URBAN | CROSSROADS

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Reference Number	Agency	Date
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LIST OF ABBREVIATED TERMS

(1)	Reference
ADT	Average Daily Traffic
CA MUTCD	California Manual on Uniform Traffic Control Devices
Caltrans	California Department of Transportation
CMP	Congestion Management Program
DIF	Development Impact Fee
HCM	Highway Capacity Manual
ICU	Intersection Capacity Utilization
ITE	Institute of Transportation Engineers
LOS	Level of Service
OCTA	Orange County Transportation Authority
PHF	Peak Hour Factor
Project	Euclid & Heil
TA	Traffic Analysis
V/C	Volume-to-Capacity
Vphpl	Vehicles per hour per lane

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1 SUMMARY OF FINDINGS

This report presents the results of the Traffic Analysis (TA) for the Euclid & Heil (Project), which is located on the northeast corner of Euclid Street and Heil Avenue in the City of Fountain Valley, as shown in Exhibit 1-1.

The purpose of this TA is to evaluate the potential circulation system deficiencies that may result when the Project is developed and where circulation system (intersection and/or roadway) improvements are needed to maintain acceptable levels of service (LOS) consistent with the City's General Plan LOS goals and policies, which are described in the City of Fountain Valley's Transportation Impact Assessment Guidelines for Land Use Projects in CEQA and for General Plan Consistency (dated June 2020) (City Guidelines). (1) The scope of analysis included in this evaluation is based on City Guidelines and consultation with City of Fountain Valley staff during the TA scoping process. The TA Scoping Agreement is included in Appendix 1.1 and has been reviewed and approved by the City of Fountain Valley.

EXHIBIT 1-1 : LOCATION MAP

1.1 PROJECT OVERVIEW

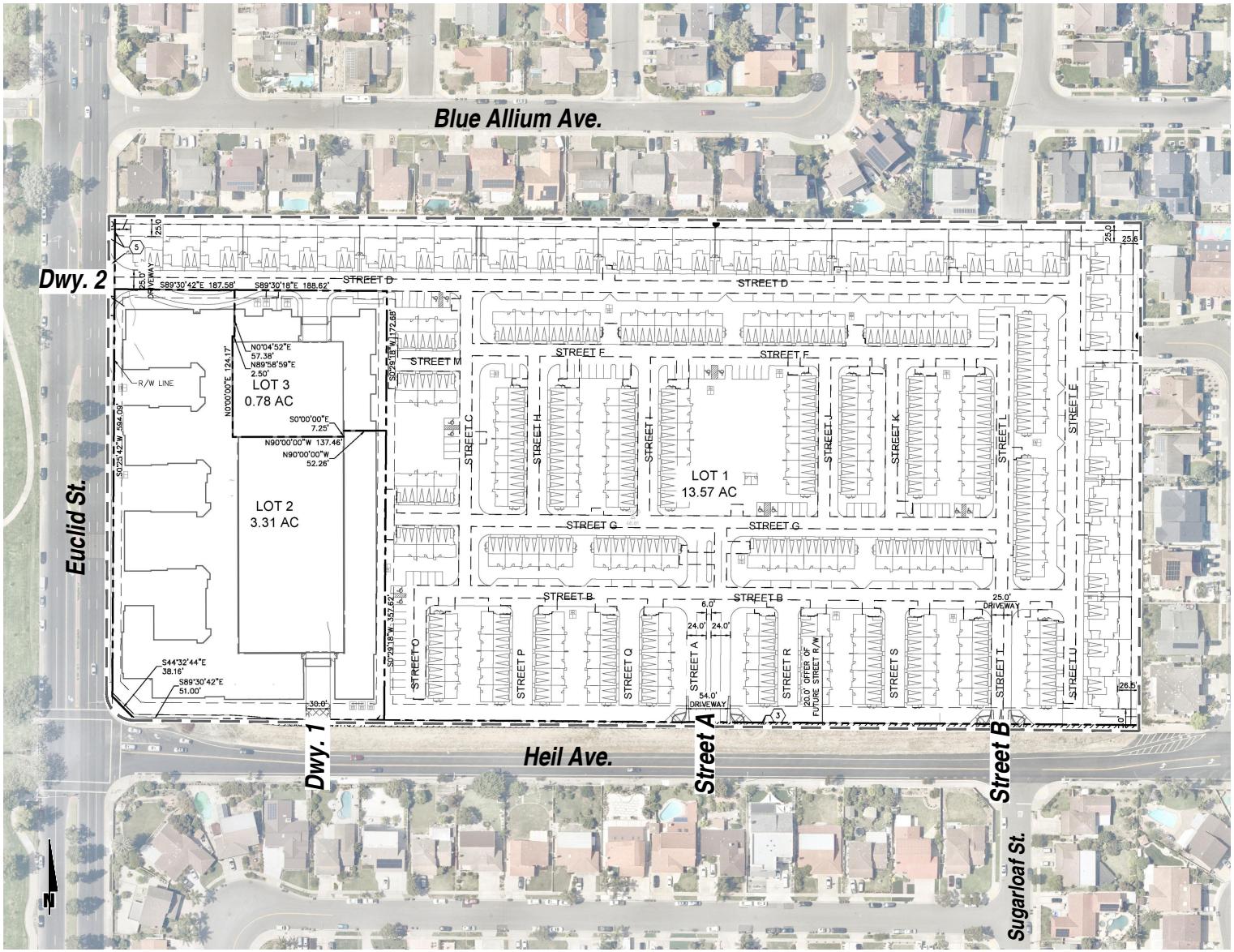
1.1.1 PROJECT BACKGROUND AND DESCRIPTION

The Project consists of the development of 36 for-sale 2-story triplexes, 183 for-sale 3-story townhomes, 304 market-rate multifamily apartment units, and 83 multifamily affordable senior units. A preliminary site plan for the proposed Project is shown in Exhibit 1-2. Access to the Project site will be accommodated via Heil Avenue (one driveway to the apartment parking structure, Driveway 1), and via Street A and Street T (for the for-sale component). Note Driveway 1 would be utilized by primarily the market-rate apartments but could also be utilized to access the affordable senior component of the Project. Another secondary access (Driveway 2) is also proposed on Euclid Street that would be accessible by all proposed product-types. Driveway 2 will be restricted to right-in/right-out access only. The Project is anticipated to have an Opening Year of 2026.

1.1.2 TRIP GENERATION

In order to develop traffic estimates for the proposed Project, trip-generation statistics as published by the Institute of Transportation Engineers (ITE) in their Trip Generation Manual (11th Edition, 2021) for the Single Family Attached (ITE Land Use Code 215), Multifamily (Mid-Rise) Residential (ITE Land Use Code 221), and Senior Housing – Attached (ITE Land Use Code 252) land use categories have been used. (2) The Project is estimated to generate 3,228 two-way trips per day with 236 AM peak hour trips and 264 PM peak hour trips. The assumptions and methods used to estimate the Project's trip generation characteristics are discussed in greater detail in Section 4.1 *Project Trip Generation* of this report.

EXHIBIT 1-2 : PRELIMINARY SITE PLAN



1.2 ANALYSIS SCENARIOS

For the purposes of this TA, peak hour intersection operations have been evaluated for each of the following traffic conditions:

- Existing (2024) Conditions
- Opening Year (2026) Without Project Conditions
- Opening Year (2026) With Project Conditions

All study area intersections have been evaluated using the Intersection Capacity Utilization (ICU) methodology for signalized intersections using the Traffix software package and Highway Capacity Manual (HCM) 7th Edition analysis methodology for all unsignalized intersections using the latest Synchro 12 analysis software package.

1.2.1 EXISTING (2024) CONDITIONS

Information for Existing (2024) conditions is disclosed to represent the current traffic conditions as they existed at the time this report was prepared.

1.2.2 OPENING YEAR (2026) CONDITIONS

Consistent with City Guidelines, Opening Year (2026) Without and With Project analysis scenarios are included to assess potential opening year cumulative circulation system deficiencies for each development phase of the Project. To account for background traffic growth, traffic associated with other known cumulative development projects in conjunction with an ambient growth factor of 1% per year, compounded annually, has been included for Opening Year (2026) traffic conditions only. Consistent with City Guidelines, a list of known and reasonably foreseeable cumulative development projects has been compiled based on information provided by the City of Fountain Valley Planning Department and information gathered by Urban Crossroads.

Opening Year (2026) conditions analysis scenarios have been included to determine if improvements funded through the City of Fountain Valley Development Impact Fee (DIF) program can accommodate the near-term cumulative traffic at the target LOS identified in the City of Fountain Valley (lead agency) General Plan. (3) The City's DIF program is discussed in more detail in Section 6 *Local Funding Mechanisms*.

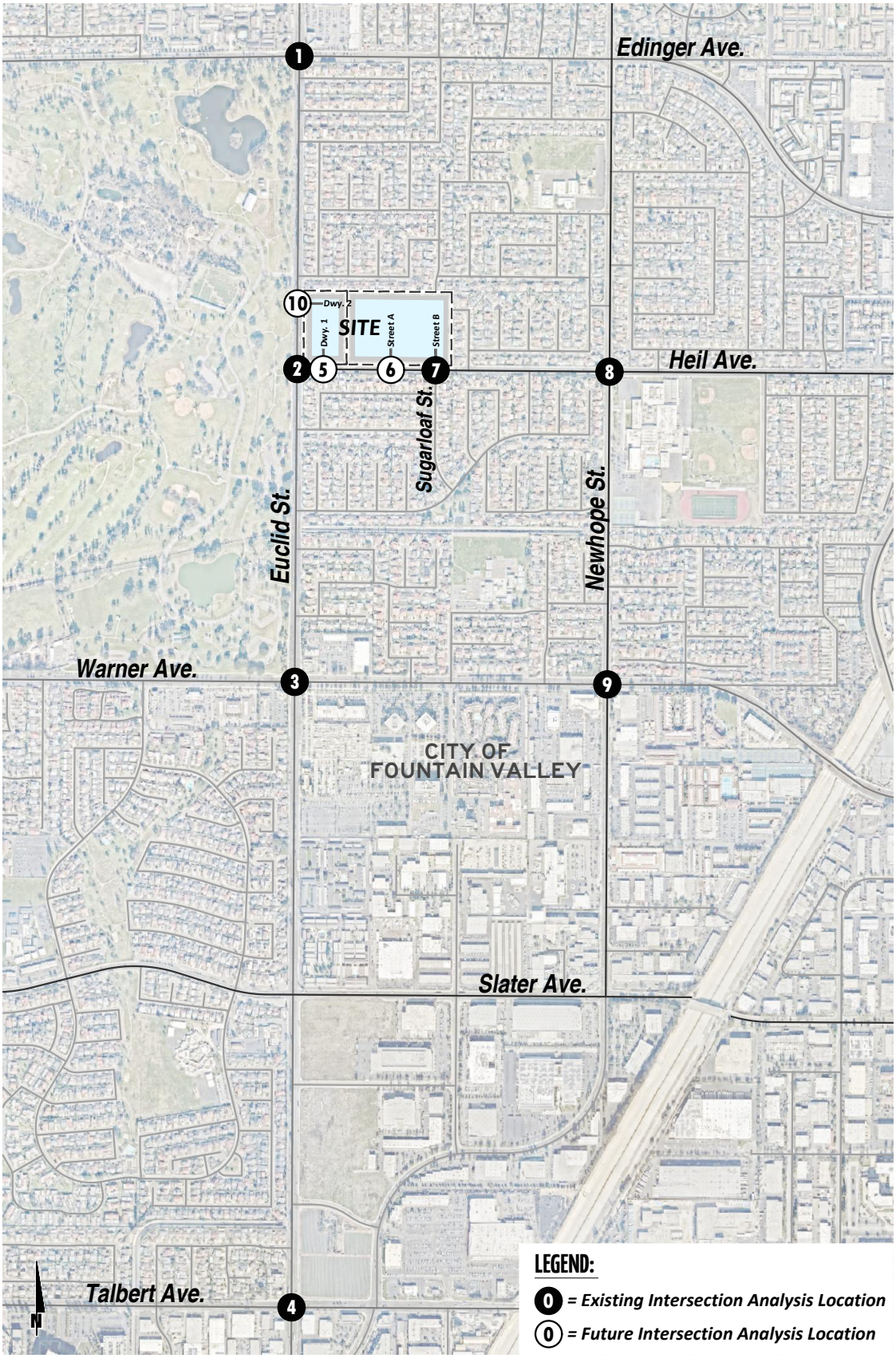
1.3 STUDY AREA

For the purposes of this TA, a total of 10 study area intersections were selected for evaluation based on City Guidelines and consultation with City staff. The study area intersections are shown graphically in Exhibit 1-3 and also listed in Table 1-1.

TABLE 1-1: INTERSECTION ANALYSIS LOCATIONS

ID	Intersection Location	Juridiction
1	Euclid St. & Edinger Ave.	Fountain Valley
2	Euclid St. & Heil Ave.	Fountain Valley
3	Euclid St. & Warner Ave.	Fountain Valley
4	Euclid St. & Talbert Ave.	Fountain Valley
5	Driveway 1 & Heil Ave.	Fountain Valley
6	Street A & Heil Ave.	Fountain Valley
7	Street B / Sugarloaf St. & Heil Ave.	Fountain Valley
8	Newhope St. & Heil Ave.	Fountain Valley
9	Newhope St. & Warner Ave.	Fountain Valley
10	Euclid St. & Driveway 2	Fountain Valley

EXHIBIT 1-3 : STUDY AREA



1.4 GENERAL PLAN CONSISTENCY REQUIREMENTS FOR INTERSECTIONS

This section provides a brief overview of the intersection and roadway segment level of service (LOS) deficiencies identified in this report. The LOS standards used for this assessment are consistent with those identified in the City of Fountain Valley General Plan. (3) Section 2 *Methodologies* provides a detailed explanation on the methodologies used for this assessment, while Section 3 *Area Conditions* and Section 5 *Opening Year (2026) Traffic Conditions* include the operations analysis results for each analysis scenario. Additionally, a summary of the peak hour LOS analysis results is presented in Exhibit 1-4.

1.4.1 EXISTING (2024) CONDITIONS

The assessment of Existing (2024) traffic conditions is performed to establish a baseline of current traffic operations and LOS operations. The following intersection is currently operating at a deficient LOS (i.e., below the City's adopted General Plan thresholds):

- Newhope St. & Warner Av. (#9) – LOS E PM peak hour only

1.4.2 OPENING YEAR (2026) CONDITIONS

An assessment of Opening Year (2026) traffic conditions is performed to identify whether the traffic contribution associated with both the proposed Project and that of other reasonably foreseeable future development projects in the area have the potential to cause intersection LOS to fall below the City's adopted thresholds. The Project's contribution to these forecasted LOS deficiencies is typically addressed through fee payments to an established fee program. The results of the LOS assessments for cumulative traffic conditions are also summarized in Exhibit 1-4, while Section 5 *Opening Year (2026) Traffic Conditions* of the report provide a more detailed list of the forecast LOS deficiencies.

EXHIBIT 1-4 : SUMMARY OF INTERSECTION LOS

		Existing (2024)	2026 Without Project	2026 With Project
1	Euclid St. & Edinger Ave.	●	●	●
2	Euclid St. & Heil Ave.	●	●	●
3	Euclid St. & Warner Ave.	●	●	●
4	Euclid St. & Talbert Ave.	●	●	●
5	Driveway 1 & Heil Ave.	N/A	N/A	●
6	Street A & Heil Ave.	N/A	N/A	●
7	Street B / Sugarloaf St. & Heil Ave.	●	●	●
8	Newhope St. & Heil Ave.	●	●	●
9	Newhope St. & Warner Ave.	◐	◐	◐
10	Euclid St. & Driveway 2	N/A	N/A	●

LEGEND:

◖ = *AM Peak Hour*
◗ = *PM Peak Hour*
● = *A-D*
● = *E*
● = *F*

1.5 RECOMMENDATIONS

1.5.1 OFF-SITE CIRCULATION RECOMMENDATIONS

Based on the results of this TA, intersection improvement recommendations are not necessary to maintain City General Plan LOS standards at the off-site study area intersections.

1.5.2 ON-SITE CIRCULATION RECOMMENDATIONS

The following recommendations, based on the improvements needed to accommodate site access and maintain acceptable peak hour LOS at site access and on-site intersections, are described below and shown on the conceptual striping plan in Exhibit 1-5. No site adjacent queues are anticipated with the proposed improvements.

Recommendation 1 **–** Euclid St. & Heil Av. (#2) – The following improvements are recommended along the Project's frontage:

- Restripe the westbound approach to accommodate dual left turn lanes and right turn lane (the left turn lanes are trap lanes from the two westbound through lanes along the Project's frontage). The westbound right turn storage length is approximately 122-feet.
- Accommodate two receiving eastbound through lanes.
- Roadway section will include a raised median.
- Modify the existing median to accommodate a 270-foot southbound left turn pocket.
- A signal modification will be required at the intersection of Euclid Street and Heil Avenue to accommodate the new lane configuration.

The following are a list of safety countermeasure recommendations for the intersection of Euclid Street at Heil Avenue:

- Extend existing red curb by 50-65 feet on the west side of Euclid Street, north of the crosswalk.
- Replace all burned-out LED vehicle head indications.
- Relocate signal indications on southwest corner.
- Replace existing "One-Way" sign on west curb with "two-way arrow" sign.
- Replace "No U-Turn" sign on mast arm with "No left/No U-Turn" sign for northbound approach.
- Relocate median warning sign.

Recommendation 2 **–** Driveway 1 & Heil Av. (#5) – The following improvements are necessary to accommodate site access:

- Install a stop control on the southbound approach and accommodate a southbound right turn lane. Driveway access will be restricted to right-in/right-out/left-in access only.
- Accommodate an eastbound left turn pocket with a storage length of approximately 99-feet and a 90-foot transition.

Recommendation 3 – Street A & Heil Av. (#6) – The following improvements are necessary to accommodate site access:

- Install a stop control on the southbound approach and a shared left-through-right turn lane. Driveway will allow for full turning movements (no turning movement restrictions).
- Accommodate an eastbound left turn pocket with a minimum of 100 feet of storage.

Recommendation 4 – Street B/Sugarloaf St. & Heil Av. (#7) – The following improvements are necessary to accommodate site access:

- Install a stop control on the southbound approach and a shared left-through-right turn lane. Driveway will allow for full turning movements (no turning movement restrictions).
- Accommodate an eastbound left turn pocket with a minimum of 100 feet of storage.
- Improvements at Street B will also include striping for a 50-foot westbound left-turn into the existing residential neighborhood off of Sugarloaf Street.

Recommendation 5 – Euclid St. & Driveway 2 (#10) – The following improvements are necessary to accommodate site access:

- Install a stop control on the westbound approach and accommodate a westbound right turn lane. Driveway access will be restricted to right-in/right-out access only.
- The highest volume of northbound right turning (inbound) vehicles occurs during the PM peak hour with 29 vehicles. This is approximately one vehicle every two minutes. In light of the low volume and the acceptable peak hour operations without a dedicated right turn pocket, no northbound deceleration/right turn pocket has been recommended. The Project will however include a 35-foot curb return on the southeast corner of the driveway in order to improve the right-turn movement. Lastly, it should be noted that there are no other similar instances, such as at private driveways or public streets, along the Euclid Street corridor that have a dedicated right-turn pocket.

Recommendation 6 – Euclid Street is a north-south oriented roadway located on the Project's western boundary. Project to implement applicable sidewalk and landscaping improvements along Euclid Street from the northerly Project boundary to Heil Avenue consistent with the City's standards.

Recommendation 7 – Heil Avenue is an east-west oriented roadway located on the Project's southern boundary. Project to construct Heil Avenue at its ultimate half-section width as a Secondary Arterial (80-foot right-of-way) between Euclid Street and the Project's eastern boundary consistent with the City's standards. Improvements will include applicable curb-and-gutter, sidewalk, and landscaping improvements. The ultimate cross-section will include two through lanes in each direction of travel separated by a raised/curbed median and a 5-foot bike lane on the north and south sides of Heil Avenue (see Exhibit 1-5).

It should be noted that trash collection would take access from Euclid Street and should occur on-site. No trash collection shall be administered within the public right-of-way.

EXHIBIT 1-5 : HEIL AVENUE CONCEPTUAL STRIPING PLAN (SHEET 1 OF 5)

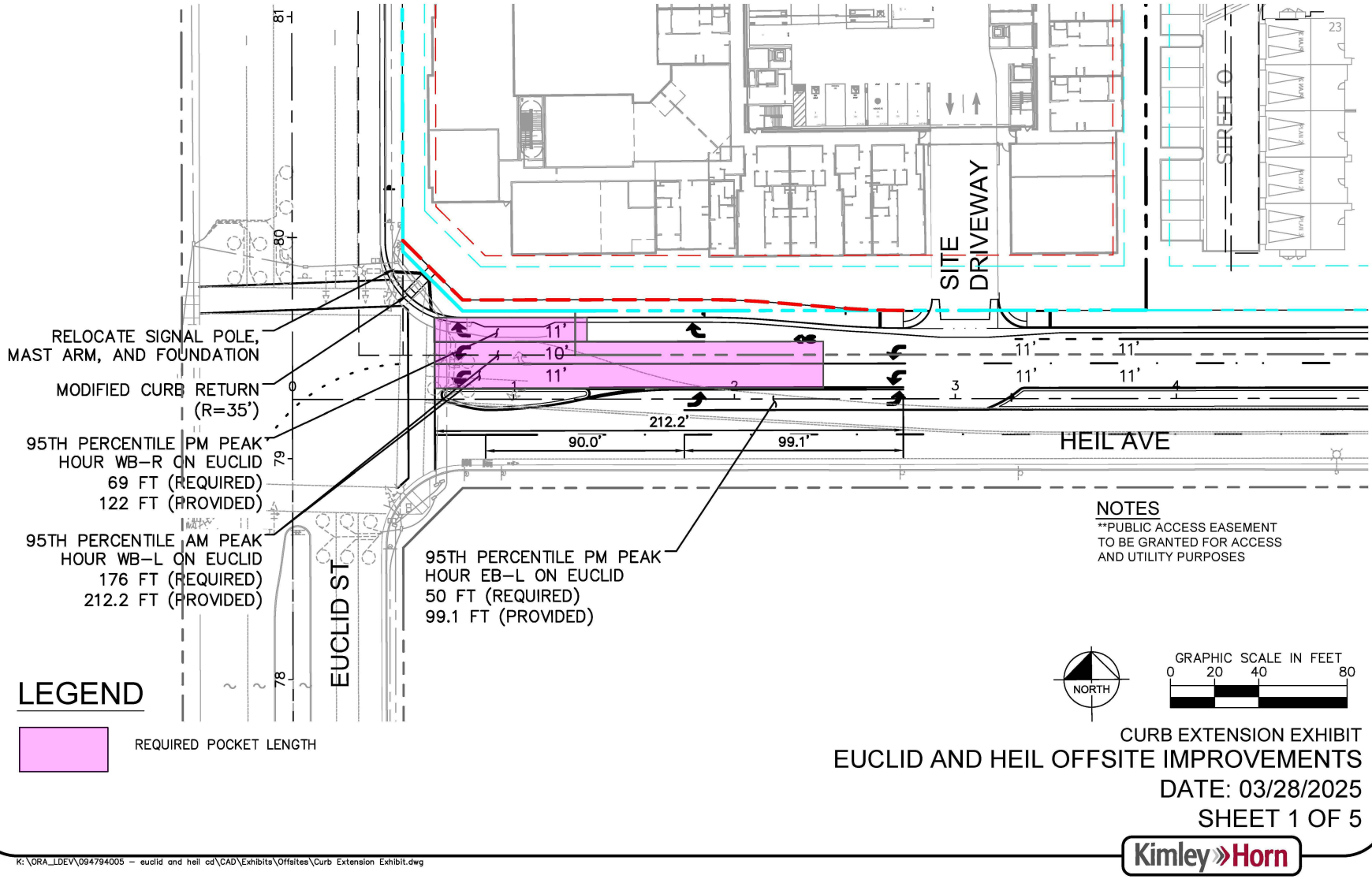


EXHIBIT 1-5 : HEIL AVENUE CONCEPTUAL STRIPING PLAN (SHEET 2 OF 5)

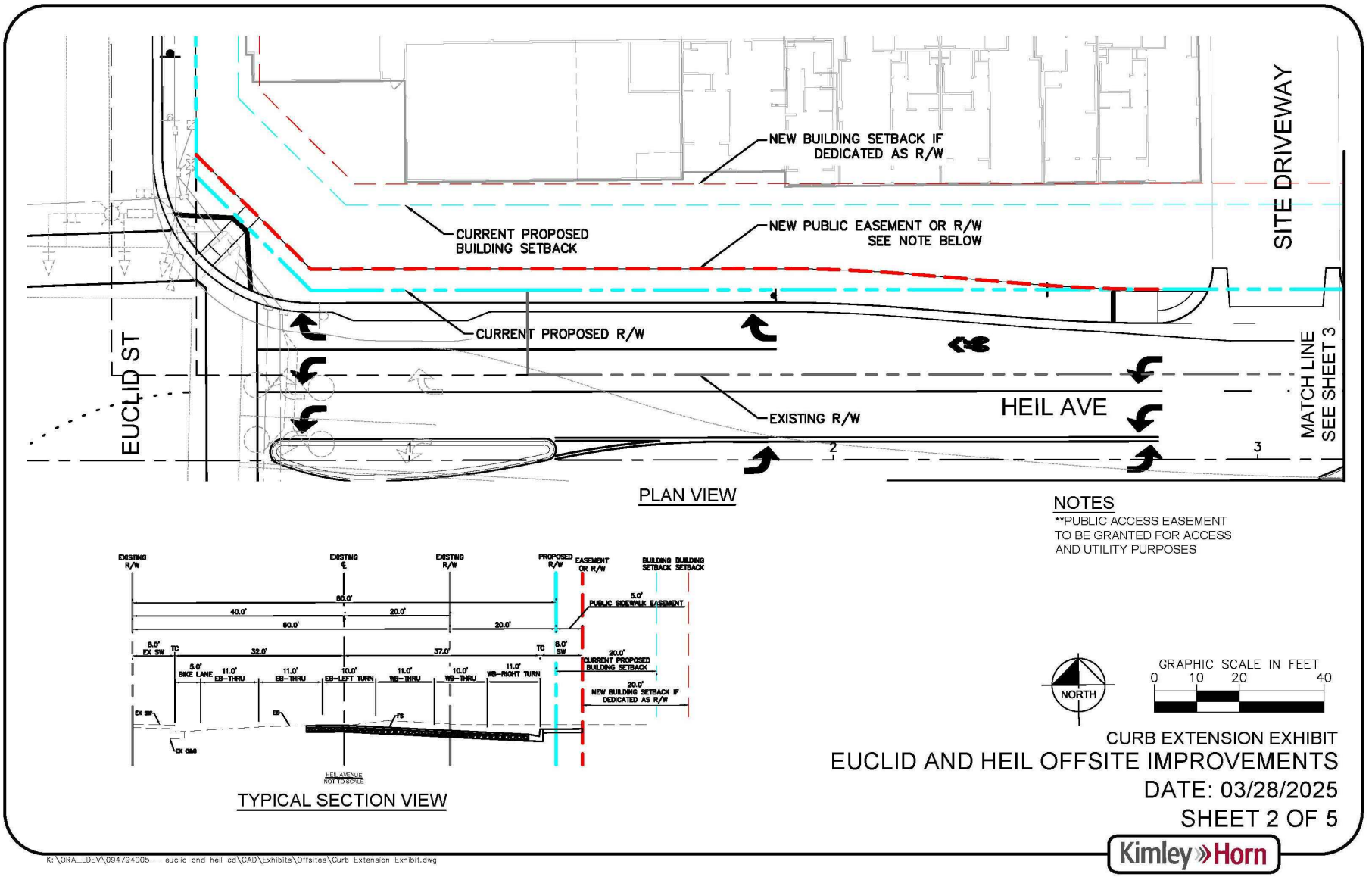


EXHIBIT 1-5 : HEIL AVENUE CONCEPTUAL STRIPING PLAN (SHEET 3 OF 5)

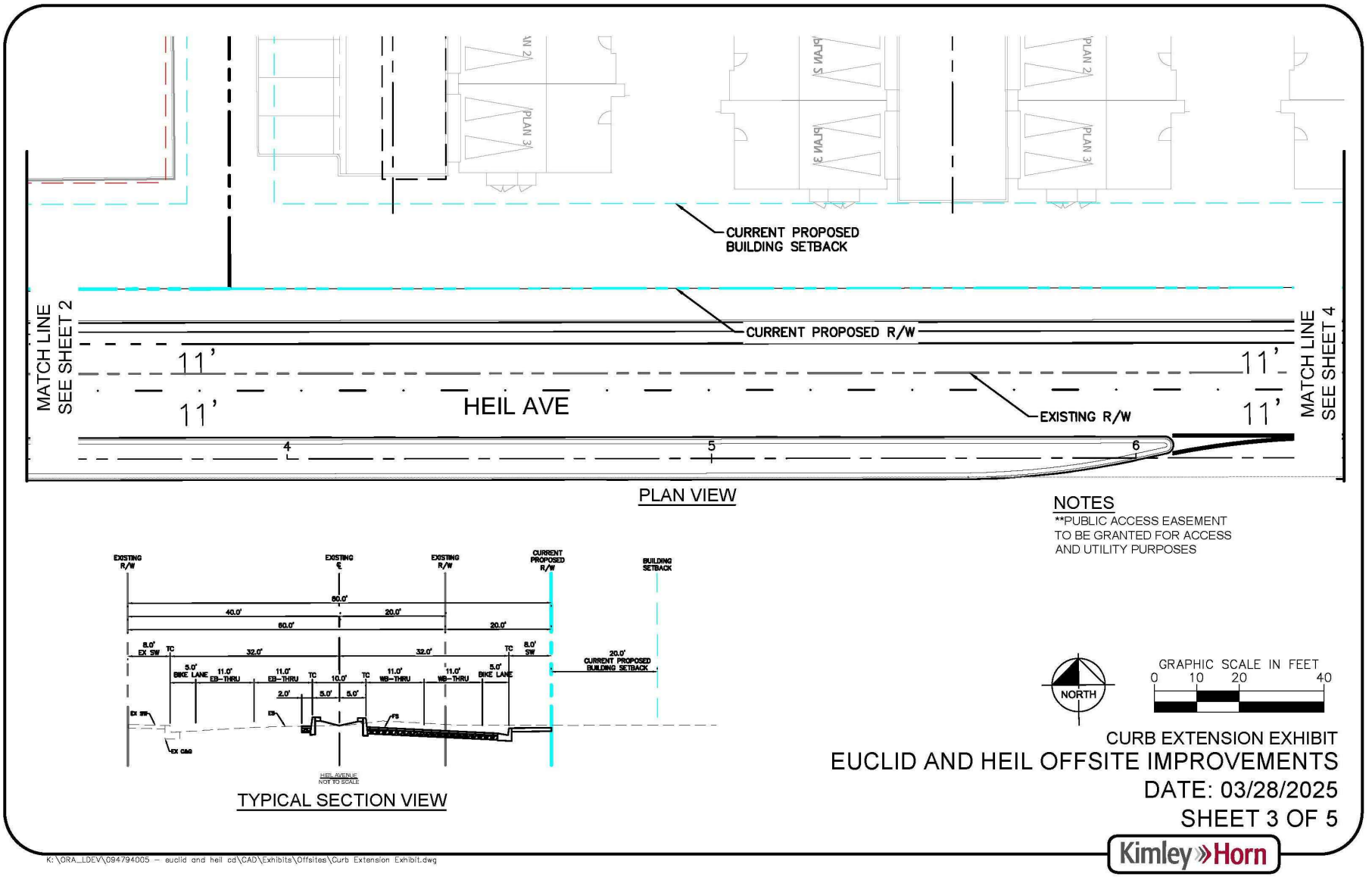


EXHIBIT 1-5 : HEIL AVENUE CONCEPTUAL STRIPING PLAN (SHEET 4 OF 5)

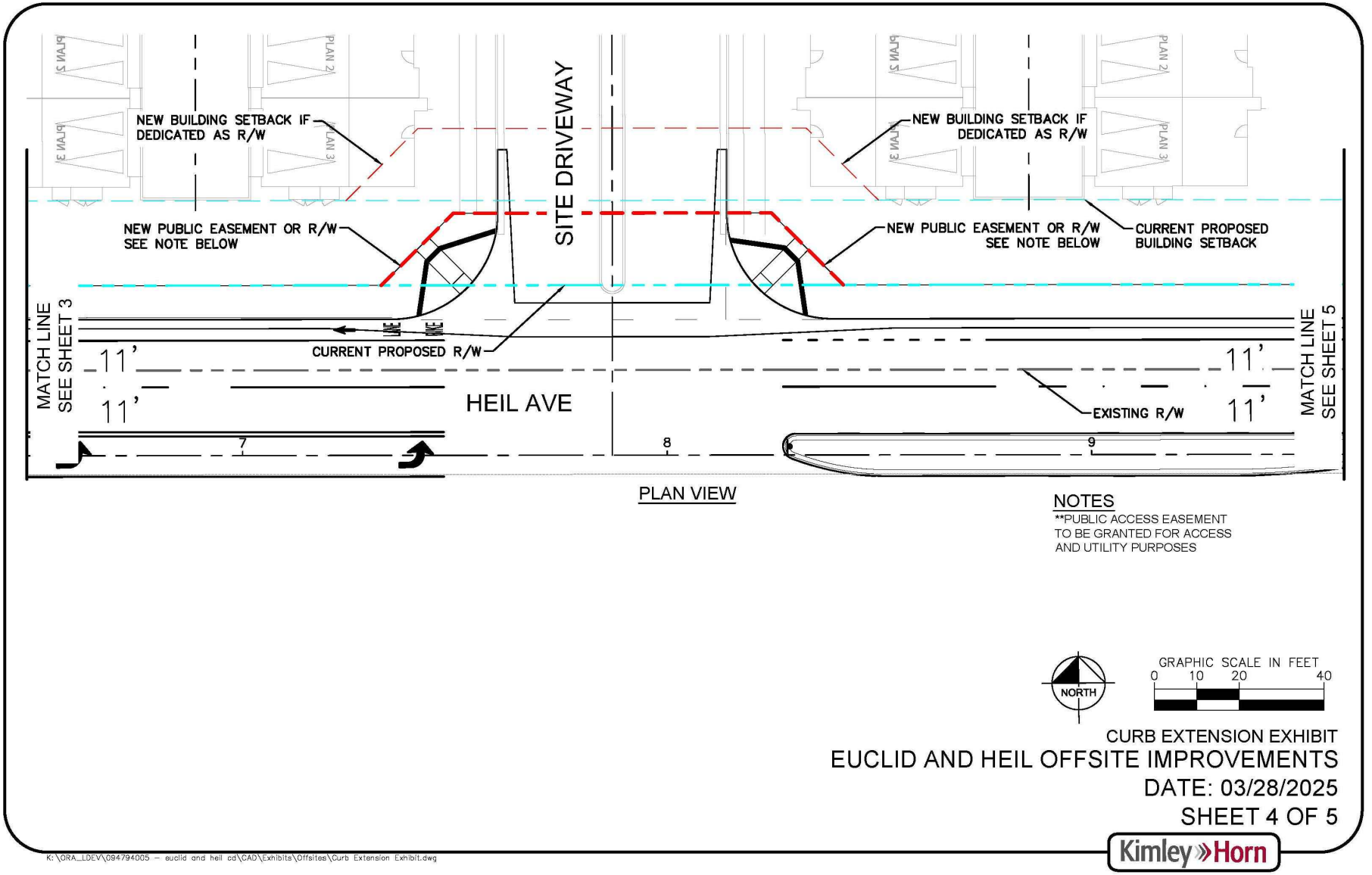
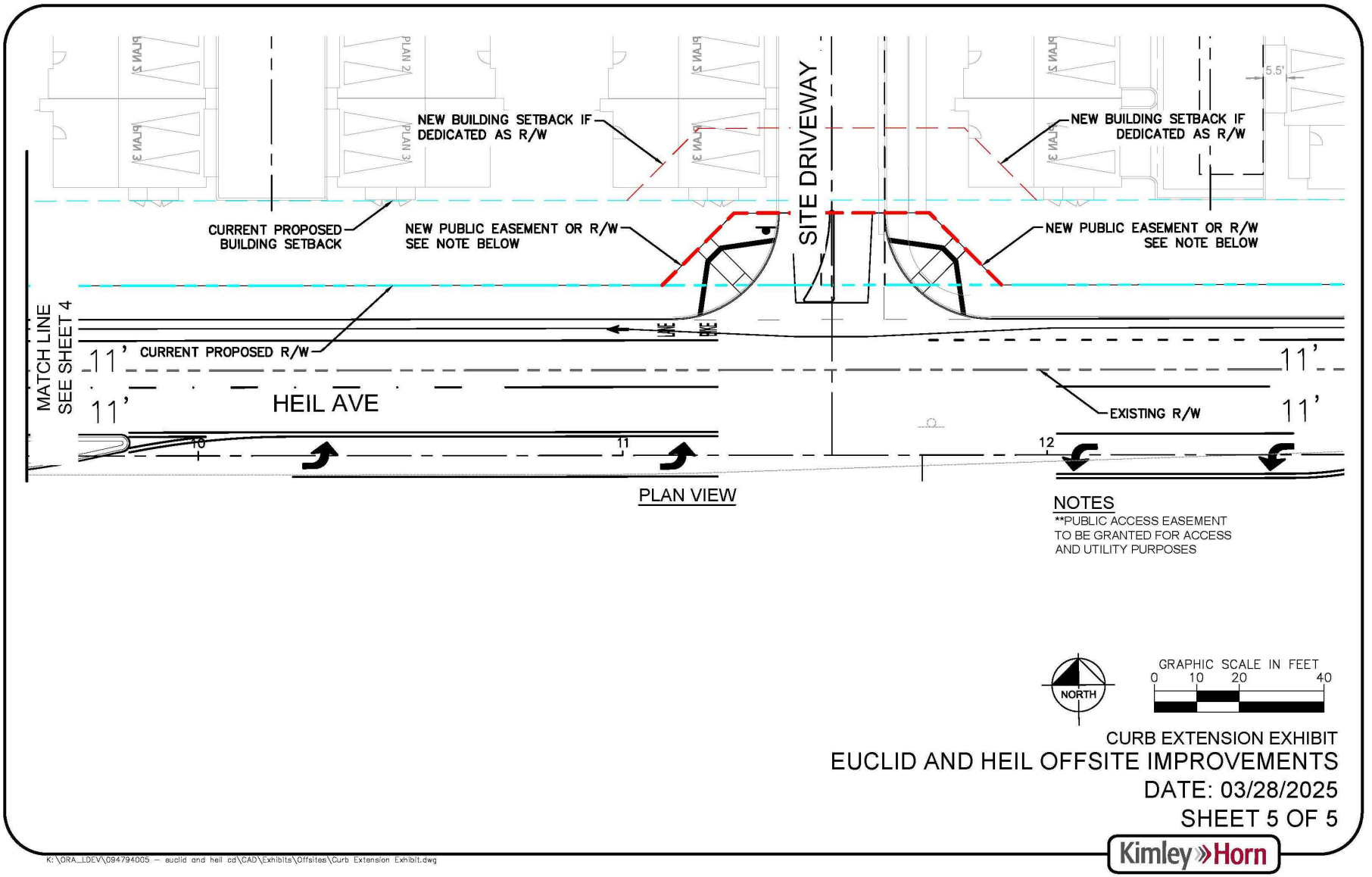


EXHIBIT 1-5 : HEIL AVENUE CONCEPTUAL STRIPING PLAN (SHEET 5 OF 5)



On-site traffic signing and striping for all phases should be implemented agreeably with the provisions of the Caltrans California Manual on Uniform Traffic Control Devices (CA MUTCD) and in conjunction with detailed construction plans for the Project site.

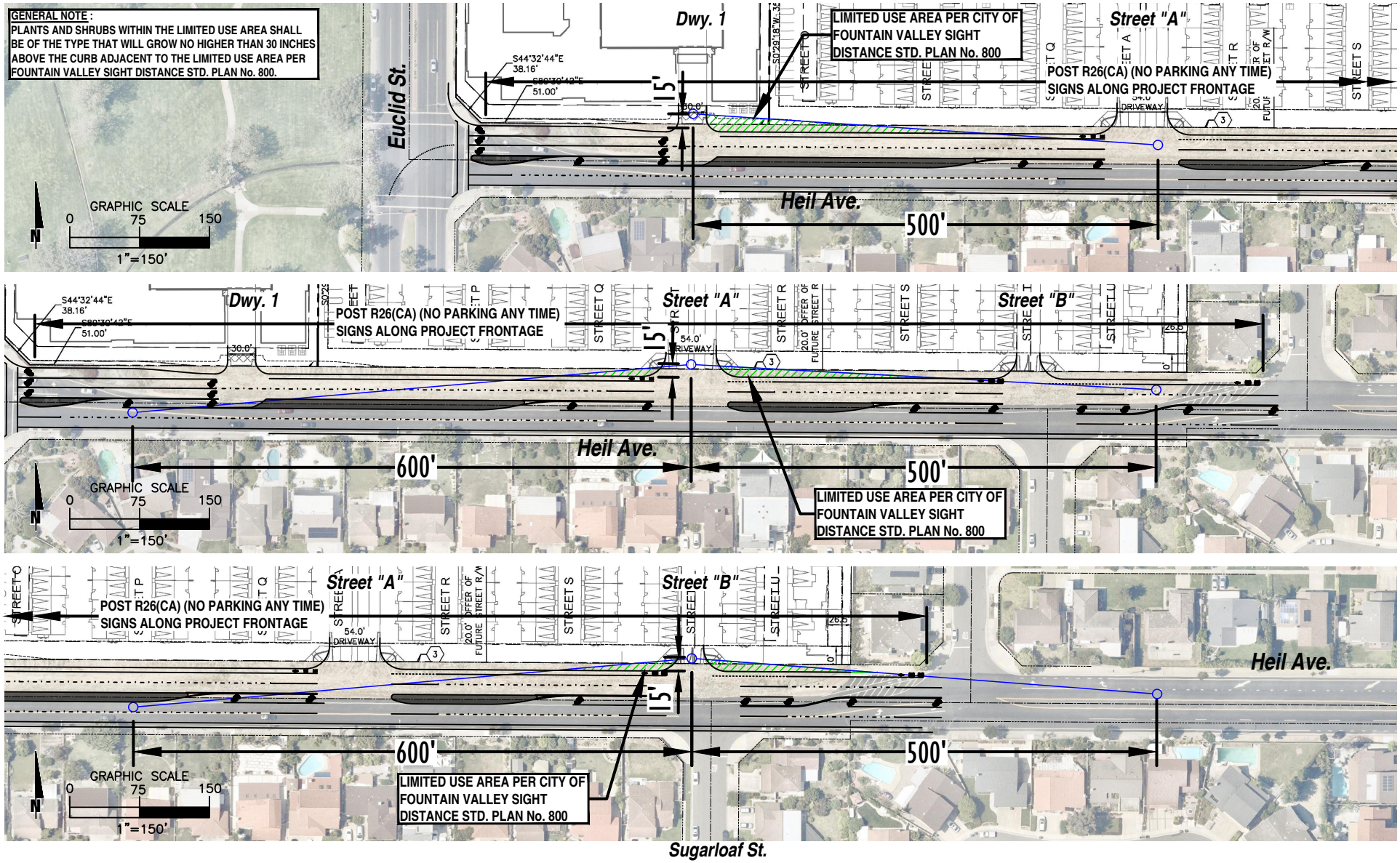
Sight distance at each project access point should be reviewed with respect to standard California Department of Transportation (Caltrans) and sight distance standards at the time of preparation of final grading, landscape, and street improvement plans.

1.6 SIGHT DISTANCE ANALYSIS

Horizontal sight distance has been evaluated for the Project access points along Heil Avenue based on the City's Standard Plan No. 800 (FV Std. Plan 800) and Caltrans Highway Design Manual (HDM). As defined by the HDM, sight distance is the continuous length of highway ahead visible to the driver. At unsignalized intersections, corner sight distance must provide a substantially clear line of sight between the driver of the vehicle waiting on the minor road (driveway) and the driver of an approaching vehicle. The sight distance is measured along the direction of travel from a point on the minor road at least 15 feet from the edge of the major road pavement and measured from a height of eye of 3.5 feet on the minor road to a height of object of 4.25 feet on the major road. It should be noted that the assessment performed for the driveway locations is considered conservative as the HDM states that corner sight distance requirements are not applicable to urban driveways unless signalized.

Adequate visibility for vehicular and pedestrian traffic can be accommodated at each Project access point by limiting sight obstructions within the identified limited use area. Any landscaping/hardscape within the limited use area should not exceed 30 inches in height. The limited use area should be kept clear of any landscaping or any other obstructions that may impede the visibility of the driver, including on-street parking. As such, restrictions to on-street parking within the limited use areas are also necessary. Minimum horizontal sight distances for the Project driveways are provided in Exhibit 1-6, however, sight distance should be re-evaluated in the field once the driveways have been constructed. It is anticipated that the minimum 500-foot sight distance to the east and 600-foot sight distance to the west, where necessary, could be accommodated. The sight distance lines, limited use area, and clear sight triangles per City's standards are illustrated in Exhibit 1-6 per FV Std. Plan 800.

EXHIBIT 1-6 : SIGHT DISTANCE



1.7 GATE STACKING ASSESSMENT

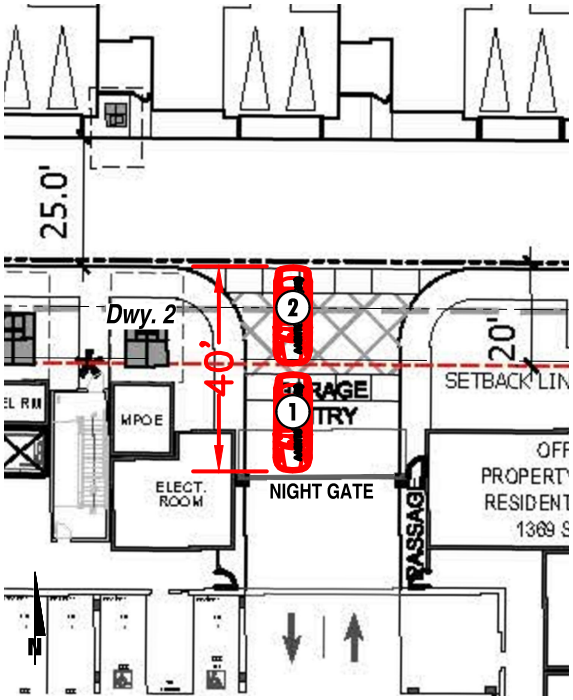
The City does not have any current standards on gate stacking for residential development. Industry practice for residential development for gate stacking is one foot per peak hour vehicle. The multifamily development is anticipated to include three gates. Two of the gates, located at the north and south entrances into the multifamily development, will operate only at night-time between the hours of 10 PM to 6 AM and will remain open during other hours of the day. It should be noted that these night-time gates would roll up and remain open for any following vehicles in a queue. The third gate is anticipated to be located near the southerly multifamily entrance within the parking structure and would be operational at all times.

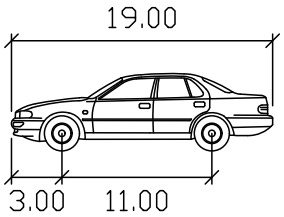
It is anticipated that approximately 23 vehicles would access the northerly multifamily entrance during the PM peak hour (fewer inbound vehicles are expected during the AM peak hour). As such, the minimum recommended stacking distance for this gated entry is 23-feet, however, the latest plans show that approximately 40-feet of stacking will be accommodated (approximately two vehicle car lengths).

It is anticipated that approximately 61 vehicles would access the southerly multifamily entrance during the PM peak hour (fewer inbound vehicles are expected during the AM peak hour). As such, the minimum recommended stacking distance for this gated entry is 61-feet. Based on the ITE time of distribution trip generation percentages, the number of vehicles accessing the entrance on Heil Avenue after 10 PM would be 22 vehicles and would continue to fall later into the evening. Nonetheless, the latest plans show that approximately 80-feet of stacking will be accommodated (approximately four vehicle car lengths). The internal gate located at the parking structure and near the southerly entrance is approximately 210-feet from Heil Avenue, which provides adequate stacking distance for approximately nine vehicles.

The stacking at each of the three gates is shown on Exhibit 1-7.

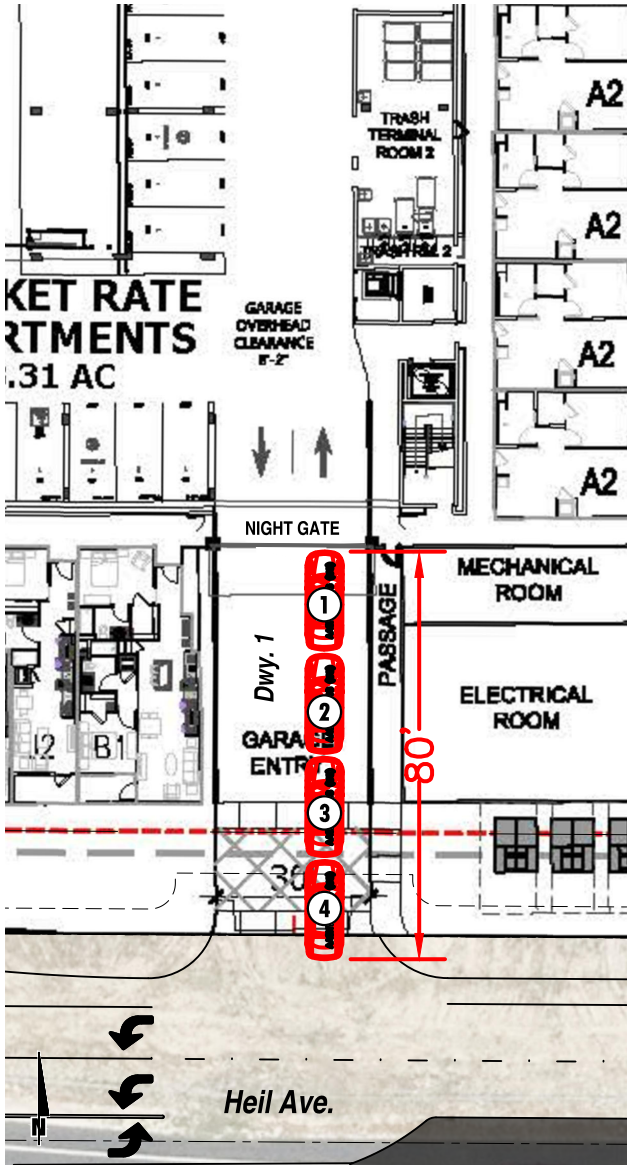
EXHIBIT 1-7 : GATE STACKING

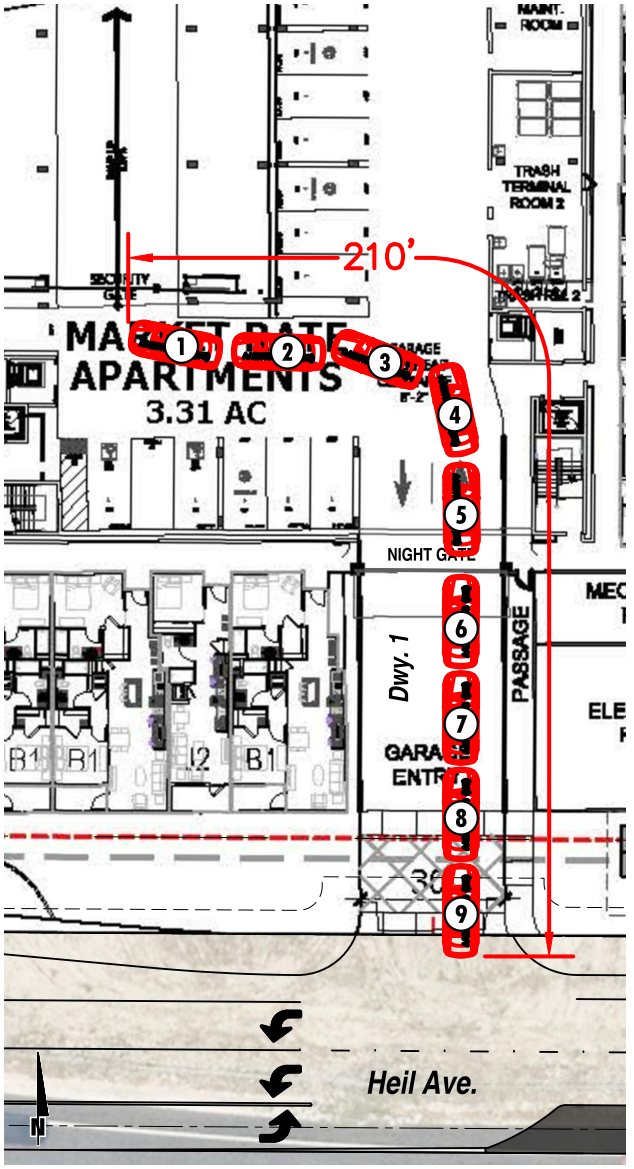




P

	feet
Width	: 7.00
Track	: 6.00
Lock to Lock Time	: 6.0
Steering Angle	: 31.6





1.8 QUEUING ANALYSIS

A queuing analysis has been conducted for the Project driveway locations and the site adjacent intersection of Euclid Street at Heil Avenue in order to identify potential queuing issues for critical movements adjacent to the Project. Synchro provides limited queuing information for unsignalized intersections. As such, the traffic modeling and signal timing optimization software package SimTraffic has been utilized to assess the queues for unsignalized study intersections. SimTraffic is designed to model networks of signalized and unsignalized intersections, with the primary purpose of checking and fine-tuning signal operations. SimTraffic uses the input parameters from Synchro to generate random simulations. These random simulations generated by SimTraffic have been utilized to determine the 95th percentile queue lengths observed for each applicable turn lane. A SimTraffic simulation has been recorded up to 5 times, during the weekday AM and weekday PM peak hours, and has been seeded for 15-minute periods with 60-minute recording intervals.

The site adjacent queuing analysis worksheets are provided in Appendix 1.2 for Opening Year (2026) With Project traffic conditions and have been used to verify the future intersection spacing anticipated to be implemented as part of the Project, as discussed in Section 1.5 Recommendations. A summary of the site adjacent queuing analysis results is shown in Table 1-2. There is no queuing issues anticipated at the Project driveways with the recommended turn pocket storage lengths and since there is no spillback between intersections, the analysis indicates there is adequate spacing between the driveways and the adjacent study area intersections, with the exception of the southbound left turn at Euclid Street and Heil Avenue. The existing southbound left turn currently accommodates 180 feet of storage, and 246 feet of storage is required during the AM peak hour under Opening Year (2026) With Project traffic conditions (66 feet more storage or approximately 2.5 vehicles). Pursuant to the City's comments on the analysis findings, it is recommended that the Project modify the existing raised median to increase the storage by 90-feet to accommodate 270-feet of storage which would accommodate the peak hour queues.

TABLE 1-2: OPENING YEAR (2026) PEAK HOUR QUEUING SUMMARY

Intersection	Movement	Available Stacking Distance (Feet)	95th Percentile Queue (Feet)		Acceptable? [1]	
			AM Peak	PM Peak	AM	PM
Euclid St. & Heil Av. (#2)	NBT	430	222	401	Yes	Yes
	SBL	180	**246**	125	**No**	Yes
	SBT	720	666	150	Yes	Yes
	WBL	222	172	113	Yes	Yes
	WBR	122	58	56	Yes	Yes
Driveway 1 & Heil Av. (#5)	SBR	100	51	46	Yes	Yes
	EBL	99	22	37	Yes	Yes
	WBT	400	18	0	Yes	Yes
Street A & Heil Av. (#6)	SBL/R	100	49	45	Yes	Yes
	EBL	99	11	21	Yes	Yes
Street B/Sugarloaf St. & Heil Av. (#7)	NBL/T/R	125	44	45	Yes	Yes
	SBL/T/R	100	42	39	Yes	Yes
	EBL	100	20	18	Yes	Yes
	WBL	50	12	17	Yes	Yes
Euclid St. & Driveway 2 (#10)	WBR	134	48	41	Yes	Yes

[1] Stacking Distance is acceptable if the required stacking distance is less than or equal to the stacking distance provided. An additional 15 feet of stacking which is assumed to be provided in the transition for turn pockets is reflected in the stacking distance shown on this table, where applicable.

2 METHODOLOGIES

This section of the report presents the methodologies used to perform the traffic analyses summarized in this report. The methodologies described are consistent with City of Fountain Valley's Traffic Study Guidelines.

2.1 LEVEL OF SERVICE

Traffic operations of roadway facilities are described using the term "Level of Service" (LOS). LOS is a qualitative description of traffic flow based on several factors, such as speed, travel time, delay, and freedom to maneuver. Six levels are typically defined ranging from LOS A, representing completely free-flow conditions, to LOS F, representing a breakdown in flow resulting in stop-and-go conditions. LOS E represents operations at or near capacity, an unstable level where vehicles are operating with the minimum spacing for maintaining uniform flow.

2.2 INTERSECTION CAPACITY UTILIZATION (ICU) ANALYSIS

2.2.1 SIGNALIZED INTERSECTIONS

The City of Fountain Valley requires signalized CMP intersections to be evaluated through ICU analysis which compares the peak hour traffic volumes to intersection capacity. Per the City Guidelines, a minimum clearance interval of 0.05 in conjunction with lane capacities of 1700 per hour of green time for through and turn lanes will be used for the ICU calculations. A minimum clearance interval of 0.05 has been assumed representing 5 percent for the yellow clearance/lost time and inherent vehicle delay between cycles with an assumed signal cycle of 100 seconds. The ICU LOS definitions based on volume to capacity (v/c) ratio are presented in Table 2-1. The Traffix software package has been utilized to evaluate the signalized intersections using the ICU methodology with the analysis parameters discussed above.

TABLE 2-1: INTERSECTION CAPACITY UTILIZATION (ICU) LOS DEFINITIONS

Level of Service	Critical Volume to Capacity Ratio
A	0.00 - 0.60
B	0.61 - 0.70
C	0.71 - 0.80
D	0.81 - 0.90
E	0.91 - 1.00
F	>1.00

Source: City General Plan Mobility Element & Growth Management Element

2.2.2 UNSIGNALIZED INTERSECTIONS

The City of Fountain Valley requires the operations of unsignalized intersections to be evaluated using the methodology described in the Highway Capacity Manual (HCM). (3) The LOS rating is based on the weighted average control delay expressed in seconds per vehicle (see Table 2-2). At two-way or side-street stop-controlled intersections, LOS is calculated for each controlled movement and for the left turn movement from the major street, as well as for the intersection as a whole.

For approaches composed of a single lane, the delay is computed as the average of all movements in that lane. Delay for the intersection is reported for the worst individual movement at a two-way stop-controlled intersection. For all-way stop-controlled intersections, LOS is computed for the intersection as a whole (average delay).

TABLE 2-2: UNSIGNALIZED INTERSECTION LOS THRESHOLDS

Description	Average Control Delay (Seconds), V/C ≤ 1.0	Level of Service, V/C ≤ 1.0[1]
Little or no delays.	0 to 10.00	A
Short traffic delays.	10.01 to 15.00	B
Average traffic delays.	15.01 to 25.00	C
Long traffic delays.	25.01 to 35.00	D
Very long traffic delays.	35.01 to 50.00	E
Extreme traffic delays with intersection capacity exceeded.	> 50.00	F

Source: HCM, 7th Edition

[1] If V/C is greater than 1.0 then LOS is F per HCM.

2.3 TRAFFIC SIGNAL WARRANT ANALYSIS METHODOLOGY

The term "signal warrants" refers to the list of established criteria used by Caltrans and other public agencies to quantitatively justify or ascertain the potential need for installation of a traffic signal at an otherwise unsignalized intersection. This TA uses the signal warrant criteria presented in the latest edition of the Caltrans CA MUTCD for all study area intersections. (4)

The signal warrant criteria for Existing conditions are based upon several factors, including volume of vehicular and pedestrian traffic, frequency of accidents, and location of school areas. The Caltrans CA MUTCD indicates that the installation of a traffic signal should be considered if one or more of the signal warrants are met. (4) Specifically, this TA utilizes the Peak Hour Volume-based Warrant 3 as the appropriate representative traffic signal warrant analysis for existing study area intersections for all analysis scenarios. Warrant 3 is appropriate to use for this TA because it provides specialized warrant criteria for intersections with urban characteristics (e.g., adjacent major streets operating at or below 40 miles per hour) or rural characteristics (e.g., adjacent major streets operating above 40 miles per hour). For the purposes of this study, the speed limit was the basis for determining whether Urban or Rural warrants were used for a given intersection. Future intersections that do not currently exist have been assessed regarding the potential need for new traffic signals based on future average daily traffic (ADT) volumes, using the Caltrans planning level ADT-based signal warrant analysis worksheets. Traffic signal warrant analyses were performed for the following study area intersections shown in Table 2-3.

TABLE 2-3: TRAFFIC SIGNAL WARRANT ANALYSIS LOCATIONS

ID	Intersection Location	Juridiction
6	Street A & Heil Ave.	Fountain Valley
7	Street B / Sugarloaf St. & Heil Ave.	Fountain Valley

The Existing conditions traffic signal warrant analysis is presented in the subsequent section, Section 3 *Area Conditions* of this report. The traffic signal warrant analyses for future conditions are presented in Section 5 *Opening Year (2026) Traffic Conditions* of this report. Traffic signal warrant analysis has not been evaluated for Driveway 1 on Heil Avenue as it is proposed for right-in/right-out/left-in access only and spacing between this location and the signalized intersection at Euclid Street would limit the ability to signalize Driveway 1. If there are operational deficiencies at Driveway 1 without a traffic signal, then additional turning movement prohibitions should be considered (i.e., no left turns in). Additionally, traffic signal warrant analysis has not been evaluated for Driveway 2 on Euclid Street as it is proposed for right-in/right-out access only.

It is important to note that a signal warrant defines the minimum condition under which the installation of a traffic signal might be warranted. Meeting this threshold condition does not require that a traffic control signal be installed at a particular location, but rather, that other traffic factors and conditions be evaluated in order to determine whether the signal is truly justified. It should also be noted that signal warrants do not necessarily correlate with LOS. An intersection may satisfy a signal warrant condition and operate at or above acceptable LOS or operate below acceptable LOS and not meet a signal warrant.

2.4 ROADWAY SEGMENT CAPACITY ANALYSIS

Roadway segment operations have been evaluated using the City's Mobility Element Roadway Functional Classifications. These roadway capacities are "rule of thumb" estimates for planning purposes and are affected by such factors as intersections (spacing, configuration and control features), degree of access control, roadway grades, design geometrics (horizontal and vertical alignment standards), sight distance, vehicle mix (truck and bus traffic) and pedestrian bicycle traffic. In other words, while using ADT for planning purposes is suitable with regards to evaluating potential volume to capacity with future forecasts, it is not suitable for operational analysis because it does not account for the factors listed previously. As such, where the ADT-based roadway segment analysis indicates a deficiency (unacceptable LOS), a review of the more detailed peak hour intersection analysis and progression analysis are undertaken. The more detailed peak hour intersection analysis explicitly accounts for factors that affect roadway capacity.

2.5 MINIMUM ACCEPTABLE LEVELS OF SERVICE (LOS)

The City requires a minimum LOS D to be maintained at study area intersections. Therefore, any intersection operating at LOS E or F will be considered deficient for the purposes of this analysis.

2.6 TRANSPORTATION EFFECTS

An intersection will be deemed deficient and require improvements to achieve an acceptable LOS when the LOS is E or F (final V/C ratio is >0.90) with the addition of the Project.

3 AREA CONDITIONS

This section provides a summary of the existing circulation network, the City of Fountain Valley General Plan Circulation Network, and a review of existing peak hour intersection operations, traffic signal warrant, and roadway segment analyses.

3.1 EXISTING CIRCULATION NETWORK

Pursuant to the agreement with City of Fountain Valley staff (Appendix 1.1), the study area includes a total of 10 existing and future intersections as shown previously in Exhibit 1-3. Exhibit 3-1 illustrates the study area intersections located near the proposed Project and identifies the number of through traffic lanes for existing roadways and intersection traffic controls.

3.2 CITY OF FOUNTAIN VALLEY GENERAL PLAN MOBILITY ELEMENT

As noted previously, the Project site is located within the City of Fountain Valley. The roadway classifications and planned (ultimate) roadway cross-sections of the major roadways within the study area, as identified on the City of Fountain Valley General Plan Mobility Element, are described subsequently. (3) Exhibit 3-2 shows the City of Fountain Valley General Plan Mobility Element.

Major Arterials are six-lane roadways and may include a median. These roadways typically have a 120-foot right-of-way and a 104-foot curb-to-curb measurement. These roadways typically direct traffic through major development areas. The following roadway within the study area is classified as a Major Arterial:

- Warner Avenue

Primary Arterial are four-lane roadways with a median. These roadways typically have a 100-foot right-of-way and an 84-foot curb-to-curb measurement. The following study area roadways within the study area are classified as a Primary Arterial:

- Edinger Avenue
- Talbert Avenue, west of Euclid Street

Augmented Primary Arterial are four-to-six-lane roadways. The following study area roadways within the study area are classified as an Augmented Primary Arterial:

- Euclid Street, south of Edinger Avenue
- Talbert Avenue, east of Euclid Street

Secondary Arterial are four-lane roadways which typically do not include a median. These roadways typically have an 80-foot right-of-way and a 64-foot curb-to-curb measurement. The following study area roadways within the study area are classified as a Collector Street:

- Euclid Street, north of Edinger Avenue
- Newhope Street

EXHIBIT 3-1 : EXISTING NUMBER OF THROUGH LANES AND INTERSECTION CONTROLS

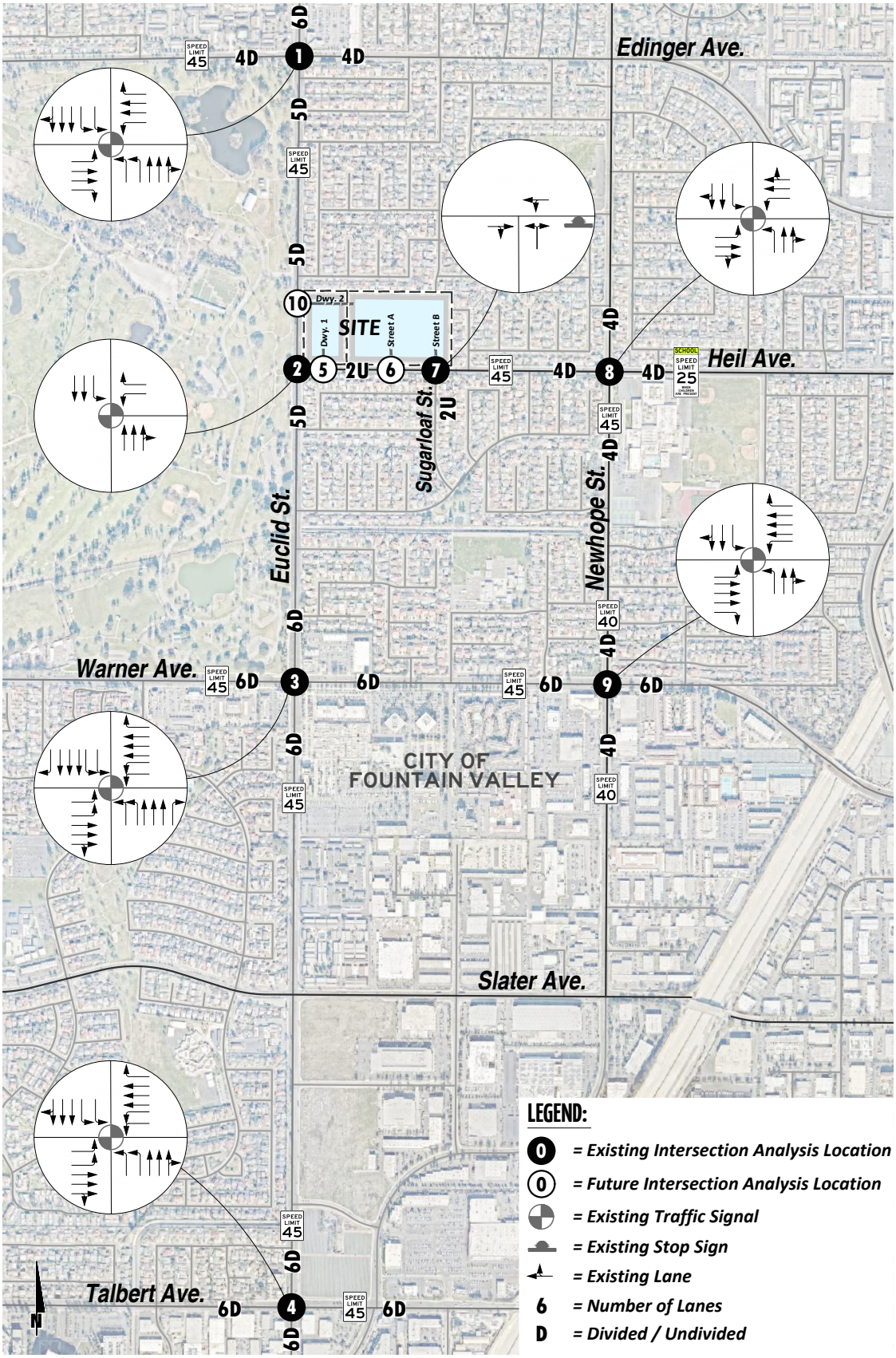
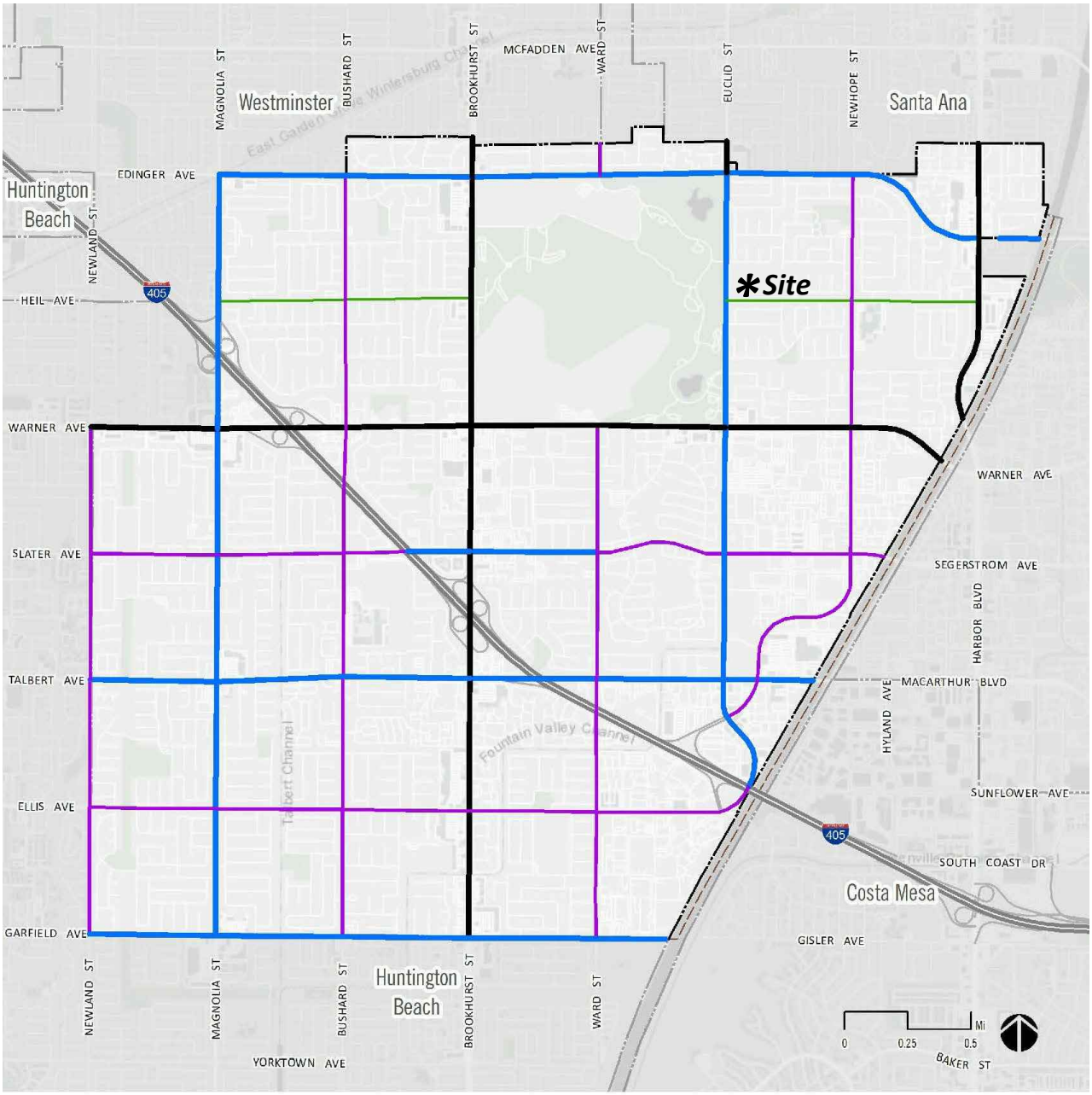


EXHIBIT 3-2 : CITY OF FOUNTAIN VALLEY GENERAL PLAN CIRCULATION PLAN MAP



Source: Fehr and Peers 2022

Date: 4/11/2023

Fountain Valley City Limit
Fountain Valley SOI

Roadway Classification

Major Arterial
Primary Arterial
Secondary Arterial
Park Boulevard

This figure shows Heil Avenue as a Park Boulevard, which is consistent with the City's intent and vision. However, Heil Avenue shall remain designed and classified as a Secondary Arterial until it is formally reclassified in the MPAH.

FUTURE READY FOUNTAIN VALLEY 2045 General Plan

Figure CM-1
Roadway Network

Park Boulevard is a two-lane roadway with a painted median along with 11 to 13 foot buffers plus bike lanes. There are 9 to 13-foot sidewalks with landscaping. These roadways typically have an 80 to 92-foot right-of-way and a 62 to 66-foot curb-to-curb measurement. The following study area roadway within the study area is classified as a Park Boulevard:

- Heil Avenue

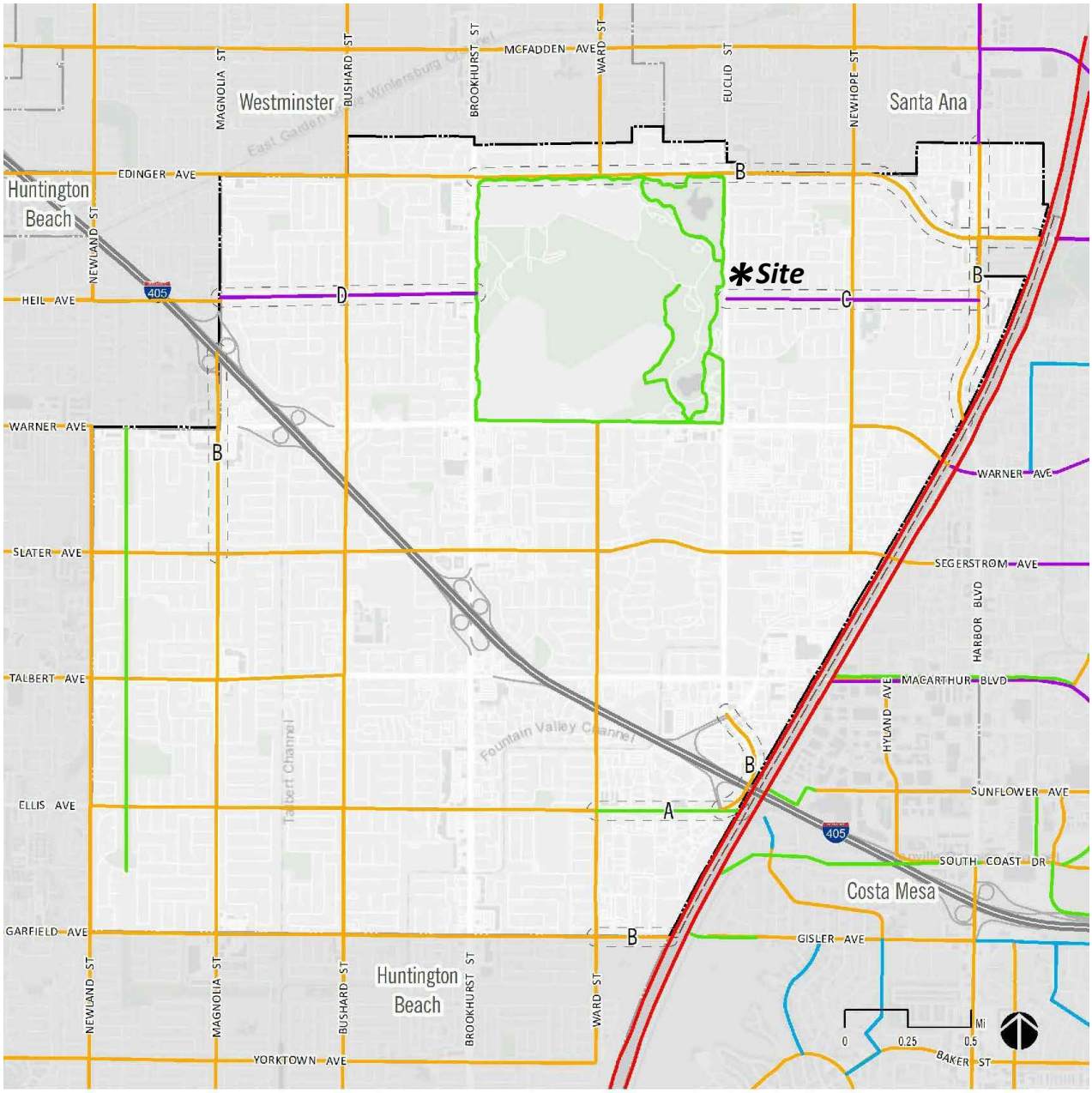
3.3 BICYCLE & PEDESTRIAN FACILITIES

Exhibit 3-3 illustrates the City of Fountain Valley General Plan Trails Plan. As shown in Exhibit 3-3, Heil Avenue is planned to have a Class II (on-street, striped) bike route along Heil Avenue between Euclid Street and Newhope Street (Newhope Street currently has Class II bike lanes). Exhibit 3-4 shows the existing pedestrian facilities within the study area. As shown in Exhibit 3-4, there are existing sidewalks within the study area and sidewalks along the north and south sides of Heil Avenue except along the Project's frontage. Although there are existing sidewalks along Euclid Street, the Project will be improving the sidewalks along Euclid Street per City standards as well as improving Heil Avenue with sidewalks to provide connectivity with existing sidewalks in the vicinity of the Project. Field observations and traffic counts conducted in March 2024 indicate light bicycle activity within the study area but there is notable pedestrian activity. Both pedestrian and bicycle activity has been accounted for in the HCM analysis.

3.4 TRANSIT SERVICE

The study area is currently served by Orange County Transportation Authority (OCTA), a public transit agency serving various jurisdictions within Orange County. The existing transit routes within the study area are shown in Exhibit 3-5. Based on a review of the existing transit routes within the vicinity of the proposed Project, Route 37 is the closest route which runs along Euclid Street within the vicinity of the Project site which could potentially serve the site. The closest bus stops are located on Euclid Street near Blue Allium Avenue and Lavender Avenue (both north and south of Heil Avenue). Service times for the stops along OCTA Route 37 are approximately every 30 minutes during the weekday peak hours. Transit service is reviewed and updated by OCTA periodically to address ridership, budget and community demand needs. Changes in land use can affect these periodic adjustments which may lead to either enhanced or reduced service where appropriate. As such, it is recommended that the Project Applicant work in conjunction with OCTA to potentially provide bus service to the site.

EXHIBIT 3-3 : CITY OF FOUNTAIN VALLEY TRAILS PLAN MAP



Source: Fehr and Peers 2022

Date: 5/16/2023

Fountain Valley City Limit
Fountain Valley SOI
Santa Ana River Trail

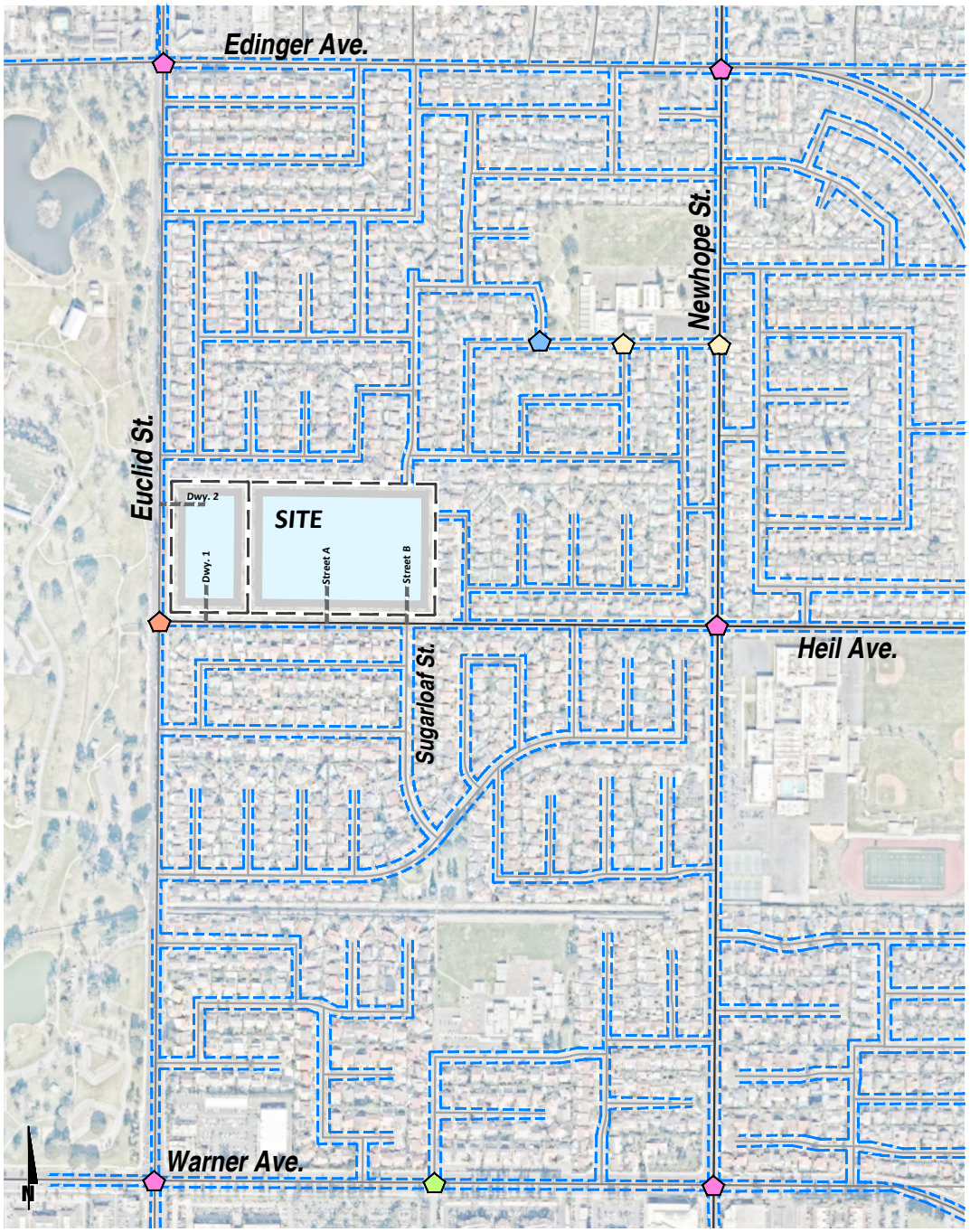
Bikeway Classification
Class I
Class II
Class III
Class IV

Proposed Bikeways
A, No existing infrastructure - Proposed Class I
B, No existing infrastructure - Proposed Class II
C, No existing infrastructure - Proposed Class IV
D, Existing Class II - Proposed Class IV

FUTURE READY FOUNTAIN VALLEY 2045 General Plan

Figure CM-4
Bicycle and Trail Network

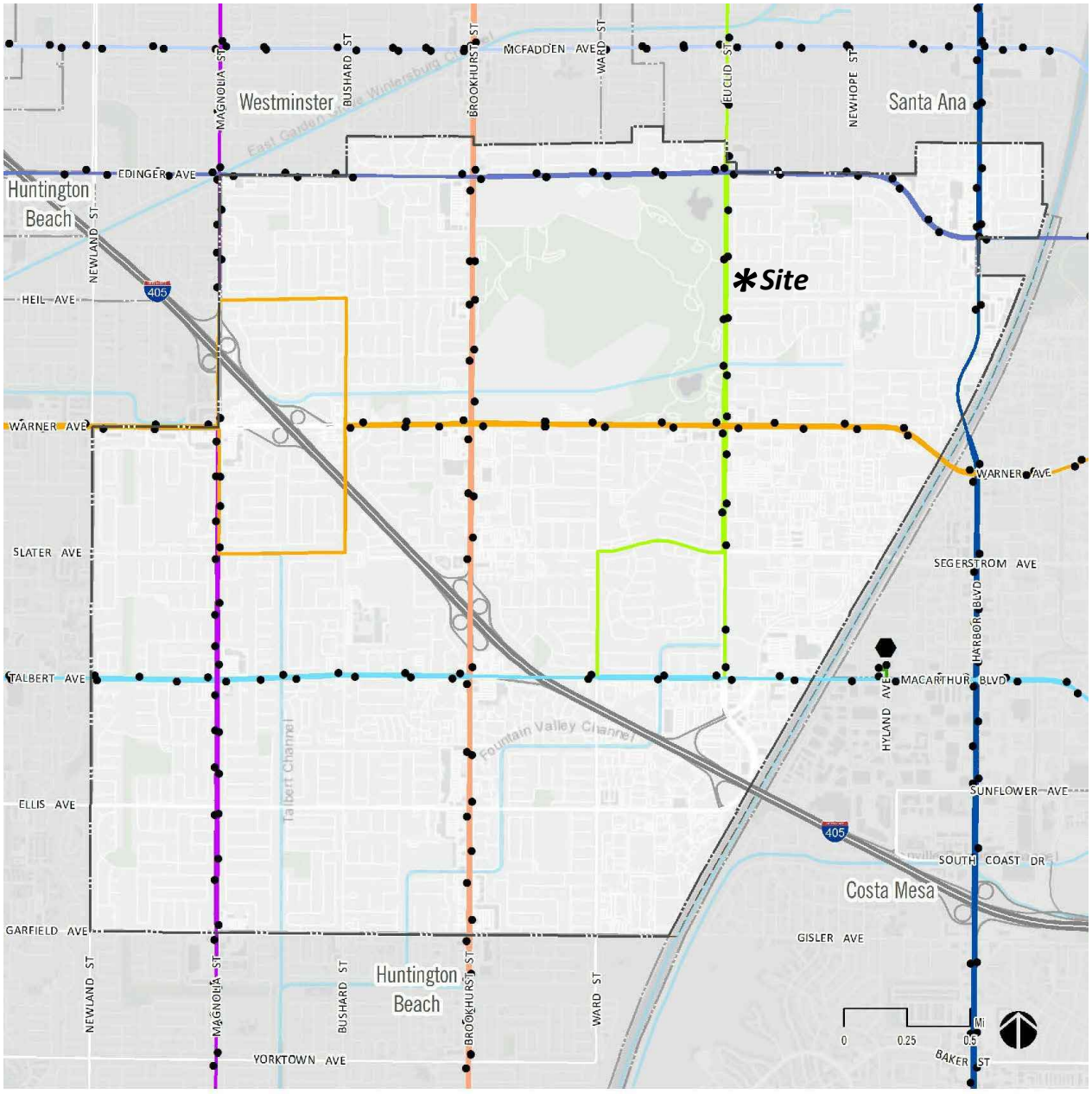
EXHIBIT 3-4 : EXISTING PEDESTRIAN FACILITIES



LEGEND:

- = 1 Approach
- = 2 Approaches
- = 3 Approaches
- = All Approaches
- = 2 Approaches (School)
- = Sidewalks

EXHIBIT 3-5 : EXISTING TRANSIT FACILITIES



Source: PlaceWorks 2022

Date: 4/11/2023

Fountain Valley City Limit
Fountain Valley SOI
Bus Stop
OCTA Transit Base
Bus Route Number
33
35
37
43
66
70
72
76
543

FUTURE READY FOUNTAIN VALLEY 2045 General Plan

Figure CM-5
Transit Network

3.5 EXISTING (2024) TRAFFIC COUNTS

The intersection LOS analysis is based on the traffic volumes observed during the peak hour conditions using traffic count data collected on March 28, 2024. The following peak hours were selected for analysis:

- Weekday AM Peak Hour (peak hour between 7:00 AM and 9:00 AM)
- Weekday PM Peak Hour (peak hour between 4:00 PM and 6:00 PM)

The 2024 weekday AM and weekday PM peak hour count data is representative of typical weekday peak hour traffic conditions in the study area. There were no observations made in the field that would indicate atypical traffic conditions on the count date, such as construction activity or detour routes and near-by schools were in session and operating on normal schedules. The raw manual peak hour turning movement traffic count data sheets are included in Appendix 3.1.

The City provided 2016 and 2019 historic traffic counts (where available) in addition to the 2016 daily volumes provided for comparison purposes. It is our understanding that the I-405 Freeway Widening Project has required several bridge closures over the years and all bridges have been reopened as of September 2023. Urban Crossroads also has obtained historic data from 2022 which would have occurred when bridges along the I-405 Freeway were closed. Urban Crossroads reviewed all count data and coordinated with City staff to develop a City-approved baseline condition that is representative of existing traffic conditions, inherent in what has historically been experienced in the City of Fountain Valley. The adjustments have been made in order to ensure that traffic volumes at study area intersections were not being understated due to traffic in the area not normalizing with the completion of construction having just occurred in September 2023. The volumes evaluated with adjustments are considered to be representative of normalized traffic over the long-term.

The following summarizes adjustments made to the traffic counts:

- March 28, 2024, southbound through traffic along Euclid Street was increased by 10%, which affects all study intersections along Euclid Street with the exception of Talbert Avenue.
- Traffic volumes at Euclid Street and Talbert Avenue are based on the March 14, 2019, traffic count data. The AM peak hour utilizes the 2019 data as-is with no further adjustments. The PM peak hour utilizes the 2019 data with the exception of the eastbound left turn which utilizes the March 2024 count data and the westbound through which was increased to 1,500 vehicles per hour.
- No adjustments to March 2024 data for the intersection of Sugarloaf Street at Heil Avenue.
- The intersection of Newhope Street and Heil Avenue utilizes the March 2024 count data with the exception of the northbound and southbound through lanes which were increased by 10%.
- The intersection of Newhope Street and Warner Avenue utilizes the September 13, 2016, traffic count data.

Existing weekday ADT volumes are shown in Exhibit 3-6. Where actual 24-hour tube count data was not available, Existing ADT volumes were based upon factored intersection peak hour counts collected by Urban Crossroads, Inc. using the following formula for each intersection leg:

Weekday PM Peak Hour (Approach Volume + Exit Volume) x 11.57 = Leg Volume

A comparison of the PM peak hour and daily traffic volumes of various roadway segments within the study area indicated that the peak-to-daily relationship is approximately 8.6 percent. As such, the above equation utilizing a factor of 11.57 estimates the ADT volumes on the study area roadway segments assuming a peak-to-daily relationship of approximately 8.6 percent (i.e., 1/0.086 = 11.57) and was assumed to sufficiently estimate ADT volumes for planning-level analyses. Existing weekday peak hour intersection volumes are shown in Exhibit 3-6 (final adjusted volumes).

3.6 INTERSECTION OPERATIONS ANALYSIS

Existing peak hour traffic operations have been evaluated for the study area intersections based on the analysis methodologies presented in Section 2.2 *Intersection Capacity Analysis* of this report. The intersection operations analysis results are summarized in Table 3-1, which indicates that the study area intersections are currently operating at an acceptable LOS during the peak hours under Existing (2024) traffic conditions, with the exception of:

- Newhope St. & Warner Av. (#9) – LOS E PM peak hour

The intersection operations analysis worksheets are included in Appendix 3.2 of this TA.

TABLE 3-1: INTERSECTION ANALYSIS FOR EXISTING (2024) CONDITIONS

#	Intersection	Traffic Control[3]	ICU[1] (secs.) AM	ICU[1] (secs.) PM	Level of Service AM	Level of Service PM	Delay[2] (secs.) AM	Delay[2] (secs.) PM	Level of Service AM	Level of Service PM
1	Euclid St. & Edinger Ave.	TS	0.726	0.693	C	B	Not Applicable[4]			
2	Euclid St. & Heil Ave.	TS	7.620	0.561	C	A	Not Applicable[4]			
3	Euclid St. & Warner Ave.	TS	0.681	0.804	B	D	Not Applicable[4]			
4	Euclid St. & Talbert Ave.	TS	0.588	0.785	A	C	Not Applicable[4]			
5	Driveway 1 & Heil Ave.		Future Intersection				Future Intersection			
6	Street A & Heil Ave.		Future Intersection				Future Intersection			
7	Street B / Sugarloaf St. & Heil Ave.	CSS	Not Applicable[4]				12.0	10.8	B	B
8	Newhope St. & Heil Ave.	TS	0.662	0.558	B	A	Not Applicable[4]			
9	Newhope St. & Warner Ave.	TS	0.652	**0.909**	B	**E**	Not Applicable[4]			
10	Euclid St. & Driveway 2	TS	Future Intersection				Future Intersection			

BOLD = LOS does not meet the applicable jurisdictional requirements (i.e., unacceptable LOS).

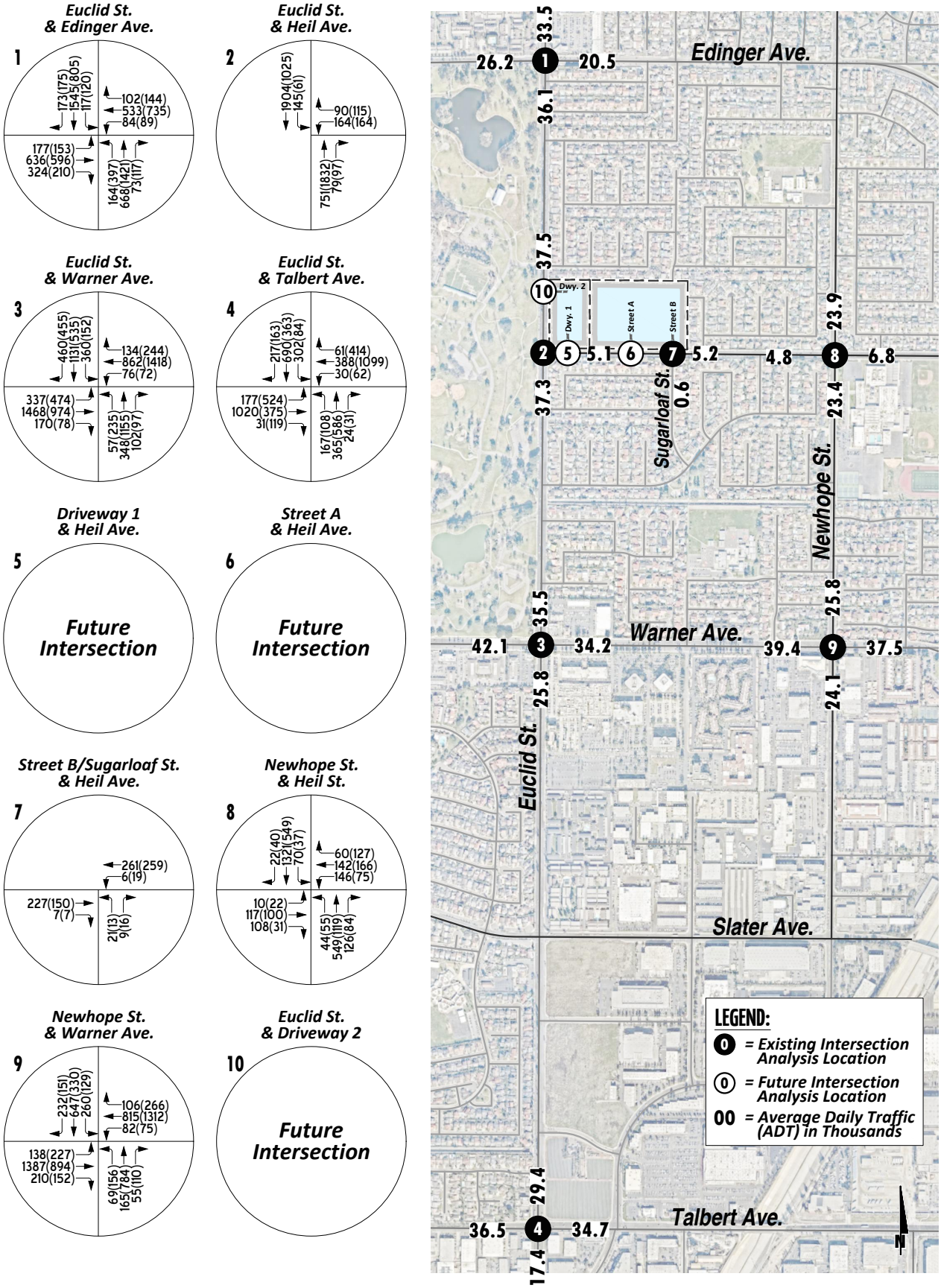
[1] Intersection capacity utilization (ICU) methodology results are presented as a volume-to-capacity ratio.

[2] Per the Highway Capacity Manual (7th Edition), overall average intersection delay and level of service are shown for intersections with a traffic signal or all-way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown.

[3] TS = Traffic Signal; CSS = Cross-street Stop

[4] ICU not reported for unsignalized intersections and HCM not reported for signalized intersections.

EXHIBIT 3-6 : EXISTING (2024) TRAFFIC VOLUMES



3.7 TRAFFIC SIGNAL WARRANTS ANALYSIS

Traffic signal warrants for Existing traffic conditions are based on existing peak hour intersection turning volumes. The unsignalized intersection of Sugarloaf Street and Heil Avenue does not currently meet a traffic signal warrant under Existing (2024) traffic conditions. Existing conditions traffic signal warrant analysis worksheets are provided in Appendix 3.3.

3.8 ROADWAY SEGMENT CAPACITY ANALYSIS

The roadway capacities utilized for the study area roadway segment analysis are obtained from the City Guidelines. These roadway segment capacities are approximate figures only and are used at the General Plan level to assist in determining the roadway functional classification (number of through lanes) needed to meet traffic demand. Table 3-2 provides a summary of the Existing (2024) Conditions roadway segment capacity analysis. As shown in Table 3-2, all study area roadway segments are currently operating at an acceptable LOS based on the daily roadway capacity thresholds and minimum LOS criteria.

TABLE 3-2: ROADWAY SEGMENT CAPACITY ANALYSIS FOR EXISTING (2024) CONDITIONS

#	Roadway	Segment Limits	Roadway Section	LOS Capacity[1]	Existing (2024) Vol	V/C[2]	LOS[3]
1	Heil Ave.	Euclid St. to Driveway 1	2U	12,500	5,116	0.409	A
2	Heil Ave.	Driveway 1 to Street A	2U	12,500	5,116	0.409	A
3	Heil Ave.	Street A to Street B/Sugarloaf St.	2U	12,500	5,116	0.409	A
4	Heil Ave.	East of Sugarloaf St.	4D	25,000	5,231	0.209	A

[1] These maximum roadway capacities are based on the City's traffic study guidelines and have been interpolated where necessary

[2] V/C = Volume to Capacity Ratio

[3] LOS = Level of Service

4 PROJECTED FUTURE TRAFFIC

The Project consists of the development of 36 for-sale 2-story triplexes, 183 for-sale 3-story townhomes, 304 market-rate multifamily apartment units, and 83 multifamily affordable senior units. Access to the Project site will be accommodated via Heil Avenue (one driveway to the apartment parking structure, Driveway 1), and via Street A and Street T (for the for-sale component). Note Driveway 1 would be utilized by primarily the market-rate apartments but could also be utilized to access the affordable senior component of the Project. Another secondary access (Driveway 2) is also proposed on Euclid Street that would be accessible by all proposed product-types. Driveway 2 will be restricted to right-in/right-out access only. The Project is anticipated to have an Opening Year of 2026.

4.1 PROJECT TRIP GENERATION

Trip generation represents the amount of traffic which is both attracted to, and produced by, a development. Determining traffic generation for a specific project is therefore based upon forecasting the amount of traffic that is expected to be both attracted to, and produced by, the specific land uses being proposed for a given development. Trip generation rates for the proposed Project are shown in Table 4-1. The trip generation rates used for this analysis are based upon information collected by the ITE as provided in their Trip Generation Manual (11th Edition, 2021). The following land use categories were utilized for calculating the trip generation for the proposed Project (see Table 4-1): (2)

- Single Family Attached Residential (Land Use Code 215)
- Multifamily Housing (Mid-Rise) (3-10 Floors) (Land Use Code 221)
- Senior Housing – Attached (Land Use Code 252)

TABLE 4-1: PROJECT TRIP GENERATION RATES

Land Use[1]	ITE Code	Units[2]	AM Peak Hour In	AM Peak Hour Out	AM Peak Hour Total	PM Peak Hour In	PM Peak Hour Out	PM Peak Hour Total	Daily
Trip Generation Rates:									
Single Family Attached Residential	215	DU	0.15	0.33	0.48	0.32	0.25	0.57	7.20
Multifamily Housing (Mid-Rise) (4-10 Floors)	221	DU	0.09	0.28	0.37	0.24	0.15	0.39	4.54
Senior Housing - Attached	252	DU	0.07	0.13	0.20	0.14	0.11	0.25	3.24

[1] Trip Generation Source: Institute of Transportation Engineers (ITE), Trip Generation Manual, Eleventh Edition (2021).

[2] DU = dwelling units

A summary of the proposed Project trip generation is shown in Table 4-2. As shown in Table 4-2, the Project is anticipated to generate a total of 3,228 two-way trips per day on a typical weekday with approximately 236 AM peak hour trips and 264 PM peak hour trips.

TABLE 4-2: PROJECT TRIP GENERATION SUMMARY

Land Use	Quantity	Units[1]	AM Peak Hour In	AM Peak Hour Out	AM Peak Hour Total	PM Peak Hour In	PM Peak Hour Out	PM Peak Hour Total	Daily
Trip Generation Summary:									
Triplexes (2-story) & Townhomes (3-story)	219	DU	33	73	106	71	54	125	1,578
Apartments (5-story)	304	DU	26	87	113	72	46	118	1,380
Affordable Senior Attached Housing	83	DU	6	11	17	12	9	21	270
Total			**65**	**171**	**236**	**155**	**109**	**264**	**3,228**

[1] DU = dwelling units

4.2 PROJECT TRIP DISTRIBUTION

Trip distribution is the process of identifying the probable destinations, directions or traffic routes that will be utilized by Project traffic. The potential interaction between the planned land uses and surrounding regional access routes are considered, to identify the route where the Project traffic would distribute. The Project trip distribution and assignment process represents the directional orientation of traffic to and from the Project site. The trip distribution pattern is heavily influenced by the geographical location of the site, the location of surrounding land uses, and the proximity to the regional freeway system. Exhibit 4-1 shows the Project trip distribution patterns for the Triplex/Townhomes, Exhibit 4-2 shows the Project trip distribution patterns for the Apartment component, and the trip distribution patterns for the Senior Affordable component is shown in Exhibit 4-3.

4.3 MODAL SPLIT

The potential for Project trips to be reduced by the use of public transit, walking, or bicycling have not been included as part of the Project's estimated trip generation. Essentially, the Project's traffic projections are "conservative" in that these alternative travel modes would reduce the forecasted traffic volumes.

4.4 PROJECT TRIP ASSIGNMENT

The assignment of traffic from the Project area to the adjoining roadway system is based upon the Project trip generation, trip distribution, and the arterial highway and local street system improvements that would be in place by the time of initial occupancy of the Project. Based on the identified Project traffic generation and trip distribution patterns, Project weekday ADT and weekday peak hour intersection turning movement volumes are shown in Exhibit 4-4.

EXHIBIT 4-1 : PROJECT (TRIPLEX/TOWNHOMES) TRIP DISTRIBUTION

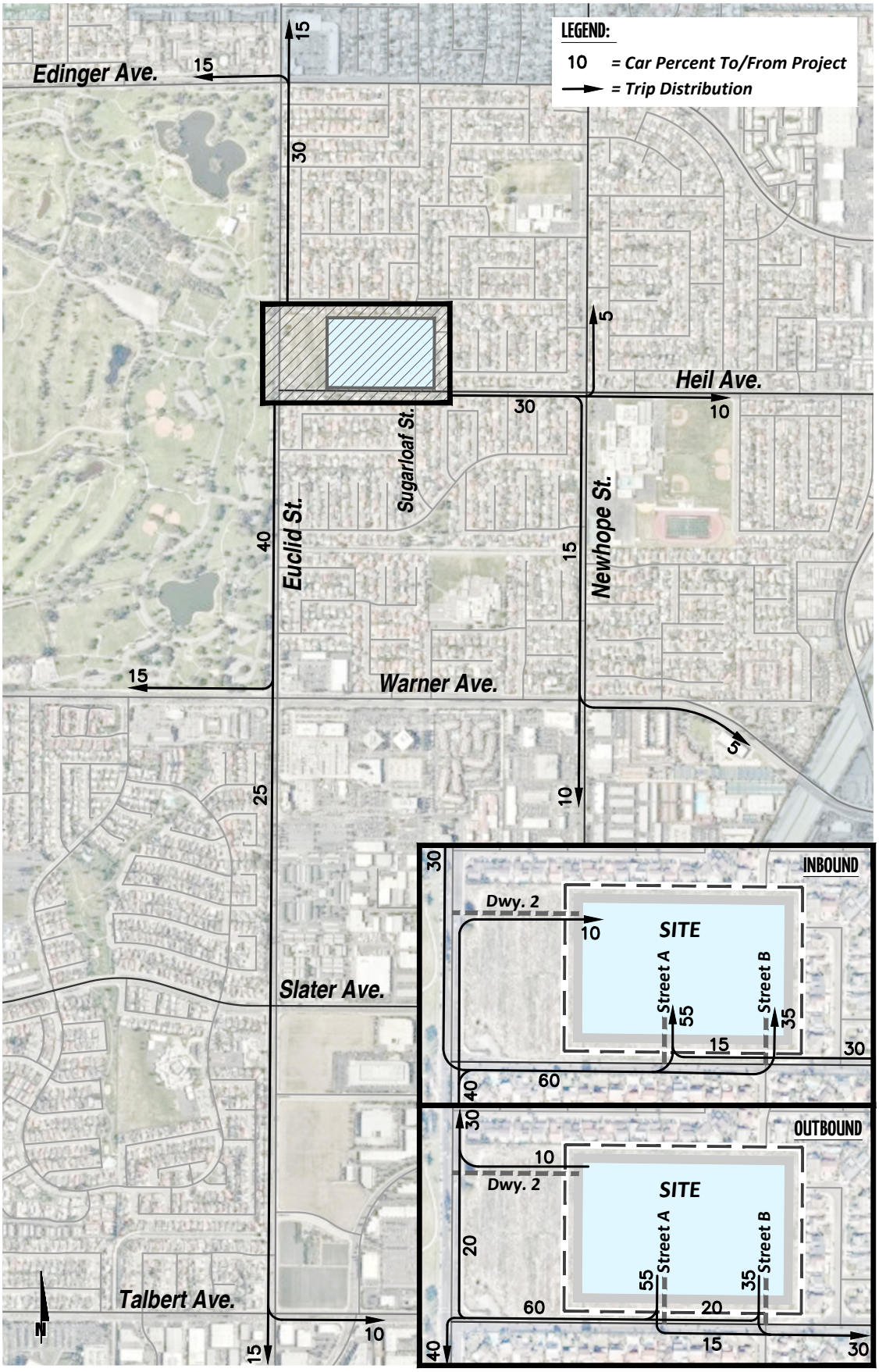


EXHIBIT 4-2 : PROJECT (APARTMENTS) TRIP DISTRIBUTION

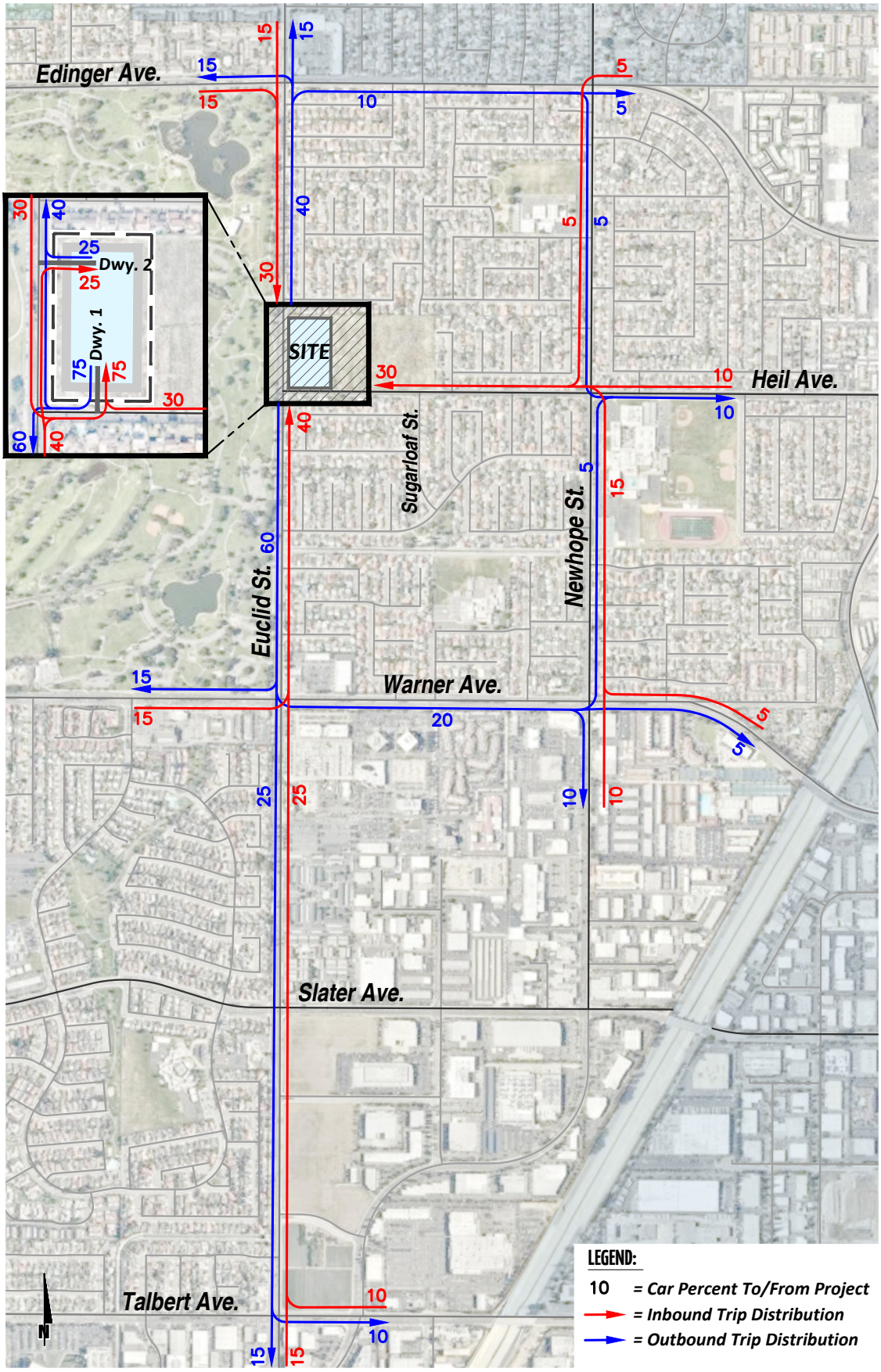


EXHIBIT 4-3 : PROJECT (SENIOR AFFORDABLE) TRIP DISTRIBUTION

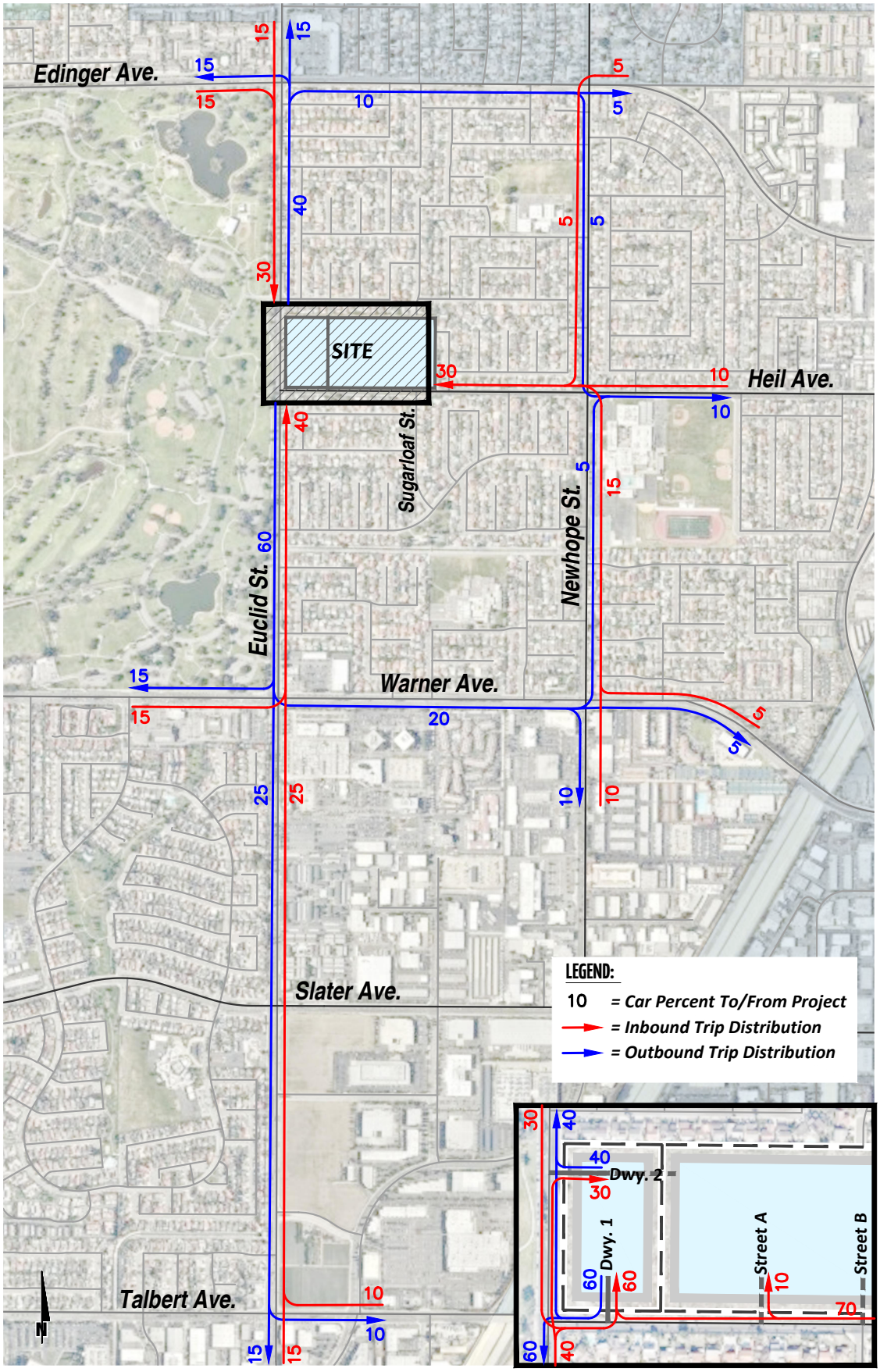
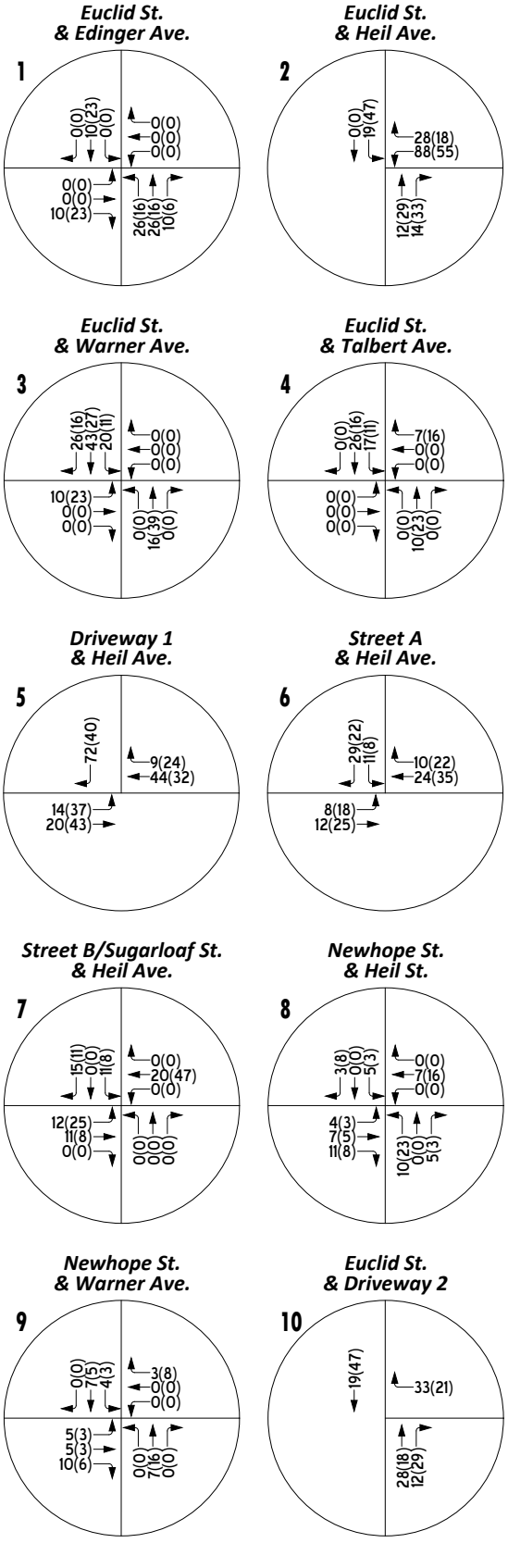
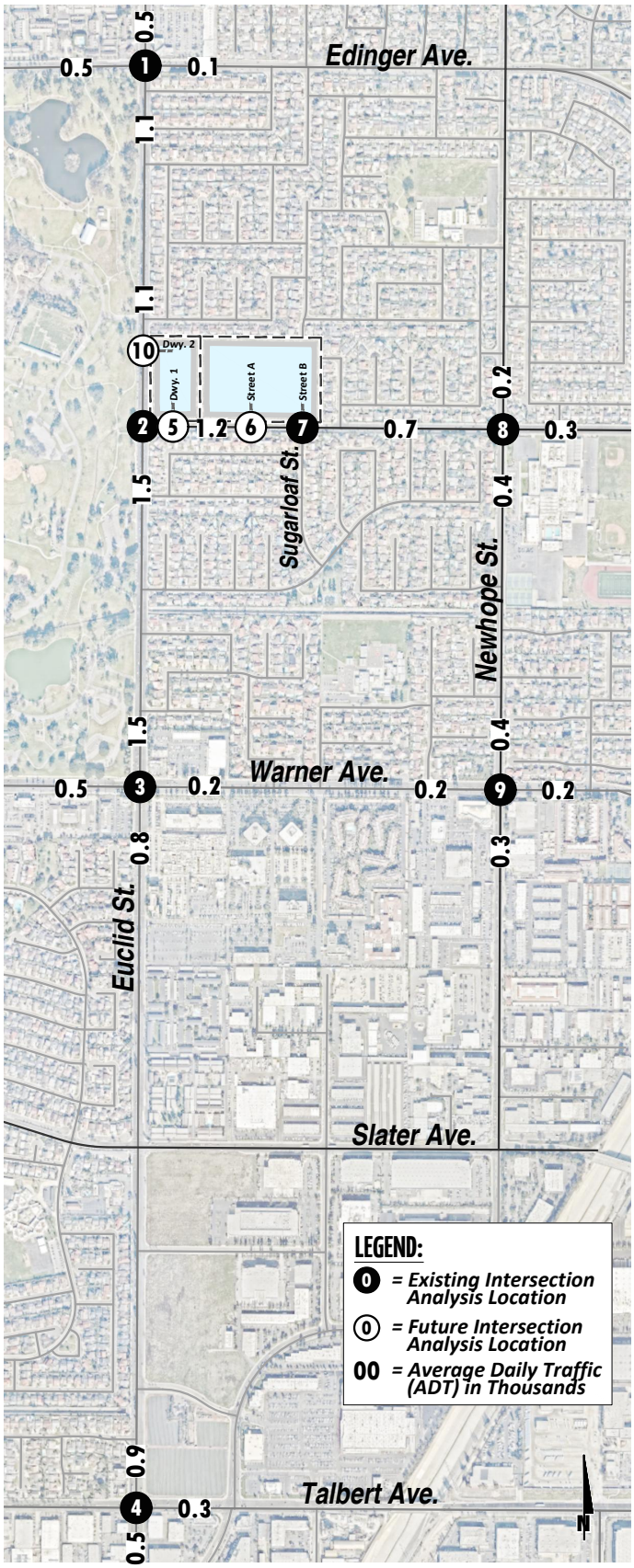


EXHIBIT 4-4 : PROJECT ONLY TRAFFIC VOLUMES





4.5 BACKGROUND TRAFFIC

Future year traffic forecasts have been based upon background (ambient) growth at 1.0% per year, compounded annually. The total ambient growth is 2.0% for 2026 traffic. The ambient growth factor is intended to approximate regional traffic growth. This ambient growth rate is added to existing traffic volumes to account for area-wide growth not reflected by cumulative development projects. Ambient growth has been added to daily and peak hour traffic volumes on surrounding roadways, in addition to traffic generated by the development of future projects that have been approved but not yet built and/or for which development applications have been filed and are under consideration by governing agencies. The traffic generated by the proposed Project is manually added to the base volume to determine Opening Year forecasts.

4.6 CUMULATIVE DEVELOPMENT TRAFFIC

A cumulative project list was developed for the purposes of this analysis through consultation with planning and engineering staff from the City of Fountain Valley as well as other near-by agencies such as City of Garden Grove, City of Westminster, City of Santa Ana, and City of Costa Mesa. The cumulative projects listed are those that would generate traffic and would contribute traffic to study area intersections. Exhibit 4-3 illustrates the cumulative development location map. A summary of cumulative development projects and their proposed land uses are shown in Table 4-3. If applicable, the traffic generated by individual cumulative projects was manually added to the Opening Year (2026) forecasts to ensure that traffic generated by the listed cumulative development projects in Table 4-3 is reflected as part of the background traffic. In an effort to conduct a conservative analysis, the cumulative projects are added in conjunction with the ambient growth identified in Section 4.5 *Background Traffic*. Cumulative ADT and peak hour intersection turning movement volumes are shown in Exhibit 4-5. It should be noted that some of the cumulative projects reflected on the list/map may have since been developed, however, these uses were still evaluated as part of this traffic study as these developments were not constructed at the time the traffic counts were conducted and would therefore not be accounted for in the baseline traffic condition.

EXHIBIT 4-5 : CUMULATIVE DEVELOPMENT LOCATION MAP

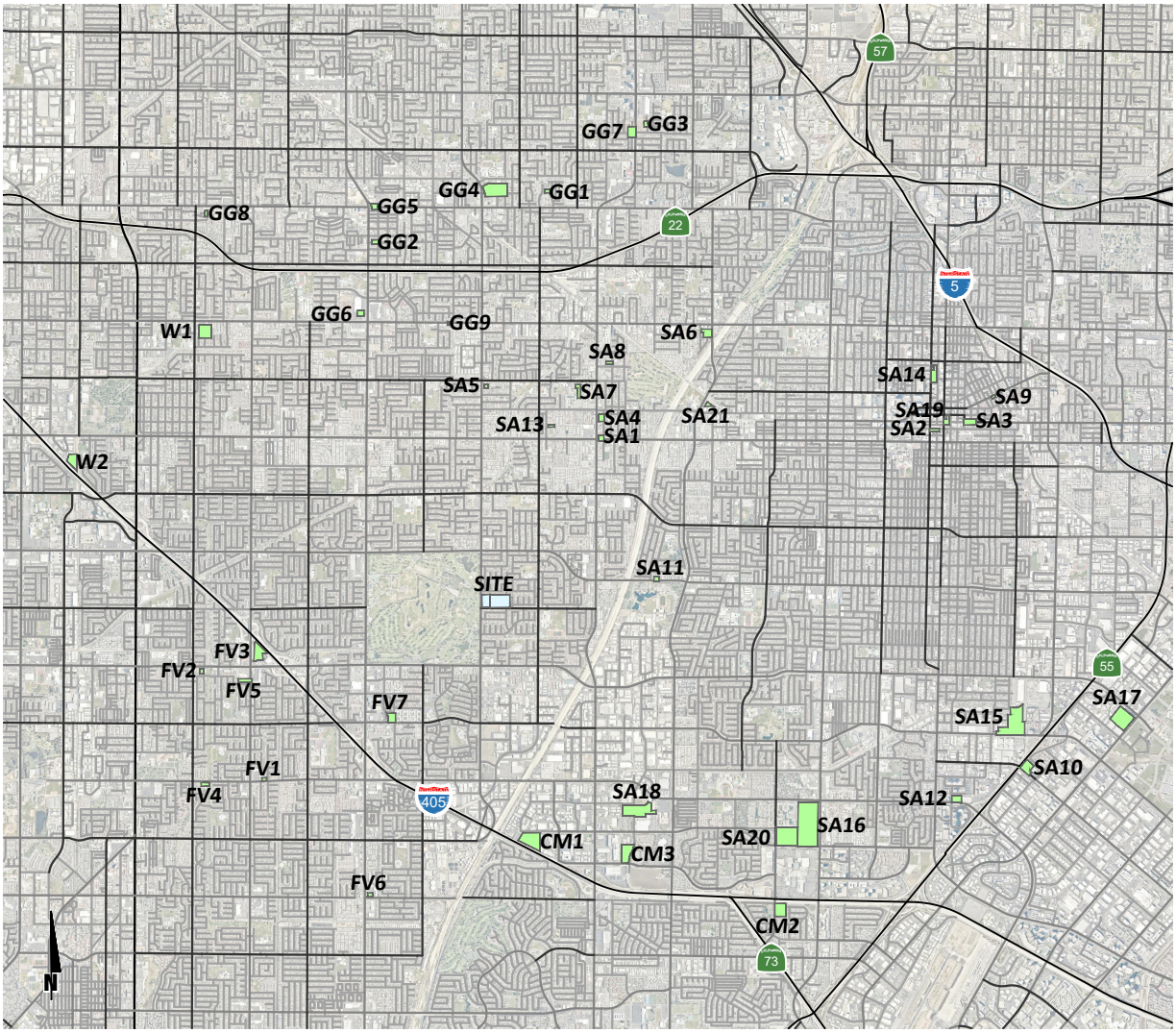
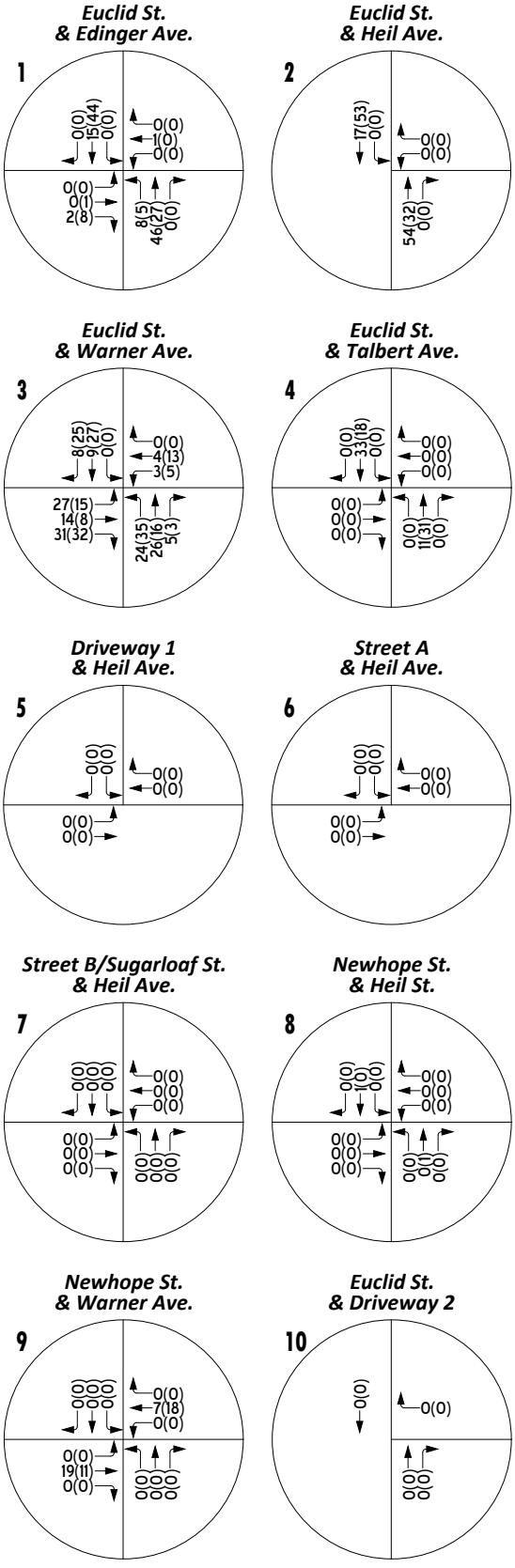


EXHIBIT 4-6 : CUMULATIVE ONLY TRAFFIC VOLUMES



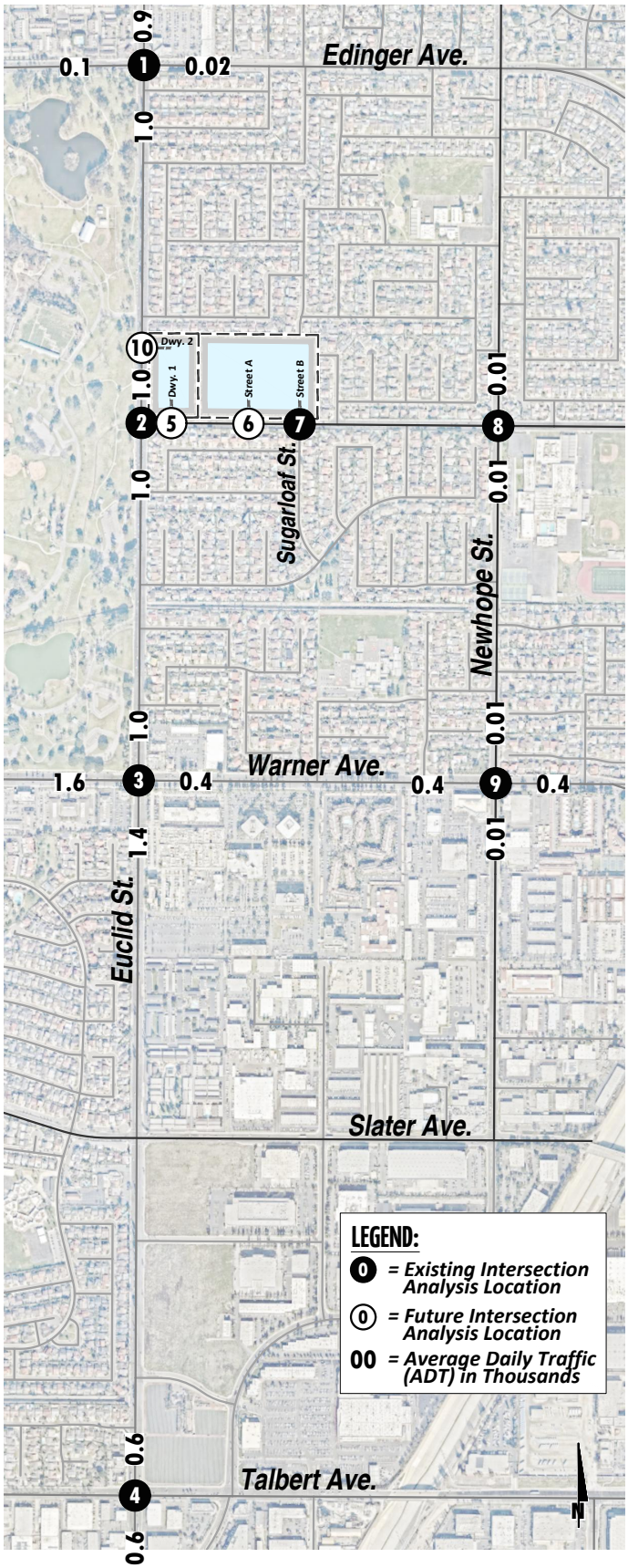


TABLE 4-3: CUMULATIVE DEVELOPMENT LAND USE SUMMARY (PAGE 1 OF 2)

#	Project Name	Jurisdiction	Land Use[1]	Quantity	Units[2]
FV1	McDonalds	Fountain Valley	Fast-Food Restaurant w/ Drive-Thru	4.000	TSF
FV2	Parkside Fountain Valley	Fountain Valley	Apartment Complex	72	DU
FV3	16800 Magnolia	Fountain Valley	Apartments	682	DU
			Retail	4.364	TSF
FV4	Bonanni Residential	Fountain Valley	Single-Family Residential (Detached)	15	DU
FV5	Guadalupe Manor	Fountain Valley	Low-Income Senior Housing	29	DU
FV6	Popeye's Louisiana Kitchen Restaurant	Fountain Valley	Fast-Food Restaurant w/ Drive-Thru	2.379	TSF
FV7	Slater Mixed-Use	Fountain Valley	Multifamily Residential	270	DU
			Quality Restaurant	5.000	TSF
SA1	First Harbor Mixed-Use	Santa Ana	Commercial	15.182	TSF
			Residential Condominiums	181	DU
SA2	3rd and Broadway Mixed-Use	Santa Ana	Multifamily Residential (High-Rise)	171	DU
			Commercial	14.816	TSF
			Hotel	75	RM
SA3	4th and Mortimer Mixed-Use	Santa Ana	Multifamily Housing (Mid-Rise)	169	DU
			Shopping Center	7.514	TSF
			High Turnover (Sit-Down) Restaurant	3.847	TSF
SA4	5th and Harbor Mixed-Use	Santa Ana	Multi-Family Residential	94	DU
			Commercial	9.500	TSF
SA5	7-Eleven Service Station	Santa Ana	Gas Station with Convenience Store	8	VFP
SA6	Arches	Santa Ana	Multi-Family Residential (Mid-Rise)	85	DU
SA7	Bella Terra Residential Community and Temple	Santa Ana	Single-Family Homes	13	DU
			Religious Temple	3.500	TSF
SA8	Bewley Street Townhomes	Santa Ana	Condominiums	10	DU
			Live-Work Residential	6	DU
SA9	FX Residences	Santa Ana	Residential	17.000	DU
SA10	Garrey Avenue Business Park	Santa Ana	Industrial Warehouse	91.500	TSF
SA11	Haphan Residential	Santa Ana	Multi-Family Residential	18	DU
SA12	Legado at the Met	Santa Ana	Multi-Family Residential (6-Story)	278	DU
SA13	Mountain View Condominiums	Santa Ana	Condominiums	8	DU
SA14	One Broadway Plaza	Santa Ana	Multifamily Housing (High-Rise)	415	DU
			General Office	199.850	TSF
			Shopping Center	8.525	TSF
			Quality Restaurant	15.915	TSF
			High Turnover (Sit-Down) Restaurant	2.681	TSF
SA15	Park 55 Industrial Redevelopment	Santa Ana	Industrial	176.000	TSF

TABLE 4-3: CUMULATIVE DEVELOPMENT LAND USE SUMMARY (PAGE 2 OF 2)

#	Project Name	Jurisdiction	Land Use[1]	Quantity	Units[2]
SA16	Related California Bristol Specific Plan	Santa Ana	Residential	3750	DU
			Commercial	350.000	TSF
			Hotel	250	RM
			Senior Care	200	DU
SA17	Warner Redhill Mixed-Use Development	Santa Ana	High-Turnover Sit Down Restaurant	20.000	TSF
			Retail	31.000	TSF
			Quality Restaurant	20.000	TSF
			Fast Casual Restaurant	3.500	TSF
			Fast-Food Restaurant without Drive-Through Window	3.500	TSF
			Coffee/Donut Shop without Drive-Through Window	2.000	TSF
SA18	South Coast Technology Center	Santa Ana	Industrial	15.8	AC
SA19	The Rafferty	Santa Ana	Residential	218	DU
			Commercial	12.350	TSF
SA20	The Village Santa Ana Specific Plan	Santa Ana	Residential	1,583	DU
			Office Space	300.000	TSF
			Retail	80.000	TSF
SA21	Vista Heritage Charter School	Santa Ana	Charter School	5.837	TSF
CM1	One Metro West	Costa Mesa	Apartments	1,057	DU
CM2	3150 Bear Street	Costa Mesa	Residential	146	DU
CM3	Hive Live	Costa Mesa	Apartments	1,050	DU
W1	Multi-Tenant Commercial Building	Westminster	Commercial Building	13.133	TSF
W2	Industrial Building	Westminster	Industrial Building	116.000	TSF
GG1	PUD-019-2024	Garden Grove	Multifamily Residential	15	DU
GG2	Melia Homes	Garden Grove	Townhomes	30	DU
GG3	SP-120-2023	Garden Grove	Apartments (6-story)	53	DU
GG4	Civic Center Revitalization	Garden Grove	Police Headquarters	104.000	TSF
GG5	SP-111-2022	Garden Grove	Retail	9.786	TSF
			Medical Space	9.270	TSF
			Apartments	52	DU
GG6	Dutch Bros	Garden Grove	Coffee Shop with Drive-Through	0.950	TSF
GG7	PUD-141-01A	Garden Grove	Hotel	500	RM
GG8	SP-119-2022	Garden Grove	Townhomes	20	DU
GG9	SP-114-2022	Garden Grove	Medical Office Building	3.670	TSF

[1] AC = Acres; TSF = Thousand Square Feet; DU = Dwelling Units; VSP = Vehicle Fueling Positions; STU = Students

5 OPENING YEAR (2026) TRAFFIC CONDITIONS

This section discusses the traffic forecasts for Opening Year (2026) traffic conditions and the resulting intersection operations, traffic signal warrant, and roadway segment analyses.

5.1 ROADWAY IMPROVEMENTS

The lane configurations and traffic controls assumed to be in place for Opening Year (2026) traffic conditions are consistent with those shown previously in Exhibit 3-1, with the exception of the following:

- Project driveways and those facilities assumed to be constructed by the Project to provide site access are also assumed to be in place for Opening Year (2026) With Project conditions (e.g., intersection and roadway improvements at the Project's frontage and driveways).
- Driveways and those facilities assumed to be constructed by cumulative developments to provide site access are also assumed to be in place for both Opening Year (2026) Without and With Project conditions only (e.g., intersection and roadway improvements along the cumulative development's frontages).

5.2 OPENING YEAR (2026) TRAFFIC VOLUME FORECASTS

The Opening Year (2026) Without Project scenario includes Existing traffic volumes plus an ambient growth factor of 2.0% and the addition of traffic generated by cumulative development projects. The Opening Year (2026) With Project scenario includes Existing traffic volumes plus an ambient growth factor of 2.0%, the addition of traffic generated by cumulative development projects, and the addition of Project traffic.

The weekday ADT and weekday peak hour intersection turning movement volumes, in actual vehicles, which can be expected for Opening Year (2026) traffic conditions are shown in Exhibits 5-1 and 5-2, respectively.

5.3 INTERSECTION OPERATIONS ANALYSIS

Opening Year (2026) peak hour traffic operations have been evaluated for the study area intersections based on the analysis methodologies presented in Section 2 *Methodologies* of this TA. The intersection analysis results are summarized in Table 5-1 for Opening Year (2026) Without Project traffic conditions, which indicates that the study area intersections are anticipated to continue to operate at an acceptable LOS during the peak hours, with the exception of the following intersection which is also operating at a deficient LOS under Existing traffic conditions:

- Newhope St. & Warner Av. (#9) – LOS E PM peak hour only

As shown in Table 5-1, there are no additional study area intersections that are anticipated to operate at an unacceptable LOS with the addition of Project traffic under Opening Year (2026) With Project traffic conditions. The addition of Project traffic increases the V/C by 0.009 (less than 1%) from the pre-project condition. The intersection operations analysis worksheets for Opening Year (2026) Without and With Project traffic conditions are included in Appendices 5.1 and 5.2, respectively.

EXHIBIT 5-1 : OPENING YEAR CUMULATIVE (2026) WITHOUT PROJECT TRAFFIC VOLUMES

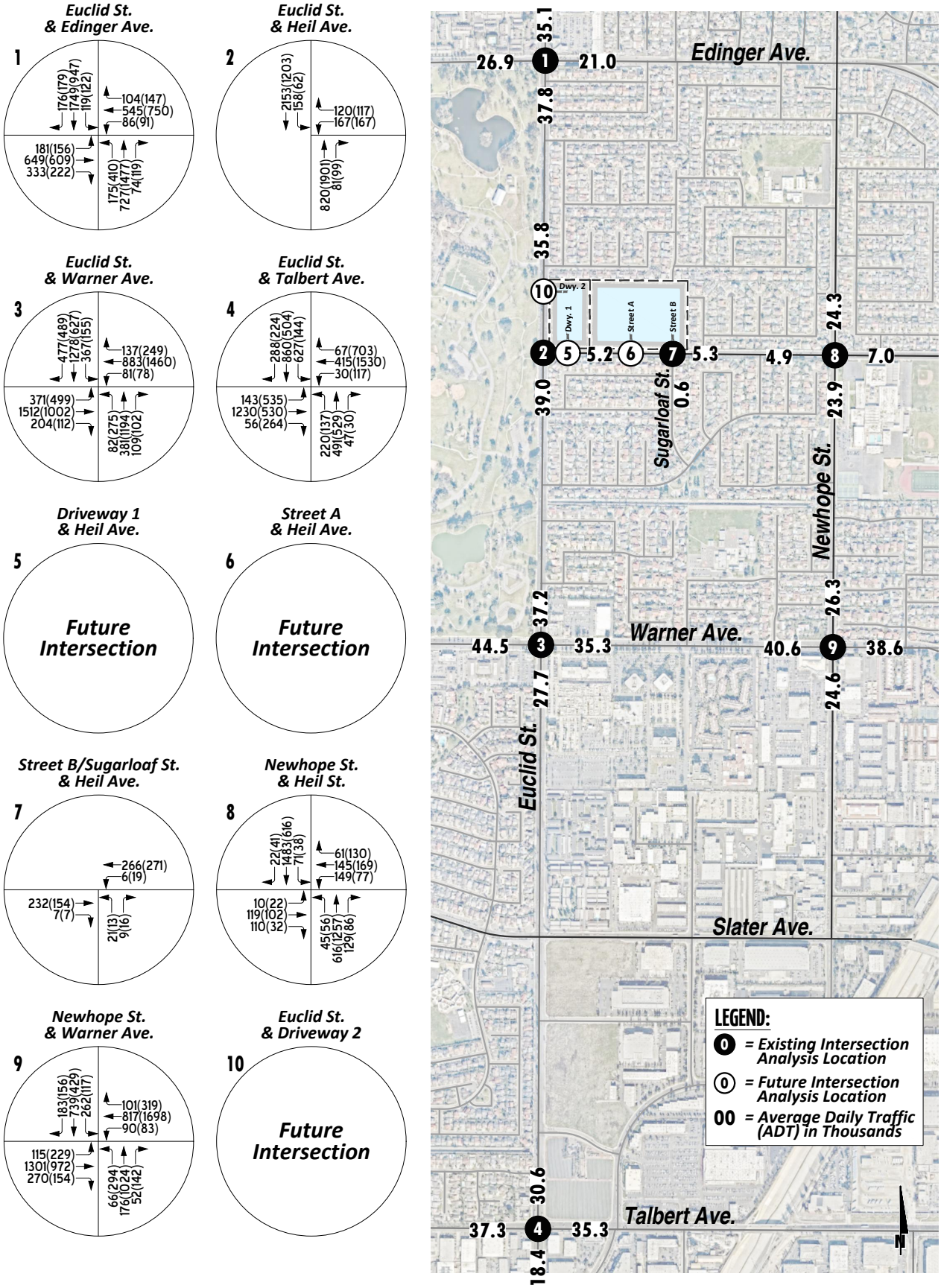


EXHIBIT 5-2 : OPENING YEAR CUMULATIVE (2026) WITH PROJECT TRAFFIC VOLUMES

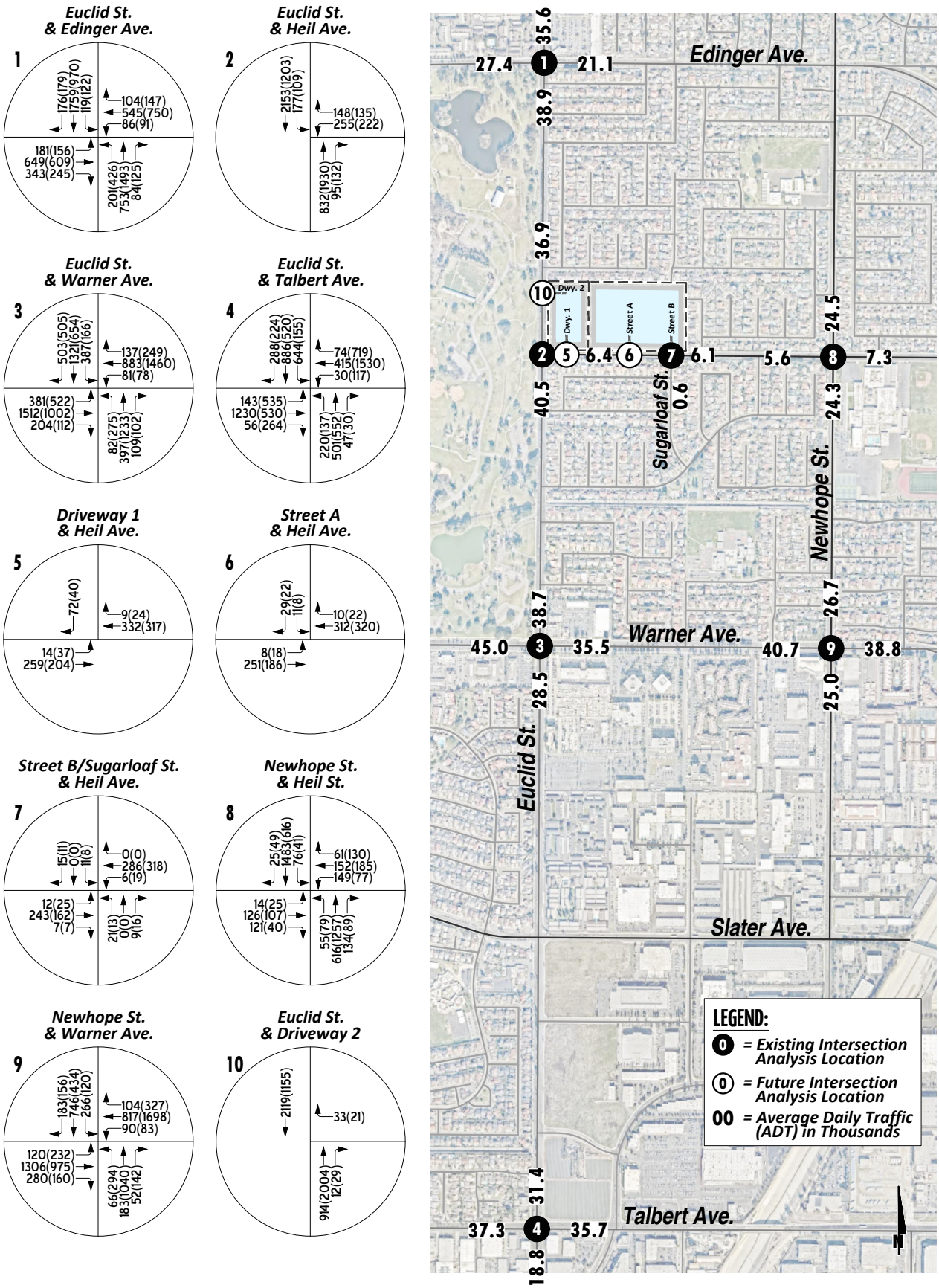


TABLE 5-1: INTERSECTION ANALYSIS FOR OPENING YEAR (2026) CONDITIONS

			2026 Without Project								2026 With Project							
			ICU[1] (secs.)		Level of Service		Delay[2] (secs.)		Level of Service		ICU[1] (secs.)		Level of Service		Delay[2] (secs.)		Level of Service	
#	Intersection	Traffic Control[3]	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
1	Euclid St. & Edinger Ave.	TS	0.746	0.711	C	C	Not Applicable[4]				0.755	0.713	C	C	Not Applicable[4]			
2	Euclid St. & Heil Ave.[5]	TS	0.782	0.577	C	A	Not Applicable[4]				0.833	0.649	D	B	Not Applicable[4]			
3	Euclid St. & Warner Ave.	TS	0.715	0.851	C	D	Not Applicable[4]				0.730	0.868	C	D	Not Applicable[4]			
4	Euclid St. & Talbert Ave.	TS	0.601	0.804	B	D	Not Applicable[4]				0.608	0.816	B	D	Not Applicable[4]			
5	Driveway 1 & Heil Ave.[5]		Future Intersection				Future Intersection				Future Intersection				9.8	9.6	A	A
6	Street A & Heil Ave.[5]		Future Intersection				Future Intersection				Future Intersection				10.2	10.2	B	B
7	Street B / Sugarloaf St. & Heil Ave.[5]	CSS	Not Applicable[4]				12.1	10.8	B	B	Not Applicable[4]				11.3	10.8	B	B
8	Newhope St. & Heil Ave.	TS	0.674	0.568	B	A	Not Applicable[4]				0.686	0.577	B	A	Not Applicable[4]			
9	Newhope St. & Warner Ave.	TS	0.668	**0.929**	B	**E**	Not Applicable[4]				0.671	**0.938**	B	**E**	Not Applicable[4]			
10	Euclid St. & Driveway 2		Future Intersection				Future Intersection				Future Intersection				13.9	28.4	B	D

BOLD = LOS does not meet the applicable jurisdictional requirements (i.e., unacceptable LOS).

[1] Intersection capacity utilization (ICU) methodology results are presented as a volume-to-capacity ratio.

[2] Per the Highway Capacity Manual (7th Edition), overall average intersection delay and level of service are shown for intersections with a traffic signal or all-way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown.

[3] TS = Traffic Signal; CSS = Cross-street Stop

[4] ICU not reported for unsignalized intersections and HCM not reported for signalized intersections.

[5] 2026 With Project results assume improvements to be implemented by the Project along Heil Avenue.

5.4 TRAFFIC SIGNAL WARRANTS ANALYSIS

Traffic signal warrants have been conducted for Opening Year (2026) traffic conditions. The traffic signal warrant analysis for Opening Year (2026) traffic conditions are based on planning level ADT peak hour volume-based traffic signal warrants. There are no unsignalized study area intersections anticipated to meet a traffic signal warrant under Opening Year (2026) Without and With Project traffic conditions (see Appendices 5.3 and 5.4, respectively).

5.5 ROADWAY SEGMENT CAPACITY ANALYSIS

The roadway capacities utilized for the study area roadway segment analysis are obtained from the City Guidelines. These roadway segment capacities are approximate figures only and are used at the General Plan level to assist in determining the roadway functional classification (number of through lanes) needed to meet traffic demand. Table 5-2 provides a summary of the Opening Year (2026) conditions roadway segment capacity analysis. As shown in Table 5-2, the study area roadway segments are anticipated to operate at an acceptable LOS based on the daily roadway capacity thresholds and minimum LOS criteria under Opening Year (2026) Without and With Project traffic conditions.

TABLE 5-2: ROADWAY SEGMENT CAPACITY ANALYSIS FOR OPENING YEAR (2026) CONDITIONS

			Roadway	LOS	2026 Without Project			2026 With Project		
#	Roadway	Segment Limits	Section	Capacity[1]	Vol	V/C[2]	LOS[3]	Vol	V/C[2]	LOS[3]
1	Heil Ave.	Euclid St. to Driveway 1	2U	12,500	5,219	0.418	A	7,129	0.570	B
2	Heil Ave.	Driveway 1 to Street A	2U	12,500	5,219	0.418	A	6,400	0.512	A
3	Heil Ave.	Street A to Street B/Sugarloaf St.	2U	12,500	5,219	0.418	A	6,254	0.500	A
4	Heil Ave.	East of Sugarloaf St.	4D	25,000	5,336	0.213	A	6,057	0.242	A

[1] These maximum roadway capacities are based on the City's traffic study guidelines and have been interpolated where necessary.
[2] V/C = Volume to Capacity Ratio
[3] LOS = Level of Service

5.6 CUMULATIVE DEFICIENCIES AND RECOMMENDED IMPROVEMENTS

This section provides a summary of Project deficiencies and recommended improvements. Improvements needed to achieve acceptable LOS have been identified at intersections or roadway segments that are anticipated to operate at a deficient LOS under Opening Year (2026) traffic conditions.

5.6.1 RECOMMENDED IMPROVEMENTS TO ADDRESS DEFICIENCIES AT INTERSECTIONS

As previously shown in Table 5-1, the study area intersections are anticipated to operate at an acceptable LOS under Opening Year (2026) With Project traffic conditions, with the exception of the intersection of Newhope Street at Warner Avenue (#9). The intersection of Newhope Street at Warner Avenue is currently operating at LOS E during PM peak hour traffic conditions and are anticipated to operate at a deficient LOS with the addition of cumulative and Project traffic. Although the City Guidelines do not specify a criteria, the County's 2023 Congestion Management Program (CMP) identifies that a CMP analysis is required for any impact where a Project would increase an LOS E capacity by 3% or more and improvements should be identified where the impact is more than 3%. As noted previously, the addition of Project traffic would increase the v/c at the intersection of Newhope Street and Warner Avenue by less than 1% from the pre-project condition. As such, no intersection improvements have been recommended.

5.6.2 RECOMMENDED IMPROVEMENTS TO ADDRESS DEFICIENCIES AT ROADWAY SEGMENTS

As shown in Table 5-2, there are no roadway segments anticipated to operate at an unacceptable LOS based on the daily roadway capacity thresholds and minimum LOS criteria under Opening Year (2026) With Project traffic conditions. As such, no improvements have been identified.

6 LOCAL FUNDING MECHANISMS

Transportation improvements within the City of Fountain Valley are funded through a combination of direct project mitigation and development impact fee (DIF) programs. Identification and timing of needed improvements is generally determined through local jurisdictions based upon a variety of factors.

6.1 CITY OF FOUNTAIN VALLEY DEVELOPMENT IMPACT FEE (DIF) PROGRAM

The Project will also be subject to City of Fountain Valley's DIF program which includes a component for transportation. The City's DIF program was updated in July 2022 (for the Fiscal Year 2023-2024) and discusses the local streets and signal improvements planned for the City through build-out of the existing City limits.

7 REFERENCES

1. **Fehr & Peers for City of Fountain Valley.** *Transportation Impact Assessment Guidelines for Land Use Projects in CEQA and for General Plan Consistency.* Fountain Valley : s.n., June 2020.
2. **Institute of Transportation Engineers.** *Trip Generation Manual.* 11th Edition. 2021.
3. **Transportation Research Board.** *Highway Capacity Manual (HCM).* 7th Edition. s.l. : National Academy of Sciences, 2022.
4. **Caltrans.** *California Manual on Uniform Traffic Control Devices (MUTCD).* 2023.

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TECHNICAL MEMORANDUM

DATE: June 4, 2025
TO: Kyle Knoke, City of Fountain Valley
FROM: Charlene So, Urban Crossroads, Inc.
JOB NO: 14388-14A Euclid Memo

SUBJECT: EUCLID & HEIL TRAFFIC ASSESSMENT FOR DRIVEWAY 2 ON EUCLID STREET

Urban Crossroads, Inc. has prepared the following Traffic Assessment for Driveway 2 on Euclid Street for the Euclid & Heil development (Project), which is located on the northeast corner of Euclid Street and Heil Avenue in the City of Fountain Valley. Specifically, the following traffic assessment addresses the proposed access at Driveway 2 on Euclid Street and whether a northbound right turn deceleration lane is needed.

PROJECT BACKGROUND

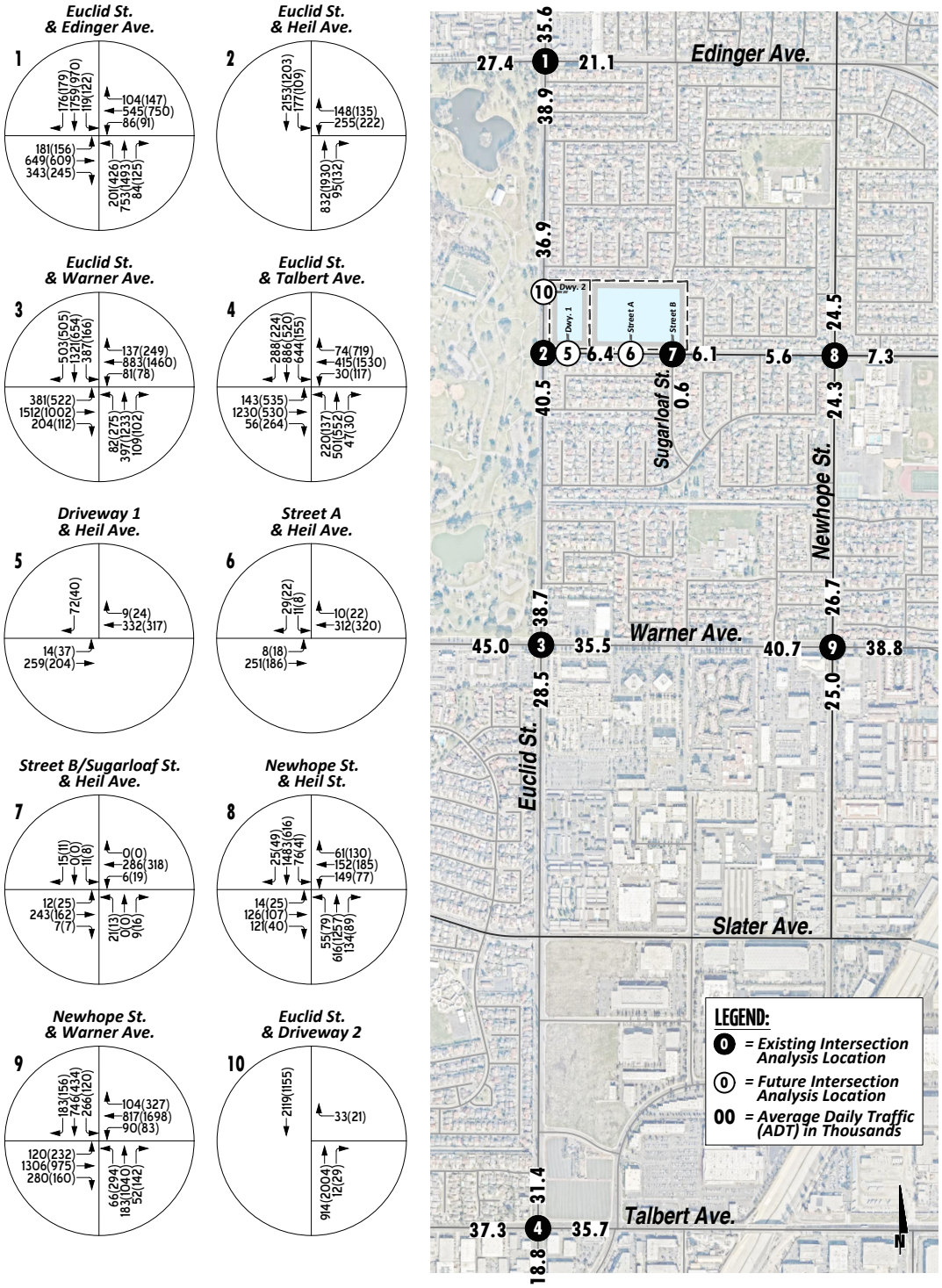
The Euclid & Heil Traffic Analysis dated April 10, 2025, referred to as 2025 Traffic Study, evaluated 36 for-sale 2-story triplexes, 183 for-sale 3-story townhomes, 304 market-rate multifamily apartment units, and 83 multifamily affordable senior units. The following assessment utilizes the analysis associated with Driveway 2 as presented in the 2025 Traffic Study to conclude why a northbound right turn deceleration lane is not necessary at Driveway 2 on Euclid Street (Intersection #10 in the 2025 Traffic Study).

Euclid Street is currently striped with two lanes southbound and three lanes northbound with a raised, landscaped median. Euclid Street has a posted speed limit of 45 miles per hour. The proposed driveway on Euclid Street would be restricted to right-in/right-out access only. It should be noted that there are other driveways into the proposed Project along Heil Avenue that would reduce pressure on the driveway proposed on Euclid Street.

TRAFFIC VOLUMES

Based on the trip generation and distribution patterns evaluated in the 2025 Traffic Study, Driveway 2 would serve up to 12 AM peak hour vehicles and 29 PM peak hour vehicles making a northbound right turn. Opening Year Cumulative (2026) With Project volumes utilized in the 2025 Traffic Study are shown in Exhibit 1.

EXHIBIT 1: OPENING YEAR (2026) WITH PROJECT VOLUMES



OPERATIONS ANALYSIS

Table 1 summarizes the level of service (LOS) analysis results for Opening Year (2026) With Project traffic conditions for Driveway 2 on Euclid Street, which indicates the intersection would operate at LOS D or better during the peak hours. Peak hour intersection operations analysis worksheets are provided in Appendix 1.

TABLE 1: OPENING YEAR (2026) INTERSECTION ANALYSIS

#	Intersection	Traffic Control[2]	Delay[1] (secs.)		Level of Service	
			AM	PM	AM	PM
10	Euclid St. & Driveway 2	CSS	13.9	28.4	B	D

1 Per the Highway Capacity Manual (7th Edition), overall average intersection delay and level of service are shown for intersections with a traffic signal or all-way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown.

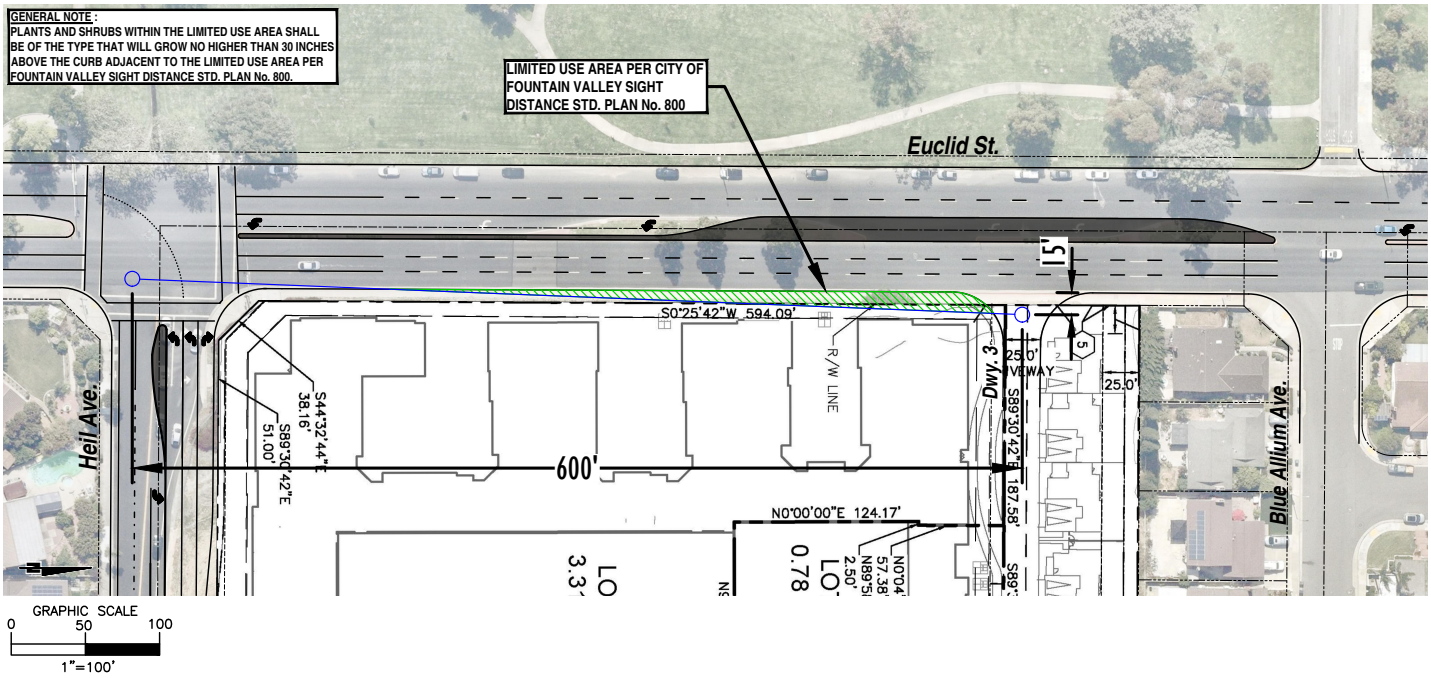
2 CSS = Cross-street Stop

SIGHT DISTANCE

Horizontal sight distance has been evaluated for Driveway 2 along Euclid Street is based on the City's Standard Plan No. 800 (FV Std. Plan 800) and Caltrans Highway Design Manual (HDM). As defined by the HDM, sight distance is the continuous length of highway ahead visible to the driver. At unsignalized intersections, corner sight distance must provide a substantially clear line of sight between the driver of the vehicle waiting on the minor road (driveway) and the driver of an approaching vehicle. The sight distance is measured along the direction of travel from a point on the minor road at 15 feet from the edge of the major road pavement and measured from a height of eye of 3.5 feet on the minor road to a height of object of 4.25 feet on the major road. It should be noted that the assessment performed for the driveway locations is considered conservative as the HDM states that corner sight distance requirements are not applicable to urban driveways unless signalized.

Adequate visibility for vehicular and pedestrian traffic can be accommodated at the Project driveway by limiting sight obstructions within the identified limited use area. Any landscaping/hardscape within the limited use area should not exceed 30 inches in height. The limited use area should be kept clear of any landscaping or any other obstructions that may impede the visibility of the driver, including on-street parking. Minimum horizontal sight distances for the Project driveways are provided in Exhibit 2, however, sight distance should be re-evaluated in the field once the driveways have been constructed. It is anticipated that the minimum 600-foot sight distance to the south and 700-foot sight distance to the north could be accommodated. The sight distance lines, limited use area, and clear sight triangles per City's standards are illustrated in Exhibit 2 per FV Std. Plan 800.

EXHIBIT 2: DRIVEWAY 2 SIGHT DISTANCE



RECOMMENDATIONS

There are no right turn pockets along Euclid Street between Warner Avenue and the northerly City limits (not at any private driveways, local residential streets, or major intersections within this section of the City). Based on a review of the following considerations, a northbound right turn deceleration lane was not recommended at Driveway 2 on Euclid Street.

- The anticipated northbound right-turn volume during the peak hours is only 29 vehicles at its highest (during the PM peak hour) which is well below the common industry threshold criteria for requiring a dedicated right-turn lane (which is typically when volumes exceed 50 peak hour trips).
- Euclid Street is a multi-modal arterial where adding unnecessary pavement for low-turning movements may conflict with broader planning goals such as minimizing impervious surfaces, maintaining pedestrian safety, and preserving right-of-way for other uses such as for landscaping and sidewalks.
- Based on the Statewide Integrated Traffic Records System (SWITRS), there were no reported collisions in 2024 at either Blue Allium Avenue or Heil Avenue along Euclid Street. There were three reported collisions at Euclid and Heil Avenue in May 2023 and the last reported collision (single collision) at Blue Allium Avenue occurred in October 2022.

CONCLUSIONS

Urban Crossroads has prepared the LOS-based Traffic Study and is the Project's Traffic Engineer of Record as it relates to the operations and queuing analyses performed to support the Traffic Study. Based on the operational characteristics of Euclid Street and the projected traffic volumes associated with the proposed development, it is our professional opinion that the LOS and queuing at Driveway 2 are within the City's LOS Thresholds as defined in the City's Traffic Study Guidelines without the need for a dedicated northbound right-turn lane. Furthermore, it is important that the expected northbound right-turn volume at Driveway 2 during the peak hour is low (maximum of 29 vehicles), falling well below typical industry thresholds for requiring a right-turn lane, which equates to approximately one vehicle every two minutes.

If you have any questions, please contact me directly at cso@urbanxroads.com.

APPENDIX 1: INTERSECTION ANALYSIS WORKSHEETS

Intersection	
Int Delay, s/veh	0.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	33	914	12	0	2119
Future Vol, veh/h	0	33	914	12	0	2119
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	36	993	13	0	2303

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	503	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7.14	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.92	-	-	-	-
Pot Cap-1 Maneuver	0	440	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	440	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s/v	13.91	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	440	-
HCM Lane V/C Ratio	-	-	0.082	-
HCM Control Delay (s/veh)	-	-	13.9	-
HCM Lane LOS	-	-	B	-
HCM 95th %tile Q(veh)	-	-	0.3	-

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	21	2004	29	0	1155
Future Vol, veh/h	0	21	2004	29	0	1155
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	23	2178	32	0	1255

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	1105	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7.14	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.92	-	-	-	-
Pot Cap-1 Maneuver	0	176	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	176	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s/v	28.41	0	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	176	-
HCM Lane V/C Ratio	-	-	0.129	-
HCM Control Delay (s/veh)	-	-	28.4	-
HCM Lane LOS	-	-	D	-
HCM 95th %tile Q(veh)	-	-	0.4	-

TECHNICAL MEMORANDUM

DATE: June 4, 2025
TO: Kyle Knoke, City of Fountain Valley
FROM: Charlene So, Urban Crossroads, Inc.
JOB NO: 14388-15A Heil Memo

SUBJECT: EUCLID & HEIL TRAFFIC ASSESSMENT FOR DRIVEWAY 1 ON HEIL AVENUE

Urban Crossroads, Inc. has prepared the following Traffic Assessment for Driveway 1 on Heil Avenue for the Euclid & Heil development (Project), which is located on the northeast corner of Euclid Street and Heil Avenue in the City of Fountain Valley. Specifically, the following traffic assessment addresses the proposed access at Driveway 1 on Heil Avenue and the proposed eastbound left turn pocket into the multifamily component..

PROJECT BACKGROUND

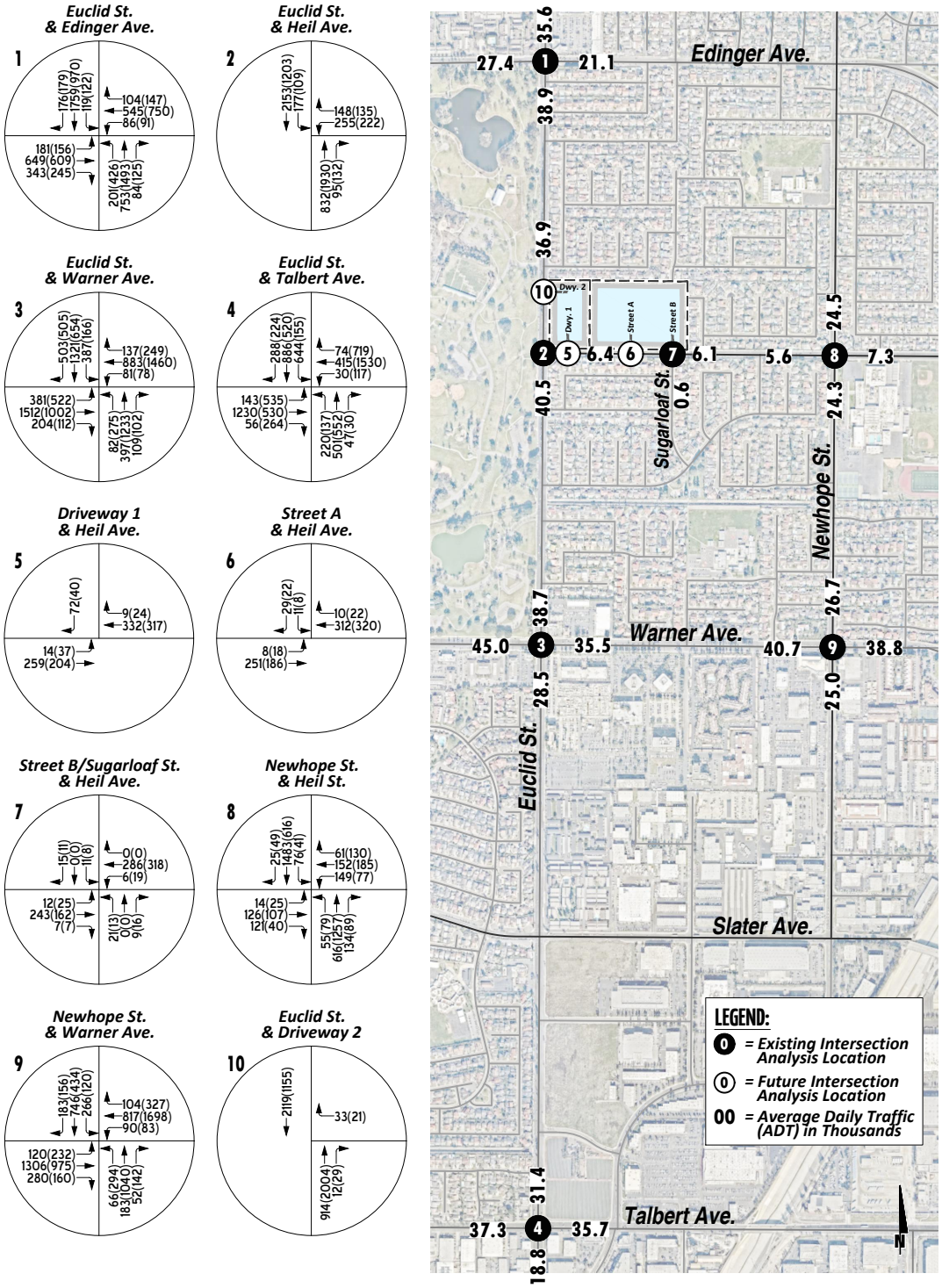
The Euclid & Heil Traffic Analysis dated April 10, 2025, referred to as 2025 Traffic Study, evaluated 36 for-sale 2-story triplexes, 183 for-sale 3-story townhomes, 304 market-rate multifamily apartment units, and 83 multifamily affordable senior units. The following assessment utilizes the analysis associated with Driveway 1 as presented in the 2025 Traffic Study to provide recommendations for the eastbound left turn at Driveway 1 on Heil Avenue into to the multifamily component of the Project (Intersection #5 in the 2025 Traffic Study).

The proposed driveway on Heil Avenue would be restricted to right-in/right-out/left-in access only (left turns out from the multifamily component would be prohibited). The driveway on Euclid Street (as well as other driveways to the east on Heil Avenue) could be utilized to access the multifamily component from the north side. Consistent with the analysis in the 2025 Traffic Study, the driveway will be designed with raised medians in order to prohibit southbound left turns out from Driveway 1 onto Heil Avenue and would accommodate approximately 99-feet of storage with a 90-foot transition. A bulb out will be implemented on the northwest corner of Driveway 1 on Heil Avenue which will open up to the westbound right turn pocket at the intersection of Euclid Street and Heil Avenue.

TRAFFIC VOLUMES

Based on the trip generation and distribution patterns evaluated in the 2025 Traffic Study, Driveway 1 would serve up to 14 AM peak hour vehicles and 37 PM peak hour vehicles making an eastbound left turn. Opening Year Cumulative (2026) With Project volumes utilized in the 2025 Traffic Study are shown in Exhibit 1.

EXHIBIT 1: OPENING YEAR (2026) WITH PROJECT VOLUMES



OPERATIONS ANALYSIS

Table 1 summarizes the level of service (LOS) analysis results for Opening Year (2026) With Project traffic conditions for Driveway 1 on Heil Avenue, which indicates the intersection would operate at LOS A during the peak hours. Peak hour intersection operations analysis worksheets are provided in Appendix 1.

TABLE 1: OPENING YEAR (2026) INTERSECTION ANALYSIS

#	Intersection	Traffic Control[2]	Delay[1] (secs.)		Level of Service	
			AM	PM	AM	PM
5	Driveway 1 & Heil Ave.	CSS	9.8	9.6	A	A

1 Per the Highway Capacity Manual (7th Edition), overall average intersection delay and level of service are shown for intersections with a traffic signal or all-way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown.

2 CSS = Cross-street Stop

QUEUING ANALYSIS

A queuing analysis was conducted in the 2025 Traffic Study for Driveway 1 on Heil Avenue in order to identify potential queuing issues for critical movements into the Project. Synchro provides limited queuing information for unsignalized intersections. As such, the traffic modeling and signal timing optimization software package SimTraffic has been utilized to assess the queues for unsignalized study intersections. SimTraffic is designed to model networks of signalized and unsignalized intersections, with the primary purpose of checking and fine-tuning signal operations. SimTraffic uses the input parameters from Synchro to generate random simulations. These random simulations generated by SimTraffic have been utilized to determine the 95th percentile queue lengths observed for each applicable turn lane. A SimTraffic simulation has been recorded up to 5 times, during the weekday AM and weekday PM peak hours, and has been seeded for 15-minute periods with 60-minute recording intervals.

The queuing analysis worksheets are provided in Appendix 2 for Opening Year (2026) With Project traffic conditions and have been used to verify the recommended turn pocket lengths presented in Table 2. A summary of the site adjacent queuing analysis results is shown in Table 2. There are no queuing issues anticipated at Driveway 1 with the recommended turn pocket storage length (99-feet) and since there is no spillback anticipated between intersections (in the through lanes), the analysis indicates there is adequate spacing between the driveways and the adjacent study area intersections. The proposed eastbound left turn proposes to accommodates 99 feet of storage, and 37 feet of storage is required during the PM peak hour under Opening Year (2026) With Project traffic conditions which can adequately be accommodated with the proposed storage.

TABLE 2: OPENING YEAR (2026) QUEUING SUMMARY

Intersection	Movement	Available Stacking Distance (Feet)	95th Percentile Queue (Feet)		Acceptable? [1]	
			AM Peak	PM Peak	AM	PM
Driveway 1 & Heil Av. (#5)	SBR	100	51	46	Yes	Yes
	EBL	99	22	37	Yes	Yes
	WBT	400	18	0	Yes	Yes

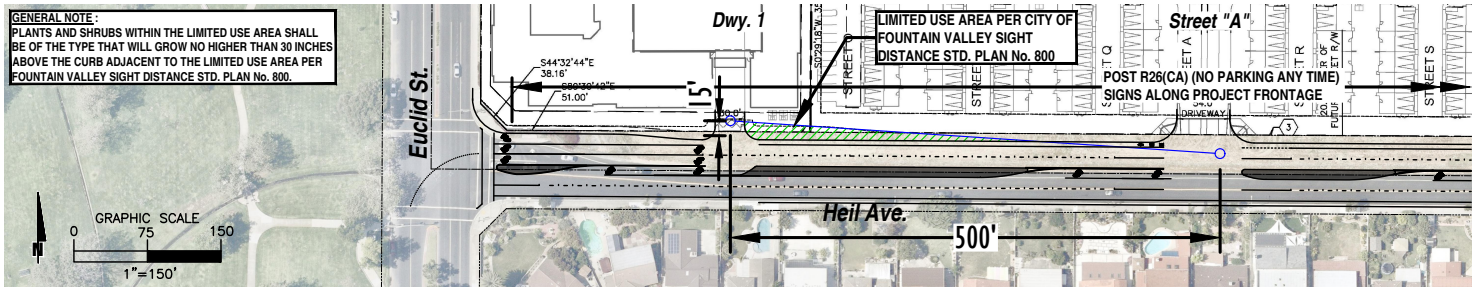
[1] Stacking Distance is acceptable if the required stacking distance is less than or equal to the stacking distance provided. An additional 15 feet of stacking which is assumed to be provided in the transition for turn pockets is reflected in the stacking distance shown on this table, where applicable.

SIGHT DISTANCE

Horizontal sight distance has been evaluated for Driveway 1 along Heil Avenue is based on the City's Standard Plan No. 800 (FV Std. Plan 800) and Caltrans Highway Design Manual (HDM). As defined by the HDM, sight distance is the continuous length of highway ahead visible to the driver. At unsignalized intersections, corner sight distance must provide a substantially clear line of sight between the driver of the vehicle waiting on the minor road (driveway) and the driver of an approaching vehicle. The sight distance is measured along the direction of travel from a point on the minor road at 15 feet from the edge of the major road pavement and measured from a height of eye of 3.5 feet on the minor road to a height of object of 4.25 feet on the major road. It should be noted that the assessment performed for the driveway locations is considered conservative as the HDM states that corner sight distance requirements are not applicable to urban driveways unless signalized.

Adequate visibility for vehicular and pedestrian traffic can be accommodated at the Project driveway by limiting sight obstructions within the identified limited use area. Any landscaping/hardscape within the limited use area should not exceed 30 inches in height. The limited use area should be kept clear of any landscaping or any other obstructions that may impede the visibility of the driver, including on-street parking. Minimum horizontal sight distances for the Project driveways are provided in Exhibit 2, however, sight distance should be re-evaluated in the field once the driveways have been constructed. It is anticipated that the minimum 500-foot sight distance to the east could be accommodated. The sight distance lines, limited use area, and clear sight triangles per City's standards are illustrated in Exhibit 2 per FV Std. Plan 800.

EXHIBIT 2: DRIVEWAY 1 SIGHT DISTANCE



RECOMMENDATIONS

Exhibit 3 illustrates the concept striping plan for Driveway 1 on Heil Avenue which reflects the lanes along Heil Avenue as well as the recommended eastbound left turn pocket and proposed medians on Heil Avenue to prohibit southbound left turns out from Driveway 1.

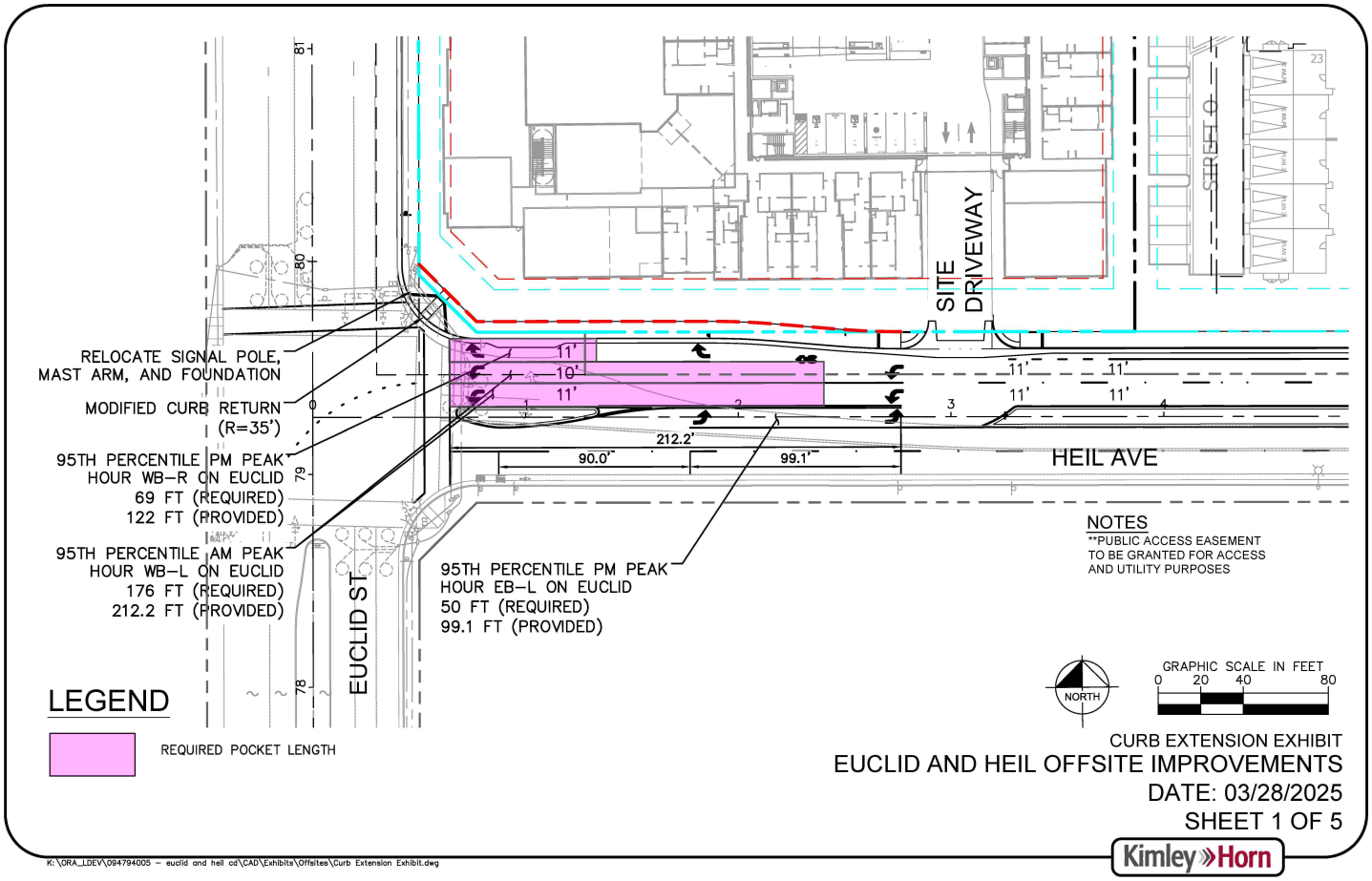
- Driveway 1 is a private driveway on Heil Avenue that is proposed to serve the future multifamily component of the Project and has at most 37 inbound vehicles during the PM peak hour. The Project proposes to implement a 99-foot eastbound left turn pocket (with 90-foot taper/transition) on Heil Avenue along with the construction of a new raised median on Heil Avenue that prohibits southbound left turns out of Driveway 1.
- The raised median on Heil Avenue at Driveway 1 will prohibit southbound left turns from Driveway 1 which would be a high-conflict turning movement across multiple lanes of traffic. By limiting the outbound access from Driveway 1 to right-out only reduces conflict points along Heil Avenue (relative to exiting vehicles, through vehicles on Heil Avenue, and crossing pedestrians). Restricting the southbound left movement and potentially accommodating a larger driveway width reduces the pedestrian and cyclist crossing path.
- The dedicated left turn pocket will remove turning vehicles from the adjacent eastbound through lane, reducing conflict between turning and through vehicles and as a result reducing potential delays and queues for eastbound through traffic.
- Based on the 95th percentile PM peak hour queue of 37-feet, a 50-foot eastbound left turn lane would be sufficient, however, a 99-foot eastbound left turn lane is being accommodated. Providing additional storage will minimize the potential risk of spillback into the through lanes. The proposed storage could accommodate a minimum of four passenger car vehicles.
- The 90-foot transition provides adequate deceleration distance for approaching left turning vehicles that is consistent with City design standards in order to promote smooth lane changes and avoid sudden braking.

CONCLUSIONS

Urban Crossroads has prepared the LOS-based Traffic Study and is the Project's Traffic Engineer of Record as it relates to the operations and queuing analyses performed to support the Traffic Study. Based on a review of the proposed site access traffic operations and anticipated queues along the Heil Avenue corridor, it is our professional opinion that the configuration of Driveway 1 on Heil Avenue, including the proposed eastbound left-turn lane and associated raised median, is expected to operate sufficiently. Based on the Traffic Study, the projected inbound volumes at Driveway 1 during the PM peak hour are expected to be 37 vehicles (approximately one vehicle every one to two minutes), which can be adequately accommodated by the proposed 99-foot eastbound left-turn pocket with a 90-foot taper. This storage length exceeds the minimum storage required based on the queuing analysis and supports the efficient and orderly movement of vehicles turning left into the site without impeding eastbound through traffic on Heil Avenue. Based on the results of the Traffic Study, the westbound queues along Heil Avenue between Euclid Street and Driveway 1 are not anticipated to adversely affect the operations at Driveway 1. The proposed eastbound left turn queues at Driveway 1 on Heil Avenue are not anticipated to spillback into the Number 1 eastbound through lane, resulting in any adverse effects to the adjacent intersection of Euclid Street and Heil Avenue (see Exhibit 3).

If you have any questions, please contact me directly at cso@urbanxroads.com.

EXHIBIT 3: CONCEPT STRIPING FOR DRIVEWAY 1



APPENDIX 1: INTERSECTION ANALYSIS WORKSHEETS

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	14	259	332	9	0	72
Future Vol, veh/h	14	259	332	9	0	72
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	99	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	15	282	361	10	0	78

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	371	0	-	0	-	185
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	4.14	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	2.22	-	-	-	-	3.32
Pot Cap-1 Maneuver	1184	-	-	-	0	825
Stage 1	-	-	-	-	0	-
Stage 2	-	-	-	-	0	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	1184	-	-	-	-	825
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s/v	0.41	0	9.82
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1184	-	-	-	825
HCM Lane V/C Ratio	0.013	-	-	-	0.095
HCM Control Delay (s/veh)	8.1	-	-	-	9.8
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.3

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	37	204	317	24	0	40
Future Vol, veh/h	37	204	317	24	0	40
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	99	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	40	222	345	26	0	43

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	371	0	-	0	-	185
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	4.14	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	2.22	-	-	-	-	3.32
Pot Cap-1 Maneuver	1184	-	-	-	0	825
Stage 1	-	-	-	-	0	-
Stage 2	-	-	-	-	0	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	1184	-	-	-	-	825
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s/v	1.25	0	9.6
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1184	-	-	-	825
HCM Lane V/C Ratio	0.034	-	-	-	0.053
HCM Control Delay (s/veh)	8.1	-	-	-	9.6
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.2

APPENDIX 2: QUEUING ANALYSIS WORKSHEETS

Intersection: 5: Heil Av. & Driveway 1

Movement	EB	WB	WB	SB
Directions Served	L	T	TR	R
Maximum Queue (ft)	36	17	26	61
Average Queue (ft)	4	1	1	30
95th Queue (ft)	22	9	18	51
Link Distance (ft)		448	448	108
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	99			
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 6: Heil Av. & Street A

Movement	EB	SB
Directions Served	L	LR
Maximum Queue (ft)	23	54
Average Queue (ft)	1	25
95th Queue (ft)	11	49
Link Distance (ft)		139
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	100	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 5: Heil Av. & Driveway 1

Movement	EB	SB
Directions Served	L	R
Maximum Queue (ft)	36	52
Average Queue (ft)	12	22
95th Queue (ft)	37	46
Link Distance (ft)		108
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	99	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 6: Heil Av. & Street A

Movement	EB	SB
Directions Served	L	LR
Maximum Queue (ft)	28	45
Average Queue (ft)	4	19
95th Queue (ft)	21	45
Link Distance (ft)		139
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	100	
Storage Blk Time (%)		
Queuing Penalty (veh)		