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Traffic Study

FINAL TRAFFIC IMPACT REPORT

SIGNORELLO WINERY USE PERMIT MODIFICATION 2020

4500 Silverado Trail (APN 020-350-042-000)
Project No. P18-00359

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I. INTRODUCTION

This report has been prepared at the request of the Signorello Winery to determine whether expanded activities at the winery as detailed in their 2020 use permit modification application will result in any significant circulation impacts to the local roadway network. The project site is located on the east side of Silverado Trail just south of the Oak Knoll Avenue intersection. (See **Figure 1 Regional Map, Figure 2 Site Specific Air Photo and Figure 3a & 3b Site Plans.**) The scope of analysis includes evaluation of Silverado Trail as well as the Silverado Trail intersections with Oak Knoll Avenue, Trancas Street and the Project Driveway for harvest Year 2019, Year 2025 and cumulative (Year 2030) horizons. The scope of service for this traffic study was developed for and approved by both the Napa County Public Works Department and the Planning, Building & Environmental Sciences Department.

II. EXECUTIVE SUMMARY OF PROJECT IMPACTS AND RECOMMENDED IMPROVEMENTS

A. IMPACTS

1. PROPOSED PROJECT HARVEST FRIDAY & SATURDAY PM PEAK HOUR TRIP GENERATION

PM PEAK HOUR TRIPS	
HARVEST FRIDAY	HARVEST SATURDAY
14	15

2. SIGNIFICANCE OF PROJECT IMPACTS

- a. **Intersection Level of Service (Silverado Trail at Oak Knoll Avenue, Trancas Street and the Project Driveway)**
 - *Less than significant*
- b. **Arterial Level of Service (Silverado Trail)**
 - *Significant* - South of Project Site. Cumulative only.
 - *Less than significant* - North of Project Site all years and south of Project Site for Existing & 2025 conditions.
- c. **Need for Left Turn Lane on Silverado Trail at the Project Driveway Intersection**
 - *Less than significant* - A left turn lane is already in place.

- d. **Sight Line Adequacy at Silverado Trail/Project Driveway Intersection**
 - *Less than significant* - Sight lines meet Caltrans stopping sight distance criteria.

- e. **Marketing Events**
 - *Less than significant* - There are no changes in the marketing event program. In addition, for all medium size events being held 2 or more times per month, daily visitors by appointment will be reduced by at least the same number of guests at the marketing event.

- f. **Pedestrian, bicycle and transit impacts**
 - *Less than significant* - There are no pedestrian walkways or transit facilities along Silverado Trail. Bike racks will be provided for all employees or guests using the bike lanes along the roadway.

- g. **Parking & Internal Circulation**
 - *Less than significant* - A total of 19 parking stalls will be provided. This will include 3 ADA stalls and 3 electric vehicle charging stalls, one of which is an ADA stall. Parking stall layout and internal roadway design meet County and CAL FIRE criteria.

- h. **TDM Program and VMT Reduction**
 - *Less than significant* - A TDM coordinator will be appointed to reduce traffic generation potential for daily employee traffic as well as to promote shuttle buses for all medium and large size marketing events. A TDM plan is attached.

B. RECOMMENDED IMPROVEMENTS

The project should pay the County's off-site traffic impact fee, currently in development, as there are no realistic capacity improvement measures for Silverado Trail that could be the responsibility of a single project.

III. SUMMARY OF “WITHOUT AND WITH PROJECT” OPERATING CONDITIONS

A. “WITHOUT PROJECT” OPERATING CONDITIONS

1. INTERSECTION LEVEL OF SERVICE

- a. **Silverado Trail/Oak Knoll Avenue - Stop sign controlled approach**
 - **Friday PM Peak Hour**
Existing, Year 2025 & Cumulative (2030) - **Unacceptable**
 - **Saturday PM Peak Hour**
Existing, Year 2025 & Cumulative (2030) - Acceptable
- b. **Silverado Trail/Trancas Street - Signal**
 - **Friday & Saturday PM Peak Hours**
Existing, Year 2025 & Cumulative (2030) - Acceptable
- c. **Silverado Trail/Project Driveway - Driveway approach**
 - **Friday & Saturday PM Peak Hours**
Existing, Year 2025 & Cumulative (2030) - Acceptable

2. ARTERIAL LEVEL OF SERVICE

- a. **Silverado Trail North and South of Project Site**
 - **Friday PM Peak Hour**
Existing, Year 2025 & Cumulative (2030)
 - Southbound - **Unacceptable**
 - Northbound - Acceptable
 - **Saturday PM Peak Hour**
Existing & Year 2025
 - North of Oak Knoll Avenue** –
 - Southbound - **Unacceptable**
 - Northbound - Acceptable
 - South of Oak Knoll Avenue** –
 - Southbound - Acceptable
 - Northbound - Acceptable
 - Cumulative (2030)
 - North of Oak Knoll Avenue** -
 - Southbound - **Unacceptable**
 - Northbound - Acceptable
 - South of Oak Knoll Avenue** -
 - Southbound - **Unacceptable** near site, Acceptable near Trancas Street
 - Northbound - Acceptable

3. INTERSECTIONS WITH VOLUMES MEETING RURAL PEAK HOUR SIGNAL WARRANT #3 CRITERIA

a. Silverado Trail/Oak Knoll Avenue

- Existing, 2025 & Cumulative (2030) - Friday & Saturday PM peak hour volumes meet rural signal Warrant #3 criteria.

4. LEFT TURN LANE VOLUME WARRANT ON SILVERADO TRAIL SOUTHBOUND APPROACH TO THE PROJECT DRIVEWAY

- A left turn lane is already provided.

B. PROJECT IMPACTS

1. OFF-SITE

a. INTERSECTION LEVEL OF SERVICE IMPACTS - Friday & Saturday PM Peak Hours

1) Silverado Trail/Oak Knoll Avenue - *Less than significant*

- **Existing, Year 2025 or Cumulative (2030)** - Project traffic would not increase delay by 5 seconds or greater on the stop sign controlled Oak Knoll Avenue approach to Silverado Trail, which would already be operating at an unacceptable LOS E or F during the Friday PM peak hour. Operation during the Saturday PM peak hour would remain acceptable during all horizons.

2) Silverado Trail/Trancas Street - *Less than significant*

- **Existing, Year 2025 & Cumulative (2030)** - Signalized operation would remain an acceptable LOS B.

3) Silverado Trail/Project Driveway - *Less than significant*

- **Existing, Year 2025 & Cumulative (2030)** - Unsignalized operation would remain an acceptable LOS B or C.

**b. ARTERIAL LEVEL OF SERVICE IMPACTS -
Friday & Saturday PM Peak Hours**

1) Silverado Trail

- **Existing & Year 2025 - *Less than significant.*** Project traffic would not increase 2-way volumes by 1% or greater along the segments of Silverado Trail already operating unacceptably at LOS E during the Friday and Saturday PM peak hours.
- **Cumulative (2030) - *Potentially significant.*** Project traffic would not increase the growth in 2-way traffic from 2019 to 2030 north of Oak Knoll Avenue by 5% or greater which would already be operating unacceptably at LOS E during either the Friday or Saturday PM peak hours. However, project traffic would result in a greater than 5% increase in the growth of traffic from 2019 to 2030 south of the Project at locations already operating unacceptably at LOS E during both the Friday and Saturday PM peak hours.

**c. NEED FOR A LEFT TURN LANE ON SOUTHBOUND SILVERADO TRAIL APPROACH TO PROJECT DRIVEWAY -
*Less than significant.***

A left turn lane is already provided on the southbound Silverado Trail approach.

d. SIGHT LINES AT SILVERADO TRAIL/PROJECT DRIVEWAY INTERSECTION - *Less than significant.*

Sight lines would continue to meet minimum Caltrans stopping sight distance criteria.

e. MARKETING EVENTS - *Less than significant.*

No new marketing events are requested. On days with moderate size events occurring 2 or more times per month daily visitation by appointment would be reduced by the level of attendance at the marketing event. Valet parking and shuttle bus service will be provided for major events.

**f. PEDESTRIAN, BICYCLE AND TRANSIT IMPACTS -
*Less than significant.***

No pedestrians or transit riders would be expected at the winery as there are no pedestrian facilities or transit routes along Silverado Trail. Bike racks would be provided for any bicyclists accessing the winery via the Class II bicycle lanes along Silverado Trail.

g. ON-SITE PARKING & INTERNAL CIRCULATION -

Less than significant.

A total of 19 parking stalls will be provided. This will include 3 ADA stalls and 3 Electric vehicle charging stalls, one of which is an ADA stall. Parking stall layout and internal roadway design meet County and CAL FIRE criteria.

h. TDM PROGRAM AND VMT REDUCTION - *Less than significant.*

A TDM coordinator will be appointed to reduce traffic generation potential for daily employee traffic as well as to promote shuttle buses for all medium and large size marketing events. A TDM plan is attached.

C. RECOMMENDED IMPROVEMENTS

The project should pay the County's off-site traffic impact fee, currently in development, as there are no realistic capacity improvement measures for Silverado Trail that could be the responsibility of a single project.

D. CONCLUSIONS & RECOMMENDATIONS

- The project will result in no significant off-site circulation system operational impacts to the Silverado Trail intersections with Oak Knoll Avenue, Trancas Street or the Project driveway. In addition, there will be no significant impacts to Silverado Trail for existing or 2025 conditions. However, project traffic will result in a significant impact along Silverado Trail south of the project during the cumulative (2030) horizon.
- A left turn lane is already provided on the southbound approach to the Project driveway and sight lines are acceptable and meet Caltrans stopping sight distance criteria at this location. Bicycle racks will be provided for all guests using the Class II bicycle lanes along Silverado Trail for access.
- No new marketing events are being proposed and on days with recurring moderate size attendance daily visitation by appointment will be reduced by the same number of guests attending the event. Finally, a TDM coordinator will be appointed to institute measures to reduce daily employee traffic as well as increase limousine and shuttle bus service for major marketing events.
- The project will pay the County's upcoming traffic impact fee to offset its cumulative impact along Silverado Trail.

IV. PROJECT LOCATION & DESCRIPTION

The Signorello Winery is located along the east side of Silverado Trail just south of the Oak Knoll intersection.

The proposed use permit modification winery will have the following characteristics:

- Production will increase from 20,000 up to 50,000 gallons per year.
- Bottling will remain on site.
- Non-harvest maximum employee total will increase from 4 full-time and 0 part-time up to 16 full-time/0 part-time (weekday) and 11 full-time/0 part-time (Saturday).
- Harvest maximum employee total of 4 full-time/0 part-time will increase up to 16 full-time/4 part-time (weekday) and 11 full-time/4 part-time (Saturday).
- Maximum daily visitation will increase from 20 up to 60 guests.
- Tours and tasting will remain 7 days/week, 10:00 AM-6:00 PM.
- Marketing events: No new events requested.
- A total of 19 parking spaces will be provided, including 3 ADA and 3 Electric vehicle spaces.
- On-site circulation and parking will be designed to meet County and CAL FIRE criteria.

V. EXISTING CIRCULATION SYSTEM EVALUATION PROCEDURES

A. ANALYSIS LOCATIONS

1. INTERSECTIONS

The following locations have been evaluated.

- a. **Silverado Trail/Oak Knoll Avenue intersection** (The Oak Knoll Avenue eastbound approach is stop sign controlled.)
- b. **Silverado Trail/Trancas Street intersection** (The intersection is signalized.)
- c. **Silverado Trail/Project Driveway intersection** (The Project driveway approach is not stop sign controlled. However, drivers approaching Silverado Trail treat it as if it was stop sign controlled.)

Figure 4 presents a schematic of approach lane geometrics and control at each analysis intersection.

2. ARTERIAL ROADWAY SEGMENTS

The following locations have been evaluated.

- a. **Silverado Trail just north of Oak Knoll Avenue, just south of the Project driveway and just north of Trancas Street**

B. VOLUMES

1. ANALYSIS SEASONS AND DAYS OF THE WEEK

Project traffic impacts have been evaluated during harvest conditions. Based upon more than four years of historical information from Caltrans PeMS (Performance Measurement System) count surveys along Silverado Trail in the Napa Valley, September has the highest daily volumes of the year (during harvest). Therefore, only September harvest conditions were selected for evaluation.

In regard to the peak traffic days of the week, the Napa County Travel Behavioral Study (*Fehr & Peers, December 8, 2014*) shows that the highest weekday volumes in Napa Valley occur on a Friday, with the highest weekend volumes occurring on a Saturday. In addition, historical count data from the City of Napa show that Friday has the highest volumes of any weekday, while Caltrans historical counts for Silverado Trail between St. Helena and Napa also show that weekday AM and PM peak hour volumes are higher on a Friday than on either a Wednesday or Thursday. Therefore, Friday and Saturday peak traffic conditions were evaluated in this study. Napa County Public Works recent direction regarding days of the week to evaluate also dictate that harvest Friday and Saturday conditions should be evaluated in all traffic impact studies.

2. COUNT RESULTS

Friday 2:00 to 6:00 PM as well as Saturday Noon to 6:00 PM turn movement counts were conducted by Crane Transportation Group (CTG) for two Fridays and two Saturdays in September and October 2019 at the Silverado Trail intersections with Oak Knoll Avenue, Trancas Street and the Project driveway. The peak traffic hours for the system were determined to be 3:15 to 4:15 PM on Friday and 4:45 to 5:45 PM on Saturday. It should be noted, however, that there were many hours on both days that had similar volumes. Based upon direction from County Public Works, results from the two Friday counts were averaged and the results shown in **Figure 5**, while results from the two Saturday counts were also averaged and also shown in **Figure 5**. Peak hour counts from each count day along with daily counts, speed survey results and classification counts are presented in **Appendix A**.

Overall, harvest PM peak hour two-way volumes along Silverado Trail at the Project site are much higher during the Friday PM peak hour than those during the Saturday PM peak hour (about 1350 vehicles on Friday versus 1040 vehicles on Saturday).

Daily (24-hour) directional volumes were also conducted for two Fridays and two Saturdays in September and October on the Project driveway and Silverado Trail adjacent to the project site. Daily speed surveys and classification counts were also conducted on Silverado Trail on a clear weather Friday/Saturday at the end of January 2020. Count results are presented in **Appendix A**.

C. ROADWAYS

Roadway descriptions are based upon the designation that Silverado Trail runs in general north-south direction through the project area, while Oak Knoll Avenue, Trancas Street and the Project driveway run in an east-west direction. The project site is along the east side of Silverado Trail just south of Oak Knoll Avenue. **Figure 4** presents existing intersection geometrics and control.

Silverado Trail provides the only major regional access to the east side of the Napa Valley. In the project vicinity it has two well-paved travel lanes, wide paved shoulders that are signed and striped as Class II bicycle lanes, and a posted speed limit of 55 miles per hour. It is level and straight. A left turn lane is in place on the northbound approach to Oak Knoll Avenue and on the southbound approach to the project driveway. A median continuous two-way left turn lane extends south of the project driveway and facilitates left turns from the project driveway. The Silverado Trail/Trancas Street T-intersection just north of the City of Napa is signalized.

The Project Driveway is a two-lane paved roadway. It is not stop sign controlled on its approach to Silverado Trail.

D. INTERSECTION LEVEL OF SERVICE

1. ANALYSIS METHODOLOGY

Transportation engineers and planners commonly use a grading system called level of service (LOS) to measure and describe the operational status of the local roadway network. LOS is a description of the quality of a roadway facility's operation, ranging from LOS A (indicating free-flow traffic conditions with little or no delay) to LOS F (representing oversaturated conditions where traffic flows exceed design capacity, resulting in long queues and delays). Intersections, rather than roadway segments between intersections, are almost always the capacity controlling locations for any circulation system.

Signalized Intersections. For signalized intersections, the Year 2017 6th Edition Highway Capacity Manual (Transportation Research Board, National Research Council) methodology was utilized. With this methodology, operations are defined by the level of service and average

control delay per vehicle (measured in seconds) for the entire intersection. For a signalized intersection, control delay is the portion of the total delay attributed to traffic signal operation. This includes delay associated with deceleration, acceleration, stopping, and moving up in the queue. **Table 1** summarizes the relationship between delay and LOS for signalized intersections.

Unsignalized Intersections. For unsignalized (all-way stop-controlled and side-street stop-controlled) intersections, the Year 2017 6th Edition Highway Capacity Manual (Transportation Research Board, National Research Council) methodology for unsignalized intersections was utilized. For side-street stop-controlled intersections, operations are defined by the level of service and average control delay per vehicle (measured in seconds), with delay reported for the stop sign controlled approaches or turn movements. For all-way stop-controlled intersections, operations are defined by the average control delay for the entire intersection (measured in seconds per vehicle). The delay at an unsignalized intersection incorporates delay associated with deceleration, acceleration, stopping, and moving up in the queue. **Table 2** summarizes the relationship between delay and LOS for unsignalized intersections and capacity worksheets are provided in **Appendix B**.

2. MINIMUM ACCEPTABLE OPERATION

Napa County's currently minimum acceptable operating standard for signalized intersections is Level of Service D (LOS D) for overall intersection operation, while at unsignalized intersections it is also Level of Service D for the side street stop sign controlled approaches at two-way stop intersections and for overall operation at all-way-stop intersections.

E. ARTERIAL LEVEL OF SERVICE

1. ANALYSIS METHODOLOGY

The 2017 Highway Capacity Manual Version 6 arterial analysis methodology has been utilized for analysis of Silverado Trail from Trancas Street to north of Oak Knoll Avenue. Analysis results are presented as a level of service and demand capacity ratio. Input includes directional volumes, road and shoulder widths, percent trucks and RVs, terrain characteristics, percent available passing distance, etc.

2. MINIMUM ACCEPTABLE OPERATION

Napa County's currently minimum acceptable operating standard for arterials such as Silverado Trail is Level of Service D (LOS D).

F. INTERSECTION SIGNAL WARRANTS

1. ANALYSIS METHODOLOGY

Traffic signals are used to provide an orderly flow of traffic through an intersection. Many times they are needed to offer side street traffic an opportunity to access a major road where high volumes and/or high vehicle speeds block crossing or turn movements. They do not, however, increase the capacity of an intersection (i.e., increase the overall intersection's ability to

accommodate additional vehicles) and, in fact, often slightly reduce the number of total vehicles that can pass through an intersection in a given period of time. Signals can also cause an increase in traffic accidents if installed at inappropriate locations

There are 10 possible tests for determining whether a traffic signal should be considered for installation. These tests, called "warrants", consider criteria such as actual traffic volume, pedestrian volume, presence of school children, and accident history. The intersection volume data together with the available collision histories were compared to warrants contained in the *California Manual on Uniform Traffic Control Devices, 2014 Rev 5 (2014 CaMUTCD Rev 5 - March 2020)*. It provides guidelines, or warrants, which may indicate need for a traffic signal at an unsignalized intersection. As indicated in the *2014 CaMUTCD Rev 5 - March 2020*, satisfaction of one or more warrants does not necessarily require immediate installation of a traffic signal. It is merely an indication that the local jurisdiction should begin monitoring conditions at that location and that a signal may ultimately be required.

2. MINIMUM ACCEPTABLE OPERATION

Warrant 3, the peak hour volume warrant, is often used as an initial check of signalization needs since peak hour volume data is typically available and this warrant is usually the first one to be met. Warrant 3 is based on a logarithmic curve and takes only the hour with the highest volume of the day into account. For intersections in rural locations (with local area population less than 10,000 people or where the posted speed limit or 85th percentile speed on the uncontrolled intersection approaches is greater than 40 miles per hour) a 70 percent warrant is applied. The regular and 70 percent warrants are typically referred to as the urban and rural peak hour warrants. Rural warrant criteria have been used for evaluation of the Silverado Trail/Oak Knoll Avenue intersection. Please see **Appendix C** for the existing condition warrant charts.

G. PLANNED IMPROVEMENTS

There are no planned and funded roadway system capacity improvements at any location evaluated in this study. (*Napa County Public Works Department, January 2020*)

H. ACCIDENT HISTORY

Accident records from January 2014 through October 2019 were obtained from the California Highway Patrol for Silverado Trail between and including the Oak Knoll Avenue and Trancas Street intersections. Locations of all accidents over this time span are presented in **Figure 6**, while year by year accident details are presented in **Appendix D**. As shown, there have not been any reported accidents at the Silverado Trail intersection with the Project driveway.

I. EXISTING PEDESTRIAN AND BICYCLE FACILITIES NEAR THE PROJECT

There are no pedestrian walkways along Silverado Trail in the project area and none are planned by the project. However, there are Class II signed and striped bicycle lanes along the paved shoulders of Silverado Trail.

J. TRANSIT SERVICE

There is no scheduled transit service along Silverado Trail north of Trancas Street.

VI. FUTURE HORIZON TRAFFIC VOLUME PROJECTIONS

Traffic analysis has been conducted for harvest existing (2019), year 2025 and cumulative (year 2030) horizons at County request. The 2030 cumulative horizon reflects the County General Plan Buildout year. Traffic modeling for the General Plan shows the following growths in two-way traffic between 2019 and 2030 for the following roadways.

<u>Route</u>	<u>2019 to 2030 Projected Growth in 2-Way Weekday PM Peak Hour Traffic</u>
Silverado Trail (5-mile segment)	PM peak hour = 11-13%
Oak Knoll Avenue	PM peak hour = 11.6%
Trancas Street	PM peak hour = 8%

Projecting straight line traffic growth for analysis purposes, this translates into the following growths in two-way traffic between 2019 and 2025 for the same roadways.

<u>Route</u>	<u>2019 to 2025 Projected Growth in 2-Way Weekday PM Peak Hour Traffic</u>
Silverado Trail (5-mile segment)	PM peak hour = 6.5-7.5%
Oak Knoll Avenue	PM peak hour = 6.2%
Trancas Street	PM peak hour = 4.4%

Since traffic modeling projections were only available for weekday PM peak hour conditions and not for the Saturday PM peak hour, Saturday two-way PM peak hour volumes were increased by the percentages found for the weekday PM peak hour.

Resultant year 2025 harvest “Without Project” Friday and Saturday PM peak hour volumes are presented in **Figure 7**, while cumulative (year 2030) harvest “Without Project” Friday and Saturday PM peak hour volumes are presented in **Figure 8**.

VII. OFF-SITE HARVEST CIRCULATION SYSTEM OPERATION – WITHOUT PROJECT

A. YEAR 2019 HARVEST (WITHOUT PROJECT) OPERATING CONDITIONS

1. EXISTING INTERSECTION LEVEL OF SERVICE – SEE TABLE 3 AND APPENDIX B FOR CAPACITY WORKSHEETS

a. SILVERADO TRAIL/OAK KNOLL AVENUE

- **Friday PM Peak Hour**

Unacceptable Oak Knoll Avenue stop sign controlled eastbound approach:
LOS E

- **Saturday PM Peak Hour**

Acceptable Oak Knoll Avenue stop sign controlled eastbound approach:
LOS C

b. SILVERADO TRAIL/TRANCAS STREET (SIGNAL)

- **Friday & Saturday PM Peak Hours**

Acceptable signalized operation: LOS B

c. SILVERADO TRAIL/PROJECT DRIVEWAY

- **Friday & Saturday PM Peak Hours**

Acceptable Project driveway approach: LOS B or C

2. EXISTING ARTERIAL SEGMENT LEVEL OF SERVICE – SEE TABLE 4

a. SILVERADO TRAIL JUST NORTH OF OAK KNOLL AVENUE

- **Friday PM Peak Hour**

Northbound – LOS C

Southbound – LOS E

- **Saturday PM Peak Hour**

Northbound – LOS B

Southbound – LOS E

b. SILVERADO TRAIL JUST SOUTH OF OAK KNOLL AVENUE

• **Friday PM Peak Hour**

Northbound – LOS C

Southbound – LOS E

• **Saturday PM Peak Hour**

Northbound – LOS B

Southbound – LOS D

c. SILVERADO TRAIL JUST NORTH OF TRANCAS STREET

• **Friday PM Peak Hour**

Northbound – LOS C

Southbound – LOS E

• **Saturday PM Peak Hour**

Northbound – LOS B

Southbound – LOS D

**3. EXISTING SIGNAL WARRANT EVALUATION –
SEE TABLE 5 & APPENDIX C**

a. SILVERADO TRAIL/OAK KNOLL AVENUE

• **Friday & Saturday PM Peak Hours**

Volumes exceed peak hour signal Warrant #3 rural criteria.

**B. YEAR 2025 HARVEST (WITHOUT PROJECT)
OPERATING CONDITIONS**

1. 2025 INTERSECTION LEVEL OF SERVICE – SEE TABLE 3

a. SILVERADO TRAIL/OAK KNOLL AVENUE

• **Friday PM Peak Hour**

Unacceptable Oak Knoll Avenue stop sign controlled eastbound approach:

LOS E

• **Saturday PM Peak Hour**

Acceptable Oak Knoll Avenue stop sign controlled eastbound approach:

LOS C

b. SILVERADO TRAIL/TRANCAS STREET (SIGNAL)

• **Friday & Saturday PM Peak Hours**

Acceptable signalized operation: LOS B

c. SILVERADO TRAIL/PROJECT DRIVEWAY

- **Friday & Saturday PM Peak Hours**
Acceptable Project driveway approach: LOS B or C

**2. 2025 ARTERIAL SEGMENT LEVEL OF SERVICE –
SEE TABLE 4**

a. SILVERADO TRAIL JUST NORTH OF OAK KNOLL AVENUE

- **Friday PM Peak Hour**
Northbound – LOS C
Southbound – LOS E
- **Saturday PM Peak Hour**
Northbound – LOS B
Southbound – LOS E

b. SILVERADO TRAIL JUST SOUTH OF OAK KNOLL AVENUE

- **Friday PM Peak Hour**
Northbound – LOS C
Southbound – LOS E
- **Saturday PM Peak Hour**
Northbound – LOS B
Southbound – LOS D

c. SILVERADO TRAIL JUST NORTH OF TRANCAS STREET

- **Friday PM Peak Hour**
Northbound – LOS C
Southbound – LOS E
- **Saturday PM Peak Hour**
Northbound – LOS B
Southbound – LOS D

3. 2025 SIGNAL WARRANT EVALUATION – SEE TABLE 5

a. SILVERADO TRAIL/OAK KNOLL AVENUE

- **Friday & Saturday PM Peak Hours**
Volumes would **exceed** peak hour signal Warrant #3 rural criteria.

C. CUMULATIVE (YEAR 2030) HARVEST (WITHOUT PROJECT) OPERATING CONDITIONS

1. 2030 INTERSECTION LEVEL OF SERVICE – SEE TABLE 3

a. SILVERADO TRAIL/OAK KNOLL AVENUE

• **Friday PM Peak Hour**

Unacceptable Oak Knoll Avenue stop sign controlled eastbound approach:
LOS F

• **Saturday PM Peak Hour**

Acceptable Oak Knoll Avenue stop sign controlled eastbound approach:
LOS D

b. SILVERADO TRAIL/TRANCAS STREET (SIGNAL)

• **Friday & Saturday PM Peak Hours**

Acceptable signalized operation: LOS B

c. SILVERADO TRAIL/PROJECT DRIVEWAY

• **Friday & Saturday PM Peak Hours**

Acceptable Project driveway approach: LOS B or C

2. 2030 ARTERIAL SEGMENT LEVEL OF SERVICE – SEE TABLE 4

a. SILVERADO TRAIL JUST NORTH OF OAK KNOLL AVENUE

• **Friday PM Peak Hour**

Northbound – LOS C

Southbound – LOS E

• **Saturday PM Peak Hour**

Northbound – LOS B

Southbound – LOS E

b. SILVERADO TRAIL JUST SOUTH OF OAK KNOLL AVENUE

• **Friday PM Peak Hour**

Northbound – LOS C

Southbound – LOS E

• **Saturday PM Peak Hour**

Northbound – LOS B

Southbound – LOS E

- c. **SILVERADO TRAIL JUST NORTH OF TRANCAS STREET**
 - **Friday PM Peak Hour**
 - Northbound – LOS C
 - Southbound – LOS E
 - **Saturday PM Peak Hour**
 - Northbound – LOS B
 - Southbound – LOS D

3. 2030 SIGNAL WARRANT EVALUATION – SEE TABLE 5

- a. **SILVERADO TRAIL/OAK KNOLL AVENUE**
 - **Friday & Saturday PM Peak Hours**
 - Volumes would **exceed** peak hour signal Warrant #3 rural criteria.

VIII. SIGNIFICANCE CRITERIA

A. COUNTY OF NAPA

The following criteria have recently been developed for traffic impact analyses in Napa County.

EXISTING + PROJECT CONDITIONS

1. ARTERIAL SEGMENTS

A project would cause a significant impact requiring mitigation if:

- a. An arterial segment operates at LOS A, B, C or D during the selected peak hours without project trips, and deteriorates to LOS E or F with the addition of project trips, or
- b. An arterial segment operates at LOS E or F during the selected peak hours without project trips, and the addition of project trips increases the total segment volume by one percent or more.

For the second criteria, the following equation should be used if the arterial operates at LOS E or F without the project:

$$\text{Project Contribution \%} = \text{Project Trips} \div \text{Existing Volumes}$$

2. SIGNALIZED INTERSECTIONS

A project would cause a significant impact requiring mitigation if:

- a. A signalized intersection operates at LOS A, B, C or D during the selected peak hours without project trips, and deteriorates to LOS E or F with the addition of project trips, or
- b. A signalized intersection operates at LOS E or F during the selected peak hours without project trips, and the addition of project trips increases the total entering volume by one percent or more.

For the second criteria, the following equation should be used if the signalized intersection operates at LOS E or F without the project:

$$\textit{Project Contribution \%} = \textit{Project Trips} \div \textit{Existing Volumes}$$

Maintaining LOS D or better at all signalized intersections would sometimes require expanding the physical footprint of an intersection. In some locations around the County, expanding physical transportation infrastructure could be in direct conflict with the County's goals of preserving the area's rural character, improving safety, and sustaining the agricultural industry, making these potential improvements infeasible. The County's Circulation Element lists intersections that are slated for improvement or expansion in unincorporated Napa County.¹

Transportation studies should individually consider the feasibility of potential mitigation measures with respect to right-of-way acquisition, regardless of the intersection's place in the Circulation Element's identified improvement lists, and present potential alternative mitigation measures that do not require right-of-way acquisition. County staff would then review that information and make the decision about the feasibility of the identified potential mitigations.

For intersections that cannot be improved without substantial additional right-of-way according to both the Circulation Element and the individual transportation impact study, and where other mitigations such as updating signal timing, signal phasing and operations, and/or signing and striping improvements do not improve the LOS, LOS E or F will be considered acceptable and the one percent threshold would not apply. Analysis of signalized intersection LOS should still be presented for informational purposes, and there should still be an evaluation of effects on safety and local access, per Policy CIR-18.

¹ According to the Circulation Element dated June 8, 2008, the following intersections can be altered or expanded as a mitigation measure: SR-12/Airport Boulevard/SR-29, SR-221/SR-12/Highway 29, and several intersections along SR-29 and SR-128 north of Napa. The significance criteria shown above should apply to facilities where appropriate based upon the most recent Circulation Element chapter of the General Plan.

3. UNSIGNALIZED INTERSECTIONS (ALL WAY STOP AND SIDE STREET STOP SIGN CONTROLLED)

LOS for all way stop controlled intersections is defined as an average of the delay at all approaches. LOS for side street stop controlled intersections is defined by the delay and LOS for the worst case approach. The recommended interpretation of Policy CIR-16 regarding unsignalized intersection significance criteria is as follows:

- a. An unsignalized intersection operates at LOS A, B, C or D during the selected peak hours without project trips, the LOS deteriorates to LOS E or F with the addition of project traffic, and the peak hour traffic signal warrant criteria should also be evaluated and presented for information purposes, or
- b. An unsignalized intersection operates at LOS E or F during the selected peak hours without project trips and the project increases stop sign controlled delay by 5 seconds or greater. The peak hour traffic signal warrant criteria should also be evaluated and presented for informational purposes.

$$\text{Project Contribution \%} = \text{Project Trips} \div \text{Existing Volumes}$$

CUMULATIVE + PROJECT CONDITIONS

1. ARTERIAL SEGMENTS, SIGNALIZED INTERSECTIONS AND UNSIGNALIZED INTERSECTIONS

A project would cause a significant cumulative impact requiring mitigation if:

- a. The overall amount of expected traffic growth causes conditions to deteriorate such that any of the significance criteria described above for existing conditions are met, and
- b. The project's contribution to a significant cumulative impact for arterials or signalized intersections would be equal to or greater than five percent of the growth in traffic from existing to cumulative conditions.
- c. The project's contribution to a cumulative significant impact at an unsignalized intersection would result with an increase in stop sign controlled delay of 5 seconds or greater.

A project's contribution to a cumulative condition would be calculated as the project's percentage contribution to the total growth in traffic from existing conditions.

$$\text{Project Contribution \%} = \text{Project Trips} \div (\text{Cumulative Volumes} - \text{Existing Volumes})$$

- If projected daily volumes on the project driveway in combination with volumes on the roadway providing access to the project driveway meet County warrant criteria for provision of a left turn lane on the approach to the project entrance.
- If sight lines at project access driveways do not meet Caltrans stopping sight distance criteria based upon prevailing vehicle speeds.

IX. PROJECT IMPACT EVALUATION

A. TRIP GENERATION

1. METHODOLOGY

Project trip generation was determined using one of the three possible methodologies recently approved by Napa County Public Works for transportation impact study analysis. As detailed from Public Works, perform a site-specific analysis by first conducting actual daily trip counts at the driveway of the project on two Fridays and two Saturdays (for winery use permit modifications). Next, determine the increment of net new daily traffic due to the use permit modification proposed project using trip rates from the use permit Winery Traffic Information/Trip Generation sheets. Based upon the two Friday and two Saturday 24-hour winery driveway counts, determine which hour on each day had the highest combined inbound + outbound traffic and determine the percent of total traffic occurring during those hours in relation to the daily counts. Apply these percentages to the net new Friday and Saturday daily traffic increments for the project to determine the amount of project traffic that would be expected to occur during the winery's peak traffic hour. Finally, assume that the winery's peak hourly traffic will occur at the time as the ambient peak traffic time on the adjacent roadway system.

Table 6 shows that the proposed use permit modification 2020 would be expected to generate 7 inbound and 7 outbound trips during a harvest Friday PM peak hour (3:15 - 4:15), with 4 inbound and 11 outbound trips during a harvest Saturday PM peak hour (4:45 - 5:45). Winery Traffic Information/Trip Generation sheets are presented in **Appendix E**.

B. TRIP DISTRIBUTION

Project traffic was distributed to Silverado Trail in a pattern reflective of existing PM peak hour distribution patterns at the Silverado Trail/Project driveway intersection. Likewise, project traffic distribution at the Silverado Trail intersections with Trancas Street and Oak Knoll Avenue was based upon existing turn patterns. For the Friday PM peak hour inbound traffic would be expected to come about equally from the north and south, while the majority of outbound traffic would be expected to turn left to the south on Silverado Trail. For the Saturday PM peak hour inbound traffic would be expected to come about equally from the north and south, while the majority of outbound traffic would be expected to turn left to go southbound on Silverado Trail.

The harvest Friday and Saturday project traffic increments expected on Silverado Trail during the times of ambient peak traffic flows are presented in **Figure 9**. Friday and Saturday “With Project” PM peak hour harvest volumes for year 2019 are presented in **Figure 10**; “With Project” PM peak hour harvest volumes for year 2025 conditions are presented in **Figure 11**, and “With Project” PM peak hour harvest volumes for cumulative (year 2030) conditions are presented in **Figure 12**.

C. OFF-SITE IMPACTS

1. EXISTING (2019) HARVEST + PROJECT CONDITIONS

a. SUMMARY

Project traffic would not result in any significant level of service impacts along Silverado Trail or at the Silverado Trail intersections with Oak Knoll Avenue, Trancas Street or the Project driveway during either Friday or Saturday PM peak traffic hours. *Less than significant.*

b. 2019 INTERSECTION LEVEL OF SERVICE IMPACTS – SEE TABLE 3

1) Silverado Trail/Oak Knoll Avenue

- **Friday PM Peak Hour**

Operation of the stop sign controlled Oak Knoll Avenue intersection approach would remain an unacceptable LOS E with the addition of project traffic. However, delay would increase by less than 5 seconds (0.6 seconds), the County significance limit. *Less than significant.*

- **Saturday PM Peak Hour**

Operation of the Oak Knoll Avenue approach would remain an acceptable LOS C with the addition of project traffic. *Less than significant.*

2) Silverado Trail/Trancas Street

- **Friday & Saturday PM Peak Hours**

Operation of the signalized Trancas Street intersection would remain an acceptable LOS B with the addition of project traffic. *Less than significant.*

3) Silverado Trail/Project Driveway

- **Friday & Saturday PM Peak Hours**

Operation of the Project driveway approach to Silverado Trail would remain an acceptable LOS B or C with the addition of project traffic. *Less than significant.*

c. 2019 ARTERIAL SEGMENT IMPACTS – SEE TABLE 4

1) Silverado Trail North of Oak Knoll Avenue

• **Friday PM Peak Hour**

Operation would remain LOS C northbound and LOS E southbound. The project would not increase total segment volumes by 1 percent or more (0.3%). *Less than significant.*

• **Saturday PM Peak Hour**

Operation would remain LOS B northbound and LOS E southbound. The project would not increase total segment volumes by 1 percent or more (0.4%). *Less than significant.*

2) Silverado Trail South of the Project Site

• **Friday PM Peak Hour**

Operation would remain LOS C northbound and LOS E southbound. The project would not increase total segment volumes by 1 percent or more (0.7%). *Less than significant.*

• **Saturday PM Peak Hour**

Operation would remain LOS B northbound and LOS D southbound. *Less than significant.*

3) Silverado Trail North of Trancas Street

• **Friday PM Peak Hour**

Operation would remain LOS C northbound and LOS E southbound. The project would not increase total segment volumes by 1 percent or more (0.7%). *Less than significant.*

• **Saturday PM Peak Hour**

Operation would remain LOS B northbound and LOS D southbound. *Less than significant.*

d. 2019 SIGNAL WARRANT EVALUATION – SEE TABLE 5

Signal warrant information is provided for informational purposes only per County significance criteria.

1) Silverado Trail/Oak Knoll Avenue

• **Friday & Saturday PM Peak Hours**

Volumes would be exceeding rural peak hour signal warrant criteria with or without project traffic. *Less than significant.*

2. YEAR 2025 HARVEST + PROJECT CONDITIONS

a. SUMMARY

Project traffic would not result in any significant level of service impacts along Silverado Trail or at the Silverado Trail intersections with Oak Knoll Avenue, Trancas Street or the Project driveway during either Friday or Saturday PM peak traffic hours. *Less than significant.*

b. 2025 INTERSECTION LEVEL OF SERVICE IMPACTS – SEE TABLE 3

1) Silverado Trail/Oak Knoll Avenue

- **Friday PM Peak Hour**

Operation of the stop sign controlled Oak Knoll Avenue intersection approach would remain an unacceptable LOS E with the addition of project traffic. However, delay would increase by less than 5 seconds (1.5 seconds), the County significance limit. *Less than significant.*

- **Saturday PM Peak Hour**

Operation of the Oak Knoll Avenue approach would remain an acceptable LOS C with the addition of project traffic. *Less than significant.*

2) Silverado Trail/Trancas Street

- **Friday & Saturday PM Peak Hours**

Operation of the signalized Trancas Street intersection would remain an acceptable LOS B with the addition of project traffic. *Less than significant.*

3) Silverado Trail/Project Driveway

- **Friday & Saturday PM Peak Hours**

Operation of the Project driveway approach to Silverado Trail would remain an acceptable LOS B or C with the addition of project traffic. *Less than significant.*

c. 2025 ARTERIAL SEGMENT IMPACTS – SEE TABLE 4

1) Silverado Trail North of Oak Knoll Avenue

- **Friday PM Peak Hour**

Operation would remain LOS C northbound and LOS E southbound. The project would not increase total segment volumes by 1 percent or more (0.3%). *Less than significant.*

- **Saturday PM Peak Hour**

Operation would remain LOS B northbound and LOS E southbound. The project would not increase total segment volumes by 1 percent or more (0.4%). *Less than significant.*

2) Silverado Trail South of the Project Site

• **Friday PM Peak Hour**

Operation would remain LOS C northbound and LOS E southbound. The project would not increase total segment volumes by 1 percent or more (0.7%). *Less than significant.*

• **Saturday PM Peak Hour**

Operation would remain LOS B northbound and LOS D southbound. *Less than significant.*

3) Silverado Trail North of Trancas Street

• **Friday PM Peak Hour**

Operation would remain LOS C northbound and LOS E southbound. The project would not increase total segment volumes by 1 percent or more (0.7%). *Less than significant.*

• **Saturday PM Peak Hour**

Operation would remain LOS B northbound and LOS D southbound. *Less than significant.*

d. 2025 SIGNAL WARRANT EVALUATION – SEE TABLE 5

Signal warrant information is provided for informational purposes only per County significance criteria.

1) Silverado Trail/Oak Knoll Avenue

• **Friday & Saturday PM Peak Hours**

Volumes would be exceeding rural peak hour signal warrant criteria with or without project traffic.

3. CUMULATIVE (YEAR 2030) HARVEST + PROJECT CONDITIONS

a. SUMMARY

Project traffic, with one exception would not result in any significant level of service impacts along Silverado Trail or at the Silverado Trail intersections with Oak Knoll Avenue, Trancas Street or the Project Driveway either the Friday or Saturday PM peak traffic hours. The exception is a significant impact to arterial operation along Silverado Trail south of the project for the cumulative (2030) horizon. *Potentially significant.*

**b. 2030 INTERSECTION LEVEL OF SERVICE IMPACTS –
SEE TABLE 3**

1) Silverado Trail/Oak Knoll Avenue

• **Friday PM Peak Hour**

Operation of the stop sign controlled Oak Knoll Avenue intersection approach would remain an unacceptable LOS F with the addition of project traffic. However, delay would increase by less than 5 seconds (2.6 seconds), the County significance limit. *Less than significant.*

• **Saturday PM Peak Hour**

Operation of the Oak Knoll Avenue approach would remain an acceptable LOS D with the addition of project traffic.
Less than significant.

2) Silverado Trail/Trancas Street

• **Friday & Saturday PM Peak Hours**

Operation of the signalized Trancas Street intersection would remain an acceptable LOS B with the addition of project traffic.
Less than significant.

3) Silverado Trail/Project Driveway

• **Friday & Saturday PM Peak Hours**

Operation of the Project driveway approach to Silverado Trail would remain an acceptable LOS B or C with the addition of project traffic.
Less than significant.

c. 2030 ARTERIAL SEGMENT IMPACTS – SEE TABLE 4

1) Silverado Trail North of Oak Knoll Avenue

• **Friday PM Peak Hour**

Operation would remain LOS C northbound and LOS E southbound. The project would not increase the change in two-way segment volumes between 2019 and 2030 by 5 percent or more (2.6%).
Less than significant.

• **Saturday PM Peak Hour**

Operation would remain LOS B northbound and LOS E southbound. The project would not increase the change in two-way segment volumes between 2019 and 2030 by 5 percent or more (3.1%).
Less than significant.

2) Silverado Trail South of Project Site

• **Friday PM Peak Hour**

Operation would remain LOS C northbound and LOS E southbound. The project would increase the change in two-way segment volumes

between 2019 and 2030 by more than 5 percent (5.3%). *Potentially significant.*

- **Saturday PM Peak Hour**

Operation would remain LOS B northbound and LOS E southbound. The project would increase the change in two-way segment volumes between 2019 and 2030 by 5 percent or more (6.8%). *Potentially significant.*

3) **Silverado Trail North of Trancas Street**

- **Friday PM Peak Hour**

Operation would remain LOS C northbound and LOS E southbound. The project would increase the change in two-way segment volumes between 2019 and 2030 by more than 5 percent (5.3%). *Potentially significant.*

- **Saturday PM Peak Hour**

Operation would remain LOS B northbound and LOS D southbound, acceptable operation. *Less than significant.*

d. 2030 SIGNAL WARRANT EVALUATION – SEE TABLE 5

Signal warrant information is provided for informational purposes only per County significance criteria.

1) **Silverado Trail/Oak Knoll Avenue**

- **Friday & Saturday PM Peak Hours**

Volumes would be exceeding rural peak hour signal warrant criteria with or without project traffic.

X. OTHER POTENTIAL PROJECT IMPACTS

A. SIGHT LINE ADEQUACY AT THE SILVERADO TRAIL/PROJECT DRIVEWAY INTERSECTION

Sight lines at the Silverado Trail/Project driveway intersection are currently acceptable to the north and south along Silverado Trail.

Sight line to the north along Silverado Trail (to see southbound vehicles) 1000+ feet
Sight line to the south along Silverado Trail (to see northbound vehicles) 1000+ feet

The Caltrans Highway Design Manual (July 2018) states that stopping sight distance is the corner sight distance criteria to be utilized at private road connections to arterial roadways. The minimum required stopping sight distances based upon various vehicle speeds are as follows.

SPEED	MINIMUM REQUIRED STOPPING SIGHT DISTANCE
55 mph	500 feet
60 mph	580 feet
65 mph	660 feet

The posted speed limit at the project entrance is 55 miles per hour, and some vehicles were observed traveling higher than the posted limit during two field surveys by Crane Transportation Group. Based upon the 65 mile per hour criteria, resultant sight lines to the north and south along Silverado Trail from the Project Driveway would be acceptable. *Less than significant.*

B. NEED FOR LEFT TURN LANE AT THE SILVERADO TRAIL/PROJECT DRIVEWAY INTERSECTION

A left turn lane is already provided on the southbound Silverado Trail approach to the Project driveway. *Less than significant.*

C. MARKETING EVENTS

There are no changes in the marketing event program. In addition, for all medium size events being held 2 or more times per month, daily visitors by appointment will be reduced by at least the same number of guests at the marketing event. *Less than significant.*

D. PEDESTRIAN, BICYCLE AND TRANSIT IMPACTS

No pedestrians or transit riders would be expected at the winery as there are no pedestrian facilities or transit routes along Silverado Trail. Bike racks will be provided for any bicyclists accessing the winery via the Class II bicycle lanes along Silverado Trail. *Less than significant.*

E. ON-SITE PARKING & INTERNAL CIRCULATION

A total of 19 parking spaces will be provided, including 3 ADA and 3 electric vehicle charging spaces. Twenty spaces are allowed under the current use permit. Visitation will be by appointment only, which allows spreading the guest parking demand throughout the day. Valet parking will be provided for major events along with shuttle buses and vans.

Internal circulation and parking stall layout has been designed to meet County and CAL FIRE criteria. Ingress and egress for visitors, employees and production is via the commercial driveway entrance along Silverado Trail. ADA accessible, standard parking and electric vehicle charging stalls are provided at both the winery/hospitality building and the fermentation building. Employees will park in the southern stalls near the fermentation building as well as in the winery garage. Fire truck turnarounds are provided at each of these buildings. A circular loop in front of the fermentation building allows adequate space for large production trucks to access the fermentation building. This loop also allows for valet parking services during events. See **Figure 3b**. *Less than significant.*

F. TRANSPORTATION DEMAND MANAGEMENT (TDM) PLAN & VEHICLE MILES TRAVELED (VMT) REDUCTION

It is an upcoming requirement of all jurisdictions in the state to reduce the Vehicle Miles Traveled (VMT) of traffic associated with new developments to lower levels than would have resulted with comparable projects in the past (per State Senate Bill 743, which will take effect in July 2020). This will help reduce greenhouse gas emissions and vehicle congestion. Specific quantitative reduction guidelines have not yet been set for wineries in Napa County, but all are expected to develop ongoing programs that will provide incentives to reduce daily and commute period employee traffic as well as measures that will entice guests to use travel modes other than the automobile or to travel at times other than peak congestion periods. Towards this end, the Signorello Winery will develop a Transportation Demand Management (TDM) plan that will help accomplish these goals.

A TDM coordinator will be appointed to reduce traffic generation potential for daily employee traffic as well as to promote shuttle buses for all medium and large size marketing events. See **Appendix F** for the proposed TDM plan. *Less than significant.*

G. YEARLY TRIP GENERATION

Based upon County formula, the Signorello Winery is currently generating 10,193 yearly trips, while with the use permit modification 2020 yearly trip generation would increase to 33,993 yearly trips, for an increase of 23,800 yearly trips. See **Appendix E**.

XI. RECOMMENDED IMPROVEMENTS

The project should pay the County's off-site traffic impact fee, currently in development, as there are no realistic capacity improvement measures for Silverado Trail that could be the responsibility of a single project.

XII. CONCLUSIONS & RECOMMENDATIONS

- The project will result in no significant off-site circulation system operational impacts to the Silverado Trail intersections with Oak Knoll Avenue, Trancas Street or the Project driveway. In addition, there will be no significant impacts to Silverado Trail for existing or 2025 conditions. However, project traffic will result in a significant impact along Silverado Trail south of the project during the cumulative (2030) horizon.
- A left turn lane is already provided on the southbound approach to the Project driveway and sight lines are acceptable and meet Caltrans stopping sight distance criteria at this location. Bicycle racks will be provided for all guests using the Class II bicycle lanes along Silverado Trail for access.
- No new marketing events are being proposed and on days with recurring moderate size attendance daily visitation by appointment will be reduced by the same number of guests attending the event. Finally, a TDM coordinator will be appointed to institute measures to reduce daily employee traffic as well as increase limousine and shuttle bus service for major marketing events.
- The project will pay the County's upcoming traffic impact fee to offset its cumulative impact along Silverado Trail.

This Report is intended for presentation and use in its entirety, together with all of its supporting exhibits, schedules, and appendices. Crane Transportation Group will have no liability for any use of the Report other than in its entirety, such as providing an excerpt to a third party or quoting a portion of the Report. If you provide a portion of the Report to a third party, you agree to hold CTG harmless against any liability to such third parties based upon their use of or reliance upon a less than complete version of the Report.

Tables

Table 1

SIGNALIZED INTERSECTION LOS CRITERIA

Level of Service	Description	Average Control Delay (Seconds Per Vehicle)
A	Operations with very low delay occurring with favorable progression and/or short cycle lengths.	≤ 10.0
B	Operations with low delay occurring with good progression and/or short cycle lengths.	10.0 to 20.0
C	Operations with average delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures begin to appear.	20.0 to 35.0
D	Operations with longer delays due to a combination of unfavorable progression, long cycle lengths, and/or high volume-to-capacity (V/C) ratios. Many vehicles stop and individual cycle failures are noticeable.	35.0 to 55.0
E	Operations with high delay values indicating poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences. This is considered to be the limit of acceptable delay.	55.0 to 80.0
F	Operation with delays unacceptable to most drivers occurring due to oversaturation, poor progression, or very long cycle lengths.	> 80.0

Source: Year 2017 6th Edition Highway Capacity Manual (Transportation Research Board).

Table 2

UNSIGNALIZED INTERSECTION LOS CRITERIA

Level of Service	Description	Average Control Delay (Seconds Per Vehicle)
A	Little or no delays	≤ 10.0
B	Short traffic delays	10.0 to 15.0
C	Average traffic delays	15.0 to 25.0
D	Long traffic delays	25.0 to 35.0
E	Very long traffic delays	35.0 to 50.0
F	Extreme traffic delays with intersection capacity exceeded (for an all-way stop), or with approach/turn movement capacity exceeded (for a side street stop controlled intersection)	> 50.0

Source: Year 2017 6th Edition Highway Capacity Manual (Transportation Research Board).

Table 3**INTERSECTION LEVEL OF SERVICE****YEAR 2019 HARVEST**

LOCATION	FRIDAY PM PEAK HOUR		SATURDAY PM PEAK HOUR	
	W/O PROJECT	WITH PROJECT	W/O PROJECT	WITH PROJECT
Silverado Trail/Trancas St	B-17.0 ⁽¹⁾	B-17.0	B-13.9	B-13.9
Silverado Trail/Project Driveway	C-15.9 ⁽²⁾	C-16.5	B-13.6	B-13.7
Silverado Trail/Oak Knoll Ave	E-47.9 ⁽³⁾	E-48.5	C-22.3	C-22.6

YEAR 2025 HARVEST

LOCATION	FRIDAY PM PEAK HOUR		SATURDAY PM PEAK HOUR	
	W/O PROJECT	WITH PROJECT	W/O PROJECT	WITH PROJECT
Silverado Trail/Trancas St	B-17.7 ⁽¹⁾	B-17.8	B-14.2	B-14.2
Silverado Trail/Project Driveway	C-16.9 ⁽²⁾	C-17.6	B-14.2	B-14.4
Silverado Trail/Oak Knoll Ave	E-76.3 ⁽³⁾	E-77.8	D-25.9	D-26.3

CUMULATIVE (YEAR 2030) HARVEST

LOCATION	FRIDAY PM PEAK HOUR		SATURDAY PM PEAK HOUR	
	W/O PROJECT	WITH PROJECT	W/O PROJECT	WITH PROJECT
Silverado Trail/Trancas St	B-18.6 ⁽¹⁾	B-18.7	B-14.6	B-14.7
Silverado Trail/Project Driveway	C-17.5 ⁽²⁾	C-18.3	B-14.7	C-14.9
Silverado Trail/Oak Knoll Ave	F-116.7 ⁽³⁾	F-119.3	D-30.1	D-30.5

⁽¹⁾ Signalized level of service – control delay in seconds

⁽²⁾ Unsignalized level of service – control delay in seconds: Project Driveway approach to Silverado Trail

⁽³⁾ Unsignalized level of service – control delay in seconds: Oak Knoll Ave approach to Silverado Trail

6th Edition Highway Capacity Manual (HCM) Analysis Methodology for unsignalized intersections (2017)

Source: Crane Transportation Group

Table 4 (Page 1 of 2)

ARTERIAL LEVEL OF SERVICE

YEAR 2019 HARVEST

LOCATION	FRIDAY PM PEAK HOUR (2:45-3:45 PM)					SATURDAY PM PEAK HOUR (2:00-3:00 PM)				
	W/O PROJECT		WITH PROJECT		% Increase in 2-way Volume due to Project (where applicable)	W/O PROJECT		WITH PROJECT		% Increase in 2-way Volume due to Project (where applicable)
	NB	SB	NB	SB		NB	SB	NB	SB	
Silverado Trail north of Oak Knoll Ave	C-.30	E-.81	C-.30	E-.81	.29	B-.18	E-.65	B-.19	E-.65	.39
Silverado Trail south of Project Driveway	C-.28	E-.62	C-.28	E-.62	.66	B-.17	D-.48	B-.17	D-.49	
Silverado Trail north of Trancas Street	C-.29	E-.58	C-.29	E-.58	.68	B-.18	D-.47	B-.18	D-.47	

YEAR 2025 HARVEST

LOCATION	FRIDAY PM PEAK HOUR (2:45-3:45 PM)					SATURDAY PM PEAK HOUR (2:00-3:00 PM)				
	W/O PROJECT		WITH PROJECT		% Increase in 2-way Volume due to Project (where applicable)	W/O PROJECT		WITH PROJECT		% Increase in 2-way Volume due to Project (where applicable)
	NB	SB	NB	SB		NB	SB	NB	SB	
Silverado Trail north of Oak Knoll Ave	C-.32	E-.86	C-.32	E-.86	.27	B-.19	E-.70	B-.20	E-.70	.36
Silverado Trail south of Project Driveway	C-.30	E-.64	C-.30	E-.65	.62	B-.18	D-.54	B-.18	D-.54	
Silverado Trail north of Trancas Street	C-.30	E-.63	C-.30	E-.63	.64	B-.19	D-.51	B-.19	D-.51	

Table 4 (Page 2 of 2)

**ARTERIAL LEVEL OF SERVICE
CUMULATIVE (YEAR 2030) HARVEST**

LOCATION	FRIDAY PM PEAK HOUR (2:45-3:45 PM)					SATURDAY PM PEAK HOUR (2:00-3:00 PM)				
	W/O PROJECT		WITH PROJECT		% Volume due to Project in relation to growth in traffic from 2019 to 2030 (where applicable)	W/O PROJECT		WITH PROJECT		% Volume due to Project in relation to growth in traffic from 2019 to 2030 (where applicable)
	NB	SB	NB	SB		NB	SB	NB	SB	
Silverado Trail north of Oak Knoll Ave	C-.33	E-.89	C-.33	E-.89	2.63	B-.20	E-.72	B-.20	E-.73	3.09
Silverado Trail south of Project Driveway	C-.31	E-.67	C-.31	E-.68	5.29	B-.19	E-.57	B-.19	E-.58	6.76
Silverado Trail north of Trancas Street	C-.31	E-.65	C-.31	E-.65	5.33	B-.20	D-.54	B-.20	D-.54	

⁽¹⁾ Level of service – demand/capacity
Highway Capacity Manual, 6th Edition (2017) analysis methodology.

Compiled by: Crane Transportation Group

Table 5

RURAL SIGNAL WARRANT EVALUATION

Silverado Trail/Oak Knoll Avenue

Do Harvest Volumes meet Caltrans Rural Warrant #3 Volume Criteria?

YEAR 2019 (EXISTING)

FRIDAY PM PEAK HOUR		SATURDAY PM PEAK HOUR	
WITHOUT PROJECT	WITH PROJECT	WITHOUT PROJECT	WITH PROJECT
Yes	Yes	Yes	Yes

YEAR 2025

FRIDAY PM PEAK HOUR		SATURDAY PM PEAK HOUR	
WITHOUT PROJECT	WITH PROJECT	WITHOUT PROJECT	WITH PROJECT
Yes	Yes	Yes	Yes

CUMULATIVE (YEAR 2030)

FRIDAY PM PEAK HOUR		SATURDAY PM PEAK HOUR	
WITHOUT PROJECT	WITH PROJECT	WITHOUT PROJECT	WITH PROJECT
Yes	Yes	Yes	Yes

Compiled by: Crane Transportation Group

Table 6

PROJECT TRIP GENERATION

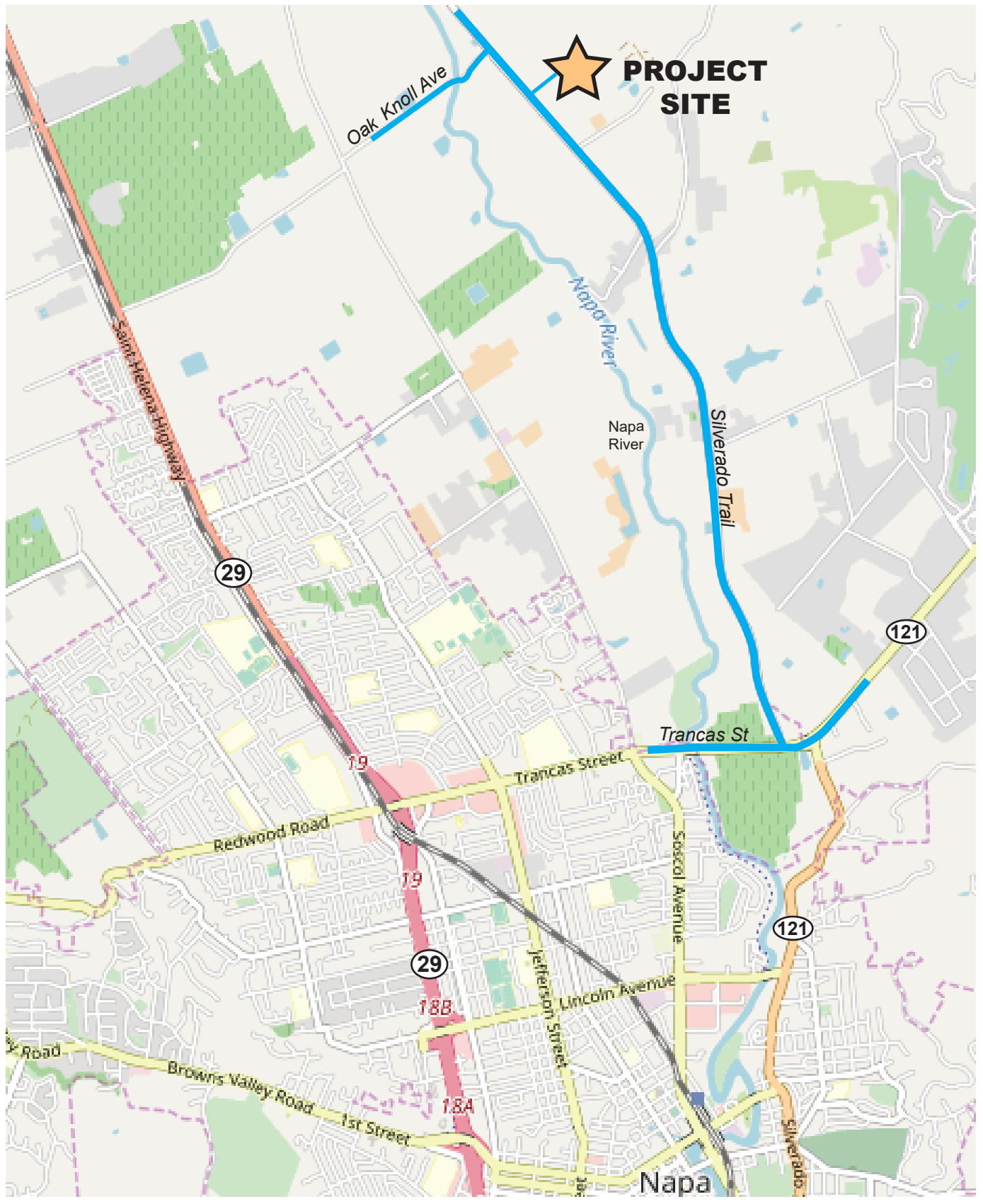
	Daily Trips			Maximum PM Hourly % of Daily 2-Way Traffic**	Resultant Project PM Peak Hour 2-Way Trip Generation
	Existing*	Existing* +Project	Increase Due to Project		
Friday	29	107	78	18%	14
Saturday	28	88	60	24%	15

*Source: Napa County Winery Trip Generation Worksheets

**Source: 2 Friday and 2 Saturday 24-hour Traffic Counts of the Winery driveway - Harvest 2019

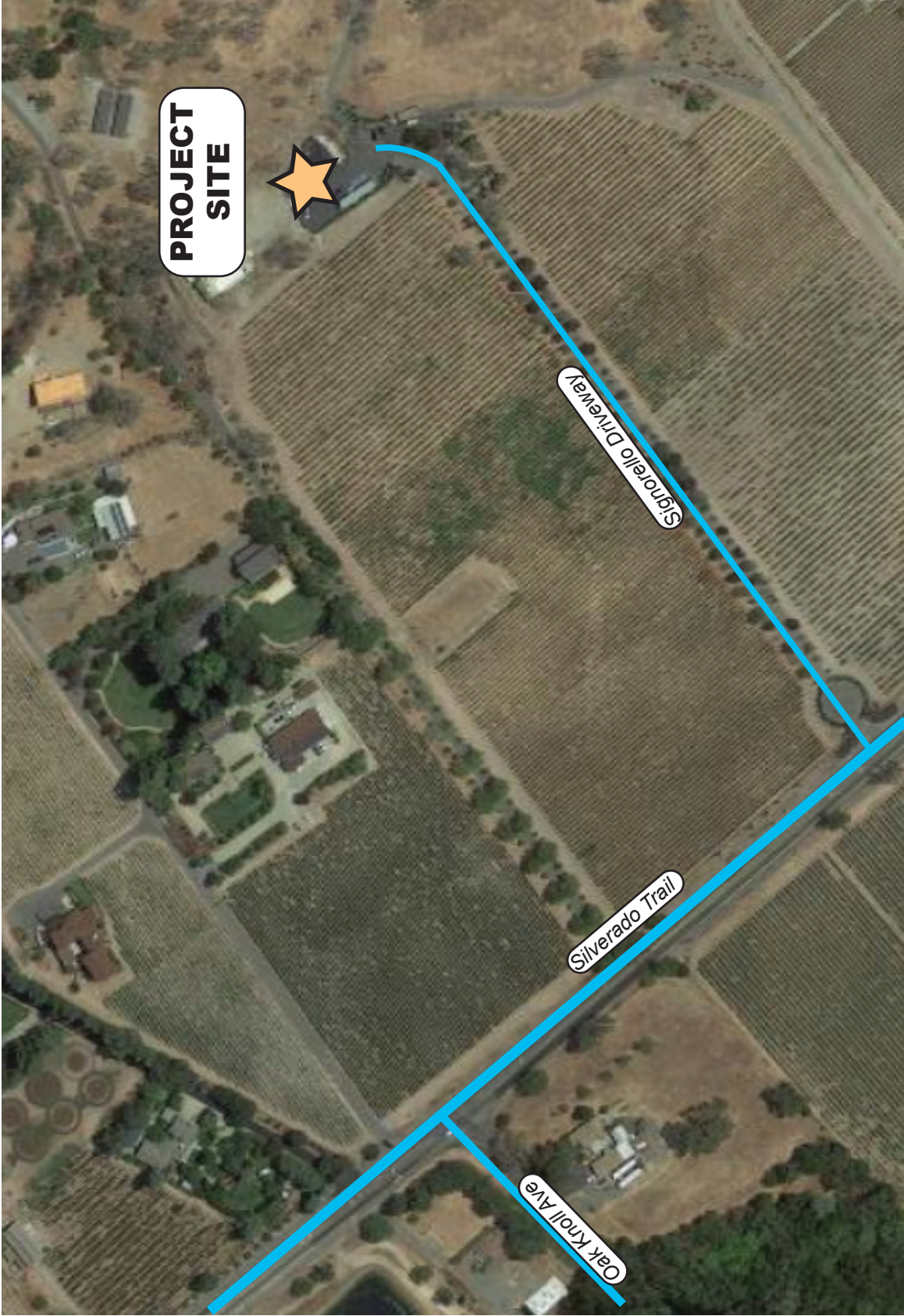
Compiled by: Crane Transportation Group

Figures



Signorello Winery Use Permit Modification 2020 Traffic Study

Figure 1
Area Map



**PROJECT
SITE**

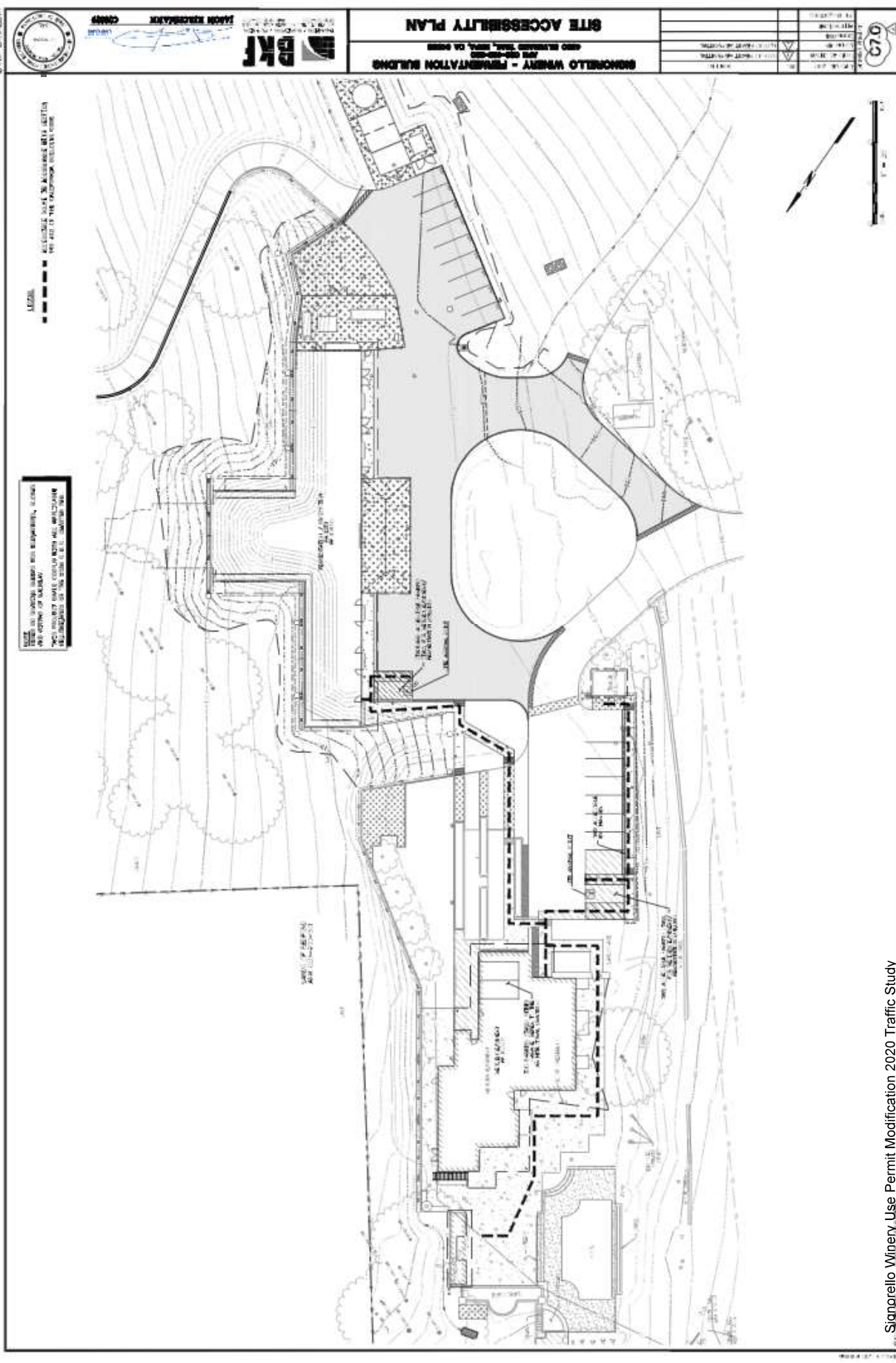
Signorello Drive (W)

Silverado Trail

Oak Knoll Ave

Signorello Winery Use Permit Modification 2020 Traffic Study

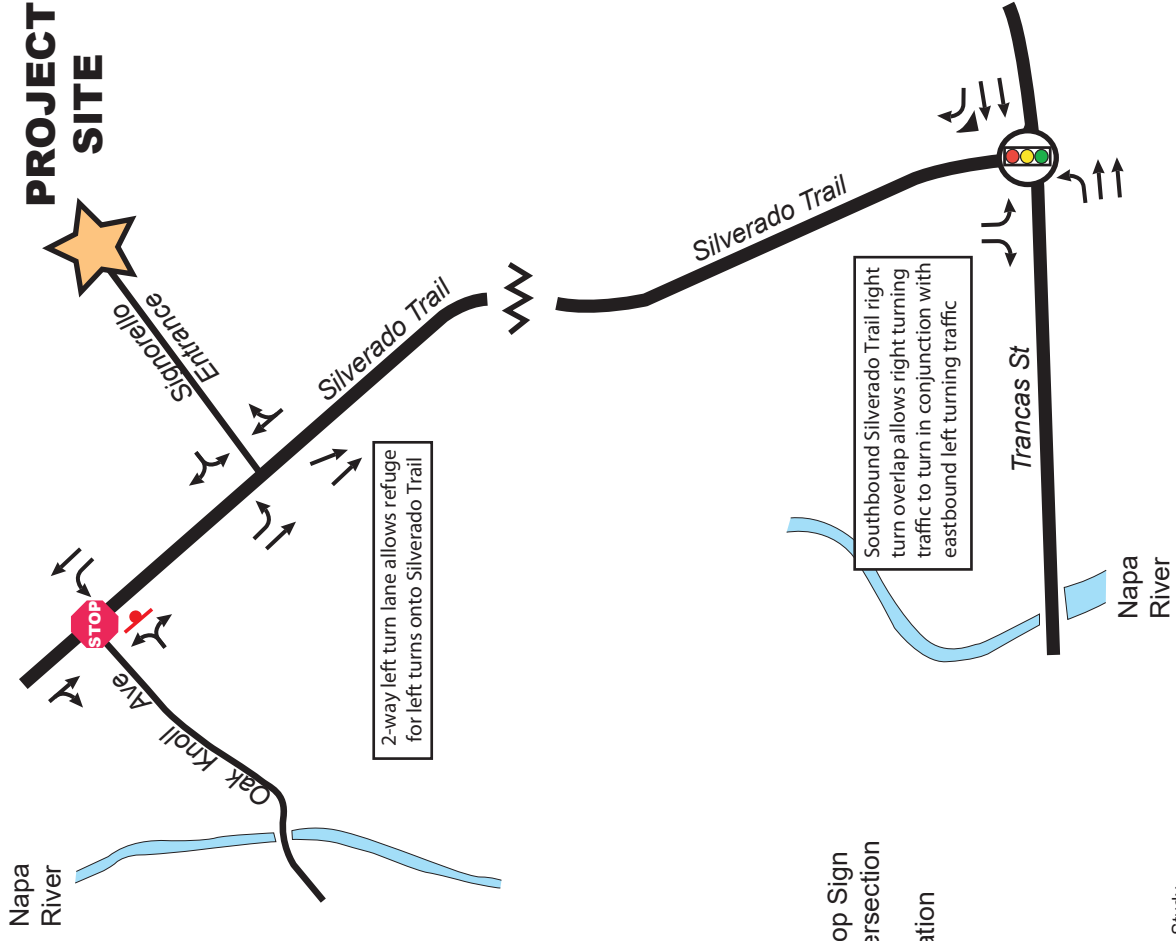
Figure 2
Site Specific Air Photo







Signoretto Winery Use Permit Modification 2020 Traffic Study

Figure 3b
Internal Circulation & Parking Plan

Not To Scale



-  = Signal
-  = Side Street Stop Sign
-  = Controlled Intersection
-  = Stop Sign location

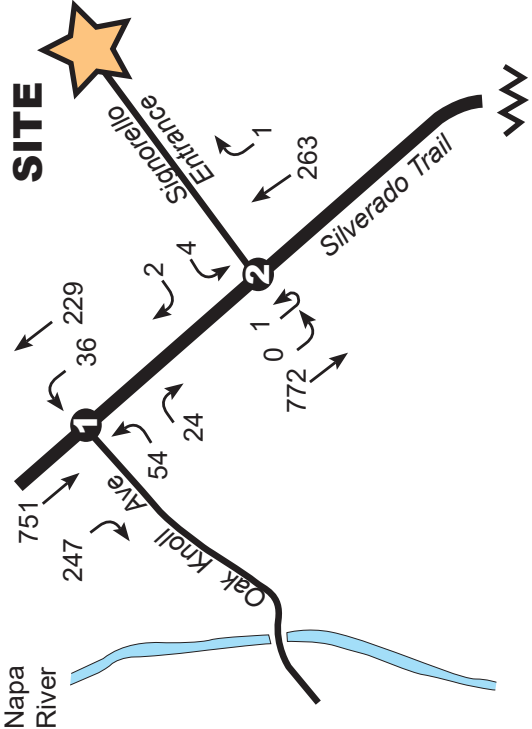
Signorello Winery Use Permit Modification 2020 Traffic Study

Figure 4
Existing Lane Geometrics
and Intersection Control

Not To Scale

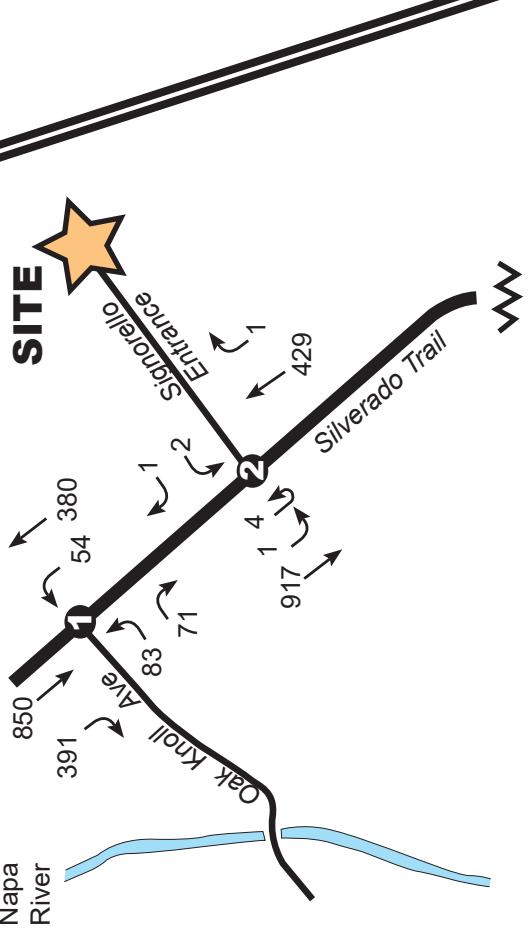


PROJECT SITE



Saturday PM Peak Hour (4:45-5:45)

PROJECT SITE

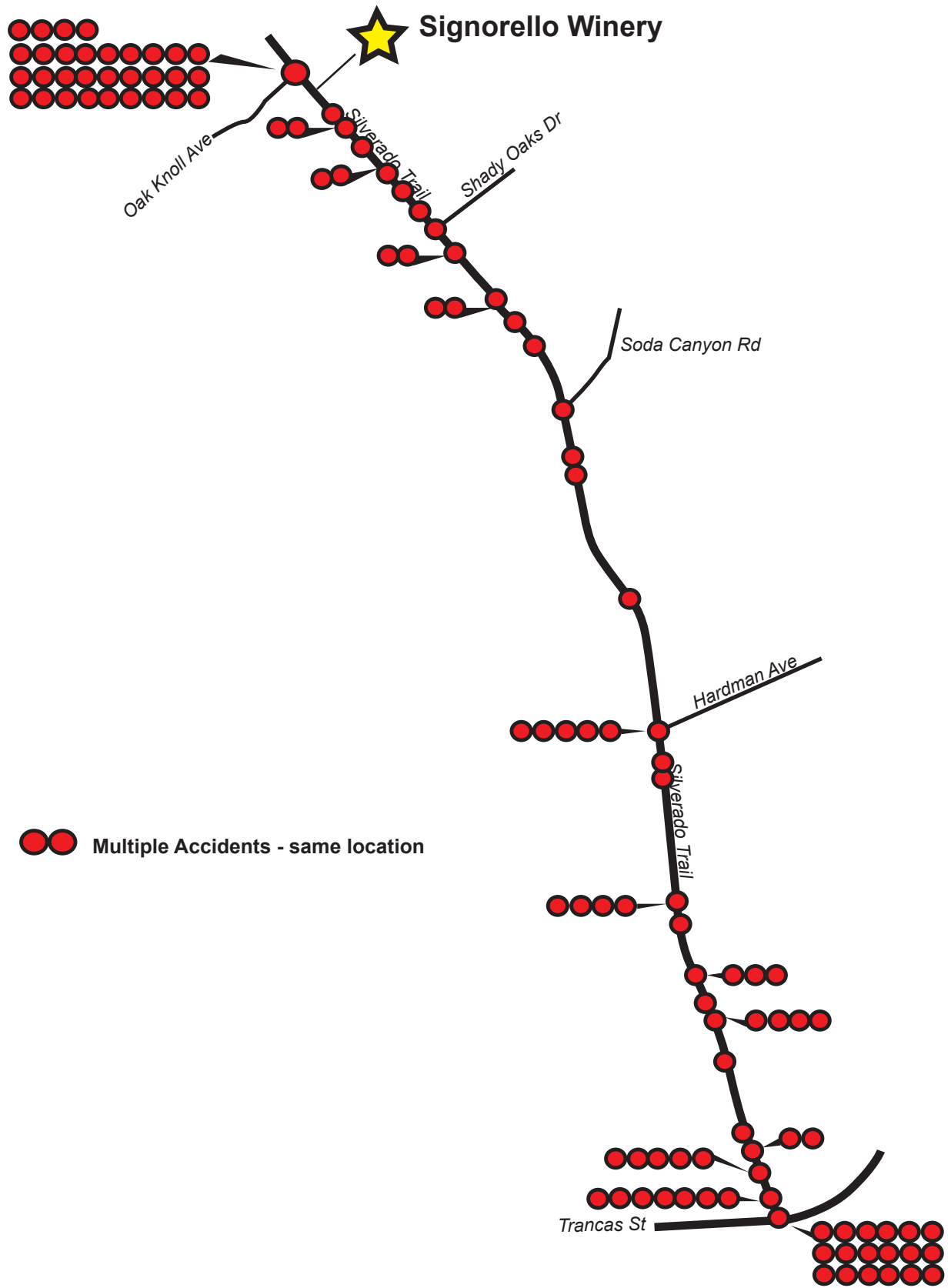


Friday PM Peak Hour (3:15-4:15)

Signorello Winery Use Permit Modification 2020 Traffic Study

Figure 5

2019 (Existing) Harvest without Project Friday and Saturday PM Peak Hour Volumes



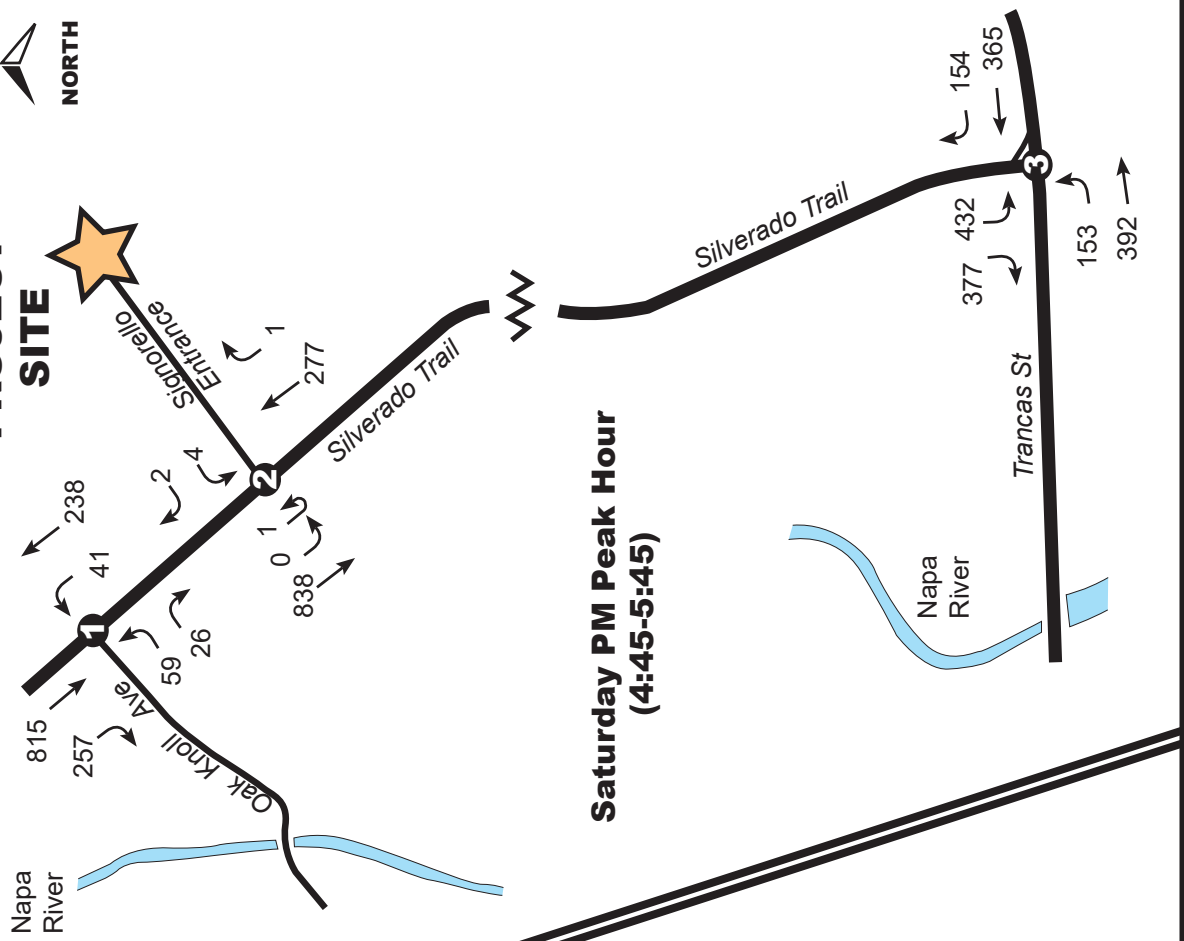
Signorello Winery Use Permit Modification 2020 Traffic Study

Figure 6
Accidents on Silverado Trail between
Oak Knoll Ave and Trancas St - 2014-2019

Not To Scale

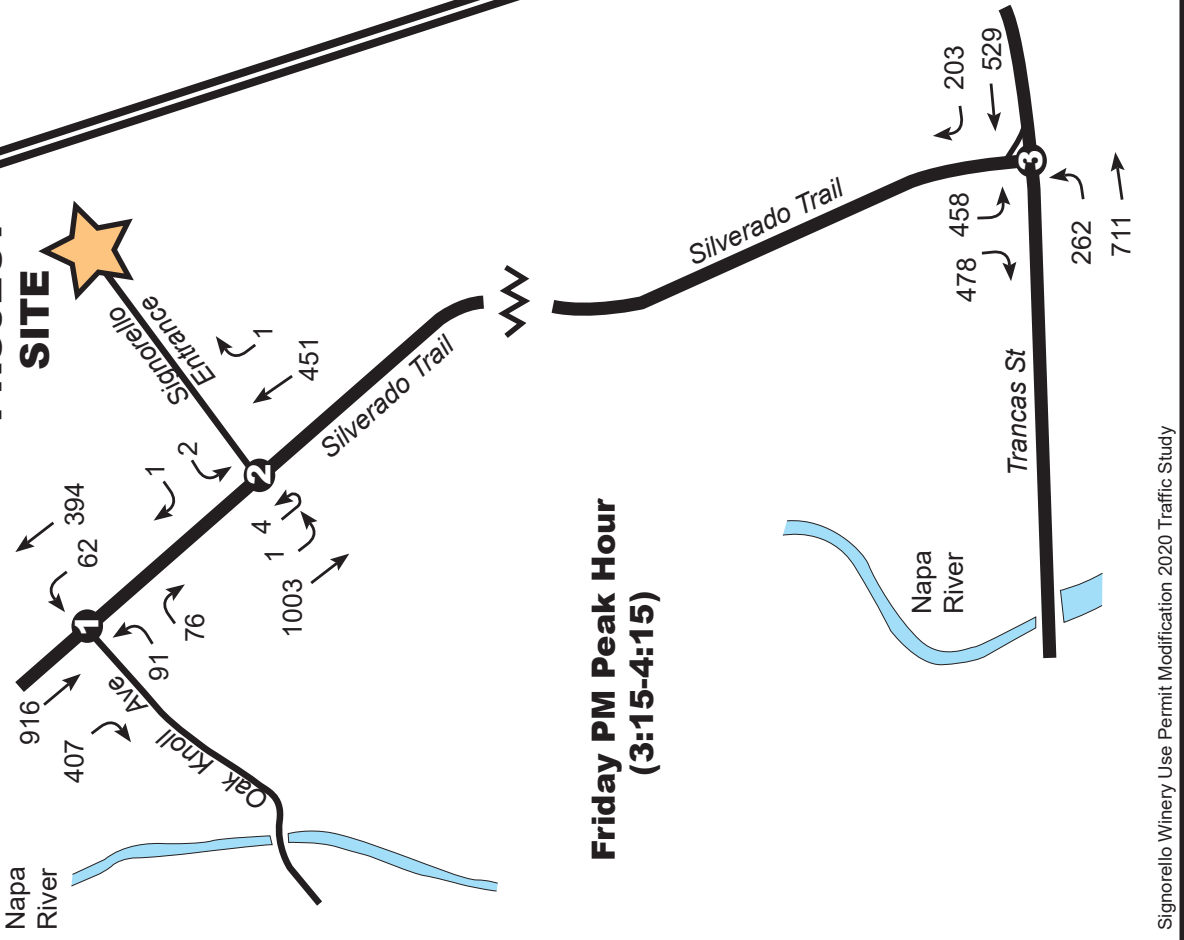
NORTH

PROJECT SITE



Saturday PM Peak Hour (4:45-5:45)

PROJECT SITE



Friday PM Peak Hour (3:15-4:15)

Signorello Winery Use Permit Modification 2020 Traffic Study

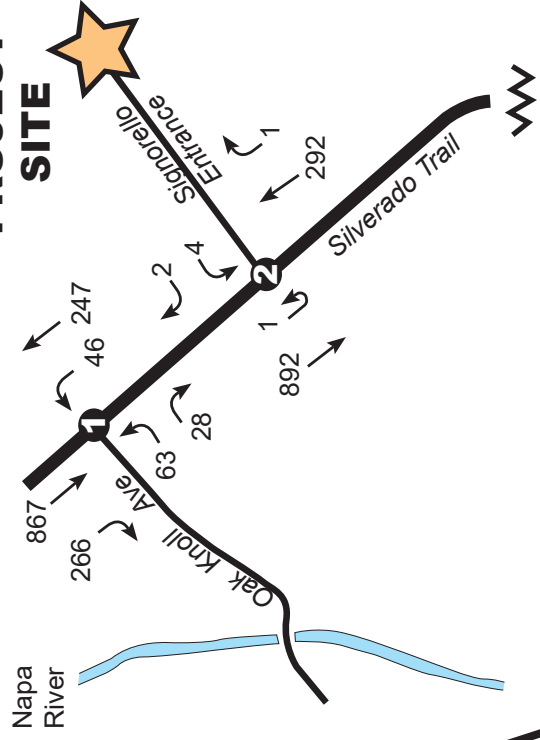
Figure 7

**2025 Harvest (without project)
 Friday and Saturday PM Peak Hour Volumes**

Not To Scale

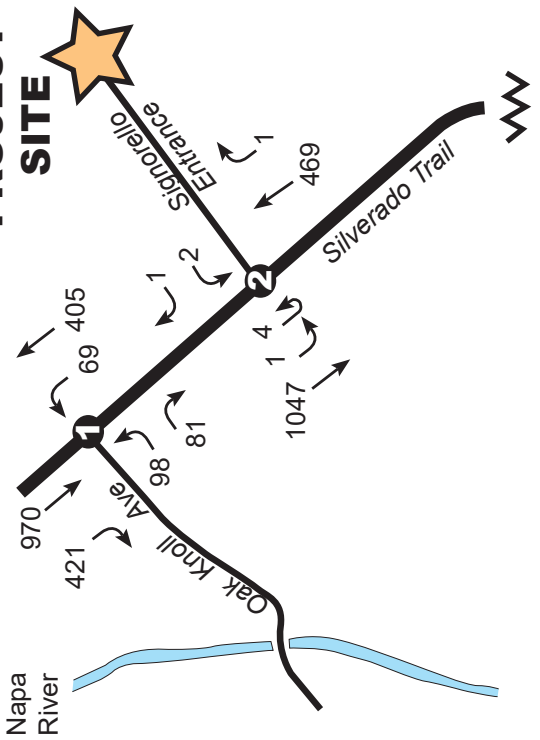


PROJECT SITE



Saturday PM Peak Hour (4:45-5:45)

PROJECT SITE



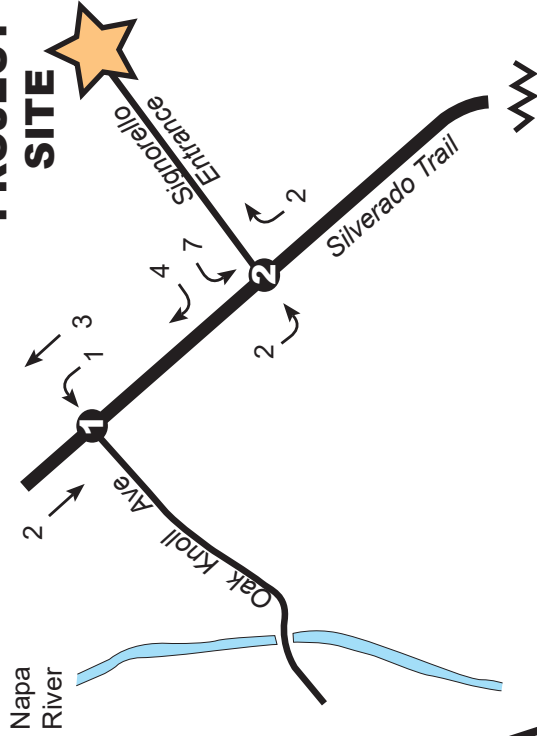
Friday PM Peak Hour (3:15-4:15)

Signorello Winery Use Permit Modification 2020 Traffic Study

Figure 8

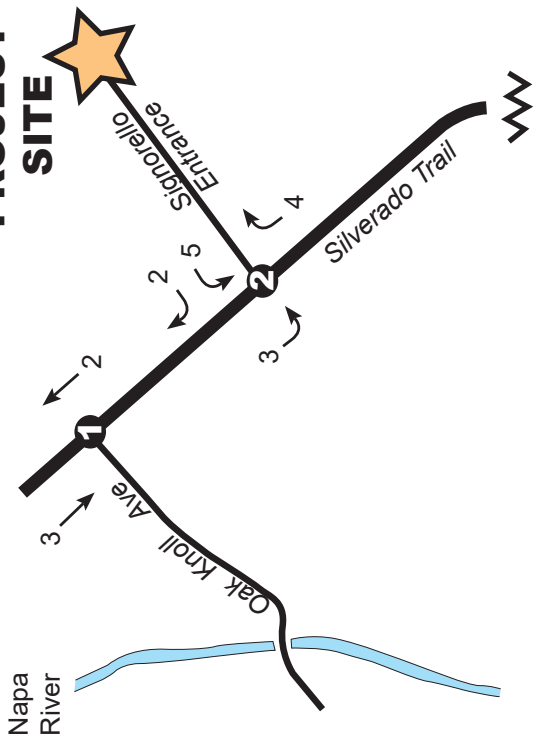
2030 (Cumulative) Harvest without Project Friday and Saturday PM Peak Hour Volumes

PROJECT SITE



Saturday PM Peak Hour (4:45-5:45)

PROJECT SITE



Friday PM Peak Hour (3:15-4:15)

Signorello Winery Use Permit Modification 2020 Traffic Study

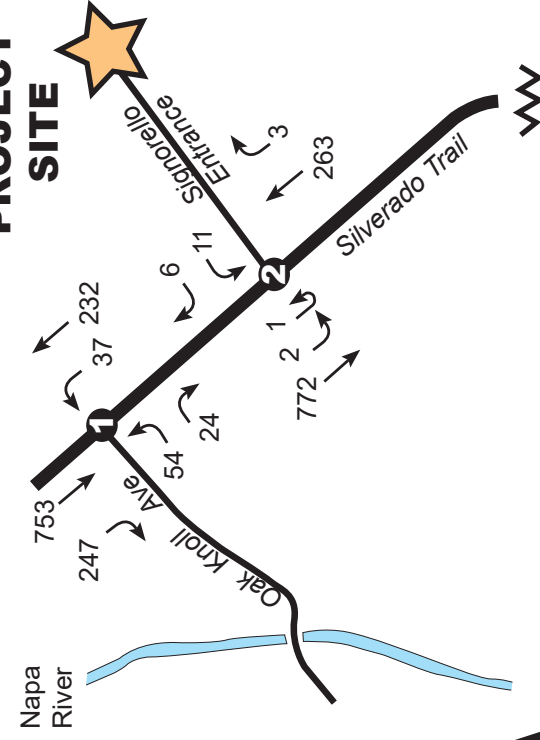
Figure 9

Project Increment - Friday and Saturday PM Peak Hour Volumes

Not To Scale

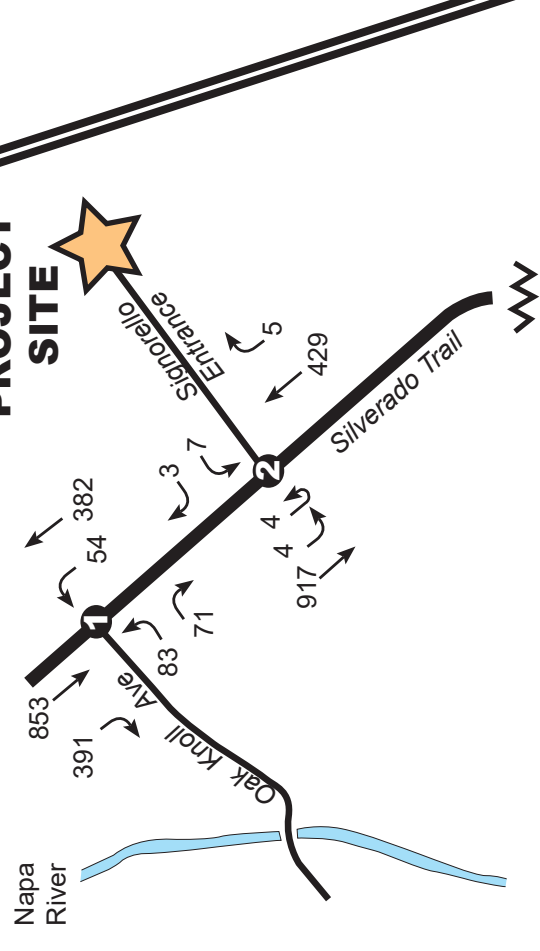


PROJECT SITE



Saturday PM Peak Hour (4:45-5:45)

PROJECT SITE



Friday PM Peak Hour (3:15-4:15)

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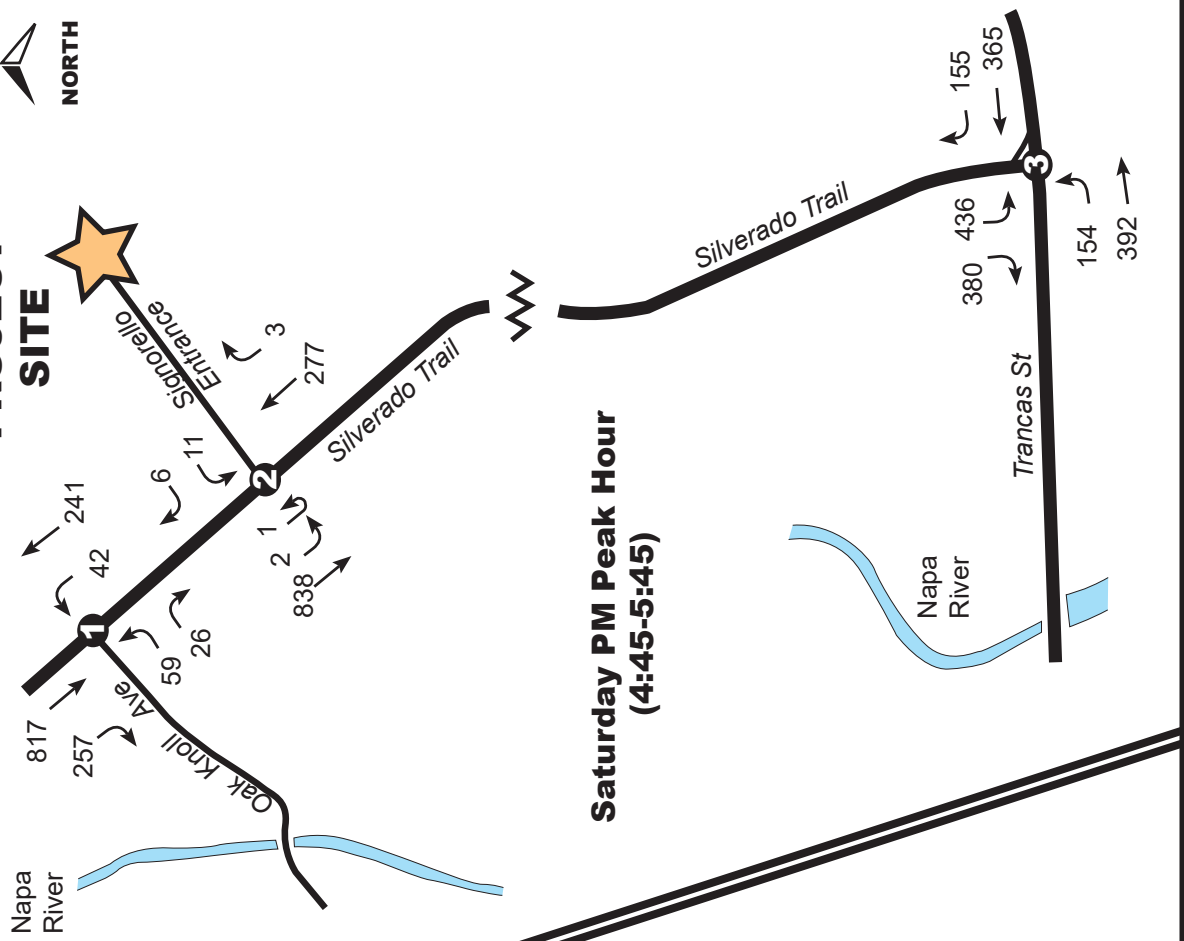
Figure 10

2019 (Existing) Harvest with Project Friday and Saturday PM Peak Hour Volumes

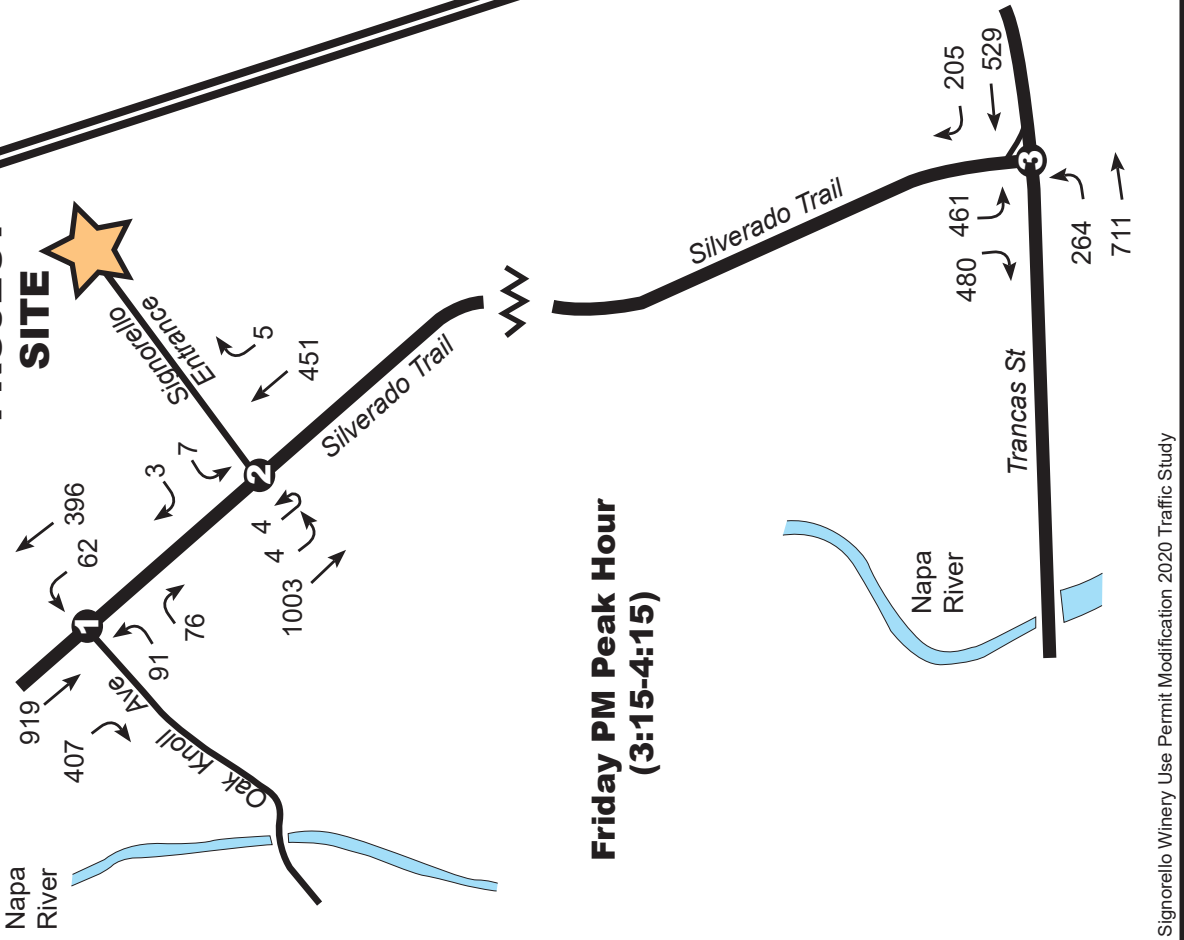
Not To Scale

NORTH

PROJECT SITE



PROJECT SITE



Signorello Winery Use Permit Modification 2020 Traffic Study

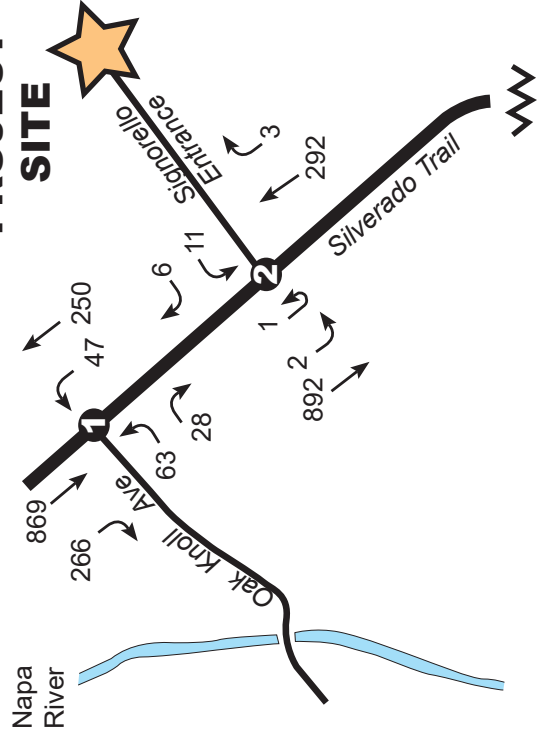
Figure 11

**2025 Harvest (with project)
 Friday and Saturday PM Peak Hour Volumes**

Not To Scale

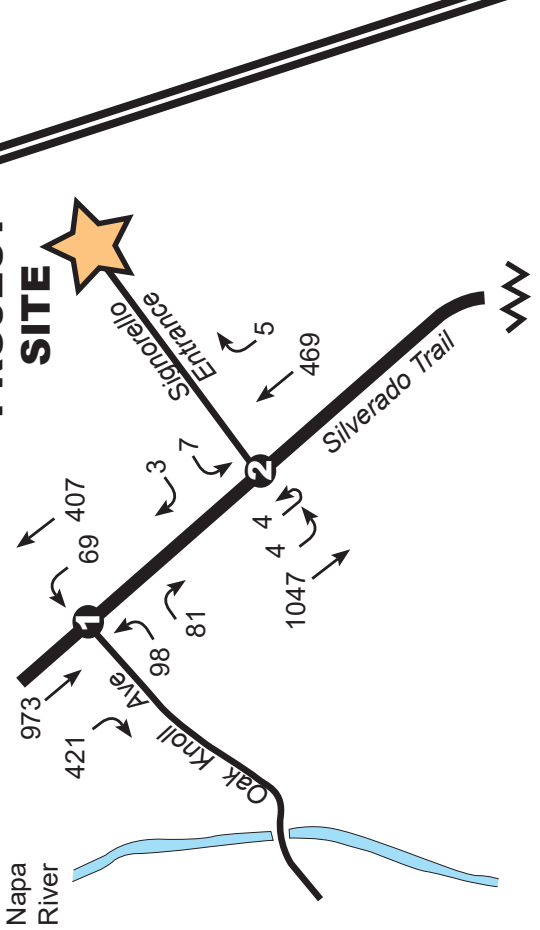


PROJECT SITE



Saturday PM Peak Hour (4:45-5:45)

PROJECT SITE



Friday PM Peak Hour (3:15-4:15)

Signorello Winery Use Permit Modification 2020 Traffic Study

Figure 12

2030 (Cumulative) Harvest with Project Friday and Saturday PM Peak Hour Volumes

Appendices

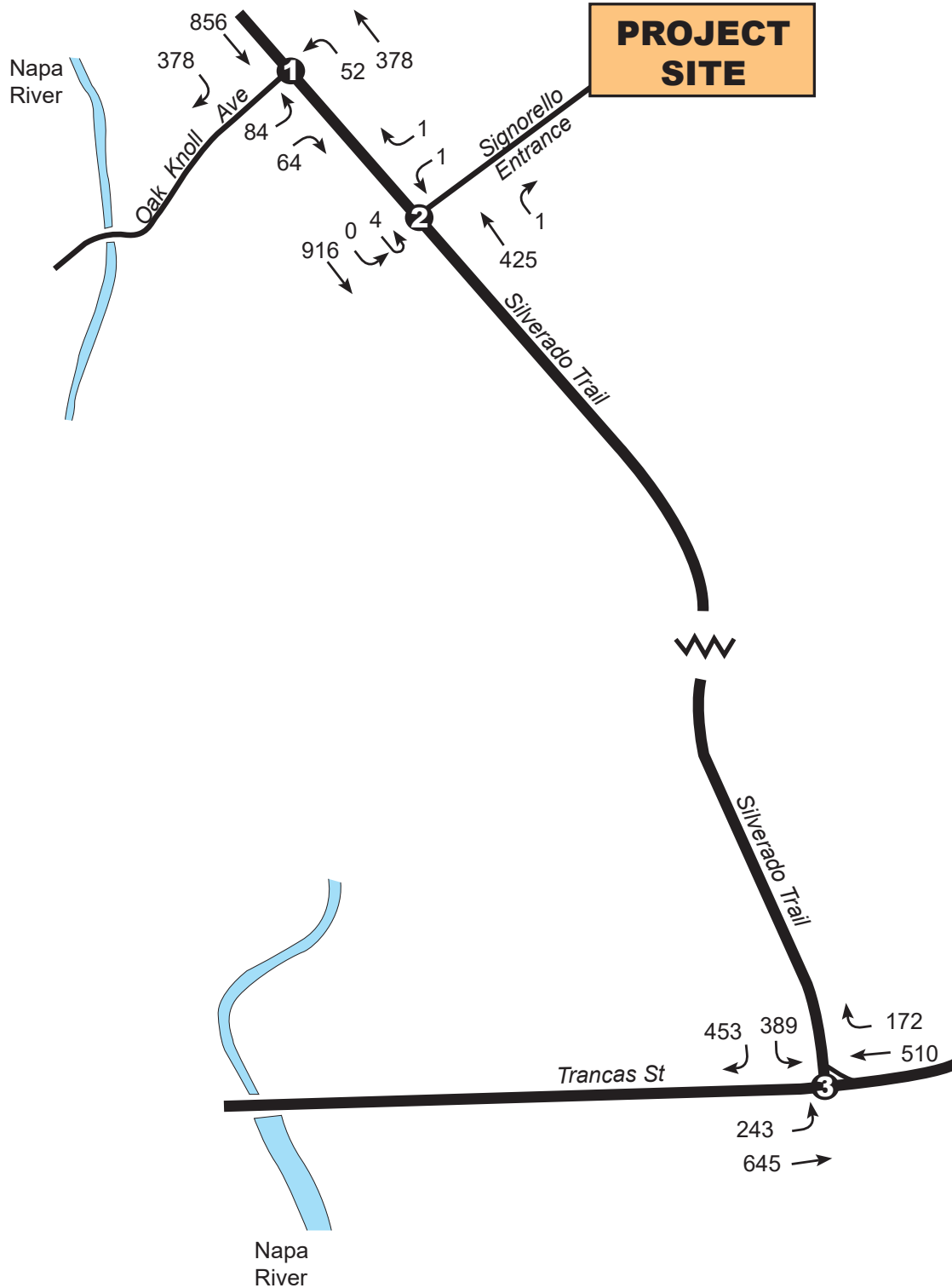


Appendix A

Not To Scale



NORTH



Signorello Winery Use Permit Modification 2020 Traffic Study



CRANE TRANSPORTATION GROUP

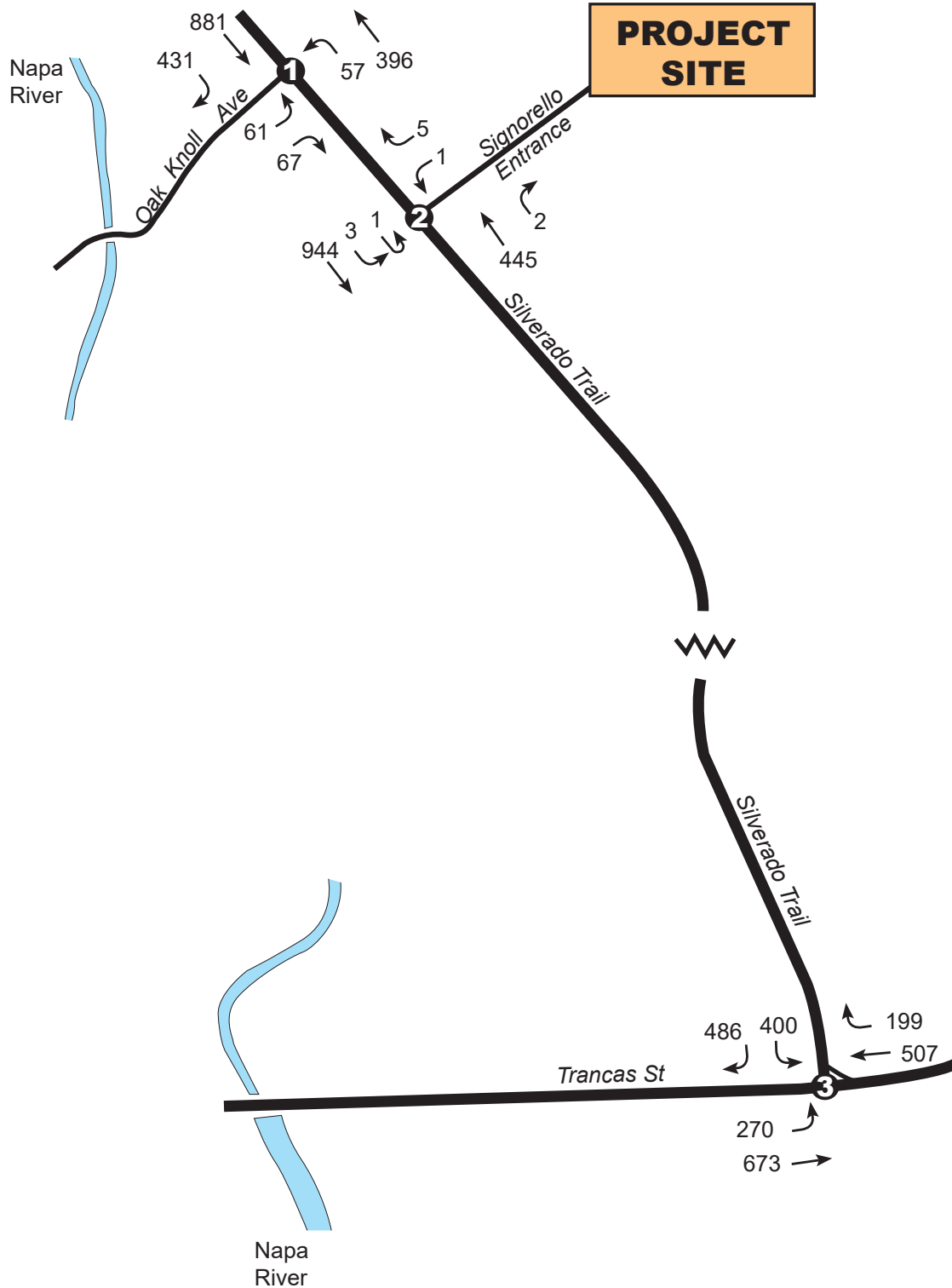
Figure A-1

**Existing Friday PM Peak Hour Volumes
Friday Sept 13, 2019 (3:15-4:15)**

Not To Scale



NORTH



Signorello Winery Use Permit Modification 2020 Traffic Study

Figure A-2

**Existing Friday PM Peak Hour Volumes
Friday Sept 20, 2019 (3:15-4:15)**

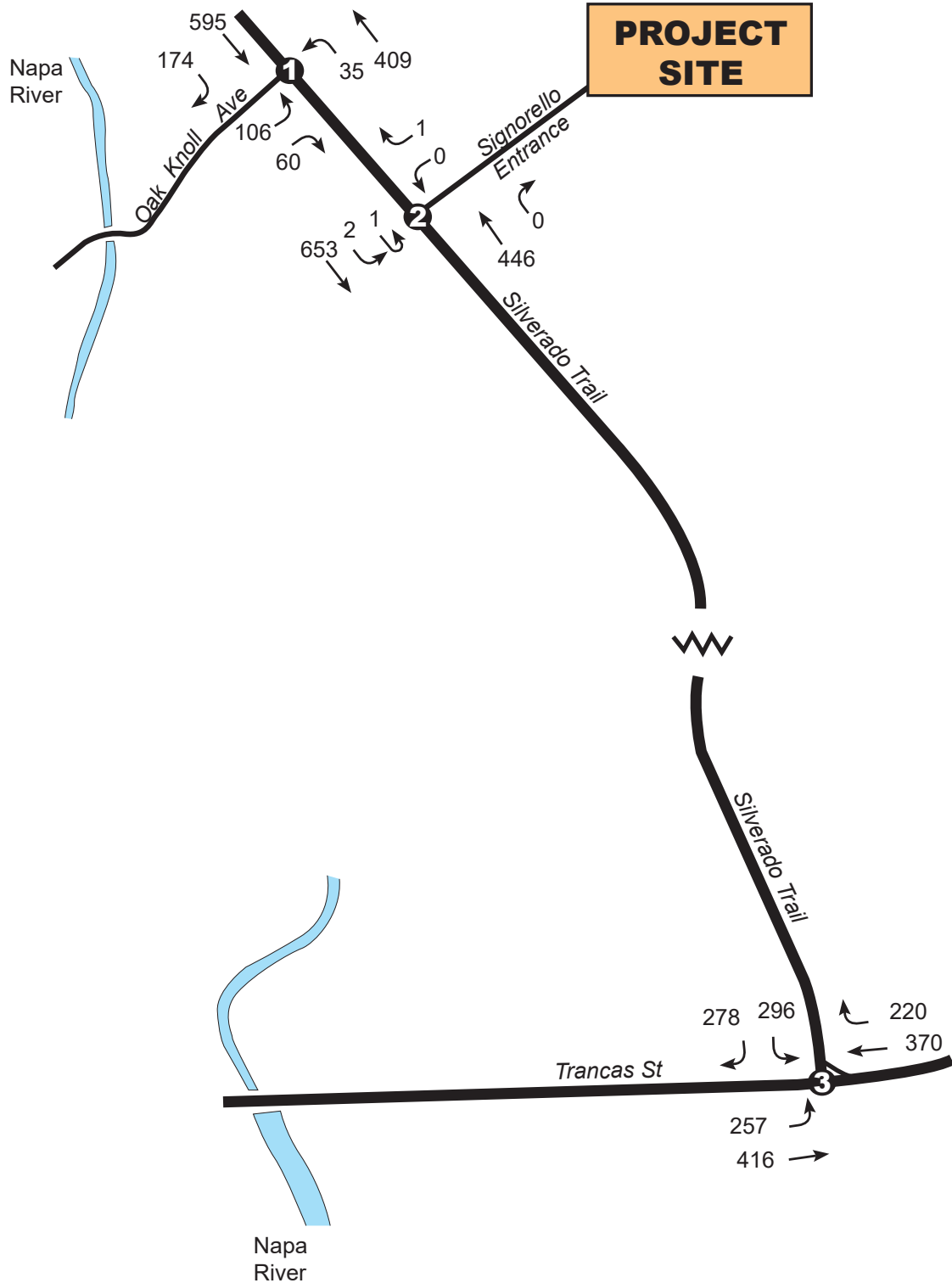


CRANE TRANSPORTATION GROUP

Not To Scale



NORTH



Signorello Winery Use Permit Modification 2020 Traffic Study



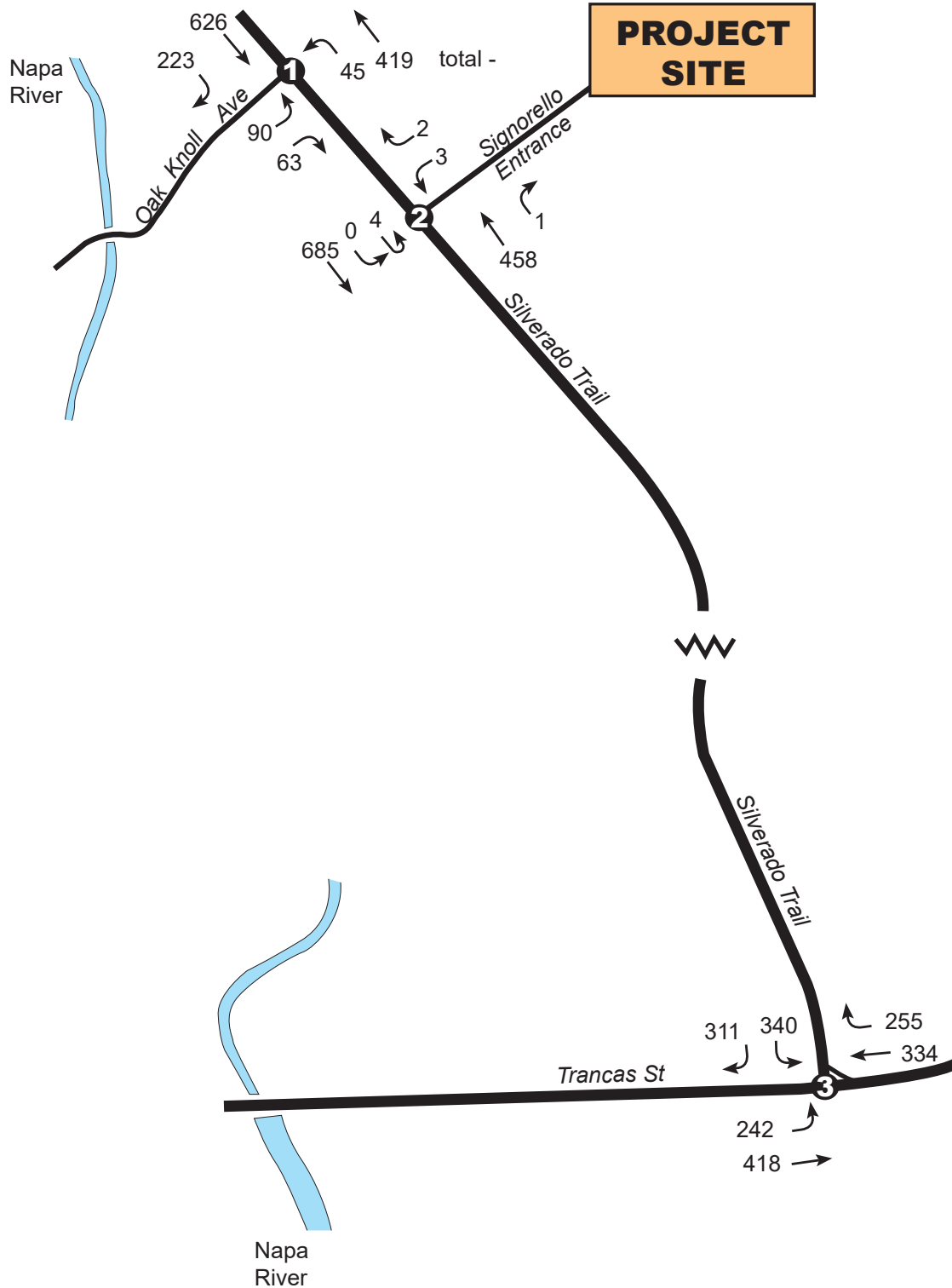
CRANE TRANSPORTATION GROUP

Figure A-3
Existing Saturday PM Peak Hour Volumes
Sept 14, 2019 (3:00-4:00)

Not To Scale



NORTH



Signorello Winery Use Permit Modification 2020 Traffic Study

Figure A-4
Existing Saturday PM Peak Hour Volumes
Sept 21, 2019 (3:00-4:00)

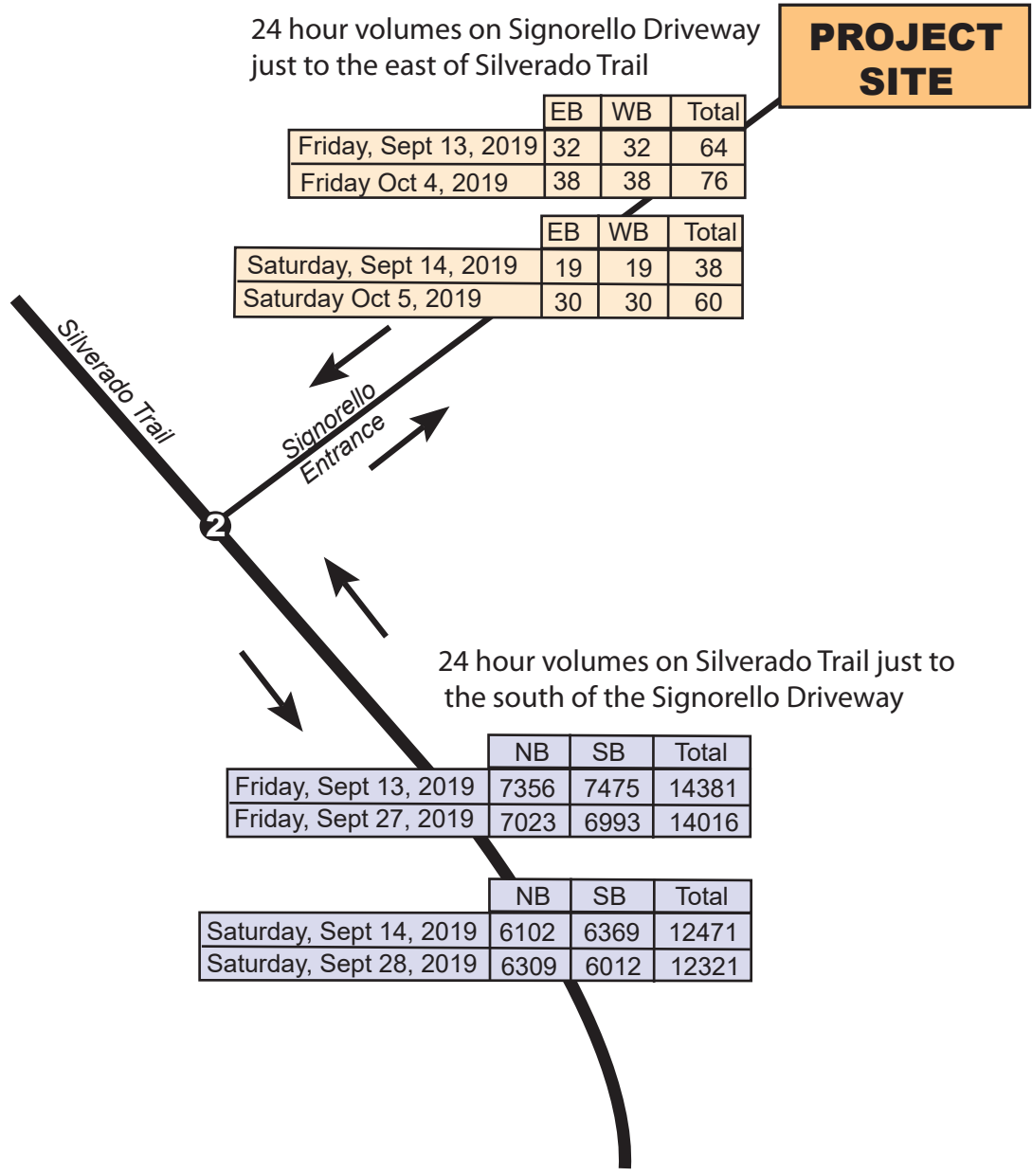


Figure A-5
Existing Friday and Saturday 24 Hour
Directional and Total Traffic Volumes

Vehicle Speed Report Summary

Location: Silverado Trail, S/O Signorello Dwy
Count Direction: Northbound / Southbound
Date Range: 1/31/2020 to 2/1/2020
Site Code: 01

	Speed Range (mph)																Total Volume	
	0 - 10	10 - 15	15 - 20	20 - 25	25 - 30	30 - 35	35 - 40	40 - 45	45 - 50	50 - 55	55 - 60	60 - 65	65 - 70	70 - 75	75 - 80	80 - 85		85 +
Study Total																		
Northbound	0	4	28	19	9	23	53	174	790	2,127	3,247	2,372	738	149	33	14	8	9,788
Percent	0.0%	0.0%	0.3%	0.2%	0.1%	0.2%	0.5%	1.8%	8.1%	21.7%	33.2%	24.2%	7.5%	1.5%	0.3%	0.1%	0.1%	100%
Southbound	6	32	27	4	6	21	101	415	1,670	3,337	2,830	1,114	245	53	15	7	6	9,889
Percent	0.1%	0.3%	0.3%	0.0%	0.1%	0.2%	1.0%	4.2%	16.9%	33.7%	28.6%	11.3%	2.5%	0.5%	0.2%	0.1%	0.1%	100%
Total	6	36	55	23	15	44	154	589	2,460	5,464	6,077	3,486	983	202	48	21	14	19,677
Percent	0.0%	0.2%	0.3%	0.1%	0.1%	0.2%	0.8%	3.0%	12.5%	27.8%	30.9%	17.7%	5.0%	1.0%	0.2%	0.1%	0.1%	100%

Total Study Percentile Speed Summary			Total Study Speed Statistics		
Northbound			Northbound		
50th Percentile (Median)	57.6	mph	Mean (Average) Speed	57.2	mph
85th Percentile	63.4	mph	10 mph Pace	52.9 - 62.9	mph
95th Percentile	67.0	mph	Percent in Pace	60.6	%
Southbound			Southbound		
50th Percentile (Median)	54.1	mph	Mean (Average) Speed	53.9	mph
85th Percentile	59.8	mph	10 mph Pace	48.5 - 58.5	mph
95th Percentile	63.8	mph	Percent in Pace	63.2	%

Location: Silverado Trail, S/O Signorello Dwy
Date Range: 1/31/2020 to 2/1/2020
Site Code: 01

January 31, 2020
Northbound

Time	Speed Range (mph)																Total Volume	
	0 - 10	10 - 15	15 - 20	20 - 25	25 - 30	30 - 35	35 - 40	40 - 45	45 - 50	50 - 55	55 - 60	60 - 65	65 - 70	70 - 75	75 - 80	80 - 85		85 +
12:00 AM	0	0	0	0	0	0	0	0	1	0	3	3	0	0	1	0	0	8
1:00 AM	0	0	0	0	0	0	0	0	2	3	2	0	0	0	0	0	0	7
2:00 AM	0	0	0	0	0	0	0	0	0	2	0	0	1	0	0	1	0	4
3:00 AM	0	0	0	0	0	0	0	0	0	0	4	1	1	0	0	0	0	6
4:00 AM	0	0	0	0	0	0	0	0	0	3	3	4	3	5	2	0	0	20
5:00 AM	0	0	0	0	1	1	2	1	3	6	33	43	28	17	2	0	2	139
6:00 AM	0	0	0	0	0	1	2	12	69	285	297	109	23	0	0	0	0	798
7:00 AM	0	0	0	0	0	0	5	1	10	50	173	182	80	13	0	2	2	518

8:00 AM	0	0	0	0	1	7	0	5	29	119	219	182	54	7	0	0	0	623
9:00 AM	0	0	1	1	0	0	0	3	13	73	136	115	31	1	1	0	0	375
10:00 AM	0	0	0	0	0	1	1	3	12	52	111	82	29	5	0	0	0	296
11:00 AM	0	1	2	0	1	3	1	1	24	66	106	79	19	1	2	0	0	306
12:00 PM	0	0	4	1	0	0	0	3	30	77	140	73	10	6	1	0	0	345
1:00 PM	0	0	1	1	2	1	0	6	19	52	99	79	8	5	0	0	0	273
2:00 PM	0	0	1	3	0	0	3	2	20	99	126	59	7	2	0	0	0	322
3:00 PM	0	0	0	0	0	0	4	10	30	60	115	99	27	2	1	0	0	348
4:00 PM	0	0	1	1	0	0	0	0	12	59	111	103	32	4	0	0	0	323
5:00 PM	0	0	0	0	0	0	3	12	9	53	86	73	24	1	0	0	0	261
6:00 PM	0	0	0	0	0	1	1	4	16	45	58	52	4	0	0	0	0	181
7:00 PM	0	0	0	0	0	0	1	4	12	9	33	34	13	3	0	0	1	110
8:00 PM	0	0	0	0	0	0	1	2	15	21	16	13	7	3	1	0	0	79
9:00 PM	0	0	0	0	0	0	0	0	2	9	22	24	5	2	2	0	0	66
10:00 PM	0	0	0	0	0	0	1	0	0	10	16	13	10	1	2	0	0	53
11:00 PM	0	0	0	0	0	0	0	0	2	8	8	8	5	2	0	0	0	33
Total	0	1	10	7	5	15	25	69	330	1,161	1,917	1,430	421	80	15	3	5	5,494
Percent	0.0%	0.0%	0.2%	0.1%	0.1%	0.3%	0.5%	1.3%	6.0%	21.1%	34.9%	26.0%	7.7%	1.5%	0.3%	0.1%	0.1%	

Daily Percentile Speed Summary		Speed Statistics	
50th Percentile (Median)	57.9 mph	Mean (Average) Speed	57.7 mph
85th Percentile	63.4 mph	10 mph Pace	52.9 - 62.9 mph
95th Percentile	66.8 mph	Percent in Pace	63.9 %

January 31, 2020
Southbound

Time	Speed Range (mph)																	Total Volume
	0 - 10	10 - 15	15 - 20	20 - 25	25 - 30	30 - 35	35 - 40	40 - 45	45 - 50	50 - 55	55 - 60	60 - 65	65 - 70	70 - 75	75 - 80	80 - 85	85 +	
12:00 AM	0	0	0	0	0	0	0	0	0	5	4	4	1	1	0	0	0	15
1:00 AM	0	0	0	0	0	0	0	0	2	1	2	2	0	0	0	0	0	7
2:00 AM	0	0	0	0	0	0	0	0	0	0	2	0	1	0	0	0	0	3
3:00 AM	0	0	0	0	0	0	0	0	0	2	1	2	1	2	0	0	0	8
4:00 AM	0	0	0	0	0	0	0	0	0	1	5	3	1	2	0	0	1	13
5:00 AM	0	0	0	1	0	1	1	1	6	2	6	10	8	3	2	0	0	41
6:00 AM	0	0	0	0	1	0	3	4	8	38	47	24	3	0	0	0	0	128
7:00 AM	0	0	0	0	0	0	0	1	11	42	79	44	11	0	1	0	0	189
8:00 AM	0	0	1	0	0	2	0	1	7	52	75	66	19	6	2	0	0	231
9:00 AM	0	1	0	0	0	2	1	5	22	78	93	39	5	5	1	0	0	252
10:00 AM	0	3	1	0	0	1	0	4	22	56	90	48	6	2	0	0	0	233
11:00 AM	0	4	0	0	1	0	0	5	29	75	110	34	5	1	1	0	0	265
12:00 PM	0	0	0	0	0	1	1	12	38	95	104	48	7	1	0	0	1	308
1:00 PM	0	1	0	0	1	0	4	7	49	138	125	41	10	1	0	0	0	377
2:00 PM	0	4	1	0	0	0	0	26	84	163	142	30	6	1	0	0	0	457
3:00 PM	0	1	1	1	0	1	21	59	164	279	172	57	3	0	0	2	0	761
4:00 PM	0	0	1	0	0	3	4	48	186	361	219	37	2	0	0	0	0	861
5:00 PM	0	0	0	1	1	0	7	16	142	282	185	37	3	0	0	0	0	674
6:00 PM	0	0	0	0	0	0	3	8	38	111	101	31	6	0	0	0	1	299
7:00 PM	0	0	0	0	0	0	0	4	7	25	36	13	7	3	0	0	0	95
8:00 PM	0	0	0	0	0	0	0	2	6	20	31	19	5	0	0	1	0	84
9:00 PM	0	0	0	0	0	0	1	1	6	22	18	16	9	5	0	0	0	78

10:00 PM	0	0	0	0	0	0	3	2	5	14	18	9	4	1	0	1	0	57
11:00 PM	0	0	0	0	0	0	1	0	1	6	13	14	9	3	0	0	1	48
Total	0	14	5	3	4	11	50	206	833	1,868	1,678	628	132	37	7	4	4	5,484
Percent	0.0%	0.3%	0.1%	0.1%	0.1%	0.2%	0.9%	3.8%	15.2%	34.1%	30.6%	11.5%	2.4%	0.7%	0.1%	0.1%	0.1%	

Daily Percentile Speed Summary			Speed Statistics		
50th Percentile (Median)	54.4	mph	Mean (Average) Speed	54.2	mph
85th Percentile	59.9	mph	10 mph Pace	49.7 - 59.7	mph
95th Percentile	63.6	mph	Percent in Pace	64.99	%

February 1, 2020
Northbound

Time	Speed Range (mph)																	Total Volume
	0 - 10	10 - 15	15 - 20	20 - 25	25 - 30	30 - 35	35 - 40	40 - 45	45 - 50	50 - 55	55 - 60	60 - 65	65 - 70	70 - 75	75 - 80	80 - 85	85 +	
12:00 AM	0	0	0	0	0	0	0	1	2	1	5	1	3	2	0	0	0	15
1:00 AM	0	0	0	0	0	0	1	0	2	0	1	2	2	2	1	0	0	11
2:00 AM	0	0	0	0	0	0	0	0	1	2	1	3	4	0	0	0	0	11
3:00 AM	0	0	0	0	0	0	0	0	0	0	1	7	2	2	0	0	0	12
4:00 AM	0	0	0	0	0	0	0	0	0	1	4	1	0	0	1	0	0	7
5:00 AM	0	0	0	0	0	0	0	1	0	0	9	17	14	3	0	0	1	45
6:00 AM	0	0	0	0	0	0	1	3	8	50	113	75	28	6	0	2	0	286
7:00 AM	0	0	1	0	0	0	0	0	6	12	37	53	38	6	6	3	1	163
8:00 AM	0	1	2	3	1	0	0	0	6	17	76	118	51	11	1	3	1	291
9:00 AM	0	0	0	0	0	0	0	3	25	64	128	102	21	8	3	1	0	355
10:00 AM	0	1	7	3	0	1	4	12	50	84	120	59	11	3	0	0	0	355
11:00 AM	0	0	1	2	0	1	4	7	69	125	134	57	13	1	0	1	0	415
12:00 PM	0	1	3	2	1	2	5	21	82	135	89	41	8	3	1	1	0	395
1:00 PM	0	0	3	2	0	1	2	15	69	108	115	56	18	2	1	0	0	392
2:00 PM	0	0	1	0	2	2	0	4	39	114	114	42	11	2	0	0	0	331
3:00 PM	0	0	0	0	0	0	2	15	30	59	81	68	20	4	0	0	0	279
4:00 PM	0	0	0	0	0	0	2	7	16	42	82	78	21	5	1	0	0	254
5:00 PM	0	0	0	0	0	0	2	6	19	65	61	26	11	1	1	0	0	192
6:00 PM	0	0	0	0	0	0	4	6	11	27	45	27	4	0	0	0	0	124
7:00 PM	0	0	0	0	0	0	0	1	10	23	22	25	5	3	0	0	0	89
8:00 PM	0	0	0	0	0	0	0	1	11	21	33	26	7	0	1	0	0	100
9:00 PM	0	0	0	0	0	0	0	1	2	8	25	29	13	1	1	0	0	80
10:00 PM	0	0	0	0	0	1	1	1	1	6	26	18	7	3	0	0	0	64
11:00 PM	0	0	0	0	0	0	0	0	1	2	8	11	5	1	0	0	0	28
Total	0	3	18	12	4	8	28	105	460	966	1,330	942	317	69	18	11	3	4,294
Percent	0.0%	0.1%	0.4%	0.3%	0.1%	0.2%	0.7%	2.4%	10.7%	22.5%	31.0%	21.9%	7.4%	1.6%	0.4%	0.3%	0.1%	

Daily Percentile Speed Summary			Speed Statistics		
50th Percentile (Median)	57.0	mph	Mean (Average) Speed	56.7	mph
85th Percentile	63.4	mph	10 mph Pace	51.9 - 61.9	mph
95th Percentile	67.3	mph	Percent in Pace	56.8	%

February 1, 2020
Southbound

Time	Speed Range (mph)																	Total Volume
	0 - 10	10 - 15	15 - 20	20 - 25	25 - 30	30 - 35	35 - 40	40 - 45	45 - 50	50 - 55	55 - 60	60 - 65	65 - 70	70 - 75	75 - 80	80 - 85	85 +	

2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Percent	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Daily Percentile Speed Summary		Speed Statistics	
50th Percentile (Median)	0.0 mph	Mean (Average) Speed	0.0 mph
85th Percentile	0.0 mph	10 mph Pace	.0 - 10.0 mph
95th Percentile	0.0 mph	Percent in Pace	0.0 %

February 2, 2020
Southbound

Time	Speed Range (mph)																	Total Volume	
	0 - 10	10 - 15	15 - 20	20 - 25	25 - 30	30 - 35	35 - 40	40 - 45	45 - 50	50 - 55	55 - 60	60 - 65	65 - 70	70 - 75	75 - 80	80 - 85	85 +		
12:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Percent	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Daily Percentile Speed Summary		Speed Statistics	
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8:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Percent	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Daily Percentile Speed Summary		Speed Statistics	
50th Percentile (Median)	0.0 mph	Mean (Average) Speed	0.0 mph
85th Percentile	0.0 mph	10 mph Pace	.0 - 10.0 mph
95th Percentile	0.0 mph	Percent in Pace	0.0 %

February 4, 2020
Southbound

Time	Speed Range (mph)																	Total Volume	
	0 - 10	10 - 15	15 - 20	20 - 25	25 - 30	30 - 35	35 - 40	40 - 45	45 - 50	50 - 55	55 - 60	60 - 65	65 - 70	70 - 75	75 - 80	80 - 85	85 +		
12:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Percent	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Daily Percentile Speed Summary		Speed Statistics	
50th Percentile (Median)	0.0 mph	Mean (Average) Speed	0 mph
85th Percentile	0.0 mph	10 mph Pace	.0 - 10.0 mph
95th Percentile	0.0 mph	Percent in Pace	0 %

February 5, 2020
Northbound

6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Percent	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Daily Percentile Speed Summary			Speed Statistics		
50th Percentile (Median)	0.0	mph	Mean (Average) Speed	0	mph
85th Percentile	0.0	mph	10 mph Pace	.0 - 10.0	mph
95th Percentile	0.0	mph	Percent in Pace	0	%

February 8, 2020
Northbound

Time	Speed Range (mph)																	Total Volume	
	0 - 10	10 - 15	15 - 20	20 - 25	25 - 30	30 - 35	35 - 40	40 - 45	45 - 50	50 - 55	55 - 60	60 - 65	65 - 70	70 - 75	75 - 80	80 - 85	85 +		
12:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Percent	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Daily Percentile Speed Summary			Speed Statistics		
50th Percentile (Median)	0.0	mph	Mean (Average) Speed	0.0	mph
85th Percentile	0.0	mph	10 mph Pace	.0 - 10.0	mph
95th Percentile	0.0	mph	Percent in Pace	0.0	%

February 8, 2020
Southbound

Time	Speed Range (mph)																	Total Volume
	0 - 10	10 - 15	15 - 20	20 - 25	25 - 30	30 - 35	35 - 40	40 - 45	45 - 50	50 - 55	55 - 60	60 - 65	65 - 70	70 - 75	75 - 80	80 - 85	85 +	
12:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Percent	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Daily Percentile Speed Summary		Speed Statistics	
50th Percentile (Median)	0.0 mph	Mean (Average) Speed	0 mph
85th Percentile	0.0 mph	10 mph Pace	.0 - 10.0 mph
95th Percentile	0.0 mph	Percent in Pace	0 %

Total Study Average
Northbound

Time	Speed Range (mph)																	Total Volume
	0 - 10	10 - 15	15 - 20	20 - 25	25 - 30	30 - 35	35 - 40	40 - 45	45 - 50	50 - 55	55 - 60	60 - 65	65 - 70	70 - 75	75 - 80	80 - 85	85 +	
12:00 AM	0	0	0	0	0	0	0	1	2	1	4	2	2	1	1	0	0	14
1:00 AM	0	0	0	0	0	0	1	0	2	2	2	1	1	1	1	0	0	11
2:00 AM	0	0	0	0	0	0	0	0	1	2	1	2	3	0	0	1	0	10
3:00 AM	0	0	0	0	0	0	0	0	0	0	3	4	2	1	0	0	0	10
4:00 AM	0	0	0	0	0	0	0	0	0	2	4	3	2	3	2	0	0	16
5:00 AM	0	0	0	0	1	1	1	1	2	3	21	30	21	10	1	0	2	94
6:00 AM	0	0	0	0	0	1	2	8	39	168	205	92	26	3	0	1	0	545
7:00 AM	0	0	1	0	0	3	1	8	31	105	118	59	10	3	3	2	2	344
8:00 AM	0	1	1	2	1	4	0	3	18	68	148	150	53	9	1	2	1	462
9:00 AM	0	0	1	1	0	0	0	3	19	69	132	109	26	5	2	1	0	368

10:00 AM	0	1	4	2	0	1	3	8	31	68	116	71	20	4	0	0	0	329
11:00 AM	0	1	2	1	1	2	3	4	47	96	120	68	16	1	1	1	0	364
12:00 PM	0	1	4	2	1	1	3	12	56	106	115	57	9	5	1	1	0	374
1:00 PM	0	0	2	2	1	1	1	11	44	80	107	68	13	4	1	0	0	335
2:00 PM	0	0	1	2	1	1	2	3	30	107	120	51	9	2	0	0	0	329
3:00 PM	0	0	0	0	0	0	3	13	30	60	98	84	24	3	1	0	0	316
4:00 PM	0	0	1	1	0	0	1	4	14	51	97	91	27	5	1	0	0	293
5:00 PM	0	0	0	0	0	0	3	9	14	59	74	50	18	1	1	0	0	229
6:00 PM	0	0	0	0	0	1	3	5	14	36	52	40	4	0	0	0	0	155
7:00 PM	0	0	0	0	0	0	1	3	11	16	28	30	9	3	0	0	1	102
8:00 PM	0	0	0	0	0	0	1	2	13	21	25	20	7	2	1	0	0	92
9:00 PM	0	0	0	0	0	0	0	1	2	9	24	27	9	2	2	0	0	76
10:00 PM	0	0	0	0	0	1	1	1	1	8	21	16	9	2	1	0	0	61
11:00 PM	0	0	0	0	0	0	0	0	2	5	8	10	5	2	0	0	0	32
Total	0	4	17	13	6	14	32	93	400	1,068	1,630	1,194	374	79	21	10	6	4,961
Percent	0.0%	0.1%	0.3%	0.3%	0.1%	0.3%	0.6%	1.9%	8.1%	21.5%	32.9%	24.1%	7.5%	1.6%	0.4%	0.2%	0.1%	

Note: Average only considered on days with 24-hours of data.

Total Study Percentile Speed Summary		Total Study Speed Statistics	
50th Percentile (Median)	57.6 mph	Mean (Average) Speed	57.2 mph
85th Percentile	63.4 mph	10 mph Pace	52.9 - 62.9 mph
95th Percentile	67.0 mph	Percent in Pace	60.6 %

Total Study Average Southbound

Time	Speed Range (mph)																	Total Volume
	0 - 10	10 - 15	15 - 20	20 - 25	25 - 30	30 - 35	35 - 40	40 - 45	45 - 50	50 - 55	55 - 60	60 - 65	65 - 70	70 - 75	75 - 80	80 - 85	85 +	
12:00 AM	0	0	0	0	0	0	0	1	0	6	6	4	2	1	0	0	0	20
1:00 AM	0	0	0	0	0	0	0	0	2	3	4	3	0	1	0	0	0	13
2:00 AM	0	0	0	0	0	0	0	0	1	2	2	1	2	0	0	0	0	8
3:00 AM	0	0	0	0	0	0	0	1	0	1	1	1	1	1	0	0	0	6
4:00 AM	0	0	0	0	0	0	0	0	0	1	5	4	2	1	0	0	1	14
5:00 AM	0	0	0	1	0	1	1	1	4	2	8	8	6	2	2	0	0	36
6:00 AM	0	0	0	0	1	0	2	2	5	28	37	20	5	0	0	1	0	101
7:00 AM	0	0	2	0	0	0	1	1	7	29	49	41	14	1	2	0	0	147
8:00 AM	0	0	2	0	0	1	0	2	6	41	61	49	15	6	2	1	0	186
9:00 AM	0	1	1	0	0	1	1	4	17	58	78	39	9	3	1	0	1	214
10:00 AM	0	2	2	0	0	2	3	9	22	48	75	42	12	2	0	0	0	219
11:00 AM	1	4	1	0	1	1	1	5	31	91	101	29	4	1	1	0	0	272
12:00 PM	1	1	2	0	0	1	2	23	44	98	103	43	5	1	0	0	1	325
1:00 PM	0	1	1	0	1	1	5	5	47	125	110	36	8	1	0	0	0	341
2:00 PM	1	3	1	0	1	1	4	31	86	151	122	24	4	1	0	1	0	431
3:00 PM	0	3	2	1	0	1	13	46	146	239	136	42	3	1	1	1	0	635
4:00 PM	1	1	2	0	0	3	4	40	196	310	171	26	3	1	0	0	1	759
5:00 PM	1	2	0	1	1	0	10	22	146	246	138	31	4	1	1	0	0	604
6:00 PM	0	0	0	0	0	1	2	8	45	101	89	30	5	1	0	0	1	283
7:00 PM	0	0	0	0	0	0	0	4	14	28	35	20	5	2	0	0	0	108
8:00 PM	0	0	0	0	0	0	1	2	7	21	31	19	4	0	0	1	0	86
9:00 PM	0	0	0	0	0	0	2	2	8	22	22	13	7	3	0	0	0	79
10:00 PM	0	0	0	0	0	0	2	2	6	17	20	15	3	1	1	1	0	68

11:00 PM	0	0	0	0	0	0	1	1	2	8	18	23	6	2	0	0	1	62
Total	5	18	16	3	5	14	55	212	842	1,676	1,422	563	129	34	11	6	6	5,017
Percent	0.1%	0.4%	0.3%	0.1%	0.1%	0.3%	1.1%	4.2%	16.8%	33.4%	28.3%	11.2%	2.6%	0.7%	0.2%	0.1%	0.1%	

Note: Average only considered on days with 24-hours of data.

Total Study Percentile Speed Summary			Total Study Speed Statistics		
50th Percentile (Median)	54.1	mph	Mean (Average) Speed	53.9	mph
85th Percentile	59.8	mph	10 mph Pace	48.5 - 58.5	mph
95th Percentile	63.8	mph	Percent in Pace	63.2	%

Vehicle Classification Report Summary

Location: Silverado Trail S/O Signorello Winery Entrance

Count Direction: Northbound / Southbound

Date Range: 9/13/2019 to 9/19/2019

Site Code: 01

	FHWA Vehicle Classification													Total Volume
	1	2	3	4	5	6	7	8	9	10	11	12	13	
Study Total														
Northbound	320	16,357	17,270	139	8,090	167	0	101	159	45	27	15	25	42,715
Percent	0.7%	38.3%	40.4%	0.3%	18.9%	0.4%	0.0%	0.2%	0.4%	0.1%	0.1%	0.0%	0.1%	100%
Southbound	325	21,229	13,037	106	6,928	169	0	100	182	26	30	11	16	42,159
Percent	0.8%	50.4%	30.9%	0.3%	16.4%	0.4%	0.0%	0.2%	0.4%	0.1%	0.1%	0.0%	0.0%	100%
Total	645	37,586	30,307	245	15,018	336	0	201	341	71	57	26	41	84,874
Percent	0.8%	44.3%	35.7%	0.3%	17.7%	0.4%	0.0%	0.2%	0.4%	0.1%	0.1%	0.0%	0.0%	100%

FHWA Vehicle Classification	
Class 1 - Motorcycles	Class 8 - Four or Fewer Axle Single-Trailer Trucks
Class 2 - Passenger Cars	Class 9 - Five-Axle Single-Trailer Trucks
Class 3 - Other Two-Axle, Four-Tire Single Unit Vehicles	Class 10 - Six or More Axle Single-Trailer Trucks
Class 4 - Buses	Class 11 - Five or fewer Axle Multi-Trailer Trucks
Class 5 - Two-Axle, Six-Tire, Single-Unit Trucks	Class 12 - Six-Axle Multi-Trailer Trucks
Class 6 - Three-Axle Single-Unit Trucks	Class 13 - Seven or More Axle Multi-Trailer Trucks
Class 7 - Four or More Axle Single-Unit Trucks	

Vehicle Classification Report Summary



Location: Signorello Entrance E/O Silverado Trail

Count Direction: Eastbound / Westbound

Date Range: 9/13/2019 to 9/19/2019

Site Code: 02

	FHWA Vehicle Classification													Total Volume
	1	2	3	4	5	6	7	8	9	10	11	12	13	
Study Total														
Eastbound	46	86	47	0	9	2	0	0	0	0	0	0	0	190
Percent	24.2%	45.3%	24.7%	0.0%	4.7%	1.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100%
Westbound	18	164	1	0	3	7	0	0	0	0	0	0	0	193
Percent	9.3%	85.0%	0.5%	0.0%	1.6%	3.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100%
Total	64	250	48	0	12	9	0	0	0	0	0	0	0	383
Percent	16.7%	65.3%	12.5%	0.0%	3.1%	2.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100%

FHWA Vehicle Classification	
Class 1 - Motorcycles	Class 8 - Four or Fewer Axle Single-Trailer Trucks
Class 2 - Passenger Cars	Class 9 - Five-Axle Single-Trailer Trucks
Class 3 - Other Two-Axle, Four-Tire Single Unit Vehicles	Class 10 - Six or More Axle Single-Trailer Trucks
Class 4 - Buses	Class 11 - Five or fewer Axle Multi-Trailer Trucks
Class 5 - Two-Axle, Six-Tire, Single-Unit Trucks	Class 12 - Six-Axle Multi-Trailer Trucks
Class 6 - Three-Axle Single-Unit Trucks	Class 13 - Seven or More Axle Multi-Trailer Trucks
Class 7 - Four or More Axle Single-Unit Trucks	

Vehicle Classification Report Summary



Location: Signorello Entrance E/O Silverado Trail

Count Direction: Eastbound / Westbound

Date Range: 9/20/2019 to 9/21/2019

Site Code: 02

	FHWA Vehicle Classification													Total Volume
	1	2	3	4	5	6	7	8	9	10	11	12	13	
Study Total														
Eastbound	5	23	15	0	7	2	0	0	0	0	0	0	0	52
Percent	9.6%	44.2%	28.8%	0.0%	13.5%	3.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100%
Westbound	7	28	0	0	0	5	0	0	0	0	0	0	0	40
Percent	17.5%	70.0%	0.0%	0.0%	0.0%	12.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100%
Total	12	51	15	0	7	7	0	0	0	0	0	0	0	92
Percent	13.0%	55.4%	16.3%	0.0%	7.6%	7.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100%

FHWA Vehicle Classification

Class 1 - Motorcycles	Class 8 - Four or Fewer Axle Single-Trailer Trucks
Class 2 - Passenger Cars	Class 9 - Five-Axle Single-Trailer Trucks
Class 3 - Other Two-Axle, Four-Tire Single Unit Vehicles	Class 10 - Six or More Axle Single-Trailer Trucks
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Class 5 - Two-Axle, Six-Tire, Single-Unit Trucks	Class 12 - Six-Axle Multi-Trailer Trucks
Class 6 - Three-Axle Single-Unit Trucks	Class 13 - Seven or More Axle Multi-Trailer Trucks
Class 7 - Four or More Axle Single-Unit Trucks	

Vehicle Classification Report Summary



Location: Signorello Entrance E/O Silverado Trail

Count Direction: Eastbound / Westbound

Date Range: 10/4/2019 to 10/6/2019

Site Code: 02

	FHWA Vehicle Classification													Total Volume
	1	2	3	4	5	6	7	8	9	10	11	12	13	
Study Total														
Eastbound	2	55	21	0	11	0	0	0	0	0	0	0	0	89
Percent	2.2%	61.8%	23.6%	0.0%	12.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100%
Westbound	0	56	27	0	5	2	0	0	0	0	0	0	0	90
Percent	0.0%	62.2%	30.0%	0.0%	5.6%	2.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100%
Total	2	111	48	0	16	2	0	0	0	0	0	0	0	179
Percent	1.1%	62.0%	26.8%	0.0%	8.9%	1.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100%

FHWA Vehicle Classification

Class 1 - Motorcycles	Class 8 - Four or Fewer Axle Single-Trailer Trucks
Class 2 - Passenger Cars	Class 9 - Five-Axle Single-Trailer Trucks
Class 3 - Other Two-Axle, Four-Tire Single Unit Vehicles	Class 10 - Six or More Axle Single-Trailer Trucks
Class 4 - Buses	Class 11 - Five or fewer Axle Multi-Trailer Trucks
Class 5 - Two-Axle, Six-Tire, Single-Unit Trucks	Class 12 - Six-Axle Multi-Trailer Trucks
Class 6 - Three-Axle Single-Unit Trucks	Class 13 - Seven or More Axle Multi-Trailer Trucks
Class 7 - Four or More Axle Single-Unit Trucks	

Vehicle Classification Report Summary



Location: Silverado Trail, S/O Signorello Dwy

Count Direction: Northbound / Southbound

Date Range: 1/31/2020 to 2/1/2020

Site Code: 01

	FHWA Vehicle Classification													Total Volume
	1	2	3	4	5	6	7	8	9	10	11	12	13	
Study Total														
Northbound	99	5,948	2,283	11	1,406	18	0	9	10	2	0	0	2	9,788
Percent	1.0%	60.8%	23.3%	0.1%	14.4%	0.2%	0.0%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	100%
Southbound	130	6,695	1,892	12	1,114	11	0	14	17	1	0	0	3	9,889
Percent	1.3%	67.7%	19.1%	0.1%	11.3%	0.1%	0.0%	0.1%	0.2%	0.0%	0.0%	0.0%	0.0%	100%
Total	229	12,643	4,175	23	2,520	29	0	23	27	3	0	0	5	19,677
Percent	1.2%	64.3%	21.2%	0.1%	12.8%	0.1%	0.0%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	100%

FHWA Vehicle Classification	
Class 1 - Motorcycles	Class 8 - Four or Fewer Axle Single-Trailer Trucks
Class 2 - Passenger Cars	Class 9 - Five-Axle Single-Trailer Trucks
Class 3 - Other Two-Axle, Four-Tire Single Unit Vehicles	Class 10 - Six or More Axle Single-Trailer Trucks
Class 4 - Buses	Class 11 - Five or fewer Axle Multi-Trailer Trucks
Class 5 - Two-Axle, Six-Tire, Single-Unit Trucks	Class 12 - Six-Axle Multi-Trailer Trucks
Class 6 - Three-Axle Single-Unit Trucks	Class 13 - Seven or More Axle Multi-Trailer Trucks
Class 7 - Four or More Axle Single-Unit Trucks	

Appendix B

HCM 6th TWSC
4: Silverado Trail & Oak Knoll

02-06-2020

Intersection						
Int Delay, s/veh	4.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↖	↗	↖	↗	↗	↖
Traffic Vol, veh/h	83	71	54	380	850	391
Future Vol, veh/h	83	71	54	380	850	391
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	25	100	-	-	50
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	1	1
Mvmt Flow	88	76	57	404	904	416

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	1422	904	1320	0	-	0
Stage 1	904	-	-	-	-	-
Stage 2	518	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	150	335	524	-	-	-
Stage 1	395	-	-	-	-	-
Stage 2	598	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	134	335	524	-	-	-
Mov Cap-2 Maneuver	134	-	-	-	-	-
Stage 1	352	-	-	-	-	-
Stage 2	598	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	47.9	1.6	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	524	-	134	335	-	-
HCM Lane V/C Ratio	0.11	-	0.659	0.225	-	-
HCM Control Delay (s)	12.7	-	72.8	18.8	-	-
HCM Lane LOS	B	-	F	C	-	-
HCM 95th %tile Q(veh)	0.4	-	3.6	0.9	-	-

HCM 6th TWSC
 8: Silverado Trail & Signorella Entrance

02-06-2020

Intersection							
Int Delay, s/veh	0						
Movement	WBL	WBR	NBT	NBR	SBU	SBL	SBT
Lane Configurations							
Traffic Vol, veh/h	2	1	429	1	4	1	917
Future Vol, veh/h	2	1	429	1	4	1	917
Conflicting Peds, #/hr	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	-	None
Storage Length	0	-	-	-	-	0	-
Veh in Median Storage, #	1	-	0	-	-	-	0
Grade, %	0	-	0	-	-	-	0
Peak Hour Factor	94	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	1	1	1
Mvmt Flow	2	1	456	1	4	1	976

Major/Minor	Minor1	Major1	Major2				
Conflicting Flow All	1435	457	0	0	-	457	0
Stage 1	457	-	-	-	-	-	-
Stage 2	978	-	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	-	4.11	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	-	2.209	-
Pot Cap-1 Maneuver	147	604	-	-	-	1109	-
Stage 1	638	-	-	-	-	-	-
Stage 2	364	-	-	-	-	-	-
Platoon blocked, %			-	-			-
Mov Cap-1 Maneuver	147	604	-	-	-	-	-
Mov Cap-2 Maneuver	272	-	-	-	-	-	-
Stage 1	638	-	-	-	-	-	-
Stage 2	364	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	15.9	0	
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	333	-
HCM Lane V/C Ratio	-	-	0.01	-
HCM Control Delay (s)	-	-	15.9	-
HCM Lane LOS	-	-	C	-
HCM 95th %tile Q(veh)	-	-	0	-

HCM 6th Signalized Intersection Summary

10: Trancas Rd & Silverado Trail

02-06-2020



Movement	EBL	EBT	WBT	WBR	SBL	SBR	
Lane Configurations							
Traffic Volume (veh/h)	257	659	509	186	395	470	
Future Volume (veh/h)	257	659	509	186	395	470	
Initial Q (Qb), veh	0	0	0	0	0	0	
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	
Work Zone On Approach		No	No		No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1870	1870	
Adj Flow Rate, veh/h	262	672	519	0	403	480	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	
Percent Heavy Veh, %	1	1	1	1	2	2	
Cap, veh/h	317	1626	715		695	898	
Arrive On Green	0.18	0.45	0.20	0.00	0.39	0.39	
Sat Flow, veh/h	1795	3676	3676	1598	1781	1585	
Grp Volume(v), veh/h	262	672	519	0	403	480	
Grp Sat Flow(s),veh/h/ln	1795	1791	1791	1598	1781	1585	
Q Serve(g_s), s	8.1	7.3	7.8	0.0	10.3	10.9	
Cycle Q Clear(g_c), s	8.1	7.3	7.8	0.0	10.3	10.9	
Prop In Lane	1.00			1.00	1.00	1.00	
Lane Grp Cap(c), veh/h	317	1626	715		695	898	
V/C Ratio(X)	0.83	0.41	0.73		0.58	0.53	
Avail Cap(c_a), veh/h	420	2701	1583		695	898	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	1.00	
Uniform Delay (d), s/veh	22.9	10.6	21.6	0.0	13.9	7.8	
Incr Delay (d2), s/veh	9.9	0.2	1.4	0.0	3.5	2.3	
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	
%ile BackOfQ(50%),veh/ln	3.7	2.0	2.8	0.0	3.7	11.6	
Unsig. Movement Delay, s/veh							
LnGrp Delay(d),s/veh	32.8	10.8	23.0	0.0	17.4	10.1	
LnGrp LOS	C	B	C		B	B	
Approach Vol, veh/h		934	519	A	883		
Approach Delay, s/veh		16.9	23.0		13.4		
Approach LOS		B	C		B		
Timer - Assigned Phs				4	6	7	8
Phs Duration (G+Y+Rc), s				30.7	27.0	14.7	16.0
Change Period (Y+Rc), s				4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s				43.5	22.5	13.5	25.5
Max Q Clear Time (g_c+I1), s				9.3	12.9	10.1	9.8
Green Ext Time (p_c), s				2.6	2.0	0.2	1.7
Intersection Summary							
HCM 6th Ctrl Delay			17.0				
HCM 6th LOS			B				
Notes							
Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.							

HCM 6th TWSC
4: Silverado Trail & Oak Knoll

02-06-2020

Intersection						
Int Delay, s/veh	1.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↖	↗	↖	↗	↗	↖
Traffic Vol, veh/h	54	24	36	229	751	247
Future Vol, veh/h	54	24	36	229	751	247
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	25	100	-	-	50
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	97	97	97	96	97	97
Heavy Vehicles, %	0	0	1	1	1	1
Mvmt Flow	56	25	37	239	774	255

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	1087	774	1029	0	-	0
Stage 1	774	-	-	-	-	-
Stage 2	313	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.11	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.209	-	-	-
Pot Cap-1 Maneuver	241	402	679	-	-	-
Stage 1	458	-	-	-	-	-
Stage 2	746	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	228	402	679	-	-	-
Mov Cap-2 Maneuver	228	-	-	-	-	-
Stage 1	433	-	-	-	-	-
Stage 2	746	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	22.3	1.4	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	679	-	228	402	-	-
HCM Lane V/C Ratio	0.055	-	0.244	0.062	-	-
HCM Control Delay (s)	10.6	-	25.8	14.5	-	-
HCM Lane LOS	B	-	D	B	-	-
HCM 95th %tile Q(veh)	0.2	-	0.9	0.2	-	-

HCM 6th TWSC
8: Silverado Trail & Signorella Entrance

02-06-2020

Intersection							
Int Delay, s/veh	0.1						
Movement	WBL	WBR	NBT	NBR	SBU	SBL	SBT
Lane Configurations	↔		↔			↔	↑
Traffic Vol, veh/h	4	2	263	1	1	0	772
Future Vol, veh/h	4	2	263	1	1	0	772
Conflicting Peds, #/hr	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	-	None
Storage Length	0	-	-	-	-	0	-
Veh in Median Storage, #	1	-	0	-	-	-	0
Grade, %	0	-	0	-	-	-	0
Peak Hour Factor	94	94	94	94	94	94	94
Heavy Vehicles, %	0	0	1	1	0	1	1
Mvmt Flow	4	2	280	1	1	0	821

Major/Minor	Minor1	Major1	Major2				
Conflicting Flow All	1102	281	0	0	-	281	0
Stage 1	281	-	-	-	-	-	-
Stage 2	821	-	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	-	4.11	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	-	2.209	-
Pot Cap-1 Maneuver	236	763	-	-	-	1287	-
Stage 1	771	-	-	-	-	-	-
Stage 2	436	-	-	-	-	-	-
Platoon blocked, %			-	-			-
Mov Cap-1 Maneuver	236	763	-	-	-	-	-
Mov Cap-2 Maneuver	348	-	-	-	-	-	-
Stage 1	771	-	-	-	-	-	-
Stage 2	436	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.6	0	
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	425	-
HCM Lane V/C Ratio	-	-	0.015	-
HCM Control Delay (s)	-	-	13.6	-
HCM Lane LOS	-	-	B	-
HCM 95th %tile Q(veh)	-	-	0	-

HCM 6th Signalized Intersection Summary

10: Trancas Rd & Silverado Trail

02-06-2020



Movement	EBL	EBT	WBT	WBR	SBL	SBR	
Lane Configurations							
Traffic Volume (veh/h)	150	363	352	143	371	377	
Future Volume (veh/h)	150	363	352	143	371	377	
Initial Q (Qb), veh	0	0	0	0	0	0	
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	
Work Zone On Approach		No	No		No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	
Adj Flow Rate, veh/h	153	370	359	0	379	385	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	
Percent Heavy Veh, %	1	1	1	1	1	1	
Cap, veh/h	200	1292	566		820	908	
Arrive On Green	0.11	0.36	0.16	0.00	0.46	0.46	
Sat Flow, veh/h	1795	3676	3676	1598	1795	1598	
Grp Volume(v), veh/h	153	370	359	0	379	385	
Grp Sat Flow(s),veh/h/ln	1795	1791	1791	1598	1795	1598	
Q Serve(g_s), s	4.1	3.6	4.6	0.0	7.2	6.8	
Cycle Q Clear(g_c), s	4.1	3.6	4.6	0.0	7.2	6.8	
Prop In Lane	1.00			1.00	1.00	1.00	
Lane Grp Cap(c), veh/h	200	1292	566		820	908	
V/C Ratio(X)	0.77	0.29	0.63		0.46	0.42	
Avail Cap(c_a), veh/h	492	3163	1854		820	908	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	1.00	
Uniform Delay (d), s/veh	21.3	11.2	19.4	0.0	9.2	6.1	
Incr Delay (d2), s/veh	6.0	0.1	1.2	0.0	1.9	1.5	
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	
%ile BackOfQ(50%),veh/ln	1.7	1.0	1.6	0.0	2.1	7.9	
Unsig. Movement Delay, s/veh							
LnGrp Delay(d),s/veh	27.3	11.4	20.6	0.0	11.1	7.5	
LnGrp LOS	C	B	C		B	A	
Approach Vol, veh/h		523	359	A	764		
Approach Delay, s/veh		16.0	20.6		9.3		
Approach LOS		B	C		A		
Timer - Assigned Phs				4	6	7	8
Phs Duration (G+Y+Rc), s				22.3	27.0	10.0	12.3
Change Period (Y+Rc), s				4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s				43.5	22.5	13.5	25.5
Max Q Clear Time (g_c+I1), s				5.6	9.2	6.1	6.6
Green Ext Time (p_c), s				1.3	1.9	0.2	1.2

Intersection Summary

HCM 6th Ctrl Delay	13.9
HCM 6th LOS	B

Notes

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

HCM 6th TWSC
4: Silverado Trail & Oak Knoll

02-06-2020

Intersection						
Int Delay, s/veh	7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↖	↗	↖	↗	↗	↖
Traffic Vol, veh/h	91	76	62	394	916	407
Future Vol, veh/h	91	76	62	394	916	407
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	25	100	-	-	50
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	1	1
Mvmt Flow	97	81	66	419	974	433

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	1525	974	1407	0	-	0
Stage 1	974	-	-	-	-	-
Stage 2	551	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	130	306	485	-	-	-
Stage 1	366	-	-	-	-	-
Stage 2	577	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	112	306	485	-	-	-
Mov Cap-2 Maneuver	112	-	-	-	-	-
Stage 1	316	-	-	-	-	-
Stage 2	577	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	76.3	1.8	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	485	-	112	306	-	-
HCM Lane V/C Ratio	0.136	-	0.864	0.264	-	-
HCM Control Delay (s)	13.6	-	122.5	20.9	-	-
HCM Lane LOS	B	-	F	C	-	-
HCM 95th %tile Q(veh)	0.5	-	5.2	1	-	-

HCM 6th TWSC
 8: Silverado Trail & Signorella Entrance

02-06-2020

Intersection							
Int Delay, s/veh	0						
Movement	WBL	WBR	NBT	NBR	SBU	SBL	SBT
Lane Configurations	W		T			T	T
Traffic Vol, veh/h	2	1	451	1	4	1	1003
Future Vol, veh/h	2	1	451	1	4	1	1003
Conflicting Peds, #/hr	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	-	None
Storage Length	0	-	-	-	-	0	-
Veh in Median Storage, #	1	-	0	-	-	-	0
Grade, %	0	-	0	-	-	-	0
Peak Hour Factor	94	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2	2
Mvmt Flow	2	1	480	1	4	1	1067

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1550	481	0	0	-	481
Stage 1	481	-	-	-	-	-
Stage 2	1069	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	-	2.218
Pot Cap-1 Maneuver	125	585	-	-	-	1082
Stage 1	622	-	-	-	-	-
Stage 2	330	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	125	585	-	-	-	-
Mov Cap-2 Maneuver	247	-	-	-	-	-
Stage 1	622	-	-	-	-	-
Stage 2	330	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	16.9	0	
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	306	-
HCM Lane V/C Ratio	-	-	0.01	-
HCM Control Delay (s)	-	-	16.9	-
HCM Lane LOS	-	-	C	-
HCM 95th %tile Q(veh)	-	-	0	-

HCM 6th Signalized Intersection Summary

10: Trancas Rd & Silverado Trail

02-06-2020



Movement	EBL	EBT	WBT	WBR	SBL	SBR	
Lane Configurations							
Traffic Volume (veh/h)	262	711	529	203	458	478	
Future Volume (veh/h)	262	711	529	203	458	478	
Initial Q (Qb), veh	0	0	0	0	0	0	
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	
Work Zone On Approach		No	No		No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1870	1870	
Adj Flow Rate, veh/h	267	726	540	0	467	488	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	
Percent Heavy Veh, %	1	1	1	1	2	2	
Cap, veh/h	321	1651	735		686	894	
Arrive On Green	0.18	0.46	0.21	0.00	0.38	0.38	
Sat Flow, veh/h	1795	3676	3676	1598	1781	1585	
Grp Volume(v), veh/h	267	726	540	0	467	488	
Grp Sat Flow(s),veh/h/ln	1795	1791	1791	1598	1781	1585	
Q Serve(g_s), s	8.4	8.0	8.2	0.0	12.8	11.3	
Cycle Q Clear(g_c), s	8.4	8.0	8.2	0.0	12.8	11.3	
Prop In Lane	1.00			1.00	1.00	1.00	
Lane Grp Cap(c), veh/h	321	1651	735		686	894	
V/C Ratio(X)	0.83	0.44	0.73		0.68	0.55	
Avail Cap(c_a), veh/h	415	2666	1563		686	894	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	
Upstream Filter(l)	1.00	1.00	1.00	0.00	1.00	1.00	
Uniform Delay (d), s/veh	23.2	10.6	21.7	0.0	15.0	8.0	
Incr Delay (d2), s/veh	10.7	0.2	1.4	0.0	5.4	2.4	
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	
%ile BackOfQ(50%),veh/ln	3.9	2.2	3.0	0.0	4.8	0.6	
Unsig. Movement Delay, s/veh							
LnGrp Delay(d),s/veh	33.9	10.8	23.2	0.0	20.4	10.4	
LnGrp LOS	C	B	C		C	B	
Approach Vol, veh/h		993	540	A	955		
Approach Delay, s/veh		17.0	23.2		15.3		
Approach LOS		B	C		B		
Timer - Assigned Phs				4	6	7	8
Phs Duration (G+Y+Rc), s				31.4	27.0	15.0	16.5
Change Period (Y+Rc), s				4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s				43.5	22.5	13.5	25.5
Max Q Clear Time (g_c+I1), s				10.0	14.8	10.4	10.2
Green Ext Time (p_c), s				2.8	2.0	0.2	1.8
Intersection Summary							
HCM 6th Ctrl Delay			17.7				
HCM 6th LOS			B				
Notes							
Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.							

HCM 6th TWSC
4: Silverado Trail & Oak Knoll

02-06-2020

Intersection						
Int Delay, s/veh	1.8					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↖	↗	↖	↗	↗	↖
Traffic Vol, veh/h	59	26	41	238	815	257
Future Vol, veh/h	59	26	41	238	815	257
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	25	100	-	-	50
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	97	97	97	96	97	97
Heavy Vehicles, %	0	0	1	1	1	1
Mvmt Flow	61	27	42	248	840	265

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	1172	840	1105	0	-	0
Stage 1	840	-	-	-	-	-
Stage 2	332	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.11	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.209	-	-	-
Pot Cap-1 Maneuver	215	368	636	-	-	-
Stage 1	427	-	-	-	-	-
Stage 2	731	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	201	368	636	-	-	-
Mov Cap-2 Maneuver	201	-	-	-	-	-
Stage 1	399	-	-	-	-	-
Stage 2	731	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	25.9	1.6	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	636	-	201	368	-	-
HCM Lane V/C Ratio	0.066	-	0.303	0.073	-	-
HCM Control Delay (s)	11.1	-	30.5	15.6	-	-
HCM Lane LOS	B	-	D	C	-	-
HCM 95th %tile Q(veh)	0.2	-	1.2	0.2	-	-

HCM 6th TWSC
 8: Silverado Trail & Signorella Entrance

02-06-2020

Intersection							
Int Delay, s/veh	0.1						
Movement	WBL	WBR	NBT	NBR	SBU	SBL	SBT
Lane Configurations	↔		↔			↔	↑
Traffic Vol, veh/h	4	2	277	1	1	0	838
Future Vol, veh/h	4	2	277	1	1	0	838
Conflicting Peds, #/hr	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	-	None
Storage Length	0	-	-	-	-	0	-
Veh in Median Storage, #	1	-	0	-	-	-	0
Grade, %	0	-	0	-	-	-	0
Peak Hour Factor	94	94	94	94	94	94	94
Heavy Vehicles, %	0	0	1	1	0	1	1
Mvmt Flow	4	2	295	1	1	0	891

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1187	296	0	0	-	296
Stage 1	296	-	-	-	-	-
Stage 2	891	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	-	4.11
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	-	2.209
Pot Cap-1 Maneuver	210	748	-	-	-	1271
Stage 1	759	-	-	-	-	-
Stage 2	404	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	210	748	-	-	-	-
Mov Cap-2 Maneuver	323	-	-	-	-	-
Stage 1	759	-	-	-	-	-
Stage 2	404	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	14.2	0	
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	398	-
HCM Lane V/C Ratio	-	-	0.016	-
HCM Control Delay (s)	-	-	14.2	-
HCM Lane LOS	-	-	B	-
HCM 95th %tile Q(veh)	-	-	0	-

HCM 6th Signalized Intersection Summary

10: Trancas Rd & Silverado Trail

02-06-2020



Movement	EBL	EBT	WBT	WBR	SBL	SBR	
Lane Configurations	↗	↑↑	↑↑	↖	↗	↖	
Traffic Volume (veh/h)	153	392	365	154	432	377	
Future Volume (veh/h)	153	392	365	154	432	377	
Initial Q (Qb), veh	0	0	0	0	0	0	
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	
Work Zone On Approach		No	No		No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	
Adj Flow Rate, veh/h	156	400	372	0	441	385	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	
Percent Heavy Veh, %	1	1	1	1	1	1	
Cap, veh/h	204	1310	579		813	905	
Arrive On Green	0.11	0.37	0.16	0.00	0.45	0.45	
Sat Flow, veh/h	1795	3676	3676	1598	1795	1598	
Grp Volume(v), veh/h	156	400	372	0	441	385	
Grp Sat Flow(s),veh/h/ln	1795	1791	1791	1598	1795	1598	
Q Serve(g_s), s	4.2	4.0	4.8	0.0	8.8	6.8	
Cycle Q Clear(g_c), s	4.2	4.0	4.8	0.0	8.8	6.8	
Prop In Lane	1.00			1.00	1.00	1.00	
Lane Grp Cap(c), veh/h	204	1310	579		813	905	
V/C Ratio(X)	0.77	0.31	0.64		0.54	0.43	
Avail Cap(c_a), veh/h	488	3137	1839		813	905	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	
Upstream Filter(l)	1.00	1.00	1.00	0.00	1.00	1.00	
Uniform Delay (d), s/veh	21.4	11.2	19.5	0.0	9.8	6.1	
Incr Delay (d2), s/veh	5.9	0.1	1.2	0.0	2.6	1.5	
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	
%ile BackOfQ(50%),veh/ln	1.7	1.1	1.7	0.0	2.6	8.0	
Unsig. Movement Delay, s/veh							
LnGrp Delay(d),s/veh	27.3	11.4	20.7	0.0	12.4	7.6	
LnGrp LOS	C	B	C		B	A	
Approach Vol, veh/h		556	372	A	826		
Approach Delay, s/veh		15.8	20.7		10.2		
Approach LOS		B	C		B		
Timer - Assigned Phs				4	6	7	8
Phs Duration (G+Y+Rc), s				22.7	27.0	10.1	12.5
Change Period (Y+Rc), s				4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s				43.5	22.5	13.5	25.5
Max Q Clear Time (g_c+I1), s				6.0	10.8	6.2	6.8
Green Ext Time (p_c), s				1.4	2.0	0.2	1.2

Intersection Summary

HCM 6th Ctrl Delay	14.2
HCM 6th LOS	B

Notes

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

Intersection						
Int Delay, s/veh	10.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↖	↗	↖	↗	↗	↖
Traffic Vol, veh/h	98	81	69	405	970	421
Future Vol, veh/h	98	81	69	405	970	421
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	25	100	-	-	50
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	1	1
Mvmt Flow	104	86	73	431	1032	448

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	1609	1032	1480	0	-	0
Stage 1	1032	-	-	-	-	-
Stage 2	577	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	115	283	455	-	-	-
Stage 1	344	-	-	-	-	-
Stage 2	562	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 97	283	455	-	-	-
Mov Cap-2 Maneuver	~ 97	-	-	-	-	-
Stage 1	289	-	-	-	-	-
Stage 2	562	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	116.7	2.1	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	455	-	97	283	-	-
HCM Lane V/C Ratio	0.161	-	1.075	0.304	-	-
HCM Control Delay (s)	14.4	-	194	23.2	-	-
HCM Lane LOS	B	-	F	C	-	-
HCM 95th %tile Q(veh)	0.6	-	6.7	1.2	-	-

Notes
 ~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

HCM 6th TWSC
 8: Silverado Trail & Signorella Entrance

02-06-2020

Intersection							
Int Delay, s/veh	0						
Movement	WBL	WBR	NBT	NBR	SBU	SBL	SBT
Lane Configurations	↔		↔			↔	↑
Traffic Vol, veh/h	2	1	469	1	4	1	1047
Future Vol, veh/h	2	1	469	1	4	1	1047
Conflicting Peds, #/hr	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	-	None
Storage Length	0	-	-	-	-	0	-
Veh in Median Storage, #	1	-	0	-	-	-	0
Grade, %	0	-	0	-	-	-	0
Peak Hour Factor	94	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2	2
Mvmt Flow	2	1	499	1	4	1	1114

Major/Minor	Minor1	Major1	Major2				
Conflicting Flow All	1616	500	0	0	-	500	0
Stage 1	500	-	-	-	-	-	-
Stage 2	1116	-	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	-	2.218	-
Pot Cap-1 Maneuver	114	571	-	-	-	1064	-
Stage 1	609	-	-	-	-	-	-
Stage 2	313	-	-	-	-	-	-
Platoon blocked, %			-	-			-
Mov Cap-1 Maneuver	114	571	-	-	-	-	-
Mov Cap-2 Maneuver	234	-	-	-	-	-	-
Stage 1	609	-	-	-	-	-	-
Stage 2	313	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	17.5	0	
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	291	-
HCM Lane V/C Ratio	-	-	0.011	-
HCM Control Delay (s)	-	-	17.5	-
HCM Lane LOS	-	-	C	-
HCM 95th %tile Q(veh)	-	-	0	-

HCM 6th Signalized Intersection Summary

10: Trancas Rd & Silverado Trail

02-06-2020



Movement	EBL	EBT	WBT	WBR	SBL	SBR	
Lane Configurations							
Traffic Volume (veh/h)	267	754	545	216	510	485	
Future Volume (veh/h)	267	754	545	216	510	485	
Initial Q (Qb), veh	0	0	0	0	0	0	
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	
Work Zone On Approach		No	No		No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1870	1870	
Adj Flow Rate, veh/h	272	769	556	0	520	495	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	
Percent Heavy Veh, %	1	1	1	1	2	2	
Cap, veh/h	325	1672	750		678	891	
Arrive On Green	0.18	0.47	0.21	0.00	0.38	0.38	
Sat Flow, veh/h	1795	3676	3676	1598	1781	1585	
Grp Volume(v), veh/h	272	769	556	0	520	495	
Grp Sat Flow(s),veh/h/ln	1795	1791	1791	1598	1781	1585	
Q Serve(g_s), s	8.6	8.6	8.6	0.0	15.1	11.8	
Cycle Q Clear(g_c), s	8.6	8.6	8.6	0.0	15.1	11.8	
Prop In Lane	1.00			1.00	1.00	1.00	
Lane Grp Cap(c), veh/h	325	1672	750		678	891	
V/C Ratio(X)	0.84	0.46	0.74		0.77	0.56	
Avail Cap(c_a), veh/h	410	2637	1546		678	891	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	
Upstream Filter(l)	1.00	1.00	1.00	0.00	1.00	1.00	
Uniform Delay (d), s/veh	23.3	10.7	21.9	0.0	16.0	8.2	
Incr Delay (d2), s/veh	11.5	0.2	1.5	0.0	8.1	2.5	
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	
%ile BackOfQ(50%),veh/ln	4.1	2.4	3.1	0.0	6.0	12.3	
Unsig. Movement Delay, s/veh							
LnGrp Delay(d),s/veh	34.8	10.9	23.3	0.0	24.1	10.7	
LnGrp LOS	C	B	C		C	B	
Approach Vol, veh/h		1041	556	A	1015		
Approach Delay, s/veh		17.1	23.3		17.6		
Approach LOS		B	C		B		
Timer - Assigned Phs				4	6	7	8
Phs Duration (G+Y+Rc), s				32.1	27.0	15.2	16.9
Change Period (Y+Rc), s				4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s				43.5	22.5	13.5	25.5
Max Q Clear Time (g_c+I1), s				10.6	17.1	10.6	10.6
Green Ext Time (p_c), s				3.0	1.7	0.2	1.8
Intersection Summary							
HCM 6th Ctrl Delay			18.6				
HCM 6th LOS			B				
Notes							
Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.							

HCM 6th TWSC
4: Silverado Trail & Oak Knoll

02-06-2020

Intersection						
Int Delay, s/veh	2.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	63	28	46	247	867	266
Future Vol, veh/h	63	28	46	247	867	266
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	25	100	-	-	50
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	97	97	97	96	97	97
Heavy Vehicles, %	0	0	1	1	1	1
Mvmt Flow	65	29	47	257	894	274

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	1245	894	1168	0	-	0
Stage 1	894	-	-	-	-	-
Stage 2	351	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.11	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.209	-	-	-
Pot Cap-1 Maneuver	194	343	602	-	-	-
Stage 1	403	-	-	-	-	-
Stage 2	717	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	179	343	602	-	-	-
Mov Cap-2 Maneuver	179	-	-	-	-	-
Stage 1	372	-	-	-	-	-
Stage 2	717	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	30.1	1.8	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	602	-	179	343	-	-
HCM Lane V/C Ratio	0.079	-	0.363	0.084	-	-
HCM Control Delay (s)	11.5	-	36.1	16.5	-	-
HCM Lane LOS	B	-	E	C	-	-
HCM 95th %tile Q(veh)	0.3	-	1.5	0.3	-	-

HCM 6th TWSC
 8: Silverado Trail & Signorella Entrance

02-06-2020

Intersection							
Int Delay, s/veh	0.1						
Movement	WBL	WBR	NBT	NBR	SBU	SBL	SBT
Lane Configurations	↔		↔			↔	↑
Traffic Vol, veh/h	4	2	292	1	1	0	892
Future Vol, veh/h	4	2	292	1	1	0	892
Conflicting Peds, #/hr	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	-	None
Storage Length	0	-	-	-	-	0	-
Veh in Median Storage, #	1	-	0	-	-	-	0
Grade, %	0	-	0	-	-	-	0
Peak Hour Factor	94	94	94	94	94	94	94
Heavy Vehicles, %	0	0	1	1	0	1	1
Mvmt Flow	4	2	311	1	1	0	949

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1261	312	0	0	-	312
Stage 1	312	-	-	-	-	-
Stage 2	949	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	-	4.11
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	-	2.209
Pot Cap-1 Maneuver	190	733	-	-	-	1254
Stage 1	747	-	-	-	-	-
Stage 2	379	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	190	733	-	-	-	-
Mov Cap-2 Maneuver	302	-	-	-	-	-
Stage 1	747	-	-	-	-	-
Stage 2	379	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	14.7	0	
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	376	-
HCM Lane V/C Ratio	-	-	0.017	-
HCM Control Delay (s)	-	-	14.7	-
HCM Lane LOS	-	-	B	-
HCM 95th %tile Q(veh)	-	-	0.1	-

HCM 6th Signalized Intersection Summary

10: Trancas Rd & Silverado Trail

02-12-2020



Movement	EBL	EBT	WBT	WBR	SBL	SBR	
Lane Configurations	↖	↑↑	↑↑	↑	↘	↘	
Traffic Volume (veh/h)	158	416	377	166	479	385	
Future Volume (veh/h)	158	416	377	166	479	385	
Initial Q (Qb), veh	0	0	0	0	0	0	
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	
Work Zone On Approach		No	No		No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	
Adj Flow Rate, veh/h	161	424	385	0	489	393	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	
Percent Heavy Veh, %	1	1	1	1	1	1	
Cap, veh/h	210	1332	592		806	903	
Arrive On Green	0.12	0.37	0.17	0.00	0.45	0.45	
Sat Flow, veh/h	1795	3676	3676	1598	1795	1598	
Grp Volume(v), veh/h	161	424	385	0	489	393	
Grp Sat Flow(s),veh/h/ln	1795	1791	1791	1598	1795	1598	
Q Serve(g_s), s	4.4	4.2	5.0	0.0	10.3	7.1	
Cycle Q Clear(g_c), s	4.4	4.2	5.0	0.0	10.3	7.1	
Prop In Lane	1.00			1.00	1.00	1.00	
Lane Grp Cap(c), veh/h	210	1332	592		806	903	
V/C Ratio(X)	0.77	0.32	0.65		0.61	0.44	
Avail Cap(c_a), veh/h	483	3107	1821		806	903	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	
Upstream Filter(l)	1.00	1.00	1.00	0.00	1.00	1.00	
Uniform Delay (d), s/veh	21.5	11.2	19.6	0.0	10.5	6.3	
Incr Delay (d2), s/veh	5.8	0.1	1.2	0.0	3.4	1.5	
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	
%ile BackOfQ(50%),veh/ln	1.8	1.2	1.7	0.0	3.2	0.4	
Unsig. Movement Delay, s/veh							
LnGrp Delay(d),s/veh	27.3	11.4	20.8	0.0	13.9	7.8	
LnGrp LOS	C	B	C		B	A	
Approach Vol, veh/h		585	385	A	882		
Approach Delay, s/veh		15.7	20.8		11.2		
Approach LOS		B	C		B		
Timer - Assigned Phs				4	6	7	8
Phs Duration (G+Y+Rc), s				23.1	27.0	10.4	12.8
Change Period (Y+Rc), s				4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s				43.5	22.5	13.5	25.5
Max Q Clear Time (g_c+I1), s				6.2	12.3	6.4	7.0
Green Ext Time (p_c), s				1.5	2.0	0.2	1.3
Intersection Summary							
HCM 6th Ctrl Delay			14.6				
HCM 6th LOS			B				
Notes							
Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.							

HCM 6th TWSC
4: Silverado Trail & Oak Knoll

02-06-2020

Intersection						
Int Delay, s/veh	4.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	83	71	54	382	853	391
Future Vol, veh/h	83	71	54	382	853	391
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	25	100	-	-	50
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	1	1
Mvmt Flow	88	76	57	406	907	416

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	1427	907	1323	0	-	0
Stage 1	907	-	-	-	-	-
Stage 2	520	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	149	334	522	-	-	-
Stage 1	394	-	-	-	-	-
Stage 2	597	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	133	334	522	-	-	-
Mov Cap-2 Maneuver	133	-	-	-	-	-
Stage 1	351	-	-	-	-	-
Stage 2	597	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	48.5	1.6	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	522	-	133	334	-	-
HCM Lane V/C Ratio	0.11	-	0.664	0.226	-	-
HCM Control Delay (s)	12.7	-	73.9	18.9	-	-
HCM Lane LOS	B	-	F	C	-	-
HCM 95th %tile Q(veh)	0.4	-	3.6	0.9	-	-

HCM 6th TWSC
8: Silverado Trail & Signorella Entrance

02-06-2020

Intersection							
Int Delay, s/veh	0.1						
Movement	WBL	WBR	NBT	NBR	SBU	SBL	SBT
Lane Configurations	↖		↗			↘	↙
Traffic Vol, veh/h	7	3	429	5	4	4	917
Future Vol, veh/h	7	3	429	5	4	4	917
Conflicting Peds, #/hr	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	-	None
Storage Length	0	-	-	-	-	0	-
Veh in Median Storage, #	1	-	0	-	-	-	0
Grade, %	0	-	0	-	-	-	0
Peak Hour Factor	94	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	1	1	1
Mvmt Flow	7	3	456	5	4	4	976

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1443	459	0	0	-	461
Stage 1	459	-	-	-	-	-
Stage 2	984	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	-	4.11
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	-	2.209
Pot Cap-1 Maneuver	146	602	-	-	-	1105
Stage 1	636	-	-	-	-	-
Stage 2	362	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	146	602	-	-	~	~
Mov Cap-2 Maneuver	270	-	-	-	-	-
Stage 1	636	-	-	-	-	-
Stage 2	362	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	16.5	0	
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	324	~
HCM Lane V/C Ratio	-	-	0.033	~
HCM Control Delay (s)	-	-	16.5	-
HCM Lane LOS	-	-	C	-
HCM 95th %tile Q(veh)	-	-	0.1	~

Notes
 ~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

HCM 6th Signalized Intersection Summary

10: Trancas Rd & Silverado Trail

02-06-2020



Movement	EBL	EBT	WBT	WBR	SBL	SBR	
Lane Configurations							
Traffic Volume (veh/h)	259	659	509	188	398	473	
Future Volume (veh/h)	259	659	509	188	398	473	
Initial Q (Qb), veh	0	0	0	0	0	0	
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	
Work Zone On Approach		No	No		No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1870	1870	
Adj Flow Rate, veh/h	264	672	519	0	406	483	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	
Percent Heavy Veh, %	1	1	1	1	2	2	
Cap, veh/h	319	1629	714		694	899	
Arrive On Green	0.18	0.45	0.20	0.00	0.39	0.39	
Sat Flow, veh/h	1795	3676	3676	1598	1781	1585	
Grp Volume(v), veh/h	264	672	519	0	406	483	
Grp Sat Flow(s),veh/h/ln	1795	1791	1791	1598	1781	1585	
Q Serve(g_s), s	8.2	7.3	7.8	0.0	10.4	11.0	
Cycle Q Clear(g_c), s	8.2	7.3	7.8	0.0	10.4	11.0	
Prop In Lane	1.00			1.00	1.00	1.00	
Lane Grp Cap(c), veh/h	319	1629	714		694	899	
V/C Ratio(X)	0.83	0.41	0.73		0.59	0.54	
Avail Cap(c_a), veh/h	420	2697	1581		694	899	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	1.00	
Uniform Delay (d), s/veh	22.9	10.6	21.7	0.0	13.9	7.8	
Incr Delay (d2), s/veh	10.1	0.2	1.4	0.0	3.6	2.3	
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	
%ile BackOfQ(50%),veh/ln	3.7	2.0	2.8	0.0	3.7	11.7	
Unsig. Movement Delay, s/veh							
LnGrp Delay(d),s/veh	33.0	10.7	23.1	0.0	17.5	10.1	
LnGrp LOS	C	B	C		B	B	
Approach Vol, veh/h		936	519	A	889		
Approach Delay, s/veh		17.0	23.1		13.5		
Approach LOS		B	C		B		
Timer - Assigned Phs				4	6	7	8
Phs Duration (G+Y+Rc), s				30.8	27.0	14.8	16.0
Change Period (Y+Rc), s				4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s				43.5	22.5	13.5	25.5
Max Q Clear Time (g_c+I1), s				9.3	13.0	10.2	9.8
Green Ext Time (p_c), s				2.6	2.0	0.2	1.7
Intersection Summary							
HCM 6th Ctrl Delay			17.0				
HCM 6th LOS			B				
Notes							
Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.							

HCM 6th TWSC
4: Silverado Trail & Oak Knoll

02-12-2020

Intersection						
Int Delay, s/veh	1.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↖	↗	↖	↗	↗	↖
Traffic Vol, veh/h	54	24	37	232	753	247
Future Vol, veh/h	54	24	37	232	753	247
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	25	100	-	-	50
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	97	97	97	96	97	97
Heavy Vehicles, %	0	0	1	1	1	1
Mvmt Flow	56	25	38	242	776	255

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	1094	776	1031	0	-	0
Stage 1	776	-	-	-	-	-
Stage 2	318	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.11	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.209	-	-	-
Pot Cap-1 Maneuver	239	401	678	-	-	-
Stage 1	457	-	-	-	-	-
Stage 2	742	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	226	401	678	-	-	-
Mov Cap-2 Maneuver	226	-	-	-	-	-
Stage 1	431	-	-	-	-	-
Stage 2	742	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	22.6	1.4	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	678	-	226	401	-	-
HCM Lane V/C Ratio	0.056	-	0.246	0.062	-	-
HCM Control Delay (s)	10.6	-	26.1	14.6	-	-
HCM Lane LOS	B	-	D	B	-	-
HCM 95th %tile Q(veh)	0.2	-	0.9	0.2	-	-

HCM 6th TWSC
8: Silverado Trail & Signorella Entrance

02-12-2020

Intersection							
Int Delay, s/veh	0.2						
Movement	WBL	WBR	NBT	NBR	SBU	SBL	SBT
Lane Configurations	↔		↔			↔	↑
Traffic Vol, veh/h	11	6	263	3	1	2	772
Future Vol, veh/h	11	6	263	3	1	2	772
Conflicting Peds, #/hr	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	-	None
Storage Length	0	-	-	-	-	0	-
Veh in Median Storage, #	1	-	0	-	-	-	0
Grade, %	0	-	0	-	-	-	0
Peak Hour Factor	94	94	94	94	94	94	94
Heavy Vehicles, %	0	0	1	1	0	1	1
Mvmt Flow	12	6	280	3	1	2	821

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1107	282	0	0	-	283
Stage 1	282	-	-	-	-	-
Stage 2	825	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	-	4.11
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	-	2.209
Pot Cap-1 Maneuver	235	762	-	-	-	1285
Stage 1	770	-	-	-	-	-
Stage 2	434	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	235	762	-	-	~-3	~-3
Mov Cap-2 Maneuver	347	-	-	-	-	-
Stage 1	770	-	-	-	-	-
Stage 2	434	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.7	0	
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	430	+
HCM Lane V/C Ratio	-	-	0.042	-
HCM Control Delay (s)	-	-	13.7	-
HCM Lane LOS	-	-	B	-
HCM 95th %tile Q(veh)	-	-	0.1	-

Notes
 ~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

HCM 6th Signalized Intersection Summary

10: Trancas Rd & Silverado Trail

02-12-2020



Movement	EBL	EBT	WBT	WBR	SBL	SBR	
Lane Configurations							
Traffic Volume (veh/h)	151	363	352	144	374	381	
Future Volume (veh/h)	151	363	352	144	374	381	
Initial Q (Qb), veh	0	0	0	0	0	0	
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	
Work Zone On Approach		No	No		No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	
Adj Flow Rate, veh/h	154	370	359	0	382	389	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	
Percent Heavy Veh, %	1	1	1	1	1	1	
Cap, veh/h	201	1294	566		819	908	
Arrive On Green	0.11	0.36	0.16	0.00	0.46	0.46	
Sat Flow, veh/h	1795	3676	3676	1598	1795	1598	
Grp Volume(v), veh/h	154	370	359	0	382	389	
Grp Sat Flow(s),veh/h/ln	1795	1791	1791	1598	1795	1598	
Q Serve(g_s), s	4.1	3.6	4.6	0.0	7.2	6.9	
Cycle Q Clear(g_c), s	4.1	3.6	4.6	0.0	7.2	6.9	
Prop In Lane	1.00			1.00	1.00	1.00	
Lane Grp Cap(c), veh/h	201	1294	566		819	908	
V/C Ratio(X)	0.77	0.29	0.63		0.47	0.43	
Avail Cap(c_a), veh/h	492	3160	1852		819	908	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	
Upstream Filter(l)	1.00	1.00	1.00	0.00	1.00	1.00	
Uniform Delay (d), s/veh	21.3	11.2	19.4	0.0	9.3	6.1	
Incr Delay (d2), s/veh	6.0	0.1	1.2	0.0	1.9	1.5	
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	
%ile BackOfQ(50%),veh/ln	1.7	1.0	1.6	0.0	2.1	0.4	
Unsig. Movement Delay, s/veh							
LnGrp Delay(d),s/veh	27.2	11.3	20.6	0.0	11.2	7.6	
LnGrp LOS	C	B	C		B	A	
Approach Vol, veh/h		524	359	A	771		
Approach Delay, s/veh		16.0	20.6		9.3		
Approach LOS		B	C		A		
Timer - Assigned Phs				4	6	7	8
Phs Duration (G+Y+Rc), s				22.3	27.0	10.0	12.3
Change Period (Y+Rc), s				4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s				43.5	22.5	13.5	25.5
Max Q Clear Time (g_c+I1), s				5.6	9.2	6.1	6.6
Green Ext Time (p_c), s				1.3	1.9	0.2	1.2

Intersection Summary

HCM 6th Ctrl Delay	13.9
HCM 6th LOS	B

Notes

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

HCM 6th TWSC
4: Silverado Trail & Oak Knoll

02-06-2020

Intersection						
Int Delay, s/veh	7.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↖	↗	↖	↗	↗	↖
Traffic Vol, veh/h	91	76	62	396	919	407
Future Vol, veh/h	91	76	62	396	919	407
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	25	100	-	-	50
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	1	1
Mvmt Flow	97	81	66	421	978	433

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	1531	978	1411	0	-	0
Stage 1	978	-	-	-	-	-
Stage 2	553	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	129	304	483	-	-	-
Stage 1	364	-	-	-	-	-
Stage 2	576	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	111	304	483	-	-	-
Mov Cap-2 Maneuver	111	-	-	-	-	-
Stage 1	314	-	-	-	-	-
Stage 2	576	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	77.8	1.8	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	483	-	111	304	-	-
HCM Lane V/C Ratio	0.137	-	0.872	0.266	-	-
HCM Control Delay (s)	13.6	-	125.1	21.1	-	-
HCM Lane LOS	B	-	F	C	-	-
HCM 95th %tile Q(veh)	0.5	-	5.2	1	-	-

HCM 6th TWSC
8: Silverado Trail & Signorella Entrance

02-06-2020

Intersection							
Int Delay, s/veh	0.1						
Movement	WBL	WBR	NBT	NBR	SBU	SBL	SBT
Lane Configurations	↔		↔			↔	↑
Traffic Vol, veh/h	7	3	451	5	4	4	1003
Future Vol, veh/h	7	3	451	5	4	4	1003
Conflicting Peds, #/hr	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	-	None
Storage Length	0	-	-	-	-	0	-
Veh in Median Storage, #	1	-	0	-	-	-	0
Grade, %	0	-	0	-	-	-	0
Peak Hour Factor	94	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2	2
Mvmt Flow	7	3	480	5	4	4	1067

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1558	483	0	0	-	485
Stage 1	483	-	-	-	-	-
Stage 2	1075	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	-	2.218
Pot Cap-1 Maneuver	124	584	-	-	-	1078
Stage 1	620	-	-	-	-	-
Stage 2	328	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	124	584	-	-	~	~
Mov Cap-2 Maneuver	245	-	-	-	-	-
Stage 1	620	-	-	-	-	-
Stage 2	328	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	17.6	0	
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	297	~
HCM Lane V/C Ratio	-	-	0.036	~
HCM Control Delay (s)	-	-	17.6	-
HCM Lane LOS	-	-	C	-
HCM 95th %tile Q(veh)	-	-	0.1	~

Notes
 ~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

HCM 6th Signalized Intersection Summary

10: Trancas Rd & Silverado Trail

02-06-2020



Movement	EBL	EBT	WBT	WBR	SBL	SBR	
Lane Configurations							
Traffic Volume (veh/h)	264	711	529	205	461	480	
Future Volume (veh/h)	264	711	529	205	461	480	
Initial Q (Qb), veh	0	0	0	0	0	0	
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	
Work Zone On Approach		No	No		No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1870	1870	
Adj Flow Rate, veh/h	269	726	540	0	470	490	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	
Percent Heavy Veh, %	1	1	1	1	2	2	
Cap, veh/h	323	1654	735		685	894	
Arrive On Green	0.18	0.46	0.21	0.00	0.38	0.38	
Sat Flow, veh/h	1795	3676	3676	1598	1781	1585	
Grp Volume(v), veh/h	269	726	540	0	470	490	
Grp Sat Flow(s),veh/h/ln	1795	1791	1791	1598	1781	1585	
Q Serve(g_s), s	8.5	8.0	8.3	0.0	12.9	11.4	
Cycle Q Clear(g_c), s	8.5	8.0	8.3	0.0	12.9	11.4	
Prop In Lane	1.00			1.00	1.00	1.00	
Lane Grp Cap(c), veh/h	323	1654	735		685	894	
V/C Ratio(X)	0.83	0.44	0.73		0.69	0.55	
Avail Cap(c_a), veh/h	414	2662	1560		685	894	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	
Upstream Filter(l)	1.00	1.00	1.00	0.00	1.00	1.00	
Uniform Delay (d), s/veh	23.2	10.6	21.8	0.0	15.1	8.0	
Incr Delay (d2), s/veh	10.9	0.2	1.4	0.0	5.5	2.4	
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	
%ile BackOfQ(50%),veh/ln	3.9	2.2	3.0	0.0	4.9	0.6	
Unsig. Movement Delay, s/veh							
LnGrp Delay(d),s/veh	34.1	10.8	23.2	0.0	20.6	10.5	
LnGrp LOS	C	B	C		C	B	
Approach Vol, veh/h		995	540	A	960		
Approach Delay, s/veh		17.1	23.2		15.4		
Approach LOS		B	C		B		
Timer - Assigned Phs				4	6	7	8
Phs Duration (G+Y+Rc), s				31.5	27.0	15.0	16.5
Change Period (Y+Rc), s				4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s				43.5	22.5	13.5	25.5
Max Q Clear Time (g_c+I1), s				10.0	14.9	10.5	10.3
Green Ext Time (p_c), s				2.8	2.0	0.2	1.8
Intersection Summary							
HCM 6th Ctrl Delay			17.8				
HCM 6th LOS			B				
Notes							
Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.							

HCM 6th TWSC
4: Silverado Trail & Oak Knoll

02-12-2020

Intersection						
Int Delay, s/veh	1.9					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↖	↗	↖	↗	↗	↖
Traffic Vol, veh/h	59	26	42	241	817	257
Future Vol, veh/h	59	26	42	241	817	257
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	25	100	-	-	50
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	97	97	97	96	97	97
Heavy Vehicles, %	0	0	1	1	1	1
Mvmt Flow	61	27	43	251	842	265

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	1179	842	1107	0	-	0
Stage 1	842	-	-	-	-	-
Stage 2	337	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.11	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.209	-	-	-
Pot Cap-1 Maneuver	212	367	634	-	-	-
Stage 1	426	-	-	-	-	-
Stage 2	728	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	198	367	634	-	-	-
Mov Cap-2 Maneuver	198	-	-	-	-	-
Stage 1	397	-	-	-	-	-
Stage 2	728	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	26.3	1.6	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	634	-	198	367	-	-
HCM Lane V/C Ratio	0.068	-	0.307	0.073	-	-
HCM Control Delay (s)	11.1	-	31	15.6	-	-
HCM Lane LOS	B	-	D	C	-	-
HCM 95th %tile Q(veh)	0.2	-	1.2	0.2	-	-

HCM 6th TWSC
 8: Silverado Trail & Signorella Entrance

02-12-2020

Intersection							
Int Delay, s/veh	0.2						
Movement	WBL	WBR	NBT	NBR	SBU	SBL	SBT
Lane Configurations	W		T			T	T
Traffic Vol, veh/h	11	6	277	3	1	2	838
Future Vol, veh/h	11	6	277	3	1	2	838
Conflicting Peds, #/hr	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	-	None
Storage Length	0	-	-	-	-	0	-
Veh in Median Storage, #	1	-	0	-	-	-	0
Grade, %	0	-	0	-	-	-	0
Peak Hour Factor	94	94	94	94	94	94	94
Heavy Vehicles, %	0	0	1	1	0	1	1
Mvmt Flow	12	6	295	3	1	2	891

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1192	297	0	0	-	298
Stage 1	297	-	-	-	-	-
Stage 2	895	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	-	4.11
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	-	2.209
Pot Cap-1 Maneuver	209	747	-	-	-	1269
Stage 1	758	-	-	-	-	-
Stage 2	402	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	209	747	-	-	~-3	~-3
Mov Cap-2 Maneuver	321	-	-	-	-	-
Stage 1	758	-	-	-	-	-
Stage 2	402	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	14.4	0	
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	402	+
HCM Lane V/C Ratio	-	-	0.045	-
HCM Control Delay (s)	-	-	14.4	-
HCM Lane LOS	-	-	B	-
HCM 95th %tile Q(veh)	-	-	0.1	-

Notes
 ~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

HCM 6th Signalized Intersection Summary

10: Trancas Rd & Silverado Trail

02-12-2020



Movement	EBL	EBT	WBT	WBR	SBL	SBR	
Lane Configurations							
Traffic Volume (veh/h)	154	392	365	155	436	380	
Future Volume (veh/h)	154	392	365	155	436	380	
Initial Q (Qb), veh	0	0	0	0	0	0	
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	
Work Zone On Approach		No	No		No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	
Adj Flow Rate, veh/h	157	400	372	0	445	388	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	
Percent Heavy Veh, %	1	1	1	1	1	1	
Cap, veh/h	205	1312	579		813	905	
Arrive On Green	0.11	0.37	0.16	0.00	0.45	0.45	
Sat Flow, veh/h	1795	3676	3676	1598	1795	1598	
Grp Volume(v), veh/h	157	400	372	0	445	388	
Grp Sat Flow(s),veh/h/ln	1795	1791	1791	1598	1795	1598	
Q Serve(g_s), s	4.2	4.0	4.8	0.0	9.0	6.9	
Cycle Q Clear(g_c), s	4.2	4.0	4.8	0.0	9.0	6.9	
Prop In Lane	1.00			1.00	1.00	1.00	
Lane Grp Cap(c), veh/h	205	1312	579		813	905	
V/C Ratio(X)	0.77	0.30	0.64		0.55	0.43	
Avail Cap(c_a), veh/h	488	3135	1838		813	905	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	1.00	
Uniform Delay (d), s/veh	21.4	11.2	19.5	0.0	9.9	6.2	
Incr Delay (d2), s/veh	5.9	0.1	1.2	0.0	2.6	1.5	
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	
%ile BackOfQ(50%),veh/ln	1.7	1.1	1.7	0.0	2.7	0.4	
Unsig. Movement Delay, s/veh							
LnGrp Delay(d),s/veh	27.3	11.4	20.7	0.0	12.5	7.6	
LnGrp LOS	C	B	C		B	A	
Approach Vol, veh/h		557	372	A	833		
Approach Delay, s/veh		15.9	20.7		10.3		
Approach LOS		B	C		B		
Timer - Assigned Phs				4	6	7	8
Phs Duration (G+Y+Rc), s				22.7	27.0	10.2	12.5
Change Period (Y+Rc), s				4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s				43.5	22.5	13.5	25.5
Max Q Clear Time (g_c+I1), s				6.0	11.0	6.2	6.8
Green Ext Time (p_c), s				1.4	2.0	0.2	1.2
Intersection Summary							
HCM 6th Ctrl Delay			14.2				
HCM 6th LOS			B				
Notes							
Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.							

HCM 6th TWSC
4: Silverado Trail & Oak Knoll

02-06-2020

Intersection						
Int Delay, s/veh	10.9					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↖	↗	↖	↗	↗	↖
Traffic Vol, veh/h	98	81	69	407	973	421
Future Vol, veh/h	98	81	69	407	973	421
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	25	100	-	-	50
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	1	1
Mvmt Flow	104	86	73	433	1035	448

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	1614	1035	1483	0	-	0
Stage 1	1035	-	-	-	-	-
Stage 2	579	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	114	282	454	-	-	-
Stage 1	342	-	-	-	-	-
Stage 2	560	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 96	282	454	-	-	-
Mov Cap-2 Maneuver	~ 96	-	-	-	-	-
Stage 1	287	-	-	-	-	-
Stage 2	560	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	119.3	2.1	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	454	-	96	282	-	-
HCM Lane V/C Ratio	0.162	-	1.086	0.306	-	-
HCM Control Delay (s)	14.5	-	198.6	23.3	-	-
HCM Lane LOS	B	-	F	C	-	-
HCM 95th %tile Q(veh)	0.6	-	6.8	1.3	-	-

Notes
 ~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

HCM 6th TWSC
8: Silverado Trail & Signorella Entrance

02-06-2020

Intersection							
Int Delay, s/veh	0.1						
Movement	WBL	WBR	NBT	NBR	SBU	SBL	SBT
Lane Configurations	↔		↔			↔	↑
Traffic Vol, veh/h	7	3	469	5	4	4	1047
Future Vol, veh/h	7	3	469	5	4	4	1047
Conflicting Peds, #/hr	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	-	None
Storage Length	0	-	-	-	-	0	-
Veh in Median Storage, #	1	-	0	-	-	-	0
Grade, %	0	-	0	-	-	-	0
Peak Hour Factor	94	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2	2
Mvmt Flow	7	3	499	5	4	4	1114

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1624	502	0	0	-	504
Stage 1	502	-	-	-	-	-
Stage 2	1122	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	-	2.218
Pot Cap-1 Maneuver	113	569	-	-	-	1061
Stage 1	608	-	-	-	-	-
Stage 2	311	-	-	-	-	-
Platoon blocked, %			-	-		
Mov Cap-1 Maneuver	113	569	-	-	~	~
Mov Cap-2 Maneuver	232	-	-	-	-	-
Stage 1	608	-	-	-	-	-
Stage 2	311	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	18.3	0	
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	282	~
HCM Lane V/C Ratio	-	-	0.038	~
HCM Control Delay (s)	-	-	18.3	-
HCM Lane LOS	-	-	C	-
HCM 95th %tile Q(veh)	-	-	0.1	~

Notes
~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

HCM 6th Signalized Intersection Summary

10: Trancas Rd & Silverado Trail

02-06-2020



Movement	EBL	EBT	WBT	WBR	SBL	SBR	
Lane Configurations							
Traffic Volume (veh/h)	269	754	545	218	513	487	
Future Volume (veh/h)	269	754	545	218	513	487	
Initial Q (Qb), veh	0	0	0	0	0	0	
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	
Work Zone On Approach		No	No		No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1870	1870	
Adj Flow Rate, veh/h	274	769	556	0	523	497	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	
Percent Heavy Veh, %	1	1	1	1	2	2	
Cap, veh/h	327	1675	750		677	892	
Arrive On Green	0.18	0.47	0.21	0.00	0.38	0.38	
Sat Flow, veh/h	1795	3676	3676	1598	1781	1585	
Grp Volume(v), veh/h	274	769	556	0	523	497	
Grp Sat Flow(s),veh/h/ln	1795	1791	1791	1598	1781	1585	
Q Serve(g_s), s	8.7	8.6	8.6	0.0	15.2	11.8	
Cycle Q Clear(g_c), s	8.7	8.6	8.6	0.0	15.2	11.8	
Prop In Lane	1.00			1.00	1.00	1.00	
Lane Grp Cap(c), veh/h	327	1675	750		677	892	
V/C Ratio(X)	0.84	0.46	0.74		0.77	0.56	
Avail Cap(c_a), veh/h	410	2633	1543		677	892	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	
Upstream Filter(l)	1.00	1.00	1.00	0.00	1.00	1.00	
Uniform Delay (d), s/veh	23.4	10.7	21.9	0.0	16.1	8.3	
Incr Delay (d2), s/veh	11.7	0.2	1.5	0.0	8.3	2.5	
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	
%ile BackOfQ(50%),veh/ln	4.1	2.4	3.1	0.0	6.1	12.4	
Unsig. Movement Delay, s/veh							
LnGrp Delay(d),s/veh	35.1	10.9	23.4	0.0	24.4	10.8	
LnGrp LOS	D	B	C		C	B	
Approach Vol, veh/h		1043	556	A	1020		
Approach Delay, s/veh		17.2	23.4		17.8		
Approach LOS		B	C		B		
Timer - Assigned Phs				4	6	7	8
Phs Duration (G+Y+Rc), s				32.2	27.0	15.3	16.9
Change Period (Y+Rc), s				4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s				43.5	22.5	13.5	25.5
Max Q Clear Time (g_c+I1), s				10.6	17.2	10.7	10.6
Green Ext Time (p_c), s				3.0	1.7	0.2	1.8
Intersection Summary							
HCM 6th Ctrl Delay			18.7				
HCM 6th LOS			B				
Notes							
Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.							

HCM 6th TWSC
4: Silverado Trail & Oak Knoll

02-12-2020

Intersection						
Int Delay, s/veh	2.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↖	↗	↖	↗	↗	↖
Traffic Vol, veh/h	63	28	47	250	869	266
Future Vol, veh/h	63	28	47	250	869	266
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	25	100	-	-	50
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	97	97	97	96	97	97
Heavy Vehicles, %	0	0	1	1	1	1
Mvmt Flow	65	29	48	260	896	274

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	1252	896	1170	0	-	0
Stage 1	896	-	-	-	-	-
Stage 2	356	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.11	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.209	-	-	-
Pot Cap-1 Maneuver	192	342	601	-	-	-
Stage 1	402	-	-	-	-	-
Stage 2	713	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	177	342	601	-	-	-
Mov Cap-2 Maneuver	177	-	-	-	-	-
Stage 1	370	-	-	-	-	-
Stage 2	713	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	30.5	1.8	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	601	-	177	342	-	-
HCM Lane V/C Ratio	0.081	-	0.367	0.084	-	-
HCM Control Delay (s)	11.5	-	36.7	16.5	-	-
HCM Lane LOS	B	-	E	C	-	-
HCM 95th %tile Q(veh)	0.3	-	1.6	0.3	-	-

HCM 6th TWSC
 8: Silverado Trail & Signorella Entrance

02-12-2020

Intersection							
Int Delay, s/veh	0.2						
Movement	WBL	WBR	NBT	NBR	SBU	SBL	SBT
Lane Configurations	W		T			T	T
Traffic Vol, veh/h	11	6	292	3	1	2	892
Future Vol, veh/h	11	6	292	3	1	2	892
Conflicting Peds, #/hr	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	-	None
Storage Length	0	-	-	-	-	0	-
Veh in Median Storage, #	1	-	0	-	-	-	0
Grade, %	0	-	0	-	-	-	0
Peak Hour Factor	94	94	94	94	94	94	94
Heavy Vehicles, %	0	0	1	1	0	1	1
Mvmt Flow	12	6	311	3	1	2	949

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1266	313	0	0	-	314
Stage 1	313	-	-	-	-	-
Stage 2	953	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	-	4.11
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	-	2.209
Pot Cap-1 Maneuver	188	732	-	-	-	1252
Stage 1	746	-	-	-	-	-
Stage 2	378	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	188	732	-	-	~-3	~-3
Mov Cap-2 Maneuver	301	-	-	-	-	-
Stage 1	746	-	-	-	-	-
Stage 2	378	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	14.9	0	
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	380	+
HCM Lane V/C Ratio	-	-	0.048	-
HCM Control Delay (s)	-	-	14.9	-
HCM Lane LOS	-	-	B	-
HCM 95th %tile Q(veh)	-	-	0.1	-

Notes
 ~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

HCM 6th Signalized Intersection Summary

10: Trancas Rd & Silverado Trail

02-12-2020



Movement	EBL	EBT	WBT	WBR	SBL	SBR	
Lane Configurations							
Traffic Volume (veh/h)	159	416	377	167	484	388	
Future Volume (veh/h)	159	416	377	167	484	388	
Initial Q (Qb), veh	0	0	0	0	0	0	
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	
Work Zone On Approach		No	No		No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	
Adj Flow Rate, veh/h	162	424	385	0	494	396	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	
Percent Heavy Veh, %	1	1	1	1	1	1	
Cap, veh/h	211	1334	592		805	904	
Arrive On Green	0.12	0.37	0.17	0.00	0.45	0.45	
Sat Flow, veh/h	1795	3676	3676	1598	1795	1598	
Grp Volume(v), veh/h	162	424	385	0	494	396	
Grp Sat Flow(s),veh/h/ln	1795	1791	1791	1598	1795	1598	
Q Serve(g_s), s	4.4	4.2	5.0	0.0	10.5	7.2	
Cycle Q Clear(g_c), s	4.4	4.2	5.0	0.0	10.5	7.2	
Prop In Lane	1.00			1.00	1.00	1.00	
Lane Grp Cap(c), veh/h	211	1334	592		805	904	
V/C Ratio(X)	0.77	0.32	0.65		0.61	0.44	
Avail Cap(c_a), veh/h	483	3104	1820		805	904	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	
Upstream Filter(l)	1.00	1.00	1.00	0.00	1.00	1.00	
Uniform Delay (d), s/veh	21.5	11.2	19.6	0.0	10.5	6.3	
Incr Delay (d2), s/veh	5.8	0.1	1.2	0.0	3.5	1.5	
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	
%ile BackOfQ(50%),veh/ln	1.8	1.2	1.7	0.0	3.3	8.3	
Unsig. Movement Delay, s/veh							
LnGrp Delay(d),s/veh	27.3	11.3	20.8	0.0	14.0	7.8	
LnGrp LOS	C	B	C		B	A	
Approach Vol, veh/h		586	385	A	890		
Approach Delay, s/veh		15.8	20.8		11.3		
Approach LOS		B	C		B		
Timer - Assigned Phs				4	6	7	8
Phs Duration (G+Y+Rc), s				23.2	27.0	10.4	12.8
Change Period (Y+Rc), s				4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s				43.5	22.5	13.5	25.5
Max Q Clear Time (g_c+I1), s				6.2	12.5	6.4	7.0
Green Ext Time (p_c), s				1.5	2.0	0.2	1.3

Intersection Summary

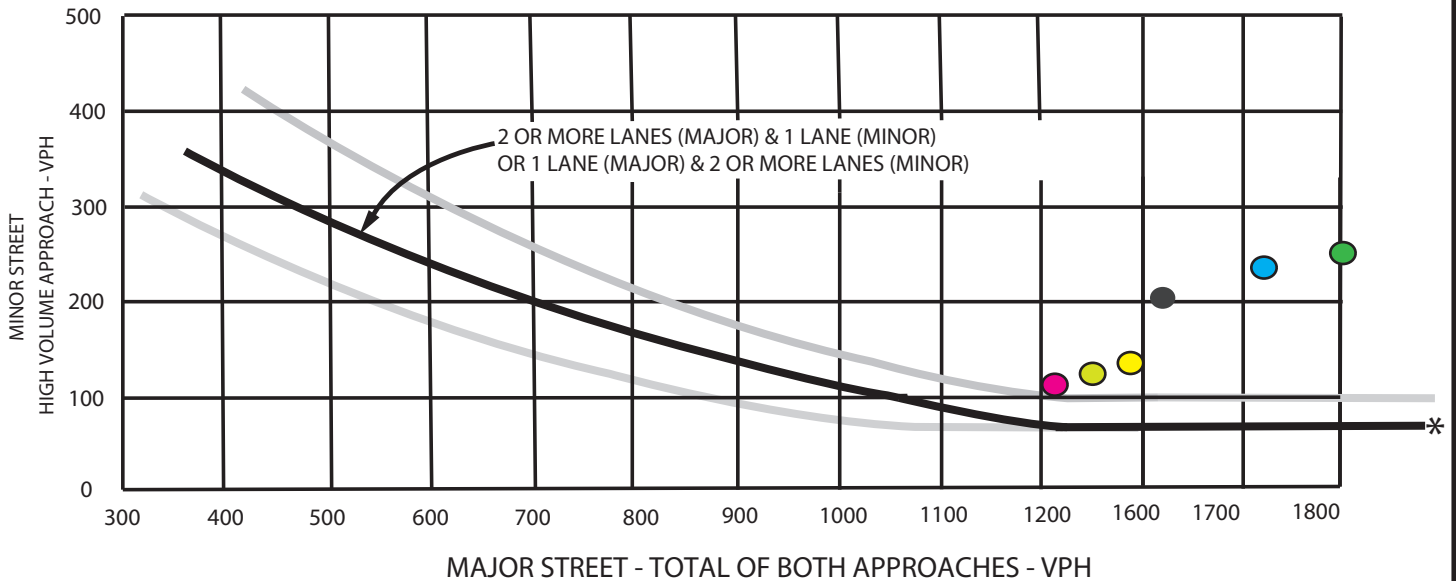
HCM 6th Ctrl Delay	14.7
HCM 6th LOS	B

Notes

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

Appendix C

**PEAK HOUR VOLUME WARRANT #3
(Rural Area)
Silverado Trail/Oak Knoll Ave**



- = Existing (2019) Friday without Project
- = Existing (2019) Saturday without Project
- = 2025 Friday without Project
- = 2025 Saturday without Project
- = 2030 Friday without Project
- = 2030 Saturday without Project

* NOTE

100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 75 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE

Source: Year 2014 Manual on Uniform Traffic Control Devices, Federal Highway Administration

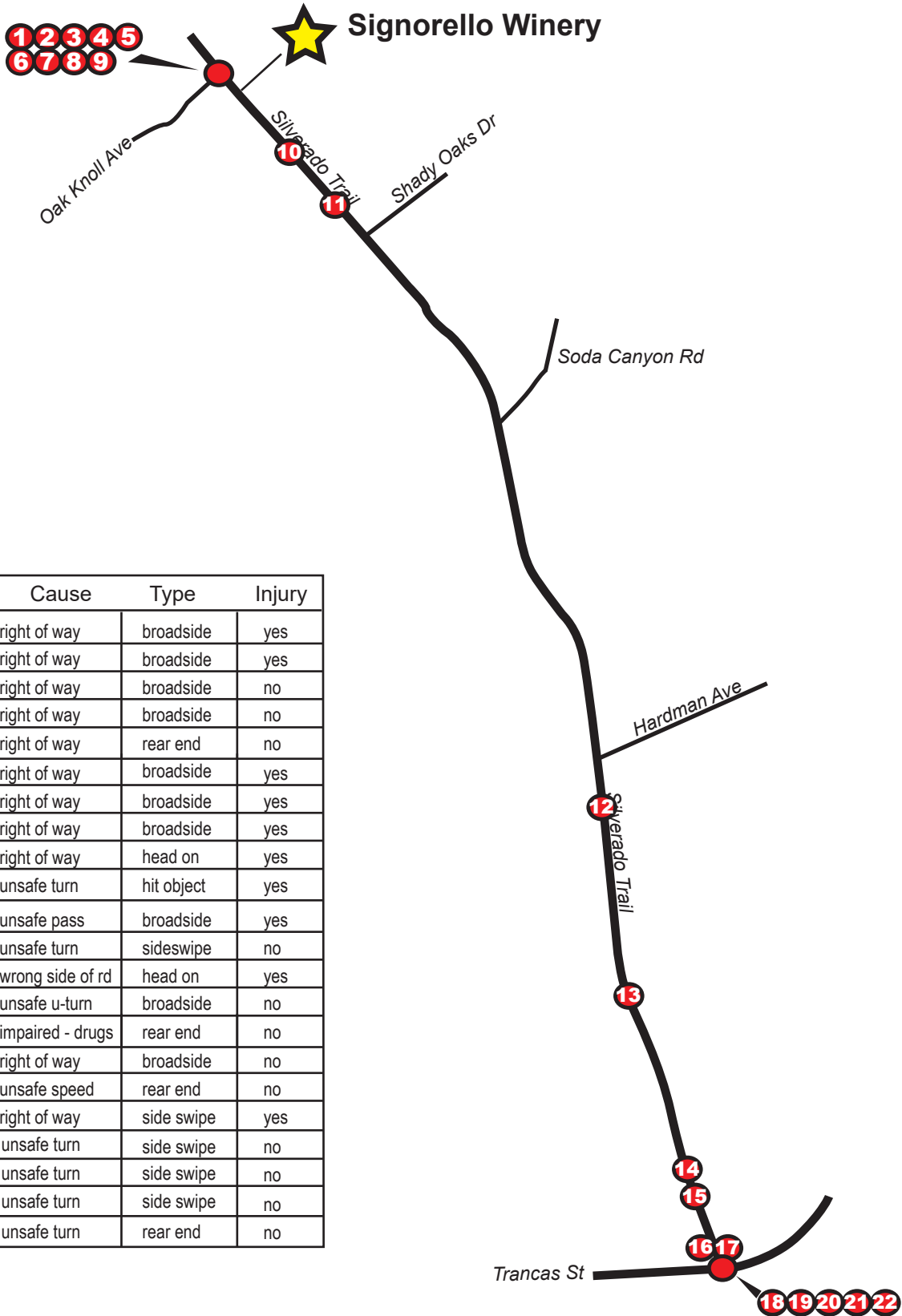
Appendix Figure C

**PEAK HOUR VOLUME WARRANT #3
(Rural Area)**

Silverado Trail/Oak Knoll Ave



Appendix D



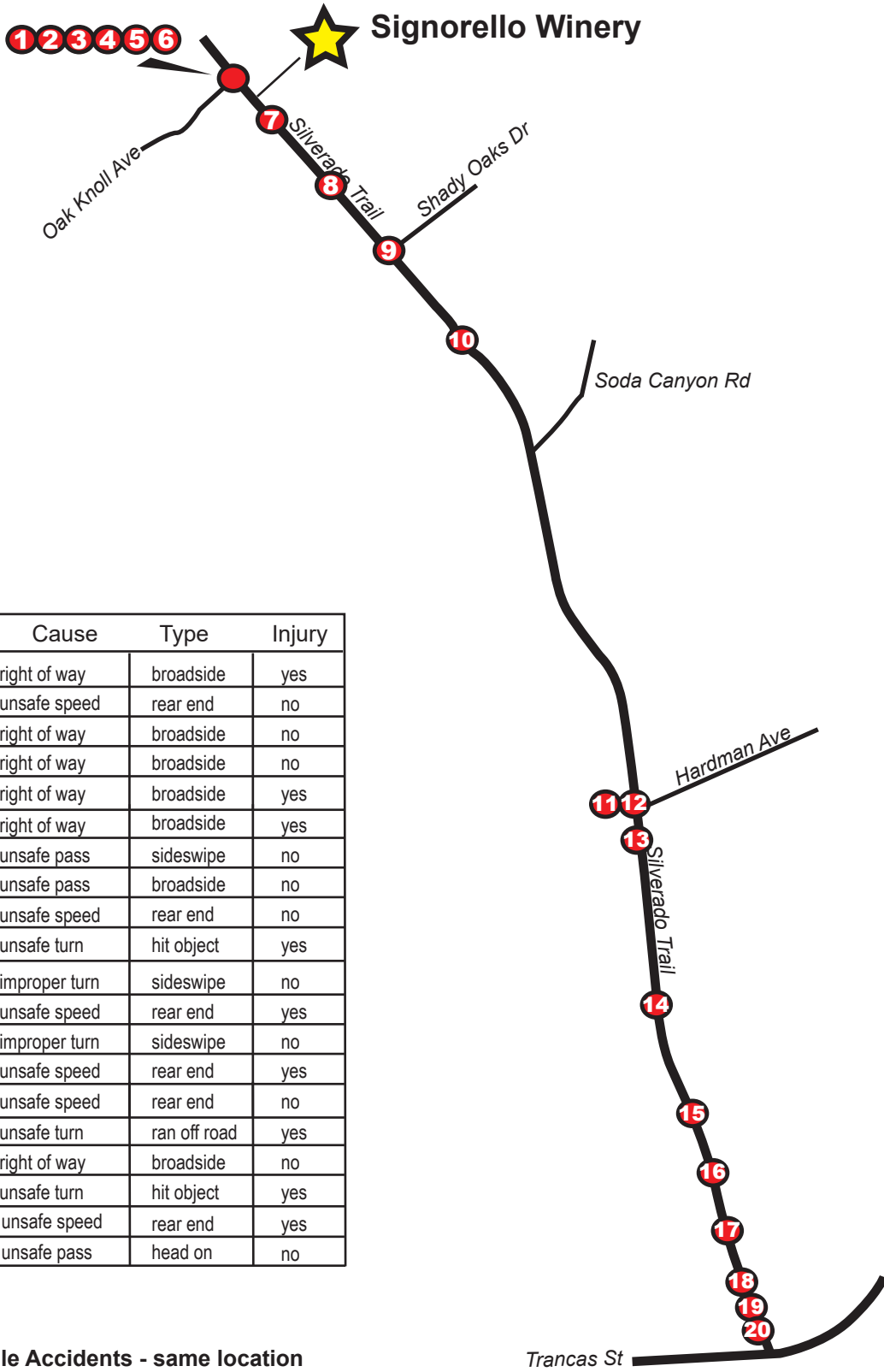
	# of veh	Cause	Type	Injury
1	2	right of way	broadside	yes
2	2	right of way	broadside	yes
3	2	right of way	broadside	no
4	2	right of way	broadside	no
5	2	right of way	rear end	no
6	2	right of way	broadside	yes
7	2	right of way	broadside	yes
8	2	right of way	broadside	yes
9	2	right of way	head on	yes
10	1	unsafe turn	hit object	yes
11	2	unsafe pass	broadside	yes
12	2	unsafe turn	sideswipe	no
13	2	wrong side of rd	head on	yes
14	2	unsafe u-turn	broadside	no
15	2	impaired - drugs	rear end	no
16	2	right of way	broadside	no
17	2	unsafe speed	rear end	no
18	2	right of way	side swipe	yes
19	2	unsafe turn	side swipe	no
20	2	unsafe turn	side swipe	no
21	2	unsafe turn	side swipe	no
22	2	unsafe turn	rear end	no

●● Multiple Accidents - same location

Signorello Winery Use Permit Modification 2020 Traffic Study

Figure D-1

Accidents on Silverado Trail between Oak Knoll Ave and Trancas St - 2014



	# of veh	Cause	Type	Injury
①	2	right of way	broadside	yes
②	2	unsafe speed	rear end	no
③	2	right of way	broadside	no
④	2	right of way	broadside	no
⑤	2	right of way	broadside	yes
⑥	2	right of way	broadside	yes
⑦	2	unsafe pass	sideswipe	no
⑧	2	unsafe pass	broadside	no
⑨	2	unsafe speed	rear end	no
⑩	1	unsafe turn	hit object	yes
⑪	2	improper turn	sideswipe	no
⑫	2	unsafe speed	rear end	yes
⑬	2	improper turn	sideswipe	no
⑭	2	unsafe speed	rear end	yes
⑮	2	unsafe speed	rear end	no
⑯	1	unsafe turn	ran off road	yes
⑰	2	right of way	broadside	no
⑱	1	unsafe turn	hit object	yes
⑲	2	unsafe speed	rear end	yes
⑳	2	unsafe pass	head on	no

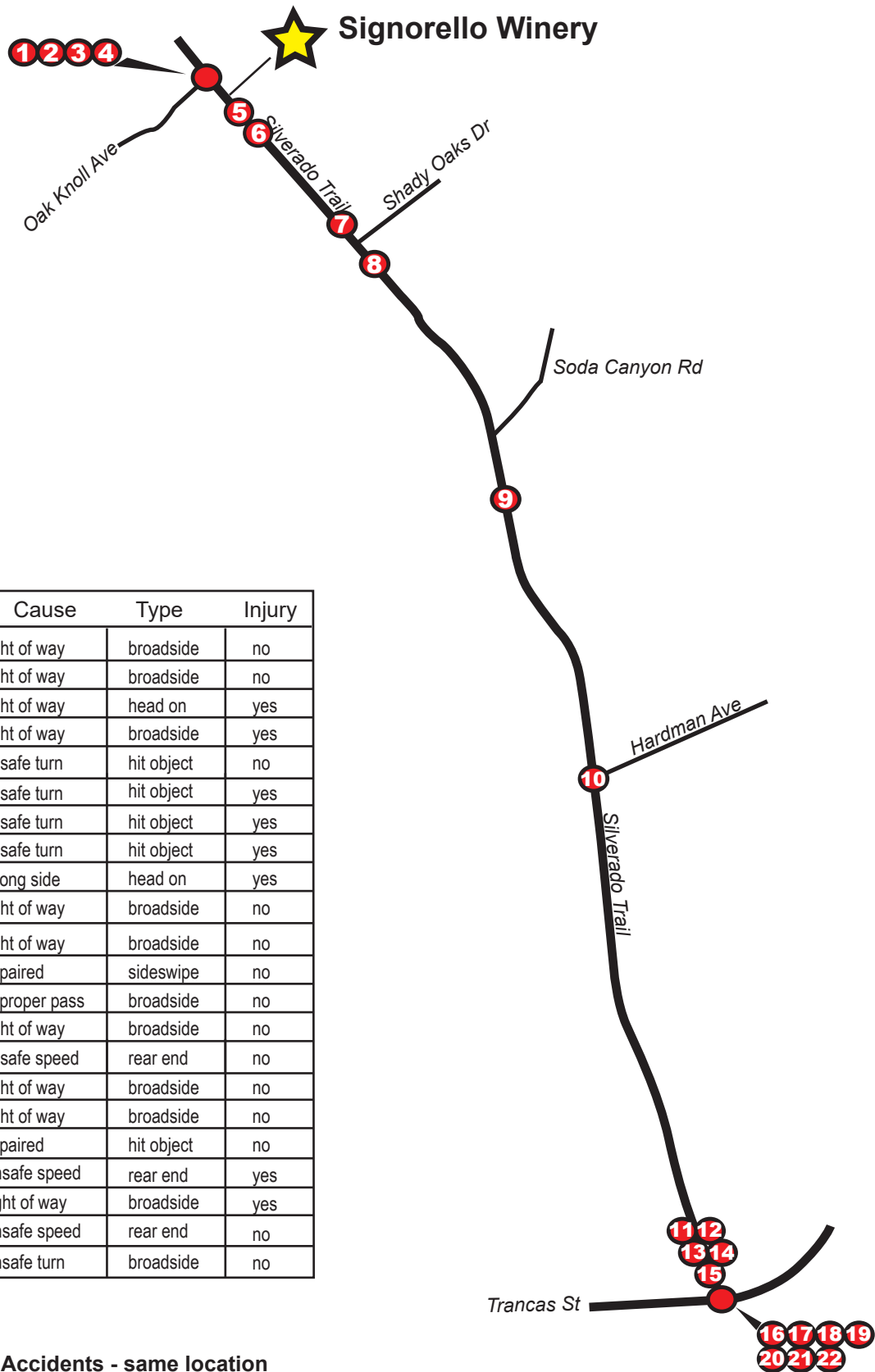
●● Multiple Accidents - same location

Signorello Winery Use Permit Modification 2020 Traffic Study

Figure D-2

Accidents on Silverado Trail between Oak Knoll Ave and Trancas St - 2015





	# of veh	Cause	Type	Injury
1	2	right of way	broadside	no
2	2	right of way	broadside	no
3	2	right of way	head on	yes
4	2	right of way	broadside	yes
5	1	unsafe turn	hit object	no
6	1	unsafe turn	hit object	yes
7	1	unsafe turn	hit object	yes
8	1	unsafe turn	hit object	yes
9	2	wrong side	head on	yes
10	2	right of way	broadside	no
11	2	right of way	broadside	no
12	2	impaired	sideswipe	no
13	2	improper pass	broadside	no
14	2	right of way	broadside	no
15	2	unsafe speed	rear end	no
16	2	right of way	broadside	no
17	2	right of way	broadside	no
18	1	impaired	hit object	no
19	2	unsafe speed	rear end	yes
20	2	right of way	broadside	yes
21	2	unsafe speed	rear end	no
22	2	unsafe turn	broadside	no

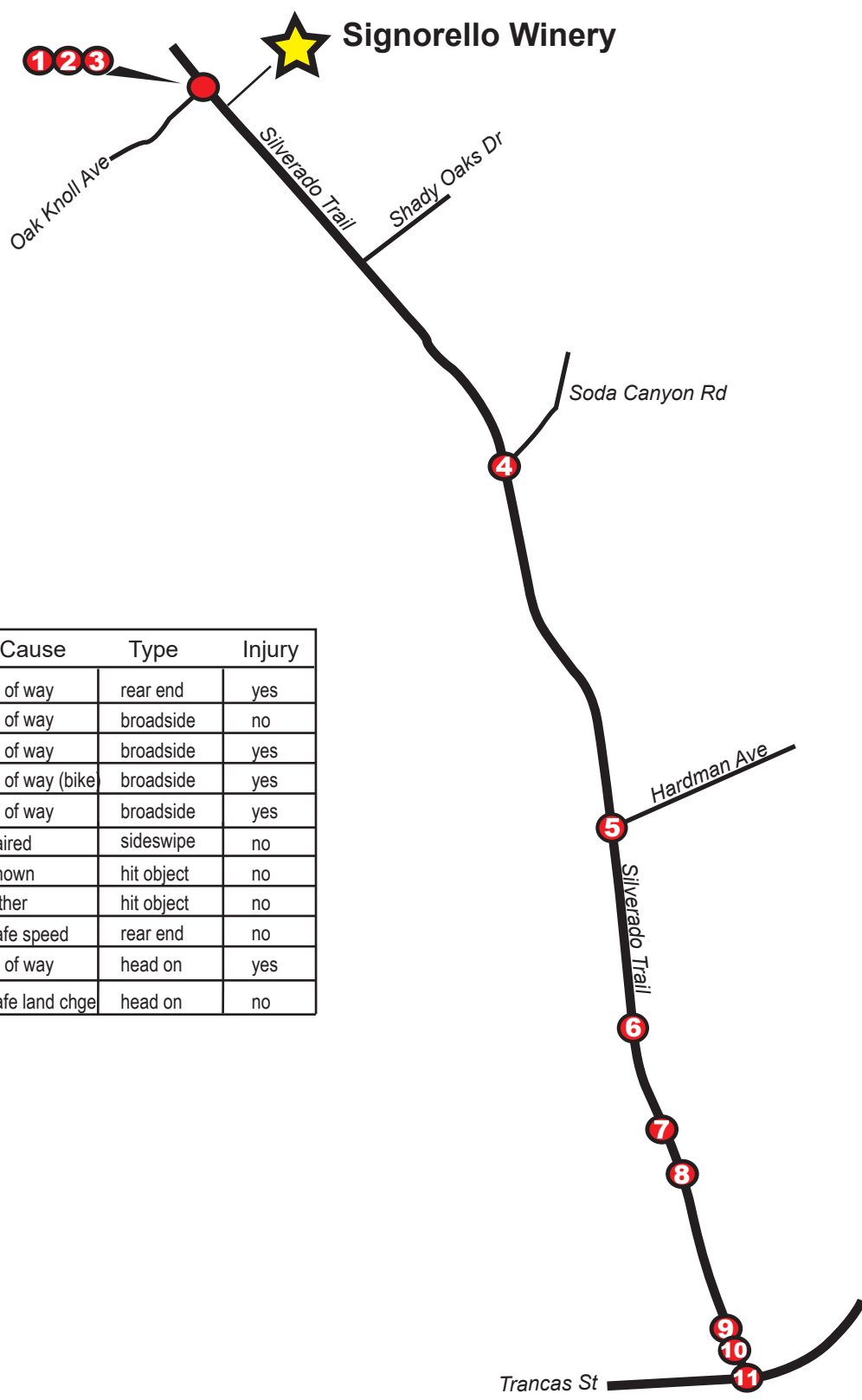
●● Multiple Accidents - same location

Signorello Winery Use Permit Modification 2020 Traffic Study

Figure D-3

Accidents on Silverado Trail between Oak Knoll Ave and Trancas St - 2016





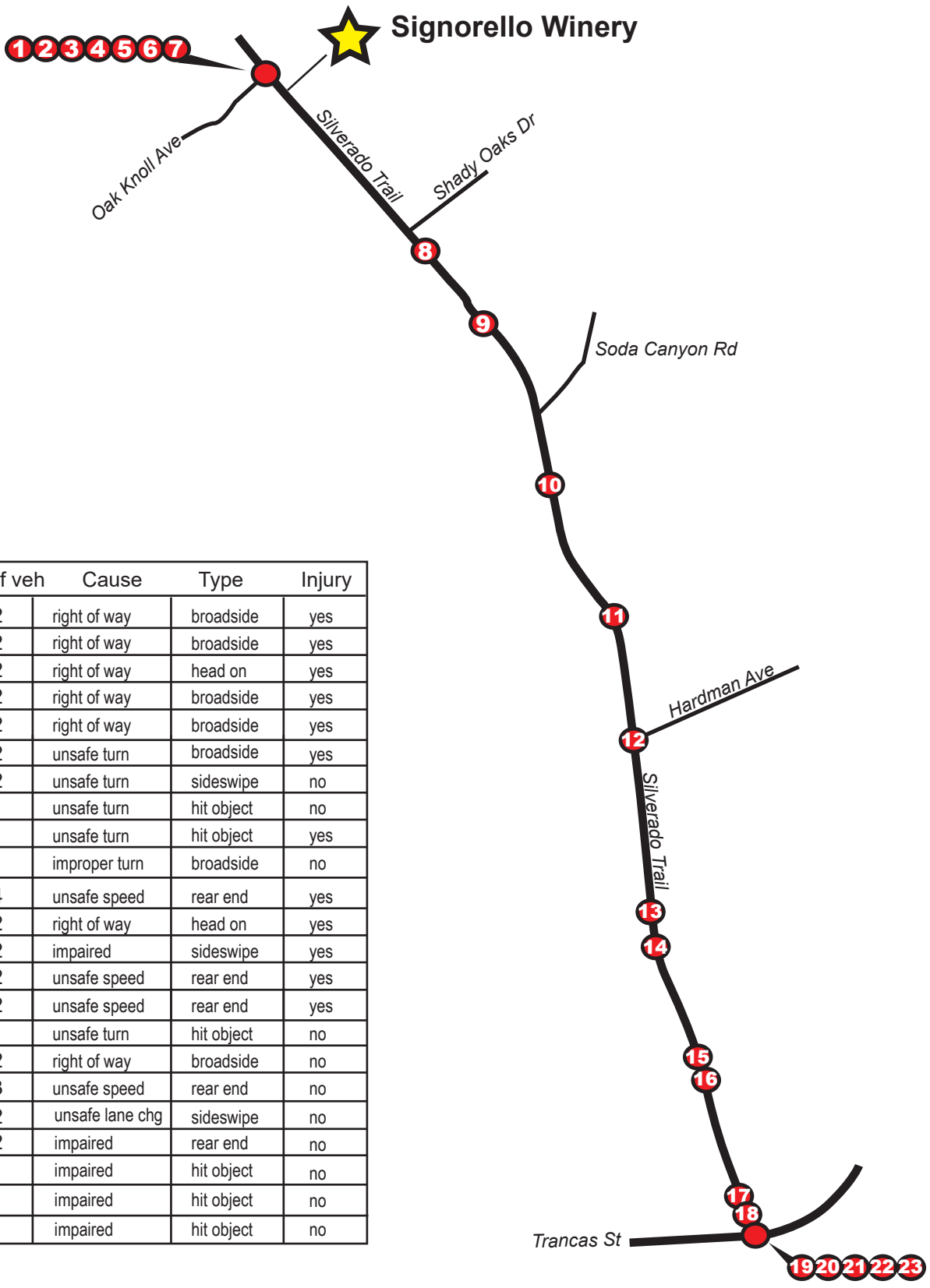
	# of veh	Cause	Type	Injury
①	2	right of way	rear end	yes
②	2	right of way	broadside	no
③	2	right of way	broadside	yes
④	2	right of way (bike)	broadside	yes
⑤	2	right of way	broadside	yes
⑥	2	impaired	sideswipe	no
⑦	1	unknown	hit object	no
⑧	1	weather	hit object	no
⑨	3	unsafe speed	rear end	no
⑩	2	right of way	head on	yes
⑪	2	unsafe land chge	head on	no

●● Multiple Accidents - same location

Signorello Winery Use Permit Modification 2020 Traffic Study

Figure D-4

Accidents on Silverado Trail between Oak Knoll Ave and Trancas St - 2017



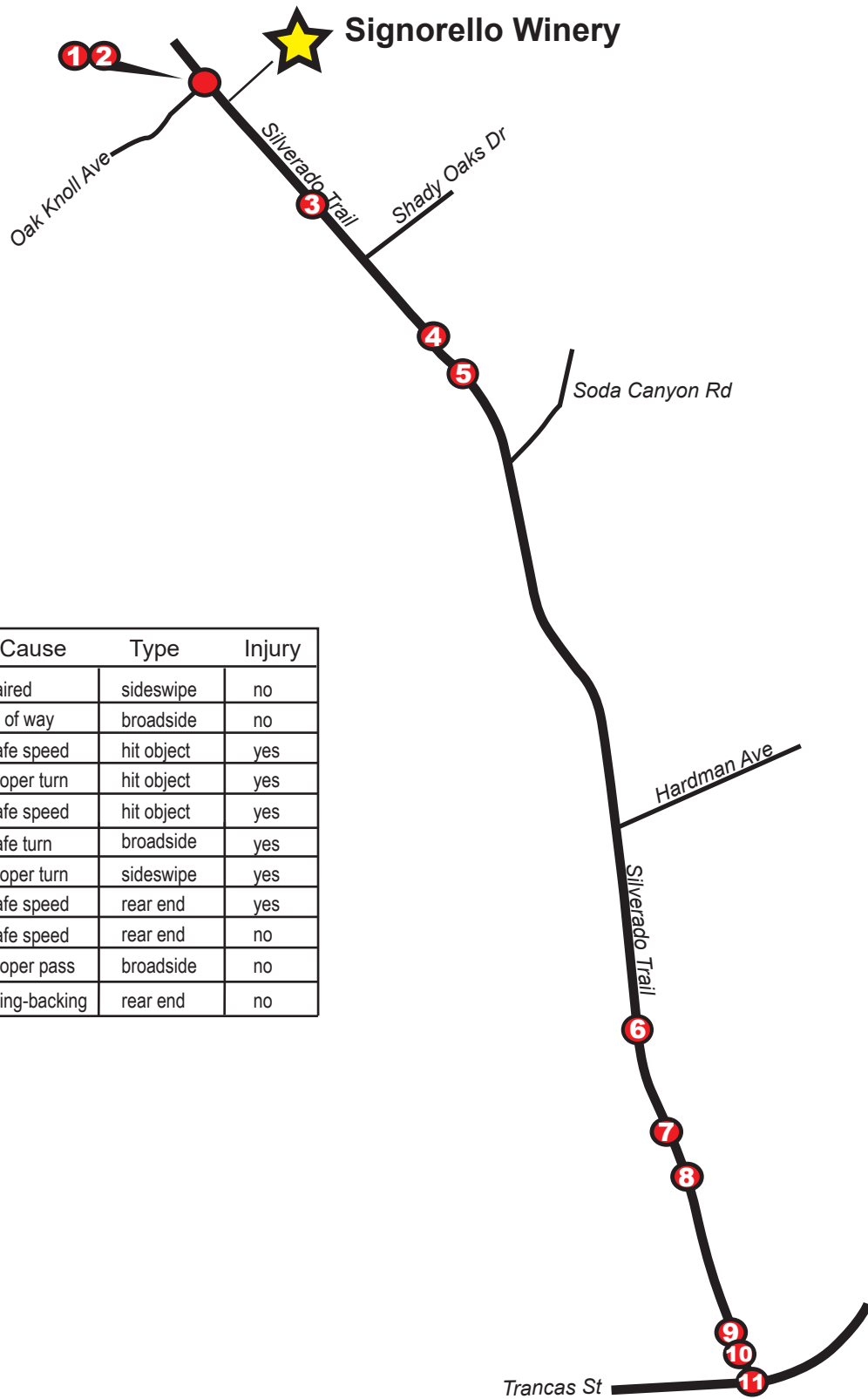
	# of veh	Cause	Type	Injury
1	2	right of way	broadside	yes
2	2	right of way	broadside	yes
3	2	right of way	head on	yes
4	2	right of way	broadside	yes
5	2	right of way	broadside	yes
6	2	unsafe turn	broadside	yes
7	2	unsafe turn	sideswipe	no
8	1	unsafe turn	hit object	no
9	1	unsafe turn	hit object	yes
10	1	improper turn	broadside	no
11	4	unsafe speed	rear end	yes
12	2	right of way	head on	yes
13	2	impaired	sideswipe	yes
14	2	unsafe speed	rear end	yes
15	2	unsafe speed	rear end	yes
16	1	unsafe turn	hit object	no
17	2	right of way	broadside	no
18	3	unsafe speed	rear end	no
19	2	unsafe lane chg	sideswipe	no
20	2	impaired	rear end	no
21	1	impaired	hit object	no
22	1	impaired	hit object	no
23	1	impaired	hit object	no

●● Multiple Accidents - same location

Signorello Winery Use Permit Modification 2020 Traffic Study

Figure D-5

Accidents on Silverado Trail between Oak Knoll Ave and Trancas St - 2018



	# of veh	Cause	Type	Injury
①	2	impaired	sideswipe	no
②	2	right of way	broadside	no
③	1	unsafe speed	hit object	yes
④	1	improper turn	hit object	yes
⑤	1	unsafe speed	hit object	yes
⑥	2	unsafe turn	broadside	yes
⑦	2	improper turn	sideswipe	yes
⑧	3	unsafe speed	rear end	yes
⑨	3	unsafe speed	rear end	no
⑩	2	improper pass	broadside	no
⑪	2	starting-backing	rear end	no

●● Multiple Accidents - same location

Signorello Winery Use Permit Modification 2020 Traffic Study

*to October 30

Figure D-6

Accidents on Silverado Trail between Oak Knoll Ave and Trancas St - 2019*

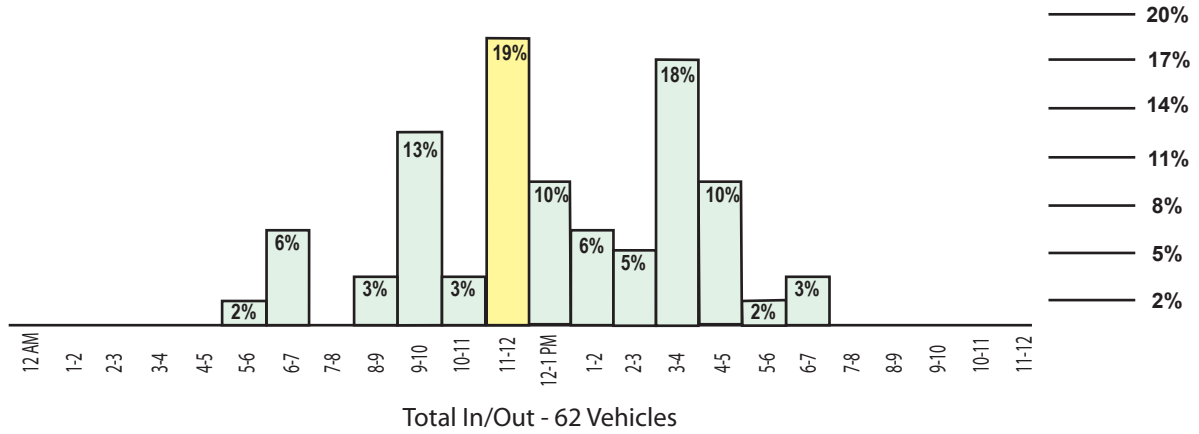


CRANE TRANSPORTATION GROUP

Appendix E

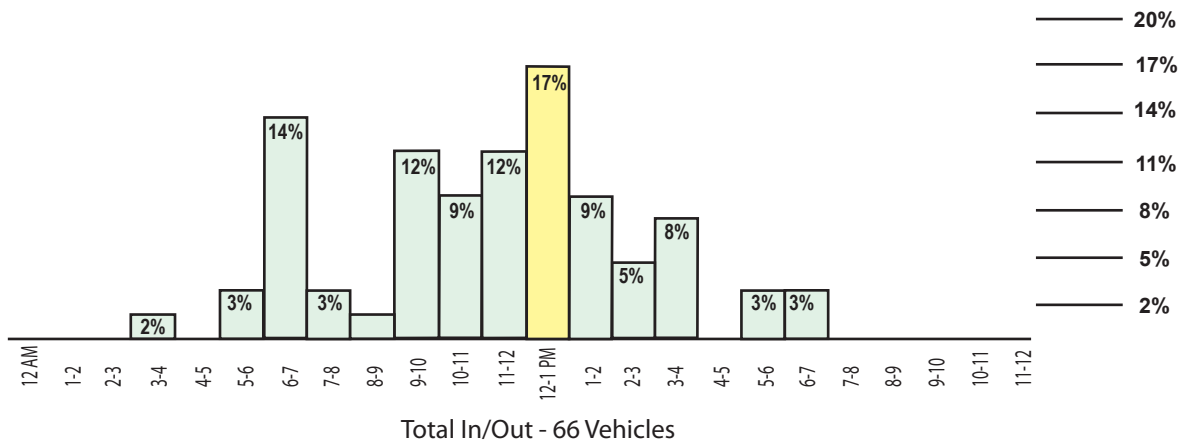
SIGNORELLO WINERY DRIVEWAY
Friday Hourly Percent of Total Trips

Friday, September 20, 2019



SIGNORELLO WINERY DRIVEWAY
Friday Hourly Percent of Total Trips

Friday, October 4, 2019

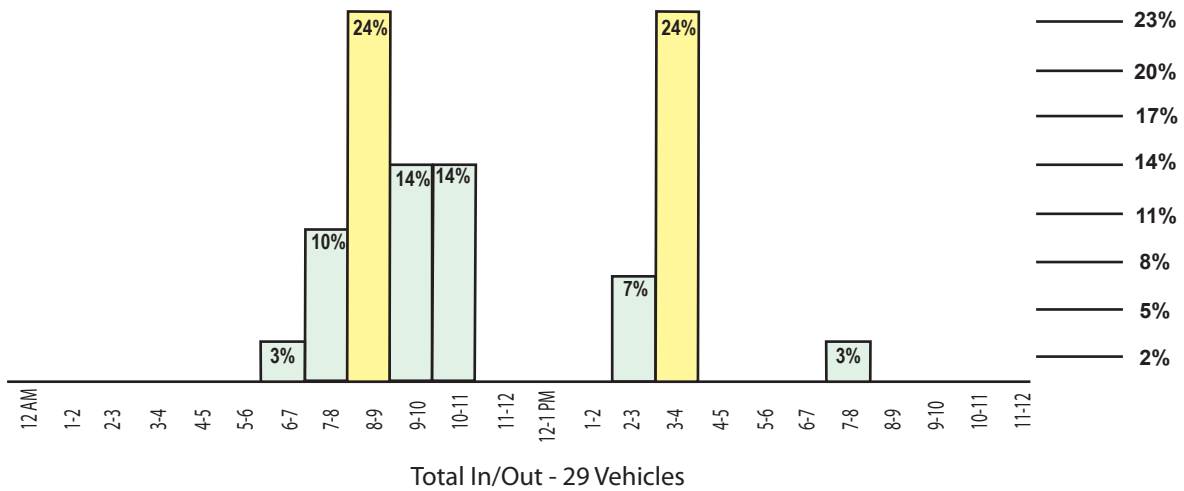


Appendix Figure E-1

Friday Traffic Totals and Percentages
SIGNORELLO Winery (by Hour) - Sept 20, & Oct 4, 2019

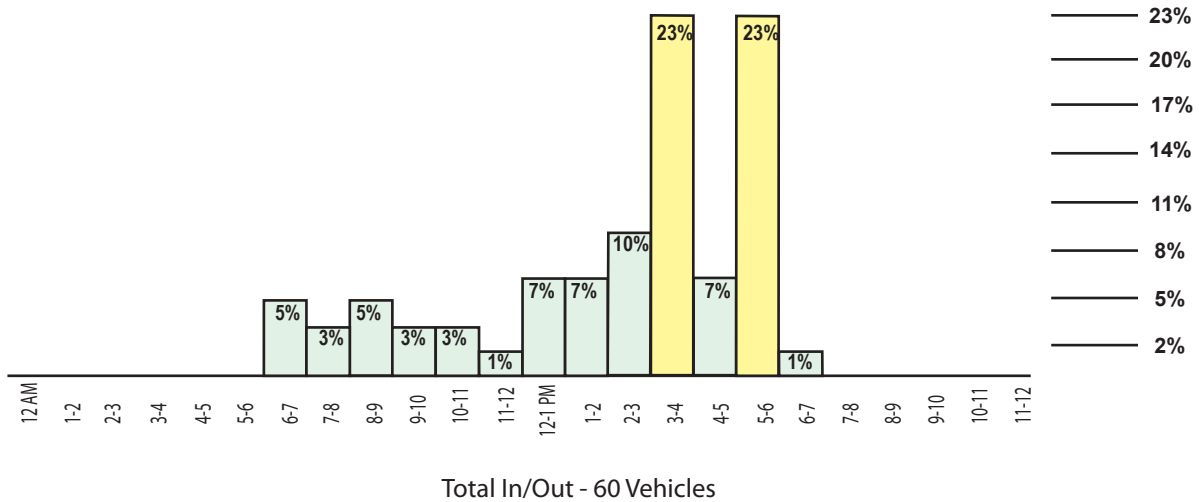
SIGNORELLO WINERY DRIVEWAY
Friday Hourly Percent of Total Trips

Saturday, September 21, 2019



SIGNORELLO WINERY DRIVEWAY
Friday Hourly Percent of Total Trips

Saturday, October 5, 2019



Appendix Figure E-2

Saturday Traffic Totals and Percentages
SIGNORELLO Winery (by Hour) - Sept 21 & Oct 5, 2019

SIGNORELLO WINERY

Existing Conditions Winery Traffic Information / Trip Generation

Determine Winery Daily Trips. Complete Sections A through I below to determine your winery project's estimated baseline daily, peak hour trips, and annual trips.

Section A. Maximum Daily Weekday Traffic (Friday, non-harvest season)

1.	Total number of FT employees ¹ : <u>4</u> x 3.05 one-way trips per employee	= <u>12.2</u> daily trips
2.	Total number of PT employees ¹ : <u>0</u> x 1.90 one-way trips per employee	= <u>0</u> daily trips
3.	Maximum weekday visitors ² : <u>20</u> /2.6 visitors per vehicle x 2 one-way trips	= <u>15.4</u> daily trips
4.	Gallons of production: <u>20,000</u> /1,000 x 0.009 daily truck trips ³ x 2 one-way trips	= <u>0.4</u> daily trips
5.	TOTAL	= <u>28</u> daily trips

Section B. Maximum Daily Weekday Traffic (Friday, harvest season)

6.	Total number of FT employees ¹ : <u>4</u> x 3.05 one-way trips per employee	= <u>12.2</u> daily trips
7.	Total number of PT employees ¹ : <u>0</u> x 1.90 one-way trips per employee	= <u>0</u> daily trips
8.	Maximum weekday visitors ² : <u>20</u> /2.6 visitors per vehicle x 2 one-way trips	= <u>15.4</u> daily trips
9.	Gallons of production: <u>20,000</u> /1,000 x 0.009 daily truck trips x 2 one-way trips	= <u>0.4</u> daily trips
10.	Avg. annual tons of grape on-haul: <u>46.6</u> / 144 truck trips x 2 one-way trips	= <u>0.6</u> daily trips
11.	TOTAL	= <u>29</u> daily trips

Section C. Maximum Daily Weekend Traffic (Saturday, non-harvest season)

12.	Total number of FT Sat. employees ¹ : <u>4</u> x 3.05 one-way trips per employee	= <u>12.2</u> daily trips
13.	Total number of PT Sat. employees ¹ : <u>0</u> x 1.90 one-way trips per employee	= <u>0</u> daily trips
14.	Maximum Saturday visitors ² : <u>20</u> /2.8 visitors per vehicle x 2 one-way trips	= <u>14.3</u> daily trips
15.	Gallons of production: <u>20,000</u> /1,000 x 0.009 daily truck trips ³ x 2 one-way trips	= <u>0.4</u> daily trips
16.	TOTAL	= <u>27</u> daily trips

Section D. Maximum Daily Weekend Traffic (Saturday, harvest season)

17.	Total number of FT Sat. employees ¹ : <u>4</u> x 3.05 one-way trips per employee	= <u>12.2</u> daily trips
18.	Total number of PT Sat. employees ¹ : <u>0</u> x 1.90 one-way trips per employee	= <u>0</u> daily trips
19.	Maximum Saturday visitors ² : <u>20</u> /2.8 visitors per vehicle x 2 one-way trips	= <u>14.3</u> daily trips
20.	Gallons of production: <u>20,000</u> /1,000 x 0.009 daily truck trips x 2 one-way trips	= <u>0.4</u> daily trips
21.	Avg. annual tons of grape on-haul: <u>46.6</u> / 144 truck trips x 2 one-way trips	= <u>0.6</u> daily trips
22.	TOTAL	= <u>28</u> daily trips

¹ Full-Time and part-time employees that staff the largest of any event that is proposed to occur two or more times in a month, on average.

² The number of weekday visitors shall include guests of the largest of any event that is proposed to occur two or more times in a month, on average.

³ Assumes 1.47 materials and supplies trips + 0.8 case goods trips per 1,000 gallons of production / 250 days per year

SIGNORELLO WINERY

Existing Conditions Winery Traffic Information / Trip Generation (continued)

Section E. PM Peak Hour Trip Generation (Friday, non-harvest season)

$$\begin{array}{r} \text{(Sum of daily trips from Sec. A, lines 3 and 4) } \times 0.38 + \text{(No. of FTE) } + \text{(line 2 / 2)} \\ 6 \qquad \qquad \qquad + \qquad \qquad \qquad 4 \end{array} = \underline{10} \text{ PM peak trips}$$

Section F. PM Peak Hour Trip Generation (Friday, harvest season)

$$\begin{array}{r} \text{(Sum of daily trips, Sec. B, lines 8, 9, 10) } \times 0.38 + \text{(No. of FTE) } + \text{(line 7 / 2)} \\ 7 \qquad \qquad \qquad + \qquad \qquad \qquad 4 \end{array} = \underline{11} \text{ PM peak trips}$$

Section G. PM Peak Hour Trip Generation (Saturday, non-harvest season)

$$\begin{array}{r} \text{(Sum of daily trips from Sec. C, line 14 and 15) } \times 0.57 + \text{(No. of FTE) } + \text{(line 13 / 2)} \\ 9 \qquad \qquad \qquad + \qquad \qquad \qquad 4 \end{array} = \underline{13} \text{ PM peak trips}$$

Section H. PM Peak Hour Trip Generation (Saturday, harvest season)

$$\begin{array}{r} \text{(Sum of daily trips Sec. D, lines 19, 20, and 21) } \times 0.57 + \text{(No. of FTE) } + \text{(line 18 / 2)} \\ 9 \qquad \qquad \qquad + \qquad \qquad \qquad 4 \end{array} = \underline{13} \text{ PM peak trips}$$

Section I. Maximum Annual Trips

$$\begin{array}{r} \text{(Sec. A, line 5 } \times 206) + \text{(Sec. B, line 11 } \times 55) + \text{(Sec. C, line 16 } \times 82) + \text{(Sec. D, line 22 } \times 22) \\ 5,768 \qquad + \qquad 1,595 \qquad + \qquad 2,214 \qquad + \qquad 616 \end{array} = \underline{10,193} \text{ Annual trips}$$

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Proposed Project Winery Traffic Information / Trip Generation

Determine Winery Daily Trips. Complete Sections J through R below to determine your winery project's estimated future daily, peak hour trips, and annual trips.

Section J. Maximum Daily Weekday Traffic (Friday, non-harvest season)

1.	Total number of FT employees ¹ : <u>16</u> x 3.05 one-way trips per employee	= <u>48.8</u> daily trips
2.	Total number of PT employees ¹ : <u>0</u> x 1.90 one-way trips per employee	= <u>0</u> daily trips
3.	Maximum weekday visitors ² : <u>60</u> /2.6 visitors per vehicle x 2 one-way trips	= <u>46.2</u> daily trips
4.	Gallons of production: <u>50,000</u> /1,000 x 0.009 daily truck trips ³ x 2 one-way trips	= <u>0.9</u> daily trips
5.	TOTAL	= <u>96</u> daily trips

Section K. Maximum Daily Weekday Traffic (Friday, harvest season)

6.	Total number of FT employees ¹ : <u>16</u> x 3.05 one-way trips per employee	= <u>48.8</u> daily trips
7.	Total number of PT employees ¹ : <u>4</u> x 1.90 one-way trips per employee	= <u>7.6</u> daily trips
8.	Maximum weekday visitors ² : <u>60</u> /2.6 visitors per vehicle x 2 one-way trips	= <u>46.2</u> daily trips
9.	Gallons of production: <u>50,000</u> /1,000 x 0.009 daily truck trips x 2 one-way trips	= <u>0.9</u> daily trips
10.	Avg. annual tons of grape on-haul: <u>213.3</u> / 144 truck trips x 2 one-way trips	= <u>3.0</u> daily trips
11.	TOTAL	= <u>107</u> daily trips

Section L. Maximum Daily Weekend Traffic (Saturday, non-harvest season)

12.	Total number of FT Sat. employees ¹ : <u>11</u> x 3.05 one-way trips per employee	= <u>33.6</u> daily trips
13.	Total number of PT Sat. employees ¹ : <u>0</u> x 1.90 one-way trips per employee	= <u>0</u> daily trips
14.	Maximum Saturday visitors ² : <u>60</u> /2.8 visitors per vehicle x 2 one-way trips	= <u>42.9</u> daily trips
15.	Gallons of production: <u>50,000</u> /1,000 x 0.009 daily truck trips ³ x 2 one-way trips	= <u>0.9</u> daily trips
16.	TOTAL	= <u>78</u> daily trips

Section M. Maximum Daily Weekend Traffic (Saturday, harvest season)

17.	Total number of FT Sat. employees ¹ : <u>11</u> x 3.05 one-way trips per employee	= <u>33.6</u> daily trips
18.	Total number of PT Sat. employees ¹ : <u>4</u> x 1.90 one-way trips per employee	= <u>7.6</u> daily trips
19.	Maximum Saturday visitors ² : <u>60</u> /2.8 visitors per vehicle x 2 one-way trips	= <u>42.9</u> daily trips
20.	Gallons of production: <u>50,000</u> /1,000 x 0.009 daily truck trips x 2 one-way trips	= <u>0.9</u> daily trips
21.	Avg. annual tons of grape on-haul: <u>213.3</u> / 144 truck trips x 2 one-way trips	= <u>3.0</u> daily trips
22.	TOTAL	= <u>88</u> daily trips

¹ Full-Time and part-time employees that staff the largest of any event that is proposed to occur two or more times in a month, on average.

² The number of weekday visitors shall include guests of the largest of any event that is proposed to occur two or more times in a month, on average.

³ Assumes 1.47 materials and supplies trips + 0.8 case goods trips per 1,000 gallons of production / 250 days per year

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Proposed Project Winery Traffic Information / Trip Generation (continued)

Determine Winery Peak Hour Trips. If the number of daily trips on either Section K, line 11, or Section M, line 21, is greater than 20, or Public Works Director determines that other circumstances such as access safety or other potential network impacts warrant further analysis, then the potential transportation impacts of your project must be evaluated in a traffic impact study (TIS) prepared in accordance with Napa County Public Works TIS Guidelines. Follow the direction outlined in Traffic Impact Study Analysis, below. If the number of daily trips on either Section K, line 11, or Section M, line 22, is equal to or less than 20, complete Sections N through R below to determine your project's estimated peak hour trips and annual trips. In lieu of completing Sections N through R, you may opt to prepare a project-specific traffic impact analysis if you anticipate the number of peak hour trips from your proposal is different from that estimated here.

Section N. PM Peak Hour Trip Generation (Friday, non-harvest season)

$$\begin{array}{r} \text{(Sum of daily trips from Sec. J, lines 3 and 4) } \times 0.38 + \text{(No. of FTE) } + \text{(line 2 / 2)} \\ 18 \qquad \qquad \qquad + \qquad \qquad \qquad 16 \end{array} = \underline{\quad 34 \quad} \text{ PM peak trips}$$

Section O. PM Peak Hour Trip Generation (Friday, harvest season)

$$\begin{array}{r} \text{(Sum of daily trips from Sec. K, lines 8, 9, 10) } \times 0.38 + \text{(No. of FTE) } + \text{(line 7 / 2)} \\ 19 \qquad \qquad \qquad + \qquad \qquad \qquad 18 \end{array} = \underline{\quad 37 \quad} \text{ PM peak trips}$$

Section P. PM Peak Hour Trip Generation (Saturday, non-harvest season)

$$\begin{array}{r} \text{(Sum of daily trips from Sec. L, line 14 and 15) } \times 0.57 + \text{(No. of FTE) } + \text{(line 13 / 2)} \\ 25 \qquad \qquad \qquad + \qquad \qquad \qquad 11 \end{array} = \underline{\quad 36 \quad} \text{ PM peak trips}$$

Section Q. PM Peak Hour Trip Generation (Saturday, harvest season)

$$\begin{array}{r} \text{(Sum of daily trips, Sec. M, lines 19, 20, and 21) } \times 0.57 + \text{(No. of FTE) } + \text{(line 18 / 2)} \\ 27 \qquad \qquad \qquad + \qquad \qquad \qquad 13 \end{array} = \underline{\quad 40 \quad} \text{ PM peak trips}$$

Section R. Maximum Annual Trips

$$\begin{array}{r} \text{(Sec. J, line 5 } \times 206) + \text{(Sec. K, line 11 } \times 55) + \text{(Sec. L, line 16 } \times 82) + \text{(Sec. M, line 22 } \times 22) \\ 19,776 \qquad + \qquad 5,885 \qquad + \qquad 6,396 \qquad + \qquad 1,936 \end{array} = \underline{\quad 33,993 \quad} \text{ Annual trips}$$

Traffic Impact Study Analysis. If the number of daily trips on either Section K, line 11, or Section M, line 22, is greater than 20, then the potential transportation impacts of your project must be evaluated in a traffic impact study (TIS) prepared in accordance with Napa County Public Works TIS Guidelines. Existing trip counts on the transportation network should be collected during the harvest season (August 16 – October 31). If collected outside of the harvest season, during the months of November through February, counts shall be adjusted upward by 15 percent to estimate harvest season network volumes. If collected during the weeks between March 1 and August 15, counts shall be adjusted upward by seven percent.

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For peak hour analysis in the TIS, the County will allow any one of the following methodologies:

- a) Use the peak hour factors in Sections E through I, above, to estimate the peak hour trips and annual trips generated by the project. To determine the potential peak hour impacts of the project, apply the harvest season estimated peak hour project trips (Sections F and H for the existing condition, and Sections O and Q for the proposed project) to roadway volumes during the hour between 3:00 p.m. and 4:00 p.m. on Fridays and Saturdays; or*
- b) For New Wineries use peak hour trip counts as projected using the Institute for Transportation Engineers' (ITE) peak hour factors for winery land uses from the most current version of ITE Trip Generation. To determine the potential peak hour impacts of the project, apply the estimated peak hour project trips from ITE to roadway volumes during the hour between 4:00 p.m. and 5:00 p.m. on a Friday and 1:45 p.m. and 2:45 p.m. on a Saturday; or*
- c) Conduct a site-specific analysis informed by actual trip counts at the driveway of the project (for winery use permit modifications) or at the driveway of a project with comparable operating characteristics to that proposed (for new winery use permits). To determine the potential peak hour impacts of the project, apply the site-specific peak hour of generator to the peak hour of the network on a Friday and the peak hour of the roadway on a Saturday, based on the assembled trip count data.*

For Average Daily Traffic (ADT) analysis in the TIS, the County will utilize one of the following methodologies:

- a) Average of the Maximum Daily Weekday Traffic and the Maximum Daily Weekend Traffic during the harvest season, as given in the Winery Traffic Information / Trip Generation worksheet.*
- b) A site specific analysis which at a minimum 24-hour vehicle counts shall be collected during a continuous week period (7-days) for which traffic count data is collected for each day of the week. Existing trip counts should be collected during the harvest season (August 16 – October 31). If collected outside of the harvest season, during the months of November through February, counts shall be adjusted upward by 15 percent to estimate harvest season network volumes. If collected during the weeks between March 1 and August 15, counts shall be adjusted upward by seven percent. Projected daily trip counts shall be based on total number of full-time employee, part-time employees, daily visitors, gallons of production, grape on-haul and the factors identified in the Proposed Winery Traffic Information and Trip Generation worksheet, respectively.*
- c) For land uses other than wineries, the ADT shall be determined using the most current version of ITE Trip Generation.*

Appendix F

APPENDIX F

Signorello Winery

Transportation Demand Management (TDM) Plan

1. A Signorello administrative employee will be appointed TDM manager
2. Financial incentives will be provided for employees to participate in carpools & vanpools
3. Electric car charging facilities will be provided for employees and guests
4. Bike racks and storage areas will be provided for employees and guests
5. High occupancy vehicle use (vans and shuttle buses) will be encouraged for large marketing events
6. Employee work hours will be staggered to the greatest extent possible to avoid congestion during the peak traffic hours along Silverado Trail
7. Work at home or at remote location opportunities (telecommuting) will be offered when possible
8. Guest appointments will be scheduled, to the extent possible, to avoid travel during the peak traffic hours along Silverado Trail
9. The Winery will enroll in “Napa Valley Forward”, a program aimed at reducing traffic along major roads in the Napa Valley by promoting carpooling, vanpooling, bike riding, and use of transit
10. The winery will enroll in the “Bay Area Commuter Benefits Program” whereby employees report their carpooling activities and receive company paid subsidies