# Appendix J Traffic Study

# Appendix

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# TRAFFIC IMPACT ANALYSIS

# LINCOLN AVENUE REDEVELOPMENT PROJECT

**Anaheim, California**

**November 25, 2019**
**(Revision of October 23, 2019)**

*Prepared for:*

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**TRAFFIC IMPACT ANALYSIS**

# LINCOLN AVENUE REDEVELOPMENT PROJECT

**Anaheim, California**
**November 25, 2019**
**(Revision of October 23, 2019)**

## 1.0 INTRODUCTION

This traffic impact analysis addresses the potential traffic impacts and circulation needs associated with the Lincoln Avenue Redevelopment Project (hereinafter referred to as Project). The proposed Project will consist of a new residential single-family attached development with a maximum of 119 units. The proposed Project is expected to be completed in the Year 2023 and will consist of two (2) phase options. Phase I (Scenario No. 1) will consist of 105 units. Phase II (Scenario No. 2) will consist of 119 units, which includes 14 additional units and is contingent on the project applicant acquiring the adjacent City owned parcels. The proposed project site is generally bounded by Euclid Street to the west, Lincoln Avenue to the south, Loara Street to the east and the Union Pacific railroad tracks and the I-5 Freeway to the north in the City of Anaheim, California. The project site is primarily vacant. However, a portion of the site is currently occupied by a 32,100 square-foot (SF) cement manufacturing company and an area used for vehicle storage/parking.

This report documents the findings and recommendations of a traffic impact analysis conducted by Linscott, Law & Greenspan, Engineers (LLG) to determine the potential impacts associated with the Project. The traffic analysis evaluates the existing operating conditions at six (6) key study intersections and five (5) key roadway segments within the project vicinity, estimates the trip generation potential of the Project, and forecasts future operating conditions without and with the proposed Project. Where necessary, intersection improvements/mitigation measures are identified.

This traffic report satisfies the City of Anaheim *Criteria for Preparation of Traffic Impact Studies* and is consistent with the requirements and procedures outlined in the most current *Congestion Management Program (CMP) for Orange County.* The Scope of Work for this traffic study, which is included in ***Appendix A***, was developed in conjunction with City of Anaheim Traffic Engineering Department staff.

The project site has been visited and an inventory of adjacent area roadways and intersections was performed. Existing traffic information has been collected at six (6) key study intersections and five (5) key roadway segments on a "typical" weekday for use in the preparation of intersection and roadway segment level of service calculations. Information concerning cumulative projects (planned and/or approved) in the vicinity of the proposed Project has been researched at the City of Anaheim and the City of Fullerton. Based on our research, there are forty-one (41) cumulative projects in the City of Anaheim and three (3) cumulative projects in the City of Fullerton within the vicinity of the subject site. These forty-four (44) planned and/or approved cumulative projects were considered in the cumulative traffic analysis for this project.

This traffic report analyzes existing and future weekday daily, AM peak hour and PM peak hour traffic conditions for a near-term (Year 2023 – Project Opening Year) and long-term buildout (Year 2035) traffic setting upon completion of the proposed Project. Daily and peak hour traffic forecasts for the Year 2023 horizon year have been projected by increasing existing traffic volumes by an annual growth rate of one percent (1.0%) per year and adding traffic volumes generated by forty-four (44) cumulative projects. General Plan Buildout (Year 2035) traffic volume forecasts were provided by City of Anaheim Traffic Engineering Department staff from the Anaheim Traffic Analysis Model (ATAM).

## 1.1 Study Area

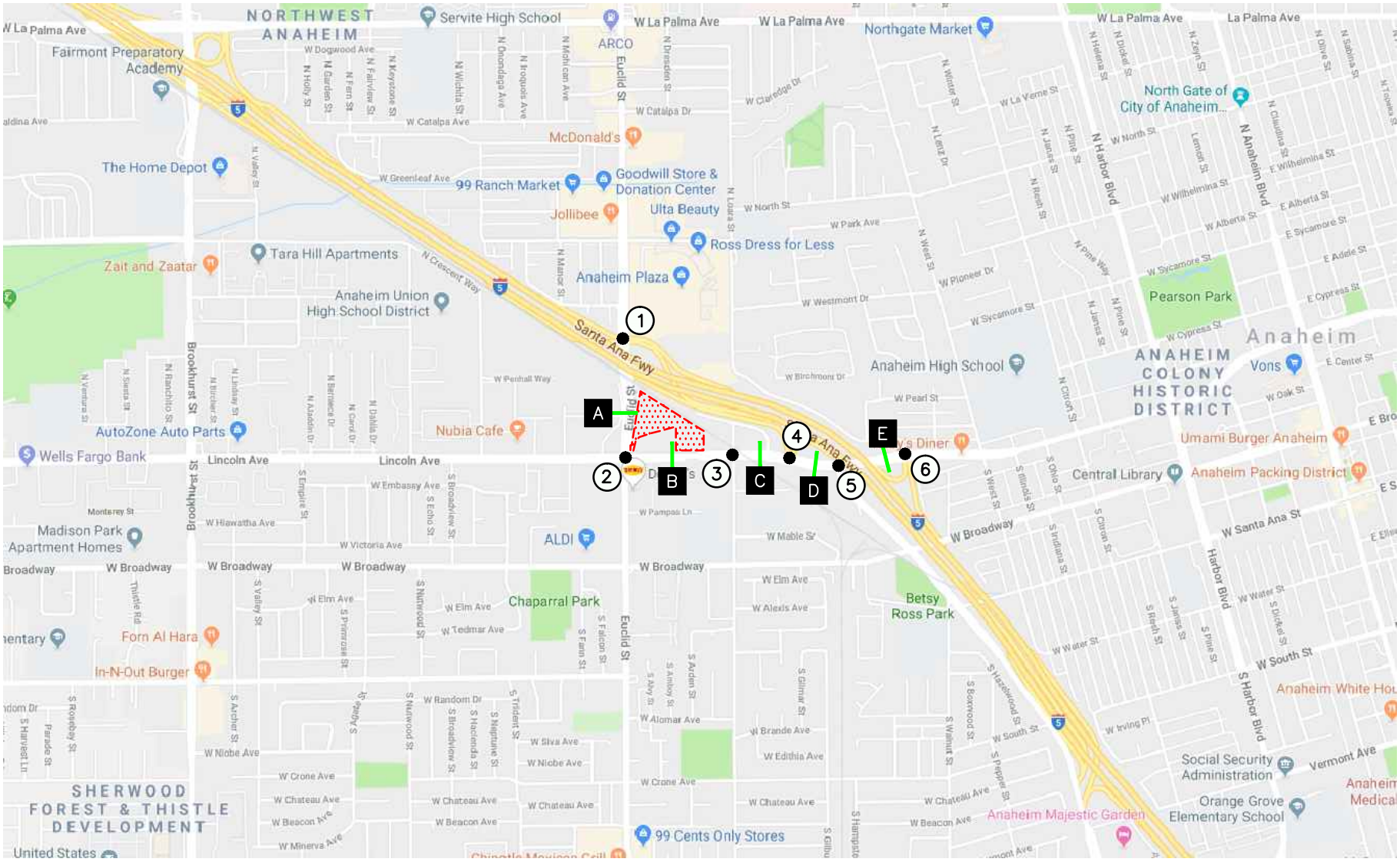
The six (6) key study intersections and five (5) key roadway segments selected for evaluation were determined based on coordination with City of Anaheim Traffic Engineering Department staff. The 6 intersections/5 roadway segments listed below provide regional and local access to the study area and define the extent of the boundaries for this traffic impact investigation. All key study intersections and key roadway segments are located within the City of Anaheim.

| ***Key Study Intersections*** |
|---|
| 1. I-5 Ramps at Euclid Street |
| 2. Euclid Street at Lincoln Avenue |
| 3. Loara Street at Lincoln Avenue |
| 4. I-5 SB Ramps at Lincoln Avenue |
| 5. Manchester Avenue at Lincoln Avenue |
| 6. I-5 NB Ramps/Wilshere Avenue at Lincoln Avenue |
| ***Key Roadway Segments*** |
| A. Euclid Street between Lincoln Avenue and I-5 Ramps |
| B. Lincoln Avenue between Euclid Street and Loara Street |
| C. Lincoln Avenue between Loara Street and I-5 SB Ramps |
| D. Lincoln Avenue between I-5 SB Ramps and Manchester Avenue |
| E. Lincoln Avenue between Manchester Avenue and I-5 NB Ramps/Wilshire Avenue |

***Figure 1-1*** presents a Vicinity Map, which illustrates the general location of the proposed Project and depicts the study locations and surrounding street system. The Level of Service (LOS) investigations at these key locations were used to evaluate the potential traffic-related impacts associated with area growth, cumulative projects and the proposed Project. When necessary, this report recommends intersection and/or roadway segment improvements that may be required to accommodate future traffic volumes and restore/maintain an acceptable Level of Service and/or mitigate the impact of the project.

Included in this Traffic Impact Analysis are:

- Existing traffic counts,
- Estimated project traffic generation/distribution/assignment,
- Estimated cumulative project traffic generation/distribution/assignment,
- Daily, AM and PM peak hour capacity analyses for existing conditions,
- Daily, AM and PM peak hour capacity analyses for existing plus project conditions (Scenario No. 2),
- Daily, AM and PM peak hour capacity analyses for existing plus cumulative plus project conditions (Scenario No. 1),
- Daily, AM and PM peak hour capacity analyses for existing plus cumulative plus project conditions (Scenario No. 2),
- Daily, AM and PM peak hour capacity analyses for future (Year 2023) conditions without and with project traffic (Scenario No. 1),
- Daily, AM and PM peak hour capacity analyses for future (Year 2023) conditions without and with project traffic (Scenario No. 2),
- Daily, AM and PM peak hour capacity analyses for general plan buildout (Year 2035) conditions,
- Daily, AM and PM peak hour capacity analyses for general plan buildout (Year 2035) conditions with cumulative project traffic,
- Daily, AM and PM peak hour capacity analyses for general plan buildout (Year 2035) conditions with project traffic (Scenario No. 2),
- Site Access Evaluation,
- Planned and Recommended Improvements, and
- Congestion Management Program (CMP) Analysis.

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LINSCOTT LAW & GREENSPAN engineers

N

NO SCALE

SOURCE: GOOGLE

KEY

(#) = STUDY INTERSECTION

A = STUDY ROADWAY SEGMENT

= PROJECT SITE

# FIGURE 1-1

## VICINITY MAP

LINCOLN AVENUE REDEVELOPMENT PROJECT, ANAHEIM

# 2.0 PROJECT DESCRIPTION

The proposed project site is generally bounded by Euclid Street to the west, Lincoln Avenue to the south, Loara Street to the east and the Union Pacific railroad tracks and the I-5 Freeway to the north in the City of Anaheim, California. The project site is primarily vacant. However, a portion of the site is currently occupied by a 32,100 square-foot (SF) cement manufacturing company and an area used for vehicle storage/parking. ***Figure 2-1*** presents the existing site.

The proposed Project will consist of a new residential single-family attached development with a maximum of 119 units. The proposed Project is expected to be completed in the Year 2023 and will consist of two (2) phase options. Phase I (Scenario No. 1) will consist of 105 units. Phase II (Scenario No. 2) will consist of 119 units, which includes 14 additional units and is contingent on the project applicant acquiring the adjacent City owned parcels. It should be noted that the Project will consist of either Phase I or Phase II and will not be entitled in two (2) phases. Therefore, Phase I traffic is never considered in the background (without Project) condition for Phase II. ***Figure 2-2*** presents the proposed site plan for the proposed Project.

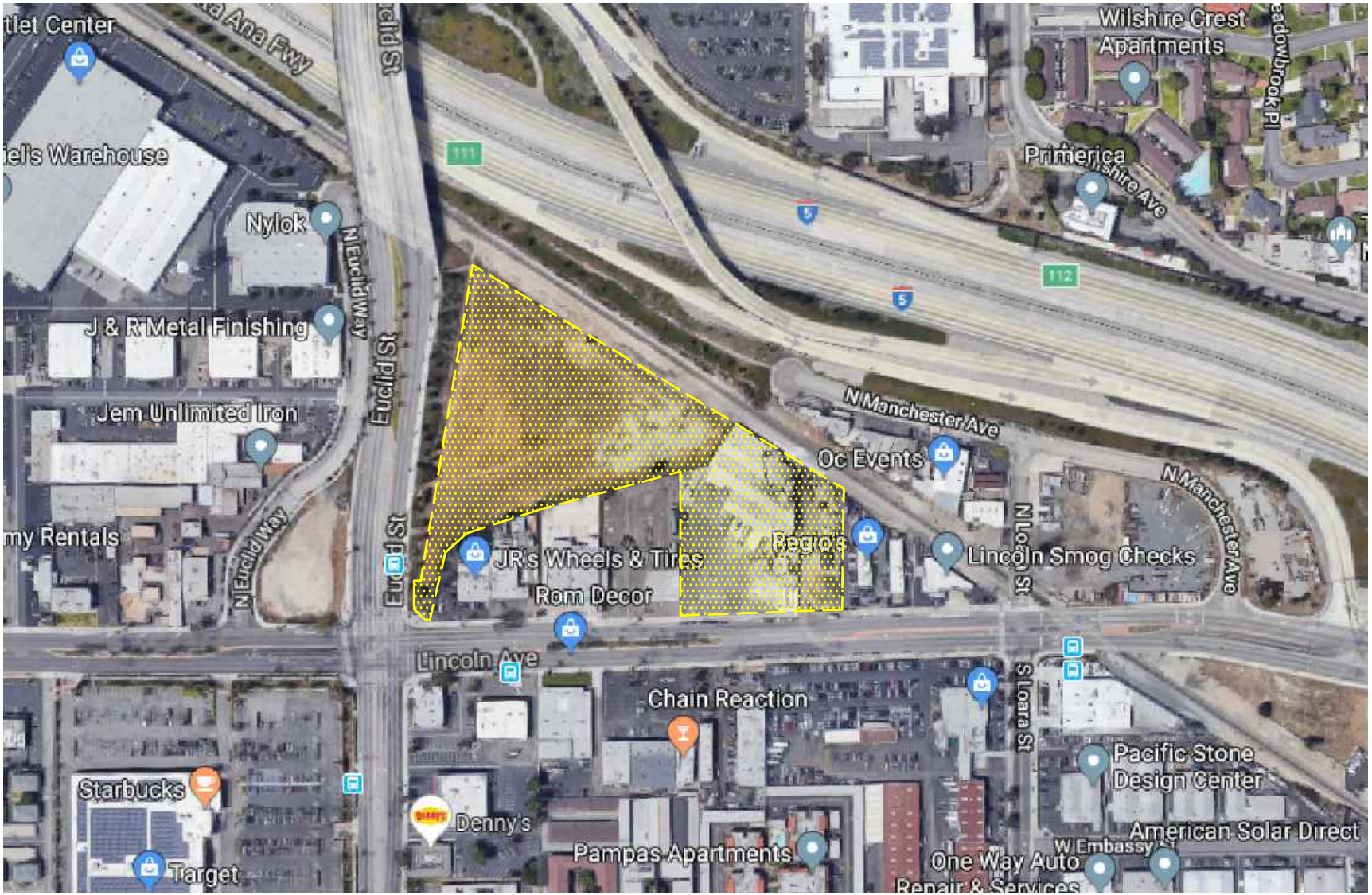
## 2.1 Site Access

As shown in *Figure 2-2*, access to the proposed Project site will be provided via two gated unsignalized driveways located along Lincoln Avenue. The easterly driveway will provide full access to the site and the westerly driveway will provide emergency access only to the site.

## 2.2 Project Specific Improvements

The following project design feature that will be constructed by the proposed Project is recommended to ensure that adequate ingress and egress to the project site is provided:

- **Project Driveway at Lincoln Avenue:** Construct the project driveway and provide one inbound lane and two outbound lanes (i.e. one southbound left-turn lane and one southbound right-turn lane). Modify the median on Lincoln Avenue to provide a single minimum 100-foot eastbound left-turn lane with a 90-foot transition. The installation of these improvements is subject to the approval of the City of Anaheim.

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SOURCE: GOOGLE

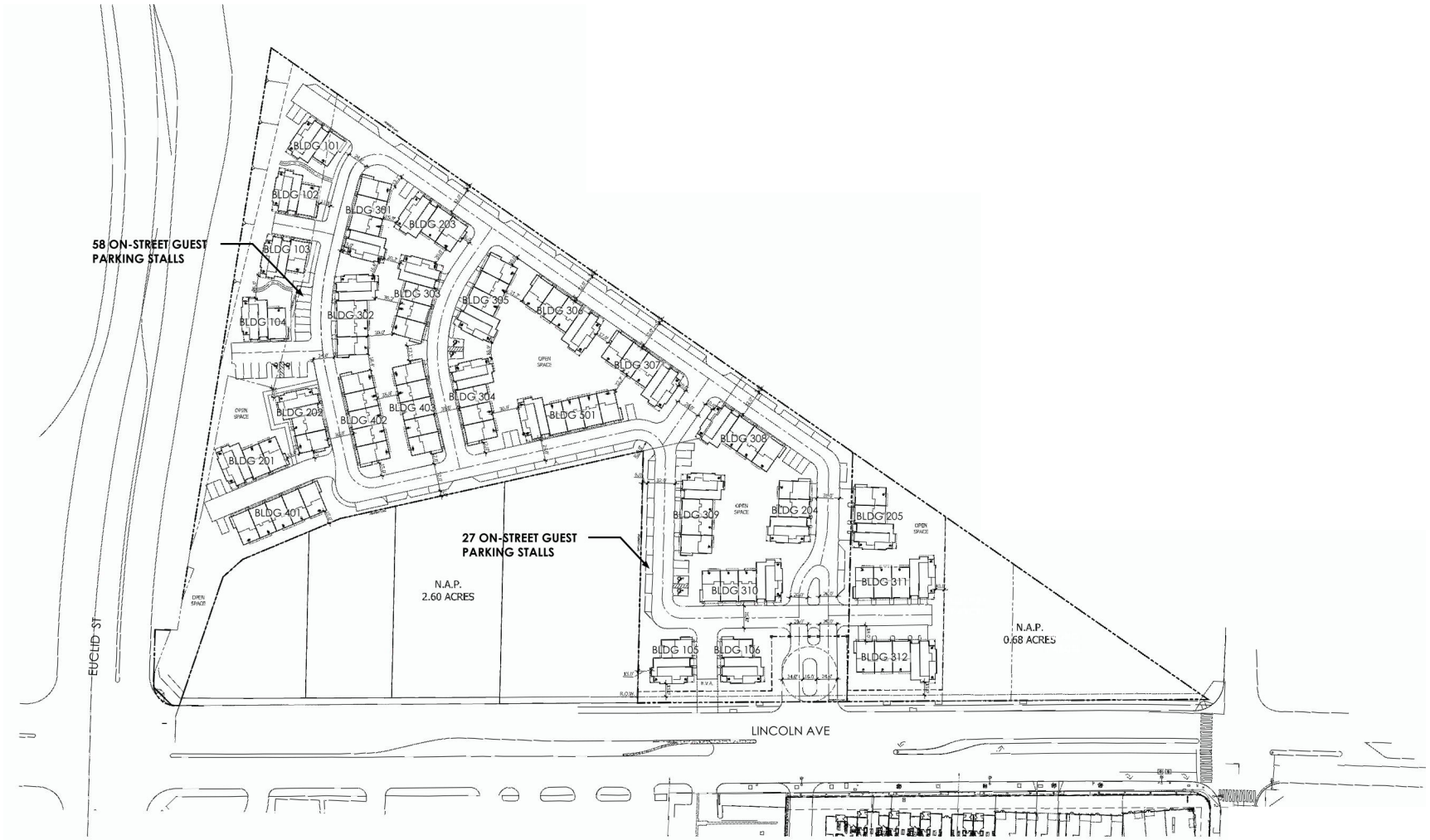
KEY

= PROJECT SITE

# FIGURE 2-1

## EXISTING SITE AERIAL

LINCOLN AVENUE REDEVELOPMENT PROJECT, ANAHEIM

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LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

SOURCE: JZMK PARTNERS

# FIGURE 2-2

## PROPOSED SITE PLAN

LINCOLN AVENUE REDEVELOPMENT PROJECT, ANAHEIM

# 3.0 EXISTING CONDITIONS

## 3.1 Existing Street System

The principal local network of streets serving the proposed Project includes Euclid Street and Lincoln Avenue. The following discussion provides a brief synopsis of these key area streets. The descriptions are based on an inventory of existing roadway conditions.

**Euclid Street** is generally a six-lane, divided roadway oriented in the north-south direction, which borders the project site to the west. On-street parking is generally not permitted along this roadway within the vicinity of the project. The posted speed limit on Euclid Street is 35 miles per hour (mph). A traffic signal controls the study intersections of Euclid Street at I-5 Ramps and Lincoln Avenue.

**Lincoln Avenue** is generally a four-lane, divided roadway west of Manchester Avenue and generally a six-lane, divided roadway east of Manchester Avenue, oriented in the east-west direction. Lincoln Avenue borders a portion of the project site to the south and will provide access to the site via one full access unsignalized driveway. On-street parking is permitted along this roadway between Euclid Street and Loara Street and is prohibited elsewhere in the study area. The posted speed limit on Lincoln Avenue is 40 mph west of Wilshire Avenue and 35 mph east of Wilshire Avenue. A traffic signal controls the study intersections of Lincoln Avenue at Euclid Street, Loara Street, I-5 SB Ramps, Manchester Avenue and I-5 NB Ramps/Wilshire Avenue.

***Figure 3-1*** presents an inventory of the existing roadway conditions for the arterials and intersections evaluated in this report. This figure identifies the number of travel lanes for key arterials, as well as intersection configurations and controls for the key area study intersections.

## 3.2 Existing Traffic Volumes

Six (6) key study intersections and five (5) key roadway segments have been identified as the locations at which to evaluate existing and future traffic operating conditions. Some portion of potential project-related traffic will pass through each of these intersections/roadway segments, and their analysis will reveal the expected relative impacts of the project. These key intersections and key roadway segments were selected for evaluation based on discussions with City of Anaheim Traffic Engineering Department staff.

Existing daily, AM and PM peak hour traffic volumes for the six (6) key study intersections and five (5) key roadway segments evaluated in this report were provided by City of Anaheim Public Works Department staff. The intersection traffic counts are Year 2017 data and the roadway segment counts are Year 2018 data. It should be noted that all Year 2017 AM peak hour and PM peak hour intersection traffic counts were factored up by the City-approved growth factor of 1.0% per year (i.e. 2.0% total growth) to bring them up to current Year 2019 existing baseline traffic conditions. It should also be noted that all Year 2018 daily roadway segment traffic counts were factored up by the City-approved growth factor of 1.0% per year (i.e. 1.0% total growth) to bring them up to current Year 2019 existing baseline traffic conditions.

***Figures 3-2*** and ***3-3*** illustrate the existing AM and PM peak hour traffic volumes at the six (6) key study intersections evaluated in this report, respectively. *Figure 3-3* also presents the existing average daily traffic volumes for the five (5) key roadway segments in the vicinity of the proposed Project.

***Appendix B*** contains the detailed peak hour count sheets for the key intersections evaluated in this report. *Appendix B* also contains the average daily traffic volumes for the key roadway segments.

## 3.3 Existing Intersection Conditions

Existing AM and PM peak hour operating conditions for the six (6) key study intersections were evaluated using the *Intersection Capacity Utilization* (ICU) methodology for signalized intersections and the methodology outlined in the *Highway Capacity Manual* (HCM) for unsignalized intersections.

### 3.3.1 *Intersection Capacity Utilization (ICU) Method of Analysis (Signalized Intersections)*

In conformance with the City of Anaheim, existing AM and PM peak hour operating conditions for the key signalized study intersections were evaluated using the Intersection Capacity Utilization (ICU) method. The ICU technique is intended for signalized intersection analysis and estimates the volume to capacity (V/C) relationship for an intersection based on the individual V/C ratios for key conflicting traffic movements.

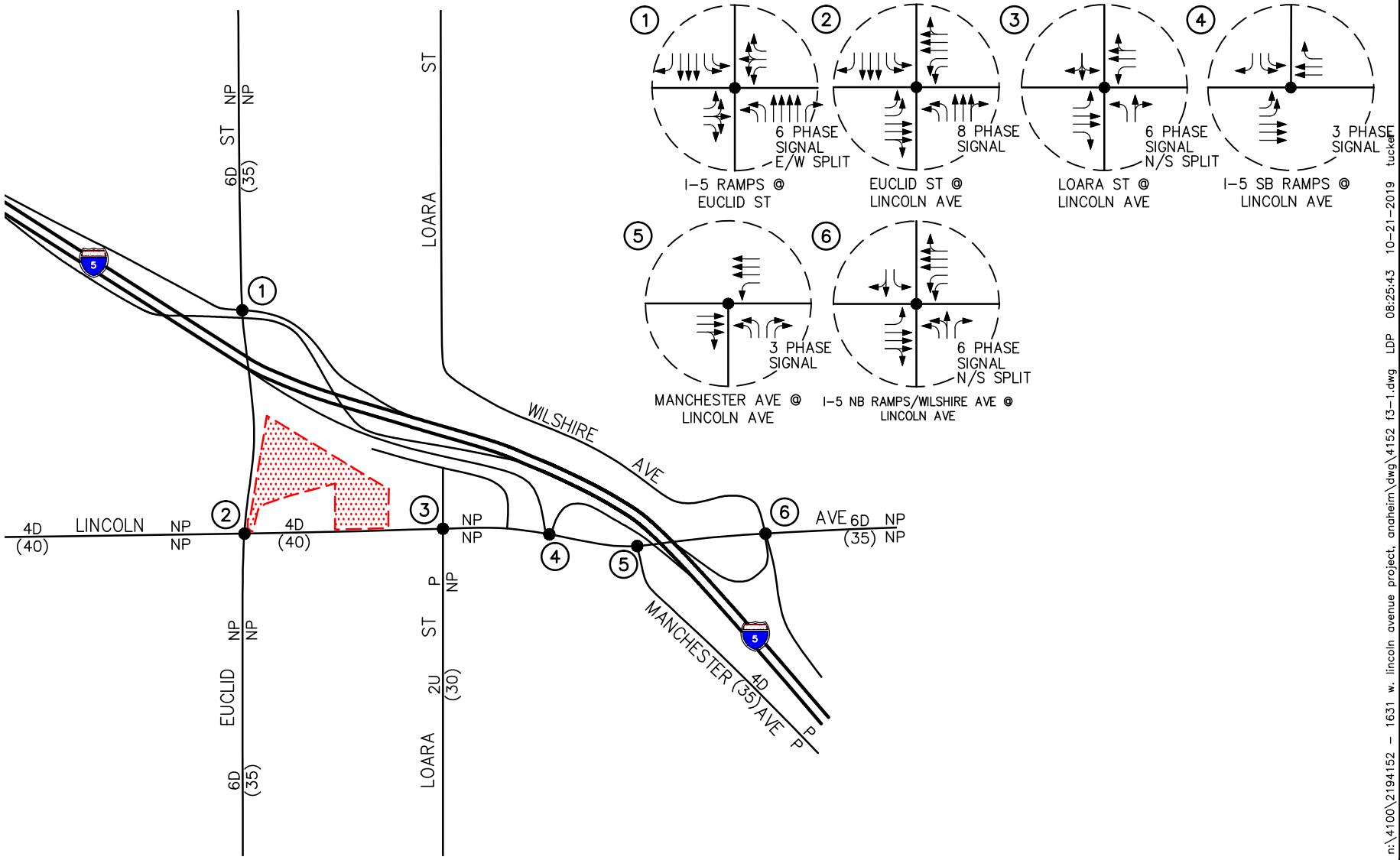
The ICU numerical value represents the percent signal (green) time and thus capacity, required by existing and/or future traffic. It should be noted that the ICU methodology assumes uniform traffic distribution per intersection approach lane and optimal signal timing.

Per City of Anaheim requirements, the ICU calculations use a lane capacity of 1,700 vehicles per hour (vph) for through and all turn lanes. A clearance adjustment factor of 0.05 was added to each Level of Service calculation.

The ICU value translates to a Level of Service (LOS) estimate, which is a relative measure of the intersection performance. The ICU value is the sum of the critical volume to capacity ratios at an intersection; it is not intended to be indicative of the LOS of each of the individual turning movements. The six qualitative categories of Level of Service have been defined along with the corresponding ICU value range and are shown in ***Table 3-1***.

### 3.3.2 *Highway Capacity Manual 6 (HCM 6) Method of Analysis (Unsignalized Intersections)*

The HCM unsignalized methodology for stop-controlled intersections was utilized for the analysis of the unsignalized intersections (i.e. proposed Project driveway). This methodology estimates the average control delay for each of the subject movements and determines the level of service for each movement. For all-way stop controlled intersections, the overall average control delay measured in seconds per vehicle, and level of service is calculated for the entire intersection. For one-way and two-way stop-controlled (minor street stop-controlled) intersections, this methodology estimates the worst side street delay, measured in seconds per vehicle and determines the level of service for that

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N NO SCALE

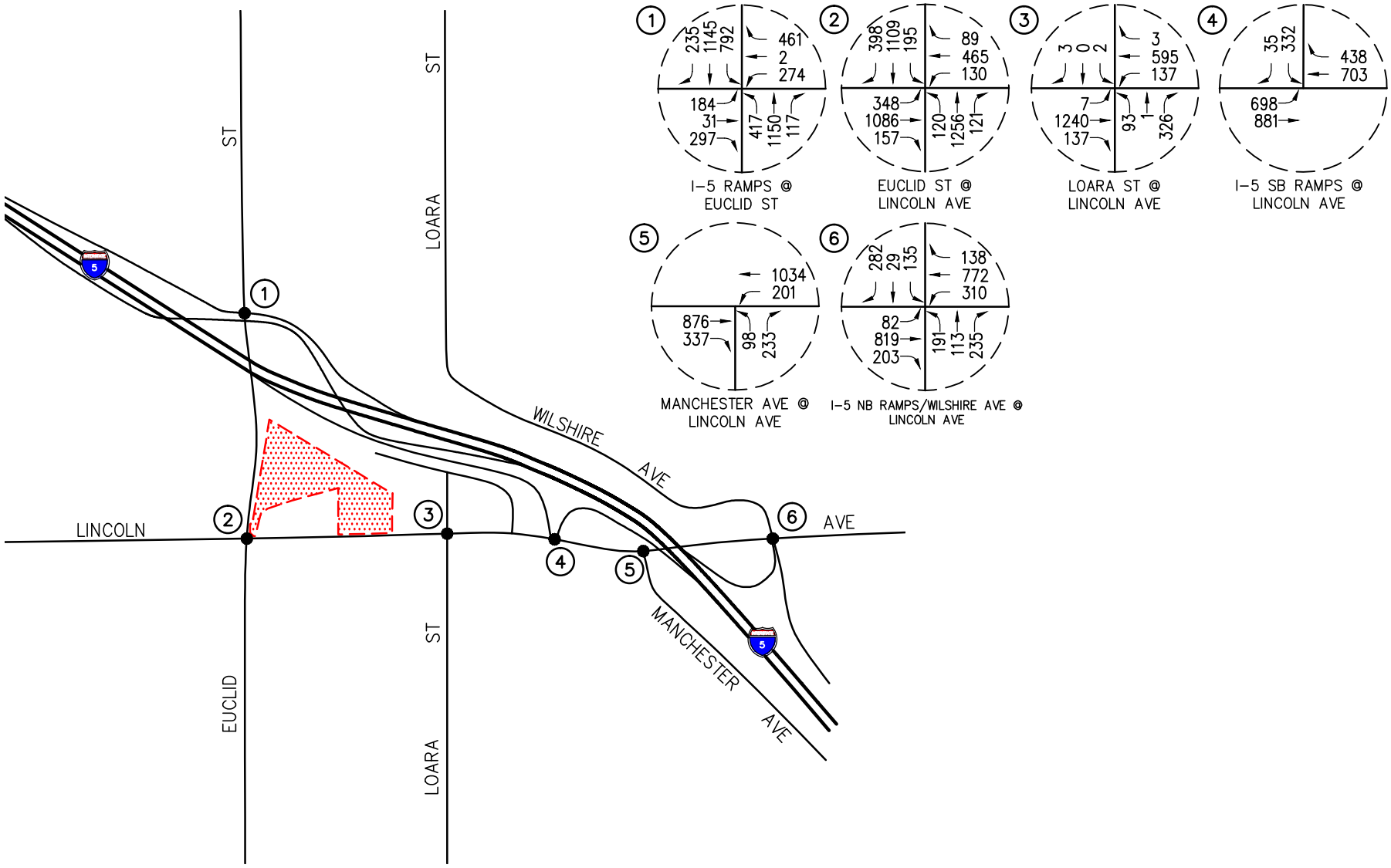
**KEY**

- ← = APPROACH LANE ASSIGNMENT
- ● = TRAFFIC SIGNAL
- P = PARKING, NP = NO PARKING
- U = UNDIVIDED, D = DIVIDED
- 2 = NUMBER OF TRAVEL LANES
- (XX)= POSTED SPEED LIMIT (MPH)
- = PROJECT SITE

# FIGURE 3-1

## EXISTING ROADWAY CONDITIONS AND INTERSECTION CONTROLS

LINCOLN AVENUE REDEVELOPMENT PROJECT, ANAHEIM

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KEY

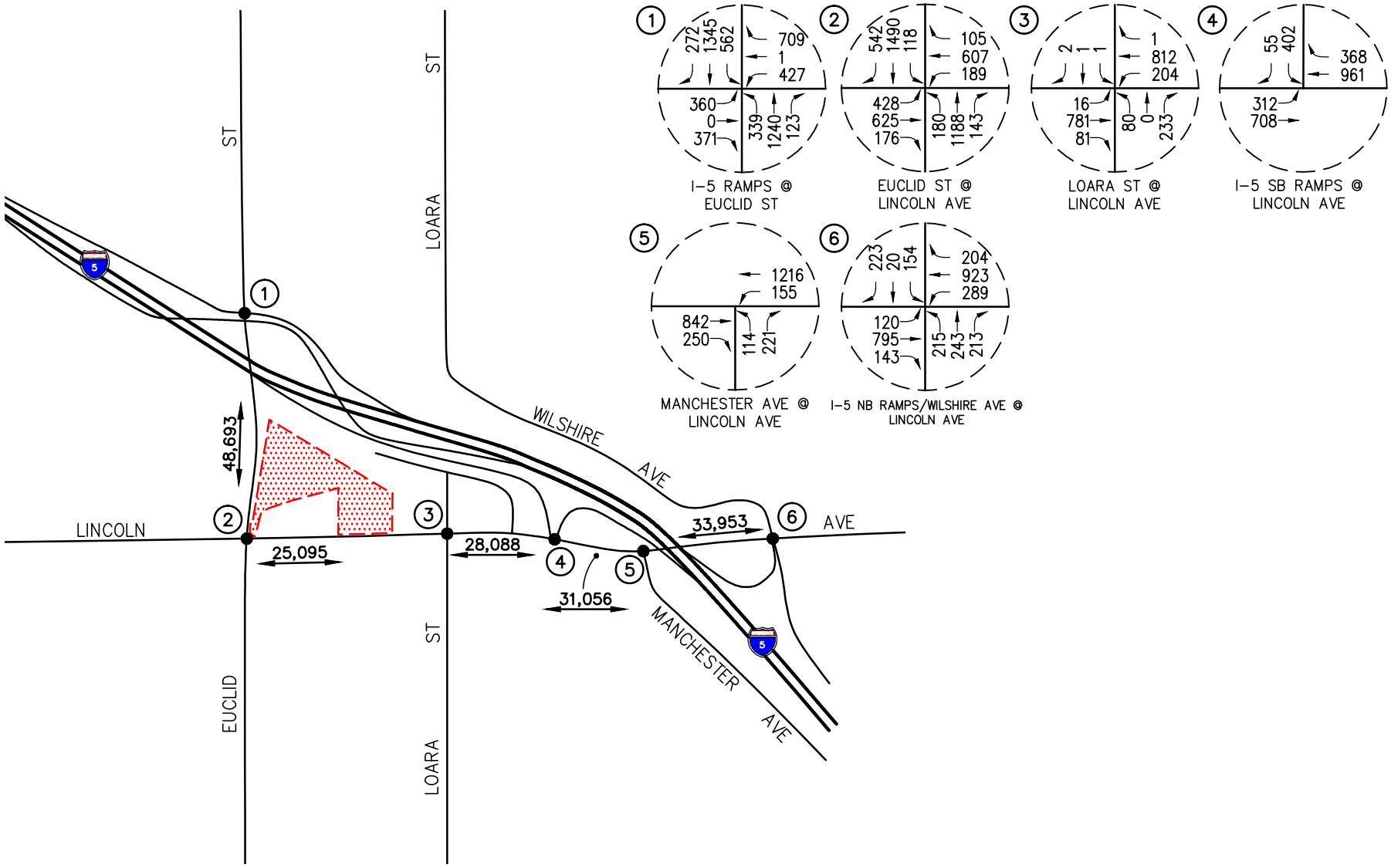
(#) = STUDY INTERSECTION

= PROJECT SITE

# FIGURE 3-2

## EXISTING AM PEAK HOUR TRAFFIC VOLUMES

LINCOLN AVENUE REDEVELOPMENT PROJECT, ANAHEIM

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NO SCALE

KEY

(#) = STUDY INTERSECTION

XX,XXX = STUDY ROADWAY SEGMENT

= PROJECT SITE

# FIGURE 3-3

## EXISTING PM PEAK HOUR AND DAILY TRAFFIC VOLUMES

LINCOLN AVENUE REDEVELOPMENT PROJECT, ANAHEIM

approach. The HCM control delay value translates to a Level of Service (LOS) estimate, which is a relative measure of the intersection performance. The six qualitative categories of Level of Service have been defined along with the corresponding HCM control delay value range, as shown in ***Table 3-2***.

## 3.4 Volume to Capacity (V/C) Ratio Method of Analysis (Roadway Segments)

Existing daily operating conditions for the five (5) key roadway segments have been investigated according to the daily volume-to-capacity (V/C) ratio of each link. The daily V/C relationship is used to estimate the LOS of the roadway segment with the volume based on the 24-hour traffic count data and the existing daily capacity based on the City's classification of each roadway. The roadway link capacity of each street classification according to the Orange County Master Plan of Arterial Highways (MPAH) is presented in ***Table 3-3***, along with the six corresponding service levels and associated V/C ratios.

## 3.5 Level of Service Criteria

According to the City of Anaheim's Circulation Element and stated in the *City of Anaheim Criteria for Preparation of Traffic Impact Studies*, LOS D is the minimum acceptable condition that should be maintained during the morning and evening peak commute hours on all City intersections. The arterial roadway criteria for the City of Anaheim involves the use of average daily traffic (ADT) volume to capacity (V/C) ratios. LOS C (V/C not to exceed 0.80) is the performance standard that has been adopted for the study area circulation system by the City of Anaheim.

## 3.6 Existing Level of Service Results

### 3.6.1 *Intersections*

***Table 3-4*** summarizes the existing peak hour service level calculations for the six (6) key study intersections based on existing traffic volumes and current street geometry. Review of *Table 3-4* indicates that all six (6) key study intersections currently operate at acceptable LOS C or better during the AM and PM peak hours.

***Appendix C*** presents the ICU/LOS calculations for the six (6) key study intersections for the AM peak hour and PM peak hour.

### 3.6.2 *Roadway Segments*

***Table 3-5*** summarizes the existing service level calculations for the five (5) key roadway segments based on existing 24-hour traffic volumes and current roadway geometry. The first column (1) shows the number of lanes, the second column (2) shows the arterial classification and the third column (3) shows the existing LOS "E" capacity. The fourth column (4) shows the daily volume, V/C ratio and resulting level of service. Review of *Table 3-5* indicates that one (1) of the five (5) key roadway segments currently operates at an unacceptable level of service on a daily basis. Roadway Segment A (Euclid Street between Lincoln Avenue and I-5 Ramps) currently operates at unacceptable LOS D on a daily basis. The remaining four (4) key roadway segments currently operate at acceptable service levels on a daily basis.

## TABLE 3-1
## LEVEL OF SERVICE CRITERIA FOR SIGNALIZED INTERSECTIONS[1]

| Level of Service (LOS) | Intersection Capacity Utilization Value (V/C) | Level of Service Description |
|---|---|---|
| A | ≤ 0.60 | EXCELLENT. No vehicle waits longer than one red light, and no approach phase is fully used. |
| B | 0.61 – 0.70 | VERY GOOD. An occasional approach phase is fully utilized; many drivers begin to feel somewhat restricted within groups of vehicles. |
| C | 0.71 – 0.80 | GOOD. Occasionally drivers may have to wait through more than one red light; backups may develop behind turning vehicles. |
| D | 0.81 – 0.90 | FAIR. Delays may be substantial during portions of the rush hours, but enough lower volume periods occur to permit clearing of developing lines, preventing excessive backups. |
| E | 0.91 – 1.00 | POOR. Represents the most vehicles intersection approaches can accommodate; may be long lines of waiting vehicles through several signal cycles. |
| F | > 1.00 | FAILURE. Backups from nearby locations or on cross streets may restrict or prevent movement of vehicles out of the intersection approaches. Potentially very long delays with continuously increasing queue lengths. |

[1] Source: *Transportation Research Board Circular 212 – Interim Materials on Highway Capacity*.

**TABLE 3-2**

**LEVEL OF SERVICE CRITERIA FOR UNSIGNALIZED INTERSECTIONS[2]**

| Level of Service (LOS) | Highway Capacity Manual Delay Value (sec/veh) | Level of Service Description |
|---|---|---|
| A | ≤ 10.0 | Little or no delay |
| B | > 10.0 and ≤ 15.0 | Short traffic delays |
| C | > 15.0 and ≤ 25.0 | Average traffic delays |
| D | > 25.0 and ≤ 35.0 | Long traffic delays |
| E | > 35.0 and ≤ 50.0 | Very long traffic delays |
| F | > 50.0 | Severe congestion |

[2] Source: *Highway Capacity Manual*.

## TABLE 3-3
## ROADWAY LINK CAPACITIES[3]

| Facility Type | Number of Lanes | Level of Service Criteria With Associated Roadway Capacity | | | | | |
|---|---|---|---|---|---|---|---|
| | | Daily Values (VPD) | | | | | |
| | | Level of Service (LOS) | | | | | |
| | | A | B | C | D | E | F |
| Principal | 8-lanes divided | 45,000 | 52,500 | 60,000 | 67,500 | 75,000 | -- |
| Major | 6-lanes divided | 33,900 | 39,400 | 45,000 | 50,600 | 56,300 | -- |
| Primary | 4-lanes divided | 22,500 | 26,300 | 30,000 | 33,800 | 37,500 | -- |
| Secondary | 4-lanes undivided | 15,000 | 17,500 | 20,000 | 22,500 | 25,000 | -- |
| Commuter Local Arterial | 2-lanes undivided | 7,500 | 8,800 | 10,000 | 11,300 | 12,500 | -- |
| V/C Ratio | | ≤ 0.60 | 0.61-0.70 | 0.71-0.80 | 0.81-0.90 | 0.91-1.00 | ≥ 1.00 |

Notes:
- VPD = vehicles per day

[3] Source: Orange County Master Plan of Arterial Highways.

## TABLE 3-4
## EXISTING PEAK HOUR LEVELS OF SERVICE SUMMARY

| Key Intersections | Time Period | Jurisdiction | Minimum Acceptable LOS | Control Type | ICU | LOS |
|---|---|---|---|---|---|---|
| 1. I-5 Ramps at Euclid Street | AM<br>PM | Anaheim | D | 6∅ Traffic Signal | 0.697<br>0.780 | B<br>C |
| 2. Euclid Street at Lincoln Avenue | AM<br>PM | Anaheim | D | 8∅ Traffic Signal | 0.659<br>0.687 | B<br>B |
| 3. Loara Street at Lincoln Avenue | AM<br>PM | Anaheim | D | 6∅ Traffic Signal | 0.691<br>0.539 | B<br>A |
| 4. I-5 SB Ramps at Lincoln Avenue | AM<br>PM | Anaheim | D | 3∅ Traffic Signal | 0.611<br>0.543 | B<br>A |
| 5. Manchester Avenue at Lincoln Avenue | AM<br>PM | Anaheim | D | 3∅ Traffic Signal | 0.475<br>0.420 | A<br>A |
| 6. 1-5 NB Ramps/Wilshire Avenue at Lincoln Avenue | AM<br>PM | Anaheim | D | 6∅ Traffic Signal | 0.663<br>0.627 | B<br>B |

Notes:
- **Bold LOS values** indicate adverse service levels based on City LOS standards
- ICU = Intersection Capacity Utilization
- ∅ = Phase

## TABLE 3-5
## EXISTING ROADWAY SEGMENT LEVEL OF SERVICE SUMMARY

| Key Roadway Segment | Jurisdiction | Min. Acc. LOS | (1) No. of Existing Lanes | (2) Arterial Class. | (3) Existing Capacity at LOS "E" | (4) Existing Traffic Conditions | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | Daily Volume | V/C Ratio | LOS |
| A. Euclid Street, between Lincoln Avenue and I-5 Ramps | Anaheim | C | 6D | Major | 56,300 | **48,693** | **0.865** | **D** |
| B. Lincoln Avenue, between Euclid Street and Loara Street | Anaheim | C | 4D | Primary | 37,500 | 25,095 | 0.669 | B |
| C. Lincoln Avenue, between Loara Street and I-5 SB Ramps | Anaheim | C | 4D | Primary | 37,500 | 28,088 | 0.749 | C |
| D. Lincoln Avenue, between I-5 SB Ramps and Manchester Avenue | Anaheim | C | 6D | Major | 56,300 | 31,056 | 0.552 | A |
| E. Lincoln Avenue, between Manchester Ave and I-5 NB Ramps/Wilshire Ave | Anaheim | C | 6D | Major | 56,300 | 33,953 | 0.603 | B |

Notes:

- **BOLD V/C ratio** indicates unacceptable service level

# 4.0 TRAFFIC FORECASTING METHODOLOGY

In order to estimate the traffic impact characteristics of the proposed Project, a multi-step process has been utilized. The first step is trip generation, which estimates the total arriving and departing traffic on a peak hour and daily basis. The traffic generation potential is forecast by applying the appropriate vehicle trip generation equations or rates to the project development tabulation.

The second step of the forecasting process is trip distribution, which identifies the origins and destinations of inbound and outbound project traffic. These origins and destinations are typically based on demographics and existing/anticipated travel patterns in the study area.

The third step is traffic assignment, which involves the allocation of project traffic to study area streets and intersections. Traffic assignment is typically based on minimization of travel time, which may or may not involve the shortest route, depending on prevailing operating conditions and travel speeds. Traffic distribution patterns are indicated by general percentage orientation, while traffic assignment allocates specific volume forecasts to individual roadway links and intersection turning movements throughout the study area.

With the forecasting process complete and project traffic assignments developed, the impact of the proposed Project is isolated by comparing operational (LOS) conditions at selected key intersections using expected future traffic volumes with and without forecast project traffic. The need for site-specific and/or cumulative local area traffic improvements can then be evaluated and the significance of the project's impacts identified.

# 5.0 PROJECT TRAFFIC CHARACTERISTICS

## 5.1 Project Traffic Generation

Traffic generation is expressed in vehicle trip ends, defined as one-way vehicular movements, either entering or exiting the generating land use. Generation equations and/or rates used in the traffic forecasting procedure are found in the 10th Edition of *Trip Generation*, published by the Institute of Transportation Engineers (ITE) [Washington D.C., 2017].

### 5.1.1 *Project Traffic Generation Forecast – Scenario No. 1*

***Table 5-1*** summarizes the trip generation rates used in forecasting the vehicular trips generated by the existing land use and the proposed Project (Scenario No. 1 – 105 dwelling units) and also presents the forecast daily and peak hour project traffic volumes for a "typical" weekday. The trip generation potential of the existing land use and the proposed Project (Scenario No. 1 – 105 dwelling units) will be estimated using ITE Land Use 150: Warehousing trip rates and ITE Land Use 220: Multifamily Housing (Low-Rise) trip rates.

Review of the middle portion of *Table 5-1* indicates that the proposed Project (Scenario No. 1 – 105 dwelling units) is forecast to generate approximately 769 daily trips, with 48 trips (11 inbound, 37 outbound) produced in the AM peak hour and 59 trips (37 inbound, 22 outbound) produced in the PM peak hour on a "typical" weekday. Review of the lower portion of *Table 5-1* indicates that the existing land use generates approximately 56 daily trips, with 5 trips (4 inbound, 1 outbound) produced in the AM peak hour and 6 trips (2 inbound, 4 outbound) produced in the PM peak hour on a "typical" weekday. Comparison of the trips generated by the existing land use to the trips generated by the proposed Project (Scenario No. 1 – 105 dwelling units) shows that the proposed Project (Scenario No. 1 – 105 dwelling units) will generate 713 net daily trips, 43 net AM peak hour trips and 53 net PM peak hour trips. The potential impact of these net additional trips have been assessed in the traffic study (i.e. Year 2023 – Scenario No. 1).

### 5.1.2 *Project Traffic Generation Forecast – Scenario No. 2*

***Table 5-2*** summarizes the trip generation rates used in forecasting the vehicular trips generated by the existing land use and the proposed Project (Scenario No. 2 – 119 dwelling units) and also presents the forecast daily and peak hour project traffic volumes for a "typical" weekday. The trip generation potential of the existing land use and the proposed Project (Scenario No. 2 – 119 dwelling units) will be estimated using ITE Land Use 150: Warehousing trip rates and ITE Land Use 220: Multifamily Housing (Low-Rise) trip rates.

Review of the middle portion of *Table 5-2* indicates that the proposed Project (Scenario No. 2 – 119 dwelling units) is forecast to generate approximately 871 daily trips, with 54 trips (12 inbound, 42 outbound) produced in the AM peak hour and 67 trips (42 inbound, 25 outbound) produced in the PM peak hour on a "typical" weekday. Review of the lower portion of *Table 5-2* indicates that the existing land use generates approximately 56 daily trips, with 5 trips (4 inbound, 1 outbound) produced in the AM peak hour and 6 trips (2 inbound, 4 outbound) produced in the PM peak hour on a "typical" weekday. Comparison of the trips generated by the existing land use to the trips generated

by the proposed Project (Scenario No. 2 – 119 dwelling units) shows that the proposed Project (Scenario No. 2 – 119 dwelling units) will generate 815 net daily trips, 49 net AM peak hour trips and 61 net PM peak hour trips. The potential impact of these net additional trips have been assessed in the traffic study (i.e. Year 2023 – Scenario No. 2). It should also be noted that these trips have been utilized in the existing plus project analysis.

## 5.2 Project Traffic Distribution and Assignment

***Figure 5-1*** presents the traffic distribution pattern for the proposed Project. Project traffic volumes both entering and exiting the site have been distributed and assigned to the adjacent street system based on the following considerations:

- the site's proximity to major traffic carriers (i.e. Euclid Street, Lincoln Avenue, etc.),
- expected localized traffic flow patterns based on adjacent street channelization and presence of traffic signals,
- existing intersection traffic volumes, and
- ingress/egress availability at the project site.

The anticipated AM and PM peak hour traffic volumes associated with the proposed Project (Scenario No. 1) are presented in ***Figures 5-2*** and ***5-3***, respectively. *Figure 5-3* also presents the daily project traffic volumes (Scenario No. 1). The traffic volume assignments presented in *Figures 5-2* and *5-3* reflect the traffic distribution characteristics shown in *Figure 5-1* and the traffic generation forecast presented in *Table 5-1*.

The anticipated AM and PM peak hour traffic volumes associated with the proposed Project (Scenario No. 2) are presented in ***Figures 5-4*** and ***5-5***, respectively. *Figure 5-5* also presents the daily project traffic volumes (Scenario No. 2). The traffic volume assignments presented in *Figures 5-4* and *5-5* reflect the traffic distribution characteristics shown in *Figure 5-1* and the traffic generation forecast presented in *Table 5-2*.

## 5.3 Existing Plus Project Traffic Conditions

The existing plus project traffic conditions have been generated based upon existing conditions and the estimated project traffic. These forecast traffic conditions have been prepared pursuant to the California Environmental Quality Act (CEQA) guidelines, which require that the potential impacts of a Project be evaluated upon the circulation system as it currently exists. This traffic volume scenario and the related intersection capacity analyses will identify the roadway improvements necessary to mitigate the direct traffic impacts of the Project, if any.

***Figures 5-6*** and ***5-7*** present projected AM and PM peak hour traffic volumes at the eight (8) key study intersections with the addition of the trips generated by the proposed Project (Scenario No. 2 – 119 dwelling units) to existing traffic volumes, respectively. *Figure 5-7* also presents the existing plus project daily traffic volumes (Scenario No. 2 – 110 dwelling units).

## TABLE 5-1
## PROJECT TRAFFIC GENERATION FORECAST (SCENARIO NO. 1)[4]

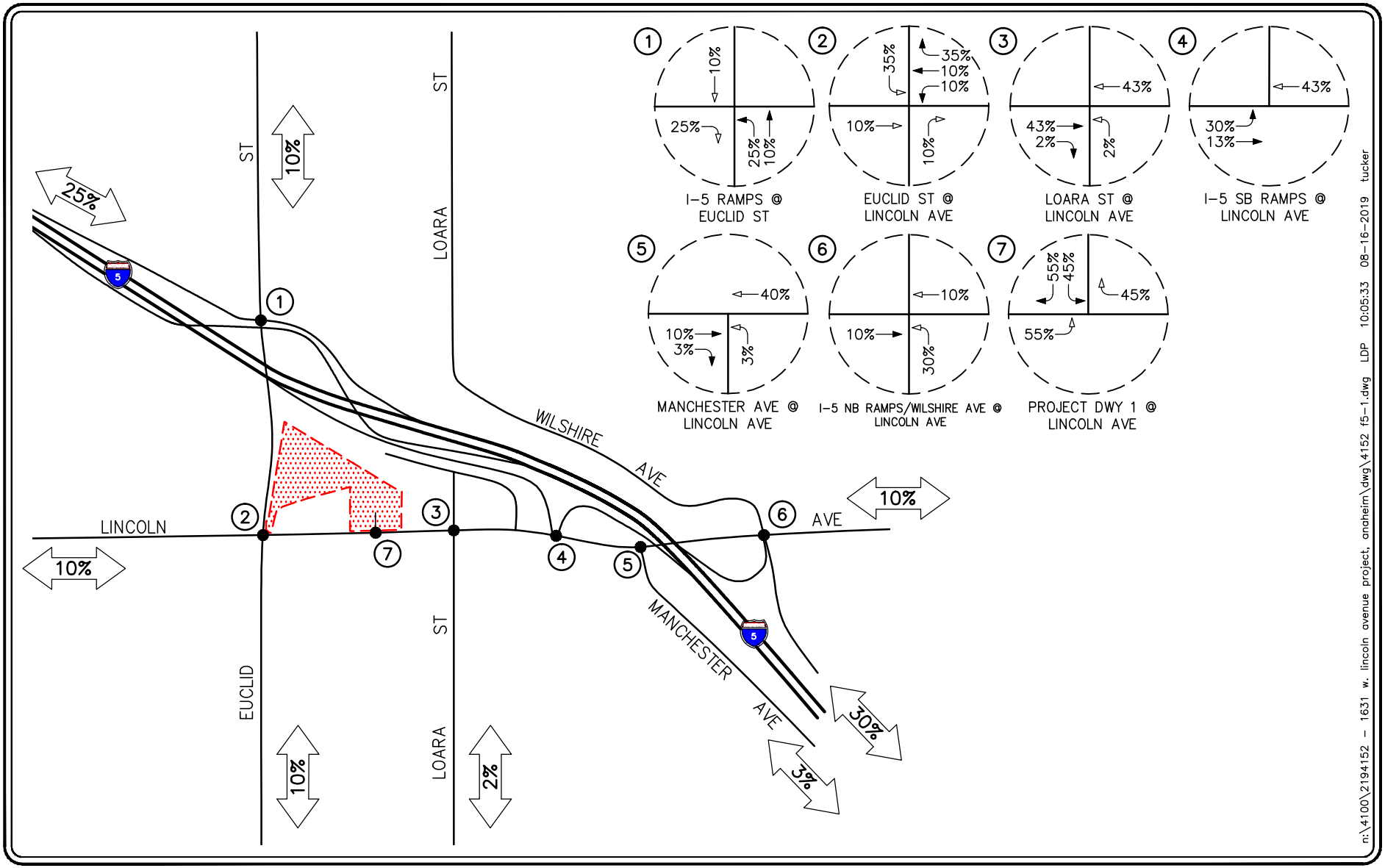
| ITE Land Use Code / Project Description | Daily 2-Way | AM Peak Hour | | | PM Peak Hour | | |
|---|---|---|---|---|---|---|---|
| | | Enter | Exit | Total | Enter | Exit | Total |
| ***Generation Factors:*** | | | | | | | |
| ▪ 150: Warehousing (TE/1000 SF) | 1.74 | 77% | 23% | 0.17 | 27% | 73% | 0.19 |
| ▪ 220: Multifamily Housing Low-Rise (TE/DU) | 7.32 | 23% | 77% | 0.46 | 63% | 37% | 0.56 |
| ***Proposed Project Generation Forecast:*** | | | | | | | |
| ▪ Scenario No. 1 Project (105 DU) | 769 | 11 | 37 | 48 | 37 | 22 | 59 |
| ***Existing Land Use Generation Forecast:*** | | | | | | | |
| ▪ Warehouse (32,100 SF) | 56 | 4 | 1 | 5 | 2 | 4 | 6 |
| **Net Project Trip Generation Forecast (Scenario No. 1 Project vs. Existing Land Use)** | **713** | **7** | **36** | **43** | **35** | **18** | **53** |

[4] Source: *Trip Generation*, 10th Edition, Institute of Transportation Engineers (ITE), Washington, D.C. (2017).

## TABLE 5-2
## PROJECT TRAFFIC GENERATION FORECAST (SCENARIO NO. 2)[5]

| ITE Land Use Code / Project Description | Daily 2-Way | AM Peak Hour | | | PM Peak Hour | | |
|---|---|---|---|---|---|---|---|
| | | Enter | Exit | Total | Enter | Exit | Total |
| ***Generation Factors:*** | | | | | | | |
| ▪ 150: Warehousing (TE/1000 SF) | 1.74 | 77% | 23% | 0.17 | 27% | 73% | 0.19 |
| ▪ 220: Multifamily Housing Low-Rise (TE/DU) | 7.32 | 23% | 77% | 0.46 | 63% | 37% | 0.56 |
| ***Proposed Project Generation Forecast:*** | | | | | | | |
| ▪ Scenario No. 2 Project (119 DU) | 871 | 12 | 42 | 54 | 42 | 25 | 67 |
| ***Existing Land Use Generation Forecast:*** | | | | | | | |
| ▪ Warehouse (32,100 SF) | 56 | 4 | 1 | 5 | 2 | 4 | 6 |
| **Net Project Trip Generation Forecast (Scenario No. 2 Project vs. Existing Land Use)** | **815** | **8** | **41** | **49** | **40** | **21** | **61** |

[5] Source: *Trip Generation*, 10th Edition, Institute of Transportation Engineers (ITE), Washington, D.C. (2017).

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N NO SCALE

KEY

= INBOUND PERCENTAGE

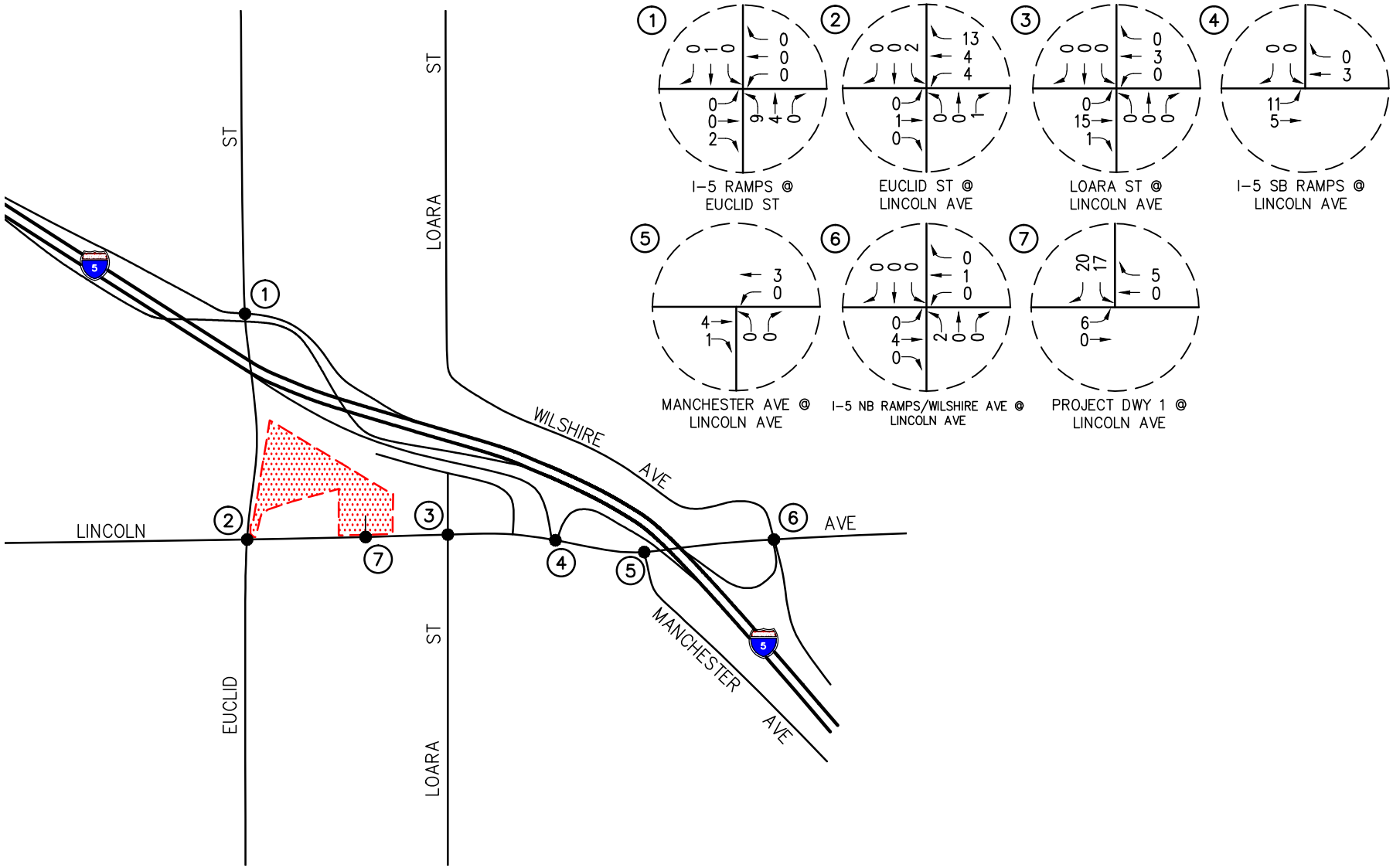
= OUTBOUND PERCENTAGE

= PROJECT SITE

# FIGURE 5-1

## PROJECT TRAFFIC DISTRIBUTION PATTERN

LINCOLN AVENUE REDEVELOPMENT PROJECT, ANAHEIM

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N NO SCALE

KEY

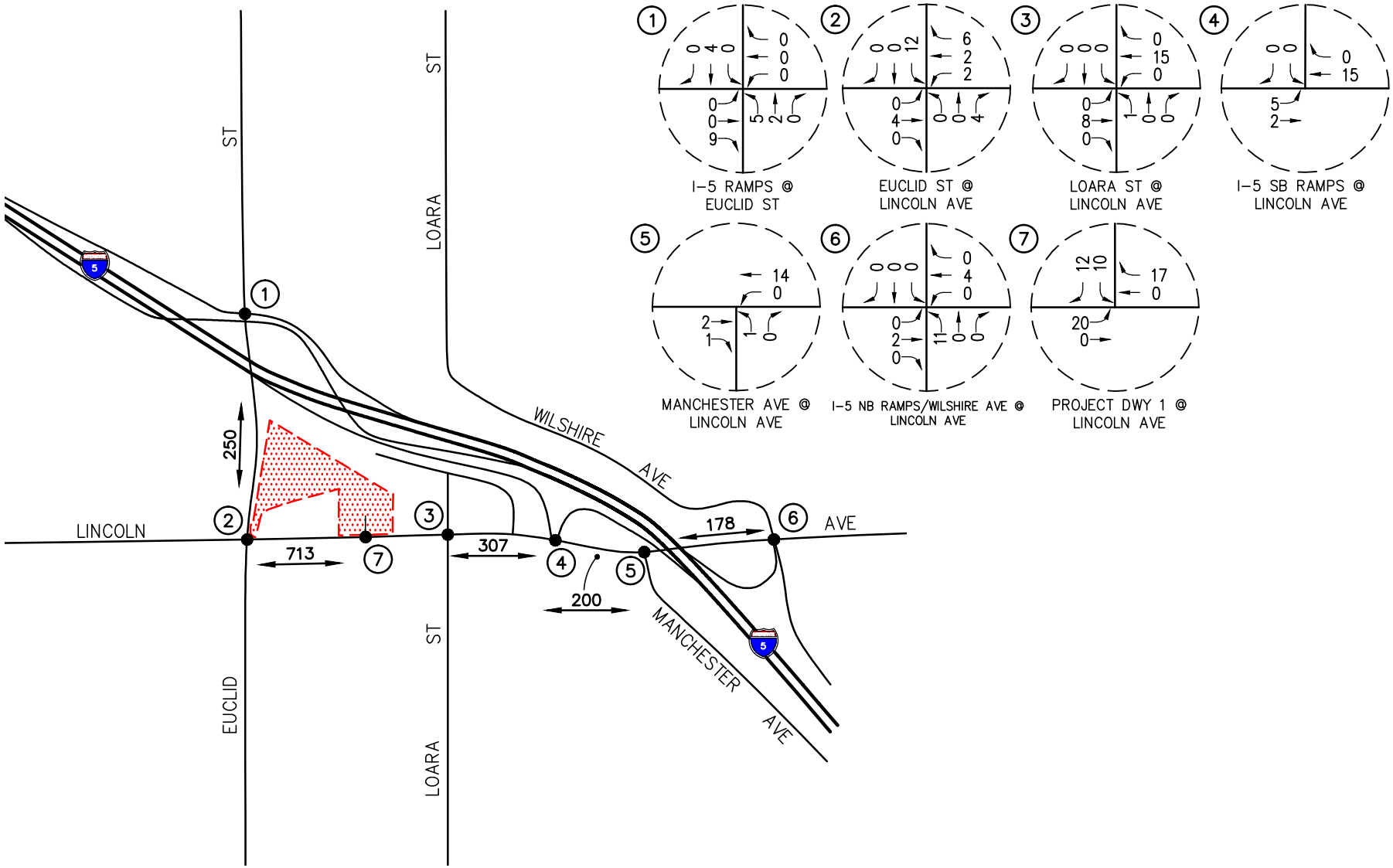
(#) = STUDY INTERSECTION

= PROJECT SITE

# FIGURE 5-2

## AM PEAK HOUR PROJECT (SCENARIO NO. 1) TRAFFIC VOLUMES

LINCOLN AVENUE REDEVELOPMENT PROJECT, ANAHEIM

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NO SCALE

KEY

(#) = STUDY INTERSECTION

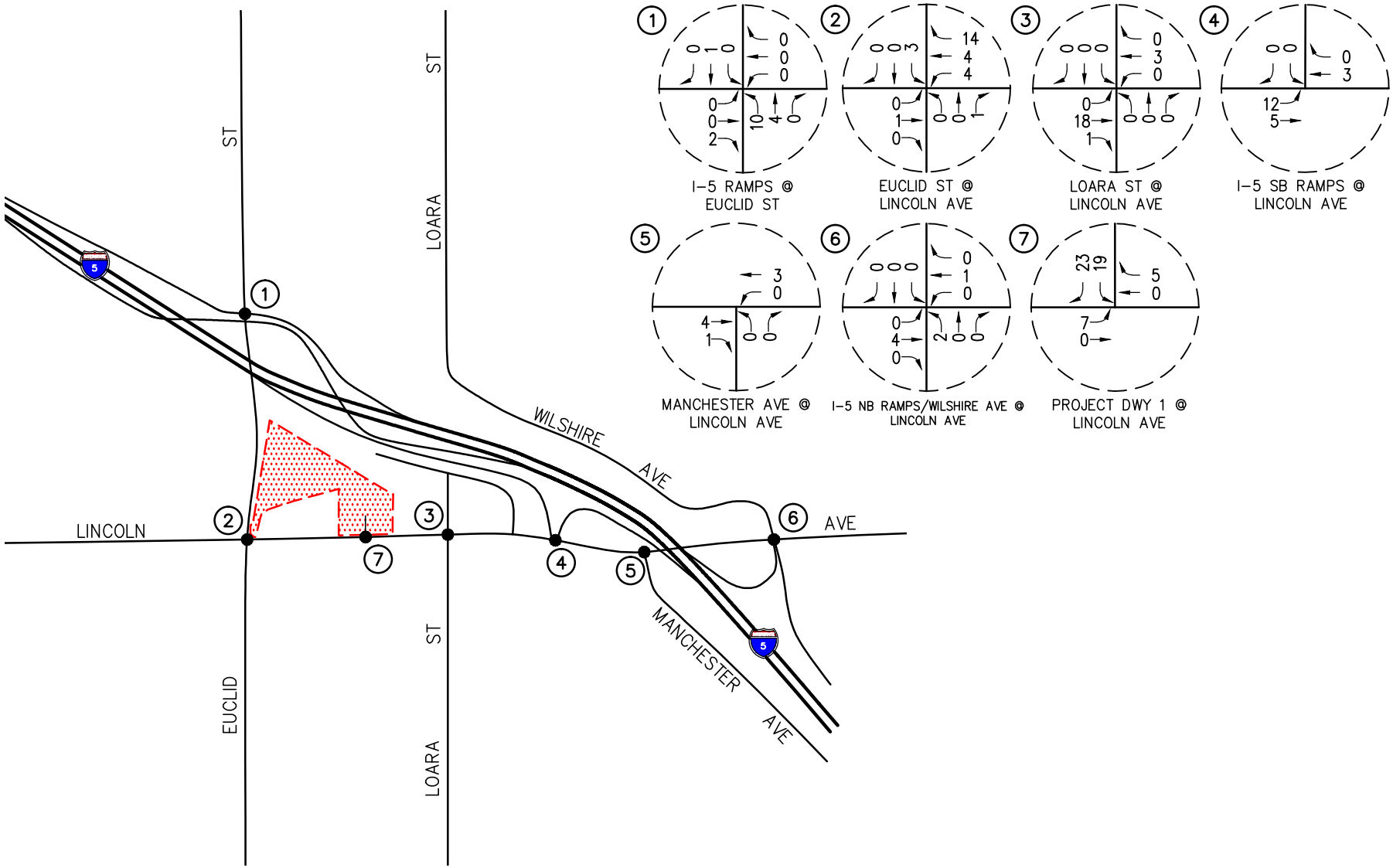
XX,XXX = STUDY ROADWAY SEGMENT

= PROJECT SITE

# FIGURE 5-3

## PM PEAK HOUR AND DAILY PROJECT (SCENARIO NO. 1) TRAFFIC VOLUMES

LINCOLN AVENUE REDEVELOPMENT PROJECT, ANAHEIM

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N NO SCALE

KEY

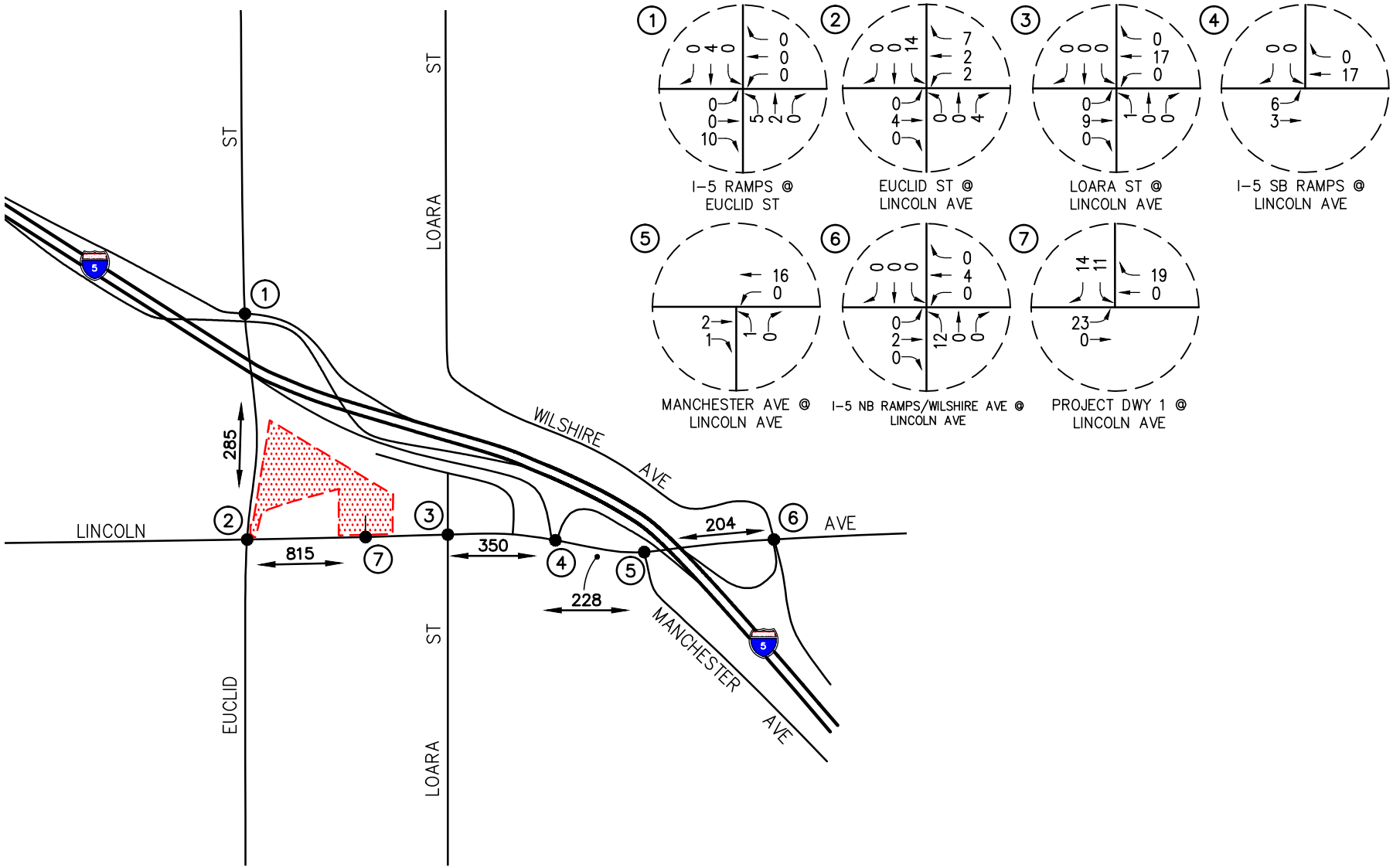
(#) = STUDY INTERSECTION

= PROJECT SITE

# FIGURE 5-4

## AM PEAK HOUR PROJECT (SCENARIO NO. 2) TRAFFIC VOLUMES

LINCOLN AVENUE REDEVELOPMENT PROJECT, ANAHEIM

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NO SCALE

KEY

(#) = STUDY INTERSECTION

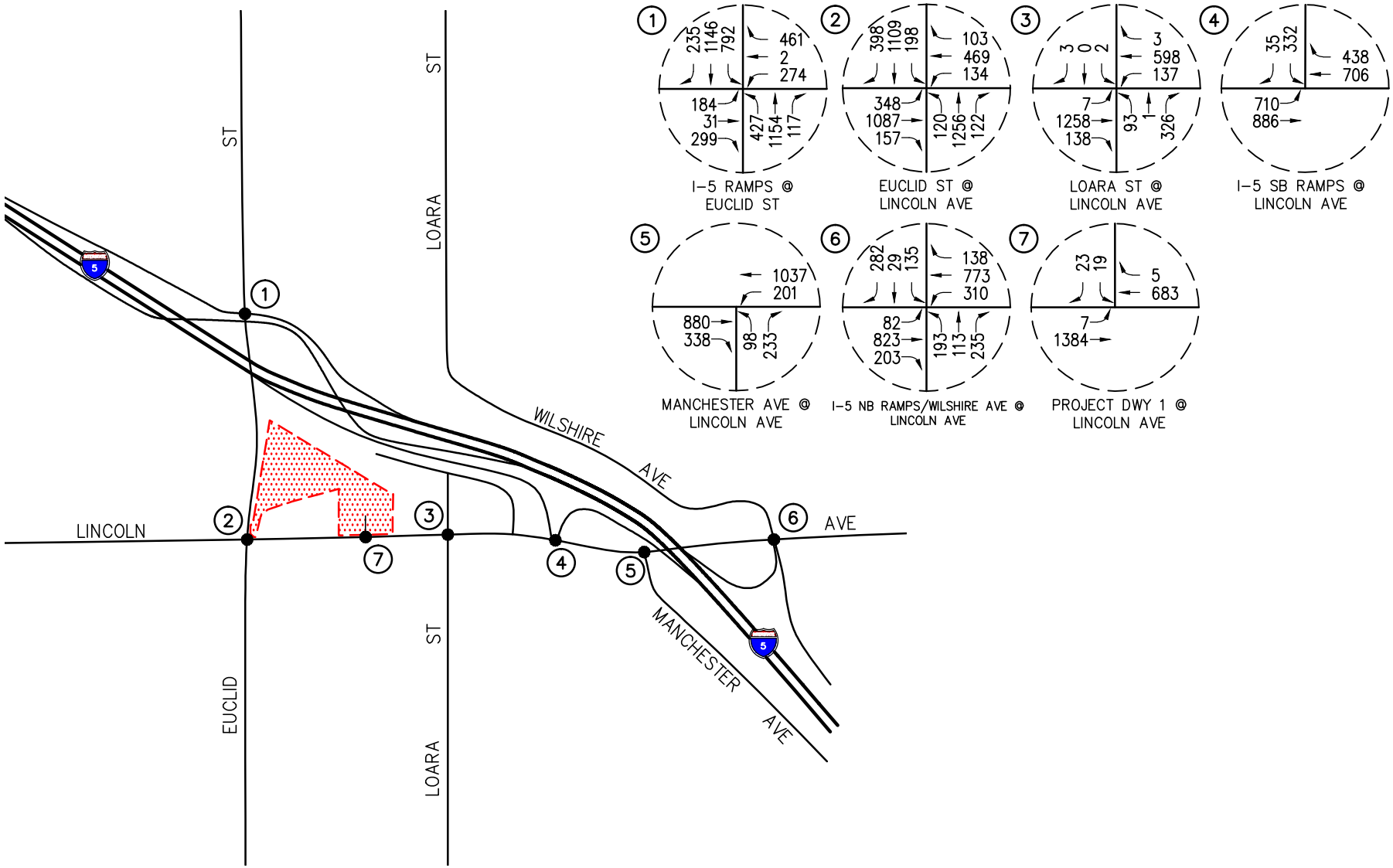
XX,XXX = STUDY ROADWAY SEGMENT

= PROJECT SITE

# FIGURE 5-5

## PM PEAK HOUR AND DAILY PROJECT (SCENARIO NO. 2) TRAFFIC VOLUMES

LINCOLN AVENUE REDEVELOPMENT PROJECT, ANAHEIM

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N NO SCALE

KEY

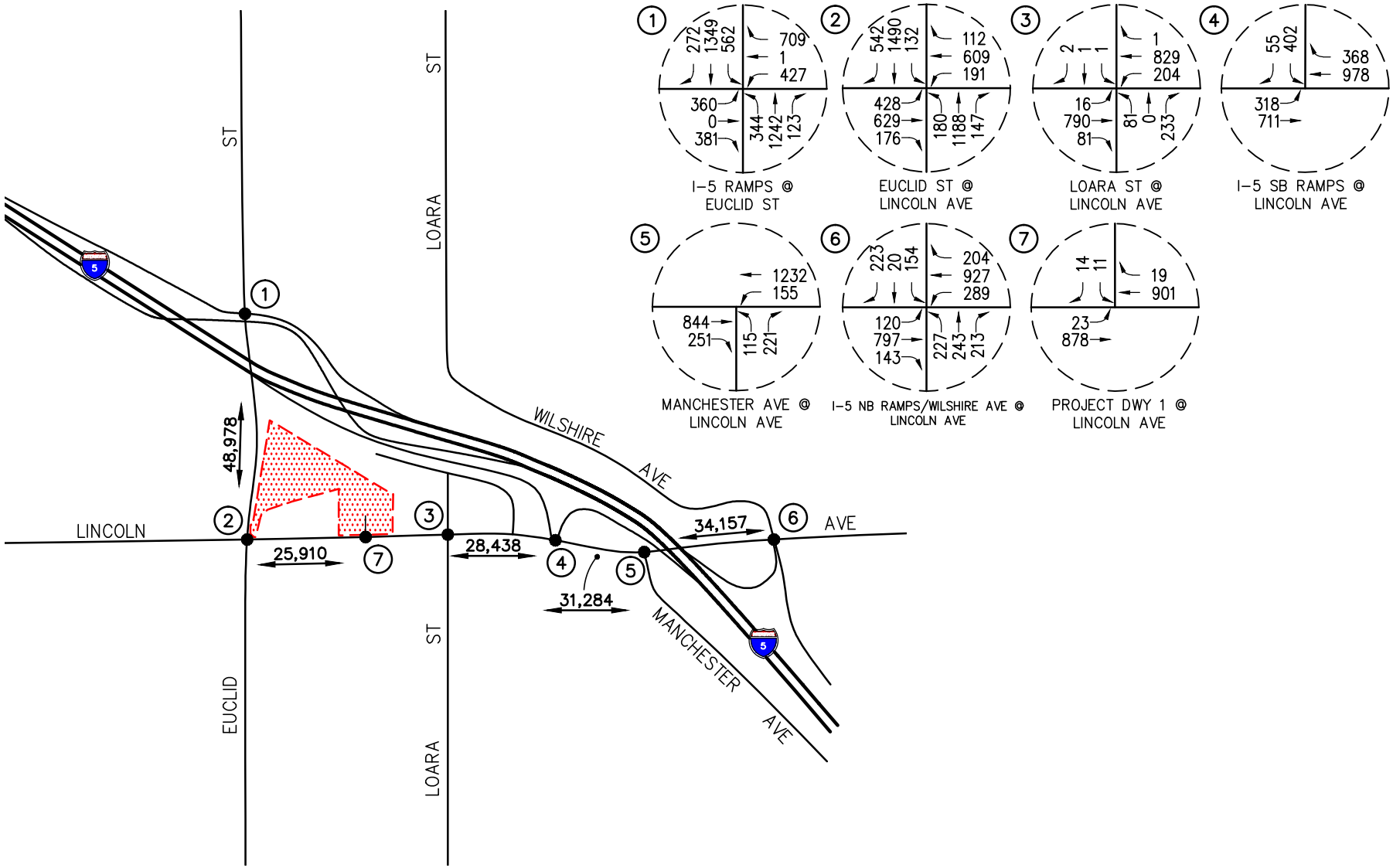
(#) = STUDY INTERSECTION

= PROJECT SITE

# FIGURE 5-6

## EXISTING PLUS PROJECT (SCENARIO NO. 2) AM PEAK HOUR TRAFFIC VOLUMES

LINCOLN AVENUE REDEVELOPMENT PROJECT, ANAHEIM

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NO SCALE

KEY

(#) = STUDY INTERSECTION

XX,XXX = STUDY ROADWAY SEGMENT

= PROJECT SITE

# FIGURE 5-7

## EXISTING PLUS PROJECT (SCENARIO NO. 2) PM PEAK HOUR AND DAILY TRAFFIC VOLUMES

LINCOLN AVENUE REDEVELOPMENT PROJECT, ANAHEIM

# 6.0 FUTURE TRAFFIC CONDITIONS

## 6.1 Ambient Traffic Growth

Horizon year, background traffic growth estimates have been calculated using an ambient traffic growth factor. The ambient traffic growth factor is intended to include unknown and future cumulative projects in the study area, as well as account for regular growth in traffic volumes due to the development of projects outside the study area. The future growth in traffic volumes has been calculated at one percent (1.0%) per year. Applied to the Year 2019 existing traffic volumes, this factor results in a 4.0% growth in existing volumes to the near-term horizon Year 2023.

## 6.2 Cumulative Projects Traffic Characteristics

In order to make a realistic estimate of future on-street conditions prior to implementation of the proposed Project, the status of other known development projects (cumulative projects) in the vicinity of the proposed Project has been researched at the City of Anaheim and the City of Fullerton. With this information, the potential impact of the proposed Project can be evaluated within the context of the cumulative impact of all ongoing development. Based on our research, there are forty-one (41) cumulative projects in the City of Anaheim and three (3) cumulative projects in the City of Fullerton within the vicinity of the subject site. These forty-four (44) planned and/or approved cumulative projects were considered in the cumulative traffic analysis for this project.

***Table 6-1*** provides a brief description for each of the forty-four (44) cumulative projects. ***Figure 6-1*** graphically illustrates the location of the cumulative projects. These cumulative projects are expected to generate vehicular traffic, which may affect the operating conditions of the key study intersections and key roadway segments.

***Table 6-2*** presents the trip generation for the forty-four (44) cumulative projects. As shown in *Table 6-2*, the forty-four (44) cumulative projects are forecast to generate a total of 20,839 daily trips, with 1,703 trips (839 inbound and 864 outbound) forecast during the AM peak hour and 1,514 trips (824 inbound and 690 outbound) forecast during the PM peak hour.

It should be noted that distribution patterns for each of the cumulative projects were developed based on the location of the trip attractors, type of land use, the site's proximity to major traffic carriers and previously completed traffic studies. It should also be noted that the analysis does not assume any roadway network improvements/mitigation measures associated with any of the forty-four (44) cumulative projects. The AM and PM peak hour traffic volumes associated with the forty-four (44) cumulative projects are presented in ***Figures 6-2*** and ***6-3***, respectively. *Figure 6-3* also presents the daily cumulative project traffic volumes.

***Figures 6-4*** and ***6-5*** present the existing plus cumulative projects AM and PM peak hour traffic volumes at the six (6) key study intersections. *Figure 6-5* also presents the existing plus cumulative projects daily traffic volumes.

***Figures 6-6*** and ***6-7*** present the existing plus cumulative projects plus project (Scenario No. 1) AM and PM peak hour traffic volumes at the six (6) key study intersections. *Figure 6-7* also presents the existing plus cumulative projects plus project (Scenario No. 1) daily traffic volumes.

***Figures 6-8*** and ***6-9*** present the existing plus cumulative projects plus project (Scenario No. 2) AM and PM peak hour traffic volumes at the six (6) key study intersections. *Figure 6-9* also presents the existing plus cumulative projects plus project (Scenario No. 2) daily traffic volumes.

## 6.3 Year 2023 Traffic Volumes

***Figures 6-10*** and ***6-11*** present the AM and PM peak hour cumulative traffic volumes (existing + ambient growth + cumulative project traffic) at the six (6) key study intersections for the Year 2023, respectively. *Figure 6-11* also presents the Year 2023 daily cumulative traffic volumes.

***Figures 6-12*** and ***6-13*** illustrate the Year 2023 forecast AM and PM peak hour traffic volumes, with the inclusion of the trips generated by the proposed Project (Scenario No. 1), respectively. *Figure 6-13* also presents the Year 2023 daily cumulative plus project traffic volumes.

***Figures 6-14*** and ***6-15*** illustrate the Year 2023 forecast AM and PM peak hour traffic volumes, with the inclusion of the trips generated by the proposed Project (Scenario No. 2), respectively. *Figure 6-15* also presents the Year 2023 daily cumulative plus project traffic volumes.

## 6.4 General Plan Buildout (Year 2035) Traffic Conditions

Long-term buildout (Year 2035) traffic volume forecasts for the six (6) key study intersections and five (5) key roadway segments were provided by City of Anaheim Traffic Engineering Department staff. The following traffic volume scenarios were provided by City staff from the Anaheim Traffic Analysis Model (ATAM).

- General Plan Buildout No Project
- General Plan Buildout With 1600 W. Lincoln Avenue Project
- General Plan Buildout Plus Project (Scenario No. 2)

***Figures 6-16*** and ***6-17*** present the AM and PM peak hour General Plan Buildout (Year 2035) traffic volumes at the six (6) key study intersections, respectively. *Figure 6-17* also presents the daily General Plan Buildout (Year 2035) traffic volumes.

***Figures 6-18*** and ***6-19*** present the AM and PM peak hour General Plan Buildout (Year 2035) with 1600 W. Lincoln Avenue Project traffic volumes at the six (6) key study intersections, respectively. *Figure 6-19* also presents the daily General Plan Buildout (Year 2035) with 1600 W. Lincoln Avenue Project traffic volumes.

***Figures 6-20*** and ***6-21*** present the AM and PM peak hour General Plan Buildout (Year 2035) with Project (Scenario No. 2) traffic volumes at the six (6) key study intersections, respectively. *Figure 6-21* also presents the daily General Plan Buildout (Year 2035) with Project (Scenario No. 2) traffic volumes.

## TABLE 6-1
## LOCATION AND DESCRIPTION OF CUMULATIVE PROJECTS[6]

| No. | Cumulative Project | Location/Address | Description |
|---|---|---|---|
| *City of Anaheim* | | | |
| 1. | Boutique Hotel (R3 Lodging) | 1100 W. Ball Road | 75-Room Hotel |
| 2. | Miller Toyota Car Wash | 1331 N. Euclid Street | 4,010 SF Car Wash Addition |
| 3. | Googie Car Wash | 1250 N. Euclid Street | 130-Foot Tunnel Automated Car Wash |
| 4. | Assisted Living Facility | 2157 W. La Palma Avenue | 47-Room Convalescent Facility |
| 5. | Moro Place Homes | 2365 W. Moro Place | 2 DU Single-Family |
| 6. | North-West College | 511 N. Brookhurst Street | 13,696 SF Student Vocational/Career College<br>• Expected AM Attendance: 75 Students<br>• Expected PM Attendance: 46 Students<br>18,786 SF Office |
| 7. | Fullerton Agape Church | 2101 W. Crescent Avenue | 1,625 SF Church |
| 8. | Jungkm Church | 2111 W. Crescent Avenue | 1,876 SF Church |
| 9. | Purely Evangelical Church | 2101 W. Crescent Avenue | 1,625 SF Church |
| 10. | Church of Nazarene | 2121 W. Crescent Avenue | 1,200 SF Church |
| 11. | Anaheim Clinical Research | 1085 N. Harbor Boulevard | 9,776 SF Clinical Research Facility Addition |
| 12. | PRE2019-00002 | 1201 N. Harbor Boulevard | 2,500 SF Convenience Store |
| 13. | La Palma Village | 1110 N. Anaheim Boulevard | 152 DU Condominiums<br>10 DU Condominiums with 1st Floor Retail |
| 14. | City Center Motel Expansion | 602-610 N. Anaheim Boulevard | 7-Room Motel Expansion |
| 15. | Kraemer Hotel | 201 E. Center Street | 24-Room Hotel |
| 16. | B.A.R.N. | 350 W. Center Street Promenade | 57 DU Apartments<br>8,250 SF Commercial<br>8,250 SF Office |
| 17. | Frontiers Academy | 310 W. Broadway | 100 Student Preschool/Elementary School |
| 18. | Cambridge Institute | 280 N. Wilshire Avenue | 25 Student Dormitory |
| 19 | Marriott Hotel | Northeast corner of Manchester Court at Lincoln Avenue | 246-Room Hotel |
| 20. | Fairmont Private School | 1557 W. Mable Street | 540 Student Preschool & K-8 School |
| 21. | 1600 W. Lincoln Avenue Project | 1600 W. Lincoln Avenue | 315 DU Apartments<br>10,500 SF Retail |
| 22. | KB Homes | 312 S. Euclid Street | 39 DU Condominiums |
| 23. | Coronado Palms Apartments | 1250 S. Euclid Street | 2 DU Apartments |

[6] Source: City of Anaheim and City of Fullerton Planning Department staff.

## TABLE 6-1 (CONTINUED)
## LOCATION AND DESCRIPTION OF CUMULATIVE PROJECTS[7]

| No. | Cumulative Project | Location/Address | Description |
|---|---|---|---|
| 24. | Big Wave Car Wash | 2219 W. Lincoln Avenue | 110-Foot Tunnel Automated Car Wash |
| 25. | Linbrook Villas | 9700 W. Lincoln Avenue | 12 DU Condominiums |
| 26. | Orange Avenue 8 Units | 9812 W. Orange Avenue | 8 DU Single-Family |
| 27. | Medical/Dental Office | 1241-1281 S. Brookhurst Street | 5,983 SF Medical/Dental Office |
| 28. | Family Union Soccer Fields | 1659 W. Lincoln Avenue | 2 Soccer Fields |
| 29. | Ball and Euclid Plaza | 901-951 S. Euclid Street | 2,500 SF Fast-Food Restaurant with Drive Thru |
| 30. | Parkgate Center | 2301-2331 W. Lincoln Avenue | 221 DU Multifamily |
| 31. | Anaheim Car Wash | 203 S. Euclid Street | 2,600 SF Automated Car Wash |
| 32. | Lemon Street Industrial | 400 S. Lemon Street | 7,200 SF General Light Industrial |
| 33. | Chase Bank Relocation | 545 N. Euclid Street | 3,980 SF Drive-In Bank |
| 34. | Raising Cane's Euclid | 101 S. Euclid Street | 3,000 SF Fast-Food Restaurant with Drive Thru |
| 35. | Multi-Tenant at Euclid/Broadway | 255 S. Euclid Street | 7,980 SF Shopping Center |
| 36. | Gilbert Warehouse | 1100 N. Gilbert Street | 14,000 SF Warehouse |
| 37. | TMB #1 Euclid 7-11 | 260 S. Euclid Street | 2,253 SF 7-11 Convenience Store & Pumps |
| 38. | Cerritos | 1609 W. Cerritos Avenue | 11 DU Single-Family |
| 39. | 18-Units on Euclid | 1525 S. Euclid Street | 18 DU Condominiums |
| 40. | Downtown Anaheim 39 | Pauline Street at North Street | 39 DU Attached Single-Family |
| 41. | Cypress Street Homes | 701 E. Cypress Street | 38 DU Single-Family |
| *City of Fullerton* | | | |
| 42. | The Broken Yolk Restaurant | 1436 S. Harbor Boulevard | 4,966 SF Restaurant |
| 43. | BLD18-01469 | 907 W. Orangethorpe Avenue | 4,594 SF Restaurant |
| 44. | Bowlero | 1501 S. Lemon Street | 40,610 SF Bowling Alley Remodel |

[7] Source: City of Anaheim and City of Fullerton Planning Department staff.

## TABLE 6-2
## CUMULATIVE PROJECTS TRAFFIC GENERATION FORECAST[8]

| Cumulative Project Description | Daily 2-Way | AM Peak Hour | | | PM Peak Hour | | |
|---|---|---|---|---|---|---|---|
| | | In | Out | Total | In | Out | Total |
| 1. Boutique Hotel | 627 | 21 | 14 | 35 | 23 | 22 | 45 |
| 2. Miller Toyota Car Wash | 405 | 13 | 9 | 22 | 22 | 21 | 43 |
| 3. Googie Car Wash | 1,157 | 24 | 40 | 64 | 76 | 46 | 122 |
| 4. Assisted Living Facility | 144 | 6 | 2 | 8 | 3 | 7 | 10 |
| 5. Moro Place Homes | 19 | 0 | 1 | 1 | 1 | 1 | 2 |
| 6. North-West College | 460 | 41 | 9 | 50 | 17 | 30 | 47 |
| 7. Fullerton Agape Church | 11 | 1 | 0 | 1 | 0 | 1 | 1 |
| 8. Jungkm Church | 13 | 1 | 0 | 1 | 0 | 1 | 1 |
| 9. Purely Evangelical Church | 11 | 1 | 0 | 1 | 0 | 1 | 1 |
| 10. Church of Nazarene | 8 | 0 | 0 | 0 | 0 | 1 | 1 |
| 11. Anaheim Clinical Research | 110 | 3 | 1 | 4 | 1 | 4 | 5 |
| 12. PRE2019-00002 | 1,715 | 70 | 70 | 140 | 31 | 29 | 60 |
| 13. La Palma Village | 1,147 | 17 | 56 | 73 | 57 | 32 | 89 |
| 14. City Center Motel Expansion | 23 | 1 | 2 | 3 | 2 | 1 | 3 |
| 15. Kraemer Hotel | 201 | 6 | 5 | 11 | 7 | 7 | 14 |
| 16. B.A.R.N. | 777 | 19 | 24 | 43 | 31 | 30 | 61 |
| 17. Frontiers Academy | 189 | 36 | 31 | 67 | 8 | 9 | 17 |
| 18. Cambridge Institute | 103 | 1 | 3 | 4 | 4 | 4 | 8 |
| 19. Marriott Hotel | 2,057 | 68 | 48 | 116 | 75 | 73 | 148 |
| 20. Fairmont Private School | 2,219 | 270 | 221 | 491 | 64 | 76 | 140 |
| 21. 1600 W. Lincoln Avenue Project[9] | 1,151 | -7 | 72 | 65 | 40 | 17 | 57 |
| 22. KB Homes | 285 | 4 | 14 | 18 | 14 | 8 | 22 |
| 23. Coronado Palms Apartments | 15 | 0 | 1 | 1 | 1 | 0 | 1 |
| 24. Big Wave Car Wash | 979 | 20 | 34 | 54 | 64 | 39 | 103 |
| 25. Linbrook Villas | 88 | 1 | 5 | 6 | 4 | 3 | 7 |
| 26. Orange Avenue 8 Units | 76 | 2 | 4 | 6 | 5 | 3 | 8 |
| 27. Medical/Dental Office | 208 | 13 | 4 | 17 | 6 | 15 | 21 |
| 28. Family Union Soccer Fields | 143 | 1 | 1 | 2 | 22 | 11 | 33 |
| 29. Ball and Euclid Plaza | 883 | 26 | 25 | 51 | 21 | 20 | 41 |
| 30. Parkgate Center | 261 | 4 | 13 | 17 | 13 | 8 | 21 |

8 Source: *Trip Generation*, 10th Edition, Institute of Transportation Engineers (ITE), Washington, D.C. (2017), unless otherwise noted.

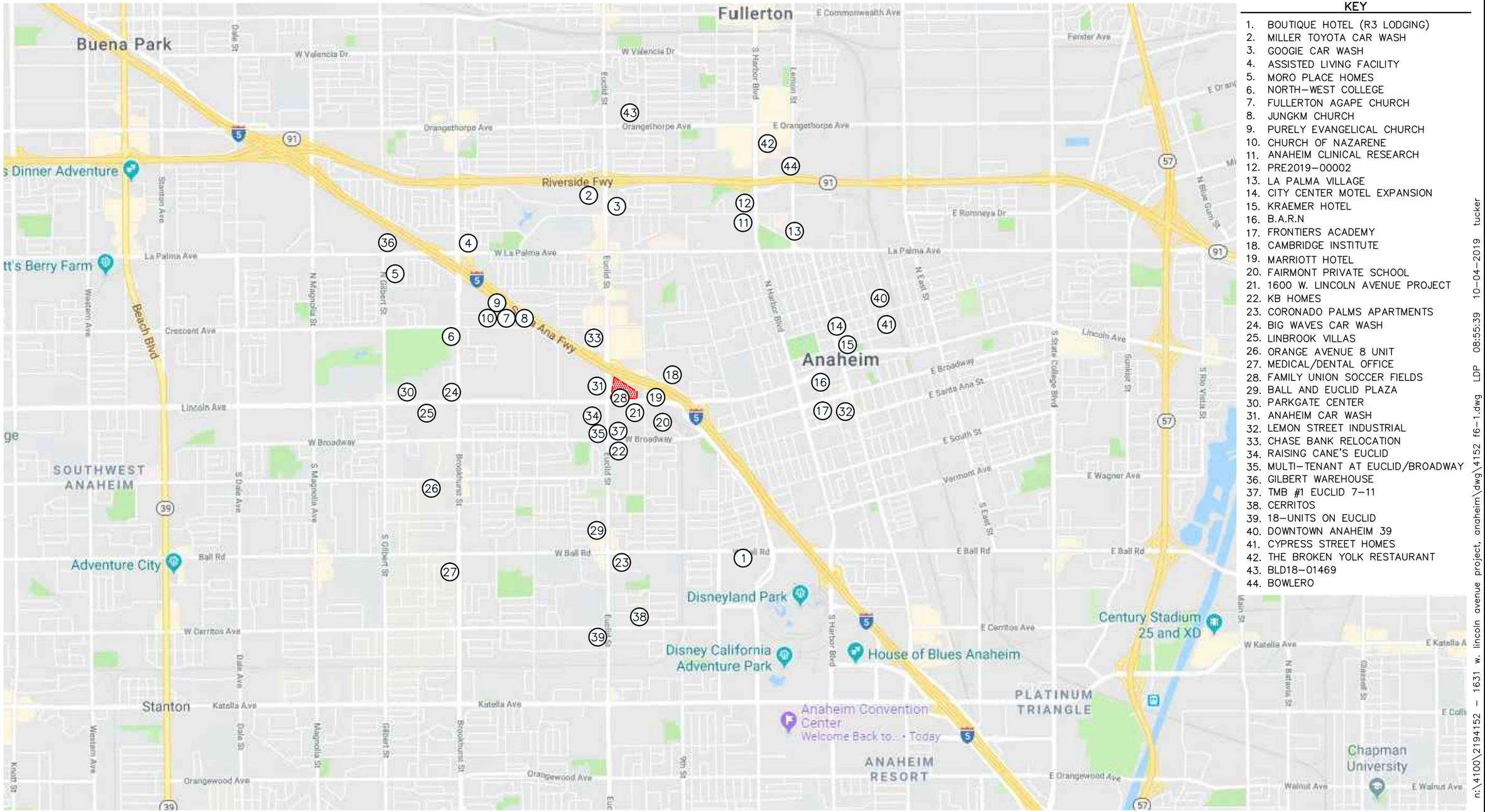
9 Source: *Traffic Impact Analysis for 1600 W. Lincoln Avenue Project,* prepared by Dudek.

## TABLE 6-2 (CONTINUED)
## CUMULATIVE PROJECTS TRAFFIC GENERATION FORECAST[10]

| Cumulative Project Description | Daily 2-Way | AM Peak Hour | | | PM Peak Hour | | |
|---|---|---|---|---|---|---|---|
| | | In | Out | Total | In | Out | Total |
| 31. Anaheim Car Wash | 369 | 9 | 9 | 18 | 19 | 18 | 37 |
| 32. Lemon Street Industrial | 36 | 4 | 1 | 5 | 1 | 4 | 5 |
| 33. Chase Bank Relocation | 298 | 16 | 11 | 27 | 27 | 26 | 53 |
| 34. Raising Cane's Euclid | 1,060 | 32 | 30 | 62 | 25 | 24 | 49 |
| 35. Multi-Tenant at Euclid/Broadway | 271 | 4 | 3 | 7 | 9 | 11 | 20 |
| 36. Gilbert Warehouse | 24 | 2 | 0 | 2 | 1 | 2 | 3 |
| 37. TMB #1 Euclid 7-11 | 1,054 | 17 | 17 | 34 | 19 | 19 | 38 |
| 38. Cerritos | 104 | 2 | 6 | 8 | 7 | 4 | 11 |
| 39. 18-Units on Euclid | 132 | 2 | 6 | 8 | 6 | 4 | 10 |
| 40. Downtown Anaheim 39[11] | 212 | 4 | 10 | 14 | 10 | 7 | 17 |
| 41. Cypress Street Homes | 359 | 7 | 21 | 28 | 24 | 14 | 38 |
| 42. The Broken Yolk Restaurant | 501 | 24 | 20 | 44 | 17 | 11 | 28 |
| 43. BLD18-01469 | 463 | 22 | 19 | 41 | 16 | 10 | 26 |
| 44. Bowlero | 471 | 31 | 2 | 33 | 31 | 16 | 47 |
| **Cumulative Project Trip Generation Potential** | **20,839** | **839** | **864** | **1,703** | **824** | **690** | **1,514** |

[10] Source: *Trip Generation*, 10th Edition, Institute of Transportation Engineers (ITE), Washington, D.C. (2017), unless otherwise noted.

[11] Source: *Traffic Impact Analysis for Downtown Anaheim 39,* prepared by LLG Engineers (December 2018).




## KEY

1. BOUTIQUE HOTEL (R3 LODGING)
2. MILLER TOYOTA CAR WASH
3. GOOGIE CAR WASH
4. ASSISTED LIVING FACILITY
5. MORO PLACE HOMES
6. NORTH–WEST COLLEGE
7. FULLERTON AGAPE CHURCH
8. JUNGKM CHURCH
9. PURELY EVANGELICAL CHURCH
10. CHURCH OF NAZARENE
11. ANAHEIM CLINICAL RESEARCH
12. PRE2019–00002
13. LA PALMA VILLAGE
14. CITY CENTER MOTEL EXPANSION
15. KRAEMER HOTEL
16. B.A.R.N
17. FRONTIERS ACADEMY
18. CAMBRIDGE INSTITUTE
19. MARRIOTT HOTEL
20. FAIRMONT PRIVATE SCHOOL
21. 1600 W. LINCOLN AVENUE PROJECT
22. KB HOMES
23. CORONADO PALMS APARTMENTS
24. BIG WAVES CAR WASH
25. LINBROOK VILLAS
26. ORANGE AVENUE 8 UNIT
27. MEDICAL/DENTAL OFFICE
28. FAMILY UNION SOCCER FIELDS
29. BALL AND EUCLID PLAZA
30. PARKGATE CENTER
31. ANAHEIM CAR WASH
32. LEMON STREET INDUSTRIAL
33. CHASE BANK RELOCATION
34. RAISING CANE'S EUCLID
35. MULTI–TENANT AT EUCLID/BROADWAY
36. GILBERT WAREHOUSE
37. TMB #1 EUCLID 7–11
38. CERRITOS
39. 18–UNITS ON EUCLID
40. DOWNTOWN ANAHEIM 39
41. CYPRESS STREET HOMES
42. THE BROKEN YOLK RESTAURANT
43. BLD18–01469
44. BOWLERO

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N NO SCALE

**KEY**

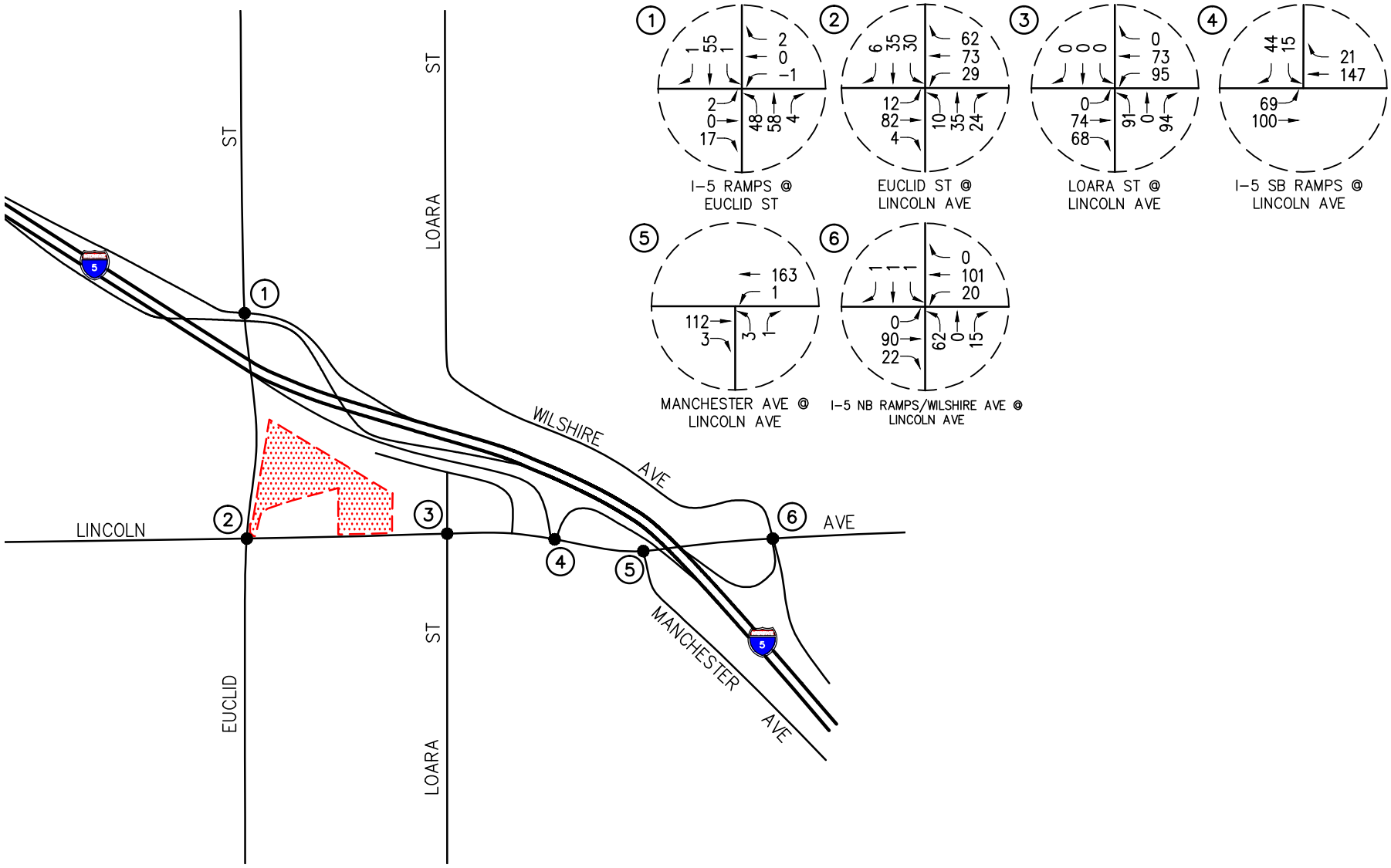
(#) = CUMULATIVE PROJECT LOCATION

= PROJECT SITE

# FIGURE 6–1

## LOCATION OF CUMULATIVE PROJECTS

LINCOLN AVENUE REDEVELOPMENT PROJECT, ANAHEIM

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N NO SCALE

KEY

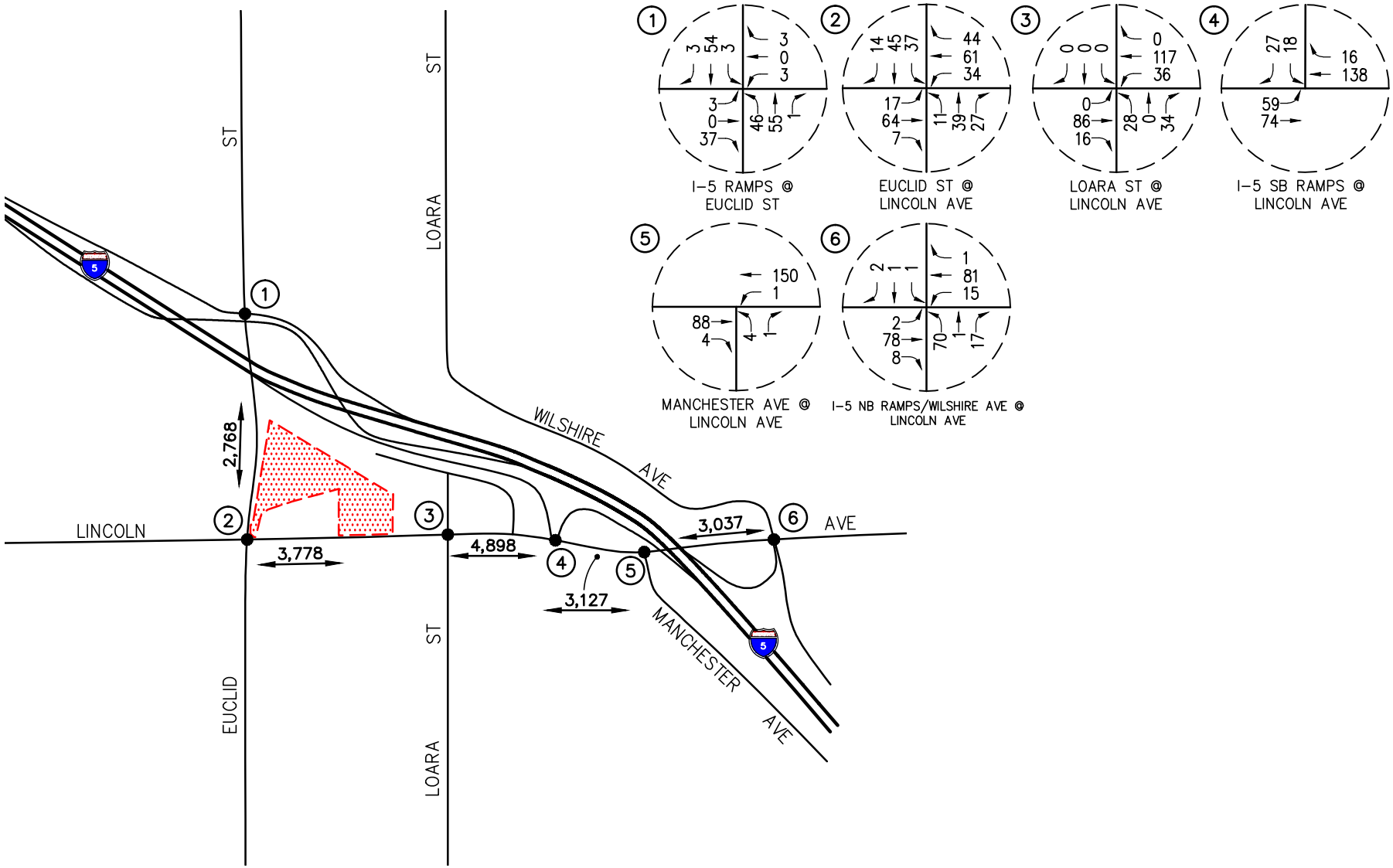
(#) = STUDY INTERSECTION

= PROJECT SITE

# FIGURE 6-2

## AM PEAK HOUR CUMULATIVE PROJECT TRAFFIC VOLUMES

LINCOLN AVENUE REDEVELOPMENT PROJECT, ANAHEIM

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NO SCALE

KEY

(#) = STUDY INTERSECTION

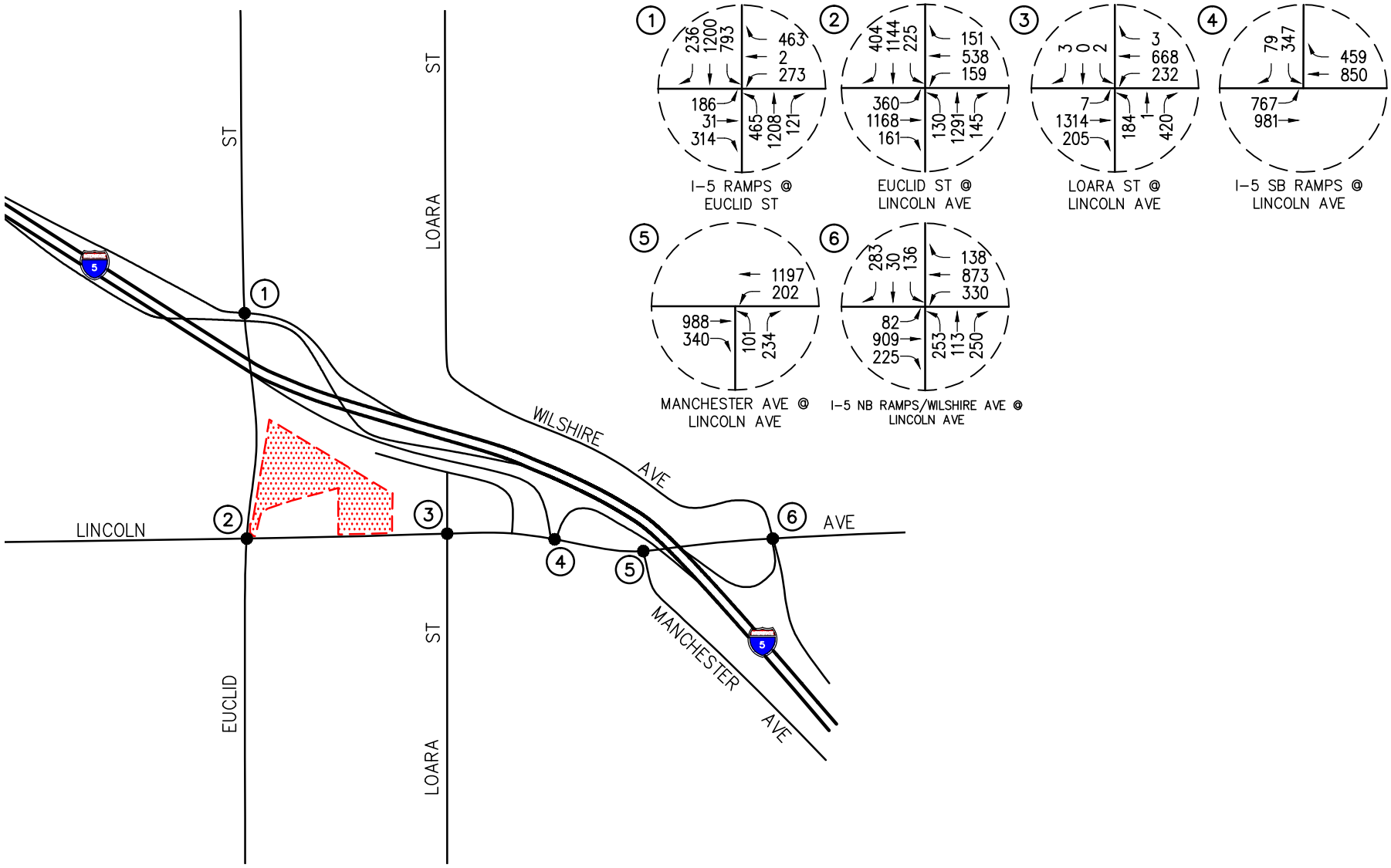
XX,XXX = STUDY ROADWAY SEGMENT

= PROJECT SITE

# FIGURE 6-3

## PM PEAK HOUR AND DAILY CUMULATIVE PROJECT TRAFFIC VOLUMES

LINCOLN AVENUE REDEVELOPMENT PROJECT, ANAHEIM

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N NO SCALE

KEY

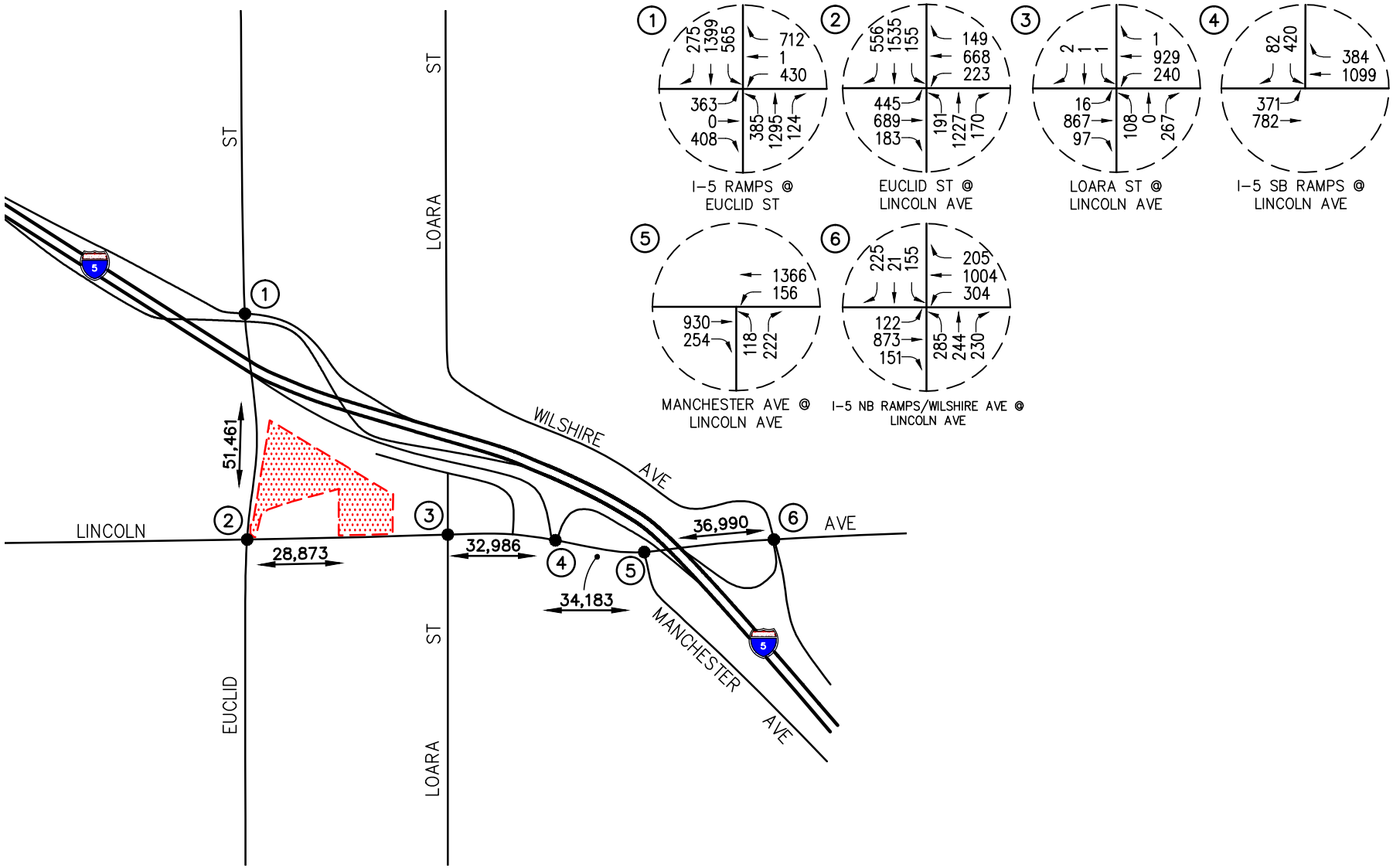
(#) = STUDY INTERSECTION

= PROJECT SITE

# FIGURE 6-4

## EXISTING PLUS CUMULATIVE PROJECTS AM PEAK HOUR TRAFFIC VOLUMES

LINCOLN AVENUE REDEVELOPMENT PROJECT, ANAHEIM

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N NO SCALE

KEY

(#) = STUDY INTERSECTION

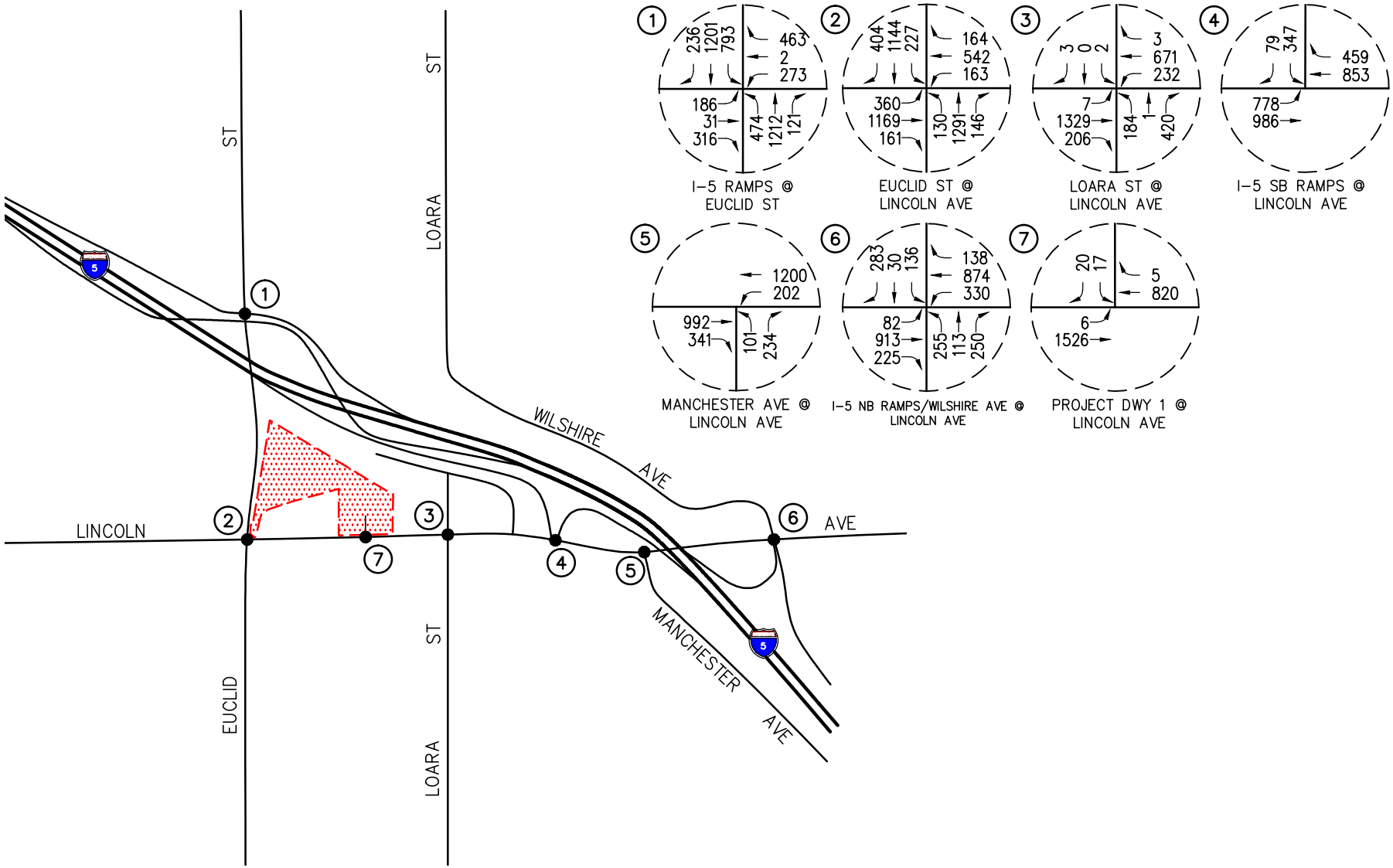
XX,XXX = STUDY ROADWAY SEGMENT

= PROJECT SITE

# FIGURE 6-5

## EXISTING PLUS CUMULATIVE PROJECTS PM PEAK HOUR AND DAILY TRAFFIC VOLUMES

LINCOLN AVENUE REDEVELOPMENT PROJECT, ANAHEIM

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N NO SCALE

KEY

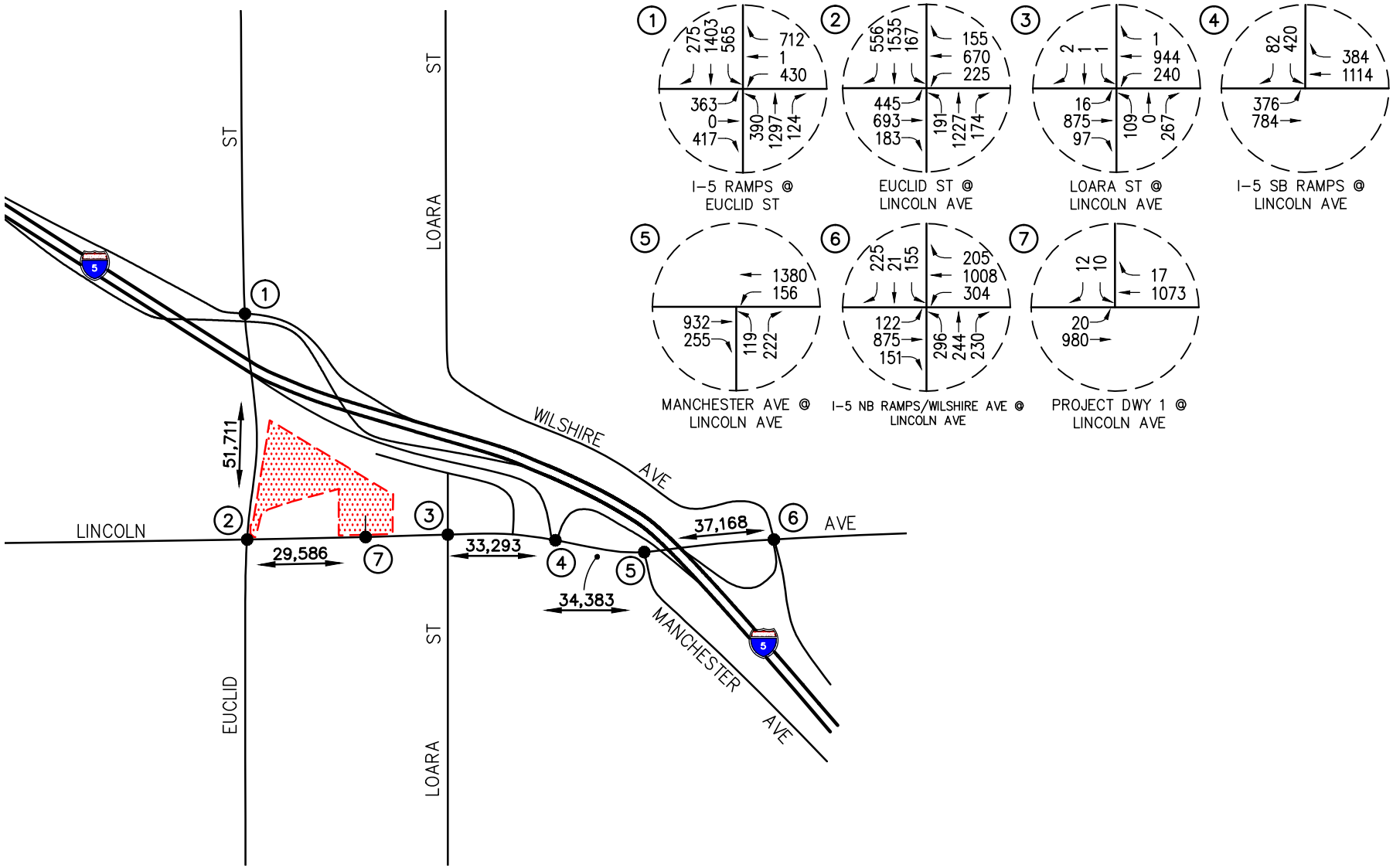
(#) = STUDY INTERSECTION

= PROJECT SITE

# FIGURE 6-6

## EXISTING PLUS CUMULATIVE PROJECTS PLUS PROJECT (SCENARIO NO. 1) AM PEAK HOUR TRAFFIC VOLUMES

LINCOLN AVENUE REDEVELOPMENT PROJECT, ANAHEIM

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N NO SCALE

KEY

(#) = STUDY INTERSECTION

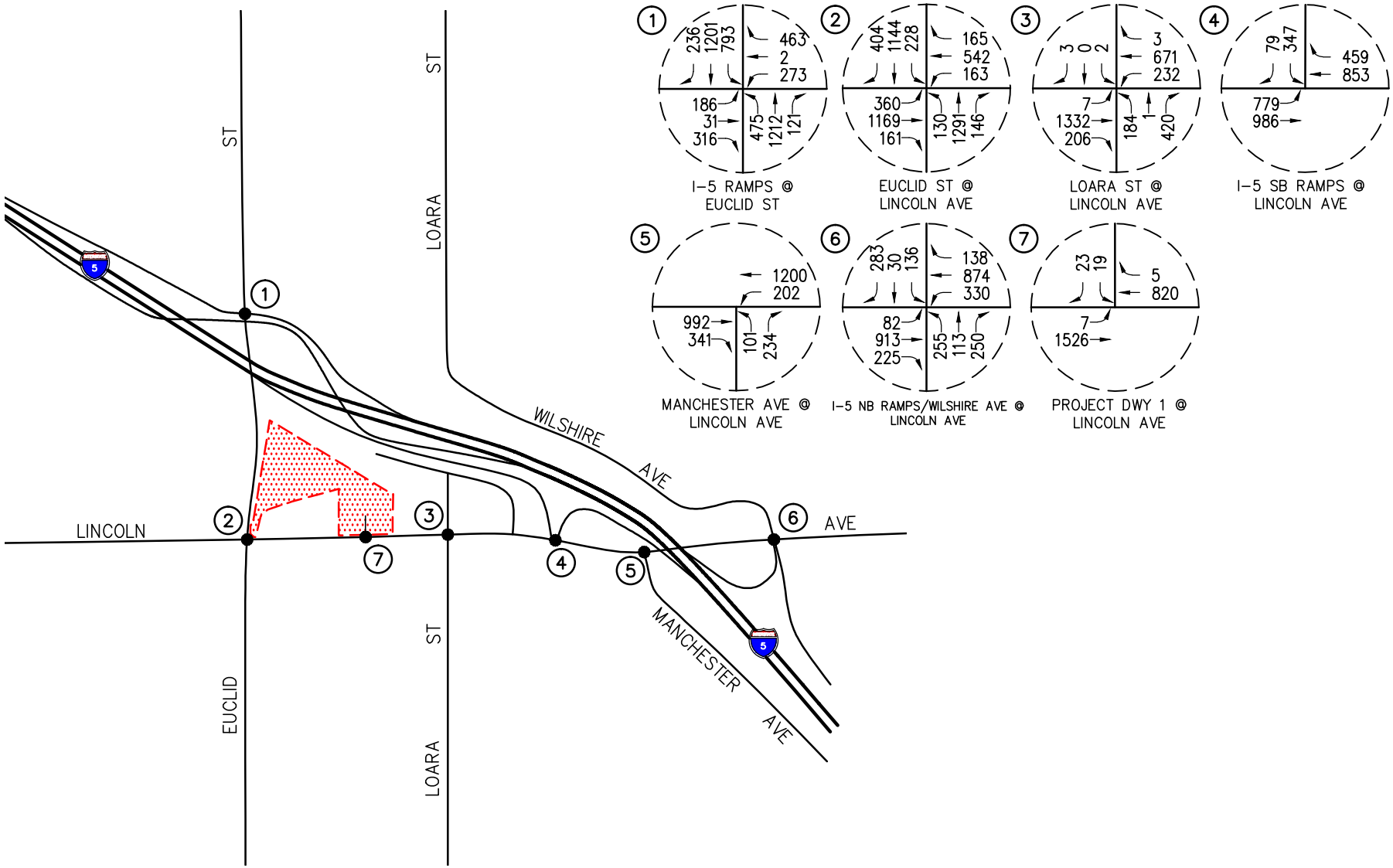
XX,XXX = STUDY ROADWAY SEGMENT

= PROJECT SITE

# FIGURE 6-7

## EXISTING PLUS CUMULATIVE PROJECTS PLUS PROJECT (SCENARIO NO. 1) PM PEAK HOUR AND DAILY TRAFFIC VOLUMES

LINCOLN AVENUE REDEVELOPMENT PROJECT, ANAHEIM

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KEY

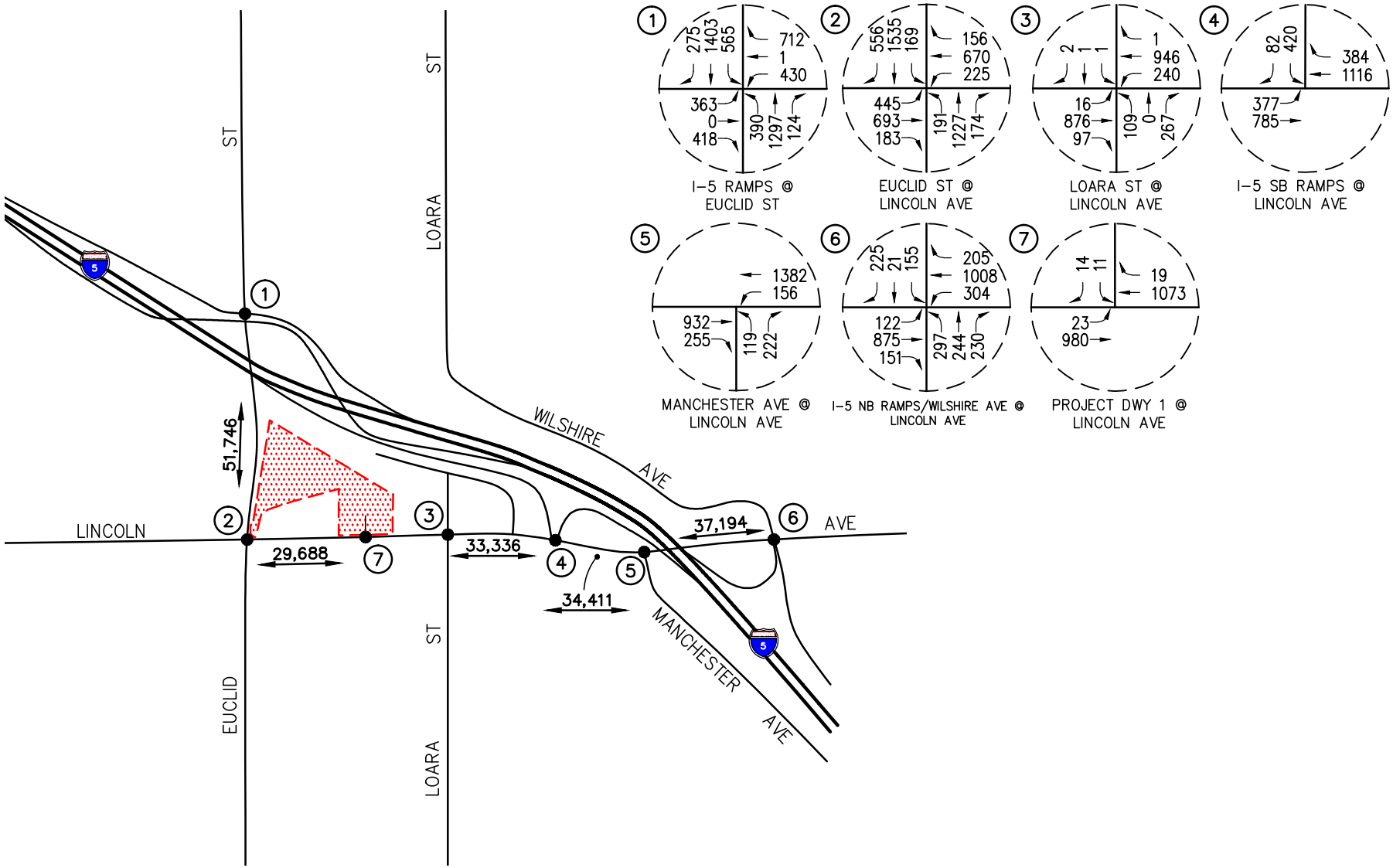
(#) = STUDY INTERSECTION

= PROJECT SITE

# FIGURE 6-8

## EXISTING PLUS CUMULATIVE PROJECTS PLUS PROJECT (SCENARIO NO. 2) AM PEAK HOUR TRAFFIC VOLUMES

LINCOLN AVENUE REDEVELOPMENT PROJECT, ANAHEIM

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LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

KEY

(#) = STUDY INTERSECTION

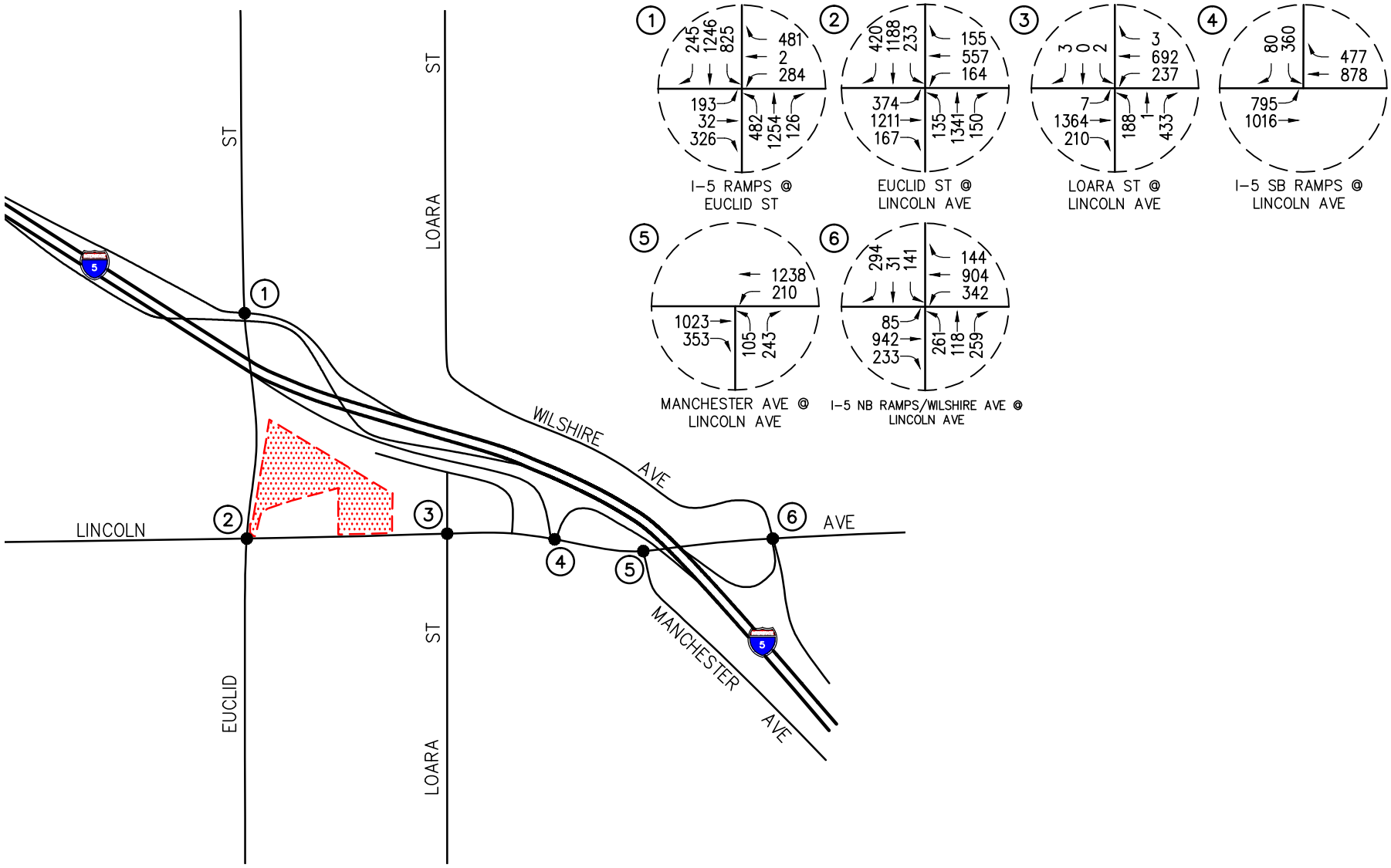
XX,XXX = STUDY ROADWAY SEGMENT

= PROJECT SITE

# FIGURE 6-9

## EXISTING PLUS CUMULATIVE PROJECTS PLUS PROJECT (SCENARIO NO. 2) PM PEAK HOUR AND DAILY TRAFFIC VOLUMES

LINCOLN AVENUE REDEVELOPMENT PROJECT, ANAHEIM

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KEY

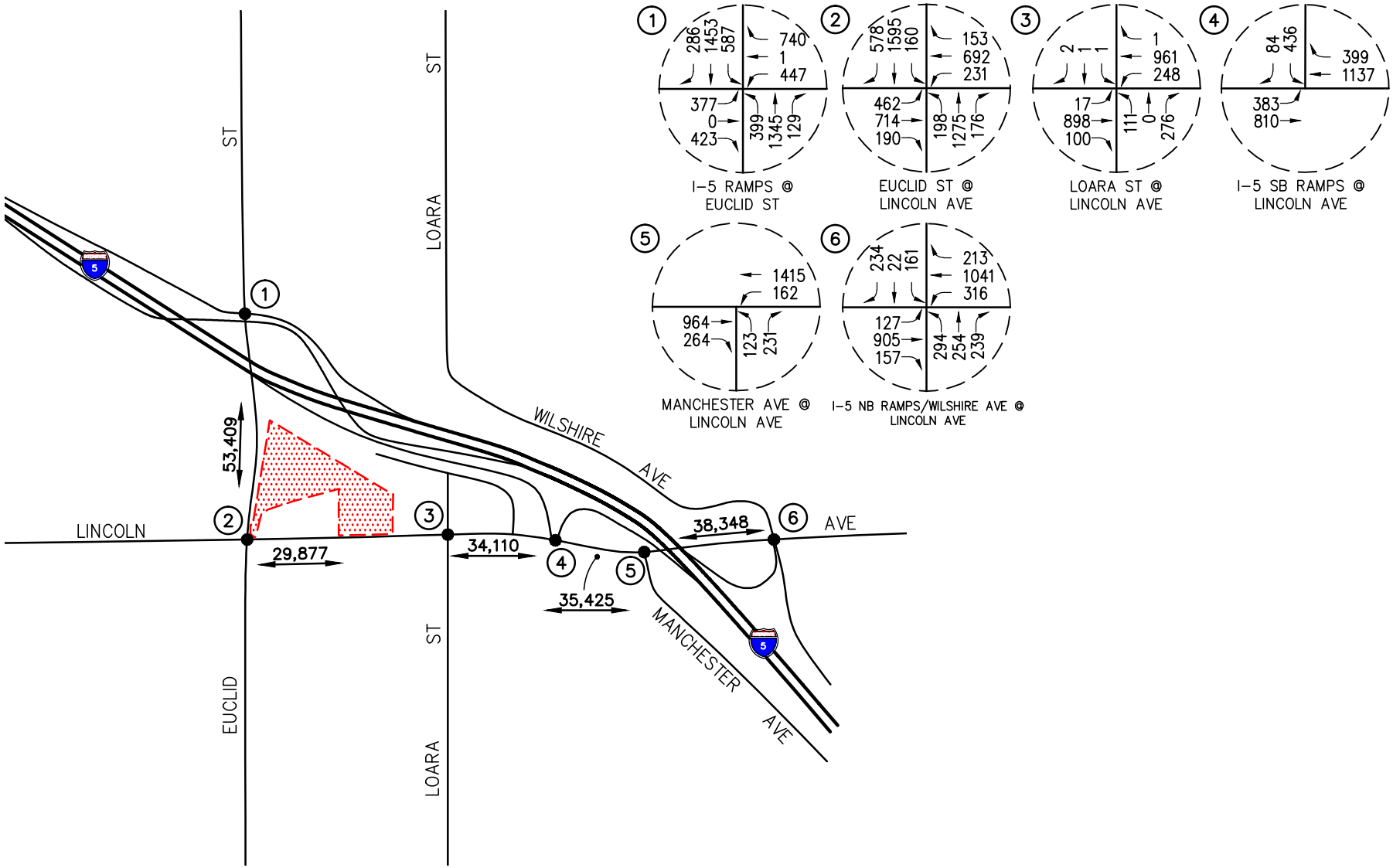
(#) = STUDY INTERSECTION

= PROJECT SITE

# FIGURE 6-10

## YEAR 2023 CUMULATIVE AM PEAK HOUR TRAFFIC VOLUMES

LINCOLN AVENUE REDEVELOPMENT PROJECT, ANAHEIM

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N NO SCALE

KEY

(#) = STUDY INTERSECTION

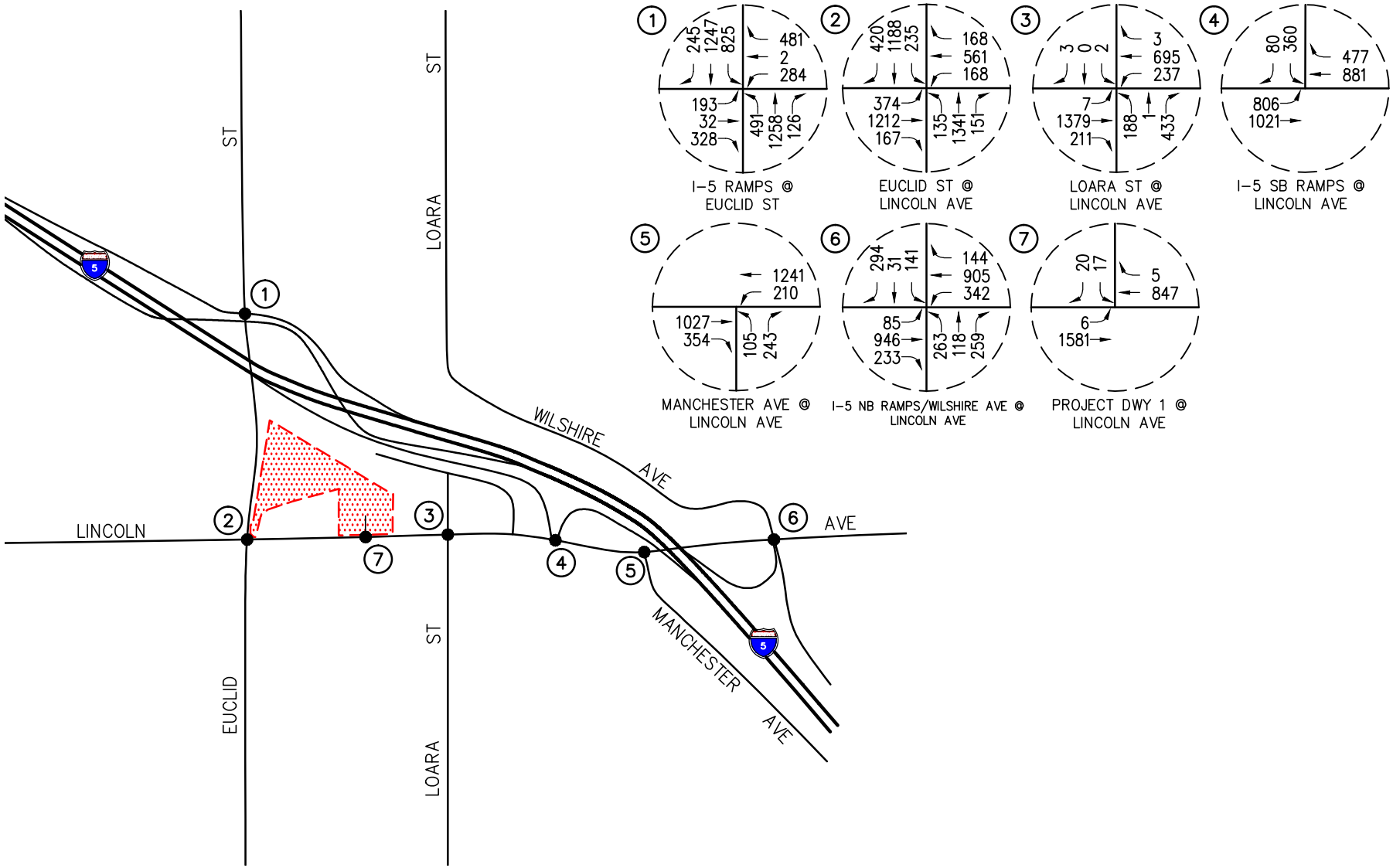
XX,XXX = STUDY ROADWAY SEGMENT

= PROJECT SITE

# FIGURE 6-11

## YEAR 2023 CUMULATIVE PM PEAK HOUR AND DAILY TRAFFIC VOLUMES

LINCOLN AVENUE REDEVELOPMENT PROJECT, ANAHEIM

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N NO SCALE

KEY

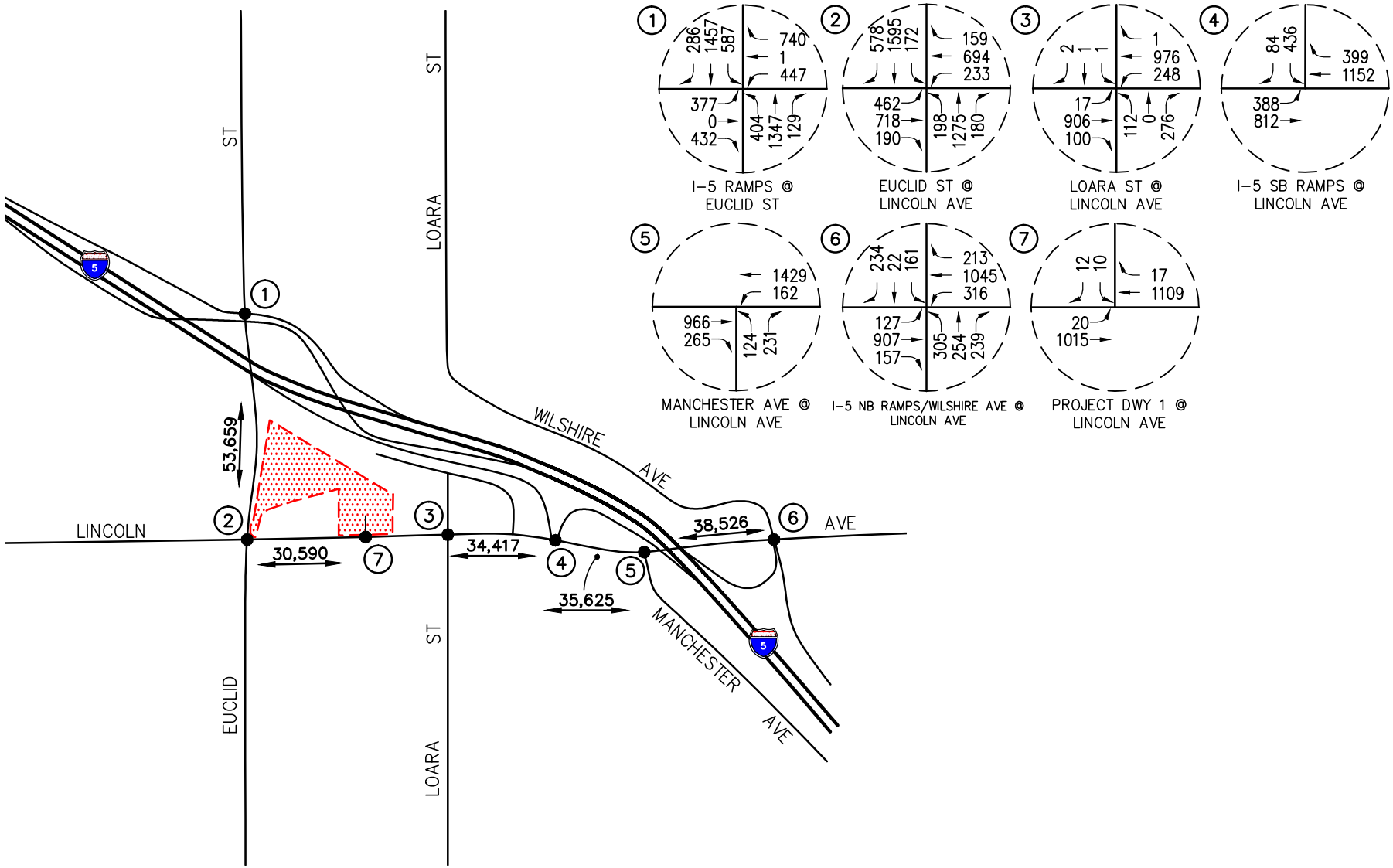
(#) = STUDY INTERSECTION

= PROJECT SITE

# FIGURE 6-12

## YEAR 2023 CUMULATIVE PLUS PROJECT (SCENARIO NO. 1) AM PEAK HOUR TRAFFIC VOLUMES

LINCOLN AVENUE REDEVELOPMENT PROJECT, ANAHEIM

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NO SCALE

KEY

(#) = STUDY INTERSECTION

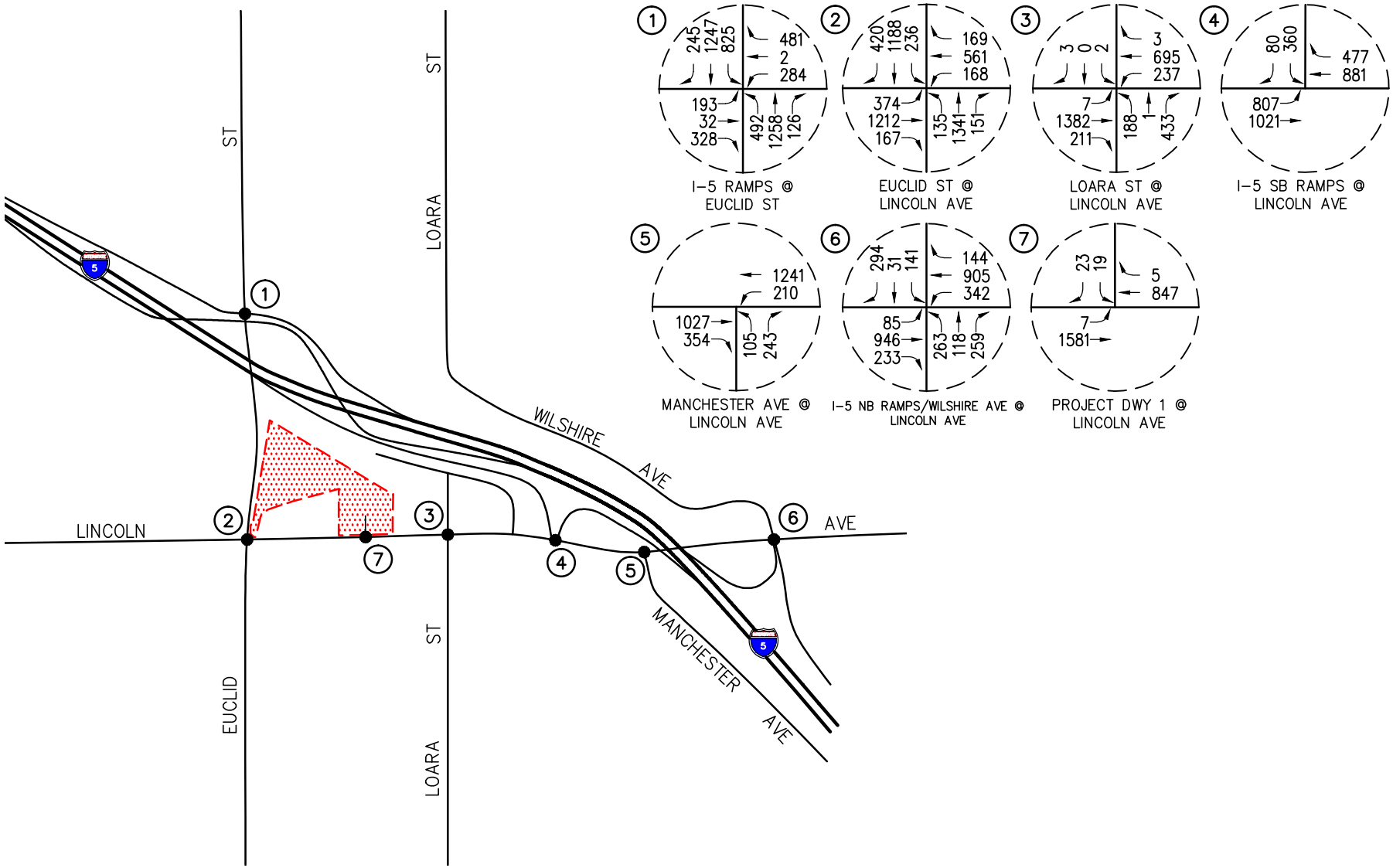
XX,XXX = STUDY ROADWAY SEGMENT

= PROJECT SITE

# FIGURE 6-13

## YEAR 2023 CUMULATIVE PLUS PROJECT (SCENARIO NO. 1) PM PEAK HOUR AND DAILY TRAFFIC VOLUMES

LINCOLN AVENUE REDEVELOPMENT PROJECT, ANAHEIM

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N NO SCALE

KEY

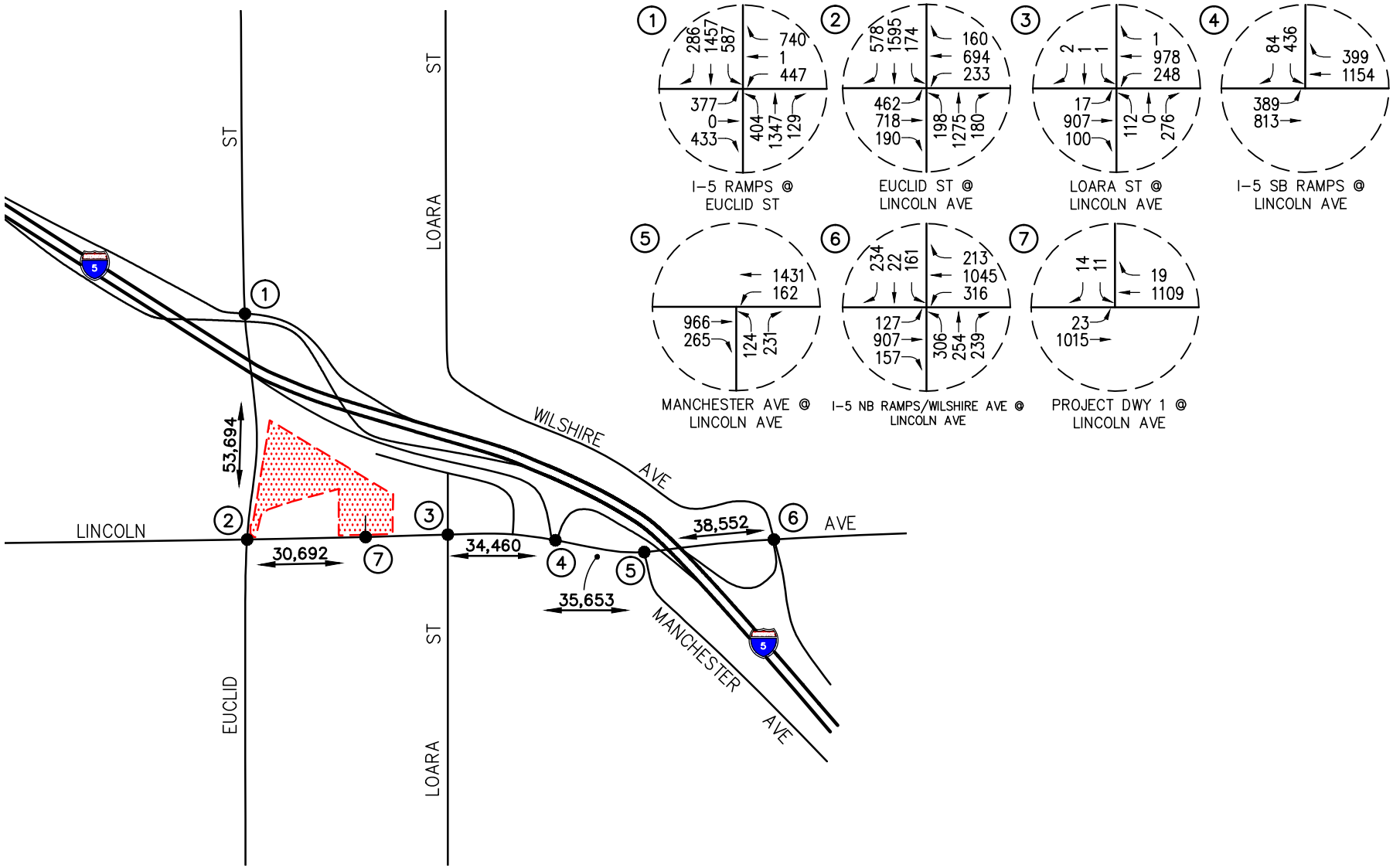
(#) = STUDY INTERSECTION

= PROJECT SITE

# FIGURE 6-14

## YEAR 2023 CUMULATIVE PLUS PROJECT (SCENARIO NO. 2) AM PEAK HOUR TRAFFIC VOLUMES

LINCOLN AVENUE REDEVELOPMENT PROJECT, ANAHEIM

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N NO SCALE

KEY

(#) = STUDY INTERSECTION

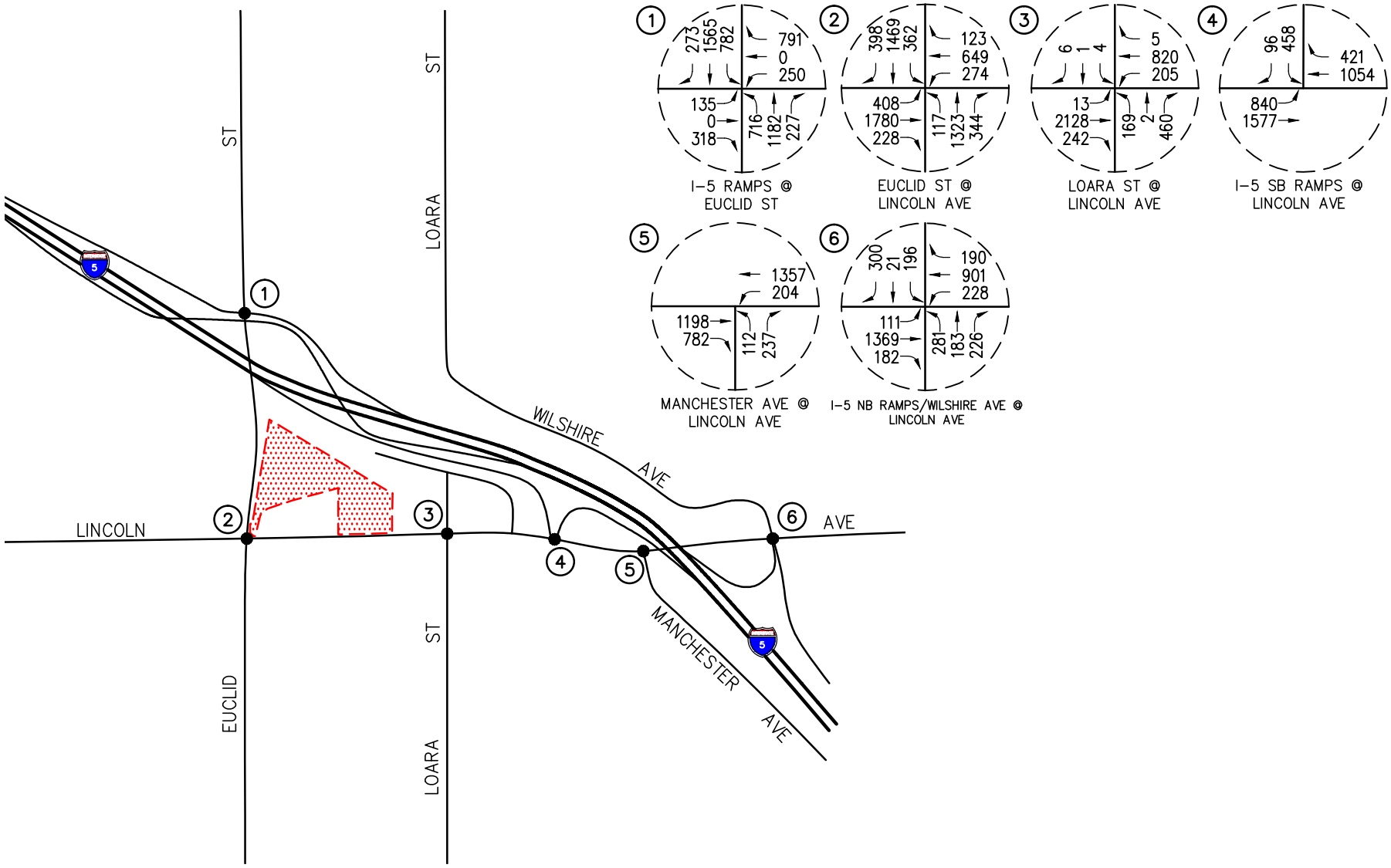
XX,XXX = STUDY ROADWAY SEGMENT

= PROJECT SITE

# FIGURE 6-15

## YEAR 2023 CUMULATIVE PLUS PROJECT (SCENARIO NO. 2) PM PEAK HOUR AND DAILY TRAFFIC VOLUMES

LINCOLN AVENUE REDEVELOPMENT PROJECT, ANAHEIM

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N NO SCALE

KEY

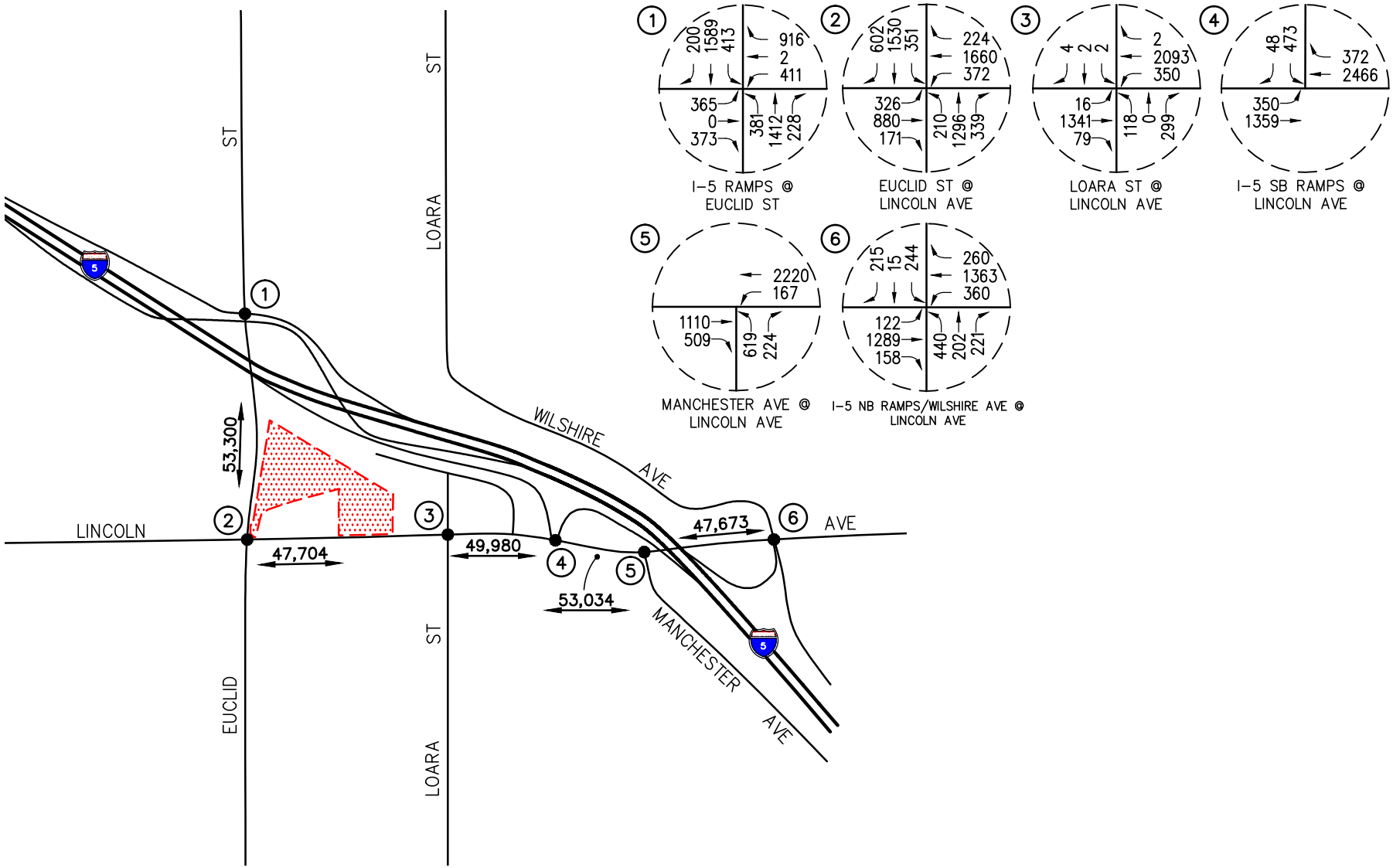
(#) = STUDY INTERSECTION

= PROJECT SITE

# FIGURE 6-16

## GENERAL PLAN BUILDOUT AM PEAK HOUR TRAFFIC VOLUMES

LINCOLN AVENUE REDEVELOPMENT PROJECT, ANAHEIM

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LINSCOTT LAW & GREENSPAN engineers

NO SCALE

KEY

(#) = STUDY INTERSECTION

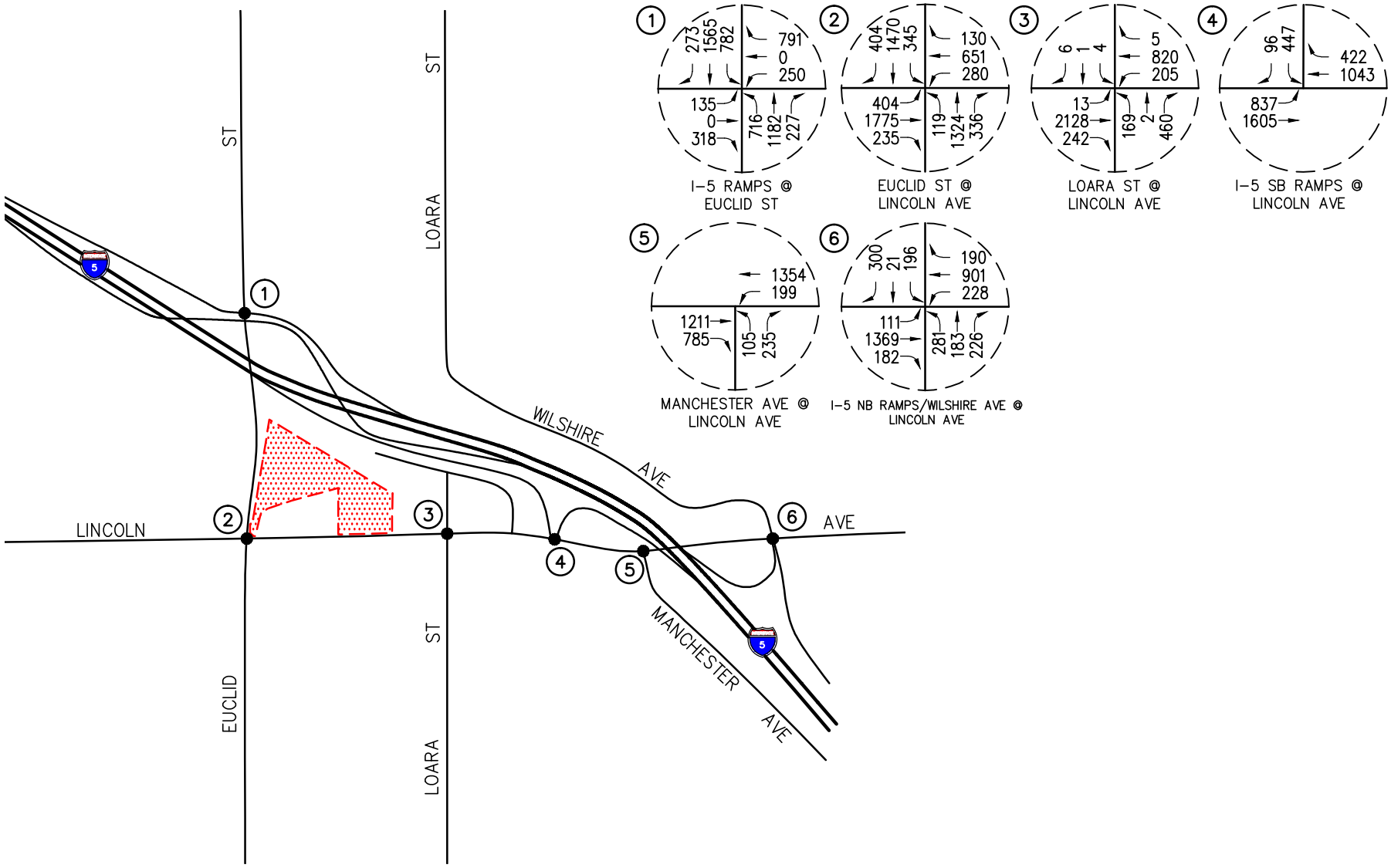
XX,XXX = STUDY ROADWAY SEGMENT

= PROJECT SITE

# FIGURE 6-17

## GENERAL PLAN BUILDOUT
## PM PEAK HOUR AND DAILY TRAFFIC VOLUMES

LINCOLN AVENUE REDEVELOPMENT PROJECT, ANAHEIM

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LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

KEY

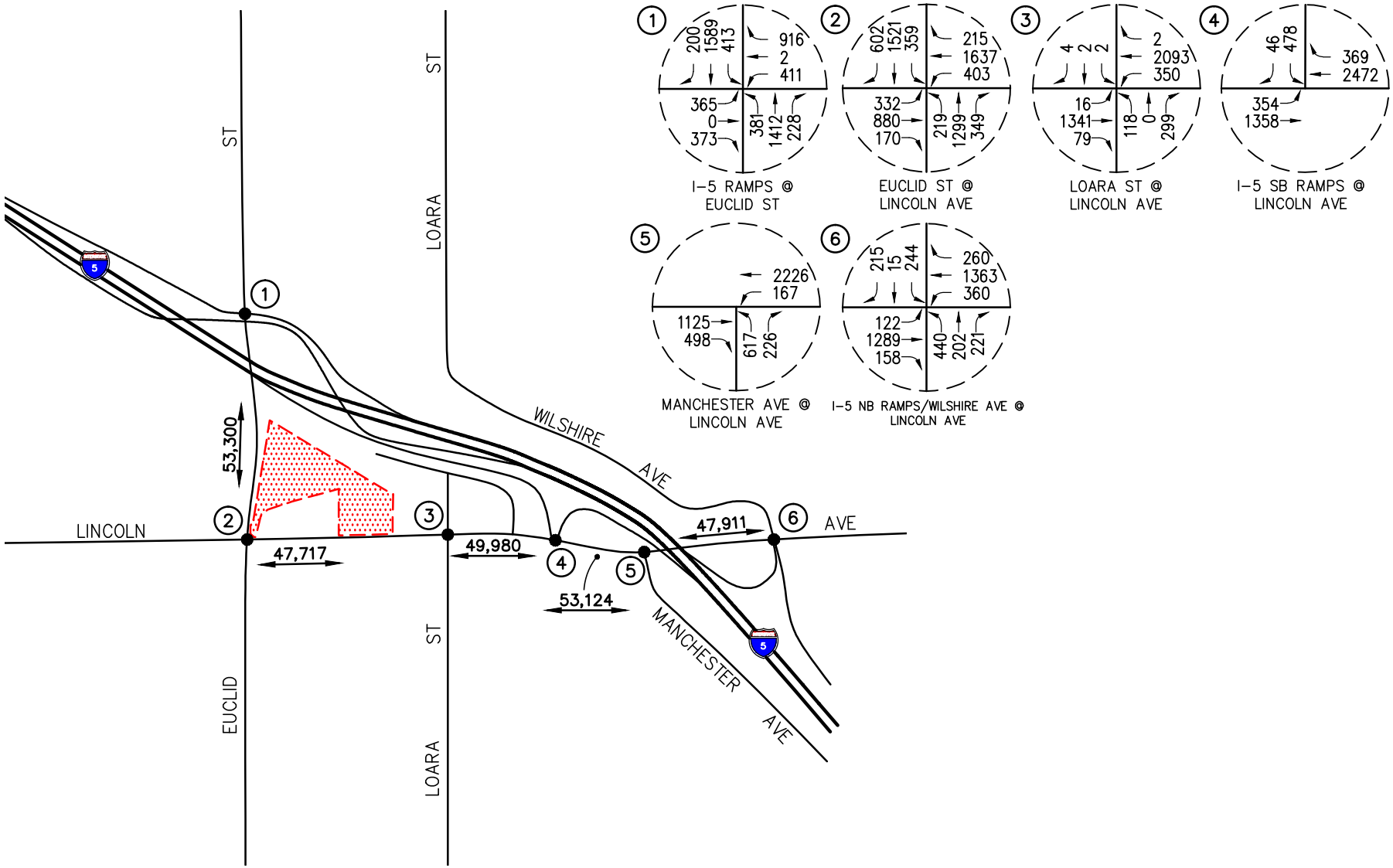
(#) = STUDY INTERSECTION

= PROJECT SITE

# FIGURE 6-18

## GENERAL PLAN BUILDOUT (WITH 1600 W. LINCOLN AVENUE PROJECT) AM PEAK HOUR TRAFFIC VOLUMES

LINCOLN AVENUE REDEVELOPMENT PROJECT, ANAHEIM

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N NO SCALE

KEY

(#) = STUDY INTERSECTION

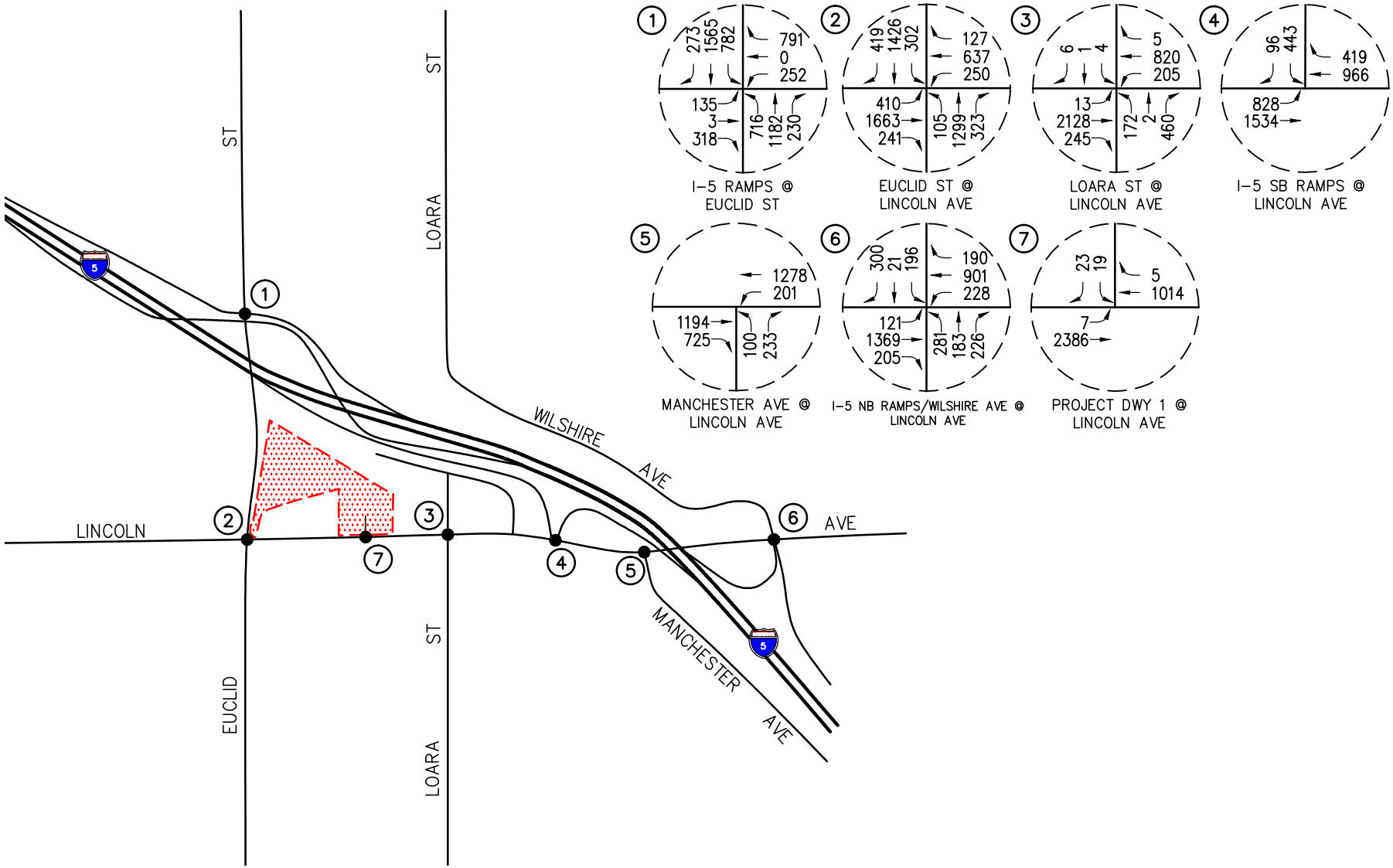
XX,XXX = STUDY ROADWAY SEGMENT

= PROJECT SITE

# FIGURE 6-19

## GENERAL PLAN BUILDOUT (WITH 1600 W. LINCOLN AVENUE PROJECT) PM PEAK HOUR AND DAILY TRAFFIC VOLUMES

LINCOLN AVENUE REDEVELOPMENT PROJECT, ANAHEIM

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N NO SCALE

KEY

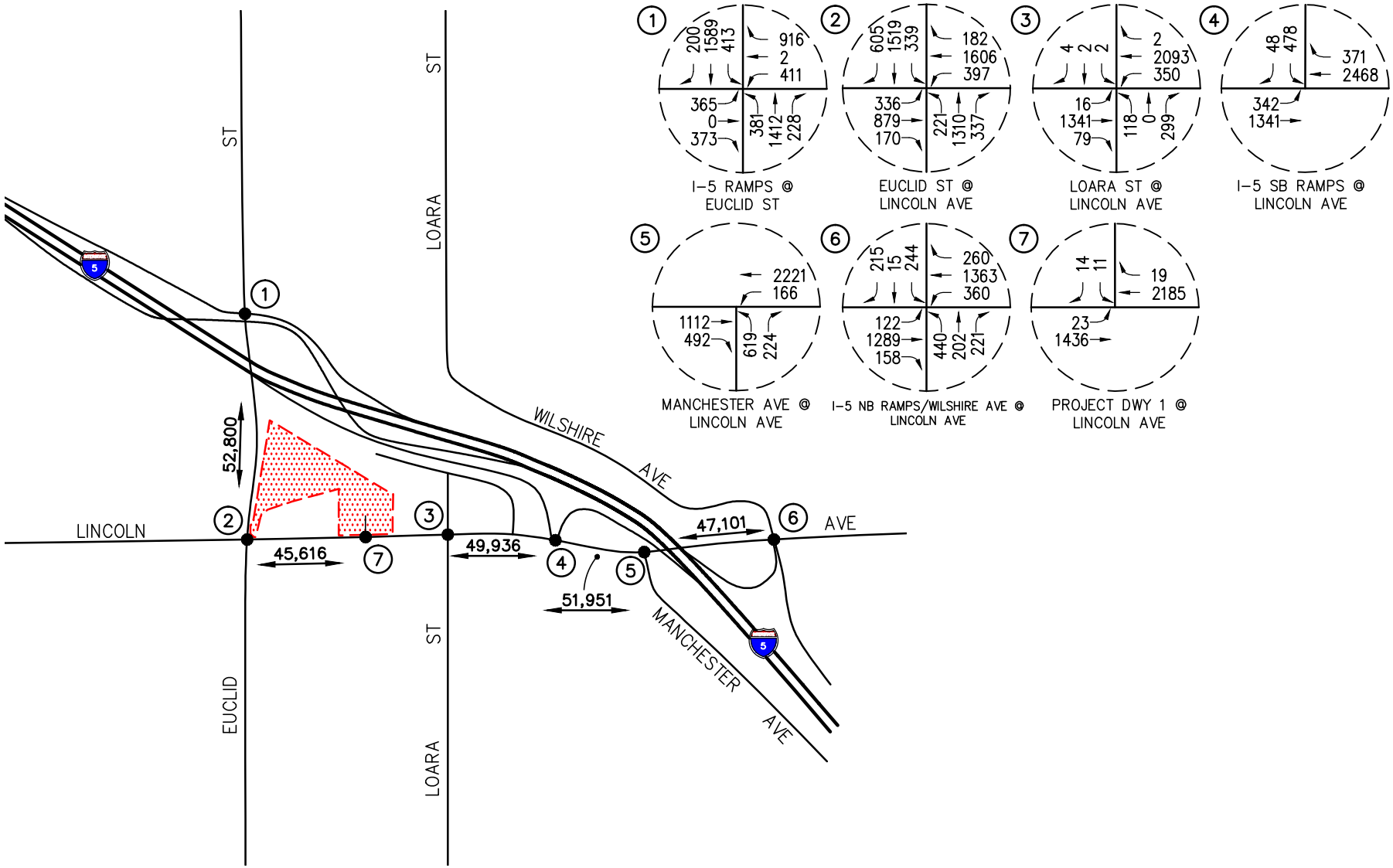
(#) = STUDY INTERSECTION

= PROJECT SITE

# FIGURE 6-20

## GENERAL PLAN BUILDOUT PLUS PROJECT (SCENARIO NO. 2) AM PEAK HOUR TRAFFIC VOLUMES

LINCOLN AVENUE REDEVELOPMENT PROJECT, ANAHEIM

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LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

KEY

(#) = STUDY INTERSECTION

XX,XXX = STUDY ROADWAY SEGMENT

= PROJECT SITE

# FIGURE 6-21

## GENERAL PLAN BUILDOUT PLUS PROJECT (SCENARIO NO. 2) PM PEAK HOUR AND DAILY TRAFFIC VOLUMES

LINCOLN AVENUE REDEVELOPMENT PROJECT, ANAHEIM

# 7.0 TRAFFIC IMPACT ANALYSIS METHODOLOGY

The relative impact of the proposed Project during the AM peak hour/PM peak hour and on a daily basis was evaluated based on analysis of future operating conditions at the six (6) key study intersections and five (5) key roadway segments, without, then with the proposed Project. The previously discussed capacity analysis procedures were utilized to investigate the future volume-to-capacity relationships and service level characteristics at each study intersection and roadway segment. The significance of the potential impacts of the Project at each key intersection and key roadway segment was then evaluated using the following traffic impact criteria.

## 7.1 Impact Criteria and Thresholds

Impacts to local and regional transportation systems located in the City of Anaheim are considered significant if:

Intersections:
According to the City's Circulation Element and stated in the *City of Anaheim Criteria for Preparation of Traffic Impact Studies*, LOS D is the minimum acceptable condition that should be maintained during the morning and evening peak commute hours on all City intersections. The significance of the potential impacts of the project at each key signalized intersection is determined based on the sliding scale criteria presented in ***Table 7-1***.

As indicated in *Table 7-1*, the project-related increase in ICU value that defines a significant impact at signalized intersections varies with LOS. Per the City's guidelines, a change in ICU value, within LOS C, equal to or greater than 0.050 is an impact and within LOS D, a change in ICU equal to or greater than 0.030 is also an impact. With LOS E or F, a change in ICU equal to or greater than 0.010 is considered an impact.

For unsignalized intersections, based on discussions with City of Anaheim Traffic Engineering Department staff, this report defines a significant impact if the project causes an intersection operating at LOS D or better to degrade to LOS E or LOS F, and the traffic signal warrant analysis determines that a traffic signal is justified.

Roadway Segments:
LOS C (V/C not to exceed 0.80) is the performance standard that has been adopted for the study area circulation system by the City of Anaheim. Per City of Anaheim criteria, a project is deemed to have a significant impact if the project results in deterioration of the daily LOS to an unacceptable LOS (i.e. LOS D, E, or F) coupled with a continued deficiency under peak hour conditions. A significant impact is also determined by an increase in the daily V/C value of 0.01 if the segment currently operates at LOS E or F under daily without project conditions and the segment is found to be deficient under peak hour conditions.

**TABLE 7-1**
**CITY OF ANAHEIM SIGNIFICANT IMPACT CRITERIA[12]**

| Final Intersection ICU value | Level of Service (LOS) | Project Related Increase in ICU value Considered Significant |
|---|---|---|
| > 0.700 and ≤ 0.800 | C | equal to or greater than 0.050 |
| > 0.800 and ≤ 0.900 | D | equal to or greater than 0.030 |
| > 0.900 | E/F | equal to or greater than 0.010 |

## 7.2 Traffic Impact Analysis Scenarios

The following scenarios are those for which volume/capacity calculations have been performed at the six (6) key study intersections and five (5) key roadway segments for existing plus project, near-term (Year 2023) and General Plan Buildout (Year 2035) traffic conditions:

(a) Existing Traffic Conditions;
(b) Existing Plus Project (Scenario No. 2) Traffic Conditions;
(c) Scenario (b) with Improvements, if necessary;
(d) Existing Plus Cumulative Projects Traffic Conditions;
(e) Existing Plus Cumulative Projects Plus Project (Scenario No. 1) Traffic Conditions;
(f) Scenario (e) with Improvements, if necessary;
(g) Existing Plus Cumulative Projects Plus Project (Scenario No. 2) Traffic Conditions;
(h) Scenario (g) with Improvements, if necessary;
(i) Year 2023 Cumulative Traffic Conditions;
(j) Year 2023 Cumulative plus Project (Scenario No. 1) Traffic Conditions;
(k) Scenario (j) with Improvements, if necessary;
(l) Year 2023 Cumulative plus Project (Scenario No. 2) Traffic Conditions;
(m) Scenario (l) with Improvements, if necessary;
(n) General Plan Buildout (Year 2035) Traffic Conditions;
(o) General Plan Buildout (Year 2035) plus Project (Scenario No. 2) Traffic Conditions;
(p) Scenario (o) with Improvements, if necessary;
(q) General Plan Buildout (Year 2035) plus Cumulative Traffic Conditions;
(r) General Plan Buildout (Year 2035) plus Cumulative plus Project (Scenario No. 2) Traffic Conditions; and
(s) Scenario (r) with Improvements, if necessary.

[12] Source: *City of Anaheim Criteria for Preparation of Traffic Impact Studies.*

# 8.0 EXISTING PLUS PROJECT ANALYSIS (SCENARIO NO. 2)

The following summarizes the "Existing Plus Project (Scenario No. 2)" level of service results for the six (6) key study intersections and five (5) key roadway segments.

## 8.1 Intersections

***Table 8-1*** summarizes the peak hour level of service results at the six (6) key study intersections for existing plus project (Scenario No. 2) traffic conditions. The first column (1) of ICU/LOS values in *Table 8-1* presents a summary of existing AM and PM peak hour traffic conditions (which were also presented in *Table 3-4*). The second column (2) lists existing plus project (Scenario No. 2) traffic conditions. The third column (3) shows the increase in ICU value due to the added peak hour project trips and indicates whether the traffic associated with the Project (Scenario No. 2) will have a significant impact based on the LOS standards and significant impact criteria defined in this report.

### 8.1.1 *Existing Plus Project (Scenario No. 2) Traffic Conditions*

Review of Columns 2 and 3 of *Table 8-1* indicates that traffic associated with the proposed Project (Scenario No. 2) ***will not*** significantly impact any of the six (6) key study intersections when compared to the LOS standards and significant impact criteria specified in this report. The six (6) key study intersections currently operate and are forecast to continue to operate at an acceptable LOS C or better during the AM and PM peak hours with the addition of Project generated traffic to existing traffic.

*Appendix C* also presents the existing plus project (Scenario No. 2) ICU/LOS calculations for the six (6) key study intersections for the AM peak hour and PM peak hour.

## 8.2 Roadway Segments

***Table 8-2*** summarizes the roadway segment level of service results at the five (5) key roadway segments for existing plus project (Scenario No. 2) traffic conditions. The first column (1) shows the number of lanes, the second column (2) shows the arterial classification and the third column (3) shows the existing LOS "E" capacity. The fourth column (4) presents a summary of existing daily traffic conditions (which were also presented in *Table 3-5*). The fifth column (5) lists existing plus project (Scenario No. 2) daily traffic conditions. Column 5 also shows the increase in V/C ratio value due to the added daily project trips and indicates whether the traffic associated with the Project (Scenario No. 2) will have a significant impact based on the LOS standards and significant impact criteria defined in this report.

### 8.2.1 *Existing Plus Project (Scenario No. 2) Traffic Conditions*

Review of Column 5 of *Table 8-2* indicates that traffic associated with the proposed Project ***will not*** significantly impact any of the five (5) key roadway segments when compared to the LOS standards and significant impact criteria specified in this report. Although Roadway Segment A is forecast to operate at unacceptable LOS D on a daily basis with the addition of project traffic, the proposed Project (Scenario No. 2) is expected to add less than the allowable threshold to the V/C ratio. The remaining four (4) key roadway segments are forecast to continue to operate at an acceptable LOS C or better on a daily basis with the addition of Project generated traffic to existing traffic.

## TABLE 8-1

## EXISTING PLUS PROJECT (SCENARIO NO. 2) PEAK HOUR INTERSECTION CAPACITY ANALYSIS SUMMARY

| Key Intersection | Time Period | Minimum Acceptable LOS | (1) Existing Traffic Conditions | | (2) Existing Plus Project (Scenario No. 2) Traffic Conditions | | (3) Significant Impact | |
|---|---|---|---|---|---|---|---|---|
| | | | ICU | LOS | ICU | LOS | Increase | Yes/No |
| 1. I-5 Ramps at Euclid Street | AM | D | 0.697 | B | 0.698 | B | 0.001 | No |
| | PM | | 0.780 | C | 0.784 | C | 0.004 | No |
| 2. Euclid Street at Lincoln Avenue | AM | D | 0.659 | B | 0.662 | B | 0.003 | No |
| | PM | | 0.687 | B | 0.689 | B | 0.002 | No |
| 3. Loara Street at Lincoln Avenue | AM | D | 0.691 | B | 0.696 | B | 0.005 | No |
| | PM | | 0.539 | A | 0.542 | A | 0.003 | No |
| 4. I-5 SB Ramps at Lincoln Avenue | AM | D | 0.611 | B | 0.614 | B | 0.003 | No |
| | PM | | 0.543 | A | 0.549 | A | 0.006 | No |
| 5. Manchester Avenue at Lincoln Avenue | AM | D | 0.475 | A | 0.476 | A | 0.001 | No |
| | PM | | 0.420 | A | 0.421 | A | 0.001 | No |
| 6. I-5 NB Ramps/Wilshire Avenue at Lincoln Avenue | AM | D | 0.663 | B | 0.664 | B | 0.001 | No |
| | PM | | 0.627 | B | 0.628 | B | 0.001 | No |

Notes:

- **Bold LOS values** indicate adverse service levels based on City LOS standards
- ICU = Intersection Capacity Utilization

## TABLE 8-2

## EXISTING PLUS PROJECT (SCENARIO NO. 2) ROADWAY SEGMENT LEVEL OF SERVICE SUMMARY

| Key Roadway Segment | Min. Acc. LOS | (1) No. of Existing Lanes | (2) Arterial Classification | (3) Existing Capacity at LOS "E" | (4) Existing Traffic Conditions | | | (5) Existing Plus Project (Scenario No. 2) Traffic Conditions | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Daily Volume | V/C Ratio | LOS | Daily Volume | V/C Ratio | LOS | Increase | Significant (Yes/No) |
| A. Euclid Street, between Lincoln Avenue and I-5 Ramps | C | 6D | Major | 56,300 | **48,693** | **0.865** | **D** | **48,978** | **0.870** | **D** | 0.005 | No |
| B. Lincoln Avenue, between Euclid Street and Loara Street | C | 4D | Primary | 37,500 | 25,095 | 0.669 | B | 25,910 | 0.691 | B | 0.022 | No |
| C. Lincoln Avenue, between Loara Street and I-5 SB Ramps | C | 4D | Primary | 37,500 | 28,088 | 0.749 | C | 28,438 | 0.758 | C | 0.009 | No |
| D. Lincoln Avenue, between I-5 SB Ramps and Manchester Avenue | C | 6D | Major | 56,300 | 31,056 | 0.552 | A | 31,284 | 0.556 | A | 0.004 | No |
| E. Lincoln Avenue, between Manchester Ave and I-5 NB Ramps/Wilshire Ave | C | 6D | Major | 56,300 | 33,953 | 0.603 | B | 34,157 | 0.607 | B | 0.004 | No |

Notes:

- **BOLD V/C ratio** indicates unacceptable service level

# 9.0 EXISTING PLUS CUMULATIVE PLUS PROJECT ANALYSIS

The following summarizes the "Existing Plus Cumulative Plus Project" level of service results for the six (6) key study intersections and five (5) key roadway segments for Scenario No. 1 and Scenario No. 2.

## 9.1 Intersections – Proposed Project (Scenario No. 1)

***Table 9-1*** summarizes the peak hour level of service results at the six (6) key study intersections for existing plus cumulative plus project (Scenario No. 1) traffic conditions. The first column (1) of ICU/LOS values in *Table 9-1* presents a summary of existing AM and PM peak hour traffic conditions (which were also presented in *Table 3-4*). The second column (2) lists projected existing plus cumulative traffic conditions based on existing intersection geometry, but without any traffic generated from the proposed Project. The third column (3) presents existing plus cumulative plus project (Scenario No. 1) traffic conditions. The fourth column (4) shows the increase in ICU value due to the added peak hour project trips and indicates whether the traffic associated with the Project (Scenario No. 1) will have a significant impact based on the LOS standards and significant impact criteria defined in this report. The fifth column (5) indicates the anticipated level of service with planned and/or recommended improvements.

### 9.1.1 *Existing Plus Cumulative Traffic Conditions*

An analysis of future existing plus cumulative traffic conditions indicates that all six (6) key study intersections are forecast to continue to operate at acceptable LOS D or better during the AM and PM peak hours with the addition of cumulative project traffic to existing traffic.

### 9.1.2 *Existing Plus Cumulative Plus Project (Scenario No. 1) Traffic Conditions*

Review of Columns 3 and 4 of *Table 9-1* indicates that traffic associated with the proposed Project (Scenario No. 1) ***will not*** significantly impact any of the six (6) key study intersections when compared to the LOS standards and significant impact criteria specified in this report. All six (6) key study intersections are forecast to continue to operate at an acceptable LOS D or better during the AM and PM peak hours with the addition of project generated traffic to existing traffic and cumulative traffic.

*Appendix C* also presents the existing plus cumulative plus project (Scenario No. 1) ICU/LOS calculations for the six (6) key study intersections for the AM peak hour and PM peak hour.

## 9.2 Intersections – Proposed Project (Scenario No. 2)

***Table 9-2*** summarizes the peak hour level of service results at the six (6) key study intersections for existing plus cumulative plus project (Scenario No. 2) traffic conditions. The structure of this table is similar to the capacity analysis summary presented in *Table 9-1.*

### 9.2.1 *Existing Plus Cumulative Plus Project (Scenario No. 2) Traffic Conditions*

Review of Columns 3 and 4 of *Table 9-2* indicates that traffic associated with the proposed Project (Scenario No. 2) ***will not*** significantly impact any of the six (6) key study intersections when

compared to the LOS standards and significant impact criteria specified in this report. All six (6) key study intersections are forecast to continue to operate at an acceptable LOS D or better during the AM and PM peak hours with the addition of project generated traffic to existing traffic and cumulative traffic.

*Appendix C* also presents the existing plus cumulative plus project (Scenario No. 2) ICU/LOS calculations for the six (6) key study intersections for the AM peak hour and PM peak hour.

## 9.3 Roadway Segments – Proposed Project (Scenario No. 1)

***Table 9-3*** summarizes the roadway segment level of service results at the five (5) key roadway segments for existing plus cumulative plus project (Scenario No. 1) traffic conditions. The first column (1) shows the number of lanes, the second column (2) shows the arterial classification and the third column (3) shows the existing LOS "E" capacity. The fourth column (4) presents a summary of projected existing plus cumulative daily traffic conditions. The fifth column (5) lists existing plus cumulative plus project (Scenario No. 1) daily traffic conditions. Column 5 also shows the increase in V/C ratio value due to the added daily project trips and indicates whether the traffic associated with the Project will have a significant impact based on the LOS standards and significant impact criteria defined in this report.

### 9.3.1 *Existing Plus Cumulative Traffic Conditions*

An analysis of future existing plus cumulative traffic conditions indicates that two (2) of the five (5) key roadway segments are forecast to operate at an adverse level of service. The two (2) locations that are forecast to operate at an adverse LOS with the addition of cumulative project traffic to existing traffic are as follows:

| Key Roadway Segment | V/C | LOS |
|---|---|---|
| A. Euclid Street between Lincoln Avenue and I-5 Ramps | 0.914 | E |
| C. Lincoln Avenue between Loara Street and I-5 SB Ramps | 0.880 | D |

The remaining three (3) key roadway segments are forecast to continue to operate at acceptable levels of service on a daily basis with the addition of cumulative project traffic to existing traffic.

### 9.3.2 *Existing Plus Cumulative Plus Project (Scenario No. 1) Traffic Conditions*

Review of Column 5 of *Table 9-3* indicates that traffic associated with the proposed Project (Scenario No. 1) ***will not*** significantly impact any of the five (5) key roadway segments when compared to the LOS standards and significant impact criteria specified in this report. Although Roadway Segments A and C are forecast to operate at unacceptable LOS E and LOS D, respectively on a daily basis with the addition of project traffic, the proposed Project (Scenario No. 1) is expected to add less than the allowable threshold to the V/C ratio. The remaining three (3) key roadway segments are forecast to continue to operate at an acceptable LOS C or better on a daily basis with the addition of Project generated traffic to existing traffic and cumulative traffic.

## 9.4 Roadway Segments – Proposed Project (Scenario No. 2)

***Table 9-4*** summarizes the roadway segment level of service results at the five (5) key roadway segments for existing plus cumulative plus project (Scenario No. 2) traffic conditions. The structure of this table is similar to the daily capacity analysis summary presented in *Table 9-3.*

### 9.4.1 *Existing Plus Cumulative Plus Project (Scenario No. 2) Traffic Conditions*

Review of Column 5 of *Table 9-4* indicates that traffic associated with the proposed Project (Scenario No. 2) ***will not*** significantly impact any of the five (5) key roadway segments when compared to the LOS standards and significant impact criteria specified in this report. Although Roadway Segments A and C are forecast to operate at unacceptable LOS E and LOS D, respectively on a daily basis with the addition of project traffic, the proposed Project (Scenario No. 2) is expected to add less than the allowable threshold to the V/C ratio. The remaining three (3) key roadway segments are forecast to continue to operate at an acceptable LOS C or better on a daily basis with the addition of Project generated traffic to existing traffic and cumulative traffic.

## TABLE 9-1

## EXISTING PLUS CUMULATIVE PLUS PROJECT (SCENARIO NO. 1) PEAK HOUR INTERSECTION CAPACITY ANALYSIS SUMMARY

| Key Intersection | Time Period | (1) Existing Traffic Conditions | | (2) Existing Plus Cum. Projects Traffic Conditions | | (3) Existing Plus Cum. Projects Plus Project (Scenario No. 1) Traffic Conditions | | (4) Significant Impact | | (5) Existing Plus Cumulative Projects Plus Project (Scenario No. 1) Plus Improvements | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | ICU | LOS | ICU | LOS | ICU | LOS | ICU Increase | Yes/No | ICU | LOS |
| 1. I-5 Ramps at Euclid Street | AM | 0.697 | B | 0.710 | C | 0.711 | C | 0.001 | No | -- | -- |
| | PM | 0.780 | C | 0.813 | D | 0.817 | D | 0.004 | No | -- | -- |
| 2. Euclid Street at Lincoln Avenue | AM | 0.659 | B | 0.705 | C | 0.707 | C | 0.002 | No | -- | -- |
| | PM | 0.687 | B | 0.724 | C | 0.726 | C | 0.002 | No | -- | -- |
| 3. Loara Street at Lincoln Avenue | AM | 0.691 | B | 0.824 | D | 0.828 | D | 0.004 | No | -- | -- |
| | PM | 0.539 | A | 0.606 | B | 0.608 | B | 0.002 | No | -- | -- |
| 4. I-5 SB Ramps at Lincoln Avenue | AM | 0.611 | B | 0.648 | B | 0.651 | B | 0.003 | No | -- | -- |
| | PM | 0.543 | A | 0.606 | B | 0.612 | B | 0.006 | No | -- | -- |
| 5. Manchester Avenue at Lincoln Avenue | AM | 0.475 | A | 0.498 | A | 0.499 | A | 0.001 | No | -- | -- |
| | PM | 0.420 | A | 0.439 | A | 0.440 | A | 0.001 | No | -- | -- |
| 6. I-5 NB Ramps/Wilshire Avenue at Lincoln Avenue | AM | 0.663 | B | 0.701 | C | 0.701 | C | 0.000 | No | -- | -- |
| | PM | 0.627 | B | 0.659 | B | 0.663 | B | 0.004 | No | -- | -- |

Notes:

- **Bold LOS values** indicate adverse service levels based on City LOS standards
- ICU = Intersection Capacity Utilization

## TABLE 9-2

## EXISTING PLUS CUMULATIVE PLUS PROJECT (SCENARIO NO. 2) PEAK HOUR INTERSECTION CAPACITY ANALYSIS SUMMARY

| Key Intersection | Time Period | (1) Existing Traffic Conditions | | (2) Existing Plus Cum. Projects Traffic Conditions | | (3) Existing Plus Cum. Projects Plus Project (Scenario No. 2) Traffic Conditions | | (4) Significant Impact | | (5) Existing Plus Cumulative Projects Plus Project (Scenario No. 2) Plus Improvements | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | ICU | LOS | ICU | LOS | ICU | LOS | ICU Increase | Yes/No | ICU | LOS |
| 1. I-5 Ramps at Euclid Street | AM | 0.697 | B | 0.710 | C | 0.711 | C | 0.001 | No | -- | -- |
| | PM | 0.780 | C | 0.813 | D | 0.817 | D | 0.004 | No | -- | -- |
| 2. Euclid Street at Lincoln Avenue | AM | 0.659 | B | 0.705 | C | 0.708 | C | 0.003 | No | -- | -- |
| | PM | 0.687 | B | 0.724 | C | 0.726 | C | 0.002 | No | -- | -- |
| 3. Loara Street at Lincoln Avenue | AM | 0.691 | B | 0.824 | D | 0.829 | D | 0.005 | No | -- | -- |
| | PM | 0.539 | A | 0.606 | B | 0.608 | B | 0.002 | No | -- | -- |
| 4. I-5 SB Ramps at Lincoln Avenue | AM | 0.611 | B | 0.648 | B | 0.651 | B | 0.003 | No | -- | -- |
| | PM | 0.543 | A | 0.606 | B | 0.613 | B | 0.007 | No | -- | -- |
| 5. Manchester Avenue at Lincoln Avenue | AM | 0.475 | A | 0.498 | A | 0.499 | A | 0.001 | No | -- | -- |
| | PM | 0.420 | A | 0.439 | A | 0.440 | A | 0.001 | No | -- | -- |
| 6. I-5 NB Ramps/Wilshire Avenue at Lincoln Avenue | AM | 0.663 | B | 0.701 | C | 0.701 | C | 0.000 | No | -- | -- |
| | PM | 0.627 | B | 0.659 | B | 0.663 | B | 0.004 | No | -- | -- |

Notes:

- **Bold LOS values** indicate adverse service levels based on City LOS standards
- ICU = Intersection Capacity Utilization

## TABLE 9-3

## EXISTING PLUS CUMULATIVE PLUS PROJECT (SCENARIO 1) ROADWAY SEGMENT LEVEL OF SERVICE SUMMARY

| Key Roadway Segment | Min. Acc. LOS | (1) No. of Existing Lanes | (2) Arterial Classification | (3) Existing Capacity at LOS "E" | (4) Existing Plus Cumulative Traffic Conditions | | | (5) Existing Plus Cumulative Plus Project (Scenario No. 1) Traffic Conditions | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Daily Volume | V/C Ratio | LOS | Daily Volume | V/C Ratio | LOS | Inc. | Significant (Yes/No) |
| A. Euclid Street, between Lincoln Avenue and I-5 Ramps | C | 6D | Major | 56,300 | **51,461** | **0.914** | **E** | **51,711** | **0.918** | **E** | 0.004 | No |
| B. Lincoln Avenue, between Euclid Street and Loara Street | C | 4D | Primary | 37,500 | 28,873 | 0.770 | C | 29,586 | 0.789 | C | 0.019 | No |
| C. Lincoln Avenue, between Loara Street and I-5 SB Ramps | C | 4D | Primary | 37,500 | **32,986** | **0.880** | **D** | **33,293** | **0.888** | **D** | 0.008 | No |
| D. Lincoln Avenue, between I-5 SB Ramps and Manchester Avenue | C | 6D | Major | 56,300 | 34,183 | 0.607 | B | 34,383 | 0.611 | B | 0.004 | No |
| E. Lincoln Avenue, between Manchester Ave and I-5 NB Ramps/Wilshire Ave | C | 6D | Major | 56,300 | 36,990 | 0.657 | B | 37,168 | 0.660 | B | 0.003 | No |

Notes:

- **BOLD V/C ratio** indicates unacceptable service level

## TABLE 9-4

## EXISTING PLUS CUMULATIVE PLUS PROJECT (SCENARIO 2) ROADWAY SEGMENT LEVEL OF SERVICE SUMMARY

| Key Roadway Segment | Min. Acc. LOS | (1) No. of Existing Lanes | (2) Arterial Classification | (3) Existing Capacity at LOS "E" | (4) Existing Plus Cumulative Traffic Conditions | | | (5) Existing Plus Cumulative Plus Project (Scenario No. 2) Traffic Conditions | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Daily Volume | V/C Ratio | LOS | Daily Volume | V/C Ratio | LOS | Inc. | Significant (Yes/No) |
| A. Euclid Street, between Lincoln Avenue and I-5 Ramps | C | 6D | Major | 56,300 | **51,461** | **0.914** | **E** | **51,746** | **0.919** | **E** | 0.005 | No |
| B. Lincoln Avenue, between Euclid Street and Loara Street | C | 4D | Primary | 37,500 | 28,873 | 0.770 | C | 29,688 | 0.792 | C | 0.022 | No |
| C. Lincoln Avenue, between Loara Street and I-5 SB Ramps | C | 4D | Primary | 37,500 | **32,986** | **0.880** | **D** | **33,336** | **0.889** | **D** | 0.009 | No |
| D. Lincoln Avenue, between I-5 SB Ramps and Manchester Avenue | C | 6D | Major | 56,300 | 34,183 | 0.607 | B | 34,411 | 0.611 | B | 0.004 | No |
| E. Lincoln Avenue, between Manchester Ave and I-5 NB Ramps/Wilshire Ave | C | 6D | Major | 56,300 | 36,990 | 0.657 | B | 37,194 | 0.661 | B | 0.004 | No |

Notes:

- **BOLD V/C ratio** indicates unacceptable service level

# 10.0 YEAR 2023 PLUS PROJECT ANALYSIS

The following summarizes the "Year 2023 Cumulative Plus Project" level of service results for the six (6) key study intersections and five (5) key roadway segments for Scenario No. 1 and Scenario No. 2.

## 10.1 Intersections – Proposed Project (Scenario No. 1)

***Table 10-1*** summarizes the peak hour level of service results at the six (6) key study intersections for Year 2023 traffic conditions (Scenario No. 1). The first column (1) of ICU/LOS values in *Table 10-1* presents a summary of existing AM and PM peak hour traffic conditions (which were also presented in *Table 3-4*). The second column (2) lists projected cumulative traffic conditions (existing plus ambient traffic plus cumulative project traffic) based on existing intersection geometry, but without any traffic generated from the proposed Project. The third column (3) presents forecast Year 2023 traffic conditions with the addition of Project (Scenario No. 1) traffic. The fourth column (4) shows the increase in ICU value due to the added peak hour project trips and indicates whether the traffic associated with the Project (Scenario No. 1) will have a significant impact based on the LOS standards and significant impact criteria defined in this report. The fifth column (5) indicates the anticipated level of service with planned and/or recommended improvements.

### 10.1.1 *Year 2023 Cumulative Traffic Conditions*

An analysis of future (Year 2023) cumulative traffic conditions indicates that all six (6) key study intersections are forecast to continue to operate at acceptable LOS D or better during the AM and PM peak hours with the addition of ambient traffic growth and cumulative project traffic to existing traffic.

### 10.1.2 *Year 2023 Cumulative Plus Project (Scenario No. 1) Traffic Conditions*

Review of Columns 3 and 4 of *Table 10-1* indicates that traffic associated with the proposed Project (Scenario No. 1) ***will not*** significantly impact any of the six (6) key study intersections when compared to the LOS standards and significant impact criteria specified in this report. All six (6) key study intersections are forecast to continue to operate at an acceptable LOS D or better during the AM and PM peak hours with the addition of project generated traffic in the Year 2023.

*Appendix C* also presents the Year 2023 cumulative plus project (Scenario No. 1) ICU/LOS calculations for the six (6) key study intersections for the AM peak hour and PM peak hour.

## 10.2 Intersections – Proposed Project (Scenario No. 2)

***Table 10-2*** summarizes the peak hour level of service results at the six (6) key study intersections for Year 2023 traffic conditions (Scenario No. 2). The structure of this table is similar to the capacity analysis summary presented in *Table 10-1.*

### 10.2.1 *Year 2023 Cumulative Plus Project (Scenario No. 2) Traffic Conditions*

Review of Columns 3 and 4 of *Table 10-2* indicates that traffic associated with the proposed Project (Scenario No. 2) ***will not*** significantly impact any of the six (6) key study intersections when compared to the LOS standards and significant impact criteria specified in this report. All six (6) key study intersections are forecast to continue to operate at an acceptable LOS D or better during the AM and PM peak hours with the addition of project generated traffic in the Year 2023.

*Appendix C* also presents the Year 2023 cumulative plus project (Scenario No. 2) ICU/LOS calculations for the six (6) key study intersections for the AM peak hour and PM peak hour.

## 10.3 Roadway Segments – Proposed Project (Scenario No. 1)

***Table 10-3*** summarizes the roadway segment level of service results at the five (5) key roadway segments for Year 2023 traffic conditions (Scenario No. 1). The first column (1) shows the number of lanes, the second column (2) shows the arterial classification and the third column (3) shows the existing LOS "E" capacity. The fourth column (4) presents a summary of projected Year 2023 cumulative daily traffic conditions. The fifth column (5) lists Year 2023 plus project (Scenario No. 1) daily traffic conditions. Column 5 also shows the increase in V/C ratio value due to the added daily project trips and indicates whether the traffic associated with the Project will have a significant impact based on the LOS standards and significant impact criteria defined in this report.

### 10.3.1 *Year 2023 Cumulative Traffic Conditions*

An analysis of future (Year 2023) cumulative traffic conditions indicates that two (2) of the five (5) key roadway segments are forecast to operate at an adverse level of service. The two (2) locations that are forecast to operate at an adverse LOS in the Year 2023 are as follows:

| Key Roadway Segment | V/C | LOS |
|---|---|---|
| A. Euclid Street between Lincoln Avenue and I-5 Ramps | 0.949 | E |
| C. Lincoln Avenue between Loara Street and I-5 SB Ramps | 0.910 | E |

The remaining three (3) key roadway segments are forecast to continue to operate at acceptable levels of service on a daily basis under Year 2023 cumulative traffic conditions (i.e. existing plus ambient traffic plus cumulative project traffic).

### 10.3.2 *Year 2023 Cumulative Plus Project (Scenario No. 1) Traffic Conditions*

Review of Column 5 of *Table 10-3* indicates that traffic associated with the proposed Project (Scenario No. 1) ***will not*** significantly impact any of the five (5) key roadway segments when compared to the LOS standards and significant impact criteria specified in this report. Although Roadway Segments A and C are forecast to operate at unacceptable LOS E on a daily basis with the addition of project traffic, the proposed Project (Scenario No. 1) is expected to add less than the allowable threshold to the V/C ratio. In addition, since Roadway Segment B is forecast to operate at unacceptable LOS D and the project adds more than 0.010 to the V/C ratio, this roadway segment requires a peak hour link assessment to determine whether or not it will be impacted by the proposed Project (Scenario No. 1). As shown in *Table 10-3*, Roadway Segment B ***will not*** be significantly

impacted by the proposed Project (Scenario No. 1) as this location is forecast to operate in the Year 2023 at an acceptable LOS without and with the proposed Project (Scenario No. 1) during the weekday AM and PM peak commute hours. The remaining two (2) key roadway segments are forecast to continue to operate at an acceptable LOS B or better on a daily basis with the addition of Project generated traffic in the Year 2023 traffic condition.

## 10.4 Roadway Segments – Proposed Project (Scenario No. 2)

***Table 10-4*** summarizes the roadway segment level of service results at the five (5) key roadway segments for Year 2023 traffic conditions (Scenario No. 2). The structure of this table is similar to the daily capacity analysis summary presented in *Table 10-3.*

### 10.4.1 *Year 2023 Cumulative Plus Project (Scenario No. 2) Traffic Conditions*

Review of Column 5 of *Table 10-4* indicates that traffic associated with the proposed Project (Scenario No. 2) ***will not*** significantly impact any of the five (5) key roadway segments when compared to the LOS standards and significant impact criteria specified in this report. Although Roadway Segments A and C are forecast to operate at unacceptable LOS E on a daily basis with the addition of project traffic, the proposed Project (Scenario No. 2) is expected to add less than the allowable threshold to the V/C ratio. In addition, since Roadway Segment B is forecast to operate at unacceptable LOS D and the project adds more than 0.010 to the V/C ratio, this roadway segment requires a peak hour link assessment to determine whether or not it will be impacted by the proposed Project (Scenario No. 2). As shown in *Table 10-4*, Roadway Segment B ***will not*** be significantly impacted by the proposed Project (Scenario No. 2) as this location is forecast to operate in the Year 2023 at an acceptable LOS without and with the proposed Project (Scenario No. 2) during the weekday AM and PM peak commute hours. The remaining two (2) key roadway segments are forecast to continue to operate at an acceptable LOS B or better on a daily basis with the addition of Project generated traffic in the Year 2023 traffic condition.

## TABLE 10-1

## YEAR 2023 CUMULATIVE PLUS PROJECT (SCENARIO NO. 1) PEAK HOUR INTERSECTION CAPACITY ANALYSIS SUMMARY

| Key Intersection | Time Period | (1) Existing Traffic Conditions | | (2) Year 2023 Cumulative Traffic Conditions | | (3) Year 2023 Cumulative Plus Project (Scenario No. 1) Traffic Conditions | | (4) Significant Impact | | (5) Year 2023 Cumulative Plus Project (Scenario No. 1) Plus Improvements | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | ICU | LOS | ICU | LOS | ICU | LOS | ICU Increase | Yes/No | ICU | LOS |
| 1. I-5 Ramps at Euclid Street | AM | 0.697 | B | 0.735 | C | 0.736 | C | 0.001 | No | -- | -- |
| | PM | 0.780 | C | 0.842 | D | 0.846 | D | 0.004 | No | -- | -- |
| 2. Euclid Street at Lincoln Avenue | AM | 0.659 | B | 0.729 | C | 0.731 | C | 0.002 | No | -- | -- |
| | PM | 0.687 | B | 0.750 | C | 0.751 | C | 0.001 | No | -- | -- |
| 3. Loara Street at Lincoln Avenue | AM | 0.691 | B | 0.849 | D | 0.853 | D | 0.004 | No | -- | -- |
| | PM | 0.539 | A | 0.625 | B | 0.627 | B | 0.002 | No | -- | -- |
| 4. I-5 SB Ramps at Lincoln Avenue | AM | 0.611 | B | 0.670 | B | 0.674 | B | 0.004 | No | -- | -- |
| | PM | 0.543 | A | 0.625 | B | 0.631 | B | 0.006 | No | -- | -- |
| 5. Manchester Avenue at Lincoln Avenue | AM | 0.475 | A | 0.515 | A | 0.516 | A | 0.001 | No | -- | -- |
| | PM | 0.420 | A | 0.454 | A | 0.455 | A | 0.001 | No | -- | -- |
| 6. I-5 NB Ramps/Wilshire Avenue at Lincoln Avenue | AM | 0.663 | B | 0.725 | C | 0.725 | C | 0.000 | No | -- | -- |
| | PM | 0.627 | B | 0.682 | B | 0.686 | B | 0.004 | No | -- | -- |

Notes:

- **Bold LOS values** indicate adverse service levels based on City LOS standards
- ICU = Intersection Capacity Utilization

## TABLE 10-2

## YEAR 2023 CUMULATIVE PLUS PROJECT (SCENARIO NO. 2) PEAK HOUR INTERSECTION CAPACITY ANALYSIS SUMMARY

| Key Intersection | Time Period | (1) Existing Traffic Conditions | | (2) Year 2023 Cumulative Traffic Conditions | | (3) Year 2023 Cumulative Plus Project (Scenario No. 2) Traffic Conditions | | (4) Significant Impact | | (5) Year 2023 Cumulative Plus Project (Scenario No. 2) Plus Improvements | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | ICU | LOS | ICU | LOS | ICU | LOS | ICU Increase | Yes/No | ICU | LOS |
| 1. I-5 Ramps at Euclid Street | AM | 0.697 | B | 0.735 | C | 0.736 | C | 0.001 | No | -- | -- |
| | PM | 0.780 | C | 0.842 | D | 0.846 | D | 0.004 | No | -- | -- |
| 2. Euclid Street at Lincoln Avenue | AM | 0.659 | B | 0.729 | C | 0.732 | C | 0.003 | No | -- | -- |
| | PM | 0.687 | B | 0.750 | C | 0.752 | C | 0.002 | No | -- | -- |
| 3. Loara Street at Lincoln Avenue | AM | 0.691 | B | 0.849 | D | 0.854 | D | 0.005 | No | -- | -- |
| | PM | 0.539 | A | 0.625 | B | 0.627 | B | 0.002 | No | -- | -- |
| 4. I-5 SB Ramps at Lincoln Avenue | AM | 0.611 | B | 0.670 | B | 0.674 | B | 0.004 | No | -- | -- |
| | PM | 0.543 | A | 0.625 | B | 0.632 | B | 0.007 | No | -- | -- |
| 5. Manchester Avenue at Lincoln Avenue | AM | 0.475 | A | 0.515 | A | 0.516 | A | 0.001 | No | -- | -- |
| | PM | 0.420 | A | 0.454 | A | 0.455 | A | 0.001 | No | -- | -- |
| 6. I-5 NB Ramps/Wilshire Avenue at Lincoln Avenue | AM | 0.663 | B | 0.725 | C | 0.725 | C | 0.000 | No | -- | -- |
| | PM | 0.627 | B | 0.682 | B | 0.687 | B | 0.005 | No | -- | -- |

Notes:

- **Bold LOS values** indicate adverse service levels based on City LOS standards
- ICU = Intersection Capacity Utilization

## TABLE 10-3

## YEAR 2023 CUMULATIVE PLUS PROJECT (SCENARIO NO. 1) ROADWAY SEGMENT LEVEL OF SERVICE SUMMARY

| Key Roadway Segment | Min. Acc. LOS | (1) No. of Existing Lanes | (2) Arterial Classification | (3) Existing Capacity at LOS "E" | (4) Year 2023 Cumulative Traffic Conditions | | | (5) Year 2023 Cumulative Plus Project (Scenario No. 1) Traffic Conditions | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Daily Volume | V/C Ratio | LOS | Daily Volume | V/C Ratio | LOS | Increase | Significant (Yes/No) |
| A. Euclid Street, between Lincoln Avenue and I-5 Ramps | C | 6D | Major | 56,300 | **53,409** | **0.949** | **E** | **53,659** | **0.953** | **E** | 0.004 | No |
| B Lincoln Avenue, between Euclid Street and Loara Street | C | 4D | Primary | 37,500 | 29,877 | 0.797 | C | **30,590** | **0.816** | **D** | **0.019** | |
| ➢ *Peak Hour Assessment* | | *AM* | *EB* | *3,200*[13] | *1,581* | *0.494* | *A* | *1,597* | *0.499* | *A* | *0.005* | *No* |
| | | | *WB* | *3,200* | *876* | *0.274* | *A* | *897* | *0.280* | *A* | *0.006* | *No* |
| | | *PM* | *EB* | *3,200* | *1,015* | *0.317* | *A* | *1,023* | *0.320* | *A* | *0.003* | *No* |
| | | | *WB* | *3,200* | *1,076* | *0.336* | *A* | *1,086* | *0.339* | *A* | *0.003* | *No* |
| C. Lincoln Avenue, between Loara Street and I-5 SB Ramps | C | 4D | Primary | 37,500 | **34,110** | **0.910** | **E** | **34,417** | **0.918** | **E** | 0.008 | No |
| D. Lincoln Avenue, between I-5 SB Ramps and Manchester Avenue | C | 6D | Major | 56,300 | 35,425 | 0.629 | B | 35,625 | 0.633 | B | 0.004 | No |
| E. Lincoln Avenue, between Manchester Ave and I-5 NB Ramps/Wilshire Ave | C | 6D | Major | 56,300 | 38,348 | 0.681 | B | 38,526 | 0.684 | B | 0.003 | No |

Notes:

- **BOLD V/C ratio** indicates unacceptable service level

[13] The directional (per lane) segment capacity is assumed to be 1,600 vehicles per hour per lane (VPHPL). Thus, the total directional segment capacity is calculated to be 3,200 vehicles per hour (i.e. 1,600 VPHPL x 2 lanes) for each direction along Lincoln Avenue.

## TABLE 10-4

## YEAR 2023 CUMULATIVE PLUS PROJECT (SCENARIO NO. 2) ROADWAY SEGMENT LEVEL OF SERVICE SUMMARY

| Key Roadway Segment | Min. Acc. LOS | (1) No. of Existing Lanes | (2) Arterial Classification | (3) Existing Capacity at LOS "E" | (4) Year 2023 Cumulative Traffic Conditions | | | (5) Year 2023 Cumulative Plus Project (Scenario No. 2) Traffic Conditions | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Daily Volume | V/C Ratio | LOS | Daily Volume | V/C Ratio | LOS | Increase | Significant (Yes/No) |
| A. Euclid Street, between Lincoln Avenue and I-5 Ramps | C | 6D | Major | 56,300 | **53,409** | **0.949** | **E** | **53,694** | **0.954** | **E** | 0.005 | No |
| B Lincoln Avenue, between Euclid Street and Loara Street | C | 4D | Primary | 37,500 | 29,877 | 0.797 | C | **30,692** | **0.818** | **D** | **0.021** | |
| ➢ *Peak Hour Assessment* | | *AM* | *EB* | *3,200*[14] | *1,581* | *0.494* | *A* | *1,600* | *0.500* | *A* | *0.006* | *No* |
| | | | *WB* | *3,200* | *876* | *0.274* | *A* | *898* | *0.281* | *A* | *0.007* | *No* |
| | | *PM* | *EB* | *3,200* | *1,015* | *0.317* | *A* | *1,024* | *0.320* | *A* | *0.003* | *No* |
| | | | *WB* | *3,200* | *1,076* | *0.336* | *A* | *1,087* | *0.340* | *A* | *0.004* | *No* |
| C. Lincoln Avenue, between Loara Street and I-5 SB Ramps | C | 4D | Primary | 37,500 | **34,110** | **0.910** | **E** | **34,460** | **0.919** | **E** | 0.009 | No |
| D. Lincoln Avenue, between I-5 SB Ramps and Manchester Avenue | C | 6D | Major | 56,300 | 35,425 | 0.629 | B | 35,653 | 0.633 | B | 0.004 | No |
| E. Lincoln Avenue, between Manchester Ave and I-5 NB Ramps/Wilshire Ave | C | 6D | Major | 56,300 | 38,348 | 0.681 | B | 38,552 | 0.685 | B | 0.004 | No |

Notes:

- **BOLD V/C ratio** indicates unacceptable service level

[14] The directional (per lane) segment capacity is assumed to be 1,600 vehicles per hour per lane (VPHPL). Thus, the total directional segment capacity is calculated to be 3,200 vehicles per hour (i.e. 1,600 VPHPL x 2 lanes) for each direction along Lincoln Avenue.

# 11.0 GENERAL PLAN BUILDOUT (YEAR 2035) PLUS PROJECT ANALYSIS

The following summarizes the "General Plan Buildout (Year 2035) Plus Project" level of service results for the six (6) key study intersections and five (5) key roadway segments. The analysis is for the proposed Project (Scenario No. 2) and consists of the following two traffic analysis scenarios as required by City of Anaheim Traffic Engineering Department staff.

- General Plan Buildout without and with the Project (Scenario No. 2).
- General Plan Buildout without (includes the 1600 W. Lincoln Avenue Cumulative Project) and with the Project (Scenario No. 2).

It should be noted that planned improvements identified by City of Anaheim Traffic Engineering Department staff have been assumed under General Plan Buildout (Year 2035) traffic conditions at key study intersections #2, #3, #4 and #6. The planned improvements are discussed in Section 14.2 and are illustrated in ***Figure 14-1***.

## 11.1 Intersections – General Plan Buildout

***Table 11-1*** summarizes the peak hour level of service results at the six (6) key study intersections for General Plan Buildout (Year 2035) traffic conditions. The first column (1) of ICU/LOS values in *Table 11-1* presents a summary of existing AM and PM peak hour traffic conditions (which were also presented in *Table 3-4*). The second column (2) lists General Plan Buildout traffic conditions. The third column (3) presents General Plan Buildout traffic conditions with the addition of Project (Scenario No. 2) traffic. The fourth column (4) shows the increase in ICU value due to the added peak hour project trips and indicates whether the traffic associated with the Project (Scenario No. 2) will have a significant impact based on the LOS standards and significant impact criteria defined in this report. The fifth column (5) indicates the anticipated level of service with planned and/or recommended improvements.

### 11.1.1 *General Plan Buildout (Year 2035) Traffic Conditions*

Review of column (2) of *Table 11-1* shows that projected General Plan Buildout (Year 2035) without project traffic will adversely impact two (2) of the six (6) key study intersections. The remaining four (4) key study intersections are forecast to operate at an acceptable LOS under General Plan Buildout (Year 2035) traffic conditions. The locations projected to operate at an adverse LOS are as follows:

| | AM Peak Hour | | PM Peak Hour | |
|---|---|---|---|---|
| Key Intersection | ICU | LOS | ICU | LOS |
| 2. Euclid Street at Lincoln Avenue | 0.913 | E | -- | -- |
| 3. Loara Street at Lincoln Avenue | 0.914 | E | -- | -- |

### 11.1.2 *General Plan Buildout (Year 2035) Plus Project (Scenario No. 2) Traffic Conditions*

Review of columns (3) and (4) of *Table 11-1* indicates that traffic associated with the proposed Project (Scenario No. 2) ***will not*** significantly impact any of the six (6) key study intersections, when

compared to the LOS standards and significant impact criteria specified in this report. Although the intersection of Loara Street/Lincoln Avenue is forecast to operate at unacceptable LOS E during the AM peak hour with the addition of project traffic, the Project (Scenario No. 2) is expected to add less than the allowable threshold to the ICU value. The remaining five (5) key study intersections are forecast to continue to operate at an acceptable LOS with the addition of project generated traffic to General Plan Buildout (Year 2035) traffic conditions.

*Appendix C* also presents the General Plan Buildout (Year 2035) ICU/LOS calculations for the six (6) key study intersections.

## 11.2 Intersections – General Plan Buildout Plus Cumulative Plus Project

***Table 11-2*** summarizes the peak hour level of service results at the six (6) key study intersections for General Plan Buildout (Year 2035) plus Cumulative plus Project traffic conditions. The first column (1) of ICU/LOS values in *Table 11-2* presents a summary of existing AM and PM peak hour traffic conditions (which were also presented in *Table 3-4*). The second column (2) lists General Plan Buildout traffic conditions and includes traffic associated with the 1600 W. Lincoln Avenue Cumulative Project. The third column (3) presents General Plan Buildout traffic conditions with the addition of Project (Scenario No. 2) traffic. The fourth column (4) shows the increase in ICU value due to the added peak hour project trips and indicates whether the traffic associated with the Project (Scenario No. 2) will have a significant impact based on the LOS standards and significant impact criteria defined in this report. The fifth column (5) indicates the anticipated level of service with planned and/or recommended improvements.

### 11.2.1 *General Plan Buildout (Year 2035) Plus Cumulative Traffic Conditions*

Review of column (2) of *Table 11-2* shows that projected General Plan Buildout (Year 2035) plus Cumulative traffic will adversely impact two (2) of the six (6) key study intersections. The remaining four (4) key study intersections are forecast to operate at an acceptable LOS under General Plan Buildout (Year 2035) plus Cumulative traffic conditions. The locations projected to operate at an adverse LOS are as follows:

| | AM Peak Hour | | PM Peak Hour | |
|---|---|---|---|---|
| Key Intersection | ICU | LOS | ICU | LOS |
| 2. Euclid Street at Lincoln Avenue | 0.907 | E | -- | -- |
| 3. Loara Street at Lincoln Avenue | 0.914 | E | -- | -- |

### 11.2.2 *General Plan Buildout (Year 2035) Plus Cum. Plus Project (Scenario No. 2) Traffic Conditions*

Review of columns (3) and (4) of *Table 11-2* indicates that traffic associated with the proposed Project (Scenario No. 2) ***will not*** significantly impact any of the six (6) key study intersections, when compared to the LOS standards and significant impact criteria specified in this report. Although the intersection of Loara Street/Lincoln Avenue is forecast to operate at unacceptable LOS E during the AM peak hour with the addition of project traffic, the Project (Scenario No. 2) is expected to add less than the allowable threshold to the ICU value. The remaining five (5) key study intersections

are forecast to continue to operate at an acceptable LOS with the addition of project generated traffic to General Plan Buildout (Year 2035) plus Cumulative traffic conditions.

*Appendix C* also presents the General Plan Buildout plus Cumulative plus Project (Year 2035) ICU/LOS calculations for the six (6) key study intersections.

## 11.3 Roadway Segments – General Plan Buildout

***Table 11-3*** summarizes the roadway segment level of service results at the five (5) key roadway segments for General Plan Buildout (Year 2035) traffic conditions. The first column (1) shows the number of lanes, the second column (2) shows the arterial classification and the third column (3) shows the existing LOS "E" capacity. The fourth column (4) presents a summary of General Plan Buildout daily traffic conditions. The fifth column (5) lists General Plan Buildout daily traffic conditions with the addition of Project (Scenario No. 2) traffic. Column 5 also shows the increase in V/C ratio value due to the added daily project trips and indicates whether the traffic associated with the Project will have a significant impact based on the LOS standards and significant impact criteria defined in this report.

### 11.3.1 *General Plan Buildout (Year 2035) Traffic Conditions*

An analysis of projected General Plan Buildout (Year 2035) without project traffic conditions indicates that all five (5) key roadway segments are forecast to operate at an adverse level of service. The locations projected to operate at an adverse LOS are as follows:

| Key Roadway Segment | V/C | LOS |
|---|---|---|
| A. Euclid Street between Lincoln Avenue and I-5 Ramps | 0.947 | E |
| B. Lincoln Avenue between Euclid Street and Loara Street | 0.847 | D |
| C. Lincoln Avenue between Loara Street and I-5 SB Ramps | 0.888 | D |
| D. Lincoln Avenue between I-5 SB Ramps and Manchester Avenue | 0.942 | E |
| E. Lincoln Ave between Manchester Ave and I-5 NB Ramps/Wilshire Ave | 0.847 | D |

### 11.3.2 *General Plan Buildout (Year 2035) Plus Project (Scenario No. 2) Traffic Conditions*

Review of Column 5 of *Table 11-3* indicates that traffic associated with the proposed Project (Scenario No. 2) ***will not*** significantly impact any of the five (5) key roadway segments when compared to the LOS standards and significant impact criteria specified in this report. Although Roadway Segments A, B, C, D and E are forecast to operate at unacceptable LOS D and/or LOS E on a daily basis with the addition of project traffic, the proposed Project (Scenario No. 2) is expected to add less than the allowable threshold to the V/C ratio.

## 11.4 Roadway Segments – General Plan Buildout Plus Cumulative Plus Project

***Table 11-4*** summarizes the roadway segment level of service results at the five (5) key roadway segments for General Plan Buildout (Year 2035) plus Cumulative plus Project traffic conditions. The first column (1) shows the number of lanes, the second column (2) shows the arterial classification and the third column (3) shows the existing LOS "E" capacity. The fourth column (4)

presents a summary of General Plan Buildout daily traffic conditions and includes traffic associated with the 1600 W. Lincoln Avenue Cumulative Project. The fifth column (5) lists General Plan Buildout daily traffic conditions with the addition of Project (Scenario No. 2) traffic. Column 5 also shows the increase in V/C ratio value due to the added daily project trips and indicates whether the traffic associated with the Project will have a significant impact based on the LOS standards and significant impact criteria defined in this report.

### 11.4.1 *General Plan Buildout (Year 2035) Plus Cumulative Traffic Conditions*

An analysis of projected General Plan Buildout (Year 2035) plus Cumulative traffic conditions indicates that all five (5) key roadway segments are forecast to operate at an adverse level of service. The locations projected to operate at an adverse LOS are as follows:

| Key Roadway Segment | V/C | LOS |
|---|---|---|
| A. Euclid Street between Lincoln Avenue and I-5 Ramps | 0.947 | E |
| B. Lincoln Avenue between Euclid Street and Loara Street | 0.848 | D |
| C. Lincoln Avenue between Loara Street and I-5 SB Ramps | 0.888 | D |
| D. Lincoln Avenue between I-5 SB Ramps and Manchester Avenue | 0.944 | E |
| E. Lincoln Ave between Manchester Ave and I-5 NB Ramps/Wilshire Ave | 0.851 | D |

### 11.4.2 *General Plan Buildout (Year 2035) Plus Cum. Plus Project (Scenario No. 2) Traffic Conditions*

Review of Column 5 of *Table 11-4* indicates that traffic associated with the proposed Project (Scenario No. 2) ***will not*** significantly impact any of the five (5) key roadway segments when compared to the LOS standards and significant impact criteria specified in this report. Although Roadway Segments A, B, C, D and E are forecast to operate at unacceptable LOS D and/or LOS E on a daily basis with the addition of project traffic, the proposed Project (Scenario No. 2) is expected to add less than the allowable threshold to the V/C ratio.

## TABLE 11-1

## GENERAL PLAN BUILDOUT PLUS PROJECT (SCENARIO NO. 2) PEAK HOUR INTERSECTION CAPACITY ANALYSIS SUMMARY

| Key Intersection | Time Period | (1) Existing Traffic Conditions | | (2) General Plan Buildout Traffic Conditions | | (3) General Plan Buildout Plus Project (Scenario No. 2) Traffic Conditions | | (4) Significant Impact | | (5) General Plan Buildout Plus Project (Scenario No. 2) Plus Improvements | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | ICU | LOS | ICU | LOS | ICU | LOS | ICU Increase | Yes/No | ICU | LOS |
| 1. I-5 Ramps at Euclid Street | AM | 0.697 | B | 0.894 | D | 0.895 | D | 0.001 | No | -- | -- |
| | PM | 0.780 | C | 0.888 | D | 0.888 | D | 0.000 | No | -- | -- |
| 2. Euclid Street at Lincoln Avenue | AM | 0.659 | B | **0.913** | **E** | 0.856 | D | -0.057 | No | -- | -- |
| | PM | 0.687 | B | 0.895 | D | 0.886 | D | -0.009 | No | -- | -- |
| 3. Loara Street at Lincoln Avenue | AM | 0.691 | B | **0.914** | **E** | **0.914** | **E** | 0.000 | No | -- | -- |
| | PM | 0.539 | A | 0.715 | C | 0.715 | C | 0.000 | No | -- | -- |
| 4. I-5 SB Ramps at Lincoln Avenue | AM | 0.611 | B | 0.721 | C | 0.695 | B | -0.026 | No | -- | -- |
| | PM | 0.543 | A | 0.849 | D | 0.848 | D | -0.001 | No | -- | -- |
| 5. Manchester Avenue at Lincoln Avenue | AM | 0.475 | A | 0.700 | B | 0.613 | B | -0.087 | No | -- | -- |
| | PM | 0.420 | A | 0.667 | B | 0.668 | B | 0.001 | No | -- | -- |
| 6. I-5 NB Ramps/Wilshire Avenue at Lincoln Avenue | AM | 0.663 | B | 0.746 | C | 0.751 | C | 0.005 | No | -- | -- |
| | PM | 0.627 | B | 0.764 | C | 0.764 | C | 0.000 | No | -- | -- |

Notes:

- **Bold LOS values** indicate adverse service levels based on City LOS standards
- ICU = Intersection Capacity Utilization

## TABLE 11-2

## GENERAL PLAN BUILDOUT PLUS PROJECT (SCENARIO NO. 2) WITH CUMULATIVE PROJECT PEAK HOUR INTERSECTION CAPACITY ANALYSIS SUMMARY

| Key Intersection | Time Period | (1) Existing Traffic Conditions | | (2) General Plan Buildout Plus Cumulative Traffic Conditions[15] | | (3) General Plan Buildout Plus Project (Scenario No. 2) Traffic Conditions | | (4) Significant Impact | | (5) General Plan Buildout Plus Project (Scenario No. 2) Plus Improvements | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | ICU | LOS | ICU | LOS | ICU | LOS | ICU Increase | Yes/No | ICU | LOS |
| 1. I-5 Ramps at Euclid Street | AM | 0.697 | B | 0.894 | D | 0.895 | D | 0.001 | No | -- | -- |
| | PM | 0.780 | C | 0.888 | D | 0.888 | D | 0.000 | No | -- | -- |
| 2. Euclid Street at Lincoln Avenue | AM | 0.659 | B | **0.907** | **E** | 0.856 | D | -0.051 | No | -- | -- |
| | PM | 0.687 | B | 0.897 | D | 0.886 | D | -0.011 | No | -- | -- |
| 3. Loara Street at Lincoln Avenue | AM | 0.691 | B | **0.914** | **E** | **0.914** | **E** | 0.000 | No | -- | -- |
| | PM | 0.539 | A | 0.715 | C | 0.715 | C | 0.000 | No | -- | -- |
| 4. I-5 SB Ramps at Lincoln Avenue | AM | 0.611 | B | 0.715 | C | 0.695 | B | -0.020 | No | -- | -- |
| | PM | 0.543 | A | 0.852 | D | 0.848 | D | -0.004 | No | -- | -- |
| 5. Manchester Avenue at Lincoln Avenue | AM | 0.475 | A | 0.698 | B | 0.613 | B | -0.085 | No | -- | -- |
| | PM | 0.420 | A | 0.668 | B | 0.668 | B | 0.000 | No | -- | -- |
| 6. I-5 NB Ramps/Wilshire Avenue at Lincoln Avenue | AM | 0.663 | B | 0.746 | C | 0.751 | C | 0.005 | No | -- | -- |
| | PM | 0.627 | B | 0.764 | C | 0.764 | C | 0.000 | No | -- | -- |

Notes:

- **Bold LOS values** indicate adverse service levels based on City LOS standards
- ICU = Intersection Capacity Utilization

[15] Includes the 1600 W. Lincoln Avenue Project.

## TABLE 11-3

## GENERAL PLAN BUILDOUT PLUS PROJECT (SCENARIO NO. 2) ROADWAY SEGMENT LEVEL OF SERVICE SUMMARY

| Key Roadway Segment | Min. Acc. LOS | (1) No. of Lanes | (2) Arterial Classification | (3) Capacity at LOS "E" | (4) General Plan Buildout Traffic Conditions | | | (5) General Plan Buildout Plus Project (Scenario No. 2) Traffic Conditions | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Daily Volume | V/C Ratio | LOS | Daily Volume | V/C Ratio | LOS | Increase | Significant (Yes/No) |
| A. Euclid Street, between Lincoln Avenue and I-5 Ramps | C | 6D | Major | 56,300 | **53,300** | **0.947** | **E** | **52,800** | **0.938** | **E** | -0.009 | No |
| B Lincoln Avenue, between Euclid Street and Loara Street | C | 6D | Major | 56,300 | **47,704** | **0.847** | **D** | **45,616** | **0.810** | **D** | -0.037 | No |
| C. Lincoln Avenue, between Loara Street and I-5 SB Ramps | C | 6D | Major | 56,300 | **49,980** | **0.888** | **D** | **49,936** | **0.887** | **D** | -0.001 | No |
| D. Lincoln Avenue, between I-5 SB Ramps and Manchester Avenue | C | 6D | Major | 56,300 | **53,034** | **0.942** | **E** | **51,951** | **0.923** | **E** | -0.019 | No |
| E. Lincoln Avenue, between Manchester Ave and I-5 NB Ramps/Wilshire Ave | C | 6D | Major | 56,300 | **47,673** | **0.847** | **D** | **47,101** | **0.837** | **D** | -0.010 | No |

Notes:

- **BOLD V/C ratio** indicates unacceptable service level

## TABLE 11-4

## GENERAL PLAN BUILDOUT PLUS PROJECT (SCENARIO NO. 2) WITH CUMULATIVE PROJECT ROADWAY SEGMENT LEVEL OF SERVICE SUMMARY

| Key Roadway Segment | Min. Acc. LOS | (1) No. of Lanes | (2) Arterial Classification | (3) Capacity at LOS "E" | (4) General Plan Buildout Plus Cumulative Traffic Conditions[16] | | | (5) General Plan Buildout Plus Project (Scenario No. 2) Traffic Conditions | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Daily Volume | V/C Ratio | LOS | Daily Volume | V/C Ratio | LOS | Increase | Significant (Yes/No) |
| A. Euclid Street, between Lincoln Avenue and I-5 Ramps | C | 6D | Major | 56,300 | **53,300** | **0.947** | **E** | **52,800** | **0.938** | **E** | -0.009 | No |
| B Lincoln Avenue, between Euclid Street and Loara Street | C | 6D | Major | 56,300 | **47,717** | **0.848** | **D** | **45,616** | **0.810** | **D** | -0.038 | No |
| C. Lincoln Avenue, between Loara Street and I-5 SB Ramps | C | 6D | Major | 56,300 | **49,980** | **0.888** | **D** | **49,936** | **0.887** | **D** | -0.001 | No |
| D. Lincoln Avenue, between I-5 SB Ramps and Manchester Avenue | C | 6D | Major | 56,300 | **53,124** | **0.944** | **E** | **51,951** | **0.923** | **E** | -0.021 | No |
| E. Lincoln Avenue, between Manchester Ave and I-5 NB Ramps/Wilshire Ave | C | 6D | Major | 56,300 | **47,911** | **0.851** | **D** | **47,101** | **0.837** | **D** | -0.014 | No |

Notes:

- **BOLD V/C ratio** indicates unacceptable service level

[16] Includes the 1600 W. Lincoln Avenue Project.

# 12.0 STATE OF CALIFORNIA (CALTRANS) METHODOLOGY

In conformance with the current Caltrans *Guide for the Preparation of Traffic Impact Studies*, existing and projected peak hour operating conditions at the three (3) state-controlled study intersections within the study area have been evaluated using the *Highway Capacity Manual 6th Edition* (HCM 6 for signalized intersections) operations method of analysis. These state-controlled locations include the following three (3) of six (6) key study intersections:

1. I-5 Ramps at Euclid Street
4. I-5 SB Ramps at Lincoln Avenue
6. I-5 NB Ramps/Wilshire Avenue at Lincoln Avenue

## 12.1 Impact Criteria and Thresholds

Based on historical agreements between the City of Anaheim and Caltrans, the following criteria has been utilized to determine project impacts at the aforementioned three (3) state-controlled study intersections.

- Based on approved historical coordination between the City of Anaheim and Caltrans, LOS D is the minimum operating standard for all Caltrans facilities.
- A significant impact occurs if the project causes an intersection operating at LOS D or better to degrade to LOS E or LOS F, or the project adds 10 seconds or more of delay to an intersection operating at LOS E or LOS F without the project.

## 12.2 Highway Capacity Manual 6 (HCM 6) Method of Analysis (Signalized Intersections)

Based on the HCM operations method of analysis, level of service for signalized intersections and approaches is defined in terms of control delay, which is a measure of the increase in travel time due to traffic signal control, driver discomfort, and fuel consumption. Control delay includes the delay associated with vehicles slowing in advance of an intersection, the time spent stopped on an intersection approach, the time spent as vehicles move up in the queue, and the time needed for vehicles to accelerate to their desired speed. LOS criteria for traffic signals are stated in terms of the control delay in seconds per vehicle. The LOS thresholds established for the automobile mode at a signalized intersection are shown in ***Table 12-1***.

## TABLE 12-1
## LEVEL OF SERVICE CRITERIA FOR SIGNALIZED INTERSECTIONS (HCM 6 METHODOLOGY)[17]

| Level of Service (LOS) | Control Delay Per Vehicle (seconds/vehicle) | Level of Service Description |
|---|---|---|
| A | ≤ 10.0 | This level of service 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. |
| B | > 10.0 and ≤ 20.0 | This level generally occurs with good progression, short cycle lengths, or both. More vehicles stop than with LOS A, causing higher levels of average delay. |
| C | > 20.0 and ≤ 35.0 | Average traffic delays. These higher delays may result from fair progression, longer cycle lengths, or both. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant at this level, though many still pass through the intersection without stopping. |
| D | > 35.0 and ≤ 55.0 | Long traffic delays At level D, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high *v/c* ratios. Many vehicles stop and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable. |
| E | > 55.0 and ≤ 80.0 | Very long traffic delays This level is considered by many agencies to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths and high *v/c* ratios. Individual cycle failures are frequent occurrences. |
| F | ≥ 80.0 | Severe congestion This level, considered to be unacceptable to most drivers, often occurs with over saturation, that is, when arrival flow rates exceed the capacity of the intersection. It may also occur at high *v/c* ratios below 1.0 with many individual cycle failures. Poor progression and long cycle lengths may also be major contributing factors to such delay levels. |

[17] Source: *Highway Capacity Manual 6*, Chapter 19: Signalized Intersections.

## 12.3 Existing Plus Project (Scenario No. 2) Traffic Conditions

***Table 12-2*** summarizes the peak hour *Highway Capacity Manual* level of service results at the three (3) state-controlled study intersections within the study area for Existing Plus Project (Scenario No. 2) traffic conditions. The first column (1) of HCM/LOS values in *Table 12-2* presents a summary of existing traffic conditions. The second column (2) presents existing plus project (Scenario No. 2) traffic conditions based on existing intersection geometry. The third column (3) indicates whether the traffic associated with the Project will have a significant impact based on the significant impact criteria defined in this report.

### 12.3.1 *Existing Traffic Conditions*

Review of column one (1) of *Table 12-2* indicates that the intersection of I-5 Ramps/Euclid Street currently operates at unacceptable LOS E during the PM peak hour. The remaining two (2) state-controlled study intersections currently operate at an acceptable LOS D or better during the AM and PM peak hours.

### 12.3.2 *Existing Plus Project (Scenario No. 2) Traffic Conditions*

Review of columns two (2) and three (3) of *Table 12-2* indicates that traffic associated with the proposed Project (Scenario No. 2) ***will not*** significantly impact the three (3) state-controlled study intersections, when compared to the LOS standards and significant impact criteria specified in this report. Although the intersection of I-5 Ramps/Euclid Street is forecast to operate at unacceptable LOS E during the PM peak hour with the addition of project traffic, the Project (Scenario No. 2) is expected to add less than the allowable threshold to the Delay value. The remaining two (2) state-controlled key study intersections are forecast to continue to operate at an acceptable LOS D or better with the addition of project generated traffic to existing traffic.

***Appendix D*** presents the existing plus project (Scenario No. 2) HCM/LOS calculations for the three (3) state-controlled study intersections.

## 12.4 Existing Plus Cumulative Plus Project (Scenario No. 1) Traffic Conditions

***Table 12-3*** summarizes the peak hour *Highway Capacity Manual* level of service results at the three (3) state-controlled study intersections within the study area for existing plus cumulative plus project (Scenario No. 1) traffic conditions. The first column (1) of HCM/LOS values in *Table 12-3* presents a summary of existing traffic conditions. The second column (2) lists projected existing plus cumulative traffic conditions based on existing intersection geometry, but without any traffic generated from the proposed Project. The third column (3) presents existing plus cumulative plus project (Scenario No. 1) traffic conditions. The fourth column (4) indicates whether the traffic associated with the Project (Scenario No. 1) will have a significant impact based on the significant impact criteria defined in this report. The fifth column (5) indicates the anticipated level of service with planned and/or recommended improvements.

### 12.4.1 *Existing Plus Cumulative Traffic Conditions*

An analysis of future existing plus cumulative traffic conditions indicates that the intersection of I-5 Ramps/Euclid Street is forecast to operate at unacceptable LOS E during the PM peak hour with the

addition of cumulative project traffic to existing traffic. The remaining two (2) state-controlled study intersections are forecast to continue to operate at acceptable LOS D or better during the AM and PM peak hours with the addition of cumulative project traffic to existing traffic.

### 12.4.2 *Existing Plus Cumulative Plus Project (Scenario No. 1) Traffic Conditions*

Review of Columns 3 and 4 of *Table 12-3* indicates that traffic associated with the proposed Project (Scenario No. 1) ***will not*** significantly impact the three (3) state-controlled study intersections, when compared to the LOS standards and significant impact criteria specified in this report. Although the intersection of I-5 Ramps/Euclid Street is forecast to operate at unacceptable LOS E during the PM peak hour with the addition of project traffic, the Project (Scenario No. 1) is expected to add less than the allowable threshold to the Delay value. The remaining two (2) state-controlled key study intersections are forecast to continue to operate at an acceptable LOS D or better with the addition of project generated traffic to existing traffic and cumulative traffic.

*Appendix D* also presents the existing plus cumulative plus project (Scenario No. 1) HCM/LOS calculations for the three (3) state-controlled intersections.

## 12.5 Existing Plus Cumulative Plus Project (Scenario No. 2) Traffic Conditions

***Table 12-4*** summarizes the peak hour *Highway Capacity Manual* level of service results at the three (3) state-controlled study intersections within the study area for existing plus cumulative plus project (Scenario No. 2) traffic conditions. The structure of this table is similar to the capacity analysis summary presented in *Table 12-3.*

### 12.5.1 *Existing Plus Cumulative Plus Project (Scenario No. 2) Traffic Conditions*

Review of Columns 3 and 4 of *Table 12-4* indicates that traffic associated with the proposed Project (Scenario No. 2) ***will not*** significantly impact the three (3) state-controlled study intersections, when compared to the LOS standards and significant impact criteria specified in this report. Although the intersection of I-5 Ramps/Euclid Street is forecast to operate at unacceptable LOS E during the PM peak hour with the addition of project traffic, the Project (Scenario No. 2) is expected to add less than the allowable threshold to the Delay value. The remaining two (2) state-controlled key study intersections are forecast to continue to operate at an acceptable LOS D or better with the addition of project generated traffic to existing traffic and cumulative traffic.

*Appendix D* also presents the existing plus cumulative plus project (Scenario No. 2) HCM/LOS calculations for the three (3) state-controlled intersections.

## 12.6 Year 2023 Plus Project (Scenario No. 1) Traffic Conditions

***Table 12-5*** summarizes the peak hour *Highway Capacity Manual* level of service results at the three (3) state-controlled study intersections within the study area for Year 2023 traffic conditions (Scenario No. 1). The first column (1) of HCM/LOS values in *Table 12-5* presents a summary of existing traffic conditions. The second column (2) presents Year 2023 cumulative traffic conditions based on existing intersection geometry, but without any Project generated traffic. The third column (3) presents future forecast traffic conditions with the addition of Project (Scenario No. 1) traffic.

The fourth column (4) indicates whether the traffic associated with the Project (Scenario No. 1) will have a significant impact based on the significant impact criteria defined in this report. The fifth column (5) indicates the anticipated level of service with planned and/or recommended improvements.

### 12.6.1 *Year 2023 Cumulative Traffic Conditions*

An analysis of future (Year 2023) cumulative traffic conditions indicates that the intersection of I-5 Ramps/Euclid Street is forecast to operate at unacceptable LOS E during the PM peak hour with the addition of ambient traffic growth and cumulative projects traffic. The remaining two (2) state-controlled study intersections are forecast to continue to operate at acceptable LOS D or better during the AM and PM peak hours with the addition of ambient traffic growth and cumulative projects traffic.

### 12.6.2 *Year 2023 Cumulative Plus Project (Scenario No. 1) Traffic Conditions*

Review of Columns 3 and 4 of *Table 12-5* indicates that traffic associated with the proposed Project (Scenario No. 1) ***will not*** significantly impact the three (3) state-controlled study intersections, when compared to the LOS standards and significant impact criteria specified in this report. Although the intersection of I-5 Ramps/Euclid Street is forecast to operate at unacceptable LOS E during the PM peak hour with the addition of project traffic, the Project (Scenario No. 1) is expected to add less than the allowable threshold to the Delay value. The remaining two (2) state-controlled key study intersections are forecast to continue to operate at an acceptable LOS D or better with the addition of project generated traffic in the Year 2023.

*Appendix D* also presents the Year 2023 cumulative plus project (Scenario No. 1) HCM/LOS calculations for the three (3) state-controlled intersections.

## 12.7 Year 2023 Plus Project (Scenario No. 2) Traffic Conditions

***Table 12-6*** summarizes the peak hour *Highway Capacity Manual* level of service results at the three (3) state-controlled study intersections within the study area for Year 2023 traffic conditions (Scenario No. 2). The structure of this table is similar to the capacity analysis summary presented in *Table 12-5.*

### 12.7.1 *Year 2023 Cumulative Plus Project (Scenario No. 2) Traffic Conditions*

Review of Columns 3 and 4 of *Table 12-6* indicates that traffic associated with the proposed Project (Scenario No. 2) ***will not*** significantly impact the three (3) state-controlled study intersections, when compared to the LOS standards and significant impact criteria specified in this report. Although the intersection of I-5 Ramps/Euclid Street is forecast to operate at unacceptable LOS E during the PM peak hour with the addition of project traffic, the Project (Scenario No. 2) is expected to add less than the allowable threshold to the Delay value. The remaining two (2) state-controlled key study intersections are forecast to continue to operate at an acceptable LOS D or better with the addition of project generated traffic in the Year 2023.

*Appendix D* also presents the Year 2023 cumulative plus project (Scenario No. 2) HCM/LOS calculations for the three (3) state-controlled intersections.

## 12.8 General Plan Buildout (Year 2035) Plus Project (Scenario No. 2) Traffic Conditions

***Table 12-7*** summarizes the peak hour *Highway Capacity Manual* level of service results at the three (3) state-controlled study intersections within the study area for General Plan Buildout (Year 2035) traffic conditions. The first column (1) of HCM/LOS values in *Table 12-7* presents a summary of existing traffic conditions. The second column (2) presents General Plan Buildout traffic conditions. The third column (3) presents General Plan Buildout traffic conditions with the addition of Project (Scenario No. 2) traffic. The fourth column (4) indicates whether the traffic associated with the Project (Scenario No. 2) will have a significant impact based on the significant impact criteria defined in this report. The fifth column (5) indicates the anticipated level of service with planned and/or recommended improvements.

It should be noted that planned improvements identified by City of Anaheim Traffic Engineering Department staff have been assumed under General Plan Buildout (Year 2035) traffic conditions at key study intersections #4 and #6. The planned improvements are discussed in Section 14.2 and are illustrated in ***Figure 14-1***.

### 12.8.1 *General Plan Buildout (Year 2035) Traffic Conditions*

An analysis of future General Plan Buildout (Year 2035) without project traffic conditions indicates that the intersection of I-5 Ramps/Euclid Street is forecast to operate at unacceptable LOS E during the AM and PM peak hours. The remaining two (2) state-controlled study intersections are forecast to continue to operate at acceptable LOS D or better during the AM and PM peak hours under General Plan Buildout (Year 2035) without project traffic conditions.

### 12.8.2 *General Plan Buildout (Year 2035) Plus Project (Scenario No. 2) Traffic Conditions*

Review of Columns 3 and 4 of *Table 12-7* indicates that traffic associated with the proposed Project (Scenario No. 2) ***will not*** significantly impact the three (3) state-controlled study intersections, when compared to the LOS standards and significant impact criteria specified in this report. Although the intersection of I-5 Ramps/Euclid Street is forecast to operate at unacceptable LOS E during the AM and PM peak hours with the addition of project traffic, the Project (Scenario No. 2) is expected to add less than the allowable threshold to the Delay value. The remaining two (2) state-controlled key study intersections are forecast to continue to operate at an acceptable LOS D or better with the addition of project generated traffic to General Plan Buildout (Year 2035) traffic conditions.

*Appendix D* also presents the General Plan Buildout (Year 2035) HCM/LOS calculations for the three (3) state-controlled intersections.

## 12.9 General Plan Buildout Plus Cumulative Plus Project (Scenario No. 2) Traffic Conditions

***Table 12-8*** summarizes the peak hour *Highway Capacity Manual* level of service results at the three (3) state-controlled study intersections within the study area for General Plan Buildout (Year 2035) plus Cumulative plus Project traffic conditions. The first column (1) of HCM/LOS values in *Table*

*12-8* presents a summary of existing traffic conditions. The second column (2) presents General Plan Buildout traffic conditions and includes traffic associated with the 1600 W. Lincoln Avenue Cumulative Project. The third column (3) presents General Plan Buildout traffic conditions with the addition of Project (Scenario No. 2) traffic. The fourth column (4) indicates whether the traffic associated with the Project (Scenario No. 2) will have a significant impact based on the significant impact criteria defined in this report. The fifth column (5) indicates the anticipated level of service with planned and/or recommended improvements.

It should be noted that planned improvements identified by City of Anaheim Traffic Engineering Department staff have been assumed under General Plan Buildout (Year 2035) traffic conditions at key study intersections #4 and #6. The planned improvements are discussed in Section 14.2 and are illustrated in ***Figure 14-1***.

### 12.9.1 *General Plan Buildout (Year 2035) Plus Cumulative Traffic Conditions*

An analysis of future General Plan Buildout (Year 2035) plus Cumulative traffic conditions indicates that the intersection of I-5 Ramps/Euclid Street is forecast to operate at unacceptable LOS E during the AM and PM peak hours. The remaining two (2) state-controlled study intersections are forecast to continue to operate at acceptable LOS D or better during the AM and PM peak hours under General Plan Buildout (Year 2035) plus Cumulative traffic conditions.

### 12.9.2 *General Plan Buildout (Year 2035) Plus Cum. Plus Project (Scenario No. 2) Traffic Conditions*

Review of Columns 3 and 4 of *Table 12-8* indicates that traffic associated with the proposed Project (Scenario No. 2) ***will not*** significantly impact the three (3) state-controlled study intersections, when compared to the LOS standards and significant impact criteria specified in this report. Although the intersection of I-5 Ramps/Euclid Street is forecast to operate at unacceptable LOS E during the AM and PM peak hours with the addition of project traffic, the Project (Scenario No. 2) is expected to add less than the allowable threshold to the Delay value. The remaining two (2) state-controlled key study intersections are forecast to continue to operate at an acceptable LOS D or better with the addition of project generated traffic to General Plan Buildout (Year 2035) plus Cumulative traffic conditions.

*Appendix D* also presents the General Plan Buildout (Year 2035) plus Cumulative plus Project HCM/LOS calculations for the three (3) state-controlled intersections.

## 12.10 Recommended Improvements – Caltrans Analysis

The results of the Caltrans analyses presented in *Tables 12-2* through *12-8* indicate that the proposed Project will not significantly impact the three (3) state-controlled study intersections under "Existing Plus Project (Scenario No. 2)", "Existing Plus Cumulative Plus Project (Scenario No. 1)", "Existing Plus Cumulative Plus Project (Scenario No. 2)", "Year 2023 Plus Project (Scenario No. 1)", "Year 2023 Plus Project (Scenario No. 2)", "General Plan Buildout Plus Project (Scenario No. 2)" and "General Plan Buildout Plus Cumulative Plus Project (Scenario No. 2)" traffic conditions. As there are no significant impacts, no traffic mitigation measures are required or recommended for the three (3) state-controlled study intersections.

## TABLE 12-2

## EXISTING PLUS PROJECT (SCENARIO NO. 2) PEAK HOUR INTERSECTION CAPACITY ANALYSIS – CALTRANS

| Key Intersection | | Time Period | (1) Existing Traffic Conditions | | (2) Existing Plus Project (Scenario No. 2) Traffic Conditions | | (3) Project Significant Impact | |
|---|---|---|---|---|---|---|---|---|
| | | | HCM | LOS | HCM | LOS | Delay Increase | Yes/No |
| 1. | I-5 Ramps at | AM | 47.6 s/v | D | 47.7 s/v | D | 0.1 s/v | No |
| | Euclid Street | PM | **66.4 s/v** | **E** | **67.3 s/v** | **E** | 0.9 s/v | No |
| 4. | I-5 SB Ramps at | AM | 24.3 s/v | C | 25.2 s/v | C | 0.9 s/v | No |
| | Lincoln Avenue | PM | 17.9 s/v | B | 17.9 s/v | B | 0.0 s/v | No |
| 6. | I-5 NB Ramps/Wilshire Avenue at | AM | 42.4 s/v | D | 42.4 s/v | D | 0.0 s/v | No |
| | Lincoln Avenue | PM | 35.5 s/v | D | 35.5 s/v | D | 0.0 s/v | No |

Notes:
s/v = seconds per vehicle

## TABLE 12-3

## EXISTING PLUS CUMULATIVE PLUS PROJECT (SCENARIO NO. 1) PEAK HOUR INTERSECTION CAPACITY ANALYSIS – CALTRANS

| Key Intersections | Time Period | (1) Existing Traffic Conditions | | (2) Existing Plus Cum. Projects Traffic Conditions | | (3) Existing Plus Cum. Projects Plus Project (Scenario No. 1) Traffic Conditions | | (4) Project Significant Impact | | (5) Existing Plus Cum. Projects Plus Project (Scenario No. 1) Plus Improvements | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | HCM | LOS | HCM | LOS | HCM | LOS | Delay Increase | Yes/No | HCM | LOS |
| 1. I-5 Ramps at | AM | 47.6 s/v | D | 49.1 s/v | D | 49.3 s/v | D | 0.2 s/v | No | -- | -- |
| Euclid Street | PM | **66.4 s/v** | **E** | **70.5 s/v** | **E** | **71.2 s/v** | **E** | 0.7 s/v | No | -- | -- |
| 4. I-5 SB Ramps at | AM | 24.3 s/v | C | 25.6 s/v | C | 25.7 s/v | C | 0.1 s/v | No | -- | -- |
| Lincoln Avenue | PM | 17.9 s/v | B | 19.5 s/v | B | 20.3 s/v | C | 0.8 s/v | No | -- | -- |
| 6. I-5 NB Ramps/Wilshire Avenue at | AM | 42.4 s/v | D | 42.4 s/v | D | 42.4 s/v | D | 0.0 s/v | No | -- | -- |
| Lincoln Avenue | PM | 35.5 s/v | D | 36.1 s/v | D | 36.2 s/v | D | 0.1 s/v | No | -- | -- |

Notes:
s/v = seconds per vehicle

## TABLE 12-4

## EXISTING PLUS CUMULATIVE PLUS PROJECT (SCENARIO NO. 2) PEAK HOUR INTERSECTION CAPACITY ANALYSIS – CALTRANS

| Key Intersections | | Time Period | (1) Existing Traffic Conditions | | (2) Existing Plus Cum. Projects Traffic Conditions | | (3) Existing Plus Cum. Projects Plus Project (Scenario No. 2) Traffic Conditions | | (4) Project Significant Impact | | (5) Existing Plus Cum. Projects Plus Project (Scenario No. 2) Plus Improvements | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | HCM | LOS | HCM | LOS | HCM | LOS | Delay Increase | Yes/No | HCM | LOS |
| 1. | I-5 Ramps at | AM | 47.6 s/v | D | 49.1 s/v | D | 49.3 s/v | D | 0.2 s/v | No | -- | -- |
| | Euclid Street | PM | **66.4 s/v** | **E** | **70.5 s/v** | **E** | **71.2 s/v** | **E** | 0.7 s/v | No | -- | -- |
| 4. | I-5 SB Ramps at | AM | 24.3 s/v | C | 25.6 s/v | C | 25.8 s/v | C | 0.2 s/v | No | -- | -- |
| | Lincoln Avenue | PM | 17.9 s/v | B | 19.5 s/v | B | 20.3 s/v | C | 0.8 s/v | No | -- | -- |
| 6. | I-5 NB Ramps/Wilshire Avenue at | AM | 42.4 s/v | D | 42.4 s/v | D | 42.4 s/v | D | 0.0 s/v | No | -- | -- |
| | Lincoln Avenue | PM | 35.5 s/v | D | 36.1 s/v | D | 36.2 s/v | D | 0.1 s/v | No | -- | -- |

Notes:
s/v = seconds per vehicle

## TABLE 12-5

## YEAR 2023 CUMULATIVE PLUS PROJECT (SCENARIO NO. 1) PEAK HOUR INTERSECTION CAPACITY ANALYSIS – CALTRANS

| Key Intersections | | Time Period | (1) Existing Traffic Conditions | | (2) Year 2023 Cumulative Traffic Conditions | | (3) Year 2023 Cumulative Plus Project (Scenario No. 1) Traffic Conditions | | (4) Significant Impact | | (5) Year 2023 Cumulative Plus Project (Scenario No. 1) Plus Improvements | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | HCM | LOS | HCM | LOS | HCM | LOS | Delay Increase | Yes/No | HCM | LOS |
| 1. | I-5 Ramps at | AM | 47.6 s/v | D | 54.1 s/v | D | 54.3 s/v | D | 0.2 s/v | No | -- | -- |
| | Euclid Street | PM | **66.4 s/v** | **E** | **78.1 s/v** | **E** | **79.0 s/v** | **E** | 0.9 s/v | No | -- | -- |
| 4. | I-5 SB Ramps at | AM | 24.3 s/v | C | 26.1 s/v | C | 26.2 s/v | C | 0.1 s/v | No | -- | -- |
| | Lincoln Avenue | PM | 17.9 s/v | B | 19.9 s/v | B | 20.0 s/v | C | 0.1 s/v | No | -- | -- |
| 6. | I-5 NB Ramps/Wilshire Avenue at | AM | 42.4 s/v | D | 45.3 s/v | D | 45.3 s/v | D | 0.0 s/v | No | -- | -- |
| | Lincoln Avenue | PM | 35.5 s/v | D | 36.5 s/v | D | 36.6 s/v | D | 0.1 s/v | No | -- | -- |

Notes:
s/v = seconds per vehicle

## TABLE 12-6

## YEAR 2023 CUMULATIVE PLUS PROJECT (SCENARIO NO. 2) PEAK HOUR INTERSECTION CAPACITY ANALYSIS – CALTRANS

| Key Intersections | | Time Period | (1) Existing Traffic Conditions | | (2) Year 2023 Cumulative Traffic Conditions | | (3) Year 2023 Cumulative Plus Project (Scenario No. 2) Traffic Conditions | | (4) Significant Impact | | (5) Year 2023 Cumulative Plus Project (Scenario No. 2) Plus Improvements | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | HCM | LOS | HCM | LOS | HCM | LOS | Delay Increase | Yes/No | HCM | LOS |
| 1. | I-5 Ramps at | AM | 47.6 s/v | D | 54.1 s/v | D | 54.3 s/v | D | 0.2 s/v | No | -- | -- |
| | Euclid Street | PM | **66.4 s/v** | **E** | **78.1 s/v** | **E** | **79.1 s/v** | **E** | 1.0 s/v | No | -- | -- |
| 4. | I-5 SB Ramps at | AM | 24.3 s/v | C | 26.1 s/v | C | 26.2 s/v | C | 0.1 s/v | No | -- | -- |
| | Lincoln Avenue | PM | 17.9 s/v | B | 19.9 s/v | B | 20.0 s/v | C | 0.1 s/v | No | -- | -- |
| 6. | I-5 NB Ramps/Wilshire Avenue at | AM | 42.4 s/v | D | 45.3 s/v | D | 45.3 s/v | D | 0.0 s/v | No | -- | -- |
| | Lincoln Avenue | PM | 35.5 s/v | D | 36.5 s/v | D | 36.6 s/v | D | 0.1 s/v | No | -- | -- |

Notes:
s/v = seconds per vehicle

## TABLE 12-7

## GENERAL PLAN BUILDOUT PLUS PROJECT (SCENARIO NO. 2) PEAK HOUR INTERSECTION CAPACITY ANALYSIS – CALTRANS

| Key Intersections | | Time Period | (1) Existing Traffic Conditions | | (2) General Plan Buildout Traffic Conditions | | (3) General Plan Buildout Plus Project (Scenario No. 2) Traffic Conditions | | (4) Significant Impact | | (5) General Plan Buildout Plus Project (Scenario No. 2) Plus Improvements | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | HCM | LOS | HCM | LOS | HCM | LOS | Delay Increase | Yes/No | HCM | LOS |
| 1. | I-5 Ramps at | AM | 47.6 s/v | D | **67.9 s/v** | **E** | **72.3 s/v** | **E** | 4.4 s/v | No | -- | -- |
| | Euclid Street | PM | **66.4 s/v** | **E** | **69.5 s/v** | **E** | **69.5 s/v** | **E** | 0.0 s/v | No | -- | -- |
| 4. | I-5 SB Ramps at | AM | 24.3 s/v | C | 25.2 s/v | C | 24.7 s/v | C | -0.5 s/v | No | -- | -- |
| | Lincoln Avenue | PM | 17.9 s/v | B | 24.1 s/v | C | 23.6 s/v | C | -0.5 s/v | No | -- | -- |
| 6. | I-5 NB Ramps/Wilshire Avenue at | AM | 42.4 s/v | D | 42.3 s/v | D | 42.8 s/v | D | 0.5 s/v | No | -- | -- |
| | Lincoln Avenue | PM | 35.5 s/v | D | 44.0 s/v | D | 44.0 s/v | D | 0.0 s/v | No | -- | -- |

Notes:
s/v = seconds per vehicle

## TABLE 12-8

## GENERAL PLAN BUILDOUT PLUS PROJECT (SCENARIO NO. 2) WITH CUMULATIVE PROJECT PEAK HOUR INTERSECTION CAPACITY ANALYSIS – CALTRANS

| Key Intersections | | Time Period | (1) Existing Traffic Conditions | | (2) General Plan Buildout Plus Cumulative Traffic Conditions[18] | | (3) General Plan Buildout Plus Project (Scenario No. 2) Traffic Conditions | | (4) Significant Impact | | (5) General Plan Buildout Plus Project (Scenario No. 2) Plus Improvements | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | HCM | LOS | HCM | LOS | HCM | LOS | Delay Increase | Yes/No | HCM | LOS |
| 1. | I-5 Ramps at | AM | 47.6 s/v | D | **67.9 s/v** | **E** | **72.3 s/v** | **E** | 4.4 s/v | No | -- | -- |
| | Euclid Street | PM | **66.4 s/v** | **E** | **69.5 s/v** | **E** | **69.5 s/v** | **E** | 0.0 s/v | No | -- | -- |
| 4. | I-5 SB Ramps at | AM | 24.3 s/v | C | 24.8 s/v | C | 24.7 s/v | C | -0.1 s/v | No | -- | -- |
| | Lincoln Avenue | PM | 17.9 s/v | B | 24.4 s/v | C | 23.6 s/v | C | -0.8 s/v | No | -- | -- |
| 6. | I-5 NB Ramps/Wilshire Avenue at | AM | 42.4 s/v | D | 42.3 s/v | D | 42.8 s/v | D | 0.5 s/v | No | -- | -- |
| | Lincoln Avenue | PM | 35.5 s/v | D | 44.0 s/v | D | 44.0 s/v | D | 0.0 s/v | No | -- | -- |

Notes:
s/v = seconds per vehicle

[18] Includes the 1600 W. Lincoln Avenue Project.

# 13.0 SITE ACCESS EVALUATION

## 13.1 Level of Service Analysis For Project Access Locations

As shown previously in *Figure 2-2*, access to the proposed Project site will be provided via two gated unsignalized driveways located along Lincoln Avenue. The easterly driveway will provide full access to the site and the westerly driveway will provide emergency access only to the site.

***Table 13-1*** summarizes the intersection operations at the proposed Project driveway for Year 2023 plus Project (Scenario No. 1) traffic conditions (column 1), Year 2023 plus Project (Scenario No. 2) traffic conditions (column 2) and General Plan Buildout plus Project (Scenario No. 2) traffic conditions (column 3). The operations analysis for the project driveway is based on the *Highway Capacity Manual 6th Edition* (HCM 6) unsignalized methodology.

Review of column 1 of *Table 13-1* shows that the proposed Project driveway is forecast to operate at LOS C during the AM and PM peak hours under Year 2023 plus Project (Scenario No. 1) traffic conditions. Review of column 2 of *Table 13-1* shows that the proposed Project driveway is forecast to operate at LOS C during the AM and PM peak hours under Year 2023 plus Project (Scenario No. 2) traffic conditions. Review of column 3 of *Table 13-1* shows that the proposed Project driveway is forecast to operate at LOS C during the AM peak hour and at LOS F during the PM peak hour under General Plan Buildout plus Project (Scenario No. 2) traffic conditions. It should be noted that it is not uncommon that unsignalized driveways that have direct access to a major arterial, such as Lincoln Avenue, operate at a LOS E or F in the General Plan Buildout traffic condition. However, if project vehicles begin to experience long delays exiting the project site, they may make a southbound right-turn out of the site, travel to the intersection of Euclid Street/Lincoln Avenue, make a westbound u-turn and then travel east on Lincoln Avenue. As such, project access will be adequate. Motorists entering and exiting the Project site will be able to do so without undue congestion.

***Appendix D*** presents the level of service calculation worksheets for the proposed Project driveway.

## 13.2 Queuing Analysis For Project Access Locations

This section of the report addresses City of Anaheim staff concerns regarding peak hour left-turn stacking/storage lengths for the eastbound left-turn lane at the proposed Project driveway on Lincoln Avenue. A queuing evaluation was prepared for the eastbound left-turn lane at the proposed Project driveway on Lincoln Avenue. The queuing evaluation was conducted based on projected Year 2023 plus Project (Scenario No. 1), Year 2023 plus Project (Scenario No. 2) and General Plan Buildout plus Project (Scenario No. 2) peak hour traffic volumes and the Highway Capacity Manual (HCM) unsignalized methodology.

***Table 13-2*** presents the 95th percentile queuing analysis results for the eastbound left-turn lane at the proposed Project driveway on Lincoln Avenue. Column one (1) presents Year 2023 plus Project (Scenario No. 1) traffic conditions, column two (2) presents Year 2023 plus Project (Scenario No. 2) traffic conditions and column three (3) presents General Plan Buildout plus Project (Scenario No. 2)

traffic conditions. As discussed in Section 2.0 of this report, a single minimum 100-foot eastbound left-turn lane will be provided at the proposed Project Driveway on Lincoln Avenue. Review of *Table 13-2* indicates that adequate storage is provided for the eastbound left-turn lane at the proposed Project Driveway on Lincoln Avenue under all traffic conditions.

## 13.3 Internal Circulation

The on-site circulation layout of the proposed Project as illustrated in *Figure 2-2* on an overall basis is adequate. Curb return radii are generally adequate for small service/delivery (FedEx, UPS) trucks and trash trucks.

## TABLE 13-1
## PROJECT DRIVEWAY PEAK HOUR LEVELS OF SERVICE SUMMARY

| Project Driveway | Time Period | Intersection Control | (1) Year 2023 Plus Project (Scenario No. 1) Traffic Conditions | | (2) Year 2023 Plus Project (Scenario No. 2) Traffic Conditions | | (3) General Plan Buildout Plus Project (Scenario No. 2) Traffic Conditions | |
|---|---|---|---|---|---|---|---|---|
| | | | HCM | LOS | HCM | LOS | HCM | LOS |
| -- Project Driveway No. 1 at Lincoln Avenue | AM | One – Way Stop | 17.6 s/v | C | 17.6 s/v | C | 21.2 s/v | C |
| | PM | | 19.0 s/v | C | 19.0 s/v | C | **74.4 s/v** | **F** |

Notes:
s/v = seconds per vehicle

## TABLE 13-2

## PEAK HOUR INTERSECTION LEFT-TURN QUEUING ANALYSIS[19]

| Key Study Intersection | Estimated/ Proposed Storage Provided (feet) | (1) Year 2023 Plus Project (Scenario No. 1) Traffic Conditions | | | | (2) Year 2023 Plus Project (Scenario No. 2) Traffic Conditions | | | | (3) General Plan Buildout Plus Project (Scenario No. 2) Traffic Conditions | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AM Peak Hour | | PM Peak Hour | | AM Peak Hour | | PM Peak Hour | | AM Peak Hour | | PM Peak Hour | |
| | | Max. Queue/ Min. Storage Required | Adequate Storage (Yes/No) | Max. Queue/ Min. Storage Required | Adequate Storage (Yes/No) | Max. Queue/ Min. Storage Required | Adequate Storage (Yes/No) | Max. Queue/ Min. Storage Required | Adequate Storage (Yes/No) | Max. Queue/ Min. Storage Required | Adequate Storage (Yes/No) | Max. Queue/ Min. Storage Required | Adequate Storage (Yes/No) |
| -- Project Driveway No.1 at Lincoln Avenue | | | | | | | | | | | | | |
| *Eastbound Left -Turn* | 100’ | 22’ | Yes | 22’ | Yes | 22’ | Yes | 22’ | Yes | 22’ | Yes | 22’ | Yes |

[19] Queue is based on the *95th Percentile Queue* and is reported in total queue length (feet) for unsignalized intersections.

# 14.0 AREA-WIDE TRAFFIC IMPROVEMENTS

For those intersections and roadway segments where projected traffic volumes are expected to result in significant cumulative impacts, this report recommends traffic improvements that change the intersection and/or roadway segments geometry to increase capacity. These capacity improvements involve roadway widening and/or re-striping to reconfigure (add lanes) roadways to specific approaches of a key intersection and/or roadway segment. The identified improvements are expected to:

- Address the impact of existing traffic, Project traffic and future non-project (ambient traffic growth and cumulative) traffic, and
- Improve Levels of Service to an acceptable range and/or to pre-project conditions.

## 14.1 Project Specific Improvements

The following project design feature that will be constructed by the proposed Project is recommended to ensure that adequate ingress and egress to the project site is provided:

- **Project Driveway at Lincoln Avenue:** Construct the project driveway and provide one inbound lane and two outbound lanes (i.e. one southbound left-turn lane and one southbound right-turn lane). Modify the median on Lincoln Avenue to provide a single minimum 100-foot eastbound left-turn lane with a 90-foot transition. The installation of these improvements is subject to the approval of the City of Anaheim.

## 14.2 Planned Improvements

The following improvements are planned by the City of Anaheim and are assumed under General Plan Buildout traffic scenarios:

- **No. 2 – Euclid Street at Lincoln Avenue:** Widen and/or restripe the eastbound and westbound approaches of Lincoln Avenue to provide an exclusive right-turn lane in each direction. Modify the existing traffic signal as needed.

- **No. 3 – Loara Street at Lincoln Avenue:** Restripe the eastbound approach of Lincoln Avenue and convert the exclusive eastbound right-turn lane to a shared through/right-turn lane. Widen and/or restripe the westbound approach of Lincoln Avenue to provide a 3rd westbound through lane. Modify the existing traffic signal as needed.

- **No. 4 – I-5 SB Ramps at Lincoln Avenue:** Restripe the westbound approach of Lincoln Avenue and convert the exclusive westbound right-turn lane to a shared through/right-turn lane. Modify the existing traffic signal as needed.

- **No. 6 – I-5 NB Ramps/Wilshire Avenue at Lincoln Avenue:** Restripe the southbound approach along Wilshire Avenue to provide a 2nd exclusive southbound left-turn lane. Modify the existing traffic signal as needed.

- **Roadway Segment B – Lincoln Avenue, between Euclid Street and Loara Street:** Widen and/or restripe Lincoln Avenue to provide a 3rd through lane in each direction.

- **Roadway Segment C – Lincoln Avenue, between Loara Street and I-5 SB Ramps:** Widen and/or restripe Lincoln Avenue to provide a 3rd through lane in each direction.

***Figure 14-1*** graphically illustrates all of the aforementioned planned improvements.

## 14.3 Existing Plus Project (Scenario No. 2) Recommended Improvements

The results of the intersection capacity analysis presented previously in *Table 8-1* shows that the proposed Project will not significantly impact any of the six (6) key study intersections under the "Existing Plus Project (Scenario No. 2)" traffic scenario. Given that there are no significant project impacts, no improvements are required under this traffic scenario.

The results of the "Existing Plus Project (Scenario No. 2)" daily roadway segment analysis presented previously in *Table 8-2* indicates that the proposed Project will not significantly impact any of the five (5) key roadway segments. Given that there are no significant project impacts, no improvements are required under this traffic scenario.

## 14.4 Existing Plus Cumulative Plus Project (Scenario No. 1) Recommended Improvements

The results of the intersection capacity analysis presented previously in *Table 9-1* shows that the proposed Project will not significantly impact any of the six (6) key study intersections under the "Existing Plus Cumulative Plus Project (Scenario No. 1)" traffic scenario. Given that there are no significant project impacts, no improvements are required under this traffic scenario.

The results of the "Existing Plus Cumulative Plus Project (Scenario No. 1)" daily roadway segment analysis presented previously in *Table 9-3* indicates that the proposed Project will not significantly impact any of the five (5) key roadway segments. Given that there are no significant project impacts, no improvements are required under this traffic scenario.

## 14.5 Existing Plus Cumulative Plus Project (Scenario No. 2) Recommended Improvements

The results of the intersection capacity analysis presented previously in *Table 9-2* shows that the proposed Project will not significantly impact any of the six (6) key study intersections under the "Existing Plus Cumulative Plus Project (Scenario No. 2)" traffic scenario. Given that there are no significant project impacts, no improvements are required under this traffic scenario.

The results of the "Existing Plus Cumulative Plus Project (Scenario No. 2)" daily roadway segment analysis presented previously in *Table 9-4* indicates that the proposed Project will not significantly impact any of the five (5) key roadway segments. Given that there are no significant project impacts, no improvements are required under this traffic scenario.

## 14.6 Year 2023 Plus Project (Scenario No. 1) Recommended Improvements

The results of the intersection capacity analysis presented previously in *Table 10-1* shows that the proposed Project will not significantly impact any of the six (6) key study intersections under the "Year 2023 Plus Project (Scenario No. 1)" traffic scenario. Given that there are no significant project impacts, no improvements are required under this traffic scenario.

The results of the "Year 2023 Plus Project (Scenario No. 1)" daily roadway segment analysis presented previously in *Table 10-3* indicates that the proposed Project will not significantly impact any of the five (5) key roadway segments. Given that there are no significant project impacts, no improvements are required under this traffic scenario.

## 14.7 Year 2023 Plus Project (Scenario No. 2) Recommended Improvements

The results of the intersection capacity analysis presented previously in *Table 10-2* shows that the proposed Project will not significantly impact any of the six (6) key study intersections under the "Year 2023 Plus Project (Scenario No. 2)" traffic scenario. Given that there are no significant project impacts, no improvements are required under this traffic scenario.

The results of the "Year 2023 Plus Project (Scenario No. 2)" daily roadway segment analysis presented previously in *Table 10-4* indicates that the proposed Project will not significantly impact any of the five (5) key roadway segments. Given that there are no significant project impacts, no improvements are required under this traffic scenario.

## 14.8 General Plan Buildout Plus Project (Scenario No. 2) Recommended Improvements

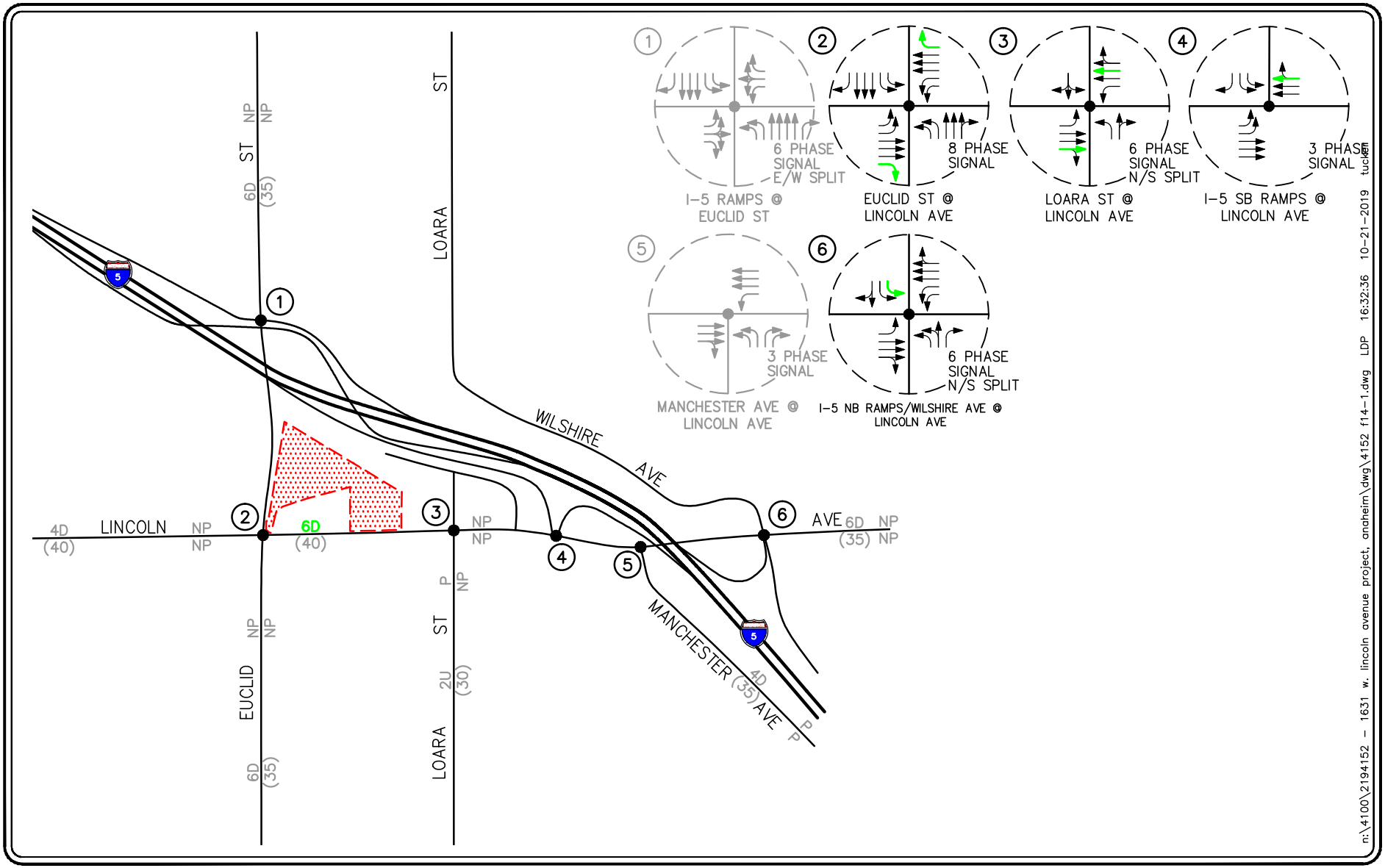
The results of the intersection capacity analysis presented previously in *Table 11-1* shows that the proposed Project will not significantly impact any of the six (6) key study intersections under the "General Plan Buildout Plus Project (Scenario No. 2)" traffic scenario. Given that there are no significant project impacts, no improvements are required under this traffic scenario.

The results of the "General Plan Buildout Plus Project (Scenario No. 2)" daily roadway segment analysis presented previously in *Table 11-3* indicates that the proposed Project will not significantly impact any of the five (5) key roadway segments. Given that there are no significant project impacts, no improvements are required under this traffic scenario.

## 14.9 General Plan Buildout Plus Cumulative Plus Project (Scenario No. 2) Recommended Improvements

The results of the intersection capacity analysis presented previously in *Table 11-2* shows that the proposed Project will not significantly impact any of the six (6) key study intersections under the "General Plan Buildout Plus Cumulative Plus Project (Scenario No. 2)" traffic scenario. Given that there are no significant project impacts, no improvements are required under this traffic scenario.

The results of the "General Plan Buildout Plus Cumulative Plus Project (Scenario No. 2)" daily roadway segment analysis presented previously in *Table 11-4* indicates that the proposed Project will not significantly impact any of the five (5) key roadway segments. Given that there are no significant project impacts, no improvements are required under this traffic scenario.

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LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

**KEY**

- ← = APPROACH LANE ASSIGNMENT
- ← = PLANNED IMPROVEMENTS
- ● = TRAFFIC SIGNAL
- P = PARKING, NP = NO PARKING
- U = UNDIVIDED, D = DIVIDED
- 2 = NUMBER OF TRAVEL LANES
- (XX)= POSTED SPEED LIMIT (MPH)
- = PROJECT SITE

# FIGURE 14-1

## GENERAL PLAN BUILDOUT PLANNED IMPROVEMENTS

LINCOLN AVENUE REDEVELOPMENT PROJECT, ANAHEIM

## 15.0 CONGESTION MANAGEMENT PROGRAM (CMP)

This analysis is consistent with the requirements and procedures outlined in the current *Orange County Congestion Management Program (CMP).* The CMP requires that a traffic impact analysis be conducted for any project generating 2,400 or more daily trips, or 1,600 or more daily trips for projects that directly access the CMP Highway System (HS). As noted in Section 5.0 of this traffic study, the proposed Project (Scenario No. 1) and the proposed Project (Scenario No. 2) are forecast to generate approximately 713 daily trip-ends and 815 daily trip-ends, respectively and thus does not meet the criteria requiring a CMP TIA.

## 16.0 SUMMARY OF FINDINGS AND CONCLUSIONS

- ***Project Description*** – The proposed project site is generally bounded by Euclid Street to the west, Lincoln Avenue to the south, Loara Street to the east and the Union Pacific railroad tracks and the I-5 Freeway to the north in the City of Anaheim, California. The project site is primarily vacant. However, a portion of the site is currently occupied by a 32,100 SF cement manufacturing company and an area used for vehicle storage/parking. The proposed Project will consist of a new residential single-family attached development with a maximum of 119 units. The proposed Project is expected to be completed in the Year 2023 and will consist of two (2) phase options. Phase I (Scenario No. 1) will consist of 105 units. Phase II (Scenario No. 2) will consist of 119 units, which includes 14 additional units and is contingent on the project applicant acquiring the adjacent City owned parcels. It should be noted that the Project will consist of either Phase I or Phase II and will not be entitled in two (2) phases. Therefore, Phase I traffic is never considered in the background (without Project) condition for Phase II.

  Access to the proposed Project site will be provided via two gated unsignalized driveways located along Lincoln Avenue. The easterly driveway will provide full access to the site and the westerly driveway will provide emergency access only to the site. The following project design feature that will be constructed by the proposed Project is recommended to ensure that adequate ingress and egress to the project site is provided:

  - **Project Driveway at Lincoln Avenue:** Construct the project driveway and provide one inbound lane and two outbound lanes (i.e. one southbound left-turn lane and one southbound right-turn lane). Modify the median on Lincoln Avenue to provide a single minimum 100-foot eastbound left-turn lane with a 90-foot transition. The installation of these improvements is subject to the approval of the City of Anaheim.

- ***Study Scope*** – The following six (6) key study intersections and five (5) key roadway segments were selected for detailed peak hour level of service analyses under Existing Traffic Conditions, Existing plus Project Traffic Conditions (Scenario No. 2), Existing plus Cumulative Traffic Conditions, Existing plus Cumulative plus Project Traffic Conditions (Scenario No. 1 and Scenario No. 2), Year 2023 Cumulative Traffic Conditions, Year 2023 Cumulative plus Project Traffic Conditions (Scenario No. 1 and Scenario No. 2), General Plan Buildout (Year 2035) Traffic Conditions, General Plan Buildout plus Cumulative Traffic Conditions and General Plan Buildout (Year 2035) plus Project Traffic Conditions (Scenario No. 2). All key study intersections and key roadway segments are located within the City of Anaheim.

| ***Key Study Intersections*** |
|---|
| 1. I-5 Ramps at Euclid Street |
| 2. Euclid Street at Lincoln Avenue |
| 3. Loara Street at Lincoln Avenue |
| 4. I-5 SB Ramps at Lincoln Avenue |
| 5. Manchester Avenue at Lincoln Avenue |
| 6. I-5 NB Ramps/Wilshere Avenue at Lincoln Avenue |

| ***Key Roadway Segments*** |
|---|
| A. Euclid Street between Lincoln Avenue and I-5 Ramps |
| B. Lincoln Avenue between Euclid Street and Loara Street |
| C. Lincoln Avenue between Loara Street and I-5 SB Ramps |
| D. Lincoln Avenue between I-5 SB Ramps and Manchester Avenue |
| E. Lincoln Avenue between Manchester Avenue and I-5 NB Ramps/Wilshire Avenue |

- ***Existing Traffic Conditions*** – All six (6) key study intersections currently operate at acceptable LOS C or better during the AM and PM peak hours. Roadway Segment A (Euclid Street between Lincoln Avenue and I-5 Ramps) currently operates at unacceptable LOS D on a daily basis. The remaining four (4) key roadway segments currently operate at acceptable service levels on a daily basis.

- ***Project Trip Generation (Scenario No. 1)*** – The proposed Project (Scenario No. 1 – 105 dwelling units) is forecast to generate approximately 769 daily trips, with 48 trips (11 inbound, 37 outbound) produced in the AM peak hour and 59 trips (37 inbound, 22 outbound) produced in the PM peak hour on a "typical" weekday. The existing land use generates approximately 56 daily trips, with 5 trips (4 inbound, 1 outbound) produced in the AM peak hour and 6 trips (2 inbound, 4 outbound) produced in the PM peak hour on a "typical" weekday. Comparison of the trips generated by the existing land use to the trips generated by the proposed Project (Scenario No. 1 – 105 dwelling units) shows that the proposed Project (Scenario No. 1 – 105 dwelling units) will generate 713 net daily trips, 43 net AM peak hour trips and 53 net PM peak hour trips. The potential impact of these net additional trips have been assessed in the traffic study (i.e. Year 2023 – Scenario No. 1).

- ***Project Trip Generation (Scenario No. 2)*** – The proposed Project (Scenario No. 2 – 119 dwelling units) is forecast to generate approximately 871 daily trips, with 54 trips (12 inbound, 42 outbound) produced in the AM peak hour and 67 trips (42 inbound, 25 outbound) produced in the PM peak hour on a "typical" weekday. The existing land use generates approximately 56 daily trips, with 5 trips (4 inbound, 1 outbound) produced in the AM peak hour and 6 trips (2 inbound, 4 outbound) produced in the PM peak hour on a "typical" weekday. Comparison of the trips generated by the existing land use to the trips generated by the proposed Project (Scenario No. 2 – 119 dwelling units) shows that the proposed Project (Scenario No. 2 – 119 dwelling units) will generate 815 net daily trips, 49 net AM peak hour trips and 61 net PM peak hour trips. The potential impact of these net additional trips have been assessed in the traffic study (i.e. Year 2023 – Scenario No. 2). It should also be noted that these trips have been utilized in the existing plus project analysis and the long-term buildout analysis.

- ***Cumulative Projects Traffic Characteristics*** – There are forty-one (41) cumulative projects in the City of Anaheim and three (3) cumulative projects in the City of Fullerton within the vicinity of the subject site. The forty-four (44) cumulative projects are forecast to generate a total of 20,839 daily trips, with 1,703 trips (839 inbound and 864 outbound) forecast during the AM peak hour and 1,514 trips (824 inbound and 690 outbound) forecast during the PM peak hour.

- ***Existing Plus Project (Scenario No. 2) Traffic Conditions*** – The proposed Project (Scenario No. 2) ***will not*** significantly impact any of the six (6) key study intersections when compared to the LOS standards and significant impact criteria specified in this report. The six (6) key study intersections currently operate and are forecast to continue to operate at an acceptable LOS C or better during the AM and PM peak hours with the addition of Project generated traffic to existing traffic.

  The proposed Project ***will not*** significantly impact any of the five (5) key roadway segments when compared to the LOS standards and significant impact criteria specified in this report. Although Roadway Segment A is forecast to operate at unacceptable LOS D on a daily basis with the addition of project traffic, the proposed Project (Scenario No. 2) is expected to add less than the allowable threshold to the V/C ratio. The remaining four (4) key roadway segments are forecast to continue to operate at an acceptable LOS C or better on a daily basis with the addition of Project generated traffic to existing traffic.

- ***Existing Plus Cumulative Plus Project (Scenario No. 1) Traffic Conditions*** – The proposed Project (Scenario No. 1) ***will not*** significantly impact any of the six (6) key study intersections when compared to the LOS standards and significant impact criteria specified in this report. All six (6) key study intersections are forecast to continue to operate at an acceptable LOS D or better during the AM and PM peak hours with the addition of project generated traffic to existing traffic and cumulative traffic.

  The proposed Project (Scenario No. 1) ***will not*** significantly impact any of the five (5) key roadway segments when compared to the LOS standards and significant impact criteria specified in this report. Although Roadway Segments A and C are forecast to operate at unacceptable LOS E and LOS D, respectively on a daily basis with the addition of project traffic, the proposed Project (Scenario No. 1) is expected to add less than the allowable threshold to the V/C ratio. The remaining three (3) key roadway segments are forecast to continue to operate at an acceptable LOS C or better on a daily basis with the addition of Project generated traffic to existing traffic and cumulative traffic.

- ***Existing Plus Cumulative Plus Project (Scenario No. 2) Traffic Conditions*** – The proposed Project (Scenario No. 2) ***will not*** significantly impact any of the six (6) key study intersections when compared to the LOS standards and significant impact criteria specified in this report. All six (6) key study intersections are forecast to continue to operate at an acceptable LOS D or better during the AM and PM peak hours with the addition of project generated traffic to existing traffic and cumulative traffic.

  The proposed Project (Scenario No. 2) ***will not*** significantly impact any of the five (5) key roadway segments when compared to the LOS standards and significant impact criteria specified in this report. Although Roadway Segments A and C are forecast to operate at unacceptable LOS E and LOS D, respectively on a daily basis with the addition of project traffic, the proposed Project (Scenario No. 2) is expected to add less than the allowable threshold to the V/C ratio. The remaining three (3) key roadway segments are forecast to continue to operate at an acceptable LOS C or better on a daily basis with the addition of Project generated traffic to existing traffic and cumulative traffic.

- ***Year 2023 Cumulative Plus Project (Scenario No. 1) Traffic Conditions*** – The proposed Project (Scenario No. 1) ***will not*** significantly impact any of the six (6) key study intersections when compared to the LOS standards and significant impact criteria specified in this report. All six (6) key study intersections are forecast to continue to operate at an acceptable LOS D or better during the AM and PM peak hours with the addition of project generated traffic in the Year 2023.

  The proposed Project (Scenario No. 1) ***will not*** significantly impact any of the five (5) key roadway segments when compared to the LOS standards and significant impact criteria specified in this report. Although Roadway Segments A and C are forecast to operate at unacceptable LOS E on a daily basis with the addition of project traffic, the proposed Project (Scenario No. 1) is expected to add less than the allowable threshold to the V/C ratio. In addition, since Roadway Segment B is forecast to operate at unacceptable LOS D and the project adds more than 0.010 to the V/C ratio, this roadway segment requires a peak hour link assessment to determine whether or not it will be impacted by the proposed Project (Scenario No. 1). Roadway Segment B ***will not*** be significantly impacted by the proposed Project (Scenario No. 1) as this location is forecast to operate in the Year 2023 at an acceptable LOS without and with the proposed Project (Scenario No. 1) during the weekday AM and PM peak commute hours. The remaining two (2) key roadway segments are forecast to continue to operate at an acceptable LOS B or better on a daily basis with the addition of Project generated traffic in the Year 2023 traffic condition.

- ***Year 2023 Cumulative Plus Project (Scenario No. 2) Traffic Conditions*** – The proposed Project (Scenario No. 2) ***will not*** significantly impact any of the six (6) key study intersections when compared to the LOS standards and significant impact criteria specified in this report. All six (6) key study intersections are forecast to continue to operate at an acceptable LOS D or better during the AM and PM peak hours with the addition of project generated traffic in the Year 2023.

  The proposed Project (Scenario No. 2) ***will not*** significantly impact any of the five (5) key roadway segments when compared to the LOS standards and significant impact criteria specified in this report. Although Roadway Segments A and C are forecast to operate at unacceptable LOS E on a daily basis with the addition of project traffic, the proposed Project (Scenario No. 2) is expected to add less than the allowable threshold to the V/C ratio. In addition, since Roadway Segment B is forecast to operate at unacceptable LOS D and the project adds more than 0.010 to the V/C ratio, this roadway segment requires a peak hour link assessment to determine whether or not it will be impacted by the proposed Project (Scenario No. 2). As shown in *Table 10-4*, Roadway Segment B ***will not*** be significantly impacted by the proposed Project (Scenario No. 2) as this location is forecast to operate in the Year 2023 at an acceptable LOS without and with the proposed Project (Scenario No. 2) during the weekday AM and PM peak commute hours. The remaining two (2) key roadway segments are forecast to continue to operate at an acceptable LOS B or better on a daily basis with the addition of Project generated traffic in the Year 2023 traffic condition.

- ***General Plan Buildout Plus Project (Scenario No. 2) Traffic Conditions*** **–** The proposed Project (Scenario No. 2) ***will not*** significantly impact any of the six (6) key study intersections, when compared to the LOS standards and significant impact criteria specified in this report. Although the intersection of Loara Street/Lincoln Avenue is forecast to operate at unacceptable LOS E during the AM peak hour with the addition of project traffic, the Project (Scenario No. 2) is expected to add less than the allowable threshold to the ICU value. The remaining five (5) key study intersections are forecast to continue to operate at an acceptable LOS with the addition of project generated traffic to General Plan Buildout (Year 2035) traffic conditions.

  The proposed Project (Scenario No. 2) ***will not*** significantly impact any of the five (5) key roadway segments when compared to the LOS standards and significant impact criteria specified in this report. Although Roadway Segments A, B, C, D and E are forecast to operate at unacceptable LOS D and/or LOS E on a daily basis with the addition of project traffic, the proposed Project (Scenario No. 2) is expected to add less than the allowable threshold to the V/C ratio.

- ***General Plan Buildout Plus Cum. Plus Project (Scenario No. 2) Traffic Conditions*** **–** The proposed Project (Scenario No. 2) ***will not*** significantly impact any of the six (6) key study intersections, when compared to the LOS standards and significant impact criteria specified in this report. Although the intersection of Loara Street/Lincoln Avenue is forecast to operate at unacceptable LOS E during the AM peak hour with the addition of project traffic, the Project (Scenario No. 2) is expected to add less than the allowable threshold to the ICU value. The remaining five (5) key study intersections are forecast to continue to operate at an acceptable LOS with the addition of project generated traffic to General Plan Buildout (Year 2035) plus Cumulative traffic conditions.

  The proposed Project (Scenario No. 2) ***will not*** significantly impact any of the five (5) key roadway segments when compared to the LOS standards and significant impact criteria specified in this report. Although Roadway Segments A, B, C, D and E are forecast to operate at unacceptable LOS D and/or LOS E on a daily basis with the addition of project traffic, the proposed Project (Scenario No. 2) is expected to add less than the allowable threshold to the V/C ratio.

- ***State of California (Caltrans) Methodology*** – The results of the Caltrans analyses indicate that the proposed Project will not significantly impact the three (3) state-controlled study intersections under "Existing Plus Project (Scenario No. 2)", "Existing Plus Cumulative Plus Project (Scenario No. 1)", "Existing Plus Cumulative Plus Project (Scenario No. 2)", "Year 2023 Plus Project (Scenario No. 1)", "Year 2023 Plus Project (Scenario No. 2)", "General Plan Buildout Plus Project (Scenario No. 2)" and "General Plan Buildout Plus Cumulative Plus Project (Scenario No. 2)" traffic conditions. As there are no significant impacts, no traffic mitigation measures are required or recommended for the three (3) state-controlled study intersections.

- ***Site Access Evaluation*** **–** The proposed Project driveway is forecast to operate at LOS C during the AM and PM peak hours under Year 2023 plus Project (Scenario No. 1) traffic conditions. The proposed Project driveway is forecast to operate at LOS C during the AM and PM peak hours under Year 2023 plus Project (Scenario No. 2) traffic conditions. The proposed Project

driveway is forecast to operate at LOS C during the AM peak hour and at LOS F during the PM peak hour under General Plan Buildout plus Project (Scenario No. 2) traffic conditions. It should be noted that it is not uncommon that unsignalized driveways that have direct access to a major arterial, such as Lincoln Avenue, operate at a LOS E or F in the General Plan Buildout traffic condition. However, if project vehicles begin to experience long delays exiting the project site, they may make a southbound right-turn out of the site, travel to the intersection of Euclid Street/Lincoln Avenue, make a westbound u-turn and then travel east on Lincoln Avenue. As such, project access will be adequate. Motorists entering and exiting the Project site will be able to do so without undue congestion.

As part of the proposed Project, a single minimum 100-foot eastbound left-turn lane will be provided at the proposed Project Driveway on Lincoln Avenue. Based on the results of the driveway queuing analysis, adequate storage is provided for the eastbound left-turn lane at the proposed Project Driveway on Lincoln Avenue under all traffic conditions.

The on-site circulation layout of the proposed Project as illustrated in *Figure 2-2* on an overall basis is adequate. Curb return radii are generally adequate for small service/delivery (FedEx, UPS) trucks and trash trucks.

- ***Project-Specific Improvements*** – The following project design feature that will be constructed by the proposed Project is recommended to ensure that adequate ingress and egress to the project site is provided:

  - **Project Driveway at Lincoln Avenue:** Construct the project driveway and provide one inbound lane and two outbound lanes (i.e. one southbound left-turn lane and one southbound right-turn lane). Modify the median on Lincoln Avenue to provide a single minimum 100-foot eastbound left-turn lane with a 90-foot transition. The installation of these improvements is subject to the approval of the City of Anaheim.

- ***Planned Improvements*** – The following improvements are planned by the City of Anaheim and are assumed under General Plan Buildout traffic scenarios:

  - **No. 2 – Euclid Street at Lincoln Avenue:** Widen and/or restripe the eastbound and westbound approaches of Lincoln Avenue to provide an exclusive right-turn lane in each direction. Modify the existing traffic signal as needed.

  - **No. 3 – Loara Street at Lincoln Avenue:** Restripe the eastbound approach of Lincoln Avenue and convert the exclusive eastbound right-turn lane to a shared through/right-turn lane. Widen and/or restripe the westbound approach of Lincoln Avenue to provide a 3rd westbound through lane. Modify the existing traffic signal as needed.

  - **No. 4 – I-5 SB Ramps at Lincoln Avenue:** Restripe the westbound approach of Lincoln Avenue and convert the exclusive westbound right-turn lane to a shared through/right-turn lane. Modify the existing traffic signal as needed.

- **No. 6 – I-5 NB Ramps/Wilshire Avenue at Lincoln Avenue:** Restripe the southbound approach along Wilshire Avenue to provide a 2nd exclusive southbound left-turn lane. Modify the existing traffic signal as needed.

- **Roadway Segment B – Lincoln Avenue, between Euclid Street and Loara Street:** Widen and/or restripe Lincoln Avenue to provide a 3rd through lane in each direction.

- **Roadway Segment C – Lincoln Avenue, between Loara Street and I-5 SB Ramps:** Widen and/or restripe Lincoln Avenue to provide a 3rd through lane in each direction.

- ***Recommended Improvements*** **–** The results of the intersection capacity analysis and daily roadway segment analysis presented previously in Sections 8.0, 9.0, 10.0 and 11.0 shows that the proposed Project will not significantly impact the six (6) key study intersections and five (5) key roadway segments under the "Existing Plus Project (Scenario No. 2)", "Existing Plus Cumulative Plus Project (Scenario No. 1)", "Existing Plus Cumulative Plus Project (Scenario No. 2)", "Year 2023 Plus Project (Scenario No. 1)", "Year 2023 Plus Project (Scenario No. 2)", "General Plan Buildout Plus Project (Scenario No. 2)" and "General Plan Buildout Plus Cumulative Plus Project (Scenario No. 2)" traffic scenarios. Given that there are no significant project impacts, no improvements are required of the proposed project.

- ***Congestion Management Program (CMP)*** **–** The proposed Project will not have any significant traffic impacts on the Congestion Management Program Highway System.