LINSCOTT LAW & GREENSPAN engineers

Engineers & Planners
Traffic
Transportation
Parking

Linscott, Law & Greenspan, Engineers
2 Executive Circle
Suite 250
Irvine, CA 92614
949.825.6175 T
949.825.6173 F
www.llgengineers.com

Pasadena
Irvine
San Diego
Woodland Hills

June 24, 2022

Mr. Mark Haupert
Rexco Development
2518 N. Santiago Boulevard
Orange, CA 92867

LLG Reference: 2.21.4448.1

Subject: **Transportation Assessment for the Proposed Serrano Oaks Townhomes Project**
Jurupa Valley, California

Dear Mr. Haupert:

Linscott, Law & Greenspan, Engineers (LLG) is pleased to submit the findings of this Transportation Assessment for the proposed Serrano Oaks Townhomes Project to be located on the east side of Clay Street north of Linares Avenue in the City of Jurupa Valley, California. This analysis evaluates the potential traffic circulation impacts associated with the proposed multifamily Project consistent with Jurupa Valley requirements based on the *City of Jurupa Valley Traffic Impact Analysis Guidelines (August 2020)*.

PROJECT LOCATION AND DESCRIPTION

The Project site is currently vacant and will be developed with 66 townhomes within thirteen (13) buildings. In addition, median modification improvements will be installed along the Project frontage to facilitate full movement access at the primary Project driveway.

Figure 1, attached, presents a Vicinity Map that illustrates the general location of the Project site and surrounding street system while ***Figure 2*** presents an existing site aerial.

Access for the proposed Project will be provided via one (1) primary full movement driveway and one (1) right-in/right-out emergency vehicle access (EVA) only driveway along Clay Street. ***Figure 3*** presents the proposed site plan for the Project, prepared by Summa Architecture.

LINSCOTT LAW & GREENSPAN engineers

PROJECT TRAFFIC CHARACTERISTICS

Trip Generation Forecast

Traffic generation is expressed in vehicle trip ends, defined as one-way vehicular movements, either entering or exiting the generating land use. Generation equations and/or rates used in the traffic forecasting procedure are found in the Eleventh (11th) Edition of *Trip Generation*, published by the Institute of Transportation Engineers (ITE) [Washington D.C., 2021].

Table 1, attached, summarizes the trip generation rates used in forecasting the vehicular trips generated for the proposed Project and also presents the proposed Project's forecast peak hour and daily traffic volumes. As shown in the upper portion of *Table 1*, the trip generation potential of the proposed Project was estimated using ITE Land Use 220: *Multifamily Housing (Low-Rise) Not Close to Rail Transit* trip rates.

Review of the bottom of *Table 1* indicates that the proposed Project is forecast to generate 445 daily trips, with 26 trips (6 inbound, 20 outbound) produced in the AM peak hour and 34 trips (21 inbound, 13 outbound) produced in the PM peak hour on a "typical" weekday.

According to the *City of Jurupa Valley Traffic Impact Analysis Guidelines (August, 2020),* projects that will generate between 50 and 100 peak hour trips will be required to conduct a Focused Transportation Assessment (FTA). In addition, based on Section B of the TIA Guidelines, "Apartments and multi-family projects of less than 150 units" may not require a full TIA that includes LOS. As a result, based on the relatively low Project trip generation and City TIA preparation criteria, the proposed Project will not impact the surrounding transportation system and not require the preparation of a full TIA that includes LOS.

SITE ACCESS AND ON-SITE CIRCULATION EVALUATION

Primary access for the Project is proposed via a full movement driveway along Clay Street (Project Driveway No. 1), which will necessitate a median design to accommodate southbound left turn movements and westbound left turn via an acceleration lane. The Project driveway geometry will consist of one (1) inbound lane and one (1) outbound lane. In order to determine whether left-turn ingress and egress will be acceptable, this report includes an AM peak hour and PM peak hour capacity analysis for the horizon Year 2024 traffic conditions based on the Highway Capacity Methodology (HCM) unsignalized methodology utilizing HCM 6 software.

The traffic volume forecast data utilized in this analysis is based on the Year 2024 AM and PM peak hour traffic volumes for the intersection of Clay Street and Linares Avenue contained in the approved Traffic Impact Analysis (TIA) for the proposed *Appaloosa Springs Project (June 25, 2021).* ***Appendix A***, attached, contains the figures presenting the Year 2024 AM and PM peak hour traffic volumes utilized as the background traffic volume data for the driveway analyses (Intersection No. 13: Clay Street at Linares Avenue). In addition, the total traffic volume data utilized for the driveway analyses consists of the Year 2024 AM and PM peak hour traffic volumes from the *Appaloosa Springs TIA* combined with the AM and PM peak hour Project traffic volumes presented in *Table 1* applied to the driveways in a 50%/50% inbound north/south Project distribution pattern (100% outbound Project distribution pattern). Furthermore, the lane geometry along Clay Street at the Project driveways consists of two (2) through lanes in each direction with a southbound left-turn lane in the center to provide left-turn storage for left-turn ingress operation and an acceleration lane for left-turn egress operation.

The results of the Year 2024 AM and PM peak hour HCM capacity analysis at the Project driveways is presented as follows:

YEAR 2024 WITH PROJECT

	AM Peak Hour		PM Peak Hour	
Key Intersection	**HCM**	**LOS**	**HCM**	**LOS**
➢ Clay Street at Project Driveway No. 1 (Full)	12.5 s/v	B	14.7 s/v	B

As presented, Project Driveway No. 1 with full movement operation is forecast to operate at acceptable level of service (LOS) B during the Year 2024 AM and PM peak hour traffic conditions. ***Appendix B***, attached, contains the Year 2024 AM and PM peak hour HCM/LOS calculation worksheets, which also presents the total traffic volume data and lane geometry.

Figure 4 presents the concept improvement plan for Clay Street along the Project frontage, which shows the proposed median modifications to provide the southbound left-turn pocket and acceleration lane median improvements within the center of the roadway as well as a median break to provide southbound left turn access for the existing Golden Star Hamburgers restaurant. In addition, ***Figure 5*** presents a fire truck turning movement analysis at the main Project entrance and emergency vehicle access (EVA) along the northern boundary of the site.

The on-site circulation layout of the proposed Project as illustrated in *Figure 3* and *Figure 5* on an overall basis is adequate. Vehicles will be able to adequately circulate throughout the site and emergency vehicle access (EVA) is provided along the northerly driveway. The driveway widths has been confirmed and are generally adequate for small service/delivery (FedEx, UPS) trucks, trash trucks, and emergency vehicles.

SIGHT DISTANCE EVALUATION

At intersections and/or project driveways, a substantially clear line of sight should be maintained between the driver of a vehicle waiting at the crossroad and the driver of an approaching vehicle. Adequate time must be provided for the waiting vehicle to either cross all lanes of through traffic, cross the near lanes and turn left, or turn right, without requiring through traffic to radically alter their speed. A sight distance evaluation has been performed for the unsignalized Project Driveway No. 1 located along Clay Street.

The Sight Distance Evaluation prepared for Project Driveway No. 1 is based on the criteria and procedures set forth by the California Department of Transportation (Caltrans) in the State's *Highway Design Manual (HDM)*. Stopping sight distance was utilized for the evaluation. Stopping sight distance is defined in the Caltrans HDM to be the distance required by the driver of a vehicle, traveling at a given speed, to bring the vehicle to a stop after an object ½-foot high on the road becomes visible. Stopping sight distance for motorists is measured from the driver's eyes, which are assumed to be 3 1/2 feet above the pavement surface, to an object 1/2-foot high on the road.

Based on the criteria set forth in Table 201.1 of the Caltrans HDM and a posted speed limit of 45 mph on Clay Street, a stop sight distance of 360 feet is required for the right-turn movements at Project Driveway No. 1.

Figure 5 presents a schematic of the sight distance evaluation performed at Project Driveway No. 1, which illustrates the actual sight distance and corresponding limited use area along Clay Street. A review of *Figure 5* indicates that the sight lines at this intersection are expected to be adequate provided obstructions within the sight triangles are minimized. In addition, any future landscaping and/or hardscapes (i.e. monument signs) should be designed such that a driver's clear line of sight is not obstructed.

LINSCOTT LAW & GREENSPAN engineers

CONCLUSION

Based on the results of the aforementioned Project trip generation forecast for the proposed Serrano Oaks Townhomes Project, which is 445 daily trips, with 26 trips (6 inbound, 20 outbound) produced in the AM peak hour and 34 trips (21 inbound, 13 outbound) produced in the PM peak hour on a "typical" weekday, we conclude that the proposed Project's traffic circulation impact is considered "insignificant" based on the "100 peak hour trip" threshold and the activities list in Section B of the *City of Jurupa Valley Traffic Impact Analysis Guidelines*. Therefore, the Project would not require any specific intersection analysis.

In addition, the proposed Project driveway is forecast to operate at acceptable service levels as a full movement operation at the primary driveway (Project Driveway No. 1) with the installation of a southbound left-turn pocket and acceleration lane within the center of Clay Street at Project Driveway No. 1. Lastly, The on-site circulation layout of the proposed Project as illustrated in *Figure 3* and *Figure 5* on an overall basis is adequate.

Lastly, adequate stopping sight distance is provided at Project Driveway No. 1 provided any future landscaping and/or hardscapes (i.e. monument signs) is designed such that a driver's clear line of sight is not obstructed.

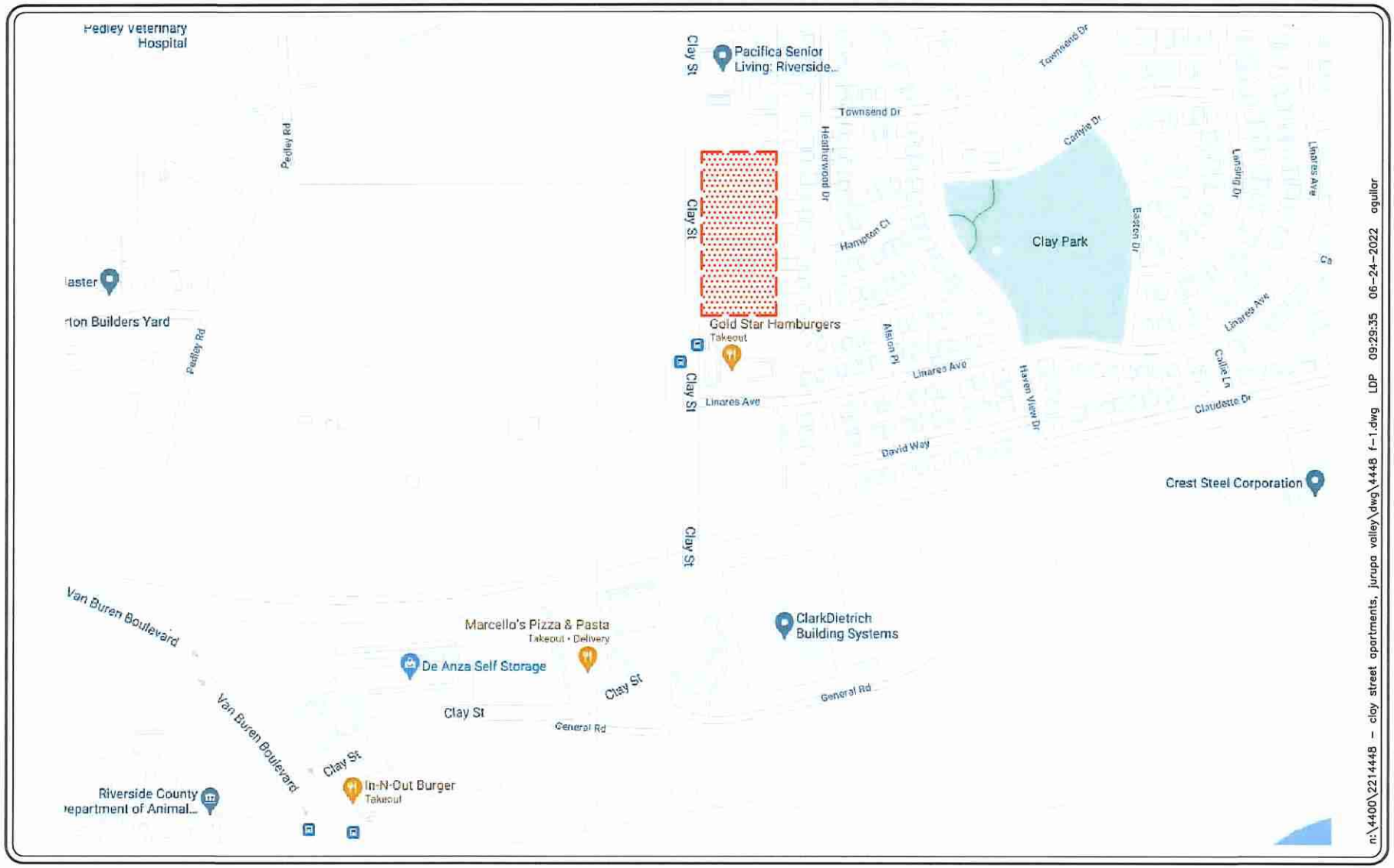
We appreciate the opportunity to provide this Transportation Assessment. Should you need further assistance, or have any questions regarding this analysis, please call us at (949) 825-6175.

Very truly yours,
Linscott, Law & Greenspan, Engineers

Keil D. Maberry, P.E.
Principal

Attachments

REGISTERED PROFESSIONAL ENGINEER
KEIL D. MABERRY, P.E.
No. 1802
Exp. 6/30/23
TRAFFIC
STATE OF CALIFORNIA



n:\4400\2214448 - clay street apartments, jurupa valley\dwg\4448 f-1.dwg LDP 09:29:35 06-24-2022 aguilar

LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

SOURCE: GOOGLE

KEY

= PROJECT SITE

FIGURE 1

VICINITY MAP

SERRANO OAKS TOWN HOMES, JURUPA VALLEY

n:\4400\2214448 - clay street apartments, jurupa valley\dwg\4448 f-2.dwg LDP 09:30:40 06-24-2022 aguilar

LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

SOURCE: GOOGLE

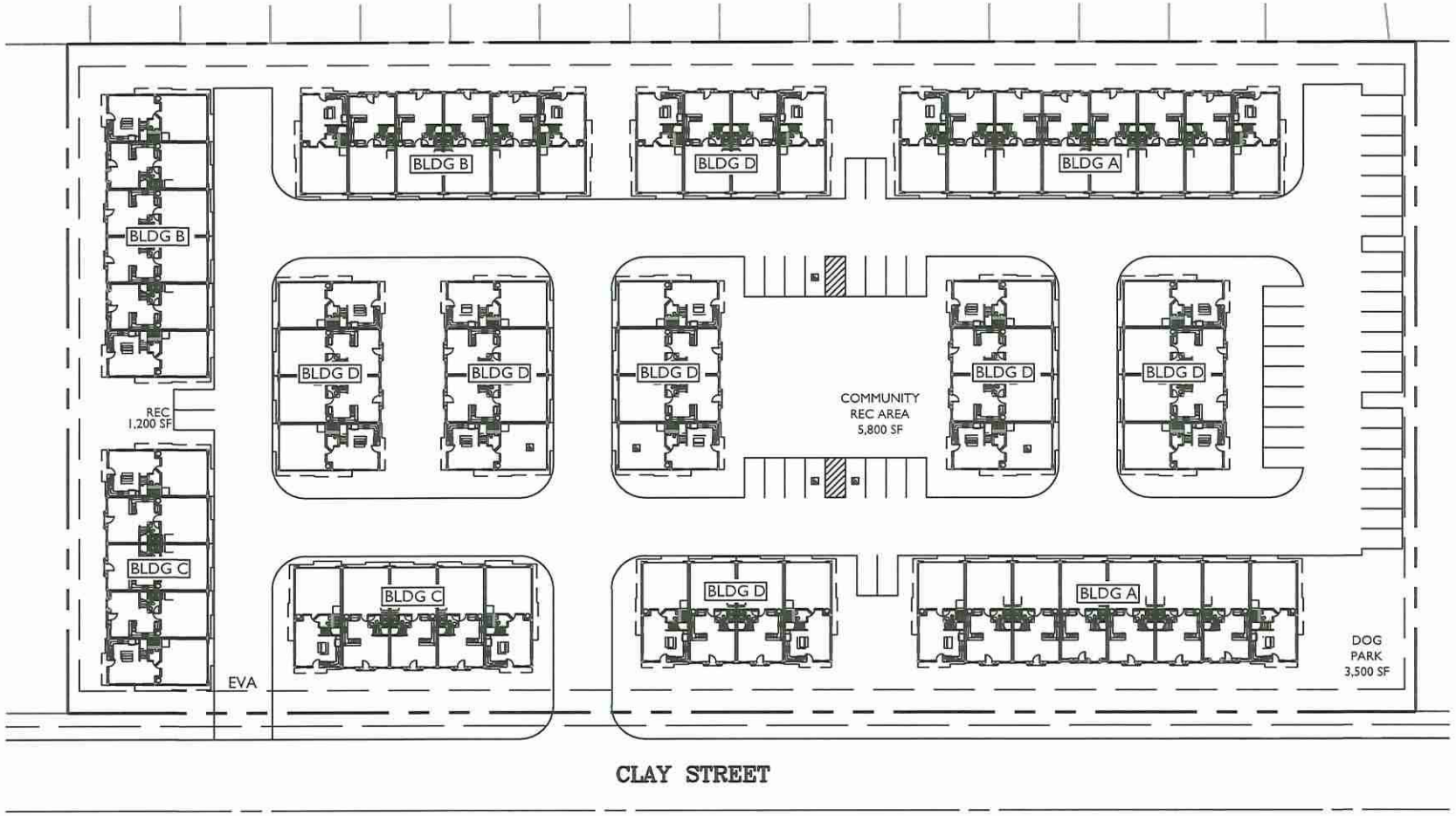
KEY

= PROJECT SITE

FIGURE 2

EXISTING SITE AERIAL

SERRANO OAKS TOWN HOMES, JURUPA VALLEY



n:\4400\2214448 - clay street apartments, jurupa valley\dwg\4448 f-3.dwg LDP 09:32:05 06-24-2022 aguilar

LINSCOTT LAW & GREENSPAN engineers

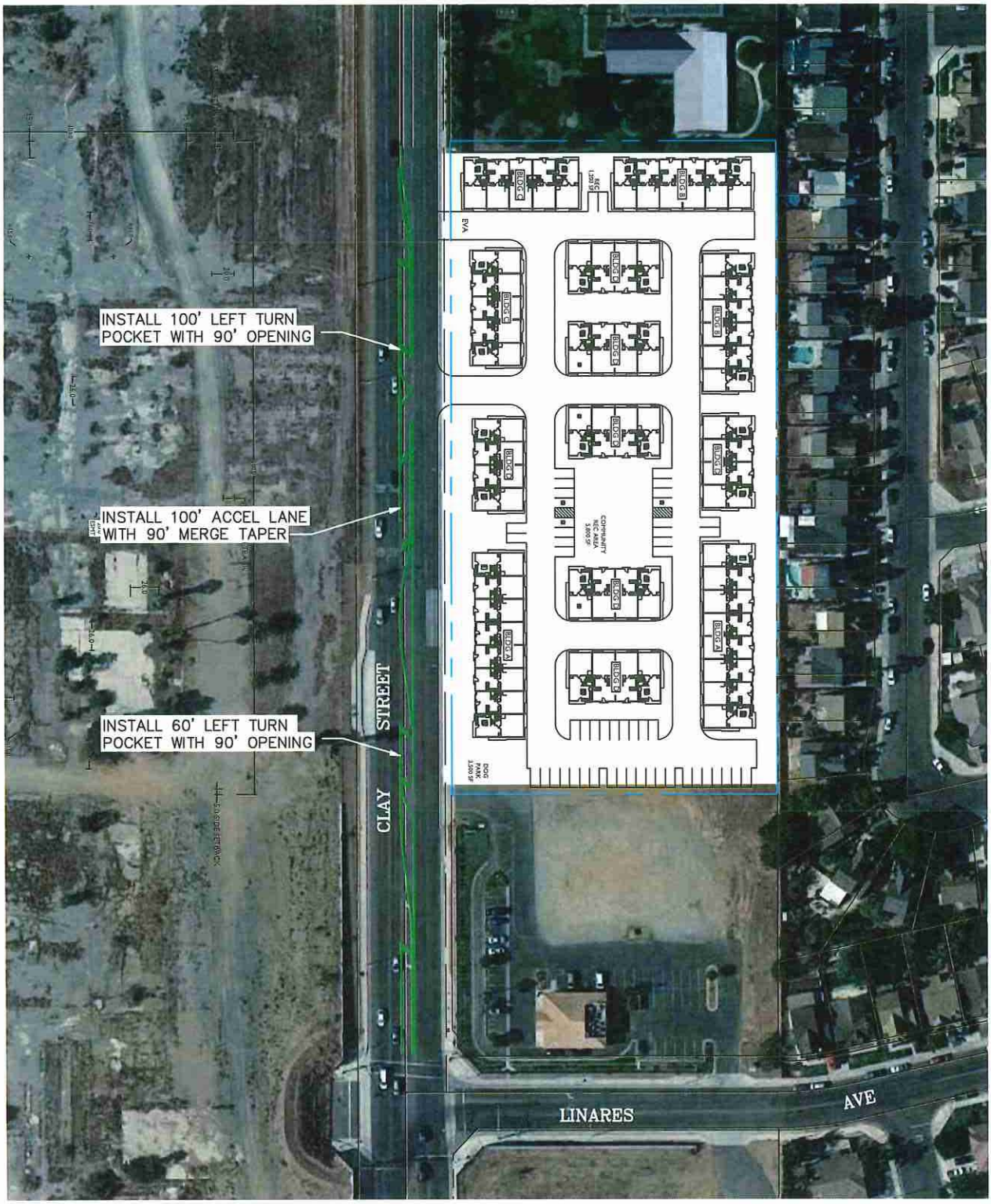
N NO SCALE

SOURCE: SUMMA ARCHITECTURE

FIGURE 3

PROPOSED SITE PLAN

SERRANO OAKS TOWN HOMES, JURUPA VALLEY



SOURCE: GOOGLE

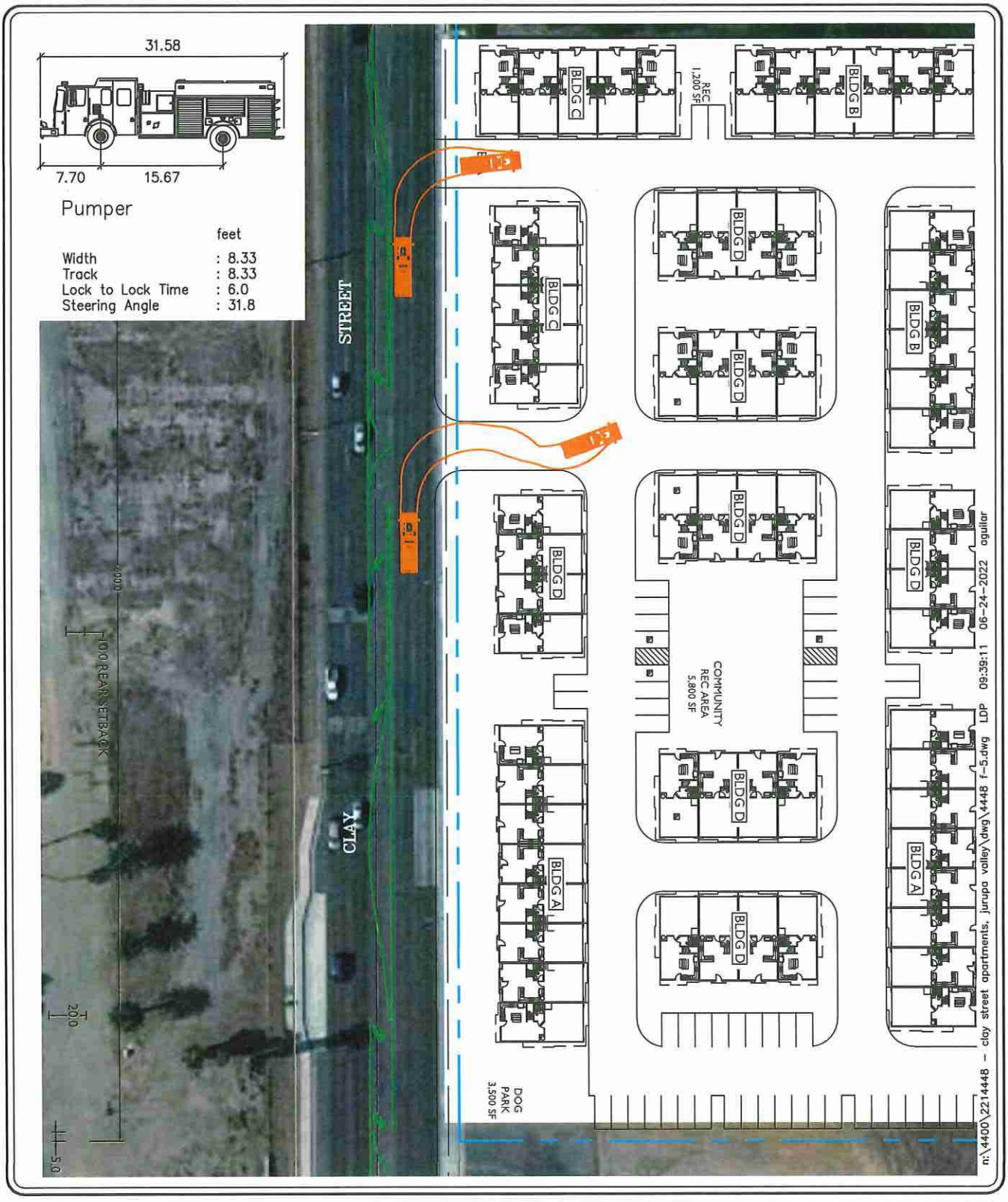
LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

FIGURE 4

CONCEPT MEDIAN MODIFICATION PLAN

SERRANO OAKS TOWN HOMES, JURUPA VALLEY



SOURCE: GOOGLE

LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

FIGURE 5

FIRE TRUCK TURNING ANALYSIS

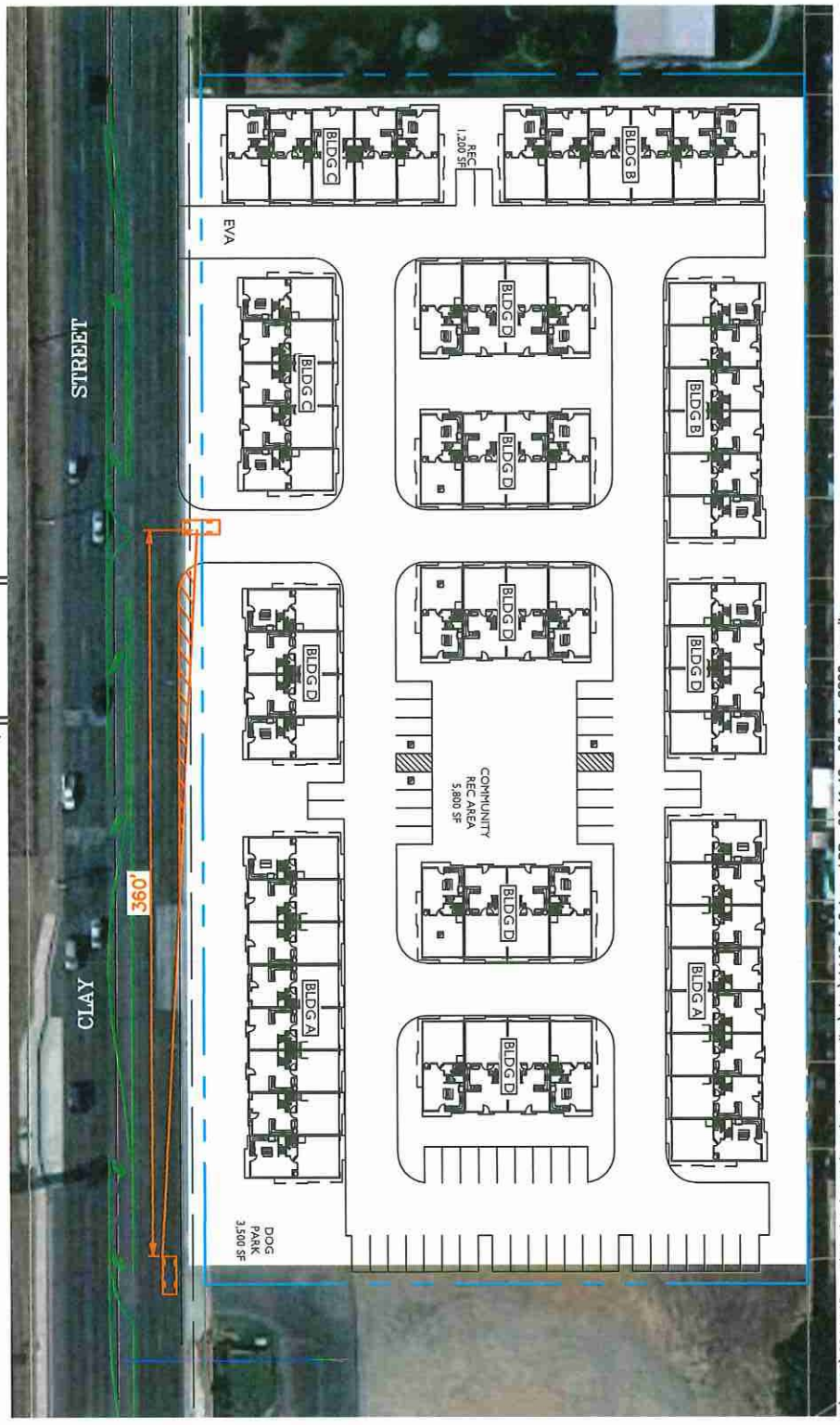
SERRANO OAKS TOWN HOMES, JURUPA VALLEY

SIGHT DISTANCE

DESIGN SPEED LIMIT:	45 MPH
REQUIRED STOPPING SIGHT DISTANCE:	360 FEET

LEGEND

PUBLIC RIGHT-OF-WAY LIMITED USE AREA: TO ENSURE ADEQUATE SIGHT DISTANCE, HARDSCAPE AND/OR LANDSCAPE SHALL NOT BE HIGHER THAN 30 INCHES ABOVE THE CURB/SIDEWALK. NO FENCES OR WALLS IN LIMITED USE AREA.



SOURCE: GOOGLE

LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

FIGURE 6

SIGHT DISTANCE EVALUATION

SERRANO OAKS TOWN HOMES, JURUPA VALLEY

LINSCOTT LAW & GREENSPAN engineers

TABLE 1

PROJECT TRAFFIC GENERATION RATES AND FORECAST[1]

SERRANO OAKS TOWNHOMES, JURUPA VALLEY

ITE Land Use Code / Project Description	Daily 2-Way	AM Peak Hour			PM Peak Hour		
		Enter	Exit	Total	Enter	Exit	Total
Generation Rates:							
▪ 220: Multifamily Housing (Low-Rise) Not Close to Rail Transit (TE/DU)	6.74	24%	76%	0.40	63%	37%	0.51
Proposed Project Generation Forecasts:							
▪ Townhomes (66 DU)	445	6	20	26	21	13	34
Project Trip Generation Forecast	**445**	**6**	**20**	**26**	**21**	**13**	**34**

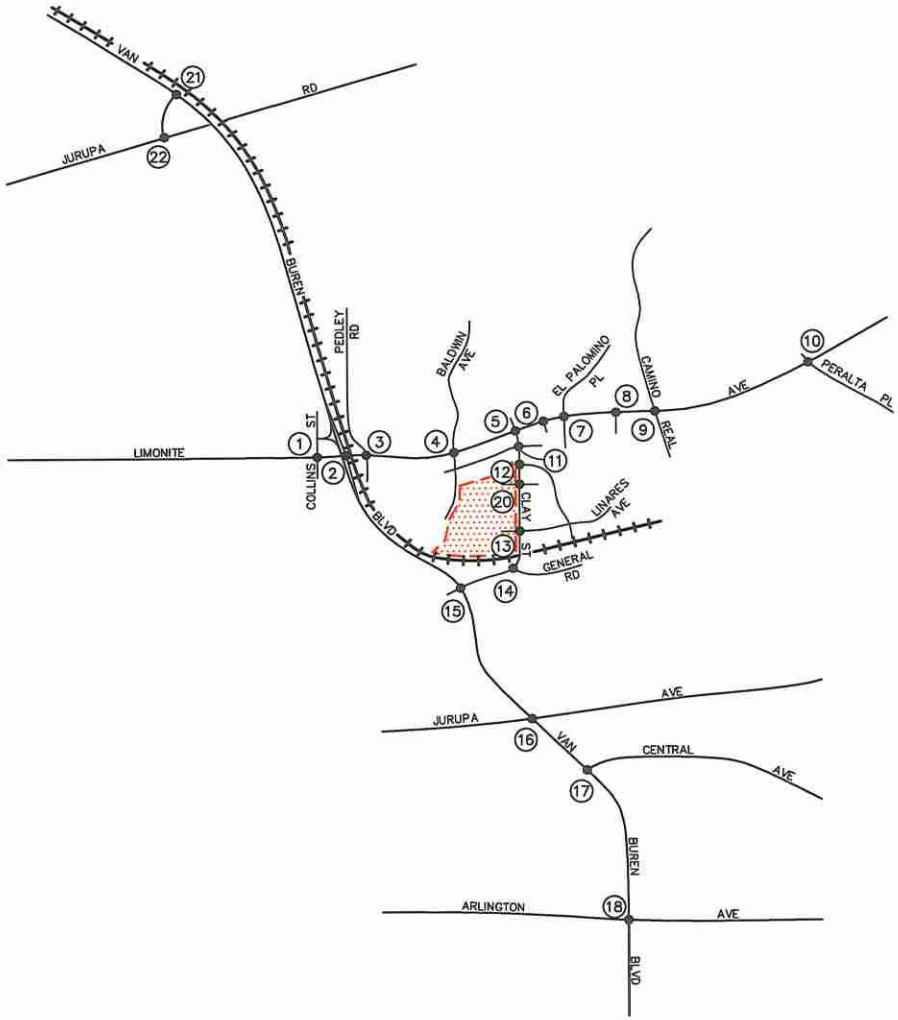
Note:

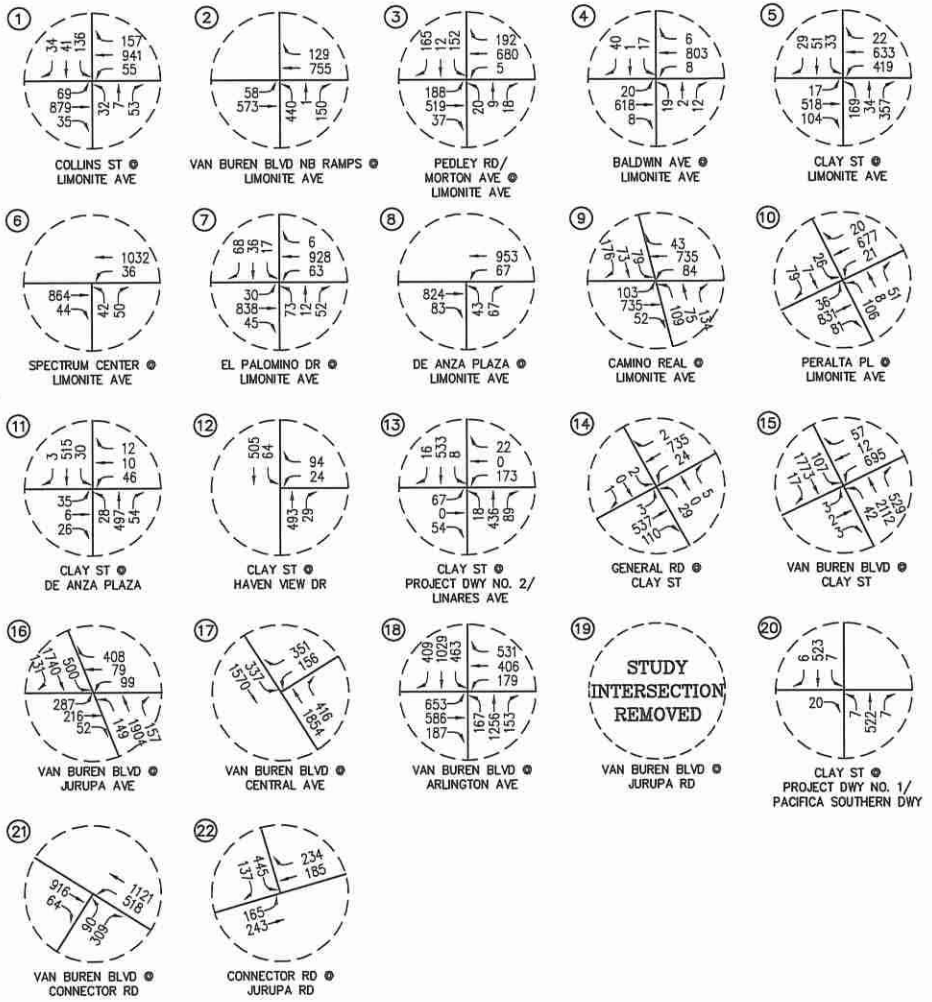
- TE/DU = Trip end per dwelling unit

[1] Source: *Trip Generation, 11th Edition*, Institute of Transportation Engineers, (ITE) [Washington, D.C. (2021)].

APPENDIX A

APPALOOSA SPRINGS TIA
TRAFFIC VOLUME DATA





n:\4000\2184053 - clay street residential project, jurupa valley\6 - dwg\4053 f6-6.dwg LDP 15:26:38 06-22-2021 tucker

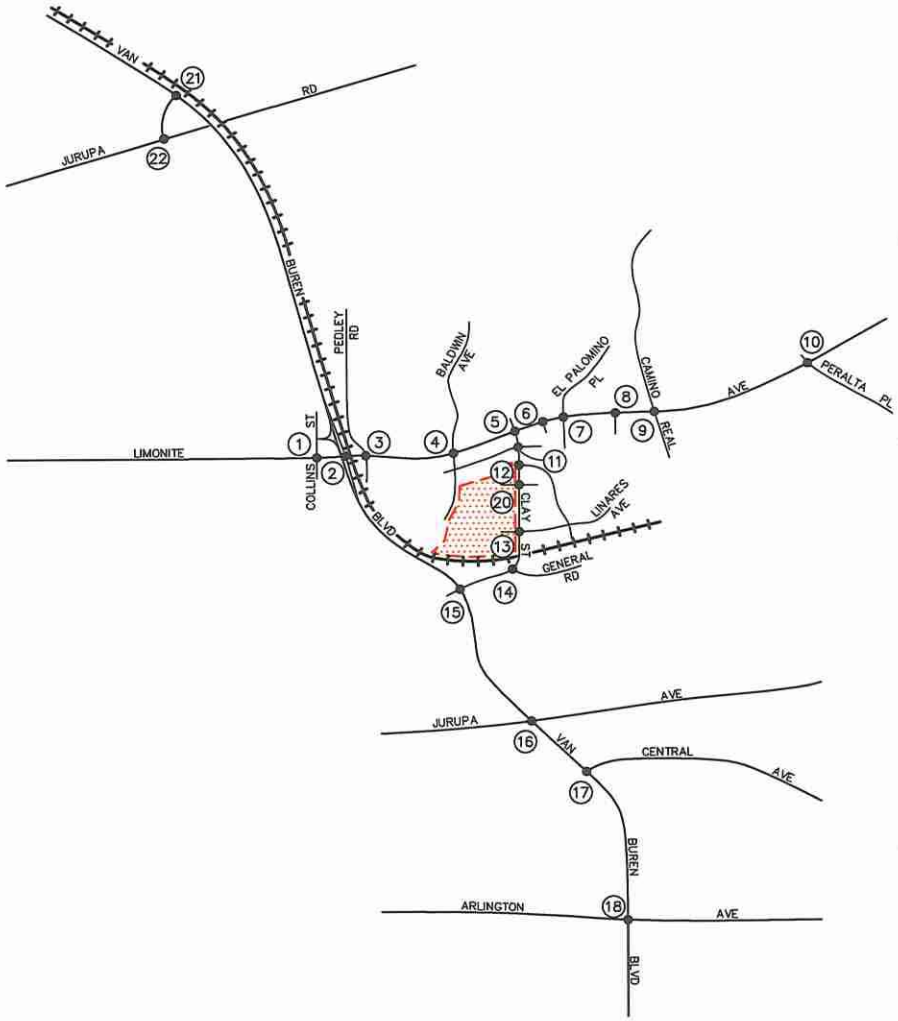
LINSCOTT LAW & GREENSPAN ENGINEERS

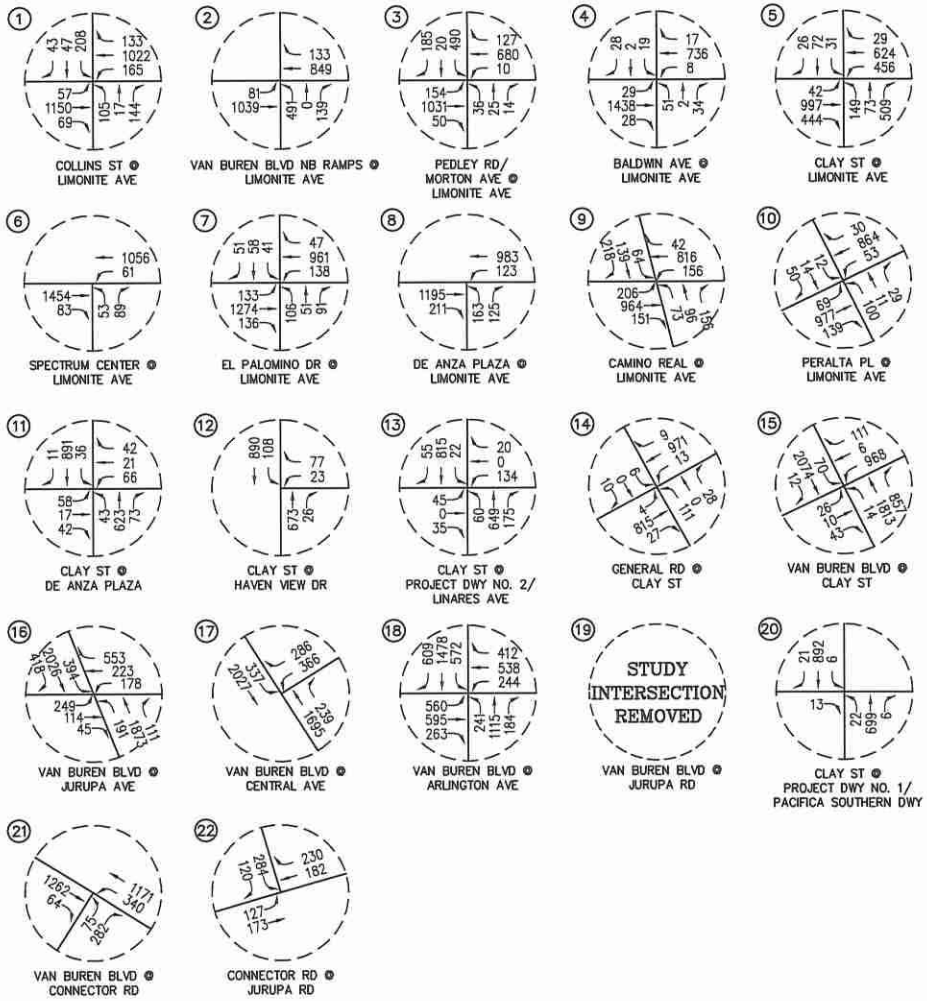
N NO SCALE

KEY
(#) = STUDY INTERSECTION
= RAILROAD TRACKS
= PROJECT SITE

FIGURE 6-6

YEAR 2024 CUMULATIVE PLUS PROJECT
AM PEAK HOUR TRAFFIC VOLUMES
APPALOOSA SPRINGS, JURUPA VALLEY





n:\4000\2184053 - clay street residential project, jurupa valley\6 - dwg\4053 f6-7.dwg LDP 15:27:04 06-22-2021 tucker

LIN-SCOTT LAW & GREENSPAN engineers

N NO SCALE

KEY
(#) = STUDY INTERSECTION
= RAILROAD TRACKS
= PROJECT SITE

FIGURE 6-7

YEAR 2024 CUMULATIVE PLUS PROJECT
PM PEAK HOUR TRAFFIC VOLUMES
APPALOOSA SPRINGS, JURUPA VALLEY

APPENDIX B

DRIVEWAY LEVEL OF SERVICE CALCULATION WORKSHEETS

Intersection Level Of Service Report
Intersection 1: Clay Street at Project Driveway 1

Control Type:	Two-way stop	Delay (sec / veh):	12.5
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.020

Intersection Setup

Name	Clay St		Clay St		Project Dwy 1	
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

Volumes

Name	Clay St		Clay St		Project Dwy 1	
Base Volume Input [veh/h]	521	3	3	551	10	10
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	521	3	3	551	10	10
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	130	1	1	138	3	3
Total Analysis Volume [veh/h]	521	3	3	551	10	10
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	2

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.00	0.01	0.02	0.01
d_M, Delay for Movement [s/veh]	0.00	0.00	8.48	0.00	12.53	10.10
Movement LOS	A	A	A	A	B	B
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.01	0.00	0.11	0.11
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.22	0.00	2.63	2.63
d_A, Approach Delay [s/veh]	0.00		0.05		11.32	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	0.23					
Intersection LOS	B					

Intersection Level Of Service Report
Intersection 1: Clay Street at Project Driveway 1

Control Type:	Two-way stop	Delay (sec / veh):	14.7
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.016

Intersection Setup

Name	Clay St		Clay St		Project Dwy 1	
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

Volumes

Name	Clay St		Clay St		Project Dwy 1	
Base Volume Input [veh/h]	699	10	11	873	6	7
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	699	10	11	873	6	7
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	175	3	3	218	2	2
Total Analysis Volume [veh/h]	699	10	11	873	6	7
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	2

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.01	0.01	0.02	0.01
d_M, Delay for Movement [s/veh]	0.00	0.00	9.12	0.00	14.75	10.81
Movement LOS	A	A	A	A	B	B
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.04	0.00	0.08	0.08
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.94	0.00	2.06	2.06
d_A, Approach Delay [s/veh]	0.00		0.11		12.63	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	0.16					
Intersection LOS	B					