

## **APPENDIX J**

# **TRAFFIC MEMORANDUM**

## TECHNICAL MEMORANDUM

**Date:** July 26, 2018  
**To:** Mark Peterson, AIA, STV Inc.  
**From:** John C. Merrill, PE, TE  
**Subject:** Trip Generation for Proposed Transit Security and Operations Center, City of Anaheim, CA

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We are submitting this Trip Generation Memorandum for the proposed Orange County Transportation Authority (OCTA) Transit Security and Operations Center (TSOC) located at the southwest corner of Manchester Avenue and Lincoln Avenue in the City of Anaheim, California. This letter presents the procedure for calculating proposed trips associated with the proposed development and a summary of the net increase of trips associated with the proposed project.

### I. PROJECT DESCRIPTION

The proposed project, a government office building and dispatch center, is proposed to be sited at the southwest corner of Manchester Avenue and Lincoln Avenue in the City of Anaheim, California (project site) (see **Figure 1**). The site is located in an area designated as General Commercial according to the City of Anaheim's General Plan Land Use Element, as revised on June 12, 2018, and zoned General Commercial and Industrial based on the City's Zoning Map.

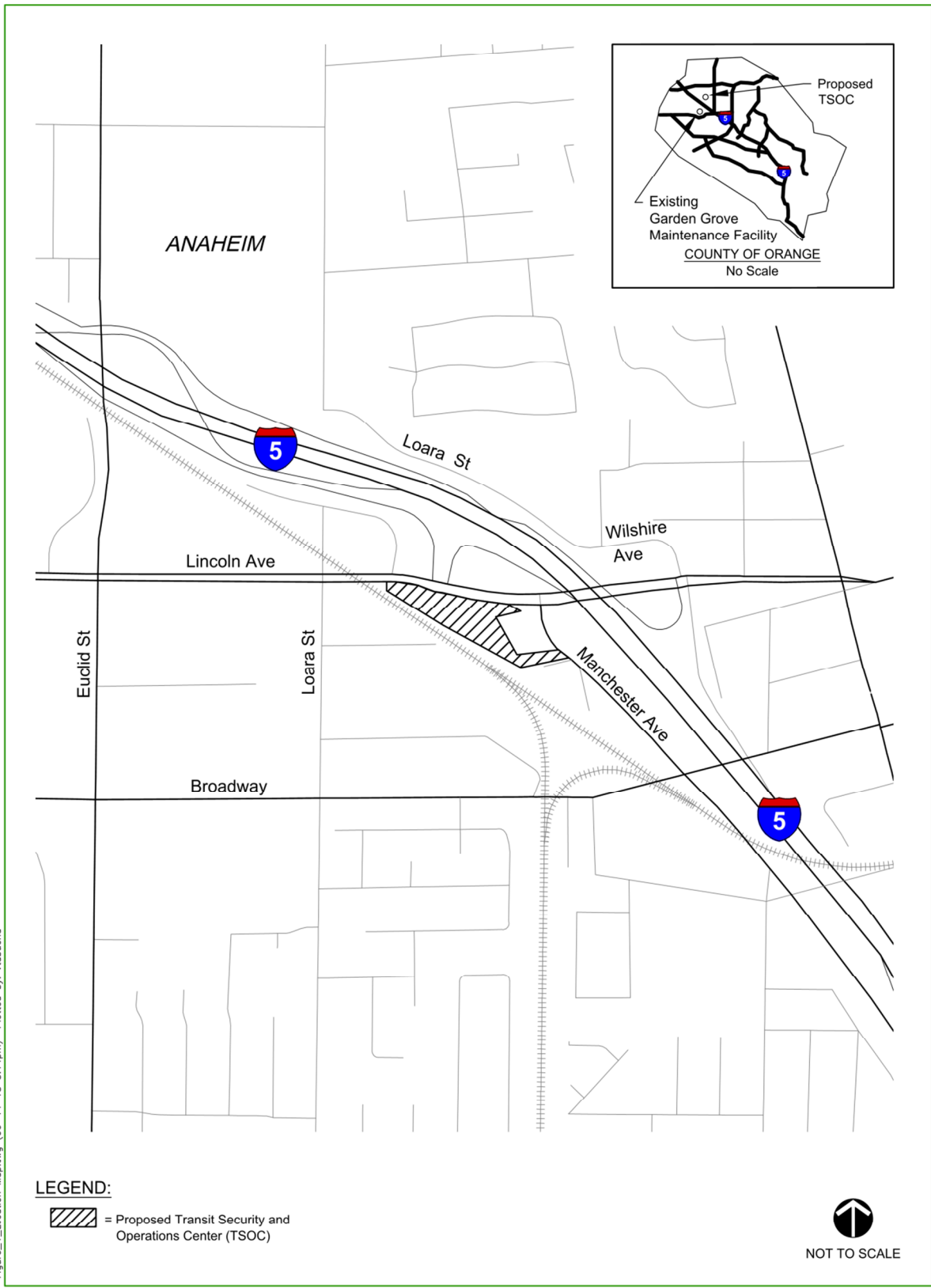
The project proposes to build a 2-story, 25,400 square foot government office building over a 3 acre lot (see **Figure 2**). The proposed project will provide three parking areas with a total of 180 spaces, including 7 accessible parking spaces<sup>1</sup>. As shown in **Figure 2**, access to the project site will be provided via Lincoln Avenue (two access driveways) and Manchester Avenue (one access driveway for exclusive use by the Orange County Sheriff's Department). The proposed TSOC building will include certain agencies relocated from the existing OCTA Garden Grove Maintenance Facility (Garden Grove facility) located at 11800 Woodbury Road in the City of Garden Grove, California. The existing OCTA facility includes an 11,270 square foot Bus Operations building and 20,000 square foot Annex building (see **Figure 3**). Most agencies currently located in the Annex building will be relocated to the proposed TSOC, which is intended to house the central operations and security staff for the OCTA bus transit system. The activities at the Bus Operations building will remain at the Garden Grove facility. The Bus Operations building and Annex building currently share one common parking lot at the facility.

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<sup>1</sup> In accordance with the *Needs Assessment Report*

## II. EXISTING TRAFFIC CONDITION

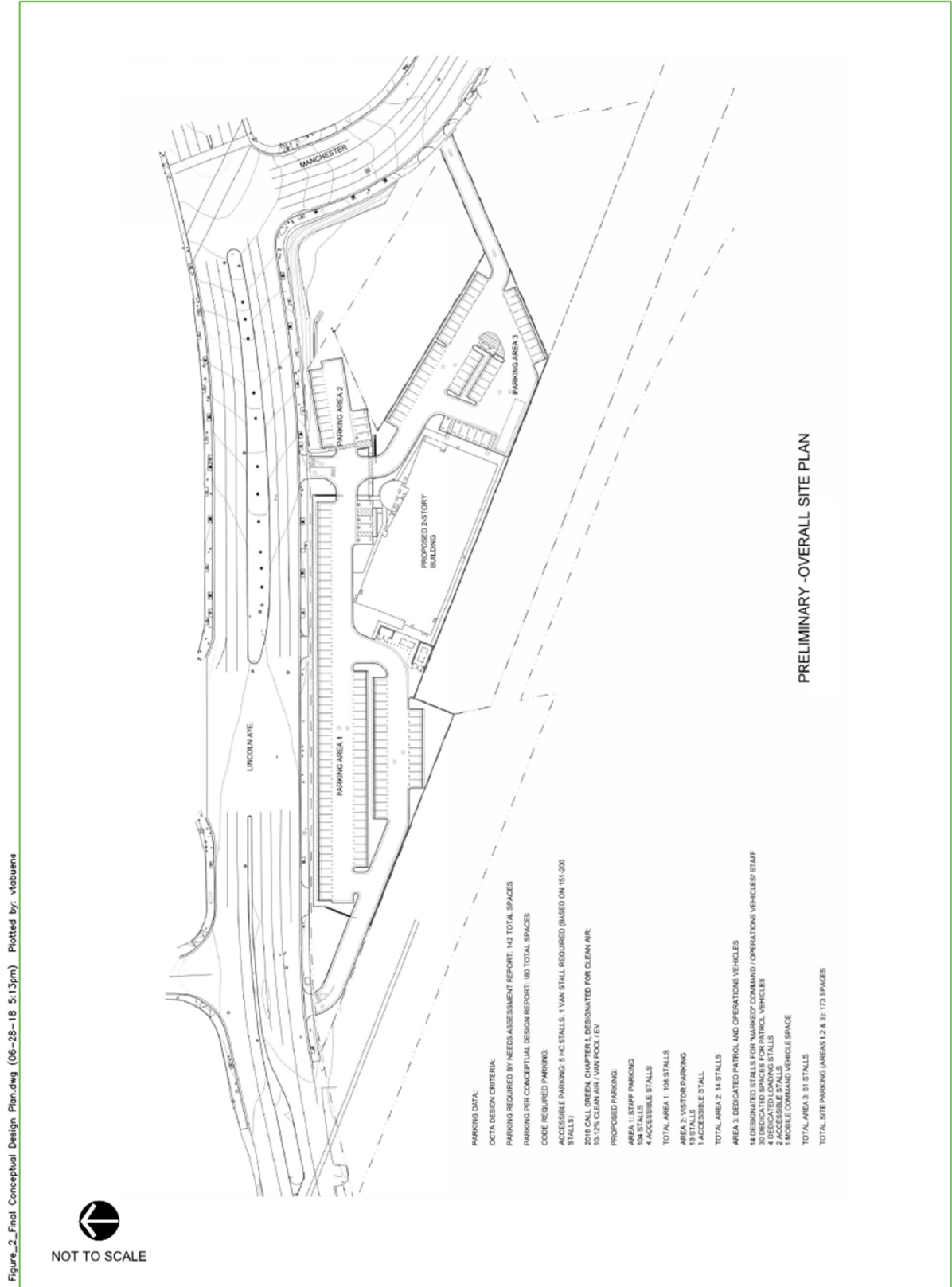
The seven study intersections near the project site and their existing lane geometry are shown in **Figure 4**. Turning movement counts were performed during weekday AM and weekday PM peak hours on March 6, 2018 (see **Figure 5**) to determine the peak hour traffic volumes at each of the study intersections. The traffic counts were performed from 7 – 9 AM and 4 – 6 PM while the local schools were in session.



Figure\_1\_Location Map.dwg (06-14-18 5:14pm) Plotted by: vtabuena

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**Figure 1: Location Map**

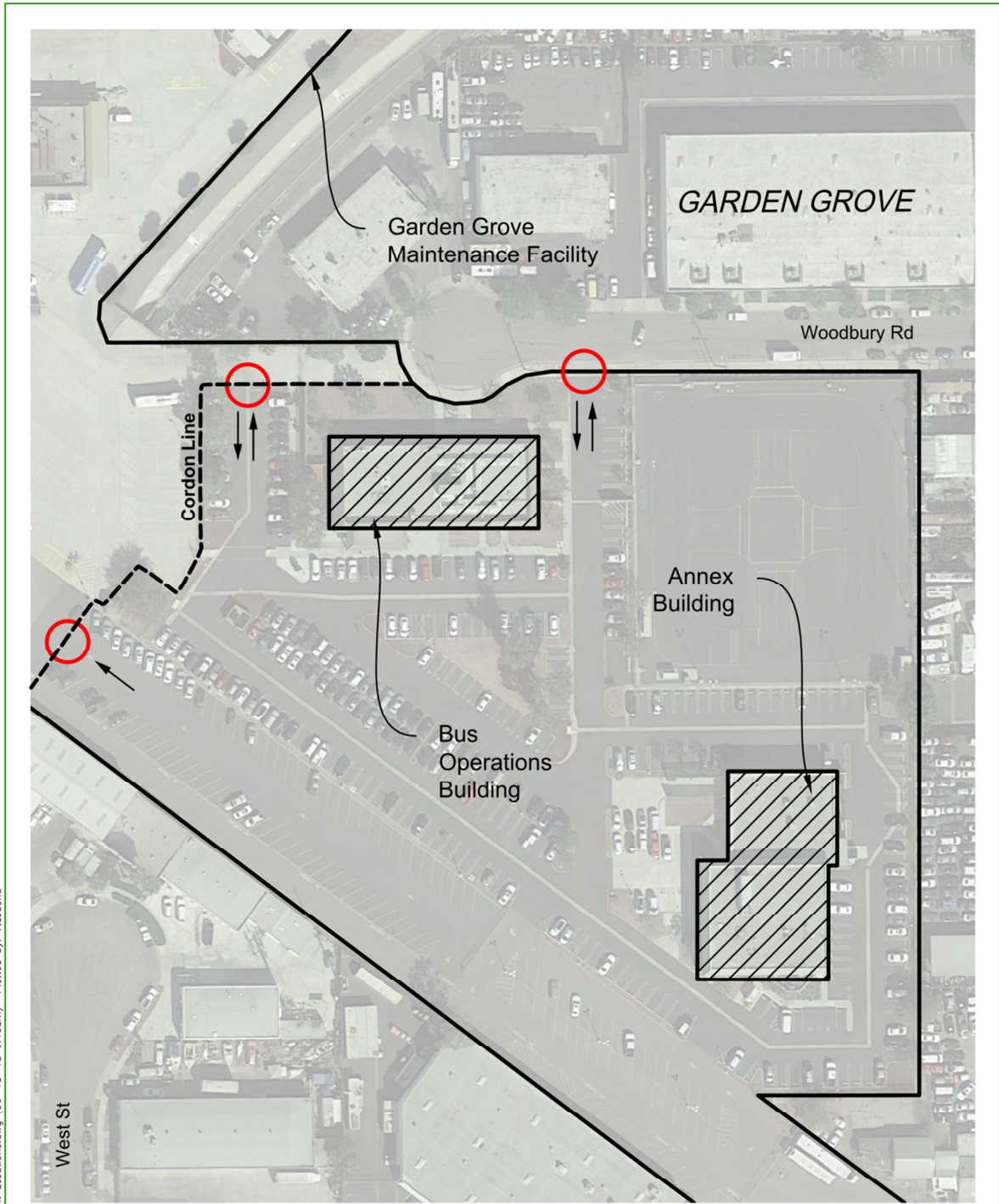


Figure\_2\_Final Conceptual Design Plan.dwg (06-28-18 5:13pm) Plotted by: viabueno



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**Figure 2: Final Conceptual Design Plan**



Figure\_5\_Proposed In-Out Count Locations.dwg (06-15-18 9:46am) Plotted by: vtobuena

**LEGEND:**

 = Driveway Count Location



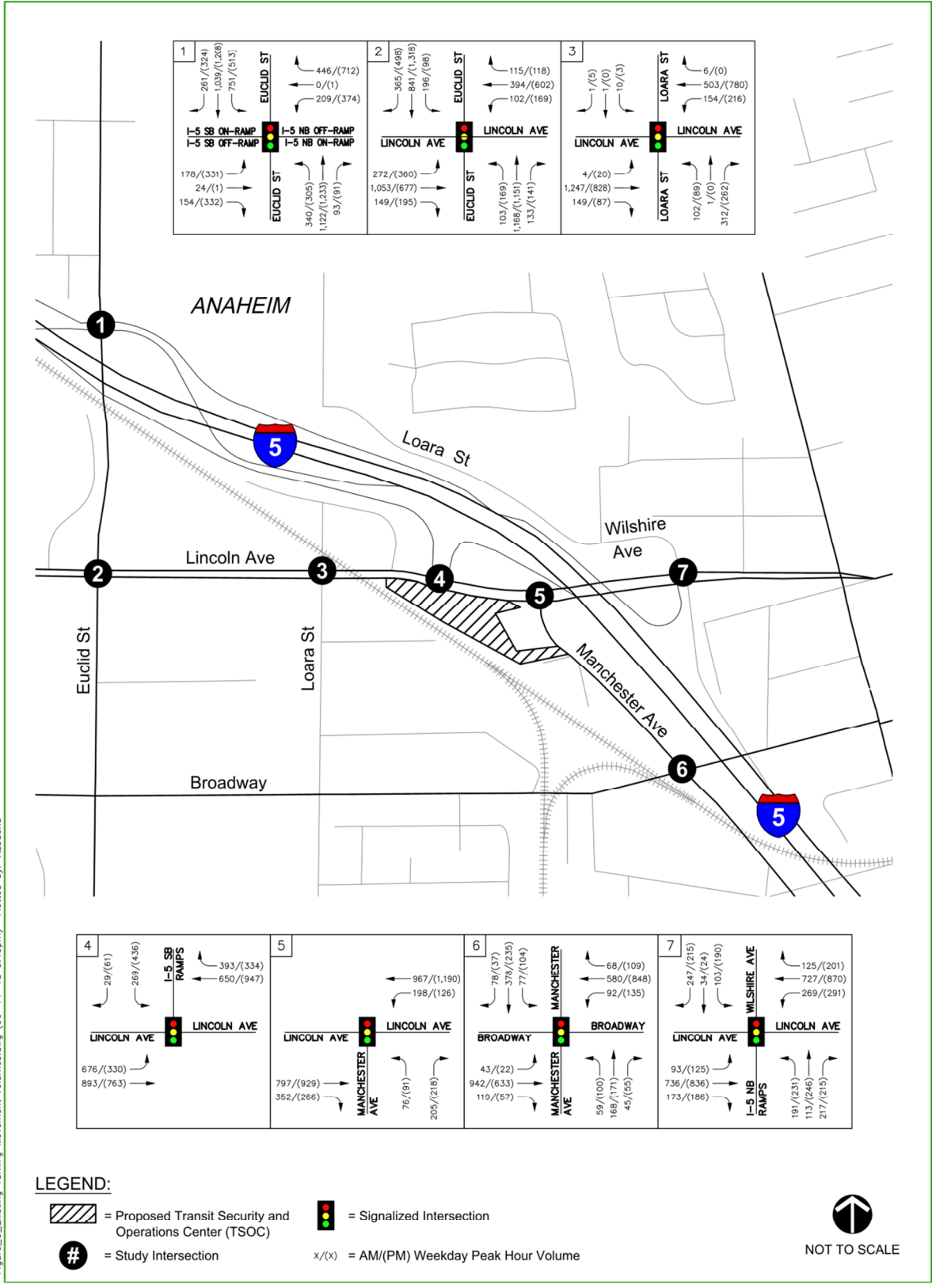
NOT TO SCALE

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**Figure 3: Existing OCTA Garden Grove Facility**



Figure\_4\_Existing Lane Geometry.dwg (07-26-18 2:27pm) Plotted by: song



Figure\_5\_Existing Turning Movement Volumes.dwg (06-14-18 5:45pm) Plotted by: vabueno



**III. PROJECT TRIP GENERATION**

Trip generation represents the amount of traffic that is produced by or attached to a development. The land use of the proposed project most closely resembled that of a Government Office Building (Land Use 730) in the ITE Trip Generation Manual, 10th Edition. However, caution was advised against using the trip generation rates published in the manual given the small sample size of only two locations surveyed. Furthermore, the two case studies that were conducted in 1970 and 2002 were both for city halls. Applying these trip generation rates for the proposed project gave project trips that, when compared to what was observable in the field, was clearly an overestimation of the traffic conditions of the existing facility.

Therefore, given the unique and specific use of the proposed project, trip generation rates for land uses published in the manual would not have been applicable. Trip generation for the proposed TSOC was calculated using counts for the existing Garden Grove Facility, as a proxy, which contains the same agencies that will move to the proposed site, using methods detailed in Chapter 9 of the Trip Generation Handbook, 3rd Edition (**Table 1**). Three, 24-hour driveway counts conducted on February 28, 2017 provided existing access and egress trips for the existing annex building and bus operations building. Trips associated with the annex building were not differentiated from trips associated with the bus operations building due to similarity in agencies and shared parking lot. The calculated trip generation for the proposed TSOC is an overestimation representing a conservative analysis. For purposes of trip estimation, gross floor area was considered to be equivalent to total floor area.

**Table 1: Calculated Average Rate of Garden Grove Facility**

Vehicle Trip Ends vs:	On a:	Total Trips	Total Floor Area (1,000 Sq. Ft.)	Average Rate
1000 Sq. Ft. Total Floor Area	Weekday	1,138	32.8	34.70
1000 Sq. Ft. Total Floor Area	Peak Hour Between 7 and 9 AM	26	32.8	0.79
1000 Sq. Ft. Total Floor Area	Peak Hour Between 4 and 6 PM	31	32.8	0.96
1000 Sq. Ft. Total Floor Area	AM Peak Hour of Generator (11:30 AM)	83	32.8	2.53
1000 Sq. Ft. Total Floor Area	PM Peak Hour of Generator (2:30 PM)	82	32.8	2.50

Source: LIN Consulting, 2018

Sq. Ft. = Square Feet

**IV. PROJECT TRIP DISTRIBUTION**

Trip distribution represents the directional orientation of traffic to and from the project site. Trip distribution is heavily influenced by the geographical location of the site, the location of residential, commercial and recreational opportunities and the proximity to the regional freeway system.

The proposed TSOC will house the following agencies from the Annex building: Central Communications, Emergency Operations Center, Transit Police Services (Sheriff), Field Operations and Information Systems, resulting in approximately 11,000 sq. ft. gross floor area. All of the agencies in the Bus Operations building will remain in the Garden Grove facility. The proposed TSOC accounts for future programmed growth of the agencies that are moving, which results in a larger gross floor area (25,400 sq. ft.). Similarly, the Annex building will have additional space for future expansion in the existing facility.

Primary access to the proposed TSOC will be via the entrance/exit driveways at Lincoln Avenue with secondary access on Manchester Avenue being primarily limited to Sheriff's vehicles. Since the Sheriff dispatch operation is expected to serve both local as well as county-wide transit locations, most trips were distributed to the freeways; however, some traffic remains on local streets due to the proximity of large transit-oriented hubs in the vicinity such as Disneyland.

Utilizing the trip generation for the Garden Grove facility provided in **Table 1**, the trip distribution pattern was calculated and presented in **Table 2**. As shown in **Table 2**, the proposed TSOC would generate approximately 882 trips per day.

**Table 2: Proposed TSOC Project Trip Generation**

Vehicle Trip Ends vs:	On a:	Quantity	Access/Egress % / %	AM Peak Hour		PM Peak Hour		Weekday Daily	
				Access	Egress	Access	Egress	Access	Egress
1000 Sq. Ft. Gross Floor Area	Weekday	25,400 Sq. Ft. Gross Floor Area	50% / 50%	---	---	---	---	441	441
1000 Sq. Ft. Gross Floor Area	Peak Hour Between 7 and 9 AM	25,400 Sq. Ft. Gross Floor Area	75% / 25%	16	5	---	---	---	---
1000 Sq. Ft. Gross Floor Area	Peak Hour Between 4 and 6 PM	25,400 Sq. Ft. Gross Floor Area	25% / 75%	---	---	6	19	---	---
1000 Sq. Ft. Gross Floor Area	AM Peak Hour of Generator (11:30 AM)	25,400 Sq. Ft. Gross Floor Area	55% / 45%	36	29	---	---	---	---
1000 Sq. Ft. Gross Floor Area	PM Peak Hour of Generator (2:30 PM)	25,400 Sq. Ft. Gross Floor Area	43% / 57%	---	---	28	36	---	---

Source: LIN Consulting, 2018

An existing auto service center is located at the project site. Trip generation was calculated for the existing land use using Automobile Parts and Service Center (Land Use 943) in the ITE Trip Generation Manual, 10th Edition (**Table 3**). For this project trip generation analysis, the trips calculated from the existing land use were not factored into the calculated trips for the proposed project given their nominal nature (170 trips per day). The project trip generation provided in **Table 2** is considered more conservative for use in this analysis.

**Table 3: Trip Generation of Existing Uses on Project Site**

Vehicle Trip Ends vs:	On a:	Quantity	Access/Egress % / %	AM Peak Hour		PM Peak Hour		Weekday Daily	
				Access	Egress	Access	Egress	Access	Egress
1000 Sq. Ft. Gross Floor Area	Weekday	10,500 Sq. Ft. Gross Floor Area	50% / 50%	---	---	---	---	85	85
1000 Sq. Ft. Gross Floor Area	Peak Hour Between 7 and 9 AM	10,500 Sq. Ft. Gross Floor Area	75% / 25%	15	6	---	---	---	---
1000 Sq. Ft. Gross Floor Area	Peak Hour Between 4 and 6 PM	10,500 Sq. Ft. Gross Floor Area	25% / 75%	---	---	9	14	---	---
1000 Sq. Ft. Gross Floor Area	AM Peak Hour of Generator (11:30 AM)	10,500 Sq. Ft. Gross Floor Area	55% / 45%	16	13	---	---	---	---
1000 Sq. Ft. Gross Floor Area	PM Peak Hour of Generator (2:30 PM)	10,500 Sq. Ft. Gross Floor Area	43% / 57%	---	---	12	15	---	---

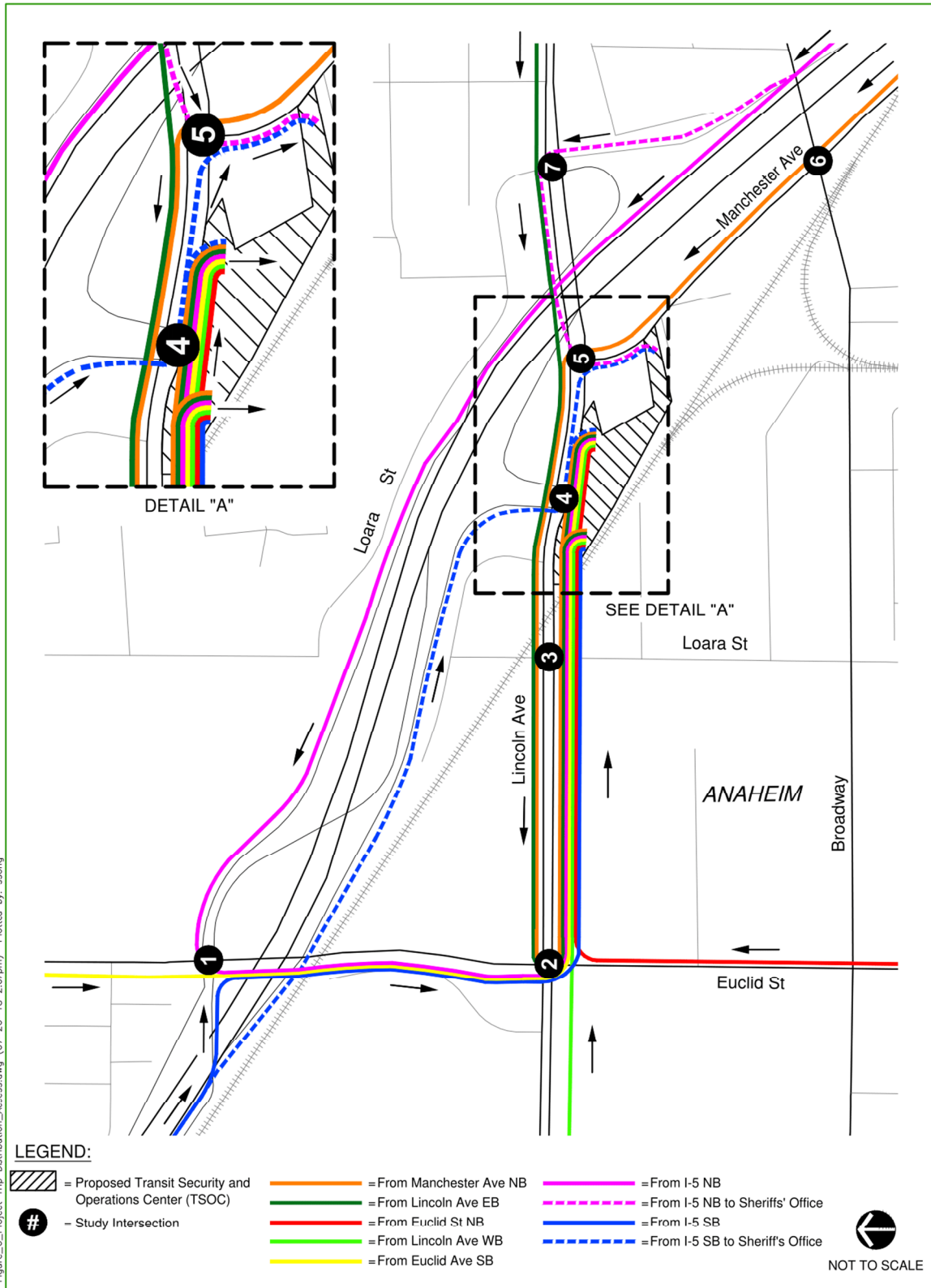
Source: LIN Consulting, 2018

**V. PROJECT TRAFFIC CIRCULATION AND TRIP ASSIGNMENT**

The assignment of traffic from the site to the adjoining roadway system have been based upon the site’s trip generation, trip distribution, and circulation to and from arterial highway and the local street systems.

Most trips entering the TSOC will have, at some point, utilized Euclid Street, Lincoln Avenue, Manchester Avenue, or Interstate 5 in order to gain access to the two parking lot driveways on Lincoln Avenue or to the exclusive Orange County Sheriff’s Department driveway on Manchester Avenue. Trips from Manchester Avenue and westbound Lincoln Avenue will access one of the driveways on Lincoln Avenue via a U-turn on Euclid Street and eastbound Lincoln Avenue. Trips to northbound and southbound Euclid Avenue, westbound Lincoln Avenue, and Interstate 5 South will egress from one of the driveways on Lincoln Avenue via a U-turn on Manchester Avenue and Lincoln Avenue. The parking lot driveway on Manchester Avenue is dedicated to Sheriff’s patrol and operations vehicles only. These vehicles will access the driveway from the Interstate 5 freeway ramps on Lincoln Avenue and will egress from the driveway to the Interstate 5 southbound ramps via a U-turn on Manchester Avenue and Lincoln Avenue and to the Interstate 5 northbound ramps via eastbound Lincoln Avenue.

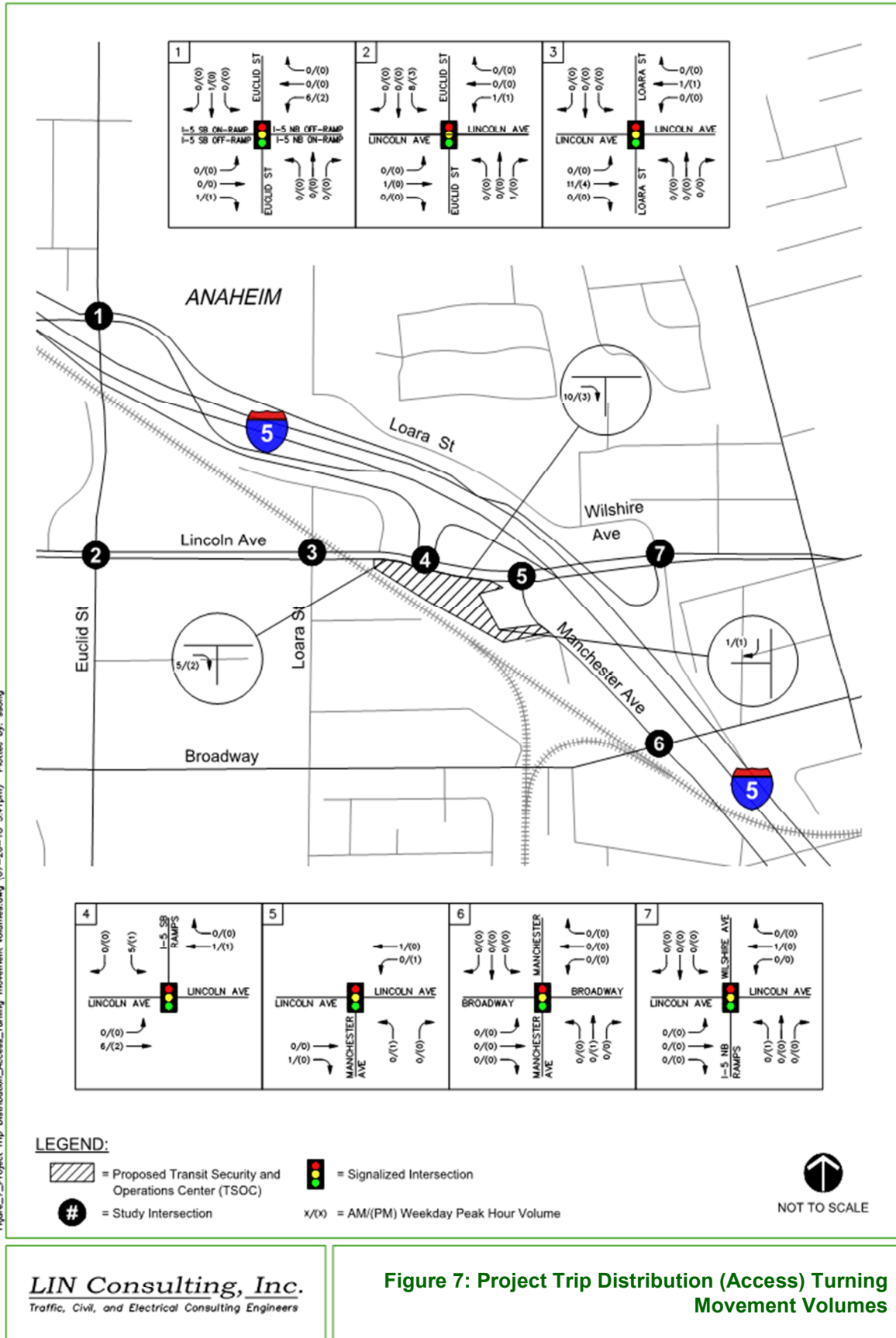
Based on this identified traffic circulation pattern and calculated access and egress trips for the AM peak hour between 7 AM and 9 AM and PM peak hour between 4 PM and 6 PM, the project related weekday AM and weekday PM peak hour turning movement volumes and project traffic circulation were calculated. **Figure 6** and **Figure 7** show the trip distribution and turning movement volumes for access, while **Figure 8** and **Figure 9** show the trip distribution and turning movement volumes for egress.



Figure\_6\_Project\_Trip\_Distribution\_Access.dwg (07-26-18 2:07pm) Plotted by: ssong

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**Figure 6: Project Trip Distribution (Access)**



Figure\_7\_Project Trip Distribution\_Access\_Turning movement volumes.dwg (07-26-18 5:41pm) Plotted by: msong

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**Figure 7: Project Trip Distribution (Access) Turning Movement Volumes**

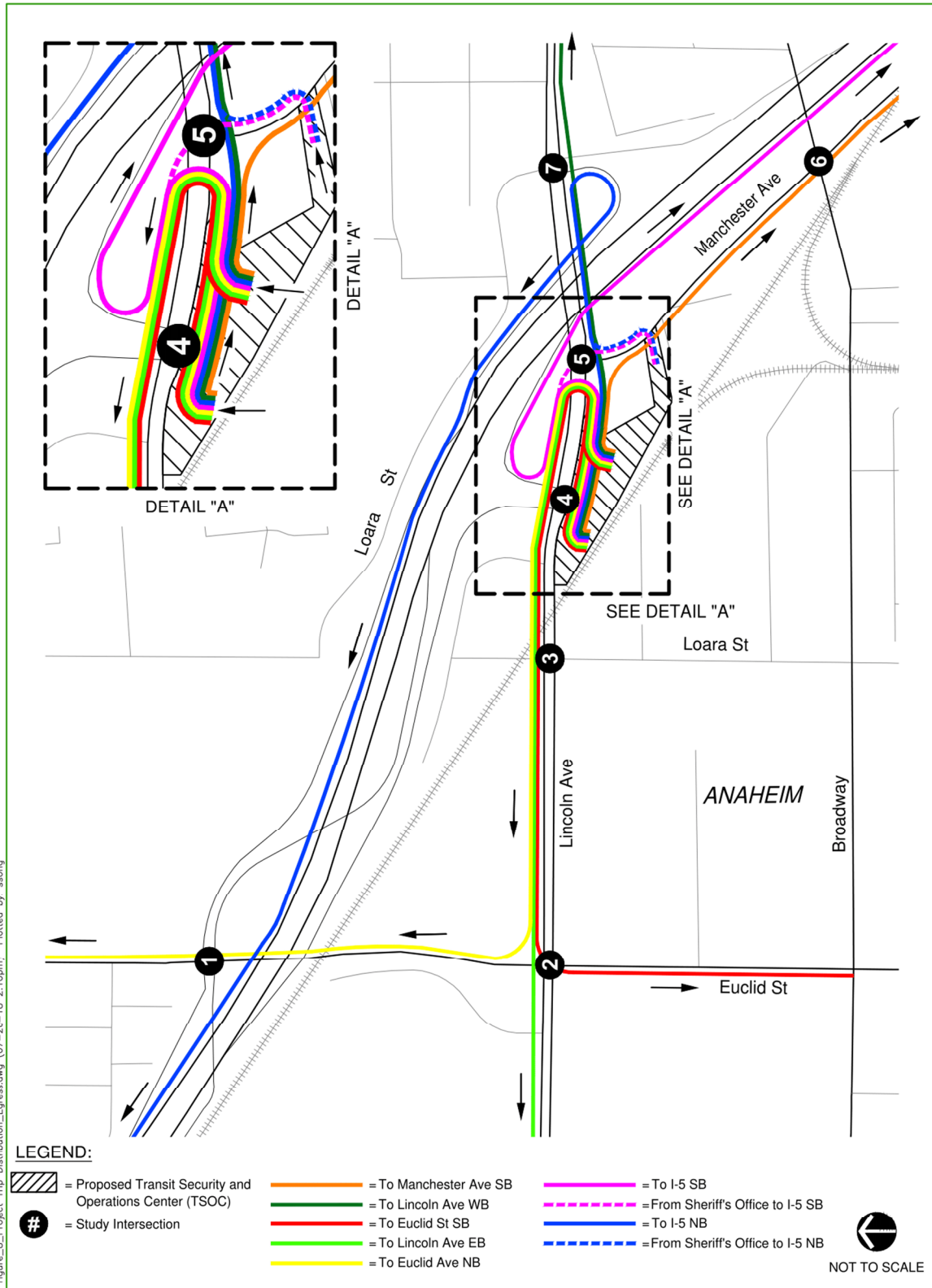
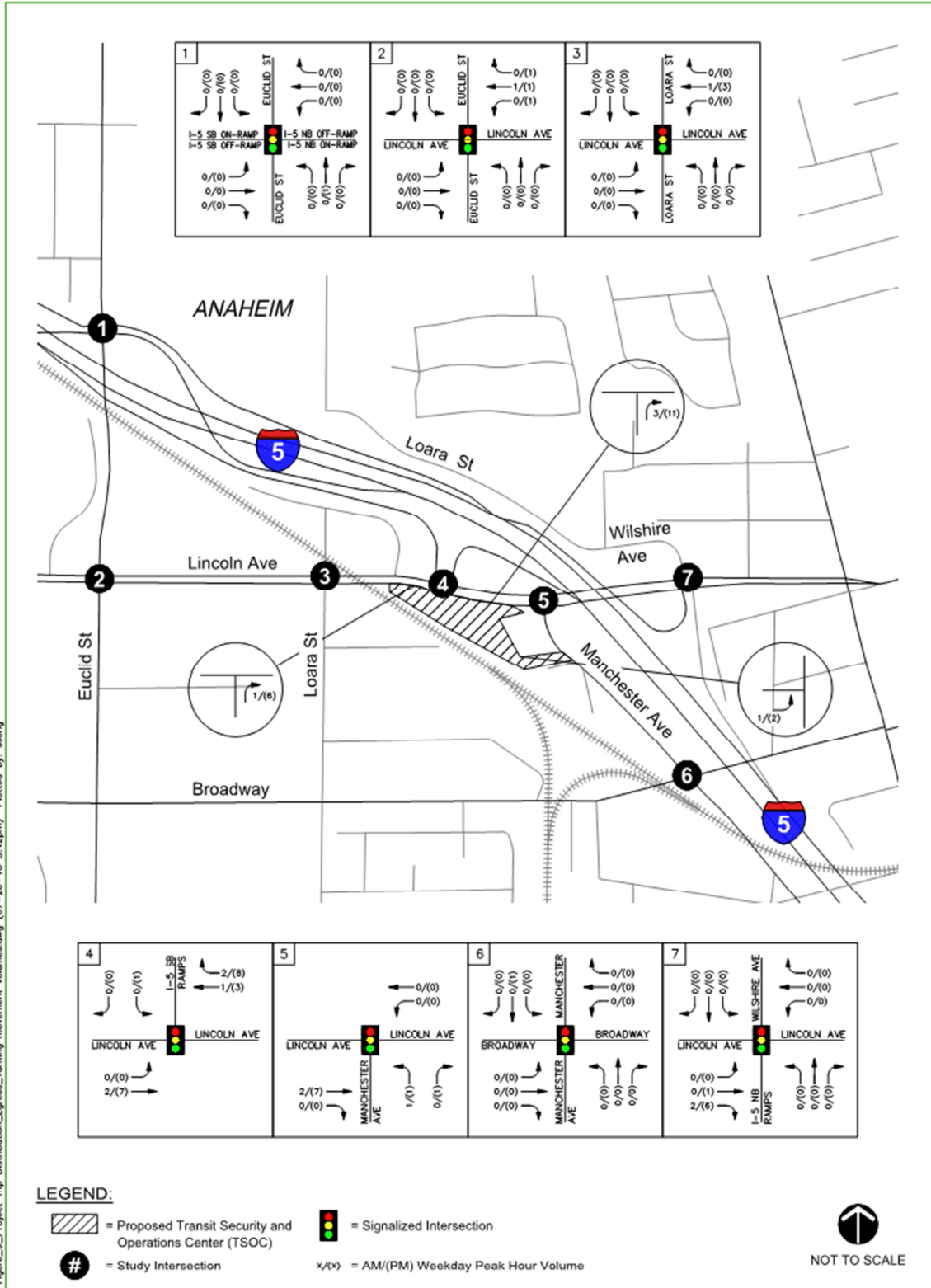


Figure 8\_Project\_Trip\_Distribution\_Egress.dwg (07-26-18 2:10pm) Plotted by: asong

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**Figure 8: Project Trip Distribution (Egress)**



Figure\_9\_Project\_Trip\_Distribution\_Egress\_Turning\_movement\_volumes.dwg (07-26-18 5:42pm) Plotted by: srong

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**Figure 9: Project Trip Distribution (Egress) Turning Movement Volumes**

Please feel free to contact our office if we could be of further assistance or if there are any inquiries not previously addressed. We look forward to working with you.

Sincerely,

A handwritten signature in blue ink, appearing to read 'John C. Merrill', with a stylized flourish extending to the right.

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