Appendix J
Transportation Impact Analysis

LYONS CANYON RESIDENTIAL PROJECT

Transportation Impact Analysis

Prepared for:
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1. INTRODUCTION

This report documents the assumptions, methodologies, and findings of a study conducted by Fehr & Peers to evaluate the potential transportation impacts of a proposed residential development in Los Angeles County. This study was conducted as part of an environmental document being prepared for the proposed Project.

PROJECT DESCRIPTION

The proposed Lyons Canyon Residential Project (the Project) is located along the west side of The Old Road just north of Calgrove Boulevard in the southwestern portion of the Santa Clarita Valley. The Assessor's Identification Number (AIN) for the parcel on which the Project is located is 2826-022-027.[1] The Project is bounded by The Old Road to the east, residential to the north, and open space to the west and south. Further north of the project site is commercial/retail space. Further to the east is the Interstate-5 Freeway, which provides regional access to the Project area. Interstate access points are located south of the project site at Calgrove Boulevard and north of the project site at Pico Canyon Road/Lyons Avenue. Two roadway access points to the project site are provided along The Old Road. **Figure 1** shows the site plan for the Project.

The Project involves the construction of 510 residential units[2] that preserves 177 acres of natural and improved open space within an approximately 233-acre Project site located in the southwestern portion of the Santa Clarita Valley. The Project includes a mix of single-family homes, detached and attached dwelling units, and affordable apartments. The Project will also construct sidewalks and site improvements such as landscaping enhancements along The Old Road fronting the project site. The Project will also provide dedicated pedestrian paseos and walkways that connect to the trail network and open space adjacent to the project site. Vehicle access for the Project is to be provided via two proposed public streets, "A" Street and "B" Street, on The Old Road.

[1] The Assessor's Identification Number (AIN) is a ten-digit number assigned by the Office of the Assessor to each piece of real property in Los Angeles County.
[2] This study conservatively analyzes 517 units as part of a previously studied version of the Project for flexibility in the project description.

Source: LAND CONCERN

Figure 1
Site Plan

STUDY SCOPE

The scope of work for this study was determined in consultation with the County of Los Angeles Department of Public Works in accordance with the County's *Transportation Impact Analysis Guidelines,* adopted in July 2020. The base assumptions and technical methodologies were discussed with County staff as part of the study approach and agreed to in a scoping memo dated February 2021 (Plan Number: ESTU2020000743).

VEHICLE MILES TRAVELED ANALYSIS

On September 27, 2013, Governor Jerry Brown signed Senate Bill (SB) 743 into law and started a process that fundamentally changed transportation impact analysis conducted as part of California Environmental Quality Act (CEQA) compliance. The Governor's Office of Planning and Research (OPR) was charged with developing new guidelines for evaluating transportation impacts under CEQA using methods that no longer focus on measuring automobile delay and level of service (LOS). This change at the state level recognizes the unintended consequences of using LOS as an impact metric, which results in understating potential transportation impacts in greenfield areas and discouraging more sustainable infill projects and alternative transportation projects. SB 743 directed agencies to create new guidelines that develop a transportation performance metric promoting: the reduction of greenhouse gas emissions, the development of multimodal networks, and a more sustainable diversity of land uses.

OPR issued proposed updates to the CEQA guidelines in support of these goals in November 2017 and a supporting technical advisory in December 2018.[3] The updates establish vehicle miles traveled (VMT) as the primary metric for evaluating a project's environmental impacts on the transportation system. The changes to CEQA guidelines Section 15064.3 to implement SB 743 were certified by the State in December of 2018. Draft environmental impact reports published after July 1, 2020, are required to implement these new requirements.

The County adopted new transportation impact study guidelines including the VMT metric and significance criteria in compliance with SB 743 guidelines in July 2020 and the impact thresholds used for this project impact analysis are based on those new guidelines.

INTERSECTION OPERATIONAL ANALYSIS

This study includes intersection-level operational analysis under both the existing and future year traffic conditions and assumes that the Project would be completed by year 2029. The following traffic scenarios have been developed and analyzed as part of this study:

- Existing (Year 2022) Conditions – The existing conditions analysis includes a description of the transportation system serving the project site, existing traffic volumes, and an assessment of the operating conditions at the study analysis locations described below.

[3] State of California, Governor's Office of Planning and Research, *Technical Advisory on Evaluating Transportation Impacts in CEQA*, December 2018.

- Future Base (Year 2029) Conditions – Future traffic projections without the proposed Project were developed for the year 2029. The objective of this analysis was to project future traffic growth and operating conditions that could be expected to result from regional growth, related projects, and transportation network changes in the vicinity of the project site by the year 2029.
- Future (Year 2029) plus Project Conditions – This traffic scenario provides projected traffic volumes and an assessment of operating conditions under future conditions with the addition of Project-generated traffic.

STUDY LOCATIONS

Two signalized intersections were selected for analysis as a result of consultation with the County.

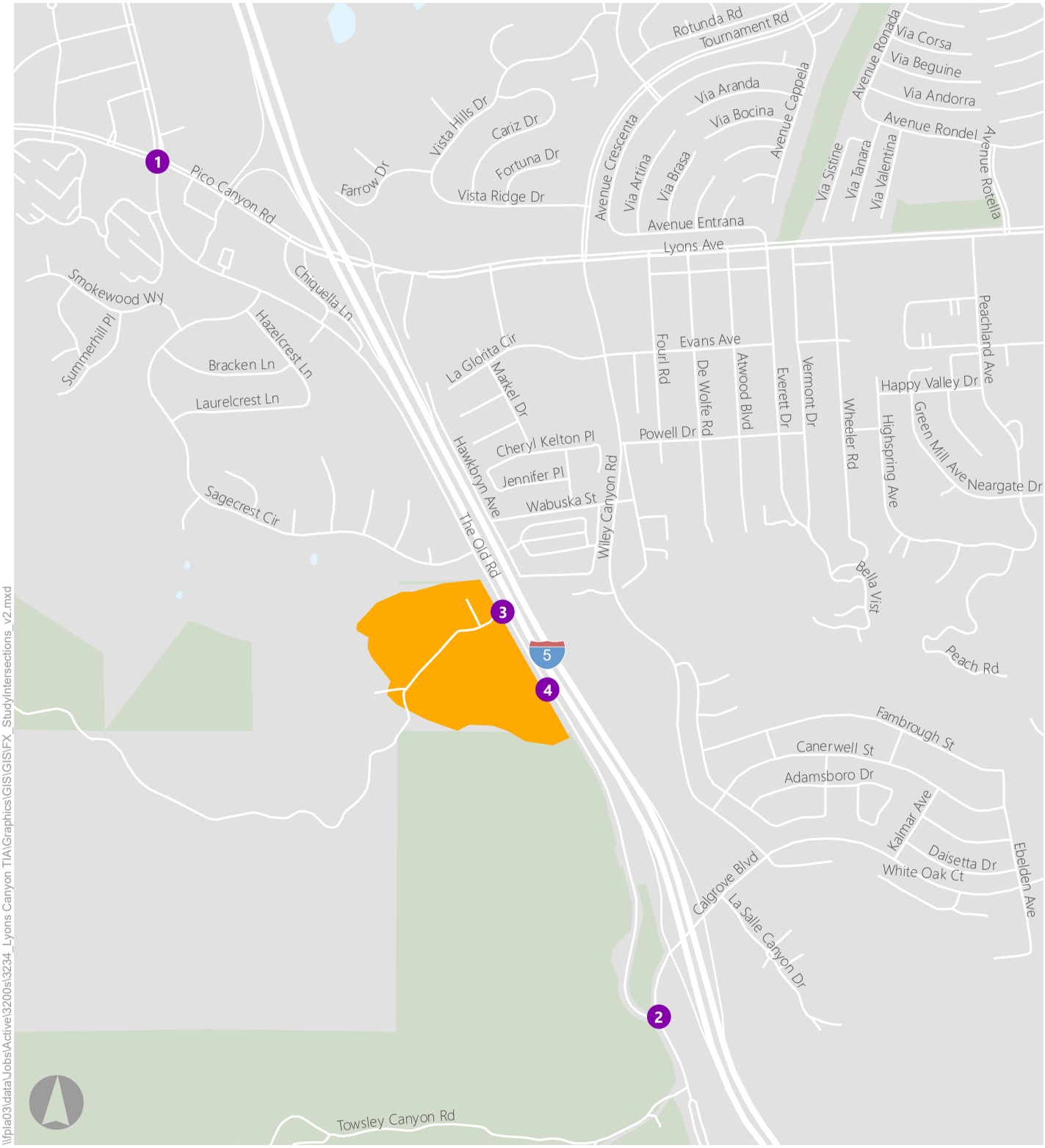
Study Intersections

Two signalized intersections and two proposed public streets that provide project access, illustrated in **Figure 2**, were identified to be analyzed as part of the scope of work for this study. The two intersections analyzed are The Old Road & Pico Canyon Road and The Old Road & Calgrove Boulevard.

Lane configurations of the study intersections are illustrated in **Appendix A**.

ORGANIZATION OF REPORT

This report is divided into six chapters, including this introduction. Chapter 2 describes the existing conditions including an inventory of the streets, highways, and transit service in the study area. Chapter 3 describes the CEQA-required VMT impact analysis conducted for the Project. The non-CEQA-required intersection operational analysis is presented in Chapter 4, including the methodologies used to develop traffic forecasts. Chapter 5 provides an overview of mitigation measures for the significant VMT impacts. Chapter 6 provides the summary and conclusions. Supporting analysis documents can be found in the Appendices.



Study Intersections

Project Site

Figure 2

Study Intersections

2. EXISTING CONDITIONS

A comprehensive data collection effort was undertaken to develop a detailed description of existing conditions in the study area. The assessment of conditions relevant to this study includes a description of the study area, an inventory of the local street system in the vicinity of the project site, a summary of the current transit service, and bicycle and pedestrian facilities in the study area. A detailed description of these elements is presented in this chapter.

STUDY AREA

The study area selected for analysis extends to include The Old Road to the east, Pico Canyon Road to the north, and Calgrove Boulevard to the south. The streets in the study area are under the jurisdiction of the County.

EXISTING STREET SYSTEM

Interstate 5 lies east of the site. This interstate provides regional access to and from the study area.

Arterials serving the study area include The Old Road and The Old Road/Calgrove Boulevard in the north/south direction and Pico Canyon Road in the east/west direction. The characteristics of the roadways serving the study area are described below.

FREEWAYS

- **Interstate 5** runs in a north/south direction east of the project site. In the vicinity of the study area, I-5 provides four lanes in each direction. Interchanges are provided at Pico Canyon Road and Calgrove Boulevard in the study area.

EAST/WEST STREETS

- **Pico Canyon Road** is classified as a Major Highway in the study area. It provides two lanes in both directions with a raised median in the study area. Parking is not permitted along either side of the street in the study area.

NORTH/SOUTH STREETS

- **The Old Road** is classified as a Secondary Highway between Pico Canyon Road and Calgrove Boulevard. North of Pico Canyon Road and south of Calgrove Boulevard, The Old Road is classified as a Major Highway. It fronts the project site and provides one lane in both directions, south of Sagecrest Circle. North of Sagecrest Circle, it provides two lanes in both directions. Parking is not permitted along either side of the street in the study area.

- **Calgrove Boulevard** is classified as a Secondary Highway and is located southeast of the project site. It provides one lane in each direction and parking is not permitted on either side of the street in the study area.

EXISTING PUBLIC TRANSIT SERVICE

Figure 3 shows the bus routes that provide service in the study area. There are four local and four express Santa Clarita Transit routes within the study area.

Details on the transit lines in the vicinity of the project site include:

- Santa Clarita Transit Route 4 – Route 4 provides local service between Bouquet Junction and the Newhall Metrolink Station. It runs along Pico Canyon Road north of the project site near the study area. Route 4 has average headways of one hour during the weekday AM and PM peak period. The Newhall Metrolink Station is approximately 3 miles from the project site.

- Santa Clarita Transit Route 5 – Route 5 provides local service between Stevenson Ranch and Forest Park. It runs along Pico Canyon Road and The Old Road north of the project site in the study area. Route 5 has average headways of one hour during the weekday AM and PM peak period.

- Santa Clarita Transit Route 6 – Route 6 provides local service between Stevenson Ranch and Shadow Pines. It runs along Pico Canyon Road and The Old Road north of the project site in the study area. Route 6 has average headways of one hour during the weekday AM and PM peak period.

- Santa Clarita Transit Route 14 – Route 14 provides local service between Plum Canyon and the Newhall Metrolink Station. It runs along Pico Canyon Road north of the project site near the study area. Route 4 has average headways of one hour during the weekday AM and PM peak period. The Newhall Metrolink Station is approximately 3 miles from the project site.

- Santa Clarita Transit Route 757 – Route 757 provides express service between the McBean Regional Transit Center and the Metro North Hollywood Station. It runs along the I-5 Freeway in the study area. Route 757 has average headways of one hour during the weekday AM peak period and 30 minutes during the PM peak period.

- Santa Clarita Transit Route 791 – Route 791 provides express service between Santa Clarita and Canoga Park. It runs along the I-5 Freeway in the study area. Route 791 has headways of 30 minutes to one hour during the weekday AM and PM peak periods.

- Santa Clarita Transit Route 792 – Route 792 provides express service between Santa Clarita and Century City. It runs along the I-5 Freeway in the study area. Route 792 has headways of 30 minutes to one hour during the weekday AM and PM peak periods.

- Santa Clarita Transit Route 794 – Route 757 provides express service between the Santa Clarita and the Burbank Metrolink Station/Union Station. It runs along the I-5 Freeway in the study area. Route

794 has one bus that runs during the AM peak period average headways of one hour during the weekday AM peak period and has an approximately one hour headway during the PM peak period.

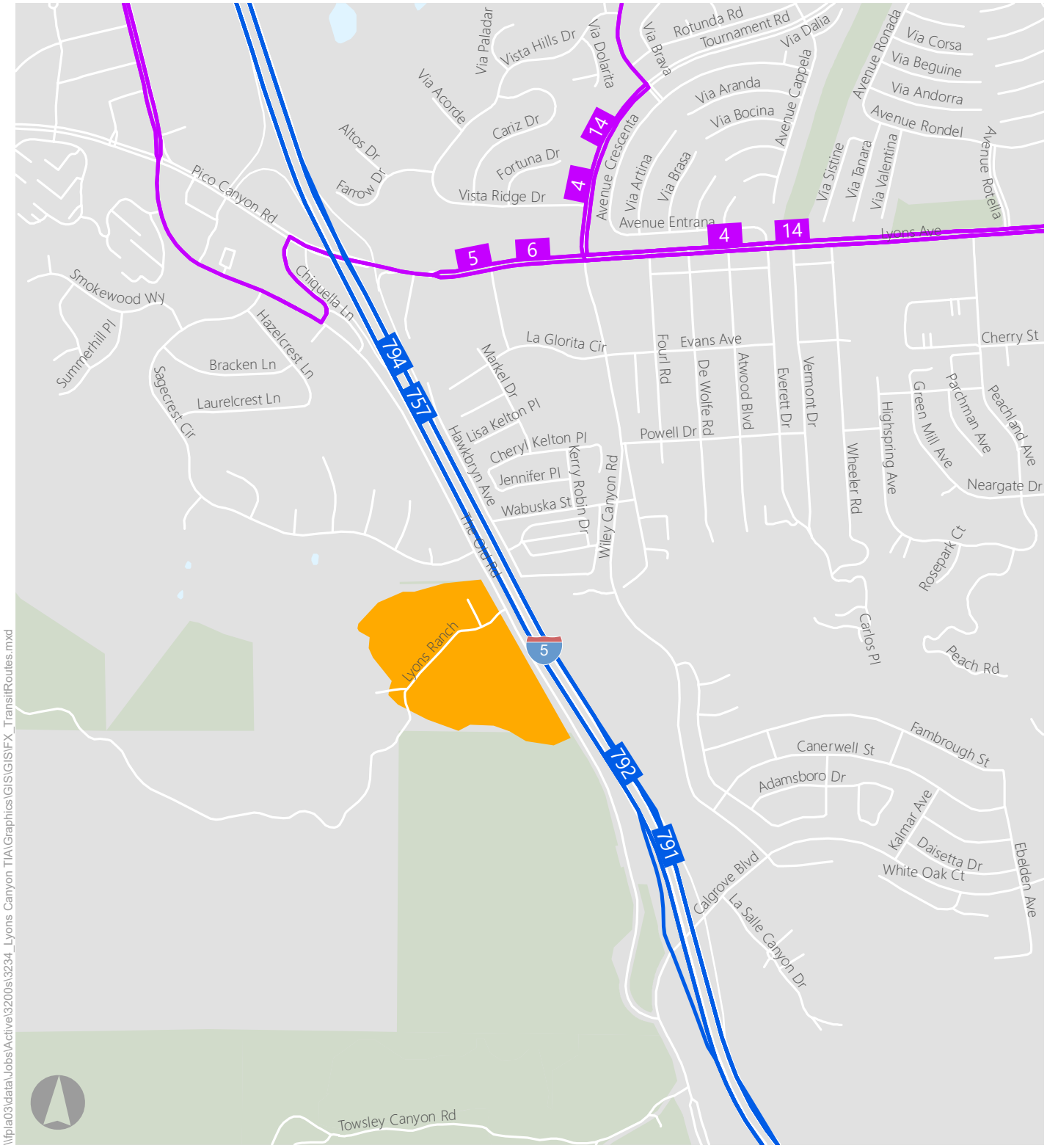
EXISTING BICYCLE AND PEDESTRIAN FACILITIES

Sidewalks are not currently present on The Old Road fronting the project site. There are sidewalks present on west side of The Old Road north of Sagecrest Circle, which continue north towards Pico Canyon Road. There are marked crosswalks provided at The Old Road & Pico Canyon Road. There are no marked crosswalks at The Old Road & Calgrove Boulevard. Pedestrian access to the Project will be provided along The Old Road once the Project is built. Pedestrian access to the nearby trail system will also be provided from the project site.

Existing bicycle facilities in the study area include a Class II bike lane on The Old Road, north of Sagecrest Circle. **Figure 4** identifies the existing and planned bicycle facilities in the Project's study area. The *County Bicycle Master Plan* (2012) as well as the *Santa Clarita Non-Motorized Transportation Plan* (2020) indicates that a Class II bike lane is planned in the study area along The Old Road, south of Sagecrest Circle; along Pico Canyon Road, west of The Old Road; and along Calgrove Boulevard, east of The Old Road.

EXISTING TRAFFIC VOLUMES

Weekday morning and evening peak hour traffic counts were collected at the two study intersections in June 2022 after stay-at-home orders during the COVID-19 pandemic were lifted and most businesses returned to working in person. The existing weekday morning and afternoon peak hour traffic volumes at the study intersections are provided in **Appendix A**. Count sheets for these intersections are contained in **Appendix B**.



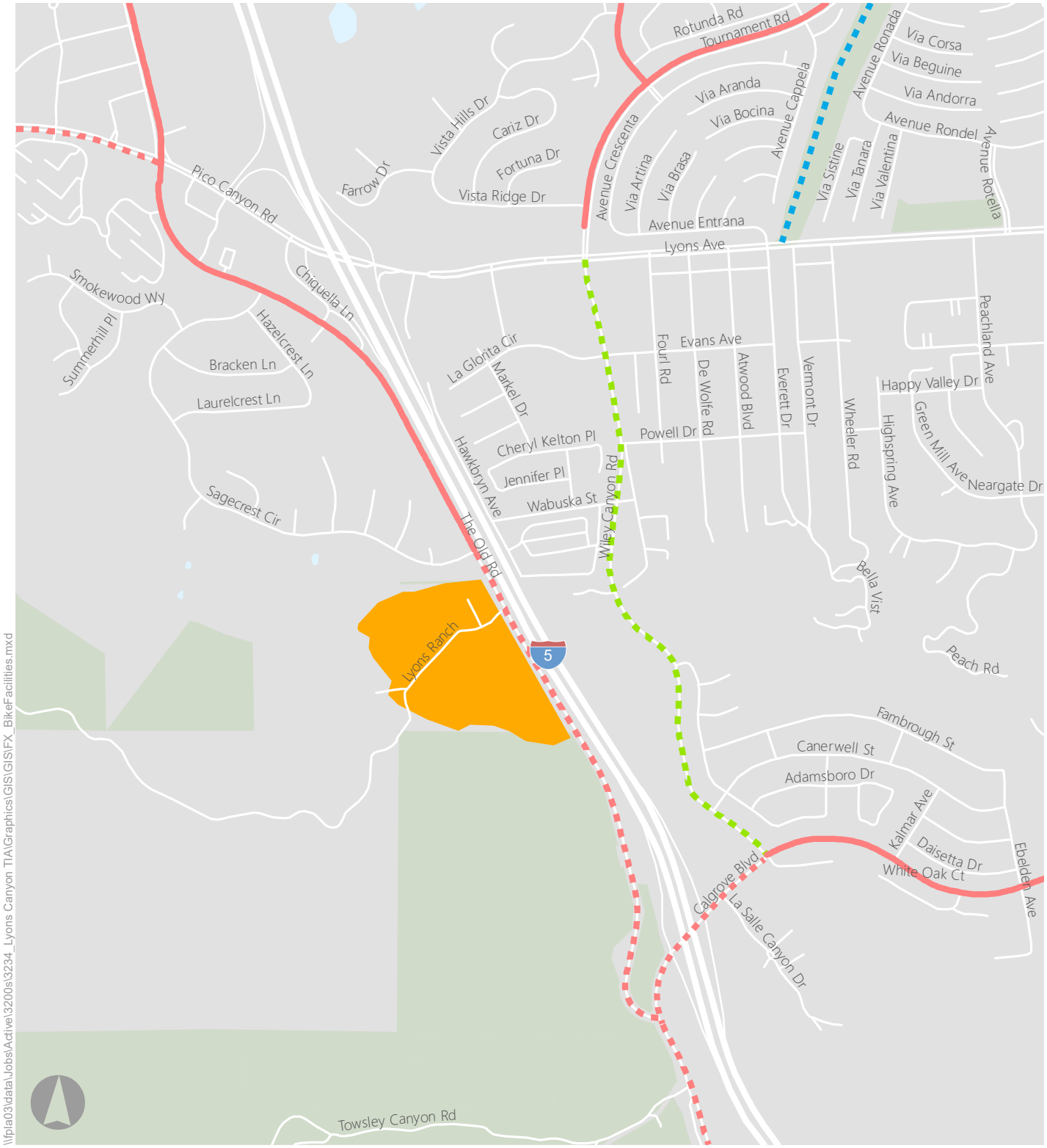
Transit Routes

- Commuter Express Service
- Local Service

Project Site

Figure 3

Transit Routes



Existing Bike Facilities
- Class I - Bike Path
- Class II - Bike Lane
- Class III - Bike Route

Planned Bike Facilities
- Class I - Bike Path
- Class II - Bike Lane
- Class III - Bike Route

Project Site

Figure 4

Existing and Planned Bicycle Facilities

3. VEHICLE MILES TRAVELED ANALYSIS

As part of the County's CEQA guidelines, analysis of proposed land use projects is required to assess whether they could result in a substantial impact on vehicle miles traveled. The follow section summarizes an assessment of VMT generated by the Project.

VMT SCREENING

The first step of a VMT analysis is to determine what type of analysis, if any, is needed. The Project was evaluated against three different screening criteria to assess if a VMT analysis would be applicable per the County's guidelines. The screening criteria are detailed below and applied for the Project to determine whether further VMT analysis is warranted.

NON-RETAIL PROJECT TRIP GENERATION SCREENING CRITERIA

If the answer is no to the question below, further analysis is not required, and a less than significant determination can be made.

- Does the development project generate a net increase of 110 or more daily vehicle trips?

Based on the Project's daily vehicle trip generation estimated using *Trip Generation, 10th Edition* (Institute of Transportation Engineers [ITE], 2017), the Project's estimated trip generation is greater than 110 daily trips and is therefore **not screened out** on this criteria.

PROXIMITY TO TRANSIT BASED SCREENING CRITERIA

If a project is located near a major transit stop or high-quality transit corridor, the following question should be considered:

- Is the project located within a one-half mile radius of a major transit stop or an existing stop along a high-quality transit corridor?

Based on existing transit service in the study area, the Project is not located within a one-half mile radius of a high-quality transit corridor. There are four Santa Clarita Transit routes that run along the I-5 Freeway with an average headway of approximately 42 minutes in the AM peak period and 61 minutes in the PM peak period. **Table 1** shows the calculation of the peak period headways.

In addition, there are no transit stops within a half-mile of the project site that provide access to the transit service along the I-5 Freeway and there are no major transit stops (planned or existing) within a half-mile radius. Therefore, the Project is **not screened out** from further VMT analysis under this screening criteria.

TABLE 1
LYONS CANYON RESIDENTIAL PROJECT
PEAK PERIOD HEADWAY TRANSIT ANALYSIS

Route	Nearest Stop to Project Site	AM Peak Period	PM Peak Period
Santa Clarita 757	CalArts	7:04 AM	5:14 PM
		8:07 AM	5:52 PM
		8:46 AM	6:22 PM
			6:51 PM
	Route Average Headway (minutes)	***51***	***32***
Santa Clarita 791	Valencia Bl & Rockwell Canyon Rd	7:35 AM	3:55 PM
		8:20 AM	5:22 PM
	Route Average Headway (minutes)	***45***	***87***
Santa Clarita 792	Valencia Bl & Rockwell Canyon Rd	7:38 AM	4:18 PM
		7:52 AM	5:32 PM
		8:36 AM	
	Route Average Headway (minutes)	***29***	***74***
Santa Clarita 794	Valencia Bl & Rockwell Canyon Rd	7:39 AM	4:37 PM
			5:29 PM
	Route Average Headway (minutes)	***n/a***	***52***
	Average Headway (minutes)	**42**	**61**

Note: Routes and schedule information from the City of Santa Clarita Transit website as of December 2021.

RESIDENTIAL LAND USE BASED SCREENING CRITERIA

Independent of the screening criteria for non-retail and retail projects, certain projects that further the State's affordable housing goals are presumed to have less than significant impact on VMT. If the project requires a discretionary action and the answer is yes to the question below, further analysis is not required, and a less than significant determination can be made.

- Are 100% of the units, excluding manager's units, set aside for lower income households?

The Project will not be providing 100% of the units for lower income households so is **not screened out** from further VMT analysis under this screening criteria.

PROJECT VMT ANALYSIS

PROJECT VMT METHODOLOGY

Per the County's procedures, daily household VMT per capita was estimated using the County's VMT Tool and compared with their published threshold guidance. The baseline VMT data in which the County thresholds are based have recently been updated to represent the amount of VMT generated by land uses within the entire County, rather than using the geographic boundaries for the North County and South County areas. The *Los Angeles County Public Works Transportation Impact Guidelines* (July 23, 2020) and a VMT calculator tool that the County provides to consultants for use in VMT impact analysis for land use projects in the County are in the process of being updated with the revised baseline VMT data and thresholds. The VMT Tool starts by allowing the user to enter in the analysis year, project location, land use type, and number of units. The VMT Tool then estimates VMT based on trip generation and trip length data from the Southern California Association of Government's (SCAG) Regional Transportation Plan (RTP) travel demand model and accounts for the effects of internalization, transit, and walkability on VMT. The VMT Tool allows for the selection of the single-family housing and multi-family housing land uses. No special land uses or modifications to the VMT tool were needed for this project.

PROJECT VMT IMPACT THRESHOLD

In Section 3.1.3, the County's published guidelines identify a significance threshold for residential projects: if the project's residential VMT per capita is not more than 16.8% below the existing residential VMT per capita for the Baseline Area in which the project is located, the project would have a significant VMT impact. If the Project would generate VMT higher than the threshold for the County baseline, then it would be expected to have a significant VMT impact, and if the Project would generate VMT lower than the threshold, then it would not be expected to have a significant VMT impact.

Consistent with the RTP and the County General Plan, the model forecasts for future years suggests that residential VMT per capita is projected to decrease over time. The County's procedures require the baseline VMT applied in the Transportation Impact Analysis be consistent with the year that the transportation study begins. The baseline analysis year for this project is 2022.

The County is in the process of updating their guidelines and VMT Tool to reflect the updated baseline VMT data and thresholds. The updated baseline VMT data was used and was taken from the *LA County Baseline VMT Data* memorandum, dated January 26, 2022, which provides the updated baseline VMT for LA County. The baseline residential VMT per capita is 12.7 for the analysis year of 2022.[4] The memorandum, which includes the updated baseline VMT data, is included in **Appendix C**.

PROJECT IMPACT DETERMINATION

Although the VMT Tool is in the process of being update, it is still appropriate to use the VMT Tool to calculate the VMT generated by the Project. According to the VMT Tool, the daily residential VMT per capita of the Project is estimated at 20.5 as shown in **Figure 5**. The significance threshold of 16.8% below the County baseline for 2022 is 10.6 residential VMT per capita (16.8% below 12.7). Thus, without mitigation, the Project's 20.5 residential VMT per capita represents a significant impact as estimated by the VMT Tool.

[4] While the Project is not located in the City of Santa Clarita, it is immediately adjacent to the City boundary. Per the *Los Angeles County Senate Bill (SB) 743 Implementation and CEQA Updates Report* (Fehr & Peers, 2020), the City of Santa Clarita's residential VMT/capita is 24.1.

COUNTY OF LOS ANGELES VMT TOOL

version 1.0

Project Information

Project Name: Lyons Canyon

Analysis Year: 2022

Parcel Number (TAZ# 20227100)

2826022027

Project Land Use Information

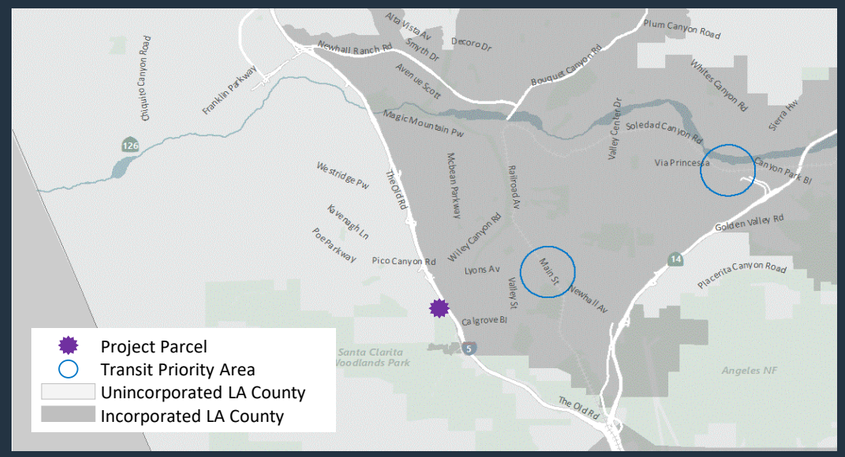
	Values	Unit
Residential - Single-Family Housing	268	DU
Residential - Multifamily Housing	214	DU
Residential - Affordable Housing	35	DU
Office - General Office		KSF
Office - Medical Office		KSF
Retail - Shopping Center, Restaurant, Services		KSF
Industrial - Warehousing		KSF
Industrial - Light Industrial		KSF
Custom Land Use (ignores all other land use entries)		Daily Trips

Project Daily Trips: 3,840

Screening Criteria for County of Los Angeles

	Value
Is the project screened in a Transit Priority Area?	No
Is the project's residential land uses 100% affordable housing?	No
Is the project's local service retail land uses under 50,000 square foot?	N/A
Does the project generate fewer than 110 daily trips? (enter project land use in the section above)	No

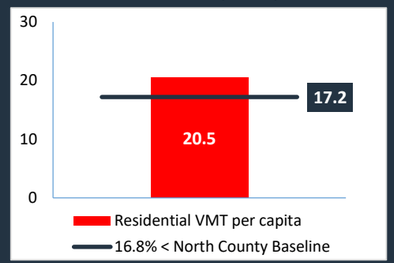
Project Location and VMT Information



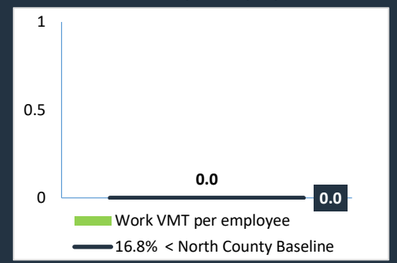
Project Summary Information

North County Residential VMT Baseline (20.7)	16.8%	% Threshold for Screening
North County Work VMT Baseline (15.9)	16.8%	% Threshold for Screening

Residential VMT per capita



Work VMT per employee



The project is not presumed to have a less than significant impact on VMT, therefore a CEQA VMT analysis may be required. Please refer to the Transportation Impact Analysis Guidelines on how to proceed forward.

FEHR PEERS

Figure 5

CUMULATIVE VMT ANALYSIS

The SCAG RTP/SCS is the regional plan that demonstrates compliance with air quality conformity requirements and GHG reduction targets. This plan includes significant transportation network improvements and major land use projects that are planned and programmed within the larger study region such as the Newhall Ranch development. As such, projects that are consistent with this plan in terms of development location, density, and intensity, are already part of the regional solution for meeting air pollution and GHG goals; and therefore, would have a less than significant cumulative impact on VMT. However, development in a location where the RTP/SCS does not specify any development may indicate a significant impact on transportation and would require further review. The first step in this additional review is to determine if a project has a significant impact in the project impact analysis. If the project does not demonstrate a significant VMT impact under baseline conditions, then a less than significant impact in the cumulative impact analysis can also be determined. This is because projects that fall under the RTP/SCS's efficiency-based impact thresholds are already shown to align with the long-term VMT and greenhouse gas reduction goals of SCAG's RTP/SCS.

Land use projects that: (1) demonstrate a project impact after applying an efficiency based VMT threshold and (2) are not deemed to be consistent with the SCAG RTP/SCS could have a significant cumulative impact on VMT. The Project's cumulative impact on VMT was further evaluated to determine whether the impact is significant. The Lyons Canyon Project demonstrates a project VMT impact as shown in the County's VMT tool and includes development in an area that is not specified by the RTP/SCS. A detailed review of the socioeconomic data in the Project TAZ (transportation analysis zone) was undertaken. It was determined that the addition of the Project's residential units could exceed the totals included in the RTP/SCS for this area. Therefore, the Project's cumulative or long-term impact on VMT was further evaluated to determine whether the impact makes a cumulatively considerable contribution to a significant impact.

CUMULATIVE PROJECT VMT METHODOLOGY

Per the County's TIA Guidelines, the SCAG RTP/SCS Travel Demand Model was used as the basis for the cumulative analysis. This analysis was conducted by running the SCAG model with the cumulative "no project" scenario representing the RTP/SCS cumulative year 2040 conditions and the cumulative "plus project" scenario representing the addition of the Project to the year 2040 conditions. The socioeconomic data in the TAZ in which the Project is located was updated to reflect the addition of the Project. The SCAG model was used to estimate average home-based trip length, vehicle trips, and population for the cumulative "no project" scenario and cumulative "plus project" scenario.

After running the SCAG model without and with the Project, the model outputs show that the cumulative "no project" residential VMT per capita for the project area is 18.4, and the cumulative plus project residential VMT per capita is 18.7 for all home-based production trips (See Appendix D for detailed description of VMT calculations).[5]

[5] Source: SCAG regional travel demand model as run by Fehr & Peers, February 2021.

Table 2 below summarizes the VMT analysis.

CUMULATIVE PROJECT VMT IMPACT THRESHOLD

As outlined in the County's guidelines, any increase in residential VMT per capita above that which was forecasted in the RTP/SCS would constitute a significant impact. Note that the cumulative VMT significance threshold is different than threshold for the project level VMT analysis. The cumulative VMT impact thresholds are summarized in **Table 2**.

CUMULATIVE PROJECT IMPACT DETERMINATION

As shown in **Table 2**, the cumulative "no project" residential VMT per capita for the project area is 18.4. Any increase to this number would represent a cumulative VMT impact. The cumulative "plus project" scenario is estimated to generate 18.7 daily residential VMT per capita, which represents an increase over the cumulative "no project" residential VMT per capita. This **indicates a significant transportation impact** under cumulative conditions without mitigation.

TABLE 2
LYONS CANYON RESIDENTIAL PROJECT
CUMULATIVE VEHICLE MILES TRAVELED (VMT) ANALYSIS

Cumulative Project VMT Impact Analysis	Future Year (2040)
Average Home-Based Trip Length (miles) [a]	14.5
Home-Based Vehicle Trips [a]	24,414
Daily Residential VMT [b]	354,006
Population [b]	18,944
Threshold: Cumulative No Project Baseline Residential VMT per Capita [c]	18.4
Cumulative Residential VMT per Capita	18.7
Significant Impact	**YES**

Notes:

[a] The Southern California Association of Governments (SCAG) Travel Demand Forecasting Model provides the ability to evaluate the transportation system in the SCAG region. The model forecasts AM and PM peak period and daily vehicle and transit flows on the transportation network in the region and calculates trip origins and destinations for those vehicle flows. Household VMT per capita is based on the home-based work and home-based other productions trips from the SCAG model as run by Fehr & Peers, February 2021.

[b] Daily VMT for residential land uses is calculated using the home-based vehicle trips and the average trip length calculated using the SCAG model. The SCAG model was also used to estimate population for the Project.

[c] Baseline VMT and impact thresholds are based on the *Los Angeles County Public Works Transportation Impact Guidelines* , July 23, 2020.

4. INTERSECTION OPERATIONAL ANALYSIS

This chapter presents the intersection operational analysis conducted as part of the transportation study.

EXISTING TRAFFIC VOLUMES AND LEVEL OF SERVICE

This section presents existing base peak hour traffic volumes, describes the methodology used to assess the traffic conditions at each intersection, and analyzes the resulting operating conditions at each, indicating delay in seconds and levels of service.

LEVEL OF SERVICE AND QUEUEING METHODOLOGY

Analysis Methodology

LOS is a qualitative measure used to describe the condition of traffic flow on the street system, ranging from excellent conditions at LOS A to overloaded conditions at LOS F. A variety of methodologies are available to analyze LOS. Consistent with the requirements of the County, the *Highway Capacity Manual* (HCM) (Transportation Research Board, 2016) methodology was used to analyze the delay. Under HCM methodology, delay is calculated in seconds for both the signalized and unsignalized intersections and given a LOS grade, as shown in **Tables 3A and 3B**. The signalized study intersections were analyzed using the HCM 6th Edition Signalized methodology and the unsignalized intersections were analyzed using the HCM 6th Edition Two-way Stop Control methodology. The Synchro software package was used to produce the HCM results.

The adequacy of the turn pocket storage lengths was evaluated with the 95th percentile queue. The 95th percentile queue is defined to be the queue length (in vehicles) that has only a 5-percent probability of being exceeded during the analysis time period. Project access is considered constrained if the addition of Project trips to a study intersection would contribute to unacceptable queueing. Unacceptable or extended queuing may be defined as spill over from turn pockets into through lanes and spill over into upstream intersections. The Synchro software package was used to produce queueing results and storage lengths were estimated through aerial photo review and field investigation.

TABLE 3A
LEVEL OF SERVICE DEFINITIONS FOR SIGNALIZED INTERSECTIONS

Level of Service	Average Control Delay (seconds/vehicle)	General Description
A	$\leq$ 10.0	Free Flow
B	> 10.0 and $\leq$ 20.0	Stable Flow (slight delays)
C	> 20.0 and $\leq$ 35.0	Stable Flow (acceptable delays)
D	> 35.0 and $\leq$ 55.0	Approaching unstable flow (tolerable delay, occasionally wait through more than one signal cycle before proceeding)
E	> 55.0 and $\leq$ 80.0	Unstable flow (intolerable delay)
F	> 80.0	Forced flow (congested and queues fail to clear)

TABLE 3B
LEVEL OF SERVICE DEFINITIONS FOR UNSIGNALIZED INTERSECTIONS

Level of Service	Average Control Delay (seconds/vehicle)
A	$\leq$ 10.0
B	> 10.0 and $\leq$ 15.0
C	> 15.0 and $\leq$ 25.0
D	> 25.0 and $\leq$ 35.0
E	> 35.0 and $\leq$ 50.0
F	> 50.0

EXISTING LEVELS OF SERVICE

Existing year (2022) traffic volumes presented in **Appendix A** were analyzed using the HCM methodology described above to determine the existing operating conditions at the study intersections. **Table 4** summarize the results of the analysis of the existing weekday morning and afternoon peak hour delay and corresponding LOS at each of the analyzed signalized intersections. As indicated below, **both study intersections analyzed operate at LOS D or better during the AM and the PM peak periods.** Analysis sheets are provided in **Appendix E**.

EXISTING QUEUES

Table 5 summarizes the results of the queueing analysis of the existing weekday morning and afternoon peak hour. As indicated below, the northbound and southbound left turn pockets have a queue length that exceeds storage at The Old Road & Pico Canyon Road during the PM peak period. Analysis sheets are provided in **Appendix E**.

TABLE 4
LYONS CANYON RESIDENTIAL PROJECT
EXISTING INTERSECTION LEVELS OF SERVICE

No.	Intersection	Peak Hour	Existing (2022)	
			Delay	LOS
1	The Old Road &	AM	36.8	D
	Pico Canyon Road	PM	49.2	D
2	The Old Road &	AM	9.4	A
	Calgrove Boulevard	PM	10.3	B

TABLE 5
LYONS CANYON RESIDENTIAL PROJECT
PEAK HOUR INTERSECTION QUEUES ANALYSIS
EXISTING CONDITIONS

No.	Intersection	Turning Movements by Lanes at Intersection	Total Capacity (ft) [a]	Existing (2022) Conditions			
				AM 95th Percentile Queue	PM 95th Percentile Queue	Queue Exceeds Storage?	
				Queue (ft)	Queue (ft)	AM	PM
1	The Old Road & Pico Canyon Road	EBL	195	63	66	No	No
		EBT	350	108	117	No	No
		EBR	150	0	0	No	No
		WBL	200	44	44	No	No
		WBT	580	97	175	No	No
		WBR	190	57	68	No	No
		NBL	120	68	150	No	**Yes**
		NBT/R	1,500	117	150	No	No
		SBL	235	159	376	No	**Yes**
		SBT/R	520	76	210	No	No
2	The Old Road & Calgrove Boulevard	EBL	200	21	56	No	No
		EBR	200	13	20	No	No
		NBL	150	41	112	No	No
		NBT	600	24	178	No	No
		SBT/R	500	46	40	No	No

[a]: Storage lengths determined based on scaled distances from online aerial photographs and verified in the field.

PROJECT TRAFFIC

The development of project related vehicle traffic estimates for the proposed Project involves the use of a 3-step process: trip generation, trip distribution, and trip assignment.

PROJECT TRIP GENERATION

As discussed in Chapter 1, the Project consists of the development of 510 residential units, including single family homes, attached and detached townhomes, and affordable apartments. However, this study conservatively analyzes 517 units as part of a previously studied version of the Project for flexibility in the project description.

Trip generation rates from *Trip Generation, 10th Edition* (Institute of Transportation Engineers [ITE], 2017)[6] were used to estimate the number of trips associated with the Project and are presented in **Table 6**.

As shown in **Table 6**, the Project is projected to generate 315 trips (77 inbound/238 outbound) during the AM peak hour and 406 trips (257 inbound/149 outbound) during the PM peak hour.

PROJECT TRAFFIC DISTRIBUTION

The geographic distribution of trips generated by the proposed Project is dependent on characteristics of the street system serving the project site; the level of accessibility of routes to and from the proposed project site, and the location of commercial and employment areas to which residents would be drawn. The previously approved version of the Project (*Lyons Canyon Ranch Draft Environmental Impact Report, 2006)* was used to help inform the general distribution pattern for this study and estimates were discussed with staff prior to analysis. The distribution of project trips is illustrated in **Figure 6**.

PROJECT TRAFFIC ASSIGNMENT

The traffic to be generated by the proposed Project was assigned to the street network using the distribution patterns described in **Figure 6**. **Appendix A** provides the assignment of the proposed Project-generated peak hour traffic volumes at the analyzed intersections during the AM and PM peak hours.

[6] The ITE Trip Generation 11th Edition was published after the Project's scoping memo. If the 11th Edition was used, it would result in fewer daily and peak hour trips, so therefore using 10th Edition is conservative. Comparisons are presented in Appendix I.

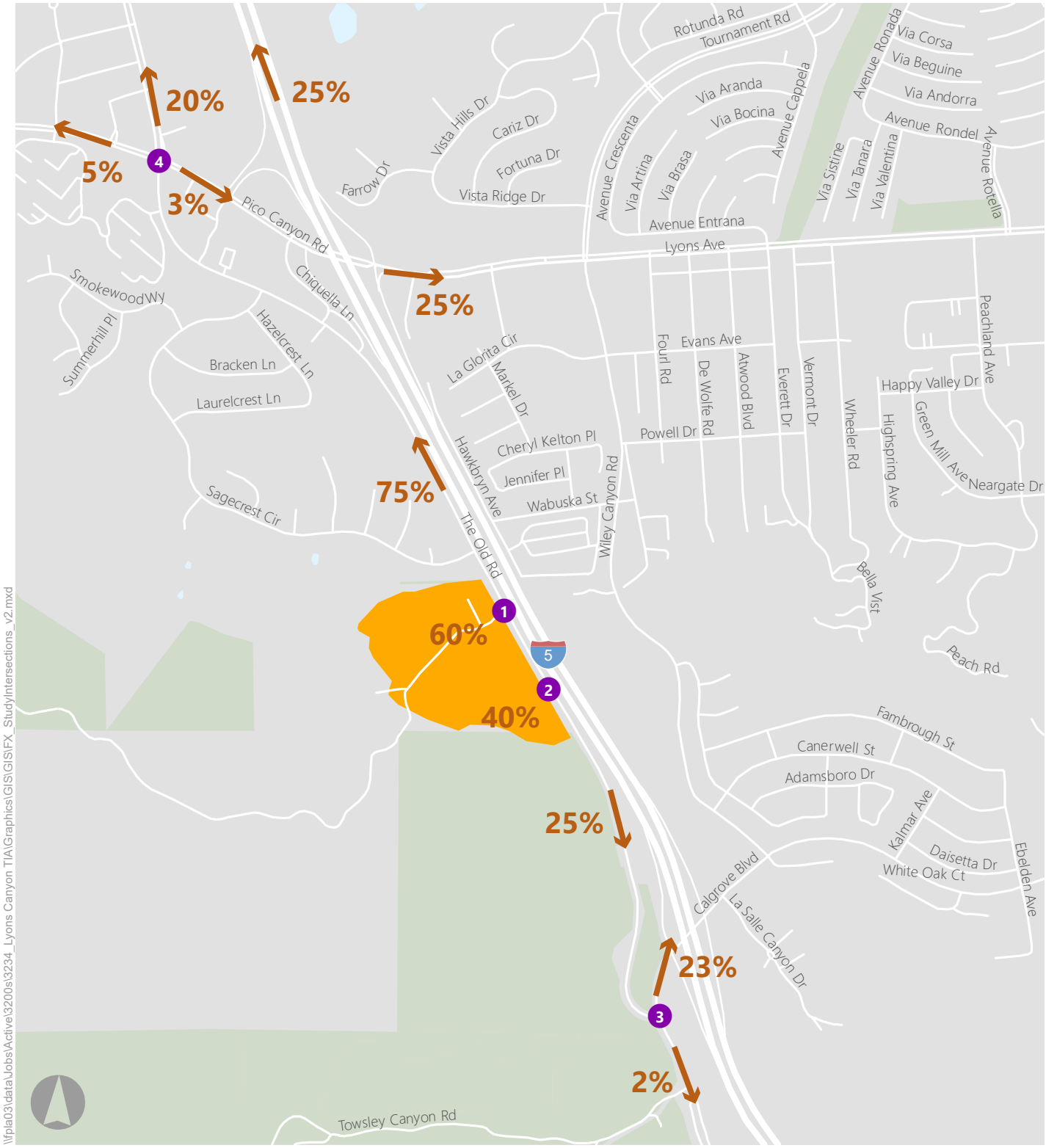
TABLE 6
LYONS CANYON RESIDENTIAL PROJECT
PROJECT PEAK HOUR TRIP GENERATION ESTIMATES

Land Use	ITE Land Use Code	Size	Trip Generation Rates [a]						Trip Generation Estimates					
			AM Peak Hour			PM Peak Hour			AM Peak Hour Trips			PM Peak Hour Trips		
			Rate	In%	Out%	Rate	In%	Out%	In	Out	Total	In	Out	Total
PROPOSED PROJECT														
Single Family Residential	210	167 Units	0.74	25%	75%	0.99	63%	37%	31	93	124	105	61	166
Detached Townhomes [b]	210	101 Units	0.74	25%	75%	0.99	63%	37%	19	56	75	63	37	100
Attached Townhomes (low-rise)	220	214 Units	0.46	23%	77%	0.56	63%	37%	23	76	99	76	44	120
Multi-Family Residential (low-rise)	220	35 Units	0.46	23%	77%	0.56	63%	37%	4	13	17	13	7	20
TOTAL PROJECT VEHICLE TRIPS									**77**	**238**	**315**	**257**	**149**	**406**

Notes:

[a] Source: Institute of Transportation Engineers (ITE), *Trip Generation, 10th Edition,* 2017. The ITE Trip Generation 11th Edition was published after the Project's scoping memo. If the 11th Edition was used, it would result in fewer daily and peak hour trips, so therefore using 10th Edition is conservative. Comparisons are presented in Appendix I.

[b] As described in Trip Generation Manual, 10th Edition, surveyed single-family units include all single-family detached homes on individual lots. While this project is comprised of a single lot, the townhomes are in detached groups and provide a two-car garage for each unit. Therefore, these detached townhomes are most similar to the Land Use 210 category (Single Family Residential).



Study Intersections

Project Site

x% Trip Distribution

Figure 6

Trip Distribution

FUTURE YEAR 2029 TRAFFIC CONDITIONS

To evaluate the potential effects of the proposed Project on future conditions, it was necessary to develop estimates of future traffic conditions for the study area intersections both without and with project traffic.

First, estimates of traffic growth were developed for the study area to forecast future conditions without the Project. These forecasts included traffic increases as a result of both regional background traffic growth and traffic generated by specific developments in the vicinity of the Project (related projects). These projected traffic volumes, identified herein as the Future Base conditions, represent the future conditions without the proposed Project. The approach in developing the forecasts is conservative since it includes both a list of specific related projects and an ambient growth factor, and in that not all of the related projects may be ultimately built and not all may be built by 2029. The analysis therefore likely overstates the future growth in traffic for the Future Base conditions.

The traffic generated by the proposed Project was then estimated and assigned to the surrounding street system. Project traffic was added to the Future Base conditions to form Future plus Project traffic conditions.

The assumptions and analysis methodology used to develop each of the future year scenarios discussed above are described in more detail in the following sections.

AMBIENT GROWTH RATE

An ambient growth rate represents a general growth in traffic volumes due to minor new developments in the study area and regional growth and development outside the study area. A review of recent and historical counts was undertaken in addition to collecting current year counts. Conditions in the local project area and LA County have been affected by the pandemic with significant shifts to telework. The long-term durability of these changes is unknown. Given these considerations, an ambient growth rate of 0.35% per year was applied to adjust the existing base year traffic volumes to reflect the effects of regional growth and development by year 2029.[7] A review of the historic and current year (2022) counts, as well as a review of the SCAG regional model supports that this growth rate represents a somewhat conservative expectation that project area traffic volumes would continue to return to pre-pandemic ambient growth trends. See **Appendix F** for memorandum summarizing this review.

RELATED PROJECT TRAFFIC GENERATION AND ASSIGNMENT

Future Base 2029 traffic forecasts also include the effects of known specific projects, called related projects, expected to be implemented in the vicinity of the proposed Project prior to the buildout date of the proposed Project. Pending and approved development projects that are expected to be completed by the buildout horizon within one-half mile from the farthest outlying study intersection are to be included in the

[7] Ambient growth rate was applied by using the exponential growth formula: (base volume) * $(1 + r/100)^t$ where r is equal to the ambient growth rate, and t is equal to the change over time in number of years.

forecasting effort to capture the local traffic growth that could be added to the intersections in the study area.

Based on the list of related projects that was provided by City of Santa Clarita and LA County, three cumulative projects were identified within one-half mile from the farthest outlying study intersection. These projects are shown in **Figure 7** and listed below:

1. Canyon View Estates – This project is located in LA County and consists of 37 single family homes. It is estimated to generate 28 trips (7 inbound/21 outbound) in the AM peak hour and 37 trips (24 inbound/13 outbound) in the PM peak hour. Trip generation estimates and assignment were provided by the *Canyon View Estates (TT 52905) Focused Access Traffic Evaluation* (Urban Crossroads, 2017).

2. Tentative Tract Map No. 74979 – This project is located in LA County and consists of seven single family homes. The project is estimated to generate approximately five trips (one inbound/four outbound) in the AM peak hour and seven trips (four inbound/three outbound) in the PM peak hour. Trip generation estimates are based on the *Trip Generation, 10th Edition* (Institute of Transportation Engineers [ITE], 2017).

3. Wiley Canyon Project – This project is located in the City of Santa Clarita and consists of 130 independent senior apartments, 60 assisted living units, and 26 memory care units. It also includes 10,000 square feet of commercial space and 375 apartments. The project is estimated to generate approximately 290 trips (100 inbound/191 outbound) in the AM peak hour and 354 trips (200 inbound/154 outbound) in the PM peak hour. Trip generation estimates are based on the *Trip Generation, 10th Edition* (Institute of Transportation Engineers [ITE], 2017).

FUTURE YEAR 2029 BASE TRAFFIC VOLUMES

Future year 2029 base weekday AM and PM peak hour traffic volumes and lane geometries for the analyzed intersections are provided in **Appendix A**. The Future Base traffic conditions represent an estimate of future conditions without the proposed Project and inclusive of the ambient background growth and related project traffic.

FUTURE PLUS PROJECT TRAFFIC PROJECTIONS

The proposed Project traffic volumes were added to the year 2029 Future Base traffic projections, resulting in Future plus Project AM and PM peak hour traffic volumes. As provided in **Appendix A**, the Future plus Project scenario presents future traffic conditions with the completion of the proposed Project.

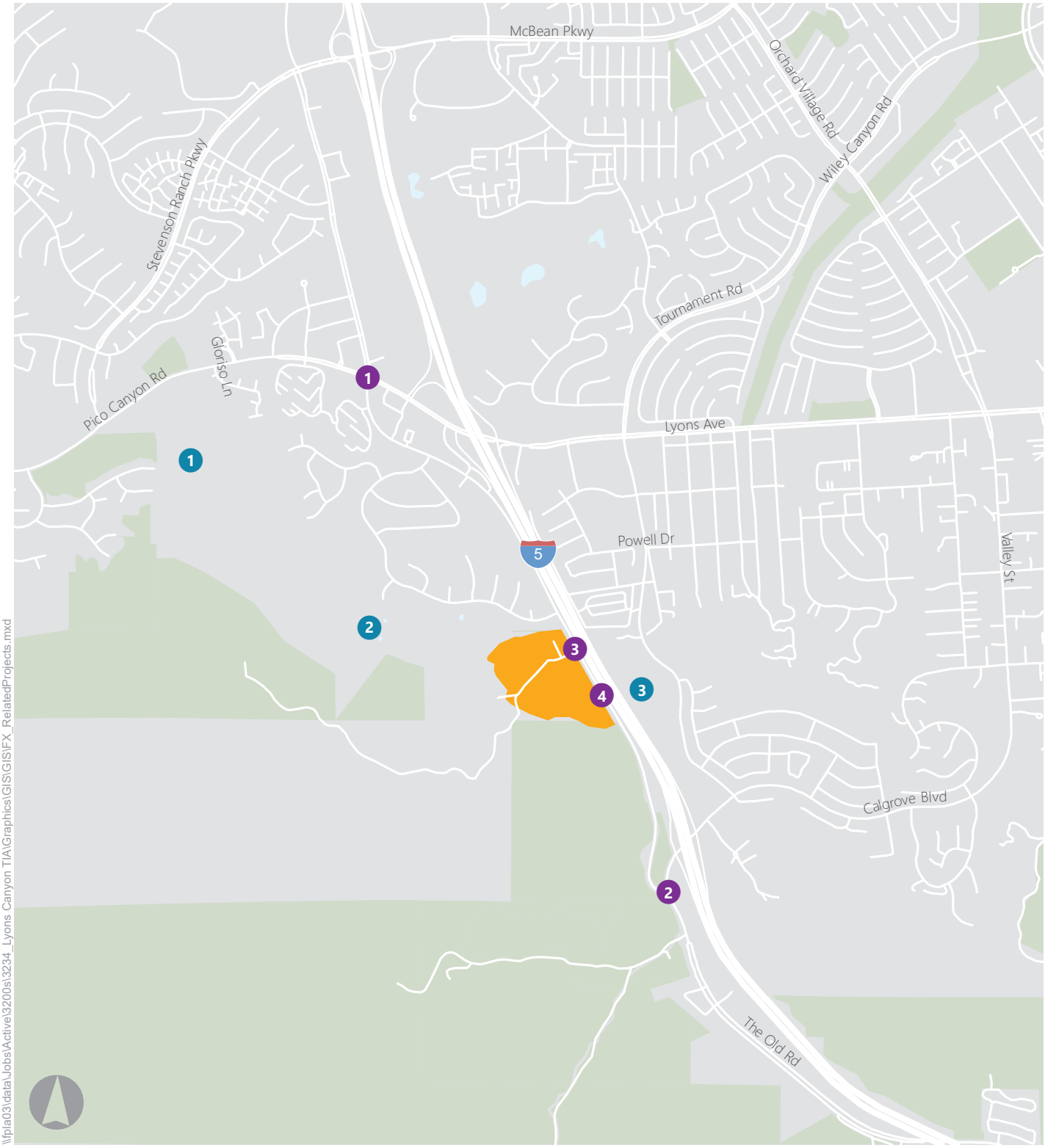


Figure 7

Related Projects

FUTURE PLUS PROJECT ANALYSIS

FUTURE BASE TRAFFIC CONDITIONS

The year 2029 Future Base peak hour traffic volumes were analyzed to determine the projected delay and LOS for each of the analyzed intersections. **Table 7** summarizes the future LOS for the signalized intersections. As indicated below, **both study intersections analyzed are projected to operate at LOS D or better during the AM and the PM peak periods**. Analysis sheets are provided in **Appendix E**.

FUTURE BASE QUEUES

Table 8 summarizes the results of the queueing analysis of the Future weekday morning and afternoon peak hour. As indicated below, the northbound left turn and southbound left turn pockets are projected to have a queue length that exceeds storage at The Old Road & Pico Canyon Road during the PM peak period. Analysis sheets are provided in **Appendix E**.

FUTURE PLUS PROJECT TRAFFIC CONDITIONS

The resulting Future plus Project peak hour traffic volumes, provided in **Appendix A**, were analyzed to determine the projected future operating conditions with the addition of the proposed Project traffic. The results of the Future plus Project analysis are presented in **Table 7** with analysis sheets provided in **Appendix E**. All study intersections analyzed are projected to **operate at LOS D or better during the AM and the PM peak periods**.

FUTURE PLUS PROJECT QUEUES

Table 8 summarizes the results of the queueing analysis of the Future plus Project weekday morning and afternoon peak hour. The northbound and southbound left turn pockets are projected to have a queue length that exceeds storage at The Old Road & Pico Canyon Road during the PM peak period, with and without the Project.

Assuming a typical queue storage length of 25 feet per car, the Project is expected to increase northbound left-turn queues by less than one car length (eight feet) during the PM peak hour. Although future queues may exceed the 120 feet striped capacity of the northbound left-turn pocket, the presence of a two-way left-turn lane (TWLTL) allows for additional storage capacity. Left turning vehicles typically queue into the TWLTL rather than through lanes in these situations. Therefore, the Project does not contribute to unacceptable levels of queueing.

At The Old Road & Pico Canyon Road, the 95th percentile queue under the Future Base (without the Project) conditions are projected to have a queue length (400 feet) that exceeds storage (235 feet) at the southbound left turn pocket, as mentioned above. The County does not have plans for improvement at this location.

With the Project, the 95th percentile queue at this movement are projected to be the same as the 95th percentile queue (400 feet) under the Future Base conditions. Although the Project would add more traffic

to the northbound through movement, it would not add any additional traffic to the southbound left turn movement and queues are not expected to increase.

Accordingly, unacceptable queueing is present in both the Future Base conditions and Future plus Project conditions. Due to the geometric constraints of existing right-of-way, and the northbound left turn lane at the upstream intersection of The Old Road and Market Drive South, there is insufficient right of way to expand the two southbound left turn pockets. Therefore, a southbound left turn queue storage geometric improvement is not feasible. Since the queue length is not increasing with the project, no change in safety conditions related to queueing for this movement is expected.

At The Old Road & Calgrove Boulevard, the Project is expected to increase the queue by approximately one car length during both peak periods. This addition does not exceed the storage length of the turn pockets and therefore does not contribute to unacceptable queueing. Analysis sheets are provided in **Appendix E**.

TABLE 7
LYONS CANYON RESIDENTIAL PROJECT
FUTURE PLUS PROJECT (2029) INTERSECTION LEVEL OF SERVICE

No.	Intersection	Peak Hour	Future Base (2029)		Future (2029) + Project	
			Delay	LOS	Delay	LOS
1	The Old Road &	AM	36.9	D	38.0	D
	Pico Canyon Road	PM	52.5	D	52.5	D
2	The Old Road &	AM	9.5	A	10.5	B
	Calgrove Boulevard	PM	10.4	B	10.9	B
3	The Old Road &	AM	N/A	N/A	3.2	A
	"A" Street	PM	N/A	N/A	1.6	A
4	The Old Road &	AM	N/A	N/A	2.7	A
	"B" Street	PM	N/A	N/A	1.1	A

TABLE 8
LYONS CANYON RESIDENTIAL PROJECT
PEAK HOUR INTERSECTION QUEUES ANALYSIS
FUTURE BASE AND FUTURE PLUS PROJECT (2029)

No.	Intersection	Turning Movements by Lanes at Intersection	Total Capacity (ft) [a]	Future Base (2029) Conditions				Future Base (2029) + Project					
				AM 95th Percentile Queue	PM 95th Percentile Queue	Queue Exceeds Storage?		AM 95th Percentile Queue	PM 95th Percentile Queue	Queue Length Increase (ft)		Queue Exceeds Storage?	
				Queue (ft)	Queue (ft)	AM	PM	Lane (ft)	Lane (ft)	AM	PM	AM	PM
1	The Old Road & Pico Canyon Road	EBL	195	65	68	No	No	65	68	0	0	No	No
		EBT	350	115	126	No	No	120	130	5	4	No	No
		EBR	150	0	0	No	No	0	0	0	0	No	No
		WBL	200	44	44	No	No	44	44	0	0	No	No
		WBT	580	104	188	No	No	108	194	4	6	No	No
		WBR	190	59	72	No	No	61	76	2	4	No	No
		NBL	120	70	153	No	**Yes**	86	161	16	8	No	**Yes**
		NBT/R	1,500	120	154	No	No	147	166	27	12	No	No
		SBL	235	164	400	No	**Yes**	164	400	0	0	No	**Yes**
		SBT/R	520	77	216	No	No	83	238	6	22	No	No
2	The Old Road & Calgrove Boulevard	EBL	200	24	61	No	No	51	83	27	22	No	No
		EBR	200	13	22	No	No	14	25	1	3	No	No
		NBL	150	43	122	No	No	48	138	5	16	No	No
		NBT	600	25	189	No	No	28	208	3	19	No	No
		SBT/R	500	50	42	No	No	53	46	3	4	No	No
3	The Old Road & "A" Street	EBL	400	N/A	N/A	N/A	N/A	25	25	N/A	N/A	No	No
		EBR	400	N/A	N/A	N/A	N/A	25	25	N/A	N/A	No	No
		NBL	100	N/A	N/A	N/A	N/A	0	25	N/A	N/A	No	No
4	The Old Road & "B" Street	EBL	600	N/A	N/A	N/A	N/A	25	25	N/A	N/A	No	No
		EBR	600	N/A	N/A	N/A	N/A	25	25	N/A	N/A	No	No
		NBL	100	N/A	N/A	N/A	N/A	0	25	N/A	N/A	No	No

[a]: Storage lengths at intersection #1 and #2 determined based on scaled distances from online aerial photographs and verified in the field. Storage lengths at intersection #3 and #4 measred from site plan.

LEVEL OF SERVICE ANALYSIS FOR PROJECT ACCESS

Vehicle access for the Project is to be provided via two proposed public streets, named "A" Street and "B" Street, under Future plus Project conditions. Their intersections at the Old Road will be unsignalized and stop-controlled.

A level of service analysis was conducted to evaluate the ability of the Project access plan to accommodate the anticipated traffic levels at "A" Street and "B" Street. Both streets will be unsignalized and stop-controlled and were analyzed using the two-way stop-controlled HCM 6th Edition methodology. The HCM methodology determines the average vehicle delay for the stop-controlled approach to find the corresponding LOS based on the definitions presented in **Table 3B**. Project access analysis LOS worksheets are included in **Appendix E**. **Table 9** shows the results of the LOS analysis at "A" Street and "B" Street.

As shown, **both "A" Street and "B" Street approaches to The Old Road are projected to operate at an acceptable LOS (LOS D or better).** They are projected to operate at LOS B during both the AM and PM Peak hours under the Future plus Project (2029) scenario. A queuing analysis was conducted for "A" Street and "B" Street to show the estimated length of queues for vehicles exiting the project site. Queues are anticipated to be minimal, approximately one vehicle. Queue results are shown in **Table 10**.

SIGNAL WARRANT ANALYSIS FOR PROJECT ACCESS

A signals warrant analysis was conducted for "A" Street and "B" Street to see if they would trigger the potential need for a traffic signal. Using the Manual on Uniform Traffic Control Devices (MUTCD) methodology, both streets were tested to see if their volumes meet signal warrants. The peak hour signal warrant was used for this analysis, and it is intended for use at a location where traffic conditions are such that for a minimum of 1 hour of an average day, the minor-street traffic suffers undue delay when entering or crossing the major street.

Both "A" Street and "B" Street **do not trigger a signal warrant** under Future plus Project conditions. **Table 11** summarizes this analysis. Analysis sheets for signal warrants can be found in **Appendix G**.

TABLE 9
LYONS CANYON RESIDENTIAL PROJECT
PROJECT ACCESS LEVEL OF SERVICE ANALYSIS

No.	Project Access	Peak Hour	Future + Project [a]	
			Delay	LOS
3	The Old Road & "A" Street	AM	10.5	B
		PM	13.8	B
4	The Old Road & "B" Street	AM	10.1	B
		PM	12.3	B

[a]: For the purpose of project access analysis, the table shows Delay/LOS on eastbound approach on "A" Street and "B" Street.

TABLE 10
LYONS CANYON RESIDENTIAL PROJECT
PROJECT ACCESS QUEUE ANALYSIS

No.	Project Access	Peak Hour	Future + Project
			95th% Queue (ft)
3	The Old Road & "A" Street	AM	25
		PM	25
4	The Old Road & "B" Street	AM	25
		PM	25

TABLE 11
LYONS CANYON RESIDENTIAL PROJECT
PEAK HOUR PROJECT ACCESS SIGNAL WARRANT ANALYSIS

No.	Project Access	Peak Hour	Future + Project Signal Warrant Met
3	The Old Road & "A" Street	AM	NO
		PM	NO
4	The Old Road & "B" Street	AM	NO
		PM	NO

5. MITIGATION MEASURES

In order to mitigate the residential VMT per capita impacts to less than significant, residential VMT per capita would need to be reduced by 48%. As previously stated, while the immediately adjacent City of Santa Clarita's residential VMT/capita is 24.1, the baseline residential VMT per capita is 12.8 for Los Angeles County in analysis year 2022. The threshold of 16.8% below the baseline is 10.6 daily household VMT per capita.

The Project is estimated to generate 20.5 daily household VMT per capita, which is higher than the threshold by 10.2 VMT per capita. To lessen the impact, the Project proposes to implement a transportation demand management (TDM) program as mitigation to reduce the VMT impacts and trip generation of the Project. A TDM program consists of strategies that are aimed at discouraging single-occupancy vehicle trips and encouraging alternative modes of transportation, such as carpooling, taking transit, walking, and biking.

CAPCOA TDM MEASURES

The 2021 California Air Pollution Control Officers Association (CAPCOA) publication, *Handbook for Analyzing Greenhouse Gas Emission Reductions, Assessing Climate Vulnerabilities, and Advancing Health and Equity*, provides tools and methods in selecting and combining transportation measures. The Project as proposed includes compliance with regulatory requirements and site design elements for pedestrian network improvements that would be expected to enhance the usage of walking, biking, and transit modes as alternatives to the automobile including:

- Site Design for Pedestrian Network Improvements (T-18) – The site will be designed to encourage walking, biking, and taking transit. Amenities would include:
    - New sidewalks and street trees along the perimeter and within the project site
    - Sharrows within the project site
    - Street and pedestrian lighting
    - Pedestrian network within the site and connecting to the surrounding pedestrian system
    - On-site recreational amenities, proximity to open space and trail network
    - Dedicated pedestrian paseos and walkways that connect to the trail network and open space adjacent to the project site

A TDM plan that will detail additional program elements beyond the regulatory and site design features described above will be prepared as mitigation to reduce the trip generation and VMT impacts of the Project. The effectiveness of the TDM strategies is based primarily on research documented in the CAPCOA publication. CAPCOA provides quantified measures at both the Project/Site scale and Plan/Community scale. Per their guidance, while it may be possible that a user's project involves measures that affect vehicle trips or VMT at both scales, it is likely that combining the percent reduction from measures of different scales would not be valid. Since the site design features for pedestrian network improvements were identified as the Plan/Community scale by CAPCOA, the following potential TDM strategies would also be applicable for residents quantitatively:

- Locating the Project near a Bike Lane (T-19-A) – The Project would include a Class III bike route on the fire access road loop. The County is also planning to extend the existing Class II bike lane along

The Old Road at the Project frontage. This proposed Class II bike lane would improve bike access to the neighborhood and benefit the Project, encouraging alternative mode use.

- Improving Bike Boulevard (T-19-B) – Per CAPCOA, Bicycle Boulevards are a designation within Class III bike route that create safe, low-stress connections for people biking and walking on streets. The Project would include a Class III bike route on the fire access road loop and improve the connectivity between The Old Road and the trails to the west.

- Expanding Bikeway Network (T-20) – The Project's main loop road would be wide enough to accommodate a Class III bike route. The paved fire access road would provide connectivity between The Old Road and the trails to the west.

- E-Bikeshare System (T-22-B)[8] – E-bike loaner program (separate from the publicly accessible options in the City) to provide residents with short-term access for trips.

- Provide Community-Based Travel Planning (T-23)[8] – This is a residential-based approach to outreach that provides households with customized information, incentives, and support to encourage the use of transportation alternatives in place of single occupancy vehicles, thereby reducing household VMT. The Project would create a ridesharing program for school children. Most school districts provide bussing services to public schools only. School Pool helps match parents to transport students to private schools or to schools where students cannot walk or bike and do not meet the requirements for bussing.

The following potential TDM strategies would be applicable for residents at project/site scale qualitatively:

- Carpool/Vanpool Incentives (T-5)[8] – Includes monetary assistance with fares or gas costs for carpool/vanpool users.

- Subsidized Transit Passes (T-9)[8] – Provides subsidized/discounted daily or monthly public transit passes.

As shown in **Table 12A**, based on research documented in the CAPCOA publication and the Fehr & Peers TDM+ tool, these strategies would result in a VMT reduction of 7.45% for the Project. The VMT reduction with cumulative mitigation strategies would be 5.23% under cumulative conditions, since the proposed E-bikeshare System (T-22-B) and Community-Based Travel Planning (T-23) measures will be active for five years following the initial deposit by the developer. The cumulative VMT mitigation of 5.23% includes all the measures in **Table 12A** except for E-bikeshare system (T-22-B) and Community-Based Travel Planning (T-23) since all the other measures in **Table 12A** bring the VMT level to less than significant under cumulative conditions. These two measures are not necessary to bring the VMT cumulative impact to less

[8] E-bikeshare system (T-22-B) and Community-Based Travel Planning (T-23) will be active for five years following the initial deposit by the developer. Carpool/Vanpool Incentives (T-5) and Subsidized Transit Passes (T-9) will be active for three years following the initial deposit by the developer.

than significant. Therefore, the cumulative impact for VMT would be less than significant with all of the measures listed in **Table 12A** except for E-bikeshare system (T-22-B) and Community-Based Travel Planning (T-23). The TDM+ tool incorporates research conducted by Fehr & Peers under contract to CAPCOA and elsewhere. It considers a variety of TDM strategies and the setting in which they may apply, estimates effectiveness for each, and applies caps when appropriate (for example, simply aggregating the effectiveness of individual TDM measures can sometimes yield a result that is overestimated since more than one measure may be targeting the same trip). Documentation for TDM+ Tool is in **Appendix H**. Mitigation measures feasibility analysis can be found in **Appendix J,** which documents other supporting measures that are applicable but not quantified to the Project.

SUPPLEMENTAL MITIGATION MEASURES

To fully mitigate the remaining VMT impact, the Project would need to implement additional TDM measures to achieve an additional 44% reduction in VMT. While this would likely exceed the CAPCOA subsector maximum reduction and not be feasible, other potential supplemental mitigation measures were evaluated by the project team. One example is the LA Metro Universal College Student Transit Pass (U-Pass) program[9]. The U-Pass program has the potential of reducing VMT by providing a low-cost transit option for college students in LA County. The VMT Mitigation Program Pilot Project identified the nexus between daily VMT reduction, number of student transit passes, and mitigation cost[10]. Although the U-Pass program can be a potential mitigation measure for certain projects in LA County where participation in the U-Pass program could potentially reduce those projects VMT, here there is no nexus. There are no schools that participate in the U-Pass program proximate to the Lyons Canyon site; there are no schools in the Santa Clarita Valley that participate in the program, with the vast majority of schools participating in the program, geographically far away, in central or south Los Angeles County. In addition, none of the bus/transportation providers with routes that provide service in the study area has a partnership with the U-Pass program. Santa Clarita Valley Transit Authority does not participate in the program. As there is no connection between a potential reduction of Project VMT and Project participation in the U-Pass program, there is no nexus between this potential mitigation measure and any reduction in a Project impact on transportation. Therefore, the U-Pass program is not feasible for the Project.

MITIGATION MEASURES SUMMARY

Table 13 shows the daily residential VMT per capita after applying mitigation measures to the Project. The daily residential VMT per capita is projected to be reduced from 20.5 to 19.0 under 2022 Project conditions, which still exceeds the significance threshold of 10.6 VMT per capita. Therefore, the **project's transportation impact is considered significant and unavoidable** as no combination of feasible mitigation measures reduces the impact below the County's threshold of significance.

The cumulative "plus project" scenario is estimated to generate 18.7 daily household VMT per capita. Applying cumulative mitigations strategies with a VMT reduction of 5.23% results in a forecast VMT per

[9] LA Metro, U-Pass Program, accessed in June 2023: https://www.metro.net/riding/u-pass-program/
[10] Fehr & Peers, *VMT Mitigation Program Pilot Project*, June 2021.

capita of 17.7. The cumulative "no project" residential VMT per capita for the project area is 18.4 per capita. Any increase to this number would represent a cumulative VMT impact. Therefore, the **cumulative transportation impact is mitigated** as the mitigation measures reduce the impact below the County's cumulative threshold of significance.

TABLE 12A
LYONS CANYON RESIDENTIAL PROJECT
TDM STRATEGIES LIST (PLAN/COMMUNITY SCALE)

Subsector	TDM Measure	Description	VMT Reduction for Project [a]	VMT reduction for Cumulative Conditions (2040) [b]
Neighborhood Design	Site Design for Pedestrian Network Improvements (T-18)	The site will be designed to encourage walking, biking, and taking transit. Providing a pedestrian access network to link areas within the project site and connecting off-site locations (retail/open space) encourages people to walk instead of drive.	5.07%	5.07%
	Locating the Project near a Bike Lane (T-19-A)	The Project would include a Class III bike route on the fire access road loop. The County is also planning to extend the existing Class II bike lane along The Old Road at the Project frontage. This proposed Class II bike lane would improve bike access to the neighborhood and benefit the Project, encouraging alternative mode use.	0.07%	0.07%
	Improve Bike Boulevard (T-19-B)	Per CAPCOA, Bicycle Boulevards are a designation within Class III bike route that create safe, low-stress connections for people biking and walking on streets. The Project would include a Class III bike route on the fire access road loop ("A" Street, "B" Street, and the Private Access Road on the northwest periphery of project site) and improve the connectivity between The Old Road and the trails to the west.	0.03%	0.03%
	Expand Bikeway Network (T-20)	The Project's main loop road ("A" Street and "B" Street) would be wide enough to accommodate a Class III bike route. The paved fire access road (the Private Access Road on the northwest periphery of project site) would provide connectivity between The Old Road and the trails to the west.	0.07%	0.07%
	E-bikeshare System (T-22-B)	E-bike loaner program (separate from the publicly accessible options in the City) to provide residents with short-term access for trips	0.06%	0.00%
Neighborhood Design Subsector Combined Reduction [c]			5.29%	5.23%
Trip Reduction Programs	Provide Community-Based Travel Planning (T-23)	This is a residential-based approach to outreach that provides households with customized information, incentives, and support to encourage the use of transportation alternatives in place of single occupancy vehicles, thereby reducing household VMT. The Project would create a ridesharing program for school children. Most school districts provide bussing services to public schools only. School Pool helps match parents to transport students to private schools or to schools where students cannot walk or bike and do not meet the requirements for bussing.	2.28%	0.00%
Total Reduction at Plan/Community Scale [c]			**7.45%**	**5.23%**

[a] VMT reduction based on research documented in the 2021 California Air Pollution Control Officers Association (CAPCOA) publication, *Handbook for Analyzing Greenhouse Gas Emission Reductions, Assessing Climate Vulnerabilities, and Advancing Health and Equity* , as well as the Fehr & Peers TDM+ tool. The TDM+ tool incorporates research conducted by Fehr & Peers under contract to the CAPCOA and elsewhere. It considers a variety of TDM strategies and the setting in which they may apply, estimates effectiveness for each, and applies caps when appropriate. CAPCOA offers methodologies based on preferred literature, along with methodologies based on alternative literature, for each strategy.

[b] E-bikeshare system (T-22-B) and Community-Based Travel Planning (T-23) will be active for five years following the initial deposit by the developer.

[c] Per CAPCOA publication, effectiveness levels for multiple measures within a subsector and across subsectors may be multiplied to determine a combined effectiveness level.

TABLE 12B
LYONS CANYON RESIDENTIAL PROJECT
TDM STRATEGIES LIST (PROJECT/SITE SCALE)

Subsector	TDM Measure [a] [b]	Description
Trip Reduction Programs	Carpool/Vanpool Incentives (T-5)	Includes monetary assistance with fares or gas costs for carpool/vanpool users
	Implement Subsidized or Discounted Transit Program (T-9)	Provides subsidized/discounted daily or monthly public transit passes

[a] Based on CAPCOA publication, combining the percent reduction from measures of different scales would not be valid. Thus, measures at the Project/Site scale would be applied to the Project qualitatively.

[b] Carpool/Vanpool Incentives (T-5) and Subsidized Transit Program (T-9) will be active for three years following the initial deposit by the developer.

TABLE 13
LYONS CANYON RESIDENTIAL PROJECT
PROJECT VEHICLE MILES TRAVELED (VMT) MITIGATION

Project VMT Impact Analysis	Baseline (2022)	Cumulative (2040)
Threshold [a]	10.6	18.4
Residential VMT per Capita	20.5	18.7
TDM Mitigation Measure VMT Reduction	7.45%	5.23%
Residential VMT per Capita with Mitigation	19.0	17.7
Significant Impact Remaining	**YES**	**NO**

Notes:
[a] Base Year Threshold: 16.8% less than County Baseline VMT
Future Year Threshold: Cumulative No Project Baseline Residential VMT per Capita
Impact thresholds are based on the Los Angeles County Public Works Transportation Impact Guidelines, July 23, 2020.

6. SUMMARY AND CONCLUSIONS

This study was undertaken to analyze the potential transportation impacts of the proposed Lyons Canyon Residential development. The following summarizes the results of this analysis:

- The Project involves the construction of 510 residential units for a total of approximately 51 acres of development. The Project includes a mix of single-family homes, detached and attached dwelling units, and affordable apartments. The Project will also construct sidewalks and improvements such as landscaping enhancements along The Old Road fronting the project site.

- The Project is estimated to generate an average daily household VMT per resident of 20.5 under Project conditions and 18.6 under Cumulative Conditions. The Project would have a significant transportation impact under both conditions using the County's VMT significance thresholds.

- The Project is projected to generate 315 trips (77 inbound/238 outbound) during the AM peak hour and 406 trips (257 inbound/149 outbound) during the PM peak hour.

- A level of service and queuing analysis were conducted for two signalized intersections, The Old Road & Pico Canyon Road and The Old Road & Calgrove Boulevard. The LOS at the two intersections are projected to operate at an acceptable LOS (LOS D or better) with the Project. The Project is expected to contribute to unacceptable queuing at the southbound left-turn pocket at The Old Road & Pico Canyon Road during the PM peak period. However, due to the geometric constraints of existing right-of-way, and the northbound left turn lane at the upstream intersection of The Old Road and Market Drive South, there is insufficient right of way to expand the two southbound left turn pockets. Therefore, a southbound left turn queue storage geometric improvement is not feasible. Since the queue length is not increasing with the project, no change in safety conditions related to queueing for this movement is expected.

- Vehicle access for the Project is to be provided via two proposed public streets named "A" Street and "B" Street on The Old Road, under Future plus Project conditions. Both streets are projected to operate at acceptable levels under Future plus Project conditions in an unsignalized, side street stop-controlled configuration. Both streets do not trigger a signal warrant under Future plus Project conditions.

- The Project will implement transportation demand measures through compliance with regulatory requirements, site design elements and a transportation demand management plan to reduce and mitigate Project VMT. The daily residential VMT per capita is projected to be reduced from 20.5 to 19.0 under Project conditions and 18.7 to 17.7 under Cumulative conditions. Under Project conditions, the residential VMT impact will remain significant and unavoidable. Under Cumulative conditions, the residential VMT impact is mitigated.

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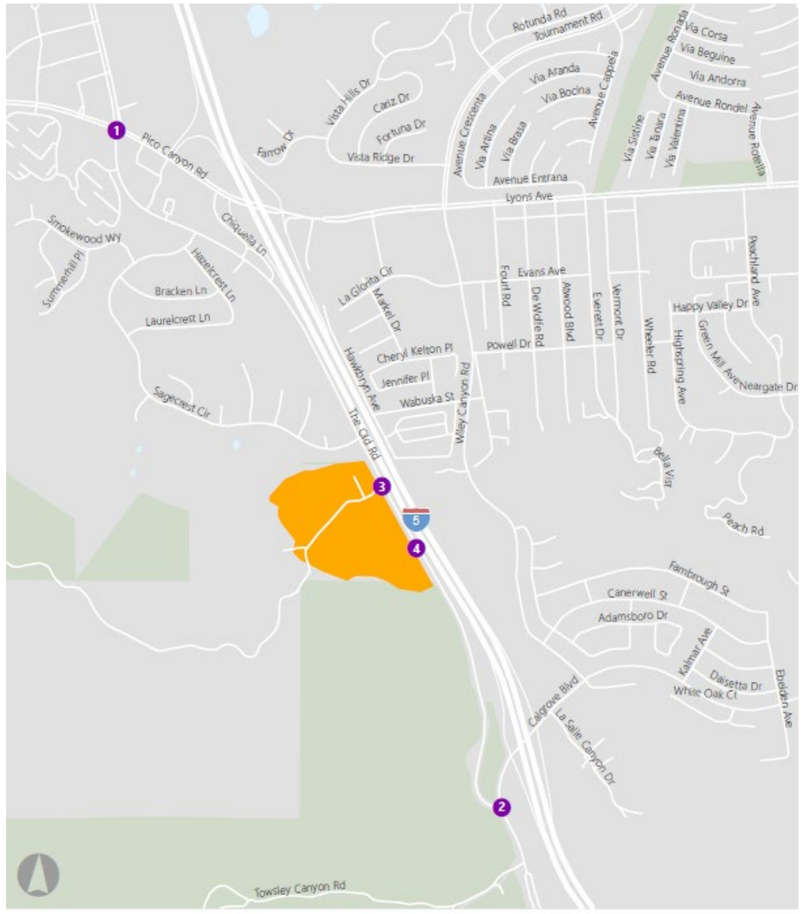
APPENDIX A:
LANE CONFIGURATIONS AND TRAFFIC VOLUMES



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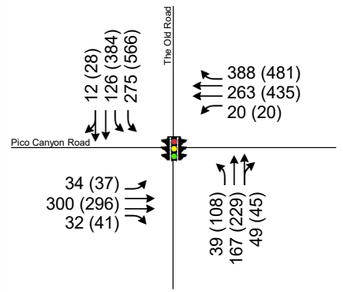

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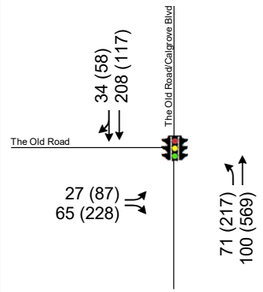

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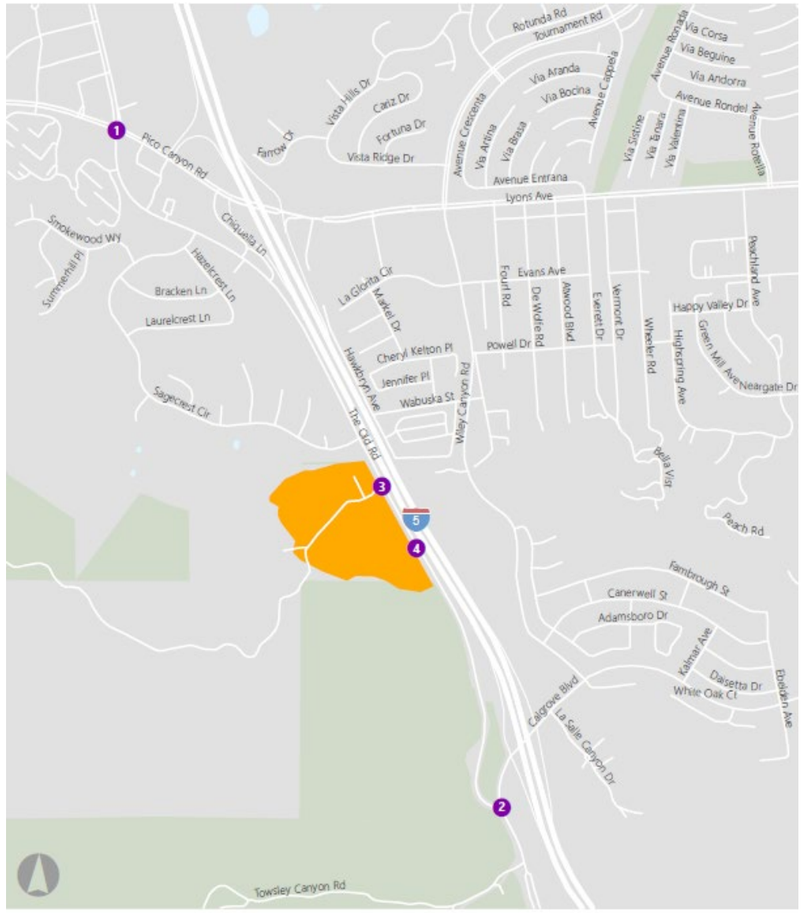
4. The Old Road/"B" Street

Does Not Yet Exist



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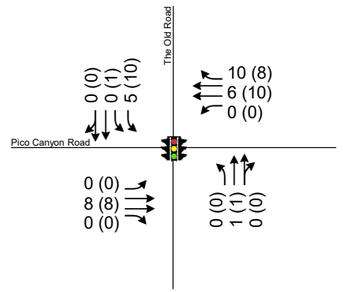

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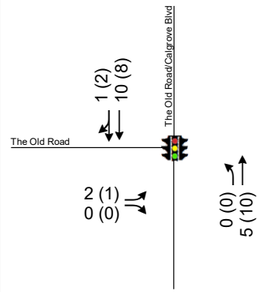

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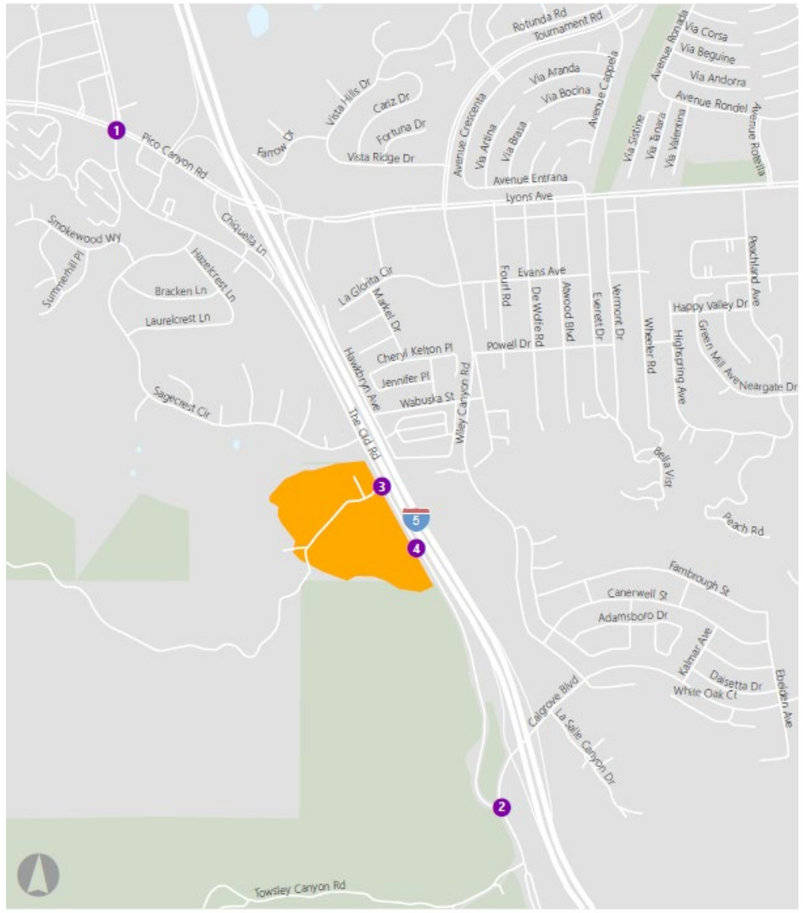

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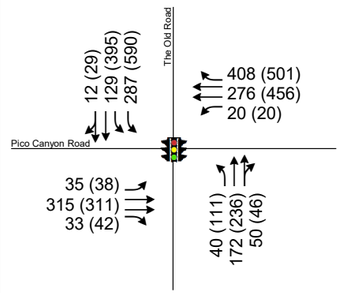

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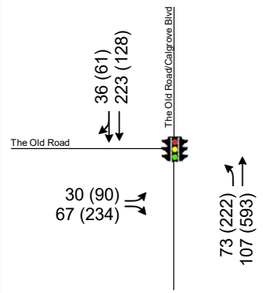

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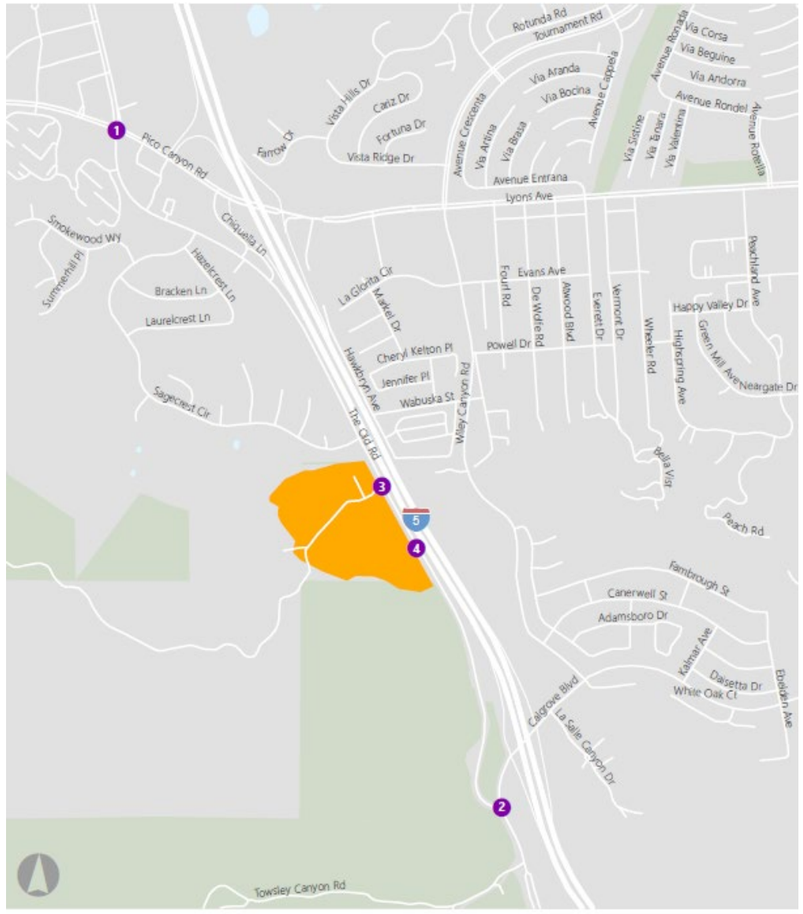

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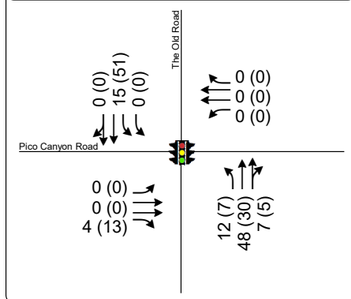

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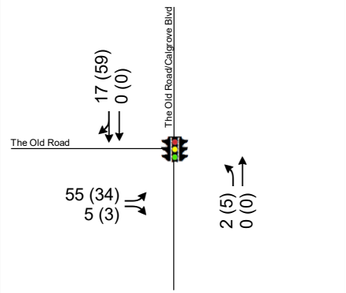

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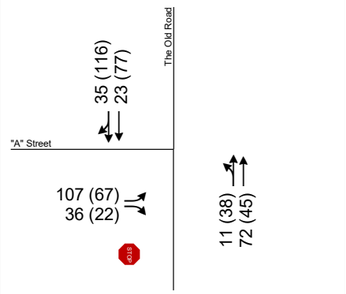

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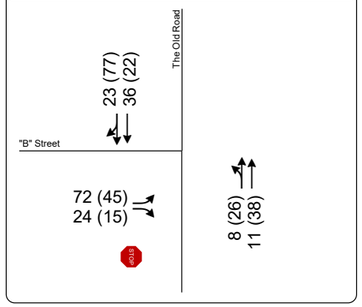
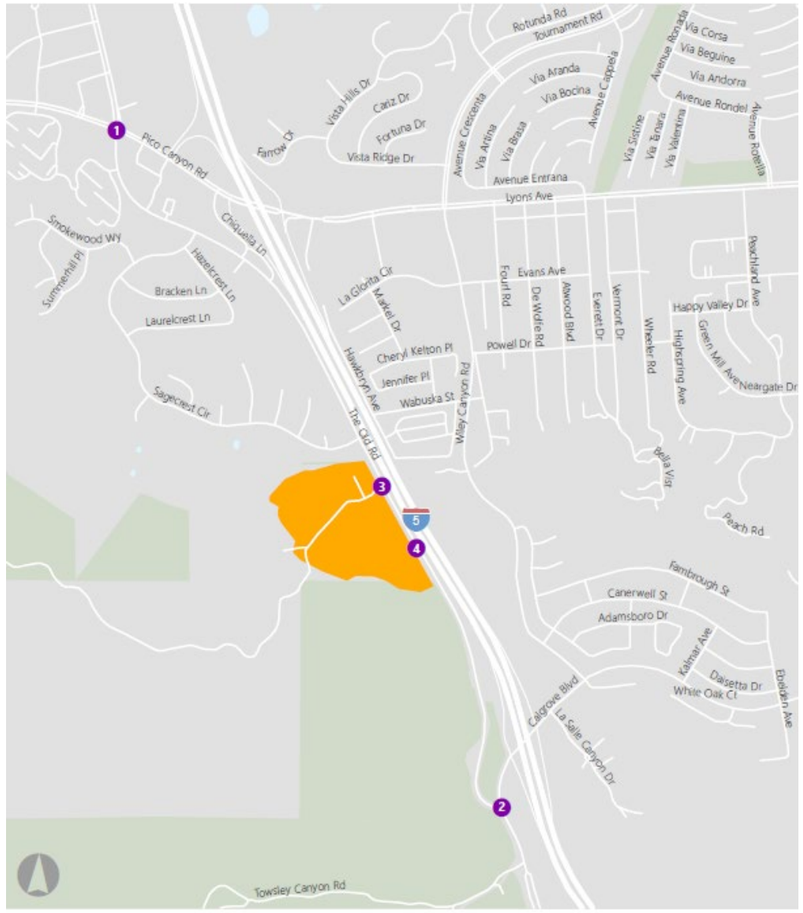


Appendix A
Peak Hour Traffic Volumes and Lane Configurations
Project Only



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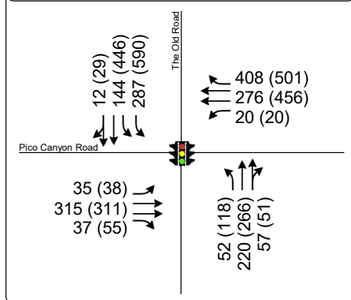

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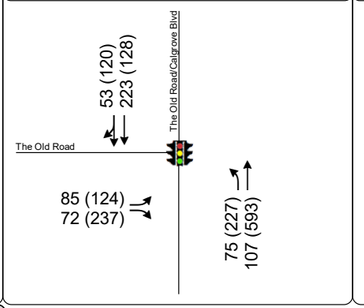

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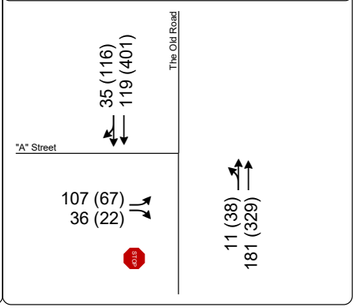

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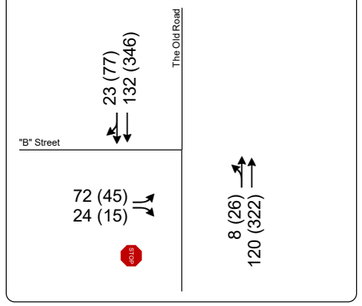


Appendix A
Peak Hour Traffic Volumes and Lane Configurations
Future (2029) + Project Conditions

APPENDIX A: AM PEAK HOUR TRAFFIC VOLUMES

			Existing (2022) AM Individual Peak Hour											
Int	**North/South**	**East/West**	**SR**	**ST**	**SL**	**WR**	**WT**	**WL**	**NR**	**NT**	**NL**	**ER**	**ET**	**EL**	**TOTAL**
1	THE OLD ROAD	PICO CANYON ROAD	12	126	275	388	263	20	49	167	39	32	300	34	1,705
2	CALGROVE BOULEVARD/ THE OLD ROAD	THE OLD ROAD	34	208	0	0	0	0	0	100	71	65	0	27	505

			Related Projects AM Individual Peak Hour											
Int	**North/South**	**East/West**	**SR**	**ST**	**SL**	**WR**	**WT**	**WL**	**NR**	**NT**	**NL**	**ER**	**ET**	**EL**	**TOTAL**
1	THE OLD ROAD	PICO CANYON ROAD	0	0	5	10	6	0	0	1	0	0	8	0	30
2	CALGROVE BOULEVARD/ THE OLD ROAD	THE OLD ROAD	1	10	0	0	0	0	0	5	0	0	0	2	18

			Future Base (2029) AM Individual Peak Hour											
Int	**North/South**	**East/West**	**SR**	**ST**	**SL**	**WR**	**WT**	**WL**	**NR**	**NT**	**NL**	**ER**	**ET**	**EL**	**TOTAL**
1	THE OLD ROAD	PICO CANYON ROAD	12	129	287	408	276	20	50	172	40	33	315	35	1,777
2	CALGROVE BOULEVARD/ THE OLD ROAD	THE OLD ROAD	36	223	0	0	0	0	0	107	73	67	0	30	536

			Project Only AM Individual Peak Hour											
Int	**North/South**	**East/West**	**SR**	**ST**	**SL**	**WR**	**WT**	**WL**	**NR**	**NT**	**NL**	**ER**	**ET**	**EL**	**TOTAL**
1	THE OLD ROAD	PICO CANYON ROAD	0	15	0	0	0	0	7	48	12	4	0	0	86
2	CALGROVE BOULEVARD/ THE OLD ROAD	THE OLD ROAD	17	0	0	0	0	0	0	0	2	5	0	55	79
3	THE OLD ROAD	"A" STREET	35	23	0	0	0	0	0	72	11	36	0	107	284
4	THE OLD ROAD	"B" STREET	23	36	0	0	0	0	0	107	8	24	0	72	270

			Future Base (2029) plus Project AM Individual Peak Hour											
Int	**North/South**	**East/West**	**SR**	**ST**	**SL**	**WR**	**WT**	**WL**	**NR**	**NT**	**NL**	**ER**	**ET**	**EL**	**TOTAL**
1	THE OLD ROAD	PICO CANYON ROAD	12	144	287	408	276	20	57	220	52	37	315	35	1,863
2	CALGROVE BOULEVARD/ THE OLD ROAD	THE OLD ROAD	53	223	0	0	0	0	0	107	75	72	0	85	615
3	THE OLD ROAD	"A" STREET	35	119	0	0	0	0	0	181	11	36	0	107	489
4	THE OLD ROAD	"B" STREET	23	132	0	0	0	0	0	120	8	24	0	72	379

APPENDIX A: PM PEAK HOUR TRAFFIC VOLUMES

			Existing (2022) PM Individual Peak Hour											
Int	**North/South**	**East/West**	**SR**	**ST**	**SL**	**WR**	**WT**	**WL**	**NR**	**NT**	**NL**	**ER**	**ET**	**EL**	**TOTAL**
1	THE OLD ROAD	PICO CANYON ROAD	28	384	566	481	435	20	45	229	108	41	296	37	2,670
2	CALGROVE BOULEVARD/ THE OLD ROAD	THE OLD ROAD	58	117	0	0	0	0	0	569	217	228	0	87	1,276

			Related Projects PM Individual Peak Hour											
Int	**North/South**	**East/West**	**SR**	**ST**	**SL**	**WR**	**WT**	**WL**	**NR**	**NT**	**NL**	**ER**	**ET**	**EL**	**TOTAL**
1	THE OLD ROAD	PICO CANYON ROAD	0	1	10	8	10	0	0	1	0	0	8	0	38
2	CALGROVE BOULEVARD/ THE OLD ROAD	THE OLD ROAD	2	8	0	0	0	0	0	10	0	0	0	1	21

			Future Base (2029) PM Individual Peak Hour											
Int	**North/South**	**East/West**	**SR**	**ST**	**SL**	**WR**	**WT**	**WL**	**NR**	**NT**	**NL**	**ER**	**ET**	**EL**	**TOTAL**
1	THE OLD ROAD	PICO CANYON ROAD	29	395	590	501	456	20	46	236	111	42	311	38	2,775
2	CALGROVE BOULEVARD/ THE OLD ROAD	THE OLD ROAD	61	128	0	0	0	0	0	593	222	234	0	90	1,328

			Project Only PM Individual Peak Hour											
Int	**North/South**	**East/West**	**SR**	**ST**	**SL**	**WR**	**WT**	**WL**	**NR**	**NT**	**NL**	**ER**	**ET**	**EL**	**TOTAL**
1	THE OLD ROAD	PICO CANYON ROAD	0	51	0	0	0	0	5	30	7	13	0	0	106
2	CALGROVE BOULEVARD/ THE OLD ROAD	THE OLD ROAD	59	0	0	0	0	0	0	0	5	3	0	34	101
3	THE OLD ROAD	"A" STREET	116	77	0	0	0	0	0	45	38	22	0	67	365
4	THE OLD ROAD	"B" STREET	77	22	0	0	0	0	0	38	26	15	0	45	223

			Future Base (2029) plus Project PM Individual Peak Hour											
Int	**North/South**	**East/West**	**SR**	**ST**	**SL**	**WR**	**WT**	**WL**	**NR**	**NT**	**NL**	**ER**	**ET**	**EL**	**TOTAL**
1	THE OLD ROAD	PICO CANYON ROAD	29	446	590	501	456	20	51	266	118	55	311	38	2,881
2	CALGROVE BOULEVARD/ THE OLD ROAD	THE OLD ROAD	120	128	0	0	0	0	0	593	227	237	0	124	1,429
3	THE OLD ROAD	"A" STREET	116	401	0	0	0	0	0	329	38	22	0	67	973
4	THE OLD ROAD	"B" STREET	77	346	0	0	0	0	0	322	26	15	0	45	831

APPENDIX B:
COUNT SHEETS

National Data & Surveying Services

Intersection Turning Movement Count

Location: The Old Rd & Pico Canyon Rd
City: Stevenson Ranch
Control: Signalized

Project ID: 22-020208-001
Date: 6/16/2022

Data - Total

NS/EW Streets:	The Old Rd				The Old Rd				Pico Canyon Rd				Pico Canyon Rd				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2	0	0	2	2	0	0	1	2	1	0	1	2	1	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	10	26	12	0	25	22	5	0	2	60	9	0	5	31	41	0	248
7:15 AM	10	29	16	0	31	14	1	0	4	81	6	0	1	43	58	0	294
7:30 AM	6	33	14	0	49	17	5	0	4	71	4	0	5	41	60	0	309
7:45 AM	8	22	6	0	42	17	2	0	6	85	8	0	5	59	55	0	315
8:00 AM	13	23	9	0	32	27	4	0	9	86	8	0	4	44	79	0	338
8:15 AM	10	29	18	0	45	24	4	0	4	93	9	0	2	46	74	0	358
8:30 AM	9	26	24	0	62	32	1	0	9	87	14	0	1	36	60	0	361
8:45 AM	8	35	15	0	37	17	7	0	10	114	5	0	5	70	63	0	386
9:00 AM	8	27	10	0	62	28	3	0	12	74	14	0	3	57	85	0	383
9:15 AM	7	29	14	0	74	21	3	0	5	93	9	0	4	64	80	0	403
9:30 AM	15	35	12	0	61	37	6	0	5	65	7	0	6	54	74	0	377
9:45 AM	15	31	18	0	69	20	5	0	9	71	7	0	14	56	94	0	409
10:00 AM	6	38	12	0	62	30	1	0	10	74	7	0	8	59	83	0	390
10:15 AM	11	46	12	0	73	34	2	0	5	76	9	0	5	50	105	0	428
10:30 AM	10	37	10	0	63	27	5	0	11	67	8	0	2	63	92	0	395
10:45 AM	12	46	15	0	77	35	4	0	8	83	8	0	5	91	108	0	492
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	158	512	217	0	864	402	58	0	113	1280	132	0	75	864	1211	0	5886
APPROACH %'s :	17.81%	57.72%	24.46%	0.00%	65.26%	30.36%	4.38%	0.00%	7.41%	83.93%	8.66%	0.00%	3.49%	40.19%	56.33%	0.00%	
PEAK HR :	10:00 AM - 11:00 AM																TOTAL
PEAK HR VOL :	39	167	49	0	275	126	12	0	34	300	32	0	20	263	388	0	1705
PEAK HR FACTOR :	0.813	0.908	0.817	0.000	0.893	0.900	0.600	0.000	0.773	0.904	0.889	0.000	0.625	0.723	0.898	0.000	0.866
	0.873				0.890				0.924				0.822				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2	0	0	2	2	0	0	1	2	1	0	1	2	1	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
3:00 PM	18	39	10	0	108	50	6	0	12	55	7	0	3	85	138	0	531
3:15 PM	23	46	11	0	98	52	5	0	6	71	7	0	7	102	109	0	537
3:30 PM	7	39	7	0	123	55	6	0	9	68	9	0	1	81	126	0	531
3:45 PM	22	72	15	0	102	82	7	0	8	68	16	0	4	108	105	0	609
4:00 PM	16	38	9	0	134	95	3	0	7	66	10	0	8	100	108	0	594
4:15 PM	31	58	15	0	114	72	8	0	5	77	11	0	6	94	103	0	594
4:30 PM	14	53	15	0	102	64	9	0	8	80	14	0	6	82	104	0	551
4:45 PM	28	70	11	0	139	91	4	0	4	76	9	0	8	113	125	0	678
5:00 PM	24	51	8	0	131	114	8	0	3	71	13	0	2	109	134	0	668
5:15 PM	35	57	12	0	137	84	7	0	10	84	9	0	6	115	117	0	673
5:30 PM	21	51	14	0	159	95	9	0	20	65	10	0	4	98	105	0	651
5:45 PM	32	53	13	0	120	71	11	0	9	49	13	0	7	116	110	0	604
6:00 PM	18	58	18	0	124	70	13	0	7	67	23	0	7	117	113	0	635
6:15 PM	21	50	11	0	85	59	7	0	10	74	17	0	9	121	107	0	571
6:30 PM	19	38	5	0	112	43	4	0	8	55	11	0	5	85	108	0	493
6:45 PM	23	38	10	0	86	57	4	0	11	42	13	0	7	91	86	0	468
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	352	811	184	0	1874	1154	111	0	137	1068	192	0	90	1617	1798	0	9388
APPROACH %'s :	26.13%	60.21%	13.66%	0.00%	59.70%	36.76%	3.54%	0.00%	9.81%	76.45%	13.74%	0.00%	2.57%	46.13%	51.30%	0.00%	
PEAK HR :	04:45 PM - 05:45 PM																TOTAL
PEAK HR VOL :	108	229	45	0	566	384	28	0	37	296	41	0	20	435	481	0	2670
PEAK HR FACTOR :	0.771	0.818	0.804	0.000	0.890	0.842	0.778	0.000	0.463	0.881	0.788	0.000	0.625	0.946	0.897	0.000	0.985
	0.876				0.930				0.908				0.951				

National Data & Surveying Services

Intersection Turning Movement Count

Location: The Old Rd & Pico Canyon Rd
City: Stevenson Ranch
Control: Signalized

Project ID: 22-020208-001
Date: 6/16/2022

Data - Cars

NS/EW Streets:	The Old Rd				The Old Rd				Pico Canyon Rd				Pico Canyon Rd				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2	0	0	2	2	0	0	1	2	1	0	1	2	1	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	9	25	11	0	24	21	5	0	2	59	7	0	4	28	39	0	234
7:15 AM	10	28	16	0	31	13	1	0	4	81	6	0	1	41	56	0	288
7:30 AM	4	33	14	0	47	16	5	0	4	71	4	0	5	40	58	0	301
7:45 AM	8	21	6	0	42	17	2	0	6	82	8	0	5	58	54	0	309
8:00 AM	13	23	9	0	32	26	4	0	9	86	8	0	4	42	75	0	331
8:15 AM	10	28	18	0	44	23	4	0	4	92	9	0	2	45	72	0	351
8:30 AM	9	26	23	0	60	31	1	0	9	86	11	0	1	36	57	0	350
8:45 AM	8	33	14	0	37	17	7	0	10	112	5	0	5	69	63	0	380
9:00 AM	6	27	10	0	61	26	3	0	12	72	14	0	3	57	84	0	375
9:15 AM	6	28	14	0	73	20	3	0	5	90	9	0	4	62	78	0	392
9:30 AM	15	35	12	0	61	36	6	0	5	62	6	0	6	54	68	0	366
9:45 AM	15	30	17	0	64	20	5	0	9	69	7	0	14	54	91	0	395
10:00 AM	6	37	12	0	62	26	1	0	10	71	7	0	8	55	77	0	372
10:15 AM	10	45	12	0	73	33	2	0	5	73	8	0	5	49	103	0	418
10:30 AM	8	37	10	0	60	27	5	0	11	66	8	0	2	61	89	0	384
10:45 AM	12	45	15	0	75	33	4	0	8	80	8	0	5	87	106	0	478
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	149	501	213	0	846	385	58	0	113	1252	125	0	74	838	1170	0	5724
APPROACH %'s :	17.27%	58.05%	24.68%	0.00%	65.63%	29.87%	4.50%	0.00%	7.58%	84.03%	8.39%	0.00%	3.55%	40.25%	56.20%	0.00%	
PEAK HR :	10:00 AM - 11:00 AM																TOTAL
PEAK HR VOL :	36	164	49	0	270	119	12	0	34	290	31	0	20	252	375	0	1652
PEAK HR FACTOR :	0.750	0.911	0.817	0.000	0.900	0.902	0.600	0.000	0.773	0.906	0.969	0.000	0.625	0.724	0.884	0.000	0.864
	0.865				0.895				0.924				0.817				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2	0	0	2	2	0	0	1	2	1	0	1	2	1	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
3:00 PM	17	38	9	0	105	47	5	0	12	54	7	0	3	83	134	0	514
3:15 PM	23	45	11	0	95	52	5	0	6	70	7	0	7	100	108	0	529
3:30 PM	7	38	7	0	118	55	6	0	9	66	8	0	1	81	126	0	522
3:45 PM	22	70	14	0	101	80	7	0	8	68	16	0	3	108	104	0	601
4:00 PM	16	38	8	0	133	91	3	0	7	65	10	0	8	100	108	0	587
4:15 PM	31	56	15	0	113	72	8	0	5	77	10	0	5	94	102	0	588
4:30 PM	13	53	15	0	101	63	9	0	8	80	13	0	6	82	103	0	546
4:45 PM	27	68	11	0	136	91	4	0	4	74	9	0	8	111	122	0	665
5:00 PM	24	51	8	0	128	114	8	0	3	69	13	0	2	109	134	0	663
5:15 PM	35	56	12	0	137	82	7	0	10	83	9	0	6	115	117	0	669
5:30 PM	21	50	14	0	158	93	9	0	20	65	10	0	4	98	104	0	646
5:45 PM	32	53	13	0	120	71	11	0	9	49	13	0	6	116	109	0	602
6:00 PM	18	57	18	0	123	70	13	0	7	65	22	0	7	117	112	0	629
6:15 PM	21	49	10	0	84	58	7	0	10	74	16	0	9	121	107	0	566
6:30 PM	19	38	5	0	112	42	4	0	8	55	11	0	5	85	107	0	491
6:45 PM	23	36	10	0	86	57	4	0	11	42	13	0	7	90	86	0	465
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	349	796	180	0	1850	1138	110	0	137	1056	187	0	87	1610	1783	0	9283
APPROACH %'s :	26.34%	60.08%	13.58%	0.00%	59.72%	36.73%	3.55%	0.00%	9.93%	76.52%	13.55%	0.00%	2.50%	46.26%	51.24%	0.00%	
PEAK HR :	04:45 PM - 05:45 PM																TOTAL
PEAK HR VOL :	107	225	45	0	559	380	28	0	37	291	41	0	20	433	477	0	2643
PEAK HR FACTOR :	0.764	0.827	0.804	0.000	0.884	0.833	0.778	0.000	0.463	0.877	0.788	0.000	0.625	0.941	0.890	0.000	0.988
	0.889				0.930				0.904				0.949				

National Data & Surveying Services

Intersection Turning Movement Count

Location: The Old Rd & Pico Canyon Rd
City: Stevenson Ranch
Control: Signalized

Project ID: 22-020208-001
Date: 6/16/2022

Data - HT

NS/EW Streets:	The Old Rd				The Old Rd				Pico Canyon Rd				Pico Canyon Rd				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2	0	0	2	2	0	0	1	2	1	0	1	2	1	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	1	1	1	0	1	1	0	0	0	1	2	0	1	3	2	0	14
7:15 AM	0	1	0	0	0	1	0	0	0	0	0	0	0	2	2	0	6
7:30 AM	2	0	0	0	2	1	0	0	0	0	0	0	0	1	2	0	8
7:45 AM	0	1	0	0	0	0	0	0	0	3	0	0	0	1	1	0	6
8:00 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	2	4	0	7
8:15 AM	0	1	0	0	1	1	0	0	0	1	0	0	0	1	2	0	7
8:30 AM	0	0	1	0	2	1	0	0	0	1	3	0	0	0	3	0	11
8:45 AM	0	2	1	0	0	0	0	0	0	2	0	0	0	1	0	0	6
9:00 AM	2	0	0	0	1	2	0	0	0	2	0	0	0	0	1	0	8
9:15 AM	1	1	0	0	1	1	0	0	0	3	0	0	0	2	2	0	11
9:30 AM	0	0	0	0	0	1	0	0	0	3	1	0	0	0	6	0	11
9:45 AM	0	1	1	0	5	0	0	0	0	2	0	0	0	2	3	0	14
10:00 AM	0	1	0	0	0	4	0	0	0	3	0	0	0	4	6	0	18
10:15 AM	1	1	0	0	0	1	0	0	0	3	1	0	0	1	2	0	10
10:30 AM	2	0	0	0	3	0	0	0	0	1	0	0	0	2	3	0	11
10:45 AM	0	1	0	0	2	2	0	0	0	3	0	0	0	4	2	0	14
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	9	11	4	0	18	17	0	0	0	28	7	0	1	26	41	0	162
APPROACH %'s :	37.50%	45.83%	16.67%	0.00%	51.43%	48.57%	0.00%	0.00%	0.00%	80.00%	20.00%	0.00%	1.47%	38.24%	60.29%	0.00%	
PEAK HR :	10:00 AM - 11:00 AM																TOTAL
PEAK HR VOL :	3	3	0	0	5	7	0	0	0	10	1	0	0	11	13	0	53
PEAK HR FACTOR :	0.375	0.750	0.000	0.000	0.417	0.438	0.000	0.000	0.000	0.833	0.250	0.000	0.000	0.688	0.542	0.000	0.736
	0.750				0.750				0.688				0.600				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2	0	0	2	2	0	0	1	2	1	0	1	2	1	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
3:00 PM	1	1	1	0	3	3	1	0	0	1	0	0	0	2	4	0	17
3:15 PM	0	1	0	0	3	0	0	0	0	1	0	0	0	2	1	0	8
3:30 PM	0	1	0	0	5	0	0	0	0	2	1	0	0	0	0	0	9
3:45 PM	0	2	1	0	1	2	0	0	0	0	0	0	1	0	1	0	8
4:00 PM	0	0	1	0	1	4	0	0	0	1	0	0	0	0	0	0	7
4:15 PM	0	2	0	0	1	0	0	0	0	0	1	0	1	0	1	0	6
4:30 PM	1	0	0	0	1	1	0	0	0	0	1	0	0	0	1	0	5
4:45 PM	1	2	0	0	3	0	0	0	0	2	0	0	0	2	3	0	13
5:00 PM	0	0	0	0	3	0	0	0	0	2	0	0	0	0	0	0	5
5:15 PM	0	1	0	0	0	2	0	0	0	1	0	0	0	0	0	0	4
5:30 PM	0	1	0	0	1	2	0	0	0	0	0	0	0	0	1	0	5
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	2
6:00 PM	0	1	0	0	1	0	0	0	0	2	1	0	0	0	1	0	6
6:15 PM	0	1	1	0	1	1	0	0	0	0	1	0	0	0	0	0	5
6:30 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	2
6:45 PM	0	2	0	0	0	0	0	0	0	0	0	0	0	1	0	0	3
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	3	15	4	0	24	16	1	0	0	12	5	0	3	7	15	0	105
APPROACH %'s :	13.64%	68.18%	18.18%	0.00%	58.54%	39.02%	2.44%	0.00%	0.00%	70.59%	29.41%	0.00%	12.00%	28.00%	60.00%	0.00%	
PEAK HR :	04:45 PM - 05:45 PM																TOTAL
PEAK HR VOL :	1	4	0	0	7	4	0	0	0	5	0	0	0	2	4	0	27
PEAK HR FACTOR :	0.250	0.500	0.000	0.000	0.583	0.500	0.000	0.000	0.000	0.625	0.000	0.000	0.000	0.250	0.333	0.000	0.519
	0.417				0.917				0.625				0.300				

National Data & Surveying Services

Intersection Turning Movement Count

Location: The Old Rd & Pico Canyon Rd
City: Stevenson Ranch
Control: Signalized

Project ID: 22-020208-001
Date: 6/16/2022

Data - Bikes

NS/EW Streets:	The Old Rd				The Old Rd				Pico Canyon Rd				Pico Canyon Rd				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2	0	0	2	2	0	0	1	2	1	0	1	2	1	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
APPROACH %'s :									0.00%	0.00%	100.00%	0.00%					
PEAK HR :	10:00 AM - 11:00 AM																TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PEAK HR FACTOR :	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2	0	0	2	2	0	0	1	2	1	0	1	2	1	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
5:45 PM	0	0	0	0	0	0	0	0	0	1	3	0	0	0	0	0	4
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
6:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	1	0	0	0	1	0	0	0	0	1	4	0	0	0	0	0	7
APPROACH %'s :	100.00%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	0.00%	0.00%	20.00%	80.00%	0.00%					
PEAK HR :	04:45 PM - 05:45 PM																TOTAL
PEAK HR VOL :	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
PEAK HR FACTOR :	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250
		0.250															

National Data & Surveying Services

Intersection Turning Movement Count

Location: The Old Rd & Pico Canyon Rd
City: Stevenson Ranch

Project ID: 22-020208-001
Date: 6/16/2022

Data - Pedestrians (Crosswalks)

NS/EW Streets:	The Old Rd		The Old Rd		Pico Canyon Rd		Pico Canyon Rd		
AM	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG		
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
7:00 AM	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	1	0	0	0	0	0	1
7:30 AM	0	0	0	1	0	0	2	0	3
7:45 AM	0	0	0	1	0	0	0	1	2
8:00 AM	0	0	0	0	1	0	0	2	3
8:15 AM	0	0	0	0	0	0	1	0	1
8:30 AM	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	1	0	1
9:00 AM	0	0	1	0	0	0	0	2	3
9:15 AM	0	0	1	0	0	0	0	1	2
9:30 AM	0	0	1	1	0	0	0	1	3
9:45 AM	0	0	0	0	0	1	0	1	2
10:00 AM	0	0	0	1	0	0	1	0	2
10:15 AM	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	1	0	0	0	0	0	1
10:45 AM	0	0	0	1	0	0	0	0	1
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
TOTAL VOLUMES :	0	0	5	5	1	1	5	8	25
APPROACH %'s :			50.00%	50.00%	50.00%	50.00%	38.46%	61.54%	
PEAK HR :	10:00 AM - 11:00 AM								TOTAL
PEAK HR VOL :	0	0	1	2	0	0	1	0	4
PEAK HR FACTOR :			0.250	0.500			0.250		0.500
			0.750				0.250		

PM	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG		
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
3:00 PM	0	0	0	0	0	1	1	0	2
3:15 PM	0	0	0	0	1	0	0	0	1
3:30 PM	0	1	0	1	1	1	0	0	4
3:45 PM	0	1	0	0	0	1	0	0	2
4:00 PM	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	1	0	0	0	0	1
5:00 PM	0	1	0	0	0	0	0	0	1
5:15 PM	0	0	0	0	0	0	3	0	3
5:30 PM	0	0	1	2	0	2	1	0	6
5:45 PM	0	0	0	0	0	0	0	0	0
6:00 PM	0	0	0	0	0	0	0	0	0
6:15 PM	0	0	0	0	0	0	2	1	3
6:30 PM	0	0	0	0	0	0	0	0	0
6:45 PM	0	0	0	0	0	0	0	0	0
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
TOTAL VOLUMES :	0	3	1	4	2	5	7	1	23
APPROACH %'s :	0.00%	100.00%	20.00%	80.00%	28.57%	71.43%	87.50%	12.50%	
PEAK HR :	04:45 PM - 05:45 PM								TOTAL
PEAK HR VOL :	0	1	1	3	0	2	4	0	11
PEAK HR FACTOR :		0.250	0.250	0.375		0.250	0.333		0.458
	0.250		0.333		0.250		0.333		

Prepared by National Data & Surveying Services

The Old Rd & Pico Canyon Rd

Peak Hour Turning Movement Count

ID: 22-020208-001
City: Stevenson Ranch

Day: Thursday
Date: 6/16/2022

PEAK HOURS

AM: 10:00 AM - 11:00 AM
NOON: NONE
PM: 04:45 PM - 05:45 PM

COUNT PERIODS

AM: 7:00 AM - 11:00 AM
NOON: NONE
PM: 3:00 PM - 07:00 PM

SOUTHBOUND — The Old Rd

AM	12	126	275	0	589	AM
NOON	0	0	0	0	0	NOON
PM	28	384	566	0	747	PM
	0	2	2	0		

EASTBOUND — Pico Canyon Rd

AM	NOON	PM		
314	0	571	⇦	
0	0	0	↶	0
34	0	37	↱	1
300	0	296	→	2
32	0	41	↳	1
AM	NOON	PM		

WESTBOUND — Pico Canyon Rd

PM	NOON	AM		
481	0	388	↰	1
435	0	263	←	2
20	0	20	↰	1
0	0	0	↶	0
907	0	624	⇨	
PM	NOON	AM		

CONTROL

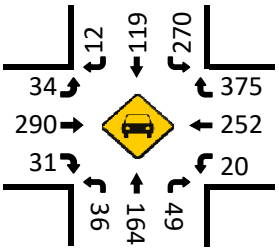
Signalized

TEV	1705 AM	0 NOON	2670 PM
PHF	0.87		0.98

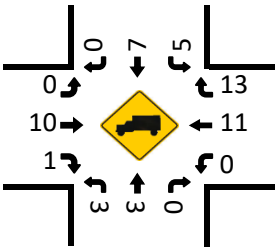
NORTHBOUND — The Old Rd

PM	445	0	108	229	45	PM
NOON	0	0	0	0	0	NOON
AM	178	0	39	167	49	AM
		0	1	2	0	

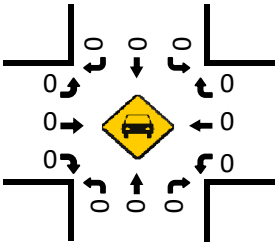
Cars (AM)



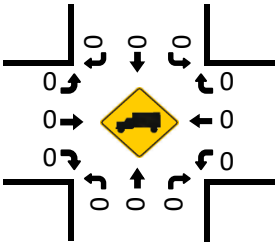
HT (AM)



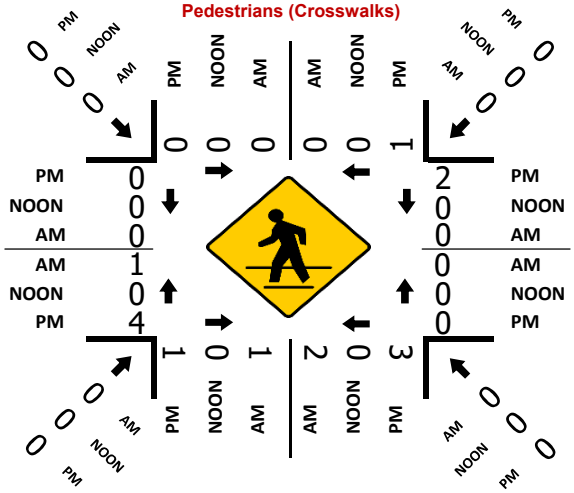
Cars (NOON)



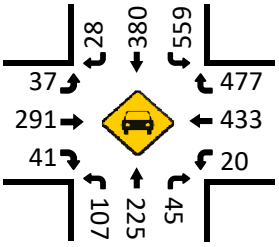
HT (NOON)



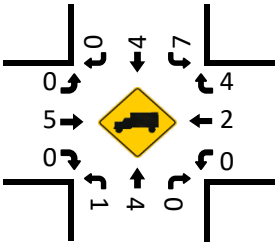
Pedestrians (Crosswalks)



Cars (PM)



HT (PM)



National Data & Surveying Services

Intersection Turning Movement Count

Location: Calgrove Blvd & The Old Rd
City: Santa Clarita
Control: Signalized

Project ID: 22-020208-002
Date: 6/16/2022

Data - Total

NS/EW Streets:	The Old Road				Calgrove Blvd				The Old Rd				Driveway				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	1	0	0	0	2	0	0	1	0	1	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	9	15	0	0	0	44	16	0	11	0	28	0	0	0	0	0	123
7:15 AM	22	26	0	0	0	65	3	0	7	0	10	0	0	0	0	0	133
7:30 AM	20	25	0	0	0	51	4	0	4	0	13	1	0	0	0	0	118
7:45 AM	20	34	0	0	0	48	11	0	4	0	14	0	0	0	0	0	131
8:00 AM	16	23	0	0	0	51	7	0	10	0	15	0	0	0	0	0	122
8:15 AM	18	24	0	0	0	42	14	0	5	0	22	1	0	0	0	0	126
8:30 AM	15	34	0	0	0	33	5	0	3	0	16	1	0	0	0	0	107
8:45 AM	14	48	0	0	0	39	11	0	1	0	10	0	0	0	0	0	123
9:00 AM	12	22	0	0	0	28	8	0	12	0	17	1	0	0	0	0	100
9:15 AM	16	23	0	0	0	23	5	0	6	0	12	0	0	0	0	0	85
9:30 AM	20	25	0	1	0	33	11	0	6	0	20	1	0	0	0	0	117
9:45 AM	16	41	0	0	0	24	7	0	3	0	15	0	0	0	0	0	106
10:00 AM	14	27	0	0	0	26	7	0	5	0	10	1	0	0	0	0	90
10:15 AM	25	50	0	0	1	20	9	0	8	0	14	0	0	0	0	0	127
10:30 AM	22	47	0	0	0	22	10	0	8	0	4	1	0	0	0	0	114
10:45 AM	15	37	0	0	0	27	13	0	5	0	17	2	0	0	0	0	116
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	274	501	0	1	1	576	141	0	98	0	237	9	0	0	0	0	1838
APPROACH %'s :	35.31%	64.56%	0.00%	0.13%	0.14%	80.22%	19.64%	0.00%	28.49%	0.00%	68.90%	2.62%					
PEAK HR :	07:00 AM - 08:00 AM																TOTAL
PEAK HR VOL :	71	100	0	0	0	208	34	0	26	0	65	1	0	0	0	0	505
PEAK HR FACTOR :	0.807	0.735	0.000	0.000	0.000	0.800	0.531	0.000	0.591	0.000	0.580	0.250	0.000	0.000	0.000	0.000	0.949
	0.792				0.890				0.590								

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	1	0	0	0	2	0	0	1	0	1	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
3:00 PM	26	90	0	0	0	31	12	0	16	0	38	0	0	0	0	0	213
3:15 PM	39	98	0	0	0	37	10	0	4	0	36	1	0	0	0	0	225
3:30 PM	43	111	0	0	0	23	10	0	9	0	21	1	0	0	0	0	218
3:45 PM	53	124	0	0	0	18	10	0	9	0	49	0	0	0	0	0	263
4:00 PM	36	127	0	0	0	27	20	0	20	0	41	0	0	0	0	0	271
4:15 PM	49	160	0	0	0	33	13	0	17	0	56	0	0	0	0	0	328
4:30 PM	47	154	0	0	0	28	15	0	18	0	46	0	0	0	0	0	308
4:45 PM	63	125	0	0	0	28	17	0	26	0	58	0	0	0	0	0	317
5:00 PM	58	130	0	0	0	28	13	0	26	0	68	0	0	0	0	0	323
5:15 PM	58	142	0	0	0	23	14	0	18	0	58	0	0	0	0	0	313
5:30 PM	52	157	0	0	0	32	15	0	18	0	45	0	0	0	0	0	319
5:45 PM	64	126	0	0	0	20	21	0	32	0	49	0	0	0	0	0	312
6:00 PM	51	91	0	0	0	17	11	0	15	0	48	0	0	0	0	0	233
6:15 PM	34	77	0	0	0	23	14	0	17	0	38	0	0	0	0	0	203
6:30 PM	38	79	1	0	0	18	9	0	20	0	25	0	0	0	0	0	190
6:45 PM	17	35	0	0	0	15	18	0	14	0	22	0	0	0	0	0	121
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	728	1826	1	0	0	401	222	0	279	0	698	2	0	0	0	0	4157
APPROACH %'s :	28.49%	71.47%	0.04%	0.00%	0.00%	64.37%	35.63%	0.00%	28.50%	0.00%	71.30%	0.20%					
PEAK HR :	04:15 PM - 05:15 PM																TOTAL
PEAK HR VOL :	217	569	0	0	0	117	58	0	87	0	228	0	0	0	0	0	1276
PEAK HR FACTOR :	0.861	0.889	0.000	0.000	0.000	0.886	0.853	0.000	0.837	0.000	0.838	0.000	0.000	0.000	0.000	0.000	0.973
	0.940				0.951				0.838								

National Data & Surveying Services

Intersection Turning Movement Count

Location: Calgrove Blvd & The Old Rd
City: Santa Clarita
Control: Signalized

Project ID: 22-020208-002
Date: 6/16/2022

Data - Cars

NS/EW Streets:	The Old Road				Calgrove Blvd				The Old Rd				Driveway				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	1	0	0	0	2	0	0	1	0	1	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	8	15	0	0	0	43	12	0	9	0	27	0	0	0	0	0	114
7:15 AM	22	22	0	0	0	60	3	0	7	0	10	0	0	0	0	0	124
7:30 AM	19	22	0	0	0	49	3	0	4	0	13	0	0	0	0	0	110
7:45 AM	20	32	0	0	0	46	10	0	4	0	14	0	0	0	0	0	126
8:00 AM	16	22	0	0	0	51	6	0	10	0	15	0	0	0	0	0	120
8:15 AM	18	23	0	0	0	41	13	0	5	0	22	0	0	0	0	0	122
8:30 AM	15	33	0	0	0	29	5	0	3	0	15	0	0	0	0	0	100
8:45 AM	14	42	0	0	0	36	10	0	0	0	10	0	0	0	0	0	112
9:00 AM	12	20	0	0	0	25	8	0	10	0	16	0	0	0	0	0	91
9:15 AM	15	22	0	0	0	21	5	0	6	0	12	0	0	0	0	0	81
9:30 AM	19	22	0	0	0	31	9	0	5	0	18	0	0	0	0	0	104
9:45 AM	15	39	0	0	0	22	7	0	2	0	15	0	0	0	0	0	100
10:00 AM	13	25	0	0	0	23	7	0	3	0	10	0	0	0	0	0	81
10:15 AM	24	47	0	0	1	20	9	0	8	0	13	0	0	0	0	0	122
10:30 AM	22	44	0	0	0	21	9	0	7	0	4	0	0	0	0	0	107
10:45 AM	15	36	0	0	0	26	11	0	5	0	17	0	0	0	0	0	110
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	267	466	0	0	1	544	127	0	88	0	231	0	0	0	0	0	1724
APPROACH %'s :	36.43%	63.57%	0.00%	0.00%	0.15%	80.95%	18.90%	0.00%	27.59%	0.00%	72.41%	0.00%					
PEAK HR :	07:00 AM - 08:00 AM																TOTAL
PEAK HR VOL :	69	91	0	0	0	198	28	0	24	0	64	0	0	0	0	0	474
PEAK HR FACTOR :	0.784	0.711	0.000	0.000	0.000	0.825	0.583	0.000	0.667	0.000	0.593	0.000	0.000	0.000	0.000	0.000	0.940
	0.769				0.897				0.611								

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	1	0	0	0	2	0	0	1	0	1	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
3:00 PM	26	87	0	0	0	27	12	0	14	0	36	0	0	0	0	0	202
3:15 PM	37	92	0	0	0	35	10	0	4	0	36	0	0	0	0	0	214
3:30 PM	42	103	0	0	0	23	10	0	9	0	21	0	0	0	0	0	208
3:45 PM	52	120	0	0	0	18	9	0	9	0	47	0	0	0	0	0	255
4:00 PM	35	124	0	0	0	27	20	0	16	0	37	0	0	0	0	0	259
4:15 PM	47	155	0	0	0	31	13	0	16	0	54	0	0	0	0	0	316
4:30 PM	46	153	0	0	0	28	15	0	18	0	46	0	0	0	0	0	306
4:45 PM	63	124	0	0	0	28	17	0	26	0	58	0	0	0	0	0	316
5:00 PM	58	126	0	0	0	27	13	0	25	0	68	0	0	0	0	0	317
5:15 PM	57	140	0	0	0	23	14	0	18	0	57	0	0	0	0	0	309
5:30 PM	52	155	0	0	0	32	15	0	18	0	45	0	0	0	0	0	317
5:45 PM	64	125	0	0	0	18	21	0	31	0	49	0	0	0	0	0	308
6:00 PM	51	91	0	0	0	17	11	0	15	0	47	0	0	0	0	0	232
6:15 PM	34	76	0	0	0	23	14	0	17	0	38	0	0	0	0	0	202
6:30 PM	38	78	0	0	0	18	9	0	20	0	25	0	0	0	0	0	188
6:45 PM	17	35	0	0	0	15	18	0	14	0	22	0	0	0	0	0	121
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	719	1784	0	0	0	390	221	0	270	0	686	0	0	0	0	0	4070
APPROACH %'s :	28.73%	71.27%	0.00%	0.00%	0.00%	63.83%	36.17%	0.00%	28.24%	0.00%	71.76%	0.00%					
PEAK HR :	04:15 PM - 05:15 PM																TOTAL
PEAK HR VOL :	214	558	0	0	0	114	58	0	85	0	226	0	0	0	0	0	1255
PEAK HR FACTOR :	0.849	0.900	0.000	0.000	0.000	0.919	0.853	0.000	0.817	0.000	0.831	0.000	0.000	0.000	0.000	0.000	0.990
	0.955				0.956				0.836								

National Data & Surveying Services

Intersection Turning Movement Count

Location: Calgrove Blvd & The Old Rd
City: Santa Clarita
Control: Signalized

Project ID: 22-020208-002
Date: 6/16/2022

Data - HT

NS/EW Streets:	The Old Road				Calgrove Blvd				The Old Rd				Driveway				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	1	0	0	0	2	0	0	1	0	1	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	1	0	0	0	0	1	4	0	2	0	1	0	0	0	0	0	9
7:15 AM	0	4	0	0	0	5	0	0	0	0	0	0	0	0	0	0	9
7:30 AM	1	3	0	0	0	2	1	0	0	0	0	1	0	0	0	0	8
7:45 AM	0	2	0	0	0	2	1	0	0	0	0	0	0	0	0	0	5
8:00 AM	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	2
8:15 AM	0	1	0	0	0	1	1	0	0	0	0	1	0	0	0	0	4
8:30 AM	0	1	0	0	0	4	0	0	0	0	1	1	0	0	0	0	7
8:45 AM	0	6	0	0	0	3	1	0	1	0	0	0	0	0	0	0	11
9:00 AM	0	2	0	0	0	3	0	0	2	0	1	1	0	0	0	0	9
9:15 AM	1	1	0	0	0	2	0	0	0	0	0	0	0	0	0	0	4
9:30 AM	1	3	0	1	0	2	2	0	1	0	2	1	0	0	0	0	13
9:45 AM	1	2	0	0	0	2	0	0	1	0	0	0	0	0	0	0	6
10:00 AM	1	2	0	0	0	3	0	0	2	0	0	1	0	0	0	0	9
10:15 AM	1	3	0	0	0	0	0	0	0	0	1	0	0	0	0	0	5
10:30 AM	0	3	0	0	0	1	1	0	1	0	0	1	0	0	0	0	7
10:45 AM	0	1	0	0	0	1	2	0	0	0	0	2	0	0	0	0	6
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	7	35	0	1	0	32	14	0	10	0	6	9	0	0	0	0	114
APPROACH %'s :	16.28%	81.40%	0.00%	2.33%	0.00%	69.57%	30.43%	0.00%	40.00%	0.00%	24.00%	36.00%					
PEAK HR :	07:00 AM - 08:00 AM																TOTAL
PEAK HR VOL :	2	9	0	0	0	10	6	0	2	0	1	1	0	0	0	0	31
PEAK HR FACTOR :	0.500	0.563	0.000	0.000	0.000	0.500	0.375	0.000	0.250	0.000	0.250	0.250	0.000	0.000	0.000	0.000	0.861
	0.688				0.800				0.333								

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	1	0	0	0	2	0	0	1	0	1	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
3:00 PM	0	3	0	0	0	4	0	0	2	0	2	0	0	0	0	0	11
3:15 PM	2	6	0	0	0	2	0	0	0	0	0	1	0	0	0	0	11
3:30 PM	1	8	0	0	0	0	0	0	0	0	0	1	0	0	0	0	10
3:45 PM	1	4	0	0	0	0	1	0	0	0	2	0	0	0	0	0	8
4:00 PM	1	3	0	0	0	0	0	0	4	0	4	0	0	0	0	0	12
4:15 PM	2	5	0	0	0	2	0	0	1	0	2	0	0	0	0	0	12
4:30 PM	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
4:45 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
5:00 PM	0	4	0	0	0	1	0	0	1	0	0	0	0	0	0	0	6
5:15 PM	1	2	0	0	0	0	0	0	0	0	1	0	0	0	0	0	4
5:30 PM	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
5:45 PM	0	1	0	0	0	2	0	0	1	0	0	0	0	0	0	0	4
6:00 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
6:15 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
6:30 PM	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2
6:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	9	42	1	0	0	11	1	0	9	0	12	2	0	0	0	0	87
APPROACH %'s :	17.31%	80.77%	1.92%	0.00%	0.00%	91.67%	8.33%	0.00%	39.13%	0.00%	52.17%	8.70%					
PEAK HR :	04:15 PM - 05:15 PM																TOTAL
PEAK HR VOL :	3	11	0	0	0	3	0	0	2	0	2	0	0	0	0	0	21
PEAK HR FACTOR :	0.375	0.550	0.000	0.000	0.000	0.375	0.000	0.000	0.500	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.438
	0.500				0.375				0.333								

National Data & Surveying Services

Intersection Turning Movement Count

Location: Calgrove Blvd & The Old Rd
City: Santa Clarita
Control: Signalized

Project ID: 22-020208-002
Date: 6/16/2022

Data - Bikes

NS/EW Streets:	The Old Road				Calgrove Blvd				The Old Rd				Driveway				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	1	0	0	0	2	0	0	1	0	1	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	1	0	0	0	6	0	0	0	0	0	0	0	0	0	0	7
8:15 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	2
9:00 AM	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
9:15 AM	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	9	0	0	0	8	0	0	0	0	0	0	0	0	0	0	17
APPROACH %'s :	0.00%	100.00%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%									
PEAK HR :	07:00 AM - 08:00 AM																TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PEAK HR FACTOR :	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	1	0	0	0	2	0	0	1	0	1	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00 PM	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	2
6:15 PM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
6:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	0	1	0	3	0	0	0	0	0	0	0	4
APPROACH %'s :					0.00%	0.00%	100.00%	0.00%	100.00%	0.00%	0.00%	0.00%					
PEAK HR :	04:15 PM - 05:15 PM																TOTAL
PEAK HR VOL :	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
PEAK HR FACTOR :	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250
							0.250										

National Data & Surveying Services

Intersection Turning Movement Count

Location: Calgrove Blvd & The Old Rd
City: Santa Clarita

Project ID: 22-020208-002
Date: 6/16/2022

Data - Pedestrians (Crosswalks)

NS/EW Streets:	The Old Road		Calgrove Blvd		The Old Rd		Driveway		
AM	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG		
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
7:00 AM	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0
9:00 AM	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	0	0	0	0
APPROACH %'s :									
PEAK HR :	**07:00 AM - 08:00 AM**								TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	0
PEAK HR FACTOR :									

PM	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG		
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
3:00 PM	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0
6:00 PM	0	0	0	0	0	0	0	0	0
6:15 PM	0	0	0	0	0	0	0	0	0
6:30 PM	0	0	0	0	0	0	0	0	0
6:45 PM	0	0	0	0	0	0	0	0	0
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	0	0	0	0
APPROACH %'s :									
PEAK HR :	**04:15 PM - 05:15 PM**								TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	0
PEAK HR FACTOR :									

Prepared by National Data & Surveying Services

The Old Road & The Old Road/Calgrove Blvd

Peak Hour Turning Movement Count

ID: 22-020208-002
City: Santa Clarita

Day: Thursday
Date: 6/16/2022

PEAK HOURS

AM	07:00 AM - 08:00 AM
NOON	NONE
PM	04:15 PM - 05:15 PM

COUNT PERIODS

AM	7:00 AM - 11:00 AM
NOON	NONE
PM	3:00 PM - 07:00 PM

SOUTHBOUND — Calgrove Blvd

AM	34	208	0	0	126	AM
NOON	0	0	0	0	0	NOON
PM	58	117	0	0	656	PM

EASTBOUND — The Old Rd

AM	NOON	PM		
106	0	275	⇦	
1	0	0	↶	0
26	0	87	↱	1
0	0	0	→	0
65	0	228	↴	1
AM	NOON	PM		

WESTBOUND — Driveway

PM	NOON	AM		
0	0	0	↰	0
0	0	0	←	0
0	0	0	↰	0
0	0	0	↶	0
0	0	0	⇨	
PM	NOON	AM		

CONTROL: Signalized

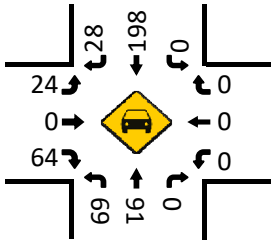
	AM	NOON	PM
TEV	505	0	1276
PHF	0.95		0.97

NORTHBOUND — The Old Road

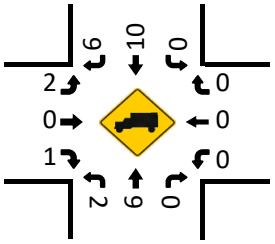
PM	345	0	217	569	0	PM
NOON	0	0	0	0	0	NOON
AM	273	0	71	100	0	AM

Turning movements at the intersection: 0 2 0 0 (EB); 0 1 1 0 (NB); 0 0 0 0 (WB).

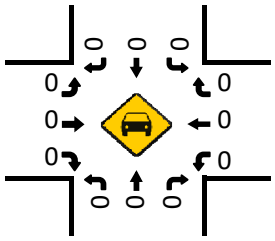
Cars (AM)



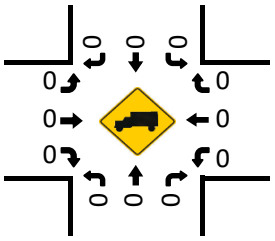
HT (AM)



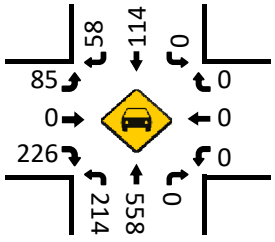
Cars (NOON)



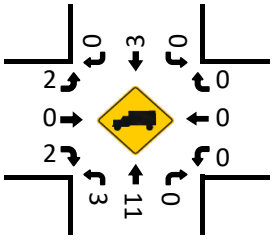
HT (NOON)



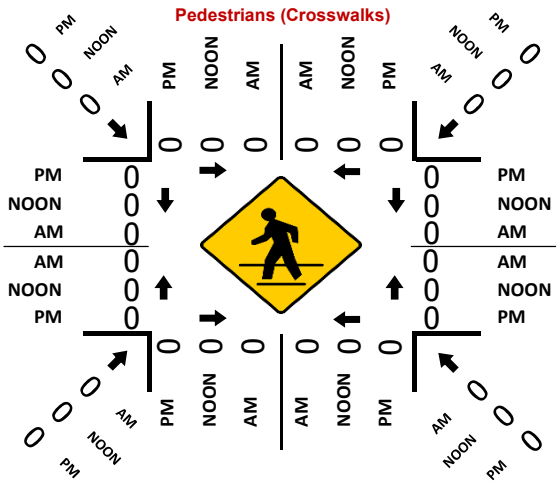
Cars (PM)



HT (PM)



Pedestrians (Crosswalks)



APPENDIX C:
LA COUNTY BASELINE VMT MEMORANDUM

FEHR PEERS

MEMORANDUM

Date: January 26, 2022

To: Kent Tsujii, PE – Los Angeles County Public Works

From: Seth Contreras and Sarah Brandenberg

Subject: ***LA County Baseline VMT Data***

LA19-3162

This memorandum presents the Baseline VMT update for LA County. The application of Baseline VMT data is described in the *Los Angeles County Public Works Transportation Impact Guidelines*, July 23, 2020. The County previously defined its Baseline VMT using the geographic boundaries for the North County and South County areas. This update to the County's Baseline VMT is being implemented to follow recommendations provided by the Office of Planning and Research (OPR).

BACKGROUND

LA County is updating its Baseline VMT to represent the amount of VMT generated by land uses within the entire County. This update is being implemented for consistency with the recommended practices for counties provided by OPR[1]. OPR suggests that comparing a project's VMT to the VMT Baseline for the entire region results in better alignment with the state's climate goals. OPR defines regional as the entire geography within a metropolitan planning organization (MPO) or a regional transportation planning agency (RTPA). For LA County, the MPO and RTPA are represented by the jurisdictional boundary of the Southern California Association of Governments (SCAG) region. The boundary used to define the Baseline VMT can be modified if it results in a VMT threshold that is more environmentally protective. Therefore, the first step in redefining the County's Baseline VMT was to compare the Baseline VMT for the entire SCAG region to the Baseline VMT of the area within the LA County border as shown in Table 1.

Table 1
Los Angeles County and SCAG Regional VMT Comparison

Total VMT per Service Population	SCAG Region	34.2
	LA County	**32.0**
	Unincorporated LA County	35.9
Home-Based VMT per Capita	SCAG	15.0
	LA County	**13.4**
	Unincorporated LA County	17.0
Home-Based Work VMT per Employee	SCAG	19.0
	LA County	**18.4**
	Unincorporated LA County	20.7

Source: *Fehr & Peers, 2021 based on VMT data from the SCAG 2016 RTP/SCS Model.*

[1] https://opr.ca.gov/ceqa/sb-743/faq.html#VMT-TA-regional

As shown in the above table, the Baseline VMT for LA County (including the incorporated cities) is slightly lower than the Baseline VMT for the entire SCAG region. Redefining the County's Baseline VMT to reflect the entire County will result in a VMT threshold that is more in alignment with the state's climate goals than applying the Baseline VMT for the entire SCAG region or applying separate VMT Baselines for the North and South areas of the County.

BASELINE VMT

Table 2 below provides the updated Baseline VMT for LA County. The Baseline VMT applied in the Transportation Impact Analysis should be consistent with the year that the transportation study begins as defined in the Scoping Document.

Table 2
Los Angeles County Baseline VMT Data by Analysis Year

Los Angeles County VMT Baseline						
	Analysis Year					
VMT Metrics	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**
Residential VMT per capita	12.9	12.8	12.7	12.6	12.6	12.5
Work VMT per employee	16.7	16.5	16.3	16.1	16.0	15.8
Total VMT per service population	30.9	30.8	30.7	30.6	30.4	30.3

Source: *Fehr & Peers, 2021 based on data from the SCAG 2016 RTP/SCS Model.*

APPENDIX D:
VMT ANALYSIS METHODOLOGY

Appendix D: VMT Analysis Methodology

This attachment describes the methodology used to develop VMT estimates from the Southern California Association of Governments (SCAG) regional travel demand model (hereinafter, "SCAG model").

Model Scenario

The SCAG 2016 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS) travel demand model was the most current RTP/SCS model available from SCAG at the time of modeling prepared for the VMT analysis presented in this study. Therefore, the 2016 RTP/SCS Year 2040 model (hereinafter, "Year 2040 SCAG model") was used to estimate the cumulative VMT and VMT metrics for the Project.

Model Zone System

The SCAG Model is a 4-step, trip-based convergence model covering the entire SCAG 6-county region, including Los Angeles, Ventura, Orange, San Bernardino, Riverside, and Imperial Counties. The model is structured geographically into approximately 4,100 tier 1 Transportation Analysis Zones (TAZs) and 11,267 tier 2 TAZs. Socioeconomic data, highway network, and transit network are primary inputs to the SCAG model to estimate trip generation and assign vehicle trips. The TAZs contains socioeconomic data and other information for the model and are attached to the networks using centroid connectors that allow travelers (trips) to access the transportation system by simulating local and neighborhood streets. They provide the spatial unit (or geographical area) within which travel behavior and traffic generation are estimated[1].

Socioeconomic Data

Socioeconomic data, which describes both demographic and economic characteristics of the region by TAZ, is used as major input to SCAG model. A total of 65 socio-economic variables and 8 joint distributions of two or more variables are developed, including population, households, school enrollments, household income, workers, and employment, etc[1].

Trip Generation

The SCAG model generates daily person trip-ends for each TAZ across 10 trip purposes[2], which can be grouped into home-based-work, home-based-other, and non-home-based, based on population, household, and employment variables. The trip production models estimate the number of person trips generated in each TAZ, using auto availability, household income, household size, number of workers and other variables to forecast trip production. The trip attraction models estimate the number of person trips attracted to each TAZ, which are a function

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[1] Southern California Association of Governments (SCAG), *SCAG Regional Travel Demand Model And 2012 Model Validation*, March 2016.

[2] The 10 trip purposes include: Home-Based Work Direct (HBWD), Home-Based Work Strategic (HBWS), Home-based school (HBSC), Home-based college and university (HBCU), Home-based shopping (HBSH), Home-based social-recreational (HBSR), Home-based serve passenger (HBSP), Home-based other (HBO), Work-based other (WBO), and Other-based other (OBO).

of land use activity measures such as employment, residential households, and school enrollment[3].

Production and attraction trip-ends are separately calculated for each zone, and generally: production trip-ends are generated by residential land uses and attraction trip-ends are generated by non-residential land uses. Focusing on residential and employment land uses, the first step to forecasting VMT requires translating the land use into model terms, the closest approximations are:

- Residential: home-based production trips
- Employment: home-based work attraction trips

Mode Choice

The SCAG mode choice model is a nested logit model, which is the process of taking the zone-to-zone person trips by trip purpose from the trip distribution model and determining how many of those person-trips are made by the various travel modes, including non-motorized modes (walk and bike), auto modes (drive alone or carpool), and transit modes. The auto mode choice distinguishes four levels of occupancy (1,2,3 and 4 persons per vehicle) and includes a pre-route toll/no toll binary choice. Besides, the model includes a HOV/non-HOV path subnets for the shared-ride choices[3]. For the mode choice of 3+ carpool, the model uses separate vehicle occupancy rates by trip purposes in peak and off-peak periods to convert person trips to vehicle trips.

VMT Calculations

VMT is presented in numerous different forms depending on the analysis being conducted. OPR recommends that daily "Home-Based VMT" per capita is used for residential projects and daily "Home-Based Work VMT" per employee for office projects.

The following steps describe the process used to calculate VMT for residential or office projects using the SCAG model for a project, study area, citywide, or regional geography[4].

- For residential or employment VMT, only daily light-duty and medium-duty vehicle trips were included.
- Custom vehicle trip Production-Attraction (PA) matrices were calculated from peak and off-peak person trip matrices
    - PA matrices at Tier 2 TAZs were used
    - Trip purposes and modes were kept separate
    - Average vehicle occupancy rates for drive-alone and shared ride trips were used to convert person trips to vehicle trips
- The final congested drive-alone peak and off-peak skim matrices were used to estimate trip length between zones

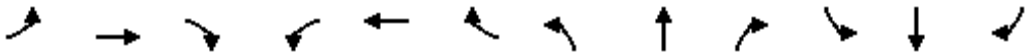
[3] Southern California Association of Governments (SCAG), *SCAG Regional Travel Demand Model And 2012 Model Validation*, March 2016.

[4] Fehr & Peers has developed VMT post-processing tools to calculate VMT from the SCAG model using these procedures.

    - Skim matrices at Tier 2 TAZs were used
- The skim matrices were multiplied by vehicle trips to estimate VMT by peak and off-peak period
- The peak and off-peak results were summed to estimate daily VMT with mode trip purpose and mode aggregated
- Automobile VMT for individual TAZs were calculated using marginal totals:
    - Residential (home-based) - row total
    - Office (home-based work) - column total
- Daily VMT at Tier 2 TAZs were aggregated based on jurisdiction most covered geographic proportional by each TAZ
- Only internal land use TAZs were analyzed (no airport, seaport, or external gateways)
- All calculations used matrix multiplication as opposed to select zone analysis

APPENDIX E:
LOS ANALYSIS SHEETS

EXISTING



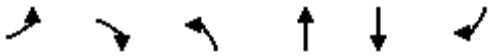
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	34	300	32	20	263	388	39	167	49	275	126	12
Future Volume (veh/h)	34	300	32	20	263	388	39	167	49	275	126	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	37	326	35	22	286	0	42	182	53	299	137	13
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	84	2072	923	62	2027		112	286	81	355	502	47
Arrive On Green	0.05	0.58	0.58	0.03	0.57	0.00	0.06	0.10	0.10	0.10	0.15	0.15
Sat Flow, veh/h	1781	3554	1583	1781	3554	1585	1781	2734	774	3456	3283	308
Grp Volume(v), veh/h	37	326	35	22	286	0	42	116	119	299	73	77
Grp Sat Flow(s),veh/h/ln	1781	1777	1583	1781	1777	1585	1781	1777	1731	1728	1777	1814
Q Serve(g_s), s	2.4	5.1	1.1	1.4	4.5	0.0	2.7	7.5	7.9	10.2	4.4	4.5
Cycle Q Clear(g_c), s	2.4	5.1	1.1	1.4	4.5	0.0	2.7	7.5	7.9	10.2	4.4	4.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.45	1.00		0.17
Lane Grp Cap(c), veh/h	84	2072	923	62	2027		112	186	181	355	272	277
V/C Ratio(X)	0.44	0.16	0.04	0.36	0.14		0.38	0.63	0.65	0.84	0.27	0.28
Avail Cap(c_a), veh/h	126	2072	923	126	2027		163	540	527	432	614	627
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	55.6	11.5	10.7	56.6	12.0	0.0	54.0	51.5	51.6	52.9	44.9	45.0
Incr Delay (d2), s/veh	1.3	0.2	0.1	1.3	0.1	0.0	0.8	5.8	6.7	10.3	0.9	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	2.0	0.4	0.7	1.8	0.0	1.2	3.7	3.8	4.9	2.0	2.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	57.0	11.6	10.7	57.9	12.2	0.0	54.7	57.3	58.3	63.1	45.8	45.9
LnGrp LOS	E	B	B	E	B		D	E	E	E	D	D
Approach Vol, veh/h		398			308	A		277			449	
Approach Delay, s/veh		15.8			15.5			57.4			57.4	
Approach LOS		B			B			E			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.2	74.5	17.3	18.0	8.7	76.0	11.5	23.8
Change Period (Y+Rc), s	4.5	6.0	5.0	5.5	4.5	6.0	4.0	5.5
Max Green Setting (Gmax), s	8.5	39.0	15.0	36.5	8.5	39.0	11.0	41.5
Max Q Clear Time (g_c+I1), s	4.4	6.5	12.2	9.9	3.4	7.1	4.7	6.5
Green Ext Time (p_c), s	0.0	3.2	0.1	2.2	0.0	4.0	0.0	1.4

Intersection Summary	
HCM 6th Ctrl Delay	36.8
HCM 6th LOS	D

Notes

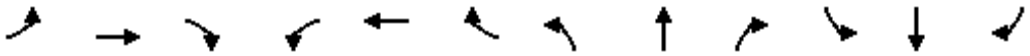
Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	27	65	71	100	208	34
Future Volume (veh/h)	27	65	71	100	208	34
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	29	71	77	109	226	37
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	254	442	242	1037	884	143
Arrive On Green	0.14	0.14	0.14	0.55	0.29	0.29
Sat Flow, veh/h	1781	1585	1781	1870	3157	494
Grp Volume(v), veh/h	29	71	77	109	130	133
Grp Sat Flow(s),veh/h/ln	1781	1585	1781	1870	1777	1781
Q Serve(g_s), s	0.5	1.2	1.4	1.0	1.9	2.0
Cycle Q Clear(g_c), s	0.5	1.2	1.4	1.0	1.9	2.0
Prop In Lane	1.00	1.00	1.00			0.28
Lane Grp Cap(c), veh/h	254	442	242	1037	513	514
V/C Ratio(X)	0.11	0.16	0.32	0.11	0.25	0.26
Avail Cap(c_a), veh/h	1311	1382	797	2375	2256	2262
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	12.9	9.4	13.5	3.7	9.5	9.5
Incr Delay (d2), s/veh	0.2	0.2	0.3	0.1	0.4	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	1.2	0.5	0.2	0.6	0.6
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	13.1	9.6	13.8	3.7	9.9	9.9
LnGrp LOS	B	A	B	A	A	A
Approach Vol, veh/h	100			186	263	
Approach Delay, s/veh	10.6			7.9	9.9	
Approach LOS	B			A	A	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		25.2		9.4	9.2	16.0
Change Period (Y+Rc), s		6.0		4.5	4.5	6.0
Max Green Setting (Gmax), s		44.0		25.5	15.5	44.0
Max Q Clear Time (g_c+I1), s		3.0		3.2	3.4	4.0
Green Ext Time (p_c), s		1.1		0.3	0.0	2.8

Intersection Summary		
HCM 6th Ctrl Delay	9.4	
HCM 6th LOS	A	



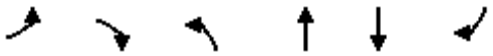
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	37	296	41	20	435	481	108	229	45	566	384	28
Future Volume (veh/h)	37	296	41	20	435	481	108	229	45	566	384	28
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	40	322	45	22	473	0	117	249	49	615	417	30
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	87	1696	754	62	1644		145	410	79	605	806	58
Arrive On Green	0.05	0.48	0.48	0.03	0.46	0.00	0.08	0.14	0.14	0.17	0.24	0.24
Sat Flow, veh/h	1781	3554	1581	1781	3554	1585	1781	2967	574	3456	3361	241
Grp Volume(v), veh/h	40	322	45	22	473	0	117	147	151	615	220	227
Grp Sat Flow(s),veh/h/ln	1781	1777	1581	1781	1777	1585	1781	1777	1764	1728	1777	1826
Q Serve(g_s), s	2.6	6.3	1.8	1.4	9.9	0.0	7.7	9.4	9.6	21.0	12.9	13.0
Cycle Q Clear(g_c), s	2.6	6.3	1.8	1.4	9.9	0.0	7.7	9.4	9.6	21.0	12.9	13.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.33	1.00		0.13
Lane Grp Cap(c), veh/h	87	1696	754	62	1644		145	246	244	605	426	438
V/C Ratio(X)	0.46	0.19	0.06	0.36	0.29		0.80	0.60	0.62	1.02	0.52	0.52
Avail Cap(c_a), veh/h	126	1696	754	119	1644		208	533	529	605	652	669
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	55.5	18.0	16.9	56.6	20.0	0.0	54.2	48.6	48.7	49.5	39.6	39.6
Incr Delay (d2), s/veh	1.4	0.2	0.2	1.3	0.4	0.0	9.0	4.0	4.3	40.9	1.7	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	2.6	0.7	0.7	4.2	0.0	3.8	4.4	4.5	12.4	5.8	6.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	56.9	18.3	17.0	57.9	20.4	0.0	63.2	52.6	53.0	90.4	41.2	41.2
LnGrp LOS	E	B	B	E	C		E	D	D	F	D	D
Approach Vol, veh/h		407			495	A		415			1062	
Approach Delay, s/veh		21.9			22.1			55.7			69.7	
Approach LOS		C			C			E			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.4	61.5	26.0	22.1	8.7	63.3	13.8	34.3
Change Period (Y+Rc), s	4.5	6.0	5.0	5.5	4.5	6.0	4.0	5.5
Max Green Setting (Gmax), s	8.5	33.5	21.0	36.0	8.0	34.0	14.0	44.0
Max Q Clear Time (g_c+I1), s	4.6	11.9	23.0	11.6	3.4	8.3	9.7	15.0
Green Ext Time (p_c), s	0.0	4.9	0.0	2.8	0.0	3.7	0.0	4.7

Intersection Summary	
HCM 6th Ctrl Delay	49.2
HCM 6th LOS	D

Notes

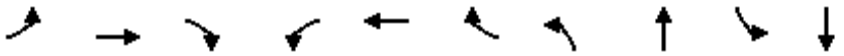
Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	87	228	217	569	117	58
Future Volume (veh/h)	87	228	217	569	117	58
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	95	248	236	618	127	63
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	339	624	363	1038	569	267
Arrive On Green	0.19	0.19	0.20	0.56	0.24	0.24
Sat Flow, veh/h	1781	1585	1781	1870	2439	1103
Grp Volume(v), veh/h	95	248	236	618	95	95
Grp Sat Flow(s),veh/h/ln	1781	1585	1781	1870	1777	1672
Q Serve(g_s), s	1.9	4.6	5.0	9.1	1.8	1.9
Cycle Q Clear(g_c), s	1.9	4.6	5.0	9.1	1.8	1.9
Prop In Lane	1.00	1.00	1.00			0.66
Lane Grp Cap(c), veh/h	339	624	363	1038	431	405
V/C Ratio(X)	0.28	0.40	0.65	0.60	0.22	0.24
Avail Cap(c_a), veh/h	1101	1303	669	1996	1896	1784
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	14.3	9.0	15.1	6.1	12.5	12.5
Incr Delay (d2), s/veh	0.4	0.4	0.7	0.9	0.4	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.1	1.8	2.3	0.6	0.6
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	14.7	9.4	15.8	7.0	12.9	13.1
LnGrp LOS	B	A	B	A	B	B
Approach Vol, veh/h	343			854	190	
Approach Delay, s/veh	10.9			9.5	13.0	
Approach LOS	B			A	B	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		28.9		12.3	12.9	16.0
Change Period (Y+Rc), s		6.0		4.5	4.5	6.0
Max Green Setting (Gmax), s		44.0		25.5	15.5	44.0
Max Q Clear Time (g_c+I1), s		11.1		6.6	7.0	3.9
Green Ext Time (p_c), s		8.1		1.0	0.1	2.0

Intersection Summary		
HCM 6th Ctrl Delay		10.3
HCM 6th LOS		B

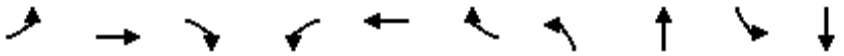


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	37	326	35	22	286	422	42	235	299	150
v/c Ratio	0.30	0.16	0.04	0.19	0.14	0.39	0.29	0.55	0.73	0.23
Control Delay	59.8	13.6	0.1	56.9	14.9	3.0	57.1	47.7	61.7	39.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.8	13.6	0.1	56.9	14.9	3.0	57.1	47.7	61.7	39.8
Queue Length 50th (ft)	28	51	0	16	58	0	31	78	117	51
Queue Length 95th (ft)	63	108	0	44	97	57	68	117	159	76
Internal Link Dist (ft)		407			454			459		523
Turn Bay Length (ft)	195		150	200			120		235	
Base Capacity (vph)	127	2071	954	125	1990	1074	162	1062	454	1212
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.29	0.16	0.04	0.18	0.14	0.39	0.26	0.22	0.66	0.12

Intersection Summary

Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Group Flow (vph)	29	71	77	109	263
v/c Ratio	0.07	0.13	0.16	0.06	0.16
Control Delay	12.1	2.8	11.9	1.9	8.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	12.1	2.8	11.9	1.9	8.2
Queue Length 50th (ft)	3	0	8	0	12
Queue Length 95th (ft)	21	13	41	24	46
Internal Link Dist (ft)	588			452	396
Turn Bay Length (ft)	200				
Base Capacity (vph)	1352	860	822	1863	3465
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.02	0.08	0.09	0.06	0.08

Intersection Summary



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	40	322	45	22	473	523	117	298	615	447
v/c Ratio	0.33	0.20	0.06	0.19	0.30	0.53	0.66	0.61	0.82	0.48
Control Delay	60.4	20.7	0.1	56.9	23.7	4.3	70.3	50.6	54.8	38.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.4	20.7	0.1	56.9	23.7	4.3	70.3	50.6	54.8	38.6
Queue Length 50th (ft)	30	71	0	16	134	0	89	108	230	147
Queue Length 95th (ft)	66	117	0	44	175	68	150	150	#376	210
Internal Link Dist (ft)		407			454			459		523
Turn Bay Length (ft)	195		150	200			120		235	
Base Capacity (vph)	128	1642	800	118	1558	981	206	1046	752	1287
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.31	0.20	0.06	0.19	0.30	0.53	0.57	0.28	0.82	0.35

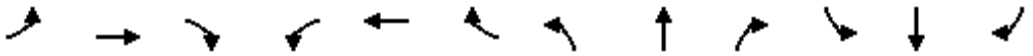
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Group Flow (vph)	95	248	236	618	190
v/c Ratio	0.26	0.26	0.47	0.50	0.22
Control Delay	18.9	1.6	17.9	7.6	12.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	18.9	1.6	17.9	7.6	12.4
Queue Length 50th (ft)	22	0	52	83	14
Queue Length 95th (ft)	56	20	112	178	40
Internal Link Dist (ft)	588			452	396
Turn Bay Length (ft)	200				
Base Capacity (vph)	1061	1043	645	1863	3142
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.09	0.24	0.37	0.33	0.06

Intersection Summary

FUTURE BASE



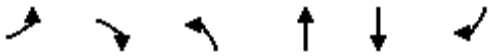
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	35	315	33	20	276	408	40	172	50	287	129	12
Future Volume (veh/h)	35	315	33	20	276	408	40	172	50	287	129	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	38	342	36	22	300	0	43	187	54	312	140	13
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	85	2052	914	62	2005		113	292	82	367	519	48
Arrive On Green	0.05	0.58	0.58	0.03	0.56	0.00	0.06	0.11	0.11	0.11	0.16	0.16
Sat Flow, veh/h	1781	3554	1583	1781	3554	1585	1781	2739	769	3456	3290	302
Grp Volume(v), veh/h	38	342	36	22	300	0	43	119	122	312	75	78
Grp Sat Flow(s),veh/h/ln	1781	1777	1583	1781	1777	1585	1781	1777	1732	1728	1777	1815
Q Serve(g_s), s	2.5	5.4	1.2	1.4	4.8	0.0	2.8	7.7	8.1	10.6	4.4	4.5
Cycle Q Clear(g_c), s	2.5	5.4	1.2	1.4	4.8	0.0	2.8	7.7	8.1	10.6	4.4	4.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.44	1.00		0.17
Lane Grp Cap(c), veh/h	85	2052	914	62	2005		113	189	185	367	280	287
V/C Ratio(X)	0.45	0.17	0.04	0.36	0.15		0.38	0.63	0.66	0.85	0.27	0.27
Avail Cap(c_a), veh/h	126	2052	914	126	2005		148	540	527	432	629	643
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	55.6	11.9	11.0	56.6	12.4	0.0	53.9	51.3	51.5	52.7	44.4	44.5
Incr Delay (d2), s/veh	1.3	0.2	0.1	1.3	0.2	0.0	0.8	5.8	6.7	11.5	0.9	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	2.2	0.4	0.7	2.0	0.0	1.3	3.8	3.9	5.2	2.0	2.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	56.9	12.0	11.0	57.9	12.6	0.0	54.7	57.1	58.2	64.2	45.3	45.3
LnGrp LOS	E	B	B	E	B		D	E	E	E	D	D
Approach Vol, veh/h		416			322	A		284			465	
Approach Delay, s/veh		16.0			15.7			57.2			58.0	
Approach LOS		B			B			E			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.2	73.7	17.8	18.3	8.7	75.3	11.6	24.4
Change Period (Y+Rc), s	4.5	6.0	5.0	5.5	4.5	6.0	4.0	5.5
Max Green Setting (Gmax), s	8.5	39.0	15.0	36.5	8.5	39.0	10.0	42.5
Max Q Clear Time (g_c+I1), s	4.5	6.8	12.6	10.1	3.4	7.4	4.8	6.5
Green Ext Time (p_c), s	0.0	3.4	0.1	2.3	0.0	4.2	0.0	1.5

Intersection Summary	
HCM 6th Ctrl Delay	36.9
HCM 6th LOS	D

Notes

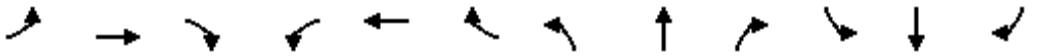
Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	30	67	73	107	223	36
Future Volume (veh/h)	30	67	73	107	223	36
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	33	73	79	116	242	39
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	262	452	246	1034	878	140
Arrive On Green	0.15	0.15	0.14	0.55	0.29	0.29
Sat Flow, veh/h	1781	1585	1781	1870	3165	488
Grp Volume(v), veh/h	33	73	79	116	139	142
Grp Sat Flow(s),veh/h/ln	1781	1585	1781	1870	1777	1782
Q Serve(g_s), s	0.6	1.2	1.4	1.0	2.1	2.2
Cycle Q Clear(g_c), s	0.6	1.2	1.4	1.0	2.1	2.2
Prop In Lane	1.00	1.00	1.00			0.27
Lane Grp Cap(c), veh/h	262	452	246	1034	508	510
V/C Ratio(X)	0.13	0.16	0.32	0.11	0.27	0.28
Avail Cap(c_a), veh/h	1299	1375	790	2354	2236	2243
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	13.0	9.4	13.6	3.7	9.7	9.7
Incr Delay (d2), s/veh	0.2	0.2	0.3	0.1	0.5	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	1.2	0.5	0.2	0.7	0.7
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	13.2	9.5	13.9	3.8	10.2	10.2
LnGrp LOS	B	A	B	A	B	B
Approach Vol, veh/h	106			195	281	
Approach Delay, s/veh	10.7			7.9	10.2	
Approach LOS	B			A	B	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		25.3		9.6	9.3	16.0
Change Period (Y+Rc), s		6.0		4.5	4.5	6.0
Max Green Setting (Gmax), s		44.0		25.5	15.5	44.0
Max Q Clear Time (g_c+I1), s		3.0		3.2	3.4	4.2
Green Ext Time (p_c), s		1.1		0.3	0.0	3.0

Intersection Summary	
HCM 6th Ctrl Delay	9.5
HCM 6th LOS	A



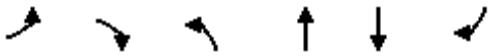
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	38	311	42	20	456	501	111	236	52	590	395	29
Future Volume (veh/h)	38	311	42	20	456	501	111	236	52	590	395	29
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	41	338	46	22	496	0	121	257	57	641	429	32
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	88	1677	746	62	1624		147	416	91	605	819	61
Arrive On Green	0.05	0.47	0.47	0.03	0.46	0.00	0.08	0.14	0.14	0.17	0.24	0.24
Sat Flow, veh/h	1781	3554	1581	1781	3554	1585	1781	2899	632	3456	3352	249
Grp Volume(v), veh/h	41	338	46	22	496	0	121	156	158	641	227	234
Grp Sat Flow(s),veh/h/ln	1781	1777	1581	1781	1777	1585	1781	1777	1754	1728	1777	1824
Q Serve(g_s), s	2.7	6.7	1.9	1.4	10.6	0.0	8.0	9.9	10.2	21.0	13.3	13.4
Cycle Q Clear(g_c), s	2.7	6.7	1.9	1.4	10.6	0.0	8.0	9.9	10.2	21.0	13.3	13.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.36	1.00		0.14
Lane Grp Cap(c), veh/h	88	1677	746	62	1624		147	255	252	605	434	446
V/C Ratio(X)	0.46	0.20	0.06	0.36	0.31		0.82	0.61	0.63	1.06	0.52	0.53
Avail Cap(c_a), veh/h	126	1677	746	119	1624		223	533	526	605	637	654
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	55.5	18.5	17.2	56.6	20.6	0.0	54.2	48.2	48.4	49.5	39.3	39.3
Incr Delay (d2), s/veh	1.4	0.3	0.2	1.3	0.5	0.0	8.3	4.0	4.4	53.5	1.7	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	2.8	0.7	0.7	4.5	0.0	3.9	4.7	4.8	13.5	6.0	6.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	56.9	18.8	17.4	57.9	21.1	0.0	62.5	52.3	52.8	103.0	40.9	40.9
LnGrp LOS	E	B	B	E	C		E	D	D	F	D	D
Approach Vol, veh/h		425			518	A		435			1102	
Approach Delay, s/veh		22.3			22.6			55.3			77.0	
Approach LOS		C			C			E			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.5	60.8	26.0	22.7	8.7	62.6	13.9	34.8
Change Period (Y+Rc), s	4.5	6.0	5.0	5.5	4.5	6.0	4.0	5.5
Max Green Setting (Gmax), s	8.5	33.5	21.0	36.0	8.0	34.0	15.0	43.0
Max Q Clear Time (g_c+I1), s	4.7	12.6	23.0	12.2	3.4	8.7	10.0	15.4
Green Ext Time (p_c), s	0.0	5.1	0.0	3.0	0.0	3.9	0.0	4.8

Intersection Summary	
HCM 6th Ctrl Delay	52.5
HCM 6th LOS	D

Notes

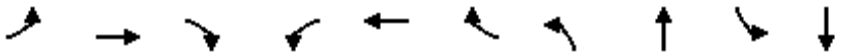
Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	90	234	222	593	128	61
Future Volume (veh/h)	90	234	222	593	128	61
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	98	254	241	645	139	66
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	339	625	364	1039	576	260
Arrive On Green	0.19	0.19	0.20	0.56	0.24	0.24
Sat Flow, veh/h	1781	1585	1781	1870	2472	1075
Grp Volume(v), veh/h	98	254	241	645	102	103
Grp Sat Flow(s),veh/h/ln	1781	1585	1781	1870	1777	1677
Q Serve(g_s), s	1.9	4.8	5.1	9.7	1.9	2.0
Cycle Q Clear(g_c), s	1.9	4.8	5.1	9.7	1.9	2.0
Prop In Lane	1.00	1.00	1.00			0.64
Lane Grp Cap(c), veh/h	339	625	364	1039	430	406
V/C Ratio(X)	0.29	0.41	0.66	0.62	0.24	0.25
Avail Cap(c_a), veh/h	1100	1303	669	1993	1893	1787
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	14.3	9.0	15.1	6.2	12.6	12.6
Incr Delay (d2), s/veh	0.5	0.4	0.8	1.0	0.5	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	4.7	1.8	2.5	0.7	0.7
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	14.8	9.4	15.9	7.3	13.1	13.2
LnGrp LOS	B	A	B	A	B	B
Approach Vol, veh/h	352			886	205	
Approach Delay, s/veh	10.9			9.6	13.1	
Approach LOS	B			A	B	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		28.9		12.4	12.9	16.0
Change Period (Y+Rc), s		6.0		4.5	4.5	6.0
Max Green Setting (Gmax), s		44.0		25.5	15.5	44.0
Max Q Clear Time (g_c+I1), s		11.7		6.8	7.1	4.0
Green Ext Time (p_c), s		8.6		1.1	0.1	2.2

Intersection Summary	
HCM 6th Ctrl Delay	10.4
HCM 6th LOS	B

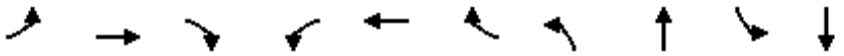


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	38	342	36	22	300	443	43	241	312	153
v/c Ratio	0.31	0.17	0.04	0.19	0.15	0.41	0.29	0.56	0.74	0.23
Control Delay	60.0	14.0	0.1	56.9	15.4	3.1	57.3	47.8	61.5	39.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.0	14.0	0.1	56.9	15.4	3.1	57.3	47.8	61.5	39.3
Queue Length 50th (ft)	29	54	0	16	62	0	32	81	122	51
Queue Length 95th (ft)	65	115	0	44	104	59	70	120	164	77
Internal Link Dist (ft)		407			454			459		523
Turn Bay Length (ft)	195		150	200			120		235	
Base Capacity (vph)	128	2051	964	125	1969	1077	147	1062	460	1241
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.30	0.17	0.04	0.18	0.15	0.41	0.29	0.23	0.68	0.12

Intersection Summary

Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Group Flow (vph)	33	73	79	116	281
v/c Ratio	0.08	0.13	0.16	0.07	0.17
Control Delay	12.2	2.8	12.0	1.9	8.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	12.2	2.8	12.0	1.9	8.3
Queue Length 50th (ft)	4	0	8	0	13
Queue Length 95th (ft)	24	13	43	25	50
Internal Link Dist (ft)	588			452	396
Turn Bay Length (ft)	200				
Base Capacity (vph)	1360	864	827	1863	3465
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.02	0.08	0.10	0.06	0.08

Intersection Summary



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	41	338	46	22	496	545	121	314	641	461
v/c Ratio	0.33	0.21	0.06	0.19	0.34	0.57	0.67	0.61	0.83	0.48
Control Delay	60.6	21.4	0.1	56.9	26.1	4.7	69.9	49.6	55.0	38.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.6	21.4	0.1	56.9	26.1	4.7	69.9	49.6	55.0	38.2
Queue Length 50th (ft)	31	73	0	16	140	0	92	113	246	155
Queue Length 95th (ft)	68	126	0	44	188	72	153	154	#400	216
Internal Link Dist (ft)		407			454			459		523
Turn Bay Length (ft)	195		150	200			120		235	
Base Capacity (vph)	129	1598	782	118	1441	959	221	1046	775	1258
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.21	0.06	0.19	0.34	0.57	0.55	0.30	0.83	0.37

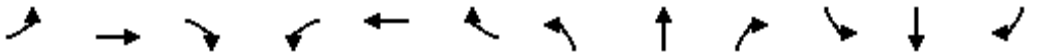
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Group Flow (vph)	98	254	241	645	205
v/c Ratio	0.27	0.27	0.48	0.51	0.24
Control Delay	19.6	1.7	18.5	7.8	12.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	19.6	1.7	18.5	7.8	12.3
Queue Length 50th (ft)	24	0	53	90	16
Queue Length 95th (ft)	61	22	122	189	42
Internal Link Dist (ft)	588			452	396
Turn Bay Length (ft)	200				
Base Capacity (vph)	1045	1034	635	1863	3106
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.09	0.25	0.38	0.35	0.07

Intersection Summary

FUTURE PLUS PROJECT



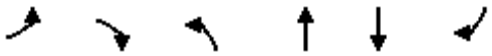
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	35	315	37	20	276	408	52	220	57	287	144	12
Future Volume (veh/h)	35	315	37	20	276	408	52	220	57	287	144	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	38	342	40	22	300	0	57	239	62	312	157	13
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	85	1980	882	62	1933		126	356	90	367	568	47
Arrive On Green	0.05	0.56	0.56	0.03	0.54	0.00	0.07	0.13	0.13	0.11	0.17	0.17
Sat Flow, veh/h	1781	3554	1582	1781	3554	1585	1781	2806	713	3456	3325	273
Grp Volume(v), veh/h	38	342	40	22	300	0	57	149	152	312	83	87
Grp Sat Flow(s),veh/h/ln	1781	1777	1582	1781	1777	1585	1781	1777	1742	1728	1777	1821
Q Serve(g_s), s	2.5	5.7	1.4	1.4	5.0	0.0	3.7	9.6	10.0	10.6	4.9	5.0
Cycle Q Clear(g_c), s	2.5	5.7	1.4	1.4	5.0	0.0	3.7	9.6	10.0	10.6	4.9	5.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.41	1.00		0.15
Lane Grp Cap(c), veh/h	85	1980	882	62	1933		126	226	221	367	303	311
V/C Ratio(X)	0.45	0.17	0.05	0.36	0.16		0.45	0.66	0.69	0.85	0.27	0.28
Avail Cap(c_a), veh/h	126	1980	882	126	1933		148	540	530	432	629	645
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	55.6	13.0	12.1	56.6	13.6	0.0	53.5	49.9	50.1	52.7	43.3	43.3
Incr Delay (d2), s/veh	1.3	0.2	0.1	1.3	0.2	0.0	0.9	5.6	6.3	11.5	0.8	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	2.3	0.5	0.7	2.1	0.0	1.7	4.6	4.7	5.2	2.2	2.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	56.9	13.2	12.2	57.9	13.8	0.0	54.4	55.5	56.4	64.2	44.1	44.2
LnGrp LOS	E	B	B	E	B		D	E	E	E	D	D
Approach Vol, veh/h		420			322	A		358			482	
Approach Delay, s/veh		17.1			16.8			55.7			57.1	
Approach LOS		B			B			E			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.2	71.3	17.8	20.7	8.7	72.8	12.5	26.0
Change Period (Y+Rc), s	4.5	6.0	5.0	5.5	4.5	6.0	4.0	5.5
Max Green Setting (Gmax), s	8.5	39.0	15.0	36.5	8.5	39.0	10.0	42.5
Max Q Clear Time (g_c+I1), s	4.5	7.0	12.6	12.0	3.4	7.7	5.7	7.0
Green Ext Time (p_c), s	0.0	3.4	0.1	2.9	0.0	4.2	0.0	1.7

Intersection Summary	
HCM 6th Ctrl Delay	38.0
HCM 6th LOS	D

Notes

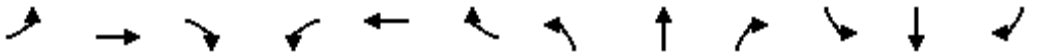
Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	85	72	75	107	223	53
Future Volume (veh/h)	85	72	75	107	223	53
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	92	78	82	116	242	58
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	320	505	248	999	778	183
Arrive On Green	0.18	0.18	0.14	0.53	0.27	0.27
Sat Flow, veh/h	1781	1585	1781	1870	2949	671
Grp Volume(v), veh/h	92	78	82	116	149	151
Grp Sat Flow(s),veh/h/ln	1781	1585	1781	1870	1777	1750
Q Serve(g_s), s	1.6	1.3	1.5	1.1	2.4	2.5
Cycle Q Clear(g_c), s	1.6	1.3	1.5	1.1	2.4	2.5
Prop In Lane	1.00	1.00	1.00			0.38
Lane Grp Cap(c), veh/h	320	505	248	999	484	477
V/C Ratio(X)	0.29	0.15	0.33	0.12	0.31	0.32
Avail Cap(c_a), veh/h	1238	1322	753	2243	2131	2099
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	13.0	9.0	14.3	4.2	10.6	10.6
Incr Delay (d2), s/veh	0.5	0.1	0.3	0.1	0.6	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	1.4	0.5	0.3	0.8	0.8
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	13.5	9.1	14.5	4.3	11.2	11.3
LnGrp LOS	B	A	B	A	B	B
Approach Vol, veh/h	170			198	300	
Approach Delay, s/veh	11.5			8.6	11.2	
Approach LOS	B			A	B	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		25.6		11.1	9.6	16.0
Change Period (Y+Rc), s		6.0		4.5	4.5	6.0
Max Green Setting (Gmax), s		44.0		25.5	15.5	44.0
Max Q Clear Time (g_c+I1), s		3.1		3.6	3.5	4.5
Green Ext Time (p_c), s		1.1		0.5	0.0	3.3

Intersection Summary			
HCM 6th Ctrl Delay		10.5	
HCM 6th LOS		B	



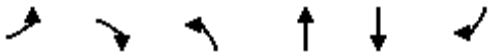
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	38	311	55	20	456	501	118	266	51	590	446	29
Future Volume (veh/h)	38	311	55	20	456	501	118	266	51	590	446	29
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	41	338	60	22	496	0	128	289	55	641	485	32
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	88	1646	732	62	1593		154	454	85	605	843	55
Arrive On Green	0.05	0.46	0.46	0.03	0.45	0.00	0.09	0.15	0.15	0.17	0.25	0.25
Sat Flow, veh/h	1781	3554	1581	1781	3554	1585	1781	2984	560	3456	3383	223
Grp Volume(v), veh/h	41	338	60	22	496	0	128	170	174	641	254	263
Grp Sat Flow(s),veh/h/ln	1781	1777	1581	1781	1777	1585	1781	1777	1767	1728	1777	1829
Q Serve(g_s), s	2.7	6.8	2.5	1.4	10.7	0.0	8.5	10.8	11.1	21.0	15.0	15.1
Cycle Q Clear(g_c), s	2.7	6.8	2.5	1.4	10.7	0.0	8.5	10.8	11.1	21.0	15.0	15.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.32	1.00		0.12
Lane Grp Cap(c), veh/h	88	1646	732	62	1593		154	270	269	605	443	455
V/C Ratio(X)	0.46	0.21	0.08	0.36	0.31		0.83	0.63	0.65	1.06	0.57	0.58
Avail Cap(c_a), veh/h	126	1646	732	119	1593		223	533	530	605	637	655
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	55.5	19.1	18.0	56.6	21.2	0.0	53.9	47.7	47.8	49.5	39.5	39.5
Incr Delay (d2), s/veh	1.4	0.3	0.2	1.3	0.5	0.0	10.9	4.1	4.4	53.5	2.0	2.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	2.9	1.0	0.7	4.6	0.0	4.3	5.1	5.2	13.5	6.8	7.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	56.9	19.4	18.2	57.9	21.7	0.0	64.9	51.8	52.2	103.0	41.5	41.5
LnGrp LOS	E	B	B	E	C		E	D	D	F	D	D
Approach Vol, veh/h		439			518	A		472			1158	
Approach Delay, s/veh		22.7			23.3			55.5			75.5	
Approach LOS		C			C			E			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.5	59.8	26.0	23.8	8.7	61.6	14.4	35.4
Change Period (Y+Rc), s	4.5	6.0	5.0	5.5	4.5	6.0	4.0	5.5
Max Green Setting (Gmax), s	8.5	33.5	21.0	36.0	8.0	34.0	15.0	43.0
Max Q Clear Time (g_c+I1), s	4.7	12.7	23.0	13.1	3.4	8.8	10.5	17.1
Green Ext Time (p_c), s	0.0	5.1	0.0	3.3	0.0	4.0	0.0	5.4

Intersection Summary	
HCM 6th Ctrl Delay	52.5
HCM 6th LOS	D

Notes

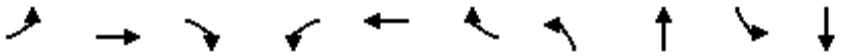
Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	124	237	227	593	128	120
Future Volume (veh/h)	124	237	227	593	128	120
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	135	258	247	645	139	130
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	343	629	364	1037	436	376
Arrive On Green	0.19	0.19	0.20	0.55	0.24	0.24
Sat Flow, veh/h	1781	1585	1781	1870	1901	1559
Grp Volume(v), veh/h	135	258	247	645	136	133
Grp Sat Flow(s),veh/h/ln	1781	1585	1781	1870	1777	1590
Q Serve(g_s), s	2.7	4.9	5.3	9.7	2.6	2.9
Cycle Q Clear(g_c), s	2.7	4.9	5.3	9.7	2.6	2.9
Prop In Lane	1.00	1.00	1.00			0.98
Lane Grp Cap(c), veh/h	343	629	364	1037	429	383
V/C Ratio(X)	0.39	0.41	0.68	0.62	0.32	0.35
Avail Cap(c_a), veh/h	1096	1299	666	1985	1886	1687
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	14.6	9.0	15.2	6.3	12.9	13.0
Incr Delay (d2), s/veh	0.7	0.4	0.8	1.1	0.7	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	4.8	1.9	2.5	1.0	0.9
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	15.4	9.4	16.1	7.3	13.7	13.9
LnGrp LOS	B	A	B	A	B	B
Approach Vol, veh/h	393			892	269	
Approach Delay, s/veh	11.5			9.8	13.8	
Approach LOS	B			A	B	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		29.0		12.5	13.0	16.0
Change Period (Y+Rc), s		6.0		4.5	4.5	6.0
Max Green Setting (Gmax), s		44.0		25.5	15.5	44.0
Max Q Clear Time (g_c+I1), s		11.7		6.9	7.3	4.9
Green Ext Time (p_c), s		8.6		1.2	0.1	3.0

Intersection Summary						
HCM 6th Ctrl Delay			10.9			
HCM 6th LOS			B			

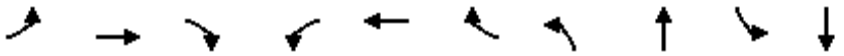


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	38	342	40	22	300	443	57	301	312	170
v/c Ratio	0.31	0.17	0.04	0.19	0.16	0.42	0.38	0.61	0.74	0.23
Control Delay	60.0	15.2	0.1	56.9	16.6	3.3	59.4	49.3	61.5	38.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.0	15.2	0.1	56.9	16.6	3.3	59.4	49.3	61.5	38.5
Queue Length 50th (ft)	29	57	0	16	64	0	43	106	122	56
Queue Length 95th (ft)	65	120	0	44	108	61	86	147	164	83
Internal Link Dist (ft)		407			454			459		523
Turn Bay Length (ft)	195		150	200			120		235	
Base Capacity (vph)	128	1987	939	125	1905	1056	151	1062	460	1243
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.30	0.17	0.04	0.18	0.16	0.42	0.38	0.28	0.68	0.14

Intersection Summary

Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Group Flow (vph)	92	78	82	116	300
v/c Ratio	0.23	0.11	0.19	0.08	0.20
Control Delay	16.4	2.4	16.0	4.3	10.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	16.4	2.4	16.0	4.3	10.9
Queue Length 50th (ft)	19	0	16	11	26
Queue Length 95th (ft)	51	14	48	28	53
Internal Link Dist (ft)	588			452	396
Turn Bay Length (ft)	200				
Base Capacity (vph)	1209	974	735	1863	3384
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.08	0.08	0.11	0.06	0.09

Intersection Summary



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	41	338	60	22	496	545	128	344	641	517
v/c Ratio	0.33	0.22	0.08	0.19	0.35	0.58	0.70	0.63	0.82	0.52
Control Delay	60.6	22.4	0.2	56.9	27.2	4.9	71.5	49.8	54.7	38.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.6	22.4	0.2	56.9	27.2	4.9	71.5	49.8	54.7	38.2
Queue Length 50th (ft)	31	76	0	16	144	0	97	125	244	175
Queue Length 95th (ft)	68	130	0	44	194	76	161	166	#400	238
Internal Link Dist (ft)		407			454			459		523
Turn Bay Length (ft)	195		150	200			120		235	
Base Capacity (vph)	129	1558	766	118	1400	947	221	1047	778	1259
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.22	0.08	0.19	0.35	0.58	0.58	0.33	0.82	0.41

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Group Flow (vph)	135	258	247	645	269
v/c Ratio	0.35	0.27	0.49	0.52	0.30
Control Delay	20.8	1.8	19.8	8.3	10.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	20.8	1.8	19.8	8.3	10.4
Queue Length 50th (ft)	34	0	57	98	17
Queue Length 95th (ft)	83	25	138	208	46
Internal Link Dist (ft)	588			452	396
Turn Bay Length (ft)	200				
Base Capacity (vph)	1010	1031	614	1863	2938
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.13	0.25	0.40	0.35	0.09

Intersection Summary

FUTURE PLUS PROJECT – PROJECT ACCESS ANALYSIS

Intersection	
Int Delay, s/veh	3.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	107	36	11	181	119	35
Future Vol, veh/h	107	36	11	181	119	35
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	50	0	100	-	-	-
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	116	39	12	197	129	38

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	271	84	167	0	-	0
Stage 1	148	-	-	-	-	-
Stage 2	123	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	696	958	1408	-	-	-
Stage 1	864	-	-	-	-	-
Stage 2	889	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	690	958	1408	-	-	-
Mov Cap-2 Maneuver	712	-	-	-	-	-
Stage 1	856	-	-	-	-	-
Stage 2	889	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.5	0.4	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1408	-	712	958	-	-
HCM Lane V/C Ratio	0.008	-	0.163	0.041	-	-
HCM Control Delay (s)	7.6	-	11	8.9	-	-
HCM Lane LOS	A	-	B	A	-	-
HCM 95th %tile Q(veh)	0	-	0.6	0.1	-	-

Intersection	
Int Delay, s/veh	2.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	72	24	8	120	132	23
Future Vol, veh/h	72	24	8	120	132	23
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	50	0	100	-	-	-
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	78	26	9	130	143	25

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	239	84	168	0	-	0
Stage 1	156	-	-	-	-	-
Stage 2	83	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	728	958	1407	-	-	-
Stage 1	856	-	-	-	-	-
Stage 2	931	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	724	958	1407	-	-	-
Mov Cap-2 Maneuver	733	-	-	-	-	-
Stage 1	851	-	-	-	-	-
Stage 2	931	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.1	0.5	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1407	-	733	958	-	-
HCM Lane V/C Ratio	0.006	-	0.107	0.027	-	-
HCM Control Delay (s)	7.6	-	10.5	8.9	-	-
HCM Lane LOS	A	-	B	A	-	-
HCM 95th %tile Q(veh)	0	-	0.4	0.1	-	-

Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	67	22	38	329	401	116
Future Vol, veh/h	67	22	38	329	401	116
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	50	0	100	-	-	-
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	73	24	41	358	436	126

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	760	281	562	0	-	0
Stage 1	499	-	-	-	-	-
Stage 2	261	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	342	716	1005	-	-	-
Stage 1	575	-	-	-	-	-
Stage 2	759	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	328	716	1005	-	-	-
Mov Cap-2 Maneuver	434	-	-	-	-	-
Stage 1	551	-	-	-	-	-
Stage 2	759	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.8	0.9	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1005	-	434	716	-	-
HCM Lane V/C Ratio	0.041	-	0.168	0.033	-	-
HCM Control Delay (s)	8.7	-	15	10.2	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.6	0.1	-	-

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	45	15	26	322	346	77
Future Vol, veh/h	45	15	26	322	346	77
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	50	0	100	-	-	-
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	49	16	28	350	376	84

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	649	230	460	0	-	0
Stage 1	418	-	-	-	-	-
Stage 2	231	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	402	772	1097	-	-	-
Stage 1	632	-	-	-	-	-
Stage 2	785	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	392	772	1097	-	-	-
Mov Cap-2 Maneuver	488	-	-	-	-	-
Stage 1	616	-	-	-	-	-
Stage 2	785	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.3	0.6	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1097	-	488	772	-	-
HCM Lane V/C Ratio	0.026	-	0.1	0.021	-	-
HCM Control Delay (s)	8.4	-	13.2	9.8	-	-
HCM Lane LOS	A	-	B	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0.3	0.1	-	-

APPENDIX F:
AMBIENT GROWTH MEMORANDUM

FEHR PEERS

Memorandum

Date: August 9, 2022

To: Los Angeles County Department of Public Works

From: Jeremy Klop and Vivian Lee, Fehr & Peers

Subject: Ambient Growth Rate for Lyons Canyon Project

LA20-3234

This memorandum summarizes a review of the ambient growth rate used in the Lyons Canyon Draft Traffic Impact Analysis. Based on previous discussion with the County and their subsequent approval, an ambient growth rate of 0.35% was used to determine future growth projections for the study. Given that new counts were taken for the analysis and the initial growth rate was developed during the COVID-19 pandemic, the County requested that Fehr & Peers review the new and historic counts to reassess the ambient growth rate used in the analysis and determine if an update is required. Fehr & Peers also conducted a review of volumes from the base and future year Southern California Association of Governments (SCAG) Travel Demand Model.

Ambient Growth Rate Analysis

New and Historic Counts

Historic counts at The Old Road & Calgrove Boulevard were provided by the County. These counts were taken in 2016. As stay-at-home orders were lifted and most businesses returned to working in person, new counts were taken in June 2022 at this location. The total intersection volume at this location in 2016 was 594 and the total intersection volume in 2022 was 505. This location shows a total decrease of 15% over the six-year period. The annualized growth rate is -2.67%.

SCAG Model

Volumes at the segment level were pulled from the 2016 existing year and future year 2040 SCAG model at select roadways in the Project study area. Each of the roadways are made up of multiple links within the model and the daily flow link volumes were average cross each of the selected roadways. The growth was then calculated for the total daily flow volumes between the base and future years. This growth was annualized for each of the locations and then averaged across all

locations. **Figure 1** shows the locations of the selected roadways from the model in red. **Table 1** shows the calculations for these locations.

Figure 1: Selected Roadways from SCAG Model

Table 1: Growth Calculations within Project Study Area

Road Name	2016 Total Daily Flow	2040 Total Daily Flow	Total Growth %	Annualized Growth %	Average Growth Rate
Pico Canyon Rd - Lyons Ave	29,100	37,100	27.49%	1.02%	0.02%
The Old Road	11,500	9,600	-16.52%	-0.75%	
Calgrove Blvd	15,500	14,600	-5.81%	-0.25%	
Stevenson Ranch Pkwy - McBean Pkwy	24,000	23,300	-2.92%	-0.12%	
Wiley Canyon Rd	12,800	13,500	5.47%	0.22%	

The table shows that annualized growth over the 24-year period ranges from 1% to -0.76% for each of the roadways within the Project study area. The average annualized growth rate for the selected roadways within the study area is 0.02%.

Conclusion

Both the counts and the volumes from the model show that there is little to negative growth projected in the study area for the Lyons Canyon Project. The counts reflect a decrease in growth at 2.67% per year since 2016. The regional SCAG model shows that the growth in the area is projected to be 0.02% per year. The ambient growth rate used in the study was 0.35%, which is conservative compared to the results from the counts and the model. Therefore, it is recommended that the ambient growth rate used in the study does not need to be updated.

APPENDIX G:
SIGNAL WARRANT SHEETS

FEHR PEERS

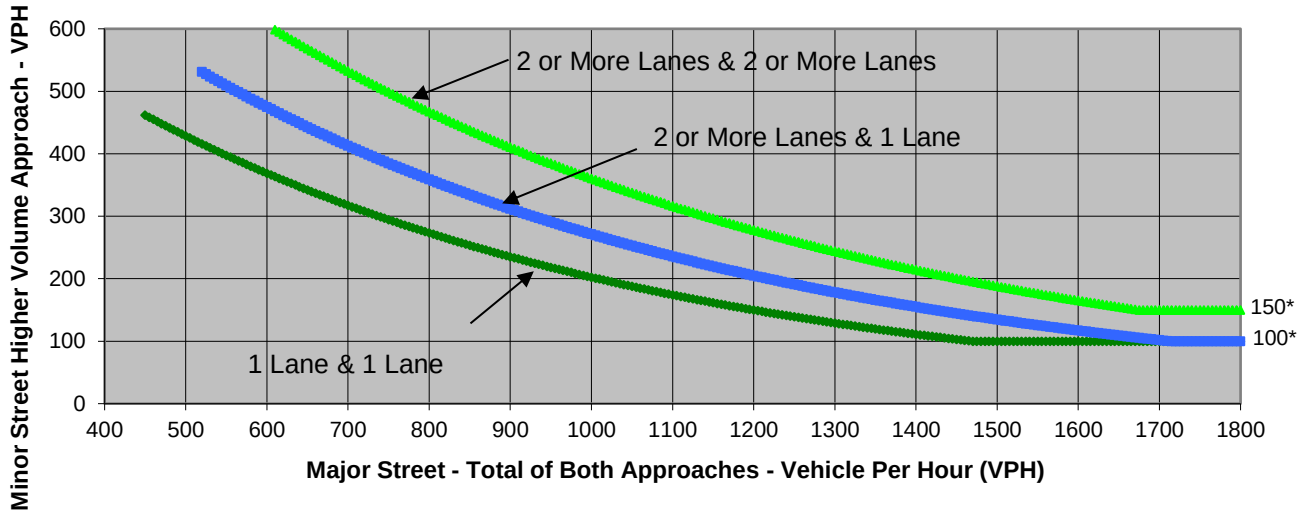
Major Street	The Old Road	Project	Lyons Canyon
Minor Street	"A" Street	Scenario	Future (2029) + Project Conditions
		Peak Hour	AM

Turn Movement Volumes

	NB	SB	EB	WB
Left	11	0	107	0
Through	181	119	0	0
Right	0	35	36	0
Total	192	154	143	0

Major Street Direction

X	North/South
	East/West



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	The Old Road	"A" Street	
Number of Approach Lanes	**2**	**1**	**NO**
Traffic Volume (VPH) *	**346**	**143**	

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

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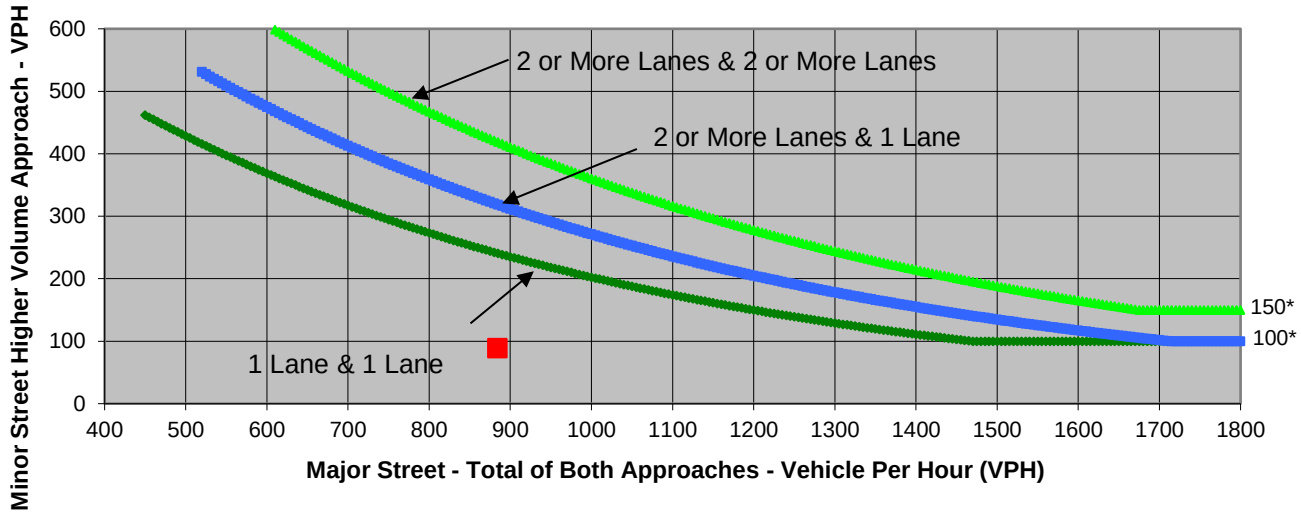
Major Street	The Old Road	Project	Lyons Canyon
Minor Street	"A" Street	Scenario	Future (2029) + Project Conditions
		Peak Hour	PM

Turn Movement Volumes

	NB	SB	EB	WB
Left	38	0	67	0
Through	329	401	0	0
Right	0	116	22	0
Total	367	517	89	0

Major Street Direction

X	North/South
	East/West



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	The Old Road	"A" Street	
Number of Approach Lanes	**2**	**1**	**NO**
Traffic Volume (VPH) *	**884**	**89**	

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR PEERS

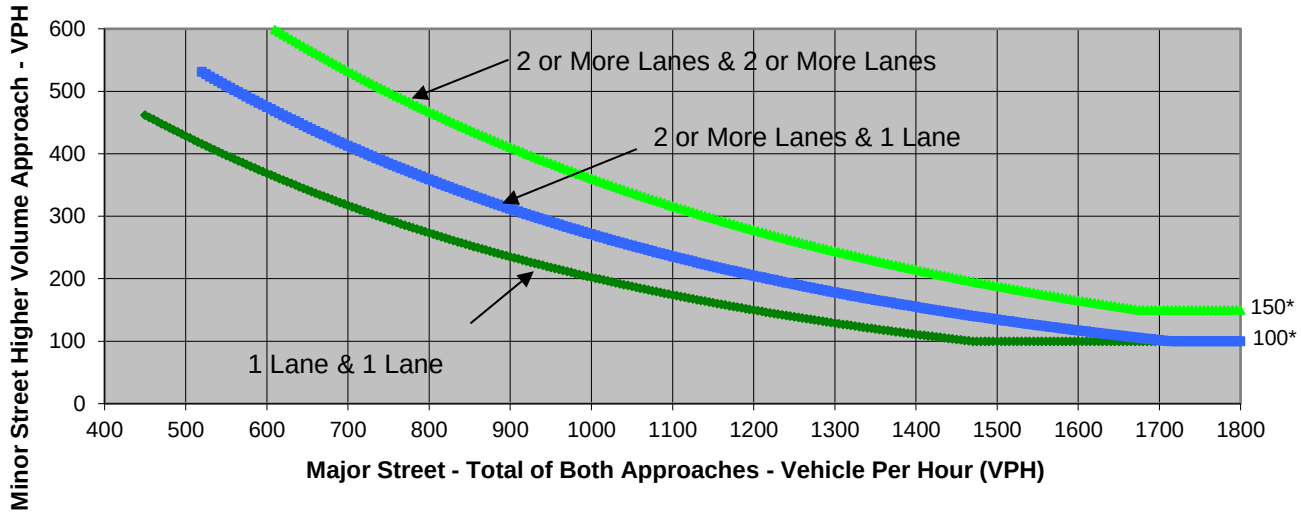
Major Street	The Old Road	Project	Lyons Canyon
Minor Street	"B" Street	Scenario	Future (2029) + Project Conditions
		Peak Hour	AM

Turn Movement Volumes

	NB	SB	EB	WB
Left	8	0	72	0
Through	120	132	0	0
Right	0	23	24	0
Total	128	155	96	0

Major Street Direction

X	North/South
	East/West



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	The Old Road	"B" Street	
Number of Approach Lanes	**2**	**1**	**NO**
Traffic Volume (VPH) *	**283**	**96**	

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR PEERS

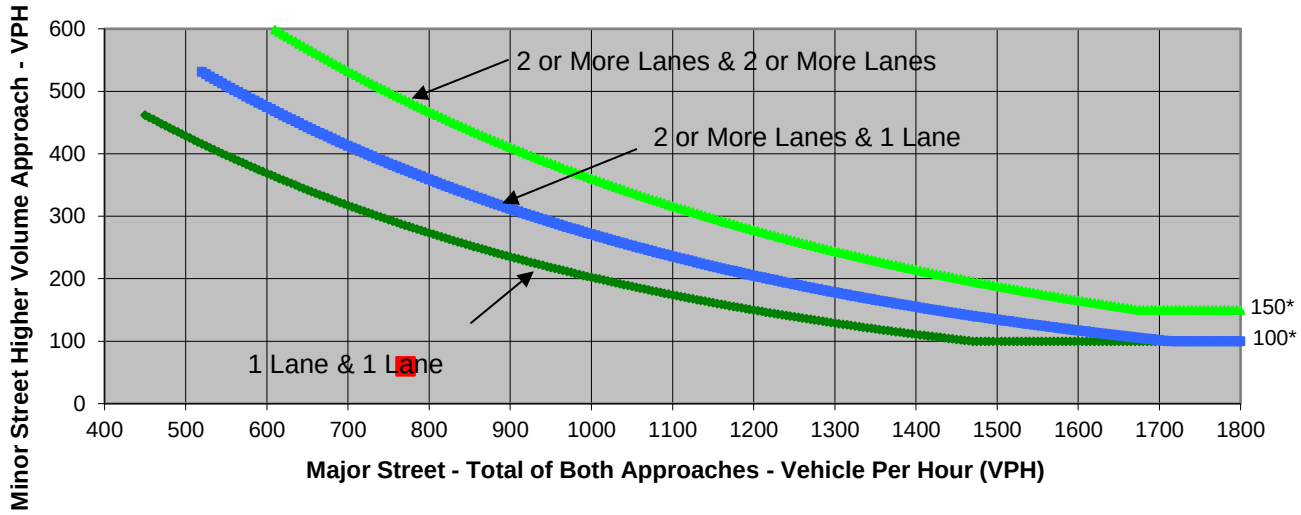
Major Street	The Old Road	Project	Lyons Canyon
Minor Street	"B" Street	Scenario	Future (2029) + Project Conditions
		Peak Hour	PM

Turn Movement Volumes

	NB	SB	EB	WB
Left	26	0	45	0
Through	322	346	0	0
Right	0	77	15	0
Total	348	423	60	0

Major Street Direction

X	North/South
	East/West



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	The Old Road	"B" Street	
Number of Approach Lanes	**2**	**1**	**NO**
Traffic Volume (VPH) *	**771**	**60**	

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

APPENDIX H:
TDM+ TOOL

FEHR & PEERS

Neighborhood Design - T-18. Provide Pedestrian Network Improvement

Locational Context	**Urban, Suburban, Rural**
Scale of Application	**Plan/Community**
Type of VMT affected:	**Household trips**
Max VMT reduction:	**6.40%**

This measure will increase the sidewalk coverage to improve pedestrian access. Providing sidewalks and an enhanced pedestrian network encourages people to walk instead of drive. This mode shift results in a reduction in VMT and GHG emissions. The 'study area' should be based on a 1 KM buffer around the area where the pedestrian network is being improved. The VMT reduction is limited to household VMT.

Existing sidewalk length in study area	3.0	**mile**	user input (default value = 0-9999)
Sidewalk length in study area with measure	6.00	**mile**	user input (default value = 0-9999)
Elasticity of VMT with respect to the ratio of sidewalks-to-streets	-0.050	**unitless**	constant (default value = -0.05)
Change in VMT	**-5.07%**	**percent reduction**	

Note: Existing sidewalk length were measured on google aerial map. Sidewalk length with measure based on the Project's proposed site plan (Figure 1).

Formula: % Change in VMT = ((Sidewalk length in study area with measure / Existing sidewalk length in study area) - 1) * Elasticity of VMT with respect to the ratio of sidewalks-to-streets

Sources:

(1) Federal Highway Administration (FHWA). 2019. 2017 National Household Travel Survey Popular Vehicle Trip Statistics. Available: https://nhts.ornl.gov/vehicle-trips. Accessed: January 2021.

(2) Frank, L., M. Greenwald, S. Kavage, and A. Devlin. 2011. An Assessment of Urban Form and Pedestrian and Transit Improvements as an Integrated GHG Reduction Strategy. WSDOT Research Report WA-RD 765.1, Washington State Department of Transportation. April. Available: www.wsdot.wa.gov/research/reports/fullreports/765.1.pdf. Accessed: January 2021.

(3) Handy, S., S. Glan-Claudia, and M. Boarnet. 2014. Impacts of Pedestrian Strategies on Passenger Vehicle Use and Greenhouse Gas Emissions: Policy Brief. September. Available: https://ww2.arb.ca.gov/sites/default/files/2020- 06/Impacts_of_Pedestrian_Strategies_on_Passenger_Vehicle_Use_and_Greenhouse_Gas_Emissions_Policy_Brief.pdf. Accessed: January 2021.

FEHR & PEERS

Neighborhood Design - T-19-A. Construct or Improve Bike Facility

Locational Context **Urban, Suburban**
Scale of Application **Plan/Community**
Type of VMT affected: **All neighborhood/city trips**
Max VMT reduction: **0.80%**

This measure will construct or improve a single bicycle lane facility (only Class I, II, or IV) that connects to a larger existing bikeway network. Providing bicycle infrastructure helps to improve biking conditions within an area. This encourages a mode shift on the roadway parallel to the bicycle facility from vehicles to bicycles, displacing VMT and thus reducing GHG emissions. When constructing or improving a bicycle facility, a best practice is to consider local or state bike lane width standards. A variation of this measure is provided as T-19-B, Construct or Improve Bike Boulevard.

Select the Core-Based Statistical Area for the project.	Los Angeles-Long Beach-Anaheim		Appendix C. T-10.1
Select existing annual average daily traffic of the facility	1 to 12,000		Appendix C. T-19.1
Select the length of the proposed bike facility	≤ 1 mile		Appendix C. T-19.1
What is the city popultion?	200,000		
Is the proposed facility in an university town?	No		
Select number of key destinations between 1/4 to 1/2 mile of facility	≥ 7		Appendix C. T-19.2
Select number of key destinations within 1/4 mile of facility	3		Appendix C. T-19.2
Select the proposed facility type	New Class II bike lane		Appendix C. T-19.3
Percent of plan/community VMT on parallel roadway	100.0%	percent	user input (default value = 0-1)
Active transportation adjustment factor	0.002	unitless	constant (default value = 0.0052-0.0207)
Credits for key destinations near project	0.003	unitless	constant (default value = 0-0.0015)
Growth factor adjustment for facility type	1.000	unitless	constant (default value = 0.54-1.54)
Annual days of use of new facility	332	day	optional (default value = 252-365)
Existing regional average one-way bicycle trip length	1.7	mile	optional (default value = 1.7-2.9)
Existing regional average one-way vehicle trip length	9.7	mile	optional (default value = 9.7-19.1)
Days per year	365	day	constant (default value = 365)
Change in VMT	-0.07%	percent reduction	

Formula: % Change in VMT = -Percent of plan/community VMT on parallel roadway * (((Annual days of use of new facility / Days per year) * (Active transportation adjustment factor + Credits for key destinations near project) * Growth factor adjustment for facility type * Existing regional average one-way bicycle trip length) / Existing regional average one-way vehicle trip length)

Sources:

(1) California Air Resources Board (CARB). 2020. Quantification Methodology for the Strategic Growth Council's Affordable Housing and Sustainable Communities Program. September. Available: https://ww2.arb.ca.gov/sites/default/files/classic/cc/capandtrade/auctionproceeds/draft_sgc_ahsc_q m_091620.pdf. Accessed: January 2021.

(2) Federal Highway Administration (FHWA). 2017. National Household Travel Survey–2017 Table Designer. Travel Day PT by TRPTRANS by HH_CBSA. Available: https://nhts.ornl.gov/. Accessed: January 2021.

(3) National Oceanic and Atmospheric Administration (NOAA). 2021. Global Historical Climatology Network–Daily (GHCN-Daily), Version 3. 2015-2019 Average of Days Per Year with Precipitation >0.1 Inches. Available: https://www.ncei.noaa.gov/access/search/data-search/dailysummaries?bbox=38.922,-120.071,38.338,-119.547&place=County:1276&dataTypes=PRCP&startDate=2015-01- 01T00:00:00&endDate=2019-01-01T23:59:59. Accessed: May 2021.

FEHR & PEERS

Neighborhood Design - T-19-B. Construct or Improve Bike Boulevard

Locational Context	**Urban, Suburban**
Scale of Application	**Plan/Community**
Type of VMT affected:	**All neighborhood/city trips**
Max VMT reduction:	**0.20%**

Construct or improve a single bicycle boulevard that connects to a larger existing bikeway network. Bicycle boulevards are a designation within Class III Bikeway that create safe, low-stress connections for people biking and walking on streets. This encourages a mode shift from vehicles to bicycles, displacing VMT and thus reducing GHG emissions. A variation of this measure is provided as T-19-A, Construct or Improve Bike Facility, which is for Class I, II, or IV bicycle infrastructure.

The following roadway conditions must be met.

- Functional classification: local and collector if there is no more than a single general-purpose travel lane in each direction.
- Design speed: <= 25 miles per hour.
- Design volume <= 5,000 average daily traffic.
- Treatments at major intersections: both directions have traffic signals (or an effective control device that prioritizes pedestrian and bicycle access such as rapid flashing beacons, pedestrian hybrid beacons, high-intensity activated crosswalks, TOUCANs), bike route signs, "sharrowed" roadway markings, and pedestrian crosswalks.

Select the Core-Based Statistical Area for the project.	Los Angeles-Long Beach-Anaheim		Appendix C. T-10.1
Percent of plan/community VMT on roadway to have bicycle boulevard	**100.0%**	**percent**	user input (default value = 0-1)
Bike mode adjustment factor	**1.140**	**unitless**	constant (default value = 1.14)
Existing bicycle trip length for all trips in region	**1.7**	**mile**	optional (default value = 1.7-2.9)
Existing vehicle trip length for all trips in region	**9.7**	**mile**	optional (default value = 9.7-19.1)
Existing bicycle mode share for work trips in region	**1.0%**	**percent**	optional (default value = 0.004-0.041)
Existing vehicle mode share for work trips in region	**90.7%**	**percent**	optional (default value = 0.671-0.953)
Change in VMT	**-0.03%**	**percent reduction**	

Formula: % Change in VMT = Percent of plan/community VMT on roadway to have bicycle boulevard * ((Existing bicycle trip length for all trips in region * (Existing bicycle mode share for work trips in region - (Bike mode adjustment factor * Existing bicycle mode share for work trips in region))) / (Existing vehicle trip length for all trips in region * Existing vehicle mode share for work trips in region))

Sources:

(1) Federal Highway Administration (FHWA). 2017a. National Household Travel Survey–2017 Table Designer. Travel Day PT by TRPTRANS by HH_CBSA. Available: https://nhts.ornl.gov/. Accessed: January 2021.

(2) Federal Highway Administration (FHWA). 2017b. National Household Travel Survey–2017 Table Designer. Workers by WRKTRANS by HH_CBSA. Available: https://nhts.ornl.gov/. Accessed: January 2021.

(3) Schwartz, S. 2021. Planning for Stress Free Connections: Estimating VMT Reductions. February.

FEHR PEERS

Neighborhood Design - T-20. Expand Bikeway Network

Locational Context **Urban, Suburban**
Scale of Application **Plan/Community**
Type of VMT affected: **Employee commute trips**
Max VMT reduction: **0.50%**

This measure will increase the length of a city or community bikeway network. A bicycle network is an interconnected system of bike lanes, bike paths, bike routes, and cycle tracks. Providing bicycle infrastructure with markings and signage on appropriately sized roads with vehicle traffic traveling at safe speeds helps to improve biking conditions (e.g., safety and convenience). In addition, expanded bikeway networks can increase access to and from transit hubs, thereby expanding the "catchment area" of the transit stop or station and increasing ridership. This encourages a mode shift from vehicles to bicycles, displacing VMT and thus reducing GHG emissions. When expanding a bicycle network, a best practice is to consider bike lane width standards from local agencies, state agencies, or the National Association of City Transportation Officials' Urban Bikeway Design Guide. The bikeway network must consist of either Class I, II, or IV infrastructure.

Select the Core-Based Statistical Area for the project.	Los Angeles-Long Beach-Anaheim		Appendix C. T-20.1
Existing bikeway miles in plan/community	0.9	**mile**	user input (default value = 0-9999)
Bikeway miles in plan/community with measure	1.3	**mile**	user input (default value = 0-9999)
Bicycle mode share in plan/community	0.2%	**percent**	optional (default value = 0.0006-0.0079)
Vehicle mode share in plan/community	4.2%	**percent**	optional (default value = 0.8696-0.9688)
Average one-way bicycle trip length in plan/community	1.7	**mile**	optional (default value = 1.7-2.9)
Average one-way vehicle trip length in plan/community	9.7	**mile**	optional (default value = 9.7-19.1)
Elasticity of bike commuters with respect to bikeway miles per 10,000 population	0.250	**unitless**	constant (default value = 0.25)
Change in VMT	-0.07%	**percent reduction**	

Formula: % Change in VMT = -1 * ((((Bikeway miles in plan/community with measure - Existing bikeway miles in plan/community) / Existing bikeway miles in plan/community) * Bicycle mode share in plan/community * Average one-way bicycle trip length in plan/community * Elasticity of bike commuters with respect to bikeway miles per 10,000 population) / (Vehicle mode share in plan/community * Average one-way vehicle trip length in plan/community))

Sources:
(1) Federal Highway Administration (FHWA). 2017. National Household Travel Survey – 2017 Table Designer. Travel Day PMT by TRPTRANS by HH_CBSA. Available: https://nhts.ornl.gov/. Accessed: January 2021.

(2) Pucher, J., Buehler, R. 2011. Analysis of Bicycling Trends and Policies in Large North American Cities: Lessons for New York. March. Available: http://www.utrc2.org/sites/default/files/pubs/analysis-bike-final_0.pdf. Accessed: January 2021.

FEHR & PEERS

Neighborhood Design - T-22-B. Implement Electric Bikeshare Programs

Locational Context **Urban, Suburban**
Scale of Application **Plan/Community**
Type of VMT affected: **All neighborhood/city trips**
Max VMT reduction: **0.06%**

This measure will establish an electric bikeshare program. Electric bikeshare programs provide users with on-demand access to electric pedal assist bikes for short-term rentals. This encourages a mode shift from vehicles to electric bicycles, displacing VMT and reducing GHG emissions. Variations of this measure are described in Measure T-22-A, Implement Pedal (Non-Electric) Bikeshare Program, and Measure T-22-C, Implement Scootershare Program. Access to electric bikesharing is measured as the percent of residences in the plan/community within 0.25-mile of an electric bikeshare station. For dockless bikes, assume that all residences within 0.25 mile of the designated dockless service area would have access.

Select the Core-Based Statistical Area for the project.	Los Angeles-Long Beach-Anaheim		Appendix C. T-10.1
Percent of residences in plan/community with access to electric bikeshare system without measure	0.0%	percent	user input (default value = 0-1)
Percent of residences in plan/community with access to electric bikeshare system with measure	100.0%	percent	user input (default value = 0-1)
Daily electric bikeshare trips per person	0.021	trip	constant (default value = 0.021)
Vehicle to electric bikeshare substitution rate	35.0%	percent	constant (default value = 0.35)
Electric bikeshare average one-way trip length	2.1	mile	optional (default value = 2.1)
Daily vehicle trips per person	2.700	trip	constant (default value = 2.7)
Regional average one-way vehicle trip length	9.7	mile	optional (default value = 9.7-19.1)
Change in VMT	-0.06%	percent reduction	

Formula: % Change in VMT = -1 * (((Percent of residences in plan/community with access to electric bikeshare system with measure - Percent of residences in plan/community with access to electric bikeshare system without measure) * Daily electric bikeshare trips per person * Vehicle to electric bikeshare substitution rate * Electric bikeshare average one-way trip length) / (Daily vehicle trips per person * Regional average one-way vehicle trip length))

Sources:

(1) Federal Highway Administration (FHWA). 2017. National Household Travel Survey–2017 Table Designer. Travel Day PT by TRPTRANS by HH_CBSA. Available: https://nhts.ornl.gov/. Accessed: January 2021.

(2) Federal Highway Administration (FHWA). 2018. Summary of Travel Trends 2017–National Household Travel Survey. July. Available: https://www.fhwa.dot.gov/policyinformation/documents/2017_nhts_summary_travel_trends.pdf. Accessed: January 2021.

(3) Fitch, D., H. Mohiuddin, and S. Handy. 2021. Examining the Effects of the Sacramento Dockless E-Bike Share on Bicycling and Driving. MDPI: Sustainability. January. Available: https://www.mdpi.com/2071-1050/13/1/368. Accessed: March 2021.

(4) Metropolitan Transportation Commission (MTC). 2017. Plan Bay Area 2040 Final Supplemental Report–Travel Modeling Report. July. Available: http://2040.planbayarea.org/files/2020-02/Travel_Modeling_PBA2040_Supplemental%20Report_7-2017.pdf. Accessed: January 2021.

FEHR & PEERS

Trip Reduction Programs - T-23. Provide Community-Based Travel Planning

Locational Context	**Urban, Suburban**
Scale of Application	**Plan/Community**
Type of VMT affected:	**Household trips**
Max VMT reduction:	**2.30%**

This measure will target residences in the plan/community with community-based travel planning (CBTP). CBTP is a residential-based approach to outreach that provides households with customized information, incentives, and support to encourage the use of transportation alternatives in place of single occupancy vehicles, thereby reducing household VMT and associated GHG emissions.

Residences in plan/community	1433	**residence**	user input (default value = 0-99999)
Residences in plan/community targeted with CBTP	1433	**residence**	user input (default value = 0-99999)
Percent of targeted residences that participate	19.0%	**percent**	constant (default value = 0.19)
Percent vehicle trip reduction by participating residences	12.0%	**percent**	constant (default value = 0.12)
Adjustment factor from vehicle trips to VMT	1.000	**unitless**	constant (default value = 1)
Change in VMT	**-2.28%**	**percent reduction**	

Formula: % Change in VMT = - (Residences in plan/community targeted with CBTP / Residences in plan/community) * Percent of targeted residences that participate * Percent vehicle trip reduction by participating residences * Adjustment factor from vehicle trips to VMT

Sources:

(1) Metropolitan Transportation Commission (MTC). 2021. Plan Bay Area 2050, Supplemental Report. (forthcoming)

APPENDIX I:
TRIP GENERATION COMPARISON

Appendix I
Comparison of Trip Generation Estimates
Using ITE 10th Edition and 11th Edition

ITE Trip Generation Manual Edition	Trip Generation Estimates					
	AM Peak Hour			PM Peak Hour		
	Total	In	Out	Total	In	Out
10th Edition [a]	315	77	238	406	257	149
11th Edition, use "Multifamily Housing (Low-Rise) (Land Use: 220)" for Attached Townhomes [b]	288	71	217	380	239	141
Compared to 10th Edition	***-27***	***-6***	***-21***	***-26***	***-18***	***-8***
11th Edition, use "Single-Family Attached Housing (Land Use: 215)" for Attached Townhomes [b]	305	76	229	392	242	150
Compared to 10th Edition	***-10***	***-1***	***-9***	***-14***	***-15***	***1***

Notes:

[a] Source: Institute of Transportation Engineers (ITE), Trip Generation Manual, 10th Edition, 2017.

[b] Source: Institute of Transportation Engineers (ITE), Trip Generation Manual, 11th Edition, 2021.

APPENDIX J:
CAPCOA MEASURES FEASIBILITY ANALYSIS

Appendix J

CAPCOA Measures Feasibility Analysis[1]

Measure #	Category	Scale [1]	VMT Reduction [2]	Evaluation
CAPCOA Transportation Measures				
Land Use				
T-1	Increase Residential Density	P/S	Not Applicable	Given the existing General Plan limitations on residential for the Project site, residential density is already at its maximum. The Project follows this measure as the Project is seeking a density bonus to exceed the otherwise applicable density limit. But even if density were to increase, any such density increase at the Project would not affect the distance people travel nor to provide greater options for the modes of travel they choose.
T-2	Increase Job Density	P/S	Not Applicable	Applies to non-residential projects.
T-3	Provide Transit-Oriented Development	P/S	Not Applicable	This measure is largely a function of, or dependent upon, site location and the surrounding neighborhood's existing conditions. The Project is not located in an existing Transit-Oriented District (TOD) per the General Plan. However, due to the Project's proximity to I-5, the Project is considered to be located in proximity to a transit corridor. While the surrounding area primarily consists of residential uses, there are nearby commercial uses to the north that are within walking distance. Given the walkability of the neighborhood, abundant open space, bike accessibility, nearby commercial uses, and proximity to a transit corridor, the Project has elements of a transit-oriented development that would support higher frequency service in the future.

[1] Page 6 of the *Handbook for Analyzing Greenhouse Gas Emissions Reductions, Assessing Climate Vulnerabilities, and Advancing Health and Equity* (the Handbook) states that "… the Handbook measures and quantitative methods (including available defaults) should not be automatically applied to a project without thoughtful consideration of project-specific circumstances."

Measure #	Category	Scale [1]	VMT Reduction [2]	Evaluation
T-4	Integrate Affordable and Below Market Rate Housing	P/S	Applicable	This measure is included as part of the project description (including very low-income senior units and moderate-income units) and its VMT reduction credits are included in the Project VMT analysis.
T-17	Improve Street Connectivity	P/C	Not Applicable	This measure is largely a function of, or dependent upon, site location and surrounding neighborhood's existing network. There is no existing network to connect to, except The Old Road. The Project includes internal street connectivity and adds two more intersections to The Old Road. This is part of the project description and thus not a mitigation measure. The Project is not retrofitting an existing street network nor introducing new network connections to surrounding networks with the exception of The Old Road.
Trip Reduction Programs				
T-5	Implement Commute Trip Reduction Program (Voluntary)	P/S	Applicable, Not Quantified	The Project will include a Carpool/Vanpool Incentives program that provides monetary assistance with fares or gas costs for carpool/vanpool users. Applicable measures at the Project/Site scale would be applied to the Project qualitatively.
T-6	Implement Commute Trip Reduction Program (Mandatory Implementation and Monitoring)	P/S	Not Applicable	The Project will include the Voluntary program (T-5). The mandatory program is aimed at employers and would require regional or local agency implementation and coordination and these programs are not available to the Project's location and context. Since this is a residential project, it does not apply to the Project.
T-7	Implement Commute Trip Reduction Marketing	P/S	Not Applicable	This measure is for employment generating uses and does not apply to the Project.

Measure #	Category	Scale [1]	VMT Reduction [2]	Evaluation
T-8	Provide Ridesharing Program	P/S	Not Applicable	This measure reduces employee commute VMT by requiring that employers of a project provide a ridesharing program to their employees. Since this is a residential project, it does not apply to the Project.
T-9	Implement Subsidized or Discounted Transit Program	P/S	Applicable, Not Quantified	The Project will provide subsidized/discounted daily or monthly public transit passes to residents. Applicable measures at the Project/Site scale would be applied to the Project qualitatively.
T-10	Provide End-of-Trip Bicycle Facilities	P/S	Not Applicable	Abundant bike parking would be provided at the Project in compliance with the County Code. This measure reduces employee commute VMT by requiring that employers of a project provide end-of-trip facilities for employee use. Since this is a residential project, it does not apply to the Project.
T-11	Provide Employer-Sponsored Van pool	P/S	Not Applicable	This measure is for employment generating uses and does not apply to the Project.
T-12	Price Workplace Parking	P/S	Not Applicable	This measure would price onsite parking at workplaces, and thus is not applicable to residential projects.
T-13	Implement Employee Parking Cash-Out	P/S	Not Applicable	This measure would require project employers to offer employee parking cash-out, and thus is not applicable to residential projects.
T-23	Provide Community-Based Travel Planning	P/C	2.28%	TDM Measure: This measure would target residences in the plan/community scale with community-based travel planning. This is a residential-based approach to outreach that provides households with customized information, incentives, and support to encourage the use of transportation alternatives in place of single occupancy vehicles, thereby reducing household VMT. The Project will create a ridesharing program for school children. Most school districts provide bussing services to public schools only. School Pool helps match parents to transport students to private schools or to schools where students cannot walk or bike and do not meet the requirements for bussing.

Measure #	Category	Scale [1]	VMT Reduction [2]	Evaluation
Parking or Road Pricing/Management				
T-14	Provide Electric Vehicle Charging Infrastructure	P/S	Infrastructure provided. Not Applicable to VMT, but applicable to GHG.	The project will provide EV charging infrastructure, but this measure is not applicable to VMT reduction. CAPCOA research does not indicate a reduction in VMT, but indicates a reduction in GHG only.
T-15	Limit Residential Parking Supply	P/S	Not Applicable	Parking requirements are regulated by the County's Zoning Code. CAPCOA states that when limiting parking supply, a best practice is to do so at sites that are located near high quality alternative modes of travel (such as a rail station, frequent bus line, or in a higher density area with multiple walkable locations nearly). This context is not present in the project location, so limiting residential parking supply is unlikely to reduce VMT.
T-16	Unbundle Residential Parking Costs from Property Cost	P/S	Infeasible	Considering the non-affordable housing component will have individual private garage parking spaces, unbundling parking is not possible. Further, unbundling of parking from affordable units is not possible as that would have an economically adverse impact on lower-income residents which would not be permissible.
T-24	Implement Market Price Public Parking (On-Street)	P/C	Not Applicable	CAPCOA states that this measure focuses on parking near central business districts, employment centers, and retail centers, and thus does not apply to a residential project in a suburban area. Additionally, monetizing parking affects the affordability of housing, which is not desirable in this context.
Neighborhood Design				

Measure #	Category	Scale [1]	VMT Reduction [2]	Evaluation
T-18	Provide Pedestrian Network Improvements	P/C	5.07%	TDM Measure: The site will be designed to encourage walking, biking, and taking transit. Providing a pedestrian access network to link areas within the project site (parks, open space, and community center) and connecting off-site locations (retail/open space) encourages people to walk instead of drive.
T-19-A	Construct or Improve Bike Facility	P/C	0.07%	TDM Measure: CAPCOA states that the bicycle lane facility must be either Class I, II, or IV. The Project would not construct these bicycle facilities within the project site but would include a Class III bike route on the fire access road loop. Considering that the roadways and private driveways would be designed to meet County road and driveway standards, a Class I, II, or IV bike facility would not be feasible within the project site, especially as such additional right-of-way would result in fewer dwelling units which would not be permissible. Class III bike boulevard designation is available on the local streets internal to the site. The County is also planning to extend the existing Class II bike lane along The Old Road at the Project frontage. This proposed Class II bike lane would improve bike access to the neighborhood and benefit the Project, encouraging alternative mode use.
T-19-B	Construct or Improve Bike Boulevard	P/C	0.03%	TDM Measure: Per CAPCOA, Bicycle Boulevards are a designation within Class III bike route that create safe, low-stress connections for people biking and walking on streets. The Project would include a Class III bike route on the fire access road loop ("A" Street, "B" Street, and the Private Access Road on the northwest periphery of project site) and improve the connectivity between The Old Road and the trails to the west.
T-20	Expand Bikeway Network	P/C	0.07%	TDM Measure: The Project's main loop road ("A" Street and "B" Street, approximately 0.6 mile) would be wide enough to accommodate a Class III bike route. The paved fire access road (the Private Access Road on the northwest periphery of project site, approximately 0.7 mile) would provide connectivity between The Old Road and the trails to the west.

Measure #	Category	Scale [1]	VMT Reduction [2]	Evaluation
T-21-A	Implement Conventional Carshare Program	P/C	Not Applicable	Considering the low-density residential nature of the Project and an absence of commercial uses, potential car share is not feasible here. Moreover, given the likely need for local agency or regional agency implementation and coordination, which is absent here, as well as the private driveways on which many of the dwelling units would be located so that carshare would be inconvenient and inaccessible, this measure would not be feasible for this lower density residential project.
T-21-B	Implement Electric Carshare Program	P/C	Not Applicable	The implementation of this measure would require regional or local agency implementation and coordination and would not likely be applicable for individual development projects. Electric vehicle charging will be provided for dwelling units within the Project.
T-22-A	Implement Pedal (Non-Electric) Bikeshare Program	P/C	Infeasible	CAPCOA: "Variations of this measure are described in Measure T-21-B, Implement Electric Bikeshare Program, and Measure T-21-C, Implement Scootershare Program". The Project will include an Electric Bikeshare Program (T-22-B), which is more efficient than the Pedal Bikeshare program in VMT reduction.
T-22-B	Implement Electric Bikeshare Programs	P/C	0.06%	TDM Measure: The Project would include E-bike loaner program (separate from the publicly accessible options in the City) to provide residents with short-term access for trips.
T-22-C	Implement Scootershare Program	P/C	Infeasible	CAPCOA: "Variations of this measure are described in Measure T-21-A, Implement Pedal (Non-Electric) Bikeshare Program, and Measure T-21-B, Implement Electric Bikeshare Program". The Project would include an Electric Bikeshare Program (T-22-B).

Measure #	Category	Scale [1]	VMT Reduction [2]	Evaluation
Transit				
T-25	Extend Transit Network Coverage or Hours	P/C	Not Applicable	The implementation of this measure would require regional or local agency implementation, substantial changes to current transit practices, and would require a transit or community plan modification. This is not applicable for individual development projects.
T-26	Increase Transit Service Frequency	P/C	Not Applicable	The implementation of this measure would require regional or local agency implementation, substantial changes to current transit practices, and would require a transit or community plan modification. This is not applicable for individual development projects.
T-27	Implement Transit-Supportive Roadway Treatments	P/C	Not Applicable	The implementation of this measure would require regional or local agency implementation, substantial changes to current transit practices, and would require a transit or community plan modification. This is not applicable for individual development projects.
T-28	Provide Bus Rapid Transit	P/C	Not Applicable	The implementation of this measure would require regional or local agency implementation, substantial changes to current transit practices, and would require a transit or community plan modification. This is not applicable for individual development projects.
T-29	Reduce Transit Fares	P/C	Not Applicable	The implementation of this measure would require regional or local agency implementation, substantial changes to current transit practices, and would require a transit or community plan modification. This is not applicable for individual development projects.
Clean Vehicles and Fuels				
T-30	Use Cleaner-Fuel Vehicles	P/S or P/C	Not Applicable	This measure does not apply to a residential land use project.
Supporting or Non-Quantified Measures				

Measure #	Category	Scale [1]	VMT Reduction [2]	Evaluation
T-31-A	Locate Project in Area with High Destination Accessibility	P/S	Applicable, Not Quantified	The measure provides for development in an area with high accessibility to destinations. Destination accessibility is measured in terms of the number of jobs or other attractions (e.g., schools, supermarkets, and health care services) that are reachable within a given travel time or travel distance. When destinations are nearby, the travel time between them is less, thus increasing the potential for people to walk and bike to those destinations and, therefore, reducing the vehicle miles traveled (VMT) and associated greenhouse gas (GHG) emissions. Convenient retail is located along The Old Road just north of Lyons Avenue/Pico Canyon Road, and also along Lyons Avenue to the east in the City of Santa Clarita. The Project would also provide convenient access to on-site trails, open space, and a recreation center, thereby reducing the need for vehicular trips.
T-31-B	Improve Destination Accessibility in Underserved Areas	P/C	Not Applicable, Not Quantified	This is not an underserved area, and therefore, the measure does not apply to project location.
T-32	Orient Project Toward Transit, Bicycle, or Pedestrian Facility	P/S	Applicable, Quantified	Project includes and accounts for T-18 Provide Pedestrian Network Improvements, T-19-A Construct or Improve Bike Facility, T-19-B Construct or Improve Bike Boulevard, and T-20 Expand Bikeway Network. Expected co-benefits include Improved Air Quality, Energy and Fuel Savings, VMT Reductions (noted above), Enhanced Pedestrian or Traffic Safety, and Improved Public Health.
T-33	Locate Project near Bike Path/Bike Lane	P/S	Applicable, Quantified	The County is planning to extend the existing Class II bike lane along The Old Road at the Project frontage. Further, the project would be connected to an extensive trail network to the west. Project includes and accounts for T-19-A Construct or Improve Bike Facility. Expected co-benefits include Improved Air Quality, Energy and Fuel Savings, VMT Reductions (noted above), Enhanced Pedestrian or Traffic Safety, and Improved Public Health.
T-34	Provide Bike Parking	All	Applicable, Not Quantified	Abundant bike parking would be provided at the Project in compliance with the County Code. Expected co-benefits include Improved Air Quality, Energy and Fuel Savings, VMT Reductions (noted above), Enhanced Pedestrian or Traffic Safety, and Improved Public Health.

Measure #	Category	Scale [1]	VMT Reduction [2]	Evaluation
T-35	Provide Traffic Calming Measures	P/C	Applicable, Not Quantified	The network includes short blocks, frequent intersections, and local street network design that support low speed and traffic calmed driving conditions. Expected co-benefits include Improved Air Quality, Energy and Fuel Savings, VMT Reductions (noted above), Enhanced Pedestrian or Traffic Safety, and Improved Public Health.
T-36	Create Urban Non-Motorized Zones	P/C	Not Applicable, Not Quantified	CAPCOA mentions that this measure is only applicable to projects located in urban environments. The project is located in a suburban environment and thus this measure is not applicable.
T-37	Dedicate Land for Bike Trails	P/C	Applicable, Not Quantified	The Project includes a Class III bike route on the fire access road loop and improve the connectivity between The Old Road and the trails to the west. Expected co-benefits include Improved Air Quality, Energy and Fuel Savings, VMT Reductions (noted above), Enhanced Pedestrian or Traffic Safety, and Improved Public Health.
T-38	Provide First and Last Mile TNC Incentives	P/C	Applicable, Not Quantified	Variations of supportive First and Last Mile measures are described in Measure T-21-A, Implement Pedal (Non-Electric) Bikeshare Program, and Measure T-21-B, Implement Electric Bikeshare Program". The Project will include an Electric Bikeshare Program (T-22-B). Expected co-benefits include Improved Air Quality, Energy and Fuel Savings, VMT Reductions (noted above), Enhanced Pedestrian or Traffic Safety, and Improved Public Health.
T-39	Implement Preferential Parking Permit Program	P/S	Not Quantified, Not Applicable	This measure does not apply to project location given the inclusion of parking in the project design and the lack of parking congestion or other parking problems identified in the surrounding area.
T-40	Implement School Bus Program	P/S	Not Applicable, Not Quantified	The Project would create a ridesharing program for school children. Most school districts provide bussing services to public schools only. School Pool helps match parents to transport students to private schools or to schools where students cannot walk or bike and do not meet the requirements for bussing.

Measure #	Category	Scale [1]	VMT Reduction [2]	Evaluation
T-41	Implement a School Pool Program	P/S	Applicable, Quantified	Project includes T-23 Provide Community-Based Travel Planning and would create a ridesharing program for school children. Most school districts provide bussing services to public schools only. School Pool helps match parents to transport students to private schools or to schools where students cannot walk or bike and do not meet the requirements for bussing. Expected co-benefits include Improved Air Quality, Energy and Fuel Savings, VMT Reductions (noted above), Enhanced Pedestrian or Traffic Safety, and Improved Public Health.
T-42	Implement Telecommute and/or Alternative Work Schedule Program	P/S	Applicable, Not Quantified	This strategy relies on effective internet infrastructure, access and speeds to individual project sites/buildings to provide the opportunity for telecommuting. Floor plans for dwelling units will also include home office space.
T-43	Provide Real-Time Transit Information	P/C	Not Applicable, Not Quantified	This measure does not apply to project location given the lack of transit facilities in the project area.
T-44	Provide Shuttles (Gas or Electric)	P/S	Not Applicable, Not Quantified	The implementation of this measure would require regional or local agency implementation, substantial changes to current transit practices, and would require a transit or community plan modification.
T-45	Provide On-Demand Microtransit	All	Not Applicable, Not Quantified	The implementation of this measure would require regional or local agency implementation, substantial changes to current transit practices, and would require a transit or community plan modification.
T-46	Improve Transit Access, Safety, and Comfort	P/C	Not Applicable, Not Quantified	The site is designed to facilitate walk and bike access to and along The Old Road in a safe and comfortable manner.
T-47	Provide Bike Parking Near Transit	P/C	Not Applicable, Not Quantified	This measure does not apply due to project location.
T-48	Implement Area or Cordon Pricing	P/C	Not Applicable, Not Quantified	The implementation of this measure would require regional or local agency implementation, substantial changes to current transportation pricing practices, and would require a community plan modification.

Measure #	Category	Scale [1]	VMT Reduction [2]	Evaluation
T-49	Replace Traffic Controls with Roundabout	P/C	Not Applicable, Not Quantified	There are no traffic controls along The Old Road in the vicinity of the Project site in the existing conditions, so therefore, it's not applicable; can't replace traffic controls that don't exist. The Project proposes two new intersections with stop-controlled on side streets. Given that there is no access through the project site to other destinations, there is no need for any roundabout to smooth traffic flow through the project site. Further, given the right-of-way constraints along The Old Road, the implementation of this measure would require regional or local agency implementation, substantial changes to current transportation plans for The Old Road, and would require a community plan modification.
T-50	Required Project Contributions to Transportation Infrastructure Improvement	P/C	Applicable, Not Quantified	The County is planning to extend the existing Class II bike lane along The Old Road at the Project frontage. This proposed Class II bike lane would improve bike access to the neighborhood and benefit the Project, encouraging alternative mode use. Additionally, the project would contribute to transportation infrastructure improvements along The Old Road. Expected co-benefits include Improved Air Quality, Energy and Fuel Savings, VMT Reductions (noted above), Enhanced Pedestrian or Traffic Safety, and Improved Public Health.
T-51	Install Park-and-Ride Lots	P/C	Not Applicable, Not Quantified	This measure does not apply to project location and transit facility context.
T-52	Designate Zero Emissions Delivery Zones	P/C	Not Applicable, Not Quantified	This measure is only applicable to commercial loading zones and does not apply to project location.
T-53	Electrify Loading Docks	P/S	Not Applicable, Not Quantified	This measure does not apply to project location given that the land use program does not include uses that will be serviced by loading docks.
T-54	Install Hydrogen Fueling Infrastructure	All	Not Applicable, Not Quantified	This measure does not apply to project location given that the land use program does not include fueling related uses.

Note:

[1] Scale of application column abbreviations: P/S = Project/Site; P/C = Plan/Community; All.

[2] VMT reduction based on research documented in the 2021 California Air Pollution Control Officers Association (CAPCOA) publication, *Handbook for Analyzing Greenhouse Gas Emission Reductions, Assessing Climate Vulnerabilities, and Advancing Health and Equity* as well as the Fehr

& Peers TDM+ tool endorsed by Caltrans on their SB 743 Implementation Resources webpage. It considers a variety of TDM strategies and the setting in which they may apply. For quantifiable measures T-1 through T-30, the handbook estimates the VMT reducing effectiveness, and applies caps when appropriate (for example, simply aggregating the effectiveness of individual TDM measures can sometimes yield a result that is overestimated since more than one measure may be targeting the same trip). CAPCOA offers methodologies based on preferred literature, along with methodologies based on alternative literature, for each **quantified** measure. Transportation measures T-31-A through T-54 are **non-quantified**, which means they can be expected to have other co-benefits, but do not have a research based quantified effect on VMT approved by CAPCOA.

Source: Fehr & Peers.