

## **APPENDIX I**

### **Transportation Assessment**



**TRANSPORTATION ASSESSMENT  
FOR  
BELCARO AT SAND CANYON  
SANTA CLARITA, CALIFORNIA**

MAY 2026

PREPARED FOR  
**NUWI-SAND CANYON, LLC**

PREPARED BY



**TRANSPORTATION ASSESSMENT  
FOR  
BELCARO AT SAND CANYON  
SANTA CLARITA, CALIFORNIA**

May 2026

Prepared for:

**NUWI-SAND CANYON, LLC**

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# **Chapter 1**

## **Introduction**

This report presents the transportation assessment for Belcaro at Sand Canyon (Project), a senior residential development located along a future extension of Lost Canyon Road, approximately 0.75 miles east of Sand Canyon Road in the City of Santa Clarita (City). The Project is proposed by NUWI-Sand Canyon, LLC (Applicant). The methodology and base assumptions used in the analysis were established in consultation with the City and in conformance with *Transportation Analysis Updates in Santa Clarita* (Fehr & Peers, May 19, 2020) (TAU), which is the City's guiding document for the preparation of transportation analysis for development projects.

### **PROJECT DESCRIPTION**

#### **Project Site Information**

As shown in Figure 1, the Project Site is generally bounded by the Santa Clara River to the north, open space to the east, Oak Springs Canyon Road to the south, and adjacent residential developments to the west. The Project Site is assigned Parcel Numbers 2840-001-118, 2840-015-025, 2840-015-031, 2840-015-032, 2840-015-033, 2840-015-034, 2840-015-035, 2840-015-045, and 2840-015-047 in the Los Angeles County Assessor's records.

#### **Project Development and Access**

The Project proposes to construct a senior living community with 341 single-family homes surrounding a recreation center on land that is currently undeveloped. Each home would have a private garage for parking, and on-street parking would be allowed within the Project Site.

There would be two vehicular access points to the Project Site. The northern Project access point would be via the Project's proposed extension of Lost Canyon Road easterly from its current

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terminus at Oak Springs Canyon Road to the northerly portion of the Project Site. A second access point would be provided on the south side of the Project Site to Oak Springs Canyon Road east of Graceton Drive. Across from this access point, the Project would provide a new road between Oak Springs Canyon Road and Robinson Ranch Road. This connection would be east of Graceton Drive and west of the Sand Canyon Country Club, as shown in Figure 2.

An internal network of private streets and trails, shown in Figure 2, would provide internal circulation and recreation opportunities (e.g., bicycling and walking) for residents and guests. The Project would also construct a new public multi-use path along the eastern and northern boundaries of the Project Site. It would continue west along Lost Canyon Road, beyond the Project Site boundary, ending at the bridge just west of Sand Canyon Road. At the southern end of the Project Site, it would also continue south along the new connection to Robinson Ranch Road. The multi-use path would connect to an existing trail at the southeast corner of the Project Site.

The Project would be constructed in one phase over approximately four years and be completed in year 2032. Entitlement applications were filed with the City Planning Department in January 2024 and were assigned Master Case Number 24-093.

### **Off-Site Project Traffic Improvements**

The Project will also be conditioned by the City to make improvements on Sand Canyon Road and at the intersection of Sand Canyon Road and Lost Canyon Road. The responsibility to construct these improvements is shared with the previously-entitled Vista Canyon development project which was also conditioned to construct these improvements. The Applicant will work with the City and the Vista Canyon project applicant to allocate cost, timing, and responsibilities for these improvements. The improvements would be implemented by the time the Project receives its first certificate of occupancy or as otherwise agreed with the City.

The improvements consist of restriping southbound Sand Canyon Road beginning south of the State Route 14 (SR 14) northbound ramps to provide two lanes, one of which would be a dedicated right turn lane to Lost Canyon Road. This lane, stretching over one quarter mile, would carry over the Santa Clara River bridge. The intersection of Sand Canyon Road & Lost Canyon

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Road would be converted to a roundabout with one circulating lane and the exclusive right-turn-only lane from southbound Sand Canyon Road to westbound Lost Canyon Road. A diagram of the improvement is included in Appendix A.

Alternatively, at the City's discretion, the intersection of Sand Canyon Road & Lost Canyon Road may be signalized. Both the roundabout and signalized options were analyzed in this report.

### **Summary of Project Features and Improvements**

Table 1 provides a comprehensive summary of all of the transportation-related Project design features and Project-adjacent off-site improvements described above which the Project would implement.

### **ANALYSIS METHODOLOGY**

The Project's Study Area, shown in Figure 3, consists of the area around Sand Canyon Road from north of Soledad Canyon Road to south of Robinson Ranch Road. The scope and methodology of the analysis in this report were developed in consultation with the City and are summarized in a Scoping Letter, provided in Appendix B, which was approved prior to conducting the study. Two broad categories of transportation analyses are required by the City in the TAU.

The first category relates to potential transportation impacts under the California Environmental Quality Act (CEQA). Should a project exceed thresholds identified in the TAU, its impact would be considered significant under CEQA and, thus, would require feasible mitigation measures be implemented to reduce the impact below the threshold of significance. The City's CEQA thresholds identified in the TAU are consistent with CEQA guidelines and State Office of Planning and Research technical guidance.

The second category, non-CEQA transportation analysis, involves the review of transportation issues relating to safety, access, and congestion as they may be affected by construction or operation of a project.

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## CEQA Analyses

- Conflicts with Plans, Programs, Ordinances, or Policies
- Vehicle Miles Traveled (VMT) screening and analysis
- Substantially Increasing Hazards Due to a Geometric Design Feature or Incompatible Use
- Freeway Safety Analysis<sup>1</sup>

## Non-CEQA Analyses

- Pedestrian, Bicycle, and Transit Access Assessment
- Project Access and Circulation Evaluation
- Project Construction

## **ORGANIZATION OF REPORT**

This report is divided into 10 chapters:

1. Introduction
2. Project Context
3. Transportation Assessment Screening
4. CEQA Analysis: Consistency with Policy
5. CEQA Analysis: VMT
6. CEQA Analysis: Geometric Design and Land Use Hazards
7. CEQA Analysis: Freeway Safety and Evacuation
8. Non-CEQA Analysis: Pedestrian, Bicycle, and Transit Access
9. Non-CEQA Analysis: Project Access, Safety, and Circulation
10. Non-CEQA Analysis: Project Construction

The appendices contain supporting documentation and additional details supporting the technical analyses.

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<sup>1</sup> A Freeway Safety Analysis was prepared pursuant to Caltrans policy and addresses the transportation thresholds of significance requiring an analysis of whether the Project conflicts with a program, plan, ordinance, or policy addressing the circulation system.



**LEGEND**

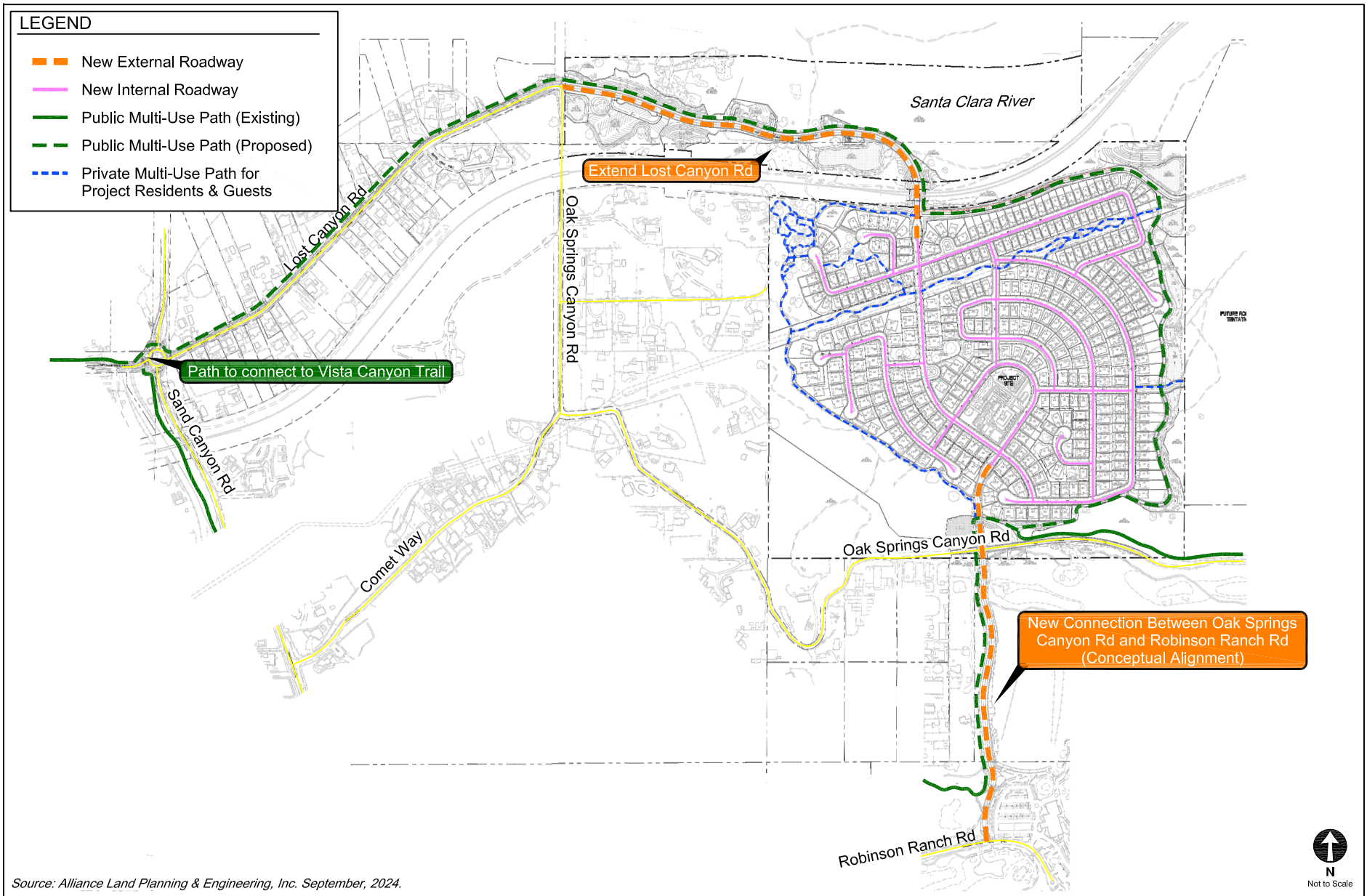
 Project Site



Not to Scale

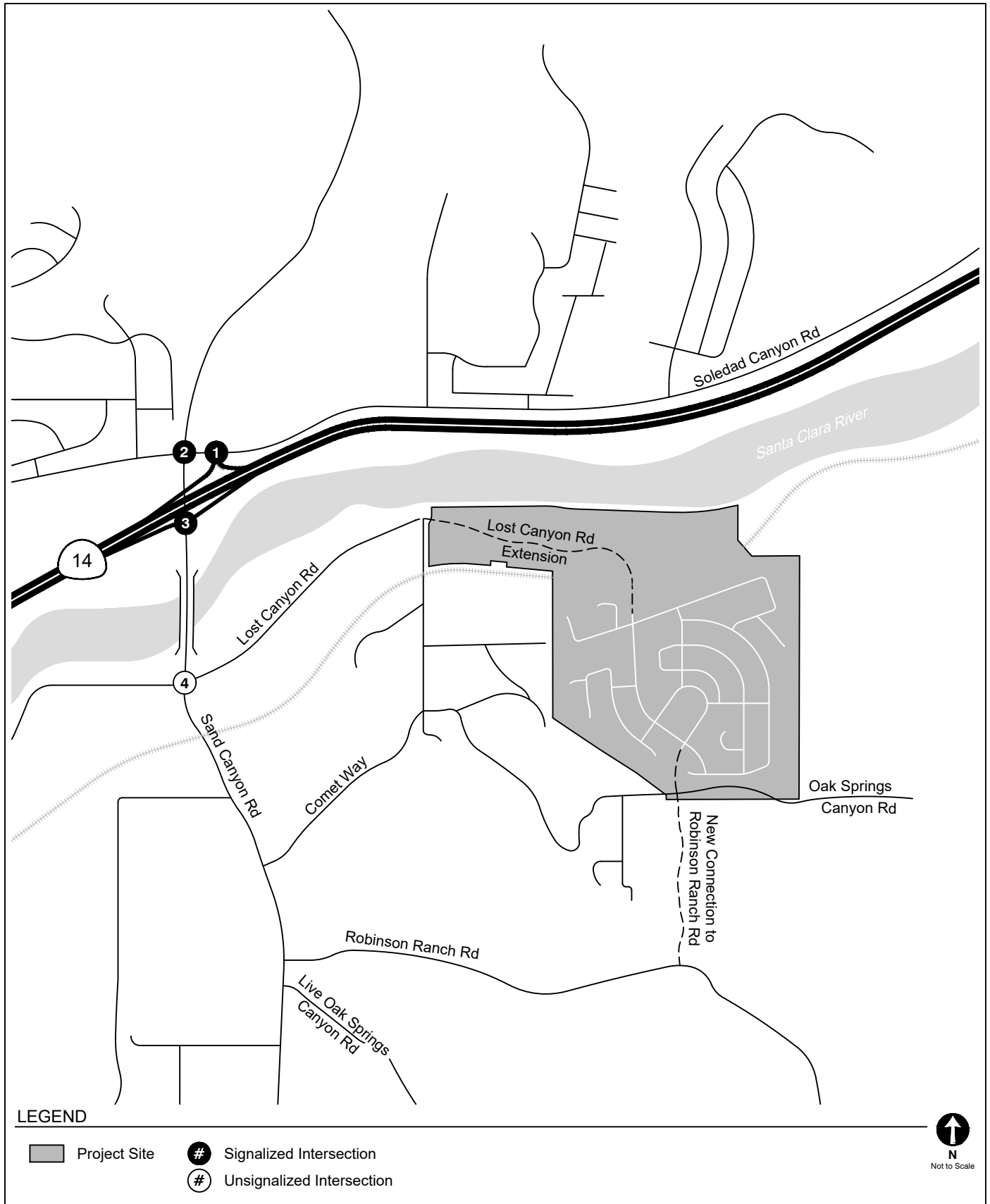
PROJECT SITE LOCATION

FIGURE  
1



PROJECT SITE PLAN

FIGURE 2



STUDY AREA AND ANALYZED INTERSECTIONS

FIGURE 3

**TABLE 1  
TRANSPORTATION-RELATED PROJECT DESIGN FEATURES AND IMPROVEMENTS**

Description	Notes
<b><i>Project Design Features</i></b>	
<b>Extension of Lost Canyon Road</b> <i>from Oak Springs Canyon Road to north Project Site entrance</i>	Will result in new 3-way intersection of Oak Springs Canyon Road & Lost Canyon Road
<b>New South Road</b> <i>from Oak Springs Canyon Road to Robinson Ranch Road</i>	Will result in new 4-way intersection with south Project Site entrance and Oak Springs Canyon Road and new 3-way intersection at Robinson Ranch Road
<b>Private Internal Roadways</b>	Internal circulation roads for Project residents and guests
<b>Internal Sidewalks and Landscaping</b>	Internal pedestrian circulation network for Project residents and guests
<b>Public Multi-Use Trail</b> <i>from Lost Canyon Road to Robinson Ranch Road around the north and east sides of the Project Site</i>	Connects to the existing east-west trails along Lost Canyon Road west of Sand Canyon Road and on Oak Springs Canyon Road east of the Project Site
<b>Private Internal Trails</b>	For use of Project residents and guests
<b>Private Garages</b>	Each home would be equipped with a private garage for vehicle and bicycle parking
<b><i>Improvements the Project Would Be Conditioned to Implement [a]</i></b>	
<b>Intersection #4</b> <b>Sand Canyon Road &amp; Lost Canyon Road</b> <i>Install roundabout or traffic signal control</i>	This improvement consists of extending the southbound right-turn lane over the Santa Clara River bridge as well as reconfiguring the intersection of Sand Canyon Road & Lost Canyon Road with either: - a roundabout with a single circulating lane and a southbound to westbound bypass lane, or - with traffic signal control instead of stop sign control

Notes:

[a] The responsibility to construct these improvements is shared with the previously-entitled Vista Canyon development project which was also conditioned to construct these improvements. The Applicant will work with the City and the Vista Canyon project applicant to allocate cost, timing, and responsibilities for these improvements. The improvements would be implemented by the time the Project receives its first certificate of occupancy or as otherwise agreed with the City.

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## **Chapter 2**

### **Project Context**

This chapter presents a comprehensive summary of the area surrounding the Project Site in conformance with the requirements of the TAU. It describes key streets, transit routes, and freeway ramps within the Study Area.

#### **EXISTING STREET SYSTEM**

The existing street system in the Study Area consists of a regional roadway system including freeways, primary and secondary arterials, and local streets that provide regional, sub-regional, or local access and circulation within the Study Area. These transportation facilities generally provide two to six travel lanes and usually allow parking on either side of the street. Typically, the speed limits range between 25 and 50 miles per hour (mph) on the streets and between 55 and 65 mph on freeways.

The Circulation Element outlines the classifications of streets within the City limits as follows:

- Regional Freeway Facilities are high-volume, high-speed roadways that provide regional access to the area. These generally have limited access provided by interchanges that carry regional through traffic and do not provide local access to adjacent land uses.
- The Surface Street System consists of five roadway types, including Major Highways, Secondary Highways, Limited Secondary Highways, Collector Streets, and Local Streets. Most roadways are further classified as “divided” or “undivided” to denote the inclusion of turning lanes to improve the vehicular capacity of the roadway.
  - Major Highways represent the widest streets and typically provide regional access to major destinations. These highways are at least six lanes wide, provide limited access to and from driveways and cross streets, and generally provide left-turn pockets at intersections. The intent of all Major Highways is to accommodate most traffic between different portions of the City and adjacent communities and the freeway system. Bicycle lanes are often delineated on major highways where parallel and adjacent bikeways are not available.

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- Secondary Highways are typically four lanes wide, provide limited access from driveways and cross streets, and generally provide left-turn pockets at intersections. The intent of all Secondary Highways is to service most through traffic and collect traffic from Limited Secondary Highways. Bicycle lanes are delineated on Secondary Highways where parallel and adjacent bikeways are not available.
  - Limited Secondary Highways are typically four lanes wide, provide partial control of vehicular and pedestrian access to the roadway from driveways, cross streets, and crosswalks, and do not typically have left-turn pockets at intersections. The roadway does provide limited on-street parking. The intent of all Limited Secondary Highways is to provide local access to Major and Secondary Highways.
  - Collector Streets are typically two lanes wide, provide limited access from driveways and cross streets, and generally do not provide left-turn pockets at intersections. The intent of all Collector Streets is to service all local traffic from residential, commercial, and industrial uses and provide access to Major, Secondary, and Limited Secondary Highways.
  - Local Streets are classified as any street that must be accessed through the use of any of the four previously identified roadways. Typical Local Streets include residential streets, private streets, service roads, and public alleys.

## **Freeways**

Primary regional access to the Project Site is provided by SR 14. The following is a brief description of the freeways serving the Study Area:

- SR 14 – SR 14 generally runs in the northeast-southwest direction approximately 1.5 miles north of the Project Site via Lost Canyon Road and Sand Canyon Road. In the vicinity of the Study Area, SR 14 provides three travel lanes in each direction with one westbound lane and one eastbound lane designated as a high occupancy vehicle lanes in the morning and afternoon peak hours, respectively. Access to and from SR 14 is available via interchanges at Placerita Canyon Road, Golden Valley Road, Via Princessa, Sand Canyon Road, and Soledad Canyon Road. SR 14 carries an average daily traffic volume between 155,000 and 170,000 in the Study Area.<sup>2</sup>

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<sup>2</sup> Source: <https://dot.ca.gov/programs/traffic-operations/census/traffic-volumes/2017/route-11-15>

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## **Roadways**

The following is a brief description of the major roadways and their designations in the Circulation Element, as summarized in Table 2:

- **Sand Canyon Road** – Sand Canyon Road is a designated Major Highway that runs in the north-south direction west of the Project Site. It provides four travel lanes, two in each direction, with additional right-turn and left-turn lanes at key intersections. On-street parking is generally not provided within the Study Area.
- **Soledad Canyon Road** – Soledad Canyon Road is a designated Major Highway that runs in the east-west direction along the north edge of the Study Area. It provides four to six travel lanes, two to three in each direction, with additional left-turn lanes. On-street parking is generally not provided within the Study Area.
- **Lost Canyon Road** – Lost Canyon Road is a designated Limited Secondary Highway that runs in the east-west direction. An easterly extension of Lost Canyon Road will connect the Sand Canyon Road corridor to the north section of the Project Site. It provides two travel lanes, one in each direction. On-street parking is generally not provided within the Study Area.

## **PEDESTRIAN, BICYCLE, AND TRANSIT FACILITIES**

A comprehensive inventory of destinations and facilities serving pedestrians, bicyclists, and transit riders within 0.5 miles of the Project Site was conducted. Figure 4 identifies commercial, institutional, and recreational destinations to which pedestrians may be drawn, along with pedestrian and bicycle infrastructure. As shown in Figure 4, the Santa Clara River is north of the Project Site, to the east is vacant land, and to the west and south are existing single-family homes. Destinations within walking distance of the Project Site are limited. There are bicycle lanes on Sand Canyon Road north of the Santa Clara River and on Soledad Canyon Road. There is a multi-use path along Oak Springs Canyon Road to the southeast of the Project Site (which would be extended around the east and north sides of the Project Site as part of the Project) and another along Sand Canyon Road south of Lost Canyon Road. Beyond the Study Area, the Santa Clara River bicycle path extends west for approximately 15 miles.

Figure 5 shows the route of Santa Clarita Transit 6, the only bus line in the Study Area, which operates on Soledad Canyon Road. Table 3 summarizes the peak period schedule for the stop at Sand Canyon Road & Soledad Canyon Road, the nearest stop, which is approximately 1.8

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miles walking distance from the northern Project access point. Additionally, Metrolink operates the Antelope Valley Line, which provides commuter rail service between Lancaster and downtown Los Angeles, where it connects with multiple services at Union Station. The Metrolink tracks bisect the Project Site, resulting in one section of the Project Site north of the tracks and a larger section south of the tracks. The nearest Metrolink Station to the Project Site is the Vista Canyon Metrolink Station on Mitchell Drive, located approximately 1.5 miles west (approximately 2.3 miles walking distance from the northern Project access point).

## **FUTURE CUMULATIVE CONDITIONS**

Project construction is anticipated to be completed in 2032. At that time, traffic in the Study Area would be affected by other development projects and transportation infrastructure improvements completed in the interim, as described in detail below. This analysis accounts for other nearby Projects anticipated to be completed by 2032.

### **Related Projects**

A list of developments that are proposed, approved, or under construction within the Study Area (collectively, the Related Projects) was provided by City, including any project that may contribute traffic to study intersections included in the operational analysis. The Related Projects, along with their vehicular trip generation estimates, are detailed in Table 4 and mapped in Figure 6. The trip generation estimates were prepared using rates from *Trip Generation Manual, 12<sup>th</sup> Edition* (Institute of Transportation Engineers, 2025) (Trip Generation Manual).

### **Future Infrastructure Improvements**

The transportation network within the Study Area could also be affected by the following regional improvement plans, local specific plans, and programmed improvements.

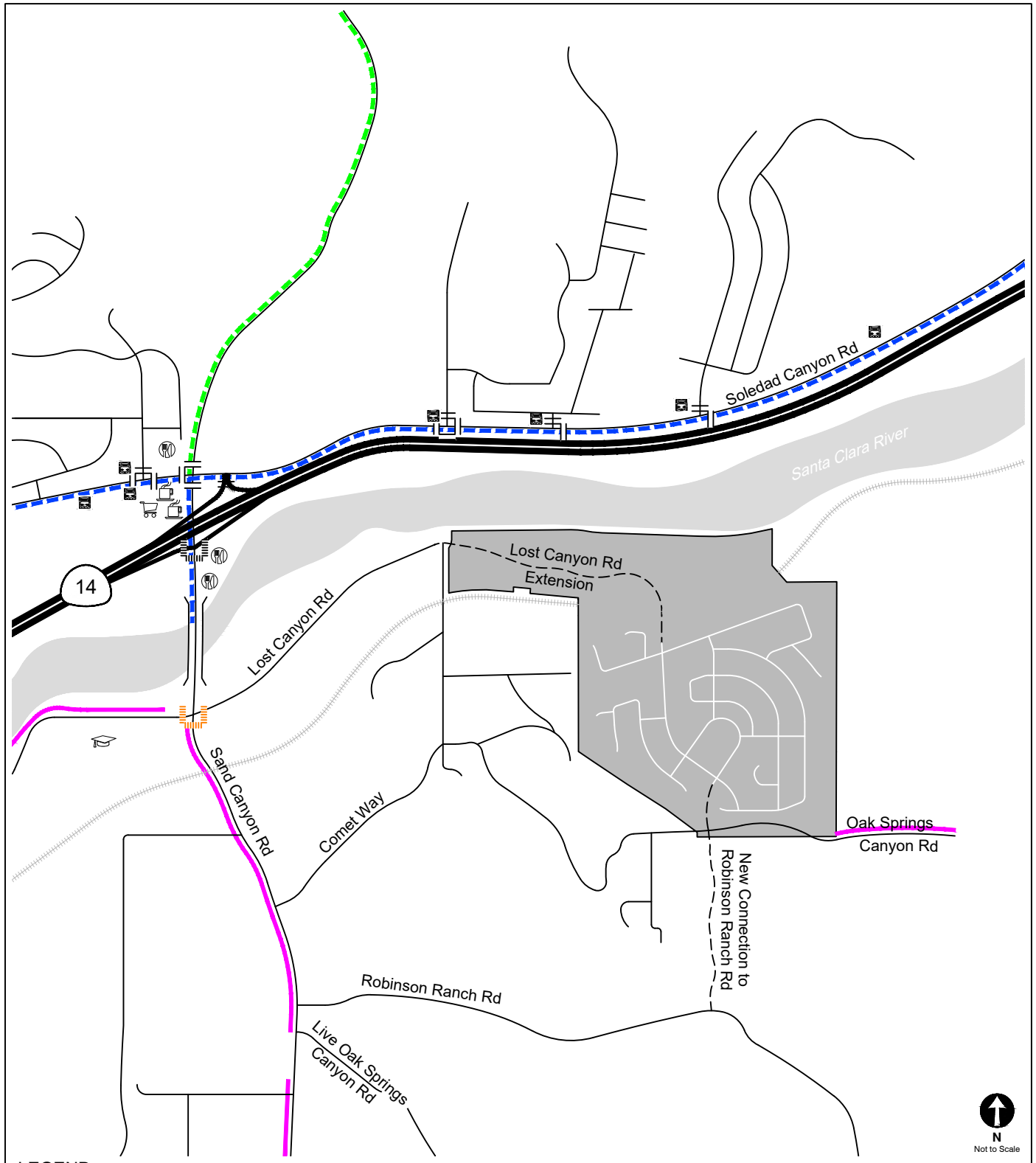
**Non-Motorized Transportation Plan.** *2020 City of Santa Clarita Non-Motorized Transportation Plan* (Alta Planning + Design, September 2020) (Non-Motorized Transportation Plan) identifies

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the City's vision for a more integrated bicycle and pedestrian network throughout the City, including within the Study Area. It proposes an extension of the Oak Springs Canyon multi-use trail to Sand Canyon Road (a substantial portion of which would be completed by the Project), a Class III bicycle route along Sand Canyon Road south of Lost Canyon Road, and an extension of the Santa Clara River bicycle path to the east past Sand Canyon Road.

**Sand Canyon Road & Lost Canyon Road Roundabout.** As described in Chapter 1, Sand Canyon Road & Lost Canyon Road (Intersection #4) will be upgraded to either a single-lane roundabout or traffic signal control. This improvement would include striping a second southbound lane on Sand Canyon Road south of the SR 14 northbound ramps which would become an exclusive right turn lane to Lost Canyon Road (a bypass lane, in the roundabout option). The Project will be conditioned by the City to install these intersection improvements. As the previously-entitled Vista Canyon development project was also conditioned to construct these improvements, the Applicant will work with the City and the Vista Canyon project applicant to allocate cost, timing and responsibilities to these improvements. The improvements would be implemented by the time the Project receives its first certificate of occupancy or as otherwise agreed with the City.

**Lost Canyon Road Improvements.** In conjunction with the proposed roundabout at Sand Canyon Road & Lost Canyon Road, the City plans improvements along Lost Canyon Road west of Sand Canyon Road to improve traffic flow during pick-up and drop-off for the schools on the south side of Lost Canyon Road. These improvements include an additional westbound lane between Sand Canyon Road and La Veda Avenue where left-turning vehicles could queue and a roundabout at the intersection of La Veda Avenue and Lost Canyon Road to facilitate U-turns. These improvements were assumed in place in *Sand Canyon & Lost Canyon Roundabout VISSIM Analysis Results* (Kittelsohn & Associates, February 17, 2026) (Kittelsohn Roundabout Study).

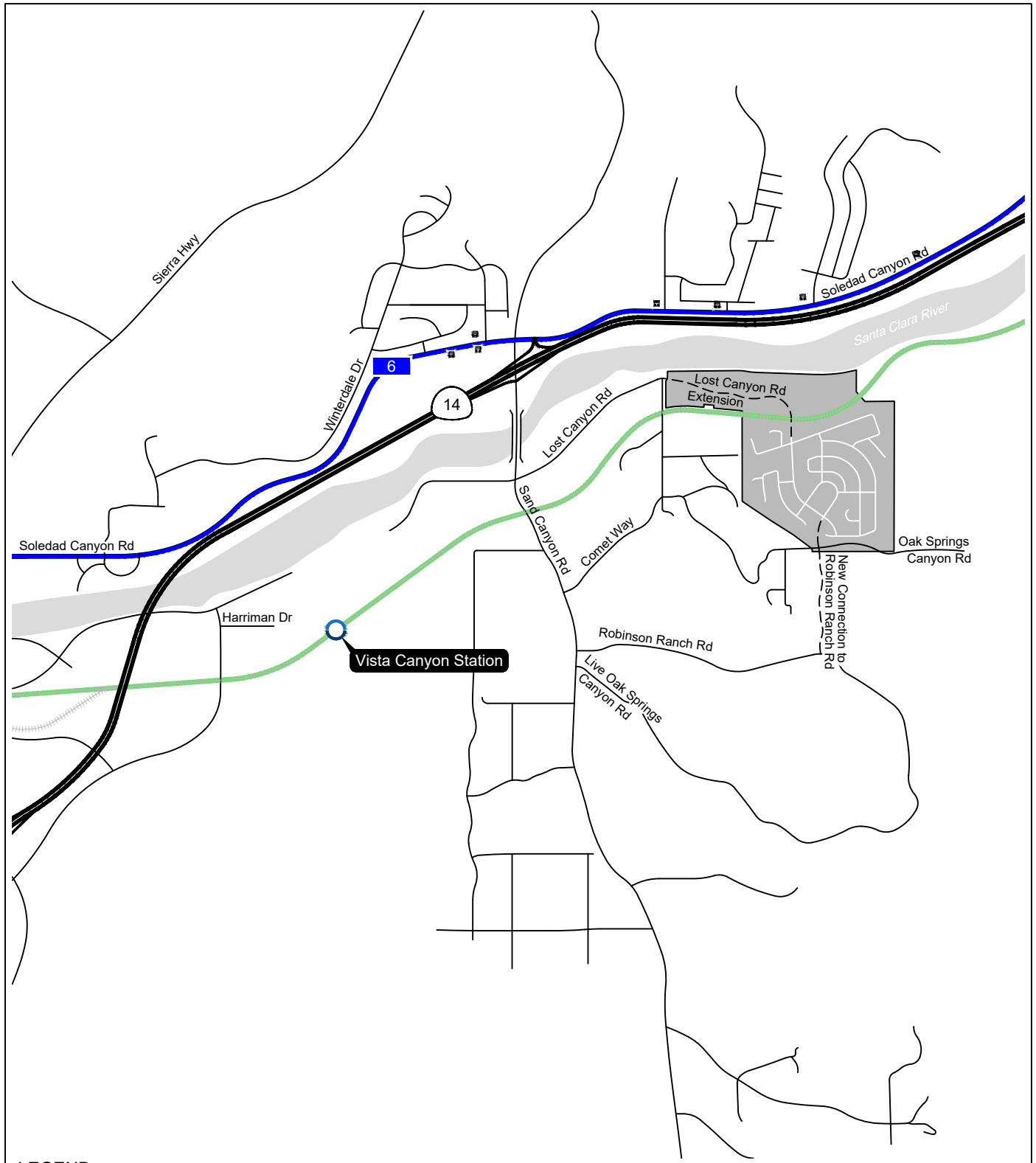


**LEGEND**

- |              |         |        |                      |                                 |                |
|--------------|---------|--------|----------------------|---------------------------------|----------------|
| Project Site | School  | Dining | Bike Lane (Class I)  | Pedestrian Crossing             | Multi-Use Path |
| Bus Stop     | Grocery | Cafe   | Bike Lane (Class II) | Pedestrian Crossing near School |                |

**EXISTING TRANSPORTATION FACILITIES AND PEDESTRIAN DESTINATIONS**

**FIGURE 4**



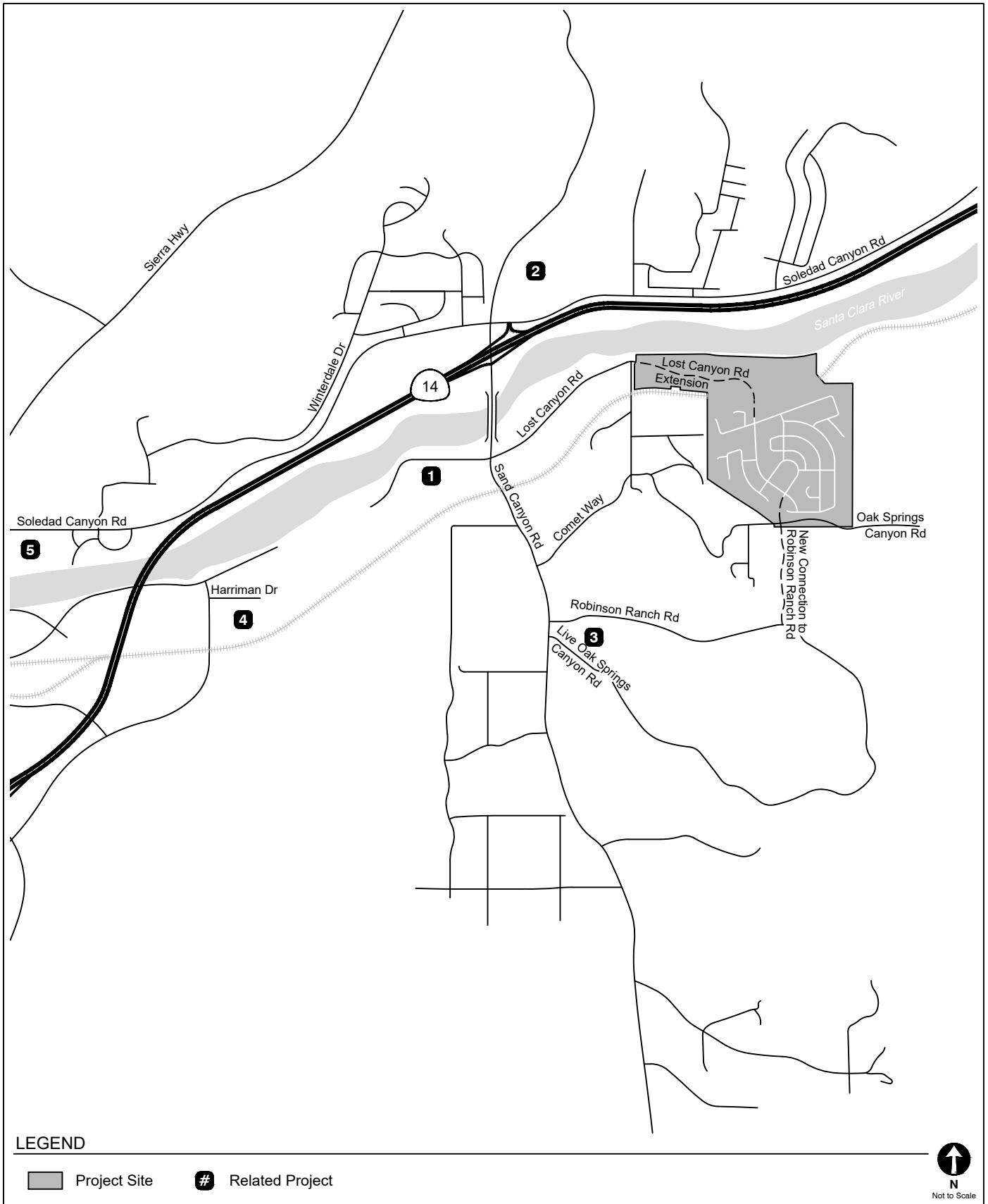
**LEGEND**

- Project Site
- Metrolink Station
- Metrolink Antelope Valley Line
- Bus Stop
- Santa Clarita Transit Bus 6



**EXISTING TRANSIT SERVICE**

**FIGURE 5**



LOCATIONS OF RELATED PROJECTS

FIGURE 6

**TABLE 2  
GENERAL PLAN STREET DESIGNATIONS**

<b>Street Designation</b>	<b>Typical ROW</b>	<b>Travel Lanes</b>	<b>Streets within Study Area</b>
Major Highways	116 - 138	6 - 8	Soledad Canyon Road Sand Canyon Road
Secondary Highways	88 - 92	2 - 4	None
Limited Secondary Highways	84	2 - 5	Lost Canyon Road
Collector Streets	64 - 66	2	None
Local Streets	58 - 60	2	None

Notes:

ROW = right-of-way, measured in feet. Travel lane total is for both directions.

Source: *City of Santa Clarita General Plan Circulation Element* (City of Santa Clarita, June 2011).

**TABLE 3  
EXISTING TRANSIT SERVICE**

Provider, Route, and Service Area	Service Type	Hours of Operation	Peak Period Schedule			
			Morning Peak Period		Afternoon Peak Period	
			Eastbound	Westbound	Eastbound	Westbound
<b>Santa Clarita Transit Route 6</b> <i>from Newhall/Stevenson Ranch to Canyon Country via Soledad Canyon Road</i>  <u>Nearest stop to Project Site:</u> Sand Canyon Road & Soledad Canyon Road	Local	5:00 AM to 10:30 PM	7:57 AM	6:18 AM	3:38 PM	3:57 PM
			8:24 AM	7:13 AM	4:11 PM	4:26 PM
				7:35 AM	4:38 PM	4:58 PM
				8:43 AM	5:57 PM	6:16 PM
					6:09 PM	6:29 PM

Notes:

AM Peak Period is from 6-9 AM and PM Peak Period is from 3-7 PM.

Schedule information collected in December, 2025 from [www.santaclaritatransit.com](http://www.santaclaritatransit.com).

Times shown are interpolated for the stop at Sand Canyon Road & Soledad Canyon Road by the scheduled stops to the east and west.

**TABLE 4  
RELATED PROJECTS**

No.	Project Name, Location, and Description	Trip Generation Estimates [a]						
		Daily Trips	Morning Peak Hour Trips			Afternoon Peak Hour Trips		
			In	Out	Total	In	Out	Total
1.	<p><b>Vista Canyon Specific Plan</b> <i>Located north of Lost Canyon Road between Fair Oaks Avenue and Sand Canyon Road</i></p> <p>Consists of 1,100 residential units (725 completed already), 646,000 sf office, 164,000 sf commercial, 200-room hotel, park space, and new Metrolink and bus transfer stations</p>	13,071	779	271	1,050	498	930	1,427
2.	<p><b>Sand Canyon Village</b> <i>Located north of SR 14, west of Pine Tree Residential Community, and east of Sand Canyon Road</i></p> <p>Consists of 580 residential units, 118,000 sf assisted living facility, and 40,000 sf retail</p>	3,851	79	125	204	179	154	333
3.	<p><b>Sand Canyon Resort</b> <i>Located at 27734 Sand Canyon Road</i></p> <p><i>Includes 283-room hotel, 12 villa suites, and amenities</i></p>	788	68	29	97	49	66	115
4.	<p><b>Metro Walk</b> <i>Bounded by Lost Canyon Road, Harriman Drive, and the railroad tracks</i></p> <p><i>Includes 498 residential units</i></p>	3,093	49	155	204	161	98	259
5.	<p><b>River Walk &amp; Soledad Mixed-Use Projects</b> <i>18228-18300 Soledad Canyon Road</i></p> <p><i>Includes 236 residential units and 10,000 sf of commercial space</i></p>	1,830	29	77	106	92	64	156

Notes:

Related project information provided by Department of City Planning.

[a] Trip generation estimates based on rates from *Trip Generation, 12th Edition* (Institute of Transportation Engineers, 2025), or taken from the traffic study of the Project.

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## **Chapter 3**

# **Transportation Assessment Screening**

As summarized in Chapter 1, the TAU provides a set of screening criteria for each of the CEQA and non-CEQA analyses that may be required in a transportation assessment. This chapter presents the screening criteria and applies them to the Project.

### **PROJECT TRIP GENERATION**

Some of the screening criteria include a minimum daily Project trip generation threshold. The TAU specifies that this estimate should be prepared using the most recent version of the Trip Generation Manual. Therefore, the trip generation estimates from the Scoping Letter, which were based on the 11<sup>th</sup> edition of the Trip Generation Manual, were updated for this analysis using the 12<sup>th</sup> edition of the Trip Generation Manual. This resulted in an increase in the Project trip generation estimate and, therefore, makes the analysis of the Project's effects more conservative.

As shown in Table 5, the Project is estimated to generate 1,596 daily trips, including 94 in the morning peak hour and 116 in the afternoon peak hour.

### **SCREENING FOR CEQA ANALYSES**

The screening criteria applicable to the Project are as follows:

- **Project Size:** Projects that generate fewer than 110 daily trips may be screened from conducting a VMT analysis. Local serving retail projects less than 50,000 square feet (sf) may be presumed to have a less than significant VMT impact, absent substantial evidence to the contrary. As shown in Table 5, the Project exceeds the 110 daily trip threshold and, therefore, requires further study.

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- Low VMT: Residential and office projects located within a low VMT generating area may be presumed to have a less than significant impact, as long as the new development in the traffic analysis zone (TAZ) is similar to the development already in the TAZ and absent substantial evidence to the contrary. As shown in Figure 7, the Project Site lies within zones that have a greater daily home-based VMT per resident than the City baseline and, therefore, requires further study.
  - Transit Priority Area (TPA): Projects located within TPAs may also be exempt from VMT analysis if they do not have the following characteristics:
    - Floor Area Ratio (FAR) < 0.75
    - More parking than required by City
    - Inconsistent with the applicable Regional Transportation Plan / Sustainable Communities Strategy (RTP/SCS) (as determined by the City)
    - Replaces affordable residential units with a smaller number of moderate- or high-income residential units

As shown in Figure 8, the Project is not located within a TPA. Therefore, the Project would not be screened out from VMT analysis.

- Affordable Housing: Affordable housing units can be presumed to have a less than significant impact on VMT, absent substantial evidence to the contrary, and can be screened from requiring further VMT analysis. The Project does not include any affordable housing units and therefore, this does not apply to the Project.

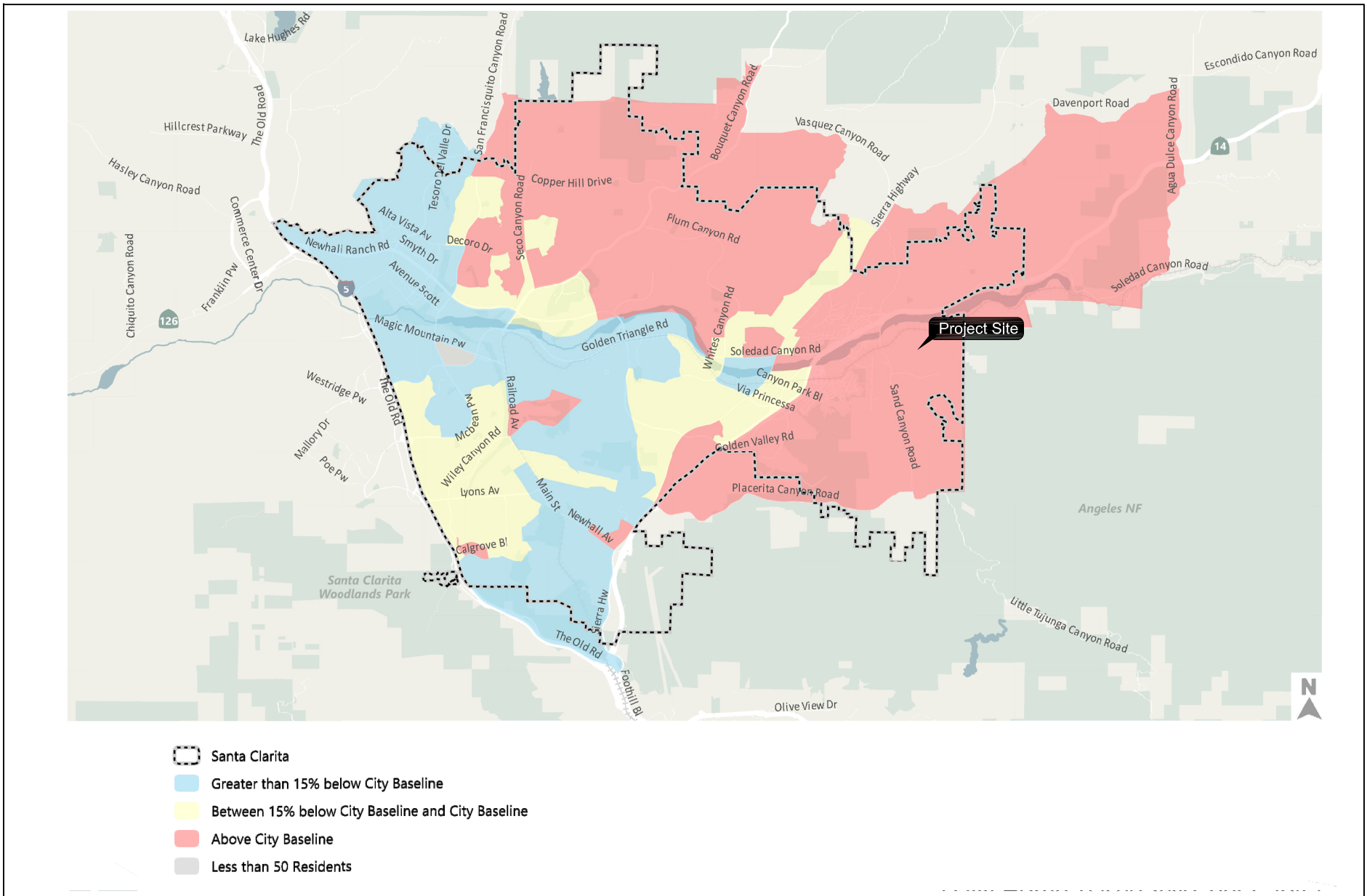
As shown above, the Project does not screen out from further VMT analysis based on any of the above screening criteria.

The remaining CEQA analyses, including further discussion on the Project's VMT, are provided in Chapters 4 through 7.

## **NON-CEQA ANALYSES REQUIREMENTS**

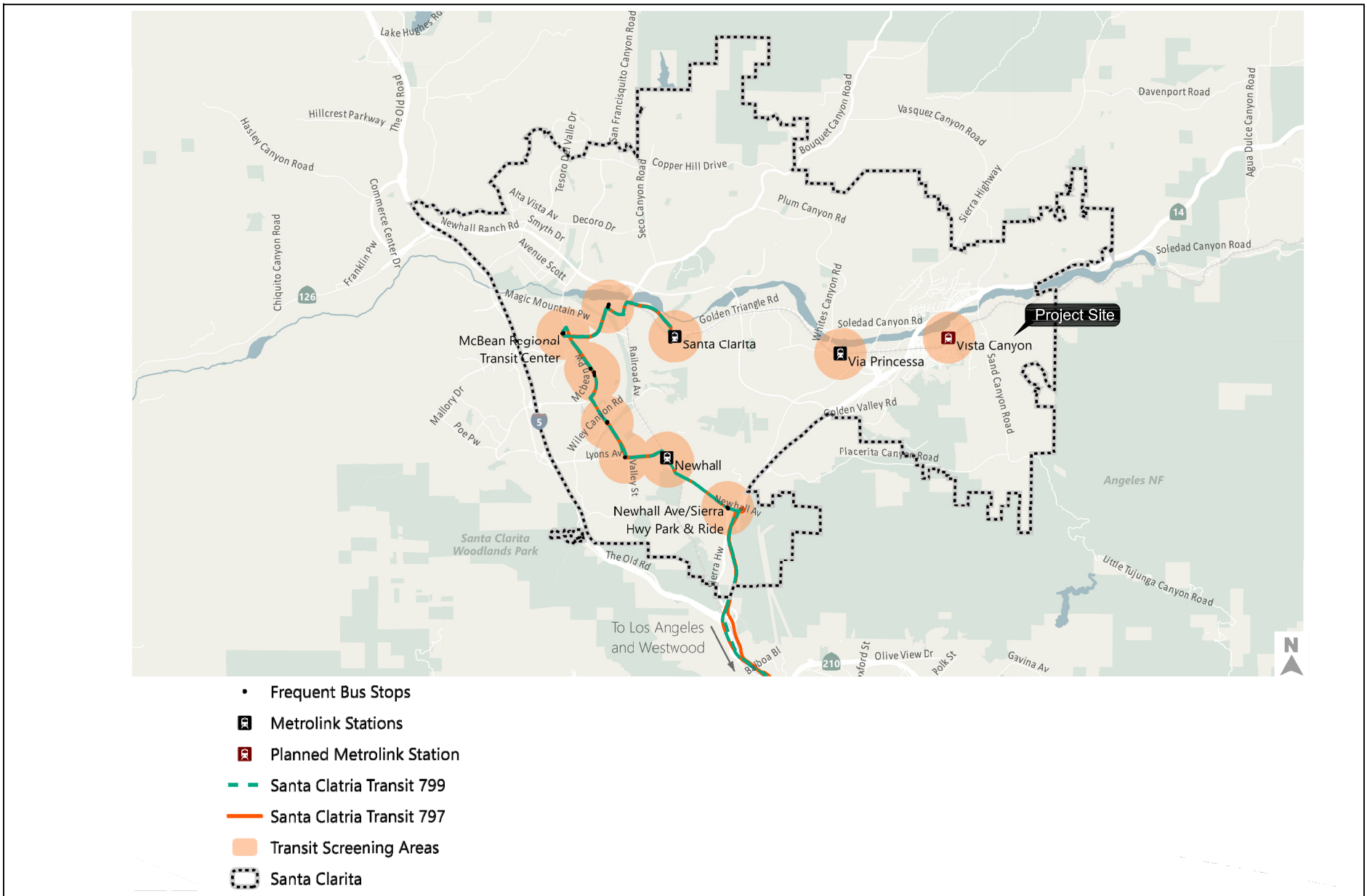
The City requires a set of non-CEQA related transportation analyses to determine if operational improvements are needed to accommodate the new traffic generated by a project. The scope and methodology of the non-CEQA analyses were established in consultation with the City Traffic Engineer.

The detailed analyses for the non-CEQA studies are provided in Chapters 8 through 10.



DAILY HOME-BASED WORK VMT PER EMPLOYEE COMPARED TO CITY AVERAGE

FIGURE 7



- Frequent Bus Stops
- 🚏 Metrolink Stations
- 🚏 Planned Metrolink Station
- Santa Clatria Transit 799
- Santa Clatria Transit 797
- Transit Screening Areas
- ⬡ Santa Clarita

TRANSIT PRIORITY SCREENING AREAS IN SANTA CLARITA

FIGURE 8

**TABLE 5  
PROJECT TRIP GENERATION ESTIMATES**

Land Use	ITE Land Use	Rate or Size	Daily	Morning Peak Hour			Afternoon Peak Hour		
				In	Out	Total	In	Out	Total
<b><i>Trip Generation Rates</i></b> [a]									
Senior Adult Housing - Single Family	251	per du	[b]	34%	66%	[b]	61%	39%	[b]
<b><i>Trip Generation Estimates</i></b>									
Senior Adult Housing - Single Family	251	341 du	1,596	32	62	94	71	45	116
<b>TOTAL PROJECT TRIPS</b>			<b>1,596</b>	<b>32</b>	<b>62</b>	<b>94</b>	<b>71</b>	<b>45</b>	<b>116</b>

Notes:

du = dwelling units.

[a] Source: *Trip Generation, 12th Edition* (Institute of Transportation Engineers, 2025).

[b] The trip rates for senior adult housing are based on logarithmic equation as follows:

Daily -  $\ln(T) = 0.80 \ln(X) + 2.71$

T = # of trips

Morning Peak Hour -  $\ln(T) = 0.71 \ln(X) + 0.40$

X = # of residential units

Afternoon Peak Hour -  $\ln(T) = 0.79 \ln(X) + 0.15$

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## **Chapter 4**

### ***CEQA Analysis: Consistency with Policy***

This chapter presents a review of the Project's consistency with plans and policies guiding the development and transportation networks in the City.

#### **SIGNIFICANCE CRITERIA**

Based on CEQA guidance, a project would result in a significant impact if it would conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadways, bicycle, and pedestrian facilities.

A project would be determined not to conflict with a particular program, plan, policy, or ordinance if it is generally in conformance and does not obstruct the implementation of that policy. If a conflict is identified, mitigation measures would focus on improving access, comfort, and safety for all road users, especially pedestrians, bicyclists, and transit riders.

#### **Cumulative Impact Analysis**

In addition to potential Project-specific impacts, CEQA requires that the Project be reviewed in combination with other development projects that may affect transportation networks within the Study Area (i.e., the Related Projects shown in Figure 6 and Table 4). The analysis would seek to identify any cumulatively significant impacts resulting from inconsistency with a particular program, plan, policy, or ordinance. The three Related Projects consist of two residential developments and a resort hotel.

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## **PLANS, PROGRAMS, ORDINANCES, AND POLICIES**

GTC identified a series of City adopted programs, plans, ordinances, and policies that establish the transportation planning regulatory framework for development in the City. Each of the documents discussed below was reviewed for applicability to the Project, and the relevant transportation-related policies, along with the Project's conformance, are described below.

### **Circulation Element of the General Plan**

The Circulation Element of the General Plan plans for the continued development of transportation systems that are consistent with regional plans, local needs, and the community's character. The Circulation Element identifies and promotes a variety of techniques for improving mobility including the development of alternative travel modes and support facilities; increased efficiency and capacity of existing systems through management strategies; and coordination of land use planning with transportation planning by promoting concentrated, mixed-use development near transit facilities. The Circulation Element identifies the following seven areas with specific goals, objectives, and policies that define the City's transportation priorities:

1. Multi-Modal Circulation Network
2. Street and Highway System
3. Vehicle Trip Reduction
4. Rail Service
5. Bus Transit
6. Bikeways
7. Pedestrian Circulation

The Circulation Element identifies operating standards for roads and highways using the level of service (LOS) metric. LOS, based on vehicle delay through an intersection, ranges from A to F according to the definitions shown in Table 6. Intersections operating at LOS A allow all vehicles to pass through with minimal delay, never having to wait through multiple signal cycles or in long queues of waiting vehicles. Intersections operating at LOS F experience heavy congestion and long vehicle queues and delay. The City strives to maintain level of service (LOS) D or better on

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highways, to the extent feasible given right-of-way and physical constraints as well as tradeoffs with the needs of alternative mobility, such as pedestrian and bicycle comfort and safety.

The Circulation Element further enumerates a variety of objectives, goals, and policies in support of each of those areas. The policies and programs that apply to the Project, along with a detailed discussion of the Project's consistency with each, are provided in Table 7. As discussed therein, the Project is consistent with all applicable objectives of the Circulation Element and would not preclude implementation of Circulation Element goals and policies.

### **Non-Motorized Transportation Plan**

The Non-Motorized Transportation Plan guides future pedestrian and bicycle infrastructure, policy, and planning in the City.

A detailed analysis of the Project's consistency with the policies in the Non-Motorized Transportation Plan is provided in Table 8. In summary, the Project is targeted to senior citizen living and, therefore, home-to-work vehicular commute trips are not expected to be a large part of the Project trip generation. The internal design of the Project, along with the provision of a park and recreation center and the extension of a multi-use trail, would promote walking and biking within and beyond the community.

### **Specific Plans**

The Project is not located within an area currently governed by a Specific Plan.

### **Santa Clarita Unified Development Code (SCUDC) Title 17 Division 5 (Use Classifications and Required Parking)**

The Project will provide residential parking in accordance with the SCUDC in private garages and driveways for each residential unit. Similar to the Project, each of the Related Projects would be individually responsible for providing on-site parking based on SCUDC requirements or any

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applicable specific plan. Therefore, the Project, together with the Related Projects, would not result in cumulative impacts concerning consistency with SCUDC Title 17 Division 5.

**2016 California Green Building Standards Code (CALGreen) Sections 5.106.4.1.1 and 5.106.4.1.2 (Bicycle Parking)**

CALGreen Sections 5.106.4.1.1 and 5.106.4.1.2 detail the bicycle parking requirements for new developments. The Project will provide for ample private bicycle parking in each residential unit and would, therefore, meet or exceed the CALGreen requirements for on-site bicycle parking supply.

Similar to the Project, each of the Related Projects would be individually responsible for providing on-site bicycle parking based on CALGreen requirements. Therefore, the Project, together with the Related Projects, would not result in cumulative impacts concerning consistency with CALGreen Sections 5.106.4.1.1 and 5.106.4.1.2.

**Streetscape Plans**

There are no streetscape plans near the Project Site; as such, streetscape plans do not apply to the Project. However, the Project design is intended to promote a balanced approach to all modes of transportation and provide safe and adequate space for sidewalks, bicycle routes, parking, vehicular traffic, street trees, landscaping, lighting, and street furnishings, consistent with the goals of other streetscape plans in the City.

**Community Character and Design Guidelines**

*City of Santa Clarita Community Character and Design Guidelines* (rrm Design Group, March 24, 2009) (Design Guidelines) identifies urban design principles to guide architects and developers in designing high-quality projects that meet the City's functional, aesthetic, and policy objectives and help foster a sense of community. The Design Guidelines are organized around four design goals: Sense of Timelessness, Sense of Ownership, Sense of Place and Identity, and Sense of Community.

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The policies that apply to this transportation assessment are those under the single-family residential design guidelines chapters. The Project meets the objectives and goals set in the Design Guidelines and is therefore consistent with all applicable policies. Table 9 provides a further summary of the Project's compliance.

Similar to the Project, the Related Projects are also required to be consistent with the Design Guidelines; therefore, the Project, together with the Related Projects, would not result in cumulative impacts concerning consistency with the Design Guidelines.

## **SUMMARY**

The Project is consistent with each of the City documents discussed above. Therefore, the Project would be consistent with all applicable local plans and policies, and no mitigation measures are required.

Each of the Related Projects considered in this cumulative analysis of consistency with plans and policies would be separately reviewed and approved by the City, including a check for their consistency with applicable policies. Therefore, the Project, together with the Related Projects identified in Table 4, would not create inconsistencies nor result in cumulative impacts concerning the identified plans and policies.

**TABLE 6  
INTERSECTION LEVEL OF SERVICE DEFINITIONS**

Level of Service	Description	Seconds of Delay	
		Signalized Intersections	Unsignalized Intersections
A	EXCELLENT. No vehicle waits longer than one red light and no approach phase is fully used.	≤ 10	≤ 10
B	VERY GOOD. An occasional approach phase is fully utilized; many drivers begin to feel somewhat restricted within groups of vehicles.	> 10 and ≤ 20	> 10 and ≤ 15
C	GOOD. Occasionally drivers may have to wait through more than one red light; backups may develop behind turning vehicles.	> 20 and ≤ 35	> 15 and ≤ 25
D	FAIR. Delays may be substantial during portions of the rush hours, but enough lower volume periods occur to permit clearing of developing lines, preventing excessive backups.	> 35 and ≤ 55	> 25 and ≤ 35
E	POOR. Represents the most vehicles intersection approaches can accommodate; may be long lines of waiting vehicles through several signal cycles.	> 55 and ≤ 80	> 35 and ≤ 50
F	FAILURE. Backups from nearby locations or on cross streets may restrict or prevent movement of vehicles out of the intersection approaches. Tremendous delays with continuously increasing queue lengths.	> 80	> 50

Notes:

Source: *Highway Capacity Manual, 7th Edition* (Transportation Research Board, 2022).

**TABLE 7  
PROJECT CONSISTENCY WITH CIRCULATION ELEMENT OF THE GENERAL PLAN**

<b>Objective</b>	<b>Analysis of Project Consistency</b>
<b><i>Area 1 – Multi-Modal Circulation Network</i></b>	
<p><b><u>Objective C 1.1</u></b> Provide multi-modal circulation systems that move people and goods efficiently while protecting environmental resources and quality of life.</p>	<p><b>Consistent.</b> The Project proposes to include a network of internal low-volume residential streets, private and public recreational trails, and would comply with any City bicycle requirements to help support this objective.</p>
<p><b><u>Objective C 1.2</u></b> Coordinate land use and circulation planning to achieve greater accessibility and mobility for users of all travel modes.</p>	<p><b>Consistent.</b> The Project provides a senior housing complex with on-site amenities connected via sidewalks and low-volume residential streets. The Project also would provide public multi-use trails beyond the Project Site connecting to existing trails.</p>
<p><b><u>Objective C 1.3</u></b> Ensure conformance of the Circulation Plan with regional transportation plans.</p>	<p><b>Consistent.</b> The Project does not preclude the implementation of the current Circulation plan or any regional transportation plans.</p>
<b><i>Area 2 – Street and Highway System</i></b>	
<p><b><u>Objective C 2.1</u></b> Implement the Circulation Plan (as shown on Exhibit C-2) for streets and highways to meet existing and future travel demands for mobility, access, connectivity, and capacity.</p>	<p><b>Consistent.</b> The Project proposes to include a network of private low-volume residential streets for internal circulation. It would also extend Lost Canyon Road east to provide access to the Project Site and would construct a new public road between Oak Springs Canyon Road and Robinson Ranch Road. The Project does not preclude the implementation of the current Circulation plan.</p>
<p><b><u>Objective C 2.2</u></b> Adopt and apply consistent standards throughout the Santa Clarita Valley for street design and service levels, which promote safety, convenience, and efficiency of travel.</p>	<p><b>Consistent.</b> The Project is consistent with the current applicable street standards.</p>
<p><b><u>Objective C 2.3</u></b> Balance the needs of congestion relief with community values for aesthetics and quality of life.</p>	<p><b>Consistent.</b> The Project supports congestion relief by providing a new off-site roadway connection between Oak Springs Canyon Road and Robinson Ranch Road. This new connection will provide alternate routes for neighborhood traffic and help during emergencies with access and evacuation.</p>

**TABLE 7 (CONTINUED)  
PROJECT CONSISTENCY WITH CIRCULATION ELEMENT OF THE GENERAL PLAN**

<b>Objective</b>	<b>Analysis of Project Consistency</b>
<p><b><u>Objective C 2.4</u></b> Allow trucks to utilize only major and secondary highways as through routes, to minimize impacts of truck traffic on surface streets and residential neighborhoods.</p>	<p><b>Consistent.</b> Once constructed the Project is not anticipated to generate commercial truck trips given it is a residential-only project. Nonetheless, any commercial truck traffic that may travel to and from the Project Site would avoid passing through residential neighborhoods.</p>
<p><b><u>Objective C 2.5</u></b> Consider the needs for emergency access in transportation planning.</p>	<p><b>Consistent.</b> The Project will comply with all emergency access needs and standards including the provision of fire lanes and adequate turning radii and Project driveways and internal intersections. In addition, a new connection between Oak Springs Canyon Road and Robinson Ranch Road will be provided. An analysis of emergency evacuation conditions is performed in Chapter 7 and Appendix C.</p>
<p><b><u>Objective C 2.6</u></b> Ensure that funding and phasing of new transportation improvements is coordinated with growth.</p>	<p><b>Not Applicable.</b> The Project will not require the funding or phasing of new transportation improvements aside from those included in the Project</p>
<p><b><u>Objective C 2.7</u></b> Pursue the safety, efficiency and tranquility of existing and future residential streets by properly planning for local, collector and arterial roadways and limiting residential driveway access onto collector or arterial roadways.</p>	<p><b>Consistent.</b> The Project extends Lost Canyon Road – a Secondary Highway – to form the primary access to the Project. It would also provide a new road between Oak Springs Canyon Road and Robinson Ranch Road, both of which are local streets. The Project proposes to include a network of internal low-volume residential streets for internal circulation.</p>
<b>Area 3 – Vehicle Trip Reduction</b>	
<p><b><u>Objective C 3.1</u></b> Promote the use of travel demand management strategies to reduce vehicle trips.</p>	<p><b>Consistent.</b> The Project will provide on-site amenities for residents including a recreation area and pedestrian and bicycle-friendly connections throughout the development. The Project also provides public and private trails within and around the Project Site.</p>
<p><b><u>Objective C 3.2</u></b> Encourage reduction in airborne emissions from vehicles through use of clean vehicles and transportation system management.</p>	<p><b>Not Applicable.</b> The Project does not encourage or discourage the use of clean vehicles nor does it affect transportation systems management on City streets.</p>

**TABLE 7 (CONTINUED)  
PROJECT CONSISTENCY WITH CIRCULATION ELEMENT OF THE GENERAL PLAN**

<b>Objective</b>	<b>Analysis of Project Consistency</b>
<p><b><u>Objective C 3.3</u></b> Make more efficient use of parking and maximize economic use of land, while decreasing impervious surfaces in urban areas, through parking management strategies.</p>	<p><b>Consistent.</b> The Project will include private parking in on-site residential garages and driveways as well as comply with any landscaping requirements.</p>
<b>Area 4 – Rail Service</b>	
<p><b><u>Objective C 4.1</u></b> Maximize the effectiveness of Metrolink’s commuter rail service through provision of support facilities and land planning.</p>	<p><b>Not Applicable.</b> The Project is not located within walking distance of any Metrolink station and would not affect rail operations.</p>
<p><b><u>Objective C 4.2</u></b> Access to a high speed rail system connecting the Santa Clarita Valley with other regions, and other regional rail service connections.</p>	<p><b>Not Applicable.</b> The Project is not located within walking distance of any rail station and would not affect rail operations.</p>
<b>Area 5 – Bus Transit</b>	
<p><b><u>Objective C 5.1</u></b> Ensure that street patterns and design standards accommodate transit needs.</p>	<p><b>Consistent.</b> The streets and intersection in the Project would be constructed to City standards; however, there are no current transit services within walking distance of the Project Site and it is not anticipated that any transit services will use streets built by the Project.</p>
<p><b><u>Objective C 5.2</u></b> Maximize the accessibility, safety, convenience, and appeal of transit stops.</p>	<p><b>Not Applicable.</b> The Project would not affect any existing or proposed public transit service. The Project would provide a multi-use trail that would connect to Sand Canyon Road at Lost Canyon Road. West of Sand Canyon Road are sidewalks and trails, by which there would be off-street transportation for pedestrians and bicyclists nearly the whole distance to the Vista Canyon Metrolink station.</p>
<p><b><u>Objective C 5.3</u></b> Explore opportunities to improve and expand bus transit service.</p>	<p><b>Not Applicable.</b> The Project Site is in a low-density rural area that is not economically practical for bus service. It is 1.3 miles walking distance to the nearest significant street (Lost Canyon Road) and 1.8 miles walking distance to the nearest existing transit stop (at Sand Canyon Road &amp; Soledad Canyon Road).</p>

**TABLE 7 (CONTINUED)  
PROJECT CONSISTENCY WITH CIRCULATION ELEMENT OF THE GENERAL PLAN**

<b>Objective</b>	<b>Analysis of Project Consistency</b>
<p><b><u>Objective C 5.4</u></b> Provide adequate funding to expand transit services to meet the needs of new development in the Valley.</p>	<p><b>Not Applicable.</b> This objective is not applicable to the Project because the Project is not responsible for transit funding and would not affect any existing or proposed transit service.</p>
<p align="center"><b><i>Area 6 – Bikeways</i></b></p>	
<p><b><u>Objective C 6.1</u></b> Adopt and implement a coordinated master plan for bikeways for the Valley, including both City and County areas, to make bicycling an attractive and feasible mode of transportation.</p>	<p><b>Consistent.</b> The Project does not preclude the implementation of any planned bike facility and will add to the proposed network via public and private multi-use trails within and around the Project Site.</p>
<p><b><u>Objective C 6.2</u></b> Encourage provision of equipment and facilities to support the use of bicycles as an alternative means of travel.</p>	<p><b>Consistent.</b> The Project will provide ample space for private bike parking facilities as well as a network of low-volume residential streets appropriate for biking. The Project also provides public and private multi-use trails within and around the Project Site.</p>
<p align="center"><b><i>Area 7 – Pedestrian Circulation</i></b></p>	
<p><b><u>Objective C 7.1</u></b> A continuous, integrated system of safe and attractive pedestrian walkways, paseos and trails linking residents to parks, open space, schools, services, and transit.</p>	<p><b>Consistent.</b> The Project would provide sidewalks withing the Project site that comply with current ADA requirements. The Project also provides public and private multi-use trails within and around the Project Site.</p>

**TABLE 8  
PROJECT CONSISTENCY WITH NON-MOTORIZED TRANSPORTATION PLAN**

Objective [a]	Analysis of Project Consistency
<p><b>Goal 1. Safety &amp; Health</b></p> <p>This NMTP will empower residents to live a more active lifestyle by providing a network of safe and comfortable walking routes and bikeways for everyone to enjoy.</p> <ul style="list-style-type: none"> <li>A. Reduce bicycle and pedestrian collisions through safe and comfortable facilities</li> <li>B. Promote an active lifestyle that includes biking and walking</li> <li>C. Reduce air pollution, asthma rates, and greenhouse gas emissions</li> </ul> <p><b>Goal 2. Access &amp; Comfort</b></p> <p>This NMTP will support increased access to neighborhood destinations such as parks, shopping and employment centers, libraries, schools, recreation centers, and transit stops. Pedestrian and bicycle facilities will be accessible and comfortable for people of all ages and abilities to use.</p> <ul style="list-style-type: none"> <li>A. Increase access to jobs, education, retail, parks and libraries, schools, recreational centers, transit, and other neighborhood destinations</li> <li>B. Address barriers so that disadvantaged populations can take part in improvements</li> <li>C. Reduce air pollution, asthma rates, and greenhouse gas emissions</li> <li>D. Reduce travel times for disadvantaged households</li> <li>E. Prioritize the needs and trip patterns of disadvantaged populations</li> <li>F. Serve people with disabilities.</li> </ul>	<p><b>Consistent.</b> The Project would provide sidewalks within the Project site that comply with current ADA requirements. The Project will provide ample space for private bike parking facilities as well as a network of low-volume residential streets appropriate for biking. The Project will develop an on-site park and recreation center and a proposes both public and private multi-use trails within and around the Project Site. These facilities would be designed to improve safety for all road users and help promote active transportation within the City.</p>
<p><b>Goal 3. Maintain &amp; Expand the Network</b></p> <p>This NMTP will help our community identify, develop, and maintain a complete and convenient bicycle and pedestrian network.</p> <ul style="list-style-type: none"> <li>A. Integrate bicycle and pedestrian network and facility needs into all city planning documents and capital improvement projects</li> <li>B. Leverage existing funding to maximize project delivery</li> <li>C. Maintain designated facilities to be comfortable and free of hazards to biking and walking</li> <li>D. Reduce long-term transportation costs by reducing the need for vehicle ownership or for parking in new developments.</li> </ul>	<p><b>Not Applicable.</b> This objective is not applicable to the Project because the Project is not responsible for planning and maintaining the transportation network beyond the Project limits.</p>

Notes:

[a] Objectives based on information provided in *2020 City of Santa Clarita Non-Motorized Transportation Plan* (Alta Planning + Design, September 2020).

**TABLE 9  
PROJECT CONSISTENCY WITH COMMUNITY CHARACTER AND DESIGN GUIDELINES**

Objective [a]	Analysis of Project Consistency
<p>Landscaped parkways and sidewalks should be incorporated to create comfortable pedestrian-oriented streets.</p>	<p><b>Consistent.</b> The Project proposes to construct a full network of landscaped sidewalks and parkways within the Project Site. It would also include a network of private trails within the Project Site and a public multi-use trails connecting to Lost Canyon Road, Robinson Ranch Road, and an existing trail along Oak Springs Canyon Road.</p>
<p>Garage placement should be varied to avoid creating a row of garages that dominates the streetscape.</p>	<p><b>Consistent.</b> The Project will locate residential garages in accordance with the design guidelines.</p>
<p>Residents of housing projects should have safe and efficient access to usable open space, whether public or private, for recreation and social activities</p>	<p><b>Consistent.</b> The Project will construct an on-site park and recreation center. It would also include a network of private trails within the Project Site and a public multi-use trails connecting to Lost Canyon Road, Robinson Ranch Road, and an existing trail along Oak Springs Canyon Road.</p>

Notes:

[a] Objectives based on information provided in *City of Santa Citywide Clarita Community Character and Design Guidelines* (rrm Design Group, March 24, 2009).

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## **Chapter 5**

### **CEQA Analysis: VMT**

This chapter presents an analysis of potential VMT impacts for the Project based on the TAU and *State of California Senate Bill No. 743* (Steinberg, 2013).

#### **VMT GUIDELINES**

The VMT requirements of the TAU are intended to promote the reduction of greenhouse gas emissions, the development of multimodal transportation networks, and a diversity of land uses. This encourages development that shortens the distance between housing, jobs, and services, increases the availability of affordable housing options proximal to public transit, offers attractive non-vehicular transportation options, provides strong TDM programs, and promotes walking and bicycling trips.

#### **VMT Screening**

As discussed in Chapter 3, the City has adopted four screening thresholds, only one of which must be satisfied in order to screen out of a full VMT analysis. The Project does not satisfy any of the screening criteria and, therefore, a full VMT analysis is required.

#### **VMT Analysis**

The City utilizes the Southern California Association of Governments (SCAG) travel demand forecasting model (SCAG Model) to determine VMT metrics. The SCAG Model is the primary source of travel demand forecasting data for the entire region and is used by most jurisdictions, including the City, for planning and policy decisions. The 2020 activity-based model based on *Connect SoCal: The 2020-2045 Regional Transportation Plan / Sustainable Communities*

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*Strategy of the Southern California Association of Governments* (SCAG, adopted September 2020) was used for this analysis. It is calibrated to existing traffic conditions as of the baseline year of 2020 and forecast for cumulative traffic conditions in Year 2045, which accounts for all anticipated local and regional growth based on socioeconomic forecasts of housing units, jobs, and population for each TAZ.

According to the TAU, a residential development's potential VMT impact is assessed on the basis of home-based VMT per capita. Home-based VMT consists of the sum of the distance of all trips originating from or returning to a person's residence. The other end of home-based trips is commonly school, work, or retail locations. To be found to have no significant impact, a residential development project must generate home-based VMT per capita (i.e., per resident) at least 15% below the Citywide average home-based VMT per capita under the baseline year of 2019. According to the TAU, the Citywide average home-based VMT per capita is 22.7 miles, and therefore the significant impact threshold is 15% lower at 19.3 miles.

The SCAG Model provides VMT and related data for each TAZ, which is provided for reference in Appendix C. The Project Site is located in TAZ 20276100 (Project TAZ), the key data for which is shown in Table 10. As shown, the Project TAZ has a population of 2,520 residents and average home-based VMT per capita of 30.6 miles in the baseline year. Therefore, the average home-based VMT per capita for existing residential uses within the Project TAZ exceeds the significant impact threshold of 19.3 miles by approximately 37%.

It is important to note that the residential uses in the Project TAZ include only standard single-family units, which have substantially different travel characteristics – including VMT per capita – than senior community developments like the Project. These factors include:

- Seniors are more likely to be retired and, therefore, less likely to have a daily commute
- Senior communities tend to have smaller households (typically singles or couples) with no resident children, reducing the number of vehicles, drivers, and trips
- Built-in amenities (such as the recreation center incorporated into the Project Site) replace longer-distance driving trips with short-distance walking trips
- Seniors may have physical limitations limiting frequent or long drives

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Collectively, these factors cause senior communities to generate fewer daily trips and those trips tend to be shorter, leading to lower VMT per capita compared to standard single-family housing.

While direct data on VMT per capita for senior communities is not available, various other data points can be used to estimate the relative difference in VMT per capita compared with standard housing, including average household size and daily trip generation rates as summarized in Table 11. For standard housing, the average household size in 2020 was 2.53 persons<sup>3</sup> and average daily trip generation in the Trip Generation Manual is 9.09 trips<sup>4</sup> per household. For senior detached housing, the average household size is approximately 1.8 persons<sup>5</sup> and average daily trip generation is 4.16 trips<sup>6</sup> per household. Dividing daily trips by average household size, standard housing generates an average of 3.59 trips per capita, while senior communities generate an average of 2.31 trips per capita.

Based on the comparison above, it can be concluded that if residents of standard housing and senior communities had the same average trip length, senior communities would generate approximately 36% fewer trips per capita than standard housing. Additionally, for the reasons identified above, senior community trips, on average, tend to be shorter in length than those by residents of standard housing. Data from the Federal Highway Administration's *2022 National Household Travel Survey* shows that on average, trip lengths for those 55 and over are more than 7% shorter than trip lengths for all drivers.<sup>7</sup> Applying the shorter trip lengths to the lower trips per capita results in a total difference in VMT per capita of approximately 40%, as shown in Table 11.

Further applying this to the current average VMT per capita of 30.6 miles (which, as noted above, is for standard detached housing), the average home-based VMT per capita for the Project would be 18.2 miles as shown in Table 11. The significance threshold is 19.3 miles and, therefore, the

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<sup>3</sup> US Census Current Population Survey, Table HH-4 "Households by Size, 1960 to Present," [www.census.gov](http://www.census.gov).

<sup>4</sup> ITE Land Use 210, Single-Family Detached Housing.

<sup>5</sup> The vast majority of households in senior communities are made up of couples. There are a small number of singles, and in rare cases there are more than two people in a household. As a conservative average, this analysis assumes 1.8 persons per household (Note: A lower senior household size results in a smaller variance in trips per capita and thus a smaller variance in VMT per capita).

<sup>6</sup> ITE Land Use 251, Senior Adult Housing – Single-Family.

<sup>7</sup> Federal Highway Administration, 2022. *2022 National Household Travel Survey*, U.S. Department of Transportation, Washington DC. <https://nhts.ornl.gov>. Analysis based on tripv2pub database using R\_AGE (respondent age) and TRPMILES (trip length in miles) data.

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Project would not have a significant transportation impact on the basis of home-based VMT per capita.

Though no mitigation measures are required, the Project would develop a new public multi-use path along the eastern and northern boundaries of the Project Site. This path would continue west along Lost Canyon Road and connect to a network of trails and bicycle facilities proposed by the City in the Non-Motorized Transportation Plan. These facilities would provide links to residential, commercial, and recreational areas of the City as well as to public transit, including the Vista Canyon Metrolink Station and the bus lines on Soledad Canyon Road. Therefore, these Project features would help to further reduce vehicle travel, and thus to reduce VMT per capita further below the less-than-significant level identified in Table 11.

## **CUMULATIVE VMT ANALYSIS**

A development project would have a cumulative VMT impact if it were deemed inconsistent with the RTP/SCS. However, based on the TAU, a project that does not result in a significant VMT impact using the City's methodology described above would be in alignment with the RTP/SCS and, therefore, would also have no cumulative VMT impact.

When considered with the Related Projects, many of which propose additional non-senior residential developments near the Project Site, the Project would help to reduce the average home-based VMT per capita in the Study Area as it consists of senior family housing, which generates approximately 40% lower VMT per capita than a traditional single-family development.

Therefore, the Project would not result in a cumulatively significant VMT impact.

**TABLE 10  
SCAG MODEL VMT DATA**

Description	Data
<b>Citywide Total</b>	
Home-Based VMT per Capita (miles)	22.7
Significant Impact Threshold (15% lower)	19.3
<b>Project Site TAZ (20276100)</b>	
Total Population (persons)	2,520
Home-Based VMT (miles)	77,110
Home-Based VMT per Capita (miles)	30.6
Significant Impact Threshold Exceedance	37%

Notes:

Data from the SCAG Model as shown in Appendix C.

**TABLE 11  
SENIOR COMMUNITY VMT PER CAPITA**

Description	Standard (Non-Age-Restricted) Single Family Homes	Senior Community Single Family Homes
<b>Standard (Non-Age-Restricted) Single Family Homes</b>		
Average Daily Trip Generation (trips per household) [a]	9.09 [a]	4.16 [b]
Average Household Size (persons) [b]	2.53 [c]	1.80 [d]
Average Trips per Capita	3.59	2.31
<b>Senior Community Compared to Standard Homes</b>		
Difference in Trips per Capita		(36%)
Difference in Trip Length [e]		(7%)
Difference in VMT per Capita		(40%)
<b>Home-Based VMT per Capita</b>		
Home-Based VMT per Capita from SCAG Model [f]		30.6
Difference in VMT per Capita for Senior Community Homes		(40%)
Home-Based VMT per Capita for Senior Community Homes		18.2

Notes:

- [a] From land use code 210, Single-Family Detached Housing, from *Trip Generation Manual, 12th Edition* (Institute of Transportation Engineers, 2025).
- [b] From land use code 251, Senior Adult Housing - Single-Family, from *Trip Generation Manual, 12th Edition*.
- [c] From US Census Current Population Survey, Table HH-4 "Households by Size, 1960 to Present," [www.census.gov](http://www.census.gov).
- [d] Estimated, assuming primarily couples, some singles, and, rarely, more than two people per household.
- [e] Based on data from the Federal Highway Administration's *2022 National Household Travel Survey*, U.S. Department of Transportation, Washington DC. <https://nhts.ornl.gov>.
- [f] See Table 10. The data from the SCAG Model represents home-based VMT per capita for standard homes.

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## Chapter 6

### ***CEQA Analysis: Geometric Design and Land Use Hazards***

This chapter presents an analysis of potential safety, operational, or capacity impacts that could be caused by the design or location of Project access points.

#### **SIGNIFICANCE CRITERIA**

This analysis determines if the Project would substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment using a high-speed roadway). It seeks to identify potential safety conflicts between vehicles, pedestrians, and bicycles, as well as operational delays or capacity reductions resulting from the design or placement of a project's access points.

The determination of significance should be based on commonly accepted traffic engineering design standards while considering the amount of pedestrian and bicycle activity crossing vehicular access points, sight distance, physical conditions like curves or grade changes, and a project's proximity to streets identified in the Safe Routes to School (SRTS) program. Significance may be determined qualitatively or quantitatively as best suits the circumstances of a project.

If a significant impact is identified, mitigation measures may include the installation of new traffic control devices, redesign or relocation of access points, turn restrictions, pavement markings, or vehicular demand management.

#### **Design Standards**

General design standards for roads, intersections, and access points include providing appropriate traffic control (e.g., stop signs or traffic signals), adequate sight distance, turning radii for all anticipated vehicle types, minimizing the number of access points (especially along higher-

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volume or higher-speed roadways), and spacing access points so they don't conflict with each other. Access points and any internal access controls must also be designed to ensure that they do not result in vehicular queuing onto public streets. Additionally, consideration must be given to potential conflicts with pedestrian or bicycle activity or facilities. The volume of vehicles, pedestrians, and bicyclists is a factor in assessing the safety of a given design.

## **PROJECT HAZARDS ANALYSIS**

All Project features would be designed to comply with best practices in accordance with the guidelines summarized above. The final design of access points, roadways, intersections, and the proposed public multi-use path would be reviewed by the City during the site plan review to ensure safe operations for vehicles, pedestrians, and bicyclists.

### **Vehicular Access and Circulation**

As shown in Figure 2 and discussed in Chapter 1, the Project Site would provide vehicular access via two new access points, each equipped with gates for resident privacy and security. The Project would develop a private extension of Lost Canyon Road east from Oak Springs Canyon Road to serve as the primary Project access point. A secondary roadway would also connect to Oak Springs Canyon Road at the south end of the Project Site. A network of internal streets would provide for circulation within the Project Site and to each individual home, and any passenger or commercial loading activity would occur internal to the Project Site.

The extension of Lost Canyon Road would form a T-intersection at Oak Springs Canyon Road, which would be designed in accordance with best practices. There are no obstacles to providing sufficient sight distance for all vehicles passing through this low-volume intersection. The extension of Lost Canyon Road would provide ample space for vehicles entering the Project Site to queue, though queuing isn't anticipated due to low peak hour trip generation. Additionally, the road would provide sufficient width and lack sharp curves that could present safety concerns or prevent access by larger vehicles.

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The access at the south end of the Project Site would form a four-way intersection with Oak Springs Canyon Road and the proposed private road extending to Robinson Ranch Road (itself a private road serving the Sand Canyon Country Club and a residential neighborhood). These features would similarly meet design standards for safe operations. Therefore, the proposed design would not result in safety hazards to vehicles, both within the Project Site and on connecting streets.

### **Pedestrian Access**

The Project's design also minimizes potential hazards to pedestrians through the use of on-site and off-site pedestrian facilities. Sidewalks would line the internal Project Site streets, and the proposed multi-use trail along the east and north boundaries of the Project Site would provide pedestrian access beyond the Project Site. These amenities would minimize conflicts between vehicles and pedestrians.

### **Bicycle Access**

The Project's design also minimizes potential hazards to bicyclists by providing off-street parking facilities for bicyclists within each residential unit. No existing bicycle facility would be affected by the Project. The low-volume, low-speed on-site roadways will provide safe internal bicycle movements and Project bicycle trips would be connected to the Citywide bicycle system through the multi-use path along the east and north boundaries of the project Site.

### **SRTS**

The Project Site does not front any SRTS paths; therefore, no students are anticipated to be walking to school through the Project site. Therefore, the Project would not result in a significant safety hazard to students.

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## **Project Hazards Analysis Summary**

Based on the Project site plan review and design assumptions, the Project does not present any geometric design hazards related to traffic movement, mobility, or pedestrian accessibility, sight lines, vehicle conflicts, capacity, and access, and no significant impact would occur. Therefore, no mitigation measures would be required.

## **CUMULATIVE ANALYSIS**

Per CEQA, a project could contribute to a significant cumulative impact concerning geometric design if the project, in combination with Related Projects with access points proposed along the same block(s), would result in significant impacts. However, as shown in Figure 6, there are no Related Projects on the same blocks as any Project access point. Further, as the Project would not result in a significant impact concerning the above analysis, it would not contribute to a cumulatively significant impact.

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## Chapter 7

### **CEQA Analysis: Freeway Safety and Evacuation**

This chapter presents an analysis based on the guidance contained in *Local Development Review (LDR) Safety Review Practitioners Guidance* (California Department of Transportation [Caltrans], February 2024) (Caltrans Safety Guidance). It also summarizes the evacuation analysis prepared for the Project, which is provided in full in Appendix D.

#### **OPERATIONAL ANALYSIS METHODOLOGY**

Appendix B, Freeway Exit-Ramp Queueing Analysis, of the Caltrans Safety Guidance relates to the identification of potential safety impacts at freeway off-ramps as a result of increased traffic from development projects. It provides a methodology and significance criteria for assessing whether additional vehicle queueing at off-ramps could result in a safety impact due to speed differentials between the mainline freeway lanes and the queued vehicles at the off-ramp.

Based on the Caltrans Safety Guidance, a transportation assessment for a development project must include an analysis of any freeway off-ramp where the project adds 25 or more peak hour trips. A project would result in a significant impact at such a ramp if each of the following three criteria were met:

1. Under a scenario analyzing future conditions upon project buildout, with project traffic included, the off-ramp queue would extend to the mainline freeway lanes based on the 95<sup>th</sup> percentile queue length using Synchro or a comparable Highway Capacity Manual analysis methodology.
2. The project would contribute at least two vehicle lengths (50 feet, assuming 25 feet per vehicle) to the queue.
3. The average speed of mainline freeway traffic adjacent to the off-ramp during the analyzed peak hour(s) is greater than 30 mph.

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Should a significant impact be identified, mitigation measures to be considered include TDM measures to reduce a project's trip generation, investments in active transportation or transit system infrastructure to reduce a project's trip generation, changes to the traffic signal timing/phasing or lane assignments at the ramp intersection, or physical changes to the off-ramp. Any physical change to the ramp would have to improve safety, not induce greater VMT, and not result in secondary environmental impacts.

## **OPERATIONAL FREEWAY SAFETY ANALYSIS**

The freeway safety analysis is based on traffic information and analysis presented in Chapter 9 as part of the Project's operational analysis. Details of the analysis are provided therein.

Table 12 summarizes the freeway safety analysis. As shown, the Project would add fewer than 25 peak hour trips to the SR 14 southbound off-ramp to Sand Canyon Road during both peak hours and to the SR 14 northbound off-ramp to Sand Canyon Road during the morning peak hour. It would add 28 trips to the SR 14 northbound off-ramp to Sand Canyon Road during the afternoon peak hour and, therefore, further analysis is required at this location.

As shown in Table 12, the SR 14 northbound off-ramp to Sand Canyon Road has a total ramp storage length of approximately 1,780 feet. The two left-turn lanes from the off-ramp are forecast to experience 95<sup>th</sup> percentile queues of approximately 360 feet each, and the right-turn lane is forecast to experience a queue of approximately 530 feet. Therefore, the total combined 95<sup>th</sup> percentile queue is approximately 1,250 feet, which is substantially less than the 1,780 feet of storage space. Therefore, no further analysis is necessary and no freeway safety impact would occur.

## **CALTRANS SAFETY REVIEW**

The Caltrans Safety Guidance recommends that the lead CEQA agency (i.e., the City) overseeing a project's entitlement conduct a review of local traffic safety plans and the Project's potential adverse effect on safety or the implementation of those plans. Under the federal Highway Safety Improvement Program (HSIP), Caltrans developed *Local Roadway Safety: A Manual for*

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*California's Local Road Owners* (Caltrans, April 2020), the Local Roadway Safety Plan (LRSP), and the Systemic Safety Analysis Report Program (SSARP).

Each of the three Caltrans documents and programs is similar in purpose, each providing a framework for local agencies (i.e., the City) to identify safety problems and develop projects designed to improve safety. The LRSP and SSARP identify funded improvement projects and plans. A review of a list of funded improvement plans under the LRSP showed that no infrastructure improvements are located in the City as of October 1, 2020<sup>9</sup>. Under the SSARP, no improvement projects were identified for funding in the City<sup>10</sup>. There are no identified and/or funded improvement projects in the City.

The HSIP itself allocates federal funding for safety programs. A review of the programs and projects selected for funding in HSIP cycles 7, 8, 9, and 10<sup>11</sup> identified several programs in the City, but none that would affect the transportation network in the vicinity of the Study Area.

The City has several programs in place to proactively identify and manage traffic safety, such as the SRTS program. As discussed in Chapter 4, the Project would not interfere with the implementation of any City plans or policies in the Study Area. Additionally, as discussed in Chapter 6, the Project would not introduce new traffic hazards nor significantly increase existing hazards. All Project access points are designed in accordance with driveway design guidelines. Therefore, the Project would not have an adverse safety impact nor impede the implementation of any safety improvement projects.

## **EVACUATION ANALYSIS**

The Project's detailed evacuation analysis is provided in Appendix D. It analyzed three routes capable of moving Project and background traffic out of the area during an emergency evacuation, including scenarios where one or more routes were blocked. It provided a travel time analysis for

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<sup>9</sup> <https://dot.ca.gov/-/media/dot-media/programs/local-assistance/documents/hsip/2020/lrsp/projects20201001-a11y.pdf>

<sup>10</sup> <https://dot.ca.gov/-/media/dot-media/programs/local-assistance/documents/hsip/2018/selectedapplications20160715.pdf>

<sup>11</sup> <https://dot.ca.gov/programs/local-assistance/fed-and-state-programs/highway-safety-improvement-program/approved-project-lists>

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evacuees from various zones (including the Project Site) to get to designated safe areas as well as a total evacuation time analysis estimating the amount of time it would take the entire area to evacuate. Each analysis was conducted with and without Project traffic. The evacuation analysis found that the addition of Project traffic to the roadway system would only marginally increase travel time and total evacuation time.

Travel time studies indicate that the intersection of Sand Canyon Road & Lost Canyon Road (Intersection #4) will have sufficient capacity to accommodate evacuation volumes with the proposed single lane roundabout with a bypass right-turn lane going southbound to westbound in place at the intersection. The roadway system would allow evacuation of the Study Area within a reasonable period of time even if the evacuation is limited to only the north and west routes or only the south route.

The evacuation analysis shows that the routes out of the Project and out of the overall Study Area are sufficient to be consistent with the Safety Element of the General Plan and Title 14, Division 1.5, Chapter 7, Subchapter 2 of *Barclays Official California Code of Regulations* (State of California, April 18, 2022) regarding evacuation routes and street standards.

**TABLE 12  
FREEWAY SAFETY ANALYSIS SCREENING**

Off Ramp	Ramp Storage [a]	Peak Hour	Project Trips Added	Meets Screening?	Queue Length [b]			Exceeds Ramp Storage?
					Left-Turn Lane(s)	Right-Turn Lane(s)	Total	
SR 14 Southbound Off-Ramp to Sand Canyon Road	1,490 ft	AM	5	No	-	-	-	-
		PM	11	No	-	-	-	-
SR 14 Northbound Off-Ramp to Sand Canyon Road	1,780 ft	AM	13	No	-	-	-	-
		PM	28	Yes	308 ft	18 ft	634 ft	No

Notes:

[a] Includes the sum of the length of each off-ramp lane and the off-ramp itself to the gore point (i.e., where the ramp meets the freeway mainline), in feet.

[b] Based on Future with Project Conditions (see Table 16). Total queue length is double the left-turn lane queue (or dual lanes) plus the right-turn queue.

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## **Chapter 8**

### ***Non-CEQA Analysis: Pedestrian, Bicycle, and Transit Access***

This chapter presents an assessment of the Project's effects on pedestrian, bicycle, and transit circulation in the vicinity of the Project Site. The choice to make a trip by a mode other than automobile is directly influenced by the perceived convenience and safety of the alternative mode and, therefore, the Project's improvements or deterioration of facilities serving pedestrians, bicyclists, or transit users is of critical importance.

#### **EXISTING INFRASTRUCTURE**

As discussed in Chapter 2, the Study Area currently provides limited dedicated pedestrian, bicycle, and transit infrastructure in the vicinity of the Project Site. There are sidewalks on the south side of Lost Canyon Road west of Sand Canyon Road and on the west side of Sand Canyon Road north of Lost Canyon Road. North of the Santa Clara River bridge, there are sidewalks on both sides of Sand Canyon Road, and there are sidewalks on both sides of Soledad Canyon Road. There are crosswalks at intersections, including continental (i.e., ladder-striped) crosswalks at three of the four study intersections.<sup>12</sup>

There are bicycle lanes on Sand Canyon Road north of the Santa Clara River Bridge and on Soledad Canyon Road. There are also multi-use paths along Sand Canyon Road south of Lost Canyon Road and along Oaks Spring Canyon Road east of the Project Site. Figure 4 provides a map of pedestrian and bicycle infrastructure in the Study Area.

As shown in Figure 5, the nearest bus stop is approximately 1.8 miles walking distance from the northern Project access point. The nearest Metrolink stop is even further, at approximately 2.3 miles walking distance.

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<sup>12</sup> Sand Canyon Road & Soledad Canyon Road (Intersection #2) has standard-striped crosswalks.

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## **PROJECT EFFECTS ON INFRASTRUCTURE**

The Project would generally improve infrastructure for pedestrians and bicyclists through the installation of a network of internal sidewalks and trails within the Project Site and the development of a new public multi-use trail along the eastern and northern boundaries of the Project Site, connecting to an existing multi-use trail along Oak Springs Canyon Road to the east, Robinson Ranch Road to the south, and Sand Canyon Road to the west. The Project would not affect existing transit infrastructure.

## **PROJECT EFFECTS ON VOLUME**

The Project would result in additional pedestrian and bicycle activity at and around the Project Site. It may also result in a modest increase in public transit usage on Santa Clarita Transit 6 and on Metrolink. However, as the Project is a senior living community where many residents are likely to be retired and thus not keep regular commute schedules that lend themselves to routine transit usage, driving is expected to be the primary mode of non-recreational transportation for Project residents. Any increases in pedestrian, bicycle, and transit activity resulting from the Project would not strain the capacity of existing and proposed infrastructure.

## **PROJECT FEATURES AND RECOMMENDED ACTIONS**

In summary, the Project would provide the following features that would directly benefit pedestrian, bicycle, or transit access at and around the Project Site:

- Construction of sidewalks and recreational trails within the Project Site
- Construction of sidewalks and recreational trails with the Project Site
- Dedicated pedestrian access to all Project development components
- Provision of a new multi-use trail along the eastern and northern boundaries of the Project Site, which would connect to key streets and existing trails in the area
- Provision of on-site bicycle parking

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Based on the analysis above, the Project would not result in substantial negative effects on pedestrian, bicycle, or transit access and, therefore, no improvements are necessary beyond those already proposed as features of the Project.

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## **Chapter 9**

### ***Non-CEQA Analysis: Project Access, Safety, and Circulation***

This chapter presents an assessment of the Project's effects on access and circulation, both adjacent to the Project Site and in the surrounding area, once the Project is operational.<sup>13</sup> Project effects may consist of operational delays on surrounding streets or conflicts between vehicles and other vehicles, bicycles, or pedestrians. Such effects are not considered significant under CEQA but could require Project modifications or off-site improvements to ensure safe and efficient circulation around the Project Site.

#### **VEHICLE OPERATIONS OVERVIEW**

The vehicle operations evaluation is a quantitative analysis of the effects of Project traffic at key surrounding intersections. Four intersections were identified through the Scoping Letter for detailed analysis, as shown in Figure 3 and listed in Table 13.

Potential effects to be identified include increases in average vehicular delay through the intersections, worsening of intersection level of service (LOS), or vehicular queuing that would exceed turn pocket lengths and extend into through lanes, block cross streets, or contribute to congestion.

The operational evaluation includes the following steps, which are described in detail in the following sections:

- Develop Project traffic estimates
- Obtain existing traffic counts and develop future baseline traffic volumes
- Conduct operational analysis of study intersections

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<sup>13</sup> The effects of Project construction are analyzed in Chapter 10.

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Based on the City's established thresholds, an intersection would be considered "affected" by Project-generated traffic if the Project would do any of the following:

- Worsen an intersection maintained by the City from LOS D or better to LOS E or F
- Cause the following increase in delay at an intersection maintained by the City that operated (with the Project) at LOS D or worse:
  - LOS D with the Project: more than four-second increase in delay
  - LOS E or F with the Project: more than two-second increase in delay

Affected intersections should be further reviewed to identify improvements to bring them below the above thresholds.

## **PROJECT TRAFFIC**

This section details the development of Project traffic estimates at the study intersections during the morning and afternoon peak hours. The assumptions used in developing the Project traffic estimates were reviewed and approved by City staff in the Scoping Letter. Following development of the Scoping Letter, the distribution pattern was modified in consultation with City staff as described below.

### **Project Trip Generation**

The estimate of Project trip generation was described in Chapter 3 and is summarized in Table 6. As shown, the Project is estimated to generate a total of 1,596 daily trips, including 94 trips during the morning peak hour (32 inbound, 62 outbound) and 116 trips during the afternoon peak hour (71 inbound, 45 outbound).

### **Project Trip Distribution**

The distribution of Project traffic throughout the surrounding streets and highways is dependent on the location of commercial centers from which residents of the Project would be drawn,

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characteristics of the street and freeway system serving the Project Site, the location of the proposed access points, and existing/proposed traffic conditions. As noted above, two adjustments were made to the Project distribution pattern following the development of the Scoping Letter. First, five percent of Project traffic was distributed to the south entrance, to Robinson Ranch Road and Sand Canyon Road to the south, and thus does not travel through any of the four analyzed intersections. Second, ten percent of Project traffic was distributed on Sand Canyon Road north of Soledad Canyon Road to reflect travel to the Sand Canyon Plaza shopping center. The general distribution patterns for Project traffic are shown in Figure 9 and are based on distribution patterns developed in the City's travel demand forecasting model and nearby development projects.

### **Project Traffic Assignment**

The trip distribution pattern shown in Figure 9 was used to assign the Project-generated traffic through the Study Area based on the trip generation estimates summarized in Table 5. Figure 10 illustrates the Project traffic volumes at the study intersections during typical weekday morning and afternoon peak hours.

## **EXISTING AND FUTURE TRAFFIC VOLUMES**

### **Existing Traffic Volumes**

Intersection turning movement counts for all intersections were collected in February 2024 on a typical weekday when schools were in session. Based on input from the City, the counts were collected from 6 AM to 8 AM to capture the morning peak period and from 4 PM to 6 PM to capture the afternoon peak period. Counts were then factored up by 2% to reflect Year 2025 traffic volumes based on the City's estimated annual rate of traffic growth.

Additionally, in consultation with the City, a detailed review was conducted of the flow of traffic between the four study intersections. Though significant variations were identified in the number of vehicles departing one intersection and arriving at the next, these variations were determined to be consistent across the peak periods and explainable by the access points to various land

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uses (e.g., gas stations, restaurants) between the intersections. Ultimately, to maximize real-world traffic consistency between the four study intersections, the peak hours (i.e., the busiest consecutive 60-minute periods within each two-hour peak period count) were identified for the Study Area as a whole rather than for each intersection separately. The morning peak hour was determined to be 6:15 AM to 7:15 AM and the afternoon peak hour was determined to be 4:30 PM to 5:30 PM.

The Existing Conditions (2025) peak hour traffic volumes are shown in Figure 11 and the traffic counts are provided in Appendix E.

### **Future Traffic Volumes**

Estimates of future traffic conditions were prepared in accordance with procedures outlined by the City using a combination of ambient traffic growth and traffic estimates from known Related Projects listed in Table 4.

**Ambient Traffic Growth.** Existing traffic is expected to increase as a result of regional growth and development outside the Study Area. Based on discussions with the City, an ambient growth factor of 2% per year was applied to the existing traffic volumes to reflect the effects of the regional growth and general background development by Year 2032. The total adjustment applied over the seven-year period between Year 2025 and the anticipated buildout year of the Project was 14%. This rate exceeds the regional traffic growth forecasts of *2010 Congestion Management Program* (Los Angeles County Metropolitan Transportation Authority, 2010) and, therefore, is conservative.

**Related Project Traffic.** The development of estimated traffic volumes added to the Study Intersections as a result of Related Projects involves the use of the same three-step process as for Project traffic: trip generation, trip distribution, and trip assignment. Trip generation estimates for the Related Projects are summarized in Table 4. The geographic distribution of the traffic generated by the Related Projects is based on logical travel routes through the street system to and from likely local destinations and regional transportation facilities. These trips were assigned to the street system via the distribution patterns. Total Related Project peak hour traffic volume estimates are shown in Figure 12.

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The Future without Project Conditions peak hour traffic volumes, reflecting 14% ambient growth and the addition of Related Project traffic from Figure 12, are shown in Figure 13.

### **With Project Traffic Volumes**

The Existing Conditions and Future without Project Conditions peak hour traffic volumes represent the baseline conditions upon which the addition of Project traffic was evaluated. Project traffic from Figure 10 was added to the Existing Conditions traffic volumes from Figure 11 to develop the Existing with Project Conditions peak hour traffic volumes, shown in Figure 14. Project traffic was also added to the Future without Project Conditions traffic volumes from Figure 13 to develop the Future with Project Conditions peak hour traffic volumes, shown in Figure 15.

## **OPERATING CONDITIONS**

The analysis of traffic operating conditions of standard intersections was conducted using the *Highway Capacity Manual, 7<sup>th</sup> Edition* (Transportation Research Board, 2022 (HCM) methodology, which calculates delay, in seconds, experienced by a vehicle passing through an intersection. For signalized intersections and stop-controlled intersections, the average delay of all traffic passing through the intersection is reported. For both signalized and unsignalized intersections, vehicular delay is converted to LOS according to the definitions shown in Table 6. The HCM analysis also provides estimates of vehicle queuing lengths at various movements through each intersection based on the 95<sup>th</sup> percentile queue length. The HCM analysis of signalized intersections accounted for the existing traffic signal cycle lengths and timing plans by using the City's Synchro<sup>14</sup> traffic network. Intersection lane configurations used in the analysis are provided in Appendix F and the HCM output is provided in Appendix G.

Under Existing with Project Conditions and Future with Project Conditions, Sand Canyon Road & Lost Canyon Road (Intersection #4) was also analyzed as a roundabout. This analysis was conducted using Sidra software to assess LOS based on Sidra's industry-standard LOS evaluation methodology. The Sidra worksheets are provided in Appendix H.

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<sup>14</sup> Trafficware's Synchro version 12 was used to implement the HCM methodology.

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### **Existing Year (2025) Intersection LOS**

Table 14 summarizes the LOS analysis for Existing Conditions and Existing with Project Conditions for each of the study intersections. As shown, under Existing Conditions, three of the four study intersections (Intersections #1, #3, and #4) operate at LOS C or better during both the morning and afternoon peak hours, while Sand Canyon Road & Soledad Canyon Road (Intersection #2) operates at LOS E during the afternoon peak hour. It is important to note that Sand Canyon Road & Lost Canyon Road (Intersection #4) currently operates with all-way stop control and was analyzed as such under this scenario.

Under Existing with Project Conditions, the same three study intersections would continue to operate at LOS C or better during both the morning and afternoon peak hours. Sand Canyon Road & Soledad Canyon Road (Intersection #2) would continue to operate at LOS E during the afternoon peak hour, with an increase in average vehicular delay of 4.4 seconds per vehicle from Project traffic. This exceeds the threshold of 2.0 seconds at LOS E for the intersection to be considered “affected” per the TAU. This Project-related increase in delay is not an impact under CEQA for which mitigation would be required, but the TAU requires identification of affected intersections to inform decision-makers on the overall effects of a project. A potential intersection improvement that would reduce delay below the TAU threshold was identified and is described below.

Sand Canyon Road & Lost Canyon Road (Intersection #4) was analyzed both as a roundabout and as a signalized intersection under Existing with Project Conditions. As shown in Table 14, if the roundabout were installed it would be projected to operate at LOS A during both the morning and afternoon peak hours. If a traffic signal were installed it would be projected to operate at LOS B during both the morning and afternoon peak hours. A traffic signal warrant analysis was prepared for this intersection and is discussed later in this section.

### **Future Year (2032) Intersection LOS**

Table 15 summarizes the LOS analysis for Future without Project Conditions and Future with Project Conditions for each of the study intersections. As shown, under Future without Project Conditions, three of the four study intersections (Intersections #1, #3, and #4) would operate at

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LOS C or better during both the morning and afternoon peak hours. Sand Canyon Road & Soledad Canyon Road (Intersection #2) would operate at LOS E during the morning peak hour and LOS F during the afternoon peak hour. Sand Canyon Road & Lost Canyon Road (Intersection #4) was analyzed both as a roundabout and a signalized intersection under Future without Project Conditions. It would operate at LOS A or B under each configuration and peak hour.

Under Future with Project Conditions, the same three study intersections would continue to operate at LOS C or better during both the morning and afternoon peak hours. Sand Canyon Road & Soledad Canyon Road (Intersection #2) would continue to operate at LOS E during the morning peak hour and LOS F during the afternoon peak hour. It would experience an increase in average vehicular delay of 1.0 seconds during the morning peak hour and 3.6 seconds during the afternoon peak hour from Project traffic. During the afternoon peak hour, this exceeds the threshold of 2.0 seconds at LOS F for the intersection to be considered “affected” per the TAU. This Project-related increase in delay is not an impact under CEQA for which mitigation would be required, but the TAU requires identification of affected intersections to inform decision-makers on the overall effects of a project. A potential intersection improvement that would reduce delay below the TAU threshold was identified and is described below.

Sand Canyon Road & Lost Canyon Road (Intersection #4) was analyzed both as a roundabout and as a signalized intersection under Future with Project Conditions. As shown in Table 15, if the roundabout were installed it would be projected to operate at LOS A during both the morning and afternoon peak hours. If a traffic signal were installed it would be projected to operate at LOS B during both the morning and afternoon peak hours. Either configuration would result in improvements over the stop-controlled configuration analyzed under Existing Conditions. A traffic signal warrant analysis was prepared for this intersection and is discussed later in this section.

As noted previously, the Project would be conditioned to install a roundabout or traffic signal (to be determined by the City), and the previously-approved Vista Canyon development project was also conditioned for this improvement. If the Project is approved, the Applicant will work with the City and the Vista Canyon project applicant to allocate cost, timing, and responsibilities for these improvements. The improvements would be implemented by the time the Project receives its first certificate of occupancy or as otherwise agreed with the City.

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## **Intersection Queuing**

In addition to providing delay and LOS, the HCM analysis provides estimates of vehicle queuing lengths at key movements through each intersection based on the 95<sup>th</sup> percentile queue length. The results, along with the turn pocket lengths, are summarized in Table 16. As shown, many of the left-turn and right-turn pockets at the study intersections are forecast to have queues exceeding turn pocket lengths under Existing Conditions and Future without Project Conditions, including:

- Intersection #1, SR 14 Southbound Ramps & Soledad Canyon Road (eastbound right-turn lane)
- Intersection #2, Sand Canyon Road & Soledad Canyon Road (left- and right-turn lanes on each approach)
- Intersection #3, Sand Canyon Road & SR 14 Northbound Ramps (northbound right-turn lane and southbound left-turn lane)

The Project would contribute to many of these queues, though in most cases it would add one car-length (25 feet) or less. These Project-related increases in queue lengths are not impacts under CEQA for which mitigation would be required, and queuing analysis is not explicitly required by the TAU. However, City staff requested queuing analysis to inform decision-makers on the overall effects of a project. Potential intersection improvements that would reduce queuing to varying degrees were identified and are described below.

As shown in Table 16, the queues at Sand Canyon Road & Lost Canyon Road (Intersection #4) are projected to be within the available turn pockets whether the intersection is converted to a roundabout or is equipped with a traffic signal.

## **INDEPENDENT ROUNDABOUT OPERATIONS ANALYSIS**

The traffic operations effects of the proposed roundabout and southbound right turn lane were independently analyzed in the Kittelson Roundabout Study. That analysis, which included the Lost Canyon Road improvements identified in Chapter 2 as a baseline condition, concluded that the roundabout at Sand Canyon Road & Lost Canyon Road would generally result in similar or

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improved operational characteristics compared with the existing all-way stop-controlled intersection, but it would not reduce southbound queuing on Sand Canyon Road and it would cause approximately five minutes of additional delay for northbound traffic on Sand Canyon Road during the afternoon school pick-up period. It also identified long queues on the northbound and eastbound approaches. The Kittelson Study did not analyze a signalized condition for the intersection of Sand Canyon Road & Lost Canyon Road, but a signal warrant analysis was conducted as discussed below. The full study is provided in Appendix I.

## **SIGNAL WARRANT ANALYSIS**

A signal warrant analysis was conducted for Intersection #4, Sand Canyon Road & Lost Canyon Road, to determine whether the anticipated traffic volumes are sufficient to technically justify the installation of a traffic signal, should that option be selected over the roundabout. The signal warrant analysis was based on the guidelines set forth in *California Manual on Uniform Traffic Control Devices 2026* (Caltrans, 2026) by applying the thresholds from Warrant #3, Peak Hour. This warrant compares the relative demand of major street (i.e., Sand Canyon Road) and minor street (i.e., Lost Canyon Road) traffic during the peak hour against established thresholds.

The analysis was conducted based on Future with Project Conditions traffic volume forecasts from Figure 15. Warrant #3 was found to be met on the basis of both the morning and afternoon peak hours. On this basis, installation of a traffic signal is technically justified at the intersection of Sand Canyon Road & Lost Canyon Road. Detailed warrant analysis worksheets are provided in Appendix J.

It should be noted that the determination that an unsignalized intersection meets the traffic signal warrant does not in itself require the installation of a signal. Rather, it is one factor in determining whether it would be appropriate to install a new traffic signal. Other factors include the actual delay experienced by vehicles making key movements through the intersection, proximity to other signalized intersections, traffic progression on a synchronized corridor, whether the new signal would encourage traffic to pass through sensitive neighborhoods, and safety considerations. At this location, the City may determine that a roundabout is the preferred traffic control device.

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## **POTENTIAL INTERSECTION IMPROVEMENTS**

Improvements were identified for Intersections #1, #2, and #3 that would reduce delay (at Intersection #2) and/or turn pocket queuing (at all three intersections) to bring those intersections closer to alignment with City operating standards. These improvements may or may not be implemented at the City's discretion and may not be feasible, so are described here for informational purposes. In all cases, the below-standard operating conditions (i.e., LOS F conditions at Intersection #2 and queues exceeding turn pocket lengths at all three intersections) currently occur under Existing Conditions, would worsen under Future without Project Conditions, and would marginally worsen still with the addition of Project traffic.

### **Intersection #1, SR 14 Southbound Ramps & Soledad Canyon Road**

Intersection #1 experiences long queues for eastbound right turns during both the morning and afternoon peak hours, as shown in Table 16. City staff identified a conceptual improvement that included widening the eastbound approach to provide a second right-turn lane. However, this would require acquisition of private property from the northern edge of the existing gas station on the southeast corner of Sand Canyon Road & Soledad Canyon Road and is therefore deemed infeasible. Nonetheless, the effects of this improvement were analyzed below.

### **Intersection #2, Sand Canyon Road & Soledad Canyon Road**

Intersection #2 operates at LOS F and experiences queues exceeding turn pockets on all exclusive left-turn and right-turn pockets, as shown in Tables 14 through 16. Initially, a potential improvement was reviewed that included widening the eastbound approach to add a second right-turn lane; however, this would only address queuing on that movement and would minimally improve intersection delay while requiring the acquisition of private property and increasing the crossing distance for pedestrians.

Therefore, an improvement was developed that would only require modification to the traffic signals. This improvement involves installation of right-turn arrows for the eastbound, westbound, and northbound approaches which would be green both during the corresponding through

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movement's green phase as well as during the overlapping left-turn phase.<sup>15</sup> This operation would preclude the ability to make U-turns from the overlapping left-turn lanes. Currently, the northbound and southbound approaches already prohibit U-turns; U-turns would need to be prohibited on the westbound approach. This improvement is considered feasible, and the effects of it were analyzed below.

### **Intersection #3, Soledad Canyon Road & SR 14 Northbound Ramps**

Intersection #3 experiences long queues for the northbound right-turn lane and the southbound left-turn lane during the afternoon peak hour as shown in Table 16. There are no feasible operational modifications to this intersection (i.e., signal timing adjustments) to address queuing that would not simultaneously result in increases to average delay. Rather, in order to reduce queuing on those two movements, it would be necessary to widen the northbound approach to provide a second right-turn lane and the southbound approach to provide a second left-turn lane. The northbound widening could potentially occur within the available public right-of-way, but would require removing the bicycle lane and narrowing the sidewalk adjacent to the gas stations on the east side of Sand Canyon Road. The southbound widening could potentially occur by restriping Sand Canyon Road over the Caltrans bridge over SR 14 to minimize the width of the median striping and removing the southbound bicycle lane in this area. Additionally, either the northbound or southbound second lane would require restriping the on-ramp to receive dual lanes and merge down to one lane. Because this improvement would require removal of sections of the existing bicycle lanes in each direction, it is deemed infeasible. Nonetheless, the effects of this improvement were analyzed below.

### **Intersection LOS, with Improvements**

Table 17 summarizes the delay and LOS results after implementation of the improvements described above. As shown, the improvement at Intersection #1, SR 14 Southbound Ramps & Soledad Canyon Road would have a minimal effect on average delay. The improvement at Intersection #3, Sand Canyon Road & SR 14 Southbound Ramps, would only improve delay

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<sup>15</sup> For example, the northbound right-turn lane would have a green arrow while the westbound left-turn lane has a green arrow.

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during the afternoon peak hour under the Future with Project with Improvement Conditions. Neither of those locations were considered “affected” by Project traffic according to the criteria in the TAU.

Intersection #2, Sand Canyon Road & Soledad Canyon Road, would be affected by Project traffic as it was found to add at least two seconds of delay to LOS E operations. The identified improvement reduces delay during both peak hours and would improve the operating conditions by one level of service during the morning peak hour and by two levels of service during the afternoon peak hour (from LOS F to LOS D). With the improvement, the operating conditions would be below the affected intersection threshold.

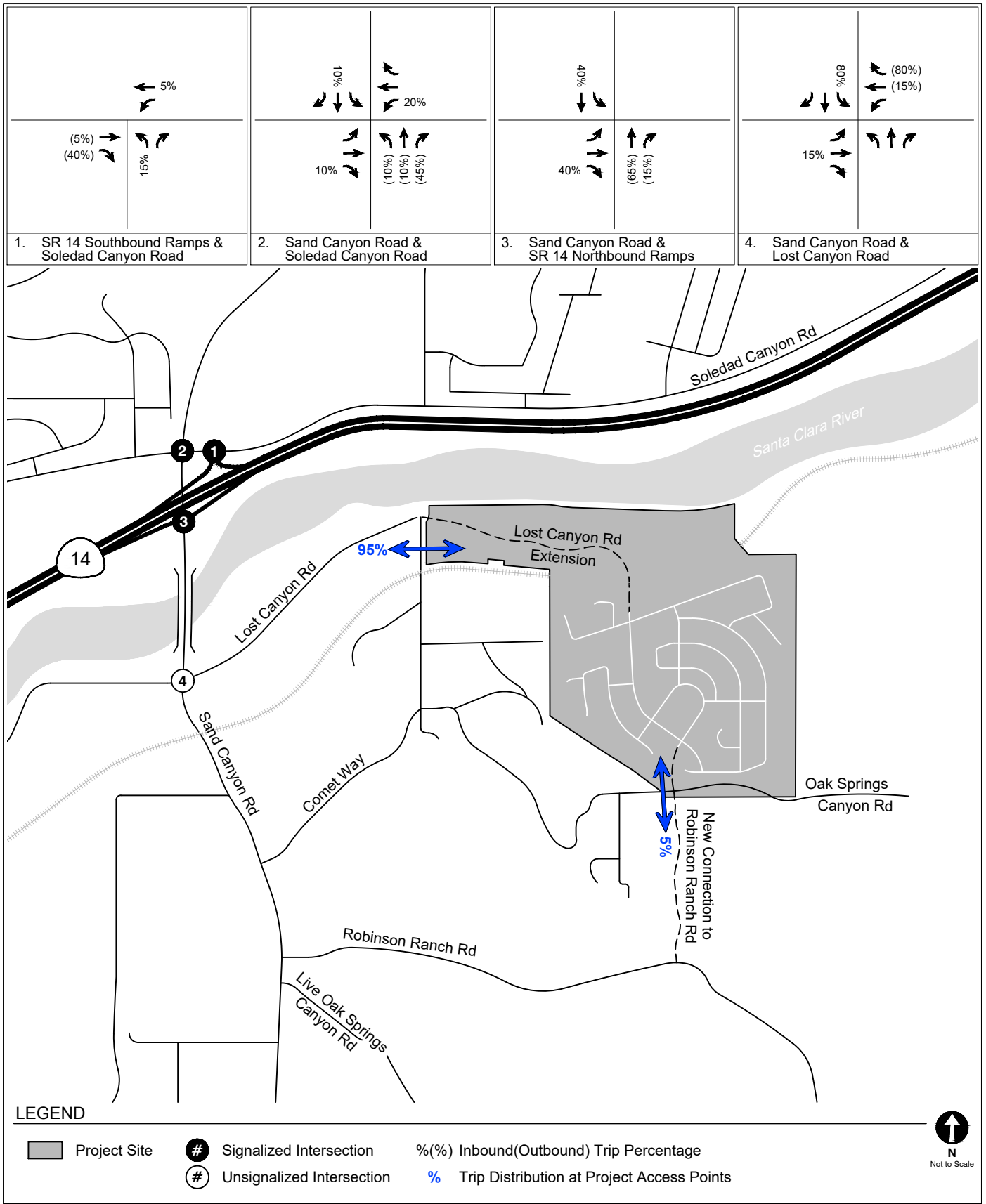
### **Intersection Queues, with Improvements**

Table 18 summarizes the queue results after implementation of the improvements described above. As previously noted, the TAU does not require queuing analysis or the identification of improvements related to queuing, but this analysis was requested by City staff. The identified improvement at Intersection #1, SR 14 Southbound Ramps & Soledad Canyon Road, though deemed infeasible, would reduce queuing in the eastbound right-turn lane during both the morning and afternoon peak hours. While the potential queue would still exceed the distance between Intersection #1 and Sand Canyon Road to the west, the improvement would reduce potential upstream congestion at Intersection #2 (Sand Canyon Road & Soledad Canyon Road).

The identified improvement at Intersection #2 would reduce queueing in the eastbound, westbound, and northbound right-turn lanes. While each of these queues would still have the potential to exceed the available turn pockets, the magnitude of the reductions would reduce congestion and the potential for upstream congestion at neighboring intersections. The improvement would not affect queueing in left-turn lanes, which would continue to exceed turn pockets. Left-turn queues could potentially be reduced with additional widening for additional left-turn lanes; however, such changes would require significant acquisitions of private property, major reconfigurations of the existing roadways, and would likely result in alignment issues across intersections. Also, for the northbound approach, a third left-turn lane could not be accommodated without also widening the westbound departure on Soledad Canyon Road to accommodate three turning lanes.

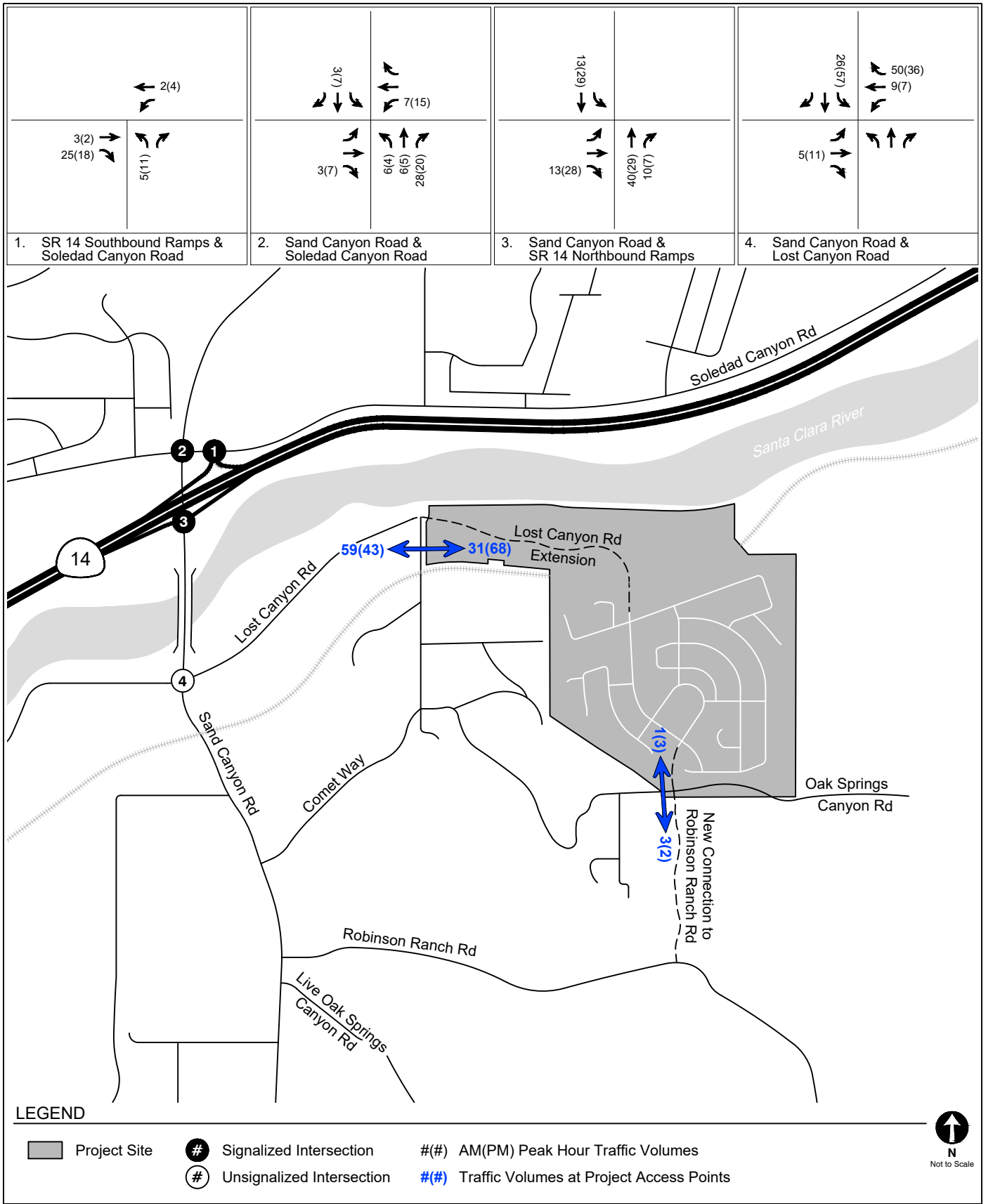
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The identified improvement at Intersection #3, Sand Canyon Road & SR 14 Northbound Ramps, though deemed infeasible, would reduce queueing in the northbound right-turn lane and the southbound left-turn lane during both peak hours. The queue in the southbound left-turn lanes would be contained within the available turn pocket lengths. The queue in the northbound right-turn lanes would continue to have the potential to exceed the turn pocket length but would less frequently interfere with driveway or northbound through lane operations.



PROJECT TRIP DISTRIBUTION

FIGURE  
9



**LEGEND**

- Project Site
- Signalized Intersection
- Unsignalized Intersection
- #(##) AM(PM) Peak Hour Traffic Volumes
- #(##) Traffic Volumes at Project Access Points

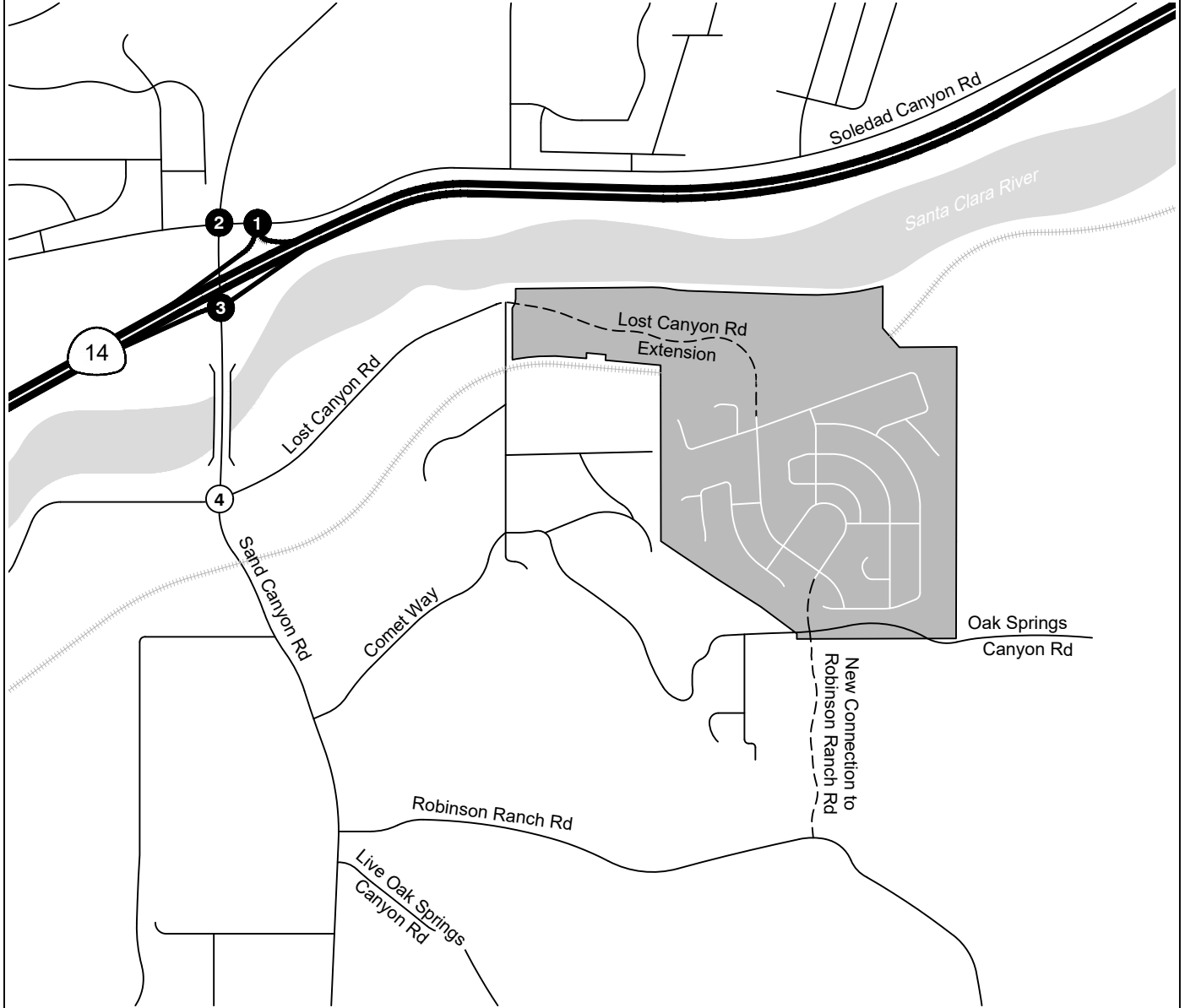


Not to Scale

**PROJECT-ONLY  
PEAK HOUR TRAFFIC VOLUMES**

**FIGURE  
10**

<p>← 39(38) ↖ 13(15)</p>	<p>↖ 25(31) ↘ 17(17) ↙ 26(23)</p> <p>↗ 6(14) ↘ 111(98) ↙ 60(49)</p>	<p>↖ 61(124) ↘ 69(53)</p>	<p>↖ 41(29) ↘ 41(33)</p> <p>↗ ↕ ↘</p>
<p>→ 27(61) ↘ 58(137)</p> <p>↖ ↗ ↘ ↙</p> <p>↖ ↗ ↘ ↙</p> <p>↖ ↗ ↘ ↙</p>	<p>↖ ↗ ↘ ↙</p> <p>↖ ↗ ↘ ↙</p> <p>↖ ↗ ↘ ↙</p> <p>↖ ↗ ↘ ↙</p>	<p>↖ ↗ ↘ ↙</p> <p>↖ ↗ ↘ ↙</p> <p>↖ ↗ ↘ ↙</p>	<p>↖ ↗ ↘ ↙</p> <p>↖ ↗ ↘ ↙</p> <p>↖ ↗ ↘ ↙</p>
<p>1. SR 14 Southbound Ramps &amp; Soledad Canyon Road</p>	<p>2. Sand Canyon Road &amp; Soledad Canyon Road</p>	<p>3. Sand Canyon Road &amp; SR 14 Northbound Ramps</p>	<p>4. Sand Canyon Road &amp; Lost Canyon Road</p>



**LEGEND**

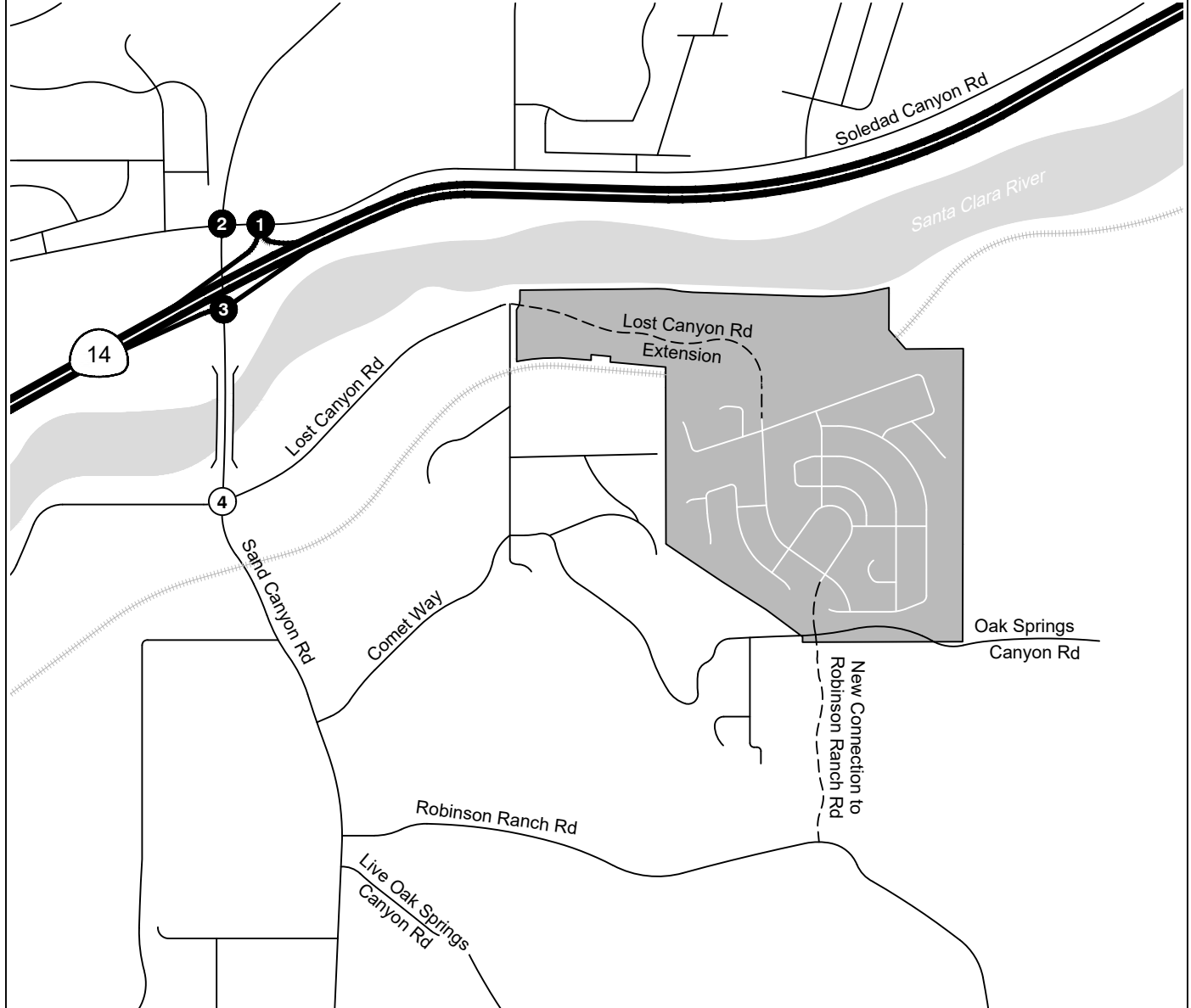
- Project Site
- # Signalized Intersection
- # Unsignalized Intersection
- #(#) AM(PM) Peak Hour Traffic Volumes



**RELATED PROJECT-ONLY  
PEAK HOUR TRAFFIC VOLUMES**

**FIGURE  
11**

1. SR 14 Southbound Ramps & Soledad Canyon Road	2. Sand Canyon Road & Soledad Canyon Road	3. Sand Canyon Road & SR 14 Northbound Ramps	4. Sand Canyon Road & Lost Canyon Road



**LEGEND**

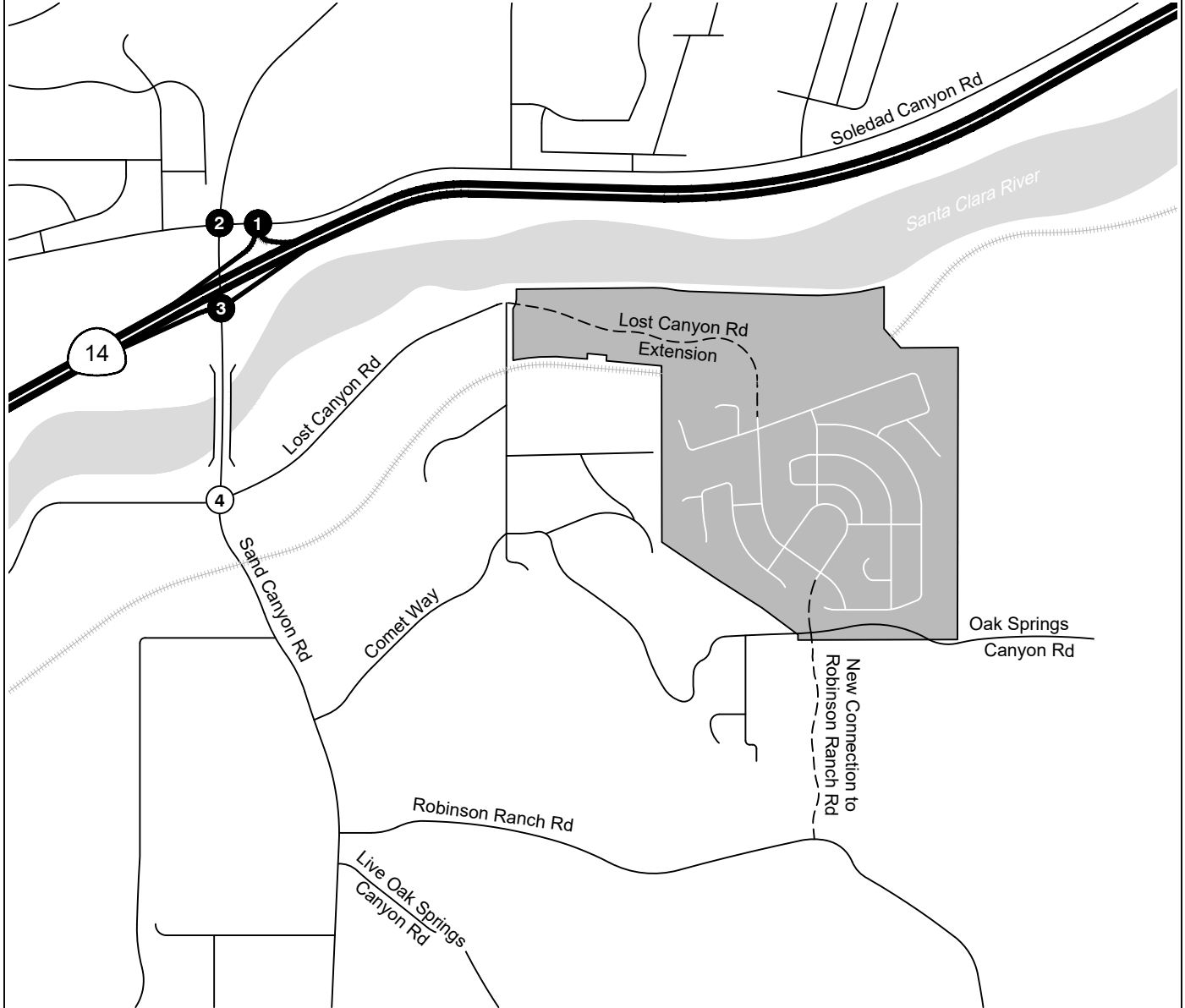
- Project Site
- # Signalized Intersection
- # Unsignalized Intersection
- #(##) AM(PM) Peak Hour Traffic Volumes
- \* Negligible Volume



**EXISTING CONDITIONS (YEAR 2025)  
PEAK HOUR TRAFFIC VOLUMES**

**FIGURE  
12**

1. SR 14 Southbound Ramps & Soledad Canyon Road	2. Sand Canyon Road & Soledad Canyon Road	3. Sand Canyon Road & SR 14 Northbound Ramps	4. Sand Canyon Road & Lost Canyon Road



**LEGEND**

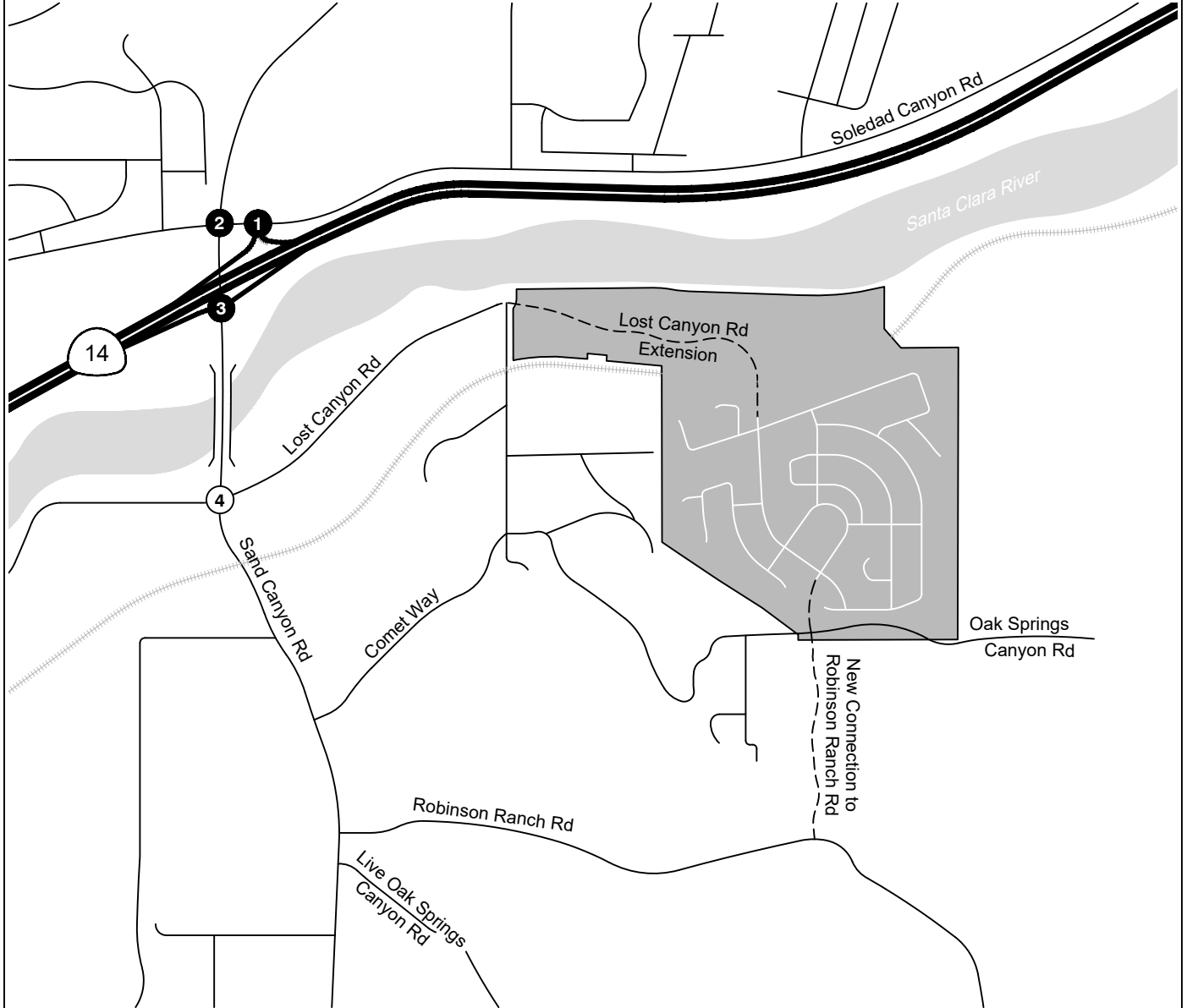
- Project Site
- # Signalized Intersection
- # Unsignalized Intersection
- #(##) AM(PM) Peak Hour Traffic Volumes
- \* Negligible Volume



**FUTURE WITHOUT PROJECT CONDITIONS (YEAR 2032)  
PEAK HOUR TRAFFIC VOLUMES**

**FIGURE  
13**

1. SR 14 Southbound Ramps & Soledad Canyon Road	2. Sand Canyon Road & Soledad Canyon Road	3. Sand Canyon Road & SR 14 Northbound Ramps	4. Sand Canyon Road & Lost Canyon Road



**LEGEND**

█ Project Site

● Signalized Intersection

## AM(PM) Peak Hour Traffic Volumes

○ Unsignalized Intersection

\* Negligible Volume

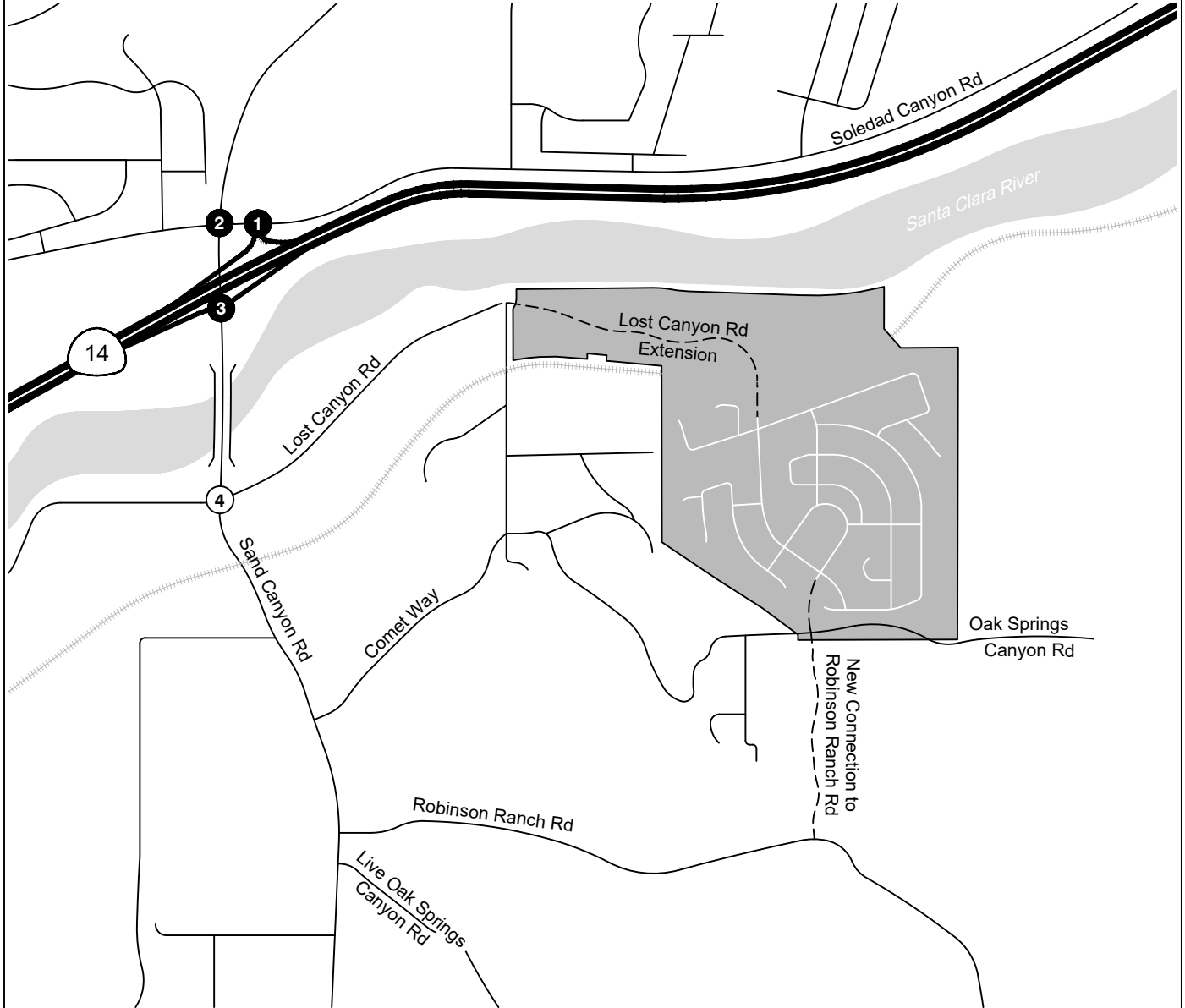


Not to Scale

**EXISTING WITH PROJECT CONDITIONS (YEAR 2025)  
PEAK HOUR TRAFFIC VOLUMES**

**FIGURE  
14**

1. SR 14 Southbound Ramps & Soledad Canyon Road	2. Sand Canyon Road & Soledad Canyon Road	3. Sand Canyon Road & SR 14 Northbound Ramps	4. Sand Canyon Road & Lost Canyon Road



**LEGEND**

Project Site

Signalized Intersection

#(#) AM(PM) Peak Hour Traffic Volumes

Unsignalized Intersection

\* Negligible Volume



**FUTURE WITH PROJECT CONDITIONS (YEAR 2032)  
PEAK HOUR TRAFFIC VOLUMES**

**FIGURE  
15**

**TABLE 13  
STUDY INTERSECTIONS**

No.	North/South Street	East/West Street	Existing Intersection Control
1	SR 14 Southbound Ramps	Soledad Canyon Road	Signalized
2	Sand Canyon Road	Soledad Canyon Road	Signalized
3	Sand Canyon Road	SR 14 Northbound Ramps	Signalized
4	Sand Canyon Road	Lost Canyon Road	All-way Stop [a]

Notes:

[a] This intersection is proposed to be signalized or converted to a roundabout as part of the Project.

**TABLE 14  
EXISTING CONDITIONS (YEAR 2025) INTERSECTION LEVELS OF SERVICE**

No.	Intersection	Peak Hour	Existing Conditions		Existing with Project Conditions				
			Delay	LOS	Delay	LOS	Δ Delay	Affected	
1.	SR 14 SB Ramps & Soledad Canyon Road	A.M.	27.1	C	27.4	C	0.3	No	
		P.M.	16.7	B	16.8	B	0.1	No	
2.	Sand Canyon Road & Soledad Canyon Road	A.M.	40.8	D	41.1	D	0.3	No	
		P.M.	95.4	F	97.9	F	2.5	Yes	
3.	Sand Canyon Road & SR 14 NB Ramps	A.M.	11.4	B	11.6	B	0.2	No	
		P.M.	16.8	B	17.2	B	0.4	No	
4. [a]	Sand Canyon Road & Lost Canyon Road	[b] Roundabout	A.M.	23.6	C	6.3	A	(17.3)	No
			P.M.	21.7	C	6.9	A	(14.8)	No
		Traffic Signal	A.M.	23.6	C	11.2	B	(12.4)	No
			P.M.	21.7	C	11.1	B	(10.6)	No

Notes:

Except where noted, intersection analysis is based on HCM 7th Edition signalized intersection methodology, which calculates the average vehicle delay in seconds.

[a] Intersection is currently unsignalized. The Existing Conditions analysis uses the HCM 7th Edition All-Way Stop Control methodology.

[b] SIDRA Standard Delay Model was used for roundabout analysis under Existing with Project Conditions. Analysis prepared by Stantec and provided in Appendix H.

**TABLE 15  
FUTURE CONDITIONS (YEAR 2032) INTERSECTION LEVELS OF SERVICE**

No.	Intersection	Peak Hour	Future without Project Conditions		Future with Project Conditions				
			Delay	LOS	Delay	LOS	Δ Delay	Affected	
1.	SR 14 SB Ramps & Soledad Canyon Road	A.M.	31.7	C	32.0	C	0.3	No	
		P.M.	29.8	C	30.1	C	0.3	No	
2.	Sand Canyon Road & Soledad Canyon Road	A.M.	58.7	E	59.1	E	0.4	No	
		P.M.	91.3	F	94.1	F	2.8	Yes	
3.	Sand Canyon Road & SR 14 NB Ramps	A.M.	12.3	B	12.6	B	0.3	No	
		P.M.	32.4	C	33.7	C	1.3	No	
4. [a]	Sand Canyon Road & Lost Canyon Road	[b] Roundabout	A.M.	6.4	A	6.7	A	0.3	No
			P.M.	7.4	A	8.3	A	0.9	No
		Traffic Signal	A.M.	12.5	B	13.7	B	1.2	No
			P.M.	12.1	B	14.4	B	2.3	No

Notes:

Except where noted, intersection analysis is based on HCM 7th Edition signalized intersection methodology, which calculates the average vehicle delay in seconds.

[a] Intersection is currently unsignalized. However, for the purposes of comparing conditions with and without the Project, the Future without Project Conditions analysis was conducted assuming a roundabout and as a signalized intersection.

[b] SIDRA Standard Delay Model was used for roundabout analysis. Analysis prepared by Stantect and provided in Appendix H.

**TABLE 16  
INTERSECTION QUEUES**

Intersection	Turn Pocket Length	Peak Hour	Queue Length			
			Existing Conditions	Future without Project Conditions	Future with Project Conditions	Project Contribution to Queue Length
<b>Intersection #1, SR 14 SB Ramps &amp; Soledad Canyon Road</b>						
Eastbound Right-Turn <i>from Soledad Canyon Road to SR 14 Southbound On-Ramp</i>	195 [a]	A.M. P.M.	333 10	508 598	573 630	65 32
Westbound Left-Turn <i>from Soledad Canyon Road to SR 14 Southbound On-Ramp</i>	500	A.M. P.M.	215 318	285 415	288 415	3 0
Northbound Left-Turn <i>from SR 14 Southbound Off-Ramp to Soledad Canyon Road</i>	440 (1,060) [b]	A.M. P.M.	368 318	520 448	523 458	3 10
<b>Intersection #2, Sand Canyon Road &amp; Soledad Canyon Road</b>						
Eastbound Left-Turn <i>from Soledad Canyon Road to Sand Canyon Road</i>	180	A.M. P.M.	133 253	195 318	195 318	0 0
Eastbound Right-Turn <i>from Soledad Canyon Road to Sand Canyon Road</i>	180	A.M. P.M.	720 223	1,210 480	1,225 503	15 23
Westbound Left-Turn <i>from Soledad Canyon Road to Sand Canyon Road</i>	190 [a]	A.M. P.M.	8 333	158 455	163 478	5 23
Westbound Right-Turn <i>from Soledad Canyon Road to Sand Canyon Road</i>	100	A.M. P.M.	3 128	3 180	3 180	0 0
Northbound Left-Turn <i>from Soledad Canyon Road to Sand Canyon Road</i>	155	A.M. P.M.	253 243	345 308	350 310	5 2
Northbound Right-Turn <i>from Soledad Canyon Road to Sand Canyon Road</i>	155	A.M. P.M.	195 793	215 895	235 935	20 40
Southbound Left-Turn <i>from Soledad Canyon Road to Sand Canyon Road</i>	160	A.M. P.M.	128 190	178 243	178 243	0 0

Notes:

All lengths shown in feet based on 25 feet per vehicle. Queues based on 95th percentile queue calculated by the HCM methodology. Turn pocket lengths based on length of striped pocket, except as noted.

[a] Reflects total distance between the limit line and the upstream intersection.

[b] The first distance is to the back of the striped turn lane(s). The second distance is the total length of the off-ramp before reaching the mainline lanes.

**TABLE 16 (CONTINUED)  
INTERSECTION QUEUES**

Intersection	Turn Pocket Length	Peak Hour	Queue Length			
			Existing Conditions	Future without Project Conditions	Future with Project Conditions	Project Contribution to Queue Length
<b>Intersection #3, Sand Canyon Road &amp; SR 14 NB Ramps</b>						
Eastbound Left-Turn <i>from SR 14 NB Off-Ramp to Sand Canyon Road</i>	250 (1,150) [b]	A.M. P.M.	50 190	415 303	90 308	(325) 5
Eastbound Right-Turn <i>from SR 14 NB Off-Ramp to Sand Canyon Road</i>	380 (1,150) [b]	A.M. P.M.	183 10	448 463	10 18	(438) (445)
Northbound Right-Turn <i>from Sand Canyon Road to SR 14 On-Ramp</i>	60	A.M. P.M.	38 150	53 258	60 263	7 5
Southbound Left-Turn <i>from Sand Canyon Road to SR 14 On-Ramp</i>	240	A.M. P.M.	48 80	78 510	83 540	5 30
<b>Intersection #4, Sand Canyon Road &amp; Lost Canyon Road (Roundabout) [c]</b>						
Eastbound Left-Turn / Through <i>from Lost Canyon Road to Sand Canyon Road</i>	[d]	A.M. P.M.	38 48	62 46	67 52	5 6
Southbound Through / Left-Turn <i>from Sand Canyon Road</i>	1,500 [e]	A.M. P.M.	270 70	92 39	98 47	6 8
Southbound Right-Turn <i>from Sand Canyon Road to Lost Canyon Road</i>	1,500 [e]	A.M. P.M.	53 20	51 23	51 24	0 1
<b>Intersection #4, Sand Canyon Road &amp; Lost Canyon Road (Signalized) [c]</b>						
Eastbound Left-Turn / Through <i>from Lost Canyon Road to Sand Canyon Road</i>	[d]	A.M. P.M.	38 48	108 145	133 203	25 58
Southbound Through / Left-Turn <i>from Sand Canyon Road to Lost Canyon Road</i>	1,500 [e]	A.M. P.M.	270 70	250 113	268 140	18 27
Southbound Right-Turn <i>from Sand Canyon Road to Lost Canyon Road</i>	1,500 [e]	A.M. P.M.	53 20	128 58	128 58	0 0

**Notes:**

All lengths shown in feet based on 25 feet per vehicle. Queues based on 95th percentile queue calculated by the HCM methodology. Turn pocket lengths based on length of striped pocket, except as noted.

[b] The first distance is to the back of the striped turn lane(s). The second distance is the total length of the off-ramp before reaching the mainline lanes.

[c] Intersection is unsignalized under Existing Conditions.

[d] The shared left-turn / through lane is the dominant movement on the eastbound approach. The road flows into the left-turn lane. The right-turn pocket, however, is approximately 45 feet long.

[e] Reflects proposed modifications on Sand Canyon Road to extend the right-turn lane to approximately 1,500 feet. Existing right-turn lane is approximately 750 feet long.

**TABLE 17  
INTERSECTION LEVEL OF SERVICE, WITH POTENTIAL IMPROVEMENTS**

No.	Intersection	Peak Hour	No Project Conditions		With Project Conditions		Conditions with Improvements			
			Delay	LOS	Delay	LOS	Delay	LOS	Δ Delay	Affected
<b>Existing Year (2025)</b>										
1.	SR 14 SB Ramps & Soledad Canyon Road	A.M. P.M.	27.1 16.7	C B	27.4 16.8	C B	26.8 16.8	C B	(0.3) 0.1	No No
2.	Sand Canyon Road & Soledad Canyon Road	A.M. P.M.	40.8 95.4	D F	41.1 97.9	D F	31.8 39.8	C D	(9.0) (55.6)	No No
3.	Sand Canyon Road & SR 14 NB Ramps	A.M. P.M.	11.4 16.8	B B	11.6 17.2	B B	11.4 16.7	B B	0.0 (0.1)	No No
<b>Future Year (2032)</b>										
1.	SR 14 SB Ramps & Soledad Canyon Road	A.M. P.M.	31.7 29.8	C C	32.0 30.1	C C	31.2 29.7	C C	(0.5) (0.1)	No No
2.	Sand Canyon Road & Soledad Canyon Road	A.M. P.M.	58.7 91.3	E F	59.1 94.1	E F	36.3 45.5	D D	(22.4) (45.8)	No No
3.	Sand Canyon Road & SR 14 NB Ramps	A.M. P.M.	12.3 32.4	B C	12.6 33.7	B C	12.3 20.2	B C	0.0 (12.2)	No No

Notes:

Intersection analysis is based on HCM 7th Edition signalized intersection methodology, which calculates the average vehicle delay in seconds.

**TABLE 18  
INTERSECTION QUEUES, WITH POTENTIAL IMPROVEMENTS**

Intersection	Turn Pocket Length	Peak Hour	Queue Length				Reduction Compared to Future with Project Conditions
			Future without Project Conditions	Future with Project Conditions	Project Contribution to Queue Length	Conditions With Improvements	
<b>Intersection #1, SR 14 SB Ramps &amp; Soledad Canyon Road</b>							
Eastbound Right-Turn <i>from Soledad Canyon Road to SR 14 Southbound On-Ramp</i>	195 [a]	A.M.	508	573	65	230	(343)
		P.M.	598	630	32	265	(365)
<b>Intersection #2, Sand Canyon Road &amp; Soledad Canyon Road</b>							
Eastbound Left-Turn <i>from Soledad Canyon Road to Sand Canyon Road</i>	180	A.M.	195	195	0	195	0
		P.M.	318	318	0	318	0
Eastbound Right-Turn <i>from Soledad Canyon Road to Sand Canyon Road</i>	180	A.M.	1,210	1,225	15	243	(982)
		P.M.	480	503	23	253	(250)
Westbound Left-Turn <i>from Soledad Canyon Road to Sand Canyon Road</i>	190 [a]	A.M.	158	163	5	163	0
		P.M.	455	478	23	478	0
Westbound Right-Turn <i>from Soledad Canyon Road to Sand Canyon Road</i>	100	A.M.	3	3	0	3	0
		P.M.	180	180	0	143	(37)
Northbound Left-Turn <i>from Soledad Canyon Road to Sand Canyon Road</i>	155	A.M.	345	350	5	350	0
		P.M.	308	310	2	310	0
Northbound Right-Turn <i>from Soledad Canyon Road to Sand Canyon Road</i>	155	A.M.	215	235	20	53	(182)
		P.M.	895	935	40	295	(640)
Southbound Left-Turn <i>from Soledad Canyon Road to Sand Canyon Road</i>	160	A.M.	178	178	0	178	0
		P.M.	243	243	0	243	0
<b>Intersection #3, Sand Canyon Road &amp; SR 14 NB Ramps</b>							
Northbound Right-Turn <i>from Sand Canyon Road to SR 14 On-Ramp</i>	60	A.M.	53	60	7	28	(32)
		P.M.	258	263	5	118	(145)
Southbound Left-Turn <i>from Sand Canyon Road to SR 14 On-Ramp</i>	240	A.M.	78	83	5	35	(48)
		P.M.	510	540	30	90	(450)

**Notes:**

All lengths shown in feet based on 25 feet per vehicle. Queues based on 95th percentile queue calculated by the HCM methodology. Turn pocket lengths based on length of striped pocket, except as noted.

[a] Reflects total distance between the limit line and the upstream intersection.

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## Chapter 10

### ***Non-CEQA Analysis: Project Construction***

This chapter describes the temporary effects of Project construction on the surrounding sidewalks and streets and how construction activities would affect pedestrian, bicycle, transit, and vehicular circulation.

#### **EVALUATION CRITERIA**

The TAU requires that the Project construction period be reviewed to determine the extent and the duration to which Project construction would interfere with pedestrian, bicycle, transit, or vehicular circulation and accessibility in the surrounding vicinity. To address this requirement three types of review were conducted:

- Temporary Transportation Constraints: This relates to the closure of streets or travel lanes. The review considers the duration of closure, the classification of the street, existing congestion levels, whether the street directly leads to a freeway ramp, and the closure's potential effect on safety and emergency services.
- Temporary Loss of Access: This relates to the closure of any bicycle or pedestrian facilities or the loss of access to any nearby parcels. The review considers the duration of closure or loss of access, the availability of alternative facilities or access, and the extent to which this condition would result in safety, convenience, or economic issues.
- Temporary Loss of Bus Stops or Rerouting of Bus Lines: This relates to the effects of Project construction on public transit operations and considers the duration that an existing bus stop would be unavailable, the potential to temporarily relocate the stop, the duration that existing service routes would be interrupted, the availability of alternative routes, and whether interruptions would occur on weekdays, weekends, or holidays.

Additionally, this chapter reviews the effect of Project construction on parking and compares the level of construction-related traffic to that generated by the Project once operational.

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## **PROJECT SETTING**

As detailed in Chapter 2, the Project Site is currently vacant (undeveloped land). There are no existing roads, pedestrian or bicycle facilities, or transit routes within or immediately adjacent to the Project Site.

## **PROJECT CONSTRUCTION DETAILS**

The construction information used in this section was provided by the Applicant.

### **Construction Schedule**

On-site construction activity would occur between 7:00 AM and 7:00 PM on weekdays and between 8:00 AM and 6:00 PM on Saturdays, consistent with the City's construction hour restrictions. There may be additional restrictions on construction activity or hauling during commuter peak periods, to be determined during the construction permitting process. Additionally, any construction within the public ROW would be subject to additional time restrictions. Construction would not occur on Sundays or federal holidays, though construction-related street or sidewalk closures may remain in place even on days construction does not occur.

The Applicant will develop a detailed projection of the anticipated timeline for Project construction. It is important to note that the construction schedule is a long-range forecast that is inherently subject to change based on market conditions and the availability of financing. The detailed schedule would represent a reasonable projection for Project construction. However, in practice, it could be compressed (resulting in more intensive construction activity over a shorter duration), extended (resulting in less intensive construction activity over a longer duration), or staggered (resulting in similar intensity as in the forecast schedule but with periods of inactivity between construction phases).

The Project is anticipated to be constructed in one construction phase over approximately four years beginning in year 2028. The Project is expected to open and be fully operational by 2032.

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## **Construction Traffic**

Project construction would result in truck traffic (haul trucks, delivery trucks, concrete trucks) and worker traffic to and from the Project Site on a daily basis. No hauling is anticipated for this Project as no material is anticipated to be removed from the Project Site. Concrete and delivery truck trips would travel directly to the Project Site without passing through residential neighborhoods, in accordance with the Construction Management Plan described below. All loading and unloading of equipment and materials would occur within the Project Site. Additionally, all construction workers would park on-site during the construction period.

## **Construction Closures**

This transportation assessment analyzed the effects of Project construction on surrounding sidewalks and streets. Construction activities would be entirely contained within the Project Site boundaries, other than for development of the new roadways (the extension of Lost Canyon Road and the connection between Oak Springs Canyon Road and Robinson Ranch Road) and the public multi-use path. Temporary lane closures may be necessary on Lost Canyon Road or Oak Springs Canyon Road near the Project access points to construct off-site improvements and to connect the access points to the existing streets. Any lane closures would require temporary traffic control plans that would be individually reviewed and approved by the City during the construction permitting process. Project construction would not prevent pedestrian or vehicular access to any neighboring properties.

## **EFFECTS OF PROJECT CONSTRUCTION**

The severity of the Project's effects on circulation, access, transit, and parking during construction was assessed. The measures proposed below to minimize the effects of Project construction would be incorporated into a Construction Management Plan, summarized at the end of this chapter. As discussed above, no permanent lane closures or constraints are identified as part of the Project construction, but temporary sidewalk and lane closures may be necessary to construct off-site improvements. No temporary loss of access, transit, or parking is expected due to the Project construction.

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Project construction would result in varying levels of truck and worker traffic to and from the Project Site on a daily basis. However, the total numbers of daily and peak hour trucks and workers on any given day would be substantially less than the operational Project trip generation estimates detailed in Table 5.

Construction workers often arrive to and depart from the Project Site outside of the morning and afternoon peak hours. Most workers would drive their own vehicles to and from the Project Site, but some would carpool with coworkers. Parking for all workers, as well as delivery receiving, would be provided on-site.

## **CONSTRUCTION MANAGEMENT PLAN**

A detailed Construction Management Plan, including street closure information, a detour plan, haul routes, and a staging plan would be prepared and submitted to the City for review and approval during the construction permitting process. The Construction Management Plan would formalize how construction would be carried out. It would include a Worksite Traffic Control Plan, which would facilitate traffic and pedestrian movement and minimize the potential conflicts between construction activities, street traffic, bicyclists, and pedestrians.

The Construction Management Plan shall be based on the nature and timing of the specific construction activities and other projects in the vicinity of the Project Site, and shall include, but not be limited to, the following elements, as appropriate:

- Scheduling of workdays to begin and end outside of the morning and afternoon peak hours to the extent feasible so as to minimize worker trips during those peak hours.
- Scheduling of construction-related deliveries so as not to coincide with major concrete pour days, to the extent feasible.
- Provision of worker parking on-site.
- Prohibition of construction-related vehicle parking on surrounding public streets.
- Temporary traffic control (e.g., flag persons) as needed during activities on or adjacent to public ROW to improve traffic flow on public roadways and to maintain access for land uses in the vicinity of the Project Site.

- 
- Safety precautions for pedestrians and bicyclists through such measures as alternate routing and protection barriers if needed.
  - Planning and scheduling of construction activities so as to minimize the duration of any temporary lane closures.
  - Coordination with emergency service providers to ensure that Project construction does not impede emergency response.
  - Provision of regular construction updates for nearby businesses and residents through a website or social media.

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## **References**

*2010 Congestion Management Program*, Los Angeles County Metropolitan Transportation Authority, 2010.

*2020 City of Santa Clarita Non-Motorized Transportation Plan*, Alta Planning + Design, September 2020.

*Barclays Official California Code of Regulations*, State of California, April 18, 2022.

*California Manual on Uniform Traffic Control Devices 2026*, California Department of Transportation, 2026.

*City of Santa Clarita Community Character and Design Guidelines*, rrm Design Group, March 24, 2009.

*City of Santa Clarita General Plan*, City of Santa Clarita, June 2011.

*Highway Capacity Manual, 7<sup>th</sup> Edition*, Transportation Research Board, 2022.

*Local Development Review (LDR) Safety Review Practitioners Guidance*, California Department of Transportation, February 2024.

*Local Roadway Safety: A Manual for California's Local Road Owners*, California Department of Transportation, April 2020.

*State of California Senate Bill No. 743*, Steinberg, 2013.

*Transportation Analysis Updates in Santa Clarita*, Fehr & Peers, May 19, 2020.

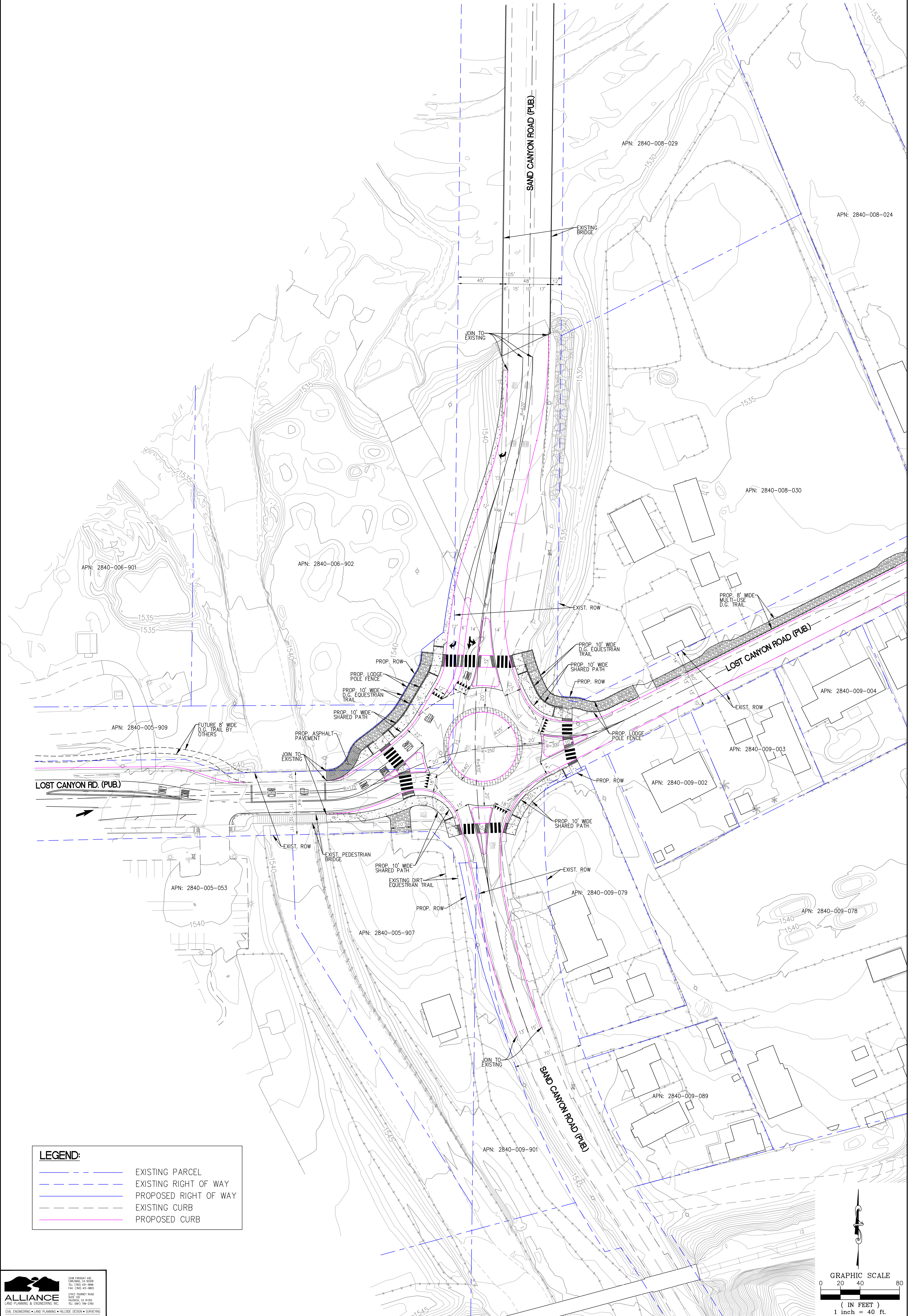
*Trip Generation Manual, 12<sup>th</sup> Edition*, Institute of Transportation Engineers, 2025.

***Appendix A***  
***Roundabout Design***

# BELCARO AT SAND CANYON

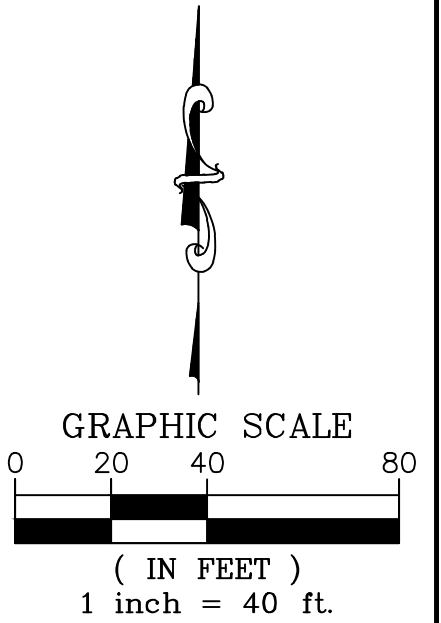
## LOST CANYON ROAD/SAND CANYON ROAD ROUNDABOUT ADJUSTMENT EXHIBIT

3/6/25



**LEGEND:**

	EXISTING PARCEL
	EXISTING RIGHT OF WAY
	PROPOSED RIGHT OF WAY
	EXISTING CURB
	PROPOSED CURB



***Appendix B***  
***Scoping Letter***



February 20, 2024

Ian Pari  
City Traffic Engineer  
City of Santa Clarita  
23920 Valencia Blvd., Suite 300  
Santa Clarita, CA 91355

**Re: TRANSPORTATION ANALYSIS SCOPE FOR THE  
BELCARO AT SAND CANYON  
SANTA CLARITA, CALIFORNIA**

**Ref: J2091**

Dear Ian:

This letter summarizes the proposed scope for a transportation analysis (TA) for Belcaro at Sand Canyon (Project), a proposed senior housing development project to be located in the City of Santa Clarita (City).

The Project proposes 359 single family senior housing units, with primary access provided from Lost Canyon Road by extending the roadway from where it currently intersects with Oak Springs Road. A secondary access will be provided via a connection through Oak Springs Canyon Road. The Project will also provide a new connection between Oak Springs Canyon Road and Robinson Ranch Road. The Project site plan is shown in Figure 1. A list of the proposed study intersections is provided in Table 1 and shown in Figure 2.

The City is proposing to install a single lane roundabout with a bypass right-turn lane going westbound to northbound at the intersection of Lost Canyon Road & Sand Canyon Road. At the direction of the City, the TA will include analysis of this intersection both with and without the proposed improvement in place.

## **ANALYSIS REQUIREMENTS**

Gibson Transportation Consulting, Inc. (GTC), along with representatives from New Urban West (Applicant), met with City Planning and Public Works staff to discuss the requirements for the TA. GTC also reviewed the guidelines in the City's *Transportation Analysis Updates in Santa Clarita* (May 19, 2020). The following requirements were identified for the TA:

### California Environmental Quality Act (CEQA) Analysis

- Review of local transportation plans, policies, and ordinances to ensure Project compliance
- Vehicle Miles Traveled screening and analysis utilizing the Southern California Association of Governments Travel Demand Model
- Review of potential geometric hazards
- Evacuation Analysis

### Non-CEQA Analysis

- Review of existing transportation conditions within the Study Area, including intersection lane configurations, bike lanes, pedestrian enhancements, and transit options
- Review of proposed transportation improvements within the Study Area
- Estimation of net new Project-related trips based on *Trip Generation Manual, 11<sup>th</sup> Edition* (Institute of Transportation Engineers, 2021) and empirical rates for single family senior housing based on local studies
- Analysis of any intersections selected by the City
- Use of Highway Capacity Manual methodology using the City's Synchro network for the capacity analyses
- Analysis of existing year and interim year 2029 conditions with and without roundabout and with and without Project traffic
- Coordination with the California Department of Transportation for analysis of State facilities

## **PROJECT TRAFFIC**

### **Trip Generation**

The number of trips expected to be generated by the Project was estimated using *Trip Generation Manual, 11<sup>th</sup> Edition* rates to calculate the number of vehicle trips traveling to and from the Project site during the morning and afternoon peak hours relative to the size of development.

The trip generation estimates for the Project, detailed in Table 2, show the Project is anticipated to generate 1,547 daily trips on a typical weekday, including 86 morning peak hour trips (28 inbound, 58 outbound) and 108 afternoon peak hour trips (66 inbound, 42 outbound).

### **Trip Distribution**

Per City guidance, traffic to/from the Project site was distributed onto the street network according to a trip distribution pattern that reflects the location of employment, recreational, and commercial opportunities around the site. Figure 3 depicts the Project trip distribution patterns at the study intersections.

### **Trip Assignment**

The Project trip generation estimates summarized in Table 2 and the trip distribution patterns shown in Figure 3 were used to assign the Project-generated traffic through the study intersections. Figure 4 illustrates the Project-only traffic volumes at the study intersections during typical weekday morning and afternoon peak hours.

## **FUTURE CONDITIONS**

### **Future Roadway Improvements**

As noted above, the City is proposing to install a single lane roundabout with a bypass right-turn lane going southbound to westbound at the intersection of Lost Canyon Road & Sand Canyon Road.

## **TRAFFIC VOLUMES AND STUDY SCENARIOS**

Traffic volumes were developed for each of the development scenarios, as described below.

### **Existing Traffic Volumes**

Traffic counts data will be conducted in February 2024 when local schools are in session and weather conditions are clear. Morning and afternoon peak period counts will be conducted from 7:00 AM to 9:00 PM and from 4:00 PM to 6:00 PM, respectively.

### **Interim Year 2029 Transportation Conditions**

The forecast of Interim Year 2029 without Project Conditions will be prepared in accordance with procedures outlined by the City. This analysis includes increases in traffic from future projects and from regional growth projections. The study will either utilize the Santa Clarita Valley Consolidated Traffic Model (SCVCTM) to develop traffic future traffic volumes or factor up existing counts and include traffic from nearby related developments.

The SCVCTM is a database that includes anticipated development projects (e.g., related projects) and specific plans such as the One Valley One Vision Area Plan, regional growth projections, and various transportation improvement plans. The SCVCTM, updated and managed by the City, can be used to forecast future traffic volumes in the region including intersection level turning movement volumes.

### **Study Scenarios**

The following Scenarios will be included in the analyzed and study.

- Existing Conditions (2024)
- Existing with Project Conditions (2024)
- Existing with Project with Roundabout Conditions (2024)
- Interim Year Conditions (2029)
- Interim Year with Roundabout Conditions (2029)
- Interim Year with Project Conditions (2029)
- Interim Year with Project with Roundabout Conditions (2029)

Ian Pari  
February 20, 2024  
Page 4

Should you have any questions or comments on the proposed scope of analysis for the TA, please don't hesitate to contact us.

Sincerely,

Patrick A. Gibson, P.E., PTOE  
Principal Associate

Rich Gibson  
Senior Associate

Eliza Hy  
Associate



Source: KTG Architecture + Planning, May, 2023.

PROJECT SITE PLAN

FIGURE  
1



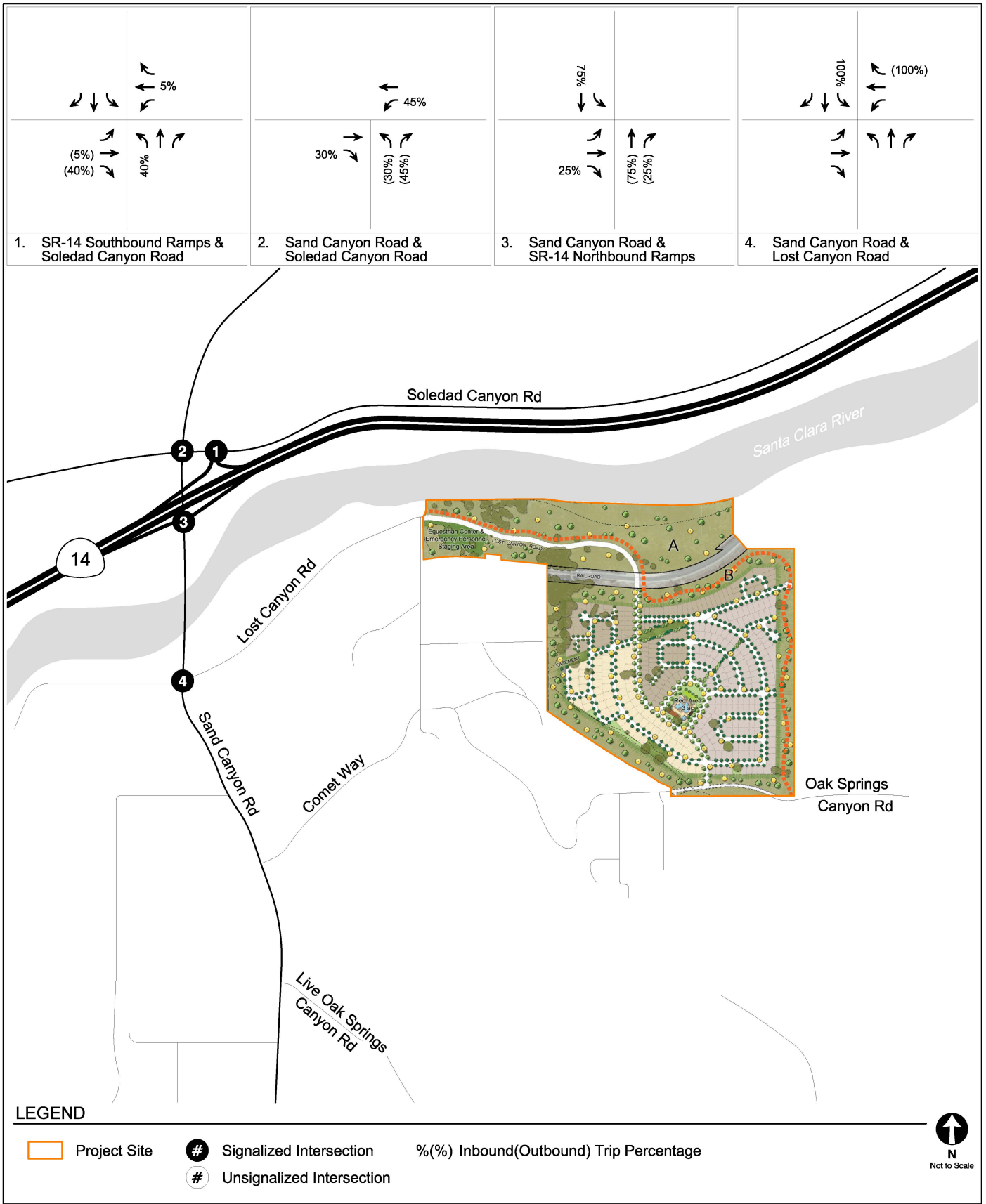
**LEGEND**

- Project Site
- # Signalized Intersection
- # Unsignalized Intersection



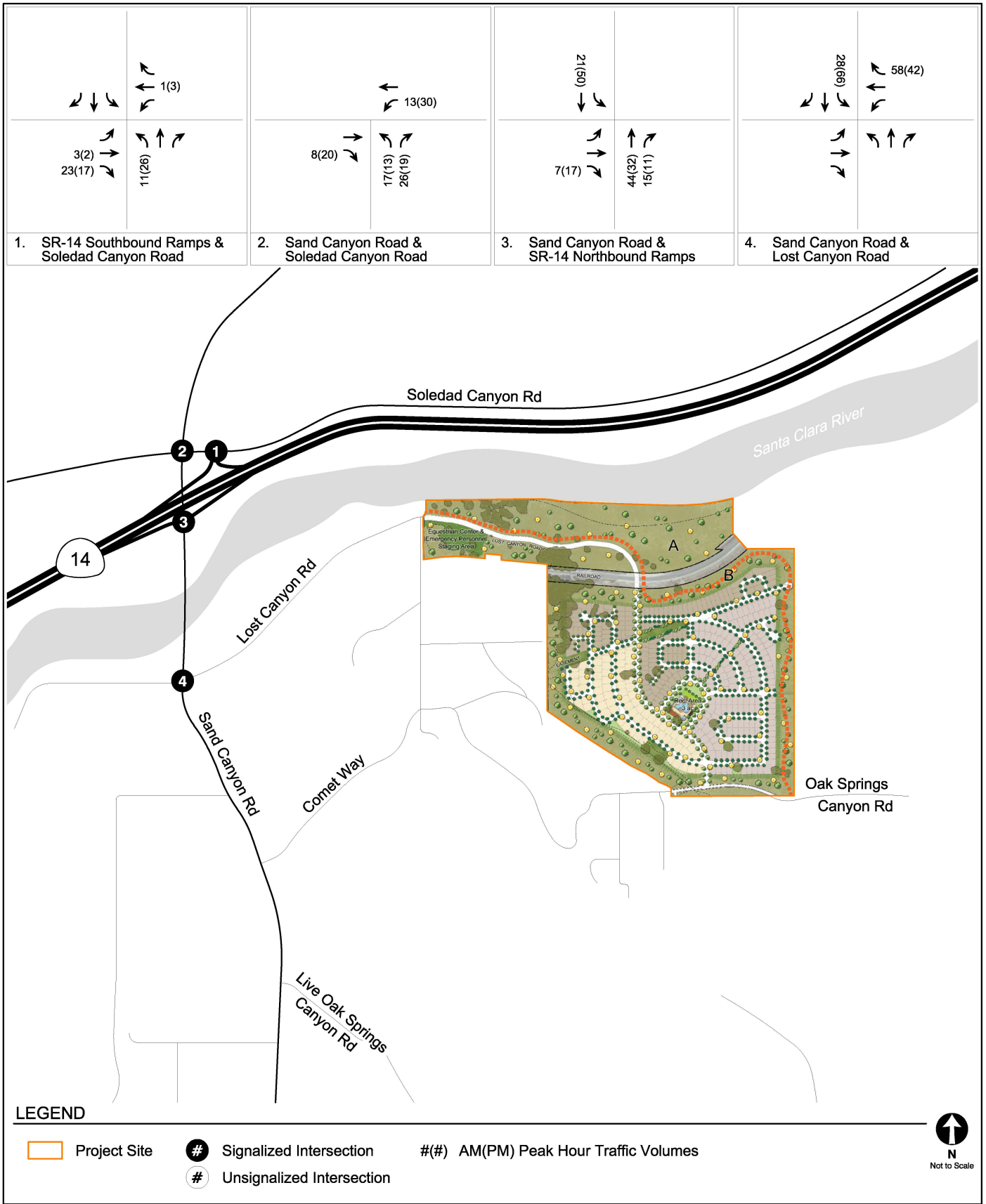
**STUDY AREA AND ANALYZED INTERSECTIONS**

**FIGURE  
2**



PROJECT TRIP DISTRIBUTION

FIGURE  
3



**PROJECT-ONLY  
PEAK HOUR TRAFFIC VOLUMES**

**FIGURE  
4**

**TABLE 1  
BELCARO AT SAND CANYON  
STUDY INTERSECTIONS**

<b>No.</b>	<b>Intersection</b>	<b>Control Type</b>
1.	SR 14 SB Ramps Soledad Canyon Road	Signal
2.	Sand Canyon Road Soledad Canyon Road	Signal
3.	Sand Canyon Road SR 14 NB Ramps	Signal
4.	Sand Canyon Road Lost Canyon Road	All Way Stop Control

**TABLE 2  
BELCARO AT SAND CANYON  
TRIP GENERATION ESTIMATES**

TRIP GENERATION RATES [a]									
Land Use	ITE Land Use	Size	Daily	Morning Peak Hour			Afternoon Peak Hour		
				In	Out	Total	In	Out	Total
Senior Adult Housing- Single Family	251	per du	4.31	33%	67%	0.24	61%	39%	0.30

TRIP GENERATION ESTIMATES									
Land Use	ITE Land Use	Size	Daily	Morning Peak Hour			Afternoon Peak Hour		
				In	Out	Total	In	Out	Total
<b><u>Proposed Project</u></b>									
Senior Adult Housing- Single Family	251	359 du	1,547	28	58	86	66	42	108
<b>TOTAL - NET NEW PROJECT TRIPS</b>			<b>1,547</b>	<b>28</b>	<b>58</b>	<b>86</b>	<b>66</b>	<b>42</b>	<b>108</b>

Notes

du - Dwelling Units

[a] Source: *Trip Generation, 11th Edition* (Institute of Transportation Engineers, 2021).

***Appendix C***

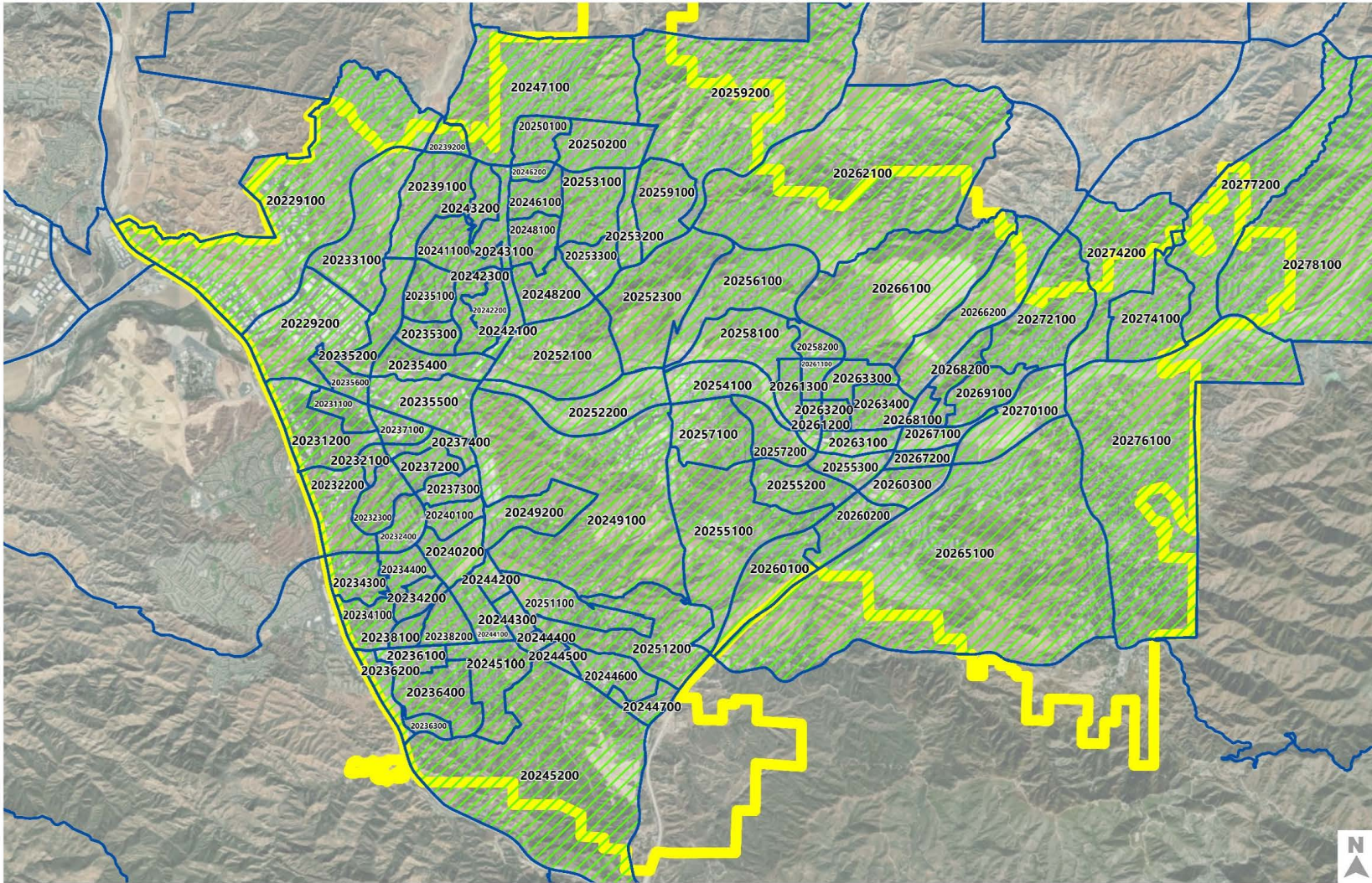
***VMT Lookup Table***

2020 VMT Summary

SCAG Tier 2 TAZ ID	Population	Employment	Home-Based VMT Summary				Home-Based Work VMT Summary			
			Home Based VMT	Home Based VMT per Capita	Santa Clarita Baseline Home Based VMT per Capita	Santa Clarita Baseline Home Based VMT per Capita % Difference	Home Based Work VMT	Home Based Work VMT per Employee	Santa Clarita Baseline Home Based Work VMT per Employee	Santa Clarita Baseline Home Based Work VMT per Employee % Difference
20247100	6,177	335	165,347	26.77	22.72	17.8%	6,514	19.42	18.45	5.3%
20239200	1,387	11	35,351	25.49	22.72	12.2%	189	17.21	18.45	-6.7%
20259200	4,025	218	105,465	26.20	22.72	15.3%	3,950	18.15	18.45	-1.6%
20250200	2,503	106	67,190	26.85	22.72	18.2%	1,919	18.05	18.45	-2.1%
20250100	2,041	146	52,009	25.48	22.72	12.2%	2,467	16.86	18.45	-8.6%
20245200	3,374	2,632	60,986	18.08	22.72	-20.4%	47,274	17.96	18.45	-2.7%
20262100	2,836	445	71,879	25.34	22.72	11.6%	8,172	18.36	18.45	-0.5%
20252300	2,474	86	63,299	25.59	22.72	12.6%	1,509	17.55	18.45	-4.9%
20253200	1,565	1,232	37,095	23.70	22.72	4.3%	23,947	19.44	18.45	5.4%
20259100	2,947	386	75,133	25.49	22.72	12.2%	6,736	17.44	18.45	-5.5%
20265100	7,273	864	169,589	23.32	22.72	2.6%	15,291	17.70	18.45	-4.1%
20276100	2,520	473	77,110	30.60	22.72	34.7%	10,239	21.66	18.45	17.4%
20274200	1,731	99	51,643	29.84	22.72	31.4%	2,211	22.30	18.45	20.9%
20260100	1,395	140	34,493	24.72	22.72	8.8%	2,554	18.19	18.45	-1.4%
20256100	5,535	116	153,409	27.72	22.72	22.0%	1,931	16.66	18.45	-9.7%
20258100	3,130	128	92,505	29.55	22.72	30.1%	2,383	18.59	18.45	0.8%
20252200	2,860	500	38,701	13.53	22.72	-40.4%	9,309	18.61	18.45	0.9%
20255100	3,652	530	74,828	20.49	22.72	-9.8%	9,274	17.51	18.45	-5.1%
20257100	3,843	902	61,943	16.12	22.72	-29.0%	17,605	19.52	18.45	5.8%
20249100	1,268	13,540	18,659	14.71	22.72	-35.2%	268,842	19.86	18.45	7.6%
20257200	2,796	393	55,828	19.97	22.72	-12.1%	5,199	13.24	18.45	-28.2%
20251200	2,379	1,288	42,661	17.93	22.72	-21.1%	20,782	16.13	18.45	-12.5%
20237300	1,689	345	33,547	19.87	22.72	-12.5%	6,060	17.56	18.45	-4.8%
20237400	1,627	2,428	24,339	14.96	22.72	-34.1%	37,645	15.50	18.45	-16.0%
20255200	2,888	255	59,503	20.61	22.72	-9.3%	3,916	15.36	18.45	-16.7%
20254100	2,814	1,367	53,598	19.05	22.72	-16.2%	24,698	18.07	18.45	-2.1%
20235500	497	3,491	7,786	15.66	22.72	-31.1%	57,309	16.41	18.45	-11.0%
20235400	1,618	343	29,079	17.98	22.72	-20.9%	5,799	16.93	18.45	-8.2%
20252100	1,627	399	33,676	20.70	22.72	-8.9%	6,902	17.29	18.45	-6.3%
20260200	2,957	717	59,868	20.25	22.72	-10.9%	11,438	15.95	18.45	-13.5%
20229100	3,506	6,454	66,018	18.83	22.72	-17.1%	146,529	22.70	18.45	23.1%
20236200	1,166	207	25,498	21.86	22.72	-3.8%	3,690	17.81	18.45	-3.4%
20232200	1,314	1,352	27,755	21.12	22.72	-7.0%	25,205	18.65	18.45	1.1%
20234300	3,112	729	60,411	19.41	22.72	-14.6%	13,985	19.17	18.45	3.9%
20234100	760	464	16,110	21.20	22.72	-6.7%	8,684	18.72	18.45	1.5%
20233100	3,968	2,131	68,148	17.17	22.72	-24.4%	41,379	19.42	18.45	5.3%
20229200	444	8,384	7,625	17.18	22.72	-24.4%	168,972	20.15	18.45	9.2%
20231200	799	2,477	15,418	19.29	22.72	-15.1%	50,889	20.55	18.45	11.4%
20239100	3,830	317	82,829	21.62	22.72	-4.8%	5,629	17.76	18.45	-3.7%
20236400	2,406	140	52,364	21.77	22.72	-4.2%	2,472	17.71	18.45	-4.0%
20245100	3,449	1,556	68,744	19.93	22.72	-12.2%	26,209	16.84	18.45	-8.7%
20244500	1,702	329	28,373	16.67	22.72	-26.6%	4,500	13.68	18.45	-25.9%
20236300	821	8	19,516	23.78	22.72	4.7%	32	4.01	18.45	-78.3%
20236100	2,183	924	48,474	22.20	22.72	-2.3%	16,888	18.27	18.45	-1.0%
20238100	1,140	195	25,727	22.56	22.72	-0.7%	3,254	16.69	18.45	-9.6%
20234200	1,211	116	26,004	21.47	22.72	-5.5%	1,783	15.39	18.45	-16.6%
20234400	2,048	118	43,097	21.04	22.72	-7.4%	1,994	16.86	18.45	-8.6%
20232400	1,436	1,485	27,093	18.87	22.72	-16.9%	28,149	18.96	18.45	2.8%
20232300	1,318	187	24,386	18.50	22.72	-18.6%	3,260	17.41	18.45	-5.6%
20232100	1,686	177	23,176	13.75	22.72	-39.5%	3,434	19.40	18.45	5.2%
20237100	0	2,415	0	NA	22.72	NA	36,197	14.99	18.45	-18.7%
20235200	3,331	122	63,178	18.97	22.72	-16.5%	2,023	16.60	18.45	-10.0%
20235600	1,556	776	26,911	17.30	22.72	-23.9%	13,090	16.87	18.45	-8.6%
20231100	1,364	391	22,090	16.20	22.72	-28.7%	7,390	18.89	18.45	2.4%
20240100	1,748	190	36,535	20.90	22.72	-8.0%	3,350	17.65	18.45	-4.3%
20240200	2,725	76	59,859	21.97	22.72	-3.3%	1,142	15.02	18.45	-18.6%
20237200	2,542	136	42,925	16.89	22.72	-25.7%	2,171	15.95	18.45	-13.6%
20244700	2,753	76	62,696	22.78	22.72	0.3%	1,400	18.38	18.45	-0.3%
20244600	3,910	162	73,270	18.74	22.72	-17.5%	2,778	17.18	18.45	-6.9%
20242100	1,456	371	28,135	19.32	22.72	-14.9%	5,925	15.96	18.45	-13.5%
20242200	1,879	138	45,598	24.27	22.72	6.8%	2,444	17.71	18.45	-4.0%
20243100	1,792	182	42,220	23.56	22.72	3.7%	3,088	17.00	18.45	-7.9%
20235300	1,516	186	32,164	21.22	22.72	-6.6%	3,319	17.80	18.45	-3.5%
20235100	2,392	135	59,751	24.98	22.72	10.0%	2,239	16.54	18.45	-10.4%
20249200	2,028	161	51,977	25.63	22.72	12.8%	3,117	19.36	18.45	4.9%
20244200	2,229	78	44,013	19.75	22.72	-13.1%	1,311	16.78	18.45	-9.1%
20251100	1,102	1,623	24,396	22.14	22.72	-2.5%	31,001	19.10	18.45	3.5%
20244300	3,423	853	59,823	17.48	22.72	-23.1%	11,252	13.19	18.45	-28.5%
20244100	1,389	512	27,962	20.13	22.72	-11.4%	8,998	17.59	18.45	-4.7%
20244400	452	1,067	4,970	11.01	22.72	-51.5%	16,188	15.18	18.45	-17.7%
20238200	1,933	430	38,405	19.87	22.72	-12.5%	7,235	16.84	18.45	-8.7%
20246200	486	165	12,374	25.45	22.72	12.0%	2,952	17.88	18.45	-3.1%
20241100	5,463	449	130,736	23.93	22.72	5.4%	7,422	16.53	18.45	-10.4%
20243200	1,645	41	40,691	24.73	22.72	8.9%	724	17.65	18.45	-4.3%
20248200	3,311	378	76,120	22.99	22.72	1.2%	6,355	16.83	18.45	-8.8%
20253100	4,073	79	111,303	27.33	22.72	20.3%	1,364	17.26	18.45	-6.4%
20248100	1,539	73	33,568	21.82	22.72	-4.0%	1,026	14.06	18.45	-23.8%
20246100	1,975	33	49,847	25.24	22.72	11.1%	564	17.09	18.45	-7.4%
20242300	1,452	33	32,565	22.42	22.72	-1.3%	645	19.72	18.45	6.9%
20253300	2,135	304	55,138	25.82	22.72	13.7%	5,312	17.50	18.45	-5.1%
20278100	3,380	147	109,790	32.48	22.72	43.0%	3,091	21.03	18.45	14.0%
20277200	3,941	39	140,729	35.71	22.72	57.2%	735	18.85	18.45	2.2%
20274100	4,558	191	145,140	31.84	22.72	40.2%	3,824	19.99	18.45	8.4%
20272100	3,747	212	106,984	28.55	22.72	25.7%	4,037	19.04	18.45	3.2%
20266200	1,375	544	31,158	22.66	22.72	-0.3%	10,161	18.69	18.45	1.3%
20266100	3,018	105	71,491	23.69	22.72	4.3%	1,908	18.20	18.45	-1.4%
20270100	3,338	499	90,151	27.01	22.72	18.9%	9,883	19.79	18.45	7.3%
20260300	3,300	515	70,745	21.44	22.72	-5.6%	8,545	16.61	18.45	-10.0%
20267200	5,769	39	124,525	21.58	22.72	-5.0%	594	15.12	18.45	-18.0%
20255300	1,257	673	22,450	17.87	22.72	-21.3%	8,875	13.19	18.45	-28.5%
20267100	2,420	294	56,754	23.45	22.72	3.3%	4,672	15.88	18.45	-13.9%
20268100	2,971	271	61,876	20.82	22.72	-8.3%	3,661	13.52	18.45	-26.7%
20268200	2,105	423	50,320	23.90	22.72	5.2%	7,344	17.37	18.45	-5.8%
20269100	2,151	64	61,751	28.71	22.72	26.4%	1,129	17.64	18.45	-4.4%
20263400	2,158	633	51,440	23.83	22.72	4.9%	10,000	15.80	18.45	-14.4%
20263300	2,659	501	60,284	22.68	22.72	-0.2%	8,654	17.29	18.45	-6.3%
20261100	1,380	70	32,444	23.52	22.72	3.5%	1,054	15.15	18.45	-17.9%
20258200	979	171	23,007	23.50	22.72	3.5%	3,200	18.68	18.45	1.3%
20263100	2,310	1,264	44,298	19.18	22.72	-15.6%	18,436	14.59	18.45	-20.9%
20261300	1,754	441	43,108	24.58	22.72	8.2%	7,125	16.16	18.45	-12.4%
20261200	509	1,087	10,094	19.82	22.72	-12.7%	16,244	14.95	18.45	-19.0%
20263200	1,242	307	28,007	22.55	22.72	-0.7%	4,648	15.15	18.45	-17.9%

Source: SCAG 2016 RTP/SCS Travel Demand Model; 2020 results interpolated based on 2012 Baseline and 2040 Future Year model results.

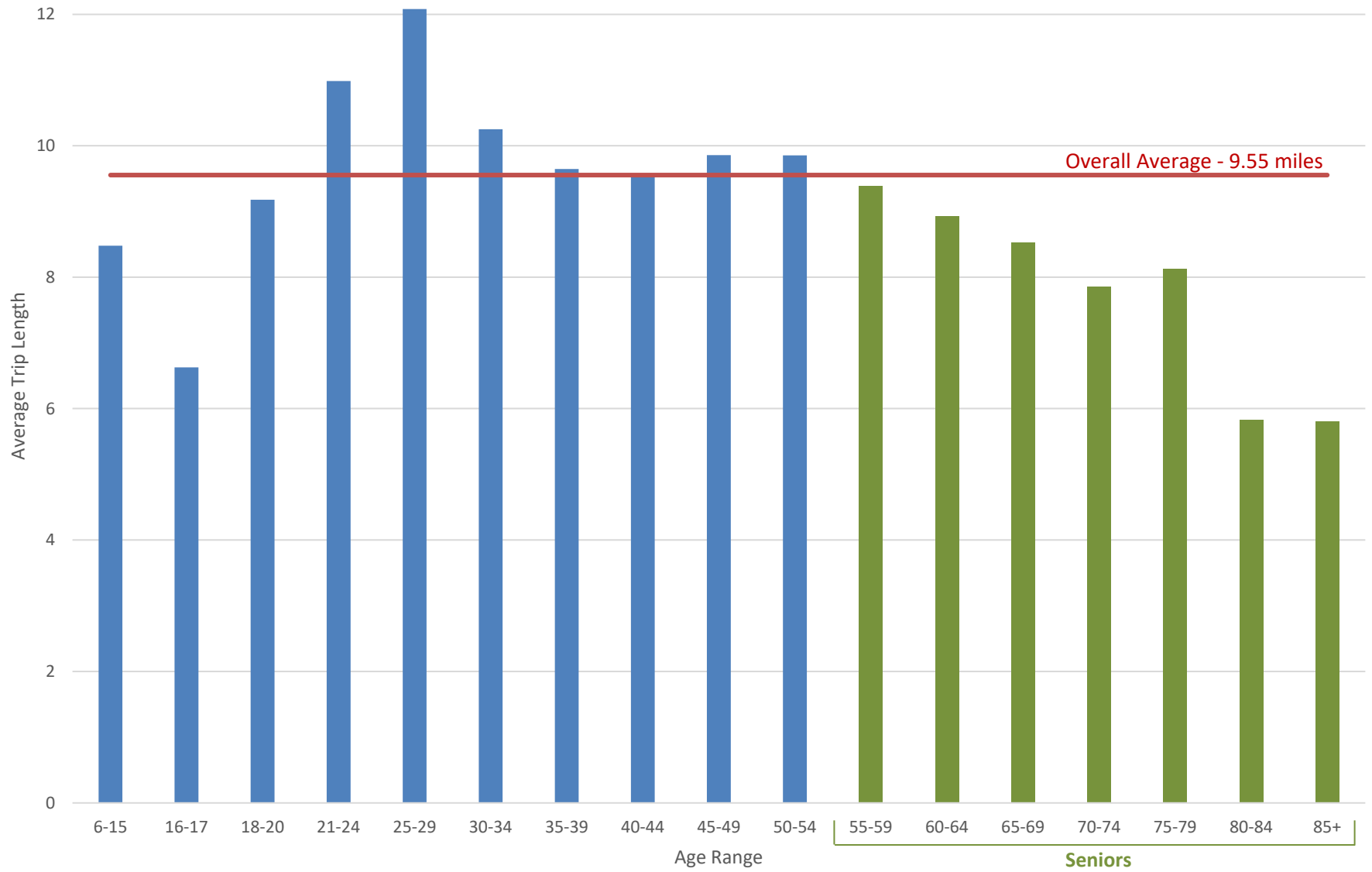
- Greater than 15% below Santa Clarita Baseline
- Between 15% below Santa Clarita Baseline and Santa Clarita Baseline
- Above Santa Clarita Baseline



- Santa Clarita Tier 2 TAZ
- Santa Clarita
- Included in Analysis
- Excluded from Analysis

Santa Clarita SCAG Tier 2 TAZs

Average Trip Length by Age



***Appendix D***  
***Evacuation Analysis***



**DRAFT**

**MEMORANDUM**

**TO:** Joel Bareng, City of Santa Clarita  
**FROM:** Jonathan Chambers, P.E.  
**DATE:** May 13, 2026  
**RE:** Belcaro at Sand Canyon Evacuation Analysis  
Santa Clarita, California

**Ref:** J2091

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Gibson Transportation Consulting, Inc. conducted an evacuation analysis for the proposed Belcaro at Sand Canyon residential development (Project). The analysis evaluates evacuation travel times assuming a fire, flood, or other natural disaster that requires the evacuation of the Project site and all other land uses in the vicinity of the Project site. This memorandum summarizes the analysis.

**PROJECT DESCRIPTION**

As proposed, the Project would contain 359<sup>1</sup> detached residential dwelling units in a deed-restricted development reserved for persons aged 55 and over. The Project would include a private recreation center for the residents and potentially an equestrian center located in the far northwest portion of the property. The residential units would be built on approximately 100 acres of the total 194-acre site, with the remaining land reserved for open space.

Figure 1 shows the location of the Project site east of Sand Canyon Road and south of State Route 14 (SR 14) in the City of Santa Clarita (City). There would be gated access to the Project site on the north and south sides. The north entry would be via a private easterly extension of Lost Canyon Road, traveling under the railroad tracks at a new underpass leading into the site. The south entry would connect to Oak Springs Canyon Road, and the Project would also construct a new private street connecting Oak Springs Canyon Road to Robinson Ranch Road (itself a private road serving the Sand Canyon Country Club and a residential neighborhood). This connection would give Project residents a second point of egress and a second route to the Sand Canyon Road corridor, providing flexibility in an emergency. It would similarly serve non-Project users of Oak Springs Canyon Road and Robinson Ranch Road, adding route flexibility to those residents and visitors in both emergency and non-emergency situations.

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<sup>1</sup> The Project was originally assumed to have 359 dwelling units. The Project is now 341 dwelling units but, to maintain a conservative analysis, the original number of 359 units was utilized.

## **Intersection #4, Sand Canyon Road & Lost Canyon Road**

Intersection #4 would be modified to replace the existing all-way stop-controlled intersection with either a roundabout or a signalized intersection.<sup>2</sup> If a roundabout were installed, it would be constructed with one circulating lane all the way around and one southbound-to-westbound bypass lane to accommodate pick-up / drop-off demand at the schools located along Lost Canyon Road west of Sand Canyon Road. Both the roundabout option and the signalized intersection option would include an extension of the southbound right-turn pocket over the Santa Clara River bridge nearly to the SR 14 northbound ramps for additional queuing. Both the roundabout and signalized options were analyzed in this report.

## **ANALYSIS PURPOSE**

The California Environmental Quality Act requires an inquiry as to whether a project would interfere with an adopted emergency response plan or emergency evacuation plan. The State of California (State) requires every city and county general plan to include a Safety Element addressing unreasonable risks from flooding, fire, and geologic hazards.

## **City Safety Element**

As required by the City's Safety Element, adopted in May 2022, the purpose of this evacuation analysis was to identify potential evacuation routes from the Project site and community, evaluate potential travel times required to evacuate the Project site and the adjacent neighborhoods served by the roadway system, and determine how additional traffic from Project residents could affect evacuation times.

The Safety Element includes a list of safety goals, objectives, and policies addressing subdivision design (both buildings and access roadways), adequate water supply and fire flow, defensible spaces around structures, and fire breaks. Policy S 3-3-3 further requires identification of "evacuation routes and their capacity, safety, and viability under a range of emergency scenarios." The Safety Element does not identify specific thresholds of significance nor any particular methodology for evaluating a Project's effects on evacuation routes. This report evaluated the three routes out of the Project site vicinity, shown in Figure 2, based on their capacity to transport evacuees to safety under two emergency scenarios. While it analyzes evacuations due to flood and fire hazards described in the Safety Element, the analysis is broadly applicable to any scenario in which local or area-wide evacuation is required.

The Safety Element identifies two fire stations serving the Study Area: Los Angeles County (County) Fire Department (LACFD) Station 132 located at 29310 Sand Canyon Road (approximately 1.0 miles north of SR 14) and LACFD Station 123 located at 26321 Sand Canyon Road (approximately 2.5 miles south of Lost Canyon Road). Per the Safety Element, the two fire stations aim to provide the Study Area with the desired response time of eight minutes for

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<sup>2</sup> The responsibility to construct these improvements is shared with the previously-entitled Vista Canyon development project, which was also conditioned to construct these improvements. The Applicant will work with the City and the Vista Canyon project applicant to allocate cost, timing, and responsibilities for these improvements. The improvements would be implemented by the time the Project receives its first certificate of occupancy or as otherwise agreed upon with the City.

suburban areas and 12 minutes for rural areas. In addition, the County has mutual aid agreements with other nearby fire service providers in the event of an emergency.

Consistent with requirements in the Safety Element, the Project provides two points of access and sufficient roadway widths and turnaround spaces for emergency vehicles.

### **Fire and Flood Risk Management**

The City prepared *2021 Santa Clarita Local Hazard Mitigation Plan* (October 2, 2021) (LHMP) to serve as its technical and operational hazard-planning document satisfying federal requirements to be eligible for hazard mitigation funding. It emphasizes public preparedness, interagency cooperation and coordination, and long-term hazard mitigation through fuel modification programs, brush clearance, and defensible space programs. The LHMP also documents the City's risk factors for both wildfires and floods. Relevant to evacuation, it describes the level of risk associated with the evacuation warning times in the City as "moderate," with a typical warning of six to 12 hours for a wildfire and more than 24 hours for a flood before an evacuation is necessary.

At the State level, the Fire Marshal designated the entire Project site vicinity as a Very High Fire Hazard Safety Zone<sup>3</sup> and as a Local Responsibility Area (meaning the City or County have primary responsibility for fire safety). This designation subjects the Project site to additional disclosure requirements intended to reduce structure ignition risk and improve community safety. The Project has been designed with ignition-resistant construction pursuant to Chapter 7A of the California Building Code and includes provisions for maintaining defensible space fuel modification zones.

The Federal Emergency Management Administration identified a small portion of the Project site as a Special Flood Hazard Area<sup>4</sup> that would be inundated in a 100-year flood due to the natural topography of the Project site. However, the Project's design reduces flood risks through grading and flood control improvements.

### **ANALYSIS METHODOLOGY**

Figure 2 shows the Study Area and the three primary evacuation routes for the Project site and the Study Area as a whole. For the purposes of this analysis, evacuees are considered to be in a safe zone upon reaching or crossing SR 14 (via the northern evacuation route), reaching Via Princessa (via the western evacuation route), or traveling approximately 1.0 miles west of Sand Canyon Road on Placerita Canyon Road (via the southern evacuation route).

The City's Travel Demand Forecast Model (Model) was used to develop traffic volume forecasts for use in the evacuation analysis. The Model forecasts were based on a typical weekday peak hour condition, so background traffic represented business-as-usual for the broader region. For the 11 Traffic Analysis Zones (TAZs) within the Study Area, shown in Figure 3, evacuation-condition trip generation estimates were developed based on the number of vehicles in those

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<sup>3</sup> <https://osfm.fire.ca.gov/what-we-do/community-wildfire-preparedness-and-mitigation/fire-hazard-severity-zones>

<sup>4</sup> <https://msc.fema.gov/portal/home>

TAZs (as described in detail below), which the Model assigned along evacuation routes to the safe zones shown in Figure 2. As shown in Figure 3, each TAZ in the Study Area depends on the Sand Canyon Road corridor for access, and it would serve as a primary evacuation route for most TAZs, including the Project site (located in TAZ 439).

Two types of analyses were prepared to determine the Project's effect on evacuation times: the Travel Time analysis and the Total Evacuation Time analysis.

### **Travel Time Analysis Methodology**

The Travel Time analysis calculates the amount of time it would take for an individual vehicle from each of a series of TAZs to get to safe zones in an ideal wildfire evacuation scenario. In this scenario, emergency officials receive sufficient advance warning from fire-weather forecasts, fire modeling, and real-time observations to implement a phased, zone-based evacuation before major roadways become congested or threatened by the fire. It would include early evacuation warnings followed by mandatory orders issued sequentially by neighborhood or evacuation zone, allowing traffic demand to be distributed over time and preserving roadway capacity for both evacuees and emergency responders.

For the Travel Time analyses, the Model was used to calculate travel times along corridors from each TAZ to the safe zones. Vehicle delay at controlled intersections was calculated and incorporated into the travel time estimates. The Model assumed a vehicle would attempt to leave after the mandatory evacuation notice is announced (amid a general rush of evacuating vehicles over). Conditions were analyzed with and without the addition of the Project to determine the effect the Project's traffic would have on individual travel times during an evacuation.

### **Total Evacuation Time Analysis Methodology**

An instantaneous area-wide evacuation occurs when rapidly changing fire conditions leave insufficient time for phased evacuations, requiring all residents within a large area to evacuate simultaneously. The Total Evacuation Time analyses calculate the total amount of time it would take to evacuate the entire Study Area to a safe zone assuming an immediate, area-wide evacuation order based on the rate at which vehicles can clear the area. The Total Evacuation Time analyses were based on the capacity of key locations along and near Sand Canyon Road, as shown in Figure 4. The location with the longest evacuation time was deemed the limiting factor in evacuation time and, thus, that location was the basis for the Total Evacuation Time for a given scenario.<sup>5</sup>

For these analyses, each location<sup>6</sup> was evaluated using Synchro software to implement a volume-to-capacity (V/C) methodology known as Intersection Capacity Utilization (ICU), which measures how close an intersection is to its maximum capacity by comparing the volume of traffic to the

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<sup>5</sup> The analysis found that Intersection #4 was the limiting factor in each scenario. Because this intersection is in the middle of the Study Area and not considered a safe zone, a travel time factor between this location and the safe zones was added to the Total Evacuation Time.

<sup>6</sup> Excepting the intersection of Sand Canyon Road and Lost Canyon Road when analyzed as a roundabout and the Santa Clara River Bridge, as described below.

intersection's capacity. A V/C ratio of 0.75 means the traffic demand in one hour is equal to 75% of the location's hourly capacity, and it would require 45 minutes for all vehicles to pass through the location. This methodology also allows evaluation of volumes exceeding the hourly capacity, because the V/C ratio scales linearly as volume increases.

The ICU methodology is not directly applicable to roundabouts or uncontrolled roadway segments. Therefore, to assess the Total Evacuation Time for the roundabout and the Santa Clara River Bridge (which is one lane in each direction), analogous methods were used to calculate V/C ratios and, thus, the amount of time to clear each facility. The roundabout V/C ratio was calculated based on the conservative assumption that only one vehicle could enter the roundabout every two seconds (based on a typical two-second vehicle follow-up time), resulting in a total capacity of 1,800 vehicles per hour. This methodology is conservative because it did not assume any simultaneous circulation of vehicles from different approaches, such as northbound and southbound through traffic (which in practice can both traverse the roundabout simultaneously without interference, though in an evacuation scenario most traffic would be expected to travel north through the roundabout). The sum of all approach traffic volumes was divided by the total capacity, resulting in the V/C ratio. Similarly, the V/C ratio for the Santa Clara River Bridge north of Lost Canyon Road was based on 1,800 vehicles per hour in the northbound direction (the southbound traffic is much lighter in all scenarios and, therefore, not a factor in the travel time on the bridge).

It is important to note that the Total Evacuation Time analysis scenarios represent an extremely unlikely event because real-world emergency management practices – particularly for wildfires – rely on phased, zone-based evacuations that prioritize areas at greatest risk and reduce unnecessary congestion on limited roadway networks. Evacuations are typically dynamic and managed in stages based on fire behavior, weather, available routes, and coordination with emergency responders, rather than a single simultaneous order affecting an entire community. Additionally, as further detailed below, the evaluation of Total Evacuation Time in this report is also based on worst-case assumptions regarding roadway capacity, population, and vehicle demand. Therefore, the analyses represent conservative, scenario-based estimates for evaluating the relative effects of the Project on evacuation times rather than predictions of how any particular real-world evacuation would unfold.

## **TRAFFIC VOLUME DEVELOPMENT**

The traffic volumes for the analysis were developed by estimating the total population of the Study Area (including residents, employees, retail and golf course patrons, hotel guests, and church attendees) and applying vehicle occupancy/ownership data from the Model to those totals to determine the total number of vehicles that could be present in the Study Area. For the purpose of developing traffic volume estimates on the roadways, additional vehicles were added to the Model to account for full occupancy of all land uses within the area. Further, only emergency vehicles and resident vehicles would be allowed to enter the area during an evacuation. Thus, the vast majority of traffic would be in the outbound direction, and non-resident vehicles would not be allowed to enter the evacuation area.

## **Background Land Use Assumptions**

Two Model land use plans were used in the evacuation analysis. The first assumed the existing land uses in the Study Area (Existing Conditions) and the second assumed the land uses projected to be in place in a future base year of 2030 (Future Conditions). The Future Conditions land uses reflect an interpolation between the Model's base year and buildout year, with select TAZs modified as applicable for specific approved or proposed land uses.

Table 1 shows the Existing and Future Conditions land use assumptions by TAZ for the Study Area. The Study Area today contains approximately 1,080 residential dwelling units, a number projected to grow to 1,620 by 2030 excluding the Project's 359<sup>7</sup> senior units. The commercial land uses within the Study Area are projected to grow by approximately 41,000 square feet (sf) in two commercial centers, in addition to 42,000 sf of industrial space, 104,000 sf of manufacturing/warehouse space, and an approximately 300-room resort hotel.

## **Evacuation Scenario Traffic Volumes**

Since the Study Area is primarily made up of residential neighborhoods, the evacuation scenario assumed that the worst-case condition for evacuation would occur on a Saturday or Sunday morning, when residents would generally be home and there may be the opportunity to evacuate with family members, pets, livestock, and all owned vehicles. It also assumed normal activity levels at the local churches, golf course, and commercial and industrial developments.

**Residential Land Uses.** The evacuation trip generation of the residential neighborhoods in the Study Area depends on the number and type of vehicles evacuating each zone. This analysis conservatively assumed that each residence would evacuate all of its automobiles in addition to all of its peripheral vehicles, including horse trailers and recreational vehicles (RVs).

Vehicle estimates were prepared using data from the United States Census Bureau. Its Neighborhood Data website (<https://map.myneighborhooddata.org>) estimates that the residential zones in the Study Area average 2.4 vehicles per residence. This was applied to the Model's estimate of existing and future residential units in each TAZ to calculate the total number of vehicles in the Study Area.

Because of the rural and equestrian character of the Study Area, an effort was made to reflect the number of non-passenger vehicles that would be involved in the evacuation. It was assumed that 10% of the total vehicles would be either horse trailers or RVs, and a passenger car equivalent (PCE) factor of 1.2 was applied to these larger vehicles to reflect their impact on traffic movement during evacuation. Therefore, the average of 2.4 vehicles per residence was assumed to be 2.16 passenger vehicles and 0.24 RVs or trailers.

The Neighborhood Data also showed the typical vehicle ownership for senior-restricted, single-family detached residential developments, such as that proposed by the Project, is 1.5 vehicles per dwelling unit, lower than that of the single-family neighborhoods in the Study Area. Because some of the senior housing unit residents may also have an RV or trailer, the same PCE increase was applied to 10% of the evacuating vehicles expected to be generated by the Project.

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<sup>7</sup> The trip generation estimates for the Project are based on 359 units though the Project would now construct 341 units.

**Commercial and Institutional Uses.** The Study Area includes an active golf course and three churches with Sunday morning services. Rather than utilize trip generation averages for these land uses, a parking occupancy count was conducted on a Sunday morning in September 2023 to determine the actual number of vehicles that could evacuate in an emergency situation.

Standard trip generation rates were applied to other commercial land uses in the Study Area to determine the amount of evacuation traffic that might be present on a Saturday or Sunday.

**Evacuation Trip Generation Totals.** Tables 2 and 3 show the calculation of the evacuation trip generation for the Study Area for both Existing with Project and Future with Project Conditions.

As shown in Table 2, under Existing with Project Conditions, the 1,445 residential dwelling units in the Study Area would generate 2,871 outbound automobile trips and an additional 295 RV/trailer trips. These 295 RV/trailer trips would generate the same effects as 354 automobile trips added to the street system, so the total impact on the street system is the same as if 3,225 auto trips ( $2,871 + 354 = 3,225$  PCE vehicles) were on the roadways.

The commercial trips would add 247 trips to the roadway system, so the resulting traffic demand leaving the Study Area under Existing with Project Conditions would be 3,472 PCE trips on the roadway system.

Table 3 shows the same calculation under Future with Project Conditions. The total traffic levels leaving the Study Area would be 5,088 PCE trips. This increase is due primarily to the increase in residential units expected to be built in the Study Area over the next several years.

### **Conservative Volume Forecasts**

The traffic volumes above and the analysis presented below are highly conservative due to the following analysis assumptions:

- Every land use in the Study Area was assumed to be fully occupied, including residences, businesses, the church, and the golf course. This does not occur in practice, as when the commercial and recreational uses in the Study Area are occupied, the residential units are not fully occupied. Conversely, if the residential units are fully occupied, it typically means the commercial and recreational uses are minimally occupied (e.g., at night).
- Every car, truck, and RV/trailer in the Study Area was included in the evacuation totals. In an emergency, many cars, trucks, and larger vehicles would be left at the properties and people would evacuate in one or two of their vehicles, generally keeping family members together to the extent possible.
- The Project was assumed to have 359 dwelling units. The Project has been reduced to 341 dwelling units, but to maintain a conservative analysis, the original project number of 359 units was utilized.

- For the Total Evacuation Time analysis, the evacuation order would be for immediate effect and phased evacuation would not be possible.<sup>8</sup>
- Neither the Travel Time analyses nor the Total Evacuation Time analyses assumed any benefit from traffic control at key locations during evacuation proceedings. Traffic control can take the form of active traffic control officers directing traffic and responding in real time to changing traffic demand and emergency conditions. It can also involve passive traffic control through signage and delineators (cones) marking lanes or even increasing the number of travel lanes on key streets.

## EVACUATION TIME EVALUATION

The vast majority of the residential neighborhoods and limited commercial and institutional uses in the Study Area would seek egress from the Study Area via Sand Canyon Road to or across SR 14. Evacuating traffic from the Study Area was assigned to the street system by the Model according to these egress patterns, shown in Figure 2:

- Northern Route – Sand Canyon Road to SR 14 and Soledad Canyon Road: 70%
- Western Route – Lost Canyon Road to SR 14 at Via Princessa: 15%
- Southern Route – Placerita Canyon Road to SR 14: 15%

In addition, the Model was used to test the evacuation conditions if (a) all access to Placerita Canyon Road was blocked, forcing evacuees to use only the north and west routes, and (b) all access to the north was blocked at Lost Canyon Road (i.e., no access to SR 14 or beyond) and all Study Area traffic had to evacuate via the south and west routes.

Table 4 summarizes the six scenarios considered in the evacuation analysis (Scenarios A through F). Other than Existing Conditions (Scenario A), each scenario included analysis using both a roundabout and signal control at Intersection #4.

### **Scenarios A and B – Existing Conditions**

**Travel Time.** Table 5 summarizes the results of the Travel Time analyses under Existing Conditions, with and without the Project. As shown, Existing Conditions Travel Time ranges from slightly over four minutes to nearly 20 minutes depending on origin TAZ and choice of evacuation route. In nearly all cases the southern route is the longest distance and thus the slowest to a safe zone.

As shown, the addition of the Project has very little effect on Travel Time from most of the TAZs in the Study Area. In fact, for traffic using the northern and western routes, the Project tends to improve evacuation Travel Time by approximately 50 seconds by upgrading Intersection #4 from stop control to a more efficient control methodology.

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<sup>8</sup> For the Travel Time analysis, it was assumed that advance warning would be provided and that evacuees would leave over the course of a few hours.

Travel Time would decrease measurably from only two TAZs: TAZ 439 (i.e., the Project site) and TAZ 440, an industrial zone located east of TAZ 439. As shown, these two TAZs would experience approximately one-to-two minutes of increased Travel Time in the analyzed evacuation scenario with the addition of the Project. It should be noted that while this analysis assumes TAZ 440, which is currently undeveloped, would take access via Lost Canyon Road and thereby be affected by the Project in an evacuation scenario, any future development in this TAZ (including the 42,000 sf of industrial uses assumed in this analysis) would more likely occur north of the Santa Clara River and take access from Soledad Canyon Road.

**Total Evacuation Time.** Table 6 summarizes the results of the Total Evacuation Time analyses under Existing Conditions, with and without the Project. As shown, under Existing Conditions, the highest calculated V/C ratio is 209.0% for Intersection #4. This equates to a total clear time of 2 hours, 5 minutes for that intersection. Other locations with clear times exceeding one hour include Intersection #3, Sand Canyon Road & SR 14 Northbound Ramps (1 hour, 17 minutes) and the Santa Clara River Bridge (1 hour, 8 minutes). The remaining locations would clear in under an hour.

These clear times are not additive; they display total clear time for each individual intersection and roadway segment based on the traffic forecast to travel through. Because Intersection #4 is located within the Study Area and most evacuating traffic would continue north toward SR 14 or Soledad Canyon Road, additional travel time was added to the highest total clear time to calculate the Total Evacuation Time. Intersection #4 is located approximately 0.5 miles south of the northern safe zone, which is estimated to add approximately three minutes of travel time to the tail end of the evacuation. As such, under Existing Conditions, the Total Evacuation Time is estimated to be 2 hours, 8 minutes.

As shown in Table 6, under Existing with Project Conditions, the highest calculated V/C ratio is 185.8% for Intersection #4 as a roundabout or 163.9% for Intersection #4 as a signalized intersection. These equate to total clear times of 1 hour, 51 minutes and 1 hour, 38 minutes, respectively, for that intersection. Other locations with clear times exceeding one hour include Intersection #1, Sand Canyon Road & Soledad Canyon Road (1 hour, 1 minute), Intersection #2, SR 14 Southbound Ramps & Soledad Canyon Road (1 hour, 3 minutes), Intersection #3 (1 hour, 23 minutes), and the Santa Clara River Bridge (1 hour, 23 minutes). The remaining locations would clear in under one hour.

Adding three minutes of travel time to the evacuation clear time for Intersection #4, under Existing with Project Conditions, the Total Evacuation Time would be 1 hour, 54 minutes with a roundabout and 1 hour, 41 minutes with a signalized intersection. The Project would reduce Total Evacuation Time by approximately 14 minutes with a roundabout and 27 minutes with a signalized intersection due to upgrading Intersection #4 to a more efficient control methodology.

### **Scenarios C and D – Future Conditions**

**Travel Time.** Table 7 summarizes the results of the Travel Time analyses under Future Conditions, with and without the Project, with the roundabout and traffic signal control at Intersection #4. As shown, Future without Project Conditions Travel Time ranges from slightly over four minutes to slightly under 21 minutes with either a roundabout or a traffic signal. Similarly to Existing Conditions, the Project would have negligible effects on Travel Time from most TAZs

and would cause approximately one-to-two minute increases in Travel Time from TAZs 439 and 440. There is a negligible difference in Travel Time between conditions with a roundabout and a traffic signal.

**Total Evacuation Time.** Table 8 summarizes the results of the Total Evacuation Time analyses under Future Conditions, with and without the Project, with the roundabout and traffic signal control at Intersection #4. As shown, under Future without Project Conditions, the highest calculated V/C ratio is 230.0% for Intersection #4 with a roundabout and 213.6% for Intersection #4 with a traffic signal, equating to clear times of 2 hours, 18 minutes and 2 hours, 8 minutes, respectively. With the exception of Intersection #7, Sand Canyon Road & Placerita Canyon Road,<sup>9</sup> all other analyzed locations would require between 1 hour, 9 minutes and 1 hour, 42 minutes to clear. Adding three minutes of travel time to the evacuation clear time for Intersection #4, under Future without Project Conditions the Total Evacuation Time would be 2 hours, 21 minutes and 2 hours, 11 minutes with a roundabout and traffic signal, respectively.

As shown in Table 8, under Future with Project Conditions, the Total Evacuation Time would increase to approximately 2 hours, 39 minutes with a roundabout and 2 hours, 26 minutes with a traffic signal. The Project's effect would be the addition of 18 minutes to Total Evacuation Time with a roundabout and 15 minutes with a traffic signal.

### **Scenarios E and F – North / West and South / West Routes Only**

Scenarios E and F are based on the Future with Project Conditions analyses from Scenario D, but each allow only two evacuation routes at a time rather than three. It is important to note that the differences reported between Scenario D and Scenarios E and F are not the result of the Project. Rather, they are solely the result of which evacuation routes are available in a given scenario.

**Travel Time.** Table 9 shows the results of the Travel Time analysis if all traffic in the Study Area were required to use only the northern and western evacuation routes (Scenario E) and Table 10 shows the Travel Time analysis if all traffic were required to use only the southern and western evacuation routes (Scenario F). These analyses were based on the Future with Project Conditions.

As shown in Table 9, under Scenario E with either a roundabout or traffic signal at Intersection #4, the Travel Time from each TAZ would be minimally affected by forcing evacuation via the northern and western routes compared to the results of Scenario D in which there were no route restrictions. This is primarily because only a fraction of evacuating traffic was assumed to use Placerita Canyon Road to SR 14 and, therefore, the amount of traffic redistributed to the north and west evacuation routes was minimal. In Scenario E, conditions with the roundabout offer slightly lower Travel Times than conditions with the traffic signal (approximately 10 seconds difference from most TAZs).

As shown in Table 10, under Scenario F, the Travel Time from each TAZ would be between approximately 67 and 84 seconds longer with a roundabout and between approximately 50 and 88 seconds longer with a traffic signal by forcing evacuation via the southern and western routes

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<sup>9</sup> Intersection #7 would clear in 33 minutes.

compared to the results of Scenario D in which there were no route restrictions. As in Scenario E, Travel Times under Scenario F would be slightly lower with the roundabout than with the traffic signal (approximately eight seconds difference from most TAZs).

Scenarios E and F showed no serious bottlenecks or capacity constraints that would preclude either of these pairs of routes from safely accommodating the entire evacuation demand in the case of an orderly, phased evacuation as described for the Travel Time analysis.

**Total Evacuation Time.** Table 11 shows the results of the Total Evacuation Time analyses if all traffic in the Study Area were required to use only the northern and western evacuation routes (Scenario E) or only the southern and western evacuation routes (Scenario F). These analyses were based on the Future with Project Conditions.

As shown in Table 11, under Scenario E, the highest V/C ratio (and, thus, evacuation clear time) would occur at Intersection #4, whether controlled with a roundabout or traffic signal. Compared to Scenario D (the equivalent scenario with access to all evacuation routes), after adding three minutes of additional travel time from Intersection #4 to the northern safe zone, the Total Evacuation Time would increase by 28 minutes (to 3 hours, 7 minutes) with a roundabout and 33 minutes (to 2 hours, 59 minutes) with a traffic signal.

As shown in Table 11, under Scenario F, the highest V/C ratio (and, thus, evacuation clear time) would also occur at Intersection #4, regardless of traffic control. Compared to Scenario D, the clear time at the intersection would actually decrease by 11 minutes to 2 hours, 25 minutes with a roundabout and by 2 minutes to 2 hours, 21 minutes with a traffic signal. However, because the additional travel time would be farther when restricted to the western and southern routes, the Total Evacuation Time is estimated to be 2 hours, 50 minutes with a roundabout and 2 hours, 46 minutes with a traffic signal. Compared to Scenario D, this is an increase in Total Evacuation Time of 11 minutes with a roundabout and 20 minutes with a traffic signal.

The Total Evacuation Time analyses under Scenario F may not fully account for downstream bottlenecks along the Lost Canyon Road corridor between Sand Canyon Road and Via Princessa, including an all-way stop-controlled intersection at La Veda Avenue, multiple small roundabouts along Lost Canyon Road and Mitchell Drive, and traffic signals on Lost Canyon Road approaching Via Princessa. These locations were outside the geographic bounds of this evacuation analysis and, therefore, Scenario F could experience longer Total Evacuation Time than identified in Table 11, notwithstanding the many conservative assumptions incorporated into these analyses as previously discussed.

## **EVACUATION PROCEDURES**

There are various physical improvements or operational measures on public roads that could improve evacuation times from the results described above. These types of procedures are described in the City's Safety Element and LHMP:

- Provision of evacuation warnings as early as possible
- Phase evacuation mandates whenever possible

- Provision of active traffic control at key intersections to help traffic flow smoothly and respond in real time to changing conditions or traffic demands
- Dynamic traffic routing based on best available routes through signage and messaging services, including sending more evacuating traffic to the south route than the 15% assumed in the analysis
- Prevention of inbound traffic from accessing the evacuated area

In the event of an emergency evacuation, there would be room on the Santa Clara River Bridge for two northbound evacuation lanes and one southbound lane that could provide emergency vehicles access to the Study Area. This operational change would have to be manually implemented by emergency personnel, but it would provide better access to and through the Sand Canyon Road & SR 14 interchange area, where 70% of the evacuating traffic is forecast to travel.

Additionally, it would be incumbent upon the Project to ensure that its internal roadways and access points remain clear and that there are protocols in place to ensure that the access gates remain operational or in the open position during an emergency.

## **CONCLUSIONS**

### **Travel Time Analyses**

The Travel Time analyses evaluated the time required for an individual vehicle from a series of TAZs to get to a safe zone via each of three different evacuation routes. This represents a typical evacuation with advance warning and phased evacuation orders. In this type of emergency event, Travel Times were found to range from approximately four minutes to approximately 21 minutes depending on origin TAZ, route, and buildout year. The Project was found to contribute one to two minutes to the Travel Time specifically for the Project's own TAZ and another industrial-zoned TAZ located east of the Project. Travel Times from other TAZs would be negligibly affected by the Project. These results are fairly consistent whether Intersection #4 is configured with a roundabout or a traffic signal.

### **Total Evacuation Time Analyses**

The Total Evacuation Time analyses evaluated the total time required to evacuate the entire Study Area simultaneously using the same three evacuation routes. In this type of evacuation event, the Total Evacuation Time would range from a low of approximately 1 hour, 41 minutes (under Existing with Project Conditions with a traffic signal at Intersection #4) to 2 hours, 39 minutes (under Future with Project Conditions with a roundabout at Intersection #4). The Project would reduce Total Evacuation Time under Existing with Project Conditions by between 14 and 27 minutes due to upgrading the existing stop signs to a roundabout or traffic signal, both of which operate more efficiently than a stop-controlled intersection. Under Future with Project Conditions, it would add between 15 and 18 minutes to the Total Evacuation Time (with traffic signal and roundabout control, respectively, at Intersection #4).

### **Restricted Route Analyses**

Travel Time and Total Evacuation Time analyses were also conducted assuming either the northern or southern evacuation routes were closed. Compared to conditions with full access to the three evacuation routes, the Travel Time would be minimally affected by closing the southern route (maintaining only the northern and western routes) and would add up to approximately 90 seconds with the closure of the northern route (maintaining only the southern and western routes). These Travel Times are minimally affected by the configuration of Intersection #4 with a roundabout or a traffic signal.

Compared to conditions with full access to the three evacuation routes, the Total Evacuation Time would increase by approximately 28 minutes with a roundabout at Intersection #4 and by approximately 33 minutes with a traffic signal at Intersection #4 if the northern route were closed. If the southern route were closed, Total Evacuation Time would increase by approximately 11 minutes with a roundabout and by approximately 20 minutes with a traffic signal.

### **Roundabout vs. Traffic Signal**

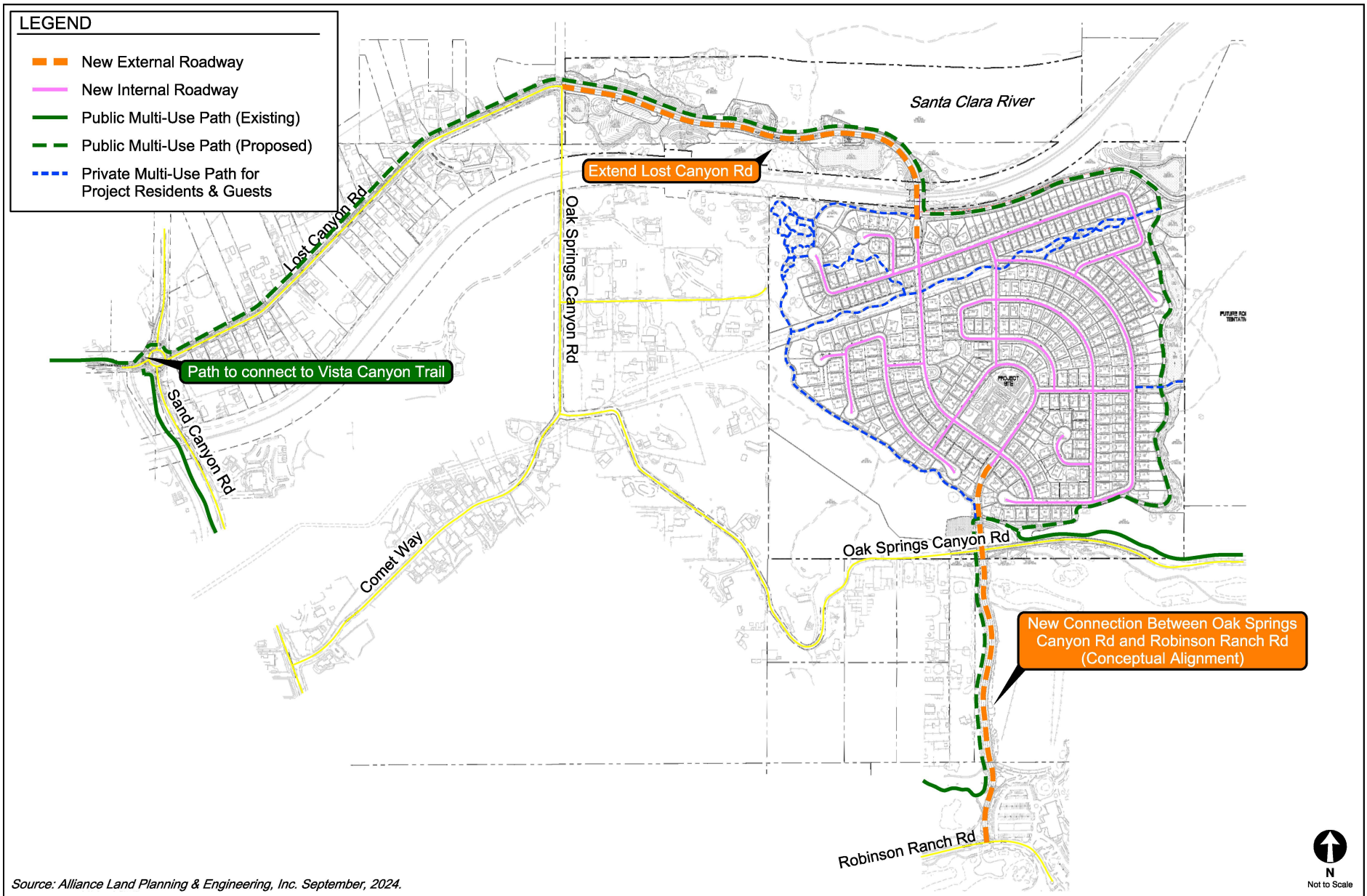
The configuration of Intersection #4 with either a roundabout or traffic signal produces negligibly different Travel Time results in a phased evacuation scenario. In a sudden emergency evacuation, the traffic signal configuration would allow for the entire Study Area to evacuate approximately 13 minutes more rapidly than the roundabout configuration.

### **Conservative Analysis**

The evacuation analyses in this report were conducted using extremely conservative assumptions regarding the number of evacuating vehicles. They assumed all land uses would be fully occupied at the time the evacuation orders were issued, that every available vehicle, including RVs and horse trailers, would be driven to safe zones during the evacuation, and there would be no traffic control at any location. Additionally, while the Travel Time analysis assumed a phased, advance-notice evacuation order, the Total Evacuation Time analysis was based on a sudden unforeseen emergency event requiring immediate evacuation of the whole area. In practice, this is not a realistic scenario.

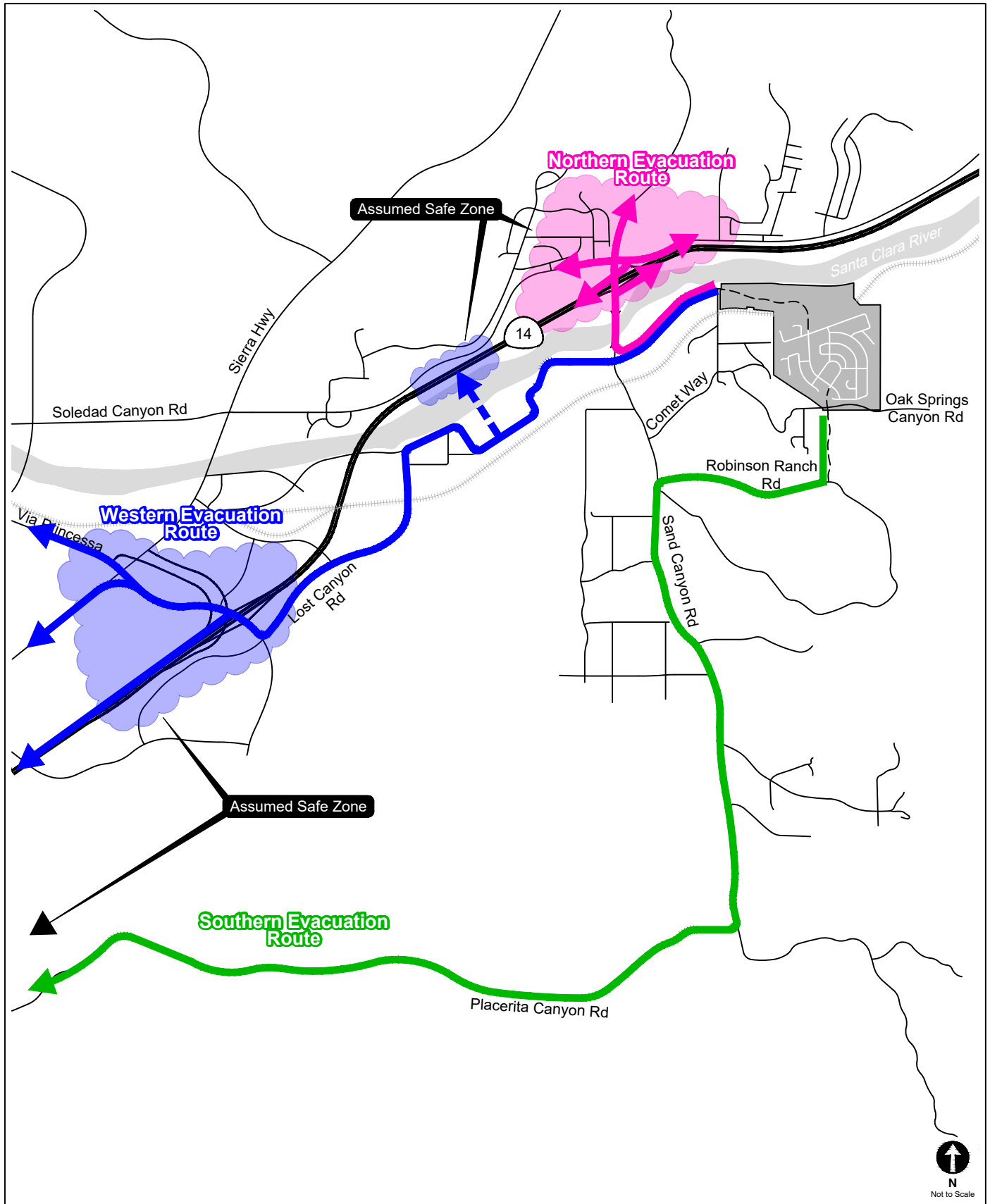
Additionally, physical improvements and/or operational measures could be taken to improve evacuation times from the results described above. Provision of active traffic control at key intersections, evacuation warnings as early as possible, phased evacuation mandates whenever possible, dynamic traffic routing based on best available routes through signage and messaging services, prevention of inbound traffic from accessing evacuated area, and redirection of traffic by traffic control personnel to the less congested of the evacuation routes could all improve the evacuation process and reduce the time required to evacuate the Study Area.

The analysis shows that the routes out of the Project site and out of the overall Study Area are sufficient to be consistent with the Safety Element. Project traffic – like all traffic in the Sand Canyon area – can evacuate in any of three directions to safe zones, providing flexibility and additional levels of safety for evacuees.



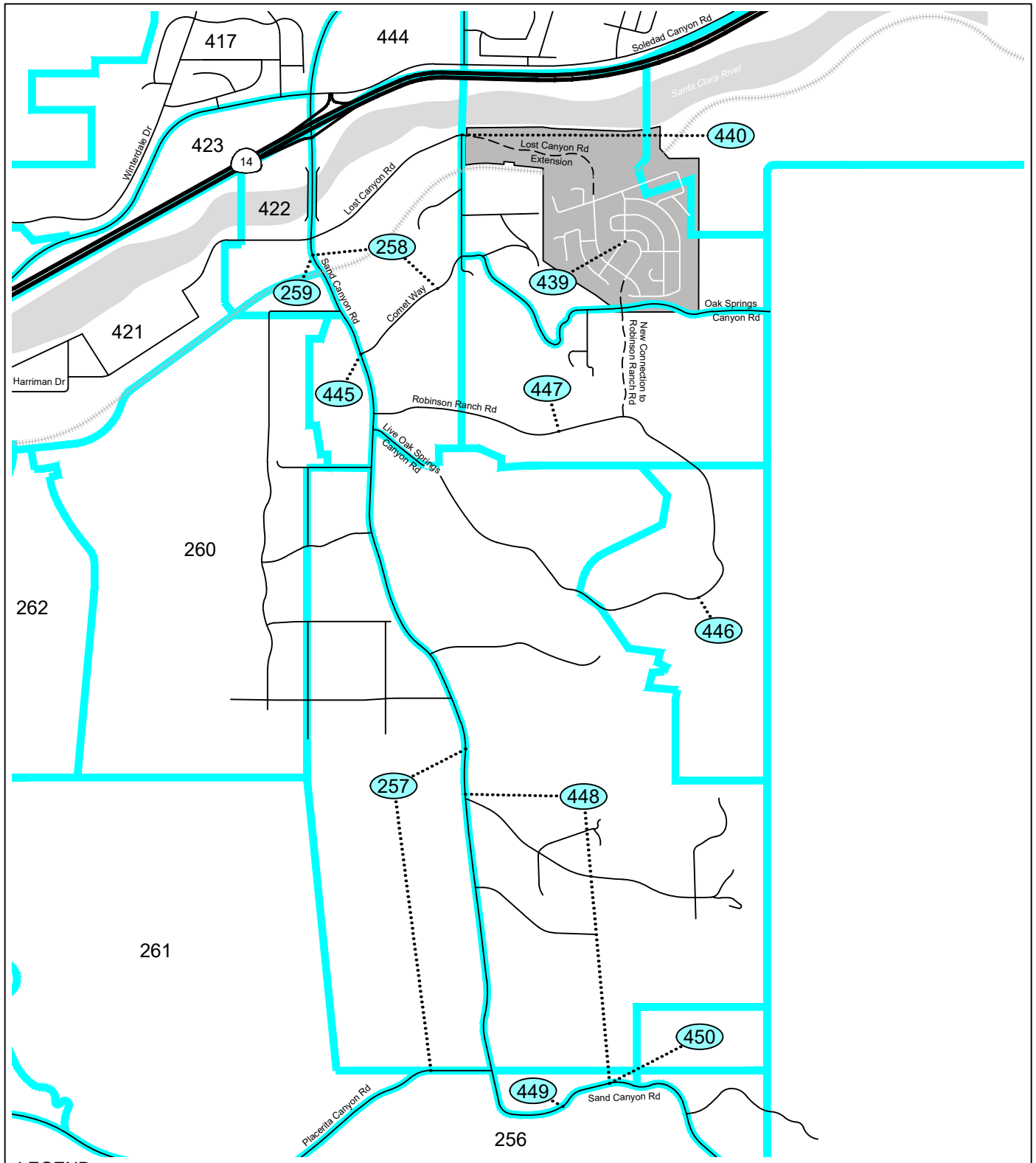
PROJECT SITE PLAN

FIGURE  
1



STUDY AREA AND EVACUATION ROUTES

FIGURE  
2



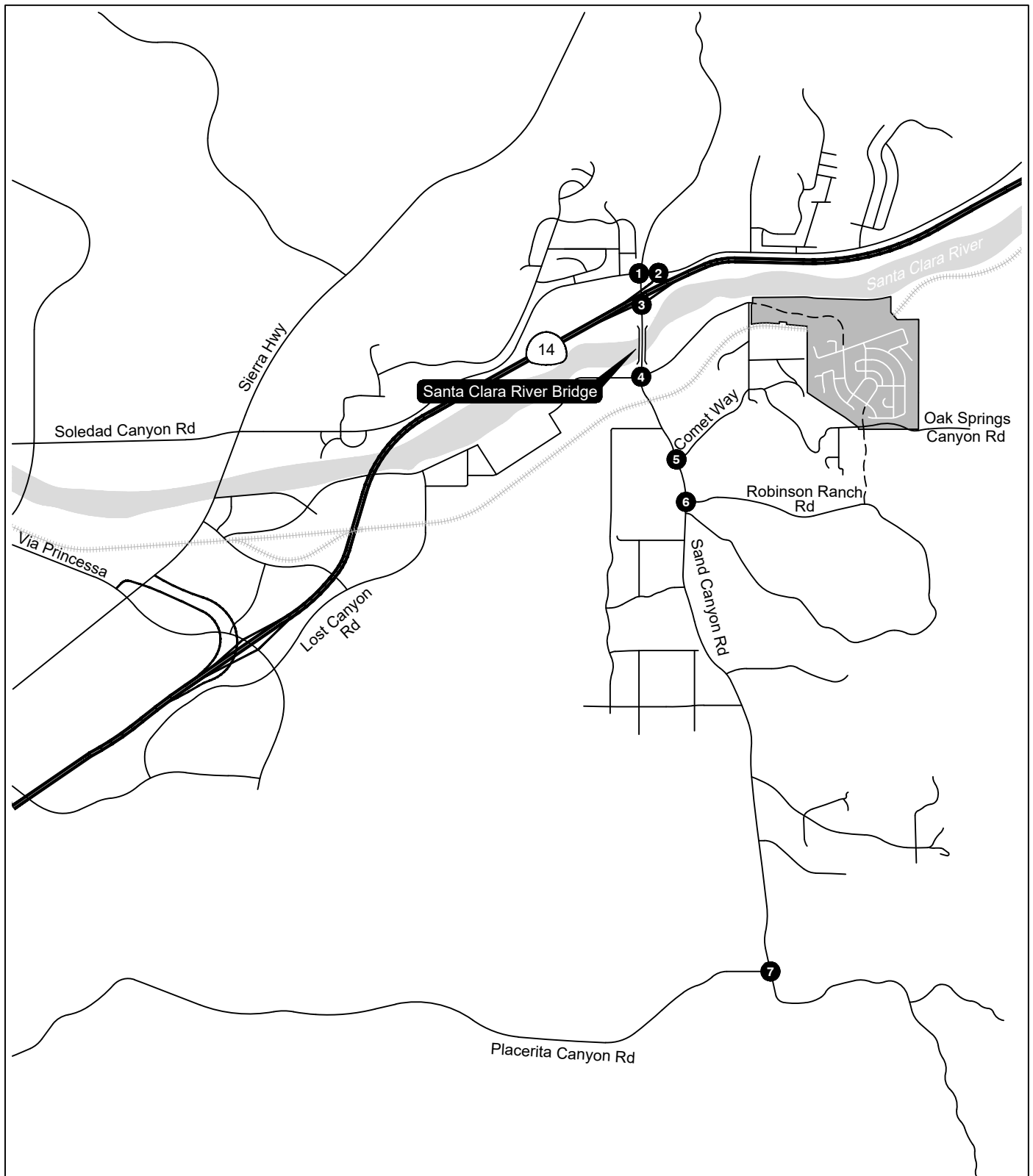
**LEGEND**

- Project Site
- # TAZ Included in Evacuation Analysis
- # Other TAZ
- Traffic Analysis Zone (TAZ) Boundaries
- Model Centroid Connector



**MODEL ROADWAY NETWORK AND TAZ LOCATIONS**

**FIGURE 3**



**LEGEND**

- Project Site
- # Analyzed Intersection



**ANALYZED INTERSECTIONS**

**FIGURE**  
4

**TABLE 1  
STUDY AREA LAND USE ASSUMPTIONS**

<b>TAZ</b>	<b>Land Use Category</b>	<b>Units</b>	<b>Existing Conditions</b>	<b>Future Conditions</b>	<b>Difference</b>
<b>257</b>	Single Family Homes	du	103	170	67
<b>258</b>	Single Family Homes	du	54	130	76
	Church	ksf	13	13	0
	Mfg/Warehouse	ksf	0	104	104
<b>259</b>	Mobile Home	du	80	80	0
	Commercial Center	ksf	4	10	6
<b>439</b>	Single Family Homes	du	164	194	30
	Commercial Center	ksf	0	35	35
<b>439 (Project)</b>	Active Senior Housing	du	0	359	359
<b>440</b>	Industrial Park	ksf	0	42	42
<b>445</b>	Single Family Homes	du	39	39	0
<b>446</b>	Single Family Homes	du	20	20	0
<b>447</b>	Single Family Homes	du	0	251	251
	Hotel / Banquet	rooms	0	302	302
	Golf Course	acre	150	150	0
<b>448</b>	Single Family Homes	du	606	691	85
<b>449/450</b>	Single Family Homes	du	20	43	23
<b>Total</b>	Single Family Homes	du	1,006	1,538	532
	Mobile Home	du	80	80	0
	Active Senior Housing	du	0	359	359
	Commercial Center	ksf	4	45	41
	Hotel / Banquet	rooms	0	302	302
	Church	ksf	13	13	0
	Industrial Park	ksf	0	42	42
	Mfg/Warehouse	ksf	0	104	104
	Golf Course	acre	150	150	0

Notes:

TAZ = traffic analysis zone (in Model); du = dwelling unit; ksf = 1,000 square feet.

**TABLE 2  
EXISTING WITH PROJECT CONDITIONS  
STUDY AREA TRIP GENERATION**

<b>Land Use \ TAZ</b>	<b>257</b>	<b>258</b>	<b>259</b>	<b>439</b>	<b>439 (Project)</b>	<b>440</b>	<b>445</b>	<b>446</b>	<b>447</b>	<b>448</b>	<b>449/450</b>	<b>Total</b>
<i>Residential Dwelling Units</i>	103	54	80	164	359	-	39	20	-	606	20	1,445
<i>Auto Ownership per Dwelling Unit</i>	2.16	2.16	2	2.16	1.5	-	2.16	2.16	2.16	2.16	2.16	-
<b>Total Auto Trip Gen</b>	<b>222</b>	<b>117</b>	<b>160</b>	<b>354</b>	<b>539</b>	<b>-</b>	<b>84</b>	<b>43</b>	<b>-</b>	<b>1,309</b>	<b>43</b>	<b>2,871</b>
<i>Horse Trailers / RVs</i>	25	13	-	39	54	-	9	5	-	145	5	295
<i>PCE Factor</i>	1.2	1.2	1.2	1.2	1.2	-	1.2	1.2	1.2	1.2	1.2	-
<b>Trailer / RV Trip Gen</b>	<b>30</b>	<b>16</b>	<b>-</b>	<b>47</b>	<b>65</b>	<b>-</b>	<b>11</b>	<b>6</b>	<b>-</b>	<b>175</b>	<b>6</b>	<b>354</b>
<b>Total Residential Trip Gen (PCE)</b>	<b>252</b>	<b>132</b>	<b>160</b>	<b>401</b>	<b>603</b>	<b>-</b>	<b>95</b>	<b>49</b>	<b>-</b>	<b>1,483</b>	<b>49</b>	<b>3,225</b>
Church	-	129	-	-	-	-	-	-	-	-	-	129
Mfg/Warehouse	-	-	-	-	-	-	-	-	-	-	-	0
Light Industry	-	-	-	-	-	-	-	-	-	-	-	0
Golf Course	-	-	-	-	-	-	-	-	106	-	-	106
Commercial Center	-	-	12	-	-	-	-	-	-	-	-	12
Hotel / Banquet	-	-	-	-	-	-	-	-	-	-	-	0
<b>Total Commercial Trip Gen (PCE)</b>	<b>0</b>	<b>129</b>	<b>12</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>106</b>	<b>0</b>	<b>0</b>	<b>247</b>
<b>Total PCE Vehicle Trips</b>	<b>252</b>	<b>261</b>	<b>172</b>	<b>401</b>	<b>603</b>	<b>0</b>	<b>95</b>	<b>49</b>	<b>106</b>	<b>1,483</b>	<b>49</b>	<b>3,472</b>

Notes:

TAZ = traffic analysis zone (in Model); PCE = passenger car equivalent; RV = recreational vehicle.

**TABLE 3  
FUTURE WITH PROJECT CONDITIONS  
STUDY AREA TRIP GENERATION**

<b>Land Use \ TAZ</b>	<b>257</b>	<b>258</b>	<b>259</b>	<b>439</b>	<b>439 (Project)</b>	<b>440</b>	<b>445</b>	<b>446</b>	<b>447</b>	<b>448</b>	<b>449/450</b>	<b>Total</b>
<i>Residential Dwelling Units</i>	170	130	80	194	359	-	39	20	251	691	43	1,977
<i>Auto Ownership per Dwelling Unit</i>	2.16	2.16	2	2.16	1.5	-	2.16	2.16	2.16	2.16	2.16	-
<b>Total Auto Trip Gen</b>	<b>367</b>	<b>281</b>	<b>160</b>	<b>419</b>	<b>539</b>	<b>-</b>	<b>84</b>	<b>43</b>	<b>542</b>	<b>1,493</b>	<b>93</b>	<b>4,021</b>
<i>Horse Trailers / RVs</i>	41	31	0	47	54	-	9	5	60	166	10	423
<i>PCE Factor</i>	1.2	1.2	1.2	1.2	1.2	-	1.2	1.2	1.2	1.2	1.2	-
<b>Trailer / RV Trip Gen</b>	<b>49</b>	<b>37</b>	<b>0</b>	<b>56</b>	<b>65</b>	<b>-</b>	<b>11</b>	<b>6</b>	<b>72</b>	<b>199</b>	<b>12</b>	<b>508</b>
<b>Total Residential Trip Gen (PCE)</b>	<b>416</b>	<b>318</b>	<b>160</b>	<b>475</b>	<b>603</b>	<b>0</b>	<b>95</b>	<b>49</b>	<b>614</b>	<b>1,692</b>	<b>105</b>	<b>4,528</b>
Church	-	129	-	-	-	-	-	-	-	0	-	129
Mfg/Warehouse	-	40	-	-	-	-	-	-	-	-	-	40
Light Industry	-	-	-	-	-	42	-	-	-	-	-	42
Golf Course	-	-	-	-	-	-	-	-	106	-	-	106
Commercial Center	-	-	30	105	-	-	-	-	-	-	-	135
Hotel / Banquet	-	-	-	-	-	-	-	-	108	-	-	108
<b>Total Commercial Trip Gen (PCE)</b>	<b>0</b>	<b>169</b>	<b>30</b>	<b>105</b>	<b>0</b>	<b>42</b>	<b>0</b>	<b>0</b>	<b>214</b>	<b>0</b>	<b>0</b>	<b>560</b>
<b>Total PCE Vehicle Trips</b>	<b>416</b>	<b>487</b>	<b>190</b>	<b>580</b>	<b>603</b>	<b>42</b>	<b>95</b>	<b>49</b>	<b>828</b>	<b>1,692</b>	<b>105</b>	<b>5,088</b>

Notes:

TAZ = traffic analysis zone (in Model); PCE = passenger car equivalent; RV = recreational vehicle.

**TABLE 4  
EVACUATION ANALYSIS SCENARIOS**

<b>ID</b>	<b>Scenario Name</b>
A	Existing Conditions [a]
B	Existing with Project Conditions
C	Future without Project Conditions
D	Future with Project Conditions
E	Future with Project Conditions, North and West Routes Only
F	Future with Project Conditions, South and West Routes Only

Notes:

All scenarios analyzed with both roundabout and traffic signal control at Intersection #4, Sand Canyon Road & Lost Canyon Road, except as noted.

[a] Under Existing Conditions, Intersection #4 is stop-controlled.

**TABLE 5  
TRAVEL TIMES BY ORIGIN ZONE AND EVACUATION ROUTE  
EXISTING YEAR CONDITIONS**

Origin TAZ	Evacuation Route	Scenario A Existing	Scenario B Existing with Project Conditions			
		Stop Control	Roundabout		Traffic Signal	
		Travel Time	Travel Time	Change	Travel Time	Change
257	North - Sand Canyon Rd toward SR 14	8 m, 45 s	8 m, 36 s	(51 s)	8 m, 35 s	(50 s)
	West - Lost Canyon Rd toward SR 14	10 m, 12 s	10 m, 2 s	(50 s)	10 m, 1 s	(49 s)
	South - Placerita Canyon Rd toward SR 14	14 m, 40 s	14 m, 41 s	1 s	14 m, 41 s	1 s
258	North - Sand Canyon Rd toward SR 14	4 m, 17 s	4 m, 8 s	(51 s)	4 m, 6 s	(50 s)
	West - Lost Canyon Rd toward SR 14	5 m, 44 s	5 m, 34 s	(50 s)	5 m, 33 s	(49 s)
	South - Placerita Canyon Rd toward SR 14	16 m, 58 s	16 m, 59 s	1 s	16 m, 59 s	1 s
259	North - Sand Canyon Rd toward SR 14	4 m, 17 s	4 m, 8 s	(51 s)	4 m, 6 s	(50 s)
	West - Lost Canyon Rd toward SR 14	5 m, 44 s	5 m, 34 s	(50 s)	5 m, 33 s	(49 s)
	South - Placerita Canyon Rd toward SR 14	16 m, 58 s	16 m, 59 s	1 s	16 m, 59 s	1 s
439	North - Sand Canyon Rd toward SR 14	5 m, 41 s	7 m, 40 s	1 m, 59 s	7 m, 49 s	2 m, 8 s
	West - Lost Canyon Rd toward SR 14	7 m, 9 s	9 m, 7 s	1 m, 58 s	9 m, 12 s	2 m, 3 s
	South - Placerita Canyon Rd toward SR 14	19 m, 55 s	21 m, 50 s	1 m, 55 s	21 m, 50 s	1 m, 55 s
440	North - Sand Canyon Rd toward SR 14	4 m, 34 s	5 m, 38 s	1 m, 4 s	5 m, 48 s	1 m, 13 s
	West - Lost Canyon Rd toward SR 14	6 m, 2 s	7 m, 5 s	1 m, 3 s	7 m, 10 s	1 m, 8 s
	South - Placerita Canyon Rd toward SR 14	18 m, 47 s	19 m, 47 s	1 m, 0 s	19 m, 52 s	1 m, 5 s
445	North - Sand Canyon Rd toward SR 14	5 m, 3 s	4 m, 54 s	(51 s)	4 m, 53 s	(50 s)
	West - Lost Canyon Rd toward SR 14	6 m, 31 s	6 m, 21 s	(50 s)	6 m, 20 s	(49 s)
	South - Placerita Canyon Rd toward SR 14	16 m, 34 s	16 m, 35 s	1 s	16 m, 35 s	1 s
446	North - Sand Canyon Rd toward SR 14	7 m, 48 s	7 m, 39 s	(51 s)	7 m, 38 s	(50 s)
	West - Lost Canyon Rd toward SR 14	9 m, 16 s	9 m, 6 s	(50 s)	9 m, 5 s	(49 s)
	South - Placerita Canyon Rd toward SR 14	18 m, 8 s	18 m, 9 s	1 s	18 m, 9 s	1 s
447	North - Sand Canyon Rd toward SR 14	7 m, 37 s	7 m, 28 s	(51 s)	7 m, 27 s	(50 s)
	West - Lost Canyon Rd toward SR 14	9 m, 5 s	8 m, 55 s	(50 s)	8 m, 54 s	(49 s)
	South - Placerita Canyon Rd toward SR 14	17 m, 48 s	17 m, 49 s	1 s	17 m, 49 s	1 s
448	North - Sand Canyon Rd toward SR 14	9 m, 28 s	9 m, 19 s	(51 s)	9 m, 18 s	(50 s)
	West - Lost Canyon Rd toward SR 14	10 m, 55 s	10 m, 45 s	(50 s)	10 m, 44 s	(49 s)
	South - Placerita Canyon Rd toward SR 14	14 m, 16 s	14 m, 17 s	1 s	14 m, 17 s	1 s
449/450	North - Sand Canyon Rd toward SR 14	12 m, 36 s	12 m, 27 s	(51 s)	12 m, 26 s	(49 s)
	West - Lost Canyon Rd toward SR 14	14 m, 4 s	13 m, 53 s	(49 s)	13 m, 52 s	(49 s)
	South - Placerita Canyon Rd toward SR 14	12 m, 41 s	12 m, 41 s	0 s	12 m, 41 s	0 s

**Notes:**

TAZ = traffic analysis zone of the City travel demand forecasting model.

**TABLE 6  
TOTAL EVACUATION TIME  
EXISTING YEAR CONDITIONS**

No.	Location	Control Type	Scenario A: Existing		Scenario B: Existing with Project		Change
			V/C Ratio [a]	Time to Clear	V/C Ratio [a]	Time to Clear	
1	Sand Canyon Road & Soledad Canyon Road	Traffic Signal	95.6%	57 minutes	101.1%	1 hour, 1 minutes	4 minutes
2	SR 14 Southbound Ramps & Soledad Canyon Road	Traffic Signal	97.8%	59 minutes	105.8%	1 hour, 3 minutes	4 minutes
3	Sand Canyon Road & SR 14 Northbound Ramps	Traffic Signal	128.8%	1 hour, 17 minutes	137.6%	1 hour, 23 minutes	6 minutes
4	Sand Canyon Road & Lost Canyon Road	All-way Stop	209.0%	2 hour, 5 minutes	n/a		n/a
		Roundabout	n/a		185.8%	1 hour, 51 minutes	minus 14 minutes
		Signal	n/a		163.9%	1 hour, 38 minutes	minus 27 minutes
5	Sand Canyon Road & Comet Way	2-way Stop	79.0%	47 minutes	83.3%	50 minutes	3 minutes
6	Sand Canyon Road & Robinson Ranch Road	2-way Stop	99.6%	60 minutes	99.6%	60 minutes	0 minutes
7	Sand Canyon Road & Placerita Canyon Road	2-way Stop	54.2%	33 minutes	53.0%	32 minutes	minus 1 minutes
8	Santa Clara River Bridge	1,800 vph capacity	112.7%	1 hour, 8 minutes	138.2%	1 hour, 23 minutes	15 minutes
<b>Total Evacuation Time - With Roundabout</b>							
Longest Time to Clear (Intersection #4)				2 hour, 5 minutes		1 hour, 51 minutes	minus 14 minutes
Additional Travel Time to Safe Zone [b]				3 minutes		3 minutes	-
<b>Total Evacuation Time</b>				<b>2 hour, 8 minutes</b>		<b>1 hour, 54 minutes</b>	<b>minus 14 minutes</b>
<b>Total Evacuation Time - With Traffic Signal</b>							
Longest Time to Clear (Intersection #4)				2 hour, 5 minutes		1 hour, 38 minutes	minus 27 minutes
Additional Travel Time to Safe Zone [b]				3 minutes		3 minutes	-
<b>Total Evacuation Time</b>				<b>2 hour, 8 minutes</b>		<b>1 hour, 41 minutes</b>	<b>minus 27 minutes</b>

**Notes:**

vph = vehicles per hour.

[a] The V/C ratio, or volume-to-capacity ratio, was calculated using the intersection capacity utilization (ICU) methodology, which measures the ratio between the amount of traffic at the intersection to the maximum intersection capacity per hour. Here, the V/C ratio was expressed as a percent of hourly intersection capacity.

[b] Estimated based on anticipated travel time to Soledad Canyon Road for the final evacuating vehicles.

**TABLE 7  
TRAVEL TIMES BY ORIGIN ZONE AND EVACUATION ROUTE  
FUTURE YEAR CONDITIONS**

Origin TAZ	Evacuation Route	Scenario C Future without Project Conditions		Scenario D Future with Project Conditions			
		Roundabout	Traffic Signal	Roundabout		Traffic Signal	
		Travel Time	Travel Time	Travel Time	Change	Travel Time	Change
257	North - Sand Canyon Rd toward SR 14	8 m, 38 s	8 m, 58 s	8 m, 38 s	0 s	9 m, 4 s	6 s
	West - Lost Canyon Rd toward SR 14	10 m, 45 s	11 m, 6 s	10 m, 49 s	4 s	11 m, 15 s	9 s
	South - Placerita Canyon Rd toward SR 14	15 m, 25 s	15 m, 25 s	15 m, 32 s	7 s	15 m, 32 s	7 s
258	North - Sand Canyon Rd toward SR 14	4 m, 10 s	4 m, 30 s	4 m, 10 s	0 s	4 m, 36 s	6 s
	West - Lost Canyon Rd toward SR 14	6 m, 17 s	6 m, 37 s	6 m, 21 s	4 s	6 m, 46 s	9 s
	South - Placerita Canyon Rd toward SR 14	17 m, 44 s	17 m, 44 s	17 m, 51 s	7 s	17 m, 51 s	7 s
259	North - Sand Canyon Rd toward SR 14	4 m, 10 s	4 m, 30 s	4 m, 10 s	0 s	4 m, 36 s	6 s
	West - Lost Canyon Rd toward SR 14	6 m, 17 s	6 m, 37 s	6 m, 21 s	4 s	6 m, 46 s	9 s
	South - Placerita Canyon Rd toward SR 14	17 m, 44 s	17 m, 44 s	17 m, 51 s	7 s	17 m, 51 s	7 s
439	North - Sand Canyon Rd toward SR 14	5 m, 54 s	5 m, 54 s	7 m, 56 s	2 m, 2 s	7 m, 48 s	1 m, 54 s
	West - Lost Canyon Rd toward SR 14	8 m, 2 s	8 m, 1 s	10 m, 7 s	2 m, 5 s	9 m, 59 s	1 m, 58 s
	South - Placerita Canyon Rd toward SR 14	20 m, 53 s	20 m, 53 s	22 m, 55 s	2 m, 2 s	22 m, 55 s	2 m, 2 s
440	North - Sand Canyon Rd toward SR 14	4 m, 44 s	4 m, 44 s	5 m, 51 s	1 m, 7 s	5 m, 42 s	58 s
	West - Lost Canyon Rd toward SR 14	6 m, 51 s	6 m, 51 s	8 m, 2 s	1 m, 11 s	7 m, 53 s	1 m, 2 s
	South - Placerita Canyon Rd toward SR 14	19 m, 41 s	19 m, 40 s	20 m, 54 s	1 m, 13 s	20 m, 46 s	1 m, 6 s
445	North - Sand Canyon Rd toward SR 14	4 m, 57 s	5 m, 17 s	4 m, 57 s	0 s	5 m, 22 s	5 s
	West - Lost Canyon Rd toward SR 14	7 m, 4 s	7 m, 24 s	7 m, 8 s	4 s	7 m, 33 s	9 s
	South - Placerita Canyon Rd toward SR 14	17 m, 20 s	17 m, 20 s	17 m, 27 s	7 s	17 m, 27 s	7 s
446	North - Sand Canyon Rd toward SR 14	8 m, 31 s	8 m, 51 s	8 m, 46 s	15 s	9 m, 12 s	21 s
	West - Lost Canyon Rd toward SR 14	10 m, 38 s	10 m, 58 s	10 m, 57 s	19 s	11 m, 22 s	24 s
	South - Placerita Canyon Rd toward SR 14	19 m, 43 s	19 m, 43 s	20 m, 5 s	22 s	20 m, 5 s	22 s
447	North - Sand Canyon Rd toward SR 14	8 m, 20 s	8 m, 41 s	8 m, 35 s	15 s	9 m, 1 s	20 s
	West - Lost Canyon Rd toward SR 14	10 m, 28 s	10 m, 48 s	10 m, 46 s	18 s	11 m, 12 s	24 s
	South - Placerita Canyon Rd toward SR 14	19 m, 23 s	19 m, 23 s	19 m, 45 s	22 s	19 m, 45 s	22 s
448	North - Sand Canyon Rd toward SR 14	9 m, 25 s	9 m, 45 s	9 m, 25 s	0 s	9 m, 51 s	6 s
	West - Lost Canyon Rd toward SR 14	11 m, 32 s	11 m, 52 s	11 m, 36 s	4 s	12 m, 1 s	9 s
	South - Placerita Canyon Rd toward SR 14	15 m, 1 s	15 m, 1 s	15 m, 8 s	7 s	15 m, 8 s	7 s
449/450	North - Sand Canyon Rd toward SR 14	12 m, 30 s	12 m, 51 s	12 m, 32 s	2 s	12 m, 57 s	6 s
	West - Lost Canyon Rd toward SR 14	14 m, 37 s	14 m, 58 s	14 m, 42 s	5 s	15 m, 8 s	10 s
	South - Placerita Canyon Rd toward SR 14	13 m, 23 s	13 m, 23 s	13 m, 32 s	9 s	13 m, 32 s	9 s

Notes:

TAZ = traffic analysis zone of the City travel demand forecasting model.

**TABLE 8  
TOTAL EVACUATION TIME  
FUTURE YEAR CONDITIONS**

No.	Location	Control Type	Scenario C: Future without Project		Scenario D: Future with Project		Change
			V/C Ratio [a]	Time to Clear	V/C Ratio [a]	Time to Clear	
1	Sand Canyon Road & Soledad Canyon Road	Traffic Signal	115.8%	1 hour, 9 minutes	120.6%	1 hour, 12 minutes	3 minutes
2	SR 14 Southbound Ramps & Soledad Canyon Road	Traffic Signal	127.4%	1 hour, 16 minutes	141.4%	1 hour, 25 minutes	9 minutes
3	Sand Canyon Road & SR 14 Northbound Ramps	Traffic Signal	149.8%	1 hour, 30 minutes	165.0%	1 hour, 39 minutes	9 minutes
4	Sand Canyon Road & Lost Canyon Road	Roundabout	230.0%	2 hour, 18 minutes	260.0%	2 hour, 36 minutes	18 minutes
		Signal	213.6%	2 hour, 8 minutes	238.4%	2 hour, 23 minutes	15 minutes
5	Sand Canyon Road & Comet Way	2-way Stop	170.7%	1 hour, 42 minutes	175.8%	1 hour, 45 minutes	3 minutes
6	Sand Canyon Road & Robinson Ranch Road	2-way Stop	133.3%	1 hour, 20 minutes	128.7%	1 hour, 17 minutes	minus 3 minutes
7	Sand Canyon Road & Placerita Canyon Road	2-way Stop	54.5%	33 minutes	54.8%	33 minutes	0 minutes
8	Santa Clara River Bridge	1,800 vph capacity	164.9%	1 hour, 39 minutes	193.9%	1 hour, 56 minutes	17 minutes
<b>Total Evacuation Time - With Roundabout</b>							
Longest Time to Clear (Intersection #4)				2 hour, 18 minutes		2 hour, 36 minutes	18 minutes
Additional Travel Time to Safe Zone [b]				3 minutes		3 minutes	-
<b>Total Evacuation Time</b>				<b>2 hour, 21 minutes</b>		<b>2 hour, 39 minutes</b>	<b>18 minutes</b>
<b>Total Evacuation Time - With Traffic Signal</b>							
Longest Time to Clear (Intersection #4)				2 hour, 8 minutes		2 hour, 23 minutes	15 minutes
Additional Travel Time to Safe Zone [b]				3 minutes		3 minutes	-
<b>Total Evacuation Time</b>				<b>2 hour, 11 minutes</b>		<b>2 hour, 26 minutes</b>	<b>15 minutes</b>

Notes:

vph = vehicles per hour.

[a] The V/C ratio, or volume-to-capacity ratio, was calculated using the intersection capacity utilization (ICU) methodology, which measures the ratio between the amount of traffic at the intersection to the maximum intersection capacity per hour. Here, the V/C ratio was expressed as a percent of hourly intersection capacity.

[b] Estimated based on anticipated travel time to Soledad Canyon Road for the final evacuating vehicles.

**TABLE 9  
TRAVEL TIMES BY ORIGIN ZONE AND EVACUATION ROUTE  
FUTURE YEAR CONDITIONS - NORTH AND WEST ROUTES ONLY**

Origin TAZ	Evacuation Route	Scenario D [a] Future with Project Conditions		Scenario E Future with Project Conditions, North and West Routes Only			
		Roundabout	Traffic Signal	Roundabout		Traffic Signal	
		Travel Time	Travel Time	Travel Time	Change	Travel Time	Change
257	North - Sand Canyon Rd toward SR 14	8 m, 38 s	9 m, 4 s	8 m, 45 s	7 s	8 m, 55 s	(9 s)
	West - Lost Canyon Rd toward SR 14	10 m, 49 s	11 m, 15 s	10 m, 56 s	7 s	11 m, 6 s	(9 s)
258	North - Sand Canyon Rd toward SR 14	4 m, 10 s	4 m, 36 s	4 m, 17 s	7 s	4 m, 27 s	(9 s)
	West - Lost Canyon Rd toward SR 14	6 m, 21 s	6 m, 46 s	6 m, 28 s	7 s	6 m, 38 s	(8 s)
259	North - Sand Canyon Rd toward SR 14	4 m, 10 s	4 m, 36 s	4 m, 17 s	7 s	4 m, 27 s	(9 s)
	West - Lost Canyon Rd toward SR 14	6 m, 21 s	6 m, 46 s	6 m, 28 s	7 s	6 m, 38 s	(8 s)
439	North - Sand Canyon Rd toward SR 14	7 m, 56 s	7 m, 48 s	8 m, 9 s	13 s	7 m, 55 s	7 s
	West - Lost Canyon Rd toward SR 14	10 m, 7 s	9 m, 59 s	10 m, 20 s	13 s	10 m, 0 s	1 s
440	North - Sand Canyon Rd toward SR 14	5 m, 51 s	5 m, 42 s	6 m, 4 s	13 s	5 m, 50 s	8 s
	West - Lost Canyon Rd toward SR 14	8 m, 2 s	7 m, 53 s	8 m, 15 s	13 s	7 m, 55 s	2 s
445	North - Sand Canyon Rd toward SR 14	4 m, 57 s	5 m, 22 s	5 m, 4 s	7 s	5 m, 14 s	(8 s)
	West - Lost Canyon Rd toward SR 14	7 m, 8 s	7 m, 33 s	7 m, 15 s	7 s	7 m, 25 s	(8 s)
446	North - Sand Canyon Rd toward SR 14	8 m, 46 s	9 m, 12 s	8 m, 53 s	7 s	9 m, 3 s	(9 s)
	West - Lost Canyon Rd toward SR 14	10 m, 57 s	11 m, 22 s	11 m, 4 s	7 s	11 m, 14 s	(8 s)
447	North - Sand Canyon Rd toward SR 14	8 m, 35 s	9 m, 1 s	8 m, 44 s	9 s	8 m, 54 s	(7 s)
	West - Lost Canyon Rd toward SR 14	10 m, 46 s	11 m, 12 s	10 m, 55 s	9 s	11 m, 5 s	(7 s)
448	North - Sand Canyon Rd toward SR 14	9 m, 25 s	9 m, 51 s	9 m, 32 s	7 s	9 m, 42 s	(9 s)
	West - Lost Canyon Rd toward SR 14	11 m, 36 s	12 m, 1 s	11 m, 43 s	7 s	11 m, 53 s	(8 s)
449/450	North - Sand Canyon Rd toward SR 14	12 m, 32 s	12 m, 57 s	11 m, 57 s	(35 s)	12 m, 7 s	(50 s)
	West - Lost Canyon Rd toward SR 14	14 m, 42 s	15 m, 8 s	14 m, 8 s	(34 s)	14 m, 18 s	(50 s)

Notes:

TAZ = traffic analysis zone of the City travel demand forecasting model.

[a] See Table 7.

**TABLE 10  
TRAVEL TIMES BY ORIGIN ZONE AND EVACUATION ROUTE  
FUTURE YEAR CONDITIONS - SOUTH AND WEST ROUTES ONLY**

Origin TAZ	Evacuation Route	Scenario D [a] Future with Project Conditions		Scenario F Future with Project Conditions, South and West Routes Only			
		Roundabout	Traffic Signal	Roundabout		Traffic Signal	
		Travel Time	Travel Time	Travel Time	Change	Travel Time	Change
257	West - Lost Canyon Rd toward SR 14	10 m, 49 s	11 m, 15 s	11 m, 57 s	1 m, 8 s	12 m, 5 s	50 s
	South - Placerita Canyon Rd toward SR 14	15 m, 32 s	15 m, 32 s	16 m, 55 s	1 m, 23 s	16 m, 55 s	1 m, 23 s
258	West - Lost Canyon Rd toward SR 14	6 m, 21 s	6 m, 46 s	7 m, 29 s	1 m, 8 s	7 m, 37 s	51 s
	South - Placerita Canyon Rd toward SR 14	17 m, 51 s	17 m, 51 s	19 m, 13 s	1 m, 22 s	19 m, 13 s	1 m, 22 s
259	West - Lost Canyon Rd toward SR 14	6 m, 21 s	6 m, 46 s	7 m, 29 s	1 m, 8 s	7 m, 37 s	51 s
	South - Placerita Canyon Rd toward SR 14	17 m, 51 s	17 m, 51 s	19 m, 13 s	1 m, 22 s	19 m, 13 s	1 m, 22 s
439	West - Lost Canyon Rd toward SR 14	10 m, 7 s	9 m, 59 s	11 m, 14 s	1 m, 7 s	11 m, 15 s	1 m, 16 s
	South - Placerita Canyon Rd toward SR 14	22 m, 55 s	22 m, 55 s	24 m, 16 s	1 m, 21 s	24 m, 16 s	1 m, 21 s
440	West - Lost Canyon Rd toward SR 14	8 m, 2 s	7 m, 53 s	9 m, 9 s	1 m, 7 s	9 m, 9 s	1 m, 16 s
	South - Placerita Canyon Rd toward SR 14	20 m, 54 s	20 m, 46 s	22 m, 13 s	1 m, 19 s	22 m, 14 s	1 m, 28 s
445	West - Lost Canyon Rd toward SR 14	7 m, 8 s	7 m, 33 s	8 m, 16 s	1 m, 8 s	8 m, 24 s	51 s
	South - Placerita Canyon Rd toward SR 14	17 m, 27 s	17 m, 27 s	18 m, 49 s	1 m, 22 s	18 m, 49 s	1 m, 22 s
446	West - Lost Canyon Rd toward SR 14	10 m, 57 s	11 m, 22 s	12 m, 5 s	1 m, 8 s	12 m, 13 s	51 s
	South - Placerita Canyon Rd toward SR 14	20 m, 5 s	20 m, 5 s	21 m, 28 s	1 m, 23 s	21 m, 28 s	1 m, 23 s
447	West - Lost Canyon Rd toward SR 14	10 m, 46 s	11 m, 12 s	11 m, 54 s	1 m, 8 s	12 m, 2 s	50 s
	South - Placerita Canyon Rd toward SR 14	19 m, 45 s	19 m, 45 s	21 m, 7 s	1 m, 22 s	21 m, 7 s	1 m, 22 s
448	West - Lost Canyon Rd toward SR 14	11 m, 36 s	12 m, 1 s	12 m, 44 s	1 m, 8 s	12 m, 52 s	51 s
	South - Placerita Canyon Rd toward SR 14	15 m, 8 s	15 m, 8 s	16 m, 31 s	1 m, 23 s	16 m, 31 s	1 m, 23 s
449/450	West - Lost Canyon Rd toward SR 14	14 m, 42 s	15 m, 8 s	15 m, 53 s	1 m, 11 s	16 m, 1 s	53 s
	South - Placerita Canyon Rd toward SR 14	13 m, 32 s	13 m, 32 s	14 m, 56 s	1 m, 24 s	14 m, 56 s	1 m, 24 s

Notes:

TAZ = traffic analysis zone of the City travel demand forecasting model.

[a] See Table 7.

**TABLE 11  
TOTAL EVACUATION TIME  
FUTURE YEAR CONDITIONS - RESTRICTED EVACUATION ROUTES**

No.	Location	Control Type	E: North & West Routes Only		F: South & West Routes Only	
			V/C Ratio [a]	Time to Clear	V/C Ratio [a]	Time to Clear
1	Sand Canyon Road & Soledad Canyon Road	Traffic Signal	135.1%	1 hour, 21 minutes	n/a	
2	SR 14 Southbound Ramps & Soledad Canyon Road	Traffic Signal	185.8%	1 hour, 51 minutes	n/a	
3	Sand Canyon Road & SR 14 Northbound Ramps	Traffic Signal	179.8%	1 hour, 48 minutes	n/a	
4	Sand Canyon Road & Lost Canyon Road	Roundabout	306.6%	3 hour, 4 minutes	241.1%	2 hour, 25 minutes
		Signal	293.5%	2 hour, 56 minutes	235.8%	2 hour, 21 minutes
5	Sand Canyon Road & Comet Way	2-way Stop	n/a		170.3%	1 hour, 42 minutes
6	Sand Canyon Road & Robinson Ranch Road	2-way Stop	n/a		121.4%	1 hour, 13 minutes
7	Sand Canyon Road & Placerita Canyon Road	2-way Stop	n/a		56.0%	34 minutes
8	Santa Clara River Bridge	1,800 vph capacity	235.2%	2 hour, 21 minutes	n/a	
<b>Total Evacuation Time - With Roundabout</b>						
Longest Time to Clear (Intersection #4)				3 hour, 4 minutes		2 hour, 25 minutes
Additional Travel Time to Safe Zone [b]				3 minutes		25 minutes
<b>Total Evacuation Time</b>				<b>3 hour, 7 minutes</b>		<b>2 hour, 50 minutes</b>
[c] Increase Compared with Scenario D (2 hour, 39 minutes)				28 minutes		11 minutes
<b>Total Evacuation Time - With Traffic Signal</b>						
Longest Time to Clear (Intersection #4)				2 hour, 56 minutes		2 hour, 21 minutes
Additional Travel Time to Safe Zone [b]				3 minutes		25 minutes
<b>Total Evacuation Time</b>				<b>2 hour, 59 minutes</b>		<b>2 hour, 46 minutes</b>
[c] Increase Compared with Scenario D (2 hour, 26 minutes)				33 minutes		20 minutes

Notes:

vph = vehicles per hour.

[a] The V/C ratio, or volume-to-capacity ratio, was calculated using the intersection capacity utilization (ICU) methodology, which measures the ratio between the amount of traffic at the intersection to the maximum intersection capacity per hour. Here, the V/C ratio was expressed as a percent of hourly intersection capacity.

[b] Estimated based on anticipated travel time to Soledad Canyon Road (for North and West routes) and for Placerita Canyon Road (for South and West Routes) for the final evacuating vehicles.

[c] See Table 8.

***Appendix E***  
***Traffic Counts***

## Turning Movement Count Report AM

Location ID: 1  
 North/South: SR-14 SB On/Off Ramps  
 East/West: Soledad Canyon Rd

Date: 02/13/24  
 City: Santa Clarita, CA

	Southbound			Westbound			Northbound			Eastbound			Totals:
	1	2	3	4	5	6	7	8	9	10	11	12	
Movements:	R	T	L	R	T	L	R	T	L	R	T	L	
6:00	0	0	0	0	311	20	0	0	103	39	71	0	544
6:15	0	0	0	0	304	25	1	0	137	41	96	0	604
6:30	0	0	0	0	350	43	1	0	93	44	92	0	623
6:45	0	0	0	0	301	67	0	0	94	75	103	0	640
7:00	0	0	0	0	195	69	0	0	53	99	81	0	497
7:15	0	0	0	0	138	49	0	0	85	134	134	0	540
7:30	0	0	0	0	161	45	1	0	62	105	130	0	504
7:45	0	0	0	0	167	45	2	0	143	75	144	0	576

Total Volume:	0	0	0	0	1927	363	5	0	770	612	851	0	4528
Approach %	0%	0%	0%	0%	84%	16%	1%	0%	99%	42%	58%	0%	

Peak Hr Begin:	7:00												
PHV	0	0	0	0	1266	155	2	0	427	199	362	0	2411
PHF	0.000			0.904			0.777			0.788			

## Turning Movement Count Report PM

Location ID: 1  
 North/South: SR-14 SB On/Off Ramps  
 East/West: Soledad Canyon Rd

Date: 02/13/24  
 City: Santa Clarita, CA

	Southbound			Westbound			Northbound			Eastbound			Totals:
	1	2	3	4	5	6	7	8	9	10	11	12	
Movements:	R	T	L	R	T	L	R	T	L	R	T	L	
16:00	0	0	0	0	110	41	0	0	56	105	282	0	594
16:15	0	0	0	0	106	30	0	0	63	109	270	0	578
16:30	0	0	0	0	112	38	0	0	80	109	278	1	618
16:45	0	0	0	0	108	34	0	0	70	124	271	0	607
17:00	0	0	0	0	138	35	0	0	74	101	305	0	653
17:15	0	0	0	0	115	38	0	0	89	97	281	0	620
17:30	0	0	0	0	118	25	1	0	71	91	327	0	633
17:45	0	0	0	0	110	42	1	0	57	96	293	0	599

Total Volume:	0	0	0	0	917	283	2	0	560	832	2307	1	4902
Approach %	0%	0%	0%	0%	76%	24%	0%	0%	100%	26%	73%	0%	

Peak Hr Begin:	16:45												
PHV	0	0	0	0	479	132	1	0	304	413	1184	0	2513
PHF	0.000			0.883			0.857			0.955			

# Pedestrian/Bicycle Count Report

Location ID: 1  
 North/South: SR-14 SB On/Off Ramps  
 East/West: Soledad Canyon Rd

Date: 02/13/24  
 City: Santa Clarita, CA

Leg:	North		East		South		West	
Class:	Peds	Bicycle	Peds	Bicycle	Peds	Bicycle	Peds	Bicycle
6:00	0	0	0	0	0	0	0	0
6:15	0	0	0	0	0	0	0	0
6:30	0	0	0	0	0	0	0	0
6:45	0	0	0	0	0	0	0	0
7:00	0	0	0	0	0	0	0	0
7:15	0	0	0	0	0	0	0	0
7:30	0	0	0	0	0	0	0	0
7:45	0	0	0	0	0	0	0	0

Leg:	North		East		South		West	
Class:	Peds	Bicycle	Peds	Bicycle	Peds	Bicycle	Peds	Bicycle
16:00	0	0	0	0	0	0	0	0
16:15	0	0	0	0	0	0	0	0
16:30	0	0	0	0	0	0	0	0
16:45	0	0	0	0	0	0	0	0
17:00	0	0	0	0	0	0	0	0
17:15	0	0	0	0	0	0	0	0
17:30	0	0	0	0	0	0	0	0
17:45	0	0	0	0	0	0	0	0

## Turning Movement Count Report AM

Location ID: 2  
 North/South: Sand Canyon Rd  
 East/West: Soledad Canyon Rd

Date: 02/13/24  
 City: Santa Clarita, CA

	Southbound			Westbound			Northbound			Eastbound			Totals:
	1	2	3	4	5	6	7	8	9	10	11	12	
Movements:	R	T	L	R	T	L	R	T	L	R	T	L	
6:00	31	23	10	14	243	146	43	39	32	52	60	11	704
6:15	33	32	20	20	258	144	58	31	45	73	63	8	785
6:30	30	23	17	31	332	111	34	34	58	61	68	15	814
6:45	39	34	36	31	262	93	59	31	85	71	84	19	844
7:00	17	33	42	13	180	64	47	32	61	102	104	22	717
7:15	16	42	40	10	143	55	68	30	60	101	151	21	737
7:30	17	29	20	11	163	69	91	26	76	82	111	20	715
7:45	22	22	22	17	199	80	73	34	72	59	109	22	731

Total Volume:	205	238	207	147	1780	762	473	257	489	601	750	138	6047
Approach %	32%	37%	32%	5%	66%	28%	39%	21%	40%	40%	50%	9%	

Peak Hr Begin:	7:15												
PHV	119	122	115	95	1032	412	198	128	249	307	319	64	3160
PHF	0.817			0.812			0.821			0.757			

## Turning Movement Count Report PM

Location ID: 2  
 North/South: Sand Canyon Rd  
 East/West: Soledad Canyon Rd

Date: 02/13/24  
 City: Santa Clarita, CA

	Southbound			Westbound			Northbound			Eastbound			Totals:
	1	2	3	4	5	6	7	8	9	10	11	12	
Movements:	R	T	L	R	T	L	R	T	L	R	T	L	
16:00	14	25	44	10	102	56	165	52	73	75	171	42	829
16:15	17	15	37	7	125	35	131	44	55	80	212	32	790
16:30	22	28	36	17	128	40	138	26	46	79	209	35	804
16:45	17	15	42	19	124	40	146	35	50	75	181	37	781
17:00	14	24	41	14	150	53	127	41	59	90	227	32	872
17:15	22	24	45	19	137	44	131	57	99	70	202	30	880
17:30	19	19	49	16	113	61	123	45	75	67	212	23	822
17:45	18	16	30	8	114	34	131	44	72	82	239	30	818

Total Volume:	143	166	324	110	993	363	1092	344	529	618	1653	261	6596
Approach %	23%	26%	51%	8%	68%	25%	56%	18%	27%	24%	65%	10%	

Peak Hr Begin:	17:00												
PHV	73	83	165	57	514	192	512	187	305	309	880	115	3392
PHF	0.882			0.879			0.875			0.929			

## Pedestrian/Bicycle Count Report

Location ID: 2  
 North/South: Sand Canyon Rd  
 East/West: Soledad Canyon Rd

Date: 02/13/24  
 City: Santa Clarita, CA

Leg:	North		East		South		West	
Class:	Peds	Bicycle	Peds	Bicycle	Peds	Bicycle	Peds	Bicycle
6:00	2	0	0	0	0	0	1	0
6:15	0	0	0	0	0	0	0	0
6:30	2	0	0	0	0	0	3	0
6:45	1	0	0	0	0	0	1	0
7:00	1	0	0	0	1	0	2	0
7:15	0	0	0	0	0	0	2	0
7:30	0	0	0	0	0	0	0	0
7:45	1	0	0	0	0	0	0	0

Leg:	North		East		South		West	
Class:	Peds	Bicycle	Peds	Bicycle	Peds	Bicycle	Peds	Bicycle
16:00	0	0	0	0	0	0	1	0
16:15	0	0	0	0	0	0	0	0
16:30	2	0	0	0	1	0	1	0
16:45	0	0	0	0	0	0	2	0
17:00	1	0	0	0	0	0	0	0
17:15	1	0	0	0	1	0	2	0
17:30	0	0	0	0	0	0	0	0
17:45	0	0	0	0	0	0	0	0

## Turning Movement Count Report AM

Location ID: 3  
 North/South: Sand Canyon Rd  
 East/West: SR-14 NB On-Off Ramps

Date: 02/13/24  
 City: Santa Clarita, CA

	Southbound			Westbound			Northbound			Eastbound			Totals:
	1	2	3	4	5	6	7	8	9	10	11	12	
Movements:	R	T	L	R	T	L	R	T	L	R	T	L	
6:00	0	201	44	0	0	0	17	51	0	16	1	56	386
6:15	0	194	56	0	0	0	35	67	0	27	0	74	453
6:30	0	150	37	0	0	0	19	88	0	29	0	62	385
6:45	0	137	47	0	0	0	24	126	0	46	0	76	456
7:00	0	156	63	0	0	0	20	83	0	61	0	63	446
7:15	0	152	50	0	0	0	31	125	0	52	0	71	481
7:30	0	120	50	0	0	0	33	150	0	55	0	69	477
7:45	0	127	34	0	0	0	19	132	0	53	0	78	443

Total Volume:	0	1237	381	0	0	0	198	822	0	339	1	549	3527
Approach %	0%	76%	24%	0%	0%	0%	19%	81%	0%	38%	0%	62%	

Peak Hr Begin:	7:45												
PHV	0	565	210	0	0	0	108	484	0	214	0	279	1860
PHF	0.885			0.000			0.809			0.994			

## Turning Movement Count Report PM

Location ID: 3  
 North/South: Sand Canyon Rd  
 East/West: SR-14 NB On-Off Ramps

Date: 02/13/24  
 City: Santa Clarita, CA

	Southbound			Westbound			Northbound			Eastbound			Totals:
	1	2	3	4	5	6	7	8	9	10	11	12	
Movements:	R	T	L	R	T	L	R	T	L	R	T	L	
16:00	0	106	60	0	0	0	67	149	0	78	1	187	648
16:15	0	95	56	0	0	0	77	137	0	63	2	156	586
16:30	0	103	63	0	0	0	64	161	0	63	5	165	624
16:45	0	106	55	0	0	0	77	136	0	72	4	169	619
17:00	0	120	53	0	0	0	70	161	0	72	2	142	620
17:15	0	99	51	0	0	0	61	172	0	60	2	160	605
17:30	0	130	44	0	0	0	58	132	0	69	0	159	592
17:45	0	94	59	0	0	0	58	124	0	64	1	167	567

Total Volume:	0	853	441	0	0	0	532	1172	0	541	17	1305	4861
Approach %	0%	66%	34%	0%	0%	0%	31%	69%	0%	29%	1%	70%	

Peak Hr Begin:	16:00												
PHV	0	410	234	0	0	0	285	583	0	276	12	677	2477
PHF	0.970			0.000			0.964			0.907			

## Pedestrian/Bicycle Count Report

Location ID: 3  
 North/South: Sand Canyon Rd  
 East/West: SR-14 NB On-Off Ramps

Date: 02/13/24  
 City: Santa Clarita, CA

Leg:	North		East		South		West	
Class:	Peds	Bicycle	Peds	Bicycle	Peds	Bicycle	Peds	Bicycle
6:00	0	0	0	0	0	0	0	0
6:15	0	0	0	0	0	0	2	0
6:30	0	0	0	0	0	0	1	0
6:45	0	0	0	0	0	0	1	0
7:00	0	0	0	0	0	0	1	0
7:15	0	0	0	0	0	0	1	0
7:30	0	0	0	0	1	0	1	0
7:45	0	0	0	0	0	0	1	0

Leg:	North		East		South		West	
Class:	Peds	Bicycle	Peds	Bicycle	Peds	Bicycle	Peds	Bicycle
16:00	0	0	0	0	1	0	1	0
16:15	0	0	0	0	0	0	0	0
16:30	0	0	2	0	1	0	3	2
16:45	0	0	0	0	1	0	3	0
17:00	0	0	1	0	0	0	2	0
17:15	0	0	0	0	2	0	4	0
17:30	0	0	0	0	0	0	1	0
17:45	0	0	0	0	0	0	1	0

## Turning Movement Count Report AM

Location ID: 4  
 North/South: Sand Canyon Rd  
 East/West: Lost Canyon Rd

Date: 02/13/24  
 City: Santa Clarita, CA

	Southbound			Westbound			Northbound			Eastbound			Totals:
	1	2	3	4	5	6	7	8	9	10	11	12	
Movements:	R	T	L	R	T	L	R	T	L	R	T	L	
6:00	26	184	0	3	1	3	0	34	2	22	0	21	296
6:15	38	160	3	5	1	1	0	45	4	27	0	34	318
6:30	48	145	7	5	1	1	0	53	7	11	0	25	303
6:45	59	86	10	7	2	3	2	60	8	9	0	45	291
7:00	119	77	5	5	1	0	2	40	18	7	0	41	315
7:15	114	62	3	4	0	3	2	50	23	8	0	77	346
7:30	92	66	4	2	0	1	0	47	22	22	0	110	366
7:45	32	111	8	7	1	3	2	43	5	12	1	84	309

Total Volume:	528	891	40	38	7	15	8	372	89	118	1	437	2544
Approach %	36%	61%	3%	63%	12%	25%	2%	79%	19%	21%	0%	79%	

Peak Hr Begin:	8:00												
PHV	357	316	20	18	2	7	6	180	68	49	1	312	1336
PHF	0.862			0.614			0.847			0.686			

## Turning Movement Count Report PM

Location ID: 4  
 North/South: Sand Canyon Rd  
 East/West: Lost Canyon Rd

Date: 02/13/24  
 City: Santa Clarita, CA

	Southbound			Westbound			Northbound			Eastbound			Totals:
	1	2	3	4	5	6	7	8	9	10	11	12	
Movements:	R	T	L	R	T	L	R	T	L	R	T	L	
16:00	35	73	8	7	1	1	1	93	6	9	1	50	285
16:15	19	61	10	9	1	1	0	98	6	9	2	38	254
16:30	32	47	8	6	2	2	0	106	1	4	2	53	263
16:45	30	61	9	11	0	1	3	108	5	2	2	23	255
17:00	36	67	9	7	1	1	3	95	5	11	2	42	279
17:15	30	53	6	9	0	2	2	110	5	4	1	47	269
17:30	48	54	7	8	0	1	0	87	4	7	1	33	250
17:45	33	66	17	10	1	0	7	85	4	6	0	29	258

Total Volume:	263	482	74	67	6	9	16	782	36	52	11	315	2113
Approach %	32%	59%	9%	82%	7%	11%	2%	94%	4%	14%	3%	83%	

Peak Hr Begin:	16:30												
PHV	128	228	32	33	3	6	8	419	16	21	7	165	1066
PHF	0.866			0.875			0.947			0.818			

## Pedestrian/Bicycle Count Report

Location ID: 4  
 North/South: Sand Canyon Rd  
 East/West: Lost Canyon Rd

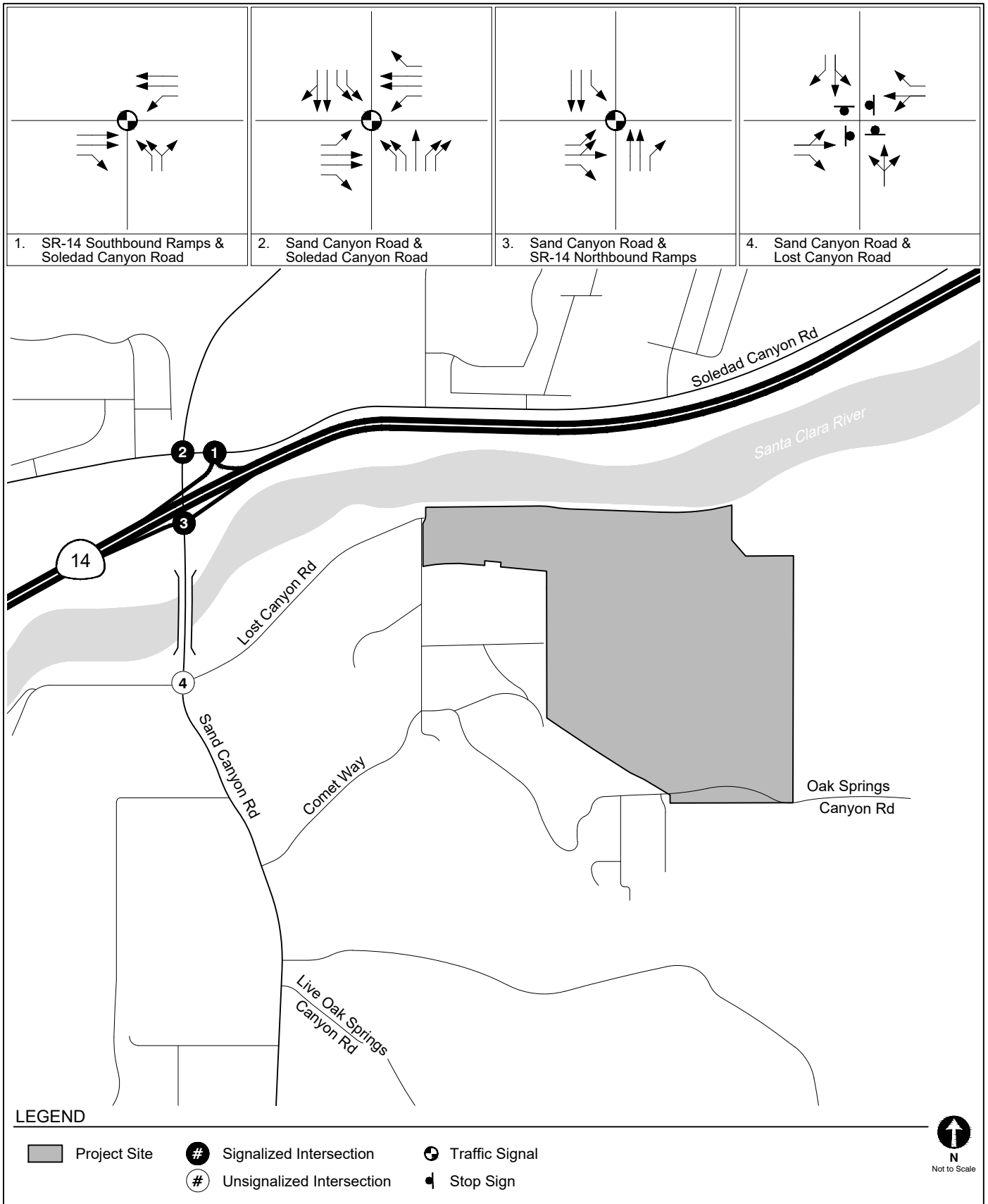
Date: 02/13/24  
 City: Santa Clarita, CA

Leg:	North		East		South		West	
Class:	Peds	Bicycle	Peds	Bicycle	Peds	Bicycle	Peds	Bicycle
6:00	0	0	0	0	0	0	0	0
6:15	0	0	0	0	0	0	0	0
6:30	0	0	0	0	0	0	0	0
6:45	0	0	0	0	0	0	0	0
7:00	0	0	0	0	0	0	0	0
7:15	0	0	0	0	2	0	3	0
7:30	0	0	2	0	1	0	4	0
7:45	0	0	0	0	0	0	0	0

Leg:	North		East		South		West	
Class:	Peds	Bicycle	Peds	Bicycle	Peds	Bicycle	Peds	Bicycle
16:00	0	0	2	0	0	0	0	0
16:15	0	0	2	0	0	0	0	2
16:30	0	0	0	0	0	0	0	0
16:45	0	0	1	0	0	0	0	0
17:00	0	0	0	0	6	0	1	0
17:15	0	0	1	0	3	0	2	0
17:30	0	0	0	0	2	0	0	0
17:45	0	0	2	0	3	0	0	0

***Appendix F***

***Intersection Lane Configurations***



INTERSECTION LANE CONFIGURATIONS

APPENDIX  
E

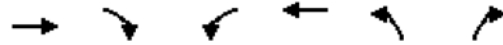
***Appendix G***

***HCM Analysis Worksheets***

***Existing Conditions (Year 2025)***

HCM 7th Signalized Intersection Summary  
 1: SR 14 SB Ramp & Soledad Canyon Road

04/20/2026



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↑	↑↑	↑↑↑	
Traffic Volume (veh/h)	379	264	208	1173	385	2
Future Volume (veh/h)	379	264	208	1173	385	2
Initial Q (Qb), veh	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00
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	412	287	226	1275	420	0
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	838	614	954	2832	510	227
Arrive On Green	0.47	0.47	0.54	0.80	0.14	0.00
Sat Flow, veh/h	3647	1585	1781	3647	3563	1585
Grp Volume(v), veh/h	412	287	226	1275	420	0
Grp Sat Flow(s),veh/h/ln	1777	1585	1781	1777	1781	1585
Q Serve(g_s), s	14.0	21.2	11.9	20.0	20.2	0.0
Cycle Q Clear(g_c), s	14.0	21.2	11.9	20.0	20.2	0.0
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	838	614	954	2832	510	227
V/C Ratio(X)	0.49	0.47	0.24	0.45	0.82	0.00
Avail Cap(c_a), veh/h	838	614	954	2832	992	441
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.93	0.93	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	39.2	27.3	21.7	5.7	73.2	0.0
Incr Delay (d2), s/veh	1.9	2.4	0.0	0.5	4.8	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	9.1	13.3	8.6	10.4	14.7	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	41.2	29.7	21.8	6.2	78.0	0.0
LnGrp LOS	D	C	C	A	E	
Approach Vol, veh/h				1501	420	
Approach Delay, s/veh				8.5	78.0	
Approach LOS				A	E	
Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		144.8		31.2	98.8	46.0
Change Period (Y+Rc), s		6.0		6.0	6.0	* 6
Max Green Setting (Gmax), s		115.0		49.0	70.0	* 40
Max Q Clear Time (g_c+I1), s		22.0		22.2	13.9	23.2
Green Ext Time (p_c), s		21.4		3.1	0.3	5.5

Intersection Summary

HCM 7th Control Delay, s/veh	27.1
HCM 7th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.  
 \* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 7th Signalized Intersection Summary  
 2: Sand Canyon Road & Soledad Canyon Road

04/20/2026



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	65	325	313	420	1053	97	254	131	202	117	124	121
Future Volume (veh/h)	65	325	313	420	1053	97	254	131	202	117	124	121
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width 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
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		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	71	353	340	457	1145	105	276	142	220	127	135	132
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	133	687	306	884	2206	984	360	246	367	265	190	170
Arrive On Green	0.12	0.32	0.32	0.99	1.00	1.00	0.10	0.13	0.13	0.08	0.11	0.10
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	3456	1870	2790	3456	1777	1585
Grp Volume(v), veh/h	71	353	340	457	1145	105	276	142	220	127	135	132
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	1728	1870	1395	1728	1777	1585
Q Serve(g_s), s	6.6	14.2	34.0	0.7	0.0	0.0	13.7	12.6	4.5	6.2	12.9	14.3
Cycle Q Clear(g_c), s	6.6	14.2	34.0	0.7	0.0	0.0	13.7	12.6	4.5	6.2	12.9	14.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	133	687	306	884	2206	984	360	246	367	265	190	170
V/C Ratio(X)	0.54	0.51	1.11	0.52	0.52	0.11	0.77	0.58	0.60	0.48	0.71	0.78
Avail Cap(c_a), veh/h	157	687	306	884	2206	984	648	340	507	422	222	198
HCM Platoon Ratio	1.67	1.67	1.67	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.83	0.83	0.83	0.90	0.90	0.90	1.00	1.00	1.00
Uniform Delay (d), s/veh	74.2	52.9	59.6	0.3	0.0	0.0	76.7	71.8	8.3	77.9	76.0	77.5
Incr Delay (d2), s/veh	1.2	2.7	84.4	0.2	0.7	0.2	1.2	0.7	0.5	1.9	9.9	17.1
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(95%),veh/ln	5.3	10.0	28.8	0.3	0.4	0.1	10.1	10.0	7.8	5.1	10.6	11.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	75.5	55.6	144.1	0.5	0.7	0.2	77.9	72.5	8.9	79.8	85.8	94.7
LnGrp LOS	E	E	F	A	A	A	E	E	A	E	F	F
Approach Vol, veh/h		764			1707			638			394	
Approach Delay, s/veh		96.8			0.6			52.9			86.8	
Approach LOS		F			A			D			F	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	32.8	38.0	22.3	22.8	17.6	113.2	18.0	27.2				
Change Period (Y+Rc), s	6.0	* 6	6.0	* 6	5.0	6.0	5.0	6.0				
Max Green Setting (Gmax), s	31.0	* 32	31.0	* 20	15.0	88.0	21.0	30.0				
Max Q Clear Time (g_c+1), s	12.5	36.0	15.7	16.3	8.6	2.0	8.2	14.6				
Green Ext Time (p_c), s	0.6	0.0	0.7	0.5	0.0	19.6	0.5	0.9				

Intersection Summary												
HCM 7th Control Delay, s/veh											40.8	
HCM 7th LOS											D	

Notes  
 User approved pedestrian interval to be less than phase max green.  
 \* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 7th Signalized Intersection Summary  
 3: Sand Canyon Road & SR14 NB Ramp

04/20/2026



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	281	0	166	0	0	0	0	371	100	207	650	0
Future Volume (veh/h)	281	0	166	0	0	0	0	371	100	207	650	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	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
Work Zone On Approach	No						No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870				0	1870	1870	1870	1870	0
Adj Flow Rate, veh/h	305	0	180				0	403	109	225	707	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2				0	2	2	2	2	0
Cap, veh/h	803	0	357				0	803	358	597	1822	0
Arrive On Green	0.23	0.00	0.23				0.00	0.23	0.23	0.18	0.51	0.00
Sat Flow, veh/h	3563	0	1585				0	3647	1585	1781	3647	0
Grp Volume(v), veh/h	305	0	180				0	403	109	225	707	0
Grp Sat Flow(s),veh/h/ln	1781	0	1585				0	1777	1585	1781	1777	0
Q Serve(g_s), s	3.2	0.0	4.4				0.0	4.4	2.5	3.5	5.4	0.0
Cycle Q Clear(g_c), s	3.2	0.0	4.4				0.0	4.4	2.5	3.5	5.4	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	803	0	357				0	803	358	597	1822	0
V/C Ratio(X)	0.38	0.00	0.50				0.00	0.50	0.30	0.38	0.39	0.00
Avail Cap(c_a), veh/h	2704	0	1203				0	3516	1568	609	4559	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	14.5	0.0	15.0				0.0	15.0	14.2	8.2	6.6	0.0
Incr Delay (d2), s/veh	0.3	0.0	1.1				0.0	0.5	0.5	0.4	0.1	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	2.0	0.0	7.3				0.0	2.8	1.5	1.9	2.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	14.8	0.0	16.1				0.0	15.5	14.7	8.6	6.7	0.0
LnGrp LOS	B		B					B	B	A	A	
Approach Vol, veh/h	485						512			932		
Approach Delay, s/veh	15.3						15.3			7.2		
Approach LOS	B						B			A		
Timer - Assigned Phs	2		4		5		6					
Phs Duration (G+Y+Rc), s	28.9		15.4		12.7		16.2					
Change Period (Y+Rc), s	6.2		5.4		4.7		6.2					
Max Green Setting (Gmax), s	56.8		33.6		8.3		43.8					
Max Q Clear Time (g_c+l1), s	7.4		6.4		5.5		6.4					
Green Ext Time (p_c), s	5.8		1.7		0.2		3.3					
Intersection Summary												
HCM 7th Control Delay, s/veh			11.4									
HCM 7th LOS			B									
Notes												
User approved volume balancing among the lanes for turning movement.												

**Intersection**

Intersection Delay, s/veh 23.6

Intersection LOS C

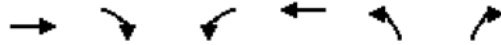
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↔		↔	↔		↔			↔	↔
Traffic Vol, veh/h	148	0	55	5	5	22	38	202	4	26	477	269
Future Vol, veh/h	148	0	55	5	5	22	38	202	4	26	477	269
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	161	0	60	5	5	24	41	220	4	28	518	292
Number of Lanes	0	1	1	0	1	1	0	1	0	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	2	2
HCM Control Delay, s/veh	3.4	10.4	15.2	29.5
HCM LOS	B	B	C	D

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	16%	100%	0%	50%	0%	5%	0%
Vol Thru, %	83%	0%	0%	50%	0%	95%	0%
Vol Right, %	2%	0%	100%	0%	100%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	244	148	55	10	22	503	269
LT Vol	38	148	0	5	0	26	0
Through Vol	202	0	0	5	0	477	0
RT Vol	4	0	55	0	22	0	269
Lane Flow Rate	265	161	60	11	24	547	292
Geometry Grp	4b	5	5	5	5	5	5
Degree of Util (X)	0.475	0.347	0.108	0.024	0.047	0.894	0.419
Departure Headway (Hd)	6.442	7.76	6.53	8.032	7.052	5.887	5.153
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	560	463	548	444	505	618	696
Service Time	4.492	5.519	4.288	5.81	4.829	3.631	2.897
HCM Lane V/C Ratio	0.473	0.348	0.109	0.025	0.048	0.885	0.42
HCM Control Delay, s/veh	15.2	14.6	10.1	11	10.2	39.1	11.6
HCM Lane LOS	C	B	B	B	B	E	B
HCM 95th-tile Q	2.5	1.5	0.4	0.1	0.1	10.8	2.1

HCM 7th Signalized Intersection Summary  
 1: SR 14 SB Ramp & Soledad Canyon Road

04/20/2026



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↑	↑↑	↑↑	↑
Traffic Volume (veh/h)	1158	440	148	482	319	1
Future Volume (veh/h)	1158	440	148	482	319	1
Initial Q (Qb), veh	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00
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	1259	478	161	524	348	0
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	2455	1300	194	2912	431	192
Arrive On Green	1.00	1.00	0.11	0.82	0.12	0.00
Sat Flow, veh/h	3647	1585	1781	3647	3563	1585
Grp Volume(v), veh/h	1259	478	161	524	348	0
Grp Sat Flow(s),veh/h/ln	1777	1585	1781	1777	1781	1585
Q Serve(g_s), s	0.0	0.0	15.6	5.5	16.7	0.0
Cycle Q Clear(g_c), s	0.0	0.0	15.6	5.5	16.7	0.0
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	2455	1300	194	2912	431	192
V/C Ratio(X)	0.51	0.37	0.83	0.18	0.81	0.00
Avail Cap(c_a), veh/h	2455	1300	218	2912	992	441
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.76	0.76	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	76.9	3.4	75.4	0.0
Incr Delay (d2), s/veh	0.6	0.6	19.1	0.1	5.1	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.4	0.4	12.7	2.9	12.7	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	0.6	0.6	96.0	3.5	80.5	0.0
LnGrp LOS	A	A	F	A	F	
Approach Vol, veh/h	1737			685	348	
Approach Delay, s/veh	0.6			25.2	80.5	
Approach LOS	A			C	F	
Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		148.7		27.3	22.6	126.1
Change Period (Y+Rc), s		6.0		6.0	5.0	6.0
Max Green Setting (Gmax), s		115.0		49.0	20.0	90.0
Max Q Clear Time (g_c+I1), s		7.5		18.7	17.6	2.0
Green Ext Time (p_c), s		5.6		2.5	0.0	35.4

Intersection Summary

HCM 7th Control Delay, s/veh	16.7
HCM 7th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

HCM 7th Signalized Intersection Summary  
 2: Sand Canyon Road & Soledad Canyon Road

04/20/2026



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	137	835	320	181	550	70	259	162	553	167	93	77
Future Volume (veh/h)	137	835	320	181	550	70	259	162	553	167	93	77
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width 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
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		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	149	908	348	197	598	76	282	176	601	182	101	84
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	171	1312	585	581	2151	959	424	234	350	265	158	120
Arrive On Green	0.19	0.74	0.74	0.11	0.20	0.20	0.12	0.13	0.13	0.08	0.08	0.07
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	3456	1870	2790	3456	1922	1462
Grp Volume(v), veh/h	149	908	348	197	598	76	282	176	601	182	93	92
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	1728	1870	1395	1728	1777	1607
Q Serve(g_s), s	14.3	24.0	18.0	18.0	25.1	6.9	13.7	16.0	11.9	9.0	8.9	9.9
Cycle Q Clear(g_c), s	14.3	24.0	18.0	18.0	25.1	6.9	13.7	16.0	11.9	9.0	8.9	9.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.91
Lane Grp Cap(c), veh/h	171	1312	585	581	2151	959	424	234	350	265	146	132
V/C Ratio(X)	0.87	0.69	0.59	0.34	0.28	0.08	0.66	0.75	1.72	0.69	0.63	0.70
Avail Cap(c_a), veh/h	410	1312	585	581	2151	959	648	340	507	422	222	201
HCM Platoon Ratio	2.00	2.00	2.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	0.93	0.93	0.93	0.74	0.74	0.74	1.00	1.00	1.00
Uniform Delay (d), s/veh	70.0	17.6	16.9	60.9	37.8	30.6	73.7	74.3	22.4	79.2	78.2	79.6
Incr Delay (d2), s/veh	5.2	3.0	4.4	0.1	0.3	0.2	0.5	1.9	332.2	4.4	6.4	9.1
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(95%),veh/ln	10.1	10.3	8.9	13.3	17.6	5.1	9.7	11.8	31.7	7.6	7.8	8.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	75.2	20.7	21.3	61.1	38.1	30.7	74.2	76.2	354.6	83.6	84.6	88.7
LnGrp LOS	E	C	C	E	D	C	E	E	F	F	F	F
Approach Vol, veh/h		1405			871			1059			367	
Approach Delay, s/veh		26.6			42.7			233.7			85.1	
Approach LOS		C			D			F			F	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	62.9	69.0	25.6	18.5	21.4	110.5	18.0	26.1				
Change Period (Y+Rc), s	6.0	* 6	6.0	* 6	5.0	6.0	5.0	6.0				
Max Green Setting (Gmax), s	40.0	* 63	31.0	* 20	40.0	63.0	21.0	30.0				
Max Q Clear Time (g_c+20), s	20.0	26.0	15.7	11.9	16.3	27.1	11.0	18.0				
Green Ext Time (p_c), s	0.2	15.4	0.7	0.6	0.2	7.0	0.7	2.1				

Intersection Summary

HCM 7th Control Delay, s/veh	95.4
HCM 7th LOS	F

Notes

User approved pedestrian interval to be less than phase max green.  
 \* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 7th Signalized Intersection Summary  
 3: Sand Canyon Road & SR14 NB Ramp

04/20/2026



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	649	13	272	0	0	0	0	643	277	226	437	0
Future Volume (veh/h)	649	13	272	0	0	0	0	643	277	226	437	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	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
Work Zone On Approach	No						No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870				0	1870	1870	1870	1870	0
Adj Flow Rate, veh/h	715	0	296				0	699	301	246	475	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2				0	2	2	2	2	0
Cap, veh/h	995	0	443				0	1118	499	441	1872	0
Arrive On Green	0.28	0.00	0.28				0.00	0.31	0.31	0.13	0.53	0.00
Sat Flow, veh/h	3563	0	1585				0	3647	1585	1781	3647	0
Grp Volume(v), veh/h	715	0	296				0	699	301	246	475	0
Grp Sat Flow(s),veh/h/ln	1781	0	1585				0	1777	1585	1781	1777	0
Q Serve(g_s), s	10.8	0.0	9.9				0.0	10.0	9.6	5.0	4.4	0.0
Cycle Q Clear(g_c), s	10.8	0.0	9.9				0.0	10.0	9.6	5.0	4.4	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	995	0	443				0	1118	499	441	1872	0
V/C Ratio(X)	0.72	0.00	0.67				0.00	0.63	0.60	0.56	0.25	0.00
Avail Cap(c_a), veh/h	2000	0	890				0	2601	1160	450	3373	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	19.4	0.0	19.1				0.0	17.5	17.3	11.5	7.7	0.0
Incr Delay (d2), s/veh	1.0	0.0	1.8				0.0	0.6	1.2	1.5	0.1	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	7.6	0.0	0.4				0.0	6.8	6.0	3.2	2.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	20.4	0.0	20.9				0.0	18.1	18.5	12.9	7.8	0.0
LnGrp LOS	C		C					B	B	B	A	
Approach Vol, veh/h	1011						1000			721		
Approach Delay, s/veh	20.6						18.2			9.6		
Approach LOS	C						B			A		
Timer - Assigned Phs	2		4		5		6					
Phs Duration (G+Y+Rc), s	37.7		22.1		12.7		25.0					
Change Period (Y+Rc), s	6.2		5.4		4.7		6.2					
Max Green Setting (Gmax), s	56.8		33.6		8.3		43.8					
Max Q Clear Time (g_c+l1), s	6.4		12.8		7.0		12.0					
Green Ext Time (p_c), s	3.6		3.9		0.1		6.8					
Intersection Summary												
HCM 7th Control Delay, s/veh	16.8											
HCM 7th LOS	B											
Notes												
User approved volume balancing among the lanes for turning movement.												

**Intersection**

Intersection Delay, s/veh 21.7

Intersection LOS C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↗		↔	↗		↔			↔	↗
Traffic Vol, veh/h	168	7	21	6	3	34	16	427	8	33	233	131
Future Vol, veh/h	168	7	21	6	3	34	16	427	8	33	233	131
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
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	183	8	23	7	3	37	17	464	9	36	253	142
Number of Lanes	0	1	1	0	1	1	0	1	0	0	1	1

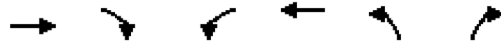
Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	1
Conflicting Approach Left SB		NB	EB	WB
Conflicting Lanes Left	2	1	2	2
Conflicting Approach Right NB		SB	WB	EB
Conflicting Lanes Right	1	2	2	2
HCM Control Delay, s/veh 4.9		10.4	32.8	13.6
HCM LOS	B	B	D	B

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	4%	96%	0%	67%	0%	12%	0%
Vol Thru, %	95%	4%	0%	33%	0%	88%	0%
Vol Right, %	2%	0%	100%	0%	100%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	451	175	21	9	34	266	131
LT Vol	16	168	0	6	0	33	0
Through Vol	427	7	0	3	0	233	0
RT Vol	8	0	21	0	34	0	131
Lane Flow Rate	490	190	23	10	37	289	142
Geometry Grp	4b	5	5	5	5	5	5
Degree of Util (X)	0.834	0.403	0.041	0.022	0.073	0.505	0.218
Departure Headway (Hd)	6.123	7.629	6.419	8.131	7.063	6.29	5.515
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	588	470	554	443	510	570	646
Service Time	4.189	5.412	4.201	5.831	4.763	4.066	3.291
HCM Lane V/C Ratio	0.833	0.404	0.042	0.023	0.073	0.507	0.22
HCM Control Delay, s/veh	32.8	15.5	9.5	11	10.3	15.4	9.8
HCM Lane LOS	D	C	A	B	B	C	A
HCM 95th-tile Q	8.7	1.9	0.1	0.1	0.2	2.8	0.8

***Existing with Project Conditions (Year 2025)***

HCM 7th Signalized Intersection Summary  
 1: SR 14 SB Ramp & Soledad Canyon Road

04/21/2026



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↓	↑↑	↓	↓
Traffic Volume (veh/h)	382	289	208	1175	390	2
Future Volume (veh/h)	382	289	208	1175	390	2
Initial Q (Qb), veh	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00
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	415	314	226	1277	426	0
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	838	617	951	2826	517	230
Arrive On Green	0.47	0.47	0.53	0.80	0.15	0.00
Sat Flow, veh/h	3647	1585	1781	3647	3563	1585
Grp Volume(v), veh/h	415	314	226	1277	426	0
Grp Sat Flow(s),veh/h/ln	1777	1585	1781	1777	1781	1585
Q Serve(g_s), s	14.2	24.4	11.9	20.2	20.4	0.0
Cycle Q Clear(g_c), s	14.2	24.4	11.9	20.2	20.4	0.0
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	838	617	951	2826	517	230
V/C Ratio(X)	0.50	0.51	0.24	0.45	0.82	0.00
Avail Cap(c_a), veh/h	838	617	951	2826	992	441
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.92	0.92	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	39.3	27.8	21.9	5.8	73.0	0.0
Incr Delay (d2), s/veh	1.9	2.7	0.0	0.5	4.7	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	9.1	14.9	8.6	10.6	14.9	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	41.2	30.6	21.9	6.3	77.8	0.0
LnGrp LOS	D	C	C	A	E	
Approach Vol, veh/h				1503	426	
Approach Delay, s/veh				8.6	77.8	
Approach LOS				A	E	
Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		144.5		31.5	98.5	46.0
Change Period (Y+Rc), s		6.0		6.0	6.0	* 6
Max Green Setting (Gmax), s		115.0		49.0	70.0	* 40
Max Q Clear Time (g_c+I1), s		22.2		22.4	13.9	26.4
Green Ext Time (p_c), s		21.4		3.1	0.3	5.1

Intersection Summary

HCM 7th Control Delay, s/veh	27.4
HCM 7th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.  
 \* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 7th Signalized Intersection Summary  
 2: Sand Canyon Road & Soledad Canyon Road

04/21/2026



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑	↗	↘	↑↑	↗	↘↗	↑	↗↘	↘↗	↑↗	
Traffic Volume (veh/h)	65	325	316	427	1053	97	260	137	230	117	127	121
Future Volume (veh/h)	65	325	316	427	1053	97	260	137	230	117	127	121
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width 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
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	71	353	343	464	1145	105	283	149	250	127	138	132
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	133	687	306	879	2197	980	367	251	374	265	192	169
Arrive On Green	0.12	0.32	0.32	0.99	1.00	1.00	0.11	0.13	0.13	0.08	0.11	0.10
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	3456	1870	2790	3456	1788	1576
Grp Volume(v), veh/h	71	353	343	464	1145	105	283	149	250	127	137	133
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	1728	1870	1395	1728	1777	1587
Q Serve(g_s), s	6.6	14.2	34.0	1.2	0.0	0.0	14.0	13.2	5.1	6.2	13.1	14.4
Cycle Q Clear(g_c), s	6.6	14.2	34.0	1.2	0.0	0.0	14.0	13.2	5.1	6.2	13.1	14.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Lane Grp Cap(c), veh/h	133	687	306	879	2197	980	367	251	374	265	191	170
V/C Ratio(X)	0.54	0.51	1.12	0.53	0.52	0.11	0.77	0.59	0.67	0.48	0.72	0.78
Avail Cap(c_a), veh/h	157	687	306	879	2197	980	648	340	507	422	222	198
HCM Platoon Ratio	1.67	1.67	1.67	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.83	0.83	0.83	0.89	0.89	0.89	1.00	1.00	1.00
Uniform Delay (d), s/veh	74.2	52.9	59.6	0.6	0.0	0.0	76.6	71.7	8.4	77.9	76.0	77.5
Incr Delay (d2), s/veh	1.2	2.7	87.8	0.2	0.7	0.2	1.2	0.7	0.7	1.9	10.4	17.3
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(95%),veh/ln	5.3	10.0	29.3	0.5	0.4	0.1	10.3	10.4	8.6	5.1	10.8	11.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	75.5	55.6	147.4	0.8	0.7	0.2	77.7	72.4	9.1	79.8	86.4	94.8
LnGrp LOS	E	E	F	A	A	A	E	E	A	E	F	F
Approach Vol, veh/h		767			1714			682			397	
Approach Delay, s/veh		98.5			0.7			51.4			87.1	
Approach LOS		F			A			D			F	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	92.4	38.0	22.7	22.9	17.6	112.8	18.0	27.6				
Change Period (Y+Rc), s	6.0	* 6	6.0	* 6	5.0	6.0	5.0	6.0				
Max Green Setting (Gmax), s	71.0	* 32	31.0	* 20	15.0	88.0	21.0	30.0				
Max Q Clear Time (g_c+I1), s	3.2	36.0	16.0	16.4	8.6	2.0	8.2	15.2				
Green Ext Time (p_c), s	0.6	0.0	0.7	0.5	0.0	19.6	0.5	1.0				

Intersection Summary												
HCM 7th Control Delay, s/veh			41.1									
HCM 7th LOS			D									

Notes  
 User approved pedestrian interval to be less than phase max green.  
 \* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 7th Signalized Intersection Summary  
 3: Sand Canyon Road & SR14 NB Ramp

04/21/2026



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖	↖					↑↑	↖	↖	↑↑	
Traffic Volume (veh/h)	281	0	179	0	0	0	0	411	110	207	663	0
Future Volume (veh/h)	281	0	179	0	0	0	0	411	110	207	663	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	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
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870				0	1870	1870	1870	1870	0
Adj Flow Rate, veh/h	305	0	195				0	447	120	225	721	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2				0	2	2	2	2	0
Cap, veh/h	791	0	352				0	842	376	585	1847	0
Arrive On Green	0.22	0.00	0.22				0.00	0.24	0.24	0.18	0.52	0.00
Sat Flow, veh/h	3563	0	1585				0	3647	1585	1781	3647	0
Grp Volume(v), veh/h	305	0	195				0	447	120	225	721	0
Grp Sat Flow(s),veh/h/ln	1781	0	1585				0	1777	1585	1781	1777	0
Q Serve(g_s), s	3.3	0.0	4.9				0.0	4.9	2.8	3.5	5.5	0.0
Cycle Q Clear(g_c), s	3.3	0.0	4.9				0.0	4.9	2.8	3.5	5.5	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	791	0	352				0	842	376	585	1847	0
V/C Ratio(X)	0.39	0.00	0.55				0.00	0.53	0.32	0.38	0.39	0.00
Avail Cap(c_a), veh/h	2664	0	1185				0	3465	1545	597	4493	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	14.9	0.0	15.5				0.0	15.0	14.2	8.2	6.5	0.0
Incr Delay (d2), s/veh	0.3	0.0	1.4				0.0	0.5	0.5	0.4	0.1	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	2.1	0.0	0.2				0.0	3.2	1.6	1.9	2.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	15.2	0.0	16.9				0.0	15.5	14.6	8.7	6.6	0.0
LnGrp LOS	B		B					B	B	A	A	
Approach Vol, veh/h		500						567			946	
Approach Delay, s/veh		15.8						15.3			7.1	
Approach LOS		B						B			A	
Timer - Assigned Phs		2		4	5	6						
Phs Duration (G+Y+Rc), s		29.5		15.4	12.7	16.8						
Change Period (Y+Rc), s		6.2		5.4	4.7	6.2						
Max Green Setting (Gmax), s		56.8		33.6	8.3	43.8						
Max Q Clear Time (g_c+I1), s		7.5		6.9	5.5	6.9						
Green Ext Time (p_c), s		6.0		1.8	0.2	3.7						

Intersection Summary		
HCM 7th Control Delay, s/veh		11.6
HCM 7th LOS		B

Notes  
 User approved volume balancing among the lanes for turning movement.

HCM 7th Signalized Intersection Summary  
 4: Lost Canyon Road & Sand Canyon Road

04/21/2026



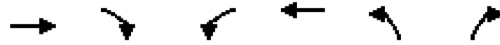
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↕	↗		↕↗			↕	↗
Traffic Volume (veh/h)	148	5	55	5	14	72	38	202	4	52	477	269
Future Volume (veh/h)	148	5	55	5	14	72	38	202	4	52	477	269
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
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	161	5	60	5	15	0	41	220	4	57	518	292
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	575	16	528	177	481		143	708	12	125	904	845
Arrive On Green	0.33	0.33	0.33	0.33	0.33	0.00	0.53	0.53	0.53	0.53	0.53	0.53
Sat Flow, veh/h	1369	48	1585	305	1444	1585	138	1328	22	111	1694	1585
Grp Volume(v), veh/h	166	0	60	20	0	0	265	0	0	575	0	292
Grp Sat Flow(s),veh/h/ln	1418	0	1585	1749	0	1585	1489	0	0	1806	0	1585
Q Serve(g_s), s	4.8	0.0	1.6	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	6.3
Cycle Q Clear(g_c), s	5.2	0.0	1.6	0.4	0.0	0.0	12.9	0.0	0.0	12.4	0.0	6.3
Prop In Lane	0.97		1.00	0.25		1.00	0.15		0.02	0.10		1.00
Lane Grp Cap(c), veh/h	591	0	528	658	0		863	0	0	1029	0	845
V/C Ratio(X)	0.28	0.00	0.11	0.03	0.00		0.31	0.00	0.00	0.56	0.00	0.35
Avail Cap(c_a), veh/h	591	0	528	658	0		863	0	0	1029	0	845
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	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	15.0	0.0	13.9	13.5	0.0	0.0	7.7	0.0	0.0	9.4	0.0	8.0
Incr Delay (d2), s/veh	1.2	0.0	0.4	0.1	0.0	0.0	0.9	0.0	0.0	2.2	0.0	1.1
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(95%),veh/ln	3.1	0.0	1.0	0.3	0.0	0.0	3.1	0.0	0.0	8.2	0.0	3.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	16.2	0.0	14.3	13.6	0.0	0.0	8.6	0.0	0.0	11.6	0.0	9.1
LnGrp LOS	B		B	B			A			B		A
Approach Vol, veh/h		226			20			265				867
Approach Delay, s/veh		15.7			13.6			8.6				10.8
Approach LOS		B			B			A				B
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		36.0		24.0		36.0		24.0				
Change Period (Y+Rc), s		4.0		4.0		4.0		4.0				
Max Green Setting (Gmax), s		32.0		20.0		32.0		20.0				
Max Q Clear Time (g_c+I1), s		14.9		7.2		14.4		2.4				
Green Ext Time (p_c), s		1.6		0.8		4.7		0.0				

Intersection Summary		
HCM 7th Control Delay, s/veh		11.2
HCM 7th LOS		B

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

HCM 7th Signalized Intersection Summary  
 1: SR 14 SB Ramp & Soledad Canyon Road

04/21/2026



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↓	↑↑	↓	↓
Traffic Volume (veh/h)	1160	458	148	486	330	1
Future Volume (veh/h)	1160	458	148	486	330	1
Initial Q (Qb), veh	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00
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	1261	498	161	528	360	0
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	2442	1300	194	2898	444	198
Arrive On Green	1.00	1.00	0.11	0.82	0.12	0.00
Sat Flow, veh/h	3647	1585	1781	3647	3563	1585
Grp Volume(v), veh/h	1261	498	161	528	360	0
Grp Sat Flow(s),veh/h/ln	1777	1585	1781	1777	1781	1585
Q Serve(g_s), s	0.0	0.0	15.6	5.7	17.3	0.0
Cycle Q Clear(g_c), s	0.0	0.0	15.6	5.7	17.3	0.0
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	2442	1300	194	2898	444	198
V/C Ratio(X)	0.52	0.38	0.83	0.18	0.81	0.00
Avail Cap(c_a), veh/h	2442	1300	218	2898	992	441
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.75	0.75	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	76.9	3.5	75.0	0.0
Incr Delay (d2), s/veh	0.6	0.6	19.1	0.1	5.0	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.4	0.4	12.7	3.0	13.0	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	0.6	0.6	96.0	3.7	80.0	0.0
LnGrp LOS	A	A	F	A	F	
Approach Vol, veh/h	1759			689	360	
Approach Delay, s/veh	0.6			25.2	80.0	
Approach LOS	A			C	F	
Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		148.1		27.9	22.6	125.4
Change Period (Y+Rc), s		6.0		6.0	5.0	6.0
Max Green Setting (Gmax), s		115.0		49.0	20.0	90.0
Max Q Clear Time (g_c+I1), s		7.7		19.3	17.6	2.0
Green Ext Time (p_c), s		5.7		2.6	0.0	36.3
<b>Intersection Summary</b>						
HCM 7th Control Delay, s/veh			16.8			
HCM 7th LOS			B			

Notes

User approved volume balancing among the lanes for turning movement.

HCM 7th Signalized Intersection Summary  
 2: Sand Canyon Road & Soledad Canyon Road

04/21/2026



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑	↗	↘	↑↑	↗	↘↗	↑	↗↘	↘↗	↑↗	
Traffic Volume (veh/h)	137	835	327	196	550	70	263	167	573	167	100	77
Future Volume (veh/h)	137	835	327	196	550	70	263	167	573	167	100	77
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width 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
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	149	908	355	213	598	76	286	182	623	182	109	84
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	171	1312	585	575	2139	954	428	241	359	265	167	119
Arrive On Green	0.19	0.74	0.74	0.11	0.20	0.20	0.12	0.13	0.13	0.08	0.08	0.07
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	3456	1870	2790	3456	1984	1410
Grp Volume(v), veh/h	149	908	355	213	598	76	286	182	623	182	97	96
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	1728	1870	1395	1728	1777	1617
Q Serve(g_s), s	14.3	24.0	18.7	19.6	25.1	6.9	13.9	16.5	12.3	9.0	9.3	10.2
Cycle Q Clear(g_c), s	14.3	24.0	18.7	19.6	25.1	6.9	13.9	16.5	12.3	9.0	9.3	10.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.87
Lane Grp Cap(c), veh/h	171	1312	585	575	2139	954	428	241	359	265	150	136
V/C Ratio(X)	0.87	0.69	0.61	0.37	0.28	0.08	0.67	0.76	1.74	0.69	0.65	0.71
Avail Cap(c_a), veh/h	410	1312	585	575	2139	954	648	340	507	422	222	202
HCM Platoon Ratio	2.00	2.00	2.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.92	0.92	0.92	0.74	0.74	0.74	1.00	1.00	1.00
Uniform Delay (d), s/veh	70.0	17.6	16.9	62.0	38.2	30.8	73.6	74.0	22.5	79.2	78.0	79.3
Incr Delay (d2), s/veh	5.2	3.0	4.6	0.1	0.3	0.2	0.5	2.4	339.3	4.4	6.5	9.2
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(95%),veh/ln	10.1	10.3	9.0	14.3	17.6	5.1	9.8	12.2	33.1	7.6	8.0	8.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	75.2	20.7	21.6	62.1	38.5	31.0	74.1	76.4	361.8	83.6	84.5	88.5
LnGrp LOS	E	C	C	E	D	C	E	E	F	F	F	F
Approach Vol, veh/h		1412			887			1091			375	
Approach Delay, s/veh		26.6			43.5			238.8			85.1	
Approach LOS		C			D			F			F	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	62.3	69.0	25.8	18.8	21.4	109.9	18.0	26.7				
Change Period (Y+Rc), s	6.0	* 6	6.0	* 6	5.0	6.0	5.0	6.0				
Max Green Setting (Gmax), s	40.0	* 63	31.0	* 20	40.0	63.0	21.0	30.0				
Max Q Clear Time (g_c+I1), s	21.6	26.0	15.9	12.2	16.3	27.1	11.0	18.5				
Green Ext Time (p_c), s	0.2	15.5	0.7	0.6	0.2	7.0	0.7	2.1				

Intersection Summary												
HCM 7th Control Delay, s/veh											97.9	
HCM 7th LOS											F	

Notes  
 User approved pedestrian interval to be less than phase max green.  
 \* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 7th Signalized Intersection Summary  
 3: Sand Canyon Road & SR14 NB Ramp

04/21/2026



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖	↖					↑↑	↖	↖	↑↑	
Traffic Volume (veh/h)	649	13	300	0	0	0	0	672	284	226	466	0
Future Volume (veh/h)	649	13	300	0	0	0	0	672	284	226	466	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	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
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870				0	1870	1870	1870	1870	0
Adj Flow Rate, veh/h	715	0	326				0	730	309	246	507	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2				0	2	2	2	2	0
Cap, veh/h	1008	0	448				0	1148	512	428	1880	0
Arrive On Green	0.28	0.00	0.28				0.00	0.32	0.32	0.13	0.53	0.00
Sat Flow, veh/h	3563	0	1585				0	3647	1585	1781	3647	0
Grp Volume(v), veh/h	715	0	326				0	730	309	246	507	0
Grp Sat Flow(s),veh/h/ln	1781	0	1585				0	1777	1585	1781	1777	0
Q Serve(g_s), s	11.1	0.0	11.4				0.0	10.8	10.1	5.1	4.8	0.0
Cycle Q Clear(g_c), s	11.1	0.0	11.4				0.0	10.8	10.1	5.1	4.8	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	1008	0	448				0	1148	512	428	1880	0
V/C Ratio(X)	0.71	0.00	0.73				0.00	0.64	0.60	0.57	0.27	0.00
Avail Cap(c_a), veh/h	1942	0	864				0	2525	1126	437	3275	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	19.8	0.0	20.0				0.0	17.8	17.6	11.9	8.0	0.0
Incr Delay (d2), s/veh	0.9	0.0	2.3				0.0	0.6	1.2	1.8	0.1	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	7.8	0.0	0.5				0.0	7.4	6.3	3.4	2.8	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	20.8	0.0	22.2				0.0	18.4	18.7	13.7	8.1	0.0
LnGrp LOS	C		C					B	B	B	A	
Approach Vol, veh/h		1041						1039			753	
Approach Delay, s/veh		21.2						18.5			9.9	
Approach LOS		C						B			A	
Timer - Assigned Phs		2		4	5	6						
Phs Duration (G+Y+Rc), s		38.8		22.8	12.7	26.1						
Change Period (Y+Rc), s		6.2		5.4	4.7	6.2						
Max Green Setting (Gmax), s		56.8		33.6	8.3	43.8						
Max Q Clear Time (g_c+I1), s		6.8		13.4	7.1	12.8						
Green Ext Time (p_c), s		3.9		4.0	0.1	7.1						

Intersection Summary

HCM 7th Control Delay, s/veh	17.2
HCM 7th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

HCM 7th Signalized Intersection Summary  
 4: Lost Canyon Road & Sand Canyon Road

04/21/2026



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↕	↗		↕↗			↕	↗
Traffic Volume (veh/h)	168	18	21	6	10	70	16	427	8	90	233	131
Future Volume (veh/h)	168	18	21	6	10	70	16	427	8	90	233	131
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width 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
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	183	20	23	7	11	0	17	464	9	98	253	142
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	497	49	528	202	283		75	952	18	264	644	845
Arrive On Green	0.33	0.33	0.33	0.33	0.33	0.00	0.53	0.53	0.53	0.53	0.53	0.53
Sat Flow, veh/h	1150	146	1585	355	849	1585	24	1785	34	351	1207	1585
Grp Volume(v), veh/h	203	0	23	18	0	0	490	0	0	351	0	142
Grp Sat Flow(s),veh/h/ln	1296	0	1585	1204	0	1585	1843	0	0	1558	0	1585
Q Serve(g_s), s	0.0	0.0	0.6	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.8
Cycle Q Clear(g_c), s	8.9	0.0	0.6	8.9	0.0	0.0	10.0	0.0	0.0	6.6	0.0	2.8
Prop In Lane	0.90		1.00	0.39		1.00	0.03		0.02	0.28		1.00
Lane Grp Cap(c), veh/h	546	0	528	485	0		1045	0	0	908	0	845
V/C Ratio(X)	0.37	0.00	0.04	0.04	0.00		0.47	0.00	0.00	0.39	0.00	0.17
Avail Cap(c_a), veh/h	546	0	528	485	0		1045	0	0	908	0	845
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	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	16.2	0.0	13.5	13.7	0.0	0.0	8.9	0.0	0.0	8.1	0.0	7.2
Incr Delay (d2), s/veh	1.9	0.0	0.2	0.1	0.0	0.0	1.5	0.0	0.0	1.2	0.0	0.4
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(95%),veh/ln	4.2	0.0	0.4	0.3	0.0	0.0	6.7	0.0	0.0	4.4	0.0	1.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	18.2	0.0	13.7	13.9	0.0	0.0	10.4	0.0	0.0	9.3	0.0	7.6
LnGrp LOS	B		B	B			B			A		A
Approach Vol, veh/h		226			18			490				493
Approach Delay, s/veh		17.7			13.9			10.4				8.8
Approach LOS		B			B			B				A
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		36.0		24.0		36.0		24.0				
Change Period (Y+Rc), s		4.0		4.0		4.0		4.0				
Max Green Setting (Gmax), s		32.0		20.0		32.0		20.0				
Max Q Clear Time (g_c+I1), s		12.0		10.9		8.6		10.9				
Green Ext Time (p_c), s		3.1		0.7		3.0		0.0				

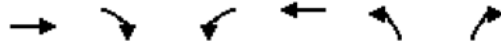
Intersection Summary		
HCM 7th Control Delay, s/veh		11.1
HCM 7th LOS		B

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

***Future without Project Conditions (Year 2032)***

HCM 7th Signalized Intersection Summary  
 1: SR 14 SB Ramp & Soledad Canyon Road

04/20/2026



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↑	↑↑	↑↑↑	
Traffic Volume (veh/h)	459	359	250	1376	578	5
Future Volume (veh/h)	459	359	250	1376	578	5
Initial Q (Qb), veh	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00
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	499	390	272	1496	633	0
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	838	715	841	2607	736	327
Arrive On Green	0.47	0.47	0.47	0.73	0.21	0.00
Sat Flow, veh/h	3647	1585	1781	3647	3563	1585
Grp Volume(v), veh/h	499	390	272	1496	633	0
Grp Sat Flow(s),veh/h/ln	1777	1585	1781	1777	1781	1585
Q Serve(g_s), s	18.2	32.4	16.7	34.1	30.2	0.0
Cycle Q Clear(g_c), s	18.2	32.4	16.7	34.1	30.2	0.0
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	838	715	841	2607	736	327
V/C Ratio(X)	0.60	0.55	0.32	0.57	0.86	0.00
Avail Cap(c_a), veh/h	838	715	841	2607	992	441
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.86	0.86	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	40.3	24.5	28.9	10.8	67.4	0.0
Incr Delay (d2), s/veh	2.7	2.6	0.1	0.9	6.8	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	10.7	20.3	11.4	18.0	20.8	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	43.0	27.1	29.0	11.7	74.1	0.0
LnGrp LOS	D	C	C	B	E	
Approach Vol, veh/h	889			1768	633	
Approach Delay, s/veh	36.0			14.4	74.1	
Approach LOS	D			B	E	
Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		133.6		42.4	87.6	46.0
Change Period (Y+Rc), s		6.0		6.0	6.0	* 6
Max Green Setting (Gmax), s		115.0		49.0	70.0	* 40
Max Q Clear Time (g_c+I1), s		36.1		32.2	18.7	34.4
Green Ext Time (p_c), s		28.5		4.2	0.3	3.2

Intersection Summary

HCM 7th Control Delay, s/veh	31.7
HCM 7th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.  
 \* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 7th Signalized Intersection Summary  
 2: Sand Canyon Road & Soledad Canyon Road

04/20/2026



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	89	414	410	539	1311	117	371	168	247	158	158	164
Future Volume (veh/h)	89	414	410	539	1311	117	371	168	247	158	158	164
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width 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
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		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	97	450	446	586	1425	127	403	183	268	172	172	178
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	135	687	306	787	2006	895	487	348	520	265	222	198
Arrive On Green	0.13	0.32	0.32	0.88	1.00	1.00	0.14	0.19	0.19	0.08	0.13	0.11
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	3456	1870	2790	3456	1777	1585
Grp Volume(v), veh/h	97	450	446	586	1425	127	403	183	268	172	172	178
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	1728	1870	1395	1728	1777	1585
Q Serve(g_s), s	9.2	19.1	34.0	19.8	0.0	0.0	20.0	15.5	5.5	8.5	16.5	19.5
Cycle Q Clear(g_c), s	9.2	19.1	34.0	19.8	0.0	0.0	20.0	15.5	5.5	8.5	16.5	19.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	135	687	306	787	2006	895	487	348	520	265	222	198
V/C Ratio(X)	0.72	0.66	1.46	0.75	0.71	0.14	0.83	0.53	0.52	0.65	0.77	0.90
Avail Cap(c_a), veh/h	157	687	306	787	2006	895	648	348	520	422	222	198
HCM Platoon Ratio	1.67	1.67	1.67	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	0.71	0.71	0.71	0.85	0.85	0.85	1.00	1.00	1.00
Uniform Delay (d), s/veh	75.0	54.6	59.6	6.9	0.0	0.0	73.5	64.6	8.5	78.9	74.6	76.9
Incr Delay (d2), s/veh	9.3	4.8	222.7	2.5	1.5	0.2	4.4	0.6	0.3	3.8	16.5	37.8
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(95%),veh/ln	7.8	12.8	48.4	6.3	0.8	0.1	13.8	11.7	8.6	7.1	13.4	15.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	84.3	59.4	282.4	9.4	1.5	0.2	77.9	65.2	8.8	82.7	91.1	114.7
LnGrp LOS	F	E	F	A	A	A	E	E	A	F	F	F
Approach Vol, veh/h		993			2138			854			522	
Approach Delay, s/veh		162.0			3.6			53.5			96.4	
Approach LOS		F			A			D			F	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	33.2	38.0	28.8	26.0	17.9	103.3	18.0	36.8				
Change Period (Y+Rc), s	6.0	* 6	6.0	* 6	5.0	6.0	5.0	6.0				
Max Green Setting (Gmax), s	1.0	* 32	31.0	* 20	15.0	88.0	21.0	30.0				
Max Q Clear Time (g_c+Y1), s	1.0	36.0	22.0	21.5	11.2	2.0	10.5	17.5				
Green Ext Time (p_c), s	0.8	0.0	0.8	0.0	0.0	29.9	0.7	1.0				

Intersection Summary

HCM 7th Control Delay, s/veh	58.7
HCM 7th LOS	E

Notes

User approved pedestrian interval to be less than phase max green.  
 \* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 7th Signalized Intersection Summary  
 3: Sand Canyon Road & SR14 NB Ramp

04/20/2026



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	422	0	203	0	0	0	0	438	138	297	810	0
Future Volume (veh/h)	422	0	203	0	0	0	0	438	138	297	810	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	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
Work Zone On Approach	No						No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870				0	1870	1870	1870	1870	0
Adj Flow Rate, veh/h	459	0	221				0	476	150	323	880	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2				0	2	2	2	2	0
Cap, veh/h	797	0	355				0	882	394	572	1863	0
Arrive On Green	0.22	0.00	0.22				0.00	0.25	0.25	0.17	0.52	0.00
Sat Flow, veh/h	3563	0	1585				0	3647	1585	1781	3647	0
Grp Volume(v), veh/h	459	0	221				0	476	150	323	880	0
Grp Sat Flow(s),veh/h/ln	1781	0	1585				0	1777	1585	1781	1777	0
Q Serve(g_s), s	5.3	0.0	5.8				0.0	5.4	3.6	5.4	7.2	0.0
Cycle Q Clear(g_c), s	5.3	0.0	5.8				0.0	5.4	3.6	5.4	7.2	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	797	0	355				0	882	394	572	1863	0
V/C Ratio(X)	0.58	0.00	0.62				0.00	0.54	0.38	0.57	0.47	0.00
Avail Cap(c_a), veh/h	2601	0	1157				0	3382	1508	583	4386	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	15.9	0.0	16.1				0.0	15.0	14.4	9.0	6.9	0.0
Incr Delay (d2), s/veh	0.7	0.0	1.8				0.0	0.5	0.6	1.2	0.2	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	8.5	0.0	0.3				0.0	3.4	2.1	3.1	3.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	16.6	0.0	17.9				0.0	15.5	15.0	10.2	7.1	0.0
LnGrp LOS	B		B					B	B	B	A	
Approach Vol, veh/h	680						626			1203		
Approach Delay, s/veh	17.0						15.4			8.0		
Approach LOS	B						B			A		
Timer - Assigned Phs	2		4		5		6					
Phs Duration (G+Y+Rc), s	30.3		15.7		12.7		17.6					
Change Period (Y+Rc), s	6.2		5.4		4.7		6.2					
Max Green Setting (Gmax), s	56.8		33.6		8.3		43.8					
Max Q Clear Time (g_c+l1), s	9.2		7.8		7.4		7.4					
Green Ext Time (p_c), s	7.8		2.5		0.1		4.1					
Intersection Summary												
HCM 7th Control Delay, s/veh			12.3									
HCM 7th LOS			B									
Notes												
User approved volume balancing among the lanes for turning movement.												

HCM 7th Signalized Intersection Summary  
 4: Lost Canyon Road & Sand Canyon Road

04/20/2026



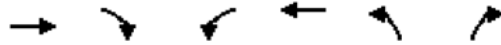
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↕	↗		↕			↕	↗
Traffic Volume (veh/h)	190	0	63	6	6	25	43	247	5	30	585	348
Future Volume (veh/h)	190	0	63	6	6	25	43	247	5	30	585	348
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
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	207	0	68	7	7	0	47	268	5	33	636	378
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	550	0	528	234	207		124	645	11	87	958	845
Arrive On Green	0.33	0.00	0.33	0.33	0.33	0.00	0.53	0.53	0.53	0.53	0.53	0.53
Sat Flow, veh/h	1289	0	1585	433	620	1585	104	1209	21	45	1797	1585
Grp Volume(v), veh/h	207	0	68	14	0	0	320	0	0	669	0	378
Grp Sat Flow(s),veh/h/ln	1289	0	1585	1054	0	1585	1334	0	0	1841	0	1585
Q Serve(g_s), s	0.0	0.0	1.8	0.1	0.0	0.0	1.5	0.0	0.0	0.0	0.0	8.8
Cycle Q Clear(g_c), s	8.9	0.0	1.8	8.9	0.0	0.0	17.1	0.0	0.0	15.6	0.0	8.8
Prop In Lane	1.00		1.00	0.50		1.00	0.15		0.02	0.05		1.00
Lane Grp Cap(c), veh/h	550	0	528	441	0		780	0	0	1045	0	845
V/C Ratio(X)	0.38	0.00	0.13	0.03	0.00		0.41	0.00	0.00	0.64	0.00	0.45
Avail Cap(c_a), veh/h	550	0	528	441	0		780	0	0	1045	0	845
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(l)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	16.3	0.0	13.9	13.8	0.0	0.0	8.1	0.0	0.0	10.2	0.0	8.6
Incr Delay (d2), s/veh	2.0	0.0	0.5	0.1	0.0	0.0	1.6	0.0	0.0	3.0	0.0	1.7
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(95%),veh/ln	4.3	0.0	1.2	0.2	0.0	0.0	4.0	0.0	0.0	10.0	0.0	5.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	18.3	0.0	14.4	14.0	0.0	0.0	9.7	0.0	0.0	13.2	0.0	10.3
LnGrp LOS	B		B	B			A			B		B
Approach Vol, veh/h		275			14			320			1047	
Approach Delay, s/veh		17.3			14.0			9.7			12.1	
Approach LOS		B			B			A			B	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		36.0		24.0		36.0		24.0				
Change Period (Y+Rc), s		4.0		4.0		4.0		4.0				
Max Green Setting (Gmax), s		32.0		20.0		32.0		20.0				
Max Q Clear Time (g_c+I1), s		19.1		10.9		17.6		10.9				
Green Ext Time (p_c), s		1.8		0.9		5.3		0.0				

Intersection Summary		
HCM 7th Control Delay, s/veh		12.5
HCM 7th LOS		B

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

HCM 7th Signalized Intersection Summary  
 1: SR 14 SB Ramp & Soledad Canyon Road

04/20/2026



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↑	↑↑	↑↑	
Traffic Volume (veh/h)	1381	639	184	587	487	7
Future Volume (veh/h)	1381	639	184	587	487	7
Initial Q (Qb), veh	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00
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	1501	695	200	638	536	0
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	2203	1279	218	2707	636	283
Arrive On Green	0.62	0.62	0.12	0.76	0.18	0.00
Sat Flow, veh/h	3647	1585	1781	3647	3563	1585
Grp Volume(v), veh/h	1501	695	200	638	536	0
Grp Sat Flow(s),veh/h/ln	1777	1585	1781	1777	1781	1585
Q Serve(g_s), s	48.9	26.5	19.5	9.2	25.6	0.0
Cycle Q Clear(g_c), s	48.9	26.5	19.5	9.2	25.6	0.0
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	2203	1279	218	2707	636	283
V/C Ratio(X)	0.68	0.54	0.92	0.24	0.84	0.00
Avail Cap(c_a), veh/h	2203	1279	218	2707	992	441
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.55	0.55	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	22.0	5.8	76.4	6.1	69.9	0.0
Incr Delay (d2), s/veh	1.0	0.9	38.8	0.2	5.2	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	24.9	23.9	16.6	5.7	17.9	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	23.0	6.8	115.1	6.3	75.1	0.0
LnGrp LOS	C	A	F	A	E	
Approach Vol, veh/h	2196			838	536	
Approach Delay, s/veh	17.8			32.3	75.1	
Approach LOS	B			C	E	
Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		138.6		37.4	25.0	113.6
Change Period (Y+Rc), s		6.0		6.0	5.0	6.0
Max Green Setting (Gmax), s		115.0		49.0	20.0	90.0
Max Q Clear Time (g_c+I1), s		11.2		27.6	21.5	50.9
Green Ext Time (p_c), s		7.2		3.8	0.0	30.9
<b>Intersection Summary</b>						
HCM 7th Control Delay, s/veh			29.8			
HCM 7th LOS			C			

Notes

User approved volume balancing among the lanes for turning movement.

HCM 7th Signalized Intersection Summary  
 2: Sand Canyon Road & Soledad Canyon Road

04/20/2026



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	189	1081	476	255	725	94	351	227	668	221	123	111
Future Volume (veh/h)	189	1081	476	255	725	94	351	227	668	221	123	111
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width 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
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		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	205	1175	517	277	788	102	382	247	726	240	134	121
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	226	1312	585	501	1880	839	508	300	448	300	190	158
Arrive On Green	0.25	0.74	0.74	0.09	0.17	0.17	0.15	0.16	0.16	0.09	0.10	0.09
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	3456	1870	2790	3456	1839	1532
Grp Volume(v), veh/h	205	1175	517	277	788	102	382	247	726	240	129	126
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	1728	1870	1395	1728	1777	1595
Q Serve(g_s), s	19.6	44.9	43.2	26.2	34.8	9.6	18.7	22.5	16.2	12.0	12.4	13.6
Cycle Q Clear(g_c), s	19.6	44.9	43.2	26.2	34.8	9.6	18.7	22.5	16.2	12.0	12.4	13.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.96
Lane Grp Cap(c), veh/h	226	1312	585	501	1880	839	508	300	448	300	183	164
V/C Ratio(X)	0.91	0.90	0.88	0.55	0.42	0.12	0.75	0.82	1.62	0.80	0.71	0.77
Avail Cap(c_a), veh/h	410	1312	585	501	1880	839	648	340	507	422	222	199
HCM Platoon Ratio	2.00	2.00	2.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.88	0.88	0.88	0.64	0.64	0.64	1.00	1.00	1.00
Uniform Delay (d), s/veh	64.6	20.4	20.1	69.3	48.5	38.1	72.0	71.5	24.3	78.8	76.3	77.8
Incr Delay (d2), s/veh	5.5	9.7	17.5	0.7	0.6	0.3	1.7	8.1	286.5	8.8	9.2	15.4
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(95%),veh/ln	12.7	16.2	19.2	18.2	23.1	7.2	12.3	16.0	35.8	9.7	10.2	10.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	70.1	30.1	37.6	70.0	49.2	38.4	73.6	79.5	310.9	87.6	85.6	93.2
LnGrp LOS	E	C	D	E	D	D	E	E	F	F	F	F
Approach Vol, veh/h		1897			1167			1355			495	
Approach Delay, s/veh		36.5			53.2			201.8			88.5	
Approach LOS		D			D			F			F	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	55.0	69.0	29.9	22.1	26.8	97.1	19.8	32.2				
Change Period (Y+Rc), s	6.0	* 6	6.0	* 6	5.0	6.0	5.0	6.0				
Max Green Setting (Gmax), s	40.0	* 63	31.0	* 20	40.0	63.0	21.0	30.0				
Max Q Clear Time (g_c+20.2), s	20.2	46.9	20.7	15.6	21.6	36.8	14.0	24.5				
Green Ext Time (p_c), s	0.3	12.3	0.8	0.6	0.2	8.9	0.8	1.8				

Intersection Summary												
HCM 7th Control Delay, s/veh											91.3	
HCM 7th LOS											F	

Notes  
 User approved pedestrian interval to be less than phase max green.  
 \* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 7th Signalized Intersection Summary  
 3: Sand Canyon Road & SR14 NB Ramp

04/20/2026



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	844	15	320	0	0	0	0	766	374	382	551	0
Future Volume (veh/h)	844	15	320	0	0	0	0	766	374	382	551	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	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
Work Zone On Approach	No						No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870				0	1870	1870	1870	1870	0
Adj Flow Rate, veh/h	928	0	348				0	833	407	415	599	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2				0	2	2	2	2	0
Cap, veh/h	1150	0	512				0	1265	564	358	1868	0
Arrive On Green	0.32	0.00	0.32				0.00	0.36	0.36	0.11	0.53	0.00
Sat Flow, veh/h	3563	0	1585				0	3647	1585	1781	3647	0
Grp Volume(v), veh/h	928	0	348				0	833	407	415	599	0
Grp Sat Flow(s),veh/h/ln	1781	0	1585				0	1777	1585	1781	1777	0
Q Serve(g_s), s	18.3	0.0	14.6				0.0	15.1	17.0	8.3	7.4	0.0
Cycle Q Clear(g_c), s	18.3	0.0	14.6				0.0	15.1	17.0	8.3	7.4	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	1150	0	512				0	1265	564	358	1868	0
V/C Ratio(X)	0.81	0.00	0.68				0.00	0.66	0.72	1.16	0.32	0.00
Avail Cap(c_a), veh/h	1564	0	696				0	2033	907	358	2637	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	23.7	0.0	22.5				0.0	20.7	21.4	19.1	10.4	0.0
Incr Delay (d2), s/veh	2.3	0.0	1.6				0.0	0.6	1.8	97.8	0.1	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	2.1	0.0	18.5				0.0	10.0	10.3	20.4	4.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	26.1	0.0	24.1				0.0	21.3	23.1	116.9	10.5	0.0
LnGrp LOS	C		C					C	C	F	B	
Approach Vol, veh/h	1276						1240			1014		
Approach Delay, s/veh	25.5						21.9			54.0		
Approach LOS	C						C			D		
Timer - Assigned Phs	2		4		5		6					
Phs Duration (G+Y+Rc), s	46.5		30.1		13.0		33.5					
Change Period (Y+Rc), s	6.2		5.4		4.7		6.2					
Max Green Setting (Gmax), s	56.8		33.6		8.3		43.8					
Max Q Clear Time (g_c+l1), s	9.4		20.3		10.3		19.0					
Green Ext Time (p_c), s	4.7		4.4		0.0		8.2					
<b>Intersection Summary</b>												
HCM 7th Control Delay, s/veh			32.4									
HCM 7th LOS			C									
<b>Notes</b>												
User approved volume balancing among the lanes for turning movement.												

HCM 7th Signalized Intersection Summary  
 4: Lost Canyon Road & Sand Canyon Road

04/20/2026



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↕	↗		↕			↕	↗
Traffic Volume (veh/h)	243	8	24	7	3	39	18	527	9	38	295	182
Future Volume (veh/h)	243	8	24	7	3	39	18	527	9	38	295	182
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width 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
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		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	264	9	26	8	3	0	20	573	10	41	321	198
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	576	16	528	291	94		75	951	16	124	868	845
Arrive On Green	0.33	0.33	0.33	0.33	0.33	0.00	0.53	0.53	0.53	0.53	0.53	0.53
Sat Flow, veh/h	1374	47	1585	562	281	1585	25	1782	30	108	1627	1585
Grp Volume(v), veh/h	273	0	26	11	0	0	603	0	0	362	0	198
Grp Sat Flow(s),veh/h/ln	1420	0	1585	843	0	1585	1837	0	0	1736	0	1585
Q Serve(g_s), s	0.0	0.0	0.7	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.0
Cycle Q Clear(g_c), s	9.6	0.0	0.7	9.6	0.0	0.0	13.4	0.0	0.0	6.7	0.0	4.0
Prop In Lane	0.97		1.00	0.73		1.00	0.03		0.02	0.11		1.00
Lane Grp Cap(c), veh/h	592	0	528	385	0		1042	0	0	992	0	845
V/C Ratio(X)	0.46	0.00	0.05	0.03	0.00		0.58	0.00	0.00	0.36	0.00	0.23
Avail Cap(c_a), veh/h	592	0	528	385	0		1042	0	0	992	0	845
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	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	16.5	0.0	13.6	14.1	0.0	0.0	9.7	0.0	0.0	8.1	0.0	7.5
Incr Delay (d2), s/veh	2.6	0.0	0.2	0.1	0.0	0.0	2.3	0.0	0.0	1.0	0.0	0.7
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(95%),veh/ln	5.8	0.0	0.4	0.2	0.0	0.0	8.7	0.0	0.0	4.5	0.0	2.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	19.1	0.0	13.7	14.2	0.0	0.0	12.0	0.0	0.0	9.1	0.0	8.1
LnGrp LOS	B		B	B			B			A		A
Approach Vol, veh/h		299			11			603				560
Approach Delay, s/veh		18.6			14.2			12.0				8.8
Approach LOS		B			B			B				A
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		36.0		24.0		36.0		24.0				
Change Period (Y+Rc), s		4.0		4.0		4.0		4.0				
Max Green Setting (Gmax), s		32.0		20.0		32.0		20.0				
Max Q Clear Time (g_c+I1), s		15.4		11.6		8.7		11.6				
Green Ext Time (p_c), s		3.8		1.0		3.1		0.0				

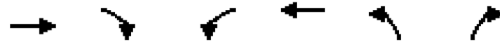
Intersection Summary		
HCM 7th Control Delay, s/veh		12.1
HCM 7th LOS		B

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

***Future with Project Conditions (Year 2032)***

HCM 7th Signalized Intersection Summary  
 1: SR 14 SB Ramp & Soledad Canyon Road

04/21/2026



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↓	↑↑	↓	↓
Traffic Volume (veh/h)	462	384	250	1378	583	5
Future Volume (veh/h)	462	384	250	1378	583	5
Initial Q (Qb), veh	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00
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	502	417	272	1498	639	0
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	838	717	838	2602	742	330
Arrive On Green	0.47	0.47	0.47	0.73	0.21	0.00
Sat Flow, veh/h	3647	1585	1781	3647	3563	1585
Grp Volume(v), veh/h	502	417	272	1498	639	0
Grp Sat Flow(s),veh/h/ln	1777	1585	1781	1777	1781	1585
Q Serve(g_s), s	18.3	37.0	16.8	34.4	30.5	0.0
Cycle Q Clear(g_c), s	18.3	37.0	16.8	34.4	30.5	0.0
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	838	717	838	2602	742	330
V/C Ratio(X)	0.60	0.58	0.32	0.58	0.86	0.00
Avail Cap(c_a), veh/h	838	717	838	2602	992	441
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.86	0.86	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	40.4	25.2	29.1	10.9	67.2	0.0
Incr Delay (d2), s/veh	2.7	2.9	0.1	0.9	6.9	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	10.7	22.9	11.5	18.2	20.9	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	43.1	28.2	29.2	11.9	74.1	0.0
LnGrp LOS	D	C	C	B	E	
Approach Vol, veh/h	919			1770	639	
Approach Delay, s/veh	36.3			14.5	74.1	
Approach LOS	D			B	E	
Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		133.3		42.7	87.3	46.0
Change Period (Y+Rc), s		6.0		6.0	6.0	* 6
Max Green Setting (Gmax), s		115.0		49.0	70.0	* 40
Max Q Clear Time (g_c+I1), s		36.4		32.5	18.8	39.0
Green Ext Time (p_c), s		28.6		4.2	0.3	0.7

Intersection Summary

HCM 7th Control Delay, s/veh	32.0
HCM 7th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.  
 \* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 7th Signalized Intersection Summary  
 2: Sand Canyon Road & Soledad Canyon Road

04/21/2026



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↙	↑↑	↗	↙	↑↑	↗	↙↗	↑	↙↗	↙↗	↑↗	
Traffic Volume (veh/h)	89	414	413	546	1311	117	377	174	275	158	161	164
Future Volume (veh/h)	89	414	413	546	1311	117	377	174	275	158	161	164
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width 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
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	97	450	449	593	1425	127	410	189	299	172	175	178
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	135	687	306	783	1999	891	493	352	525	265	222	198
Arrive On Green	0.13	0.32	0.32	0.88	1.00	1.00	0.14	0.19	0.19	0.08	0.13	0.11
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	3456	1870	2790	3456	1777	1585
Grp Volume(v), veh/h	97	450	449	593	1425	127	410	189	299	172	175	178
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	1728	1870	1395	1728	1777	1585
Q Serve(g_s), s	9.2	19.1	34.0	21.2	0.0	0.0	20.3	16.1	6.2	8.5	16.8	19.5
Cycle Q Clear(g_c), s	9.2	19.1	34.0	21.2	0.0	0.0	20.3	16.1	6.2	8.5	16.8	19.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	135	687	306	783	1999	891	493	352	525	265	222	198
V/C Ratio(X)	0.72	0.66	1.47	0.76	0.71	0.14	0.83	0.54	0.57	0.65	0.79	0.90
Avail Cap(c_a), veh/h	157	687	306	783	1999	891	648	352	525	422	222	198
HCM Platoon Ratio	1.67	1.67	1.67	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.70	0.70	0.70	0.84	0.84	0.84	1.00	1.00	1.00
Uniform Delay (d), s/veh	75.0	54.6	59.6	7.2	0.0	0.0	73.4	64.5	8.6	78.9	74.7	76.9
Incr Delay (d2), s/veh	9.3	4.8	226.9	2.7	1.5	0.2	4.6	0.7	0.8	3.8	17.9	37.8
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(95%),veh/ln	7.8	12.8	49.0	6.5	0.8	0.1	14.0	12.0	9.4	7.1	13.7	15.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	84.3	59.4	286.6	9.9	1.5	0.2	78.0	65.2	9.4	82.7	92.6	114.7
LnGrp LOS	F	E	F	A	A	A	E	E	A	F	F	F
Approach Vol, veh/h		996			2145			898			525	
Approach Delay, s/veh		164.2			3.8			52.5			96.9	
Approach LOS		F			A			D			F	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	82.9	38.0	29.1	26.0	17.9	103.0	18.0	37.1				
Change Period (Y+Rc), s	6.0	* 6	6.0	* 6	5.0	6.0	5.0	6.0				
Max Green Setting (Gmax), s	71.0	* 32	31.0	* 20	15.0	88.0	21.0	30.0				
Max Q Clear Time (g_c+I1), s	23.2	36.0	22.3	21.5	11.2	2.0	10.5	18.1				
Green Ext Time (p_c), s	0.8	0.0	0.8	0.0	0.0	29.9	0.7	1.1				

Intersection Summary												
HCM 7th Control Delay, s/veh			59.1									
HCM 7th LOS			E									

Notes  
 User approved pedestrian interval to be less than phase max green.  
 \* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 7th Signalized Intersection Summary  
 3: Sand Canyon Road & SR14 NB Ramp

04/21/2026



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖	↖					↑↑	↖	↖	↑↑	
Traffic Volume (veh/h)	422	0	216	0	0	0	0	478	148	297	823	0
Future Volume (veh/h)	422	0	216	0	0	0	0	478	148	297	823	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	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
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870				0	1870	1870	1870	1870	0
Adj Flow Rate, veh/h	459	0	235				0	520	161	323	895	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2				0	2	2	2	2	0
Cap, veh/h	818	0	364				0	932	416	552	1876	0
Arrive On Green	0.23	0.00	0.23				0.00	0.26	0.26	0.17	0.53	0.00
Sat Flow, veh/h	3563	0	1585				0	3647	1585	1781	3647	0
Grp Volume(v), veh/h	459	0	235				0	520	161	323	895	0
Grp Sat Flow(s),veh/h/ln	1781	0	1585				0	1777	1585	1781	1777	0
Q Serve(g_s), s	5.4	0.0	6.4				0.0	6.0	4.0	5.6	7.6	0.0
Cycle Q Clear(g_c), s	5.4	0.0	6.4				0.0	6.0	4.0	5.6	7.6	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	818	0	364				0	932	416	552	1876	0
V/C Ratio(X)	0.56	0.00	0.65				0.00	0.56	0.39	0.59	0.48	0.00
Avail Cap(c_a), veh/h	2503	0	1114				0	3255	1452	563	4221	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	16.3	0.0	16.7				0.0	15.2	14.5	9.3	7.1	0.0
Incr Delay (d2), s/veh	0.6	0.0	1.9				0.0	0.5	0.6	1.5	0.2	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	3.6	0.0	0.4				0.0	3.9	2.4	3.3	3.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	16.9	0.0	18.6				0.0	15.8	15.1	10.9	7.3	0.0
LnGrp LOS	B		B					B	B	B	A	
Approach Vol, veh/h		694						681			1218	
Approach Delay, s/veh		17.5						15.6			8.3	
Approach LOS		B						B			A	
Timer - Assigned Phs		2		4	5	6						
Phs Duration (G+Y+Rc), s		31.4		16.4	12.7	18.7						
Change Period (Y+Rc), s		6.2		5.4	4.7	6.2						
Max Green Setting (Gmax), s		56.8		33.6	8.3	43.8						
Max Q Clear Time (g_c+I1), s		9.6		8.4	7.6	8.0						
Green Ext Time (p_c), s		8.0		2.6	0.1	4.5						

Intersection Summary		
HCM 7th Control Delay, s/veh		12.6
HCM 7th LOS		B

Notes  
 User approved volume balancing among the lanes for turning movement.

HCM 7th Signalized Intersection Summary  
 4: Lost Canyon Road & Sand Canyon Road

04/21/2026



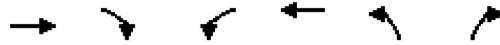
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↕	↗		↕↗			↕	↗
Traffic Volume (veh/h)	190	5	63	6	15	75	43	247	5	56	585	348
Future Volume (veh/h)	190	5	63	6	15	75	43	247	5	56	585	348
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
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	207	5	68	7	16	0	47	268	5	61	636	378
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	413	9	528	119	232		118	607	10	118	899	845
Arrive On Green	0.33	0.33	0.33	0.33	0.33	0.00	0.53	0.53	0.53	0.53	0.53	0.53
Sat Flow, veh/h	883	26	1585	122	696	1585	92	1138	20	99	1685	1585
Grp Volume(v), veh/h	212	0	68	23	0	0	320	0	0	697	0	378
Grp Sat Flow(s),veh/h/ln	909	0	1585	818	0	1585	1249	0	0	1784	0	1585
Q Serve(g_s), s	0.4	0.0	1.8	0.2	0.0	0.0	2.1	0.0	0.0	0.0	0.0	8.8
Cycle Q Clear(g_c), s	15.4	0.0	1.8	15.3	0.0	0.0	19.6	0.0	0.0	17.6	0.0	8.8
Prop In Lane	0.98		1.00	0.30		1.00	0.15		0.02	0.09		1.00
Lane Grp Cap(c), veh/h	422	0	528	351	0		735	0	0	1017	0	845
V/C Ratio(X)	0.50	0.00	0.13	0.07	0.00		0.44	0.00	0.00	0.69	0.00	0.45
Avail Cap(c_a), veh/h	422	0	528	351	0		735	0	0	1017	0	845
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	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	18.6	0.0	13.9	14.5	0.0	0.0	8.4	0.0	0.0	10.5	0.0	8.6
Incr Delay (d2), s/veh	4.2	0.0	0.5	0.4	0.0	0.0	1.9	0.0	0.0	3.8	0.0	1.7
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(95%),veh/ln	5.3	0.0	1.2	0.4	0.0	0.0	4.1	0.0	0.0	10.7	0.0	5.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	22.8	0.0	14.4	14.8	0.0	0.0	10.3	0.0	0.0	14.2	0.0	10.3
LnGrp LOS	C		B	B			B			B		B
Approach Vol, veh/h		280			23			320			1075	
Approach Delay, s/veh		20.8			14.8			10.3			12.9	
Approach LOS		C			B			B			B	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		36.0		24.0		36.0		24.0				
Change Period (Y+Rc), s		4.0		4.0		4.0		4.0				
Max Green Setting (Gmax), s		32.0		20.0		32.0		20.0				
Max Q Clear Time (g_c+I1), s		21.6		17.4		19.6		17.3				
Green Ext Time (p_c), s		1.6		0.3		5.2		0.0				

Intersection Summary		
HCM 7th Control Delay, s/veh		13.7
HCM 7th LOS		B

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

HCM 7th Signalized Intersection Summary  
 1: SR 14 SB Ramp & Soledad Canyon Road

04/21/2026



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↑	↑↑	↑↑	
Traffic Volume (veh/h)	1383	657	184	591	498	8
Future Volume (veh/h)	1383	657	184	591	498	8
Initial Q (Qb), veh	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00
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	1503	714	200	642	549	0
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	2189	1279	218	2694	650	289
Arrive On Green	0.62	0.62	0.12	0.76	0.18	0.00
Sat Flow, veh/h	3647	1585	1781	3647	3563	1585
Grp Volume(v), veh/h	1503	714	200	642	549	0
Grp Sat Flow(s),veh/h/ln	1777	1585	1781	1777	1781	1585
Q Serve(g_s), s	49.5	27.9	19.5	9.4	26.2	0.0
Cycle Q Clear(g_c), s	49.5	27.9	19.5	9.4	26.2	0.0
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	2189	1279	218	2694	650	289
V/C Ratio(X)	0.69	0.56	0.92	0.24	0.85	0.00
Avail Cap(c_a), veh/h	2189	1279	218	2694	992	441
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.54	0.54	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	22.5	6.0	76.4	6.3	69.6	0.0
Incr Delay (d2), s/veh	1.0	1.0	38.8	0.2	5.4	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	25.2	25.2	16.6	5.8	18.3	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	23.5	6.9	115.1	6.5	74.9	0.0
LnGrp LOS	C	A	F	A	E	
Approach Vol, veh/h	2217			842	549	
Approach Delay, s/veh	18.1			32.3	74.9	
Approach LOS	B			C	E	
Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		137.9		38.1	25.0	112.9
Change Period (Y+Rc), s		6.0		6.0	5.0	6.0
Max Green Setting (Gmax), s		115.0		49.0	20.0	90.0
Max Q Clear Time (g_c+I1), s		11.4		28.2	21.5	51.5
Green Ext Time (p_c), s		7.2		3.9	0.0	30.8

Intersection Summary

HCM 7th Control Delay, s/veh	30.1
HCM 7th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

HCM 7th Signalized Intersection Summary  
 2: Sand Canyon Road & Soledad Canyon Road

04/21/2026



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑	↗	↘	↑↑	↗	↘↗	↑	↗↘	↘↗	↑↗	
Traffic Volume (veh/h)	189	1081	483	270	725	94	355	232	688	221	130	111
Future Volume (veh/h)	189	1081	483	270	725	94	355	232	688	221	130	111
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width 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
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	205	1175	525	293	788	102	386	252	748	240	141	121
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	226	1312	585	497	1872	835	511	304	454	300	197	157
Arrive On Green	0.25	0.74	0.74	0.09	0.17	0.17	0.15	0.16	0.16	0.09	0.10	0.09
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	3456	1870	2790	3456	1881	1497
Grp Volume(v), veh/h	205	1175	525	293	788	102	386	252	748	240	133	129
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	1728	1870	1395	1728	1777	1601
Q Serve(g_s), s	19.6	44.9	45.1	27.8	34.8	9.6	18.9	22.9	16.5	12.0	12.7	13.9
Cycle Q Clear(g_c), s	19.6	44.9	45.1	27.8	34.8	9.6	18.9	22.9	16.5	12.0	12.7	13.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.93
Lane Grp Cap(c), veh/h	226	1312	585	497	1872	835	511	304	454	300	186	168
V/C Ratio(X)	0.91	0.90	0.90	0.59	0.42	0.12	0.76	0.83	1.65	0.80	0.71	0.77
Avail Cap(c_a), veh/h	410	1312	585	497	1872	835	648	340	507	422	222	200
HCM Platoon Ratio	2.00	2.00	2.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.87	0.87	0.87	0.63	0.63	0.63	1.00	1.00	1.00
Uniform Delay (d), s/veh	64.6	20.4	20.4	70.3	48.8	38.4	72.0	71.3	24.4	78.8	76.2	77.7
Incr Delay (d2), s/veh	5.5	9.7	19.0	1.1	0.6	0.3	1.7	8.5	297.5	8.8	9.8	16.0
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(95%),veh/ln	12.7	16.2	20.1	19.1	23.1	7.2	12.4	16.3	37.4	9.7	10.5	10.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	70.1	30.1	39.4	71.4	49.4	38.6	73.7	79.7	321.9	87.6	86.1	93.7
LnGrp LOS	E	C	D	E	D	D	E	E	F	F	F	F
Approach Vol, veh/h		1905			1183			1386			502	
Approach Delay, s/veh		37.0			53.9			208.8			88.8	
Approach LOS		D			D			F			F	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	54.6	69.0	30.0	22.4	26.8	96.7	19.8	32.6				
Change Period (Y+Rc), s	6.0	* 6	6.0	* 6	5.0	6.0	5.0	6.0				
Max Green Setting (Gmax), s	40.0	* 63	31.0	* 20	40.0	63.0	21.0	30.0				
Max Q Clear Time (g_c+I1), s	29.8	47.1	20.9	15.9	21.6	36.8	14.0	24.9				
Green Ext Time (p_c), s	0.3	12.2	0.8	0.5	0.2	8.9	0.8	1.7				

Intersection Summary

HCM 7th Control Delay, s/veh	94.1
HCM 7th LOS	F

Notes

User approved pedestrian interval to be less than phase max green.  
 \* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 7th Signalized Intersection Summary  
 3: Sand Canyon Road & SR14 NB Ramp

04/21/2026



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖	↖					↑↑	↖	↖	↑↑	
Traffic Volume (veh/h)	844	15	348	0	0	0	0	795	381	382	580	0
Future Volume (veh/h)	844	15	348	0	0	0	0	795	381	382	580	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	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
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870				0	1870	1870	1870	1870	0
Adj Flow Rate, veh/h	928	0	378				0	864	414	415	630	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2				0	2	2	2	2	0
Cap, veh/h	1149	0	511				0	1283	572	350	1877	0
Arrive On Green	0.32	0.00	0.32				0.00	0.36	0.36	0.11	0.53	0.00
Sat Flow, veh/h	3563	0	1585				0	3647	1585	1781	3647	0
Grp Volume(v), veh/h	928	0	378				0	864	414	415	630	0
Grp Sat Flow(s),veh/h/ln	1781	0	1585				0	1777	1585	1781	1777	0
Q Serve(g_s), s	18.5	0.0	16.5				0.0	16.0	17.6	8.3	7.9	0.0
Cycle Q Clear(g_c), s	18.5	0.0	16.5				0.0	16.0	17.6	8.3	7.9	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	1149	0	511				0	1283	572	350	1877	0
V/C Ratio(X)	0.81	0.00	0.74				0.00	0.67	0.72	1.18	0.34	0.00
Avail Cap(c_a), veh/h	1540	0	685				0	2003	893	350	2598	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	24.1	0.0	23.4				0.0	21.0	21.5	19.1	10.5	0.0
Incr Delay (d2), s/veh	2.4	0.0	2.9				0.0	0.6	1.8	108.4	0.1	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	12.3	0.0	0.7				0.0	10.5	10.5	21.6	5.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	26.5	0.0	26.3				0.0	21.6	23.2	127.5	10.6	0.0
LnGrp LOS	C		C					C	C	F	B	
Approach Vol, veh/h		1306						1278			1045	
Approach Delay, s/veh		26.5						22.1			57.0	
Approach LOS		C						C			E	
Timer - Assigned Phs		2		4	5	6						
Phs Duration (G+Y+Rc), s		47.3		30.5	13.0	34.3						
Change Period (Y+Rc), s		6.2		5.4	4.7	6.2						
Max Green Setting (Gmax), s		56.8		33.6	8.3	43.8						
Max Q Clear Time (g_c+I1), s		9.9		20.5	10.3	19.6						
Green Ext Time (p_c), s		5.0		4.5	0.0	8.5						
<b>Intersection Summary</b>												
HCM 7th Control Delay, s/veh			33.7									
HCM 7th LOS			C									
<b>Notes</b>												
User approved volume balancing among the lanes for turning movement.												

HCM 7th Signalized Intersection Summary  
 4: Lost Canyon Road & Sand Canyon Road

04/21/2026



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↕	↗		↕↗			↕	↗
Traffic Volume (veh/h)	243	19	24	7	10	75	18	527	9	95	295	182
Future Volume (veh/h)	243	19	24	7	10	75	18	527	9	95	295	182
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width 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
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	264	21	26	8	11	0	20	573	10	103	321	198
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	384	21	528	89	91		75	951	16	227	667	845
Arrive On Green	0.33	0.33	0.33	0.33	0.33	0.00	0.53	0.53	0.53	0.53	0.53	0.53
Sat Flow, veh/h	806	64	1585	12	273	1585	25	1782	30	286	1251	1585
Grp Volume(v), veh/h	285	0	26	19	0	0	603	0	0	424	0	198
Grp Sat Flow(s),veh/h/ln	870	0	1585	284	0	1585	1837	0	0	1536	0	1585
Q Serve(g_s), s	0.0	0.0	0.7	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.0
Cycle Q Clear(g_c), s	19.7	0.0	0.7	19.8	0.0	0.0	13.4	0.0	0.0	8.9	0.0	4.0
Prop In Lane	0.93		1.00	0.42		1.00	0.03		0.02	0.24		1.00
Lane Grp Cap(c), veh/h	406	0	528	180	0		1042	0	0	894	0	845
V/C Ratio(X)	0.70	0.00	0.05	0.11	0.00		0.58	0.00	0.00	0.47	0.00	0.23
Avail Cap(c_a), veh/h	406	0	528	180	0		1042	0	0	894	0	845
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	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	19.9	0.0	13.6	15.9	0.0	0.0	9.7	0.0	0.0	8.5	0.0	7.5
Incr Delay (d2), s/veh	9.8	0.0	0.2	1.2	0.0	0.0	2.3	0.0	0.0	1.8	0.0	0.7
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(95%),veh/ln	8.1	0.0	0.4	0.4	0.0	0.0	8.7	0.0	0.0	5.6	0.0	2.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	29.7	0.0	13.7	17.1	0.0	0.0	12.0	0.0	0.0	10.3	0.0	8.1
LnGrp LOS	C		B	B			B			B		A
Approach Vol, veh/h		311			19			603			622	
Approach Delay, s/veh		28.3			17.1			12.0			9.6	
Approach LOS		C			B			B			A	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		36.0		24.0		36.0		24.0				
Change Period (Y+Rc), s		4.0		4.0		4.0		4.0				
Max Green Setting (Gmax), s		32.0		20.0		32.0		20.0				
Max Q Clear Time (g_c+I1), s		15.4		21.7		10.9		21.8				
Green Ext Time (p_c), s		3.8		0.0		3.8		0.0				

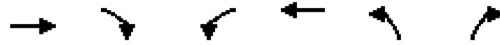
Intersection Summary		
HCM 7th Control Delay, s/veh		14.4
HCM 7th LOS		B

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

## ***Conditions with Improvements***

HCM 7th Signalized Intersection Summary  
 1: SR 14 SB Ramp & Soledad Canyon Road

04/21/2026



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑↑	↑	↑↑	↑↑	
Traffic Volume (veh/h)	382	289	208	1175	390	2
Future Volume (veh/h)	382	289	208	1175	390	2
Initial Q (Qb), veh	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00
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	415	314	226	1277	426	0
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	838	1086	951	2826	517	230
Arrive On Green	0.47	0.47	0.53	0.80	0.15	0.00
Sat Flow, veh/h	3647	2790	1781	3647	3563	1585
Grp Volume(v), veh/h	415	314	226	1277	426	0
Grp Sat Flow(s),veh/h/ln	1777	1395	1781	1777	1781	1585
Q Serve(g_s), s	14.2	10.8	11.9	20.2	20.4	0.0
Cycle Q Clear(g_c), s	14.2	10.8	11.9	20.2	20.4	0.0
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	838	1086	951	2826	517	230
V/C Ratio(X)	0.50	0.29	0.24	0.45	0.82	0.00
Avail Cap(c_a), veh/h	838	1086	951	2826	992	441
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.96	0.96	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	39.3	25.0	21.9	5.8	73.0	0.0
Incr Delay (d2), s/veh	2.0	0.6	0.0	0.5	4.7	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	9.2	7.3	8.6	10.6	14.9	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	41.3	25.6	21.9	6.3	77.8	0.0
LnGrp LOS	D	C	C	A	E	
Approach Vol, veh/h				1503	426	
Approach Delay, s/veh				8.6	77.8	
Approach LOS				A	E	
Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		144.5		31.5	98.5	46.0
Change Period (Y+Rc), s		6.0		6.0	6.0	* 6
Max Green Setting (Gmax), s		115.0		49.0	70.0	* 40
Max Q Clear Time (g_c+I1), s		22.2		22.4	13.9	16.2
Green Ext Time (p_c), s		21.4		3.1	0.3	6.9

Intersection Summary

HCM 7th Control Delay, s/veh	26.8
HCM 7th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.  
 \* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 7th Signalized Intersection Summary  
 2: Sand Canyon Road & Soledad Canyon Road

04/21/2026



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑	↗	↘	↑↑	↗	↘↗	↑	↗↘	↘↗	↑↗	
Traffic Volume (veh/h)	65	325	316	427	1053	97	260	137	230	117	127	121
Future Volume (veh/h)	65	325	316	427	1053	97	260	137	230	117	127	121
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width 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
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	71	353	343	464	1145	105	283	149	250	127	138	132
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	133	687	475	879	2197	1115	367	251	1775	265	192	169
Arrive On Green	0.12	0.32	0.32	0.99	1.00	1.00	0.11	0.13	0.13	0.08	0.11	0.10
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	3456	1870	2790	3456	1788	1576
Grp Volume(v), veh/h	71	353	343	464	1145	105	283	149	250	127	137	133
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	1728	1870	1395	1728	1777	1587
Q Serve(g_s), s	6.6	14.2	11.1	1.2	0.0	0.0	14.0	13.2	1.6	6.2	13.1	14.4
Cycle Q Clear(g_c), s	6.6	14.2	11.1	1.2	0.0	0.0	14.0	13.2	1.6	6.2	13.1	14.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Lane Grp Cap(c), veh/h	133	687	475	879	2197	1115	367	251	1775	265	191	170
V/C Ratio(X)	0.54	0.51	0.72	0.53	0.52	0.09	0.77	0.59	0.14	0.48	0.72	0.78
Avail Cap(c_a), veh/h	157	687	475	879	2197	1115	648	340	1908	422	222	198
HCM Platoon Ratio	1.67	1.67	1.67	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.83	0.83	0.83	0.89	0.89	0.89	1.00	1.00	1.00
Uniform Delay (d), s/veh	74.2	52.9	44.5	0.6	0.0	0.0	76.6	71.7	4.8	77.9	76.0	77.5
Incr Delay (d2), s/veh	1.2	2.7	9.2	0.2	0.7	0.1	1.2	0.7	0.0	1.9	10.4	17.3
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(95%),veh/ln	5.3	10.0	7.2	0.5	0.4	0.1	10.3	10.4	1.8	5.1	10.8	11.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	75.5	55.6	53.7	0.8	0.7	0.1	77.7	72.4	4.9	79.8	86.4	94.8
LnGrp LOS	E	E	D	A	A	A	E	E	A	E	F	F
Approach Vol, veh/h		767			1714			682			397	
Approach Delay, s/veh		56.6			0.7			49.9			87.1	
Approach LOS		E			A			D			F	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	92.4	38.0	22.7	22.9	17.6	112.8	18.0	27.6				
Change Period (Y+Rc), s	6.0	* 6	6.0	* 6	5.0	6.0	5.0	6.0				
Max Green Setting (Gmax), s	71.0	* 32	31.0	* 20	15.0	88.0	21.0	30.0				
Max Q Clear Time (g_c+I1), s	3.2	16.2	16.0	16.4	8.6	2.0	8.2	15.2				
Green Ext Time (p_c), s	0.6	5.3	0.7	0.5	0.0	19.6	0.5	1.0				

Intersection Summary												
HCM 7th Control Delay, s/veh			31.8									
HCM 7th LOS			C									

Notes  
 User approved pedestrian interval to be less than phase max green.  
 \* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 7th Signalized Intersection Summary  
 3: Sand Canyon Road & SR14 NB Ramp

04/21/2026

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	281	0	179	0	0	0	0	411	110	207	663	0
Future Volume (veh/h)	281	0	179	0	0	0	0	411	110	207	663	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	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
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870				0	1870	1870	1870	1870	0
Adj Flow Rate, veh/h	305	0	195				0	447	120	225	721	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2				0	2	2	2	2	0
Cap, veh/h	790	0	351				0	848	666	1145	1851	0
Arrive On Green	0.22	0.00	0.22				0.00	0.24	0.24	0.18	0.52	0.00
Sat Flow, veh/h	3563	0	1585				0	3647	2790	3456	3647	0
Grp Volume(v), veh/h	305	0	195				0	447	120	225	721	0
Grp Sat Flow(s),veh/h/ln	1781	0	1585				0	1777	1395	1728	1777	0
Q Serve(g_s), s	3.3	0.0	4.9				0.0	4.9	1.5	1.7	5.5	0.0
Cycle Q Clear(g_c), s	3.3	0.0	4.9				0.0	4.9	1.5	1.7	5.5	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	790	0	351				0	848	666	1145	1851	0
V/C Ratio(X)	0.39	0.00	0.56				0.00	0.53	0.18	0.20	0.39	0.00
Avail Cap(c_a), veh/h	2658	0	1183				0	3456	2713	1168	4482	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	14.9	0.0	15.6				0.0	14.9	13.6	7.6	6.5	0.0
Incr Delay (d2), s/veh	0.3	0.0	1.4				0.0	0.5	0.1	0.1	0.1	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	2.1	0.0	0.2				0.0	3.2	0.8	0.9	2.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	15.2	0.0	16.9				0.0	15.4	13.8	7.7	6.6	0.0
LnGrp LOS	B		B					B	B	A	A	
Approach Vol, veh/h		500						567			946	
Approach Delay, s/veh		15.9						15.1			6.9	
Approach LOS		B						B			A	
Timer - Assigned Phs		2		4	5	6						
Phs Duration (G+Y+Rc), s		29.7		15.4	12.7	17.0						
Change Period (Y+Rc), s		6.2		5.4	4.7	6.2						
Max Green Setting (Gmax), s		56.8		33.6	8.3	43.8						
Max Q Clear Time (g_c+I1), s		7.5		6.9	3.7	6.9						
Green Ext Time (p_c), s		6.0		1.8	0.3	3.8						
<b>Intersection Summary</b>												
HCM 7th Control Delay, s/veh			11.4									
HCM 7th LOS			B									
<b>Notes</b>												
User approved volume balancing among the lanes for turning movement.												

HCM 7th Signalized Intersection Summary  
 1: SR 14 SB Ramp & Soledad Canyon Road

04/21/2026



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑↑	↑	↑↑	↑↑	↑
Traffic Volume (veh/h)	1160	458	148	486	330	1
Future Volume (veh/h)	1160	458	148	486	330	1
Initial Q (Qb), veh	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00
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	1261	498	161	528	360	0
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	2442	2288	194	2898	444	198
Arrive On Green	1.00	1.00	0.11	0.82	0.12	0.00
Sat Flow, veh/h	3647	2790	1781	3647	3563	1585
Grp Volume(v), veh/h	1261	498	161	528	360	0
Grp Sat Flow(s),veh/h/ln	1777	1395	1781	1777	1781	1585
Q Serve(g_s), s	0.0	0.0	15.6	5.7	17.3	0.0
Cycle Q Clear(g_c), s	0.0	0.0	15.6	5.7	17.3	0.0
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	2442	2288	194	2898	444	198
V/C Ratio(X)	0.52	0.22	0.83	0.18	0.81	0.00
Avail Cap(c_a), veh/h	2442	2288	218	2898	992	441
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.80	0.80	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	76.9	3.5	75.0	0.0
Incr Delay (d2), s/veh	0.6	0.2	19.1	0.1	5.0	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.4	0.1	12.7	3.0	13.0	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	0.6	0.2	96.0	3.7	80.0	0.0
LnGrp LOS	A	A	F	A	F	
Approach Vol, veh/h	1759			689	360	
Approach Delay, s/veh	0.5			25.2	80.0	
Approach LOS	A			C	F	
Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		148.1		27.9	22.6	125.4
Change Period (Y+Rc), s		6.0		6.0	5.0	6.0
Max Green Setting (Gmax), s		115.0		49.0	20.0	90.0
Max Q Clear Time (g_c+I1), s		7.7		19.3	17.6	2.0
Green Ext Time (p_c), s		5.7		2.6	0.0	36.3
<b>Intersection Summary</b>						
HCM 7th Control Delay, s/veh			16.8			
HCM 7th LOS			B			
<b>Notes</b>						
User approved volume balancing among the lanes for turning movement.						

HCM 7th Signalized Intersection Summary  
 2: Sand Canyon Road & Soledad Canyon Road

04/21/2026



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑	↗	↘	↑↑	↗	↘↗	↑	↗↘	↘↗	↑↗	
Traffic Volume (veh/h)	137	835	327	196	550	70	263	167	573	167	100	77
Future Volume (veh/h)	137	835	327	196	550	70	263	167	573	167	100	77
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width 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
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	149	908	355	213	598	76	286	182	623	182	109	84
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	171	1312	782	575	2139	1089	428	241	1284	265	167	119
Arrive On Green	0.19	0.74	0.74	0.11	0.20	0.20	0.12	0.13	0.13	0.08	0.08	0.07
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	3456	1870	2790	3456	1984	1410
Grp Volume(v), veh/h	149	908	355	213	598	76	286	182	623	182	97	96
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	1728	1870	1395	1728	1777	1617
Q Serve(g_s), s	14.3	24.0	0.0	19.6	25.1	5.4	13.9	16.5	4.6	9.0	9.3	10.2
Cycle Q Clear(g_c), s	14.3	24.0	0.0	19.6	25.1	5.4	13.9	16.5	4.6	9.0	9.3	10.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.87
Lane Grp Cap(c), veh/h	171	1312	782	575	2139	1089	428	241	1284	265	150	136
V/C Ratio(X)	0.87	0.69	0.45	0.37	0.28	0.07	0.67	0.76	0.49	0.69	0.65	0.71
Avail Cap(c_a), veh/h	410	1312	782	575	2139	1089	648	340	1432	422	222	202
HCM Platoon Ratio	2.00	2.00	2.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.92	0.92	0.92	0.74	0.74	0.74	1.00	1.00	1.00
Uniform Delay (d), s/veh	70.0	17.6	10.3	62.0	38.2	19.0	73.6	74.0	17.4	79.2	78.0	79.3
Incr Delay (d2), s/veh	5.2	3.0	1.9	0.1	0.3	0.1	0.5	2.4	0.1	4.4	6.5	9.2
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(95%),veh/ln	10.1	10.3	7.1	14.3	17.6	3.8	9.8	12.2	9.9	7.6	8.0	8.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	75.2	20.7	12.2	62.1	38.5	19.2	74.1	76.4	17.4	83.6	84.5	88.5
LnGrp LOS	E	C	B	E	D	B	E	E	B	F	F	F
Approach Vol, veh/h		1412			887			1091			375	
Approach Delay, s/veh		24.3			42.5			42.1			85.1	
Approach LOS		C			D			D			F	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	62.3	69.0	25.8	18.8	21.4	109.9	18.0	26.7				
Change Period (Y+Rc), s	6.0	* 6	6.0	* 6	5.0	6.0	5.0	6.0				
Max Green Setting (Gmax), s	40.0	* 63	31.0	* 20	40.0	63.0	21.0	30.0				
Max Q Clear Time (g_c+I1), s	21.6	26.0	15.9	12.2	16.3	27.1	11.0	18.5				
Green Ext Time (p_c), s	0.2	15.5	0.7	0.6	0.2	7.0	0.7	2.1				





















Intersection Summary												
HCM 7th Control Delay, s/veh											39.8	
HCM 7th LOS											D	

Notes  
 User approved pedestrian interval to be less than phase max green.  
 \* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.

# HCM 7th Signalized Intersection Summary

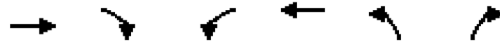
## 3: Sand Canyon Road & SR14 NB Ramp

04/21/2026

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	649	13	300	0	0	0	0	672	284	226	466	0
Future Volume (veh/h)	649	13	300	0	0	0	0	672	284	226	466	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	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
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870				0	1870	1870	1870	1870	0
Adj Flow Rate, veh/h	715	0	326				0	730	309	246	507	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2				0	2	2	2	2	0
Cap, veh/h	1006	0	448				0	1156	908	838	1885	0
Arrive On Green	0.28	0.00	0.28				0.00	0.33	0.33	0.13	0.53	0.00
Sat Flow, veh/h	3563	0	1585				0	3647	2790	3456	3647	0
Grp Volume(v), veh/h	715	0	326				0	730	309	246	507	0
Grp Sat Flow(s),veh/h/ln	1781	0	1585				0	1777	1395	1728	1777	0
Q Serve(g_s), s	11.2	0.0	11.5				0.0	10.8	5.2	2.4	4.8	0.0
Cycle Q Clear(g_c), s	11.2	0.0	11.5				0.0	10.8	5.2	2.4	4.8	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	1006	0	448				0	1156	908	838	1885	0
V/C Ratio(X)	0.71	0.00	0.73				0.00	0.63	0.34	0.29	0.27	0.00
Avail Cap(c_a), veh/h	1932	0	860				0	2512	1972	854	3258	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	20.0	0.0	20.1				0.0	17.7	15.9	10.5	8.0	0.0
Incr Delay (d2), s/veh	0.9	0.0	2.3				0.0	0.6	0.2	0.2	0.1	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	7.8	0.0	15.1				0.0	7.4	2.8	1.4	2.8	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	20.9	0.0	22.4				0.0	18.3	16.1	10.7	8.0	0.0
LnGrp LOS	C		C					B	B	B	A	
Approach Vol, veh/h		1041						1039			753	
Approach Delay, s/veh		21.4						17.7			8.9	
Approach LOS		C						B			A	
Timer - Assigned Phs		2		4	5	6						
Phs Duration (G+Y+Rc), s		39.1		22.9	12.7	26.4						
Change Period (Y+Rc), s		6.2		5.4	4.7	6.2						
Max Green Setting (Gmax), s		56.8		33.6	8.3	43.8						
Max Q Clear Time (g_c+I1), s		6.8		13.5	4.4	12.8						
Green Ext Time (p_c), s		3.9		4.0	0.3	7.4						
<b>Intersection Summary</b>												
HCM 7th Control Delay, s/veh			16.7									
HCM 7th LOS			B									
<b>Notes</b>												
User approved volume balancing among the lanes for turning movement.												

HCM 7th Signalized Intersection Summary  
 1: SR 14 SB Ramp & Soledad Canyon Road

04/21/2026



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑↑	↑	↑↑	↑↑	↑↑
Traffic Volume (veh/h)	462	384	250	1378	583	5
Future Volume (veh/h)	462	384	250	1378	583	5
Initial Q (Qb), veh	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00
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	502	417	272	1498	639	0
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	838	1263	838	2602	742	330
Arrive On Green	0.47	0.47	0.47	0.73	0.21	0.00
Sat Flow, veh/h	3647	2790	1781	3647	3563	1585
Grp Volume(v), veh/h	502	417	272	1498	639	0
Grp Sat Flow(s),veh/h/ln	1777	1395	1781	1777	1781	1585
Q Serve(g_s), s	18.3	14.2	16.8	34.4	30.5	0.0
Cycle Q Clear(g_c), s	18.3	14.2	16.8	34.4	30.5	0.0
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	838	1263	838	2602	742	330
V/C Ratio(X)	0.60	0.33	0.32	0.58	0.86	0.00
Avail Cap(c_a), veh/h	838	1263	838	2602	992	441
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.90	0.90	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	40.4	20.9	29.1	10.9	67.2	0.0
Incr Delay (d2), s/veh	2.8	0.6	0.1	0.9	6.9	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	10.8	9.2	11.5	18.2	20.9	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	43.2	21.6	29.2	11.9	74.1	0.0
LnGrp LOS	D	C	C	B	E	
Approach Vol, veh/h				1770	639	
Approach Delay, s/veh				14.5	74.1	
Approach LOS				B	E	
Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		133.3		42.7	87.3	46.0
Change Period (Y+Rc), s		6.0		6.0	6.0	* 6
Max Green Setting (Gmax), s		115.0		49.0	70.0	* 40
Max Q Clear Time (g_c+I1), s		36.4		32.5	18.8	20.3
Green Ext Time (p_c), s		28.6		4.2	0.3	8.1

Intersection Summary































HCM 7th Control Delay, s/veh	31.2
HCM 7th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.  
 \* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 7th Signalized Intersection Summary  
 2: Sand Canyon Road & Soledad Canyon Road

04/21/2026

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 		 		 	 	 	
Traffic Volume (veh/h)	89	414	413	546	1311	117	377	174	275	158	161	164
Future Volume (veh/h)	89	414	413	546	1311	117	377	174	275	158	161	164
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width 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
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	97	450	449	593	1425	127	410	189	299	172	175	178
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	135	687	533	783	1999	1027	493	352	1775	265	222	198
Arrive On Green	0.13	0.32	0.32	0.88	1.00	1.00	0.14	0.19	0.19	0.08	0.13	0.11
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	3456	1870	2790	3456	1777	1585
Grp Volume(v), veh/h	97	450	449	593	1425	127	410	189	299	172	175	178
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	1728	1870	1395	1728	1777	1585
Q Serve(g_s), s	9.2	19.1	16.4	21.2	0.0	0.0	20.3	16.1	1.9	8.5	16.8	19.5
Cycle Q Clear(g_c), s	9.2	19.1	16.4	21.2	0.0	0.0	20.3	16.1	1.9	8.5	16.8	19.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	135	687	533	783	1999	1027	493	352	1775	265	222	198
V/C Ratio(X)	0.72	0.66	0.84	0.76	0.71	0.12	0.83	0.54	0.17	0.65	0.79	0.90
Avail Cap(c_a), veh/h	157	687	533	783	1999	1027	648	352	1775	422	222	198
HCM Platoon Ratio	1.67	1.67	1.67	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.70	0.70	0.70	0.84	0.84	0.84	1.00	1.00	1.00
Uniform Delay (d), s/veh	75.0	54.6	43.2	7.2	0.0	0.0	73.4	64.5	4.9	78.9	74.7	76.9
Incr Delay (d2), s/veh	9.3	4.8	15.0	2.7	1.5	0.2	4.6	0.7	0.0	3.8	17.9	37.8
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(95%),veh/ln	7.8	12.8	9.7	6.5	0.8	0.1	14.0	12.0	2.1	7.1	13.7	15.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	84.3	59.4	58.2	9.9	1.5	0.2	78.0	65.2	5.0	82.7	92.6	114.7
LnGrp LOS	F	E	E	A	A	A	E	E	A	F	F	F
Approach Vol, veh/h		996			2145			898			525	
Approach Delay, s/veh		61.3			3.8			51.0			96.9	
Approach LOS		E			A			D			F	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	82.9	38.0	29.1	26.0	17.9	103.0	18.0	37.1				
Change Period (Y+Rc), s	6.0	* 6	6.0	* 6	5.0	6.0	5.0	6.0				
Max Green Setting (Gmax), s	71.0	* 32	31.0	* 20	15.0	88.0	21.0	30.0				
Max Q Clear Time (g_c+I1), s	23.2	21.1	22.3	21.5	11.2	2.0	10.5	18.1				
Green Ext Time (p_c), s	0.8	5.5	0.8	0.0	0.0	29.9	0.7	1.1				
<b>Intersection Summary</b>												
HCM 7th Control Delay, s/veh			36.3									
HCM 7th LOS			D									
<b>Notes</b>												
User approved pedestrian interval to be less than phase max green.												
* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.												

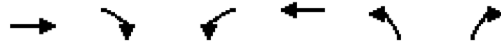
HCM 7th Signalized Intersection Summary  
 3: Sand Canyon Road & SR14 NB Ramp

04/21/2026

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	422	0	216	0	0	0	0	478	148	297	823	0
Future Volume (veh/h)	422	0	216	0	0	0	0	478	148	297	823	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	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
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870				0	1870	1870	1870	1870	0
Adj Flow Rate, veh/h	459	0	235				0	520	161	323	895	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2				0	2	2	2	2	0
Cap, veh/h	817	0	363				0	940	738	1080	1880	0
Arrive On Green	0.23	0.00	0.23				0.00	0.26	0.26	0.17	0.53	0.00
Sat Flow, veh/h	3563	0	1585				0	3647	2790	3456	3647	0
Grp Volume(v), veh/h	459	0	235				0	520	161	323	895	0
Grp Sat Flow(s),veh/h/ln	1781	0	1585				0	1777	1395	1728	1777	0
Q Serve(g_s), s	5.5	0.0	6.4				0.0	6.1	2.2	2.6	7.6	0.0
Cycle Q Clear(g_c), s	5.5	0.0	6.4				0.0	6.1	2.2	2.6	7.6	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	817	0	363				0	940	738	1080	1880	0
V/C Ratio(X)	0.56	0.00	0.65				0.00	0.55	0.22	0.30	0.48	0.00
Avail Cap(c_a), veh/h	2494	0	1110				0	3243	2546	1102	4206	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	16.4	0.0	16.7				0.0	15.2	13.8	8.2	7.1	0.0
Incr Delay (d2), s/veh	0.6	0.0	1.9				0.0	0.5	0.1	0.2	0.2	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	3.6	0.0	9.7				0.0	3.9	1.1	1.4	3.8	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	17.0	0.0	18.7				0.0	15.7	13.9	8.4	7.3	0.0
LnGrp LOS	B		B					B	B	A	A	
Approach Vol, veh/h		694						681			1218	
Approach Delay, s/veh		17.6						15.3			7.6	
Approach LOS		B						B			A	
Timer - Assigned Phs		2		4	5	6						
Phs Duration (G+Y+Rc), s		31.6		16.4	12.7	18.9						
Change Period (Y+Rc), s		6.2		5.4	4.7	6.2						
Max Green Setting (Gmax), s		56.8		33.6	8.3	43.8						
Max Q Clear Time (g_c+I1), s		9.6		8.4	4.6	8.1						
Green Ext Time (p_c), s		8.0		2.6	0.4	4.6						
<b>Intersection Summary</b>												
HCM 7th Control Delay, s/veh			12.3									
HCM 7th LOS			B									
<b>Notes</b>												
User approved volume balancing among the lanes for turning movement.												

HCM 7th Signalized Intersection Summary  
 1: SR 14 SB Ramp & Soledad Canyon Road

04/21/2026



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑↑	↑	↑↑	↑↑	
Traffic Volume (veh/h)	1383	657	184	591	498	8
Future Volume (veh/h)	1383	657	184	591	498	8
Initial Q (Qb), veh	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00
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	1503	714	200	642	549	0
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	2189	2251	218	2694	650	289
Arrive On Green	0.62	0.62	0.12	0.76	0.18	0.00
Sat Flow, veh/h	3647	2790	1781	3647	3563	1585
Grp Volume(v), veh/h	1503	714	200	642	549	0
Grp Sat Flow(s),veh/h/ln	1777	1395	1781	1777	1781	1585
Q Serve(g_s), s	49.5	11.7	19.5	9.4	26.2	0.0
Cycle Q Clear(g_c), s	49.5	11.7	19.5	9.4	26.2	0.0
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	2189	2251	218	2694	650	289
V/C Ratio(X)	0.69	0.32	0.92	0.24	0.85	0.00
Avail Cap(c_a), veh/h	2189	2251	218	2694	992	441
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.59	0.59	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	22.5	4.4	76.4	6.3	69.6	0.0
Incr Delay (d2), s/veh	1.1	0.2	38.8	0.2	5.4	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	25.4	10.6	16.6	5.8	18.3	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	23.5	4.6	115.1	6.5	74.9	0.0
LnGrp LOS	C	A	F	A	E	
Approach Vol, veh/h	2217			842	549	
Approach Delay, s/veh	17.5			32.3	74.9	
Approach LOS	B			C	E	
Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		137.9		38.1	25.0	112.9
Change Period (Y+Rc), s		6.0		6.0	5.0	6.0
Max Green Setting (Gmax), s		115.0		49.0	20.0	90.0
Max Q Clear Time (g_c+I1), s		11.4		28.2	21.5	51.5
Green Ext Time (p_c), s		7.2		3.9	0.0	30.4

Intersection Summary

HCM 7th Control Delay, s/veh	29.7
HCM 7th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

HCM 7th Signalized Intersection Summary  
 2: Sand Canyon Road & Soledad Canyon Road

04/21/2026



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑	↗	↘	↑↑	↗	↘↗	↑	↗↘	↘↗	↑↗	
Traffic Volume (veh/h)	189	1081	483	270	725	94	355	232	688	221	130	111
Future Volume (veh/h)	189	1081	483	270	725	94	355	232	688	221	130	111
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width 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
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	205	1175	525	293	788	102	386	252	748	240	141	121
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	226	1312	820	497	1872	986	511	304	1255	300	197	157
Arrive On Green	0.25	0.74	0.74	0.09	0.17	0.17	0.15	0.16	0.16	0.09	0.10	0.09
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	3456	1870	2790	3456	1881	1497
Grp Volume(v), veh/h	205	1175	525	293	788	102	386	252	748	240	133	129
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	1728	1870	1395	1728	1777	1601
Q Serve(g_s), s	19.6	44.9	0.0	27.8	34.8	7.6	18.9	22.9	6.5	12.0	12.7	13.9
Cycle Q Clear(g_c), s	19.6	44.9	0.0	27.8	34.8	7.6	18.9	22.9	6.5	12.0	12.7	13.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.93
Lane Grp Cap(c), veh/h	226	1312	820	497	1872	986	511	304	1255	300	186	168
V/C Ratio(X)	0.91	0.90	0.64	0.59	0.42	0.10	0.76	0.83	0.60	0.80	0.71	0.77
Avail Cap(c_a), veh/h	410	1312	820	497	1872	986	648	340	1309	422	222	200
HCM Platoon Ratio	2.00	2.00	2.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.87	0.87	0.87	0.63	0.63	0.63	1.00	1.00	1.00
Uniform Delay (d), s/veh	64.6	20.4	9.9	70.3	48.8	24.4	72.0	71.3	18.7	78.8	76.2	77.7
Incr Delay (d2), s/veh	5.5	9.7	3.8	1.1	0.6	0.2	1.7	8.5	0.3	8.8	9.8	16.0
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(95%),veh/ln	12.7	16.2	10.1	19.1	23.1	5.7	12.4	16.3	11.8	9.7	10.5	10.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	70.1	30.1	13.7	71.4	49.4	24.6	73.7	79.7	18.9	87.6	86.1	93.7
LnGrp LOS	E	C	B	E	D	C	E	E	B	F	F	F
Approach Vol, veh/h		1905			1183			1386			502	
Approach Delay, s/veh		29.9			52.7			45.2			88.8	
Approach LOS		C			D			D			F	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	54.6	69.0	30.0	22.4	26.8	96.7	19.8	32.6				
Change Period (Y+Rc), s	6.0	* 6	6.0	* 6	5.0	6.0	5.0	6.0				
Max Green Setting (Gmax), s	40.0	* 63	31.0	* 20	40.0	63.0	21.0	30.0				
Max Q Clear Time (g_c+I1), s	29.8	46.9	20.9	15.9	21.6	36.8	14.0	24.9				
Green Ext Time (p_c), s	0.3	12.4	0.8	0.5	0.2	8.9	0.8	1.7				

Intersection Summary												
HCM 7th Control Delay, s/veh			45.5									
HCM 7th LOS			D									

Notes  
 User approved pedestrian interval to be less than phase max green.  
 \* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 7th Signalized Intersection Summary  
 3: Sand Canyon Road & SR14 NB Ramp

04/21/2026



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	844	15	348	0	0	0	0	795	381	382	580	0
Future Volume (veh/h)	844	15	348	0	0	0	0	795	381	382	580	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	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
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870				0	1870	1870	1870	1870	0
Adj Flow Rate, veh/h	928	0	378				0	864	414	415	630	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2				0	2	2	2	2	0
Cap, veh/h	1158	0	515				0	1255	985	679	1852	0
Arrive On Green	0.33	0.00	0.33				0.00	0.35	0.35	0.11	0.52	0.00
Sat Flow, veh/h	3563	0	1585				0	3647	2790	3456	3647	0
Grp Volume(v), veh/h	928	0	378				0	864	414	415	630	0
Grp Sat Flow(s),veh/h/ln	1781	0	1585				0	1777	1395	1728	1777	0
Q Serve(g_s), s	18.0	0.0	16.0				0.0	15.7	8.5	5.3	7.8	0.0
Cycle Q Clear(g_c), s	18.0	0.0	16.0				0.0	15.7	8.5	5.3	7.8	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	1158	0	515				0	1255	985	679	1852	0
V/C Ratio(X)	0.80	0.00	0.73				0.00	0.69	0.42	0.61	0.34	0.00
Avail Cap(c_a), veh/h	1585	0	705				0	2061	1618	692	2673	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	23.3	0.0	22.6				0.0	20.9	18.6	15.2	10.5	0.0
Incr Delay (d2), s/veh	2.1	0.0	2.6				0.0	0.7	0.3	1.5	0.1	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	11.9	0.0	0.7				0.0	10.3	4.7	3.6	5.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	25.4	0.0	25.1				0.0	21.6	18.8	16.7	10.6	0.0
LnGrp LOS	C		C					C	B	B	B	
Approach Vol, veh/h		1306						1278			1045	
Approach Delay, s/veh		25.3						20.7			13.0	
Approach LOS		C						C			B	
Timer - Assigned Phs		2		4	5	6						
Phs Duration (G+Y+Rc), s		45.6		30.0	12.7	32.9						
Change Period (Y+Rc), s		6.2		5.4	4.7	6.2						
Max Green Setting (Gmax), s		56.8		33.6	8.3	43.8						
Max Q Clear Time (g_c+I1), s		9.8		20.0	7.3	17.7						
Green Ext Time (p_c), s		5.0		4.6	0.2	9.0						

Intersection Summary		
HCM 7th Control Delay, s/veh		20.2
HCM 7th LOS		C

Notes  
 User approved volume balancing among the lanes for turning movement.

***Appendix H***

***Roundabout Analysis Worksheets***

**Table 1 Roundabout LOS Analysis Summary for Sand Canyon Road at Lost Canyon Road for Proposed Belcaro Project**

Average Vehicle Delay and LOS by Movement													
Scenario	SBL	SBT	SBR	WBL	WBT	WBR	NBL	NBT	NBR	EBL	EBT	EBR	Average (delay/LOS)
Weekday AM Peak Hour – Existing (2025) Conditions													
LOS	9.9	4.5	4.6	11.8	6.4	6.2	10.8	5.4	5.2	12.3	7.1	6.8	6.0
Delay	A	A	A	B	A	A	B	A	A	B	A	A	A
Volume	26	477	269	5	5	22	38	202	4	148	1	55	--
Weekday PM Peak Hour – Existing (2025) Conditions													
LOS	9.7	4.3	4.4	13.6	8.2	8.0	11.4	6.0	5.8	10.3	5.1	4.8	6.4
Delay	A	A	A	B	A	A	B	A	A	B	A	A	A
Volume	33	233	131	6	3	34	16	427	8	168	7	21	--
Weekday AM Peak Hour – Existing (2025) with Project Conditions													
LOS	10.0	4.6	4.6	11.9	6.5	6.3	11.0	5.6	5.4	12.6	7.3	7.1	6.3
Delay	A	A	A	B	A	A	B	A	A	B	A	A	A
Volume	52	477	269	5	14	72	38	202	4	148	5	55	--
Weekday PM Peak Hour – Existing (2025) with Project Conditions													
LOS	9.8	4.4	4.5	13.8	8.4	8.2	12.0	6.6	6.4	10.8	5.6	5.3	6.9
Delay	A	A	A	B	A	A	B	A	A	B	A	A	A
Volume	90	233	131	6	10	70	16	427	8	168	18	21	--
Weekday AM Peak Hour – Future (2032) Conditions without Project													
LOS	10.0	4.6	4.7	12.4	7.0	6.9	11.2	5.8	5.6	13.8	8.5	8.3	6.4
Delay	A	A	A	B	A	A	B	A	A	B	A	A	A
Volume	30	585	348	6	6	25	43	247	5	190	1	63	--
Weekday PM Peak Hour – Future (2032) Conditions without Project													
LOS	9.7	4.3	4.4	15.8	10.4	10.2	13.2	7.8	7.6	11.0	5.8	5.5	7.4
Delay	A	A	A	B	B	B	B	A	A	B	A	A	A
Volume	38	295	182	7	3	39	18	527	9	243	8	24	--



**Table 1 Roundabout LOS Analysis Summary for Sand Canyon Road at Lost Canyon Road for Proposed Belcaro Project**

<b>Average Vehicle Delay and LOS by Movement</b>													
<b>Scenario</b>	<b>SBL</b>	<b>SBT</b>	<b>SBR</b>	<b>WBL</b>	<b>WBT</b>	<b>WBR</b>	<b>NBL</b>	<b>NBT</b>	<b>NBR</b>	<b>EBL</b>	<b>EBT</b>	<b>EBR</b>	<b>Average (delay/LOS)</b>
Weekday AM Peak Hour – Future (2032) Conditions with Project													
LOS	10.1	4.7	4.7	12.7	7.3	7.1	11.4	6.0	5.8	14.2	9.0	8.7	6.7
Delay	B	A	A	B	A	A	B	A	A	B	A	A	A
Volume	56	585	348	6	15	75	43	247	5	190	5	63	--
Weekday PM Peak Hour – Future (2032) Conditions with Project													
LOS	9.8	4.4	4.5	16.1	10.7	10.5	14.9	9.5	9.3	11.6	6.3	6.0	8.3
Delay	A	A	A	B	B	B	B	A	A	B	A	A	A
Volume	95	295	182	7	10	75	18	527	9	243	19	24	--
(delay in seconds per vehicle / corresponding LOS)													



# MOVEMENT FLOWS FOR SITE (INPUT)

Approach movement input flow rates by movement class (vehicles per 60 mins)

Site: [4a] AM Peak Hour (2025 Existing without Project Conditions)

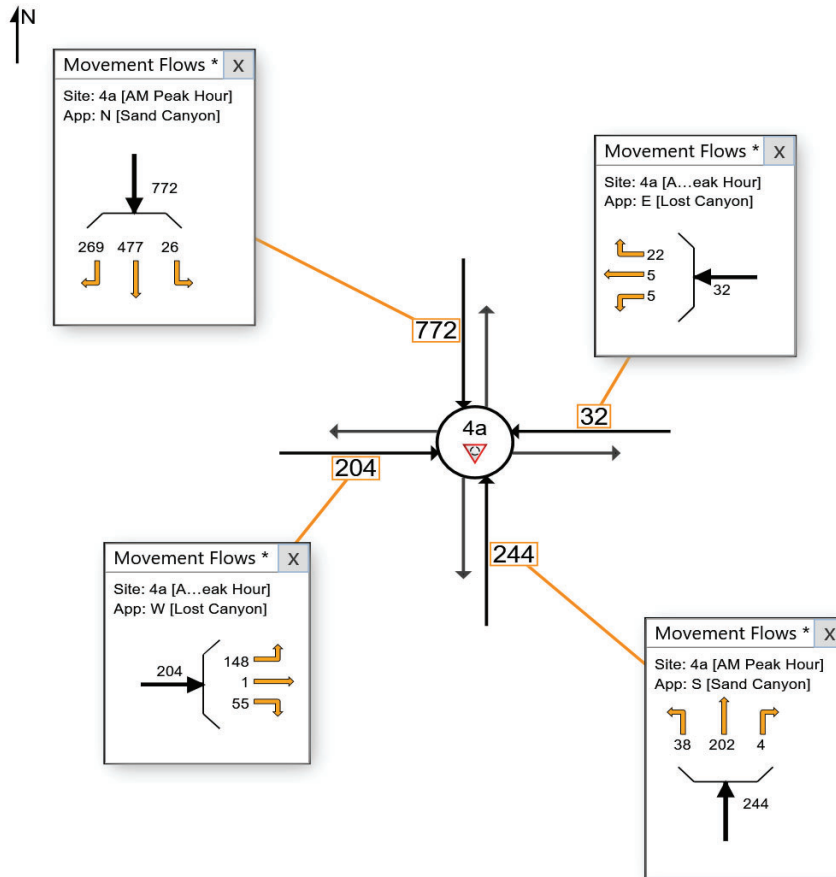
Output produced by SIDRA INTERSECTION Version: 10.0.5.217

Weekday AM Peak Hour  
 Site Category: (None)  
 Roundabout  
 Site Scenario: 1 | Local Volumes

Use the button below to open or close all popup boxes. Click value labels to open selected ones. Click and drag popup boxes to move to preferred positions.

Close All Popups

## All Movement Classes (\*)



# LANE LEVEL OF SERVICE

Lane Level of Service

**Site: [4a] AM Peak Hour** (2025 Existing without Project Conditions)

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

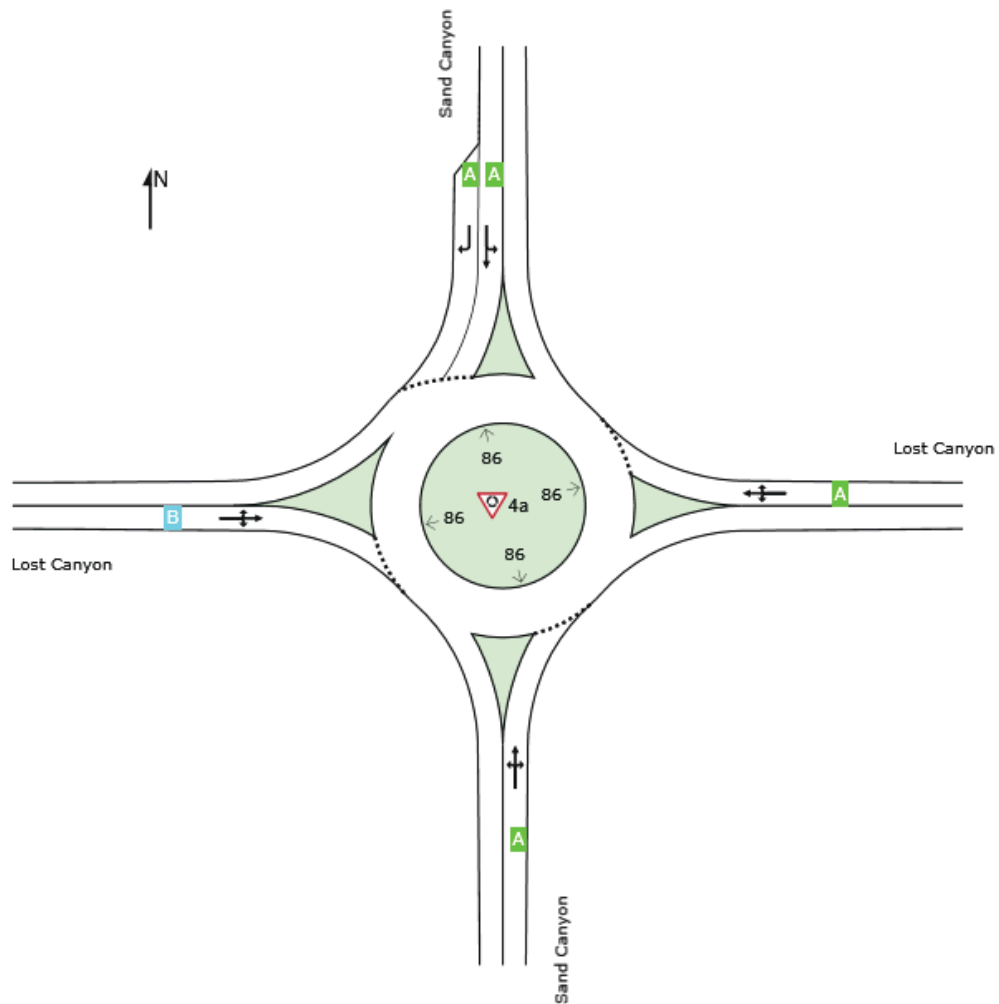
Weekday AM Peak Hour

Site Category: (None)

Roundabout

Site Scenario: 1 | Local Volumes

LOS	Approaches				Intersection
	South	East	North	West	
LOS	A	A	A	B	A



Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Roundabout LOS Method: SIDRA Roundabout LOS.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

# MOVEMENT SUMMARY

Site: [4a] AM Peak Hour (2025 Existing without Project Conditions)

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

Weekday AM Peak Hour

Site Category: (None)

Roundabout

Site Scenario: 1 | Local Volumes

Vehicle Movement Performance													
Move	Turn	Demand	Arrival	Deg.	Aver.	Delay	Level of	95% Back Of	Prop.	Eff.	Number	Aver.	Speed
ID	Class	Flows	Flows	Satn	Delay	Service	Queue	Queue	Queued	Stop of Cycles	Rate to Depart	Rate to Depart	mph
		[ Total HV ]	[ Total HV ]	%	v/c	veh.	ft	veh.	ft				

South: Sand Canyon														
3	L2	All MCS	41	2.0	41	2.0	0.240	10.8	LOS B	1.5	37.8	0.44	0.51	19.1
8	T1	All MCS	220	2.0	220	2.0	0.240	5.4	LOS A	1.5	37.8	0.44	0.51	32.0
18	R2	All MCS	4	2.0	4	2.0	0.240	5.2	LOS A	1.5	37.8	0.44	0.51	30.3
Approach														
			265	2.0	265	2.0	0.240	6.2	LOS A	1.5	37.8	0.44	0.51	29.9
East: Lost Canyon														
1	L2	All MCS	5	2.0	5	2.0	0.038	11.8	LOS B	0.2	4.9	0.53	0.59	29.6
6	T1	All MCS	5	2.0	5	2.0	0.038	6.4	LOS A	0.2	4.9	0.53	0.59	17.7
16	R2	All MCS	24	2.0	24	2.0	0.038	6.2	LOS A	0.2	4.9	0.53	0.59	30.9
Approach														
			35	2.0	35	2.0	0.038	7.1	LOS A	0.2	4.9	0.53	0.59	28.7
North: Sand Canyon														
7	L2	All MCS	28	2.0	28	2.0	0.364	9.9	LOS A	2.6	66.3	0.23	0.40	31.7
4	T1	All MCS	518	2.0	518	2.0	0.364	4.5	LOS A	2.6	66.3	0.23	0.40	33.2
14	R2	All MCS	292	2.0	292	2.0	0.233	4.6	LOS A	1.4	36.1	0.22	0.46	30.9
Approach														
			839	2.0	839	2.0	0.364	4.7	LOS A	2.6	66.3	0.23	0.42	32.5
West: Lost Canyon														
5	L2	All MCS	161	2.0	161	2.0	0.266	12.3	LOS B	1.6	40.3	0.67	0.71	26.1
2	T1	All MCS	1	2.0	1	2.0	0.266	7.1	LOS A	1.6	40.3	0.67	0.71	24.3
12	R2	All MCS	60	2.0	60	2.0	0.266	6.8	LOS A	1.6	40.3	0.67	0.71	25.4
Approach														
			222	2.0	222	2.0	0.266	10.8	LOS B	1.6	40.3	0.67	0.71	25.9
All Vehicles														
			1361	2.0	1361	2.0	0.364	6.0	LOS A	2.6	66.3	0.35	0.49	30.8

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).  
 Roundabout LOS Method: SIDRA Roundabout LOS.  
 Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.  
 LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).  
 Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).  
 Roundabout Capacity Model: SIDRA HCM.  
 Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).  
 Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.  
 Gap-Acceptance Capacity Formula: SIDRA Standard (Akgeilik M3D).  
 HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.  
 Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

## MOVEMENT FLOWS FOR SITE (INPUT)

Approach movement input flow rates by movement class (vehicles per 60 mins)

 Site: [4b] PM Peak Hour (2025 Existing without Project Conditions)

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

Weekday PM Peak Hour

Site Category: (None)

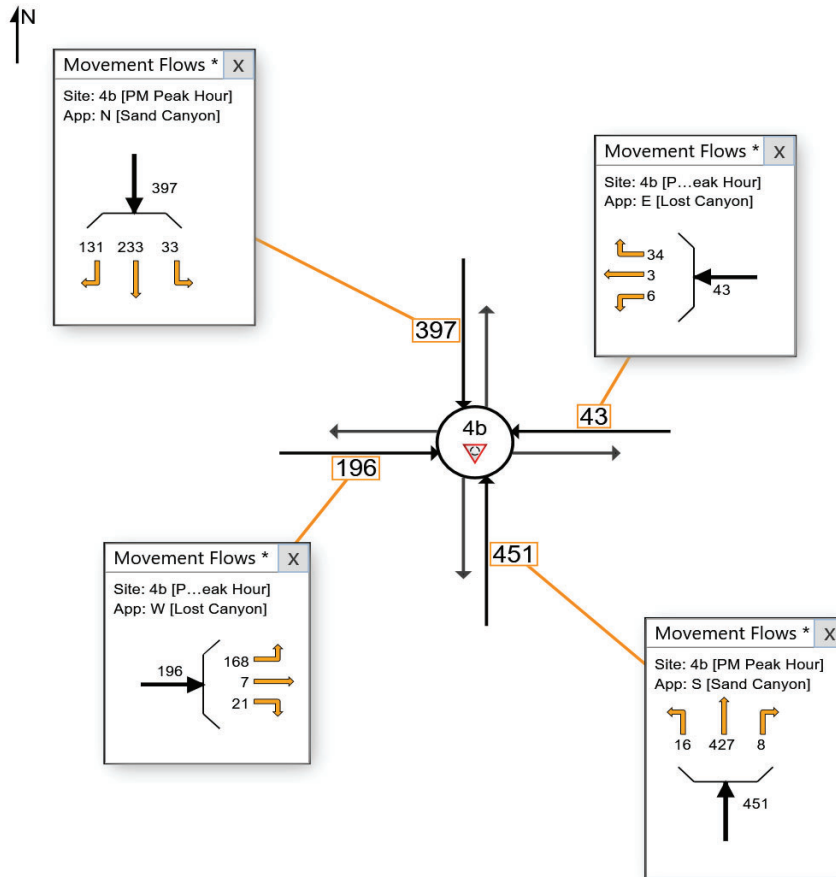
Roundabout

Site Scenario: 1 | Local Volumes

Use the button below to open or close all popup boxes. Click value labels to open selected ones. Click and drag popup boxes to move to preferred positions.

Close All Popups

### All Movement Classes (\*)



# LANE LEVEL OF SERVICE

Lane Level of Service

**Site: [4b] PM Peak Hour** (2025 Existing without Project Conditions)

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

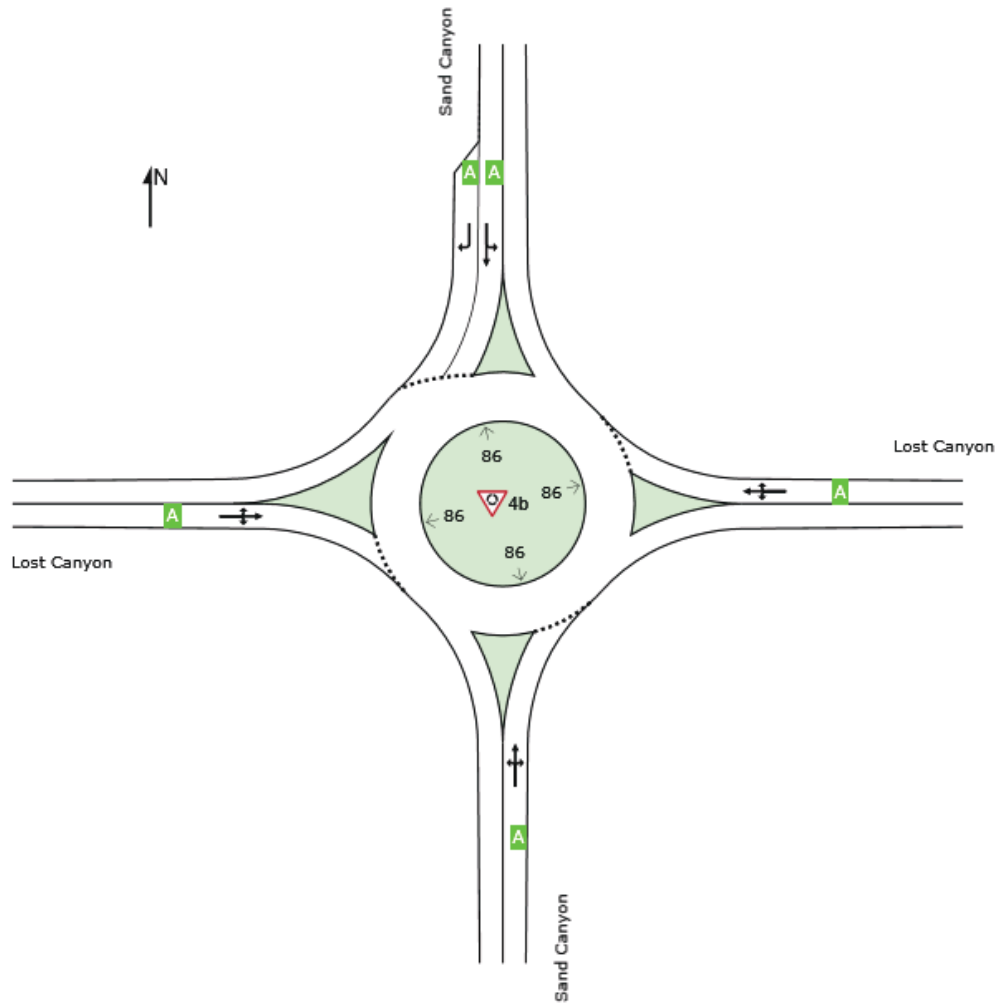
Weekday PM Peak Hour

Site Category: (None)

Roundabout

Site Scenario: 1 | Local Volumes

LOS	Approaches				Intersection
	South	East	North	West	
LOS	A	A	A	A	A



Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Roundabout LOS Method: SIDRA Roundabout LOS.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

# MOVEMENT SUMMARY

Site: [4b] PM Peak Hour (2025 Existing without Project Conditions)

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

Weekday PM Peak Hour

Site Category: (None)

Roundabout

Site Scenario: 1 | Local Volumes

Vehicle Movement Performance													
Move	Turn	Demand	Arrival	Deg.	Aver.	Level of	95% Back Of	Prop.	Eff.	Number	Aver.	Speed	Class
ID	Class	Flows	Flows	Satn	Delay	Service	Queue	Qued	Stop of Cycles	Rate to Depart	mph	Speed	Class
		[ Total HV ] [ Total HV ]				[ Veh. Dist ]							
		veh/h % veh/h		v/c		veh							

South: Sand Canyon														
L2	All MCS	17	2.0	17	2.0	0.455	11.4	LOS B	3.3	84.3	0.57	0.53	0.57	18.9
T1	All MCS	464	2.0	464	2.0	0.455	6.0	LOS A	3.3	84.3	0.57	0.53	0.57	31.7
R2	All MCS	9	2.0	9	2.0	0.455	5.8	LOS A	3.3	84.3	0.57	0.53	0.57	30.0
Approach														
L2	All MCS	7	2.0	7	2.0	0.064	13.6	LOS B	0.4	9.4	0.69	0.69	0.69	28.4
T1	All MCS	3	2.0	3	2.0	0.064	8.2	LOS A	0.4	9.4	0.69	0.69	0.69	17.0
R2	All MCS	37	2.0	37	2.0	0.064	8.0	LOS A	0.4	9.4	0.69	0.69	0.69	29.8
Approach														
L2	All MCS	36	2.0	36	2.0	0.188	9.7	LOS A	1.1	28.6	0.14	0.42	0.14	31.9
T1	All MCS	253	2.0	253	2.0	0.188	4.3	LOS A	1.1	28.6	0.14	0.42	0.14	33.4
R2	All MCS	142	2.0	142	2.0	0.112	4.4	LOS A	0.6	15.6	0.14	0.46	0.14	31.2
Approach														
L2	All MCS	183	2.0	183	2.0	0.206	10.3	LOS B	1.1	28.6	0.48	0.65	0.48	27.0
T1	All MCS	8	2.0	8	2.0	0.206	5.1	LOS A	1.1	28.6	0.48	0.65	0.48	25.4
R2	All MCS	23	2.0	23	2.0	0.206	4.8	LOS A	1.1	28.6	0.48	0.65	0.48	26.4
Approach														
L2	All Vehicles	1182	2.0	1182	2.0	0.455	6.4	LOS A	3.3	84.3	0.40	0.52	0.40	30.9

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).  
 Roundabout LOS Method: SIDRA Roundabout LOS.  
 Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.  
 LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).  
 Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).  
 Roundabout Capacity Model: SIDRA HCM.  
 Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).  
 Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.  
 Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).  
 HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.  
 Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

## MOVEMENT FLOWS FOR SITE (INPUT)

Approach movement input flow rates by movement class (vehicles per 60 mins)

Site: [4c] AM Peak Hour (2025 Existing with Project Conditions)

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

Weekday AM Peak Hour

Site Category: (None)

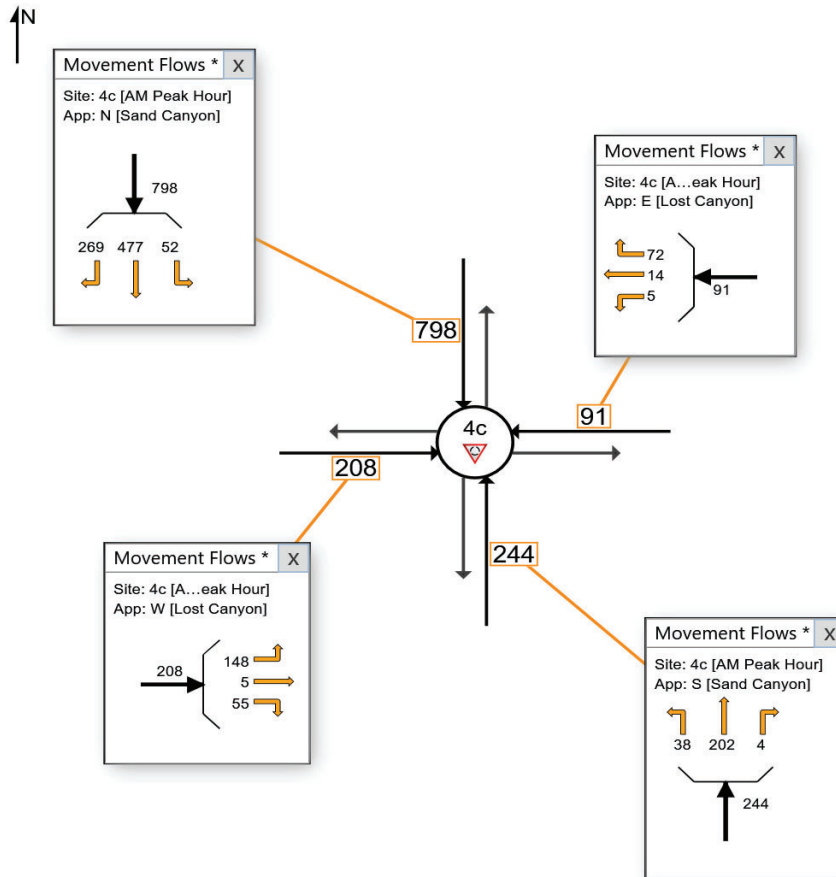
Roundabout

Site Scenario: 1 | Local Volumes

Use the button below to open or close all popup boxes. Click value labels to open selected ones. Click and drag popup boxes to move to preferred positions.

Close All Popups

### All Movement Classes (\*)



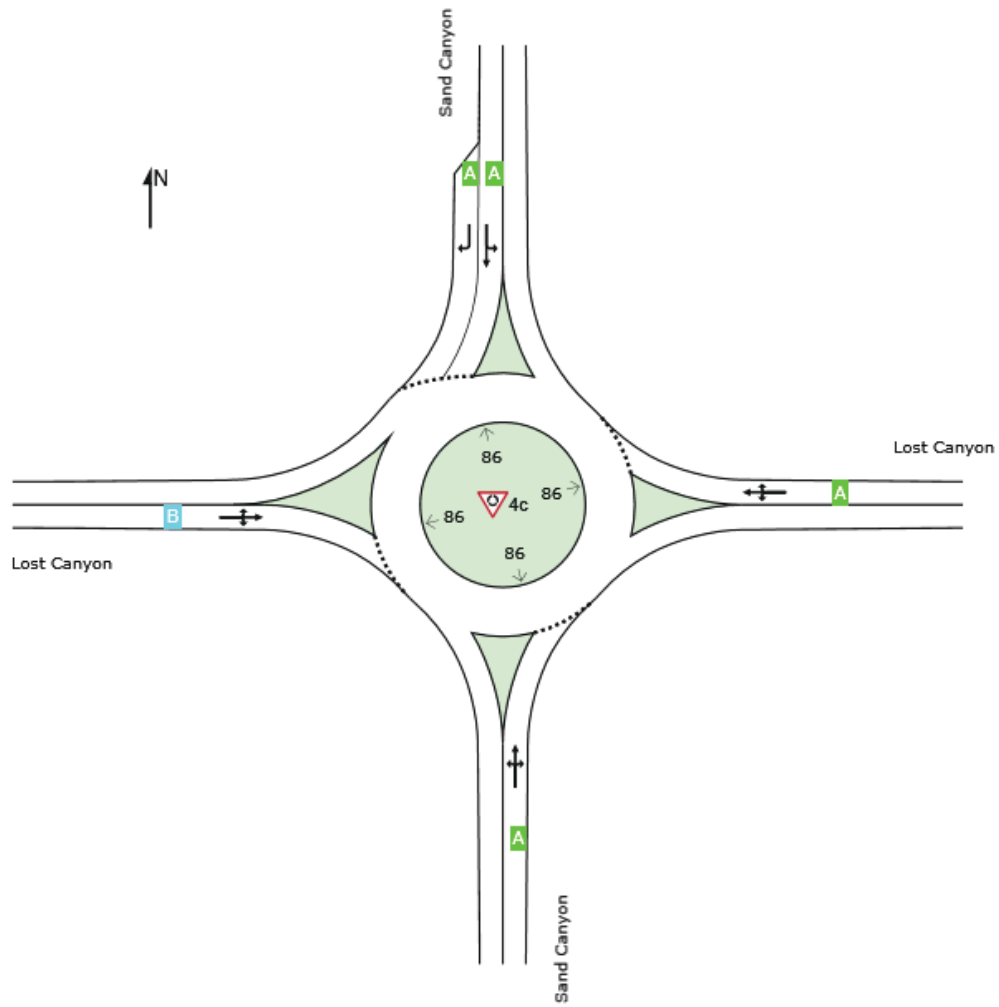
# LANE LEVEL OF SERVICE

Lane Level of Service

**Site: [4c] AM Peak Hour (2025 Existing with Project Conditions)**  
 Output produced by SIDRA INTERSECTION Version: 10.0.5.217

Weekday AM Peak Hour  
 Site Category: (None)  
 Roundabout  
**Site Scenario: 1 | Local Volumes**

LOS	Approaches				Intersection
	South	East	North	West	
A	A	A	A	B	A



Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).  
 Roundabout LOS Method: SIDRA Roundabout LOS.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

# MOVEMENT SUMMARY

Site: [4c] AM Peak Hour (2025 Existing with Project Conditions) Output produced by SIDRA INTERSECTION Version: 10.0.5.217

Weekday AM Peak Hour

Site Category: (None)

Roundabout

Site Scenario: 1 | Local Volumes

Vehicle Movement Performance												
Mov	Turn	Class	Demand	Arrval	Deg:	Aver.	Level of	95% Back Of	Prop.	Queue	Rate to Depart	Aver.
ID	Flows	Flows	Flows	Satn	Delay	Service	Queue	Stop of Cycles	Speed	mph		
	[ Total HV ]	% veh/h	% veh/h	%	sec	veh	ft					

South: Sand Canyon													
3	L2	All MCS	41	2.0	41	2.0	0.247	11.0	LOS B	1.5	38.4	0.47	19.0
8	T1	All MCS	220	2.0	220	2.0	0.247	5.6	LOS A	1.5	38.4	0.47	31.8
18	R2	All MCS	4	2.0	4	2.0	0.247	5.4	LOS A	1.5	38.4	0.47	30.1
Approach													
			265	2.0	265	2.0	0.247	6.4	LOS A	1.5	38.4	0.47	29.8
East: Lost Canyon													
1	L2	All MCS	5	2.0	5	2.0	0.107	11.9	LOS B	0.6	14.6	0.55	29.8
6	T1	All MCS	15	2.0	15	2.0	0.107	6.5	LOS A	0.6	14.6	0.55	17.8
16	R2	All MCS	78	2.0	78	2.0	0.107	6.3	LOS A	0.6	14.6	0.55	31.2
Approach													
			99	2.0	99	2.0	0.107	6.7	LOS A	0.6	14.6	0.55	29.1
North: Sand Canyon													
7	L2	All MCS	57	2.0	57	2.0	0.385	10.0	LOS A	2.8	71.1	0.26	31.4
4	T1	All MCS	518	2.0	518	2.0	0.385	4.6	LOS A	2.8	71.1	0.26	33.0
14	R2	All MCS	292	2.0	292	2.0	0.238	4.6	LOS A	1.4	36.5	0.24	30.8
Approach													
			867	2.0	867	2.0	0.385	4.9	LOS A	2.8	71.1	0.25	32.3
West: Lost Canyon													
5	L2	All MCS	161	2.0	161	2.0	0.280	12.6	LOS B	1.7	43.0	0.69	26.0
2	T1	All MCS	5	2.0	5	2.0	0.280	7.3	LOS A	1.7	43.0	0.69	24.2
12	R2	All MCS	60	2.0	60	2.0	0.280	7.1	LOS A	1.7	43.0	0.69	25.3
Approach													
			226	2.0	226	2.0	0.280	11.0	LOS B	1.7	43.0	0.69	25.8
All Vehicles													
			1458	2.0	1458	2.0	0.385	6.3	LOS A	2.8	71.1	0.38	30.6

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).  
 Roundabout LOS Method: SIDRA Roundabout LOS.  
 Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.  
 LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).  
 Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).  
 Roundabout Capacity Model: SIDRA HCM.  
 Delay Model: SIDRA Standard (Control Delay is included).  
 Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.  
 Gap-Acceptance Capacity Formula: SIDRA Standard (Akcelik M3D).  
 HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.  
 Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

## MOVEMENT FLOWS FOR SITE (INPUT)

Approach movement input flow rates by movement class (vehicles per 60 mins)

Site: [4d] PM Peak Hour (2025 Existing with Project Conditions)

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

Weekday PM Peak Hour

Site Category: (None)

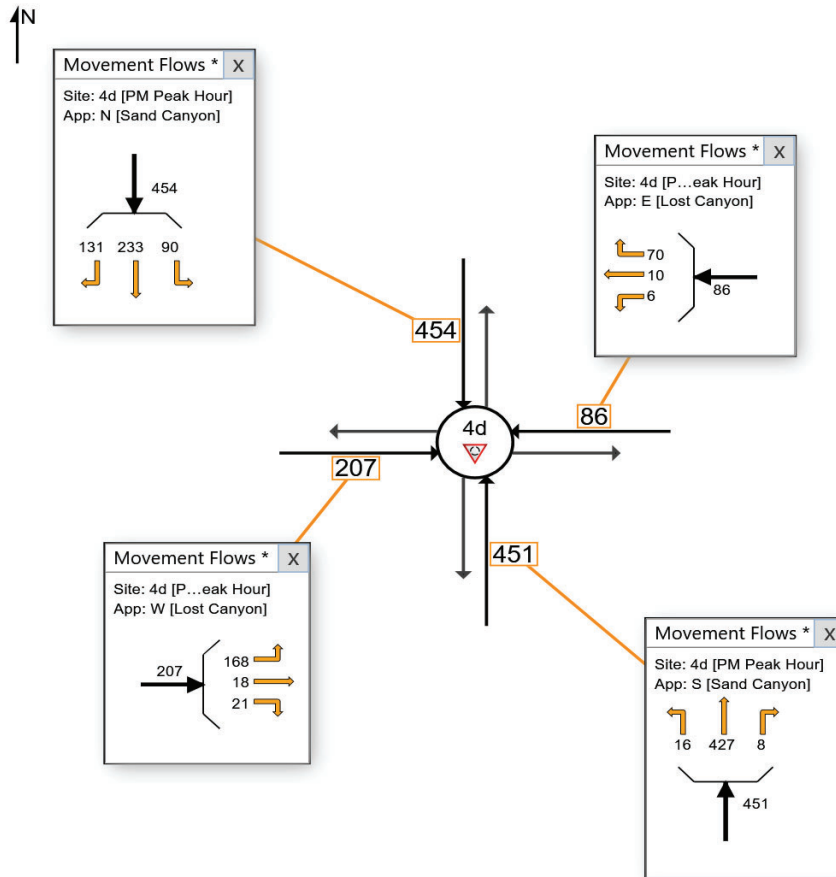
Roundabout

Site Scenario: 1 | Local Volumes

Use the button below to open or close all popup boxes. Click value labels to open selected ones. Click and drag popup boxes to move to preferred positions.

Close All Popups

### All Movement Classes (\*)



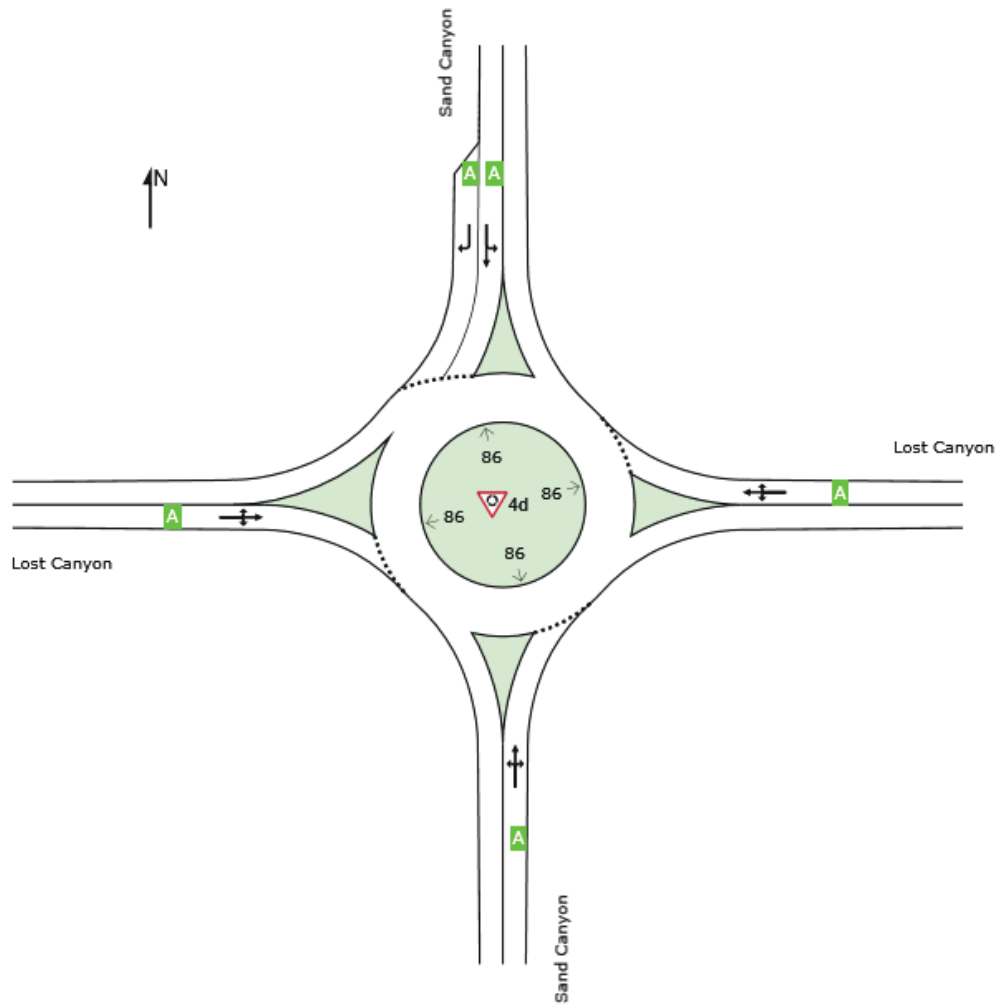
# LANE LEVEL OF SERVICE

Lane Level of Service

 **Site: [4d] PM Peak Hour (2025 Existing with Project Conditions)**  
 Output produced by SIDRA INTERSECTION Version: 10.0.5.217

Weekday PM Peak Hour  
 Site Category: (None)  
 Roundabout  
**Site Scenario: 1 | Local Volumes**

LOS	Approaches				Intersection
	South	East	North	West	
LOS	A	A	A	A	A



Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).  
 Roundabout LOS Method: SIDRA Roundabout LOS.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

# MOVEMENT SUMMARY

Site: [4d] PM Peak Hour (2025 Existing with Project Conditions) Output produced by SIDRA INTERSECTION Version: 10.0.5.217

Weekday PM Peak Hour

Site Category: (None)

Roundabout

Site Scenario: 1 | Local Volumes

Vehicle Movement Performance												
Mov	Turn	Class	Demand	Arrval	Deg:	Aver.	Level of	95% Back Of	Prop.	Eff:	Number	Aver.
ID	Class	Flows	Flows	Satn	Delay	Service	Queue	Que	Stop of Cycles	Rate to Depart	Speed	mph
		[ Total HV ] [ Total HV ]		veh/h %		veh. Dist ]		ft		veh		

South: Sand Canyon														
3	L2	All MCS	17	2.0	17	2.0	0.484	12.0	LOS B	3.5	89.3	0.64	0.58	18.7
8	T1	All MCS	464	2.0	464	2.0	0.484	6.6	LOS A	3.5	89.3	0.64	0.58	31.4
18	R2	All MCS	9	2.0	9	2.0	0.484	6.4	LOS A	3.5	89.3	0.64	0.58	29.7
Approach														
			490	2.0	490	2.0	0.484	6.8	LOS A	3.5	89.3	0.64	0.58	30.9
East: Lost Canyon														
1	L2	All MCS	7	2.0	7	2.0	0.131	13.8	LOS B	0.8	19.8	0.72	0.69	28.5
6	T1	All MCS	11	2.0	11	2.0	0.131	8.4	LOS A	0.8	19.8	0.72	0.69	17.0
16	R2	All MCS	76	2.0	76	2.0	0.131	8.2	LOS A	0.8	19.8	0.72	0.69	29.9
Approach														
			93	2.0	93	2.0	0.131	8.7	LOS A	0.8	19.8	0.72	0.69	28.3
North: Sand Canyon														
7	L2	All MCS	98	2.0	98	2.0	0.230	9.8	LOS A	1.4	36.3	0.16	0.47	31.2
4	T1	All MCS	253	2.0	253	2.0	0.230	4.4	LOS A	1.4	36.3	0.16	0.47	32.8
14	R2	All MCS	142	2.0	142	2.0	0.118	4.5	LOS A	0.6	16.3	0.16	0.46	31.1
Approach														
			493	2.0	493	2.0	0.230	5.5	LOS A	1.4	36.3	0.16	0.47	32.1
West: Lost Canyon														
5	L2	All MCS	183	2.0	183	2.0	0.229	10.8	LOS B	1.3	32.6	0.54	0.66	26.9
2	T1	All MCS	20	2.0	20	2.0	0.229	5.6	LOS A	1.3	32.6	0.54	0.66	25.2
12	R2	All MCS	23	2.0	23	2.0	0.229	5.3	LOS A	1.3	32.6	0.54	0.66	26.3
Approach														
			225	2.0	225	2.0	0.229	9.8	LOS A	1.3	32.6	0.54	0.66	26.7
All Vehicles														
			1302	2.0	1302	2.0	0.484	6.9	LOS A	3.5	89.3	0.45	0.56	30.5

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).  
 Roundabout LOS Method: SIDRA Roundabout LOS.  
 Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.  
 LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).  
 Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).  
 Roundabout Capacity Model: SIDRA HCM.  
 Delay Model: SIDRA Standard (Control Delay is included).  
 Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.  
 Gap-Acceptance Capacity Formula: SIDRA Standard (Akcelik M3D).  
 HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.  
 Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

## MOVEMENT FLOWS FOR SITE (INPUT)

Approach movement input flow rates by movement class (vehicles per 60 mins)

Site: [4e] AM Peak Hour (2032 Future without Project Conditions)

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

Weekday AM Peak Hour

Site Category: (None)

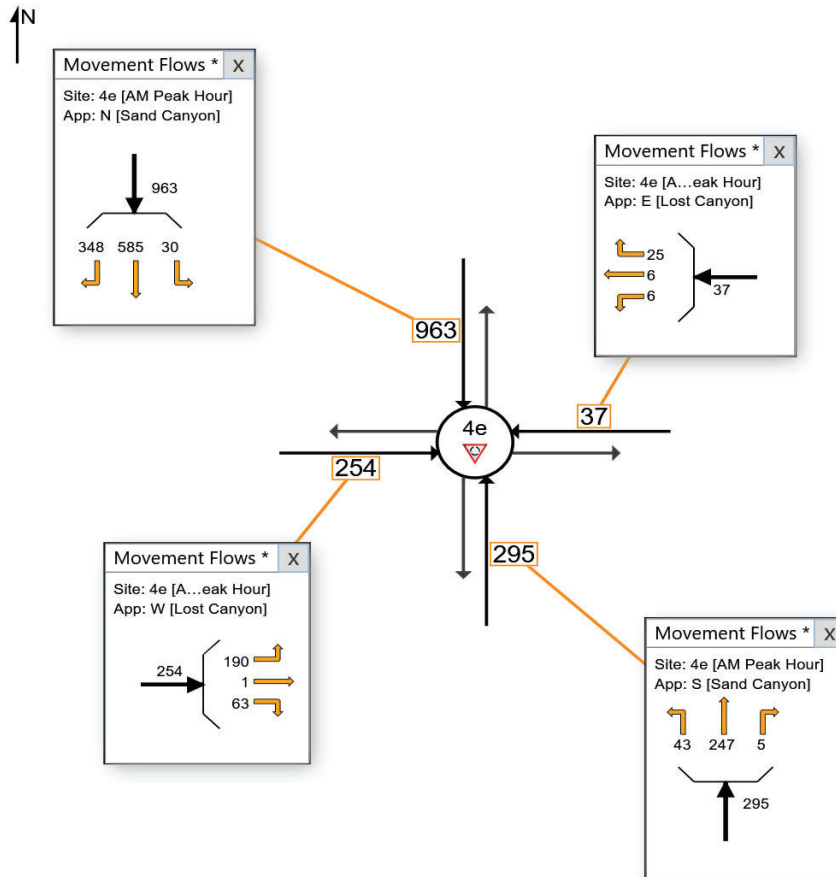
Roundabout

Site Scenario: 1 | Local Volumes

Use the button below to open or close all popup boxes. Click value labels to open selected ones. Click and drag popup boxes to move to preferred positions.

Close All Popups

### All Movement Classes (\*)



# LANE LEVEL OF SERVICE

Lane Level of Service

**Site: [4e] AM Peak Hour** (2032 Future without Project Conditions)

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

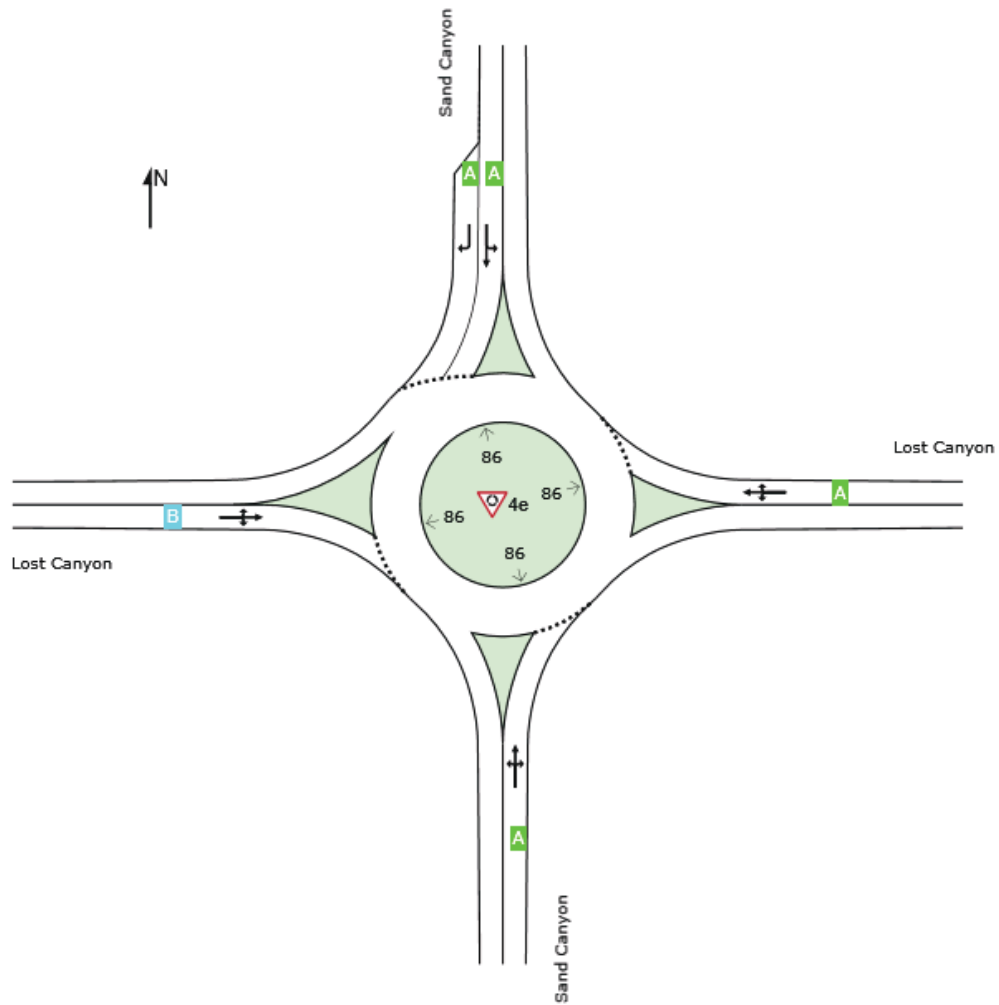
Weekday AM Peak Hour

Site Category: (None)

Roundabout

Site Scenario: 1 | Local Volumes

LOS	Approaches				Intersection
	South	East	North	West	
LOS	A	A	A	B	A



Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Roundabout LOS Method: SIDRA Roundabout LOS.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

# MOVEMENT SUMMARY

Site: [4e] AM Peak Hour (2032 Future without Project Conditions) Output produced by SIDRA INTERSECTION Version: 10.0.5.217

Weekday AM Peak Hour  
Site Category: (None)  
Roundabout

Site Scenario: 1 | Local Volumes

Vehicle Movement Performance													
Mov	Turn	Class	Demand	Arrval	Deg:	Aver.	Level of	95% Back Of	Prop.	Eff.	Number	Aver.	
ID	Flows	Flows	Flows	Satn	Delay	Service	Queue	Queue	Qued	Stop of Cycles	Speed	mph	
[ Total HV ]		[ Total HV ]		%		veh/h		%		veh		ft	

South: Sand Canyon															
3	L2	All MCS	47	2.0	47	2.0	0.306	11.2	LOS B	2.0	51.5	0.53	0.54	0.53	18.9
8	T1	All MCS	268	2.0	268	2.0	0.306	5.8	LOS A	2.0	51.5	0.53	0.54	0.53	31.6
18	R2	All MCS	5	2.0	5	2.0	0.306	5.6	LOS A	2.0	51.5	0.53	0.54	0.53	29.9
Approach															
321			321	2.0	321	2.0	0.306	6.5	LOS A	2.0	51.5	0.53	0.54	0.53	29.7
East: Lost Canyon															
1	L2	All MCS	7	2.0	7	2.0	0.048	12.4	LOS B	0.3	6.5	0.59	0.63	0.59	29.1
6	T1	All MCS	7	2.0	7	2.0	0.048	7.0	LOS A	0.3	6.5	0.59	0.63	0.59	17.5
16	R2	All MCS	27	2.0	27	2.0	0.048	6.9	LOS A	0.3	6.5	0.59	0.63	0.59	30.5
Approach															
40			40	2.0	40	2.0	0.048	7.8	LOS A	0.3	6.5	0.59	0.63	0.59	28.2
North: Sand Canyon															
7	L2	All MCS	33	2.0	33	2.0	0.448	10.0	LOS A	3.6	92.4	0.28	0.41	0.28	31.5
4	T1	All MCS	636	2.0	636	2.0	0.448	4.6	LOS A	3.6	92.4	0.28	0.41	0.28	33.0
14	R2	All MCS	378	2.0	378	2.0	0.301	4.7	LOS A	2.0	50.9	0.26	0.46	0.26	30.7
Approach															
1047			1047	2.0	1047	2.0	0.448	4.8	LOS A	3.6	92.4	0.28	0.43	0.28	32.3
West: Lost Canyon															
5	L2	All MCS	207	2.0	207	2.0	0.373	13.8	LOS B	2.4	61.6	0.78	0.76	0.78	25.1
2	T1	All MCS	1	2.0	1	2.0	0.373	8.5	LOS A	2.4	61.6	0.78	0.76	0.78	23.2
12	R2	All MCS	68	2.0	68	2.0	0.373	8.3	LOS A	2.4	61.6	0.78	0.76	0.78	24.4
Approach															
276			276	2.0	276	2.0	0.373	12.4	LOS B	2.4	61.6	0.78	0.76	0.78	24.9
All Vehicles															
1684			1684	2.0	1684	2.0	0.448	6.4	LOS A	3.6	92.4	0.41	0.51	0.41	30.5

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).  
 Roundabout LOS Method: SIDRA Roundabout LOS.  
 Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.  
 LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).  
 Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).  
 Roundabout Capacity Model: SIDRA HCM.  
 Delay Model: SIDRA Standard (Control Delay is included).  
 Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.  
 Gap-Acceptance Capacity Formula: SIDRA Standard (Akcelik M3D).  
 HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.  
 Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

## MOVEMENT FLOWS FOR SITE (INPUT)

Approach movement input flow rates by movement class (vehicles per 60 mins)

Site: [4f] PM Peak Hour (2032 Future without Project Conditions)

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

Weekday PM Peak Hour

Site Category: (None)

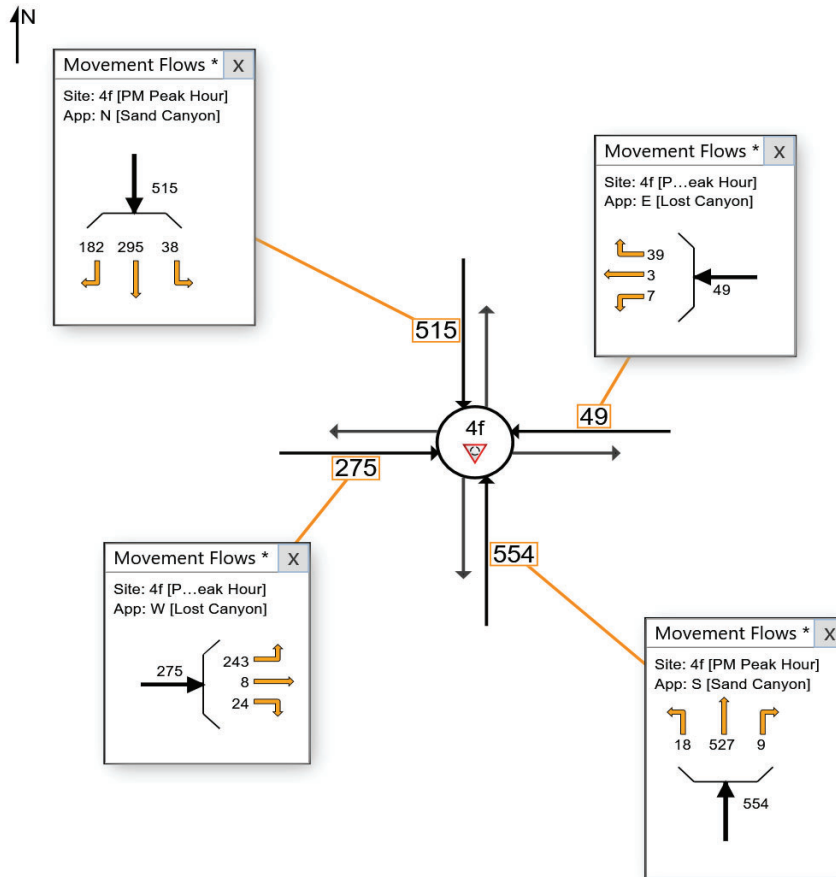
Roundabout

Site Scenario: 1 | Local Volumes

Use the button below to open or close all popup boxes. Click value labels to open selected ones. Click and drag popup boxes to move to preferred positions.

Close All Popups

### All Movement Classes (\*)



# LANE LEVEL OF SERVICE

Lane Level of Service

 Site: [4f] PM Peak Hour (2032 Future without Project Conditions)

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

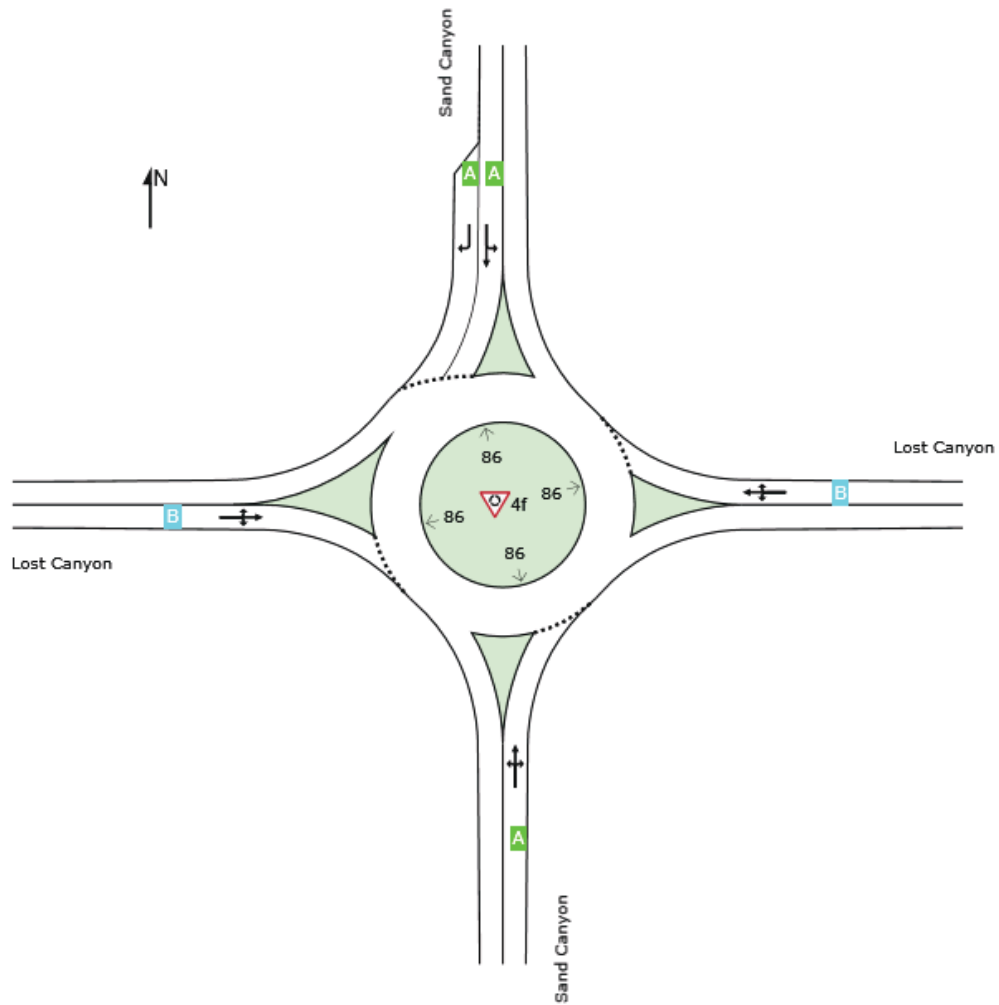
Weekday PM Peak Hour

Site Category: (None)

Roundabout

Site Scenario: 1 | Local Volumes

LOS	Approaches				Intersection
	South	East	North	West	
A	A	B	A	B	A



Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Roundabout LOS Method: SIDRA Roundabout LOS.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

# MOVEMENT SUMMARY

Site: [4] PM Peak Hour (2032 Future without Project Conditions) Output produced by SIDRA INTERSECTION Version: 10.0.5.217

Weekday PM Peak Hour

Site Category: (None)

Roundabout

Site Scenario: 1 | Local Volumes

Vehicle Movement Performance													
Mov	Turn	Class	Demand	Arrval	Deg:	Satn	Delay	Level of	95% Back Of	Queue	Prop.	Eff. Number	
ID	Class	Flows	Flows	Arrval	Deg:	Satn	Delay	Level of	95% Back Of	Queue	Prop.	Eff. Number	
		[ Total HV ] [ Total HV ]		%		veh/h		%		veh		ft	
		[ Veh. Dist ]		Rate to Depart		Speed		Aver.		Number		Cycles	

South: Sand Canyon															
3	L2	All MCS	20	20	20	2.0	0.608	13.2	LOS B	5.7	145.4	0.75	0.65	0.81	18.1
8	T1	All MCS	573	2.0	573	2.0	0.608	7.8	LOS A	5.7	145.4	0.75	0.65	0.81	30.5
18	R2	All MCS	10	2.0	10	2.0	0.608	7.6	LOS A	5.7	145.4	0.75	0.65	0.81	28.6
Approach															
602			602	2.0	602	2.0	0.608	8.0	LOS A	5.7	145.4	0.75	0.65	0.81	30.0
East: Lost Canyon															
1	L2	All MCS	8	2.0	8	2.0	0.094	15.8	LOS B	0.6	15.0	0.81	0.75	0.81	27.0
6	T1	All MCS	3	2.0	3	2.0	0.094	10.4	LOS B	0.6	15.0	0.81	0.75	0.81	16.1
16	R2	All MCS	42	2.0	42	2.0	0.094	10.2	LOS B	0.6	15.0	0.81	0.75	0.81	28.4
Approach															
53			53	2.0	53	2.0	0.094	11.0	LOS B	0.6	15.0	0.81	0.75	0.81	27.5
North: Sand Canyon															
7	L2	All MCS	41	2.0	41	2.0	0.237	9.7	LOS A	1.5	39.2	0.16	0.42	0.16	31.8
4	T1	All MCS	321	2.0	321	2.0	0.237	4.3	LOS A	1.5	39.2	0.16	0.42	0.16	33.4
14	R2	All MCS	198	2.0	198	2.0	0.154	4.4	LOS A	0.9	22.9	0.16	0.46	0.16	31.1
Approach															
560			560	2.0	560	2.0	0.237	4.8	LOS A	1.5	39.2	0.16	0.43	0.16	32.6
West: Lost Canyon															
5	L2	All MCS	264	2.0	264	2.0	0.307	11.0	LOS B	1.8	46.3	0.58	0.68	0.58	26.5
2	T1	All MCS	9	2.0	9	2.0	0.307	5.8	LOS A	1.8	46.3	0.58	0.68	0.58	24.8
12	R2	All MCS	26	2.0	26	2.0	0.307	5.5	LOS A	1.8	46.3	0.58	0.68	0.58	25.9
Approach															
299			299	2.0	299	2.0	0.307	10.4	LOS B	1.8	46.3	0.58	0.68	0.58	26.4
All Vehicles															
1514			1514	2.0	1514	2.0	0.608	7.4	LOS A	5.7	145.4	0.50	0.58	0.52	30.2

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).  
 Roundabout LOS Method: SIDRA Roundabout LOS.  
 Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.  
 LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).  
 Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).  
 Roundabout Capacity Model: SIDRA HCM.  
 Delay Model: SIDRA Standard (Control Delay is included).  
 Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.  
 Gap-Acceptance Capacity Formula: SIDRA Standard (Akcelik M3D).  
 HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.  
 Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

## MOVEMENT FLOWS FOR SITE (INPUT)

Approach movement input flow rates by movement class (vehicles per 60 mins)

Site: [4g] AM Peak Hour (2032 Future with Project Conditions)

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

Weekday AM Peak Hour

Site Category: (None)

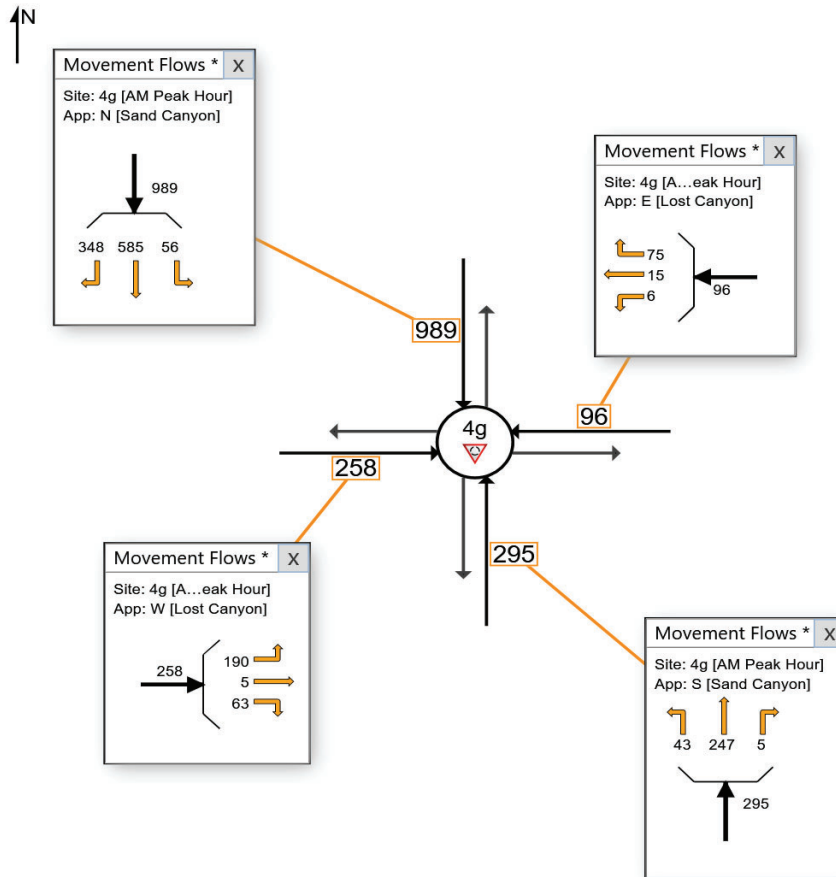
Roundabout

Site Scenario: 1 | Local Volumes

Use the button below to open or close all popup boxes. Click value labels to open selected ones. Click and drag popup boxes to move to preferred positions.

Close All Popups

### All Movement Classes (\*)



# LANE LEVEL OF SERVICE

Lane Level of Service

**Site: [4g] AM Peak Hour (2032 Future with Project Conditions)**

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

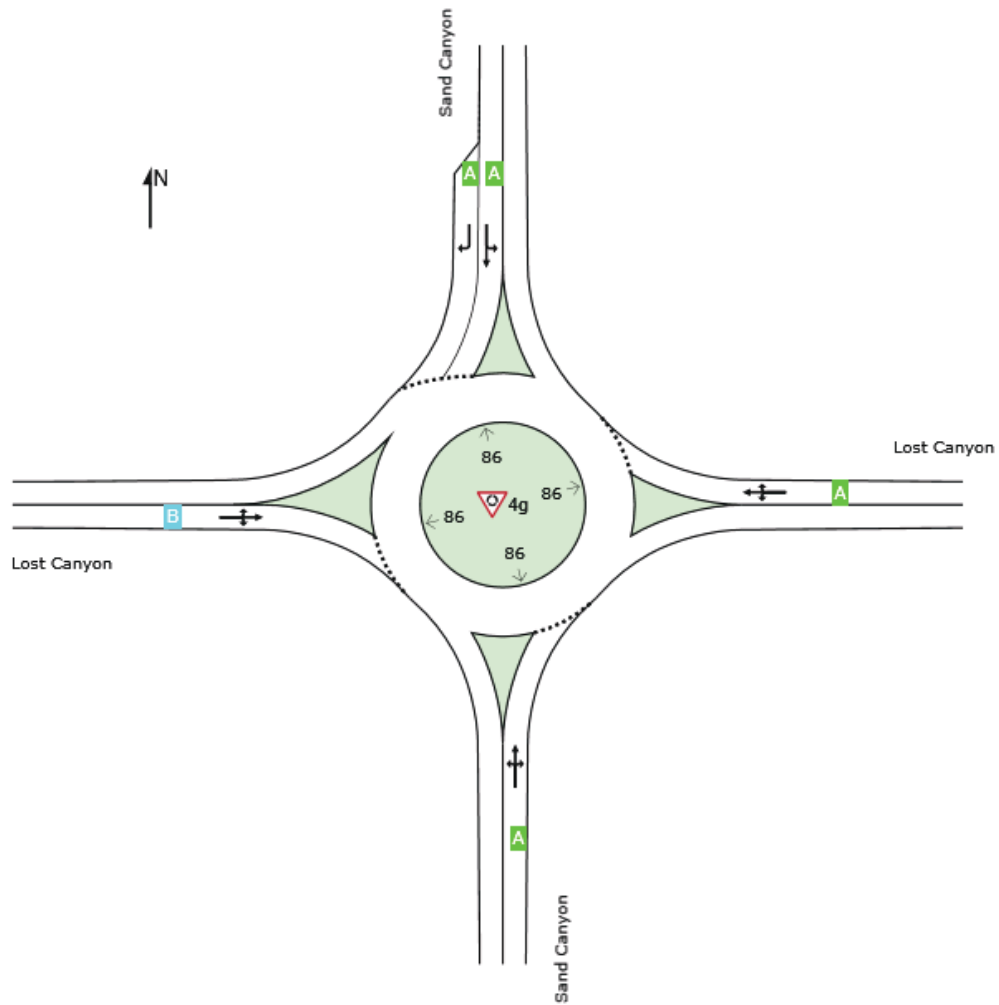
Weekday AM Peak Hour

Site Category: (None)

Roundabout

Site Scenario: 1 | Local Volumes

LOS	Approaches				Intersection
	South	East	North	West	
LOS	A	A	A	B	A



Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Roundabout LOS Method: SIDRA Roundabout LOS.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

# MOVEMENT SUMMARY

Site: [4g] AM Peak Hour (2032 Future with Project Conditions)  
 Output produced by SIDRA INTERSECTION Version: 10.0.5.217

Weekday AM Peak Hour

Site Category: (None)

Roundabout

Site Scenario: 1 | Local Volumes

Vehicle Movement Performance													
Mov	Turn	Class	Demand	Arrval	Deg:	Satn	Delay	Level of	95% Back Of	Queue	Prop.	Eff. Number	
ID	Class	Flows	Flows	Arrval	Deg:	Satn	Delay	Level of	95% Back Of	Queue	Prop.	Eff. Number	
		[ Total HV ] [ Total HV ]		%		veh/h		%		veh		ft	
		[ Total HV ] [ Total HV ]		%		veh/h		%		veh		ft	
		Rate to Depart		Stop of Cycles		Speed		Aver.		Number		mph	

South: Sand Canyon													
3	L2	All MCS	47	2.0	47	2.0	0.315	11.4	LOS B	2.1	52.5	0.56	18.8
8	T1	All MCS	268	2.0	268	2.0	0.315	6.0	LOS A	2.1	52.5	0.56	31.5
18	R2	All MCS	5	2.0	5	2.0	0.315	5.8	LOS A	2.1	52.5	0.56	29.8
Approach													
			321	2.0	321	2.0	0.315	6.8	LOS A	2.1	52.5	0.56	29.6
East: Lost Canyon													
1	L2	All MCS	7	2.0	7	2.0	0.124	12.7	LOS B	0.7	17.6	0.62	29.3
6	T1	All MCS	16	2.0	16	2.0	0.124	7.3	LOS A	0.7	17.6	0.62	17.5
16	R2	All MCS	82	2.0	82	2.0	0.124	7.1	LOS A	0.7	17.6	0.62	30.7
Approach													
			104	2.0	104	2.0	0.124	7.4	LOS A	0.7	17.6	0.62	28.6
North: Sand Canyon													
7	L2	All MCS	61	2.0	61	2.0	0.470	10.1	LOS B	3.9	98.3	0.31	31.2
4	T1	All MCS	636	2.0	636	2.0	0.470	4.7	LOS A	3.9	98.3	0.31	32.8
14	R2	All MCS	378	2.0	378	2.0	0.306	4.7	LOS A	2.0	51.3	0.28	30.6
Approach													
			1075	2.0	1075	2.0	0.470	5.0	LOS A	3.9	98.3	0.30	32.1
West: Lost Canyon													
5	L2	All MCS	207	2.0	207	2.0	0.392	14.2	LOS B	2.6	66.5	0.80	24.9
2	T1	All MCS	5	2.0	5	2.0	0.392	9.0	LOS A	2.6	66.5	0.80	22.9
12	R2	All MCS	68	2.0	68	2.0	0.392	8.7	LOS A	2.6	66.5	0.80	24.1
Approach													
			280	2.0	280	2.0	0.392	12.8	LOS B	2.6	66.5	0.80	24.7
All Vehicles													
			1780	2.0	1780	2.0	0.470	6.7	LOS A	3.9	98.3	0.45	30.2

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).  
 Roundabout LOS Method: SIDRA Roundabout LOS.  
 Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.  
 LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).  
 Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).  
 Roundabout Capacity Model: SIDRA HCM.  
 Delay Model: SIDRA Standard (Control Delay is included).  
 Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.  
 Gap-Acceptance Capacity Formula: SIDRA Standard (Akcelik M3D).  
 HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.  
 Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

## MOVEMENT FLOWS FOR SITE (INPUT)

Approach movement input flow rates by movement class (vehicles per 60 mins)

Site: [4h] PM Peak Hour (2032 Future with Project Conditions)

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

Weekday PM Peak Hour

Site Category: (None)

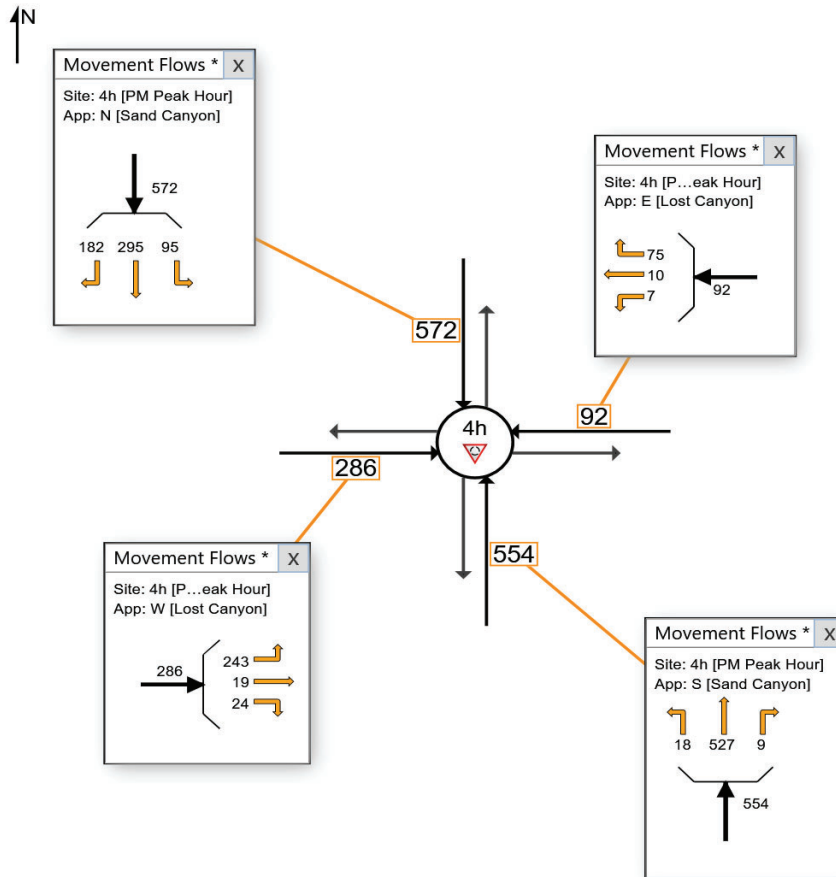
Roundabout

Site Scenario: 1 | Local Volumes

Use the button below to open or close all popup boxes. Click value labels to open selected ones. Click and drag popup boxes to move to preferred positions.

Close All Popups

### All Movement Classes (\*)



# LANE LEVEL OF SERVICE

Lane Level of Service

**Site: [4h] PM Peak Hour (2032 Future with Project Conditions)**

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

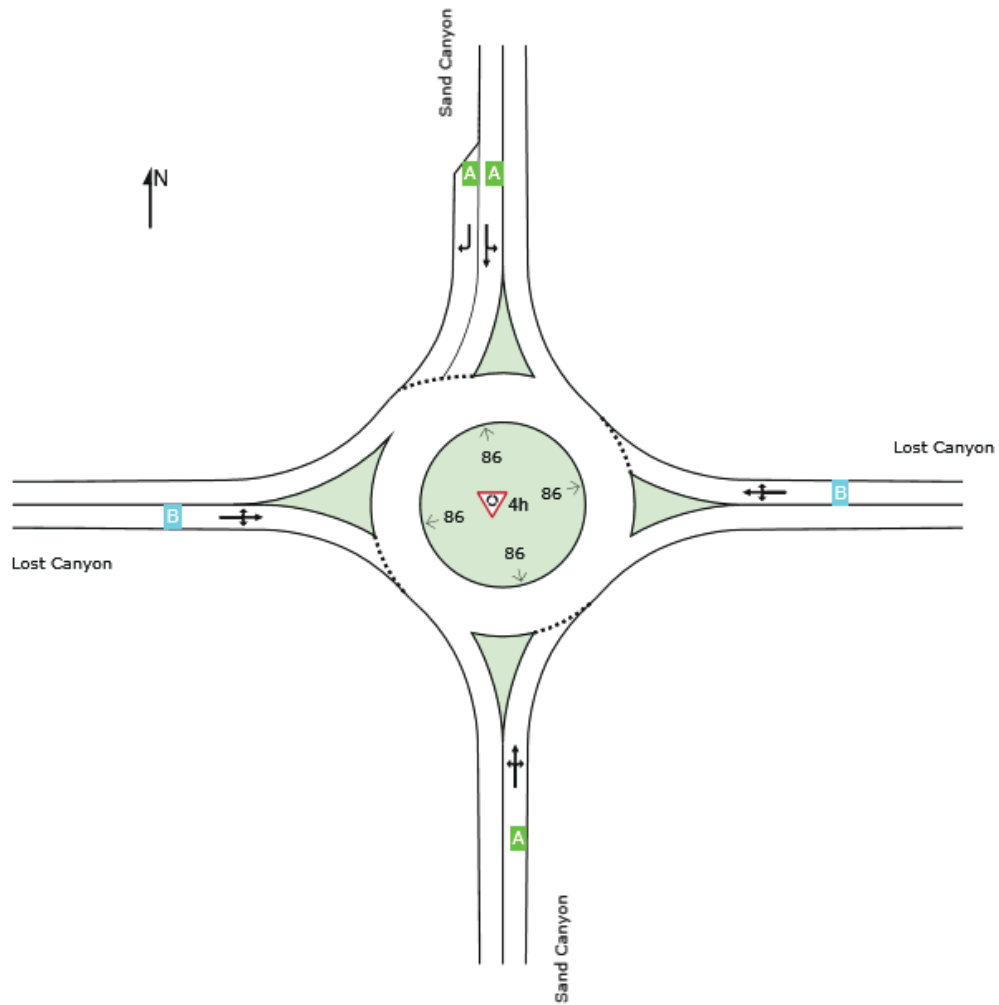
Weekday PM Peak Hour

Site Category: (None)

Roundabout

Site Scenario: 1 | Local Volumes

LOS	Approaches				Intersection
	South	East	North	West	
A	A	B	A	B	A



Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Roundabout LOS Method: SIDRA Roundabout LOS.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

# MOVEMENT SUMMARY

Site: [4h] PM Peak Hour (2032 Future with Project Conditions)  
 Output produced by SIDRA INTERSECTION Version: 10.0.5.217

Weekday PM Peak Hour

Site Category: (None)

Roundabout

Site Scenario: 1 | Local Volumes

Vehicle Movement Performance												
Mov	Turn	Class	Demand	Arrval	Deg:	Aver.	Level of	95% Back Of	Prop.	Eff.	Number	Aver.
ID	Flows	Flows	Flows	Satn	Delay	Service	Queue	Queue	Stop of Cycles	Rate to Depart	Speed	mph
		[ Total HV ] [ Total HV ]		veh/h %		veh		ft		mph		

South: Sand Canyon															
3	L2	All MCS	20	2.0	20	2.0	0.647	14.9	LOS B	6.7	170.3	0.82	0.74	0.97	17.6
8	T1	All MCS	573	2.0	573	2.0	0.647	9.5	LOS A	6.7	170.3	0.82	0.74	0.97	29.6
18	R2	All MCS	10	2.0	10	2.0	0.647	9.3	LOS A	6.7	170.3	0.82	0.74	0.97	27.7
Approach															
			602	2.0	602	2.0	0.647	9.7	LOS A	6.7	170.3	0.82	0.74	0.97	29.2
East: Lost Canyon															
1	L2	All MCS	8	2.0	8	2.0	0.180	16.1	LOS B	1.2	29.9	0.84	0.76	0.84	26.9
6	T1	All MCS	11	2.0	11	2.0	0.180	10.7	LOS B	1.2	29.9	0.84	0.76	0.84	16.1
16	R2	All MCS	82	2.0	82	2.0	0.180	10.5	LOS B	1.2	29.9	0.84	0.76	0.84	28.4
Approach															
			100	2.0	100	2.0	0.180	11.0	LOS B	1.2	29.9	0.84	0.76	0.84	27.0
North: Sand Canyon															
7	L2	All MCS	103	2.0	103	2.0	0.279	9.8	LOS A	1.9	47.4	0.18	0.46	0.18	31.3
4	T1	All MCS	321	2.0	321	2.0	0.279	4.4	LOS A	1.9	47.4	0.18	0.46	0.18	32.8
14	R2	All MCS	198	2.0	198	2.0	0.160	4.5	LOS A	0.9	23.5	0.18	0.46	0.18	31.0
Approach															
			622	2.0	622	2.0	0.279	5.3	LOS A	1.9	47.4	0.18	0.46	0.18	32.1
West: Lost Canyon															
5	L2	All MCS	264	2.0	264	2.0	0.336	11.6	LOS B	2.1	52.2	0.63	0.69	0.63	26.3
2	T1	All MCS	21	2.0	21	2.0	0.336	6.3	LOS A	2.1	52.2	0.63	0.69	0.63	24.5
12	R2	All MCS	26	2.0	26	2.0	0.336	6.0	LOS A	2.1	52.2	0.63	0.69	0.63	25.6
Approach															
			311	2.0	311	2.0	0.336	10.8	LOS B	2.1	52.2	0.63	0.69	0.63	26.1
All Vehicles															
			1635	2.0	1635	2.0	0.647	8.3	LOS A	6.7	170.3	0.54	0.62	0.60	29.6

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).  
 Roundabout LOS Method: SIDRA Roundabout LOS.  
 Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.  
 LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).  
 Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).  
 Roundabout Capacity Model: SIDRA HCM.  
 Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).  
 Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.  
 Gap-Acceptance Capacity Formula: SIDRA Standard (Akcelik M3D).  
 HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.  
 Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

***Appendix I***

***Kittelson Roundabout Study***

# TECHNICAL MEMORANDUM

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February 17, 2026

Project# 32079

To: Joel Bareng, City of Santa Clarita  
From: Jacki Smith, Ryan Casburn, and Lee Rodegerdts, PE  
CC: Corey Harpole  
RE: Sand Canyon & Lost Canyon Roundabout VISSIM Analysis Results

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This memorandum presents the results of a VISSIM simulation analysis of a proposed roundabout at Sand Canyon Road/Lost Canyon Road located near two schools in Santa Clarita, California. The City of Santa Clarita requested a VISSIM analysis to understand the potential impacts that proposed changes to the school queuing area and the proposed roundabout at Sand Canyon Road/Lost Canyon Road would have on traffic operations and queuing in the study area during school peak hours. In particular, the City is interested in understanding the delay and queuing impact of school traffic on Sand Canyon Road between SR 14 and Lost Canyon Road.

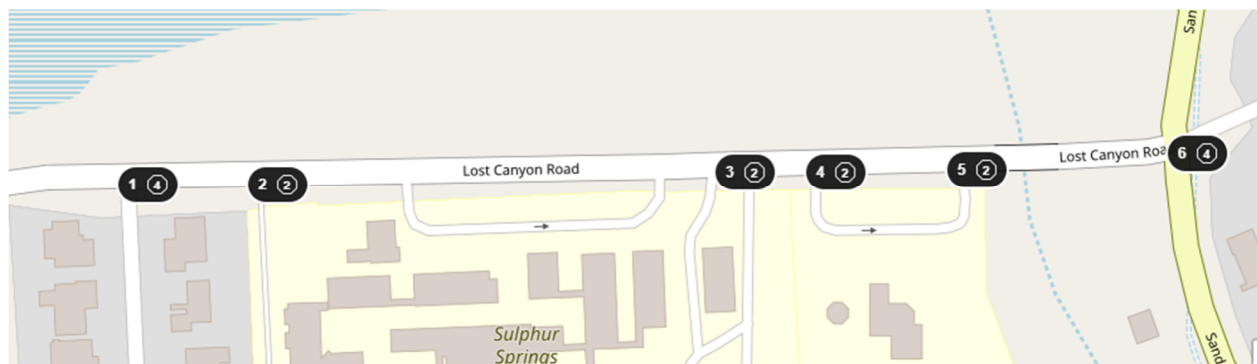
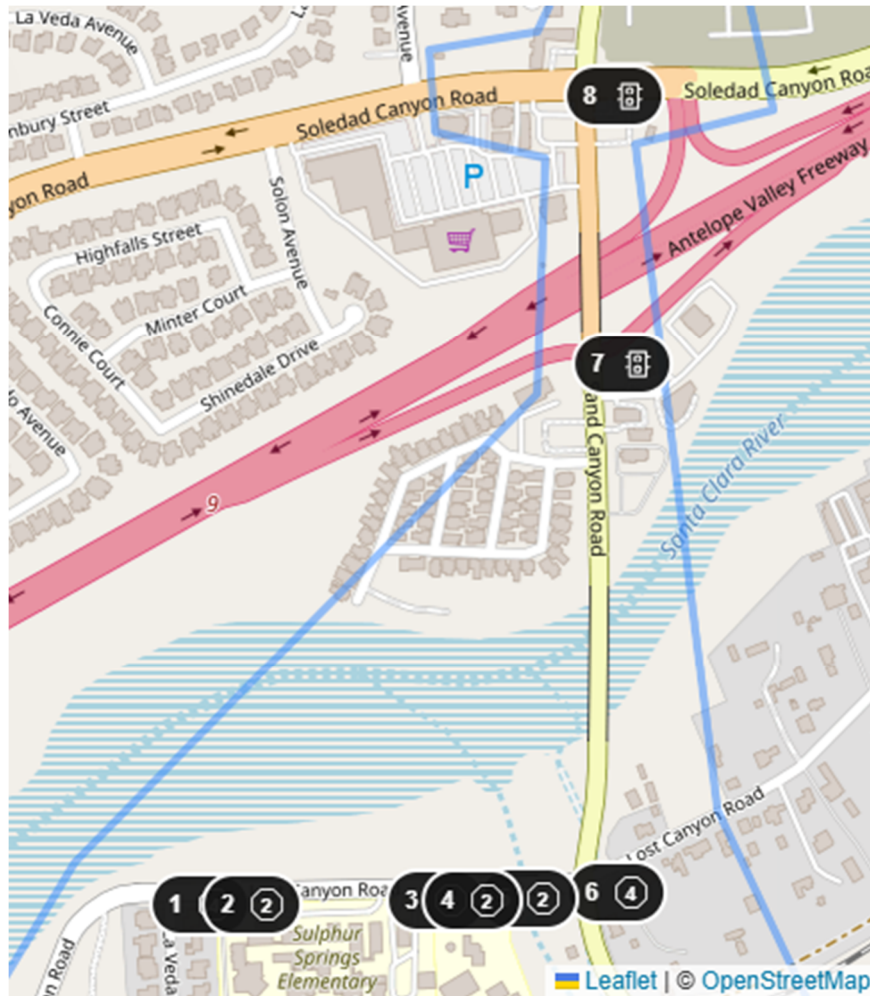
This memorandum is divided into three sections. The memorandum introduces the study area and existing and projected challenges with traffic operations. Next, the memorandum documents the simulation modeling inputs and assumptions used to develop traffic volumes and other modeling assumptions. Finally, the memorandum presents the results of the analysis.

In summary, traffic operations during the school release peak period are poor during future conditions with and without the proposed roundabout. Queues block traffic movement on Lost Canyon Road, and occasionally back onto Sand Canyon Road. Traffic on Sand Canyon Road is occasionally obstructed by these queues. In general, the roundabout operates as well or better than the existing all-way stop-controlled intersection. However, after the school release time and subsequent increase in traffic eastbound on Lost Canyon Road, the roundabout does have worse operations, with about 5 minutes additional delay, for the northbound movement on Sand Canyon Road due to the northbound traffic needing to yield to the eastbound traffic already in the roundabout. For both the no-build and build conditions, queuing may extend through the SR 14 intersection ramp terminal intersections to Soledad Canyon Road.

## Introduction

The intersection of Sand Canyon Road/Lost Canyon Road is located south of the SR 14/Sand Canyon Road interchange and east of two schools—Sulphur Springs Elementary School and Gorman Learning Center—on Lost Canyon Road. Sulphur Springs Elementary School has three driveway loops (two modeled), and Gorman Learning Center has one driveway loop. Figure 1 shows the study area for existing conditions.

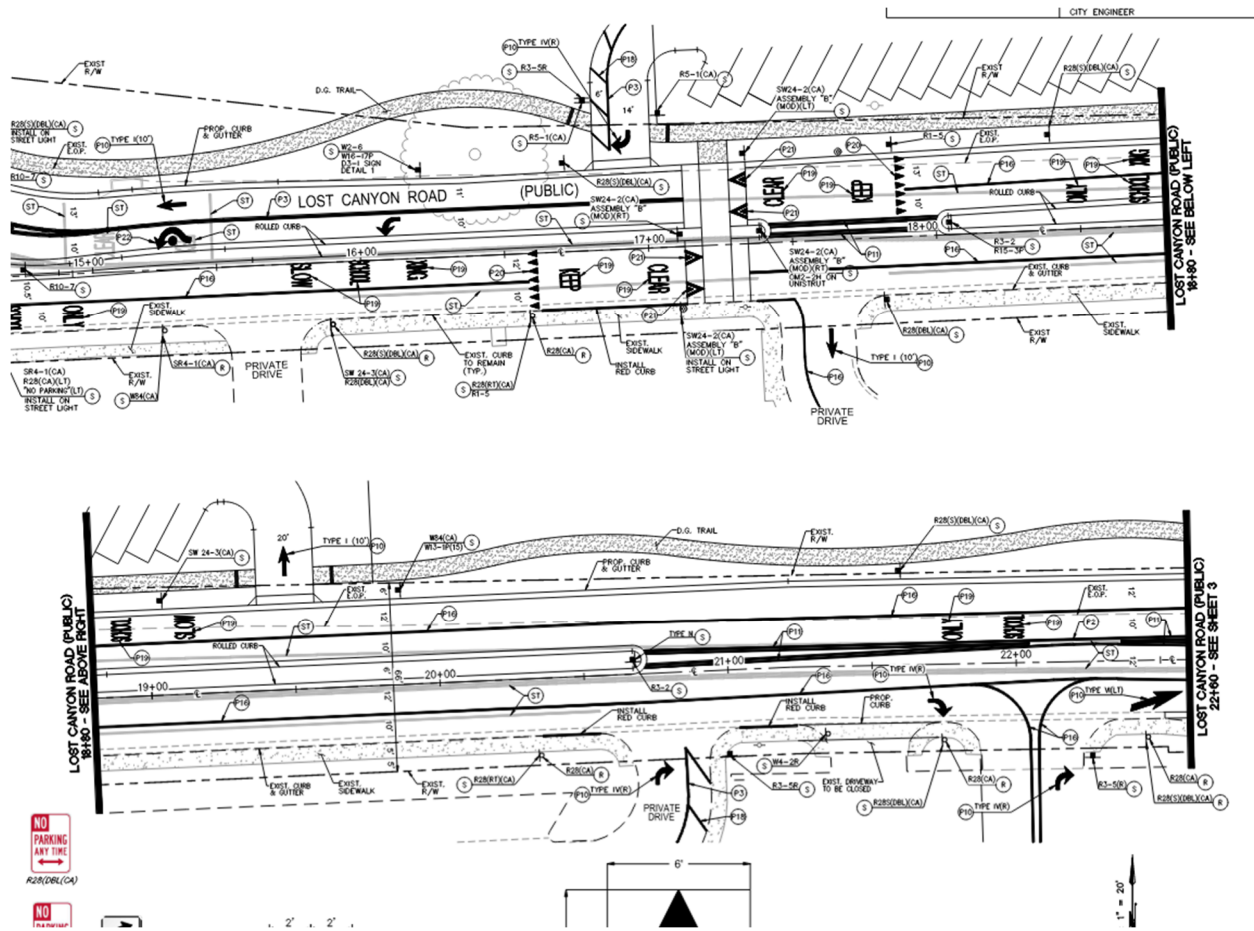
Figure 1: Existing Roadway Network and Lane Configuration



During the school peak period in the weekday afternoon, parents arrive and wait to pick up children from each school, creating queues that extend off school property along Lost Canyon Road, through the existing Sand Canyon Road/Lost Canyon Road all-way stop-controlled intersection, reaching north to the SR 14/Sand Canyon Road interchange. Queuing is expected to increase due to Sulphur Springs Elementary School anticipating growth in enrollment, thus adding to the existing queuing concerns.

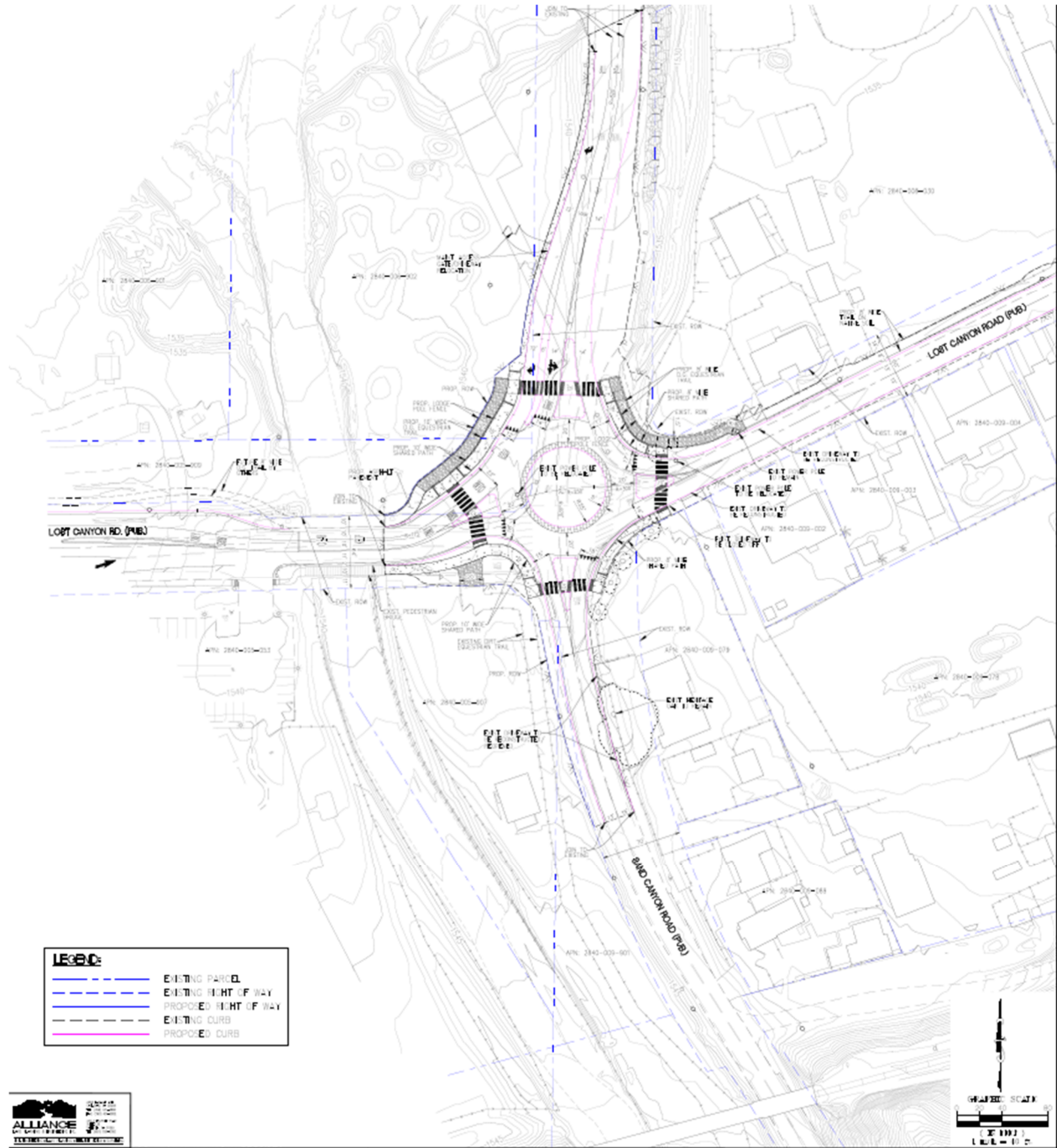
To mitigate the existing and projected additional queuing for the schools, the City of Santa Clarita has proposed modifications to Lost Canyon Road to add a single-lane roundabout at Lost Canyon Road/La Veda Avenue and add a center lane along Lost Canyon Road between La Veda Avenue and Sand Canyon Road for queue storage. For the purposes of this memorandum, this project is considered part of the no-build condition. Figure 2 shows the proposed design.

Figure 2: No-Build Conditions Roadway Network and Lane Configuration



As part of a proposed development to the east of Sand Canyon Road/Lost Canyon Road (hereafter referred to as the "Gibson TIA"), a single-lane roundabout is also proposed at Sand Canyon Road/Lost Canyon Road to replace the existing all-way stop-controlled intersection. This roundabout includes a separate right-turn-only lane on the north leg for queue storage. Figure 3 shows the proposed design.

Figure 3: Build Conditions Roadway Network and Lane Configuration



# Simulation Modeling Inputs and Assumptions

This section documents the modeling inputs and assumptions used in the VISSIM simulation analysis, which has been developed to approximate school queuing operations and to model roundabout and other intersection operations. Drivers wait at the school pick-up locations for up to an hour. In addition, the primary potential expected failure mode of the roundabout is the school queue exceeding allowable space. Changes to any of these assumptions may significantly change the overall model results.

Kittelson used VISSIM version 2025 (Service Pack 7), developed by PTV Software, for this analysis. VISSIM was chosen based on its flexibility in modeling the types of traffic operations needed to approximate school queuing operations, as well as the ability to model roundabouts and other intersection types. Kittelson modeled the following scenarios:

- Existing traffic conditions
- Future no-build traffic conditions
- Future build traffic conditions

Performance measures presented in this memorandum are based on an average of ten simulation runs with varying random number seeds.

## Traffic Volumes

Traffic volumes are a critical parameter for the evaluation of traffic operating conditions in any model. In this model, that importance is amplified as a large proportion of traffic in this model is purposely held in a queue, potentially impacting other traffic. Not only is the volume of traffic important, but the distribution of the arrival rate of school traffic also impacts how quickly the queue builds and when it may impact the rest of the network.

## SUMMARY OF DATA RECEIVED

Kittelson received traffic count data from the City as follows:

- Sand Canyon Road/Soledad Canyon Road
  - We received turning movement count data from 2023.
  - Data contained 24-hour hourly turning movement count data. Fifteen-minute level data were not available for the school peak period.
- SR 14/Sand Canyon Road
  - We received no turning movement count data.
  - Data from a Replica data set with Caltrans traffic volume data were used to estimate turning movement percentages.
- Sand Canyon Road/Lost Canyon Road

- We received turning movement count data from 2022.
- Lost Canyon Road/La Veda Avenue
  - We received turning movement count data from 2025.
  - Data contained 24-hour hourly count data. Fifteen-minute level data were available for part of the school peak period.
- Lost Canyon Road/School Driveways
  - We received turning movement count data from 2025 for Sulphur Springs East Driveway and Gorman Learning Center Driveway.
  - No count data were available for Sulphur Springs West Driveway.
  - Sulphur Springs parent pickup also appears to use the parking lot across the street based on the drone footage, but no count data was provided for this location either. This parking area is not modeled in the simulation.

The City also provided video collected by unmanned aerial vehicle (drone) traffic operations along Lost Canyon Road during afternoon school operations. The specific date of the drone footage is unknown.

## EXISTING NETWORK VOLUME ESTIMATES

Counts completed prior to 2025 were grown to an estimated 2025 value with a 2% growth rate. This growth rate is consistent with the ambient growth factor of 2% from the Gibson TIA. The turning movement volumes were then balanced between intersections, primarily by adding volume to balance to the traffic projected on Lost Canyon Road using the school count data.

To calibrate the existing conditions model to queuing observations from the drone footage, we added 30 vehicles to the eastbound right turn into the schools, 30 vehicles to the northbound left turn out of the schools, and 30 vehicles of westbound-to-eastbound U-turns at the Lost Canyon Road/La Veda Avenue roundabout. The network-wide traffic flow was balanced based on initially treating all school driveways as a single loading point into the network. The traffic for this loading point was then subdivided into the different school entrances based on approximate use of each driveway from observing drone video.

Kittelson divided the study period of 2:30 PM–4:30 PM into a series of 15-minute time slices to simulate variations in traffic through the study period. Within each time period Kittelson assigned traffic volumes to the network to replicate turning movements at study intersections. Background traffic volumes were assigned uniformly across each time period except for traffic volumes to and from schools, which were adjusted to account for the peaking conditions of the school traffic. Table 1 shows the proportion of the peak hour school demand assigned to each school entrance by time period. This was determined through iteration with the simulation to generally match existing conditions to the observed drone footage.

**Table 1: Proportion of Peak Hour School Demand by School Entrance and Time Period**

Simulation Time Period	2:30 PM–2:45 PM)	2:45 PM–3:00 PM	3:00 PM–3:15 PM	3:15 PM–3:30 PM	3:30 PM–3:45 PM	3:45 PM–4:00 PM	4:00 PM–4:15 PM	4:15 PM–4:30 PM	Total
<b>Gorman Learning Center</b>	3.125%	6.250%	12.500%	6.250%	1.875%	0.625%	0.625%	0.000%	<b>31.25%</b>
<b>Sulphur Springs East</b>	1.250%	5.000%	5.000%	6.250%	12.500%	8.750%	5.000%	2.500%	<b>46.25%</b>
<b>Sulphur Springs West</b>	1.250%	1.875%	3.125%	4.375%	6.250%	3.750%	1.250%	0.625%	<b>22.50%</b>
<b>Total Percentage by Time Period</b>	<b>5.625%</b>	<b>13.125%</b>	<b>20.625%</b>	<b>16.875%</b>	<b>20.625%</b>	<b>13.125%</b>	<b>6.875%</b>	<b>3.125%</b>	<b>100%</b>

## FUTURE YEAR VOLUME DEVELOPMENT

The City provided Kittelson with future PM peak period volumes for the year 2031. As the model is focused on the school release time period, which is earlier than the PM peak period, Kittelson developed traffic volume projections for the school peak period. First, the existing traffic was separated into school trips and background trips. Kittelson increased existing school trips by 18.5% based on the projected increase in attendance at Sulphur Springs Elementary school from approximately 760 students to 900 students, as provided by the City.

Kittelson increased background trips by 2% per year to be consistent with the ambient growth factor reported in the Gibson TIA. Finally, Kittelson added development traffic based on the information provided in the Gibson TIA.

## SCHOOL RELEASE TIME

The release time of the schools is important to the formation and clearance of queues for school pickup. Adjusting the times of the school release may impact the overlap between the parent arrival for pickup which may lead to different school behavior.

Based on the information provided by the City, Gorman School typically releases at 3:00 PM and Sulphur Springs Elementary School typically releases at 3:30 PM. This schedule was assumed for future conditions.

From this information, we have set the Gorman School to begin releasing 30 minutes into the simulation (at 3:00 PM) and Sulphur Springs to begin releasing at 60 minutes into the simulation (at 3:30 PM).

## SCHOOL RELEASE RATE

The release of vehicles from the school queues is a critical parameter in this model as it dictates both how quickly the queue will clear once school ends, and the flow rate of vehicles reaching the study roundabout.

Kittelson was provided with drone footage of around the school release time period. Kittelson reviewed this drone footage to determine a release rate to use in the model. The drone footage provided was sped up at a rate that wasn't specified. Based on travel time of vehicles along Sand Canyon Road, we estimated that the video speed was double that of real time.

The drone footage view varied throughout the study area, limiting our ability to observe the school driveways during the entire school release period. During a time when an uninterrupted view of each driveway was recorded, we measured the time between adjacent vehicles leaving the pickup area. About 20 vehicles were observed for both Gorman School and Sulphur Springs School in the drone footage. More than one vehicle can load at a time, leading to a bimodal distribution, with groups of vehicles leaving together. Histograms of the observed headways are in Figure 1 and Figure 2. Based on these values, a normal distribution appears to be reasonable for simulate the school release rate. Each school would have its own release rate as shown in Table 2. These distributions have been scaled to the total field observations for comparison between the figures and are shown in Figure 3 and Figure 4.

**Table 2: Modeled School Release Rate Distribution Values Assuming Departures Are Normally Distributed**

<b>Location</b>	<b>Mean (Seconds)</b>	<b>Standard Deviation (Seconds)</b>
Gorman	8.0	9.2
Sulphur Springs	7.5	7.0

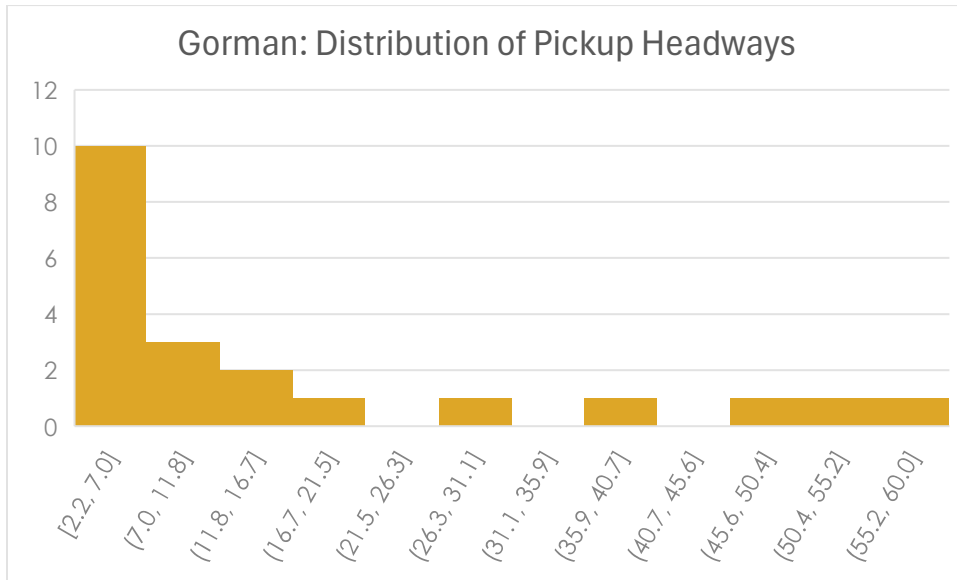


Figure 1: Observed Distribution of Vehicle Headways for Gorman School Release

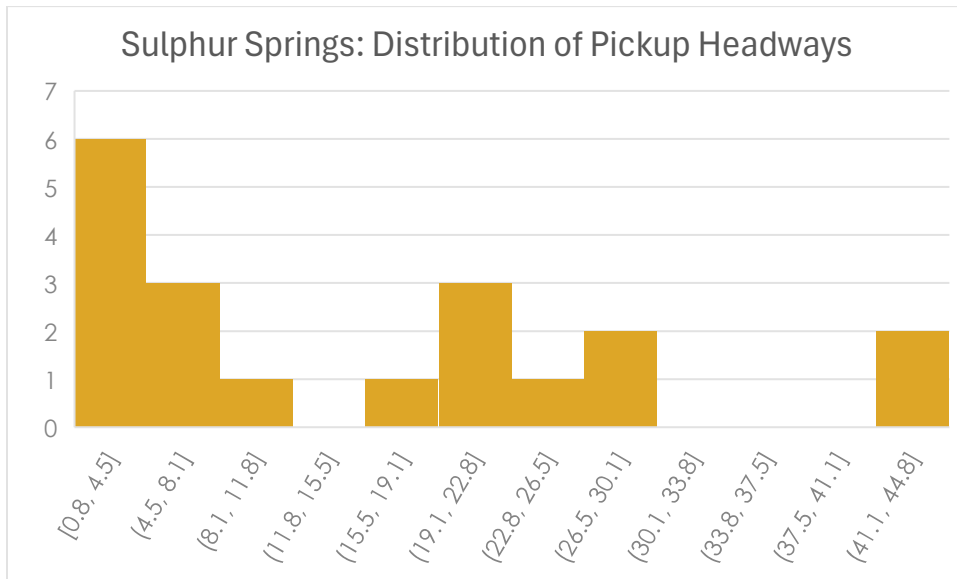


Figure 2: Observed Distribution of Vehicle Headways for Sulphur Springs School Release

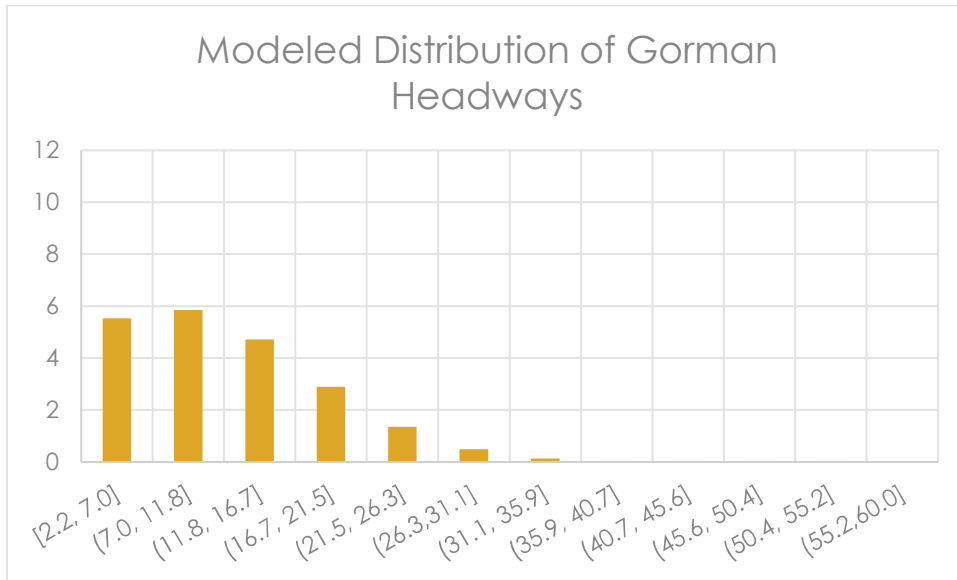


Figure 3: Modeled Distribution of Vehicle Headway for Gorman School Release

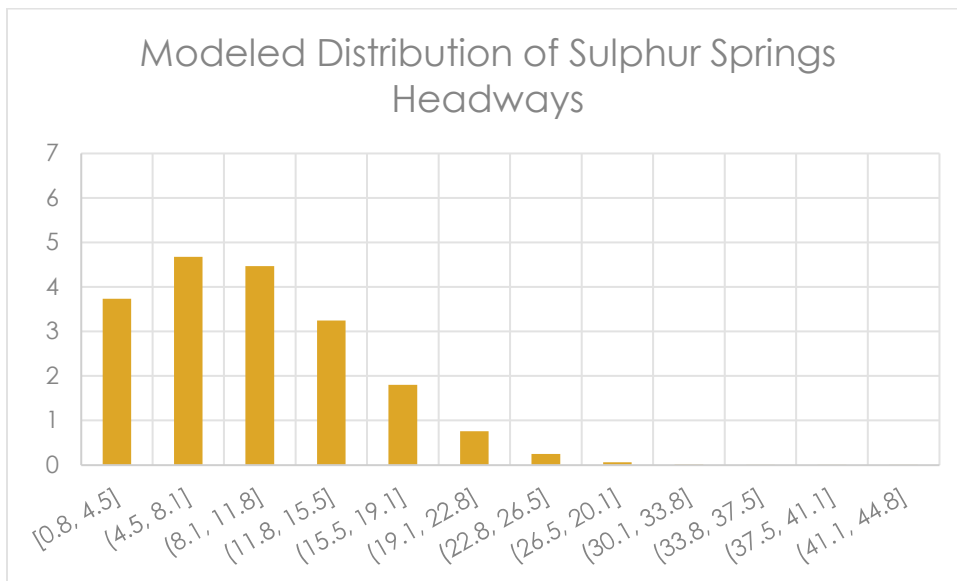


Figure 4: Modeled Distribution of Vehicle Headway for Sulphur Springs School Release

## OTHER ASSUMPTIONS

Except for the parameters described above, all remaining parameters in VISSIM were assigned default values as provided by VISSIM.

## CALIBRATION

Due to limited field data at the schools and the unusual condition of traffic queuing for significant periods of time, the primary calibration method was visual: observing the simulation and manually comparing it to drone footage. Many rounds of simulation were conducted to observe the model with small tweaks made to better represent the behaviors, queuing, and delay observed in the drone footage.

In addition to the visual calibration, the model's volume estimates at the main Sand Canyon Road/Lost Canyon Road intersection were compared with those developed for analysis to ensure the model reasonably reflected expected demand. The GEH statistic is used in traffic calibration as it is more fairly balanced for both large and small volume movements. Percentage difference, as an example alternative, provides too narrow of an acceptable range at small volume movements. GEH is a unitless statistic where lower numbers are better. Common criteria for calibration are to have at least 85% of movements have a GEH statistic less than 5. The GEH statistic is calculated as:

$$GEH = \sqrt{\frac{2(M - C)^2}{M + C}}$$

Where GEH is the calculated statistic, M = modeled volume, and C = counted volume.

In this analysis, no movement had a GEH statistic higher than 2. This is an exceptional result for calibration, when the typical target is for 85% of movements to have a GEH statistic under 5.

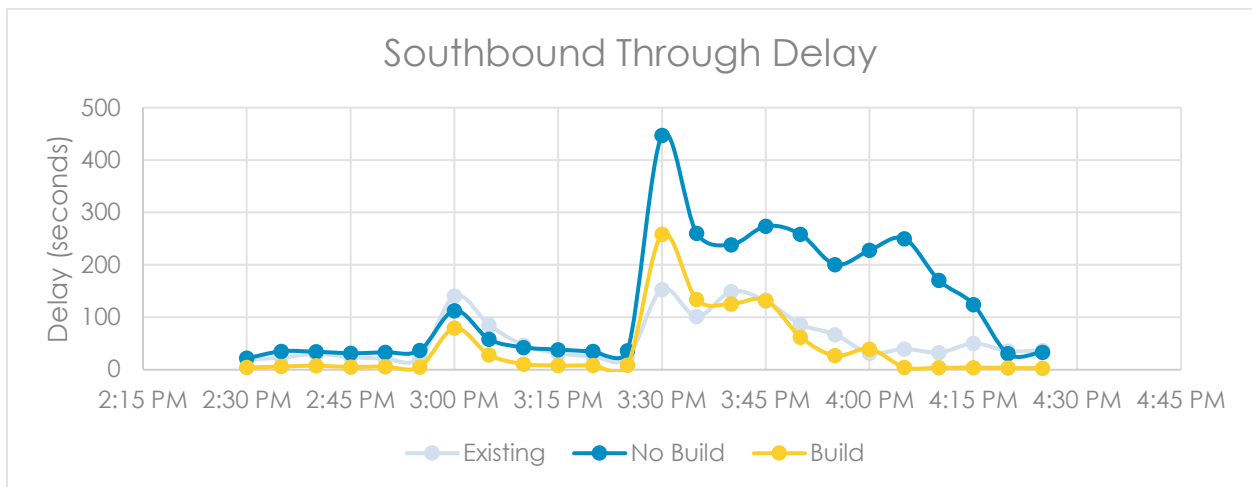
# Modeling Outputs

## Sand Canyon Road Impacts

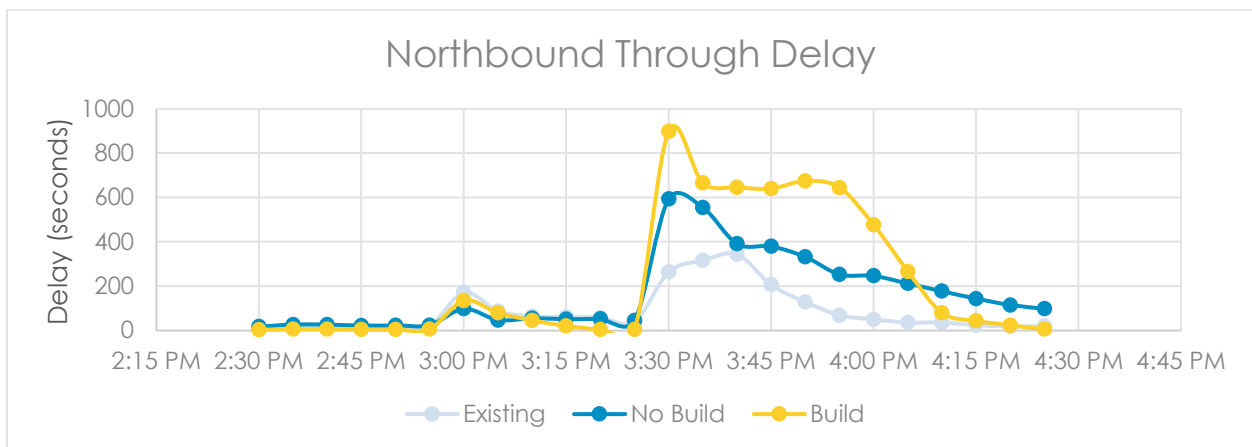
As noted previously, a key performance measure to the City is the impact of school traffic on Sand Canyon Road between SR 14 and Lost Canyon Road. For southbound Sand Canyon Road, we conducted a measurement of travel time and delay between a point 300 feet south of the Sand Canyon Road/SR 14 Westbound Ramps intersection to a point just south of the Sand Canyon Road/Lost Canyon Road intersection. For northbound, we conducted a measurement of travel time and delay was conducted from a point 1400 feet south of the Sand Canyon Road/Lost Canyon Road intersection to a point 400 feet north of the Sand Canyon/Lost Canyon Road intersection. For each of these, delay and travel time was measured and reported in 5-minute averages. These are graphed in Figure 5 and Figure 6 for southbound Sand Canyon Road and northbound Sand Canyon Road, respectively.

In the southbound direction, the no-build scenario results in considerably higher delays than the existing conditions, especially at peak time following the release of Sulphur Springs Elementary School at 3:30 PM. In the northbound direction, the no build scenario results in delay about double the existing conditions after the Sulphur Springs Elementary School release time.

In the southbound direction, the build condition helps reduce much of the delay seen in the no-build scenario. This suggests that, compared to the no-build, the build scenario offers improvements in managing delays, particularly outside of the peak school release window. In the northbound direction, the build condition performs worse than the no-build after the 3:30 PM release of Silver Springs school. The northbound direction is blocked for about 10-15 minutes as the school release traffic blocks the northbound roundabout entry. Once this congestion clears (around 4:10 PM), the build condition then operates better than the no-build scenario. This indicates that while the build scenario initially leads to greater delays immediately following school release, it ultimately recovers and surpasses the performance of the no-build scenario later in the afternoon.



**Figure 5: Southbound Through Delay on Sand Canyon Road between SR 14 and Lost Canyon Road**



**Figure 6: Northbound Through Delay on Sand Canyon Road between SR 14 and Lost Canyon Road**

## Sand Canyon Road/Lost Canyon Road Queues

Table 3 shows projected maximum queue lengths for each key movement at the Sand Canyon Road/Lost Canyon Road intersection. These queue lengths are the maximum queue length experienced, averaged over 10 simulation runs. Individual simulation runs experienced queue lengths larger than these values. Similarly, there is expected to be day-to-day variability in queue lengths.

In the build condition, the maximum queue length for the southbound right turn lane is projected to be approximately 670 feet, which is less than the available queue storage length of 755 feet. This queue length is similar in the no-build condition, with a distance of about 700 feet, which also fits within available storage. These are both larger than the existing queue of about 500 feet.

**Table 3: Projected Maximum Queue Lengths for Sand Canyon Road/Lost Canyon Road Intersection**

Movement	Available Queue Storage	Existing (AWSC)	No Build (AWSC)	Build (Roundabout)
Southbound Right	755 feet	500 feet	700 feet	670 feet
Southbound Through/Left	N/A	345 feet	860 feet	395 feet
Northbound	N/A	550 feet	830 feet	> 1400 feet
Eastbound	N/A	~860 feet	>2500 feet	>2500 feet
Westbound	N/A	100 feet	130 feet	300 feet

Note: AWSC = All-way stop-controlled

Both the no-build and build conditions experience queue lengths in average conditions near the end of the southbound right turn queue storage, without impacting the through traffic. However, the queue length of the southbound right turn is highly variable due to the saturation of the system, with a standard deviation of 690 feet in the build condition and 540 feet in the no build condition. In some simulation runs of both no-build and build, this queue extends through the SR 14 intersection ramp terminal intersections to Soledad Canyon Road (up to 465 ft and 485 ft north of the SR 14 WB Ramps intersection, respectively). The potential effect on freeway operations was not modeled.

The nature of the stopped queue condition with the school release leads to the variability experienced as the random ordering of vehicles and arrival rates can drastically change queue conditions.

## Conclusion

Based on the results of this analysis, we conclude the following:

- The queuing of the southbound right turn of Sand Canyon and Lost Canyon is a key performance measure for this project. The roundabout (build) doesn't significantly change this queue compared to the all-way stop-controlled intersection (no-build) condition. The average maximum queue was 700 feet for the no-build condition and 670 feet for the build condition. However, in some simulations for both the no-build and build conditions, queues spill back to Soledad Canyon Road.

- After school release, northbound traffic will likely experience greater impacts with a roundabout (build) than with an all-way stop-controlled intersection (no-build), due to differences in traffic control priorities. With heavy school release traffic entering the roundabout on the eastbound approach, the northbound approach is impacted.
- A roundabout reduces queues for some movements but increases queues for others. The travel time and delay improves in the southbound direction with a roundabout, but worsens for the northbound direction.

***Appendix J***

***Signal Warrant Worksheets***

**FUTURE WITH PROJECT CONDITIONS (MORNING PEAK HOUR)**

**Belcaro at Sand Canyon**

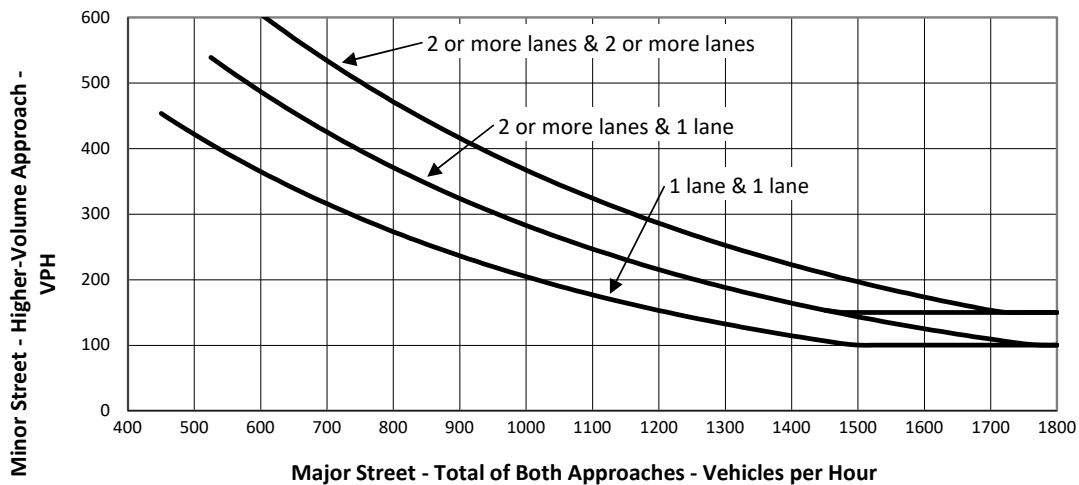
Traffic Signal Warrant Analysis  
Warrant 3, Peak Hour

**4. SAND CANYON ROAD & LOST CANYON ROAD**

Major Street Name: Sand Canyon Road	Vehicles per Hour (Peak Hour) [a]
Minor Street Name: Lost Canyon Road	Major Street (Southbound): 545
Major Street Lanes: 1	Major Street (Northbound): 390
Minor Street Lanes: 1	[b] Major Street Left-Turns: -
	Minor Street (Eastbound): 286
[c] Urban/Rural: Urban	

Vehicles per Hour (Peak Hour)			
Major Street (Approach 1):	545	Minimum Major Street Volume:	450
Major Street (Approach 2):	390	Satisfied?	YES
Total Major Street Volume:	935		
Major Street Left Turns:	-	Minimum Minor Street Volume:	224
Minor Street (Higher Volume):	286	Satisfied?	YES
Total Minor Street Volume:	286	Warrant 3 Satisfied?	<b>YES</b>

**Figure 4C-3. Warrant 3, Peak Hour [d]**



- [a] Excludes right-turn volumes where a separate right-turn lane is provided (i.e., the southbound and eastbound approaches).
- [b] Major street left-turn volume is added to minor street volume if a protected left-turn signal phase is proposed.
- [c] Setting to "Rural" reduces minimum test volumes to approximately 70% of "Urban" test volumes. This may be used when major street speed exceeds 40 mph or in an isolated community of less than 10,000 residents.
- [d] From *California Manual on Uniform Traffic Control Devices, 2014 Edition*; Caltrans.

**FUTURE WITH PROJECT CONDITIONS (AFTERNOON PEAK HOUR)**

**Belcaro at Sand Canyon**

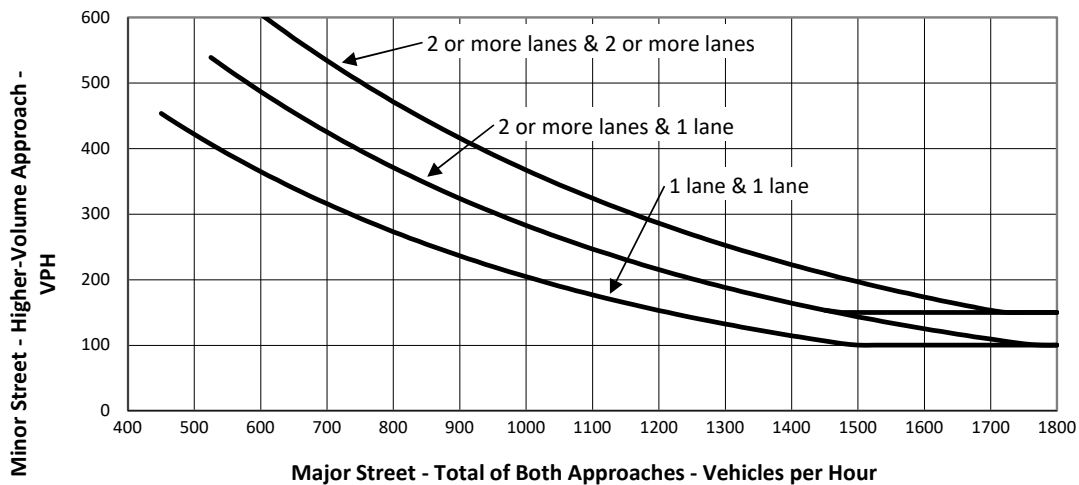
Traffic Signal Warrant Analysis  
Warrant 3, Peak Hour

**4. SAND CANYON ROAD & LOST CANYON ROAD**

Major Street Name: Sand Canyon Road	Vehicles per Hour (Peak Hour) [a]
Minor Street Name: Lost Canyon Road	Major Street (Southbound): 641
Major Street Lanes: 1	Major Street (Northbound): 290
Minor Street Lanes: 1	[b] Major Street Left-Turns: -
	Minor Street (Eastbound): 258
[c] Urban/Rural: Urban	

Vehicles per Hour (Peak Hour)			
Major Street (Approach 1):	641	Minimum Major Street Volume:	450
Major Street (Approach 2):	290	Satisfied?	YES
Total Major Street Volume:	931		
Major Street Left Turns:	-	Minimum Minor Street Volume:	226
Minor Street (Higher Volume):	258	Satisfied?	YES
Total Minor Street Volume:	258	Warrant 3 Satisfied?	<b>YES</b>

**Figure 4C-3. Warrant 3, Peak Hour [d]**



- [a] Excludes right-turn volumes where a separate right-turn lane is provided (i.e., the southbound and eastbound approaches).
- [a] Major street left-turn volume is added to minor street volume if a protected left-turn signal phase is proposed.
- [b] Setting to "Rural" reduces minimum test volumes to approximately 70% of "Urban" test volumes. This may be used when major street speed exceeds 40 mph or in an isolated community of less than 10,000 residents.
- [c] From *California Manual on Uniform Traffic Control Devices, 2014 Edition*; Caltrans.