

## APPENDIX A

### TRAFFIC STUDY SCOPE OF WORK

# MEMORANDUM

To: Mr. Zdenek "Zed" Kekula, P.E.  
City of Santa Ana

Date: October 19, 2016

From: Richard E. Barretto, P.E., Principal  
LLG Ref: 2.16.3755.1  
Linscott, Law & Greenspan, Engineers

Subject: ***Traffic Impact Analysis Scope of Work for The Madison  
Santa Ana, California***

Linscott, Law & Greenspan, Engineers (LLG) is pleased to submit the following Traffic Impact Analysis Scope of Work for the proposed Madison Mixed-Use project in the City of Santa Ana for your review and approval. The work program summarized below considers the City of Santa Ana requirements as outlined in the prior scope of work prepared for this site dated August 4, 2014 and our recent experience within the City.

## **Traffic Study Scope of Work**

The Traffic Impact Analysis for the Madison Mixed-Use project (herein after referred to as Project) will satisfy the traffic impact requirements of the City of Santa Ana and will be consistent with the requirements and procedures outlined in the most current *Congestion Management Program (CMP) for Orange County*. Given the location of the Project site, the criteria outlined in the current *Caltrans Guide for the Preparation of Traffic Impact Studies* will also be considered. The *Traffic Impact Study for the Metro East Overlay Zone in the City of Santa Ana* and *Supplemental Traffic Analysis* will be used as a database and a reference.

**A. Project Location:** The Project site, located at 200 N. Cabrillo Park Drive, is a 2.79-acre vacant parcel of land within the Metro East Mixed Use Overlay Zone that is generally located north of First Street, south of Fourth Street, east of the Santa Ana (I-5) Freeway and west of Cabrillo Park Drive. Access to the subject property is now provided at the Xerox Centre/Cabrillo Park Drive signalized intersection. See **Figure 1-1**, a Vicinity Map that illustrates the general location of the Project and surrounding street system. **Figure 2-1** is an existing aerial photograph of the Project site.

**B. Project Description:** The Madison will consist of a seven story apartment podium with a total of 280 apartment homes consisting of 53 studio units, 159 one-bedroom units, 17 one-bedroom with loft units, 43 two-bedroom units, 4 three-bedroom units and 4 live/work units, each with 626.75 square feet (SF) of dedicated retail/commercial space, and 6,368 SF of ground floor retail space within two (2) suites over a two-level parking garage (plus subterranean level) with a total of 500 parking spaces. On-site facilities/amenities of the proposed Project include a leasing office, a lounge/lobby, business center, pool/spa, and a

fitness center for residents and two roof top decks.

**Table 2-1** provides a summary of the proposed Project components. **Figure 2-2** illustrates the proposed site plan for the Project prepared by MVE+Partners.

Vehicular access to the Project's parking garage will be provided from a proposed driveway on Xerox Centre Drive at N. Cabrillo Park Drive; no vehicular access from State Fund Drive is proposed.

**C. Traffic Study Locations:** The following fifteen (15) key study intersections and eight (8) key roadway segments have been selected for evaluation *Figure 1-1* identifies the study locations.

**Key Study Intersections**

1. I-5 SB On-Ramp at First Street
2. Cabrillo Park Drive at First Street
3. Golden Circle Drive at First Street
4. Tustin Avenue at First Street
5. Cabrillo Park Drive at Xerox Centre
6. Cabrillo Park Drive at State Fund
7. I-5 SB Off-Ramp/Marbury Street at Fourth Street
8. I-5 NB Ramps at Fourth Street
9. Cabrillo Park Drive at Fourth Street
10. Golden Circle Drive at Fourth Street
11. Park Center Drive at Fourth Street
12. Tustin Avenue at Fourth Street
13. SR-55 SB Ramps at Fourth Street
14. SR-55 NB Ramps at Fourth Street
15. Tustin Avenue at Sixth Street

**Key Roadway Segments**

- a. First Street, between I-5 SB On-Ramp/Marbury Street and Cabrillo Park Drive
- b. First Street, between Cabrillo Park Drive and Golden Circle Drive
- c. First Street, between Golden Circle Drive and Tustin Avenue
- d. Cabrillo Park Drive, between Xerox Centre and State Fund
- e. Fourth Street, between I-5 NB Ramps and Cabrillo Park Drive
- f. Fourth Street, between Cabrillo Park Drive and Golden Circle Drive
- g. Tustin Avenue, between First Street and Fourth Street
- h. Tustin Avenue, between Fourth Street and Sixth Street

**D. Traffic Counts:** Daily, AM peak hour and PM peak hour traffic counts for the 15 key study intersections and 8 key roadway segments were conducted during the week of October 3, 2016.

**E. Project Traffic Generation:** The trip generation potential of the proposed Project will be estimated using trip rates contained in the 9<sup>th</sup> Edition of *Trip Generation*, published by the Institute of Transportation Engineers (ITE), [Washington, D.C., 2012]. As shown in the upper portion of **Table 5-1**, ITE Land Use 220: Apartments trip rates will be used to forecast the trip generation potential of the residential component of the Project. For the retail/commercial component of the Project, ITE Land Use 820: Shopping Center averages trips will be used.

A review of the lower portion of this table indicates that the proposed Project is forecast to generate approximately 2,129 “net” daily trips, with 143 “net” trips (32 inbound, 111 outbound) produced in the AM peak hour and 197 “net” trips (123 inbound, 74 outbound) produced in the PM peak hour on a “typical” weekday.

**F. Project Trip Distribution Pattern:** See attached **Figure 5-1** for the Project Trip Distribution as well as a tabular summary on **Table 5-2** for review by the City. Project traffic volumes both entering and exiting the site have been distributed and assigned to the adjacent street system based on the following considerations:

- location of site access points in relation to the surrounding street system,
- the site's proximity to major traffic carriers and regional access routes,
- physical characteristics of the circulation system such as lane channelization and presence of traffic signals that affect travel patterns,
- presence of traffic congestion in the surrounding vicinity,
- ingress/egress availability at the project site,
- distribution patterns contained within the *Traffic Impact Study for the Metro East Overlay Zone in the City of Santa Ana*, and
- input from City staff.

**G. Near-Term Cumulative Background Traffic:**

- Project Completion Year: 2019
- Ambient Growth Rate: 1% per year
- Cumulative Projects: Planned and/or approved projects within a two-mile radius and in the vicinity of the Project site that may contribute traffic to the Project study area will be researched at the City of Santa Ana and adjacent jurisdictions (i.e. Tustin) and confirmed with City staff.

## H. Long-Term Buildout Traffic:

Long-Term traffic volumes forecasts will be developed based on buildout traffic volume projections contained in *Traffic Impact Study for the Metro East Overlay Zone in the City of Santa Ana*. Metro East Overlay Zone allows for the construction of up to 5,551 residential units, 3.4 million square feet of office space and 1.3 million square-foot of commercial space. For the subject property, the site is entitled for up to 210,000 square-foot of office space and is included as part of the Metro East Overlay Zone. Therefore, to forecast “no project” buildout traffic volumes, trips associated with 210,000 SF of office space will be subtracted from the key study intersections.

As an alternative, contact OCTA and formally request preparation of OCTAM 3.4 approved computer traffic model runs for baseline conditions, and buildout conditions for the AM and PM peak periods and daily traffic conditions.

Forecast future buildout traffic volumes using the following methodology:

- a. Peak period traffic volumes will be converted to peak hour (i.e., one-hour) traffic volumes using a conversion factor of 0.38 for the AM peak hour and 0.28 for the PM peak hour;
- b. Calculate the difference between the baseline and buildout peak period traffic volumes and convert to AM and PM peak hour (i.e., one-hour) link traffic volumes;
- c. Link traffic volumes (i.e., two-way directional traffic volumes on each roadway segment) will be post-processed using the “b-turns” program and the relationship of the base year validation model run output to the base year "ground" traffic counts to develop buildout AM and PM peak hour traffic volumes.

**I. Analysis Scenarios:** Prepare AM peak hour and PM peak hour and daily Level of Service (LOS) calculations at up to 15 study intersections and 8 roadway segments to determine the potential impacts of the proposed Project. The following traffic scenarios will be prepared.

1. Existing Traffic Conditions;
2. Existing Plus Project Traffic Conditions;
3. Scenario (2) with Mitigation, if necessary;
4. Near-Term (Year 2019) Background Traffic Conditions (Existing plus Ambient Growth plus Related Projects);
5. Near-Term (Year 2019) Background Plus Project Traffic Conditions;
6. Scenario (5) with Mitigation, if necessary;
7. Long-Term Buildout Traffic Conditions;
8. Long-Term Buildout Plus Project Traffic Conditions; and
9. Scenario (8) with Mitigation, if necessary.

The LOS calculations will be based on the Intersection Capacity Utilization (ICU) methodology for signalized intersections and the Highway Capacity Manual (HCM) methodology for unsignalized intersections. The Project's potential impacts will be based on City of Santa Ana significant impact criteria and Orange County CMP requirements.

The key study intersections at the I-5 Freeway and SR-55 Freeway will also be evaluated using the HCM signalized methodology per Caltrans requirements.

**J. Other Issues:**

- Evaluate Site Access and Internal Circulation. Assess operations of the Xerox Centre / Cabrillo Park Drive vehicular queues with the Project.
- Identify measures to mitigate the impact of project traffic including roadway and intersection widening, traffic signals installation & modification signing, localized street improvement striping/channelization and all others improvements to provide acceptable LOS.

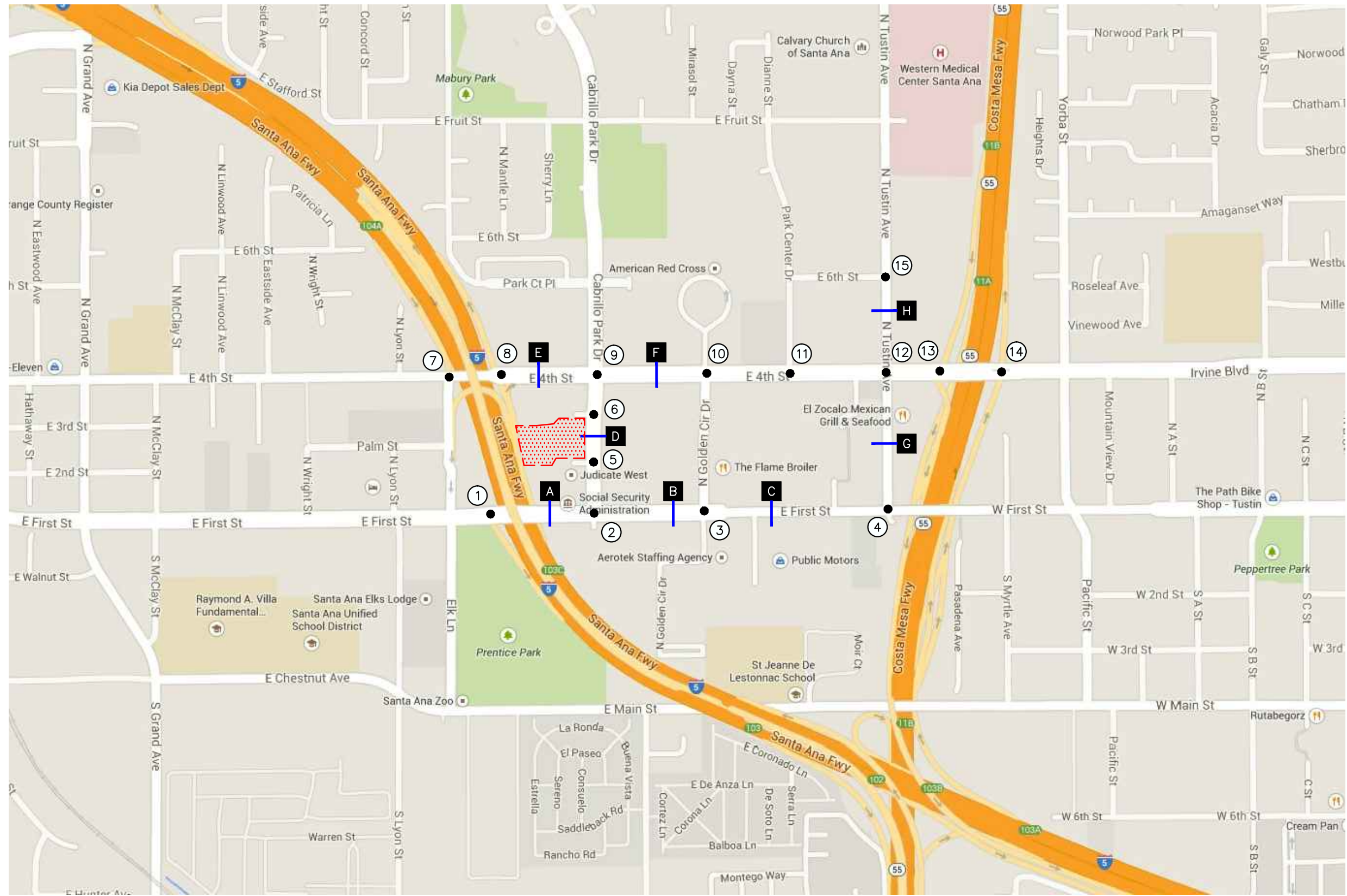
We appreciate the opportunity to provide this scope of work. Should you have any questions, please call us at (949)825-6175. Thank you.

**Approved by:**

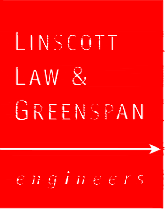
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City of Santa Ana

\_\_\_\_\_  
Date

Attachments



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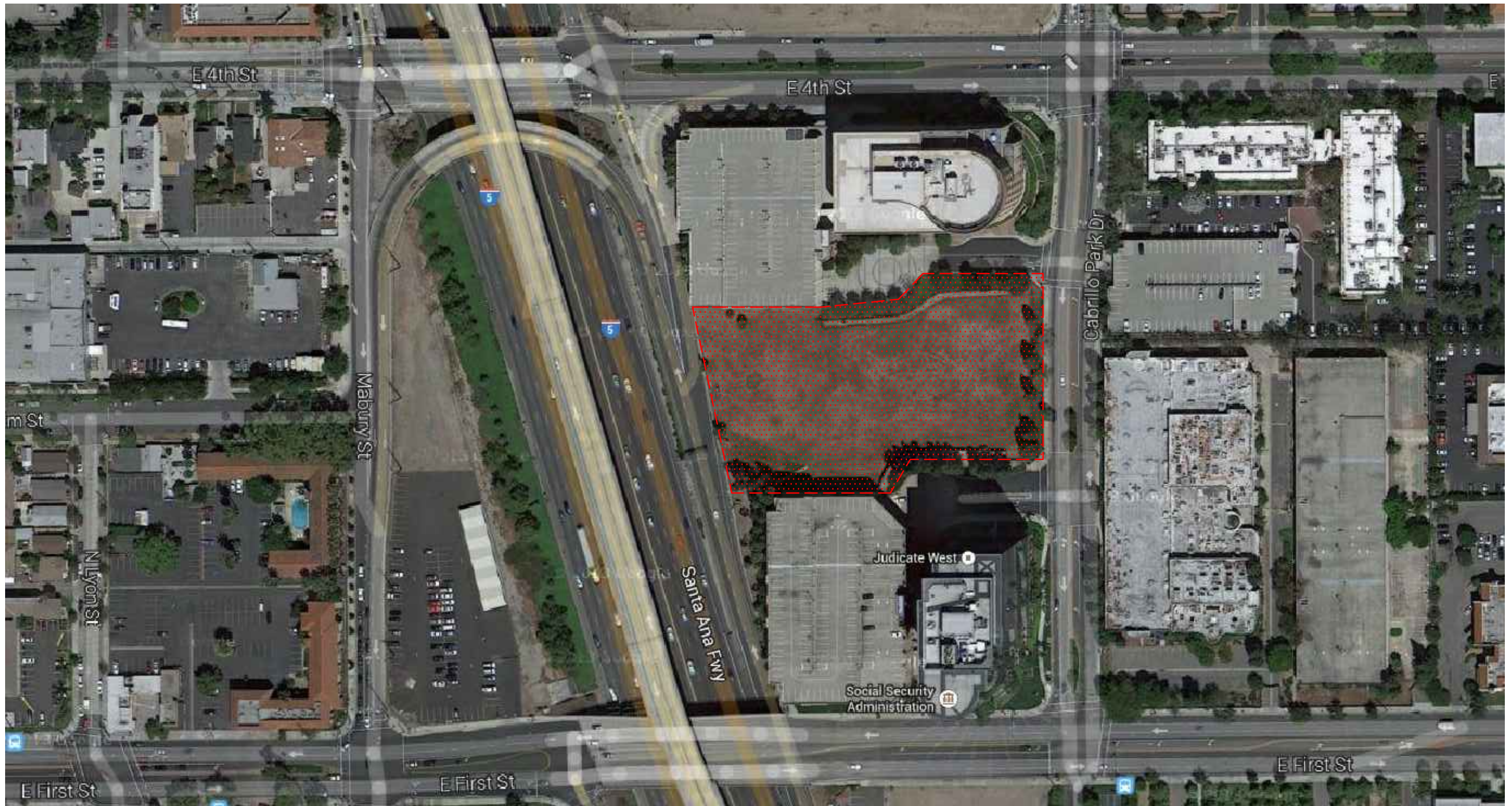
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KEY

- = STUDY INTERSECTION
- = STUDY ROADWAY SEGMENT
- = PROJECT SITE

FIGURE 1-1

VICINITY MAP  
THE MADISON, SANTA ANA



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LINSCOTT  
LAW &  
GREENSPAN  
engineers



SOURCE: GOOGLE

KEY


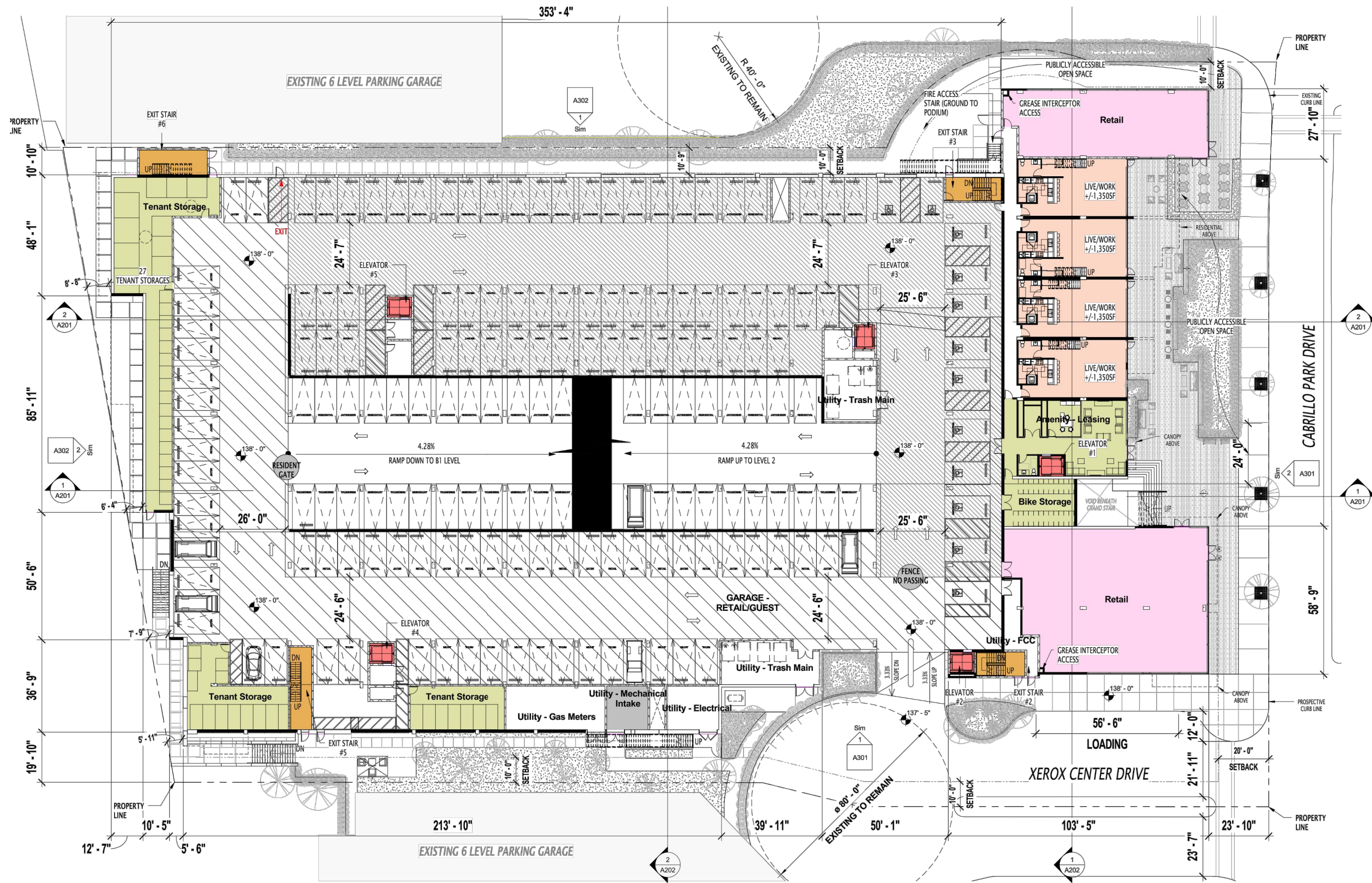
 = PROJECT SITE

FIGURE 2-1

EXISTING AERIAL SITE PHOTOGRAPH  
THE MADISON, SANTA ANA





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SOURCE: MVE+PARTNERS

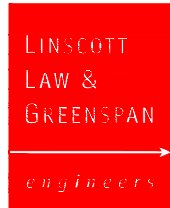
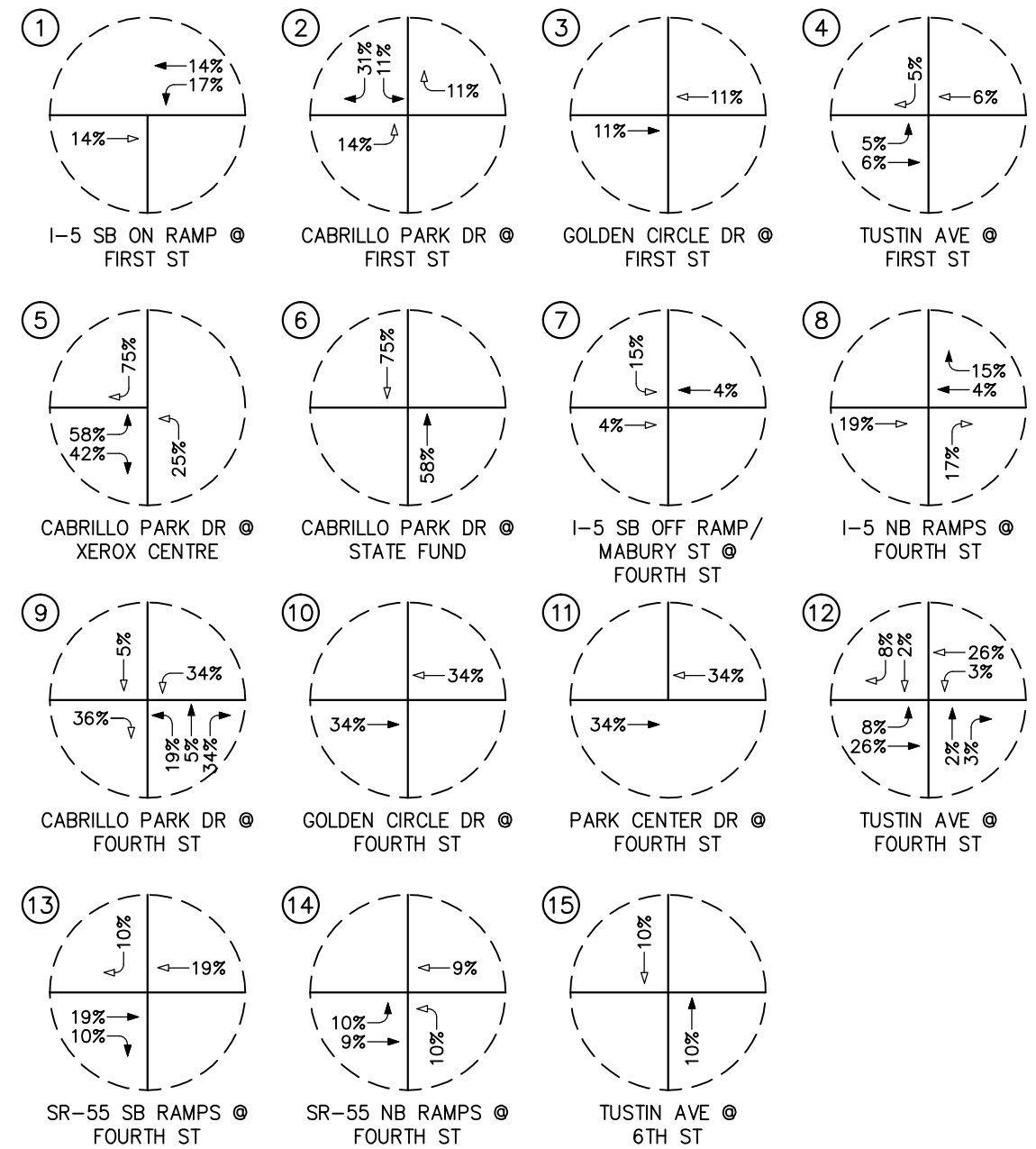
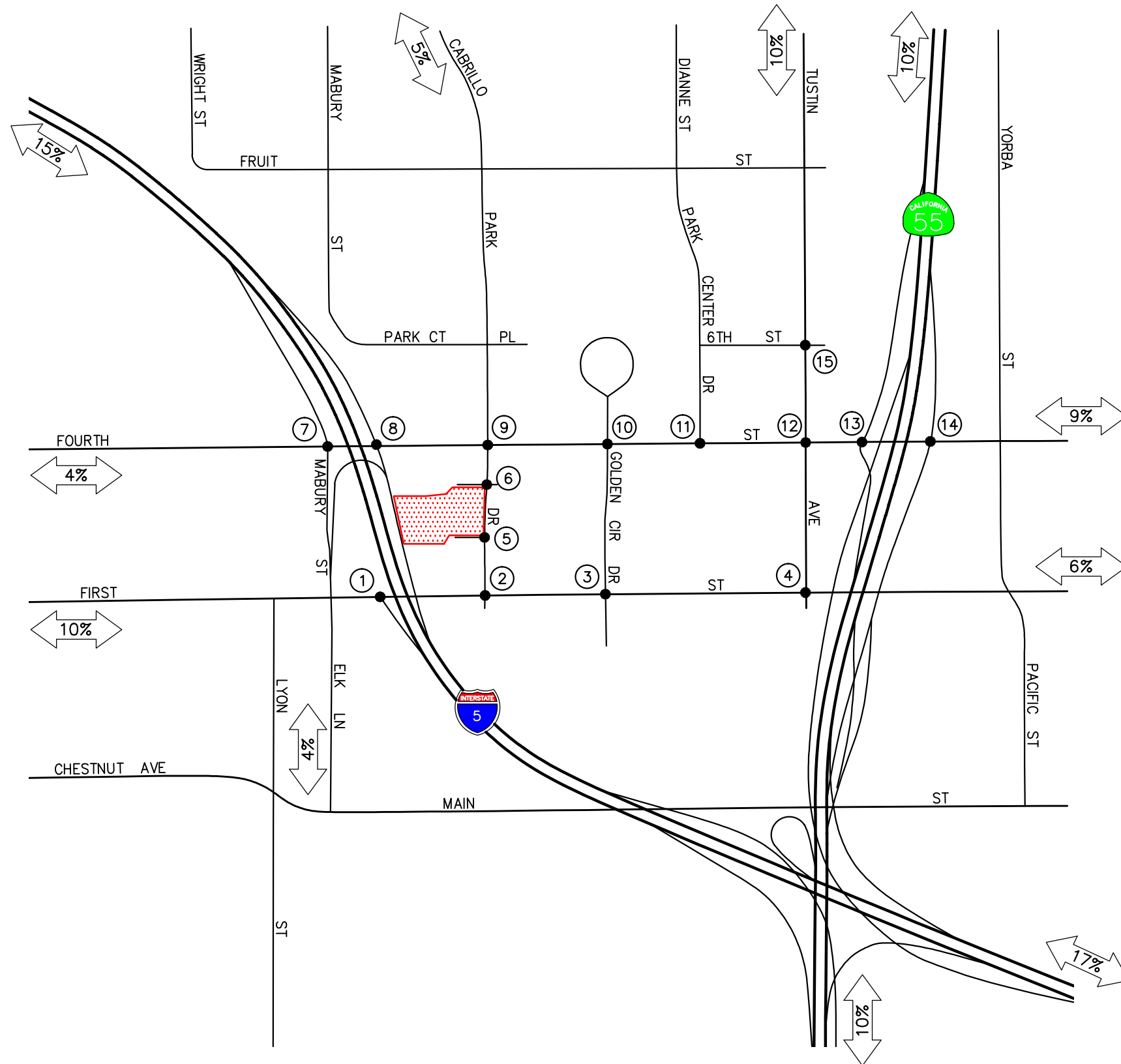
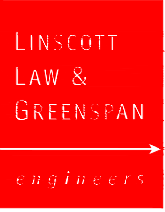


FIGURE 2-2

PROPOSED SITE PLAN - GROUND FLOOR  
THE MADISON, SANTA ANA



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**KEY**  
 ← = INBOUND PERCENTAGE  
 → = OUTBOUND PERCENTAGE  
 [Red Hatched Box] = PROJECT SITE

**FIGURE 5-1**

**PROJECT TRAFFIC DISTRIBUTION PATTERN  
 THE MADISON, SANTA ANA**

**TABLE 2-1  
PROJECT DEVELOPMENT SUMMARY<sup>1</sup>**

<b>Land Use / Project Description</b>	<b>Project Development Totals</b>
<b><i>The Madison Mixed-Use Development</i></b>	
<input type="checkbox"/> Studio Units (603 SF Average)	53 Units
<input type="checkbox"/> 1 Bedroom Units (803 SF Average)	159 Units
<input type="checkbox"/> 1 Bedroom + Loft Units (803 SF Average)	17 Units
<input type="checkbox"/> 2 Bedroom Units (928 SF Average)	43 Units
<input type="checkbox"/> 3 Bedroom Units (1,600 SF Average)	4 Units
<input type="checkbox"/> 1 Live/Work Units (1,459 SF Average)	<u>4 Units</u>
○ 2,507 SF commercial space	
<b><i>Total Residential Units:</i></b>	<b><i>280 Units</i></b>
<input type="checkbox"/> Retail Suite North	2,084 SF
<input type="checkbox"/> Retail Suite South	<u>4,284 SF</u>
<b><i>Total Retail Space:</i></b>	<b><i>6,368 SF</i></b>
<b><i>Parking Supply</i></b>	
<input type="checkbox"/> Resident Parking – 1 <sup>st</sup> Access (includes 10 H/C)	255 spaces
<input type="checkbox"/> Resident Parking – 2 <sup>nd</sup> Access/Tandem	186 spaces
<input type="checkbox"/> Guest Parking (includes 1 H/C spaces)	<u>59 spaces</u>
<b><i>Total Parking Supply:</i></b>	<b><i>500 spaces</i></b>

<sup>1</sup> Source: MVE+Partners, 9/16/2016.

**TABLE 5-1  
PROJECT TRAFFIC GENERATION RATES AND FORECAST<sup>2</sup>**

Description	Daily 2-Way	AM Peak Hour			PM Peak Hour		
		Enter	Exit	Total	Enter	Exit	Total
<b><u>Trip Rates:</u></b>							
▪ 220: Apartments (TE/ DU)	6.65	20%	80%	0.51	65%	35%	0.62
▪ 820: Shopping Center (TE/1000 SF)	42.70	62%	38%	0.96	48%	52%	3.71
<b><u>Trip Generation:</u></b>							
▪ The Madison Apartments (280 DU)	1,862	29	114	143	113	61	174
▪ The Madison Retail/Commercial Component of Live/Work (2,507 SF)	107	1	1	2	4	5	9
▪ The Madison Retail (6,368 SF)	272	4	2	6	12	12	24
<b>Total Project Trip Generation:</b>	<b>2,241</b>	<b>34</b>	<b>117</b>	<b>151</b>	<b>129</b>	<b>78</b>	<b>207</b>
<b>Internal Trip Capture (5%)</b>	<b>-112</b>	<b>-2</b>	<b>-6</b>	<b>-8</b>	<b>-6</b>	<b>-4</b>	<b>-10</b>
<b>Total Net Project Trip Generation</b>	<b>2,129</b>	<b>32</b>	<b>111</b>	<b>143</b>	<b>123</b>	<b>74</b>	<b>197</b>

**Notes:**

TE/1000 SF = Trip End per 1,000 Square Feet of Gross Floor Area

TE/DU = Trip End per Dwelling Unit

<sup>2</sup> Source: *Trip Generation*, 9<sup>th</sup> Edition, Institute of Transportation Engineers (ITE), Washington, D.C. (2012).  
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**TABLE 5-2**  
**PROJECT DIRECTIONAL DISTRIBUTION PATTERN**

<b>Distribution Percentage</b>	<b>Orientation/Direction</b>
15%	To/from the north via I-5 Freeway
17%	To/from the south via I-5 Freeway
10%	To/from the north via SR-55 Freeway
10%	To/from the south via SR-55 Freeway
5%	To/from the north via Cabrillo Park Drive
10%	To/from the north via Tustin Avenue
4%	To/from the south via Elk Avenue
9%	To/from the east via Fourth Street/Irvine Boulevard
4%	To/from the west via Fourth Street
6%	To/from the east via First Street
10%	To/from the west via First Street
<b>100%</b>	<b>Total</b>