

# **Cedar Avenue Technology Center TRAFFIC IMPACT ANALYSIS REPORT**

Prepared for

**County of San Bernardino**

385 N. Arrowhead Avenue  
San Bernardino, CA 92415

Prepared by



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## **EXECUTIVE SUMMARY**

This study analyzes the forecast traffic impact of the proposed Cedar Avenue Technology Center (the "Project"), located on a vacant 9.60-acre site on the northeast corner of Cedar Avenue and Orange Street in the unincorporated community of Bloomington, San Bernardino County. The proposed project will consist of a 184,770 square-foot Warehouse Center. The project will take access via Vine Street and Orange Street.

The project will generate approximately 863 trips per day, which includes approximately 74 AM (60 inbound and 14 outbound) peak hour trips and approximately 77 PM (20 inbound and 57 outbound) peak hour trips.

The results of the analysis show that all the study intersections are currently operating at acceptable level of service (LOS D or better). The addition of project-related trips to existing traffic volumes do not result in significant impacts at the study intersections. Therefore, no mitigation measures are required under Existing Plus Project conditions.

The Opening Year 2019 conditions analysis includes the addition of traffic generated by 8 approved or pending projects located in the San Bernardino County, City of Rialto and the City of Fontana. The cumulative projects that would contribute traffic within the larger study area are forecast to generate approximately 18,079 trips per day, which includes approximately 1,342 AM peak hour trips and approximately 1,433 PM peak hour trips.

Under the Opening Year 2019 without Project conditions, all study intersections are forecast to operate at acceptable levels of service (LOS D or better) with the exception of Cedar Avenue / I-10 Eastbound Ramps. The analysis results show the intersection of Cedar Avenue / I-10 Eastbound Ramp is forecast to operate at an unacceptable level of service (LOS 'E') in the AM peak hour. The intersection of Cedar Avenue / I-10 Eastbound Ramps continues to operate poorly (LOS 'E') with the addition of project-related traffic.

Improvements to the I-10 / Cedar Avenue interchange are currently in the design phase and projected to decrease congestion and improve traffic operations. The I-10 / Cedar Avenue interchange project includes widening the Interstate 10 overcrossing, roadway improvements along Cedar Avenue from Bloomington Avenue to Slover Avenue, and adding lanes to the freeway ramps. According to the San Bernardino Associated Governments (SANBAG) Federal Transportation Improvement Program, the I-10 / Cedar Avenue interchange project is fully funded and currently in design review. Construction notice to proceed is scheduled for February 2020 and complete for beneficial use is scheduled for January 2022 based on the March 2017 Project Status prepared by the San Bernardino County Transportation Authority. The I-10 Eastbound Ramp / Cedar Avenue intersection is included in the SANBAG Rialto Sphere Nexus Study Development Impact Fee (DIF) program, therefore, payment of the DIF for this intersection mitigates the project's potential contribution to significant impacts. As such, impacts at this intersection are considered less than significant and mitigation measures are not required.

Horizon Year 2035 without the proposed Project conditions analysis results show that all study intersections are expected to operate at acceptable levels of service (LOS D or better). With the addition of project-related traffic, all study intersections continue to operate at acceptable levels of service (LOS D or better). Therefore, no new significant impacts are expected to occur as a result of the proposed project. It should be noted that at the I-10 / Cedar Avenue interchange, the “Minimum Build Alternative” improvements evaluated in Caltrans Supplemental Traffic Operations Report dated May 11, 2016 prepared by Parsons is assumed in the Horizon Year 2035 Without and With Project conditions since improvements are anticipated to be constructed prior to Year 2035.

**Tables ES-1** and **ES-2** summarize the results of the peak hour intersection analysis under the Existing and Opening Year 2019 conditions without and with the proposed project. **Table ES-3** summarize the results of the peak hour intersection analysis under the Horizon Year 2035 conditions with and without the proposed project.

**Table ES-4** summarizes the intersection operations at the I-10 / Cedar Avenue interchange with the assumed improvements. Although the Cedar Avenue / I-10 Westbound Ramps are not significantly impacted by the project, Table 10 summarizes the operational improvements at this location since the interchange improvements include both the I-10 Eastbound and Westbound ramp intersections.

Interstate 10 / Cedar Avenue interchange improvements assumed in this analysis are illustrated graphically in **Exhibit ES-1**.

**Table ES-1  
Summary of Peak Hour Intersection Operations  
Existing – Without and With Proposed Project**

Study Intersection	Existing Conditions		Existing With Project Conditions		Significant Impact? <sup>2</sup>	
	AM	PM	AM	PM	AM	PM
	Delay <sup>1</sup> - LOS	Delay <sup>1</sup> - LOS	Delay <sup>1</sup> - LOS	Delay <sup>1</sup> - LOS		
1 - Cedar Ave. / Valley Blvd.	36.3 - D	42.6 - D	38.0 - D	45.5 - D	No	No
2 - Cedar Ave. / I-10 WB Ramps	35.6 - D	28.6 - C	39.0 - D	30.9 - C	No	No
3 - Cedar Ave. / I-10 EB Ramps	42.5 - D	38.4 - D	48.6 - D	43.0 - D	No	No
4 - Cedar Ave. / Orange St.	12.2 - B	12.3 - B	20.5 - C	15.6 - B	No	No
5 - Cedar Ave. / Slover Ave.	27.9 - C	32.5 - C	29.3 - C	34.8 - C	No	No
6 - Orange St. / Vine St.	0.2 - A	0.2 - A	9.2 - A	9.1 - A	No	No
7 - Orange St. / Project Dwy. 1	Does Not Exist		9.0 - A	9.4 - A	No	No
8 - Vine St. / Project Dwy. 2	Does Not Exist		8.3 - A	8.6 - A	No	No
9 - Vine St. / Project Dwy. 3	Does Not Exist		8.3 - A	8.4 - A	No	No

Note: Deficient intersection operations indicated in **bold**

<sup>1</sup> Average seconds of delay per vehicle.

<sup>2</sup> Significance criteria are provided in County of San Bernardino Traffic Impact Study Guidelines (Revised April 9,2014)

LOS = level of service.

**Table ES-2  
Summary of Peak Hour Intersection Operations  
Opening Year 2019 – Without and With Proposed Project**

Study Intersection	Opening Year 2019 Without Project Conditions		Opening Year 2019 With Project Conditions		Significant Impact? <sup>2</sup>	
	AM	PM	AM	PM	AM	PM
	Delay <sup>1</sup> - LOS	Delay <sup>1</sup> - LOS	Delay <sup>1</sup> - LOS	Delay <sup>1</sup> - LOS		
1 - Cedar Ave. / Valley Blvd.	37.4 - D	47.1 - D	38.2 - D	47.5 - D	No	No
2 - Cedar Ave. / I-10 WB Ramps	52.7 - D	37.3 - D	53.3 - D	38.6 - D	No	No
3 - Cedar Ave. / I-10 EB Ramps <sup>3</sup>	<b>55.9 - E</b>	48.3 - D	<b>58.6 - E</b>	49.8 - D	No	No
4 - Cedar Ave. / Orange St.	16.1 - B	18.4 - B	26.3 - C	23.8 - C	No	No
5 - Cedar Ave. / Slover Ave.	47.6 - D	45.6 - D	48.5 - D	46.0 - D	No	No
6 - Orange St. / Vine St.	0.3 - A	9.2 - A	9.2 - A	9.0 - A	No	No
7 - Orange St. / Project Dwy. 1	Does Not Exist		9.0 - A	9.4 - A	No	No
8 - Vine St. / Project Dwy. 2	Does Not Exist		8.3 - A	8.6 - A	No	No
9 - Vine St. / Project Dwy. 3	Does Not Exist		8.3 - A	8.4 - A	No	No

Note: Deficient intersection operations indicated in **bold**.

<sup>1</sup> Average seconds of delay per vehicle.

<sup>2</sup> Significance criteria are provided in County of San Bernardino Traffic Impact Study Guidelines (Revised April 9,2014)

<sup>3</sup> The Cedar Ave. / I-10 EB Ramps intersection is fully funded and included in the SANBAG DIF program, therefore, the intersection is considered not to be significantly impacted by the proposed project. Interchange improvements are detailed in Table ES-4 of this TIA.

LOS = level of service.

**Table ES-3**  
**Summary of Peak Hour Intersection Operations**  
**Horizon Year 2035 Conditions – Without and With Proposed Project**

Study Intersection	Year 2035 Without Project Conditions		Year 2035 With Project Conditions		Significant Impact? <sup>2</sup>	
	AM	PM	AM	PM	AM	PM
	Delay <sup>1</sup> - LOS	Delay <sup>1</sup> - LOS	Delay <sup>1</sup> - LOS	Delay <sup>1</sup> - LOS		
1 - Cedar Ave. / Valley Blvd.	49.3 - D	50.9 - D	50.9 - D	53.0 - D	No	No
2 - Cedar Ave. / I-10 WB Ramps <sup>3</sup>	21.2 - C	18.4 - B	21.4 - C	19.0 - B	No	No
3 - Cedar Ave. / I-10 EB Ramps <sup>3</sup>	31.6 - C	30.7 - C	32.0 - C	31.0 - C	No	No
4 - Cedar Ave. / Orange St.	24.3 - C	22.9 - C	35.4 - D	29.6 - C	No	No
5 - Cedar Ave. / Slover Ave.	48.6 - D	52.5 - D	50.2 - D	52.8 - D	No	No
6 - Orange St. / Vine St.	0.3 - A	9.6 - A	9.4 - A	9.2 - A	No	No
7 - Orange St. / Project Dwy. 1	Does Not Exist		9.1 - A	9.6 - A	No	No
8 - Vine St. / Project Dwy. 2	Does Not Exist		8.3 - A	8.6 - A	No	No
9 - Vine St. / Project Dwy. 3	Does Not Exist		8.3 - A	8.4 - A	No	No

Note: Deficient intersection operations indicated in **bold**.

<sup>1</sup> Average seconds of delay per vehicle.

<sup>2</sup> Significance criteria are provided in County of San Bernardino Traffic Impact Study Guidelines (Revised April 9,2014)

<sup>3</sup> At the I-10 / Cedar Avenue interchange, the "Minimum Build Alternative" improvements per Caltrans Supplemental Traffic Operations Report dated May 11, 2016 prepared by Parsons are assumed in this analysis to be constructed prior to the Horizon Year 2035 conditions.

LOS = level of service.

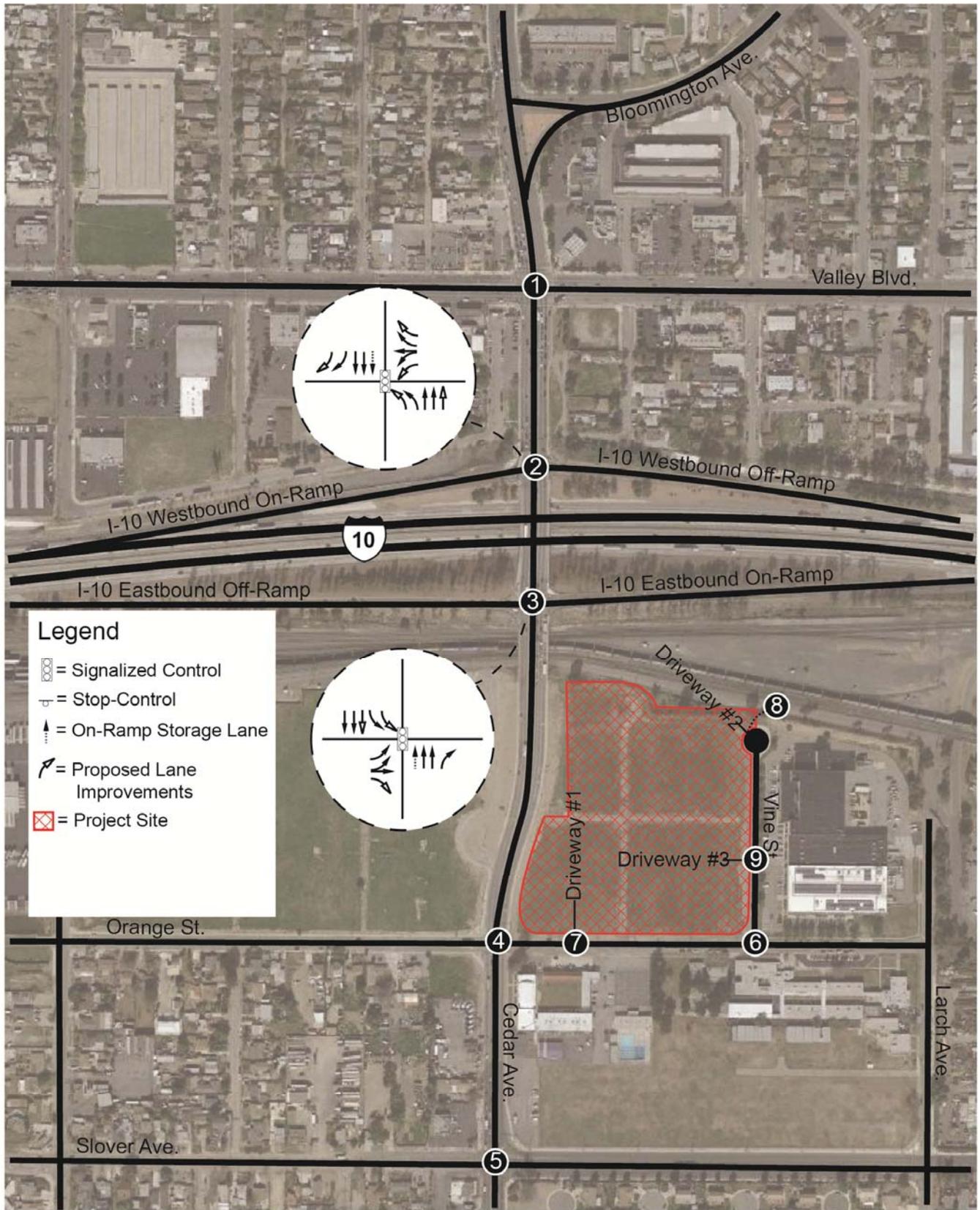
**Table ES-4  
Summary of Intersection Improvements**

Int. #	Intersection	Peak Hour	Without Project Without Improvements	With Project Without Improvements	Funded Caltrans Improvements <sup>(2)</sup>	With Project With Improvements	Project Responsibility
			Delay <sup>(1)</sup> – LOS	Delay <sup>(1)</sup> – LOS		Delay <sup>(1)</sup> – LOS	
<b>Opening Year 2019 Conditions</b>							
2	Cedar Ave. / I-10 WB Ramps	AM	52.7 - D	53.3 - D	NB Approach: Widen to provide dual left-turn lanes & three (3) through lanes. SB Approach: Widen to provide three through lanes and dual right-turn lanes. WB Approach: Widen off-ramp to provide a dedicated left-turn lane, shared through/left-turn lane, and dual right-turn lanes.	19.5 - B	Pay Development Impact Fee
		PM	37.3 - D	38.6 - D		18.8 - B	
3	Cedar Ave. / I-10 EB Ramps	AM	<b>55.9 – E</b>	<b>58.6 - E</b>	NB Approach: No change to existing lane geometry. SB Approach: Widen to provide dual left-turn lanes and three (3) through lanes.	27.5 - C	Pay Development Impact Fee
		PM	48.3 – D	49.8 - D		EB Approach: Widen off-ramp to provide a dedicated left-turn lane, shared through/left-turn lane, and one (1) dedicated right-turn lane.	

**Note:** Deficient intersection operation shown in **bold**.

<sup>(1)</sup> Seconds of delay per vehicle.

<sup>(2)</sup> Minimum Build Alternative is assumed in this analysis based on the Supplemental Traffic Operations Report of the Cedar Avenue Interchange on Interstate 10 dated May 11, 2016 prepared by Parsons.



## INTRODUCTION

This study analyzes the forecast traffic impact of the proposed Cedar Avenue Technology Center project, located on a vacant 9.6-acre site on the northeast corner of Cedar Avenue and Orange Street in the unincorporated community of Bloomington, San Bernardino County. The proposed project will consist of a 184,770 square-foot Warehouse Distribution Center. The project will take access from Vine Street and Orange Street.

**Exhibit 1** shows the regional project vicinity. The project site plan is illustrated in **Exhibit 2**.

As required by San Bernardino County, this traffic impact study has been prepared in accordance with the *County of San Bernardino Traffic Impact Study Guidelines* (Revised April 9, 2014) and the *Guidelines for CMP Traffic Impact Analysis Reports in San Bernardino County* (Appendix B). The threshold to determine the need for traffic studies is a project generating 100 or more peak hour trips. The project will generate approximately 863 trips per day, which includes approximately 74 AM (60 inbound and 14 outbound) peak hour trips and approximately 77 PM (20 inbound and 57 outbound) peak hour trips.

### Project Study Area

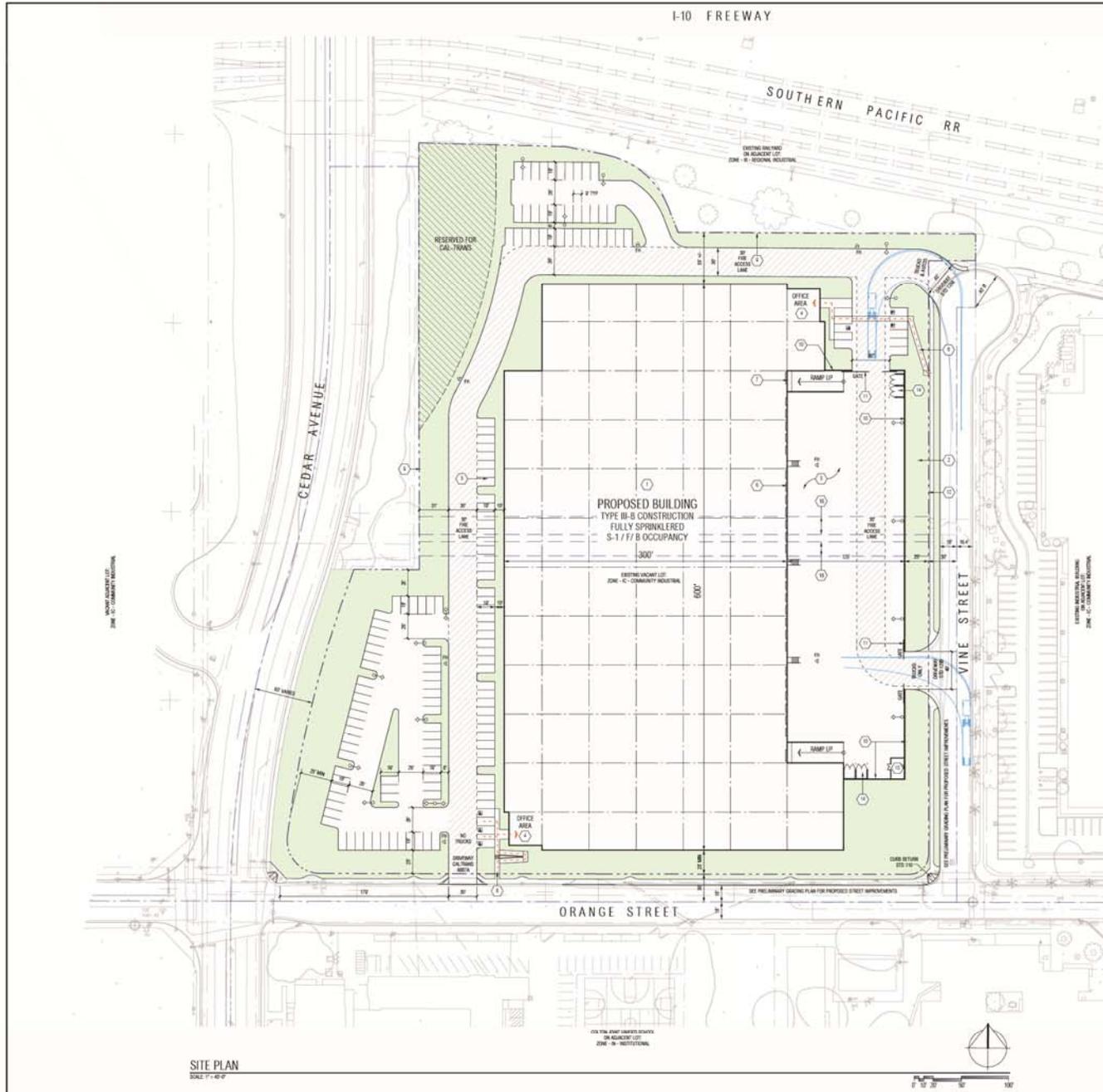
The project study area was defined based on input from San Bernardino County staff. A scoping agreement has been reviewed and approved by County staff to establish the trip generation, study area and trip distribution, refer to **Appendix A**. The study area as shown in **Exhibit 3** includes the following nine (9) study intersections which include the three (3) proposed project driveways:

- 1) Cedar Avenue / Valley Boulevard
- 2) Cedar Avenue / I-10 Westbound Ramps
- 3) Cedar Avenue / I-10 Eastbound Ramps
- 4) Cedar Avenue / Orange Street
- 5) Cedar Avenue / Slover Avenue
- 6) Orange Street / Vine Street
- 7) Orange Street / Project Driveway #1
- 8) Vine Street / Project Driveway #2
- 9) Vine Street / Project Driveway #3

The following scenarios have been analyzed in this report:

- Existing Conditions
- Existing Plus Project Conditions
- Opening Year 2019 Conditions Without Project
- Opening Year 2019 Conditions With Project
- Horizon Year 2035 Conditions Without Project
- Horizon Year 2035 Conditions With Project





**PROJECT DATA**

SITE AREA	432,422 SF (1.88 AC)
BUILDING FOOTPRINT	AREA TO BE COVERED BY BUILDING
PARKING	AREA TO BE COVERED BY PARKING
CONSTRUCTION TYPE	TYPE OF CONSTRUCTION
OCCUPANCY	TYPE OF OCCUPANCY

**PARKING ANALYSIS**

PROPOSED	40 STALLS	40 STALLS
OFFICE	34 STALLS	34 STALLS
TOTAL	104 STALLS	104 STALLS
ACCESSIBLE STALLS	5 STALLS	5 STALLS

- KEYNOTES**
- PROPOSED PAINTED CONCRETE TILT-UP MANUFACTURING / OFFICE / MANUFACTURING FACILITY
  - EXISTING AREA PROPOSED AS PAVED DRIVEWAY / DRIVEWAY WITH 18" OF CONCRETE CURB FOR ALL INTERSECTIONS
  - TYPICAL STANDARD PARKING STALL SHALL BE 8' 0" BY 17' 0" (OVERLAP) - STRIP PAVEMENT
  - ACCESSIBLE PARKING SPACES WITH ADJACENT BIKEWAY
  - CONCRETE PAVED TRUCK YARD
  - DOCK HIGH TRUCK DOCK (SEE ELEVATIONS FOR ADDITIONAL INFO)
  - GRADE LEVEL SHOWN ON PLAN (SEE ELEVATIONS FOR ADDITIONAL INFO)
  - ON SITE ACCESSIBLE PARK AND DRIVEWAY
  - 8" TYP. BLACK ASPHALT DRIVEWAY ALONG INTERSECTIONS
  - NEW PAINTED CONCRETE TILT-UP SCREEN WALL SHALL BE 12" OF 18" x 12" x 12" CONCRETE WITH 18" TYPICAL STEEL SECURITY BARS WITH EACH BAR FOR THE DEPARTMENT ACCESS
  - PUBLIC UTILITY
  - SEE SPINNAKER PUMP HOUSE
  - 8" OF HIGH CONCRETE TILT-UP TRUCK ENCLOSED FOR REUSE AND RECYCLING (SEE FOR MORE DETAILS AND CAPACITY)
  - BASED ON SITE UTILITY INFORMATION TO BE PROVIDED

**APPLICATION TYPE**  
 NEW BUILDING DEVELOPMENT  
 COUNTY OF SAN BERNARDINO ZONING - C-COMMUNITY INDUSTRIAL

**APN'S**  
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 F 949-341-0022  
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**LEGAL DESCRIPTION**  
 PARCELS 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 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At study intersections, existing peak hour traffic volumes were collected for passenger cars, 2-axle trucks, 3-axle trucks, and 4+ axle trucks. Using the conversion factor detailed in the *Guidelines for CMP Traffic Impact Analysis Reports in San Bernardino County*, existing peak hour traffic volumes were converted to Passenger Car Equivalents (PCE) based on the following factors:

Vehicle Type	Passenger Car Equivalent (PCE)
Passenger Car	1.0
2 Axle Truck	1.5
3 Axle Truck	2.0
4+ Axle Truck	3.0

It should be noted the analysis in this report is based on PCE's for all study scenarios.

**Ambient Growth**

Ambient growth refers to a growth rate applied to existing traffic volumes to account for other general traffic growth in and around the study area. For this analysis, the ambient growth rate is based on a 1.1% annual growth for three (3) years to represent the 2019 traffic conditions. The total ambient growth is 3.3% (growth of 1.1% per year from 2016 to 2019 i.e. 3 years). This ambient growth rate 3.3% is added to existing traffic (daily and peak hour) volumes to account for general growth not reflected by cumulative projects.

**Cumulative Projects**

The term “cumulative” in this study refers to cumulative development which includes pending and/or approved projects that are expected to be completed and occupied, after the date of existing counts but prior to the project’s expected opening day (2019) that would contribute traffic within the project study area. Forecast project traffic associated with the City of Fontana, City of Rialto and San Bernardino County were identified and evaluated. Each jurisdiction provided a list of projects that could potentially generate traffic within the study area by the project’s opening year (2019). Michael Baker reviewed each cumulative project and determined that a total of eight (8) cumulative projects added traffic to the study area. This cumulative traffic has been analyzed in the Opening Day (2019) conditions with and without the proposed project.

## ANALYSIS METHODOLOGY

In accordance with the *County of San Bernardino Traffic Impact Study Guidelines (Revised April 9, 2014)*, this study analyzes the following study scenarios:

- **Existing Conditions** – Analysis of existing traffic count volumes, intersection geometry and existing roadway network.
- **Existing With Project Conditions** – Analysis of existing traffic volumes with ambient growth (3.3%) overlaid with the forecast traffic generated by the proposed project. The existing intersection geometry and roadway network were used in this analysis.
- **Opening Year 2019 Conditions Without Project** – Analysis of existing traffic volumes with ambient growth (3.3%) overlaid with traffic associated with approved or pending projects anticipated to be constructed by project opening year (approximately Year 2019).
- **Opening Year 2019 Conditions With Project** – Analysis of existing traffic volumes with ambient growth (3.3%) overlaid with cumulative project traffic and traffic generated by the proposed project.
- **Horizon Year 2035 Conditions Without Project** – Analysis of Horizon Year 2035 conditions is based on the build-out of the San Bernardino County General Plan land uses and Circulation Element roadway network. Horizon Year 2035 forecast daily traffic volumes used in this analysis are based on the San Bernardino Transportation Analysis Traffic Model (SBTAM). All build-out roadway improvements in the project study area such as the I-10/Cedar Avenue interchange improvements are included in the analysis of Horizon Year 2035 conditions.
- **Horizon Year 2035 Conditions With Project** – Analysis of Horizon Year 2035 conditions was conducted using the forecast 2035 traffic volumes overlaid with traffic generated by the proposed project.

### Intersection Analysis

Analysis of all intersections in the project study area is based on *County of San Bernardino Traffic Impact Study Guidelines (Revised April 9, 2014)* and the *Guidelines for CMP Traffic Impact Analysis Reports in San Bernardino County* (Appendix B).

As required, the 2010 Highway Capacity Manual (HCM) operation methodology for *Signalized and Un-signalized Intersections* was used to determine the operating Levels of Service (LOS) of the study intersections. The Synchro (Version 8.0) software package was used to evaluate the study intersections using the HCM methodology. The HCM methodology describes the operation of an intersection using a range of levels of service (LOS) from LOS A (free-flow conditions) to LOS F (severely congested conditions) as shown in **Table 1**. The corresponding delay per vehicle thresholds for signalized and un-signalized intersections are provided in **Table 2**. San Bernardino County and Caltrans considers LOS D or better to be acceptable intersection operating conditions during peak traffic periods. Any intersection that is operating at LOS “E” or “F” will be considered deficient for purposes of this analysis.

**Table 1  
Level of Service Descriptions**

LOS	Description
A	This level is typically assigned when the volume-to-capacity ratio is low and either progression is exceptionally favorable or the cycle length is very short. If it is due to favorable progression, most vehicles arrive during the green indication and travel through the intersection without stopping.
B	This level is typically assigned when the volume-to-capacity ratio is low and either progression is highly favorable or the cycle length is short. More vehicles stop than with LOS A.
C	This level is typically assigned when progression is favorable or the cycle length is moderate. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant, although many vehicles still pass through the intersection without stopping.
D	This level is typically assigned when the volume-to-capacity ratio is high and either progression is ineffective or the cycle length is long. Many vehicles stop and individual cycle failures are noticeable.
E	This level is typically assigned when the volume-to-capacity ratio is high, progression is unfavorable, and the cycle length is long. Individual cycle failures are frequent.
F	This level is typically assigned when the volume-to-capacity ratio is very high, progression is very poor, and the cycle length is long. Most cycles fail to clear the queue.

Source: HCM 2010; Chapter 18, page 18-6

**Table 2  
Level of Service & Delay Ranges**

LOS	Delay (seconds/vehicle)	
	Signalized Intersections	Un-signalized Intersections
A	≤ 10.0	≤ 10.0
B	> 10.0 to ≤ 20.0	> 10.0 to ≤ 15.0
C	> 20.0 to ≤ 35.0	> 15.0 to ≤ 25.0
D	> 35.0 to ≤ 55.0	> 25.0 to ≤ 35.0
E	> 55.0 to ≤ 80.0	> 35.0 to ≤ 50.0
F	> 80.0	> 50.0

Source: 2010 Highway Capacity Manual.

### **Roadway Segments**

Roadway segment level of service standards are generally used as long-range planning guidelines to determine the functional classification of roadways and are not always accurate indicators of roadway performance. Typically, the performance and level of service of a roadway segment is heavily influenced by the ability of intersections to accommodate peak hour volumes. Therefore, peak hour signalized and un-signalized intersections within the study area are the focus of the project traffic analysis summarized in this report since intersections control the movement of vehicles along road segments. The roadway segment volumes provided in this report are for information only, not for determining the significance of a potential impact.

### **Freeway Segments**

According to the *Guidelines for CMP Traffic Impact Analysis Reports in San Bernardino County*, if a project contributes 100 or more two-way peak hour trips to a freeway segment, then a freeway analysis is required. This project contributes approximately 23 trips in the PM peak hour to Interstate 10, therefore, a freeway analysis is not required or provided in this report.

### **Thresholds of Significance**

To determine whether the addition of project-generated trips results in a significant impact at a study intersection, and thus requires mitigation, San Bernardino County TIA Guidelines utilizes the following thresholds of significance. Caltrans does not have specific significance thresholds for determining project-related impacts, therefore, the County's thresholds have been applied to the I-10 / Cedar Avenue interchange.

#### **Signalized Intersections:**

Any study intersection that is operating at a LOS 'A', 'B', 'C' or 'D' for any study scenario without project traffic in which the addition of project traffic causes the intersection to degrade to a LOS 'E' or 'F' shall mitigate the impact to bring the intersection back to at least LOS 'D'. Any study intersection that is operating at LOS 'E' or 'F' for any study scenario without project traffic shall mitigate any impacts so as to bring the intersection back to the overall level of delay established prior to project traffic being added.

#### **Un-signalized Intersections:**

An impact is considered significant if the study determines that either section a) or both sections b) and c) occur.

- a.) The addition of project related traffic causes the intersection to move from a LOS 'D' or better to a LOS 'E' or worse

**OR**

- b.) The project contributes additional traffic to an intersection that is already projected to operate at a LOS 'E' or 'F' with background traffic

**AND**

- c.) One or both of the following conditions are met:
  - 1.) The project adds ten (10) or more trips to any approach
  - 2.) The intersection meets the peak hour traffic signal warrant after the addition of project traffic

**Appendix B** includes the *County of San Bernardino Traffic Impact Study Guidelines* and the *Guidelines for CMP Traffic Impact Analysis Reports in San Bernardino County*.

## EXISTING CONDITIONS

### Existing Land Use

Currently the 9.6-acre project site is vacant and un-developed.

### Existing Roadway Circulation System

A detailed field review was conducted to determine the existing intersection geometry, traffic control devices, signal phasing and other factors, which may affect intersection capacity. The existing intersection geometry is illustrated in **Exhibit 4**. The following is a detailed description of roadways in the study area.

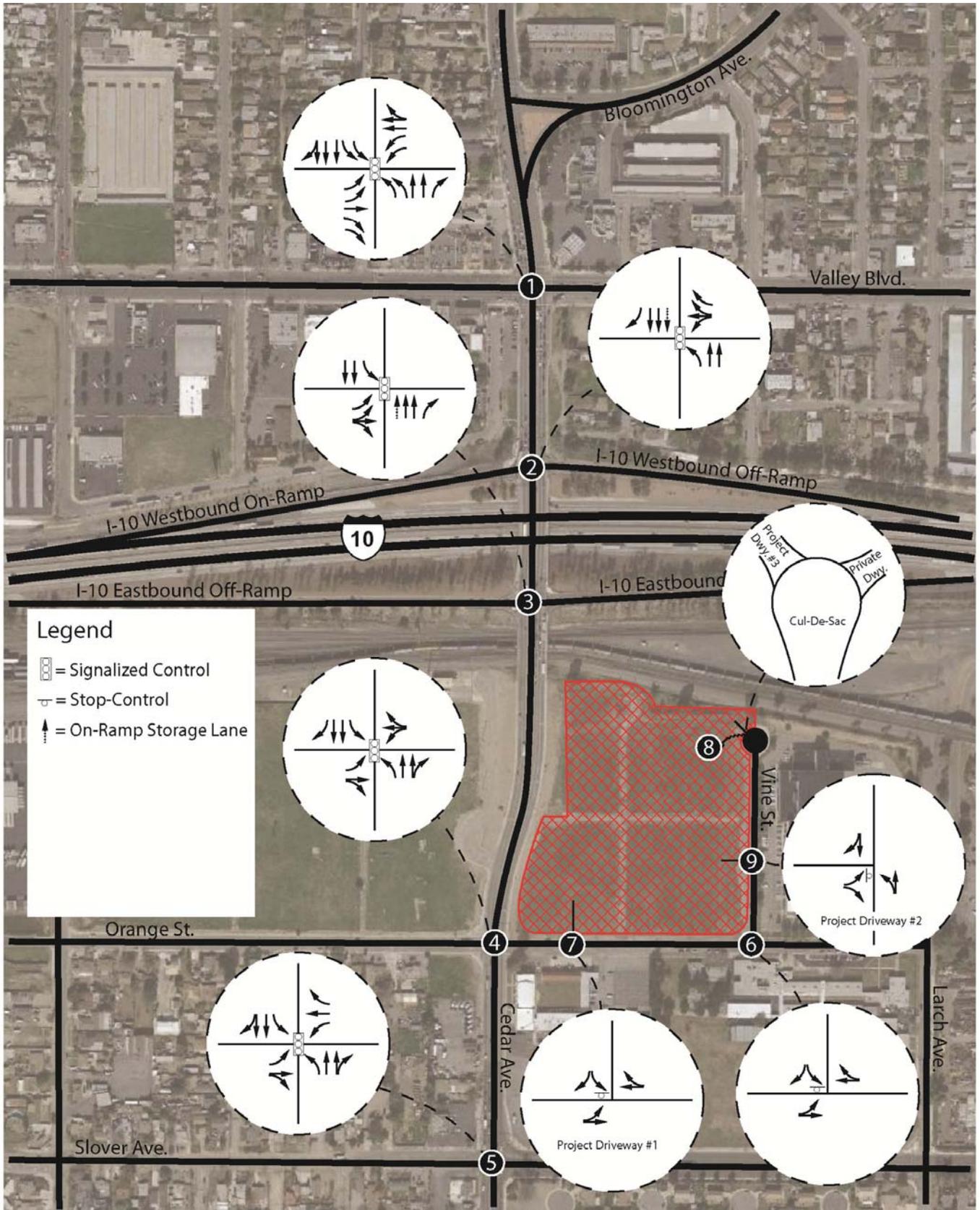
**Cedar Avenue** is a four-lane undivided roadway and is generally oriented in a north-south direction. From Interstate 10, Cedar Avenue extends north through the City of Rialto, and south towards Crestmore Heights. The Bloomington Community Circulation Element classifies Cedar Avenue as a Major Highway from the northern to southern boundaries of Bloomington. The posted speed limit along Cedar Avenue between Valley Boulevard and Slover Avenue is 40 mph. Class II bike lanes are not provided on either side of the roadway and parking is prohibited along Cedar Avenue within the study area.

**Valley Boulevard** is constructed as a four-lane divided roadway oriented in an east-west direction. The roadway extends from Interstate 15 to the 215 parallel to the I-10 along the north side. The Bloomington Community Circulation Element classifies Valley Boulevard as a Major Highway within the boundaries of Bloomington. The posted speed limit along Valley Boulevard is 40 mph. Class II bike lanes are not provided on either side of the roadway. Parking is permitted on both sides of Valley Blvd.

**Orange Street** is a two-lane undivided roadway orientated in an east-west direction. This roadway is a local unclassified roadway serving residents and the Bloomington Junior High School. The posted speed limit on this roadway is 25 mph and parking is permitted on both sides of the road.

**Slover Avenue** is a two-lane to four-lane roadway with a two-way left turn lane orientated in an east-west direction. Slover Avenue is classified as a Major Highway according to the Bloomington Community Circulation Element. Class II bike lanes are not provided on either side of the roadway and the posted speed limit is 50 mph.

**Vine Street** is a two-lane undivided roadway oriented in a north-south direction. This roadway is a local unclassified roadway serving the adjacent properties. Vine Street originates at Orange Street and terminates approximately 650 feet north in a cul-de-sac. Two project driveways are proposed along Vine Street, one at the north end of the cul-de-sac and the other driveway located approximately 250 feet north of Orange Street.



## Existing Conditions Traffic Volumes

To determine the existing operations of the study intersections, traffic counts were collected on Thursday, September 1, 2016 during the AM (7:00 to 9:00 AM) and PM (4:00 to 6:00 PM) peak periods at the following six (6) intersections:

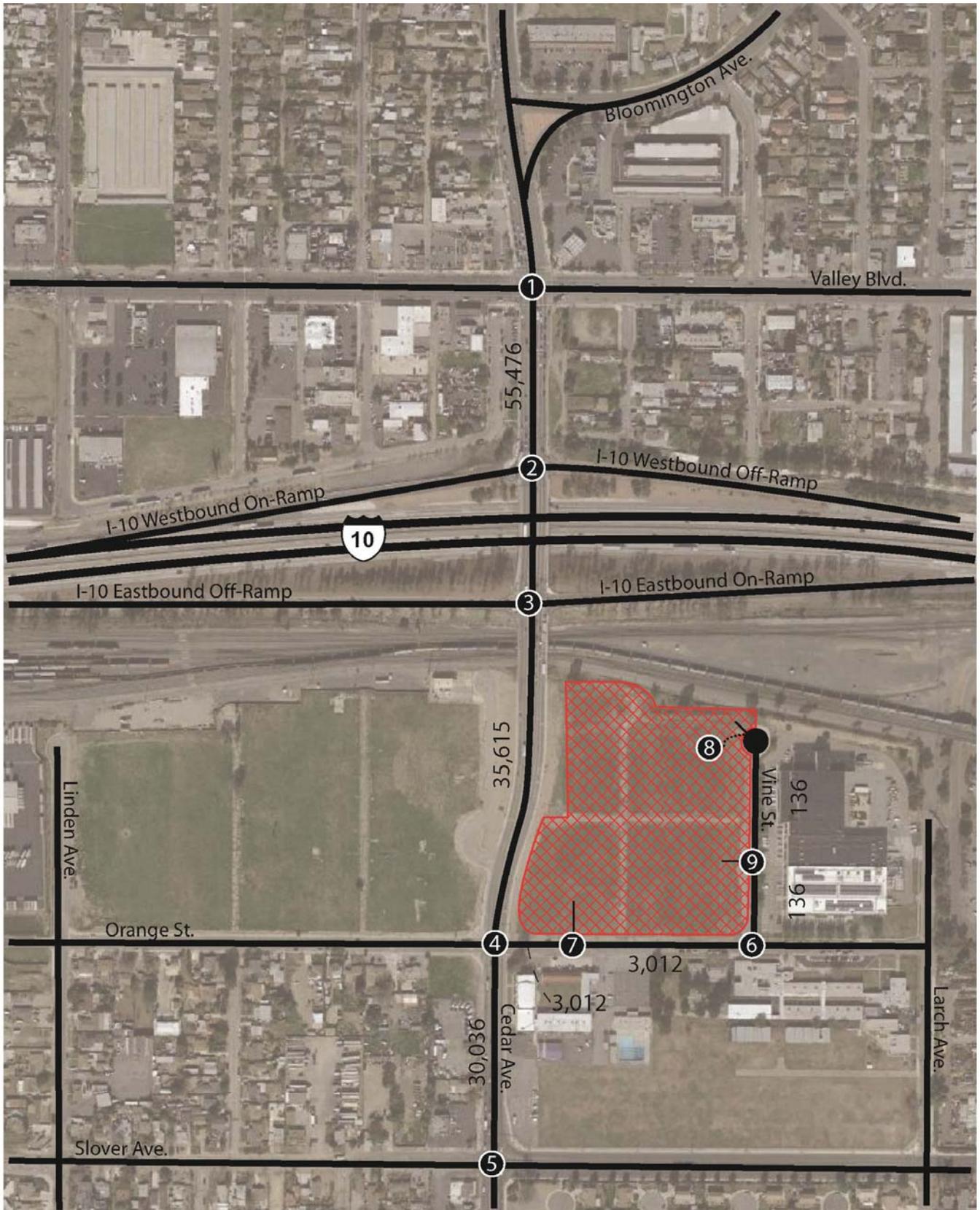
1. Cedar Avenue / Valley Boulevard
2. Cedar Avenue / I-10 Westbound Ramps
3. Cedar Avenue / I-10 Eastbound Ramps
4. Cedar Avenue / Orange Street
5. Cedar Avenue / Slover Avenue
6. Orange Street / Vine Street

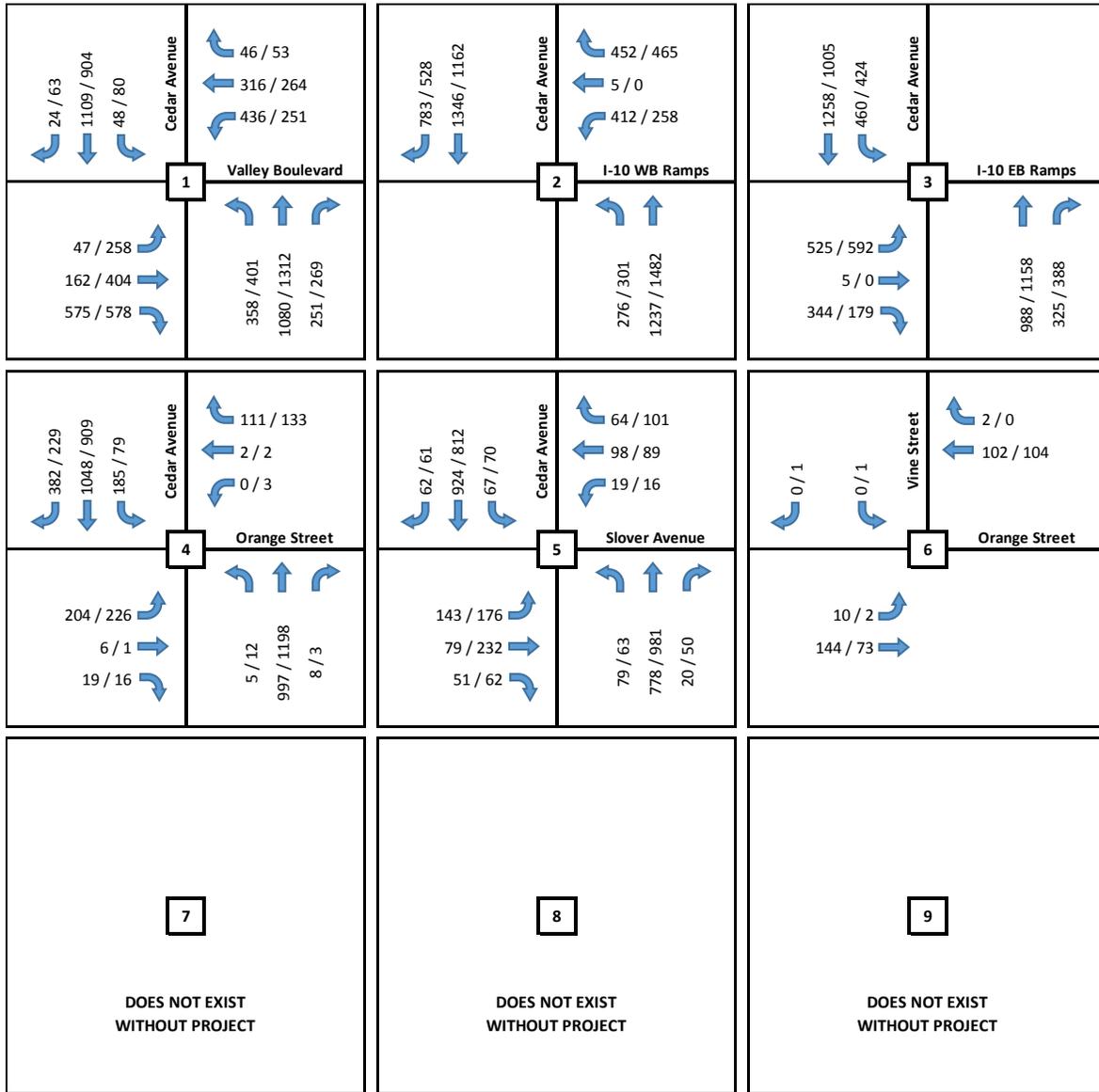
The traffic counts collected at the study intersections include vehicle classifications such as passenger cars, 2-axle trucks, 3-axle trucks, and 4+axle trucks. For purposes of this analysis, all truck traffic was converted into Passenger Car Equivalents (PCE) due to the fact these trucks occupy the same space as two or more passenger cars. In addition, the time it takes for these larger vehicles to accelerate and slow-down is much longer than passenger cars and varies depending on type of vehicle and number of axles. For these reasons, a PCE factor of 1.5 has been applied to 2-axle trucks, 2.0 for 3-axle trucks and 3.0 for 4-axle trucks. These PCE factors are consistent with the Guidelines for CMP Traffic Impact Analysis Reports in San Bernardino County. PCE conversion worksheets can be found in **Appendix C**.

As previously mentioned, roadway segment volumes provided in this report are for information only, not for determining the significance of a potential impact. **Exhibit 5** shows existing roadway segment daily volumes.

**Exhibit 6** shows the existing AM and PM peak hour intersection volumes. Detailed traffic count data is contained in **Appendix C**.

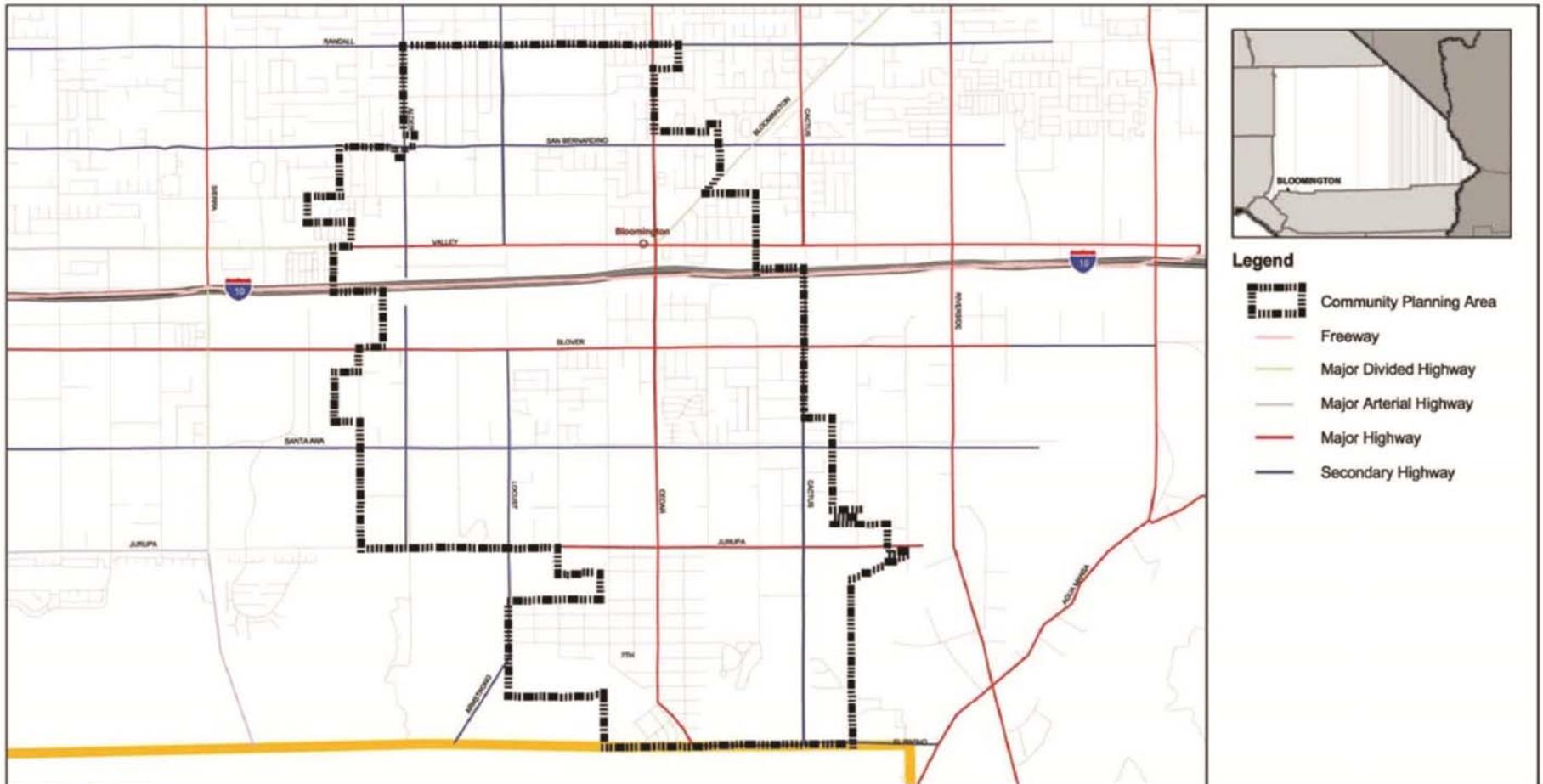
**Exhibit 7** illustrates Bloomington Community Plan Circulation Element showing the classification and configuration of arterial highways planned to serve the ultimate development defined by the land use element of the General Plan. **Exhibit 8** shows the San Bernardino General Plan roadway cross-sections.





Notes:

XX / XX = AM / PM Peak Hour Volumes



Source: County of San Bernardino

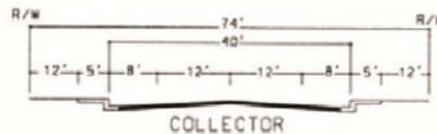
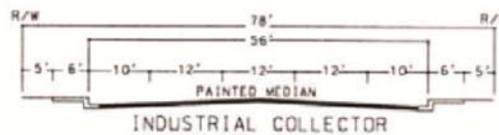
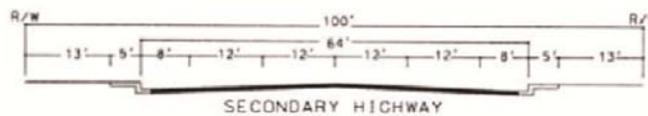
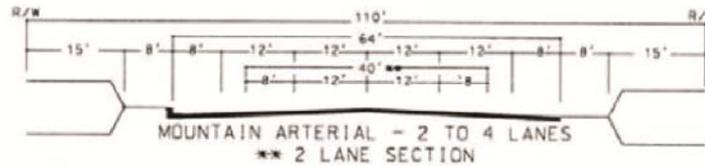
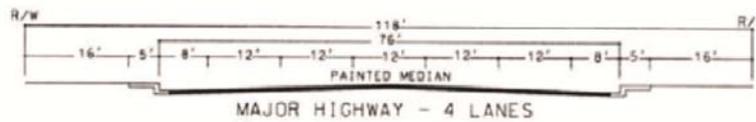
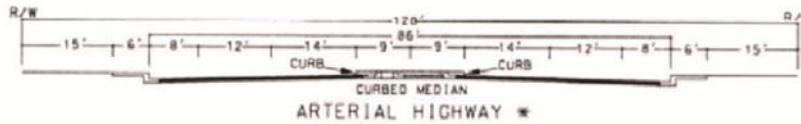
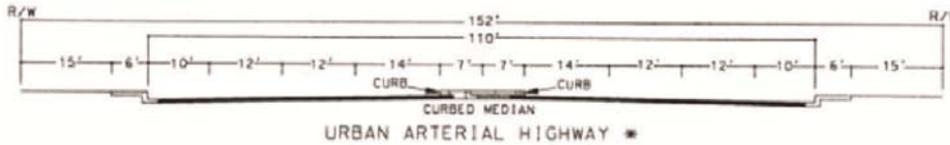
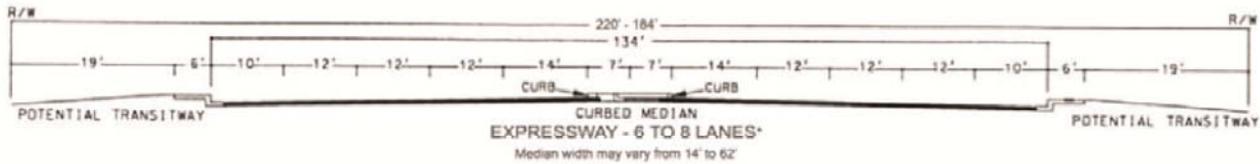


County of San Bernardino  
Community

City Streets

## Bloomington Community Plan Circulation Element

# PROPOSED GENERAL PLAN ROADWAY CROSS SECTIONS



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

Revised 7/3/2003

## San Bernardino County General Plan Roadway Cross-Sections

## Existing Levels of Service

**Table 3** summarizes the existing AM and PM peak hour intersection LOS of the study intersections based on the existing peak hour intersection volumes and existing intersection geometry. Detailed HCM calculation sheets are contained in **Appendix D**.

**Table 3  
Existing Peak Hour Intersection Conditions**

Study Intersection	Traffic Control	Existing Conditions	
		AM Delay <sup>1</sup> - LOS	PM Delay <sup>1</sup> - LOS
1 - Cedar Ave. / Valley Blvd.	Signal	36.3 - D	42.6 - D
2 - Cedar Ave. / I-10 WB Ramps	Signal	35.6 - D	28.6 - C
3 - Cedar Ave. / I-10 EB Ramps	Signal	42.5 - D	38.4 - D
4 - Cedar Ave. / Orange St.	Signal	12.2 - B	12.3 - B
5 - Cedar Ave. / Slover Ave.	Signal	27.9 - C	32.5 - C
6 - Orange St. / Vine St.	OWSC	0.2 - A	0.2 - A
7 - Orange St. / Project Dwy. 1		Does Not Exist	
8 - Vine St. / Project Dwy. 2		Does Not Exist	
9 - Vine St. / Project Dwy. 3		Does Not Exist	

Note: Deficient intersection operation indicated in **bold**.

<sup>1</sup> Average seconds of delay per vehicle.

LOS = level of service.

OWSC = One-Way Stop Control, worst approach delay and LOS is reported.

As shown in **Table 3**, all study intersections currently operate at acceptable levels of service (LOS D or better).

## Existing Bicycle and Pedestrian Access

There are currently no Class II bike lanes in each direction of travel on Orange Street and Cedar Avenue in the vicinity of the project site. Sidewalks exist on the streets surrounding the project site, except on the north side of Orange Street east of Cedar Avenue and the west side of Vine Street. The project will be providing sidewalks along the project frontage on Vine Street and Orange Street.

## Existing Transit Access

The nearest transit facility to the project site is a bus stop on Cedar Avenue south of Orange Street and is serviced by OmniTrans Route 29. This bus stop are located less than one-tenth of a mile from the proposed project site. Route 29 originates and terminates at the South Fontana Transfer Center next to Kaiser Hospital off of Sierra Avenue north of Valley Boulevard.

## PROPOSED PROJECT

This study analyzes the forecast traffic impact of the proposed Cedar Avenue Technology Center (the "Project"), located on a vacant 9.60-acre site on the northeast corner of Cedar Avenue and Orange Street in the unincorporated community of Bloomington, San Bernardino County. The proposed project will consist of a 184,770 square-foot Warehouse Center. The project will take access from Vine Street and Orange Street.

### Project Trip Generation

To determine the trips forecast to be generated by the proposed project, *ITE Trip Generation Manual, 9<sup>th</sup> Edition* rates were utilized in accordance with the San Bernardino County Guidelines. **Table 4** shows the trip generation rates used for the proposed project as well as the breakdown by vehicle type. The vehicle type breakdown is based on the *Truck Trip Generation Study* prepared by the City of Fontana. Trip generation rates can be found in **Appendix E**.

As discussed previously, passenger car equivalent (PCE) factors were applied to the trip generation. As summarized in **Table 5**, the proposed project is expected to generate 863 average daily trips, which includes 74 AM (60 inbound and 14 outbound) peak hour trips and approximately 77 PM (20 inbound and 57 outbound) peak hour trips. There are no trip reductions applied to the trip generation since the site is currently vacant and undeveloped.

**Table 4**  
**Trip Generation Rates**

Vehicle Type Breakdown <sup>1</sup>		Daily Trip Rate <sup>2</sup>	AM Peak Hour <sup>2</sup>		PM Peak Hour <sup>2</sup>	
			Rate	In : out	Rate	In : out
Passenger Car	79.57%	2.833 /KSF	0.239	79% : 21%	0.255	25% : 75%
2 Axle Truck	3.46%	0.123 /KSF	0.010		0.011	
3 Axle Truck	4.64%	0.165 /KSF	0.014		0.015	
4+ Axle Truck	12.33%	0.439 /KSF	0.037		0.039	
Total Trucks	20.43%	0.727 /KSF	0.061		0.065	
Total	100%	3.56 /KSF	0.30		0.32	

Notes:

KSF= Thousand Square Feet

<sup>1</sup>Source: Truck Trip Generation Study, City of Fontana, August 2003

<sup>2</sup>Source: ITE Trip Generation Manual, 9th edition. Land Use Code 150

**Table 5  
Proposed Project Trip Generation  
Trip Generation in Vehicles**

Warehouse Center		Daily Trips	AM Peak Hour			PM Peak Hour			
Vehicle Type Breakdown <sup>1</sup>	Intensity		Volume	Inbound	Outbound	Volume	Inbound	Outbound	
Passenger Car	79.57%	184.77 KSF	523	44	35	9	47	12	35
2 Axle Truck	3.46%		23	2	2	0	2	1	2
3 Axle Truck	4.64%		31	3	2	1	3	1	2
4+ Axle Truck	12.33%		81	7	6	1	7	2	5
Total Trucks	20.43%		135	12	10	2	12	3	9
Total	100%		658	56	45	11	59	15	44

Notes:

<sup>1</sup>Source: Truck Trip Generation Study, City of Fontana, August 2003

**Trip Generation in PCE's**

Warehouse Center		PCE <sup>2</sup>	Daily Trips	AM Peak Hour			PM Peak Hour		
Vehicle Type Breakdown <sup>1</sup>				Volume	Inbound	Outbound	Volume	Inbound	Outbound
Passenger Car	79.57%	1.00	523	44	35	9	47	12	35
2 Axle Truck	3.46%	1.50	35	3	2	1	3	1	2
3 Axle Truck	4.64%	2.00	62	6	5	1	6	2	5
4+ Axle Truck	12.33%	3.00	243	21	18	3	21	5	16
Total Trucks	20.43%		340	30	25	5	30	8	23
Total	100%		863	74	60	14	77	20	57

Notes:

<sup>1</sup>Source: Truck Trip Generation Study, City of Fontana, August 2003

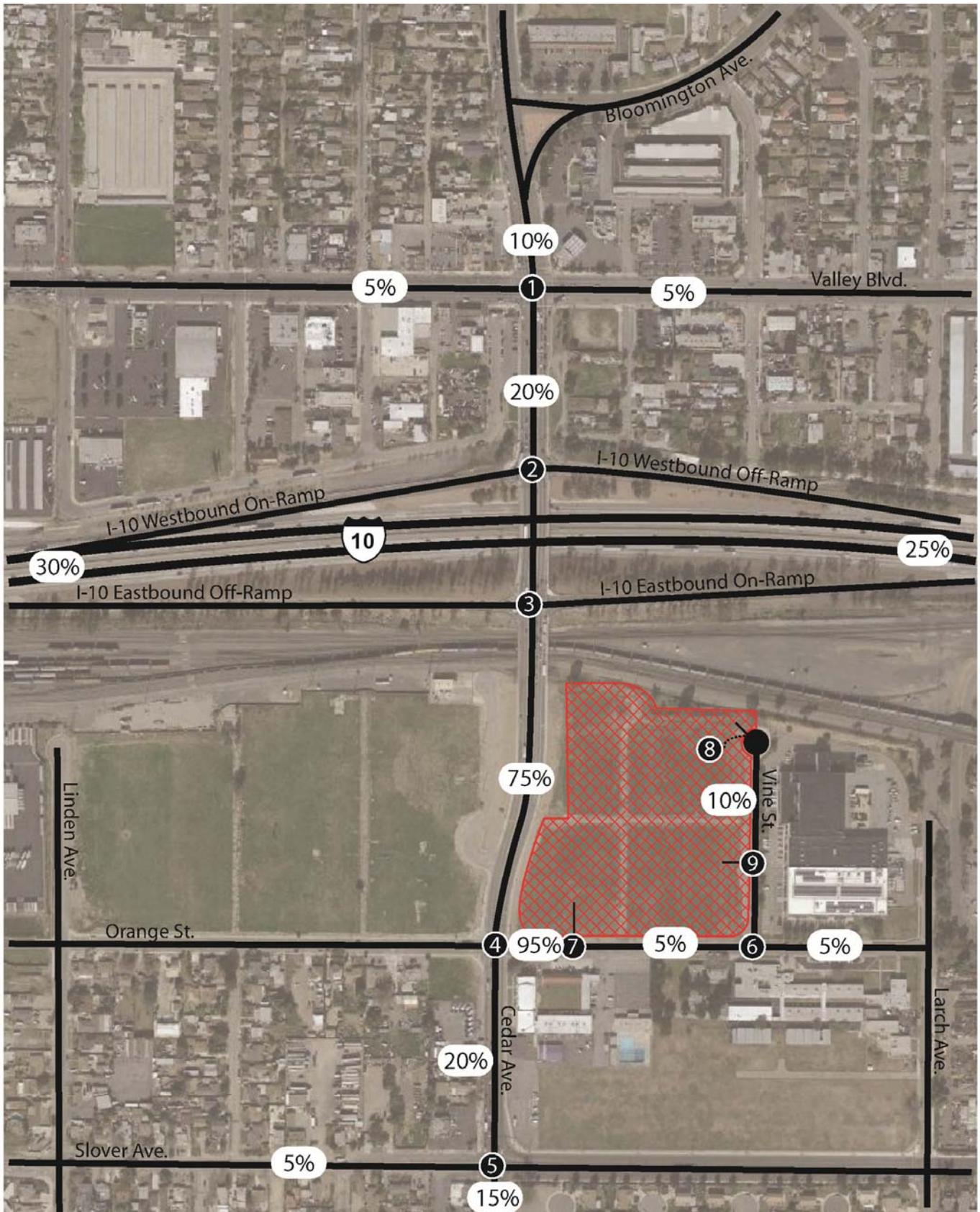
<sup>2</sup>PCE=Passenger Car Equivalent- Source: San Bernardino Association of Governments (SANBAG)

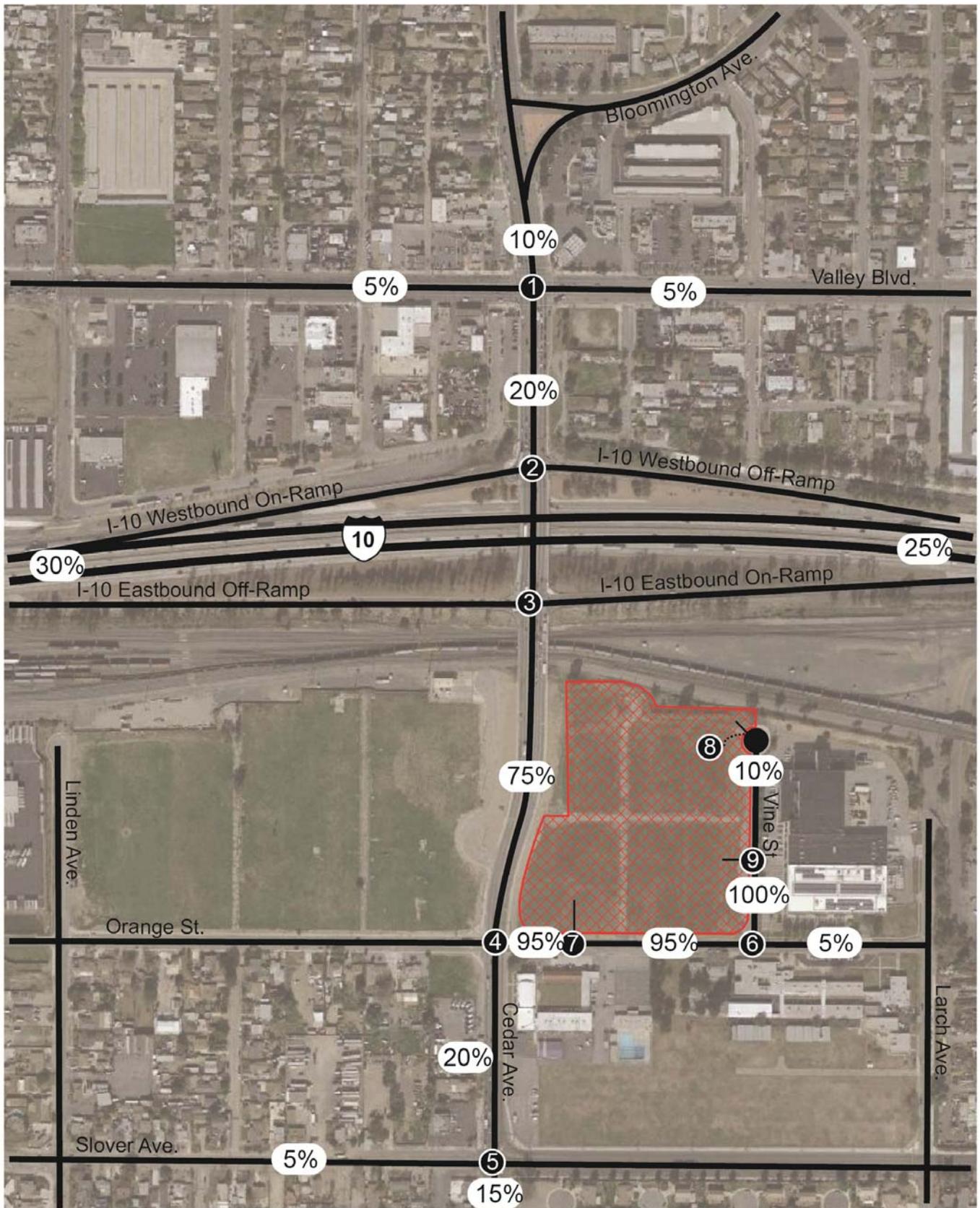
### Project Trip Distribution and Assignment

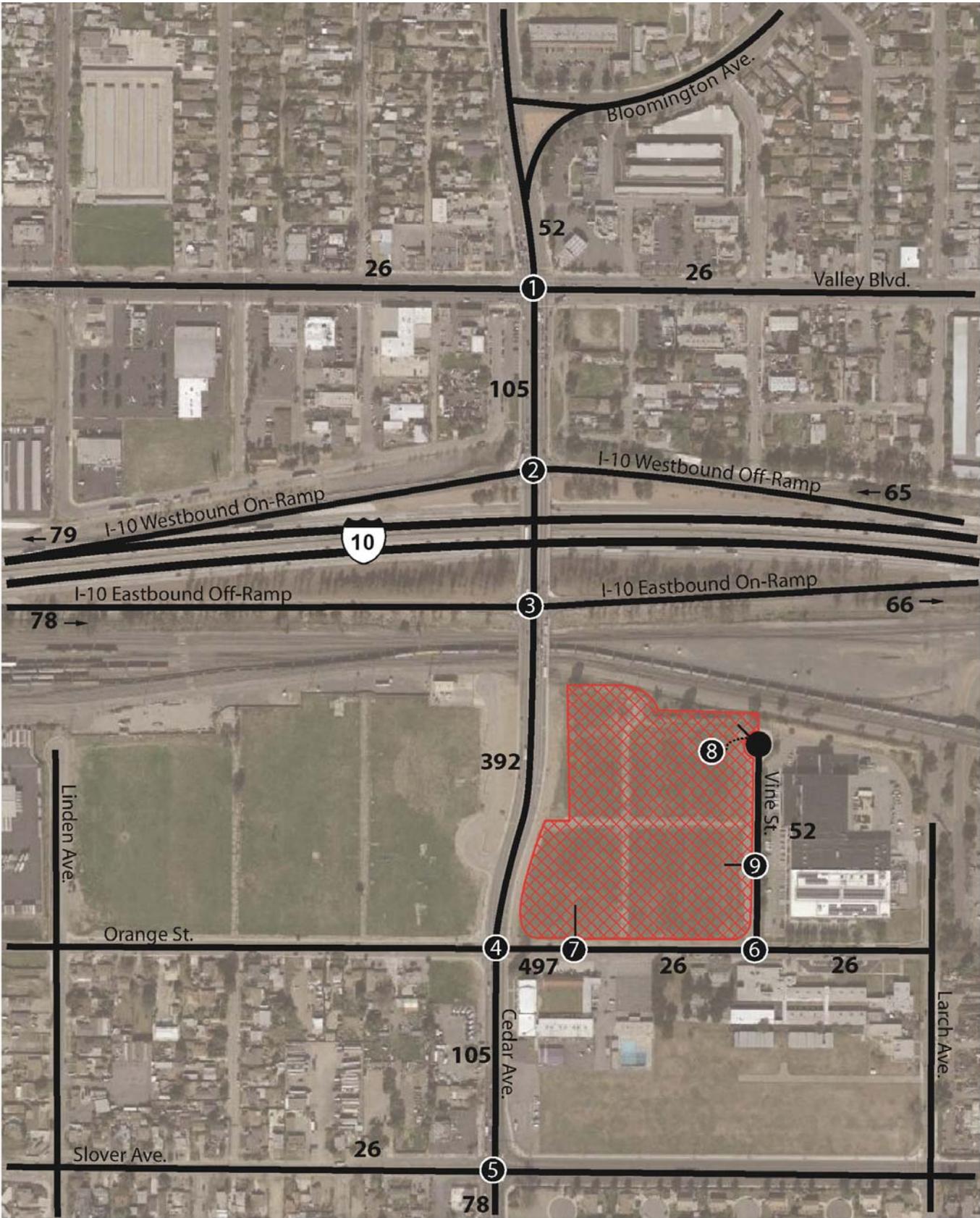
The project trip distribution was developed based on the existing roadway network and surrounding land uses, existing traffic patterns and access to Interstate 10.

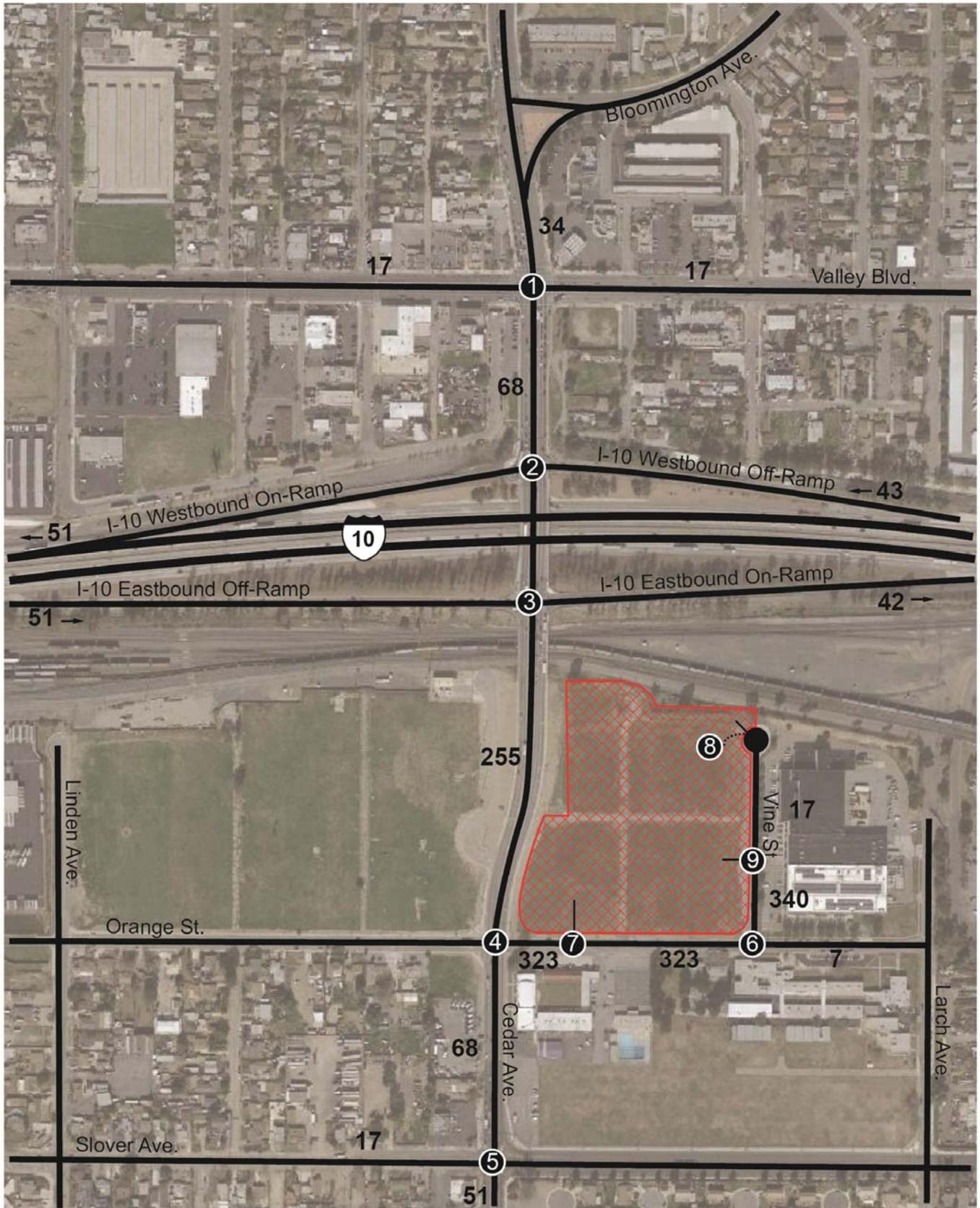
**Exhibit 9** illustrates the project's trip distribution for passenger cars and **Exhibit 10** illustrates the project's trip distribution for trucks. Trip distribution for truck traffic is slightly different than the distribution for passenger vehicles primarily due to access. All trucks will access the project site via Vine Street whereas passenger vehicles will access the site via Orange Street and Vine Street.

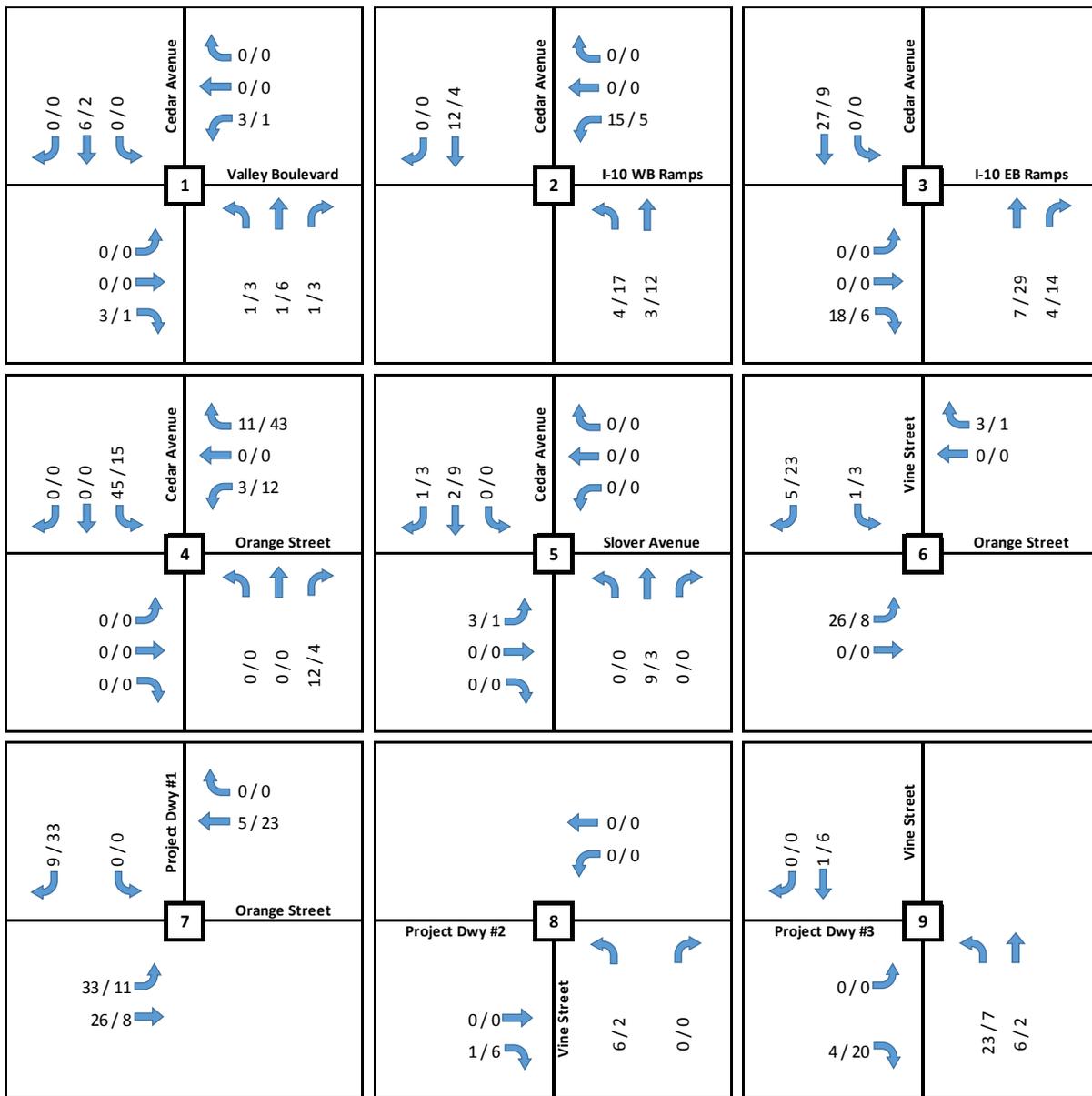
Utilizing the project trip distribution shown in **Exhibits 9 and 10**, the forecast project-generated trips were assigned to the roadway network. **Exhibits 11 & 12** show the daily project trip assignment for passenger vehicles and trucks, respectively. AM/PM peak hour project trip assignment for both passenger vehicles and trucks is provided in **Exhibit 13**.











Notes:

XX / XX = AM / PM Peak Hour Volumes

## **Site Access**

The project is proposed to have access on Orange Street via Driveway 1 and Vine Street via Driveways 2 and 3 as illustrated in Exhibit 3 of this report.

On Orange Street, Driveway 1 will serve as an all-way access strictly for passenger cars only (no trucks) since this driveway provides a direct access to the surface parking lot serving employees and visitors. Orange Street is an east-west oriented roadway located along the project's southern boundary. The project plans to construct the northern portion of Orange Street to its ultimate half-width section of 30 feet (curb to curb) along the project's frontage. According to San Bernardino County Road Standard #130, the minimum spacing required from Cedar Avenue to Driveway 1 is 150 feet. As required, Driveway 1 will be designed to provide at least 150-foot spacing.

On Vine Street, Driveway 2 will serve as an all-way access utilized by trucks and passenger cars as indicated on the site plan. Driveway 2 is located at the northern end of the cul-de-sac and would be difficult for larger trucks to use this driveway and maneuver on-site to/from the loading docks. Therefore, the analysis assumes only 10% of truck traffic use this driveway for ingress and egress.

Driveway 3 via Vine Street with a driveway width of 40 feet will serve as an all-way access for trucks only. This driveway would be located approximately 175 feet north of Orange Street and provides direct access to the loading docks facing Vine Street. This analysis assumes 90% of truck traffic uses Driveway 3 for ingress and egress.

Sight distance at each project access point should not be a problem but should be reviewed with respect to standard County of San Bernardino sight distance standards at the time of preparation of final grading, landscape and street improvement plans.

## EXISTING PLUS PROJECT CONDITIONS

To determine the Existing Plus Project operating conditions at the study intersections, the project-generated trips were added to the existing conditions volumes. As previously mentioned, an ambient growth factor (3.3%) was applied to the existing traffic volumes to account for area wide growth. **Exhibit 14** shows Existing Plus Project roadway segment daily volumes and **Exhibit 15** shows Existing Plus Project AM and PM peak hour intersection volumes.

**Table 6** summarizes the Existing Plus Project AM and PM peak hour intersection LOS for the study intersections. Detailed HCM calculation sheets are contained in **Appendix F**.

**Table 6**  
**Existing Plus Project Peak Hour Intersection Conditions**

Study Intersection	Traffic Control	Existing Plus Project Conditions	
		AM Delay <sup>1</sup> - LOS	PM Delay <sup>1</sup> - LOS
1 - Cedar Ave. / Valley Blvd.	Signal	38.0 - D	45.5 - D
2 - Cedar Ave. / I-10 WB Ramps	Signal	39.0 - D	30.9 - C
3 - Cedar Ave. / I-10 EB Ramps	Signal	48.6 - D	43.0 - D
4 - Cedar Ave. / Orange St.	Signal	20.5 - C	15.6 - B
5 - Cedar Ave. / Slover Ave.	Signal	29.3 - C	34.8 - C
6 - Orange St. / Vine St.	OWSC	9.2 - A	9.1 - A
7 - Orange St. / Project Dwy. 1	OWSC	9.0 - A	9.4 - A
8 - Vine St. / Project Dwy. 2	OWSC	8.3 - A	8.6 - A
9 - Vine St. / Project Dwy. 3	OWSC	8.3 - A	8.4 - A

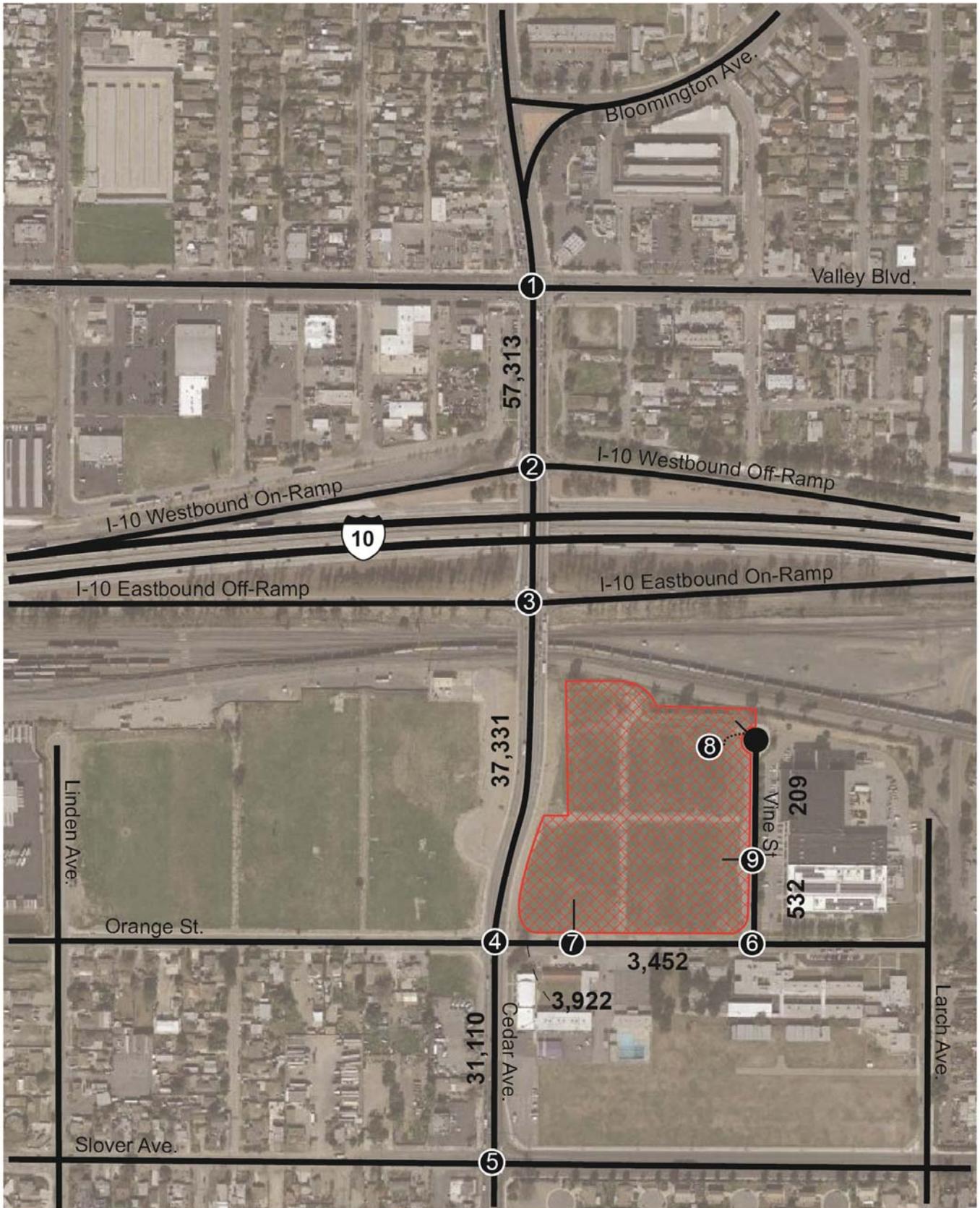
Note: Deficient intersection operation indicated in **bold**.

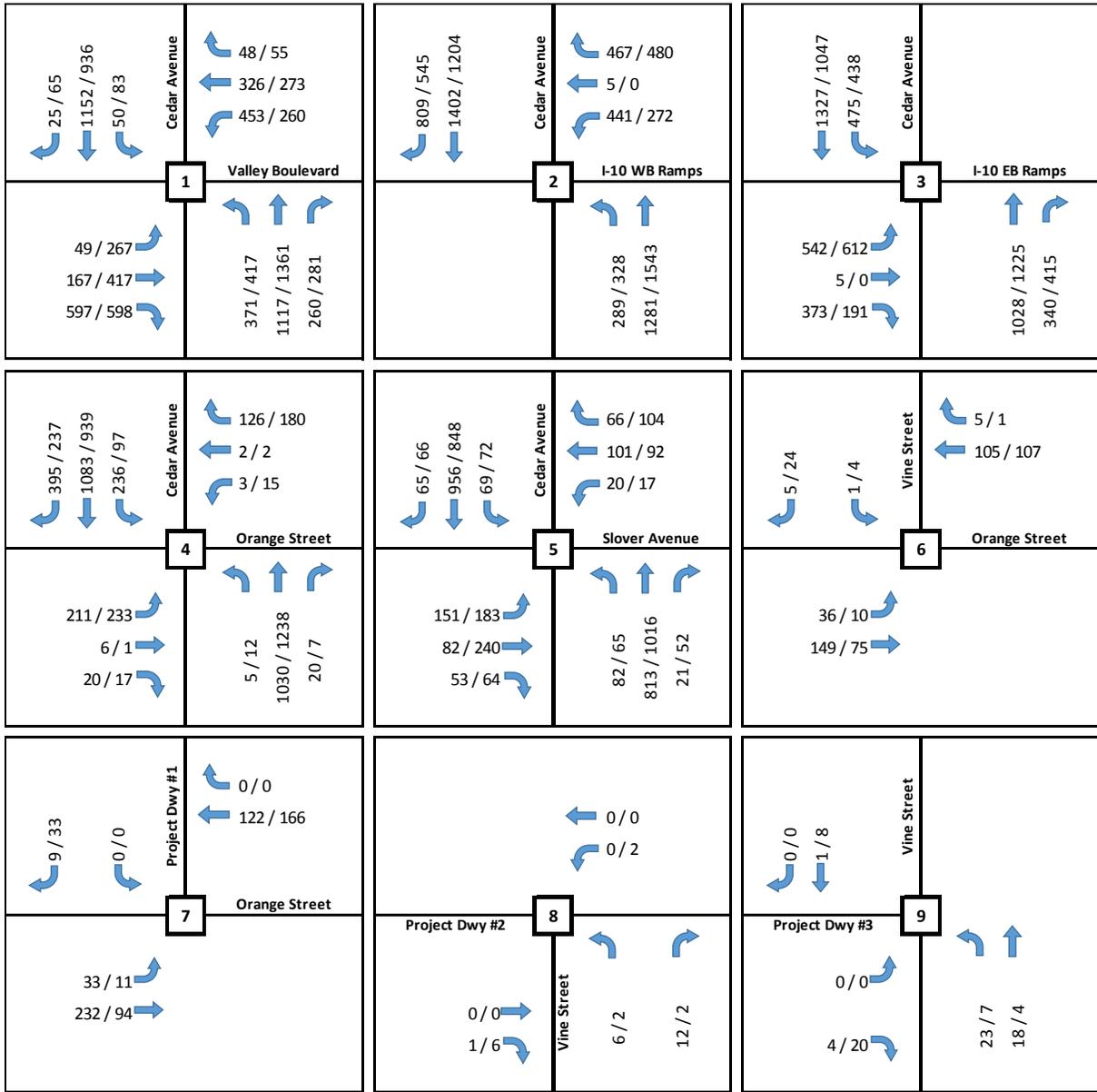
<sup>1</sup> Average seconds of delay per vehicle.

LOS = level of service.

OWSC = One-Way Stop Control, worst approach delay and LOS is reported.

As shown in **Table 6**, all study intersections are projected to operate at acceptable LOS (D or better) under the Existing Plus Project conditions.





Notes:

XX / XX = AM / PM Peak Hour Volumes

## **OPENING YEAR 2019 – WITHOUT AND WITH PROJECT**

To determine the Opening Year 2019 conditions in the project study area, forecast project traffic associated with San Bernardino County, City of Rialto and the City of Fontana approved or pending projects were added to existing traffic volumes. County staff identified the list of projects that would generate traffic into the study area by the projects opening year (approximately 2019). Cumulative project traffic data through the study area is based on information from traffic impact studies prepared for the cumulative projects where available. The list of cumulative projects and the trips generated by each project are presented in **Table 7**.

As presented in **Table 7**, the eight (8) cumulative projects are forecast to generate approximately 18,079 trips per day, which includes approximately 1,342 AM peak hour trips and approximately 1,433 PM peak hour trips using ITE trip generation rates.

The locations of the cumulative projects are provided in **Exhibit 16**. **Exhibit 17** illustrates the daily trips generated by the cumulative projects. The AM and PM peak hour trips generated by the cumulative projects are shown in **Exhibit 18**.

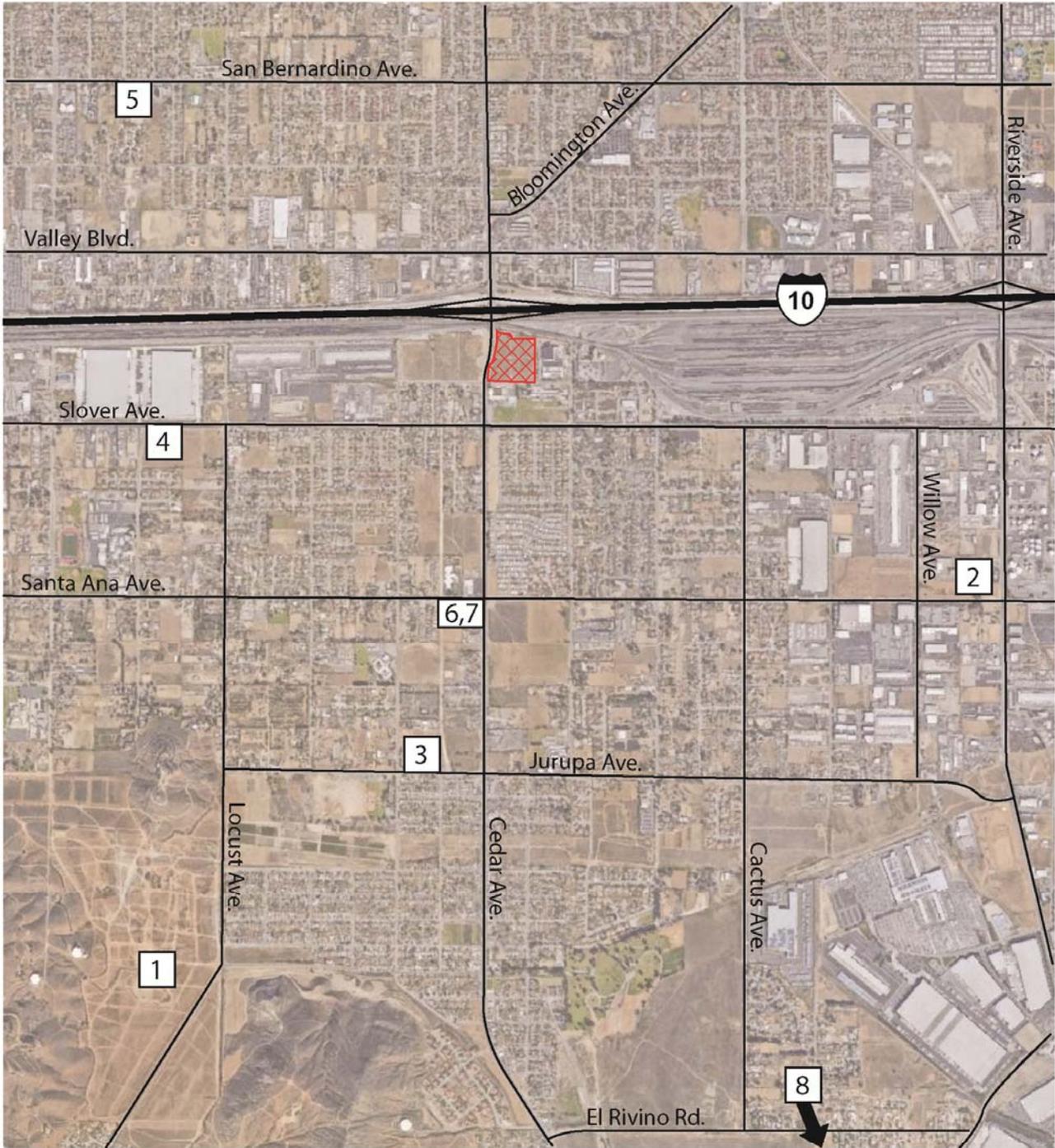
To determine the Opening Year 2019 operating conditions, the cumulative project trips were added to the existing traffic volumes at the intersections and roadway segments within the project study area.

**Table 7  
Cumulative Projects Trip Generation**

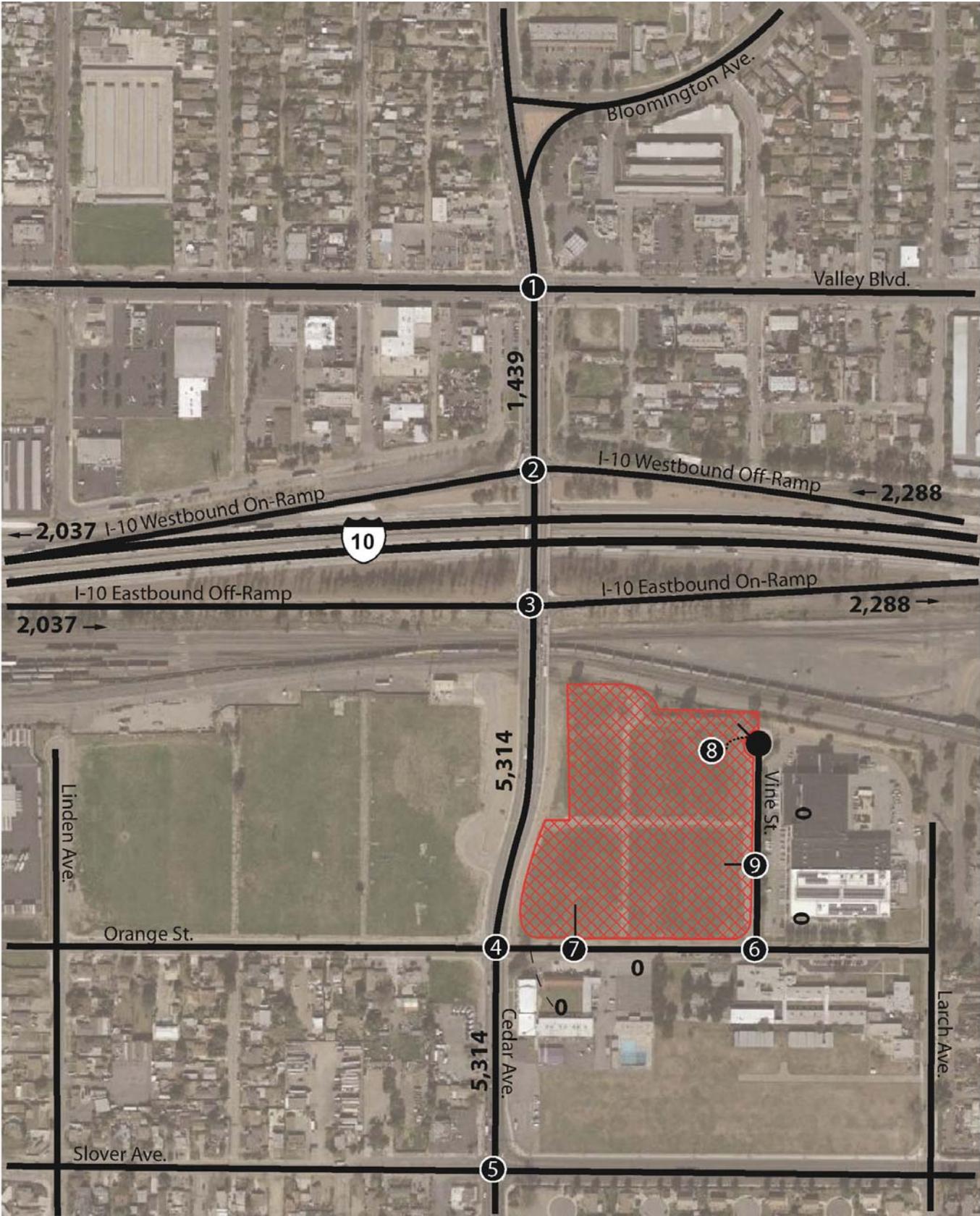
Project	Land Use	Jurisdiction	Size	Vehicle Type	ADT	AM Peak Hour			PM Peak Hour			
						Total	Inbound	Outbound	Total	Inbound	Outbound	
1	West Valley Logistics Center SP	Warehouse/High-Cube Warehouse	Fontana	3,474 KSF	Car+Truck	8,365	575	380	195	621	223	398
2	Caprock Distribution Center	High-Cube Warehouse	Rialto	527.9 KSF	Car	1,128	95	77	18	101	25	76
					Truck	2,023	170	135	35	183	48	135
3	Bloomington Option C	High-Cube Warehouse	SBC	676.98 KSF	Car	905	59	43	16	65	22	43
					Truck	585	43	30	13	43	13	30
4	Bloomington Business Center	High-Cube Warehouse	SBC	344 KSF	Car	460	30	21	9	33	23	10
					Truck	298	20	14	6	21	6	15
5	APN 0252041580000	Church	SBC	1,100 Seats	Car	671	67	60	7	67	60	7
6	APN 0257081010000	Commercial Retail	SBC	8.32 KSF	Car	369	57	27	30	23	10	13
7	P201400139	Gas Station With Convenience Store/Car Wash	SBC	6 VFP	Car	1,954	122	61	61	162	81	81
8	Agua Mansa High-Cube Warehouse	High-Cube Warehouse & Cross-Dock Facility	SBC	471.86 KSF	Car	803	64	48	16	68	17	51
					Truck	518	40	30	10	46	11	33
<b>Total Cumulative Project Trips</b>						<b>18,079</b>	<b>1,342</b>	<b>926</b>	<b>416</b>	<b>1,433</b>	<b>539</b>	<b>892</b>

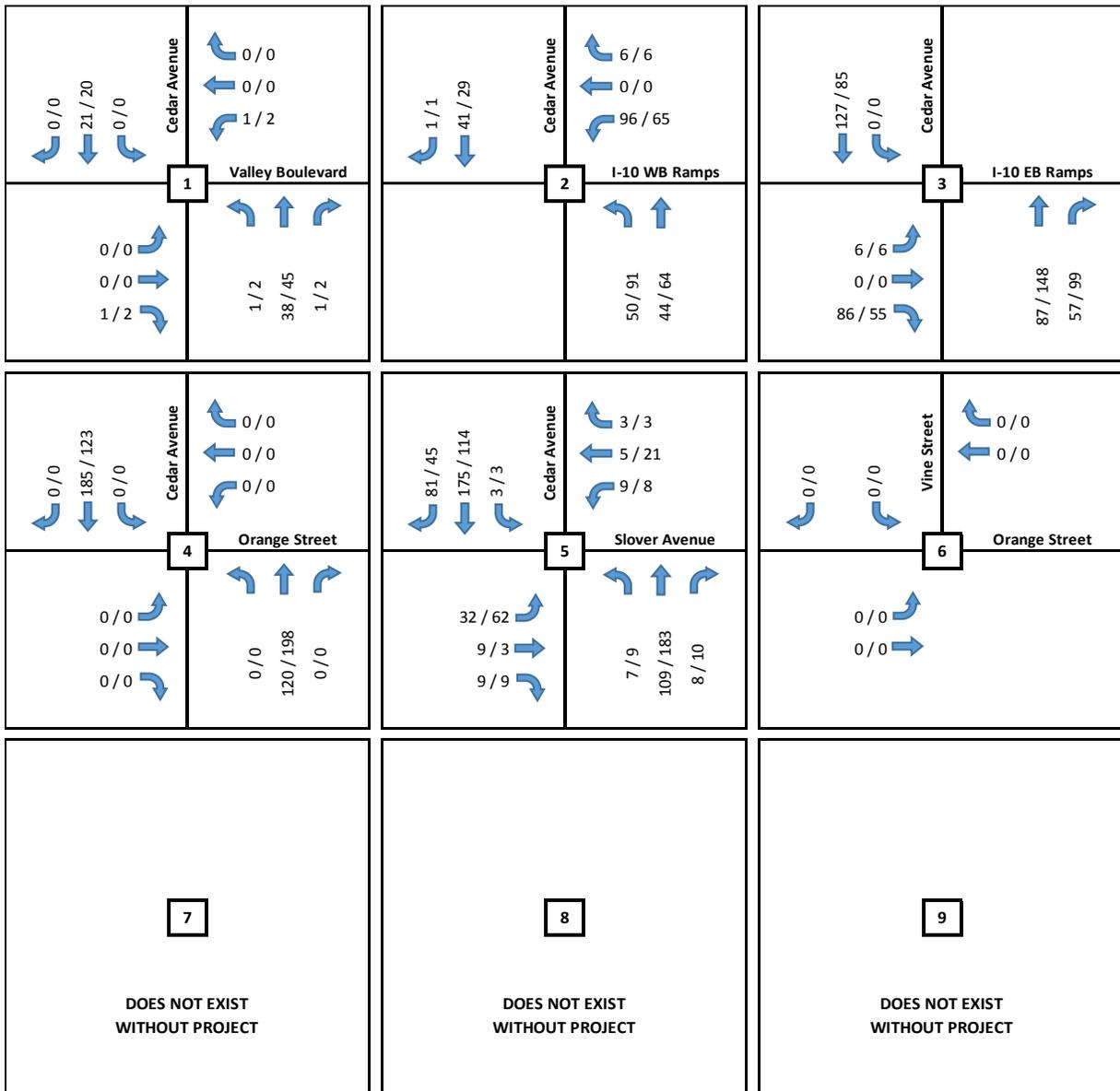
Note: all volumes are in passenger car equivalents (PCE's)

SBC = San Bernardino County; KSF = Thousand Square Feet; VFP = Vehical Fuel Pump



Refer to Table 7 for cumulative project's descriptions





Notes:

XX / XX = AM / PM Peak Hour Volumes

## Opening Year 2019 Conditions Level of Service Analysis

**Table 8** summarizes the Opening Year 2019 conditions peak hour intersection analysis using HCM methodology, without and with the proposed project. Detailed HCM calculation sheets are contained in **Appendix G**. **Exhibit 19** and **Exhibit 20** show the Opening Year 2019 roadway segment daily volumes and, AM and PM peak hour intersection volumes respectively, for the without project conditions. **Exhibit 21** and **Exhibit 22** show the Opening Year 2019 with project roadway segment daily volumes and, AM and PM peak hour intersection volumes respectively.

**Table 8**  
**Opening Year 2019 Peak Hour Intersection Conditions**  
**Without and With Project**

Study Intersection	Opening Year 2019 Without Project Conditions		Opening Year 2019 With Project Conditions		Significant Impact? <sup>2</sup>	
	AM	PM	AM	PM	AM	PM
	Delay <sup>1</sup> - LOS	Delay <sup>1</sup> - LOS	Delay <sup>1</sup> - LOS	Delay <sup>1</sup> - LOS		
1 - Cedar Ave. / Valley Blvd.	37.4 - D	47.1 - D	38.2 - D	47.5 - D	No	No
2 - Cedar Ave. / I-10 WB Ramps	52.7 - D	37.3 - D	53.3 - D	38.6 - D	No	No
3 - Cedar Ave. / I-10 EB Ramps <sup>3</sup>	<b>55.9 - E</b>	48.3 - D	<b>58.6 - E</b>	49.8 - D	No	No
4 - Cedar Ave. / Orange St.	16.1 - B	18.4 - B	26.3 - C	23.8 - C	No	No
5 - Cedar Ave. / Slover Ave.	47.6 - D	45.6 - D	48.5 - D	46.0 - D	No	No
6 - Orange St. / Vine St.	0.3 - A	9.2 - A	9.2 - A	9.0 - A	No	No
7 - Orange St. / Project Dwy. 1	Does Not Exist		9.0 - A	9.4 - A	No	No
8 - Vine St. / Project Dwy. 2	Does Not Exist		8.3 - A	8.6 - A	No	No
9 - Vine St. / Project Dwy. 3	Does Not Exist		8.3 - A	8.4 - A	No	No

Note: Deficient intersection operations indicated in **bold**.

<sup>1</sup> Average seconds of delay per vehicle.

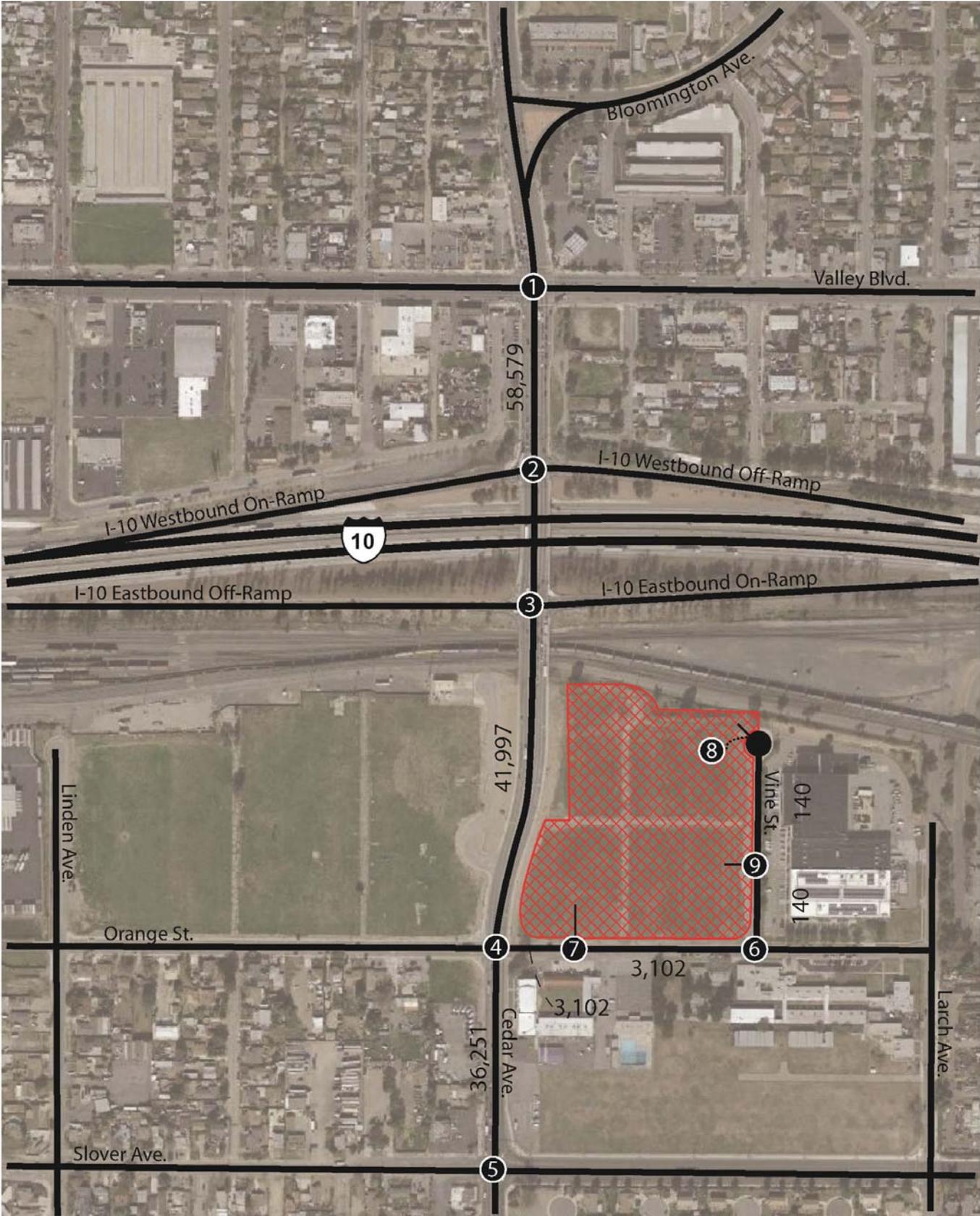
<sup>2</sup> Significance criteria are provided in County of San Bernardino Traffic Impact Study Guidelines (Revised April 9, 2014)

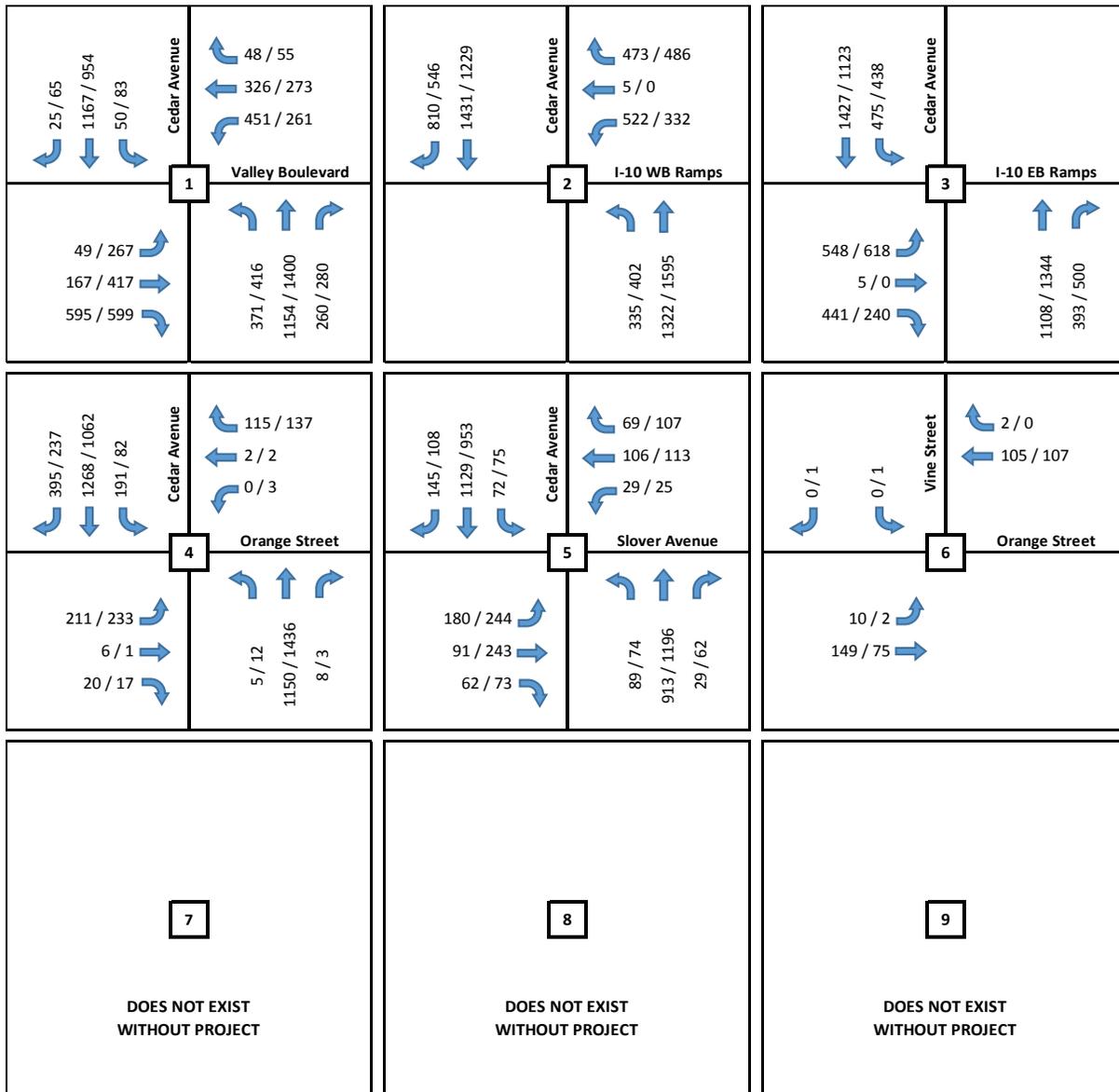
<sup>3</sup> The Cedar Ave. / I-10 EB Ramps intersection is fully funded and included in the SANBAG DIF program, therefore, the intersection is considered not to be significantly impacted by the proposed project. Interchange improvements are detailed in Table ES-4 of this TIA. LOS = level of service.

As shown in **Table 8**, the following intersection is forecast to operate at a deficient level of service (LOS E) under Opening Year 2019 Conditions both without and with the proposed project:

- Cedar Avenue / I-10 Eastbound Ramps (Without Project)                      LOS E
- Cedar Avenue / I-10 Eastbound Ramps (With Project)                      LOS E

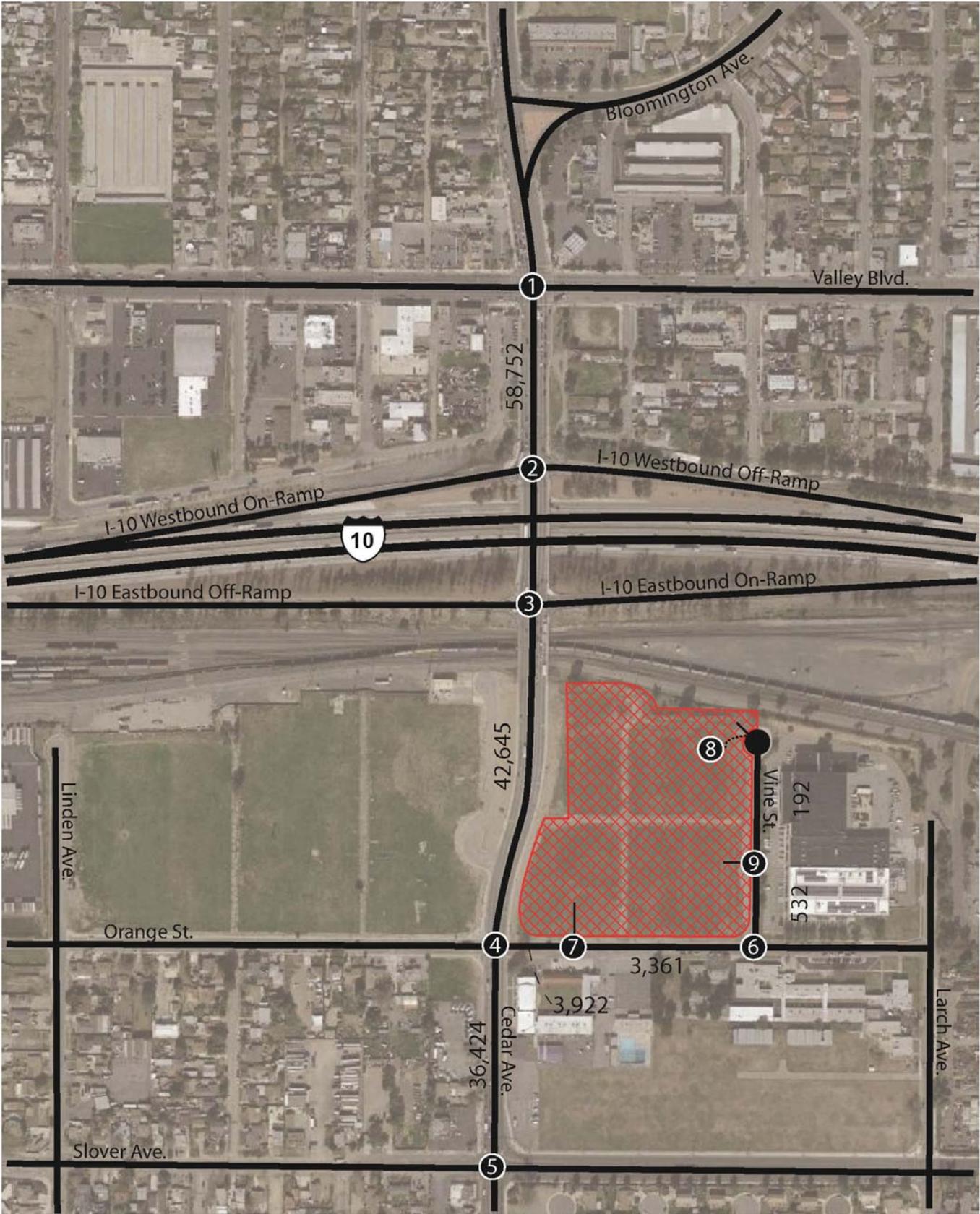
The addition of project-related traffic to the intersection of Cedar Avenue / I-10 Eastbound Ramps results in a deficient level of service (LOS E). This intersection is included in the SANBAG Rialto Sphere Nexus Study DIF program, therefore, payment of the DIF for this intersection mitigates the project's potential contribution to significant impacts. As such, impacts at this intersection are considered less than significant and mitigation measures are not required.

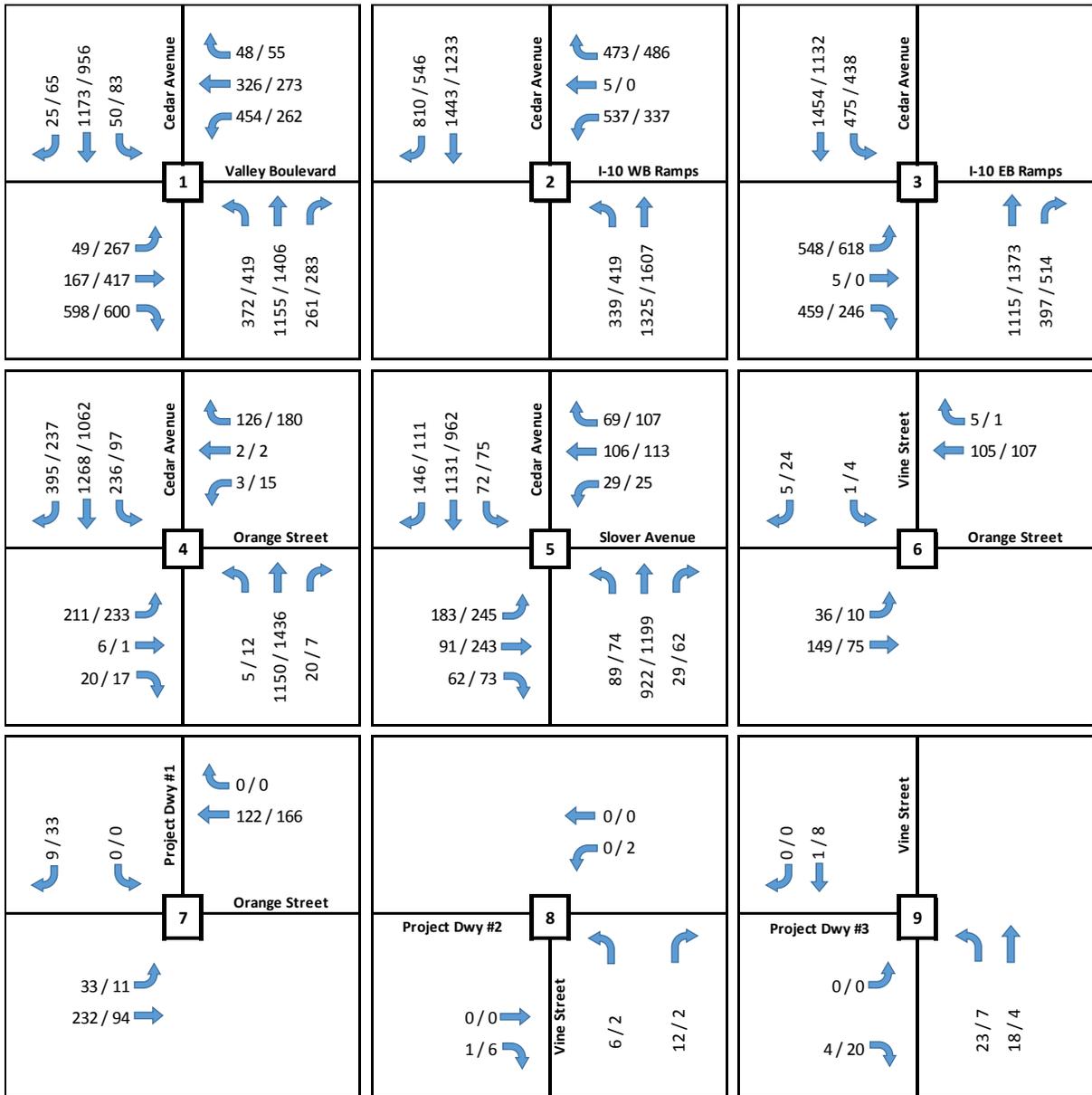




Notes:

XX / XX = AM / PM Peak Hour Volumes





Notes:

XX / XX = AM / PM Peak Hour Volumes

## HORIZON YEAR 2035 CONDITIONS – WITHOUT AND WITH PROJECT

Analysis of Horizon Year 2035 conditions is based on the build-out of San Bernardino County's General Plan land uses and Circulation Element roadway network. Horizon Year 2035 forecast daily traffic volumes from the San Bernardino Transportation Analysis Model (SBTAM) were used in this analysis.

Forecast year 2035 peak hour volumes were obtained by applying a factored growth rate between the SBTAM 2008 Network ADT Flow and SBTAM 2035 Network ADT Flow models. The forecast 2035 daily traffic volumes were post-processed to develop peak hour intersection volumes. The Horizon Year 2035 AM and PM peak hour intersection volumes were generated using the forecast growth from existing (2016) conditions to 2035. Adjustments were made where appropriate to reflect traffic growth for all study intersections. The post-processing volume worksheets and the traffic models used to prepare the Horizon Year 2035 AM and PM peak hour intersection volumes are provided in **Appendix H**.

At the I-10 / Cedar Avenue interchange, the "Minimum Build Alternative" improvements evaluated in Caltrans Supplemental Traffic Operations Report dated May 11, 2016 prepared by Parsons is assumed in the Horizon Year 2035 Without and With Project conditions since improvements are anticipated to be constructed prior to Year 2035. Construction notice to proceed is scheduled for February 2020 and complete for beneficial use is scheduled for January 2022 based on the March 2017 Project Status prepared by the San Bernardino County Transportation Authority. The following improvements have been assumed in the Horizon Year 2035 analysis only:

### Cedar Avenue / Interstate 10 Westbound Ramps

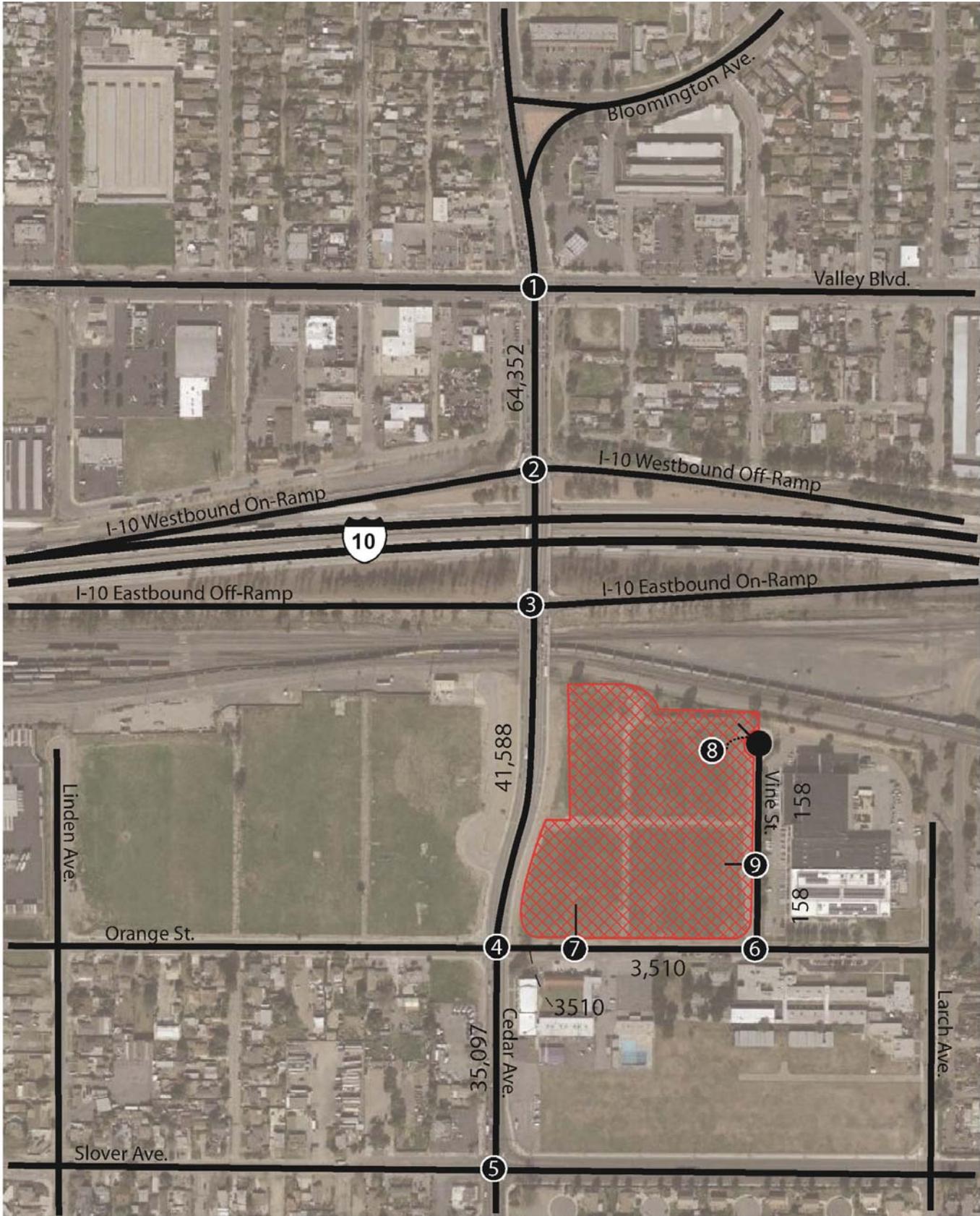
- Northbound: Widen to provide dual left-turn lanes and three (3) through lanes
- Southbound: Widen to provide three (3) through lanes and dual right-turn lanes
- Westbound: Widen off-ramp to provide a dedicated left-turn lane, shared through/left-turn lane, and dual right-turn lanes.

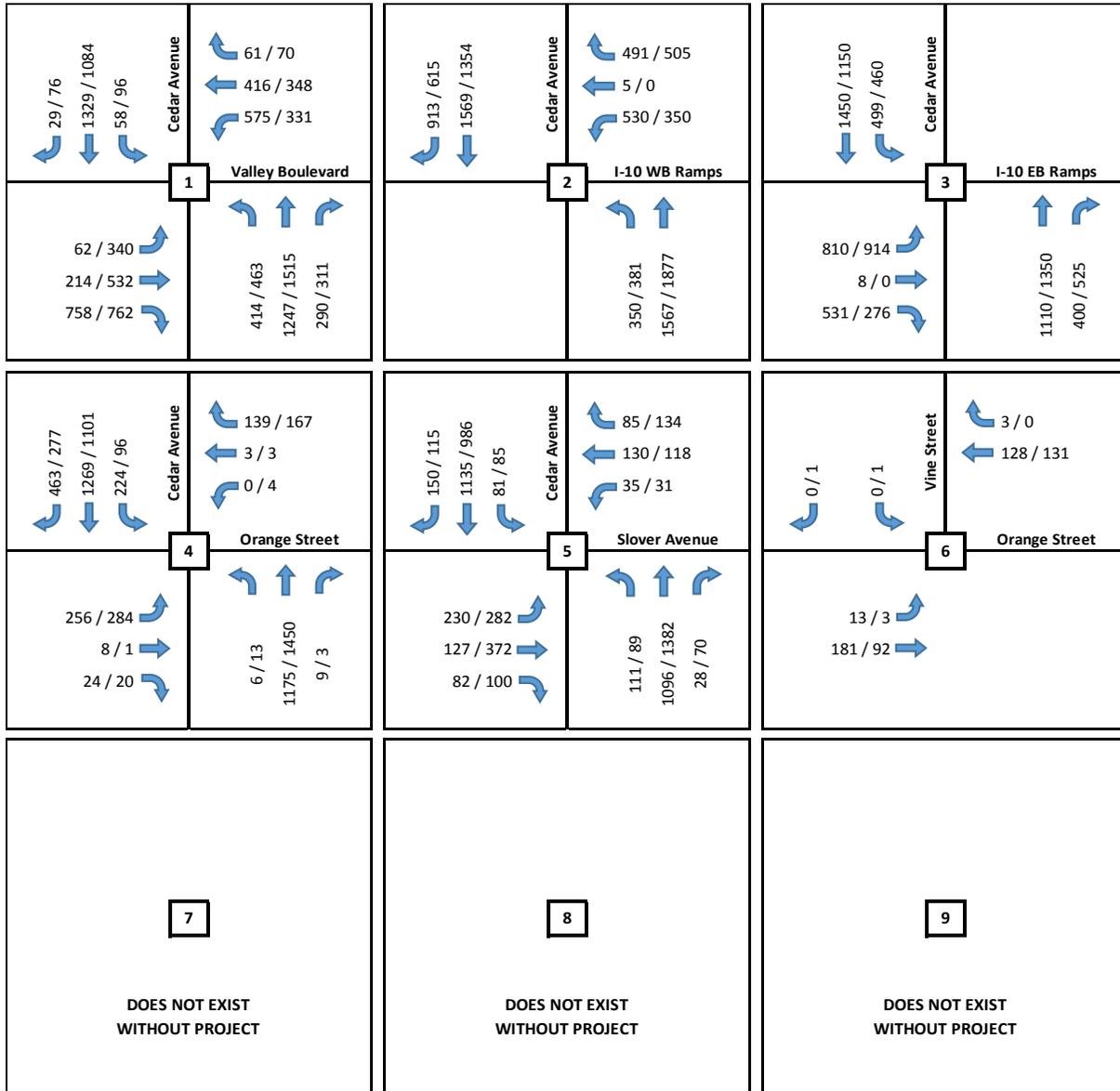
### Cedar Avenue / Interstate 10 Eastbound Ramps

- Northbound: No change to existing lane geometry
- Southbound: Widen to provide dual left-turn lanes and three (3) through lanes
- Eastbound: Widen off-ramp to provide a dedicated left-turn lane, shared through/left-turn lane, and one (1) dedicated right-turn lane.

**Exhibit 23** and **Exhibit 24** shows the Horizon Year 2035 roadway segment daily volumes and, AM and PM peak hour intersection volumes respectively, for the without project conditions.

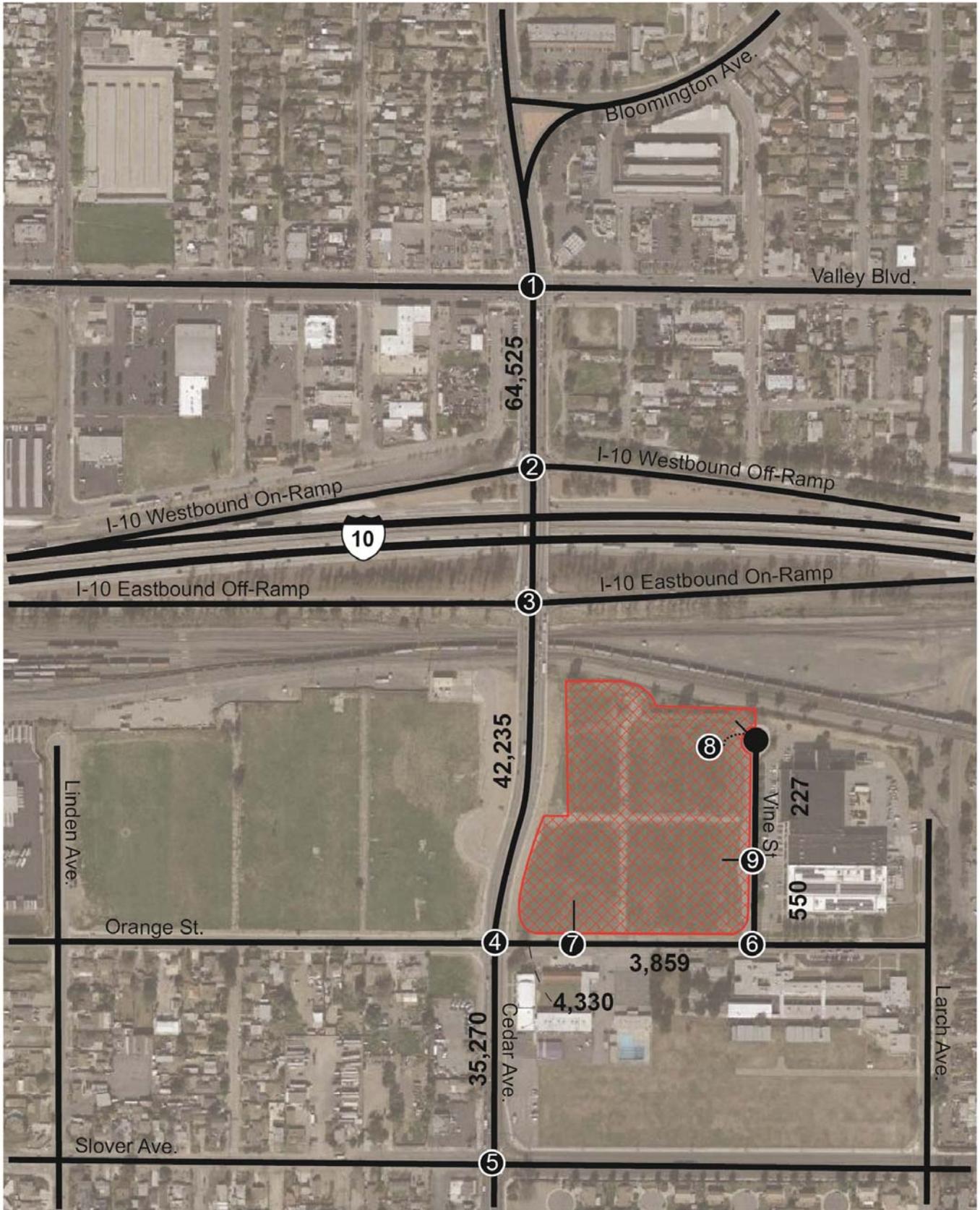
**Exhibit 25** and **Exhibit 26** shows the Horizon Year 2035 with project roadway segment daily volumes and, AM and PM peak hour intersection volumes respectively.

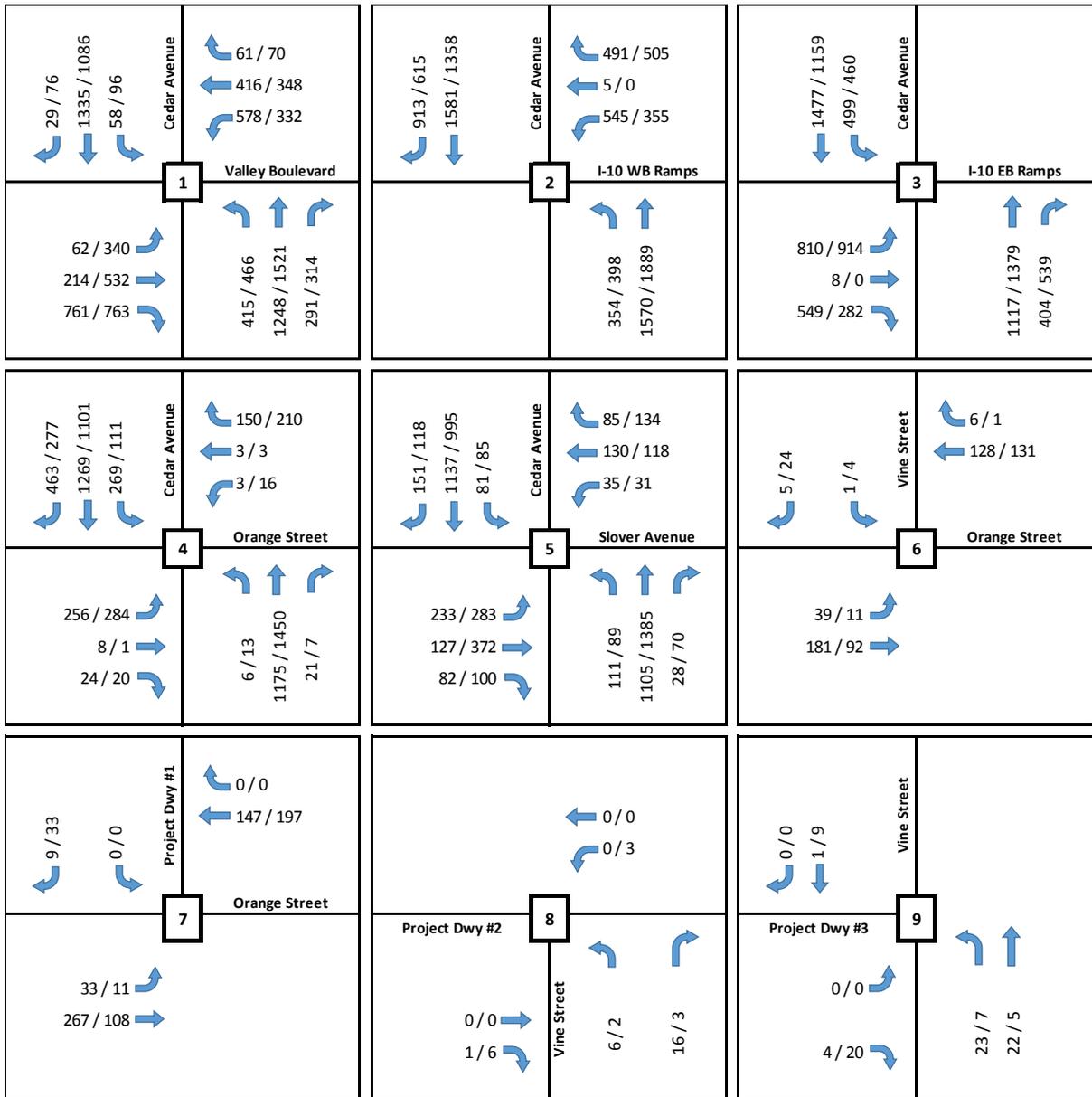




Notes:

XX / XX = AM / PM Peak Hour Volumes





Notes:

XX / XX = AM / PM Peak Hour Volumes

## Horizon Year 2035 Conditions Level of Service Analysis

The results of the Horizon Year 2035 intersection level of service analysis at study intersections are summarized in **Table 9**. Detailed HCM calculation worksheets are contained in **Appendix I**.

**Table 9**  
**Horizon Year 2035 Peak Hour Intersection Conditions Without and With Project**

Study Intersection	Year 2035 Without Project Conditions		Year 2035 With Project Conditions		Significant Impact? <sup>2</sup>	
	AM	PM	AM	PM	AM	PM
	Delay <sup>1</sup> - LOS	Delay <sup>1</sup> - LOS	Delay <sup>1</sup> - LOS	Delay <sup>1</sup> - LOS		
1 - Cedar Ave. / Valley Blvd.	49.3 - D	50.9 - D	50.9 - D	53.0 - D	No	No
2 - Cedar Ave. / I-10 WB Ramps <sup>3</sup>	21.2 - C	18.4 - B	21.4 - C	19.0 - B	No	No
3 - Cedar Ave. / I-10 EB Ramps <sup>3</sup>	31.6 - C	30.7 - C	32.0 - C	31.0 - C	No	No
4 - Cedar Ave. / Orange St.	24.3 - C	22.9 - C	35.4 - D	29.6 - C	No	No
5 - Cedar Ave. / Slover Ave.	48.6 - D	52.5 - D	50.2 - D	52.8 - D	No	No
6 - Orange St. / Vine St.	0.3 - A	9.6 - A	9.4 - A	9.2 - A	No	No
7 - Orange St. / Project Dwy. 1	Does Not Exist		9.1 - A	9.6 - A	No	No
8 - Vine St. / Project Dwy. 2	Does Not Exist		8.3 - A	8.6 - A	No	No
9 - Vine St. / Project Dwy. 3	Does Not Exist		8.3 - A	8.4 - A	No	No

Note: Deficient intersection operations indicated in **bold**.

<sup>1</sup> Average seconds of delay per vehicle.

<sup>2</sup> Significance criteria are provided in County of San Bernardino Traffic Impact Study Guidelines (Revised April 9,2014)

<sup>3</sup> At the I-10 / Cedar Avenue interchange, the "Minimum Build Alternative" improvements per Caltrans Supplemental Traffic Operations Report dated May 11, 2016 prepared by Parsons are assumed in this analysis to be constructed prior to the Horizon Year 2035 conditions.

LOS = level of service.

As shown in **Table 9**, all study intersections are forecast to operate at acceptable levels of service (LOS D or better) under Horizon Year 2035 conditions both without and with the proposed project.

Signal warrants were evaluated at the intersection of Orange Street / Vine Street under the Horizon Year 2035 With Project conditions. Using the *California Manual on Traffic Control Devices (MUTCD) 2014*, signal warrants were not satisfied at this location in either the AM or PM peak hour. The results of the analysis shows this intersection is forecast to operate acceptably (LOS C) as a one-way stop controlled intersection under the Horizon Year 2035 conditions with the proposed project. Therefore, a signal is not needed or recommended at this location.

## **SIGNIFICANT IMPACTS AND MITIGATION**

San Bernardino County utilizes the following thresholds of significance to determine whether the addition of project-generated trips results in a significant impact at a study intersection. Caltrans does not have specific significance thresholds for determining project-related impacts, therefore, the County's thresholds have been applied to the I-10 / Cedar Avenue interchange ramp intersections.

### **Thresholds of Significance**

To determine whether the addition of project-generated trips results in a significant impact at a study intersection, and thus requires mitigation, San Bernardino County TIA Guidelines utilizes the following thresholds of significance. Caltrans does not have specific significance thresholds for determining project-related impacts, therefore, the County's thresholds have been applied to the I-10 / Cedar Avenue interchange.

#### **Signalized Intersections:**

Any study intersection that is operating at a LOS 'A', 'B', 'C' or 'D' for any study scenario without project traffic in which the addition of project traffic causes the intersection to degrade to a LOS 'E' or 'F' shall mitigate the impact to bring the intersection back to at least LOS 'D'. Any study intersection that is operating at LOS 'E' or 'F' for any study scenario without project traffic shall mitigate any impacts so as to bring the intersection back to the overall level of delay established prior to project traffic being added.

#### **Un-signalized Intersections:**

An impact is considered significant if the study determines that either section a) or both sections b) and c) occur.

- d.) The addition of project related traffic causes the intersection to move from a LOS 'D' or better to a LOS 'E' or worse

**OR**

- e.) The project contributes additional traffic to an intersection that is already projected to operate at a LOS 'E' or 'F' with background traffic

**AND**

- f.) One or both of the following conditions are met:
  - 1.) The project adds ten (10) or more trips to any approach
  - 2.) The intersection meets the peak hour traffic signal warrant after the addition of project traffic

The proposed project's traffic impacts and recommended mitigation measures are described in detail below:

### **Existing Plus Project Conditions: Significant Impacts and Recommended Mitigation**

The results of the Existing Plus Project conditions analysis show that the addition of project-related trips to existing traffic volumes do not result in significant impacts at the study intersections. Therefore, no mitigation measures are required under Existing Plus Project conditions.

### **Opening Year 2019 Conditions: Significant Impacts and Recommended Mitigation**

Under Opening Year 2019 Conditions, the addition of project-related traffic results in a deficient level of service at Cedar Ave. / I-10 EB Ramps in the AM peak hour. As previously discussed, the I-10 Eastbound Ramp / Cedar Avenue intersection is included in the SANBAG Rialto Sphere Nexus Study Development Impact Fee (DIF) program, therefore, payment of the DIF for this intersection mitigates the project's potential contribution to significant impacts. As such, impacts at this intersection are considered less than significant and mitigation measures are not required.

**Table 10** summarizes the intersection operations at the I-10 / Cedar Avenue interchange with the assumed improvements. Although the Cedar Avenue / I-10 Westbound Ramps are not significantly impacted by the project, Table 10 summarizes the operational improvements at this location.

Interstate 10 / Cedar Avenue interchange improvements assumed in this analysis are illustrated graphically in **Exhibit 27**.

### **Horizon Year 2035 Significant Impacts and Recommended Mitigation**

For study intersections, the addition of projected-related trips to Horizon Year 2035 traffic volumes do not result in significant impacts. Therefore, no mitigation measures are required under Horizon Year 2035 With Project Conditions.

The HCM worksheets with the proposed Cedar Avenue interchange improvements are provided in **Appendix J**.

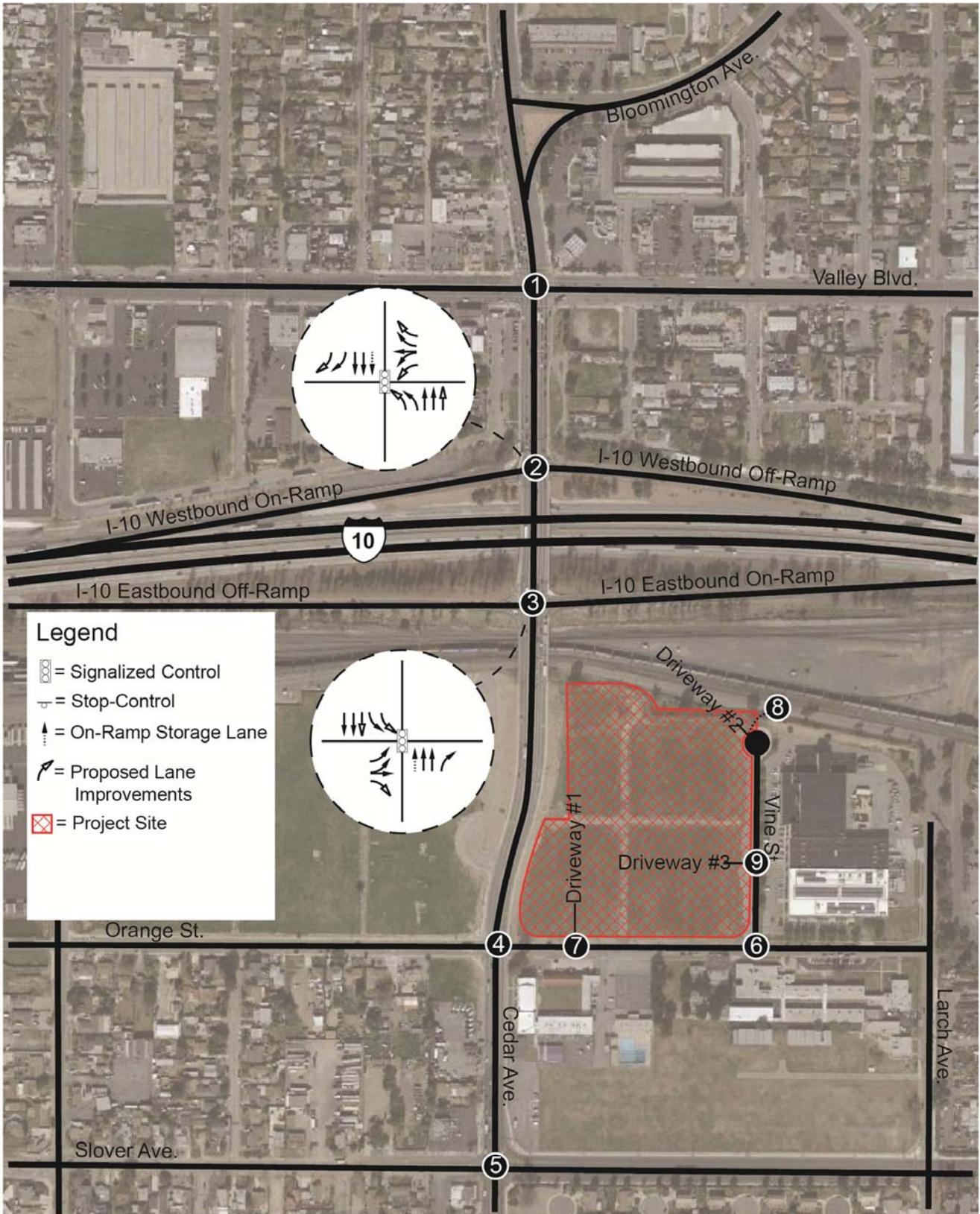
**Table 10  
Summary of Intersection Improvements**

Int. #	Intersection	Peak Hour	Without Project Without Improvements	With Project Without Improvements	Funded Caltrans Improvements <sup>(2)</sup>	With Project With Improvements	Project Responsibility
			Delay <sup>(1)</sup> – LOS	Delay <sup>(1)</sup> – LOS		Delay <sup>(1)</sup> – LOS	
<b>Opening Year 2019 Conditions</b>							
2	Cedar Ave. / I-10 WB Ramps	AM	52.7 - D	53.3 - D	NB Approach: Widen to provide dual left-turn lanes & three (3) through lanes. SB Approach: Widen to provide three through lanes and dual right-turn lanes.	19.5 - B	Pay Development Impact Fee
		PM	37.3 - D	38.6 - D		WB Approach: Widen off-ramp to provide a dedicated left-turn lane, shared through/left-turn lane, and dual right-turn lanes.	
3	Cedar Ave. / I-10 EB Ramps	AM	<b>55.9 – E</b>	<b>58.6 - E</b>	NB Approach: No change to existing lane geometry. SB Approach: Widen to provide dual left-turn lanes and three (3) through lanes.	27.5 - C	Pay Development Impact Fee
		PM	48.3 – D	49.8 - D		EB Approach: Widen off-ramp to provide a dedicated left-turn lane, shared through/left-turn lane, and one (1) dedicated right-turn lane.	

**Note:** Deficient intersection operation shown in **bold**.

<sup>(1)</sup> Seconds of delay per vehicle.

<sup>(2)</sup> Minimum Build Alternative is assumed in this analysis based on the Supplemental Traffic Operations Report of the Cedar Avenue Interchange on Interstate 10 dated May 11, 2016 prepared by Parsons.



## CONCLUSIONS

The proposed Cedar Avenue Technology Center is located on a vacant 9.60-acre site on the northeast corner of Cedar Avenue and Orange Street in the unincorporated community of Bloomington, San Bernardino County. The proposed project will consist of a 184,770 square-foot Warehouse Center.

The project will generate approximately 863 trips per day, which includes approximately 74 AM (60 inbound and 14 outbound) peak hour trips and approximately 77 PM (20 inbound and 57 outbound) peak hour trips.

Under the Existing Plus Project conditions, the results of the analysis show that all the study intersections are currently operating at acceptable level of service (LOS D or better). The addition of project-related trips to existing traffic volumes do not result in significant impacts at the study intersections. Therefore, no mitigation measures are required under Existing Plus Project conditions.

Under the Opening Year 2019 Without and With Project conditions, the results of the analysis show that all the study intersections operate at acceptable level of service (LOS D or better) except at the I-10 EB Ramps / Cedar Avenue intersection which operate at LOS E in the AM peak hour. This intersection is included in the SANBAG Rialto Sphere Nexus Study DIF program. Therefore, payment of the DIF for this intersection mitigates the project's potential contribution to significant impacts. As such, impacts at this intersection are considered less than significant and mitigation measures are not required.

Under the Horizon Year 2035 conditions, the proposed project will result in no significant impacts at study intersections. This analysis assumes the I-10 / Cedar Avenue interchange improvements are built prior to Year 2035. Construction notice to proceed is scheduled for February 2020 and complete for beneficial use is scheduled for January 2022 based on the March 2017 Project Status prepared by the San Bernardino County Transportation Authority.