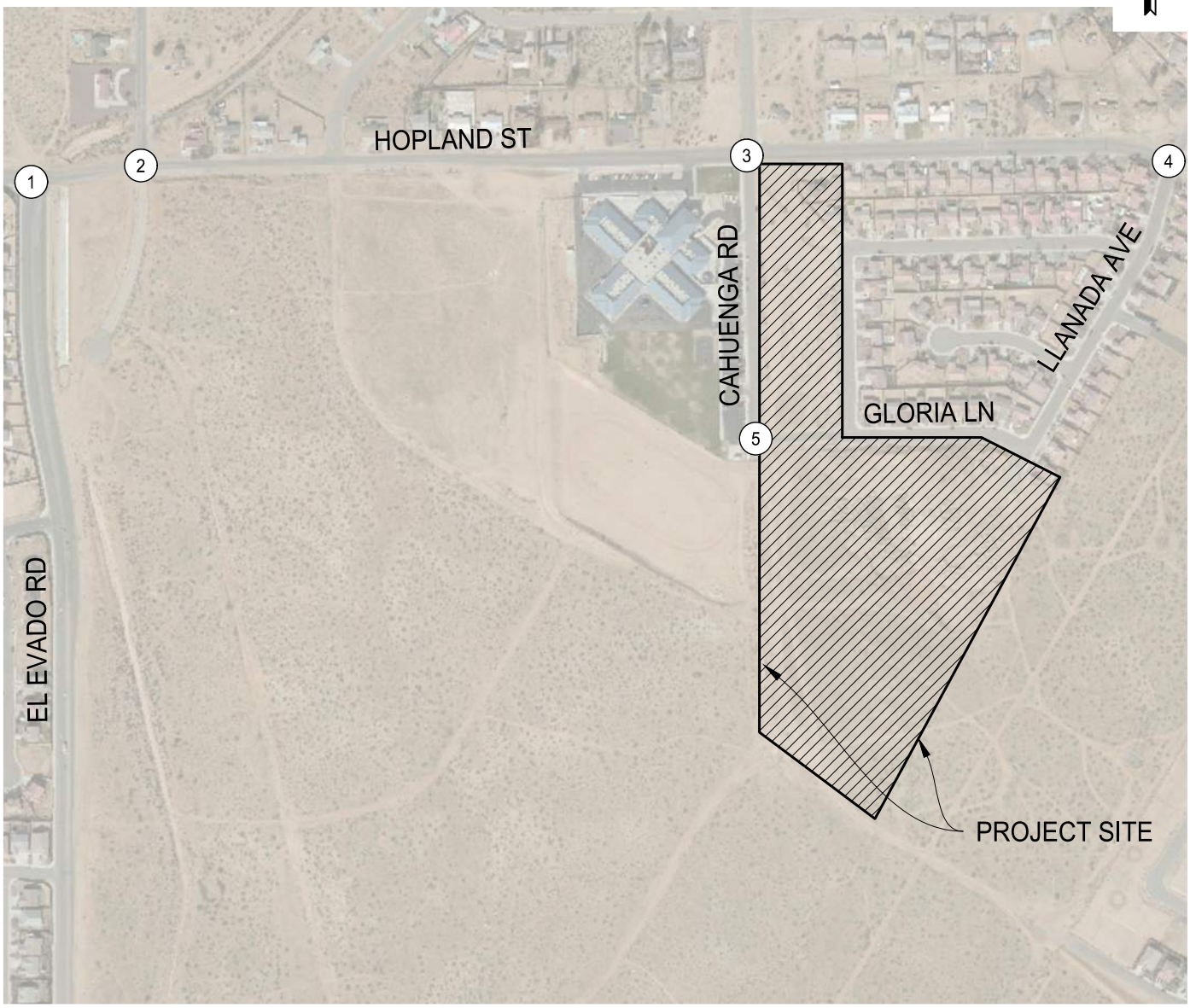
Source: David Evans and Associates, Inc.

As presented in *Table 5-2,* under the background traffic conditions, the study intersections would operate at LOS C or better.

5.3.1 Background (Cumulative) Conditions Traffic Signal Warrant Analysis at Hopland St and Cahuenga Rd

Similar to the traffic signal warrant analysis conducted for previous scenarios, the background scenario does not meet the eight-hour (Warrant 1) and four-hour (Warrant 2) warrants, and the school crossing warrant (Warrant 5) remains inapplicable due to the existence of crossing guards at two of the intersection's approaches. The Traffic Signal Warrant Analysis (TSW) is provided in *Appendix C.*

The intersection also did not meet the California MUTCD's warrants for all-way stop control (Section 2B.07: Multi-Way Stop Applications, 2014 Edition). The all-way stop control warrant analysis is provided in Appendix D*.*



LEGEND

XX/XX - AM/PM PROJECT TRIP

(#) - STUDY INTERSECTIONS

- SIGNALIZED INTERSECTION

- STOP CONTROLLED APPROACH

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FIGURE 9: BACKGROUND CONDITION TRAFFIC VOLUMES TENTATIVE TRACT MAP NO. 20280 VICTORVILLE, CALIFORNIA

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6 PROJECT TRAFFIC CONDITIONS

This scenario adds the project's estimated traffic generation at buildout (2021) to the Background (Cumulative) Conditions scenario described above. Impacts identified in this near-term scenario are considered "cumulative" impacts—impacts that the project contributes to, but does not solely cause, and may be responsible for a fair-share of the cost to implement any mitigation measures.

6.1 Project Traffic Analysis

The traffic volumes under this scenario are illustrated in *Figure 10.* Intersection capacity analysis for the study intersections uses the existing lanes geometries, intersection improvements built as part of the project, and planned improvements within the study area by the year 2031, if any.*Table 6-1* presents the LOS for the study intersections.

Table 6-1: Intersection Capacity Analysis – Project Conditions

Intersection		AM Peak Hour		PM Peak Hour	
		Delay (1)	LOS (2)	Delay (1)	LOS (2)
1	Hopland St and S. El Evado Rd (3)	12.1	B	12.8	B
2	Hopland St and N. El Evado Rd (3)	10.6	B	9.2	A
3	Hopland St and Cahuenga Rd (3)	17.7	C	11.1	B
4	Hopland St and Llanada Ave (3)	13.4	B	10.3	B
5	Cahuenga Rd and Gloria Ln (3)	8.8	A	8.7	A

(1) Delay – In Seconds

(2) LOS – Level of Service – HCM

(3) Stop Controlled Intersection

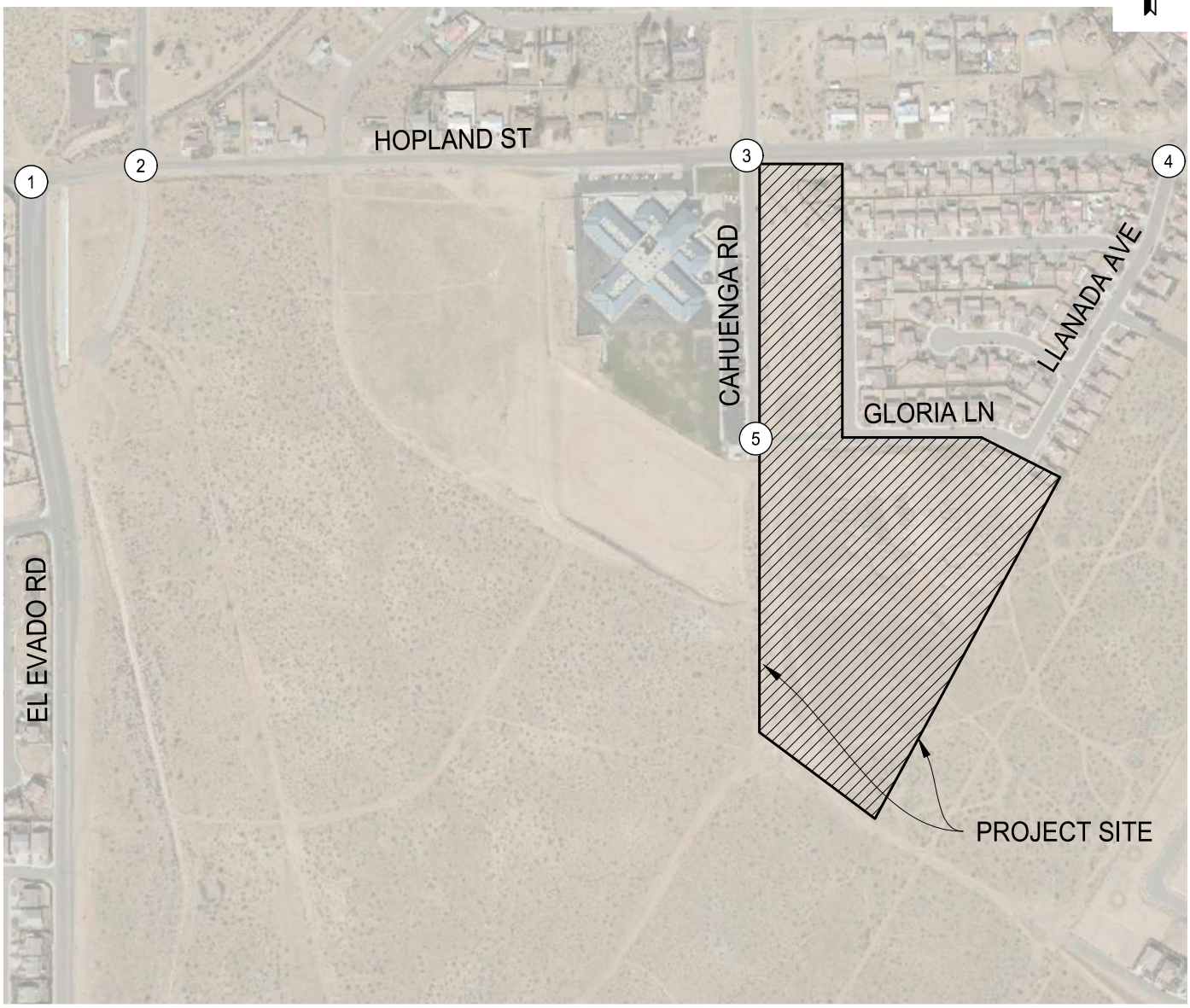
Source: David Evans and Associates, Inc.

As presented in *Table 6-1*, under the project conditions, the study intersections would operate at LOS C or better.

6.1.1 Project Conditions Traffic Signal Warrant Analysis at Hopland St and Cahuenga Rd

Similar to the traffic signal warrant analysis conducted for previous scenarios, the project conditions scenario does not meet the eight-hour (Warrant 1) and four-hour (Warrant 2) warrants, and the school crossing warrant (Warrant 5) remains inapplicable due to the existence of crossing guards at two of the intersection's approaches. The Traffic Signal Warrant Analysis (TSW) is provided in *Appendix C.*

The intersection also did not meet the California MUTCD's warrants for all-way stop control (Section 2B.07: Multi-Way Stop Applications, 2014 Edition). The all-way stop control warrant analysis is provided in Appendix D.



LEGEND

XX/XX - AM/PM PROJECT TRIP

(#) - STUDY INTERSECTIONS

- SIGNALIZED INTERSECTION

- STOP CONTROLLED APPROACH

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FIGURE 10: PROJECT CONDITION TRAFFIC VOLUMES
TENTATIVE TRACT MAP NO. 20280
VICTORVILLE, CALIFORNIA

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7 FUTURE CONDITIONS (YEAR 2031)

This long-term scenario addresses impacts due to overall regional ambient growth in traffic (assumed to be 3% annually for this study) and typically represents a long-range planning horizon that typically coincides with buildout of the City's General Plan or other long-term period in order to identify the need for major transportation facility improvements.

7.1 Future Year 2031 Traffic Analysis

The Future Conditions (Year 2031) forecasted traffic volumes are illustrated in *Figure 11* and presented in the turn movement summary worksheets provided in *Appendix A* of this report. The results of the analysis are shown in *Table 7-1* and provided in *Appendix B* of this report.

Table 7-1: Intersection Capacity Analysis – Future Conditions (Year 2031)

	Intersection	AM Peak Hour		PM Peak Hour	
		Delay (1)	LOS (2)	Delay (1)	LOS (2)
1	Hopland St and S. El Evado Rd (3)	12.3	B	13.5	B
2	Hopland St and N. El Evado Rd (3)	11.1	B	9.2	A
3	Hopland St and Cahuenga Rd (3)	21.5	C	11.1	B
4	Hopland St and Llanada Ave (3)	16.3	C	10.5	B
5	Cahuenga Rd and Gloria Ln (3)	8.6	A	8.6	A

(1) Delay – In Seconds

(2) LOS – Level of Service

(3) Stop Controlled Intersection

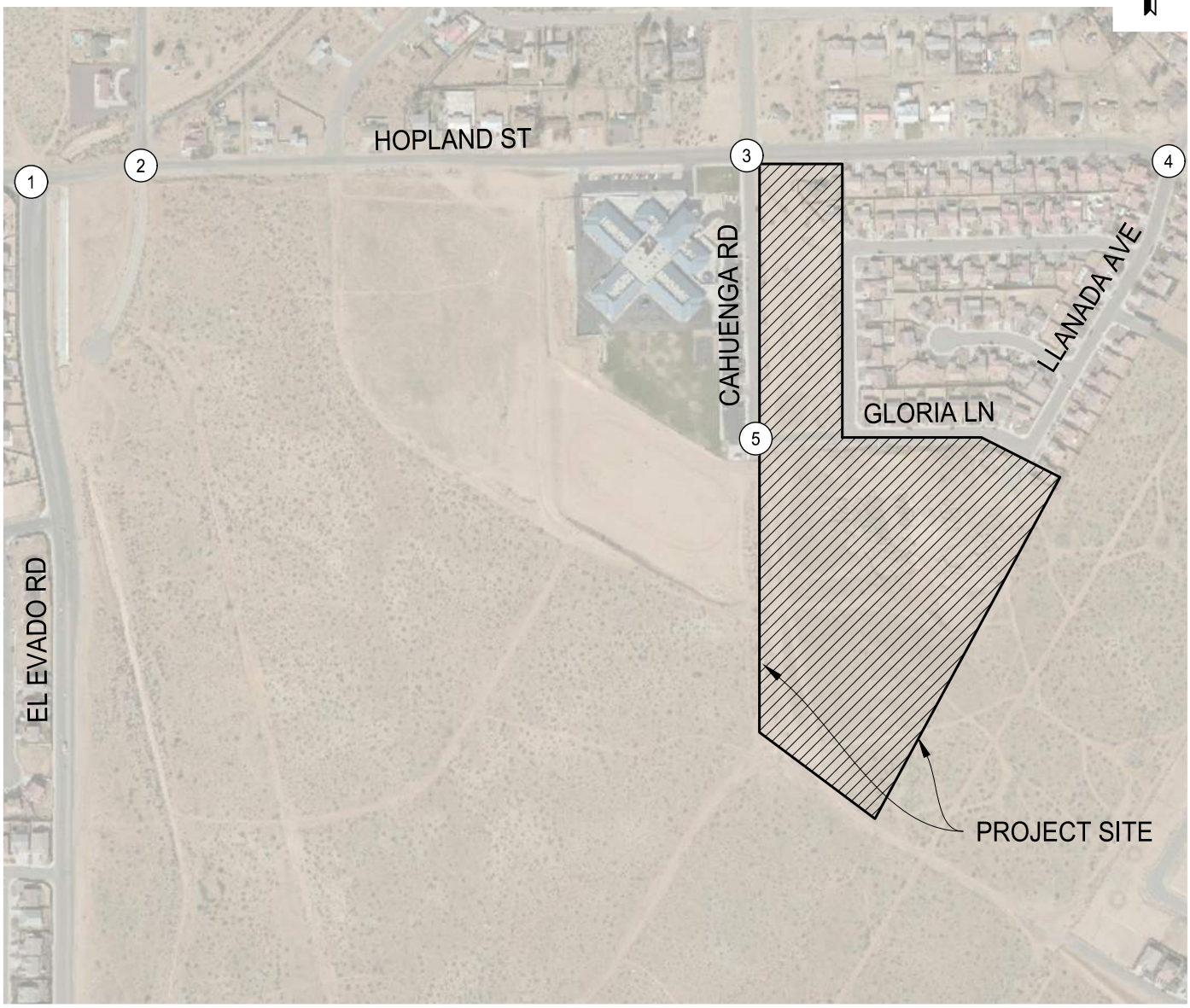
Source: David Evans and Associates, Inc.

As presented in under the *Table 7-1*, under the future conditions (year 2031) scenario, the study intersections would operate at a LOS C or better.

7.1.1 Project Conditions Traffic Signal Warrant Analysis at Hopland St and Cahuenga Rd

Similar to the traffic signal warrant analysis conducted for previous scenarios, the project conditions scenario does not meet the eight-hour (Warrant 1) and four-hour (Warrant 2) warrants, and the school crossing warrant (Warrant 5) remains inapplicable due to the existence of crossing guards at two of the intersection's approaches. The Traffic Signal Warrant Analysis (TSW) is provided in *Appendix C.*

The intersection also did not meet the California MUTCD's warrants for all-way stop control (Section 2B.07: Multi-Way Stop Applications, 2014 Edition). The all-way stop control warrant analysis is provided in Appendix D*.*



LEGEND

XX/XX - AM/PM PROJECT TRIP

(#) - STUDY INTERSECTIONS

- SIGNALIZED INTERSECTION

- STOP CONTROLLED APPROACH

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FIGURE 11: FUTURE CONDITIONS (YEAR 2031)
TRAFFIC VOLUME
TENTATIVE TRACT MAP NO. 20280
VICTORVILLE, CALIFORNIA

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8 FUTURE PLUS PROJECT CONDITIONS (YEAR 2031)

This scenario adds the project's estimated traffic generation to the Future Conditions (Year 2031) scenario described above. Impacts identified in this long-rang scenario are those that the project contributes to, but does not solely cause, are cumulative by definition and the project may be responsible for a fair-share of the cost to implement any mitigation measures.

8.1 Future Year 2031 plus Project Traffic Analysis

The forecasted volumes for this scenario are illustrated in *Figure 12,* and presented in the turn movement summary worksheets provided in *Appendix A*. for Future plus Project Conditions (Year 2031) was performed using the methodology presented in *Chapter 3.* The results of the intersection capacity analysis are shown in *Table 7-1* and provided in *Appendix A.*

Table 8-1: Intersection Capacity Analysis – Future Plus Project Conditions (Year 2031)

Intersection		AM Peak Hour		PM Peak Hour	
		Delay(1)	LOS(2)	Delay(1)	LOS(2)
1	Hopland St and S. El Evado Rd (3)	13.2	B	14.3	B
2	Hopland St and N. El Evado Rd (3)	11.5	B	9.4	A
3	Hopland St and Cahuenga Rd (3)	26.4	D	11.8	B
4	Hopland St and Llanada Ave (3)	16.9	C	10.6	B
5	Cahuenga Rd and Gloria Ln (3)	8.8	A	8.9	A

(1) Delay – In Seconds

(2) LOS – Level of Service

(3) Stop Controlled Intersection

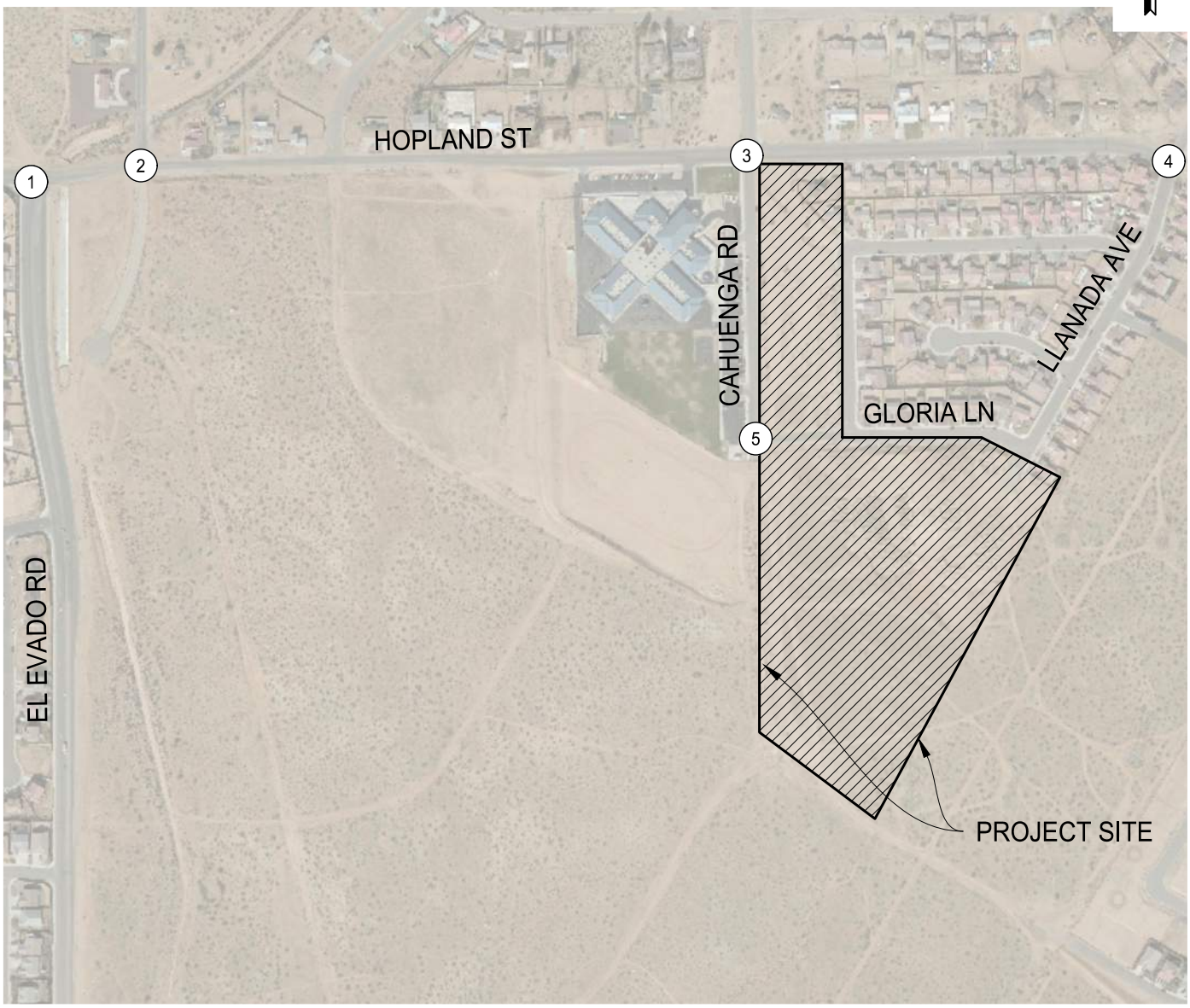
Source: David Evans and Associates, Inc.

As presented in *Table 8-1*, under scenario, the study intersections would operate at a LOS D or better.

8.1.1 Future Plus Project Conditions Traffic Signal Warrant Analysis at Hopland St and Cahuenga Rd

Similar to the traffic signal warrant analysis conducted for previous scenarios, the project conditions scenario does not meet the eight-hour (Warrant 1) and four-hour (Warrant 2) warrants, and the school crossing warrant (Warrant 5) remains inapplicable due to the existence of crossing guards at two of the intersection's approaches. The Traffic Signal Warrant Analysis (TSW) is provided in *Appendix C.*

The intersection also did not meet the California MUTCD's warrants for all-way stop control (Section 2B.07: Multi-Way Stop Applications, 2014 Edition). The all-way stop control warrant analysis is provided in Appendix D.



LEGEND

XX/XX - AM/PM PROJECT TRIP

(#) - STUDY INTERSECTIONS

- SIGNALIZED INTERSECTION

- STOP CONTROLLED APPROACH

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FIGURE 12: FUTURE PLUS PROJECT CONDITIONS (YEAR 2031) TRAFFIC VOLUMES TENTATIVE TRACT MAP NO. 20280 VICTORVILLE, CALIFORNIA

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9 SUMMARY OF TECHNICAL FINDINGS AND RECOMMENDATIONS

9.1 Comparison of Scenarios With and Without Project

Table 9-1 compares existing service levels with existing plus project service levels. In this comparison the addition of project traffic to already acceptable levels of service results in small changes in delay and no change in LOS. There are no significant impacts in this scenario and, therefore, no mitigation is required.

Table 9-1: Comparison of Existing and Existing Plus Project Levels of Service

Intersection	Existing Conditions				Existing + Project Conditions			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
Hopland St and S. El Evado Rd	10.5	B	10.8	B	11.1	B	11.3	B
Hopland St and N. El Evado Rd	9.9	A	8.8	A	9.9	A	8.9	A
Hopland St and Cahuenga Rd	16.6	C	9.5	A	20.9	C	9.8	A
Hopland St and Llanada Ave	15.1	C	9.2	A	15.8	C	9.3	A
Cahuenga Rd and Gloria Ln	n/a	n/a	n/a	n/a	8.6	A	8.5	A

All intersections in this table are side street stop-controlled intersections and the delay and LOS presented are for the worst stop-controlled approach or lane group.

Delay = controlled delay in seconds per vehicle.

LOS = Level of Service

n/a = future intersection does not have existing condition.

Table 9-2 compares background (cumulative) condition service levels with background (cumulative) condition plus project service levels. In this comparison the addition of project traffic to already acceptable levels of service results in small changes in delay and no change in LOS. There are no significant impacts in this scenario and, therefore, no mitigation is required.

Table 9-2: Comparison of Background (Cumulative) and Background (Cumulative) Plus Project Levels of Service

Intersection	Background (Cumul) Conditions				Background + Project Conditions			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
Hopland St and S. El Evado Rd	11.3	B	12.1	B	12.1	B	12.8	B
Hopland St and N. El Evado Rd	10.3	B	9.0	A	10.6	B	9.2	A
Hopland St and Cahuenga Rd	15.6	C	10.5	B	17.7	C	11.1	B
Hopland St and Llanada Ave	13.1	B	10.1	B	13.4	B	10.3	B
Cahuenga Rd and Gloria Ln	8.6	A	10.6	B	8.8	A	8.7	A

All intersections in this table are side street stop-controlled intersections and the delay and LOS presented are for the worst stop-controlled approach or lane group.
Delay = controlled delay in seconds per vehicle.
LOS = Level of Service
n/a = future intersection does not have existing condition.

Finally, Table 9-3 compares future (2031) condition service levels with future (2031) plus project service levels. In this comparison the addition of project traffic to already acceptable levels of service results in small changes in delay and one change in service level from LOS C to LOS D which remains within the City's performance standard. There are no significant impacts in this scenario and, therefore, no mitigation is required.

Table 9-3: Comparison of Future (2031) and Future Plus Project Levels of Service

Intersection	Background (Cumul) Conditions				Background + Project Conditions			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
Hopland St and S. El Evado Rd	12.3	B	13.5	B	13.2	B	14.3	B
Hopland St and N. El Evado Rd	11.1	B	9.2	A	11.5	B	9.4	A
Hopland St and Cahuenga Rd	21.5	C	11.1	B	26.4	D	11.8	B
Hopland St and Llanada Ave	16.3	C	10.5	B	16.9	C	10.6	B
Cahuenga Rd and Gloria Ln	8.6	A	8.6	A	8.8	A	8.9	A

All intersections in this table are side street stop-controlled intersections and the delay and LOS presented are for the worst stop-controlled approach or lane group.

Delay = controlled delay in seconds per vehicle.

LOS = Level of Service

n/a = future intersection does not have existing condition.

9.2 Required Mitigation Measures and Other Recommended Improvements

This section summarizes any required measures to mitigate significant impacts identified in the traffic analysis and recommendations for project-specific improvements that may be integrated into the project's Conditions of Approval.

9.2.1 Required Mitigation Measures

1. **Off-Site Mitigation Measures**. The project does not cause any significant traffic impact under the existing, background (cumulative), or Future (2031) scenarios. **No off-site mitigation measures are required.**
2. **Traffic Control at Hopland Street and Cahuenga Road**. Traffic signal warrants (1, 2 and 5) from the California Manual on Uniform Traffic Control Devices were not met under any scenario with or without the project. Neither were the warrants met for multi-way stop control. Therefore, the intersection of Hopland Street and Cahuenga Road will remain a side-street stop-controlled intersection with Hopland Street being the major uncontrolled street. **No change in intersection traffic control is required.**

9.2.2 Other Recommended Improvements

1. **Frontage Improvements on Cahuenga Road.** The project will be conditioned to improve its frontage with Cahuenga Road. Within the right-of-way the following improvements are recommended:
    a. Dedicate the necessary property to provide a 67-foot right-of-way (from back of sidewalk to back of sidewalk plus required utility easements behind the sidewalks that

are not included in the width).

b. Within this right-of-way construct the east side of Cahuenga Road (about 1,800 feet in length) with a mid-block cross-section comprised of a 47-foot traveled way (face of curb to face of curb) with a 17.5-foot wide northbound travel lane, a 12-foot continuous two-way turn lane, a 14.5-foot wide southbound travel lane, an 18-inch wide gutter and 6-inch curb, and a 10-foot wide sidewalk on the east side of the street. *Figure 13* illustrates the recommended mid-block cross-section.

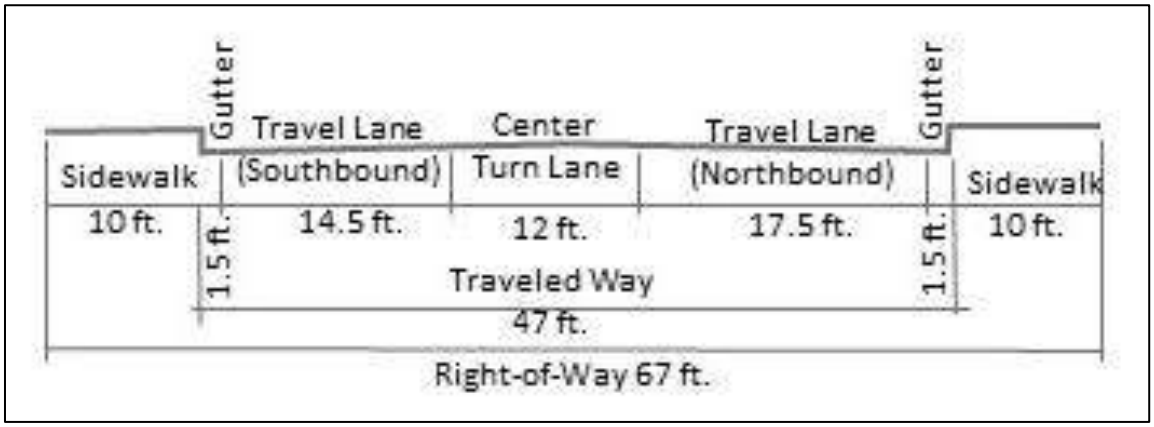

Figure 13: Recommended Improved Mid-Block Cross-Section for Cahuenga Road

c. Construct intersection corners and curb returns, ADA ramps, drainage facilities, safety lighting, and crosswalks at:

   i. Southeast corner of Hopland Street and Cahuenga Road, including restriping of the school crosswalks on the north side of Hopland Street, the south side of Hopland Street, and on the west side of Cahuenga Street.

   ii. Northeast and southeast corners of Cahuenga Road and Gloria Lane including a school crosswalk across Gloria Lane on the east side of Cahuenga Road.

   iii. Northeast corner of Cahuenga Road and Tawny Ridge Lane.

d. On Cahuenga Road approaching Hopland Street, construct a northbound right-turn bay 115-feet in length from the southeast corner curb return and taper the right turn bay curbing to align with the new Cahuenga Road curbing using a 50-foot long a 50-foot long transition.

3. **Striping Improvements on Cahuenga Road's Approach to Hopland Street.** Provide the following lane delineation for the northbound approach:

   a. A left turn lane, a through lane, and a right turn lane all approximately 115-feet in length. See *Figure 14* for lane dimensions.

   b. A 12-foot wide Continuous Left-Turn Lane (CTWLTL) extending south from the northbound left turn lane described above to terminate north of Gloria Lane where it serves as a left-turn lane into Gloria Lane.

4. Continue the CTWLTL south of Gloria Lane and immediately taper the lane to the centerline terminating approximately 790-feet north of Tawny Ridge Lane. See *Figure 14.*

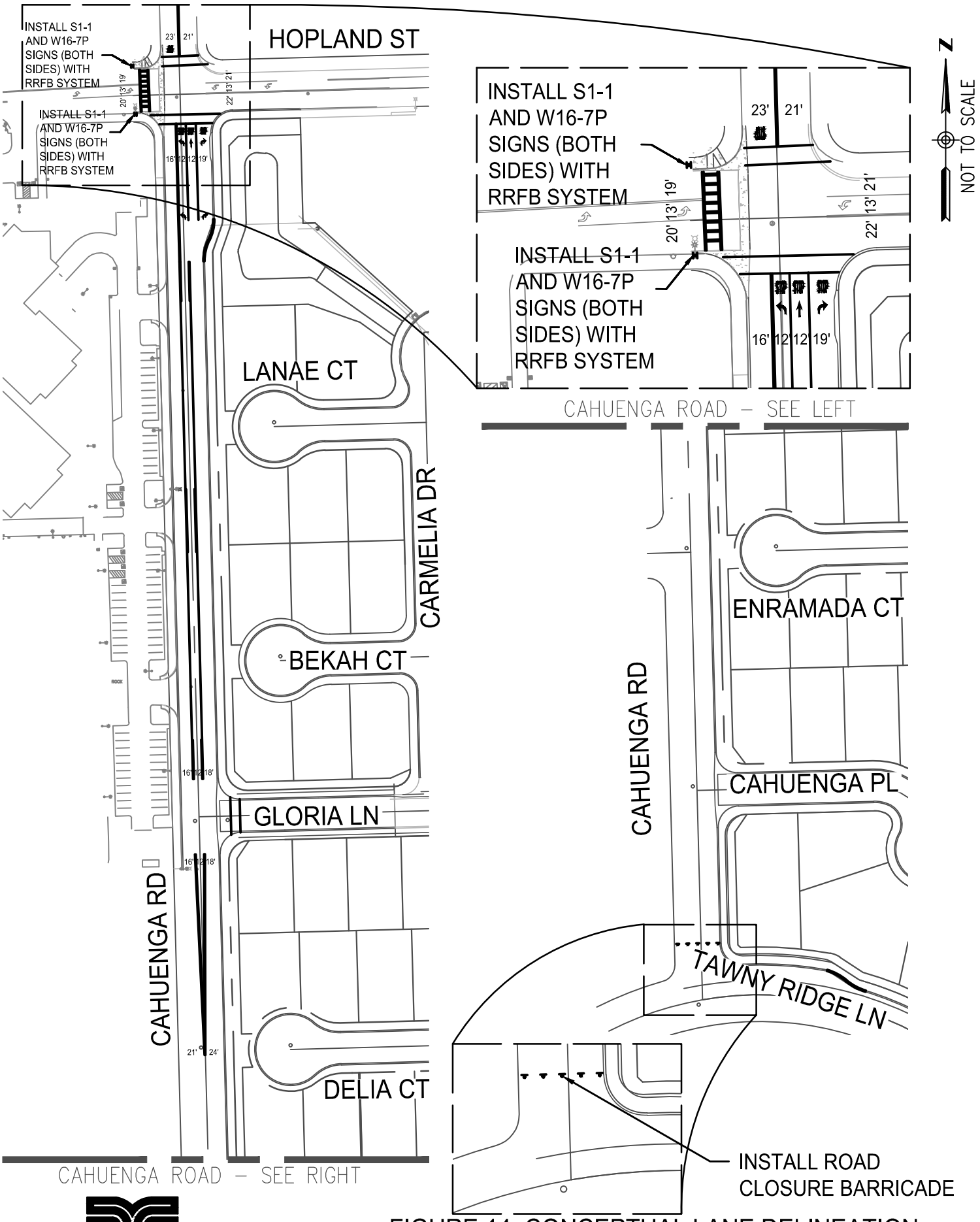

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FIGURE 14: CONCEPTUAL LANE DELINEATION
IMPROVEMENTS ON CAHUENGA ROAD
TENTATIVE TRACT MAP NO. 20280
VICTORVILLE, CALIFORNIA

5. **Frontage Improvements on Hopland Street.** The project will be conditioned to improve its frontage on Hopland Street. Within the right-of-way the following improvements are recommended:
    a. Construct sidewalk, curb and gutter on**:**
        i. Hopland Street from Cahuenga Road to current terminus of existing sidewalk approximately 130-feet east of Cahuenga Road. These improvements are shown in *Figure 2* (Site Plan) in Section 1 of this report.
6. **Frontage Improvements on Tawny Ridge Lane.** The project will be conditioned to improve its frontage on Tawny Ridge Lane. Within the right-of-way the following improvements are recommended:
    a. Construct curb, gutter and sidewalk on Tawny Ridge Lane from Cahuenga Road to end of project property, approximately 300-feet in length.
    b. Construct a westbound right turn lane approximately 130-feet in length with a 50-foot long transition.
7. **Install a Rectangular Rapid Flash Beacon (RRFB) at the School Crosswalk on Hopland St west of Cahuenga Road.** An RRFB is an approved traffic control device that significantly increases driver yielding behavior at uncontrolled crossings when supplementing standard pedestrian crossing warning signs and markings. This device is being recommended because the project adds traffic to the school crossing during school peak and off-peak times when crossing guards are not present and creates conflicts with pedestrians, many who are children. An RFBB can be designed to be triggered manually or automatically when pedestrians are detected. RRFBs typically receive power by standalone solar panel units but may also be wired to a traditional power source. *Figure 15* shows a typical installation of an RFBB at an intersection.

Figure 15: Typical installation of a Rectangular Rapid Flash Beacon (RRFB) at an intersection crossing.

8. Install road closure barricades at the southern terminus of Cahuenga Rd. See *Figure 14.*

10 APPENDICES

Appendix A: Intersection Capacity Analysis Calculations
Appendix B: Other Area Projects
Appendix C: Traffic Signal Warrants Worksheet
Appendix D: All Way Stop Control Warrant