APPENDIX 10 – TRAFFIC

Appendix 10
A: Traffic Impact Analysis

September 2014 | Technical Report

SYCAMORE ACADEMY TRAFFIC IMPACT ANALYSIS

for Sycamore Academy of Science and Cultural Arts

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PLACEWORKS

Table of Contents

APPENDICES

Table of Contents

List of Figures

List of Tables

1. Executive Summary

This Traffic Impact Analysis (TIA) has been prepared to analyze the potential traffic impacts from construction and operation of the Sycamore Academy ("proposed project"). Existing traffic conditions are used as the "baseline" for the analysis in this TIA and to evaluate the potential impacts of the proposed project. The overall purpose of this TIA is to inform the City's decision makers and the general public whether the proposed project would result in any significant impacts.

The proposed project would be at 23151 Palomar Street in the City of Wildomar. The school is scheduled to open in the fall of 2015 with a capacity of 594 students from grades K to 8. The project is expected to generate up to 766 vehicle trips on a typical weekday, with 267 trips during the AM peak hour and 89 trips during the PM peak hour.

Five intersections have been included in this analysis, including four existing intersections:

- I-15 Southbound Ramps at Clinton Keith Road
- I-15 Northbound Ramps at Clinton Keith Road
- Palomar Street at Clinton Keith Road
- Washington Street at Nutmeg Street/Calle Del Oso Oro
- Palomar Street at Project access

All study area intersections currently operate at acceptable levels of service during the peak hours for existing traffic conditions.

The traffic conditions were also analyzed for Existing Plus Project, Opening Year 2016 Without Project, and Opening Year 2016 With Project. While the school is proposed to be operational by fall 2015, it has been conservatively assumed that the project opening year for background conditions is 2016 to add two years of ambient growth. An ambient growth rate of 2 percent per year and a list of cumulative projects to be fully operational by 2016 were included to the background traffic conditions. No deficiencies and significant impacts have been developed in accordance with the City of Wildomar, City of Murrieta, and Caltrans requirements.

Site access will be provided via a driveway on Palomar Street that would allow for full access (right-turn in, right turn out, left turn in, and left turn out). The internal driveway could accommodate up to 22 vehicles before student drop-off point. On-site queuing is generally not expected to extend onto Palomar Street and create the need for a separate right turn lane at Palomar Street. The typical morning peak drop-off and afternoon pick-up activity lasts about 20 minutes, and any possible queue would dissipate immediately after the drop-off and pick-up periods.

1. Executive Summary

Vehicular queuing was analyzed to assess the potential for arriving vehicles coming from the south that would wait on the median at Palomar Street to make a left turn into the school access driveway and into the school drop-off zone. A striped pocket on the northbound left turn lane on Palomar Street would be provided to allow storage along the section of the road that would be widened. This widened section of Palomar Street would extend 300 feet to the south of the site. The left turn pocket would provide sufficient storage to prevent cars from spilling into Palomar Street.

A preliminary sight distance evaluation for the proposed driveway has been prepared for the project access to Palomar Street and shows that sufficient sight distance would be provided. Observations at the project site also indicate that the sight distance exceeds these standards at the existing driveway locations. Since the site would be easily accessible from arterials and the minimum peripheral visibility would be maintained per the Caltrans HDM, no mitigation measures would be necessary.

Several recommendations have been provided in Section 8 to implement proper site access and to provide adequate circulation features in the vicinity of the project site.

2. Introduction

2.1 PROJECT OVERVIEW

The proposed project would be at 23151 Palomar Street in the City of Wildomar. The project site is a 7.2-acre site that is currently vacant and bounded by the World Harvest Church to the west, single-family residences and open space across Palomar Street to the north, open space to the east, and residences to the south. The school is scheduled to open in the fall of 2015 with a capacity of 594 students from grades K to 8. The proposed project would construct four "barn door" styled classroom buildings that would provide 22,560 building square feet of classroom space. An administration building of 2,350 building square feet and a multipurpose building of 2,940 square feet would also be built. In addition to the school buildings, the school campus would have a central landscaped courtyard, hardcourts and play area, and an outdoor amphitheater. The proposed natural turf field would encompass the southwestern half of the project site.

2.2 METHODOLOGY

The City of Wildomar follows the Riverside County Traffic Impact Study Guidelines for analyzing traffic impacts from projects on the roadway network and thresholds of significance. The methodology used for the preparation of this traffic impact study is consistent with these guidelines.

Definition of Level of Service

Roadway capacity is generally limited by the ability to move vehicles through intersections. A level of service (LOS) is a standard performance measurement to describe the operating characteristics of a street system in terms of the level of congestion or delay experienced by motorists. Service levels range from A through F, which relate to traffic conditions from best (uncongested, free-flowing conditions) to worst (total breakdown with stop-and-go operation).

Intersection LOS

The methodology used to assess the operation of a signalized intersection is based on the Highway Capacity Manual (HCM). The intersection LOS analysis is based on the traffic volumes observed during the peak hour conditions. The peak hours selected for analysis are the highest volumes that occur in four consecutive 15-minute periods from 7 to 9 AM and from 4 to 6 PM on weekdays. Per the HCM methodology, overall average intersection delay at signalized intersections was calculated, and the worst-case approach delay was calculated at unsignalized intersections. The level of service corresponds to the delay calculated. Table 1, *Intersection Level of Service Description,* describes the level of service concept and the operating conditions expected under each level of service for signalized and unsignalized intersections.

2. Introduction

Table 1 Intersection Level of Service Descriptions

LOS	Description	Average Delay Per Vehicle (seconds)	
		Signalized	Unsignalized
A	Level of Service A occurs when progression is extremely favorable and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.	0 to 10.00	0 to 10.00
B	Level of Service B generally occurs with good progression and/or short cycle lengths. More vehicles stop than for Level of Service A, causing higher levels of average total delay.	10.01 to 20.00	10.01 to 15.00
C	Level of Service C generally results when there is fair progression and/or longer cycle lengths. Individual cycle failures may begin to appear in this level. The number of vehicles stopping is significant at this level, although many still pass through the intersection without stopping.	20.01 to 35.00	15.01 to 25.00
D	Level of Service D generally results in noticeable congestion. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high volume to capacity ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.	35.01 to 55.00	25.01 to 35.00
E	Level of Service E is considered to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths, and high volume to capacity ratios. Individual cycle failures are frequent occurrences.	55.01 to 80.00	35.01 to 50.00
F	Level of Service F is considered to be unacceptable to most drivers. This condition often occurs with oversaturation, i.e., when arrival flow rates exceed the capacity of the intersection. It may also occur at high volume to capacity ratios below 1.00 with many individual cycle failures. Poor progression and long cycle lengths may also be major contributing causes to such delay levels.	80.01 and up	50.01 and up

Source: Highway Capacity Manual, Transportation Research Board, 2000.

The software Synchro Version 9 was used to determine the LOS at the study area intersections. The 2000 Highway Capacity Manual (HCM 2000) signalized intersection methodology presents LOS in terms of control delay (in seconds per vehicle).

Acceptable LOS and Thresholds of Significance

The City of Wildomar and the City of Murrieta have established LOS "D" as the minimum level of service for its intersections. According to Caltrans's traffic study guidelines, LOS "D" is considered the limit of acceptable traffic operations during the peak hour at intersections maintained by Caltrans.

Potential traffic impacts would occur if, during the weekday peak hours:

- At intersections currently operating at acceptable LOS (A to D), the addition of project trips would change the LOS to an unacceptable LOS E or F.
- At intersections currently operating at unacceptable LOS E or F, the project would increase the delay by more than 5 seconds.

3. Existing Conditions

3.1 STUDY AREA ROADWAY NETWORK

General Plan Circulation Network

The City of Wildomar has adopted the Country of Riverside General Plan standards. At the time of the preparation of this report, the City of Wildomar is currently preparing its own General Plan and has made public a draft version of its circulation element. The study-area roadways discussed below are in the circulation elements of the General Plans for the County of Riverside and the City of Wildomar. Figure 1, *City of Wildomar General Plan Circulation Network,* shows the roadway extents and classifications that are needed to adequately implement the roadway network depicted in the General Plan for City's long-range buildout conditions.

Surrounding Street System

Roadways that will be utilized for project trips include Clinton Keith Road, Palomar Street, Washington Avenue, Nutmeg Street, and Calle Del Oso Oro.

Clinton Keith Road: This east-west roadway currently varies from four to six lanes in the study area and is classified as an Urban Arterial road in the County of Riverside General Plan Circulation Element. Its final configuration in the County General Plan would be a 6-lane divided roadway with a right of way of 152 feet. The City's draft General Plan Circulation Element includes Clinton Keith Road as an Urban Arterial Street with a minimum right of way of 128 feet.

Palomar Street: This north-south roadway currently is two to four lanes in the study area and is classified as an Arterial Highway in the County of Riverside General Plan Circulation Element. Its final configuration in the County's General Plan would be a 6-lane divided roadway with a right of way of 128 feet. The City's draft General Plan Circulation Element includes Palomar Street as an Arterial Street with a minimum right of way of 128 feet.

Washington Avenue: This north-south roadway currently is two lanes undivided in the study area. Washington Avenue is classified in the City of Murrieta General Plan Circulation Element as a 4-lane Secondary road with a right of way of 88 feet.

Nutmeg Street and Calle Del Oso Oro: These east-west roadways currently range from two to four lanes in the study area. They are classified in the City of Murrieta General Plan Circulation Element as 4-lane Secondary roads with a right of way of 88 feet.

3. Existing Conditions

Study Area Intersections

The study area was defined according to the County's guidelines for the preparation of traffic impact studies. The guidelines require that intersections at streets with a minimum classification of collector or higher where the project adds 50 or more peak hour trips should be studied. Based on the calculated project trip generation and distribution, the following intersections were analyzed:

1. Clinton Keith Road at I-15 southbound ramps (Caltrans)
2. Clinton Keith Road at I-15 northbound ramps (Caltrans)
3. Clinton Keith Road at Palomar Street (Wildomar)
4. Nutmeg Street at Washington Street (Murrieta)
5. Project access at Palomar Street (Wildomar)

As listed above, intersections 1 and 2 are under the jurisdiction of Caltrans, intersections 3 and 5 in Wildomar, and intersection 4 in Murrieta. Intersection 5 would be the driveway access implemented with the project, which currently does not exist. Figure 2, *Study Area Roadway Network and Intersections,* presents the study area intersections in the vicinity of the Project site.

Existing Travel Lanes and Intersection Controls

Figure 3, *Existing Travel Lanes and Intersection Lane Configurations,* identifies the existing roadway conditions for study area roadways. The number of through lanes for existing roadways and the existing intersection controls are identified.

3.2 EXISTING INTERSECTIONS OPERATIONS

Existing Traffic Volumes

Weekday AM and PM peak hour turn movement volumes were collected at the study-area intersections. The counts were collected on Wednesday, September 3, 2014. In addition, a 24-hour traffic count was taken at Palomar Street between the project site and Clinton Keith Road. The existing AM and PM peak hour turn-movement volumes are presented in Figure 4, *Existing AM and PM Peak Hour Intersection Volumes*. Traffic count worksheets are provided in Appendix A.

Existing Conditions Intersection Operations Analysis

The intersection operations analysis results are summarized in Table 2, *Existing Peak Hour Intersection Levels of Service*. All study area intersections currently operate at acceptable LOS during the peak hours for Existing traffic conditions.

Table 2 Existing Peak Hour Intersection Levels of Service

Intersection	Jurisdiction	AM Peak Hour		PM Peak Hour	
		Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS
1. I-15 Southbound Ramps at Clinton Keith Road	Caltrans	13.7	B	14.8	B
2. I-15 Northbound Ramps at Clinton Keith Road	Caltrans	14.3	B	13.6	B
3. Palomar Street at Clinton Keith Road	Wildomar	31.8	C	29.5	C
4. Washington Street at Nutmeg Street/Calle Del Oso Oro	Murrieta	31.0	C	28.4	C

Notes: All intersections are signalized.
Delay and LOS worksheets are included in Appendix "B".

3.3 TRANSIT SERVICE AND NON-MOTORIZED CIRCULATION

Riverside Transit Agency (RTA) provides transit service in the study area. Currently there are no bus stops within a mile of the project site. There is no scheduled public transit service in the area of the school, nor is any public service planned in the future. A paved sidewalk has been constructed on the north side of Palomar Street that provides access from Clinton Keith Road to the project site.

3. Existing Conditions

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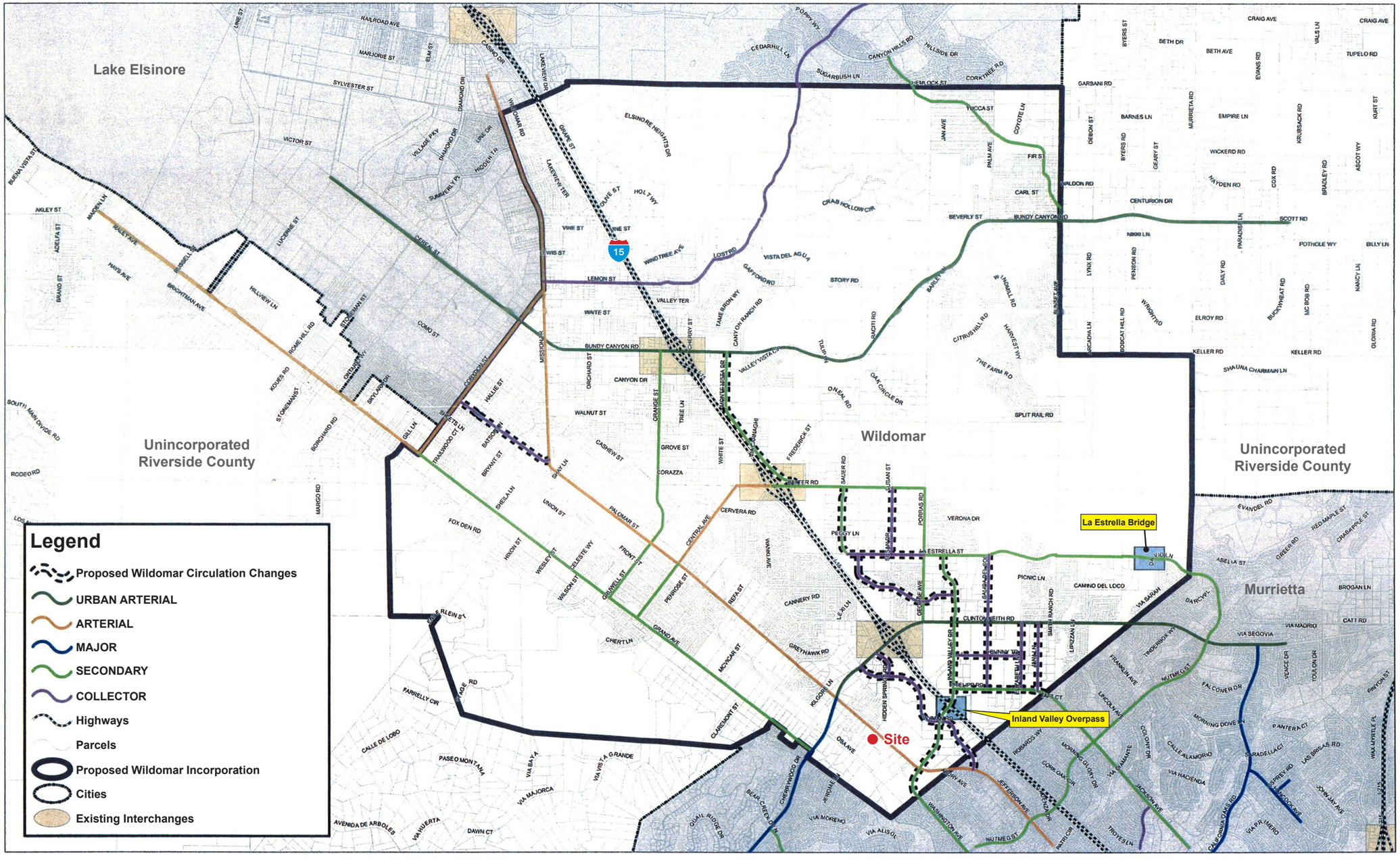
Figure 1 - City of Wildomar General Plan Circulation Network



Source: City of Wildomar Draft General Plan Circulation Element, 2014

3. Existing Conditions

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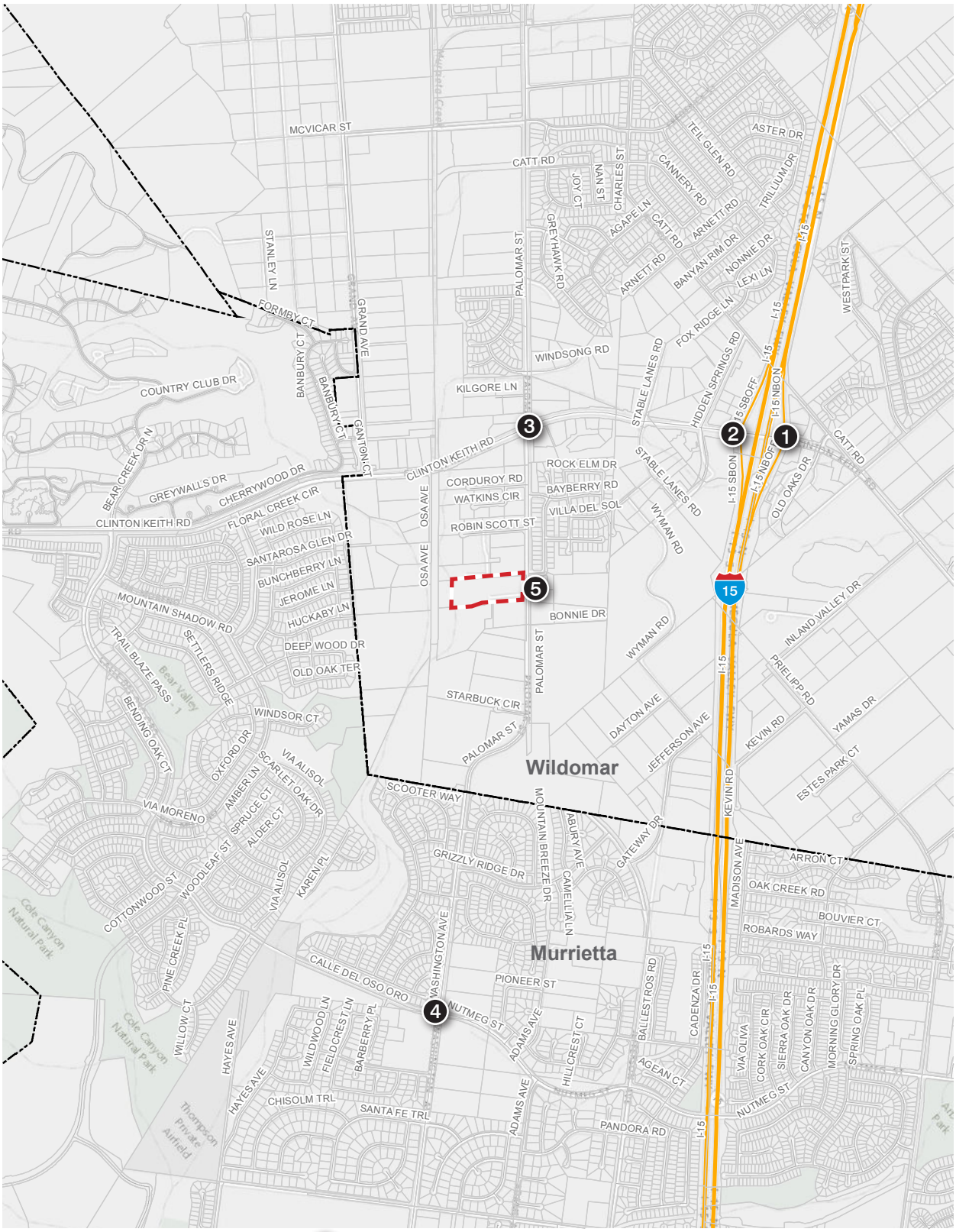
Figure 2 - Study Area Roadway Network and Intersections



Source: ESRI, 2014

3. Existing Conditions

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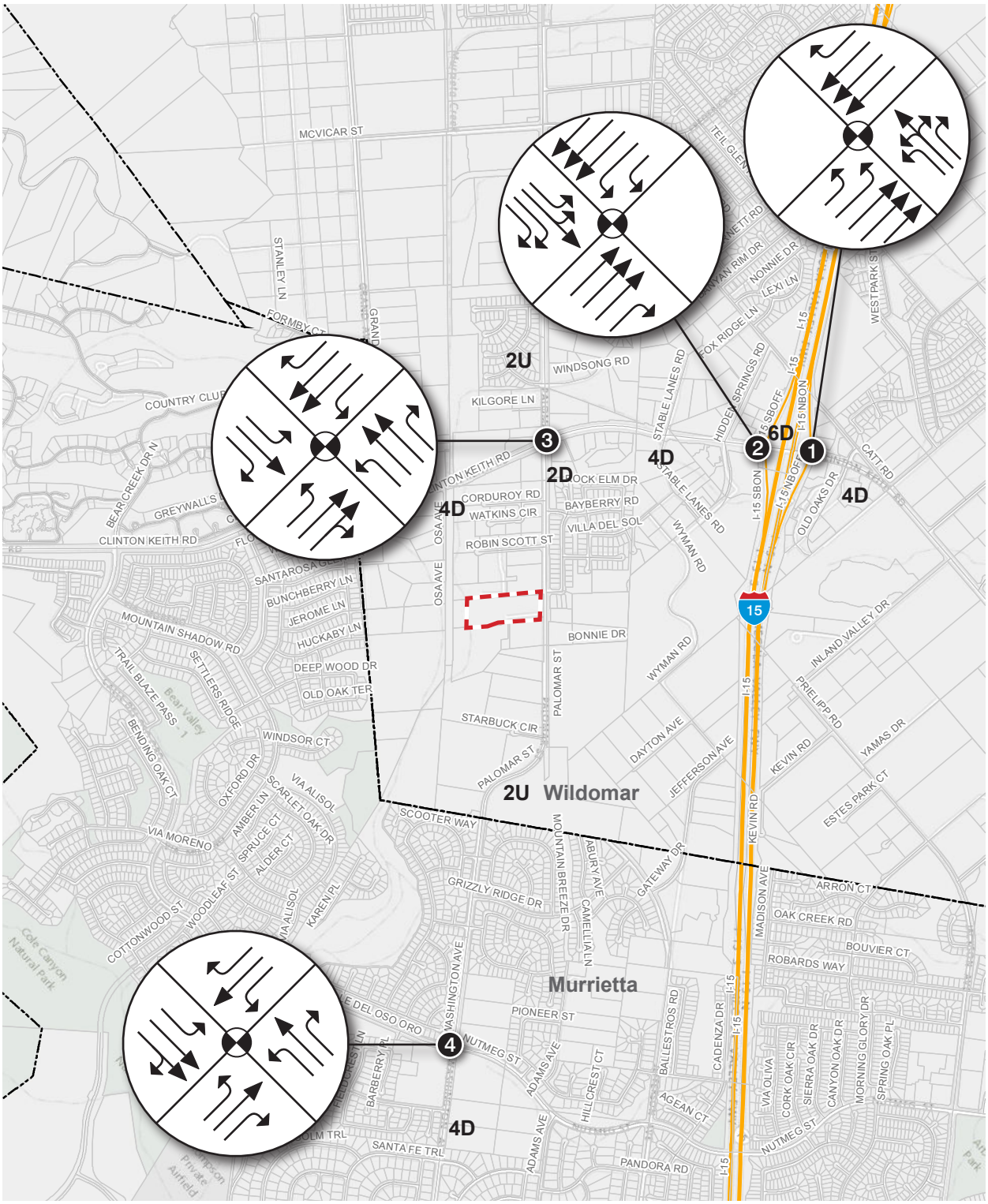
Figure 3 - Existing Intersections and Roadway Lane Configurations



Site Boundary
City Boundary
1 Intersection Location Number
Traffic Signal

2 Number of Travel Lanes
U Undivided Roadway
D Divided Roadway

0 2,000
Scale (Feet)

Source: ESRI, 2014

3. Existing Conditions

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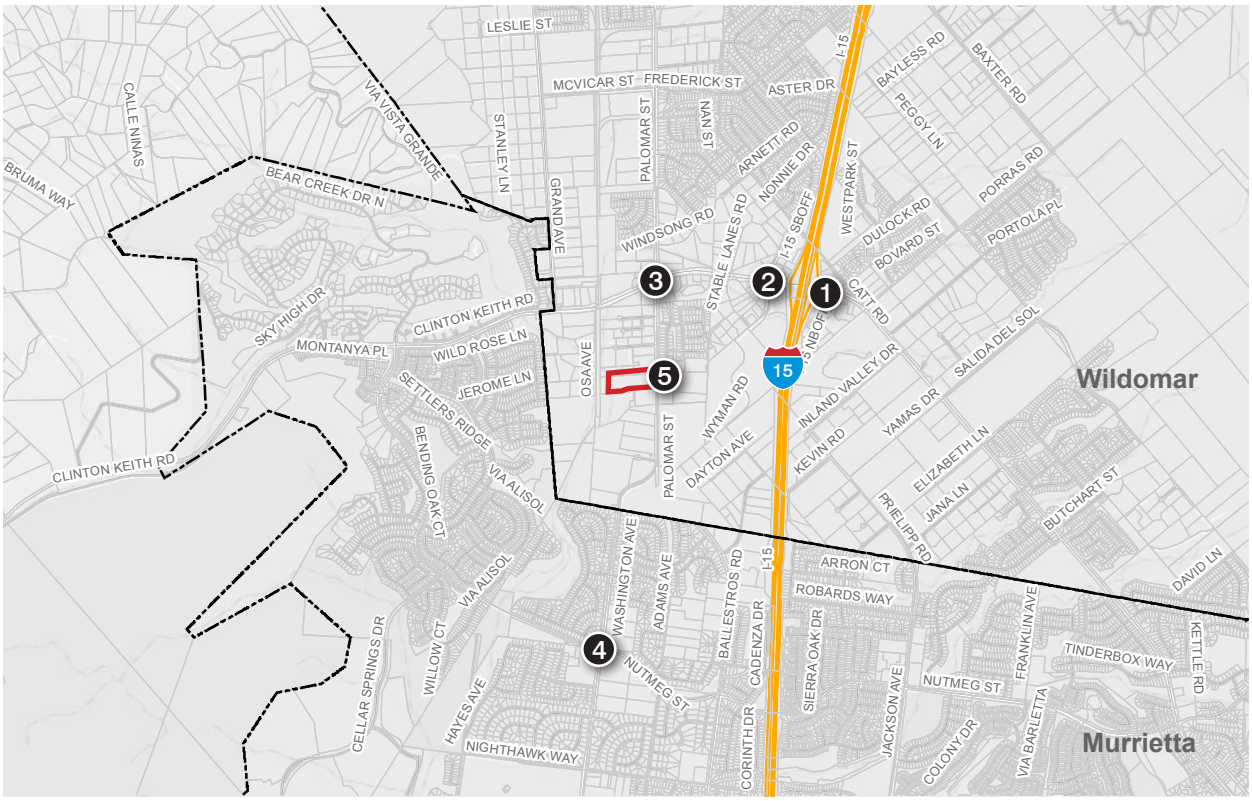
Figure 4 - Existing AM and PM Peak Hour Intersection Volumes



1 I-15 NB Off Ramps/ Clinton Keith Rd

SB		WB
0/0 0/0 0/0		445/433 660/668 0/0
318/230 804/864 0/0 EB	287/578 4/1 282/397 NB	

2 I-15 SB Off Ramps/ Clinton Keith Rd

SB		WB
303/415 1/1 413/436		0/0 652/986 288/268
0/0 707/656 631/460 EB	0/0 0/0 0/0 NB	

3 Palomar St/ Clinton Keith Rd

SB		WB
44/16 87/106 213/155		159/163 337/612 193/278
27/37 637/526 70/59 EB	32/60 82/201 225/192 NB	

4 Washington Ave/ Nutmeg St

SB		WB
44/17 265/287 52/63		35/110 151/206 160/115
46/15 231/148 463/261 EB	269/348 213/291 108/114 NB	

5 Palomar St/ Project Access Driveway

SB		WB
0/0 350/443 0/0		0/0 0/0 0/0
0/0 0/0 0/0 EB	0/0 339/453 0/0 NB	

Site Boundary

City Boundary

1 Intersection Location Number

0 4,000
Scale (Feet)

Source: ESRI, 2014

3. Existing Conditions

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4. Project Traffic

4.1 TRIP GENERATION

As stated previously, the project would have a capacity of 594 students from grades K to 8. The trip generation was calculated based on rates in the ITE Trip Generation Manual (9th edition) for Land Use 520, Elementary School. Table 3, *Project Trip Generation,* shows the trip generation rates and project trip generation for the AM and PM peak hours and daily. The project is expected to generate up to 766 vehicle trips on a typical weekday, with 267 trips (147 inbound and 120 outbound) during the AM peak hour and 89 trips (44 inbound and 45 outbound) during the PM peak hour.

The general approach for conducting traffic impact analyses is to evaluate weekday peak hour traffic during the commute peak traffic conditions that generally occur from 7 to 9 AM and 4 to 6 PM. It should be noted that the project would generate 75 inbound trips and 91 outbound trips during the school pick-up hour at approximately 3 PM. These volumes are less than the volumes calculated for the AM peak hour, which coincides with the AM peak hour traffic on the overall street network. However, because the peak traffic in the afternoon occurs earlier than the general traffic in the area, the overall PM peak hour at the circulation network is evaluated in this analysis. This study focuses on the highest volume traffic hour during commute peak hours, but also considers on-site drop-off and loading during the period at the end of the school day. The performance of the project access during school drop-off and pick-up times is evaluated in detail in Section 7 of this report.

Table 3 Project Trip Generation

		Trip Generation[1]						
			AM Peak Hour			PM Peak Hour[3]		
Land Use	Unit1	Daily	In	Out	Total	In	Out	Total
Elementary School Rates [2]	STU	1.29	0.25	0.20	0.45	0.07	0.08	0.15
Project Trip Generation	**594**	**766**	**147**	**120**	**267**	**44**	**45**	**89**

Notes:
[1] Units are per student.
[2] Based on rates for land use code 520 of the ITE's Trip Generation Manual, 9th Edition.
[3] Commute PM peak hour from 4 to 6 PM.

4.2 TRIP DISTRIBUTION

The project's trip distribution is based on data provided by the Sycamore Academy for current student enrollment at its current facility less than ½ mile from the proposed site. The traffic that would be generated by the school was geographically distributed onto the street network by evaluating the layout of the study area roadway network and the distribution of the students' residences. The data was aggregated in zones in GIS to

estimate the general direction of travel and likely routes to be utilized to and from the project. Figure 5, *Project Trip Distribution,* presents the anticipated trip distribution for the school. The data show that approximately 50 percent of the students live in Wildomar, 20 percent in Lake Elsinore, 20 percent in Murrieta, and the remaining in other parts of the county. Appendix C shows the student distribution map according to existing enrollment data.

4.3 MODAL SPLIT AND TRIP ASSIGNMENT

The trip distribution percentages are applied to the project trip generation to determine the traffic volumes forecast to be added at each intersection (i.e., trip assignment). Figure 6, *Project AM and PM Peak Hour Intersection Volumes*, shows the trip assignment for the proposed project for the study area intersections.

4.4 EXISTING PLUS PROJECT TRAFFIC CONDITIONS

To assess Existing Plus Project traffic conditions, existing traffic is combined with project traffic. The intersection operations for the Existing Plus Project traffic conditions have been calculated and are shown in Table 4, *Intersection Delay and LOS, Existing Plus Project Conditions*. Figure 7 presents the *Existing Plus Project AM and PM Peak Hour Intersection Volumes.*

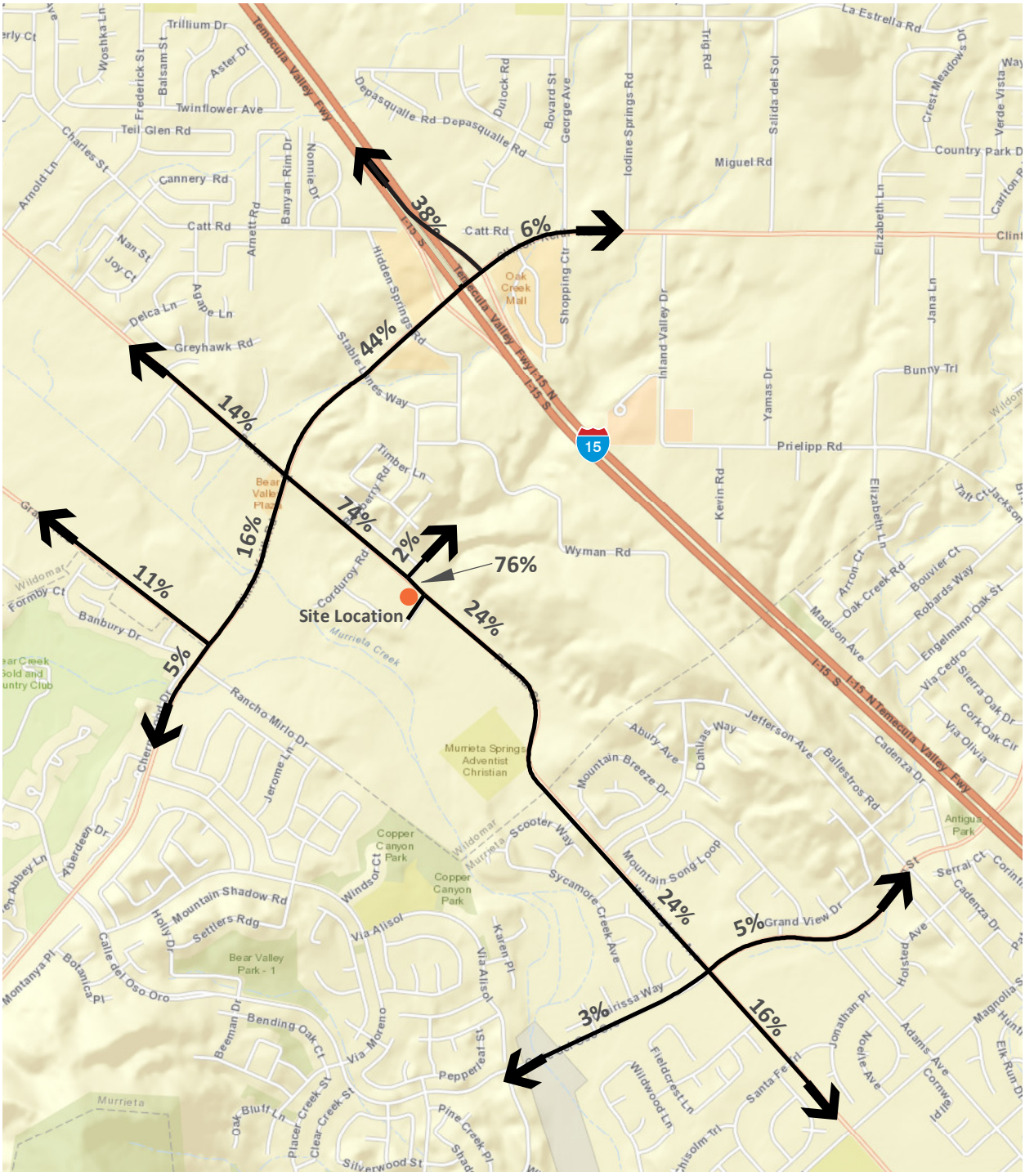
Table 4 Intersection Delay and LOS, Existing Plus Project Conditions.

Intersection	Jurisdiction	AM Peak Hour		PM Peak Hour	
		Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS
1. I-15 Southbound Ramps at Clinton Keith Road	Caltrans	14.3	B	15.0	B
2. I-15 Northbound Ramps at Clinton Keith Road	Caltrans	14.4	B	13.7	B
3. Palomar Street at Clinton Keith Road	Wildomar	35.7	D	28.5	C
4. Washington Street at Nutmeg Street/Calle Del Oso Oro	Murrieta	31.1	D	28.5	C
5. Project Access at Palomar Street	Wildomar	20.9	C	18.8	C

Notes:
Intersections 1 to 4 are signalized, Project access would be unsignalized. The project Access details are presented in Section 7 of this report.
Delay and LOS worksheets for Existing Plus Project conditions are included in Appendix "D".

All study area intersections would operate at acceptable levels of service during the peak hours for Existing Plus Project traffic conditions. Significant impacts are determined by comparing with- and without-project scenarios for each traffic condition. As discussed in Section 2.2, impacts could only occur at intersections where there is a deficiency (LOS E of F). No impacts would occur during Existing Plus Project conditions.

Figure 5 - Project Trip Distribution



Route from Project

XX% Percent from Project

NOTE: Inbound trip distribution utilizes I-15 freeway soutbound off-ramp

0 2,000
Scale (Feet)

Source: ESRI, 2014

4. Project Traffic

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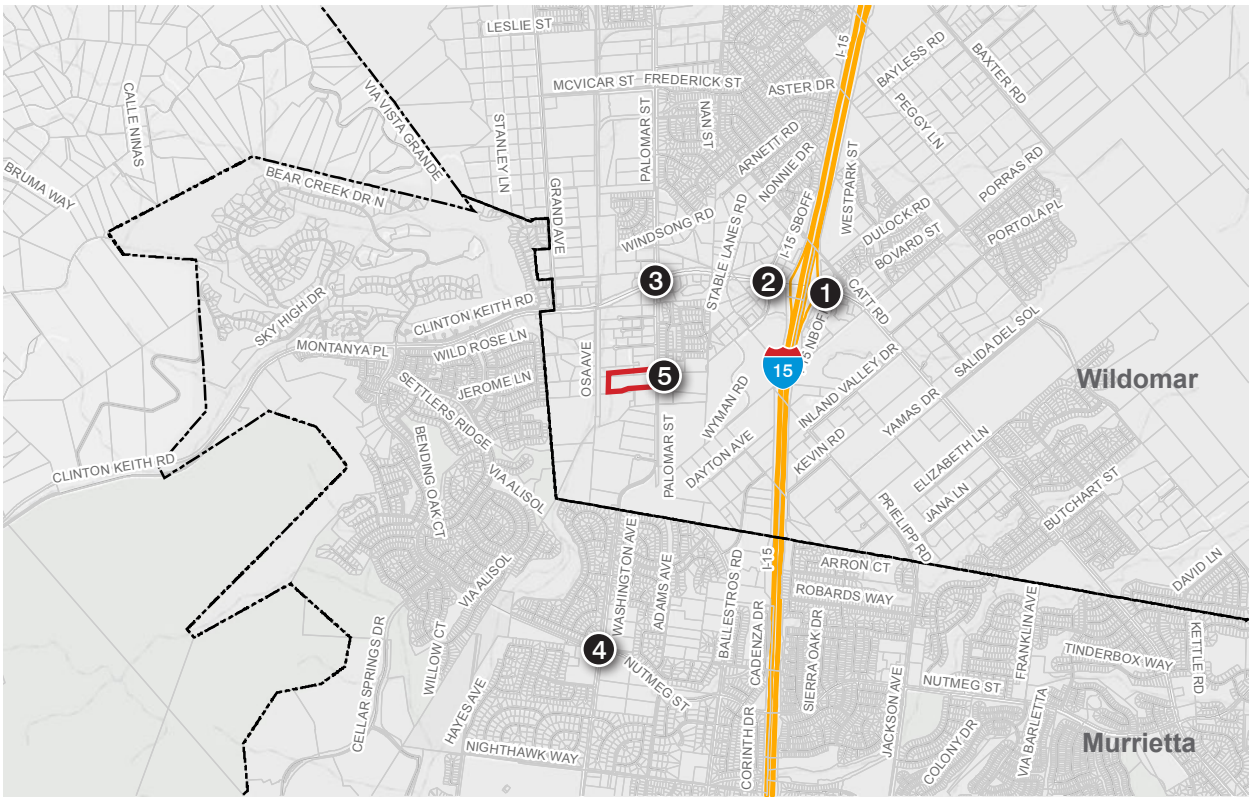
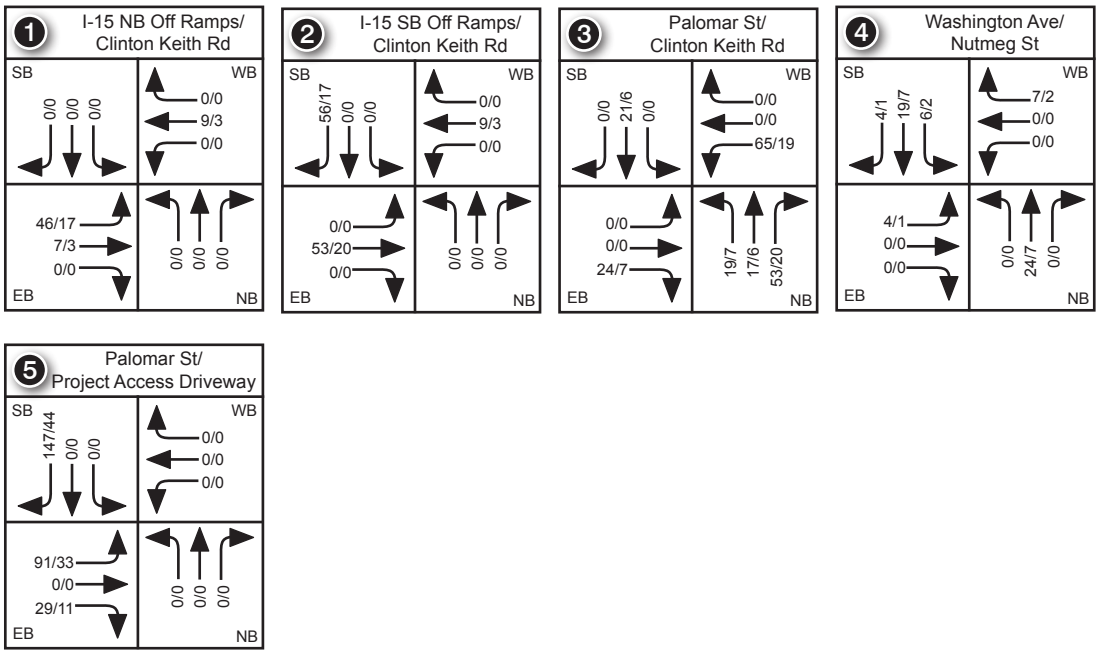
Figure 6 - Project AM and PM Peak Hour Intersection Volumes





Site Boundary

City Boundary

1 Intersection Location Number

0 4,000
Scale (Feet)

Source: ESRI, 2014

4. Project Traffic

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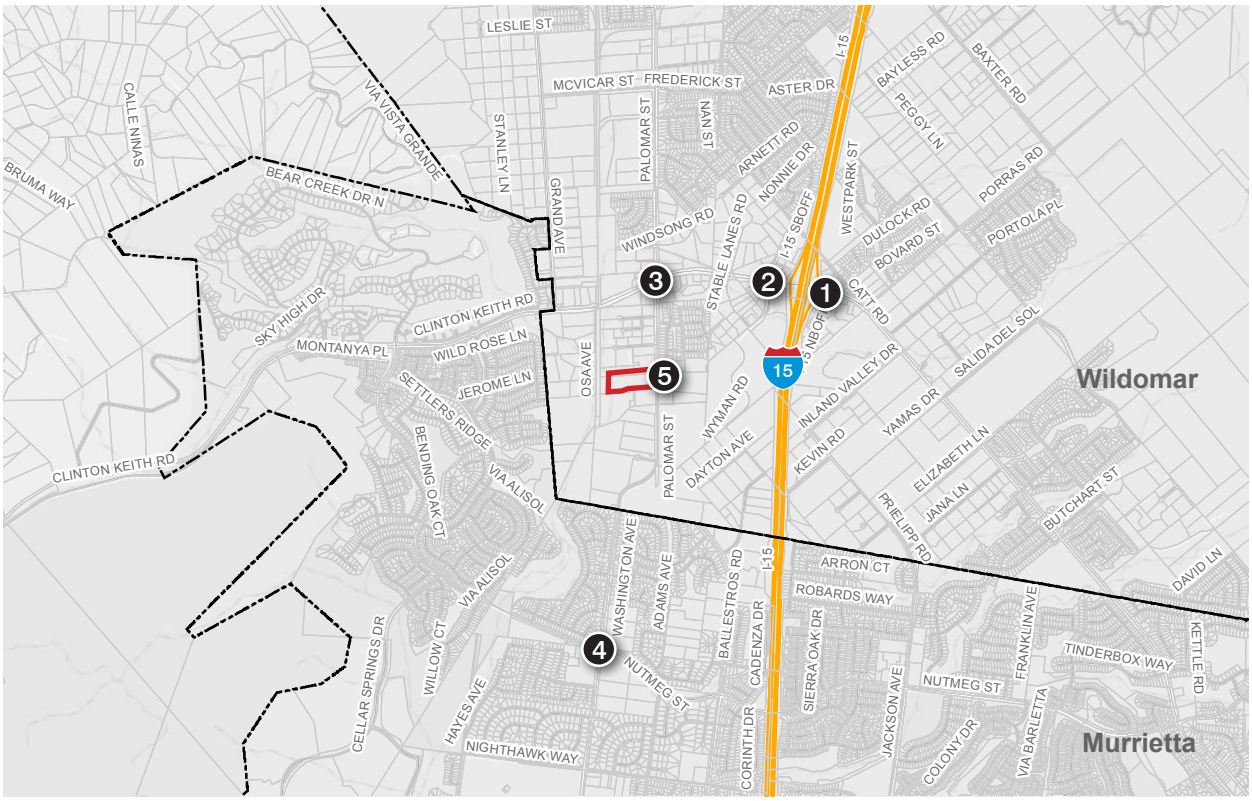
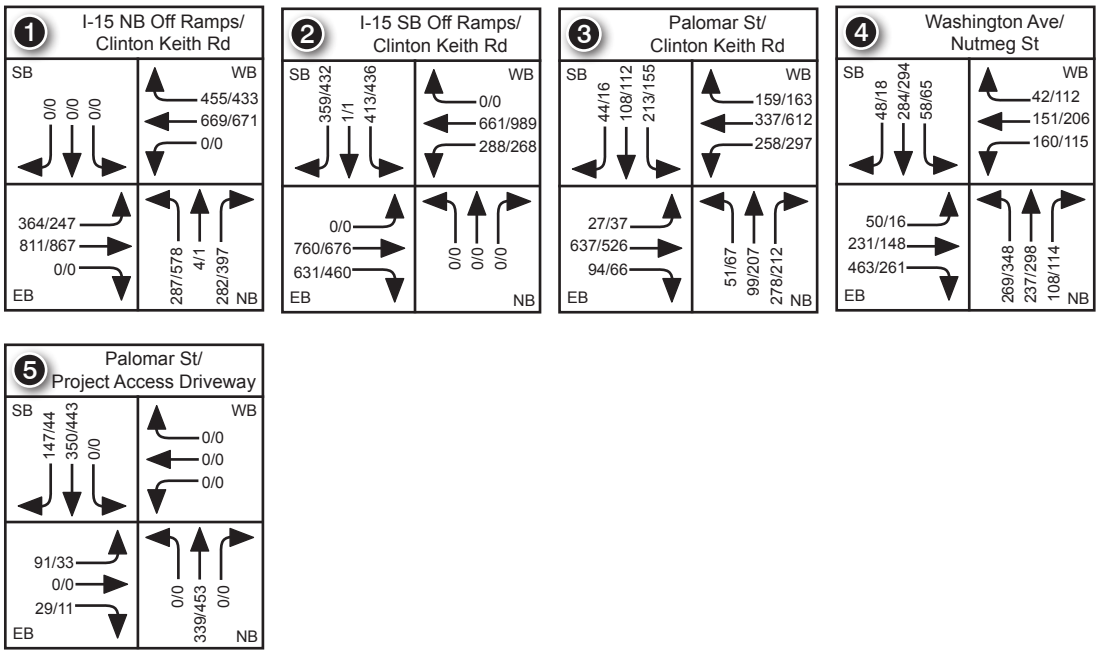
Figure 7 - Existing Plus Project AM and PM Peak Hour Intersection Volumes





Site Boundary

City Boundary

1 Intersection Location Number

0 4,000
Scale (Feet)

Source: ESRI, 2014

4. Project Traffic

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5. Future Traffic Conditions

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. This ambient growth rate is added to existing traffic volumes to account for area-wide growth not reflected by cumulative development projects. Future year traffic forecasts for 2016 traffic conditions have been based upon two years of ambient growth at 2 percent per year. The total ambient growth is the compounded growth of 2 percent per year over two years, which results in a total growth of 4 percent.

For the purposes of this analysis, a list of cumulative projects anticipated to contribute traffic to any study area facility by project opening year 2016 was developed through consultation with staff from the cities of Wildomar and Murrieta. The list consists of cumulative projects that are reasonably and foreseeably anticipated to be constructed and operational by 2016. Figure 8, *Cumulative Developments Location Map,* shows the cumulative developments included in the analysis. The trip generation rates are given in Table 5, and a summary of cumulative development land uses and resulting trips is in Table 6. The cumulative development projects assumed in this traffic analysis are estimated to generate 9,984 trip-ends per day during a typical weekday, with approximately 682 vehicle trips during the AM peak hour and 1,022 vehicle trips during the PM peak hour. The AM and PM traffic volumes from cumulative projects are shown in Figure 9, *Cumulative Projects AM and PM Peak Hour Intersection Volumes.*

5. Future Traffic Conditions

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Table 5 Cumulative Projects Trip Generation Rates

Land Use	ITE Land Use Code	Trip Generation[2]							
		Unit[1]	AM Peak Hour			PM Peak Hour			Daily
			In	Out	Total	In	Out	Total	
Single Family Residential	210	DU	0.19	0.56	0.75	0.63	0.37	1.00	9.52
Residential Condominium/Townhouse	230	DU	0.07	0.37	0.44	0.35	0.17	0.52	5.81
Shopping Center	820	TSF	0.60	0.36	0.96	1.78	1.93	3.71	42.70
Apartments	220	DU	0.08	0.43	0.51	0.42	0.2	0.62	6.63
Day Care	565	TSF	6.46	5.72	12.18	5.80	6.54	12.34	74.06

Notes:
[1] DU = Dwelling Units, TSF = thousand square feet..
[2] Based on rates from the ITE's Trip Generation Manual, 9th Edition.

Table 6 Cumulative Projects Trip Generation

City	Project ID	City of Wildomar Project #	Project Name	Land Use	Quantity	Units	AM Peak Hour			PM Peak Hour			Daily
							In	Out	Total	In	Out	Total	
Wildomar	W1	12-0392	Lesle (Tract 36519)	SFR	10	DU	2	6	8	6	4	10	95
	W2	12-0395	C.V. Communities (Tract 25122 & Tract 32078)	SFR	157	DU	30	88	118	99	58	157	1,495
	W3	13-0033	C.V. Communities (Tract 32535)	SFR	84	DU	16	47	63	53	31	84	800
	W4	12-0015	Lennar Homes Andalusia (Tract 30839 & Tract 30939)	SFR	55	DU	10	31	41	35	20	55	524
	W5	11-0099	Meritage Homes (Tract 31499)	SFR	74	DU	14	41	55	47	27	74	704

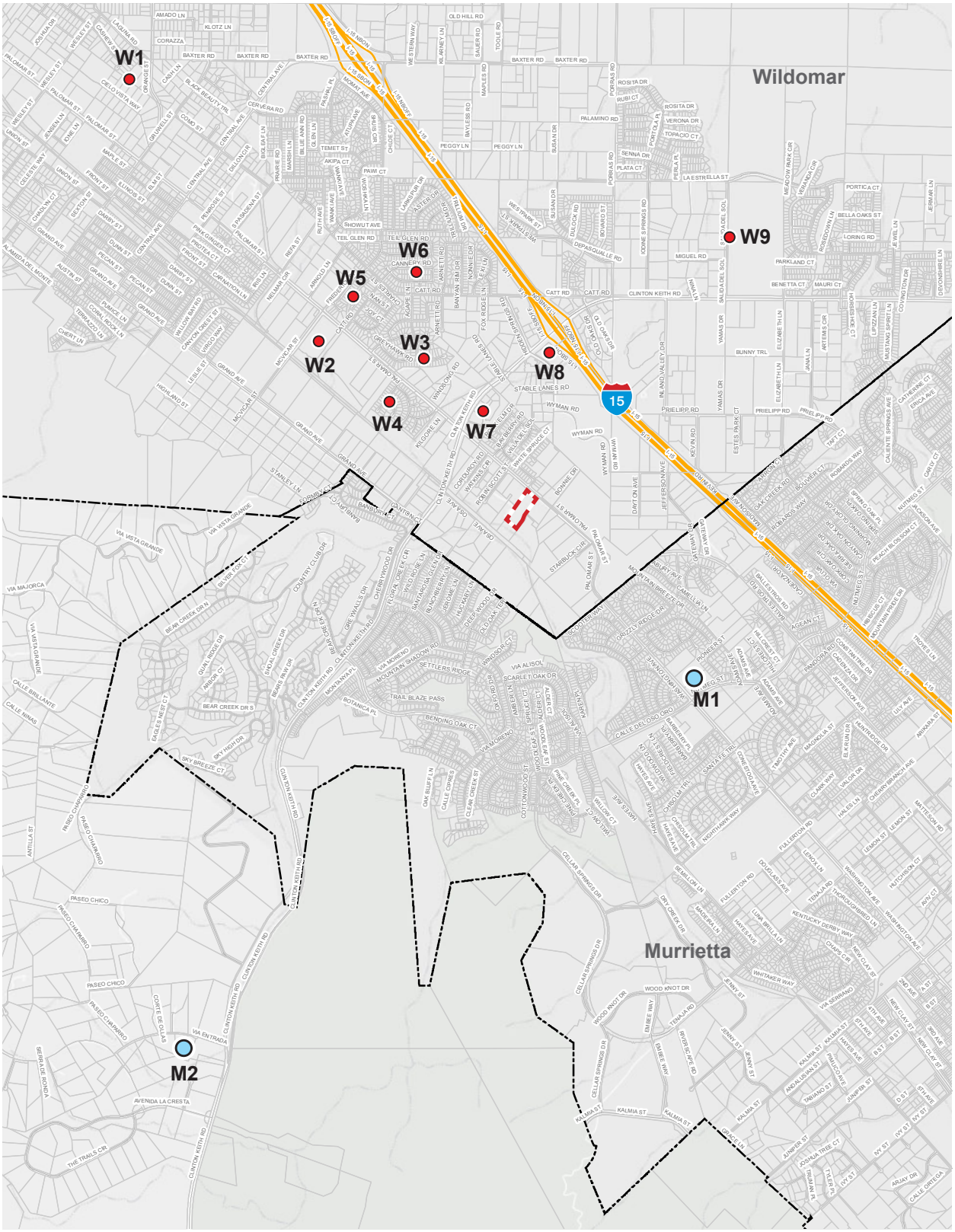
5. Future Traffic Conditions

Table 6 Cumulative Projects Trip Generation

City	Project ID	City of Wildomar Project #	Project Name	Land Use	Quantity	Units	AM Peak Hour			PM Peak Hour			Daily
							In	Out	Total	In	Out	Total	
	W6	12-0401	Andalusia I (Tract 31837)	SFR	44	DU	8	25	33	28	16	44	419
	W7	08-0166	Stable Lanes Retail Center	Retail	20,894	SF	13	8	21	37	40	77	892
				Day Care	9,305	SF	60	53	113	54	61	115	689
				Subtotal	30,199	SF	73	61	134	91	101	192	1,581
	W8	08-0072	Wildomar Square Retail Center (PM 36080)	Retail	46,600	SF	28	17	45	83	90	173	1,990
	W9	13-0083	Rancon 51 Development Agreement (Tract 31479)	SFR	51	DU	10	29	39	32	19	51	486
Murrieta	M1		Nutmeg Apartments Tract 28333-2	Apartments	210	DU	17	90	107	88	42	130	1,392
	M2		Bear Creek (TTM 36328)	SFR	52	DU	10	29	39	33	19	52	498
						Total Cumulative Projects	218	464	682	595	427	1,022	9,984

Notes: Project ID corresponds to Figure 8, Cumulative Developments Location Map
Trip generation for Wildomar projects were calculated based on rates from the ITE Trip Generation Manual, 9th Edition.
Trip generation for Murrieta projects were obtained from respective traffic studies provided by the City of Murrieta.

Figure 8 - Cumulative Developments Location Map



Source: ESRI, 2014

5. Future Traffic Conditions

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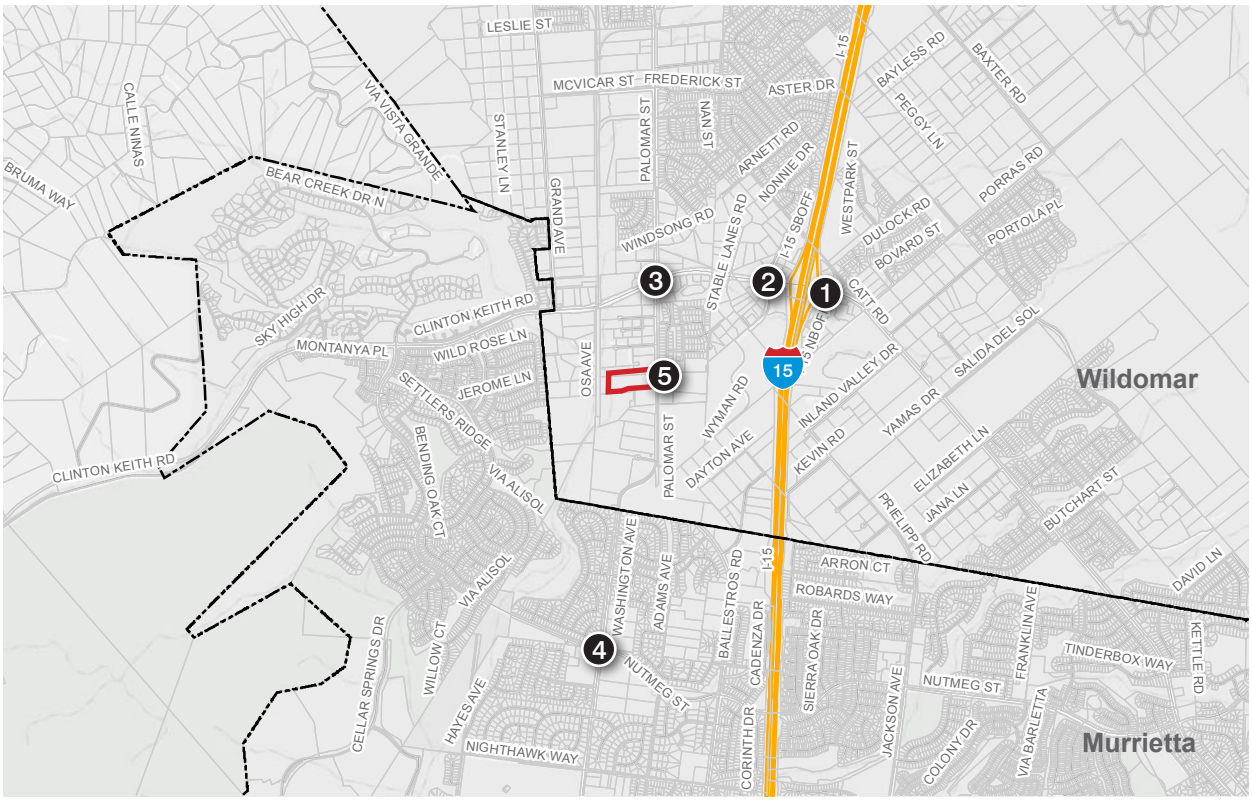
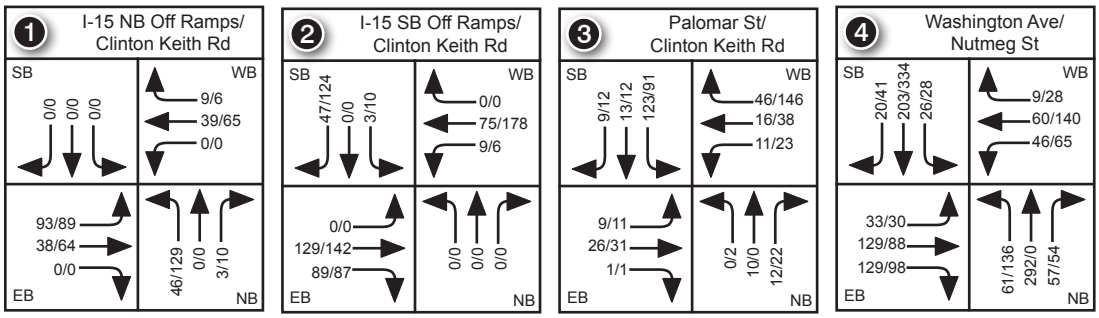
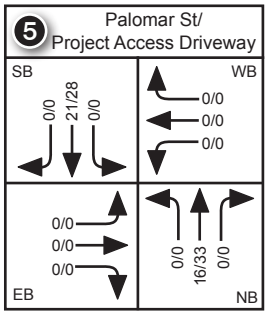
Figure 9 - Cumulative Projects AM and PM Peak Hour Intersection Volumes







Site Boundary

City Boundary

1 Intersection Location Number

0 4,000
Scale (Feet)

Source: ESRI, 2014

5. Future Traffic Conditions

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5.1 2016 NO PROJECT TRAFFIC CONDITIONS

To assess future background traffic conditions at the time of project opening year, existing traffic is combined with the anticipated ambient growth and the traffic from cumulative developments anticipated to be operational in 2016. The intersection operations for the 2016 No Project traffic conditions have been calculated and are given in Table 7, *Intersection Delay and LOS, 2016 No Project Conditions*. Figure 10 shows the *2016 No Project AM and PM Peak Hour Intersection Volumes.*

Table 7 Intersection Delay and LOS, 2016 No Project Conditions.

Intersection	Jurisdiction	AM Peak Hour		PM Peak Hour	
		Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS
1. I-15 Southbound Ramps at Clinton Keith Road	Caltrans	15.2	B	17.5	B
2. I-15 Northbound Ramps at Clinton Keith Road	Caltrans	14.5	B	14.3	B
3. Palomar Street at Clinton Keith Road	Wildomar	41.4	D	35.3	D
4. Washington Street at Nutmeg Street/Calle Del Oso Oro	Murrieta	38.6	D	44.2	D

Notes:
Intersections 1 to 4 are signalized.
Delay and LOS worksheets for 2016 No Project conditions are included in Appendix "E".

All study area intersections would operate at acceptable levels of service during the peak hours for 2016 No Project traffic conditions.

5.2 2016 WITH PROJECT TRAFFIC CONDITIONS

To assess future traffic conditions with the project at the time of project opening year, project traffic is added to the background 2016 conditions discussed above. The intersection operations for the 2016 With Project traffic conditions have been calculated and are listed in Table 8, *Intersection Delay and LOS, 2016 With Project Conditions*. Figure 11 shows the *2016 With Project AM and PM Peak Hour Intersection Volumes.*

Table 8 Intersection Delay and LOS, 2016 With Project Conditions.

Intersection	Jurisdiction	AM Peak Hour		PM Peak Hour	
		Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS
1. I-15 southbound Ramps at Clinton Keith Road	Caltrans	15.4	B	17.7	B
2. I-15 northbound Ramps at Clinton Keith Road	Caltrans	15.1	B	14.3	B
3. Palomar Street at Clinton Keith Road	Wildomar	45.5	D	37.7	D
4. Washington Street at Nutmeg Street/Calle Del Oso Oro	Murrieta	39.6	D	44.6	D
5. Project Access at Palomar Street	Wildomar	20.5	C	19.7	C

Notes:
Intersections 1 to 4 are signalized, Project access would be unsignalized.
Delay and LOS worksheets for 2016 Wth Project conditions are included in Appendix "F".

5. Future Traffic Conditions

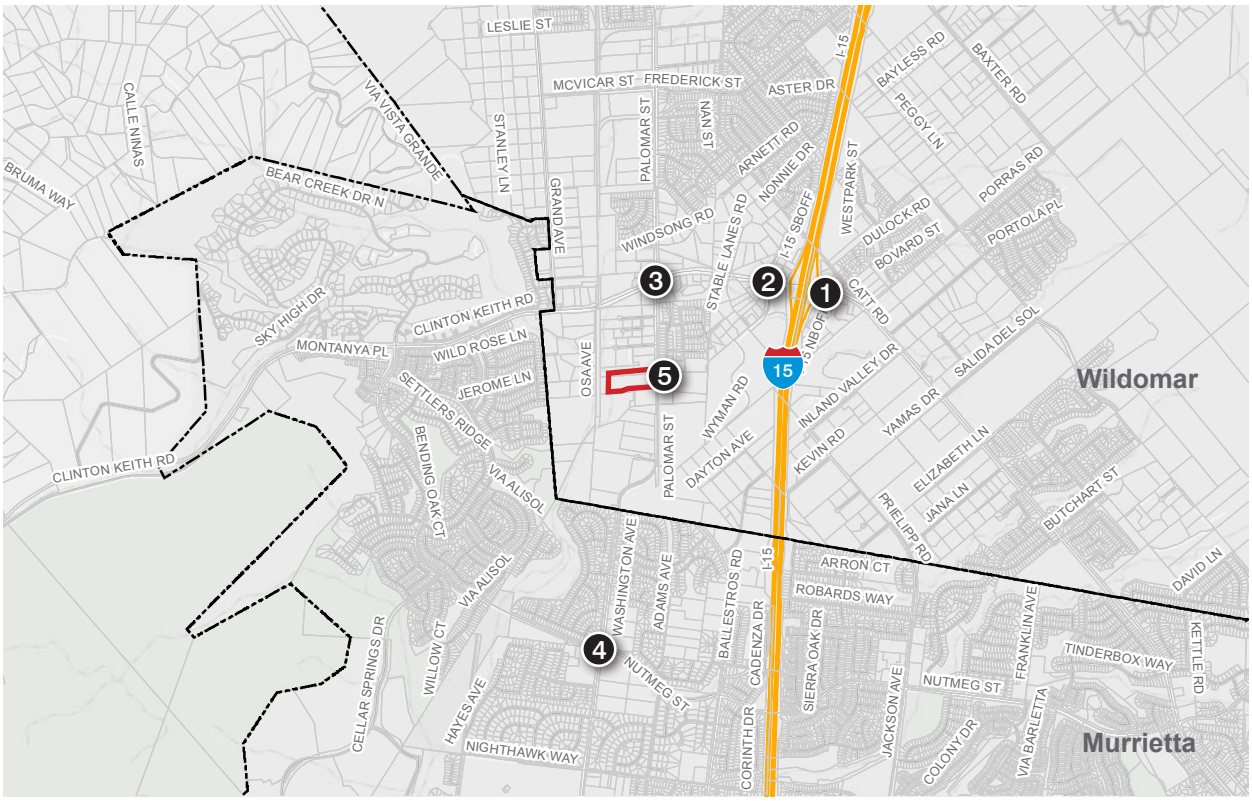
Significant impacts are determined by comparing with- and without-project scenarios for each traffic condition. As discussed in Section 2.2, potential traffic impacts would occur if, during the weekday peak hours:

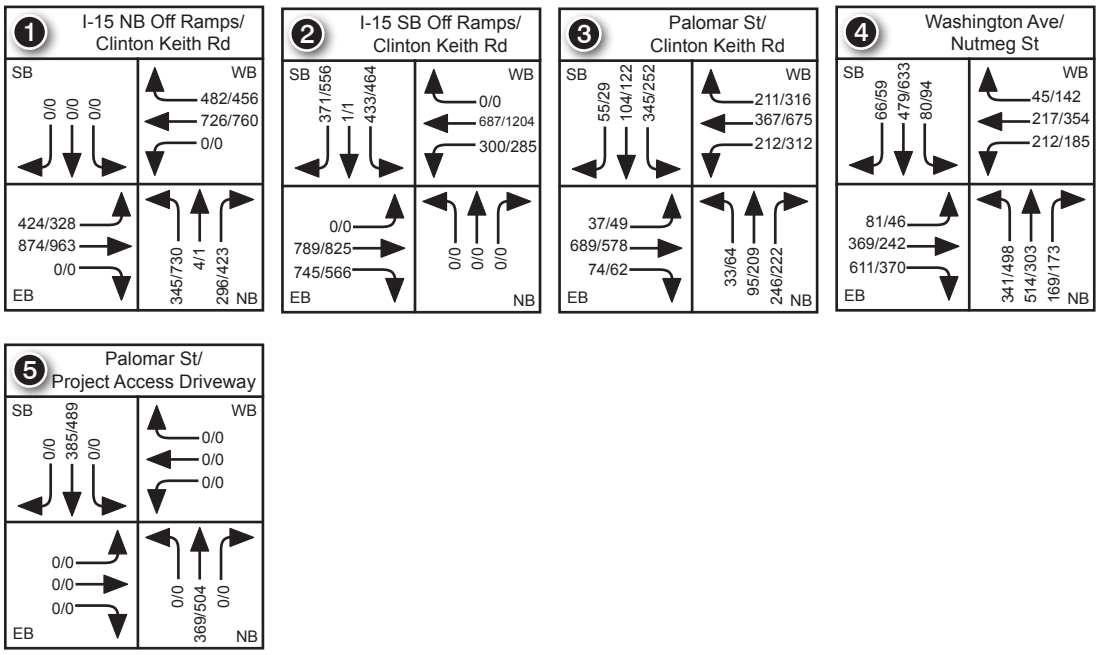
- At intersections currently operating at acceptable LOS (A to D), the addition of project trips would change the LOS to an unacceptable LOS E or F.

- At intersections currently operating at unacceptable LOS E or F, the project would increase the delay by more than 5 seconds.

The maximum increase in delay related to the project would occur at the intersection of Palomar Street at Clinton Keith Road—an increase of 4.1 seconds in the AM peak hour. All study area intersections would continue to operate at acceptable levels of service during the peak hours for 2016 With Project traffic conditions. Therefore, the project would not cause a significant impact at any study area intersection. No mitigation would be required.

Figure 10 - 2016 No Project AM and PM Peak Hour Intersection Volumes





Site Boundary

City Boundary

1 Intersection Location Number

0 4,000
Scale (Feet)

Source: ESRI, 2014

5. Future Traffic Conditions

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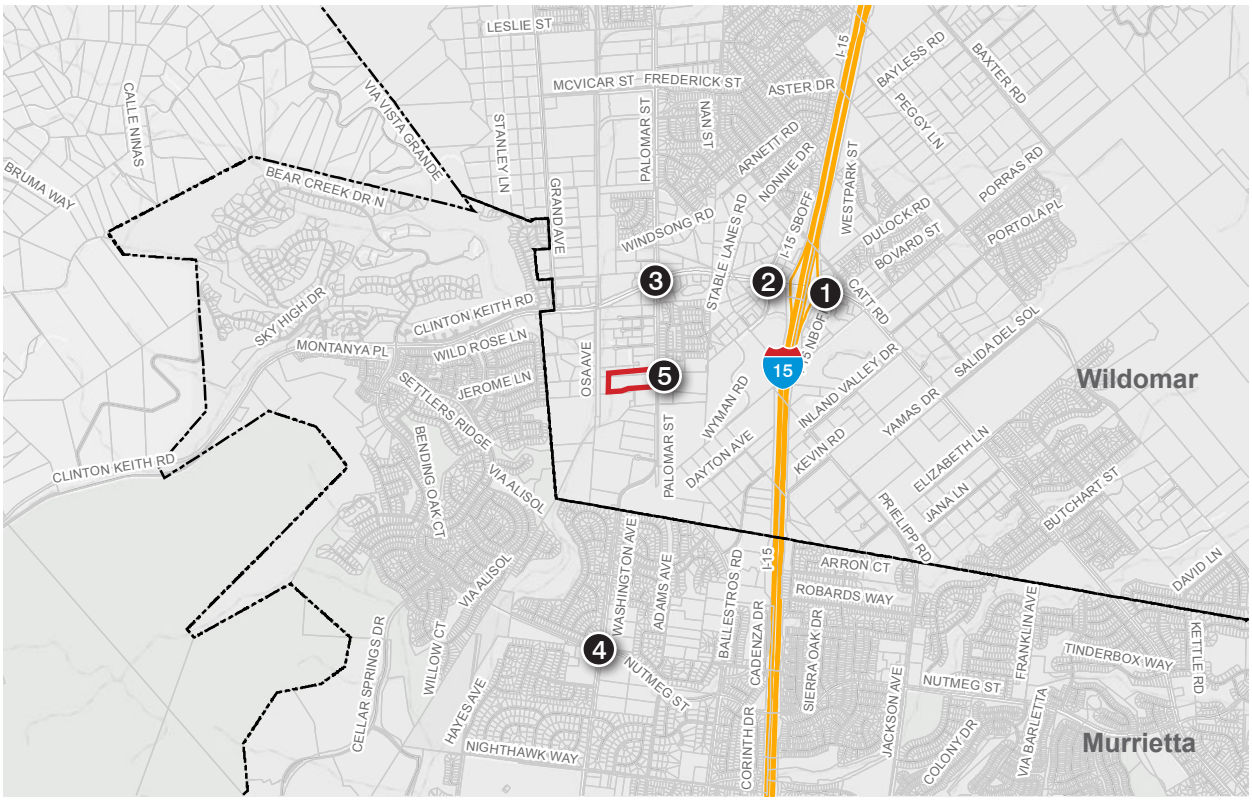
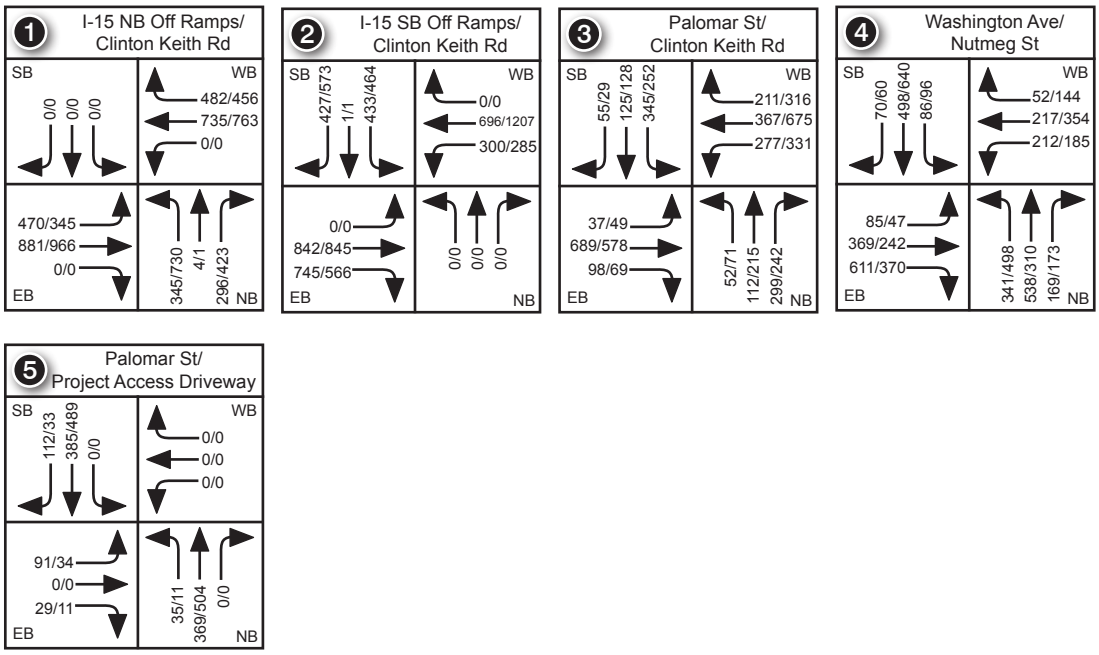
Figure 11 - 2016 With Project AM and PM Peak Hour Intersection Volumes





Site Boundary

City Boundary

1 Intersection Location Number

0 4,000
Scale (Feet)

Source: ESRI, 2014

5. Future Traffic Conditions

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6. Congestion Management Plan Conformance

The Congestion Management Program (CMP) in effect in Riverside County was approved by the Riverside County Transportation Commission (RCTC) in 2011. All freeways and selected arterial roadways in the county are designated elements of the CMP system of highways and roadways. The nearest CMP roadway from the study area is Interstate 15. According to the RTCT CMP plan, when a deficiency is identified, a deficiency plan must be prepared by the local agency (in this case Caltrans). Other agencies identified as contributors to the deficiency, which include the City of Wildomar and the County of Riverside, are also required to coordinate with the development of the plan. The plan must contain mitigation measures, including consideration of Transportation Demand Management strategies and transit alternatives, and a schedule for mitigating deficiency.

The project would generate 267 AM peak hour trips and is not considered a project of regional significance. The project would add 51 peak hour trips to each direction of travel on the I-15 Freeway during the AM peak hour, which is negligible compared to approximately 6,000 trips in each direction during the peak hour. Therefore, the project would not conflict with the RCTC CMP.

6. Congestion Management Plan Conformance

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7. Site Access

The following discusses project site access features, including drop-off/pick-up, queues, and sight distance.

7.1 PROPOSD SITE ACCESS DRIVEWAYS AND STUDENT PICK-UP/DROP-OFF

Site access will be provided via a driveway on Palomar Street that would allow for full access (right turn in, right turn out, left turn in, and left turn out movements). Left turns in would be provided via a left turn pocket just south of the project driveway. The access driveway would be in the southeastern corner of the site, approximately 280 feet south of the driveway of the adjacent church, as shown in Figure 12, *Project Site Access*.

A student drop-off and pick-up area is proposed on-site in the south portion of the site at the overflow parking area. Vehicles could circulate on-site within the parking lots of the school. Loading along Palomar Street would be prohibited. A driveway of approximately 350 feet would run along the southern boundary of the site. That driveway would reach an overflow parking area with a driveway approximately 200 feet long at the eastern portion of the parking lot. The drop-off and pick-up route would run counter-clockwise along the overflow parking lot just south of the school buildings. Assuming an average length of 25 feet per vehicle, the internal driveways could accommodate up to 22 vehicles before the student drop-off point.

7.2 QUEUES

This analysis estimates whether the lengths of the northbound left turn approach and storage lane on Palomar Street would adequately accommodate the anticipated traffic volumes accessing the school during the AM drop-off, PM pick-up periods. Vehicular queuing was analyzed to assess the potential for vehicles arriving from the south that would wait on the median at Palomar Street to make a left turn into the school access driveway and into the school drop-off zone. The auxiliary lane should be sufficiently long to store the number of vehicles likely to accumulate during the critical drop-off and pick-up periods to avoid the possibility of left-turn vehicles stopping in the through lanes to wait for a gap in the opposing traffic flow. An analysis consistent with the HCM methodology was performed for the 95th percentile queue for the school open year condition using the Synchro traffic analysis software. The 95th percentile queue is the queue length that has only a 5 percent probability of being exceeded during the analysis period.

As discussed in Section 4, the highest turn movement volumes at the access driveway would occur during the AM peak hour with student drop-off. Figure 12, *Project Site Access,* illustrates the projected volumes during the AM drop-off, PM peak up, and PM street peak hours. This analysis focuses on the worst-case scenario that occurs in the AM peak hour, when the traffic volumes related to the school are highest and coincide with the AM traffic peak hour on streets. Since the volumes for other periods are similar but less than in the AM peak, the afternoon pick-up and peak hour times have not been evaluated in detail. During the AM peak hour the

project would generate 147 vehicular inbound trips, and these would be spread over the hour with a higher concentration approximately 30 minutes prior to class times start. During the AM peak hour, 35 vehicles would access the site from the south making a left turn into the site driveway. In this case the number of southbound vehicles on Palomar Street opposing the north left turn would be 369, and the number of vehicles making a left-turn out would be 91. The southbound volumes on Palomar Street in the AM peak hour would be 385, and there would be sufficient gaps to prevent a substantial buildup in the queue. Based on a detailed review of the HCM calculation worksheets, the northbound left approach is expected to operate at LOS "A". The 95th percentile queue for the northbound left turn lane would be one vehicle because, on average, one car would make a northbound left turn every two minutes during the AM peak hour. However, it should be noted that at times the queues may be greater because arrivals at the school may be concentrated in a shorter period, especially in the AM peak hour. The Geometric Design of Highways and Streets published by the American Association of State Highway and Transportation Officials (AASHTO) recommends, as a rule of thumb, that unsignalized intersections provide sufficient storage for the number of vehicles likely to arrive in an average 2-minute interval. The worst-case scenario would occur during the AM drop-off time, when 35 vehicles make a northbound left turn into the school's driveway. Assuming a worst-case scenario where 75 percent of those cars arrive in a 15-minute period, a 2-minute interval would have an average of 4 arrivals at the northbound left-turn lane. Therefore, according to AASHTO's 2-minute arrival rule of thumb, a storage length would need to allow for 4 vehicles. The section of Palomar Street in front of the school and extending approximately 300 feet to the south of the site would be widened, and a striped pocket on the northbound left turn lane on Palomar Street would be provided to allow storage along the section of the road that would be widened. A striped pocket that would extend a minimum of 100 feet south of the driveway access to allow for storage of up to 4 vehicles should be sufficient to accommodate the longest queue expected most of the time. The striped pocket should be tapered or extended to allow proper vehicle deceleration into the left turn lane.

Finally, on-site queuing along the student drop-off/pick-up route would minimize vehicular queuing extending into the adjoining street and creating delays for through traffic. On-site queuing is generally not expected to extend onto the southbound lanes of Palomar, except during the drop-off and pick-up periods when queues may extend out of the school's access driveways. The typical morning peak drop-off and afternoon pick-up activity lasts about 20 minutes, and any possible queue would dissipate immediately after the drop-off and pickup periods. To facilitate circulation and to accommodate the potential for queues to spill into the southbound lanes at Palomar Street, curbside parking shall be prohibited along Palomar Street in front of the school.

7.3 SIGHT DISTANCE

Access to the school would be provided by a driveway on Palomar Street; no additional driveways are proposed in conjunction with the project. At intersections and project driveways, a substantially clear line of sight shall be maintained between the driver of a vehicle waiting at the crossroad and the driver of an approaching vehicle. Sight distance is the continuous length of roadway visible to the user. A preliminary sight distance evaluation prepared for the proposed driveway was based on criteria and procedures from the Caltrans in the State's Highway Design Manual (HDM). Table 201.1 "Sight Distance Standards" of the HDM

relates minimum sight distance values to a range of design speeds. For this analysis, a design speed of an arterial roadway of 45 mph has been utilized. Based on the design speed of 45 mph, the minimum sight distance from the access driveway on Palomar Street would be 360 feet. A preliminary sight distance diagram shown on Figure 13, *Sight Distance Evaluation*, has been prepared for the project access to Palomar Street and shows that sufficient sight distance would be provided, since the road is relatively straight and maintains a constant grade for at least 800 feet in each direction. Observations at the project site also indicate that the sight distance exceeds these standards at the existing driveway locations. Since the site would be easily accessible from arterials and the minimum peripheral visibility would be maintained per the Caltrans HDM, no mitigation measures would be necessary.

7. Site Access

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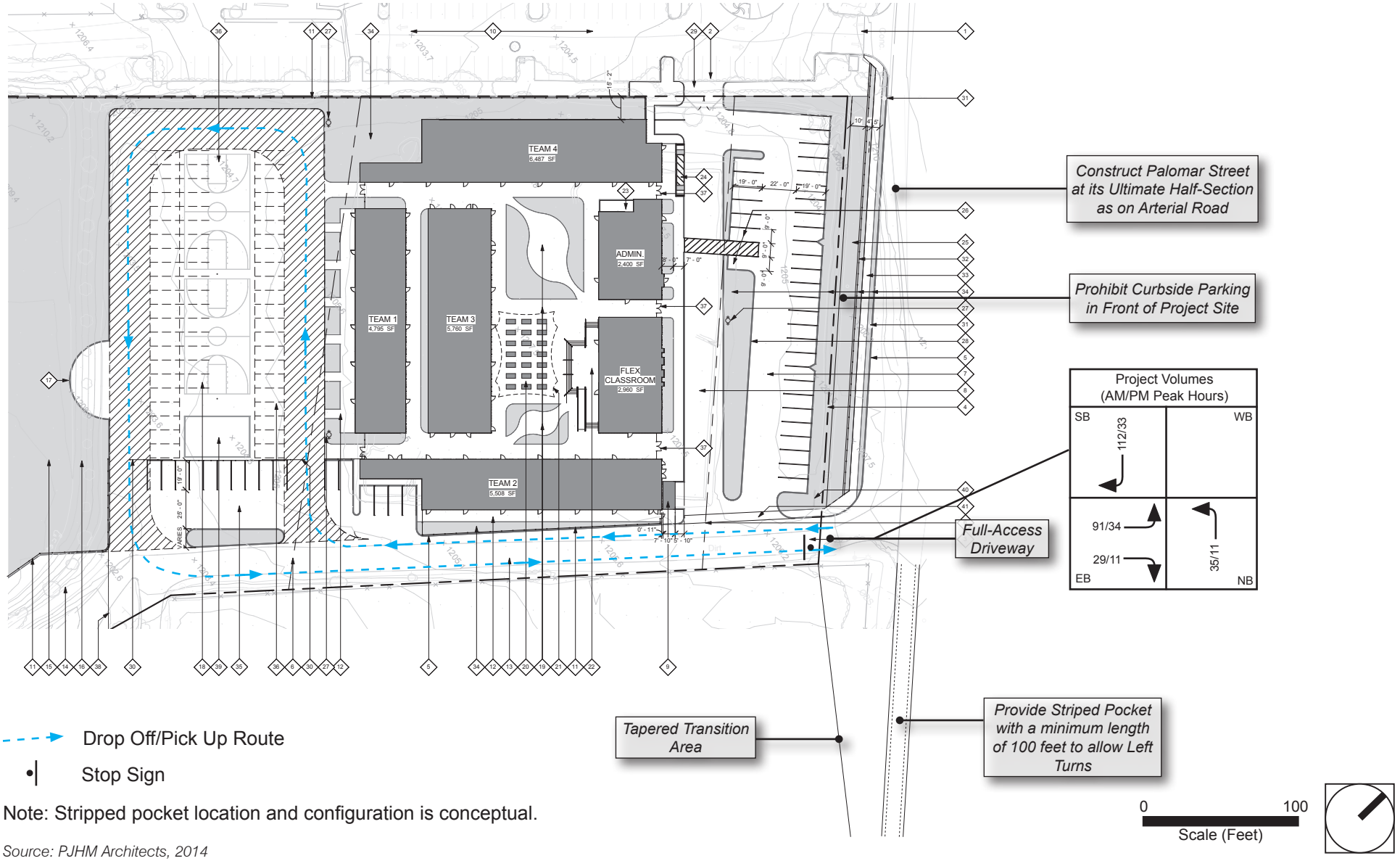
Figure 12 - Project Site Access



Note: Stripped pocket location and configuration is conceptual.

Source: PJHM Architects, 2014

7. Site Access

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Figure 13 - Sight Distance Evaluation

Note: Required stopping sight distance = 360'

Stop Sign

0 300
Scale (Feet)

Basemap Source: Google Earth Pro, 2014; Site Plan: PJHM Architects, 2014

7. Site Access

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8. Recommendations

- Construct Palomar Avenue at its ultimate half-section width as an arterial road with a right of way of 128 feet between the project's northern boundary and extending 300 feet south of the southern boundary with a taper rate and design standards set by the City of Wildomar. A striped pocket with a minimum length of 100 feet extending from the school's driveway entrance shall be included to allow for left turns into the project's access driveway.

- Prior to the opening of the project, the school shall work with the City of Wildomar to identify on-site traffic signing and striping to be implemented in conjunction with detailed construction plans for the project. These shall be in conformance with design standards from the California Manual of Uniform Traffic Control Devices for Streets and Highways (CA MUTCD) and City of Wildomar standards.

- Curbside parking shall be prohibited along Palomar Street in front of the school.

- Sight distance at the project access point should be precisely reviewed with respect to standard California Department of Transportation (Caltrans) and City of Wildomar standards at the time of preparation of final grading and street improvement plans. The final grading, landscaping, and street improvement plans shall demonstrate that sight distance standards are met. Such plans must be reviewed by the City and approved as consistent with this measure prior to issue of grading permits.

- The school shall continue to educate parents and students about the safety concerns related to on-street drop-off and pick-up. A "Suggested Route to School" plan should be prepared to provide information to students, parents, and faculty and to be used as a plan for implementing future pedestrian safety improvements. These proposed measures are subject to approval by the City of Wildomar.

- The school and the City of Wildomar should periodically review traffic operations in the vicinity of the project once the project is constructed to assure that traffic operations are satisfactory. If queuing at the entrance becomes an issue, it would be possible to prohibit northbound left turns during the drop-off and pick-up periods. This action would, however, require that parents arriving from the south take different routes and enter the site from the north via Clinton Keith Road or find opportunities to make a U-turn downstream on Palomar Street.

8. Recommendations

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9. References

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Institute of Transportation Engineers. Trip Generation, 9th Edition, 2012.

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9. References

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