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Traffic Study

TRAFFIC IMPACT REPORT

VINE CLIFF WINERY USE PERMIT MODIFICATION 2017

June 1, 2017

Prepared for: VINE CLIFF WINERY

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I. INTRODUCTION

This report has been prepared at the request of the existing Vine Cliff Winery to determine whether the proposed Use Permit Modification 2017 will result in any significant circulation impacts to the local roadway network. The scope of analysis includes evaluation of the Silverado Trail intersections with the winery driveway, Yountville Cross Road and Oakville Cross Road for Existing, Year 2020 and year 2030 horizons (see **Figure 1**).

II. PROPOSED PROJECT SUMMARY

The proposed Use Permit Modification 2017 will be comprised of the following components.

- No change in production – remaining at 48,000 gallons/year.
- 5 additional employees (non-visitor serving), 9:00 AM-4:00 PM Monday-Friday.
- New tours & tasting employees – 1 on weekdays, 3 on weekend days, 10:00 AM-6:00 PM
- Extended tours & tasting hours by appointment (from 10:00 AM-5:00 PM to 10:00 AM-6:00 PM).
- Add 46 tours & tasting visitors/day by appointment, 10:00 AM-6:00 PM.
- No new grape deliveries.
- Six new marketing events with 100 guests each. Events to be scheduled to preclude any new traffic on the local roadway system between 3:00 and 5:30 PM.

III. SCOPE OF SERVICES

The scope of services for this traffic study was developed to provide analysis that is consistent with other recent winery expansion traffic studies approved by both the Napa County Public Works and Planning, Building & Environmental Sciences departments. Evaluation was conducted for harvest Friday PM commute peak hour and Saturday afternoon peak hour traffic conditions. Historical traffic count information for major Napa County roadways indicates that there are higher volumes during this time period than during all other times of the year. Existing, year 2020 and year 2030 (Cumulative – General Plan Buildout) operating conditions were evaluated both with and without project traffic at the Silverado Trail intersections with the project driveway, Yountville Cross Road and Oakville Cross Road. Sight line adequacy was also evaluated at the project driveway intersection with Silverado Trail. Significant impacts, if any, were identified and measures listed, if needed, to mitigate all impacts to a less than significant level.

IV. SUMMARY OF FINDINGS

A. “WITHOUT PROJECT” OPERATING CONDITIONS

1. Existing Volumes – Harvest 2016

Silverado Trail adjacent to the proposed project site has higher September two-way traffic volumes during the Friday PM peak traffic hour compared Saturday PM peak traffic hour (about 1,830 two-way peak hour vehicles from 3:15 to 4:15 PM on Friday versus about 1,650 two-way peak hour vehicles from 3:30 to 4:30 PM on Saturday). The driveway serving the project site had a total of 9 two-way vehicles turning to/from Silverado Trail during the Friday PM peak hour and 13 two-way vehicles during the Saturday PM peak hour. However, many of these vehicles did not enter the project site, particularly on Saturday afternoon.

2. Planned & Ongoing Roadway Improvements

There are no planned circulation system improvements along Silverado Trail in the project vicinity. A left turn lane is already in place on the southbound Silverado Trail approach to the existing winery driveway.

3. Year 2016 Harvest “Without Project” Circulation System Operation

- **Silverado Trail/Oakville Cross Road** intersection – unacceptable level of service and delay on the stop sign controlled Oakville Cross Road approach during both the Friday and Saturday PM peak hours.
- **Silverado Trail/Yountville Cross Road** intersection – unacceptable level of service and delay on the stop sign controlled Yountville Cross Road approach during both the Friday and Saturday PM peak hours.
- Both intersections have volumes meeting both urban and rural peak hour signal Warrant #3 criteria levels during the Friday and Saturday PM peak hours.

4. Year 2020 Harvest “Without Project” Circulation System Operation

- **Silverado Trail/Oakville Cross Road** intersection – unacceptable level of service and delay on the stop sign controlled Oakville Cross Road approach during both the Friday and Saturday PM peak hours.
- **Silverado Trail/Yountville Cross Road** intersection – unacceptable level of service and delay on the stop sign controlled Yountville Cross Road approach during both the Friday and Saturday PM peak hours.
- Both intersections would have volumes meeting both urban and rural peak hour signal Warrant #3 criteria levels.

5. Cumulative (Year 2030) Harvest “Without Project” Circulation System Operation

- **Silverado Trail/Oakville Cross Road** intersection – unacceptable level of service and delay on the stop sign controlled Oakville Cross Road approach during both the Friday and Saturday PM peak hours.
- **Silverado Trail/Yountville Cross Road** intersection – unacceptable level of service and delay on the stop sign controlled Yountville Cross Road approach during both the Friday and Saturday PM peak hours.
- Both intersections would have volumes meeting both urban and rural peak hour signal Warrant #3 criteria levels during the Friday and Saturday PM peak hours.

B. PROJECT IMPACTS

1. Project Trip Generation

Peak hour project trip generation expected during harvest on the local circulation system would be as follows.

FRIDAY PM PEAK HOUR TRIPS		SATURDAY AFTERNOON PEAK HOUR TRIPS	
IN	OUT	IN	OUT
3	8	3	2

2. Year 2016 Harvest Existing + Project Off-Site Circulation Impacts

The proposed project would not result in any significant off-site circulation impacts to the Silverado Trail/Oakville Cross Road or Silverado Trail/Yountville Cross Road intersections. The project would not degrade operation from acceptable to unacceptable at any analyzed location, increase peak hour volumes by 1 percent or greater at any location already experiencing unacceptable “Without Project” operation nor increase volumes on the stop sign controlled side street approaches to Silverado Trail by 10 percent or greater.

3. Year 2020 Harvest + Project Off-Site Circulation Impacts

The proposed project would not result in any significant off-site circulation impacts to the Silverado Trail/Oakville Cross Road or Silverado Trail/Yountville Cross Road intersections. The project would not degrade operation from acceptable to unacceptable at any analyzed location, increase peak hour volumes by 1 percent or greater at any location already experiencing unacceptable “Without Project” operation nor increase volumes on the stop sign controlled side street approaches to Silverado Trail by 10 percent or greater..

4. Cumulative (Year 2030) Harvest + Project Off-Site Circulation Impacts

The proposed project would not result in any significant off-site circulation impacts to the Silverado Trail/Oakville Cross Road or Silverado Trail/Yountville Cross Road

intersections. The project would not degrade operation from acceptable to unacceptable at any analyzed location, increase peak hour volumes by 1 percent or greater at any location already experiencing unacceptable “Without Project” operation nor increase volumes on the stop sign controlled side street approaches to Silverado Trail by 10 percent or greater.

5. Sight Lines at the Project Driveway

Sight lines at the Winery’s driveway connection to Silverado Trail meet minimum stopping sight distance criteria based upon the Caltrans March 2014 *Highway Design Manual*.

6. Marketing Events

Six new events are proposed, each with 100 guests. Events could occur on any day of the week, but will be scheduled to avoid new traffic on the local roadway system between 3:00 and 5:30 PM.

7. Mitigations

No mitigations are required.

C. CONCLUSIONS & RECOMMENDATIONS

The project will result in no significant off-site circulation system operational impacts to Silverado Trail nor to the Silverado Trail intersections with Oakville Cross Road and Yountville Cross Road. A left turn lanes is already provided on the Silverado Trail southbound approach to the existing winery driveway. In addition, sight lines at the winery driveway connection to Silverado Trail are acceptable and meet Caltrans stopping sight distance criteria. No circulation system mitigations are required.

V. PROJECT LOCATION & DESCRIPTION

The Vine Cliff Winery is located on the east side of Silverado Trail about a mile south of the Oakville Cross Road intersection and about a mile and a half north of the Yountville Cross Road intersection (see **Figure 1**). A left turn lane is already in place on the southbound Silverado Trail approach to the project entrance. For analysis purposes, the proposed Use Permit Modification 2017 is comprised of the following components.

- No change in production – remaining at 48,000 gallons/year.
- 5 additional full-time employees (non-visitor-serving), 9:00 AM-4:00 PM Monday-Friday.
- 4 additional part-time employees (non-visitor-serving), 6:00 AM-3:00 PM Monday-Friday.
- 2 additional part-time employees (non-visitor-serving), 6:00 AM-3:00 PM Saturday & Sunday.

- New tours & tasting employees – 1 on weekdays, 3 on weekend days, 10:00 AM-6:00 PM
- Extended tours & tasting hours by appointment (from 10:00 AM-5:00 PM to 10:00 AM-6:00 PM).
- Add 46 tours & tasting visitors/day by appointment, 10:00 AM-6:00 PM.
- No new grape deliveries.
- Six new marketing events with 100 guests each. Events could occur on any day of the week, but would avoid contributing new traffic to the local roadway system between 3:00 and 5:30 PM.

VI. EXISTING CIRCULATION SYSTEM EVALUATION PROCEDURES

A. ANALYSIS LOCATIONS

The following locations have been evaluated.

- 1. Silverado Trail/Oakville Cross Road intersection (The Oakville Cross Road approach is stop sign controlled.)**
- 2. Silverado Trail/Yountville Cross Road intersection (The Yountville Cross Road eastbound approach is stop sign controlled.)**
- 3. Silverado Trail/Vine Cliff Driveway intersection (A left turn lane is already in place on the southbound Silverado Trail approach to the winery driveway.)**

Figure 2 presents a schematic of approach lane geometrics and control at each analysis intersection.

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 SR 29 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 regards to the peak traffic days of the week, the Napa County Travel Behavioral Study¹ 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 SR 29 between St. Helena and Napa also show that weekday AM and PM peak hour volumes are higher on a Friday rather than on either a Wednesday or Thursday. Therefore, Friday and Saturday peak traffic conditions were evaluated in this study.

2. COUNT RESULTS

Friday 3:00 to 6:00 PM as well as Saturday 1:00 to 6:00 PM turn movement counts were conducted by Crane Transportation Group (CTG) in October 2016 at the Silverado Trail intersections with Yountville Cross Road and Oakville Cross Road. The peak traffic hours for the system were determined to be 3:15 to 4:15 PM on Friday and 3:30 to 4:30 PM on Saturday. Please see count results in the **Appendix**. It should be noted, however, that there were many hours on both days that had similar volumes. In addition, traffic counts were conducted at the Silverado Trail/Vine Cliff Winery driveway on Friday, November 18, 2016 (3:00 to 6:00 PM) and on Saturday, December 3, 2016 (from noon to 5:00 PM). Please see count results in the **Appendix**.

3. SEASONAL ADJUSTMENTS

October 2016 peak hour traffic counts were seasonally adjusted to reflect 2016 September harvest conditions. Historical traffic count data from Caltrans PeMS system as well as past studies were used to determine that September weekday volumes are about 1.5 percent higher than October weekday volumes, while September weekend volumes are about 2 percent higher than October weekend volumes. Project driveway November and December counts were also adjusted higher based upon PeMS data.

Resultant 2016 Friday and Saturday PM peak hour harvest volumes are presented in **Figure 3**. Overall harvest Friday PM peak hour two-way volumes along Silverado Trail at the winery entrance would be expected to be about 11 percent higher than Saturday PM peak hour volumes (1,830 vehicles on Friday versus 1,650 vehicles on Saturday).

C. ROADWAYS

Roadway descriptions are based upon the designation that Silverado Trail runs in a general north-south direction through the project area while Oakville Cross Road and Yountville Cross Road run in an east-west direction. The project site is along the east side of Silverado Trail.

Silverado Trail in the project vicinity has two well-paved 12-foot travel lanes and wide paved shoulders that are signed and striped as Class II bicycle lanes. Left turn lanes are provided on the northbound Silverado Trail approaches to Oakville Cross Road and Yountville Cross Road as

¹ Fehr & Peers, December 8, 2014.

well as the southbound approach to the Vine Cliff Winery driveway. The posted speed limit is 55 miles per hour.

Oakville Cross Road is a two-lane rural collector roadway extending westerly from Silverado Trail to SR 29. It is stop sign controlled on its eastbound approach to Silverado Trail.

Yountville Cross Road is a two-lane collector roadway extending westerly from Silverado Trail to the community of Yountville and an indirect connection to SR 29. It is stop sign controlled on its eastbound 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.

Unsignalized Intersections. For unsignalized (all-way stop-controlled and side-street stop-controlled) intersections, the 2010 *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, although overall delay is also typically reported for intersections along state highways. 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. It should be noted that the 2010 analysis software for unsignalized intersections does not report overall intersection delay. However, the year 2000 software does report overall delay and was utilized to report overall intersection operation. **Table 1** summarizes the relationship between delay and LOS for unsignalized intersections.

2. MINIMUM ACCEPTABLE OPERATION

Napa County has recently adopted new minimum acceptable operating condition standards for unsignalized intersections. Based upon the new standards, Level of Service D (LOS D) is the poorest acceptable operation for side street stop sign controlled approaches at two-way stop intersections and for all-way-stop intersections.

E. SIGNAL WARRANT EVALUATION

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 *Manual on Uniform Traffic Control Devices* (MUTCD), Federal Highway Administration, 2012, and the *Manual on Unified Traffic Control Devices* Federal Highway Administration, 2003 California Supplement, which has been adopted by the State of California as a replacement for *Caltrans Traffic Manual* (*Caltrans Manual on Uniform Traffic Control Devices, 2014 [CMUTCD]*). Section 4C of the CMUTCD provides guidelines, or warrants, which may indicate need for a traffic signal at an unsignalized intersection. As indicated in the MUTCD, 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.

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.

In areas where there are less than 10,000 people in the immediate vicinity of an intersection or where the travel speeds on the uncontrolled intersection approaches are greater than 40 miles per hour, "rural" warrant criteria apply. They require only 70 percent of the volume levels of "urban" warrant criteria. Please see the **Appendix** for the warrant charts.

F. PLANNED IMPROVEMENTS

There are no planned and funded improvements at any location evaluated in this study.²

² Mr. Rick Marshall, Napa County Public Works Department, December 2016.

G. MARKETING EVENTS

Six new marketing events per year are proposed. Each would have up to 100 guests, resulting in about 36 to 39 vehicles. Events could occur on any day of the week, but would be scheduled to preclude any new traffic to the local roadway system between 3:00 and 5:30 PM (see **Table 7**).

VII. FUTURE HORIZON TRAFFIC VOLUME PROJECTIONS

Traffic analysis has been conducted for existing (2016), year 2020 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 2016 and 2030 for the following roadways.

<u>Route</u>	<u>2016 to 2030 Projected Growth in Weekday Traffic</u>
Silverado Trail	PM peak hour = 12.4%
Oakville Cross Road	PM peak hour = 47%
Yountville Cross Road	PM peak hour = 15%

Projecting straight line traffic growth for analysis purposes, this translates into the following growths in two-way traffic between 2016 and 2020 for the same roadways.

<u>Route</u>	<u>2016 to 2020 Projected Growth in Weekday Traffic</u>
Silverado Trail	PM peak hour = 3.5%
Oakville Cross Road	PM peak hour = 14%
Yountville Cross Road	PM peak hour = 5%

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 2020 harvest “Without Project” Friday and Saturday PM peak hour volumes are presented in **Figure 4**, while cumulative year 2030 harvest “Without Project” Friday and Saturday PM peak hour volumes are presented in **Figure 5**.

VIII. OFF-SITE CIRCULATION SYSTEM OPERATION – WITHOUT PROJECT

1. EXISTING (2016) HARVEST (WITHOUT PROJECT) OPERATING CONDITIONS

A. INTERSECTION LEVEL OF SERVICE – Table 2

1) SILVERADO TRAIL/OAKVILLE CROSS ROAD

a) Friday PM Peak Hour

Unacceptable Oakville Cross Road stop sign controlled eastbound approach: LOS F

b) Saturday PM Peak Hour

Unacceptable Oakville Cross Road stop sign controlled eastbound approach: LOS E

2) SILVERADO TRAIL/YOUNTVILLE CROSS ROAD

a) Friday PM Peak Hour

Unacceptable Yountville Cross Road stop sign controlled eastbound approach: LOS F

b) Saturday PM Peak Hour

Unacceptable Yountville Cross Road stop sign controlled eastbound approach: LOS F

B. SIGNAL WARRANT EVALUATION – Table 3

1) SILVERADO TRAIL/OAKVILLE CROSS ROAD

a) Friday PM Peak Hour

Volumes exceed peak hour signal Warrant #3 urban and rural criteria.

b) Saturday PM Peak Hour

Volumes exceed peak hour signal Warrant #3 urban and rural criteria.

2) SILVERADO TRAIL/YOUNTVILLE CROSS ROAD

a) Friday PM Peak Hour

Volumes exceed peak hour signal Warrant #3 urban and rural criteria.

b) Saturday PM Peak Hour

Volumes exceed peak hour signal Warrant #3 urban and rural criteria.

2. YEAR 2020 (WITHOUT PROJECT) HARVEST OPERATING CONDITIONS

A. INTERSECTION LEVEL OF SERVICE – Table 2

1) SILVERADO TRAIL/OAKVILLE CROSS ROAD

a) Friday PM Peak Hour

Unacceptable Oakville Cross Road stop sign controlled eastbound approach: LOS F

b) Saturday PM Peak Hour

Unacceptable Oakville Cross Road stop sign controlled eastbound approach: LOS E

2) SILVERADO TRAIL/YOUNTVILLE CROSS ROAD

b) Friday PM Peak Hour

Unacceptable Yountville Cross Road stop sign controlled eastbound approach: LOS F

b) Saturday PM Peak Hour

Unacceptable Yountville Cross Road stop sign controlled eastbound approach: LOS F

B. SIGNAL WARRANT EVALUATION – Table 3

1) SILVERADO TRAIL/OAKVILLE CROSS ROAD

a) Friday PM Peak Hour

Volumes would exceed peak hour signal Warrant #3 urban and rural criteria.

b) Saturday PM Peak Hour

Volumes would exceed peak hour signal Warrant #3 urban and rural criteria.

2) SILVERADO TRAIL/YOUNTVILLE CROSS ROAD

a) Friday PM Peak Hour

Volumes would exceed peak hour signal Warrant #3 urban and rural criteria.

b) Saturday PM Peak Hour

Volumes would exceed peak hour signal Warrant #3 urban and rural criteria.

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

A. INTERSECTION LEVEL OF SERVICE – Table 2

1) SILVERADO TRAIL/OAKVILLE CROSS ROAD

a) Friday PM Peak Hour

Unacceptable Oakville Cross Road stop sign controlled eastbound approach: LOS F

b) Saturday PM Peak Hour

Unacceptable Oakville Cross Road stop sign controlled eastbound approach: LOS F

2) SILVERADO TRAIL/YOUNTVILLE CROSS ROAD

a) Friday PM Peak Hour

Unacceptable Yountville Cross Road stop sign controlled eastbound approach: LOS F

b) Saturday PM Peak Hour

Unacceptable Yountville Cross Road stop sign controlled eastbound approach: LOS F

B. SIGNAL WARRANT EVALUATION – Table 3

1) SILVERADO TRAIL/OAKVILLE CROSS ROAD

a) Friday PM Peak Hour

Volumes would exceed peak hour signal Warrant #3 urban and rural criteria.

b) Saturday PM Peak Hour

Volumes would exceed peak hour signal Warrant #3 urban and rural criteria.

2) SILVERADO TRAIL/YOUNTVILLE CROSS ROAD

a) Friday PM Peak Hour

Volumes would exceed peak hour signal Warrant #3 urban and rural criteria.

b) Saturday PM Peak Hour

Volumes would exceed peak hour signal Warrant #3 urban and rural criteria.

IX. PROJECT IMPACT EVALUATION

A. SIGNIFICANCE CRITERIA

1. COUNTY OF NAPA

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

EXISTING + PROJECT CONDITIONS

A. ARTERIAL SEGMENTS

A project would cause a significant impact requiring mitigation if:

1. 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
2. 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:

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

B. SIGNALIZED INTERSECTIONS

A project would cause a significant impact requiring mitigation if:

1. 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
2. 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:

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

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.³

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

³ 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.

there should still be an evaluation of effects on safety and local access, per Policy CIR-18.

C. 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:

1. 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
2. An unsignalized intersection operates at LOS E or F during the selected peak hours without project trips and the project contributes one percent or more of the total entering traffic for all way stop controlled intersections, or 10 percent or more of the traffic on a side street approach for side street stop controlled intersections; the peak hour traffic signal warrant criteria should also be evaluated and presented for informational purposes.

All Way Stop Controlled Intersections

For the second criteria at an all way stop controlled intersection, the following equation should be used if the all way stop controlled intersection operates at LOS E or F without the project.

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

Side Street Stop Controlled Intersections

For the second criteria at a side street stop controlled intersection, the following equation should be used if the side street stop controlled intersection operates at LOS E or F without the project.

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

Both of those volumes are for the stop controlled approaches only. Each stop controlled approach that operates at LOS E or F should be analyzed individually.

CUMULATIVE+ PROJECT CONDITIONS

A. ARTERIAL SEGMENTS, SIGNALIZED INTERSECTIONS AND UNSIGNALIZED INTERSECTIONS

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

1. 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
2. The project's contribution to a significant cumulative impact would be equal to or greater than five percent of the growth in traffic from existing conditions.

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.

B. PROJECT TRIP GENERATION

Friday and Saturday PM peak hour trip generation projections were developed with the assistance of the project applicant and their representative for all components of new employee and visitor activities associated with the proposed Vine Cliff Winery expansion (see worksheets in the **Appendix**). Results are presented on an hourly basis in **Tables 4** and **5** for harvest Friday and Saturday conditions. A summary of peak hour trips is presented in **Table 6**. During the harvest Friday PM peak traffic hour there would be a projected 3 inbound and 8 outbound vehicles, while during the harvest Saturday PM peak traffic hour, there would be a projected 3 inbound and 2 outbound vehicles. Friday PM peak hour project trip generation would be a combination of new employee and visitor traffic, while during the Saturday PM peak hour project trip generation would be new visitor traffic only.

C. PROJECT TRIP DISTRIBUTION

Project traffic was distributed to Silverado Trail in a pattern reflective of existing distribution patterns at the Vine Cliff Winery driveway intersection. Most visitor and employee traffic would be expected to travel to/from the south.

The harvest Friday and Saturday project traffic increments expected on SR 29 during the times of ambient peak traffic flows are presented in **Figure 6**. Friday and Saturday Existing “With Project” PM peak hour harvest volumes are presented in **Figure 7**; “With Project” PM peak hour harvest volumes for year 2020 conditions are presented in **Figure 8**, and “With Project” PM peak hour harvest volumes for 2030 conditions are presented in **Figure 9**.

D. PROJECT OFF-SITE IMPACTS

1. EXISTING HARVEST + PROJECT CONDITIONS

a. Summary

Project traffic would not result in any significant level of service or signal warrant impacts at the Silverado Trail intersections with Oakville Cross Road or Yountville Cross Road during either the Friday or Saturday PM peak traffic hours. *Less than significant.*

b. Intersection Level of Service Impacts – see Table 2

- **Silverado Trail/Oakville Cross Road**

- Friday PM Peak Hour

Operation of the stop sign controlled Oakville Cross Road intersection approach would remain LOS F with the addition of project traffic. The project would not increase volumes passing through the intersection by 1 percent or more (0.2%), nor increase volumes on the stop sign controlled approach by 10 percent or greater (0%). *Less than significant.*

- Saturday PM Peak Hour

Operation of the stop sign controlled Oakville Cross Road intersection approach would remain LOS F with the addition of project traffic. The project would not increase volumes passing through the intersection by 1 percent or more (0.1%), nor increase volumes on the stop sign controlled approach by 10 percent or greater (0%). *Less than significant.*

- **Silverado Trail/Yountville Cross Road**

- Friday PM Peak Hour

Operation of the stop sign controlled Oakville Cross Road intersection approach would remain LOS F with the addition of project traffic. The project would not increase volumes passing through the intersection by 1 percent or more (0.3%), nor increase volumes on the stop sign controlled approach by 10 percent or greater (0%). *Less than significant.*

- Saturday PM Peak Hour

Operation of the stop sign controlled Oakville Cross Road intersection approach would remain LOS F with the addition of project traffic. The project would not increase volumes passing through the intersection by 1 percent or more (0.2%), nor

increase volumes on the stop sign controlled approach by 10 percent or greater (0%).
Less than significant.

c. Signal Warrant Impacts – see Table 3

• **Silverado Trail/Oakville Cross Road**

○ Friday PM Peak Hour

The addition of project traffic would increase volumes less than 1 percent at this intersection which would already have volumes exceeding urban and rural signal warrant criteria. *Less than significant.*

○ Saturday PM Peak Hour

The addition of project traffic would increase volumes less than 1 percent at this intersection which would already have volumes exceeding urban and rural signal warrant criteria. *Less than significant.*

• **Silverado Trail/Yountville Cross Road**

○ Friday PM Peak Hour

The addition of project traffic would increase volumes less than 1 percent at this intersection which would already have volumes exceeding urban and rural signal warrant criteria. *Less than significant.*

○ Saturday PM Peak Hour

The addition of project traffic would increase volumes less than 1 percent at this intersection which would already have volumes exceeding urban and rural signal warrant criteria. *Less than significant.*

2. YEAR 2020 HARVEST + PROJECT CONDITIONS

a. Summary

Project traffic would not result in any significant level of service or signal warrant impacts at the Silverado Trail intersections with Oakville Cross Road or Yountville Cross Road during either the Friday or Saturday PM peak traffic hours. *Less than significant.*

b. Intersection Level of Service Impacts – see Table 2

• **Silverado Trail/Oakville Cross Road**

○ Friday PM Peak Hour

Operation of the stop sign controlled Oakville Cross Road intersection approach would remain LOS F with the addition of project traffic. The project would not increase volumes passing through the intersection by 1 percent or more (0.2%), nor increase volumes on the stop sign controlled approach by 10 percent or greater (0%).
Less than significant.

- Saturday PM Peak Hour
Operation of the stop sign controlled Oakville Cross Road intersection approach would remain LOS F with the addition of project traffic. The project would not increase volumes passing through the intersection by 1 percent or more (0.1%), nor increase volumes on the stop sign controlled approach by 10 percent or greater (0%).
Less than significant.
- **Silverado Trail/Yountville Cross Road**
 - Friday PM Peak Hour
Operation of the stop sign controlled Oakville Cross Road intersection approach would remain LOS F with the addition of project traffic. The project would not increase volumes passing through the intersection by 1 percent or more (0.3%), nor increase volumes on the stop sign controlled approach by 10 percent or greater (0%).
Less than significant.
 - Saturday PM Peak Hour
Operation of the stop sign controlled Oakville Cross Road intersection approach would remain LOS F with the addition of project traffic. The project would not increase volumes passing through the intersection by 1 percent or more (0.2%), nor increase volumes on the stop sign controlled approach by 10 percent or greater (0%).
Less than significant.

c. Signal Warrant Impacts – see Table 3

- **Silverado Trail/Oakville Cross Road**
 - Friday PM Peak Hour
The addition of project traffic would increase volumes less than 1 percent at this intersection which would already have volumes exceeding urban and rural signal warrant criteria. *Less than significant.*
 - Saturday PM Peak Hour
The addition of project traffic would increase volumes less than 1 percent at this intersection which would already have volumes exceeding urban and rural signal warrant criteria. *Less than significant.*
- **Silverado Trail/Yountville Cross Road**
 - Friday PM Peak Hour
The addition of project traffic would increase volumes less than 1 percent at this intersection which would already have volumes exceeding urban and rural signal warrant criteria. *Less than significant.*
 - Saturday PM Peak Hour
The addition of project traffic would increase volumes less than 1 percent at this intersection which would already have volumes exceeding urban and rural signal warrant criteria. *Less than significant.*

3. CUMULATIVE (YEAR 2030) HARVEST + PROJECT CONDITIONS

a. Summary

Project traffic would not result in any significant level of service or signal warrant impacts at the Silverado Trail intersections with Oakville Cross Road or Yountville Cross Road during either the Friday or Saturday PM peak traffic hours. *Less than significant.*

b. Intersection Level of Service Impacts – see Table 2

- **Silverado Trail/Oakville Cross Road**

- Friday PM Peak Hour

Operation of the stop sign controlled Oakville Cross Road intersection approach would remain LOS F with the addition of project traffic. The project would not increase volumes passing through the intersection by 1 percent or more (0.2%), nor increase volumes on the stop sign controlled approach by 10 percent or greater (0%). *Less than significant.*

- Saturday PM Peak Hour

Operation of the stop sign controlled Oakville Cross Road intersection approach would remain LOS F with the addition of project traffic. The project would not increase volumes passing through the intersection by 1 percent or more (0.1%), nor increase volumes on the stop sign controlled approach by 10 percent or greater (0%). *Less than significant.*

- **Silverado Trail/Yountville Cross Road**

- Friday PM Peak Hour

Operation of the stop sign controlled Oakville Cross Road intersection approach would remain LOS F with the addition of project traffic. The project would not increase volumes passing through the intersection by 1 percent or more (0.3%), nor increase volumes on the stop sign controlled approach by 10 percent or greater (0%). *Less than significant.*

- Saturday PM Peak Hour

Operation of the stop sign controlled Oakville Cross Road intersection approach would remain LOS F with the addition of project traffic. The project would not increase volumes passing through the intersection by 1 percent or more (0.1%), nor increase volumes on the stop sign controlled approach by 10 percent or greater (0%). *Less than significant.*

c. Signal Warrant Impacts – see Table 3

• Silverado Trail/Oakville Cross Road

- Friday PM Peak Hour

The addition of project traffic would increase volumes less than 1 percent at this intersection which would already have volumes exceeding urban and rural signal warrant criteria. *Less than significant.*

- Saturday PM Peak Hour

The addition of project traffic would increase volumes less than 1 percent at this intersection which would already have volumes exceeding urban and rural signal warrant criteria. *Less than significant.*

• Silverado Trail/Yountville Cross Road

- Friday PM Peak Hour

The addition of project traffic would increase volumes less than 1 percent at this intersection which would already have volumes exceeding urban and rural signal warrant criteria. *Less than significant.*

- Saturday PM Peak Hour

The addition of project traffic would increase volumes less than 1 percent at this intersection which would already have volumes exceeding urban and rural signal warrant criteria. *Less than significant.*

E. SIGHT LINES AT PROJECT ENTRANCE

Sight lines at the Silverado Trail/project access driveway intersection are currently acceptable to the north and south along Silverado Trail (at more than 800 feet in each direction).

Sight line to the north along Silverado Trail (to see southbound vehicles) 800+ feet
Sight line to the south along Silverado Trail (to see northbound vehicles) 800+ feet

The Caltrans Design Manual (March 2014) 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
50 mph	430 feet
55 mph	500 feet
60 mph	580 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 60 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.*

F. LEFT TURN LANE AT PROJECT ENTRANCE

There is already a left turn lane on the southbound Silverado Trail approach to the Vine Cliff Winery entrance. *Less than significant.*

G. MARKETING EVENTS

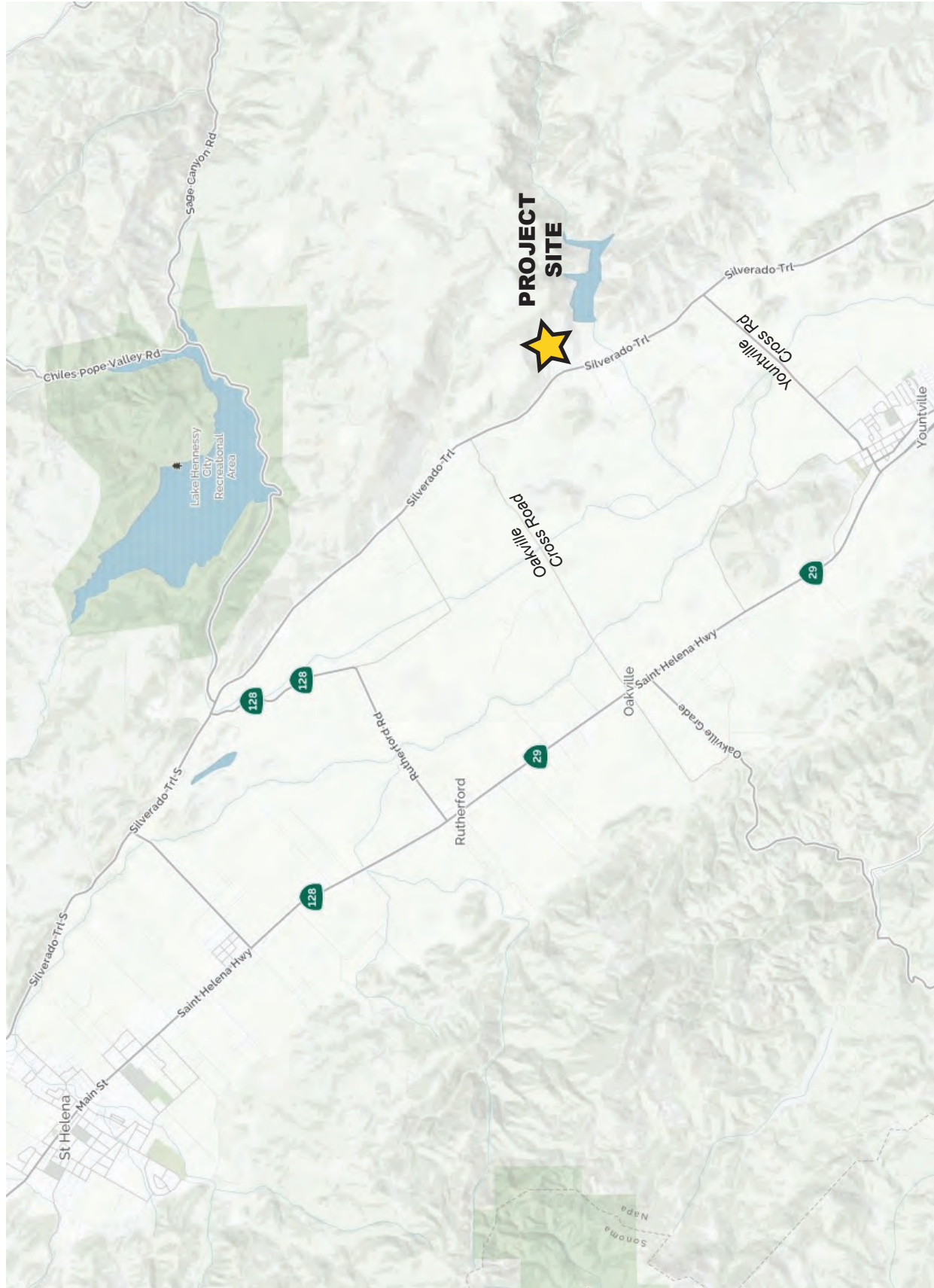
Six new marketing events per year are proposed. Each would have up to 100 guests, resulting in about 36 to 39 vehicles. Events could occur on any day of the week, but would be scheduled to preclude any new traffic to the local roadway system between 3:00 and 5:30 PM (see **Table 7**).

X. CONCLUSIONS & RECOMMENDATIONS

The project will result in no significant off-site circulation system operational impacts to the Silverado Trail intersections with Oakville Cross Road and Yountville Cross Road. A left turn lanes is already provided on the Silverado Trail southbound approach to the existing winery driveway. In addition, sight lines at the winery driveway connection to Silverado Trail are now acceptable and meet Caltrans stopping sight distance criteria. No circulation system mitigations are required.

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.

Figures



@Mapquest2017

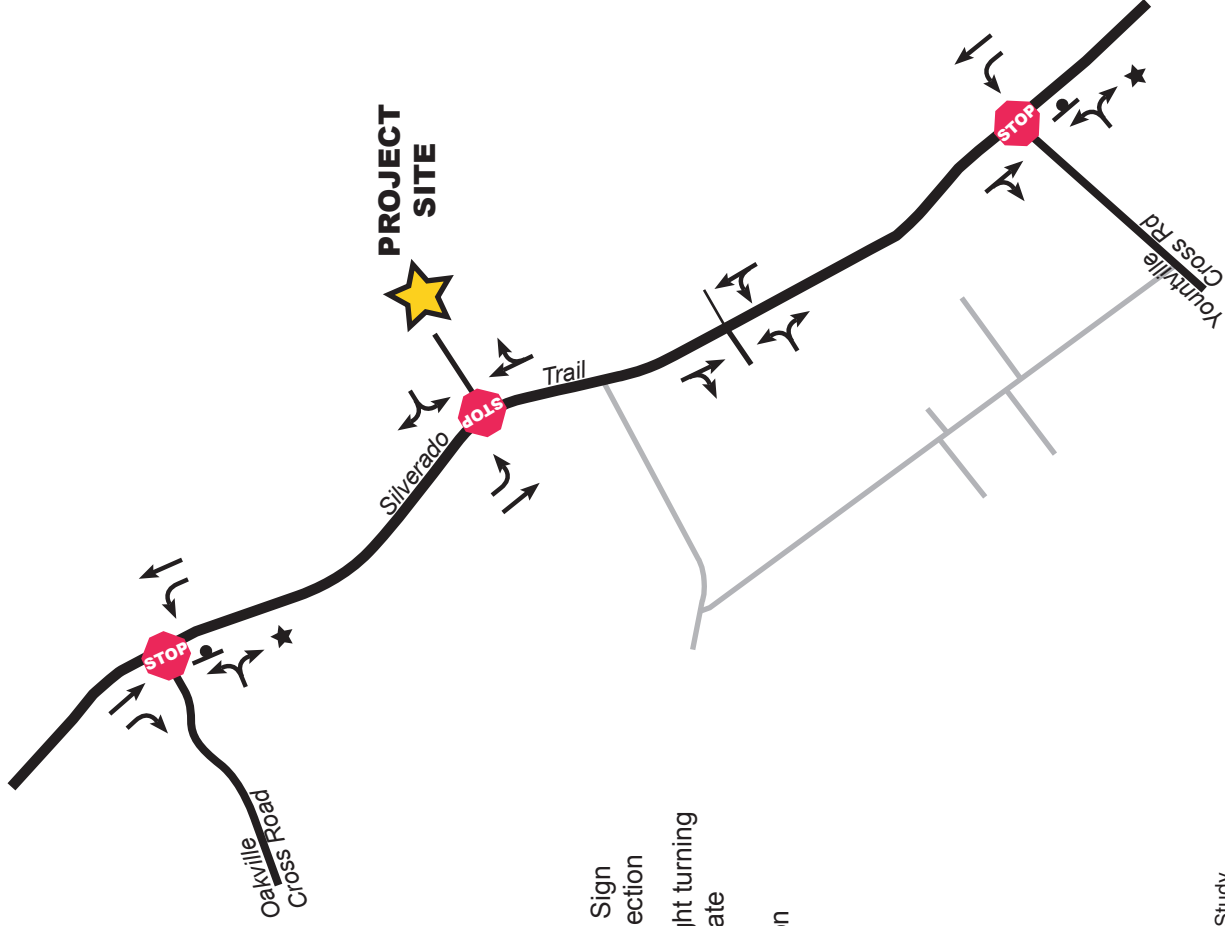
Vine Cliff Winery Use Permit Modification 2017 Traffic Study




Figure 1
Area Map

Not To Scale



NORTH



-  = Side Street Stop Sign Controlled Intersection
-  = Room for one right turning vehicle to separate
-  = Stop Sign location

Vine Cliff Winery Use Permit Modification 2017 Traffic Study

Figure 2
Lane Geometrics and Intersection Control

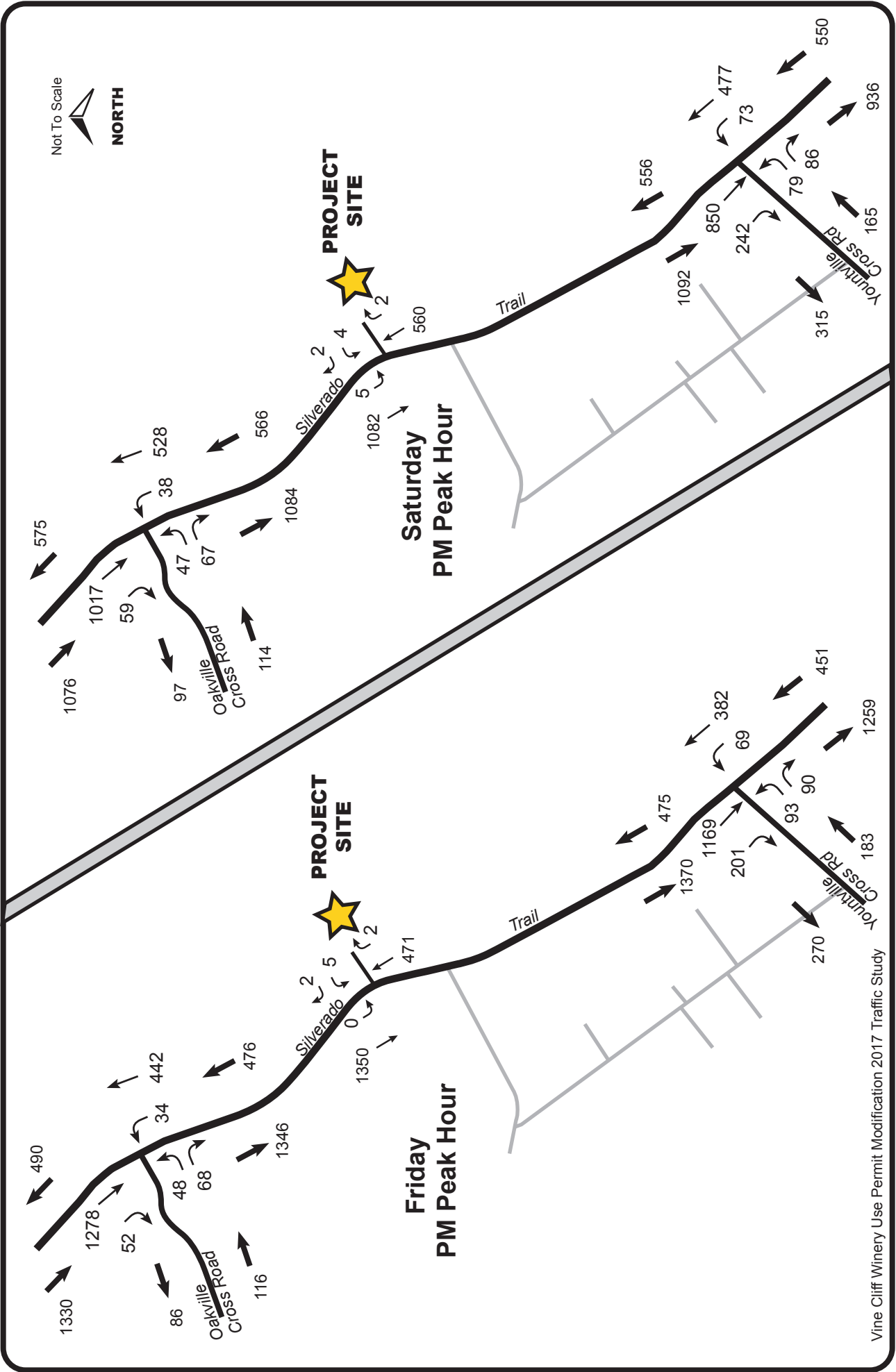


Figure 3

2016 Harvest (without Project)

Friday and Saturday PM Peak Hour Volumes

Vine Cliff Winery Use Permit Modification 2017 Traffic Study

CRANE TRANSPORTATION GROUP

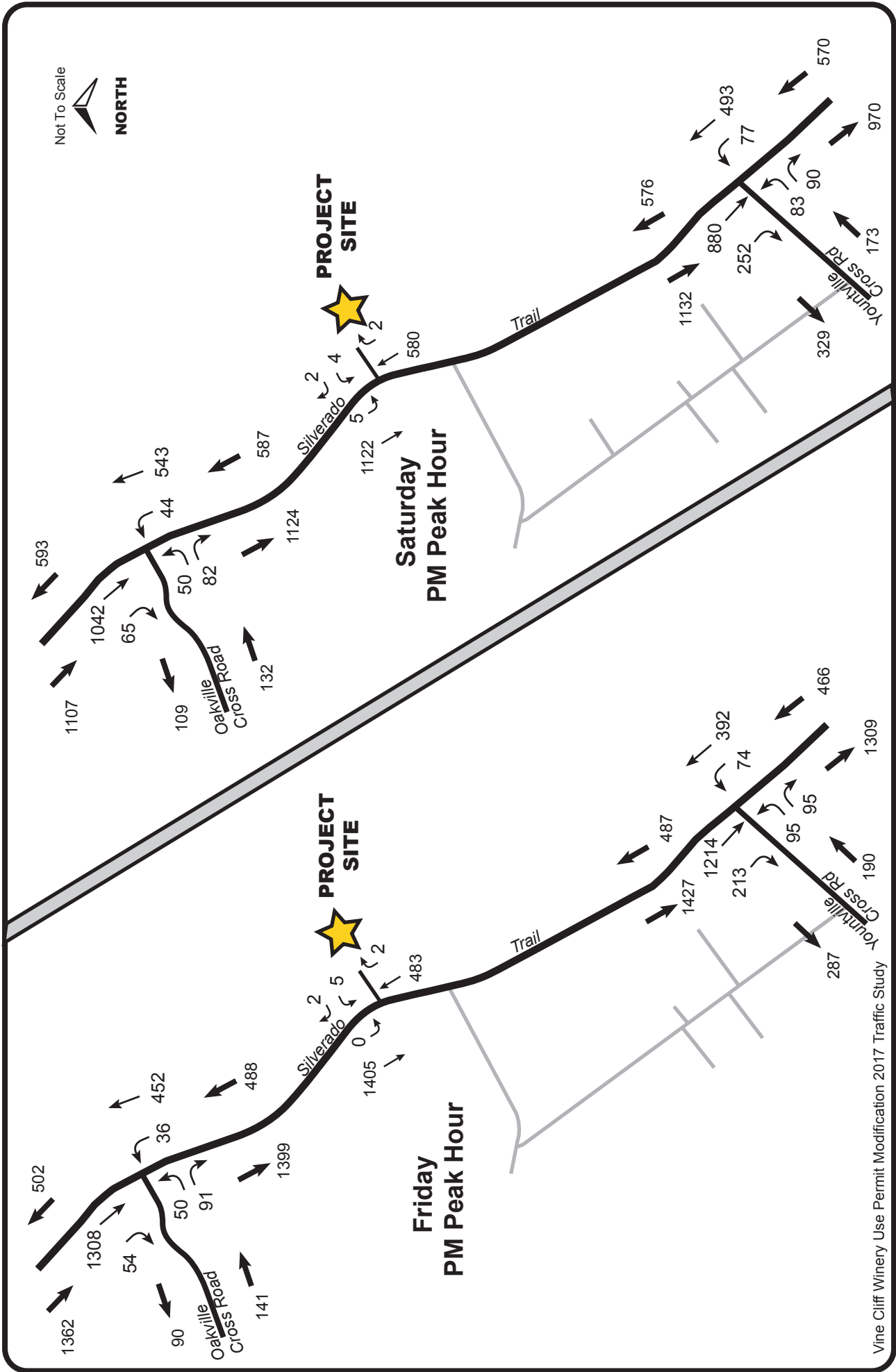


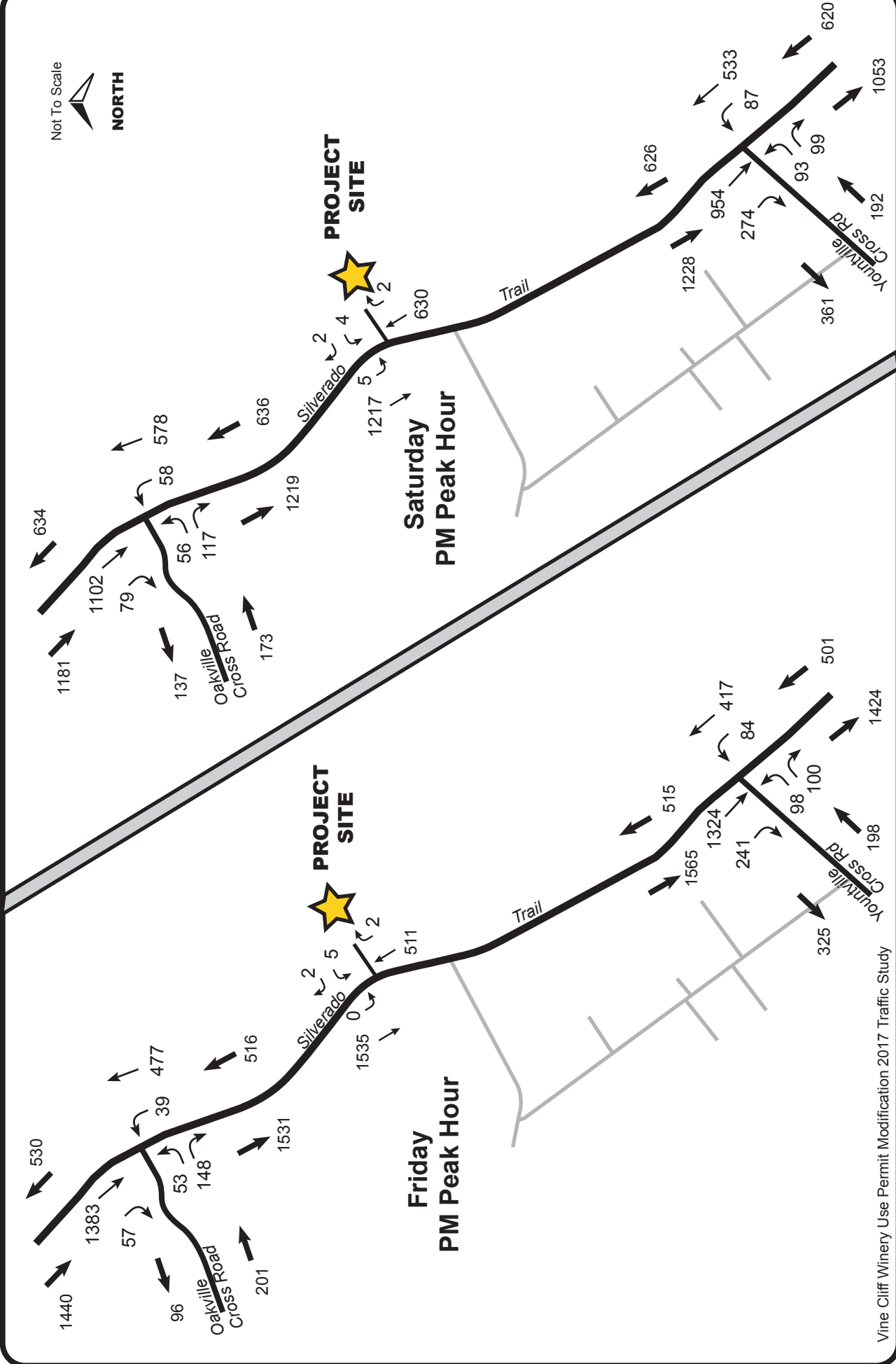
Figure 4
2020 Harvest (without Project)
Friday and Saturday PM Peak Hour Volumes

Vine Cliff Winery Use Permit Modification 2017 Traffic Study



CRANE TRANSPORTATION GROUP

Not To Scale
NORTH



Vine Cliff Winery Use Permit Modification 2017 Traffic Study

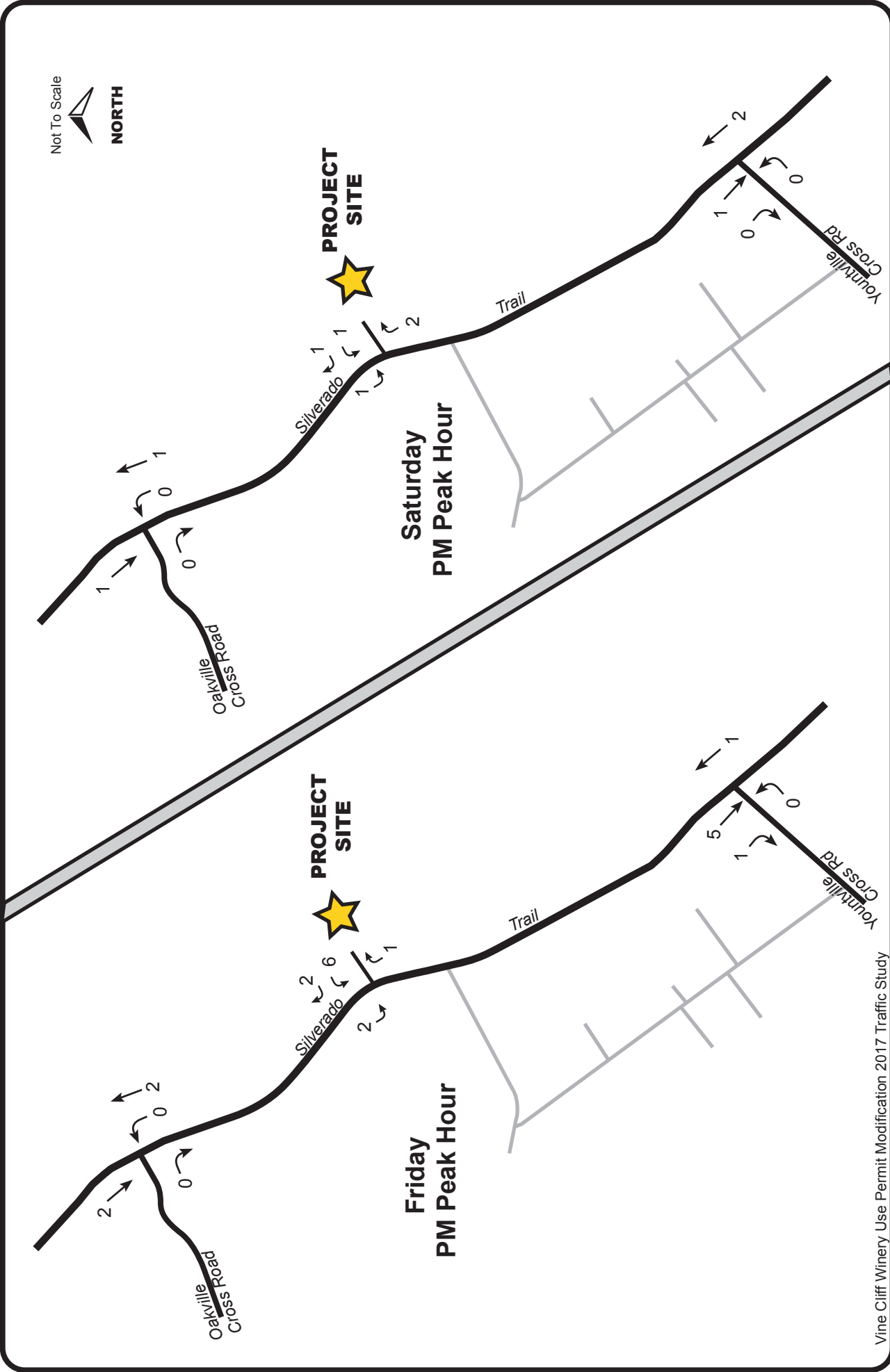
Figure 5

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

Not To Scale



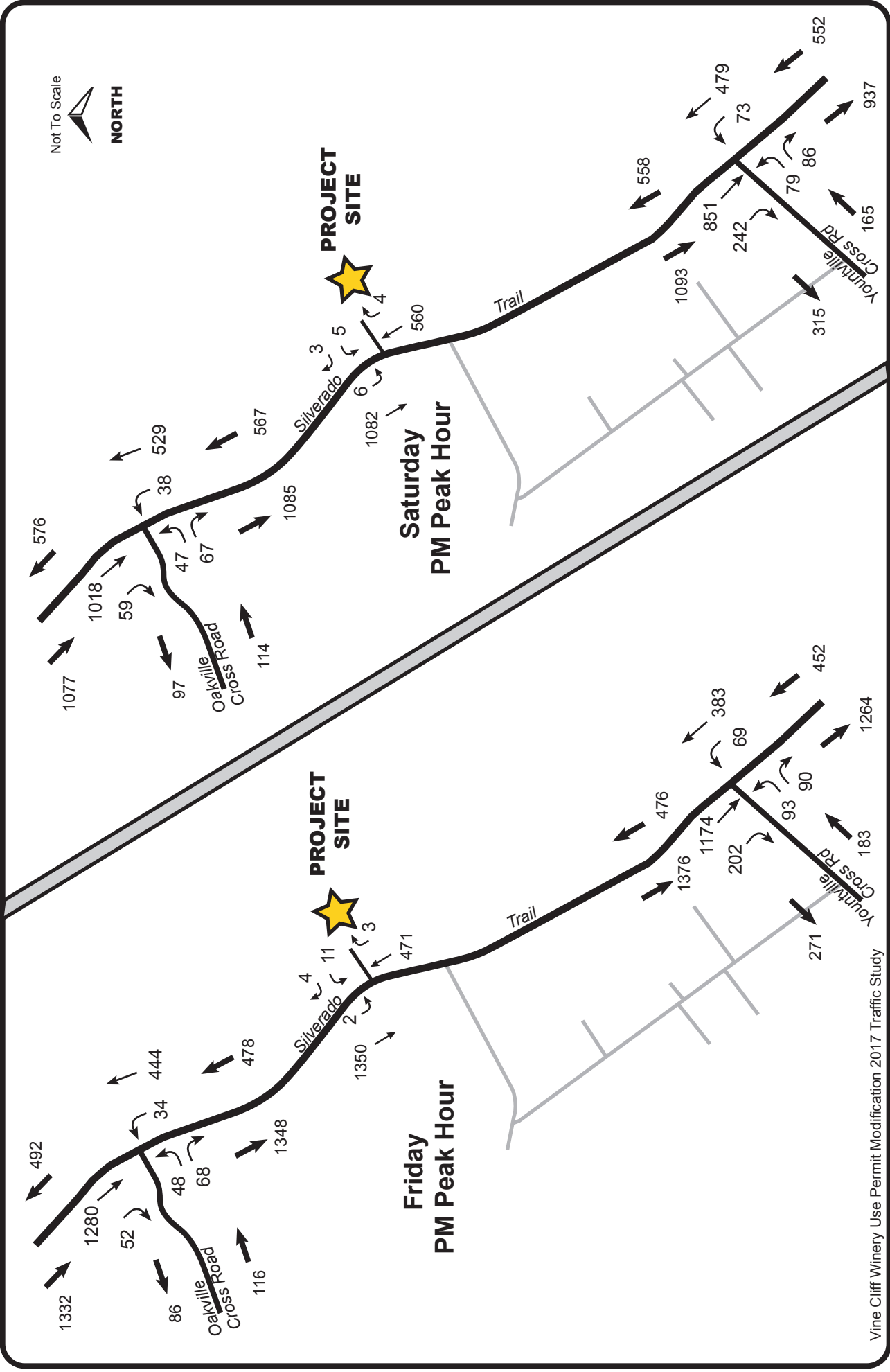
NORTH



Vine Cliff Winery Use Permit Modification 2017 Traffic Study

Figure 6

**Project Increment
Friday and Saturday PM Peak Hour Volumes**



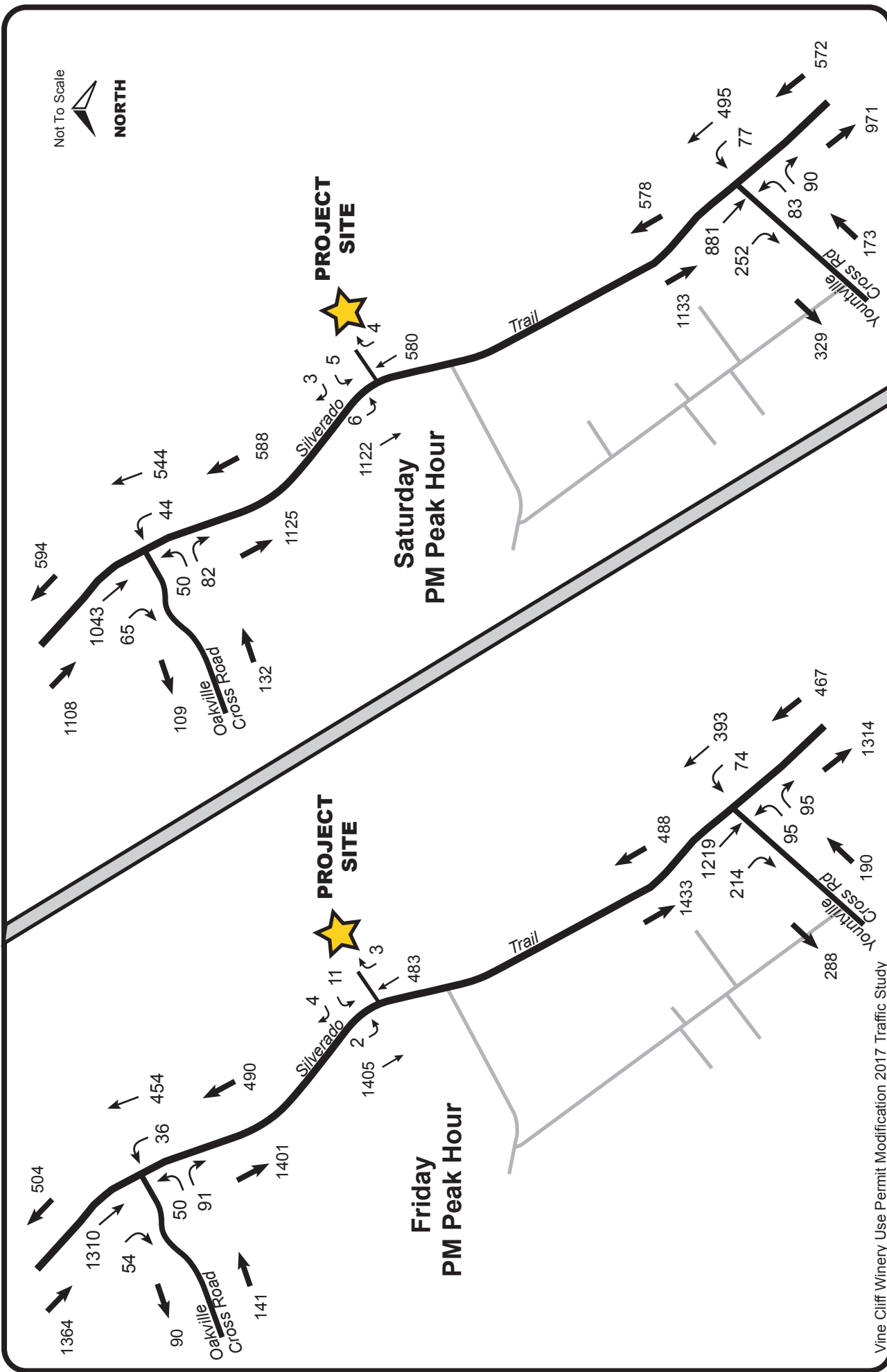
Vine Cliff Winery Use Permit Modification 2017 Traffic Study

Figure 7
2016 Harvest with Project
Friday and Saturday PM Peak Hour Volumes

Not To Scale



NORTH



Vine Cliff Winery Use Permit Modification 2017 Traffic Study



CRANE TRANSPORTATION GROUP

Figure 8

**2020 Harvest with Project
Friday and Saturday PM Peak Hour Volumes**

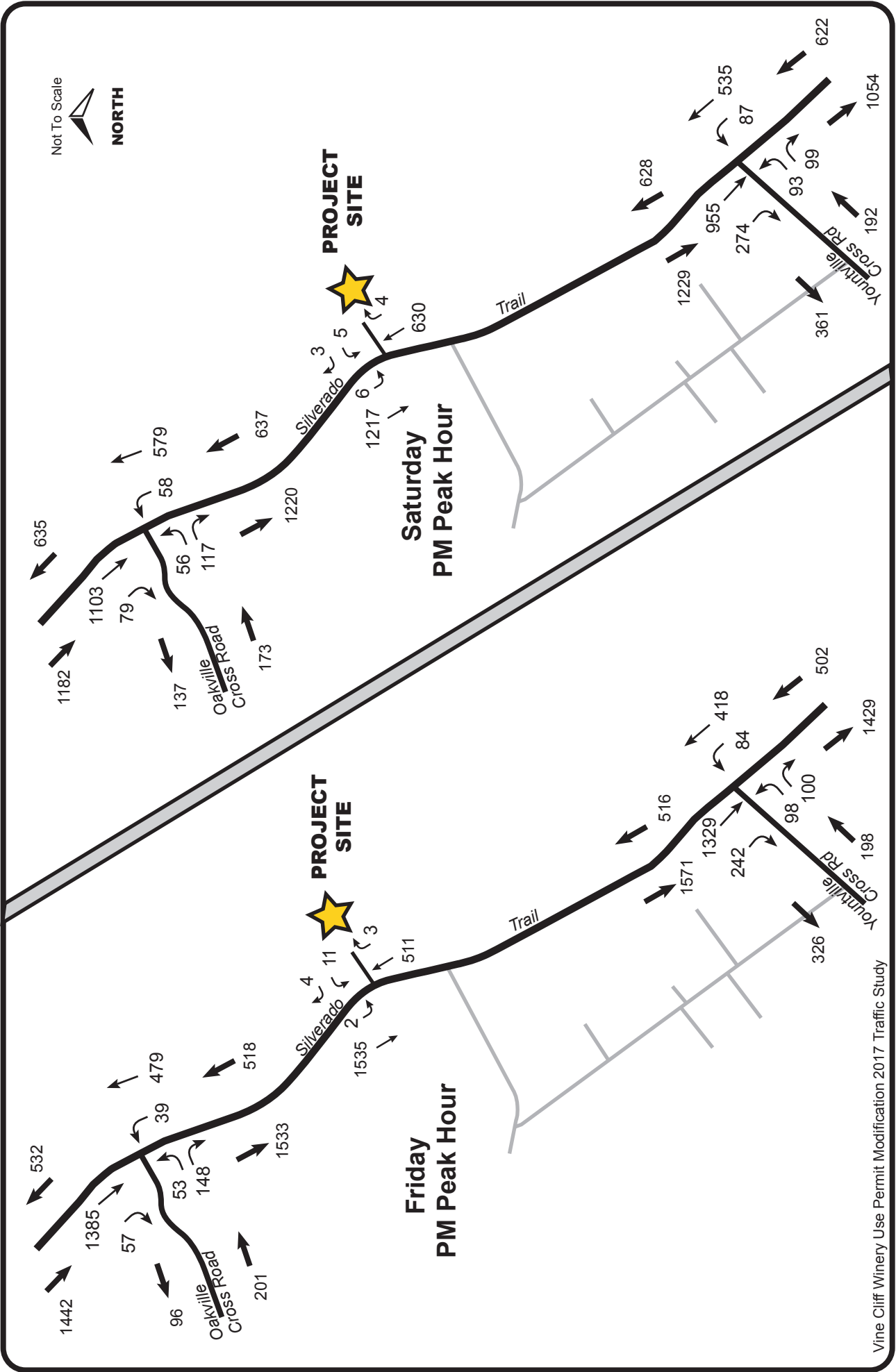


Figure 9
2030 Harvest with Project
Friday and Saturday PM Peak Hour Volumes

Vine Cliff Winery Use Permit Modification 2017 Traffic Study

Tables

Table 1

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: 2010 Highway Capacity Manual (Transportation Research Board).

Table 2

INTERSECTION LEVEL OF SERVICE

EXISTING – 2016 HARVEST

INTERSECTION	FRIDAY PM PEAK HOUR		SATURDAY PM PEAK HOUR	
	W/O PROJECT	WITH PROJECT	W/O PROJECT	WITH PROJECT
	Silverado Trail/Oakville Cross Road	F-94.8 ⁽¹⁾	F-95.0 [.2%] (0%)*	E-40.5
Silverado Trail/Yountville Cross Road	F-181.7 ⁽²⁾	F-186.4 [.3%] (0%)*	F-56.1	F-56.1 [.2%] (0%)*

YEAR 2020 HARVEST

INTERSECTION	FRIDAY PM PEAK HOUR		SATURDAY PM PEAK HOUR	
	W/O PROJECT	WITH PROJECT	W/O PROJECT	WITH PROJECT
	Silverado Trail/Oakville Cross Road	F-108.4 ⁽¹⁾	F-110.8 [.2%] (0%)*	E-45.7
Silverado Trail/Yountville Cross Road	F-233.8 ⁽²⁾	F-240.2 [.3%] (0%)*	F-69.9	F-71.2 [.2%] (0%)*

CUMULATIVE YEAR 2030 HARVEST

INTERSECTION	FRIDAY PM PEAK HOUR		SATURDAY PM PEAK HOUR	
	W/O PROJECT	WITH PROJECT	W/O PROJECT	WITH PROJECT
	Silverado Trail/Oakville Cross Road	F-202.6 ⁽¹⁾	F-207.9 [.2%] (0%)*	F-63.9
Silverado Trail/Yountville Cross Road	F-381.4 ⁽²⁾	F-381.8 [.3%] (0%)*	F-131.2	F-134.3 [.1%] (0%)*

- (1) Unsignalized level of service – control delay in seconds: Oakville Cross Rd. stop sign controlled approach.
 (2) Unsignalized level of service – control delay in seconds: Yountville Cross Rd. stop sign controlled approach.

* [xx] – Percent project traffic added to intersection. Less than a 1% increase is not considered a significant impact.
 (xx) – Percent project traffic added to the side street stop sign controlled approach. Less than a 10% increase is not considered a significant impact.

Theoretical control delay results above 120 seconds with LOS F operation are presented for “with” versus “without” project comparison purposes only. Doubtful if some drivers would wait this long to make a left turn.

Year 2010 Highway Capacity Manual (HCM) Analysis Methodology for unsignalized intersections
 Source: Crane Transportation Group

Table 3

INTERSECTION SIGNAL WARRANT EVALUATION

Do Volumes Meet Caltrans Peak Hour Warrant #3 Volume Criteria Levels?

EXISTING – 2016 HARVEST

INTERSECTION	FRIDAY PM PEAK HOUR		SATURDAY PM PEAK HOUR	
	W/O PROJECT	WITH PROJECT	W/O PROJECT	WITH PROJECT
Silverado Trail/Oakville Cross Road	Yes	Yes	Yes	Yes
Silverado Trail/Yountville Cross Road	Yes	Yes	Yes	Yes

YEAR 2020 HARVEST

INTERSECTION	FRIDAY PM PEAK HOUR		SATURDAY PM PEAK HOUR	
	W/O PROJECT	WITH PROJECT	W/O PROJECT	WITH PROJECT
Silverado Trail/Oakville Cross Road	Yes	Yes	Yes	Yes
Silverado Trail/Yountville Cross Road	Yes	Yes	Yes	Yes

CUMULATIVE (YEAR 2030) HARVEST

INTERSECTION	FRIDAY PM PEAK HOUR		SATURDAY PM PEAK HOUR	
	W/O PROJECT	WITH PROJECT	W/O PROJECT	WITH PROJECT
Silverado Trail/Oakville Cross Road	Yes	Yes	Yes	Yes
Silverado Trail/Yountville Cross Road	Yes	Yes	Yes	Yes

Criteria: Caltrans Manual of Uniform Traffic Control Devices, 2014.

Source: Crane Transportation Group

Table 4

**PROJECT TRIP GENERATION
VINE CLIFF WINERY USE PERMIT MODIFICATION 2017**

HARVEST

FRIDAY

NEW EMPLOYEES OR VISITORS	NET NEW	HOURS	TRIPS							
			3-4 PM		4-5 PM		5-6 PM		3:15-4:15 PM*	
			IN	OUT	IN	OUT	IN	OUT	IN	OUT
Administrative Employees – Full Time	5	9:00 AM-4:00 PM	0	0	0	+5	0	0	0	+5
Production Employees – Part Time	4	6:00 AM-3:00 PM	0	+4	0	0	0	0	0	0
Tours/Tasting Employees (increase from 1 to 2 employees)	1	10:00 AM-6:00 PM	0	0	0	0	0	0	0	0
Visitor increase & change in visitation hours from 10:00 AM-5:00 PM to 10:00 AM-6:00 PM	+46 visitors/day (18 vehicles/day) ⁽¹⁾	10:00 AM-6:00 PM	+3	+3	+3	+3	0	+3	+3	+3
TOTAL			+3	+7	+3	+8	0	+3	+3	+8

* Peak traffic hours at Silverado Trail intersections with Yountville Cross Road and Oakville Cross Road.

⁽¹⁾ 2.6 visitors/vehicle average on weekdays per County data.

Source: Vine Cliff Winery project applicant; Compiled by: Crane Transportation Group

Table 5

**PROJECT TRIP GENERATION
VINE CLIFF WINERY USE PERMIT MODIFICATION 2017**

HARVEST

SATURDAY

NEW EMPLOYEES OR VISITORS	NET NEW	HOURS	TRIPS												
			1-2 PM		2-3 PM		3-4 PM		4-5 PM		5-6 PM		3:30-4:30 PM*		
			IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	
Production Employees – Part Time	2	6:00 AM-3:00 PM	0	0	0	0	0	2	0	0	0	0	0	0	0
Tours/Tasting Employees (increase from 1 to 4 employees)	3	10:00 AM-6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Visitor increase & increase visitation hours from 10:00 AM-5:00 PM to 10:00 AM-6:00 PM	+46 visitors/day (17 vehicles/day) ⁽¹⁾	10:00 AM-6:00 PM	+2	+2	+2	+2	+3	+2	+3	+3	0	+3	+3	+2	
TOTAL			+2	+2	+2	+2	+3	+4	+3	+3	0	+3	+3	+2	

* Peak traffic hours at Silverado Trail intersections with Yountville Cross Road and Oakville Cross Road.

⁽¹⁾ 2.8 visitors/vehicle average on weekdays per County data.

Source: Vine Cliff Winery project applicant; Compiled by: Crane Transportation Group

Table 6

**SUMMARY OF VINE CLIFF WINERY
USE PERMIT MODIFICATION 2017
TRIP GENERATION**

FRIDAY PM PEAK HOUR TRIPS		SATURDAY AFTERNOON PEAK HOUR TRIPS	
IN	OUT	IN	OUT
3	8	3	2

Compiled by: Crane Transportation Group

Table 7

**VINE CLIFF WINERY USE PERMIT MODIFICATION 2017
MARKETING EVENT TRAFFIC DETAILS**

MARKETING EVENT	STAFF/GUEST CATEGORY	# OF PEOPLE	# OF VEHICLES	TIMES	REGULAR VISITATION ELIMINATED DURING MARKETING EVENT?
6/year	Guests	100	36-39	11:00 AM-2:30 PM	Yes
	Extra Winery Staff	2	2	6:00-10:00 PM	
	Caterers	1	1		
	Entertainers				
	Delivery vehicles				

Source: Vine Cliff Winery applicant

Appendix

Appendix

VINE CLIFF WINERY USE PERMIT MODIFICATION 2017 TRAFFIC ACTIVITY DETAILS – HARVEST

Existing Gallons/Year Production: 48,000 gallons/year

Project Increment Gallons/Year: 0 additional gallons due to the project

1st Year of Expected Full Production After Project Completion: 2019

EXISTING HARVEST	PROJECT INCREMENT (DURING HARVEST)*
<p>A. Full-time admin employees # on Weekdays <u> 3 </u> # on Saturday <u> 0 </u> # on Sunday <u> 0 </u> Work hours: Weekday 9:00 AM to 4:00 PM Saturday N/A Sunday N/A</p>	<p>New Full-time admin employees # on Weekdays <u> 5 </u> # on Saturday <u> 0 </u> # on Sunday <u> 0 </u> Work hours: Weekday 9:00 AM to 4:00 PM Saturday N/A Sunday N/A</p>
<p>B. Part-time admin employees # on Weekdays <u> 0 </u> # on Saturday <u> 0 </u> # on Sunday <u> 0 </u> Work hours: Weekday N/A Saturday N/A Sunday N/A</p>	<p>New part-time admin employees # on Weekdays <u> 0 </u> # on Saturday <u> 0 </u> # on Sunday <u> 0 </u> Work hours: Weekday N/A Saturday N/A Sunday N/A</p>
<p>C. Full-time production employees # on Weekdays <u> 3 </u> # on Saturday <u> 3 </u> # on Sunday <u> 3 </u> Work hours: Weekday 6:00 AM to 3:00 PM Saturday 6:00 AM to 3:00 PM Sunday 6:00 AM to 3:00 PM</p>	<p>New full-time production employees # on Weekdays <u> 0 </u> # on Saturday <u> 0 </u> # on Sunday <u> 0 </u> Work hours: Weekday N/A Saturday N/A Sunday N/A</p>
<p>D. Part-time production employees # on Weekdays <u> 2 </u> # on Saturday <u> 2 </u> # on Sunday <u> 2 </u> Work hours: Weekday 6:00 AM to 3:00 PM Saturday 6:00 AM to 3:00 PM Sunday 6:00 AM to 3:00 PM</p>	<p>New part-time production employees # on Weekdays <u> 4 </u> # on Saturday <u> 2 </u> # on Sunday <u> 2 </u> Work hours: Weekday 6:00 AM to 3:00 PM Saturday 6:00 AM to 3:00 PM Sunday 6:00 AM to 3:00 PM</p>

* This is the added employees, trucks & visitors due only to the project. This is NOT the Existing + Project total.

Appendix

VINE CLIFF WINERY USE PERMIT MODIFICATION 2017 TRAFFIC ACTIVITY DETAILS – HARVEST

EXISTING HARVEST	PROJECT INCREMENT (DURING HARVEST)*
<p>E. Tours & tasting employees # on Weekdays <u> 1 </u> # on Saturday <u> 1 </u> # on Sunday <u> 1 </u> Work hours: Weekday 10:00 AM to 6:00 PM Saturday 10:00 AM to 6:00 PM Sunday 10:00 AM to 6:00 PM</p>	<p>New tours & tasting employees # on Weekdays <u> 1 </u> # on Saturday <u> 3 </u> # on Sunday <u> 3 </u> Work hours: Weekday 10:00 AM to 6:00 PM Saturday 10:00 AM to 6:00 PM Sunday 10:00 AM to 6:00 PM</p>
<p>F. Maximum tours/tasting visitors # on Weekdays <u> 4 </u> # on Saturday <u> 4 </u> # on Sunday <u> 4 </u> Tasting hours: Weekday 10:00 AM to 5:00 PM Saturday 10:00 AM to 5:00 PM Sunday 10:00 AM to 5:00 PM</p>	<p>New maximum tours/tasting visitors # on Weekdays <u> 46 </u> # on Saturday <u> 46 </u> # on Sunday <u> 46 </u> Tasting hours: Weekday 10:00 AM to 6:00 PM Saturday 10:00 AM to 6:00 PM Sunday 10:00 AM to 6:00 PM</p>
<p>G. Other trucks # on Weekdays <u> 1 </u> # on Saturday <u> 0 </u> # on Sunday <u> 0 </u> Delivery hours: Weekday 9:00 AM to 5:00 PM Saturday N/A Sunday N/A</p>	<p>New other trucks # on Weekdays <u> 0 </u> # on Saturday <u> 0 </u> # on Sunday <u> 0 </u> Delivery hours: Weekday N/A Saturday N/A Sunday N/A</p>

* This is the added employees, trucks & visitors due only to the project. This is NOT the Existing + Project total.

Appendix

VINE CLIFF WINERY USE PERMIT MODIFICATION 2017 TRAFFIC ACTIVITY DETAILS – HARVEST

H. **Grape Delivery**

No new traffic.

I. **Elimination of Existing Grape Outhaul Truck Trips**

There will be no elimination of any grape outhaul truck trips due to the proposed project.

J. **Marketing Events During the Year**

Six new events with 100 guests each. Could occur any day of the week and would be scheduled to preclude traffic on the local roadway system between 3:00 and 5:30 PM.

K. **Bottling – No expanded production**

No new bottling.

Appendix

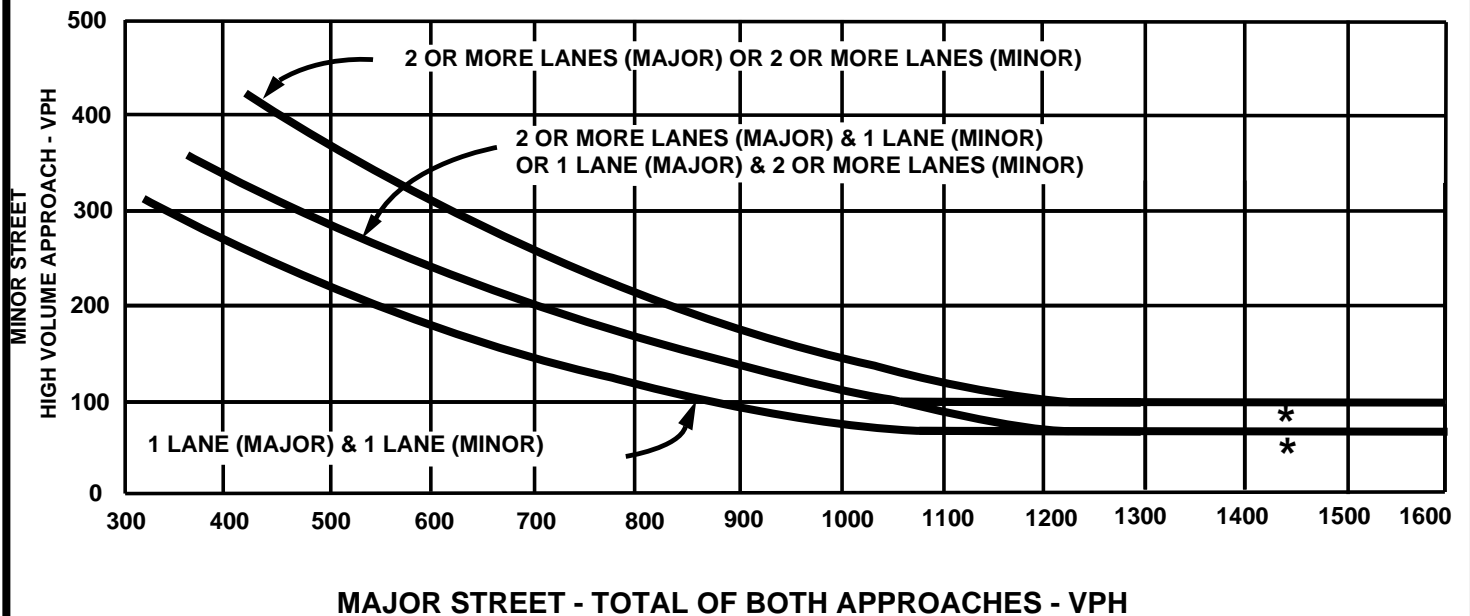
TRAFFIC VOLUMES ON VINE CLIFF WINERY DRIVEWAY

FRIDAY, NOV. 18 & SATURDAY, DEC. 3, 2016

	INBOUND	OUTBOUND	TOTAL
<i>Friday, Nov. 18, 2016</i>			
3:00-4:00 PM	2	6	8
4:00-5:00 PM	2	3	5
5:00-6:00 PM	0	1	1
<i>Saturday, December 3, 2016</i>			
12:00-1:00 PM	1	0	1
1:00-2:00 PM	2	2	4
2:00-3:00 PM	0	1	1
3:00-4:00 PM	3	1	4
4:00-5:00 PM	2	3	5

Source: Crane Transportation Group

PEAK HOUR VOLUME WARRANT #3 (Rural Area)



*** 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

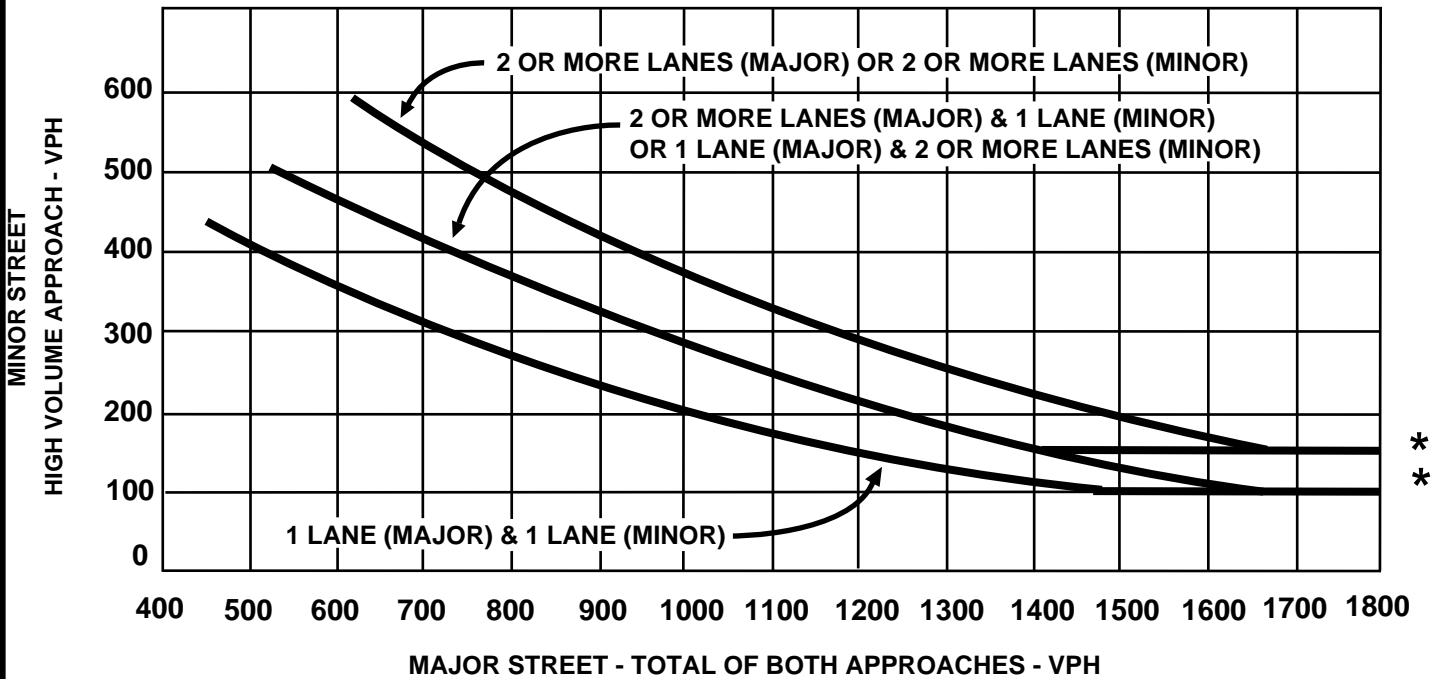
Source: California Manual on Uniform Traffic Control Devices, 2010



CRANE TRANSPORTATION GROUP

Rural Area Peak Hour Volume Warrant #3

PEAK HOUR VOLUME WARRANT #3 (Urban Area)



*** NOTE**

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

Source: California Manual on Uniform Traffic Control Devices, 2010



CRANE TRANSPORTATION GROUP

Urban Area Peak Hour Volume Warrant #3

TECHNICAL APPENDIX

Capacity Worksheets

Year 2016

Intersection

Int Delay, s/veh 5.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↘	↗	↘	↗	↗	↗
Traffic Vol, veh/h	48	68	34	442	1278	52
Future Vol, veh/h	48	68	34	442	1278	52
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	-	-	75
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	2	0	0	2	2	4
Mvmt Flow	53	75	37	486	1404	57

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	1964	1404	0
Stage 1	1404	-	-
Stage 2	560	-	-
Critical Hdwy	6.42	6.2	4.1
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.3	2.2
Pot Cap-1 Maneuver	69	173	493
Stage 1	227	-	-
Stage 2	572	-	-
Platoon blocked, %			-
Mov Cap-1 Maneuver	64	173	493
Mov Cap-2 Maneuver	64	-	-
Stage 1	227	-	-
Stage 2	529	-	-

Approach	EB	NB	SB
HCM Control Delay, s	94.8	0.9	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBTLn1	EBLn2	SBT	SBR
Capacity (veh/h)	493	-	64 173	-	-
HCM Lane V/C Ratio	0.076	-0.824	0.432	-	-
HCM Control Delay (s)	12.9	-171.4	40.8	-	-
HCM Lane LOS	B	-	F E	-	-
HCM 95th %tile Q(veh)	0.2	-	3.8 2	-	-

Intersection

Int Delay, s/veh 17

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↘	↗	↘	↗	↗	↗
Traffic Vol, veh/h	93	90	69	382	1169	201
Future Vol, veh/h	93	90	69	382	1169	201
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	250	-	-	75
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	4	4	4	1	2	4
Mvmt Flow	100	97	74	411	1257	216

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	1816	1257	0
Stage 1	1257	-	-
Stage 2	559	-	-
Critical Hdwy	6.44	6.24	4.14
Critical Hdwy Stg 1	5.44	-	-
Critical Hdwy Stg 2	5.44	-	-
Follow-up Hdwy	3.536	3.336	2.236
Pot Cap-1 Maneuver	~ 85	207	547
Stage 1	265	-	-
Stage 2	568	-	-
Platoon blocked, %			-
Mov Cap-1 Maneuver	~ 74	207	547
Mov Cap-2 Maneuver	~ 74	-	-
Stage 1	265	-	-
Stage 2	491	-	-

Approach	EB	NB	SB
HCM Control Delay, s	181.7	1.9	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBTLn1	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	547	-	74	207	-	-
HCM Lane V/C Ratio	0.136	-	1.351	0.468	-	-
HCM Control Delay (s)	12.6	-	\$ 322	36.8	-	-
HCM Lane LOS	B	-	F	E	-	-
HCM 95th %tile Q(veh)	0.5	-	8	2.3	-	-

Notes

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

Intersection

Int Delay, s/veh 5.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↘	↗	↘	↗	↗	↗
Traffic Vol, veh/h	48	68	34	444	1280	52
Future Vol, veh/h	48	68	34	444	1280	52
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	-	-	75
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	2	0	0	2	2	4
Mvmt Flow	53	75	37	488	1407	57

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	1970	1407	0
Stage 1	1407	-	-
Stage 2	563	-	-
Critical Hdwy	6.42	6.2	4.1
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.3	2.2
Pot Cap-1 Maneuver	69	172	491
Stage 1	226	-	-
Stage 2	570	-	-
Platoon blocked, %			-
Mov Cap-1 Maneuver	64	172	491
Mov Cap-2 Maneuver	64	-	-
Stage 1	226	-	-
Stage 2	527	-	-

Approach	EB	NB	SB
HCM Control Delay, s	95	0.9	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBTLn1	EBLn2	SBT	SBR
Capacity (veh/h)	491	-	64 172	-	-
HCM Lane V/C Ratio	0.076	-0.824	0.434	-	-
HCM Control Delay (s)	12.9	-171.4	41.1	-	-
HCM Lane LOS	B	-	F E	-	-
HCM 95th %tile Q(veh)	0.2	-	3.8 2	-	-

Intersection

Int Delay, s/veh 29.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↘	↗	↘	↗	↗	↗
Traffic Vol, veh/h	93	90	69	383	1174	202
Future Vol, veh/h	93	90	69	383	1174	202
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	250	-	-	75
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	4	4	4	1	2	4
Mvmt Flow	100	97	74	412	1262	217

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	1822	1262	0
Stage 1	1262	-	-
Stage 2	560	-	-
Critical Hdwy	7.14	6.24	-
Critical Hdwy Stg 1	6.14	-	-
Critical Hdwy Stg 2	6.14	-	-
Follow-up Hdwy	3.536	3.336	-
Pot Cap-1 Maneuver	~ 59	205	-
Stage 1	206	-	-
Stage 2	509	-	-
Platoon blocked, %			-
Mov Cap-1 Maneuver	~ 53	205	-
Mov Cap-2 Maneuver	~ 53	-	-
Stage 1	178	-	-
Stage 2	440	-	-

Approach	EB	NB	SB
HCM Control Delay, s	\$ 315.5	1.9	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBTLn1	EBLn2	SBT	SBR
Capacity (veh/h)	544	-	53 205	-	-
HCM Lane V/C Ratio	0.136	-	1.887 0.472	-	-
HCM Control Delay (s)	12.7	\$	584.7 37.3	-	-
HCM Lane LOS	B	-	F E	-	-
HCM 95th %tile Q(veh)	0.5	-	9.7 2.3	-	-

Notes

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

Intersection

Int Delay, s/veh 2.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↘	↗	↘	↗	↗	↗
Traffic Vol, veh/h	47	67	38	529	1018	59
Future Vol, veh/h	47	67	38	529	1018	59
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	-	-	75
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	98	98	98	98	98	98
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	48	68	39	540	1039	60

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	1656	1039	0
Stage 1	1039	-	-
Stage 2	617	-	-
Critical Hdwy	6.4	6.2	4.1
Critical Hdwy Stg 1	5.4	-	-
Critical Hdwy Stg 2	5.4	-	-
Follow-up Hdwy	3.5	3.3	2.2
Pot Cap-1 Maneuver	109	283	677
Stage 1	344	-	-
Stage 2	542	-	-
Platoon blocked, %			-
Mov Cap-1 Maneuver	103	283	677
Mov Cap-2 Maneuver	103	-	-
Stage 1	344	-	-
Stage 2	511	-	-

Approach	EB	NB	SB
HCM Control Delay, s	40.5	0.7	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	677	-	103	283	-	-
HCM Lane V/C Ratio	0.057	-	0.466	0.242	-	-
HCM Control Delay (s)	10.6	-	67.3	21.7	-	-
HCM Lane LOS	B	-	F	C	-	-
HCM 95th %tile Q(veh)	0.2	-	2	0.9	-	-

Intersection

Int Delay, s/veh 5.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↘	↗	↘	↗	↗	↗
Traffic Vol, veh/h	79	86	73	479	851	242
Future Vol, veh/h	79	86	73	479	851	242
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	250	-	-	75
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	83	91	77	504	896	255

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	1554	896	896	0	-
Stage 1	896	-	-	-	-
Stage 2	658	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-
Pot Cap-1 Maneuver	126	342	766	-	-
Stage 1	402	-	-	-	-
Stage 2	519	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	113	342	766	-	-
Mov Cap-2 Maneuver	113	-	-	-	-
Stage 1	402	-	-	-	-
Stage 2	467	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	56.1	1.4	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NB	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	766	-	113	342	-	-
HCM Lane V/C Ratio	0.1	-	0.736	0.265	-	-
HCM Control Delay (s)	10.2	-	96.1	19.3	-	-
HCM Lane LOS	B	-	F	C	-	-
HCM 95th %tile Q(veh)	0.3	-	4	1	-	-

Intersection

Int Delay, s/veh 2.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↘	↗	↘	↗	↗	↗
Traffic Vol, veh/h	47	67	38	528	1017	59
Future Vol, veh/h	47	67	38	528	1017	59
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	-	-	75
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	98	98	98	98	98	98
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	48	68	39	539	1038	60

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	1654	1038	0
Stage 1	1038	-	-
Stage 2	616	-	-
Critical Hdwy	6.4	6.2	4.1
Critical Hdwy Stg 1	5.4	-	-
Critical Hdwy Stg 2	5.4	-	-
Follow-up Hdwy	3.5	3.3	2.2
Pot Cap-1 Maneuver	109	283	678
Stage 1	344	-	-
Stage 2	543	-	-
Platoon blocked, %			-
Mov Cap-1 Maneuver	103	283	678
Mov Cap-2 Maneuver	103	-	-
Stage 1	344	-	-
Stage 2	512	-	-

Approach	EB	NB	SB
HCM Control Delay, s	40.5	0.7	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBL	NBE	NBLn1	NBLn2	SBT	SBR
Capacity (veh/h)	678	-	103	283	-	-
HCM Lane V/C Ratio	0.057	-	0.466	0.242	-	-
HCM Control Delay (s)	10.6	-	67.3	21.7	-	-
HCM Lane LOS	B	-	F	C	-	-
HCM 95th %tile Q(veh)	0.2	-	2	0.9	-	-

Intersection

Int Delay, s/veh 5.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↘	↗	↘	↗	↗	↗
Traffic Vol, veh/h	79	86	73	477	850	242
Future Vol, veh/h	79	86	73	477	850	242
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	250	-	-	75
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	83	91	77	502	895	255

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	1551	895	895	0	-
Stage 1	895	-	-	-	-
Stage 2	656	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-
Pot Cap-1 Maneuver	126	342	767	-	-
Stage 1	402	-	-	-	-
Stage 2	520	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	113	342	767	-	-
Mov Cap-2 Maneuver	113	-	-	-	-
Stage 1	402	-	-	-	-
Stage 2	468	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	56.1	1.4	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NB	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	767	-	113	342	-	-
HCM Lane V/C Ratio	0.1	-	0.736	0.265	-	-
HCM Control Delay (s)	10.2	-	96.1	19.3	-	-
HCM Lane LOS	B	-	F	C	-	-
HCM 95th %tile Q(veh)	0.3	-	4	1	-	-

Year 2020

Intersection

Int Delay, s/veh 7.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↘	↗	↘	↗	↗	↗
Traffic Vol, veh/h	50	91	36	452	1308	54
Future Vol, veh/h	50	91	36	452	1308	54
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	-	-	75
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	2	0	0	2	2	4
Mvmt Flow	55	100	40	497	1437	59

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	2013	1437	0
Stage 1	1437	-	-
Stage 2	576	-	-
Critical Hdwy	6.42	6.2	4.1
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.3	2.2
Pot Cap-1 Maneuver	65	165	479
Stage 1	219	-	-
Stage 2	562	-	-
Platoon blocked, %			-
Mov Cap-1 Maneuver	60	165	479
Mov Cap-2 Maneuver	60	-	-
Stage 1	219	-	-
Stage 2	515	-	-

Approach	EB	NB	SB
HCM Control Delay, s	108.4	1	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBTLn1	EBLn2	SBT	SBR
Capacity (veh/h)	479	-	60 165	-	-
HCM Lane V/C Ratio	0.083	-0.916	0.606	-	-
HCM Control Delay (s)	13.2	-204.4	55.7	-	-
HCM Lane LOS	B	-	F F	-	-
HCM 95th %tile Q(veh)	0.3	-	4.2 3.3	-	-

Intersection

Int Delay, s/veh 21.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↘	↗	↘	↗	↗	↗
Traffic Vol, veh/h	95	95	74	392	1214	213
Future Vol, veh/h	95	95	74	392	1214	213
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	250	-	-	75
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	4	4	4	1	2	4
Mvmt Flow	102	102	80	422	1305	229

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	1886	1305	1305 0
Stage 1	1305	-	- -
Stage 2	581	-	- -
Critical Hdwy	6.44	6.24	4.14 -
Critical Hdwy Stg 1	5.44	-	- -
Critical Hdwy Stg 2	5.44	-	- -
Follow-up Hdwy	3.536	3.336	2.236 -
Pot Cap-1 Maneuver	~ 77	194	524 -
Stage 1	251	-	- -
Stage 2	555	-	- -
Platoon blocked, %			- -
Mov Cap-1 Maneuver	~ 65	194	524 -
Mov Cap-2 Maneuver	~ 65	-	- -
Stage 1	251	-	- -
Stage 2	470	-	- -

Approach	EB	NB	SB
HCM Control Delay, s	233.8	2.1	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBTLn1	EBLn2	SBT	SBR
Capacity (veh/h)	524	-	65 194	-	-
HCM Lane V/C Ratio	0.152	-	1.572 0.527	-	-
HCM Control Delay (s)	13.1	-	\$ 425 42.5	-	-
HCM Lane LOS	B	-	F E	-	-
HCM 95th %tile Q(veh)	0.5	-	8.9 2.7	-	-

Notes

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

Intersection

Int Delay, s/veh 8.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↘	↗	↘	↗	↗	↗
Traffic Vol, veh/h	50	91	36	452	1310	54
Future Vol, veh/h	50	91	36	452	1310	54
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	-	-	75
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	2	0	0	2	2	4
Mvmt Flow	55	100	40	497	1440	59

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	2016	1440	0
Stage 1	1440	-	-
Stage 2	576	-	-
Critical Hdwy	6.42	6.2	4.1
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.3	2.2
Pot Cap-1 Maneuver	64	165	477
Stage 1	218	-	-
Stage 2	562	-	-
Platoon blocked, %			-
Mov Cap-1 Maneuver	59	165	477
Mov Cap-2 Maneuver	59	-	-
Stage 1	218	-	-
Stage 2	515	-	-

Approach	EB	NB	SB
HCM Control Delay, s	110.8	1	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NB	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	477	-	59	165	-	-
HCM Lane V/C Ratio	0.083	-	0.931	0.606	-	-
HCM Control Delay (s)	13.2	-	211.2	55.7	-	-
HCM Lane LOS	B	-	F	F	-	-
HCM 95th %tile Q(veh)	0.3	-	4.3	3.3	-	-

Intersection

Int Delay, s/veh 36.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↘	↗	↘	↗	↗	↗
Traffic Vol, veh/h	95	95	74	393	1219	214
Future Vol, veh/h	95	95	74	393	1219	214
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	250	-	-	75
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	4	4	4	1	2	4
Mvmt Flow	102	102	80	423	1311	230

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	1893	1311	0
Stage 1	1311	-	-
Stage 2	582	-	-
Critical Hdwy	7.14	6.24	-
Critical Hdwy Stg 1	6.14	-	-
Critical Hdwy Stg 2	6.14	-	-
Follow-up Hdwy	3.536	3.336	-
Pot Cap-1 Maneuver	~ 52	192	-
Stage 1	194	-	-
Stage 2	495	-	-
Platoon blocked, %			-
Mov Cap-1 Maneuver	~ 46	192	-
Mov Cap-2 Maneuver	~ 46	-	-
Stage 1	164	-	-
Stage 2	419	-	-

Approach	EB	NB	SB
HCM Control Delay, s \$	396.6	2.1	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBEBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	521	-	46 192	-	-
HCM Lane V/C Ratio	0.153	-	2.221 0.532	-	-
HCM Control Delay (s)	13.2	\$	749.9 43.3	-	-
HCM Lane LOS	B	-	F E	-	-
HCM 95th %tile Q(veh)	0.5	-	10.6 2.7	-	-

Notes

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

Intersection

Int Delay, s/veh 3.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↘	↗	↘	↗	↗	↘
Traffic Vol, veh/h	50	82	44	544	1042	65
Future Vol, veh/h	50	82	44	544	1042	65
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	-	-	75
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	98	98	98	98	98	98
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	51	84	45	555	1063	66

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	1708	1063	0
Stage 1	1063	-	-
Stage 2	645	-	-
Critical Hdwy	6.4	6.2	4.1
Critical Hdwy Stg 1	5.4	-	-
Critical Hdwy Stg 2	5.4	-	-
Follow-up Hdwy	3.5	3.3	2.2
Pot Cap-1 Maneuver	101	274	663
Stage 1	335	-	-
Stage 2	526	-	-
Platoon blocked, %			-
Mov Cap-1 Maneuver	94	274	663
Mov Cap-2 Maneuver	94	-	-
Stage 1	335	-	-
Stage 2	490	-	-

Approach	EB	NB	SB
HCM Control Delay, s	45.7	0.8	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBL	NBTLn1	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	663	-	94	274	-	-
HCM Lane V/C Ratio	0.068	-	0.543	0.305	-	-
HCM Control Delay (s)	10.8	-	81.6	23.8	-	-
HCM Lane LOS	B	-	F	C	-	-
HCM 95th %tile Q(veh)	0.2	-	2.4	1.3	-	-

Intersection

Int Delay, s/veh 11.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↘	↗	↘	↗	↗	↗
Traffic Vol, veh/h	83	90	77	495	881	252
Future Vol, veh/h	83	90	77	495	881	252
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	250	-	-	75
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	87	95	81	521	927	265

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	1610	927	927	0	-
Stage 1	927	-	-	-	-
Stage 2	683	-	-	-	-
Critical Hdwy	7.1	6.2	4.1	-	-
Critical Hdwy Stg 1	6.1	-	-	-	-
Critical Hdwy Stg 2	6.1	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-
Pot Cap-1 Maneuver	~ 85	328	746	-	-
Stage 1	324	-	-	-	-
Stage 2	442	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	~ 78	328	746	-	-
Mov Cap-2 Maneuver	~ 78	-	-	-	-
Stage 1	289	-	-	-	-
Stage 2	394	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	122.4	1.4	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBTLn1	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	746	-	78	328	-	-
HCM Lane V/C Ratio	0.109	-	1.12	0.289	-	-
HCM Control Delay (s)	10.4	-	233.1	20.4	-	-
HCM Lane LOS	B	-	F	C	-	-
HCM 95th %tile Q(veh)	0.4	-	6.3	1.2	-	-

Notes

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

Intersection

Int Delay, s/veh 3.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↘	↗	↘	↗	↗	↗
Traffic Vol, veh/h	50	82	44	543	1042	65
Future Vol, veh/h	50	82	44	543	1042	65
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	-	-	75
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	98	98	98	98	98	98
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	51	84	45	554	1063	66

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	1707	1063	0
Stage 1	1063	-	-
Stage 2	644	-	-
Critical Hdwy	6.4	6.2	4.1
Critical Hdwy Stg 1	5.4	-	-
Critical Hdwy Stg 2	5.4	-	-
Follow-up Hdwy	3.5	3.3	2.2
Pot Cap-1 Maneuver	101	274	663
Stage 1	335	-	-
Stage 2	527	-	-
Platoon blocked, %			-
Mov Cap-1 Maneuver	94	274	663
Mov Cap-2 Maneuver	94	-	-
Stage 1	335	-	-
Stage 2	491	-	-

Approach	EB	NB	SB
HCM Control Delay, s	45.7	0.8	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	663	-	94	274	-	-
HCM Lane V/C Ratio	0.068	-	0.543	0.305	-	-
HCM Control Delay (s)	10.8	-	81.6	23.8	-	-
HCM Lane LOS	B	-	F	C	-	-
HCM 95th %tile Q(veh)	0.2	-	2.4	1.3	-	-

Intersection

Int Delay, s/veh 6.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↘	↗	↘	↗	↗	↗
Traffic Vol, veh/h	83	90	77	493	880	252
Future Vol, veh/h	83	90	77	493	880	252
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	250	-	-	75
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	87	95	81	519	926	265

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	1607	926	926	0	-
Stage 1	926	-	-	-	-
Stage 2	681	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-
Pot Cap-1 Maneuver	117	329	746	-	-
Stage 1	389	-	-	-	-
Stage 2	506	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	104	329	746	-	-
Mov Cap-2 Maneuver	104	-	-	-	-
Stage 1	389	-	-	-	-
Stage 2	451	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	69.9	1.4	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NB	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	746	-	104	329	-	-
HCM Lane V/C Ratio	0.109	-	0.84	0.288	-	-
HCM Control Delay (s)	10.4	-	123.6	20.3	-	-
HCM Lane LOS	B	-	F	C	-	-
HCM 95th %tile Q(veh)	0.4	-	4.8	1.2	-	-

Year 2030

Intersection

Int Delay, s/veh 19.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↘	↗	↘	↗	↗	↗
Traffic Vol, veh/h	53	148	39	477	1383	57
Future Vol, veh/h	53	148	39	477	1383	57
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	-	-	75
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	2	0	0	2	2	4
Mvmt Flow	58	163	43	524	1520	63

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	2130	1520	1520 0
Stage 1	1520	-	- -
Stage 2	610	-	- -
Critical Hdwy	6.42	6.2	4.1 -
Critical Hdwy Stg 1	5.42	-	- -
Critical Hdwy Stg 2	5.42	-	- -
Follow-up Hdwy	3.518	3.3	2.2 -
Pot Cap-1 Maneuver	~ 55	~ 148	445 -
Stage 1	199	-	- -
Stage 2	542	-	- -
Platoon blocked, %			- -
Mov Cap-1 Maneuver	~ 50	~ 148	445 -
Mov Cap-2 Maneuver	~ 50	-	- -
Stage 1	199	-	- -
Stage 2	490	-	- -

Approach	EB	NB	SB
HCM Control Delay, s	202.6	1.1	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBEBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	445	-	50 148	-	-
HCM Lane V/C Ratio	0.096	-	1.165 1.099	-	-
HCM Control Delay (s)	13.9	\$	311.9 163.5	-	-
HCM Lane LOS	B	-	F F	-	-
HCM 95th %tile Q(veh)	0.3	-	5.2 8.8	-	-

Notes

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

Intersection

Int Delay, s/veh 33.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↘	↗	↘	↗	↗	↗
Traffic Vol, veh/h	98	100	84	417	1324	241
Future Vol, veh/h	98	100	84	417	1324	241
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	250	-	-	75
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	4	4	4	1	2	4
Mvmt Flow	105	108	90	448	1424	259

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	2053	1424	0
Stage 1	1424	-	-
Stage 2	629	-	-
Critical Hdwy	6.44	6.24	-
Critical Hdwy Stg 1	5.44	-	-
Critical Hdwy Stg 2	5.44	-	-
Follow-up Hdwy	3.536	3.336	-
Pot Cap-1 Maneuver	~ 60	165	-
Stage 1	220	-	-
Stage 2	528	-	-
Platoon blocked, %			-
Mov Cap-1 Maneuver	~ 49	165	-
Mov Cap-2 Maneuver	~ 49	-	-
Stage 1	220	-	-
Stage 2	427	-	-

Approach	EB	NB	SB
HCM Control Delay, s \$	381.4	2.4	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBTLn1	EBLn2	SBT	SBR
Capacity (veh/h)	472	-	49 165	-	-
HCM Lane V/C Ratio	0.191	-	2.151 0.652	-	-
HCM Control Delay (s)	14.4	-	\$ 709 60.4	-	-
HCM Lane LOS	B	-	F F	-	-
HCM 95th %tile Q(veh)	0.7	-	10.7 3.7	-	-

Notes

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

Intersection

Int Delay, s/veh 19.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↘	↗	↘	↗	↗	↗
Traffic Vol, veh/h	53	148	39	479	1385	57
Future Vol, veh/h	53	148	39	479	1385	57
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	-	-	75
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	2	0	0	2	2	4
Mvmt Flow	58	163	43	526	1522	63

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	2134	1522	1522 0
Stage 1	1522	-	- -
Stage 2	612	-	- -
Critical Hdwy	6.42	6.2	4.1 -
Critical Hdwy Stg 1	5.42	-	- -
Critical Hdwy Stg 2	5.42	-	- -
Follow-up Hdwy	3.518	3.3	2.2 -
Pot Cap-1 Maneuver	~ 54	~ 147	444 -
Stage 1	199	-	- -
Stage 2	541	-	- -
Platoon blocked, %			-
Mov Cap-1 Maneuver	~ 49	~ 147	444 -
Mov Cap-2 Maneuver	~ 49	-	- -
Stage 1	199	-	- -
Stage 2	489	-	- -

Approach	EB	NB	SB
HCM Control Delay, s	207.9	1.1	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBEBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	444	-	49 147	-	-
HCM Lane V/C Ratio	0.097	-1.189	1.106	-	-
HCM Control Delay (s)	14	\$ 323.6	166.4	-	-
HCM Lane LOS	B	-	F F	-	-
HCM 95th %tile Q(veh)	0.3	-	5.3 8.8	-	-

Notes

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

Intersection

Int Delay, s/veh 54.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↘	↗	↘	↗	↗	↗
Traffic Vol, veh/h	98	100	84	418	1329	242
Future Vol, veh/h	98	100	84	418	1329	242
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	250	-	-	75
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	4	4	4	1	2	4
Mvmt Flow	105	108	90	449	1429	260

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	2059	1429	1429 0
Stage 1	1429	-	- -
Stage 2	630	-	- -
Critical Hdwy	7.14	6.24	4.14 -
Critical Hdwy Stg 1	6.14	-	- -
Critical Hdwy Stg 2	6.14	-	- -
Follow-up Hdwy	3.536	3.336	2.236 -
Pot Cap-1 Maneuver	~ 40	164	470 -
Stage 1	166	-	- -
Stage 2	466	-	- -
Platoon blocked, %			- -
Mov Cap-1 Maneuver	~ 34	164	470 -
Mov Cap-2 Maneuver	~ 34	-	- -
Stage 1	134	-	- -
Stage 2	377	-	- -

Approach	EB	NB	SB
HCM Control Delay, s \$	620.9	2.4	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBEBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	470	-	34 164	-	-
HCM Lane V/C Ratio	0.192	-	3.099 0.656	-	-
HCM Control Delay (s)	14.5	\$	1192.1 61.2	-	-
HCM Lane LOS	B	-	F F	-	-
HCM 95th %tile Q(veh)	0.7	-	12.2 3.7	-	-

Notes

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

Intersection

Int Delay, s/veh 6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↘	↗	↘	↗	↗	↗
Traffic Vol, veh/h	56	117	58	579	1103	79
Future Vol, veh/h	56	117	58	579	1103	79
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	-	-	75
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	98	98	98	98	98	98
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	57	119	59	591	1126	81

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	1835	1126	0
Stage 1	1126	-	-
Stage 2	709	-	-
Critical Hdwy	6.4	6.2	4.1
Critical Hdwy Stg 1	5.4	-	-
Critical Hdwy Stg 2	5.4	-	-
Follow-up Hdwy	3.5	3.3	2.2
Pot Cap-1 Maneuver	84	252	628
Stage 1	313	-	-
Stage 2	491	-	-
Platoon blocked, %			-
Mov Cap-1 Maneuver	76	252	628
Mov Cap-2 Maneuver	76	-	-
Stage 1	313	-	-
Stage 2	445	-	-

Approach	EB	NB	SB
HCM Control Delay, s	65	1	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBTLn1	EBLn2	SBT	SBR
Capacity (veh/h)	628	-	76 252	-	-
HCM Lane V/C Ratio	0.094	-0.752	0.474	-	-
HCM Control Delay (s)	11.3	-134.9	31.5	-	-
HCM Lane LOS	B	-	F D	-	-
HCM 95th %tile Q(veh)	0.3	-	3.6 2.4	-	-

Intersection

Int Delay, s/veh 13.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↘	↗	↘	↗	↗	↗
Traffic Vol, veh/h	93	99	87	535	955	274
Future Vol, veh/h	93	99	87	535	955	274
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	250	-	-	75
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	98	104	92	563	1005	288

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	1751	1005	1005 0
Stage 1	1005	-	- -
Stage 2	746	-	- -
Critical Hdwy	6.4	6.2	4.1 -
Critical Hdwy Stg 1	5.4	-	- -
Critical Hdwy Stg 2	5.4	-	- -
Follow-up Hdwy	3.5	3.3	2.2 -
Pot Cap-1 Maneuver	~ 95	296	697 -
Stage 1	357	-	- -
Stage 2	472	-	- -
Platoon blocked, %			- -
Mov Cap-1 Maneuver	~ 82	296	697 -
Mov Cap-2 Maneuver	~ 82	-	- -
Stage 1	357	-	- -
Stage 2	410	-	- -

Approach	EB	NB	SB
HCM Control Delay, s	134.3	1.5	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBEBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	697	-	82 296	-	-
HCM Lane V/C Ratio	0.131	-1.194	0.352	-	-
HCM Control Delay (s)	10.9	-252.2	23.6	-	-
HCM Lane LOS	B	-	F C	-	-
HCM 95th %tile Q(veh)	0.5	-	7.1 1.5	-	-

Notes

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

Intersection

Int Delay, s/veh 5.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↘	↗	↘	↗	↗	↗
Traffic Vol, veh/h	56	117	58	578	1102	79
Future Vol, veh/h	56	117	58	578	1102	79
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	-	-	75
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	98	98	98	98	98	98
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	57	119	59	590	1124	81

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	1832	1124	1124 0
Stage 1	1124	-	- -
Stage 2	708	-	- -
Critical Hdwy	6.4	6.2	4.1 -
Critical Hdwy Stg 1	5.4	-	- -
Critical Hdwy Stg 2	5.4	-	- -
Follow-up Hdwy	3.5	3.3	2.2 -
Pot Cap-1 Maneuver	85	252	629 -
Stage 1	313	-	- -
Stage 2	492	-	- -
Platoon blocked, %			- -
Mov Cap-1 Maneuver	77	252	629 -
Mov Cap-2 Maneuver	77	-	- -
Stage 1	313	-	- -
Stage 2	446	-	- -

Approach	EB	NB	SB
HCM Control Delay, s	63.9	1	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NB	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	629	-	77	252	-	-
HCM Lane V/C Ratio	0.094	-	0.742	0.474	-	-
HCM Control Delay (s)	11.3	-	131.5	31.5	-	-
HCM Lane LOS	B	-	F	D	-	-
HCM 95th %tile Q(veh)	0.3	-	3.6	2.4	-	-

Intersection

Int Delay, s/veh 12.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↘	↗	↘	↗	↗	↗
Traffic Vol, veh/h	93	99	87	533	954	274
Future Vol, veh/h	93	99	87	533	954	274
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	250	-	-	75
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	98	104	92	561	1004	288

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	1748	1004	0
Stage 1	1004	-	-
Stage 2	744	-	-
Critical Hdwy	6.4	6.2	4.1
Critical Hdwy Stg 1	5.4	-	-
Critical Hdwy Stg 2	5.4	-	-
Follow-up Hdwy	3.5	3.3	2.2
Pot Cap-1 Maneuver	~ 96	296	698
Stage 1	357	-	-
Stage 2	473	-	-
Platoon blocked, %			-
Mov Cap-1 Maneuver	~ 83	296	698
Mov Cap-2 Maneuver	~ 83	-	-
Stage 1	357	-	-
Stage 2	411	-	-

Approach	EB	NB	SB
HCM Control Delay, s	131.2	1.5	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBTLn1	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	698	-	83	296	-	-
HCM Lane V/C Ratio	0.131	-	1.179	0.352	-	-
HCM Control Delay (s)	10.9	-	245.8	23.6	-	-
HCM Lane LOS	B	-	F	C	-	-
HCM 95th %tile Q(veh)	0.5	-	7.1	1.5	-	-

Notes

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