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Final Traffic Impact Report

Bella Union P19-00139
Planning Commission Hearing Date December 7, 2022

CRANE TRANSPORTATION GROUP

BELLA UNION WINERY
FINAL TRAFFIC IMPACT REPORT

1695 St. Helena Hwy S. (SR 29-128)
St. Helena, CA 94574

APN 027-470-007-000
PROJECT NO. P19-00139

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I. INTRODUCTION

This revised report has been prepared at the request of the Bella Union Winery (formerly Provenance Winery) to determine whether expanded activities at the Winery as detailed in their Use Permit Modification Application will result in any significant circulation impacts to the local roadway network. It contains updates to the original March 2, 2022 Traffic Impact Report reflecting our responses on June 16, 2022 to the May 25, 2022 Comment Memo from the County Public Works Department. The project site is located on the west side of the SR 29-128 Highway opposite Mee Lane. Access is provided by a driveway that is the west leg of the SR 29-128/Mee Lane intersection. See **Figure 1** Regional Map, **Figure 2** Site Plan and **Figure 3** Site Plan Parking Detail. The Scope of Analysis includes evaluation of SR 29-128 and the SR 29-128 intersection with Mee Lane and the Project Driveway for Harvest Year 2017, 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 and the Planning, Building & Environmental Services Departments.

II. EXECUTIVE SUMMARY OF PROJECT IMPACTS & RECOMMENDED IMPROVEMENTS

A. IMPACTS

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

NET NEW PM PEAK HOUR PROJECT TRIPS (BELLA UNION WINERY COMPARED TO PROVENANCE WINERY)	
HARVEST FRIDAY	HARVEST SATURDAY
33	24

2. SIGNIFICANCE OF PROJECT IMPACTS IN RELATION TO COUNTY CRITERIA

a. Intersection Level of Service and Delay
(SR 29-128 at Mee Lane-Project Driveway)

- ***Impact Exceeds County Criteria***

b. Arterial Level of Service
(SR 29-128 from the Project Driveway north to Zinfandel Lane and south to Rutherford Road)

- ***Impact Less than County Criteria***

c. Intersection Signal Warrant
(SR 29-128/Mee Lane-Project Driveway Intersection)

- ***Provided for informational purposes only.***
  The addition of project traffic would not increase volumes to meet peak hour Signal Warrant #3 Criteria levels.

d. Need for Left-Turn Lane
(On SR 29-128 at the Project Driveway Intersection)

- ***Impact Less than County Criteria***
  Left-turn lanes are already provided on the SR 29-128 approaches to the Mee Lane-Project Driveway intersection.

e. Sight Line Adequacy
(At the SR 29-128 at Mee Lane-Project Driveway)

- ***Impact Less than County Criteria***
  Sight Lines exceed Caltrans Stopping-Sight-Distance Criteria.

f. Marketing Events

- ***Impact Less than County Criteria***
  The Winery is currently permitted 36 marketing events per year. Bella Union Winery proposes to modify this marketing plan to 3/week for up to 50 guests (1 lunch/2 dinners); 12 events/year for up to 100 guests; and 1 event/year for up to 500 guests. Guests will arrive to the annual event mostly by shuttle and the Winery will be closed to the public at this time to provide sufficient parking for those who drive.

g. Pedestrian, Bicycle and Transit Impacts

- ***Impact Less than County Criteria***
  No employees or visitors would be expected to access the Winery by walking or taking transit. Bicycle racks will be provided for any employees or guests bicycling to/from the site via the paved shoulders along SR 29-128.

h. Parking & Internal Circulation

- ***Impact Less than County Criteria***
  A total of 59 on-site parking spaces will be provided for the project. This will include 13 spaces on the west side of the building (which will include 1 ADA space) and 46 additional spaces on the north and south sides of the Winery: 25 spaces on the north side (which will include 2 ADA spaces) and 21 spaces on the south side (which will include 1 ADA space). See **Figure 3**.

  All parking will meet Napa County Road and Street Standard (NCRSS) criteria for stall dimensions and back-up distances. Large marketing events will be valet parked and/or served by shuttle buses or vans from hotels or off-site parking. Overflow parking will all be accommodated on-site by the valets using paved parking aisles or vineyard access roads.

The project 2-way access driveway will split into two, 2-way flow driveways leading to the parking areas north and south of the Winery. Two-way traffic flow will be maintained through each parking area. A 1-way counterclockwise flow driveway will then be provided starting at the west end of the north parking area which will extend around the Winery to the south parking lot. All driveways will meet NCRSS criteria for slope, width and turning radii. This combined 1- and 2-way system will accommodate all Winery-related traffic (including the largest trucks) as well as emergency vehicles.

i. TDM Program & VMT Reduction

- ***Impact Less than County & California Environmental Quality Act (CEQA) Criteria***

  A TDM Plan has been developed and is provided in the **Appendix**. This will include appointing a TDM coordinator who will develop programs to reduce daily and commute period employee traffic, promote shuttle buses and limousine service for all medium and large size marketing events and make sure that daily and major marketing event guest arrivals are spread over the day.

B. RECOMMENDED IMPROVEMENTS

- Provide an exclusive right-turn lane on the Project Driveway approach to SR 29-128. The existing paved crossing of the Wine Train track has enough width to accommodate this lane.

- Eliminate all project traffic during the Friday and Saturday PM peak traffic hours through guest and employee scheduling adjustments.

- Provide bicycle lockers and a shower for employees.

III. SUMMARY OF "WITHOUT & WITH PROJECT" OPERATING CONDITIONS

A. "WITHOUT PROJECT" OPERATING CONDITIONS
Friday & Saturday PM Peak Hours

1. INTERSECTION LEVEL OF SERVICE

a. SR 29-128/Mee Lane-Project Driveway
Stop-sign controlled approaches
Existing, Year 2025 & Cumulative (2030) - **Unacceptable**

2. ARTERIAL LEVEL OF SERVICE

a. SR 29-128 North of the Mee Lane-Project Driveway Intersection to Zinfandel Lane and South to Rutherford Road

- **Existing** - **Unacceptable**, except Friday PM peak hour northbound
- **Year 2025 & Cumulative** (**2030) - Unacceptable**

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

a. SR 29-128/Mee Lane-Project Driveway

- **Existing**, **2025 & Cumulative (2030)**
  Friday & Saturday PM peak hour volumes do **NOT** meet Rural Signal Warrant #3 Criteria.

4. LEFT-TURN LANE VOLUME WARRANT ON THE NORTHBOUND SR 29-128 APPROACH TO THE PROJECT DRIVEWAY

A left-turn lane is already provided.

5. SIGHT LINES AT SR 29-128/MEE LANE-PROJECT DRIVEWAY INTERSECTION
Sight Lines exceed minimum Caltrans Stopping-Sight-Distance Criteria.

B. "WITH PROJECT" OPERATING CONDITIONS

1. INTERSECTION LEVEL OF SERVICE

- ***Impact Exceeds County Criteria***

a. SR 29-128/Mee Lane-Project Driveway

- **Existing, Year 2025 or Cumulative**
  Delay change due to project traffic would be greater than 5 seconds during both the Friday and Saturday PM peak hours on both the Mee Lane and the Project Driveway approaches.

2. ARTERIAL LEVEL OF SERVICE

- ***Impact Less than County Criteria***

a. SR 29-128 North of the Mee Lane-Project Driveway Intersection to Zinfandel Lane and South to Rutherford Road

- **Existing & Year 2025**
  Project traffic would not increase directional volumes by 1% or greater along the segments of SR 29 already operating unacceptably at LOS E during the Friday and Saturday PM peak hours.

- **Cumulative (2030)**
  Project traffic would not increase the growth in directional traffic from 2017 to 2030 by 5% or greater along segments of SR 29 that would already be operating unacceptably at LOS E during the Friday and Saturday PM peak hours.

3. INTERSECTION SIGNAL WARRANT

- ***Provided for Informational purposes only.***

The addition of project traffic would not increase volumes at the SR 29-128/Mee Lane-Project Driveway Intersection to meet peak hour Signal Warrant #3 Criteria levels.

4. NEED FOR A LEFT-TURN LANE ON THE NORTHBOUND SR 29-128 APPROACH TO THE PROJECT DRIVEWAY & REQUIRED 95TH PERCENTILE QUEUING STORAGE.

- ***Impact Less than County Criteria***
  A left-turn lane is already provided. Also, the 110-foot length of the turn lane will accommodate the 95th percentile queuing demand of cumulative (Year 2030) PM peak hour project traffic.

5. SIGHT-LINE ADEQUACY AT SR 29-128/MEE LANE-PROJECT DRIVEWAY INTERSECTION

- ***Impact Less than County Criteria***
  Sight lines meet minimum Caltrans Stopping-Sight-Distance Criteria.

6. MARKETING EVENTS

- ***Impact Less than County Criteria***

The Winery is currently permitted 36 marketing events per year. Bella Union Winery proposes to modify this marketing plan to 3/week for up to 50 guests (1 lunch/2 dinners); 12 events/year for up to 100 guests; and 1 event/year for up to 500 guests. Guests will arrive to the annual event mostly by shuttle and the Winery will be closed to the public at this time providing sufficient parking for those who drive as well.

7. PEDESTRIAN, BICYCLE & TRANSIT IMPACTS

- ***Impact Less than County Criteria***

  No pedestrians would be expected to access the Bella Union Winery as there are no pedestrian facilities located along SR 29-128 in the project vicinity. Bicycle racks would be provided for any bike riders accessing the Winery via the paved shoulders along SR 29-128 that are used for bike riding. Few, if any employees would be expected to use the existing VINE transit routes along SR 29-128 due to the lack of frequent service and the more than 1-mile walk from the nearest bus stops along SR 29-128 to the Winery (north at Zinfandel Lane and south at Rutherford Road).

8. PARKING & INTERNAL CIRCULATION

- ***Impact Less than County Criteria***

  A total of 59 on-site parking spaces will be provided for the project. This will include 13 spaces on the west side of the building (which will include 1 ADA space) and 46 additional spaces on the north and south sides of the Winery: 25 spaces on the north side (which will include 2 ADA spaces) and 21 spaces on the south side (which will include 1 ADA space). See **Figure 3**.

  All parking will meet Napa County Road and Street Standard (NCRSS) criteria for stall dimensions and back-up distances. Large marketing events will be valet parked and/or served by shuttle buses or vans from hotels or off-site parking. Overflow parking will all be accommodated on-site by the valets using paved parking aisles or vineyard access roads.

  The project 2-way access driveway will split into two, 2-way flow driveways leading to the parking areas north and south of the Winery. Two-way traffic flow will be maintained through each parking area. A 1-way counterclockwise flow driveway will then be provided starting at the west end of the north parking area which will extend around the Winery to the south parking lot. All driveways will meet NCRSS criteria for slope, width and turning radii. This combined 1- and 2-way system will accommodate all Winery-related traffic (including the largest trucks) as well as emergency vehicles.

9. TDM PROGRAM & VMT REDUCTION

- ***Impact Less than County & CEQA Criteria***

  A TDM Plan has been developed and is included in **Appendix G**. This will include appointing a TDM coordinator who will develop programs to reduce daily and commute period employee traffic, promote shuttle buses and limousine service for all medium-and-large-size marketing events and make sure that daily and major marketing event guest arrivals are spread out over the day.

C. RECOMMENDED IMPROVEMENTS

- Provide an exclusive right-turn lane on the Project Driveway approach to SR 29-128. The existing paved crossing of the Wine Train track has enough width to accommodate this lane.

- Eliminate all project traffic during the Friday and Saturday PM peak traffic hours through guest and employee scheduling adjustments.

- Provide bicycle lockers and a shower for employees.

D. CONCLUSIONS & RECOMMENDATIONS

- The project will result in no off-site harvest Friday or Saturday PM peak hour circulation system County criteria operational impacts to SR 29-128 north or south of the project site. However, at the SR 29-128 intersection with Mee Lane and the Project Driveway, the addition of project traffic will increase delays for turns from both the Project Driveway and Mee Lane beyond County acceptable criteria.

- A left-turn lane is already provided on the northbound SR 29-128 approach to the Project Driveway. Also, sight lines at the Project Driveway connection to SR 29-128 exceed acceptable Caltrans Stopping-Sight-Distance Criteria.

- Bicycle racks will be provided for all bicycle riders accessing the site via SR 29-128.

- The Winery is currently permitted 36 marketing events per year. Bella Union Winery proposes to modify this marketing plan to 3/week for up to 50 guests (1 lunch/2 dinners); 12 events/year for up to 100 guests; and 1 event/year for up to 500 guests. Guests will arrive to the annual event mostly by shuttle and the Winery will be closed to the public at this time providing sufficient parking for those who drive as well.

- A Transportation Demand Management (TDM) Plan (presented in the Appendix) will be instituted to reduce Vehicle Miles Traveled (VMT) by 15% or greater when compared to operation without a plan through programs minimizing employee and guest traffic.

- A total of 59 on-site parking spaces will be provided (which include 4 ADA spaces). Valet parking, shuttle buses and vans will be provided for all large marketing events.

- The following measures are proposed to eliminate the project's peak hour impacts:

  → Provide an exclusive right-turn lane on the Project Driveway approach to SR 29-128. The existing paved crossing of the Wine Train track has enough width to accommodate this lane.

  → Eliminate all project traffic during the Friday and Saturday PM peak traffic hours through guest and employee scheduling adjustments.

  → Provide bicycle lockers and a shower for employees.

IV. PROJECT LOCATION & DESCRIPTION

The Bella Union Winery is located on the west side of SR 29-128 and is served by a driveway opposite Mee Lane.

The proposed Use Permit Modification Winery will change production, employees and visitation from the previous Provenance Winery to the proposed Bella Union Winery as follows:

- Yearly production will be increased from 180,000 up to 300,000 gallons.
- Bottling will continue on-site.
- Non-harvest maximum employees will change from 12 full-time and 0 part-time (Friday and Saturday) to 28 full-time and 7 part-time (Friday), and 13 full-time and 7 part-time (Saturday).
- Harvest maximum employee total will increase from 12 full-time and 0 part-time up to 38 full-time and 7 part-time (Friday), and 13 full-time and 7 part-time (Saturday).
- Maximum daily visitation will change from 25 up to 175 guests on a Friday, and increase from 25 up to 225 guests on a Saturday.
- Tours and tasting will remain 7 days/week, 10:00 AM - 6:00 PM.
- Marketing Events

  The Winery is currently permitted 36 marketing events per year. Bella Union Winery proposes to modify this marketing plan to 3/week for up to 50 guests (1 lunch/2 dinners); 12 events/year for up to 100 guests; and 1 event/year for up to 500 guests. Guests will arrive to the annual event mostly by shuttle and the Winery will be closed to the public at this time providing sufficient parking for those who drive as well.

- Stop signs and stop bars will remain on the Project Driveway approaches to the Napa Wine Train at grade crossing and a stop bar and painted stop sign will remain on the eastbound approach to SR 29-128. Painted stop signs on the pavement will be redone where required.

- Total on-site parking for the project will be 59 spaces (4 of which will be ADA spaces). All parking will meet Napa County Road and Street Standard (NCRSS) criteria for stall dimensions and back-up distances. Large marketing events will be valet parked and/or served by shuttle buses or vans from hotels or off-site parking. Overflow parking will all be accommodated on-site by the valets using paved parking aisles or vineyard access roads.

- The existing driveway and proposed internal circulation system (see Figure 3) will meet NCRSS criteria for slope, width and turning radii. This system will accommodate all Winery-related traffic (including the largest trucks) as well as emergency vehicles.

- A Transportation Demand Management (TDM) Plan (presented in Appendix G) will be instituted to provide programs to reduce employee and guest Vehicle Miles Traveled (VMT) by at least 15% compared to conditions without the TDM Plan in operation. Detailed records of TDM Plan operation and success will be maintained for County inspection.

V. EXISTING CIRCULATION SYSTEM EVALUATION PROCEDURES

A. ANALYSIS LOCATIONS

1. INTERSECTIONS

The following location has been evaluated:

a. SR 29-128/Mee Lane-Project Driveway
The Mee Lane westbound approach is controlled by a stop sign as well as a painted stop bar and painted "stop" message, while the eastbound Project Driveway approach has a painted stop bar and a painted "stop" message. The eastbound approach also has an at grade crossing of the Napa Wine Train single track about 15 feet west of the stop bar on the approach to the SR 29-128 southbound travel lane. There is a stop sign, a painted stop bar and part of a painted "stop" message on the eastbound approach to the at grade crossing, as well as a stop sign and painted stop bar on the westbound approach to the Napa Wine Train crossing. There are no gates or flashing lights protecting the crossing .

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

2. ARTERIAL ROADWAY SEGMENTS

The following locations have been evaluated.

a. SR 29-128 North of the Mee Lane-Project Driveway Intersection to Zinfandel Lane and south to Rutherford Road.

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 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 SR 29 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. JANUARY 2022 COUNT RESULTS

Friday (2:00 - 6:00 PM) as well as Saturday (Noon - 6:00 PM) turn movement counts were conducted under the supervision of Crane Transportation Group (CTG) for two Friday/Saturday combinations (January 7/8 and 14/15, 2022) at the SR 29-128 intersection with Mee Lane and the Project Driveway. The peak traffic hours for the system were determined to be 3:00 - 4:00 PM on both Friday and Saturday. It should be noted, however, that there were many hours on both days that had similar volumes. Results from the two Friday and Saturday counts are shown in **Appendix A.**

3. SEASONAL AND YEARLY COUNT ADJUSTMENTS

Based upon County criteria all traffic analysis must be conducted using harvest volumes. Therefore, the County designated 15% increase in January 2022 volumes to reflect harvest conditions was utilized. Resultant harvest 2022 Friday and Saturday PM peak hour volumes are also presented in **Appendix A.**

The January 2022 seasonally adjusted counts along SR 29-128 were then compared to Harvest 2015 to 2017 traffic projections for the same area obtained from past traffic studies. It was found that the 2022 Friday and Saturday peak hour counts after seasonal adjustment were about 15% lower than those from 2015 to 2017. In addition, Caltrans PeMS volumes along the SR 29 freeway at Trancas Street in the northwest section of the City of Napa, while being much higher than at Mee Lane, showed no significant percent changes in September Friday and Saturday peak period volumes between 2017 and 2019, while there was a 30% decrease in 2021 harvest volumes. After discussion with the County Senior Traffic Engineer, it was determined that:

- Current Harvest Friday and Saturday PM peak hour volumes are still significantly lower than in 2019 and earlier years potentially due to COVID-19 related impacts reducing tourist traffic to the Napa Valley as well as impacts due to recent fires.

- Available Year 2017 Harvest Friday and Saturday PM peak hour volumes on SR 29-128 in the project vicinity should be used for analysis of the Bella Union Winery project.

Overall, Year 2017 harvest Friday PM peak hour two-way volumes along SR 29-128 at Mee Lane were similar to those during the Saturday PM peak hour (about 2050 vehicles on Friday versus 2145 vehicles on Saturday). See **Figure 5.**

4. SPEED SURVEYS

Based upon mid-afternoon speed surveys on a Friday in January 2022, the 85th percentile northbound speed on SR 29-128 was 58 MPH with a maximum speed of 69 MPH, while the 85th percentile southbound speed was 59 MPH with a maximum speed of 65 MPH.

C. ROADWAYS

Roadway descriptions are based upon the designation that SR 29-128 runs in general north-south direction through the project area, while Mee Lane and the Project Driveway run in an east-west direction. **Figure 4** presents existing intersection geometrics and control.

SR 29-128 provides the only major regional access to the west side of the Napa Valley and a connection to Mee Lane and the Project Driveway. In the vicinity of the Mee Lane-Project Driveway intersection, it has two well-paved 12-foot travel lanes and 6-8 foot-wide paved shoulders. The posted speed limit is 50 MPH and the roadway is level and straight. SR 29-128 is not controlled on its approaches to the Mee Lane-Project Driveway intersection, but left-turn lanes are provided on the northbound and southbound intersection approaches.

MEE LANE AND PROJECT DRIVEWAY is a narrow two-lane dead end rural County road extending easterly from its intersection with SR 29. It is stop-sign controlled on its single-lane approach to the State Highway. The Project Driveway, which formerly served the Provenance Winery, is wide enough to accommodate 2-way traffic flow. It crosses the single track of the Napa Valley Wine Train just west of SR 29-128. The driveway eastbound approach to the State Highway is about 25-feet wide and provides about 22 feet of storage between the railroad track and the stop bar for a vehicle turning left, and about 12 to 14 feet of storage between the railroad track and the stop bar for a vehicle turning right. During the peak tourist season there are currently never more than a few train crossings during an afternoon and early evening. The Project Driveway is also stop-sign controlled on both of its approaches to the railroad crossing. However, there are no gates or flashing lights.

D. NAPA WINE TRAIN ACTIVITY

At most, there would be only one train crossing the Bella Union Winery Driveway during either the Friday or Saturday PM peak hours. The number of trains traveling between Napa and St. Helena on a daily basis depends upon the tourist demand. Three to four trains during peak tourist season would be a maximum possible, with two trains per day more likely (lunch and dinner trains). The time for a northbound train to reach St. Helena, allow train passengers some sightseeing time and then return south would be more than one hour. Therefore, at most there would be only one train crossing of the Bella Union Winery driveway per hour, and during most hours, no crossings.

Regarding the impact of a train crossing to the operation of the Bella Union Winery Driveway intersection:

- The train travels at 15 Miles Per hour
- With a typical train consisting of two to three engines and six to seven cars, it would take the train about 40-45 seconds to clear the crossing. Since there are no gates or flashing lights at the crossing, there would potentially be an additional 30 seconds of warning with the train blowing its horn before the train arrived at the crossing. Therefore, the realistic closure time would be up to 75 seconds (or 2% of an hour).
- A train crossing would not impact the Mee Lane intersection approach.
- Per Synchro software analysis, there would be no increase in peak hour delay for the Bella Union Winery Driveway approach to SR 29-128 with inclusion of time for the passage of one train.

E. 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 2017 *Highway Capacity Manual Version 6*, *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 1** summarizes the relationship between delay and LOS for unsignalized intersections while Intersection Capacity Worksheets are provided in **Appendix B**.

2. MINIMUM ACCEPTABLE OPERATION

Napa County's currently minimum acceptable operating standard for unsignalized intersections is Level of Service D (LOS D) for side-street-stop-sign controlled approaches at two-way stop intersections and for overall operation at all-way-stop intersections. It should be noted, however, that the recently approved General Plan Update Circulation element shows that LOS F is now acceptable for SR 29 in the project area. However, to provide a conservative analysis the LOS D criteria as minimum acceptable has been used.

F. ARTERIAL LEVEL OF SERVICE

1. ANALYSIS METHODOLOGY

The *2017 Highway Capacity Manual Version 6 Arterial Analysis Methodology* has been utilized for analysis of SR 29-128 to the north and south of the Mee Lane/Project Driveway intersection. 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 is Level of Service D (LOS D). It should be noted, however, that the recently approved General Plan Update Circulation element shows that LOS F is now acceptable for SR 29 in the project area. However, to provide a conservative analysis the LOS D criteria as minimum acceptable has been used.

G. 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, Revision 5 (2014 CMUTCD Rev. 5). *Section 4C of the 2014 CMUTCD Rev. 5* provides guidelines or warrants which may indicate need for a traffic signal at an unsignalized intersection. As indicated in the *2014 CMUTCD Rev. 5*, 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 MPH) a 70% warrant is applied. The regular and 70% warrants are typically referred to as the urban and rural peak hour warrants. Please see **Appendix C** for the warrant charts.

The rural chart has been utilized for evaluation of the SR 29-128/Mee Lane-Project Driveway intersection as speeds along the State Highway are greater than 40 MPH and the intersection is in a rural setting. Based upon County guidelines, signal warrant analysis is provided for informational purposes only and is not by itself used to determine a significant impact.

H. 95TH PERCENTILE VEHICLE QUEUING

1. ANALYSIS METHODOLOGY

The Synchro software program which analyzes intersection Level of Service also determines 95th percentile vehicle queuing on intersection approaches for select lanes. It has been used to determine the adequacy of available storage in the left-turn lane on the northbound SR 29-128 approach to the Project Driveway.

I. 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 2017.)

J. ACCIDENT HISTORY

Accident records from January 2017 through December 2021 were obtained from the California Highway Patrol for SR 29-128 between and including the Zinfandel Lane and Rutherford Road intersections. Locations of all accidents over this time span are presented in **Figure 6**, while attached Year-by-Year Accident Details are presented in **Appendix D.** As shown, there have not been any reported accidents at the SR 29-128/Mee Lane-Project Driveway intersection. The location with the greatest accident history was the SR 29-128/Zinfandel Lane intersection.

K. EXISTING PEDESTRIAN, BICYCLE & TRANSIT FACILITIES NEAR THE PROJECT

There are no pedestrian walkways along SR 29-128 in the project vicinity and none are planned by the project. Likewise, there are no Class 1 to 4 Bicycle facilities along SR 29-128 in the project vicinity and none are planned by the project. However, the paved shoulders along SR 29-128 are occasionally used by bicycle riders. VINE bus service is provided along SR 29 extending between Calistoga and the City of Napa, with connections to adjacent counties in Napa. The closest stops to the Bella Union Winery are more than a mile from the Winery to the north of Zinfandel Lane and to the south at Rutherford Road. See **Figure 7.**

VI. FUTURE HORIZON TRAFFIC VOLUME PROJECTIONS

Traffic analysis has been conducted for Harvest Existing (2017), 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 2017 and 2030 for the following roadways.

Route	2017 to 2030 Projected Growth in 2-Way Weekday PM Peak Hour Traffic
SR 29-128	PM peak hour = 17.3%

Projecting straight line traffic growth for analysis purposes, this translates into the following growths in two-way traffic between 2019 and 2024 for the same roadways.

Route	2017 to 2025 Projected Growth in 2-Way Weekday PM Peak Hour Traffic
SR 29-128	PM peak hour = 10.6%

It should be noted that the 2025 and 2030 projections also include traffic from approved, but not constructed projects in close proximity to the Bella Union Winery project. The list of projects was provided by County PBES Staff and is presented in **Table 5** along with their projected Friday and Saturday PM peak hour trip generation.

Since traffic modeling projections were only available for weekday PM peak hour conditions and not for the Saturday PM peak hour, Saturday 2-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 8**, while Cumulative (Year 2030) Harvest "Without Project" Friday and Saturday PM peak hour volumes are presented in **Figure 9**.

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

A. YEAR 2017 HARVEST (WITHOUT PROJECT) OPERATING CONDITIONS

1. EXISTING INTERSECTION LEVEL OF SERVICE – SEE TABLE 2 AND APPENDIX B FOR CAPACITY WORKSHEETS

a. SR 29-128/MEE LANE-PROJECT DRIVEWAY

- **Friday & Saturday PM Peak Hours**
  Mee Lane and Project Site Driveway stop-sign controlled approaches:
  Unacceptable LOS F

2. EXISTING ARTERIAL SEGMENT LEVEL OF SERVICE – SEE TABLE 3

a. SR 29-128 JUST NORTH AND SOUTH OF THE MEE LANE-PROJECT DRIVEWAY INTERSECTION

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

3. EXISTING SIGNAL WARRANT EVALUATION – SEE TABLE 4

a. SR 29-128/MEE LANE-PROJECT DRIVEWAY INTERSECTION

- **Friday & Saturday PM Peak Hours**
  Volumes do **NOT** meet peak hour signal Warrant #3 rural criteria.

B. YEAR 2025 HARVEST (WITHOUT PROJECT) OPERATING CONDITIONS

1. 2025 INTERSECTION LEVEL OF SERVICE – SEE TABLE 2

a. SR 29-128/MEE LANE-PROJECT DRIVEWAY

- **Friday & Saturday PM Peak Hours**
  Mee Lane and Project Site Driveway stop-sign controlled approaches:
  Unacceptable LOS F

2. 2025 ARTERIAL SEGMENT LEVEL OF SERVICE – SEE TABLE 3

a. SR 29-128 JUST NORTH & SOUTH OF THE MEE LANE-PROJECT DRIVEWAY INTERSECTION

- **Friday & Saturday PM Peak Hours**
  Northbound – **Unacceptable** LOS E
  Southbound – **Unacceptable** LOS E

3. 2025 SIGNAL WARRANT EVALUATION – SEE TABLE 4

a. SR 29-128/MEE LANE-PROJECT DRIVEWAY INTERSECTION

- **Friday & Saturday PM Peak Hours**
  Volumes would **NOT** 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 2

a. SR 29-128/MEE LANE-PROJECT DRIVEWAY

- **Friday & Saturday PM Peak Hours**
  Mee Lane and Project Site Driveway stop-sign controlled approaches:
  Unacceptable LOS F

2. 2030 ARTERIAL SEGMENT LEVEL OF SERVICE – SEE TABLE 3

a. SR 29-128 JUST NORTH & SOUTH OF THE MEE LANE-PROJECT DRIVEWAY INTERSECTION

- **Friday & Saturday PM Peak Hours**
  Northbound – **Unacceptable** LOS E
  Southbound – **Unacceptable** LOS E

3. 2030 SIGNAL WARRANT EVALUATION – SEE TABLE 4

a. SR 29-128/MEE LANE-PROJECT DRIVEWAY INTERSECTION

- **Friday & Saturday PM Peak Hours**
  Volumes would **NOT** 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 1% or more.

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

Project Contribution % = Project Trips ÷ 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:

Project Contribution % = Project Trips ÷ 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 *(*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)*.

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 the 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 LOS F will be considered acceptable and the 1% 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*.

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 informational 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.

Project Contribution % = Project Trips ÷ Existing Volumes

CUMULATIVE + PROJECT CONDITIONS

4. 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 5% 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:

Project Contribution % = Project Trips ÷ (Cumulative Volumes - Existing Volumes)

IX. PROJECT IMPACT EVALUATION

A. TRIP GENERATION

1. METHODOLOGY

Project trip generation was determined using one of the three possible analysis procedures approved by Napa County Public Works for Transportation Impact Studies (for Winery Use Permits). Analysis utilized actual trip counts at driveways of wineries with comparable operating characteristics to that of the proposed Winery--in this case Bella Union Winery. Two recent studies of comparable facilities provided Friday and Saturday 2-way hourly volumes and the hourly percent of daily volumes. The list of wineries and harvest weekday characteristics is as follows:

COMPARABLE WINERIES

Far Niente Winery ..... 30 full & part-time harvest weekday employees + 160 visitors/day

Artesa Winery ..... 51 full & part-time harvest weekday employees + 250 visitors/day

In comparison to

Bella Union Winery ..... 45 full & part-time harvest weekday employees + 175 visitors/day (with 225 on Saturdays).

Appendix E contains the 2019 harvest Friday and Saturday hourly percent traffic now occurring at the Far Niente and Artesa Wineries and the 2020 harvest hourly percentages at the Artesa Winery. Twenty-four-hour counts were conducted on two Fridays and two Saturdays at each facility. The highest hourly traffic percentage from the two surveyed facilities between 2:00 and 5:00 PM was used in conjunction with the daily traffic projections from the *County's Winery Trip Generation Worksheet* for projecting Bella Union Winery Friday and Saturday PM peak hour volumes. Using this methodology, 15% of Bella Union Winery daily traffic would be expected to occur during the Friday PM peak hour, while 14% of Bella Union Winery daily traffic was projected to occur during the Saturday PM peak hour.

Finally, it was assumed that the Winery's PM peak hourly traffic on a Friday and Saturday would occur at the same time as the ambient peak traffic time on the adjacent roadway system.

2. PROJECT PM PEAK HOUR NET NEW VOLUMES

Table 6 shows that the proposed Use Permit Modification 2019 with the Bella Union Winery replacing the Provenance Winery would be expected to generate 17 net new inbound and 16 net new outbound trips during a harvest Friday PM peak hour, with 12 net new inbound and 12 net new outbound trips during a harvest Saturday PM peak hour. Winery Traffic Information/Trip Generation sheets and the percent of existing hourly traffic on the driveways of 2 comparable existing wineries for 2 Fridays and 2 Saturdays are presented in **Appendix E**.

B. TRIP DISTRIBUTION

Project traffic was distributed north-south on SR 29-128 in a pattern reflective of existing distribution patterns to/from the Mee Lane intersection. Most outbound traffic during both PM peak hours would be expected to travel to the south on SR 29-128, while inbound PM peak hour traffic would be expected to come primarily from the north on Friday and from the south on Saturday. Mee Lane's source of traffic is primarily from two wineries--Alpha Omega Winery and Lagniappe Vineyard Winery.

The harvest Friday and Saturday project traffic increments expected on SR 29-128 during the times of ambient peak traffic flows are presented in **Figure 10**. Friday and Saturday "With Project" PM peak hour Harvest Volumes for Year 2017 are presented in **Figure 11.** "With Project" PM peak hour Harvest Volumes for Year 2025 conditions are presented in **Figure 12**, and "With Project" PM peak hour Harvest Volumes for Cumulative (Year 2030) conditions are presented in **Figure 13.**

C. OFF-SITE IMPACTS

1. EXISTING (2017) HARVEST + PROJECT CONDITIONS

a. 2017 INTERSECTION LEVEL OF SERVICE IMPACTS – SEE TABLE 2

1) SR 29-128/Mee Lane-Project Driveway Intersection

- **Friday or Saturday PM Peak Hours**
  Operation of the stop-sign controlled Mee Lane and Project Driveway approaches to SR 29-128 would remain an **unacceptable** LOS F with the addition of project traffic. In addition, vehicle delay would be increased by more than 5 seconds on each approach. **Impact exceeds County criteria.**

b. 2017 ARTERIAL SEGMENT LEVEL OF SERVICE IMPACTS – SEE TABLE 3

1) SR 29-128 North of the Mee Lane-Project Driveway Intersection

- **Friday PM Peak Hour**
  Operation would remain LOS D northbound and LOS E southbound. However, the project would not increase total segment volumes by 1% or more (0.78% to 0.85%). ***Impact Less than County Criteria.***
- **Saturday PM Peak Hour**
  Operation would remain LOS E in both directions. However, the project would not increase total segment volumes by 1% or more (0.38% to 0.45%). ***Impact Less than County Criteria.***

2) SR 29-128 South of the Mee Lane-Project Driveway Intersection

- **Friday PM Peak Hour**
  Operation would remain LOS D northbound and LOS E southbound. However, the project would not increase total segment volumes by 1% or more (0.77% to 0.78%). ***Impact Less than County Criteria.***
- **Saturday PM Peak Hour**
  Operation would remain LOS E in both directions. However, the project would not increase total segment volumes by 1% or more (0.66% to 0.72%). ***Impact Less than County Criteria.***

c. 2017 SIGNAL WARRANT EVALUATION – SEE TABLE 4

Signal warrant information is provided for informational purposes only per County Significance Criteria.

1) SR 29-128/Mee Lane-Project Driveway Intersection

- **Friday or Saturday PM Peak Hours**
  Volumes would not be meeting rural peak hour signal warrant criteria with or without project traffic.

2. YEAR 2025 HARVEST + PROJECT CONDITIONS

a. 2025 INTERSECTION LEVEL OF SERVICE IMPACTS – SEE TABLE 2

1) SR 29-128/Mee Lane-Project Driveway Intersection

- **Friday or Saturday PM Peak Hours**
  Operation of the stop-sign controlled Mee Lane and Project Driveway approaches to SR 29-128 would remain an **unacceptable** LOS F with the addition of project traffic. In addition, vehicle delay would be increased by more than 5 seconds on each approach. **Impact exceeds County criteria.**

b. 2025 ARTERIAL SEGMENT LEVEL OF SERVICE IMPACTS – SEE TABLE 3

1) SR 29-128 North of Mee Lane-Project Driveway Intersection

- **Friday PM Peak Hour**
  Operation would remain LOS E in both directions. However, the project would not increase total segment volumes by 1% or more (0.70% - 0.77%). ***Impact Less than County Criteria.***
- **Saturday PM Peak Hour**
  Operation would remain LOS E in both directions. However, the project would not increase total segment volumes by 1% or more (0.35% - 0.41%). ***Impact Less than County Criteria.***

2) SR 29-128 South of Mee Lane-Project Driveway Intersection

- **Friday PM Peak Hour**
  Operation would remain LOS E in both directions. However, the project would not increase total segment volumes by 1% or more (0.70%). ***Impact Less than County Criteria.***
- **Saturday PM Peak Hour**
  Operation would remain LOS E in both directions. However, the project would not increase total segment volumes by 1% or more (0.60% - 0.65%). ***Impact Less than County Criteria.***

c. 2025 SIGNAL WARRANT EVALUATION – SEE TABLE 4

Signal warrant information is provided for informational purposes only per County Significance Criteria.

1) SR 29-128/Mee Lane-Project Driveway Intersection

- **Friday or Saturday PM Peak Hours**
  Volumes would not be meeting rural peak hour signal warrant criteria with or without project traffic.

3. CUMULATIVE (YEAR 2030) HARVEST + PROJECT CONDITIONS

a. 2030 INTERSECTION LEVEL OF SERVICE IMPACTS – SEE TABLE 2

1) SR 29-128/Mee Lane-Project Driveway Intersection

- **Friday or Saturday PM Peak Hours**
  Operation of the stop-sign controlled Mee Lane and Project Driveway approaches to SR 29-128 would remain an **unacceptable** LOS F with the addition of project traffic. In addition, vehicle delay would be increased by more than 5 seconds on each approach. **Impact exceeds County criteria.**

b. 2030 ARTERIAL SEGMENT LEVEL OF SERVICE IMPACTS – SEE TABLE 3

1) SR 29-128 North of the Mee Lane-Project Driveway Intersection

- **Friday PM Peak Hour**
  Operation would remain LOS E in both directions. The project would not increase the change in 2-way segment volumes between 2017 and 2030 by 5% or more (4.5% - 4.9%). ***Impact Less than County Criteria.***
- **Saturday PM Peak Hour**
  Operation would remain LOS E in both directions. The project would not increase the change in 2-way segment volumes between 2017 and 2030 by 5% or more (2.2% - 2.8%). ***Impact Less than County Criteria.***

2) SR 29-128 South of the Mee Lane-Project Driveway Intersection

- **Friday PM Peak Hour**
  Operation would remain LOS E in both directions. The project would not increase the change in 2-way segment volumes between 2017 and 2030 by 5% or more (4.4% - 4.5%). ***Impact Less than County Criteria.***
- **Saturday PM Peak Hour**
  Operation would remain LOS E in both directions. The project would not increase the change in 2-way segment volumes between 2017 and 2030 by 5% or more (3.8% - 4.4%). ***Impact Less than County Criteria.***

c. 95TH PERCENTILE QUEUING IN THE LEFT-TURN LANE ON THE NORTHBOUND SR 29-128 APPROACH TO THE WINERY DRIVEWAY

The left-turn lane on the northbound SR 29-128 approach to the Bella Union Winery Driveway is about 110 feet long and was constructed by Caltrans more than 15 years ago. For Year 2030 "With Project" conditions and a Wine Train crossing of the Bella Union Winery Driveway during both analysis hours, the resultant harvest Friday and Saturday PM peak hour 95th percentile queues in the northbound left-turn lane would be:

Friday PM peak hour:	78 feet
Saturday PM peak hour:	71 feet

Therefore, the existing northbound SR 29-127 left-turn would provide adequate peak hour storage for vehicles waiting to turn left into the Winery driveway for 2030 traffic conditions.

d. 2030 SIGNAL WARRANT EVALUATION – SEE TABLE 4

Signal warrant information is provided for informational purposes only per County Significance Criteria.

1) SR 29-128/Mee Lane-Project Driveway Intersection

- **Friday or Saturday PM Peak Hours**
  Volumes would not be meeting rural peak hour signal warrant criteria with or without project traffic.

X. OTHER POTENTIAL PROJECT IMPACTS

A. SIGHT LINES AT THE SR 29-128/MEE LANE-PROJECT DRIVEWAY INTERSECTION

Sight lines at the SR 29-128/Mee Lane-Project Driveway intersection are currently acceptable to the north and south along SR 29-128 from the Project Driveway.

Sight line to the north along SR 29-128 (to see southbound vehicles) 1500+ feet
Sight line to the south along SR 29-128 (to see northbound vehicles) 1500+ feet

The *Caltrans Highway Design Manual (July 2020)* 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 on SR 29-128 at the project entrance is 50 MPH, and some vehicles were observed traveling higher than the posted limit during speed surveys conducted under supervision of Crane Transportation Group--See **Appendix F**. The surveyed 85th percentile speeds were 59 MPH southbound and 58 MPH northbound. Based upon the 65 MPH criteria, resultant sight lines to the north and south along SR 29-128 from the Project Driveway would be acceptable. ***Impact Less than County Criteria.***

B. LEFT-TURN LANE AT THE SR 29-128/MEE LANE-PROJECT DRIVEWAY INTERSECTION

Left-turn lanes are already constructed on the north and southbound SR 29-128 approaches to the Mee Lane-Project Driveway intersection. ***Impact Less than County Criteria.***

C. MARKETING EVENTS

The Winery is currently permitted 36 marketing events per year. Bella Union Winery proposes to modify this marketing plan to 3/week for up to 50 guests (1 lunch/2 dinners); 12 events/year for up to 100 guests; and 1 event/year for up to 500 guests. Guests will arrive to the annual event mostly by shuttle and the Winery will be closed to the public at this time providing sufficient parking for those who drive as well. ***Impact Less than County Criteria.***

D. PEDESTRIAN, BICYCLE & TRANSIT IMPACTS

There are no pedestrian facilities located along any local road. Bicycle racks would be provided for any bike riders accessing the Winery area via the wide shoulders along SR 29-128 that are used for bike riding. Minimal or no employee use of the existing VINE transit routes along SR 29-128 would be expected due to the lack of frequent service and the more than 1-mile walk along SR 29-128 from the closest bus stops (Zinfandel Lane on the north and Rutherford Road on the south) and to the Winery. ***Impact Less than County Criteria.***

E. PARKING & INTERNAL CIRCULATION

A total of 59 on-site parking spaces will be provided for the project. This will include 13 spaces on the west side of the building (which will include 1 ADA space) and 46 additional spaces on the north and south sides of the Winery: 25 spaces on the north side (which will include 2 ADA spaces) and 21 spaces on the south side (which will include 1 ADA space). See **Figure 3**.

All parking will meet Napa County Road and Street Standard (NCRSS) criteria for stall dimensions and back-up distances. Large marketing events will be valet parked and/or served by shuttle buses or vans from hotels or off-site parking. Overflow parking will all be accommodated on-site by the valets using paved parking aisles or vineyard access roads.

The project 2-way access driveway will split into two, 2-way flow driveways leading to the parking areas north and south of the Winery. Two-way traffic flow will be maintained through each parking area. A 1-way counterclockwise flow driveway will then be provided starting at the west end of the north parking area which will extend around the Winery to the south parking lot. All driveways will meet NCRSS criteria for slope, width and turning radii. This combined 1- and 2-way system will accommodate all Winery-related traffic (including the largest trucks) as well as emergency vehicles.

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

It is a 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 took effect in July 2020). This will help reduce greenhouse gas emissions and vehicle congestion. Specific quantitative reduction guidelines have not yet been officially approved for wineries in Napa County, but a 15% reduction in VMT due to a TDM plan in operation compared to VMT with no TDM measures is the current temporary guideline. All wineries 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. Toward this end, the Bella Union Winery has developed a Transportation Demand Management (TDM) Plan that will help accomplish these goals. See **Appendix G** for the proposed plan.

The applicant will be appointing a TDM coordinator to carry out the proposed plan. Measures will include providing incentives to establish carpools and riding bicycles to work. Bike racks will be provided for employees and guests. In addition, shuttle buses will be provided for all large events. ***Impact Less than County & California Environmental Quality Act (CEQA) Criteria.***

G. YEARLY TRIP GENERATION

Based upon County formula the Provenance Winery is currently generating 36,586 yearly trips, while with the use Permit Modification, Yearly Trip Generation would increase to 102,730 yearly trips for an increase of 66,144 yearly trips. See **Appendix E**.

XI. RECOMMENDED IMPROVEMENTS

- Provide an exclusive right-turn lane on the Project Driveway approach to SR 29-128. The existing paved crossing of the Wine Train track has enough width to accommodate this lane. While this measure will facilitate turns from the Winery Driveway to SR 29-128, it will not reduce "With Project" delay to within 5 seconds of baseline (without project) conditions on either the Winery Driveway or Mee Lane intersection approaches. Therefore, a second measure is also recommended to improve Friday and Saturday PM peak hour operation at the Project Driveway intersection with SR 29-128.

- Schedule all guests by appointment and employees during the Friday and Saturday PM peak traffic hours (3:00 – 4:00 PM) to preclude any new inbound or outbound traffic during these hours. Guest appointments will last from 2:45 to 4:15 PM. Any appointment before 2:00 PM will need to end no later than 2:45 PM or end after 4:00 PM. Any guest appointments after 4:00 PM will begin no sooner than 4:15 - 4:30 PM. This measure to eliminate new traffic during the Friday and Saturday PM peak hours is the same as the one developed and approved by the County for the Saintsbury Winery in the Los Carneros area within the last two years. With this measure, there would be no difference in Level of Service or delay during the Friday and Saturday PM peak traffic hours for "With" versus "Without" project conditions.

- Provide bike lockers and a shower for employees.

XII. CONCLUSIONS & RECOMMENDATIONS

- The project will result in no off-site harvest Friday or Saturday PM peak hour circulation system County criteria operational impacts to SR 29-128 north or south of the project site. However, at the SR 29-128 intersection with Mee Lane and the Project Driveway, the addition of project traffic will increase delays for turns from both the Project Driveway and Mee Lane beyond County acceptable criteria.

- A left-turn lane is already provided on the northbound SR 29-128 approach to the Project Driveway. Also, sight lines at the Project Driveway connection to SR 29-128 exceed acceptable Caltrans Stopping-Sight-Distance Criteria.

- Bicycle racks will be provided for all bicycle riders accessing the site via SR 29-128.

- The Winery is currently permitted 36 marketing events per year. Bella Union Winery proposes to modify this marketing plan to 3/week for up to 50 guests (1 lunch/2 dinners); 12 events/year for up to 100 guests; and 1 event/year for up to 500 guests. Guests will arrive to the annual event mostly by shuttle and the Winery will be closed to the public at this time providing sufficient parking for those who drive as well.

- A Transportation Demand Management (TDM) Plan (presented in the Appendix) will be instituted to reduce Vehicle Miles Traveled (VMT) by 15% or greater when compared to operation without a plan through programs minimizing employee and guest traffic.

- A total of 59 on-site parking spaces will be provided (which include 4 ADA spaces). Valet parking, shuttle buses and vans will be provided for all large marketing events.

- The following measures are proposed to eliminate the project's peak hour impacts:

  → Provide an exclusive right-turn lane on the Project Driveway approach to SR 29-128. The existing paved crossing of the Wine Train track has enough width to accommodate this lane.

  → Eliminate all project traffic during the Friday and Saturday PM peak traffic hours through guest and employee scheduling adjustments.

  → Provide bicycle lockers and a shower for employees.

TABLES

1 - 6

1. Unsignalized Intersection LOS Criteria
2. Intersection Level of Service
3. Arterial Level of Service
4. Rural Signal Warrant Evaluation
5. Trip Generation - Approved (But Not Constructed) Projects
6. Project Trip Generation - Harvest

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

CRANE TRANSPORTATION GROUP

BELLA UNION WINERY
FINAL TRAFFIC IMPACT REPORT

TABLE 2

INTERSECTION LEVEL OF SERVICE

YEAR 2017 HARVEST

LOCATION	FRIDAY PM PEAK HOUR (2:45 - 3:45 PM)		SATURDAY PM PEAK HOUR (2:00 - 3:00 PM)	
	WITHOUT PROJECT	WITH PROJECT	WITHOUT PROJECT	WITH PROJECT
SR 29/Mee Lane-Project Driveway	F-67.7/F-126.4 [(1)]	F-116/F-139.9	F-54.5/F-164.9	F-78.6/F-183.9

YEAR 2025 HARVEST

LOCATION	FRIDAY PM PEAK HOUR (2:45 - 3:45 PM)		SATURDAY PM PEAK HOUR (2:00 - 3:00 PM)	
	WITHOUT PROJECT	WITH PROJECT	WITHOUT PROJECT	WITH PROJECT
SR 29/Mee Lane-Project Driveway	F-106/F-211.3	F-212.4/F-244.6	F-81.9/F-303.8	F-121.9/F-328.9

CUMULATIVE (YEAR 2030) HARVEST

LOCATION	FRIDAY PM PEAK HOUR (2:45 - 3:45 PM)		SATURDAY PM PEAK HOUR (2:00 - 3:00 PM)	
	WITHOUT PROJECT	WITH PROJECT	WITHOUT PROJECT	WITH PROJECT
SR 29/Mee Lane-Project Driveway	F-138.8/F-328.5	F-344.2/F-396.8	F-100/F-442.9	F-190.6/F-541.4

[(1)] Unsignalized Level of Service – Control delay in seconds: Project Driveway stop-sign controlled approach to SR 29/Mee Lane stop-sign controlled approach to SR 29

6th Edition Highway Capacity Manual (HCM) Analysis Methodology for Unsignalized Intersections (2017)
Source: Crane Transportation Group

TABLE 3

ARTERIAL LEVEL OF SERVICE

YEAR 2017 HARVEST										
	FRIDAY PM PEAK HOUR (2:45 - 3:45 PM)					SATURDAY PM PEAK HOUR (2:00 - 3:00 PM)				
	WITHOUT PROJECT		WITH PROJECT		% VOL DUE TO PROJECT	WITHOUT PROJECT		WITH PROJECT		% VOL DUE TO PROJECT
LOCATION	NB	SB	NB	SB		NB	SB	NB	SB	
SR 29 North of Project Driveway	D-.57 (1)	E-.74	D-.58	E-.75	NB-.78%|SB-.85%	E-.65	E-.69	E-.65	E-.69	NB-.38%|SB-.45%
SR 29 South of Project Driveway	D-.57 (1)	E-.74	D-.57	E-77	NB-.78%|SB-.77%	E-.66	E-.69	E-.66	E-.69	NB-.66%|SB-.72%
YEAR 2025 HARVEST										
	FRIDAY PM PEAK HOUR (2:45 - 3:45 PM)					SATURDAY PM PEAK HOUR (2:00 -3 :00 PM)				
	WITHOUT PROJECT		WITH PROJECT		% VOL DUE TO PROJECT	WITHOUT PROJECT		WITH PROJECT		% VOL DUE TO PROJECT
LOCATION	NB	SB	NB	SB		NB	SB	NB	SB	
SR 29 North of Project Driveway	E-.63 (1)	E-.82	E-.64	E-.83	NB-.70%|SB-.77%	E-.72	E-.76	E-.72	E-.76	NB-.35%|SB-.41%
SR 29 South of Project Driveway	E-.63 (1)	E-.82	E-.63	E-.82	NB-.70%|SB-.70%	E-.72	E-.76	E-.73	E-.77	NB-.60%|SB-.65%
CUMULATIVE (YEAR 2030) HARVEST										
	FRIDAY PM PEAK HOUR (2:45 - 3:45 PM)					SATURDAY PM PEAK HOUR (2:00 - 3:00 PM)				
	WITHOUT PROJECT		WITH PROJECT		% Volume Due to Project in relation to growth in traffic from 2017 to 2030	WITHOUT PROJECT		WITH PROJECT		% Volume Due to Project in relation to growth in traffic from 2019 to 2030
LOCATION	NB	SB	NB	SB		NB	SB	NB	SB	
SR 29 North of Project Driveway	E-.66 (1)	E-.86	E-.67	E-.87	NB-4.5%|SB-4.9%	E-.77	E-.80	E-.77	E-.80	NB-.2.2%|SB-2.8%
SR 29 South of Project Driveway	E-.66 (1)	E-.86	E-67	E-.87	NB-4.5%|SB-4.4%	E-.77	E-.80	E-.78	E-.81	NB-.3.8%|SB-4.4%

(1) Level of Service – Demand/Capacity
Highway Capacity Manual, 6th Edition (2017) Analysis Methodology

Source: Crane Transportation Group

BELLA UNION WINERY
FINAL TRAFFIC IMPACT REPORT

TABLE 4

RURAL SIGNAL WARRANT EVALUATION

SR 29/Mee Lane-Project Driveway

Do Volumes meet Caltrans Rural Warrant #3 Volume Criteria?

EXISTING

FRIDAY PM PEAK HOUR		SATURDAY PM PEAK HOUR	
WITHOUT PROJECT	WITH PROJECT	WITHOUT PROJECT	WITH PROJECT
NO	NO	NO	NO

YEAR 2025

FRIDAY PM PEAK HOUR		SATURDAY PM PEAK HOUR	
WITHOUT PROJECT	WITH PROJECT	WITHOUT PROJECT	WITH PROJECT
NO	NO	NO	NO

CUMULATIVE (YEAR 2030)

FRIDAY PM PEAK HOUR		SATURDAY PM PEAK HOUR	
WITHOUT PROJECT	WITH PROJECT	WITHOUT PROJECT	WITH PROJECT
NO	NO	NO	NO

California Manual on Uniform Traffic Control Devices
Source: Crane Transportation Group

BELLA UNION WINERY
FINAL TRAFFIC IMPACT REPORT

TABLE 5

TRIP GENERATION - APPROVED (BUT NOT CONSTRUCTED) PROJECTS

WINERY	LOCATION	FRIDAY PM PEAK HOUR TRIPS		SATURDAY PM PEAK HOUR TRIPS	
		IN	OUT	IN	OUT
LMR Rutherford [1]	East of SR 29 & north of Rutherford Road	0	0	0	5
Mathew Bruno Wines Tasting Room [2]	South of Rutherford Road & east of SR 29	4	5	7	9
Scarlett Winery [3]	Ponti Road west of Silverado Trail	2	1	0	1
Frank Family Benjamin Ranch Winery [4]	Conn Creed Road west of Silverado Trail	46	23	33	32
Taplin Cellars Winery [5]	Lewelling Lane west of SR 29 in St. Helena	1	2	2	2
Castellucci Family Winery [6]	Northwest corner of Zinfandel Lane/Silverado Trail intersection	0	5	4	5
Pelosi Winery [7]	North of Zinfandel Lane & west of Silverado Trail	0	2	1	1
Raymond-Ticen Winery [8]	East of SR 29 & north of Mee Lane + south of Zinfandel Lane	13	17	10	15

[1] LMR Rutherford Traffic Study by Crane Transportation Group (2014)
[2] Mathew Bruno Wines Tasting Room Focused Traffic Analysis by GHD (June 2019)
[3] Scarlett Winery Traffic Study by Crane Transportation Group by (2019)
[4] Frank Family Benjamin Ranch Winery Traffic Impact Study by W-Trans (March 2021)
[5] Taplin Cellars Winery Major Modification Traffic Projections by Napa County Public Works (July 2020) and Crane Transportation Group (January 2022)
[6] Castellucci Family Winery Traffic Study by Crane Transportation Group (May 2014)
[7] Pelosi Winery Traffic (2005) Traffic Projections by Crane Transportation Group (January 2022) Crane Transportation Group (January 2022)
[8] Raymond-Ticen Winery Traffic Study by Crane Transportation Group (August 2016)

Project List Compiled by: County of Napa Planning, Building & Environmental Services
Trip Generation Projections Compiled by: Crane Transportation Group

TABLE 6

PROJECT TRIP GENERATION

HARVEST					
	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	114	334	220	15%	33
Saturday	110	281	171	14%	24

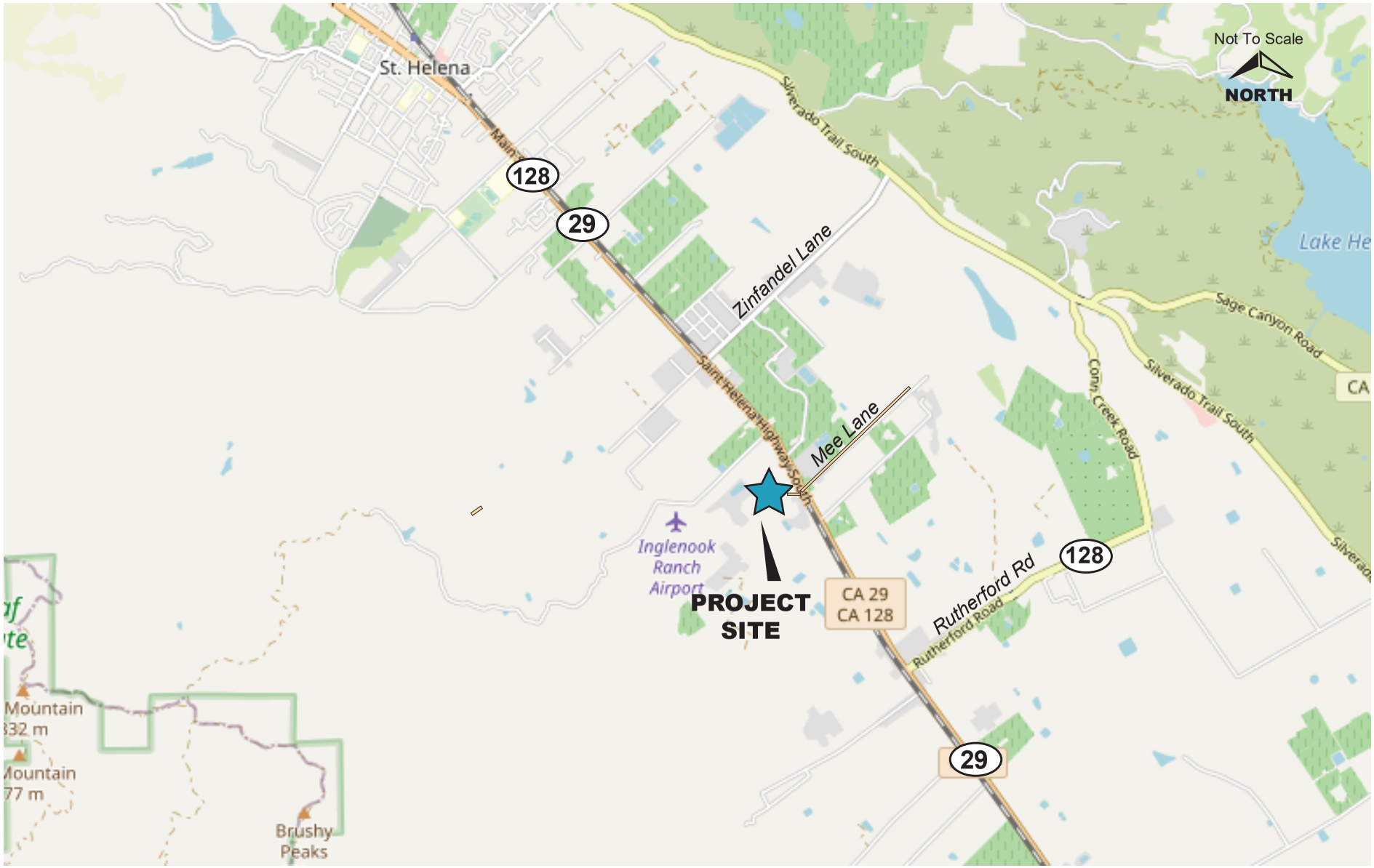
* *Napa County Winery Trip Generation Worksheet*
** 2 Friday and 2 Saturday 24-hour Traffic Counts of similar Winery Driveways - Harvest 2019
*** An approximate equal inbound-outbound split of project traffic would be expected as the PM peak traffic hour along SR 29-128 on both Friday and Saturday occurs from 3:00 - 4:00 PM. These volumes would be almost exclusively visitor traffic.

Source: Crane Transportation Group

FIGURES

1 - 13

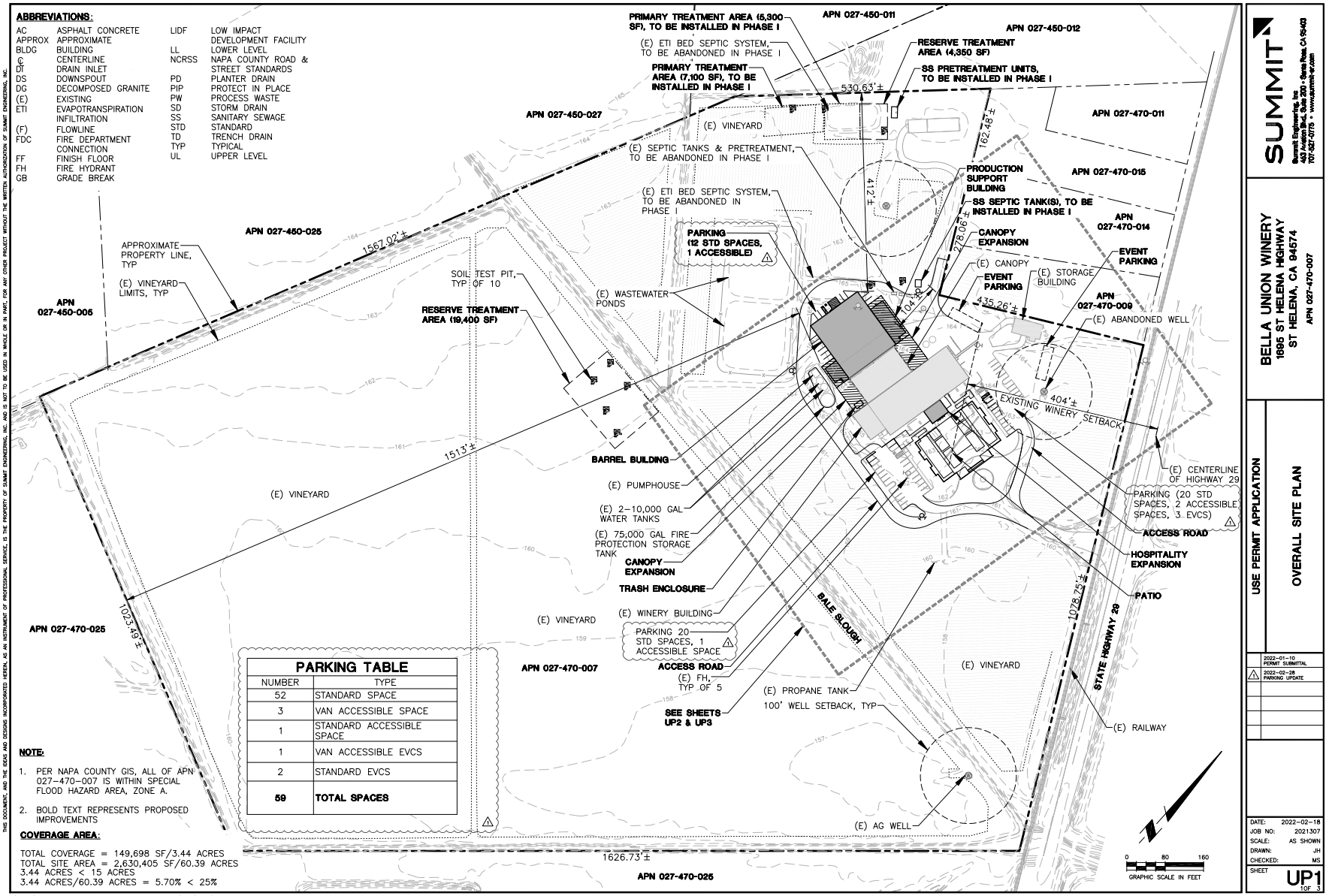
1. Area Map
2. Site Plan
3. Site Plan With Expanded Parking Detail
4. Intersection Lane Geometrics and Intersection Control
5. Existing (2017) Harvest Friday and Saturday (Without Project) Volumes
6. Reported Accidents Within One Mile
7. Transit Routes
8. Year 2025 Harvest Friday and Saturday (Without Project) Volumes
9. Year 2030 Harvest Friday and Saturday (Without Project) Volumes
10. Harvest Friday and Saturday Project Traffic Increment
11. Existing (2017) Harvest Friday and Saturday (With Project) Volumes
12. Year 2025 Harvest Friday and Saturday (With Project) Volumes
13. Year 2030 Harvest Friday and Saturday (With Project) Volumes



Bella Union Winery Traffic Study

CRANE TRANSPORTATION GROUP

Figure 1
Area Map



Bella Union Winery Traffic Study

Figure 2

Site Plan

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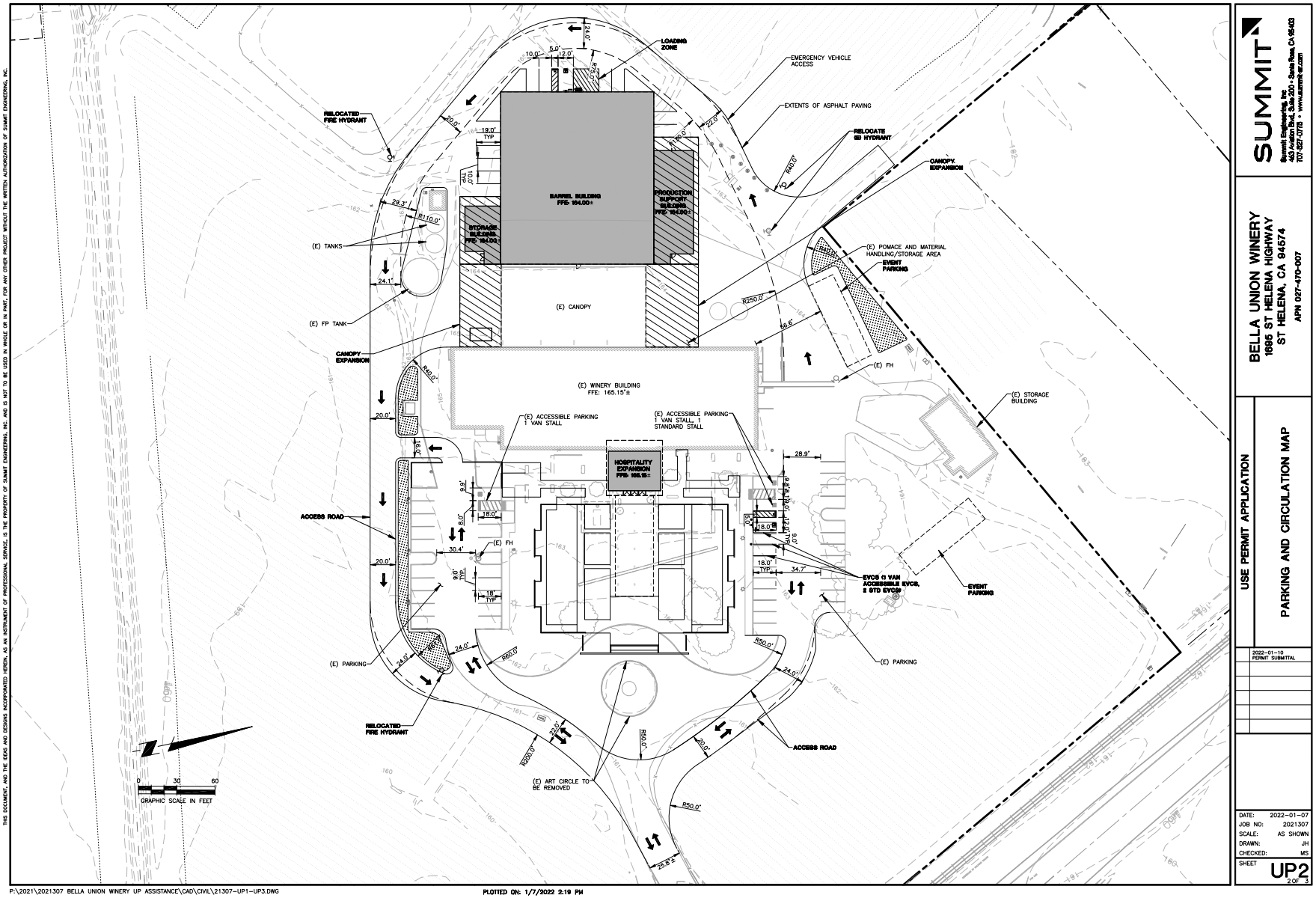


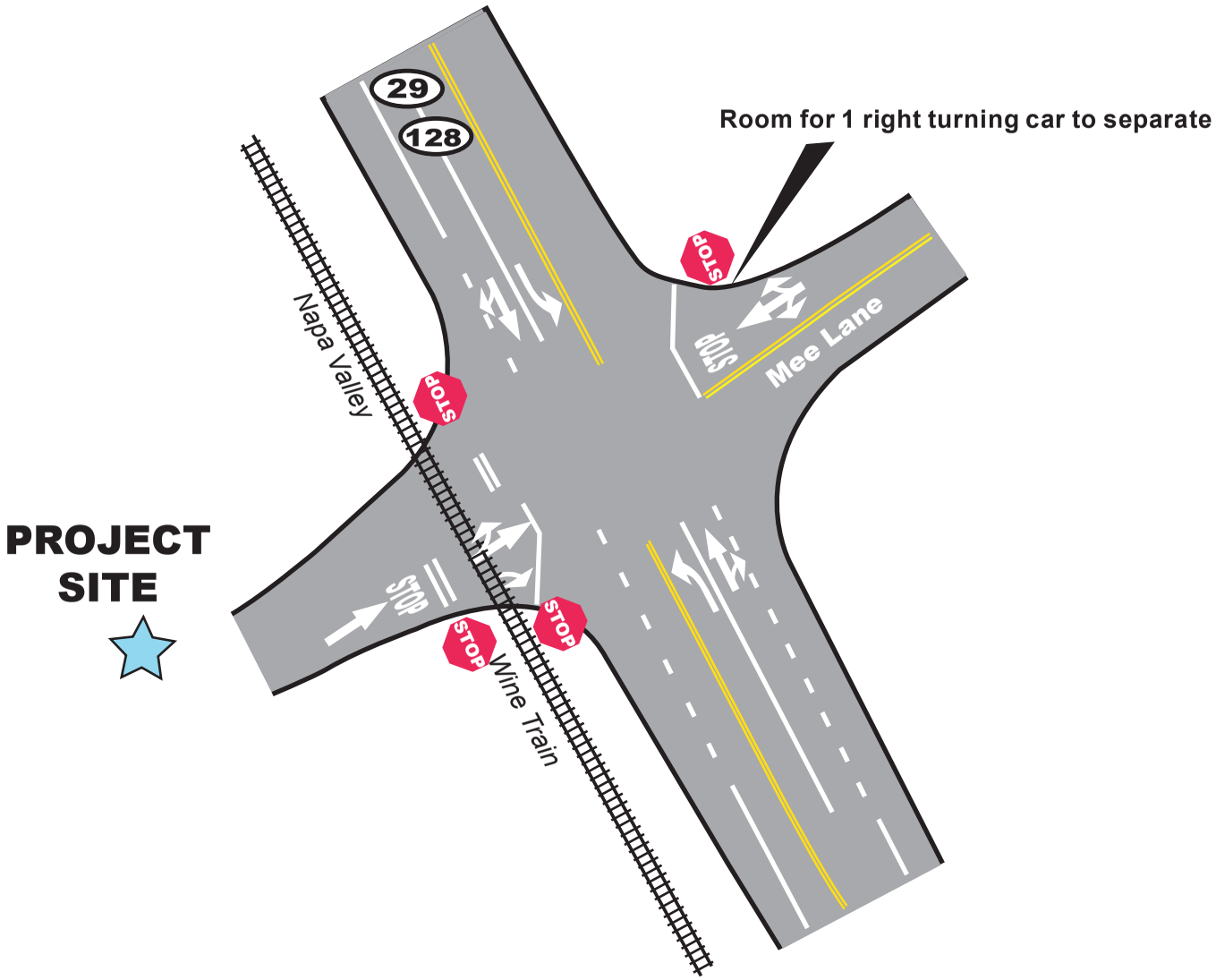
CRANE TRANSPORTATION GROUP

Figure 3

Site Plan
With Expanded Parking Detail

NORTH

Not To Scale



Bella Union Winery Traffic Study

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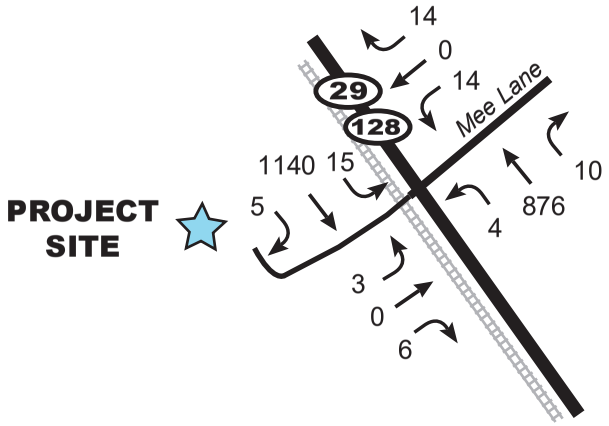
Figure 4

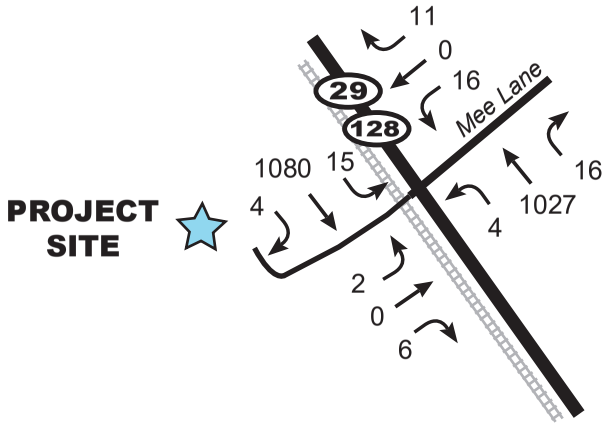
Existing Lane Geometrics and Intersection Control

NORTH

Not To Scale



Year 2017 Harvest Friday PM Peak Hour



Year 2017 Harvest Saturday PM Peak Hour

Bella Union Winery Traffic Study

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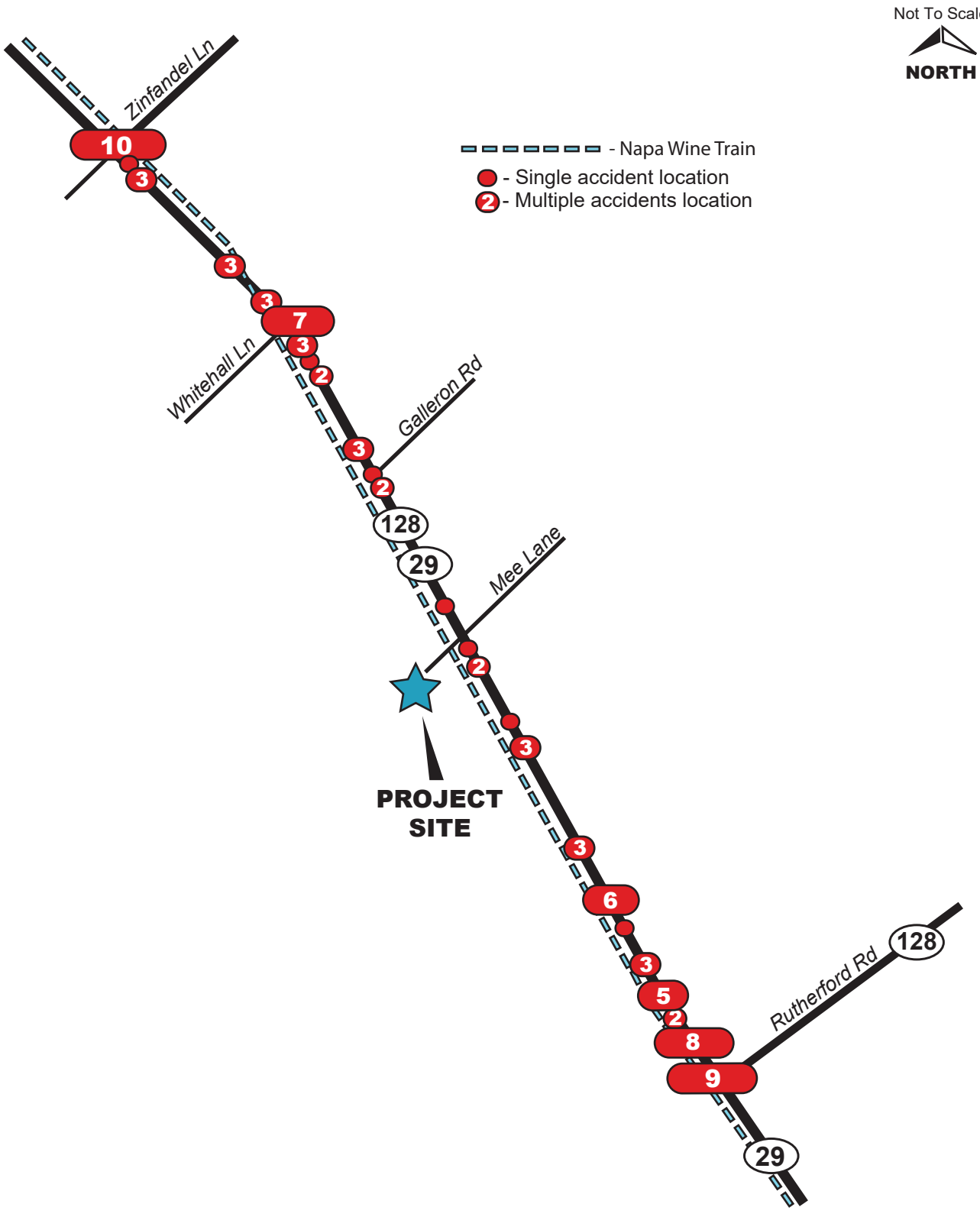
Figure 5

Existing (2017) Harvest Friday and Saturday PM Peak Hour Volumes without Project



Bella Union Winery Traffic Study

Accident Report Source: California Highway Patrol

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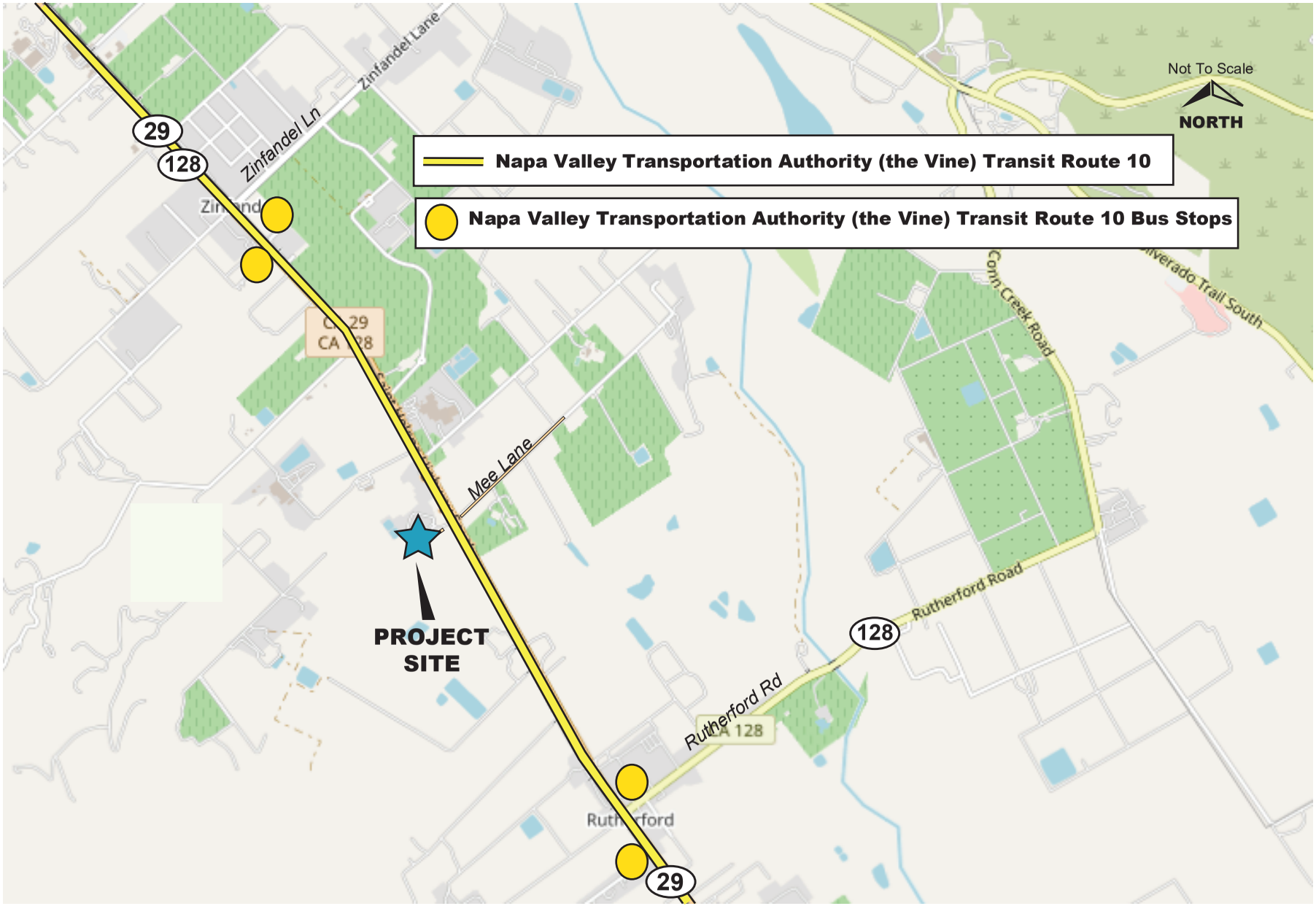
Figure 6

Reported Accidents within One Mile of the Project Site - Jan 2017 - Nov 2021



Bella Union Winery Traffic Study

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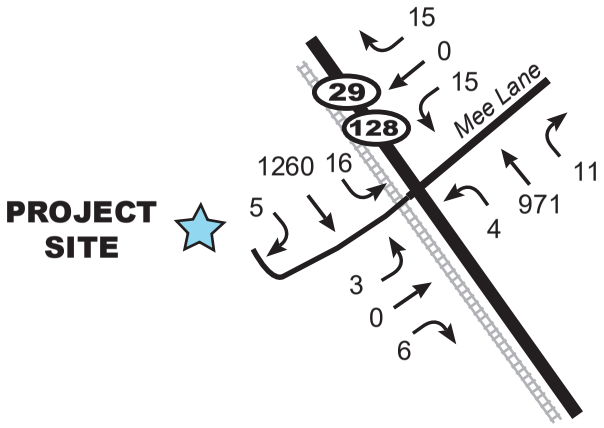
Figure 7

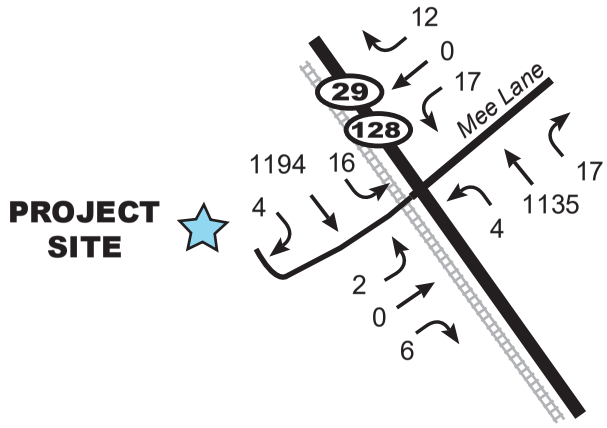
Transit Routes

NORTH

Not To Scale



Year 2025 Harvest Friday PM Peak Hour



Year 2025 Harvest Saturday PM Peak Hour

Bella Union Winery Traffic Study

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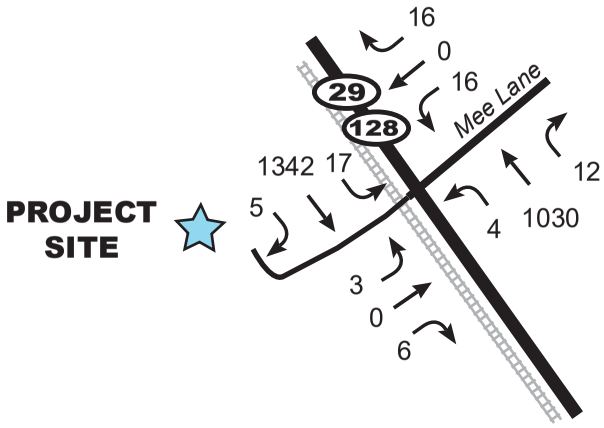
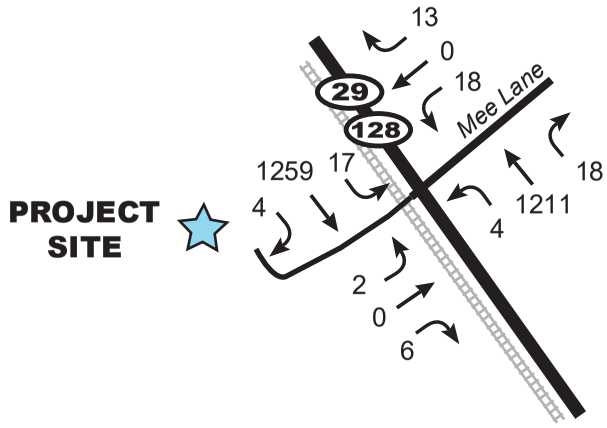
Figure 8
Year 2025 Harvest Friday and Saturday PM Peak Hour Volumes without Project

NORTH

Not To Scale



2030 Harvest Friday PM Peak Hour



2030 Harvest Saturday PM Peak Hour

Bella Union Winery Traffic Study

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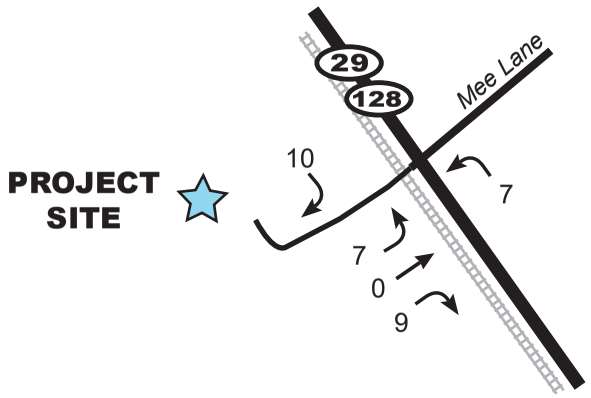
Figure 9

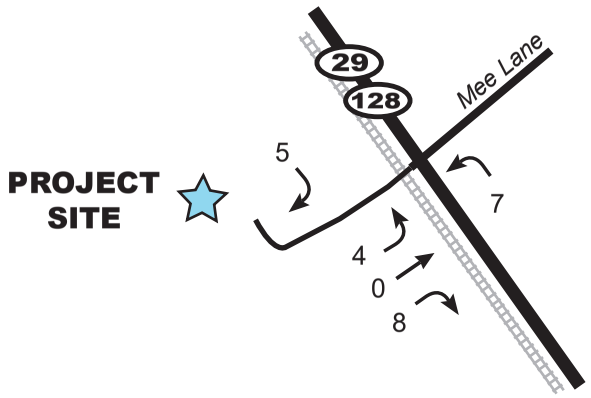
Year 2030 Harvest Friday and Saturday PM Peak Hour Volumes without Project

NORTH

Not To Scale



Harvest Friday PM Peak Hour



Harvest Saturday PM Peak Hour

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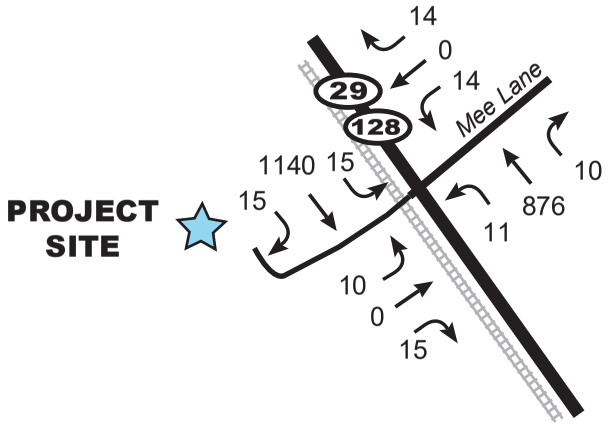
Figure 10

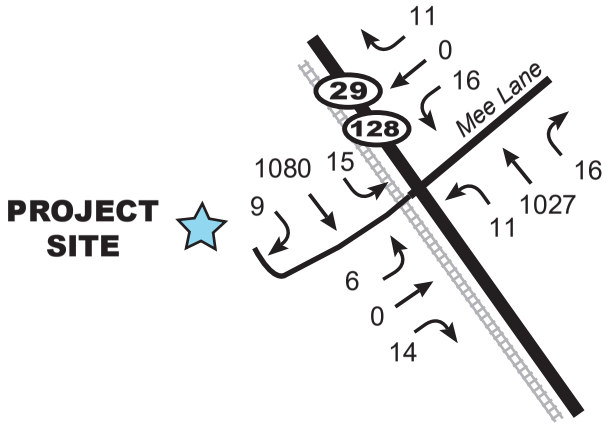
Harvest Friday and Saturday Project Increment

NORTH

Not To Scale



Year 2017 Harvest Friday PM Peak Hour



Year 2017 Harvest Saturday PM Peak Hour

Bella Union Winery Traffic Study

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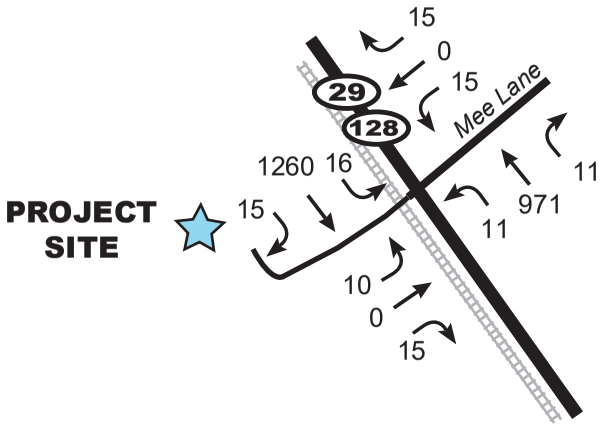
Figure 11

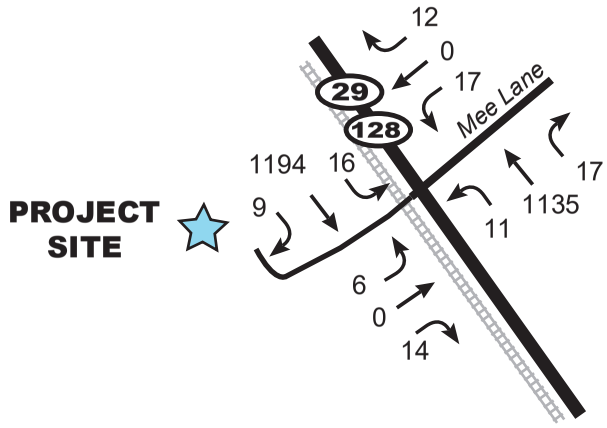
Existing (2017) Harvest Friday and Saturday PM Peak Hour Volumes with Project

NORTH

Not To Scale



Year 2025 Harvest Friday PM Peak Hour



Year 2025 Harvest Saturday PM Peak Hour

Bella Union Winery Traffic Study

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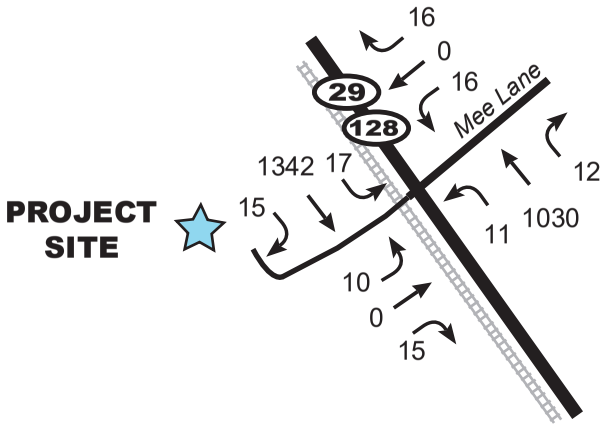
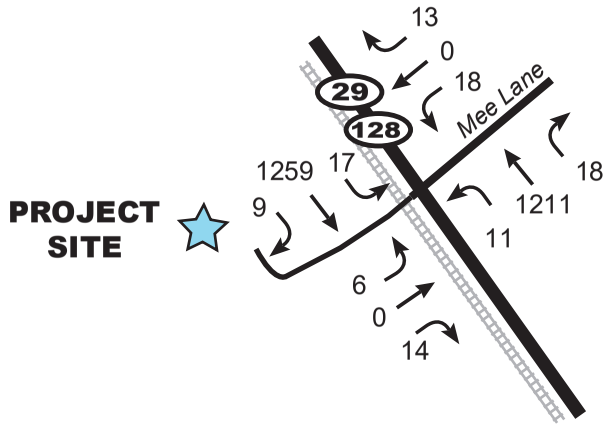
Figure 12
Year 2025 Harvest Friday and Saturday PM Peak Hour Volumes with Project

NORTH

Not To Scale



2030 Harvest Friday PM Peak Hour



2030 Harvest Saturday PM Peak Hour

Bella Union Winery Traffic Study

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Figure 13

Year 2030 Harvest Friday and Saturday PM Peak Hour Volumes with Project

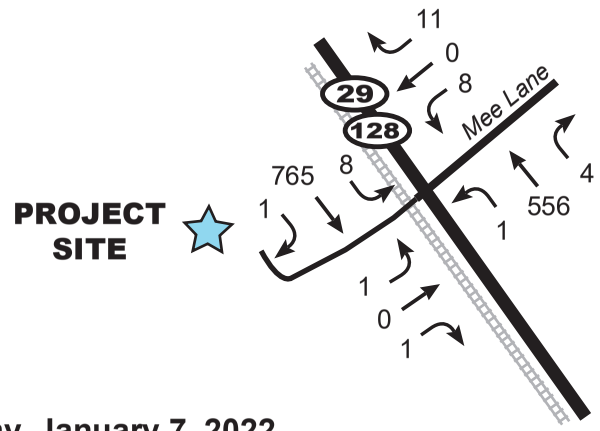
APPENDICES

A1 - G1

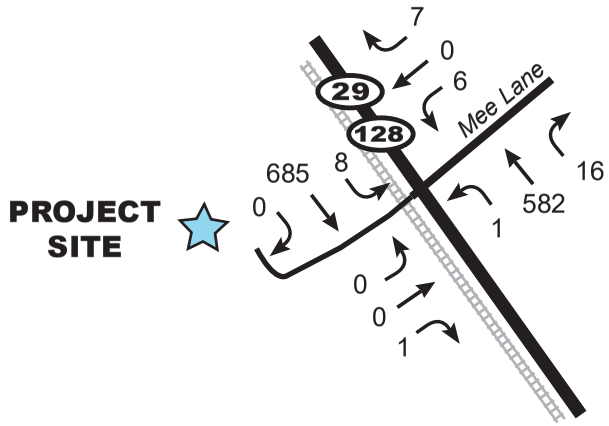
A-1	Friday and Saturday Peak Hour Volumes (January 2022)
A-2	2022 Harvest Friday and Saturday Volumes (with Provenance Winery)
B-1	Intersection LOS Worksheets
C-1	Peak Hour Volume Warrant #3 (Rural Area)
D-1	Year 2017 Reported Accidents
D-2	Year 2018 Reported Accidents
D-3	Year 2019 Reported Accidents
D-4	Year 2020 Reported Accidents
D-5	Year 2021 Reported Accidents
E-1	Friday Harvest 2019 Traffic Percentages (Far Niente Winery)
E-2	Saturday Harvest 2019 Traffic Percentages (Far Niente Winery)
E-3	Friday Harvest 2019 Traffic Percentages (Artesa Winery)
E-4	Saturday Harvest 2019 Traffic Percentages (Artesa Winery)
E-5	Friday Harvest 2020 Traffic Percentages (Artesa Winery)
E-6	Saturday Harvest 2020 Traffic Percentages (Artesa Winery)
E-7	Winery Trip Generation Worksheet
F-1	IDAX Radar Sample Speed Survey SR 29-128
G-1	Transportation Demand Management Plan

APPENDIX A

A-1 Friday and Saturday PM Peak Hour Volumes (January 2022)
A-2 2022 Harvest Friday and Saturday PM Peak Hour Volumes (with Provenance Winery)



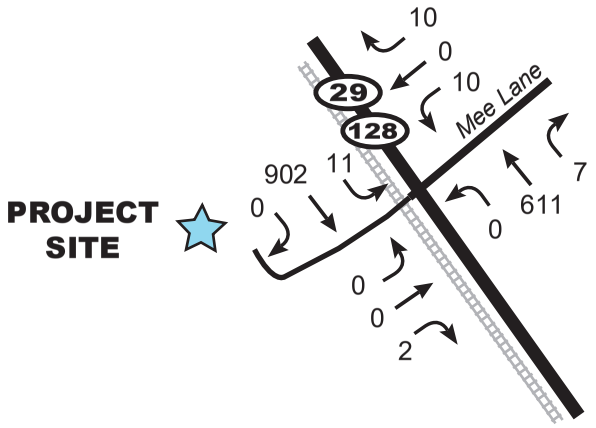
Friday, January 7, 2022
2:45-3:45 PM



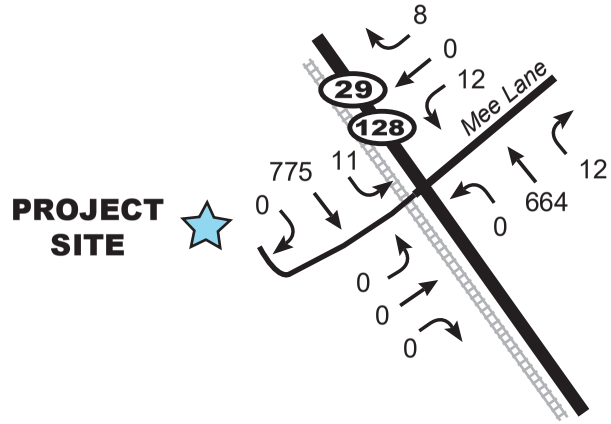
Saturday, January 8, 2022
2:15-3:15 PM

NORTH

Not To Scale



Friday, January 14, 2022
3:00-4:00 PM



Saturday, January 15, 2022
3:00-4:00 PM

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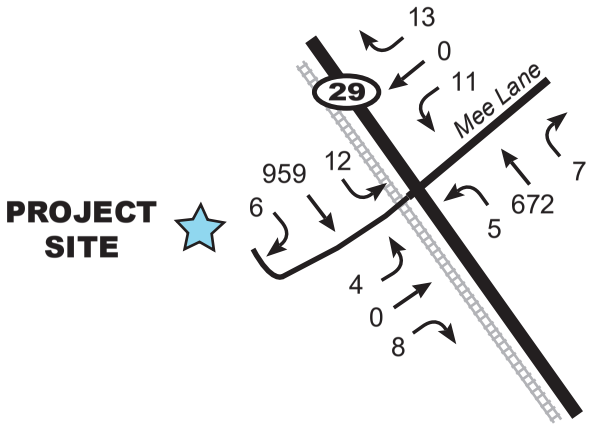
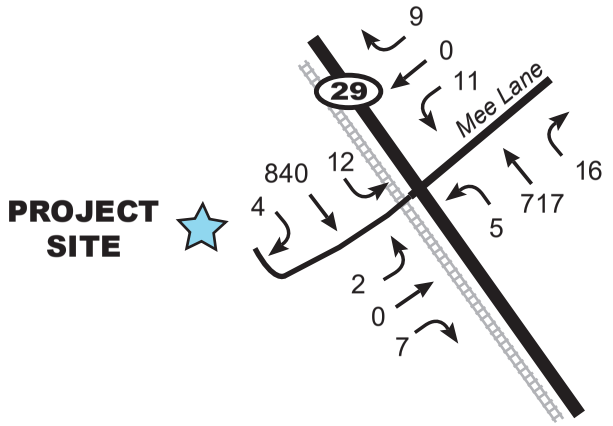
Appendix A-1
Friday and Saturday Peak Hour Volumes January 2022

NORTH

Not To Scale



Harvest Friday PM Peak Hour



Harvest Saturday PM Peak Hour

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Appendix A-2

2022 Harvest Friday and Saturday PM Peak Hour Volumes with Provenance Winery

APPENDIX B

B-1 Intersection LOS Worksheets

Intersection	
Int Delay, s/veh	2.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	0	6	14	0	14	4	876	10	15	1140	5
Future Vol, veh/h	3	0	6	14	0	14	4	876	10	15	1140	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	25	100	-	-	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0	0	2	0	0	2	0
Mvmt Flow	3	0	7	15	0	15	4	952	11	16	1239	5

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2247	2245	1242	2243	2242	958	1244	0	0	963	0	0
Stage 1	1274	1274	-	966	966	-	-	-	-	-	-	-
Stage 2	973	971	-	1277	1276	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	30	42	215	30	43	315	567	-	-	723	-	-
Stage 1	207	240	-	309	336	-	-	-	-	-	-	-
Stage 2	306	334	-	206	240	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	28	41	215	28	42	315	567	-	-	723	-	-
Mov Cap-2 Maneuver	28	41	-	28	42	-	-	-	-	-	-	-
Stage 1	206	235	-	307	334	-	-	-	-	-	-	-
Stage 2	289	332	-	195	235	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	67.7	126.4	0.1	0.1
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	567	-	-	67	28	315	723	-	-
HCM Lane V/C Ratio	0.008	-	-	0.146	0.543	0.048	0.023	-	-
HCM Control Delay (s)	11.4	-	-	67.7	235.8	17	10.1	-	-
HCM Lane LOS	B	-	-	F	F	C	B	-	-
HCM 95th %tile Q(veh)	0	-	-	0.5	1.7	0.2	0.1	-	-

Intersection	
Int Delay, s/veh	2.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	0	6	16	0	11	4	1027	16	15	1080	4
Future Vol, veh/h	2	0	6	16	0	11	4	1027	16	15	1080	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	4	0	0	4
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	25	100	-	-	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	92
Heavy Vehicles, %	0	0	0	0	0	0	0	1	0	0	1	0
Mvmt Flow	2	0	6	17	0	12	4	1081	17	16	1137	4

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2279	2285	1143	2276	2279	1094	1145	0	0	1102	0	0
Stage 1	1175	1175	-	1102	1102	-	-	-	-	-	-	-
Stage 2	1104	1110	-	1174	1177	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	29	40	246	29	40	263	618	-	-	641	-	-
Stage 1	236	268	-	259	290	-	-	-	-	-	-	-
Stage 2	258	287	-	236	267	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	27	39	245	27	39	262	616	-	-	639	-	-
Mov Cap-2 Maneuver	27	39	-	27	39	-	-	-	-	-	-	-
Stage 1	234	260	-	256	287	-	-	-	-	-	-	-
Stage 2	245	284	-	224	260	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	54.5	164.9	0	0.1
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	616	-	-	81	27	262	639	-	-
HCM Lane V/C Ratio	0.007	-	-	0.104	0.624	0.044	0.025	-	-
HCM Control Delay (s)	10.9	-	-	54.5	264.9	19.4	10.8	-	-
HCM Lane LOS	B	-	-	F	F	C	B	-	-
HCM 95th %tile Q(veh)	0	-	-	0.3	2	0.1	0.1	-	-

Intersection	
Int Delay, s/veh	3.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	0	6	15	0	15	4	971	11	16	1260	5
Future Vol, veh/h	3	0	6	15	0	15	4	971	11	16	1260	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	25	100	-	-	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0	0	2	0	0	2	0
Mvmt Flow	3	0	7	16	0	16	4	1055	12	17	1370	5

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2484	2482	1373	2479	2478	1061	1375	0	0	1067	0	0
Stage 1	1407	1407	-	1069	1069	-	-	-	-	-	-	-
Stage 2	1077	1075	-	1410	1409	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	20	30	180	21	30	274	505	-	-	661	-	-
Stage 1	174	207	-	270	300	-	-	-	-	-	-	-
Stage 2	268	298	-	173	207	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	18	29	180	20	29	274	505	-	-	661	-	-
Mov Cap-2 Maneuver	18	29	-	20	29	-	-	-	-	-	-	-
Stage 1	173	202	-	268	298	-	-	-	-	-	-	-
Stage 2	250	296	-	162	202	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	106	211.3	0	0.1
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	505	-	-	45	20	274	661	-	-
HCM Lane V/C Ratio	0.009	-	-	0.217	0.815	0.06	0.026	-	-
HCM Control Delay (s)	12.2	-	-	106$	403.7	19	10.6	-	-
HCM Lane LOS	B	-	-	F	F	C	B	-	-
HCM 95th %tile Q(veh)	0	-	-	0.7	2.3	0.2	0.1	-	-

Intersection	
Int Delay, s/veh	4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	0	6	17	0	12	4	1135	17	16	1194	4
Future Vol, veh/h	2	0	6	17	0	12	4	1135	17	16	1194	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	4	0	0	4
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	25	100	-	-	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	92
Heavy Vehicles, %	0	0	0	0	0	0	0	1	0	0	1	0
Mvmt Flow	2	0	6	18	0	13	4	1195	18	17	1257	4

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2516	2522	1263	2512	2515	1208	1265	0	0	1217	0	0
Stage 1	1297	1297	-	1216	1216	-	-	-	-	-	-	-
Stage 2	1219	1225	-	1296	1299	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	19	28	209	19	29	225	556	-	-	580	-	-
Stage 1	201	234	-	223	256	-	-	-	-	-	-	-
Stage 2	223	254	-	201	234	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	17	27	208	18	28	224	554	-	-	578	-	-
Mov Cap-2 Maneuver	17	27	-	18	28	-	-	-	-	-	-	-
Stage 1	199	227	-	221	253	-	-	-	-	-	-	-
Stage 2	209	251	-	189	227	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	81.9	$ 303.8	0	0.2
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	554	-	-	55	18	224	578	-	-
HCM Lane V/C Ratio	0.008	-	-	0.153	0.994	0.056	0.029	-	-
HCM Control Delay (s)	11.5	-	-	81.9	$ 502.8	22	11.4	-	-
HCM Lane LOS	B	-	-	F	F	C	B	-	-
HCM 95th %tile Q(veh)	0	-	-	0.5	2.6	0.2	0.1	-	-

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

Intersection	
Int Delay, s/veh	4.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	0	6	16	0	16	4	1030	12	17	1342	5
Future Vol, veh/h	3	0	6	16	0	16	4	1030	12	17	1342	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	25	100	-	-	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0	0	2	0	0	2	0
Mvmt Flow	3	0	7	17	0	17	4	1120	13	18	1459	5

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2641	2639	1462	2636	2635	1127	1464	0	0	1133	0	0
Stage 1	1498	1498	-	1135	1135	-	-	-	-	-	-	-
Stage 2	1143	1141	-	1501	1500	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	16	24	160	~ 16	24	251	467	-	-	624	-	-
Stage 1	154	187	-	248	280	-	-	-	-	-	-	-
Stage 2	246	278	-	154	187	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	14	23	160	~ 15	23	251	467	-	-	624	-	-
Mov Cap-2 Maneuver	14	23	-	~ 15	23	-	-	-	-	-	-	-
Stage 1	153	182	-	246	277	-	-	-	-	-	-	-
Stage 2	227	275	-	143	182	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	138.8	$ 328.5	0	0.1
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	467	-	-	36	15	251	624	-	-
HCM Lane V/C Ratio	0.009	-	-	0.272	1.159	0.069	0.03	-	-
HCM Control Delay (s)	12.8	-	-	138.8	$ 636.5	20.4	10.9	-	-
HCM Lane LOS	B	-	-	F	F	C	B	-	-
HCM 95th %tile Q(veh)	0	-	-	0.9	2.7	0.2	0.1	-	-

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

Intersection	
Int Delay, s/veh	5.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	0	6	18	0	13	4	1211	18	17	1259	4
Future Vol, veh/h	2	0	6	18	0	13	4	1211	18	17	1259	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	4	0	0	4
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	25	100	-	-	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	92
Heavy Vehicles, %	0	0	0	0	0	0	0	1	0	0	1	0
Mvmt Flow	2	0	6	19	0	14	4	1275	19	18	1325	4

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2667	2673	1331	2663	2666	1289	1333	0	0	1298	0	0
Stage 1	1367	1367	-	1297	1297	-	-	-	-	-	-	-
Stage 2	1300	1306	-	1366	1369	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	15	23	191	~ 15	23	202	524	-	-	540	-	-
Stage 1	183	217	-	201	234	-	-	-	-	-	-	-
Stage 2	200	232	-	184	216	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	14	22	190	~ 14	22	201	522	-	-	538	-	-
Mov Cap-2 Maneuver	14	22	-	~ 14	22	-	-	-	-	-	-	-
Stage 1	181	209	-	199	231	-	-	-	-	-	-	-
Stage 2	185	229	-	172	208	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	100	$ 442.9	0	0.2
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	522	-	-	46	14	201	538	-	-
HCM Lane V/C Ratio	0.008	-	-	0.183	1.353	0.068	0.033	-	-
HCM Control Delay (s)	12	-	-	100	$ 745.3	24.2	11.9	-	-
HCM Lane LOS	B	-	-	F	F	C	B	-	-
HCM 95th %tile Q(veh)	0	-	-	0.6	3	0.2	0.1	-	-

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

Intersection	
Int Delay, s/veh	3.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	10	0	15	14	0	14	11	876	10	15	1140	15
Future Vol, veh/h	10	0	15	14	0	14	11	876	10	15	1140	15
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	25	100	-	-	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0	0	2	0	0	2	0
Mvmt Flow	11	0	16	15	0	15	12	952	11	16	1239	16

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2268	2266	1247	2269	2269	958	1255	0	0	963	0	0
Stage 1	1279	1279	-	982	982	-	-	-	-	-	-	-
Stage 2	989	987	-	1287	1287	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	29	41	214	29	41	315	561	-	-	723	-	-
Stage 1	206	239	-	302	330	-	-	-	-	-	-	-
Stage 2	300	328	-	204	237	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	27	39	214	26	39	315	561	-	-	723	-	-
Mov Cap-2 Maneuver	27	39	-	26	39	-	-	-	-	-	-	-
Stage 1	202	234	-	296	323	-	-	-	-	-	-	-
Stage 2	279	321	-	184	232	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	116	139.9	0.1	0.1
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	561	-	-	57	26	315	723	-	-
HCM Lane V/C Ratio	0.021	-	-	0.477	0.585	0.048	0.023	-	-
HCM Control Delay (s)	11.6	-	-	116	262.7	17	10.1	-	-
HCM Lane LOS	B	-	-	F	F	C	B	-	-
HCM 95th %tile Q(veh)	0.1	-	-	1.8	1.8	0.2	0.1	-	-

Intersection	
Int Delay, s/veh	3.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	6	0	14	16	0	11	11	1027	16	15	1080	9
Future Vol, veh/h	6	0	14	16	0	11	11	1027	16	15	1080	9
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	4	0	0	4
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	25	100	-	-	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	92
Heavy Vehicles, %	0	0	0	0	0	0	0	1	0	0	1	0
Mvmt Flow	6	0	15	17	0	12	12	1081	17	16	1137	10

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2298	2304	1146	2300	2301	1094	1151	0	0	1102	0	0
Stage 1	1178	1178	-	1118	1118	-	-	-	-	-	-	-
Stage 2	1120	1126	-	1182	1183	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	28	39	245	28	39	263	614	-	-	641	-	-
Stage 1	235	267	-	254	285	-	-	-	-	-	-	-
Stage 2	253	282	-	234	265	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	26	37	244	25	37	262	612	-	-	639	-	-
Mov Cap-2 Maneuver	26	37	-	25	37	-	-	-	-	-	-	-
Stage 1	230	260	-	248	278	-	-	-	-	-	-	-
Stage 2	237	276	-	214	258	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	78.6	183.9	0.1	0.1
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	612	-	-	69	25	262	639	-	-
HCM Lane V/C Ratio	0.019	-	-	0.305	0.674	0.044	0.025	-	-
HCM Control Delay (s)	11	-	-	78.6	297	19.4	10.8	-	-
HCM Lane LOS	B	-	-	F	F	C	B	-	-
HCM 95th %tile Q(veh)	0.1	-	-	1.1	2.1	0.1	0.1	-	-

Intersection	
Int Delay, s/veh	5.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	10	0	15	15	0	15	11	971	11	16	1260	15
Future Vol, veh/h	10	0	15	15	0	15	11	971	11	16	1260	15
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	25	100	-	-	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0	0	2	0	0	2	0
Mvmt Flow	11	0	16	16	0	16	12	1055	12	17	1370	16

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2505	2503	1378	2505	2505	1061	1386	0	0	1067	0	0
Stage 1	1412	1412	-	1085	1085	-	-	-	-	-	-	-
Stage 2	1093	1091	-	1420	1420	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	20	29	179	20	29	274	500	-	-	661	-	-
Stage 1	173	206	-	265	295	-	-	-	-	-	-	-
Stage 2	262	293	-	171	204	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	18	28	179	18	28	274	500	-	-	661	-	-
Mov Cap-2 Maneuver	18	28	-	18	28	-	-	-	-	-	-	-
Stage 1	169	201	-	259	288	-	-	-	-	-	-	-
Stage 2	240	286	-	151	199	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	212.4	244.6	0.1	0.1
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	500	-	-	39	18	274	661	-	-
HCM Lane V/C Ratio	0.024	-	-	0.697	0.906	0.06	0.026	-	-
HCM Control Delay (s)	12.4	-	-	212.4$	470.1	19	10.6	-	-
HCM Lane LOS	B	-	-	F	F	C	B	-	-
HCM 95th %tile Q(veh)	0.1	-	-	2.5	2.4	0.2	0.1	-	-

Intersection	
Int Delay, s/veh	5.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	6	0	14	17	0	12	11	1135	17	16	1194	9
Future Vol, veh/h	6	0	14	17	0	12	11	1135	17	16	1194	9
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	4	0	0	4
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	25	100	-	-	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	92
Heavy Vehicles, %	0	0	0	0	0	0	0	1	0	0	1	0
Mvmt Flow	6	0	15	18	0	13	12	1195	18	17	1257	10

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2535	2541	1266	2536	2537	1208	1271	0	0	1217	0	0
Stage 1	1300	1300	-	1232	1232	-	-	-	-	-	-	-
Stage 2	1235	1241	-	1304	1305	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	19	27	208	19	28	225	553	-	-	580	-	-
Stage 1	200	233	-	219	252	-	-	-	-	-	-	-
Stage 2	218	249	-	199	232	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	17	25	207	~ 17	26	224	551	-	-	578	-	-
Mov Cap-2 Maneuver	17	25	-	~ 17	26	-	-	-	-	-	-	-
Stage 1	195	226	-	214	246	-	-	-	-	-	-	-
Stage 2	201	243	-	179	225	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	129.1	$ 328.9	0.1	0.1
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	551	-	-	48	17	224	578	-	-
HCM Lane V/C Ratio	0.021	-	-	0.439	1.053	0.056	0.029	-	-
HCM Control Delay (s)	11.7	-	-	129.1	$ 545.5	22	11.4	-	-
HCM Lane LOS	B	-	-	F	F	C	B	-	-
HCM 95th %tile Q(veh)	0.1	-	-	1.6	2.6	0.2	0.1	-	-

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

Intersection	
Int Delay, s/veh	8.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	10	0	15	16	0	16	11	1030	12	17	1342	15
Future Vol, veh/h	10	0	15	16	0	16	11	1030	12	17	1342	15
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	25	100	-	-	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0	0	2	0	0	2	0
Mvmt Flow	11	0	16	17	0	17	12	1120	13	18	1459	16

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2662	2660	1467	2662	2662	1127	1475	0	0	1133	0	0
Stage 1	1503	1503	-	1151	1151	-	-	-	-	-	-	-
Stage 2	1159	1157	-	1511	1511	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	15	23	159	~ 15	23	251	463	-	-	624	-	-
Stage 1	153	186	-	243	275	-	-	-	-	-	-	-
Stage 2	241	273	-	152	185	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	13	22	159	~ 13	22	251	463	-	-	624	-	-
Mov Cap-2 Maneuver	13	22	-	~ 13	22	-	-	-	-	-	-	-
Stage 1	149	181	-	237	268	-	-	-	-	-	-	-
Stage 2	218	266	-	132	180	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	$ 344.2	$ 396.8	0.1	0.1
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	463	-	-	29	13	251	624	-	-
HCM Lane V/C Ratio	0.026	-	-	0.937	1.338	0.069	0.03	-	-
HCM Control Delay (s)	13	-	-	$ 344.2	$ 773.2	20.4	10.9	-	-
HCM Lane LOS	B	-	-	F	F	C	B	-	-
HCM 95th %tile Q(veh)	0.1	-	-	3.1	2.8	0.2	0.1	-	-

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

Intersection	
Int Delay, s/veh	8.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	6	0	14	18	0	13	11	1211	18	17	1259	9
Future Vol, veh/h	6	0	14	18	0	13	11	1211	18	17	1259	9
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	4	0	0	4
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	25	100	-	-	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	92
Heavy Vehicles, %	0	0	0	0	0	0	0	1	0	0	1	0
Mvmt Flow	6	0	15	19	0	14	12	1275	19	18	1325	10

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2686	2692	1334	2687	2688	1289	1339	0	0	1298	0	0
Stage 1	1370	1370	-	1313	1313	-	-	-	-	-	-	-
Stage 2	1316	1322	-	1374	1375	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	15	22	190	~ 14	22	202	521	-	-	540	-	-
Stage 1	183	216	-	197	230	-	-	-	-	-	-	-
Stage 2	196	228	-	182	215	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	13	21	189	~ 12	21	201	519	-	-	538	-	-
Mov Cap-2 Maneuver	13	21	-	~ 12	21	-	-	-	-	-	-	-
Stage 1	178	208	-	192	224	-	-	-	-	-	-	-
Stage 2	178	222	-	162	207	-	-	-	-	-	-	-

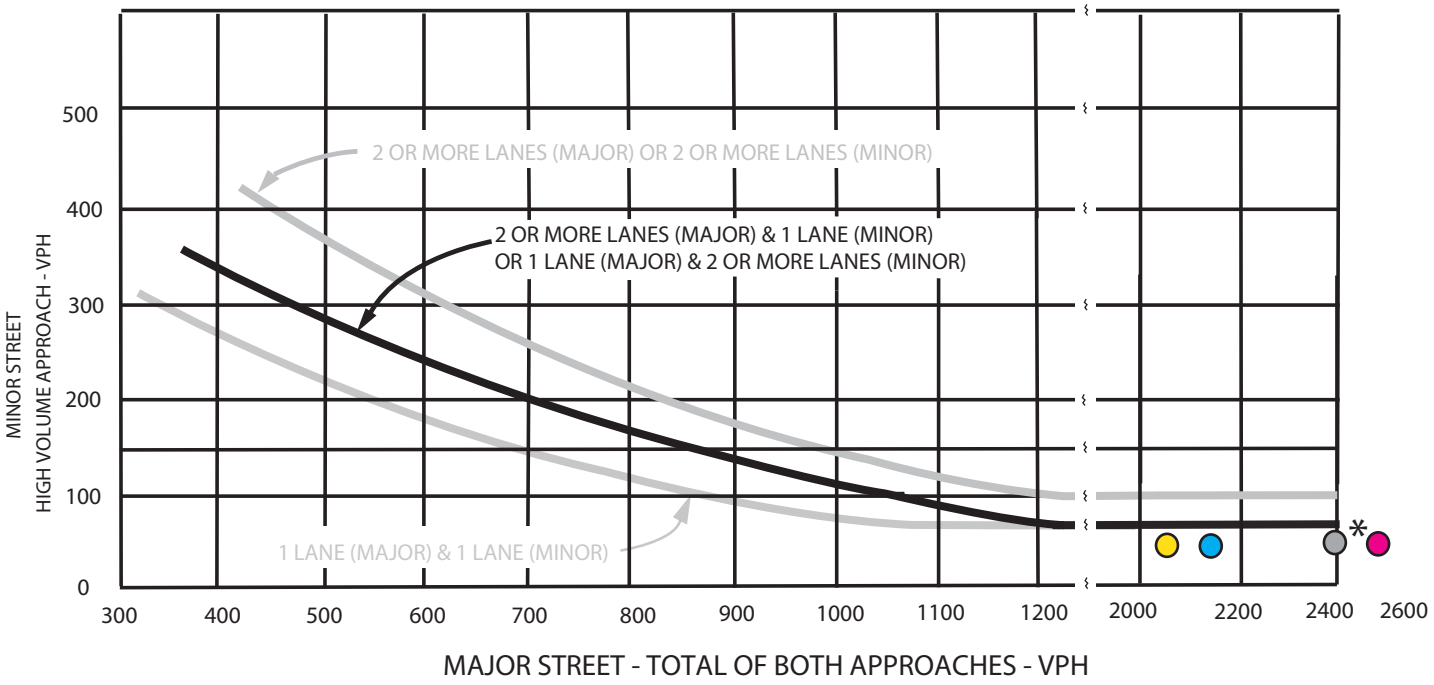
Approach	EB	WB	NB	SB
HCM Control Delay, s	190.6	$ 541.4	0.1	0.2
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	519	-	-	37	12	201	538	-	-
HCM Lane V/C Ratio	0.022	-	-	0.569	1.579	0.068	0.033	-	-
HCM Control Delay (s)	12.1	-	-	190.6	$ 915	24.2	11.9	-	-
HCM Lane LOS	B	-	-	F	F	C	B	-	-
HCM 95th %tile Q(veh)	0.1	-	-	2	3.1	0.2	0.1	-	-

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

APPENDIX C

C-1 Peak Hour Volume Warrant #3 (Rural Area)



- Existing Friday PM Peak Hour (with Project)
- Year 2030 Friday PM Peak Hour (with Project)
- Existing Saturday PM Peak Hour (with Project)
- Year 2030 Saturday PM Peak Hour (with 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: California Manual of Uniform Traffic Control Devices, 2021

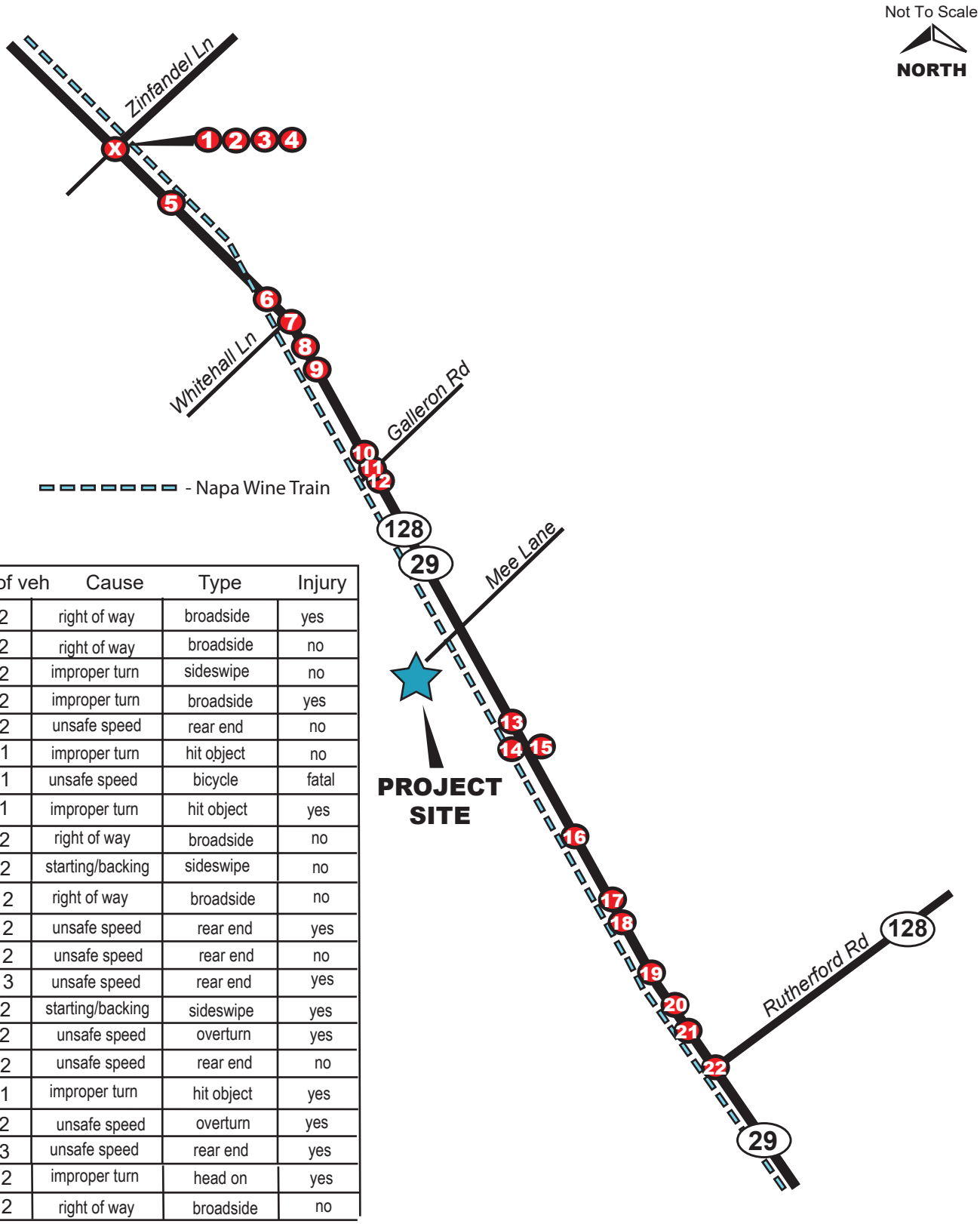
CRANE TRANSPORTATION GROUP

Appendix C-1

PEAK HOUR VOLUME WARRANT #3
(Rural Area)
SR29-128/Mee Lane/Project Entrance

APPENDIX D

D-1 Year 2017 Reported Accidents
D-2 Year 2018 Reported Accidents
D-3 Year 2019 Reported Accidents
D-4 Year 2020 Reported Accidents
D-5 Year 2021 Reported Accidents



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

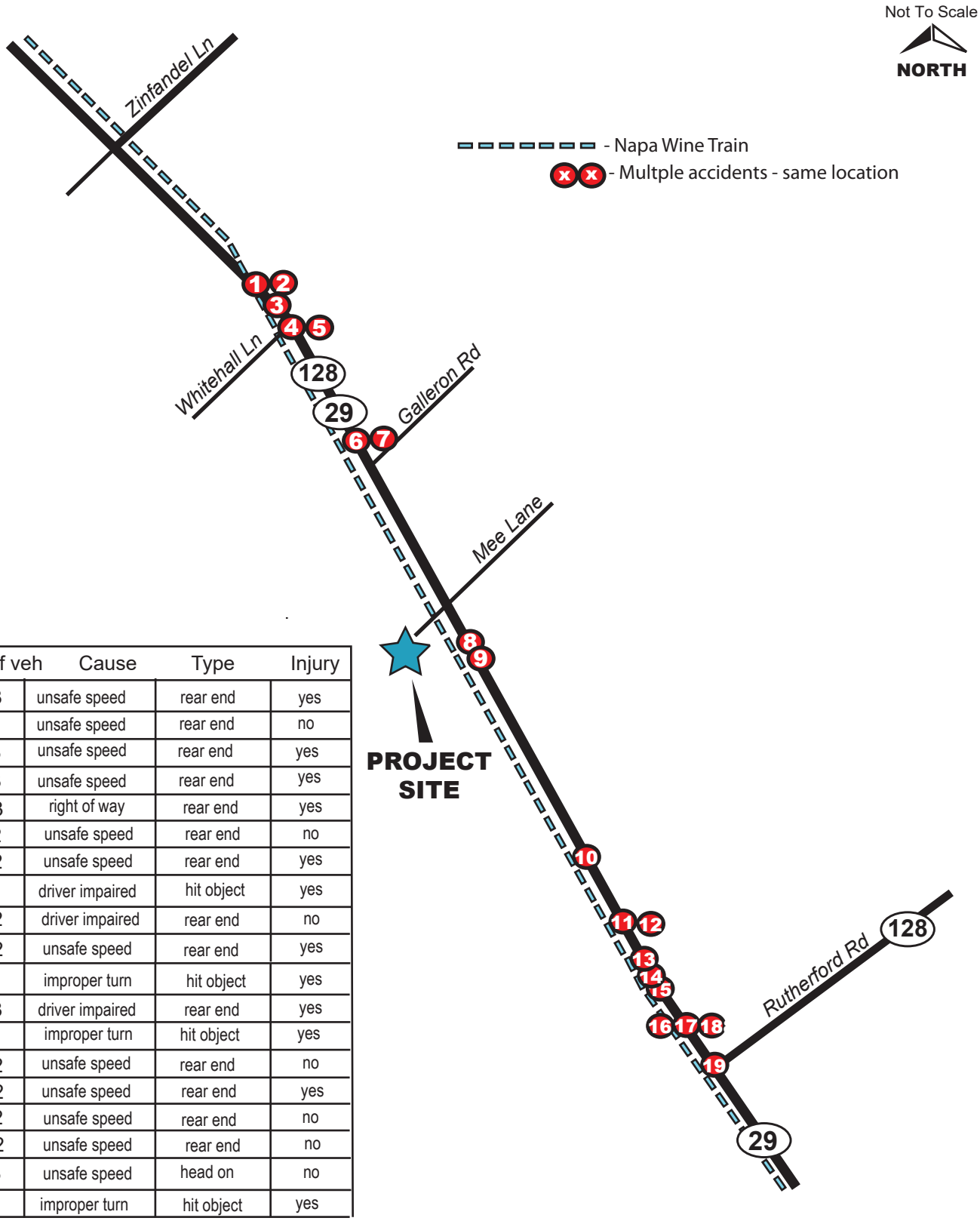
Bella Union Winery Traffic Study

Accident Report Source: California Highway Patrol

Appendix D-1

Year 2017 Reported Accidents within 1 Mile of the Project Site

CRANE TRANSPORTATION GROUP



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

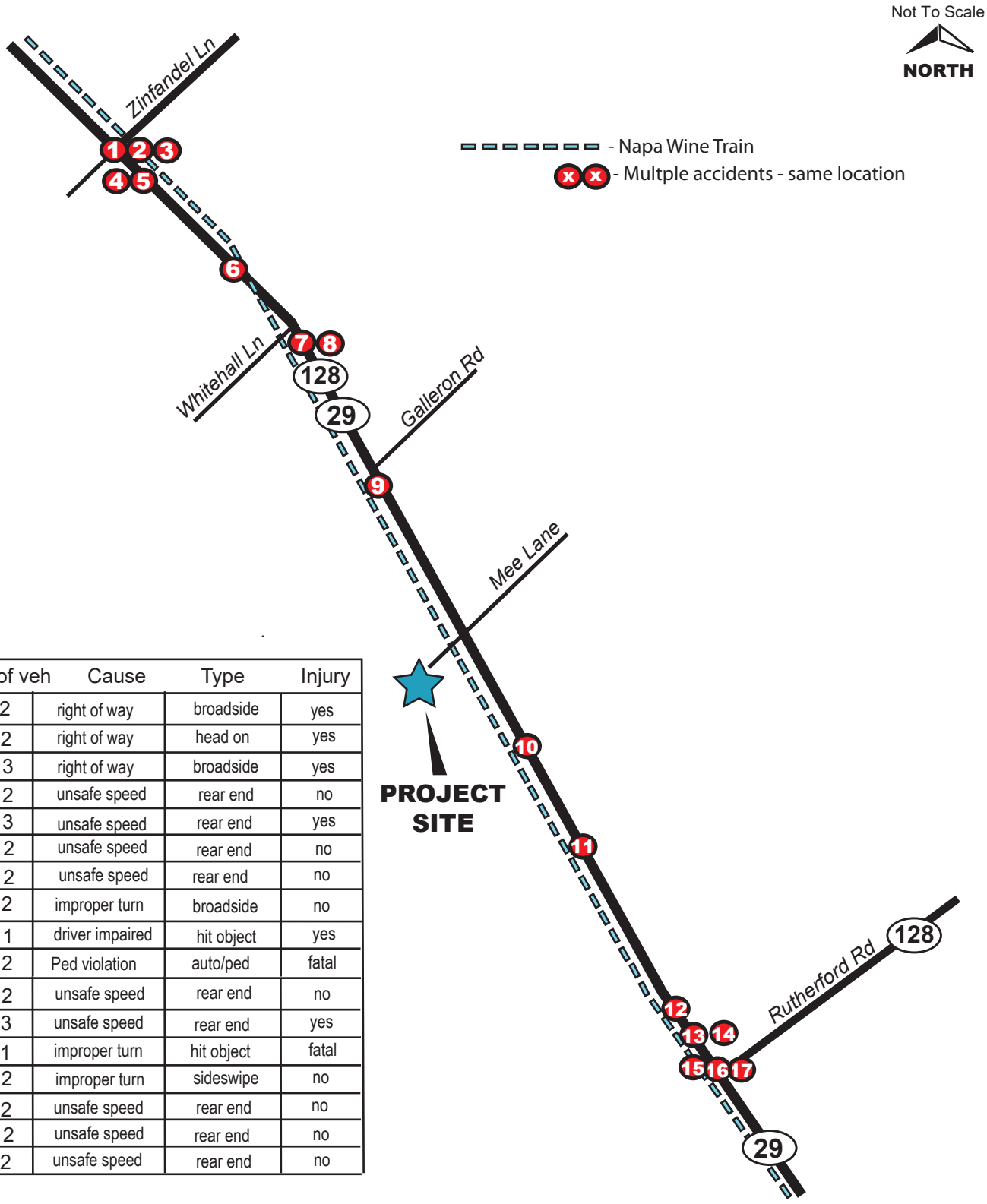
Bella Union Winery Traffic Study

Accident Report Source: California Highway Patrol

CRANE TRANSPORTATION GROUP

Appendix D-2

Year 2018 Reported Accidents within 1 Mile of the Project Site



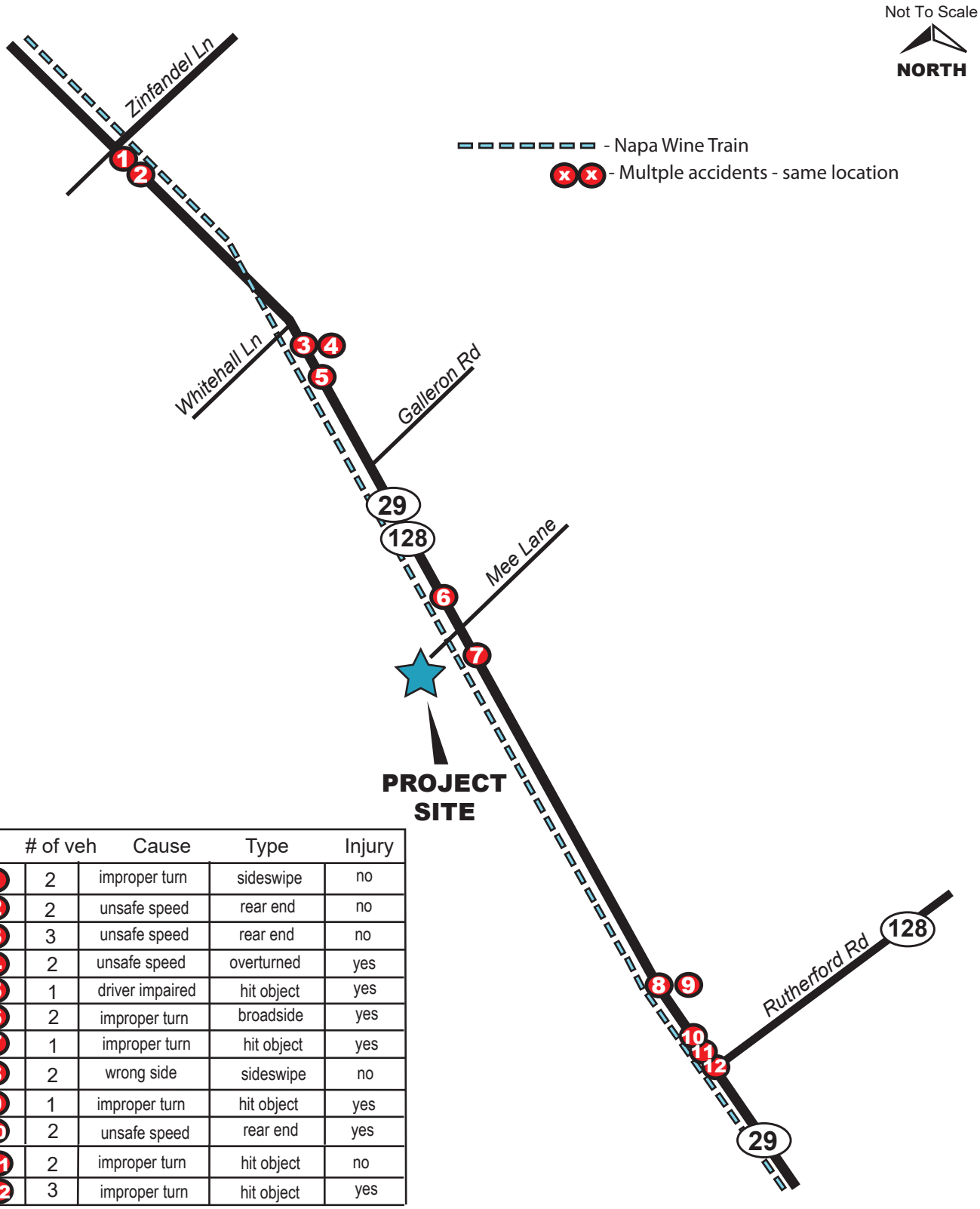
	# of veh	Cause	Type	Injury
1	2	right of way	broadside	yes
2	2	right of way	head on	yes
3	3	right of way	broadside	yes
4	2	unsafe speed	rear end	no
5	3	unsafe speed	rear end	yes
6	2	unsafe speed	rear end	no
7	2	unsafe speed	rear end	no
8	2	improper turn	broadside	no
9	1	driver impaired	hit object	yes
10	2	Ped violation	auto/ped	fatal
11	2	unsafe speed	rear end	no
12	3	unsafe speed	rear end	yes
13	1	improper turn	hit object	fatal
14	2	improper turn	sideswipe	no
15	2	unsafe speed	rear end	no
16	2	unsafe speed	rear end	no
17	2	unsafe speed	rear end	no

Bella Union Winery Traffic Study

Accident Report Source: California Highway Patrol

CRANE TRANSPORTATION GROUP

Appendix D-3
Year 2019 Reported Accidents within 1 Mile of the Project Site



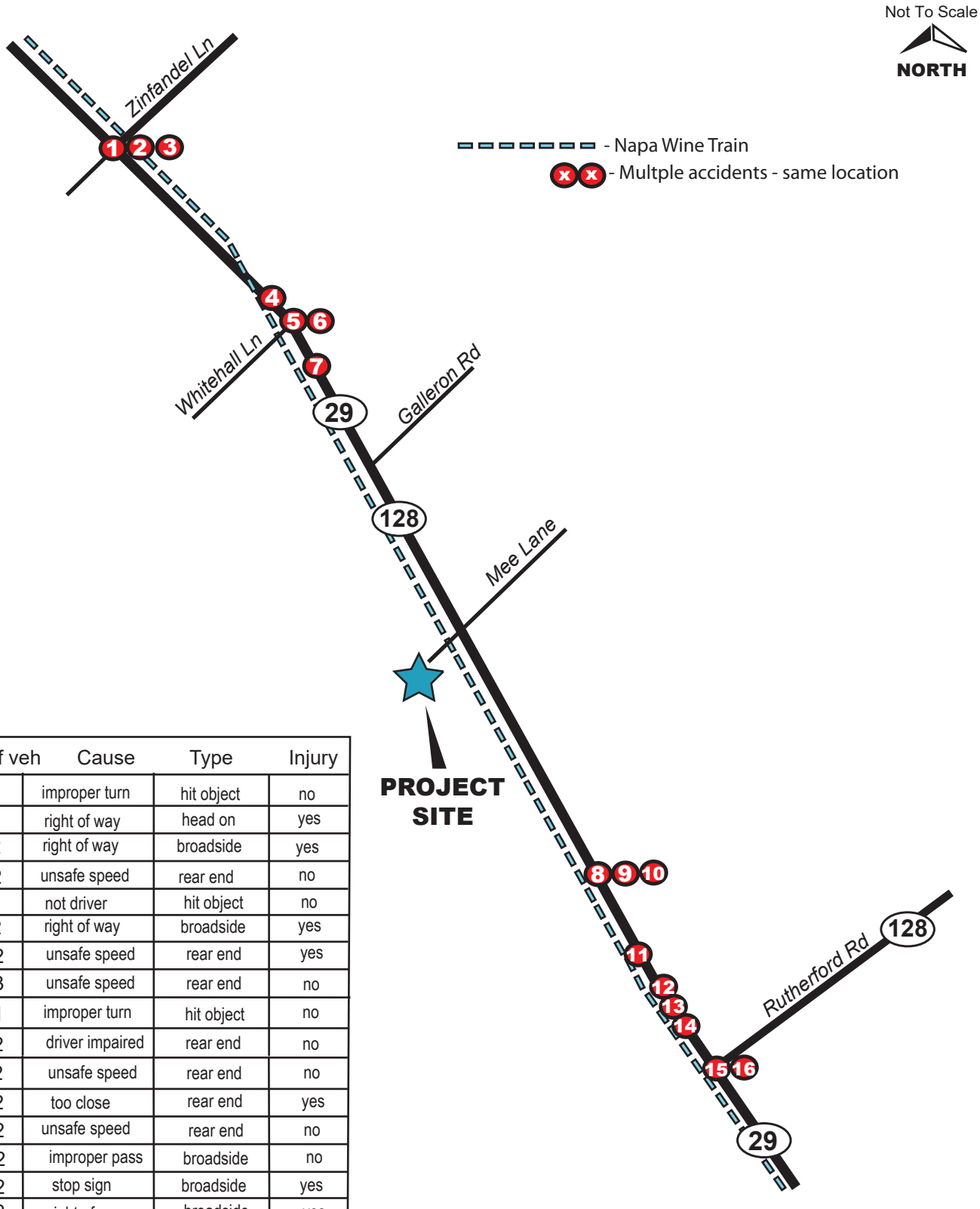
	# of veh	Cause	Type	Injury
1	2	improper turn	sideswipe	no
2	2	unsafe speed	rear end	no
3	3	unsafe speed	rear end	no
4	2	unsafe speed	overturned	yes
5	1	driver impaired	hit object	yes
6	2	improper turn	broadside	yes
7	1	improper turn	hit object	yes
8	2	wrong side	sideswipe	no
9	1	improper turn	hit object	yes
10	2	unsafe speed	rear end	yes
11	2	improper turn	hit object	no
12	3	improper turn	hit object	yes

Bella Union Winery Traffic Study

Accident Report Source: California Highway Patrol

CRANE TRANSPORTATION GROUP

Appendix D-4
Year 2020 Reported Accidents within 1 Mile of the Project Site



	# of veh	Cause	Type	Injury
1	1	improper turn	hit object	no
2	2	right of way	head on	yes
3	2	right of way	broadside	yes
4	2	unsafe speed	rear end	no
5	1	not driver	hit object	no
6	2	right of way	broadside	yes
7	2	unsafe speed	rear end	yes
8	3	unsafe speed	rear end	no
9	1	improper turn	hit object	no
10	2	driver impaired	rear end	no
11	2	unsafe speed	rear end	no
12	2	too close	rear end	yes
13	2	unsafe speed	rear end	no
14	2	improper pass	broadside	no
15	2	stop sign	broadside	yes
16	2	right of way	broadside	yes

Bella Union Winery Traffic Study

Accident Report Source: California Highway Patrol

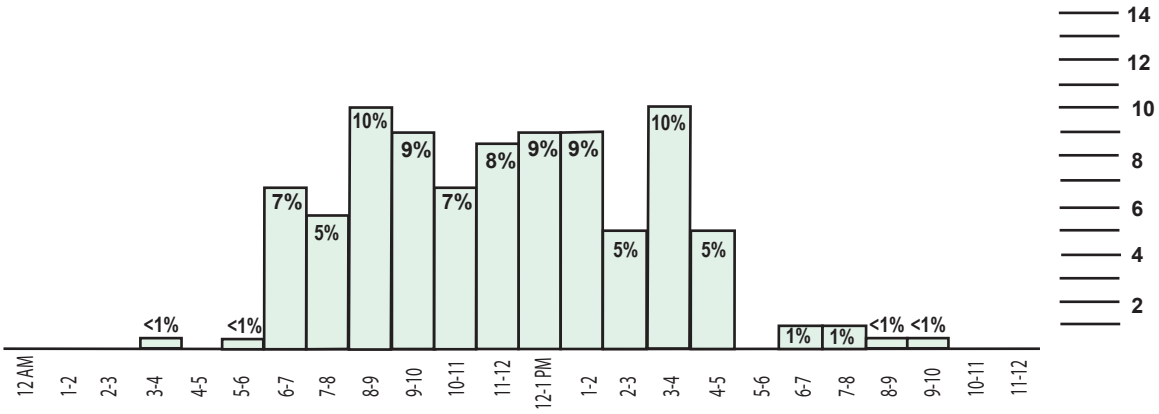
CRANE TRANSPORTATION GROUP

Appendix D-5
Year 2021 Reported Accidents
within 1 Mile of the Project Site (to Nov 2, 2021)

APPENDIX E

FAR NIENTE WINERY DRIVEWAY
Friday Hourly Percent of Total Trips

Friday, September 27, 2019

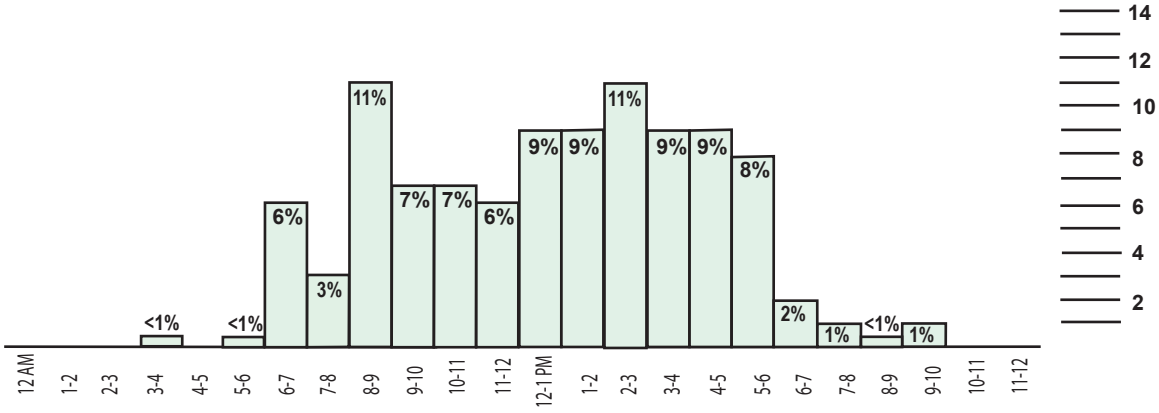


Friday, September 27, 2019

Total In/Out - 350 Vehicles

FAR NIENTE WINERY DRIVEWAY
Friday Hourly Percent of Total Trips

Friday, October 4, 2019



Friday, October 4, 2019

Total In/Out - 384 Vehicles

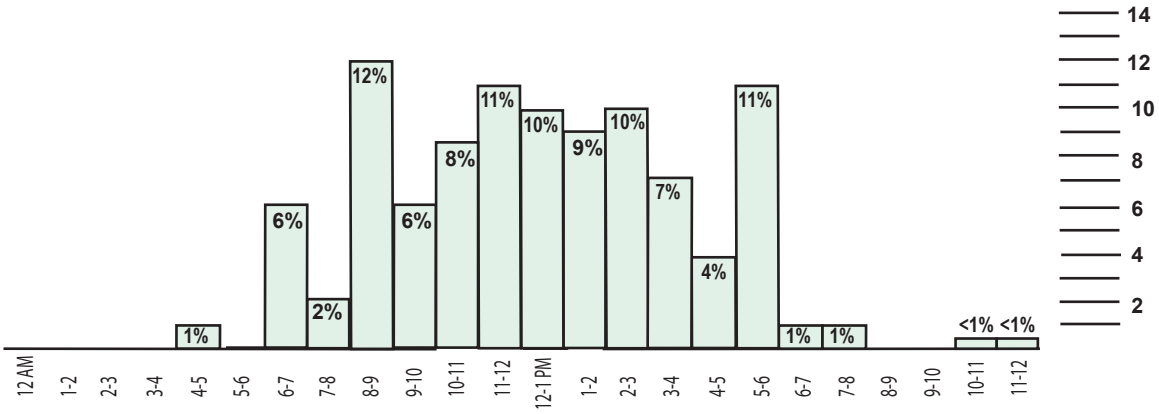
Source: CraneTransportation Group

Appendix E-1

Friday Traffic Percentages
Far Niente (by Hour) - Friday Sept 27 and Oct 4, 2019

FAR NIENTE WINERY DRIVEWAY
Saturday Hourly Percent of Total Trips

Saturday, September 28, 2019

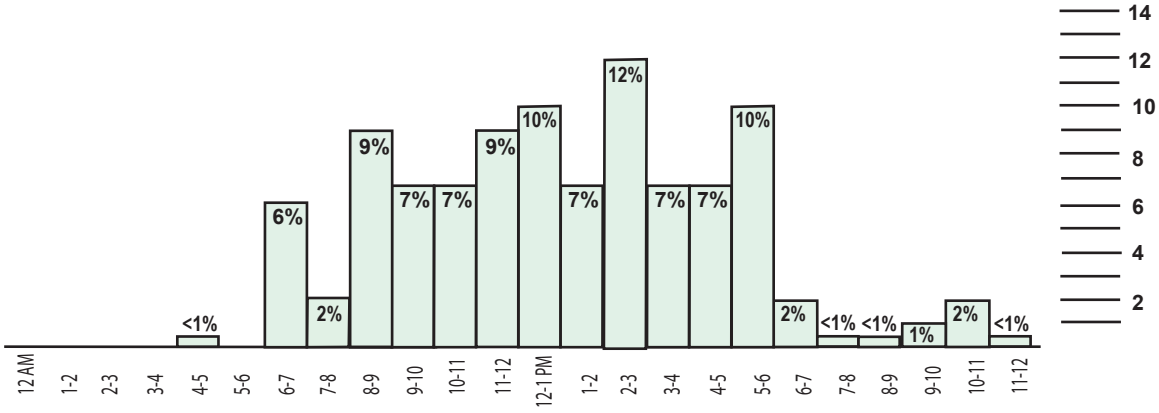


Saturday, September 28, 2019

Total In/Out - 282 Vehicles

FAR NIENTE WINERY DRIVEWAY
Saturday Hourly Percent of Total Trips

Saturday, October 5, 2019



Saturday, October 5, 2019

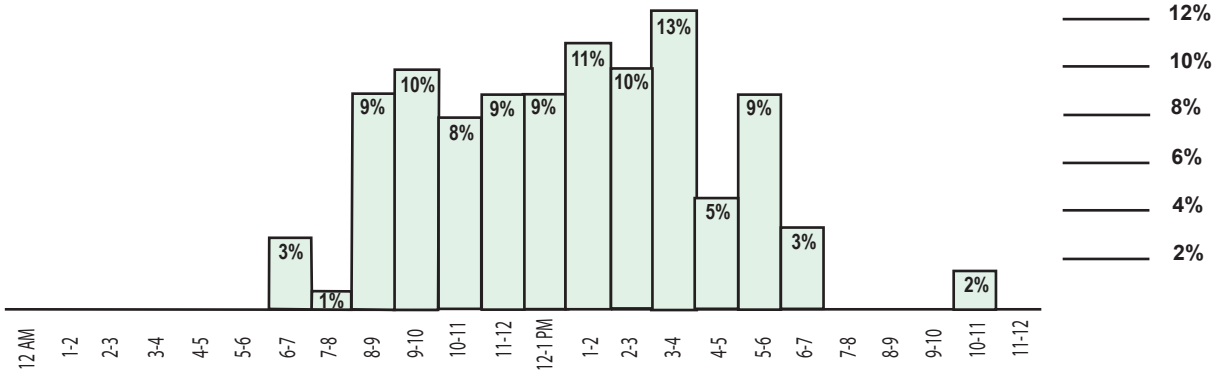
Total In/Out - 267 Vehicles

Source: CraneTransportation Group

Appendix E-2

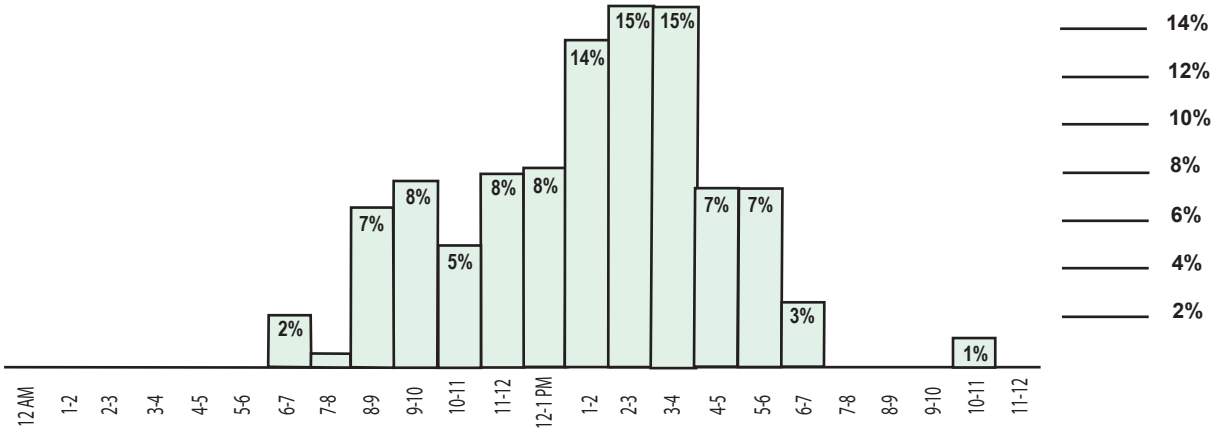
Saturday Traffic Percentages
Far Niente (by Hour) - Saturday Sept 28 and Oct 5, 2019

ARTESA WINERY DRIVEWAY
Friday Hourly Percent of TOTAL Trips
September 20, 2019



Friday, September 20, 2019
Total In/Out - 264 Vehicles

ARTESA WINERY DRIVEWAY
Friday Hourly Percent of TOTAL Trips
October 4, 2019



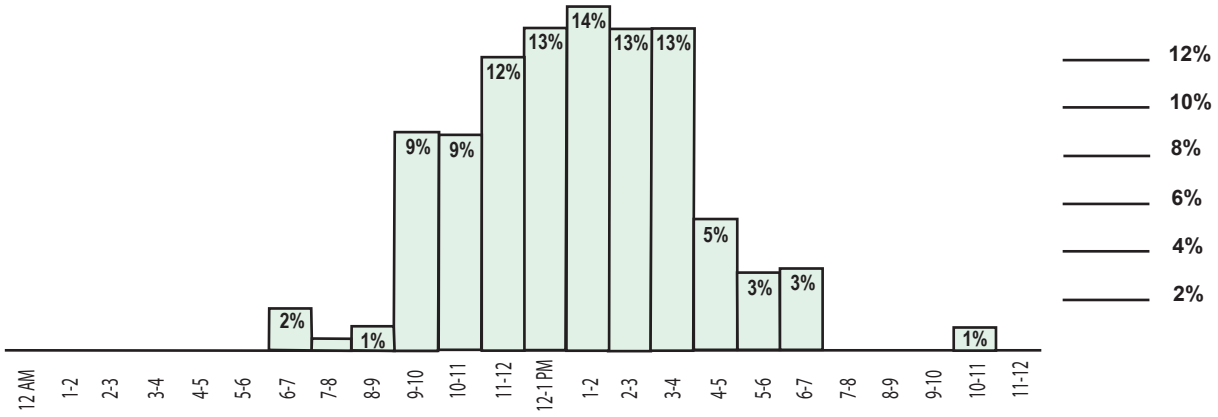
Friday, October 4, 2019
Total In/Out - 352 Vehicles

Source: CraneTransportation Group

Appendix E-3

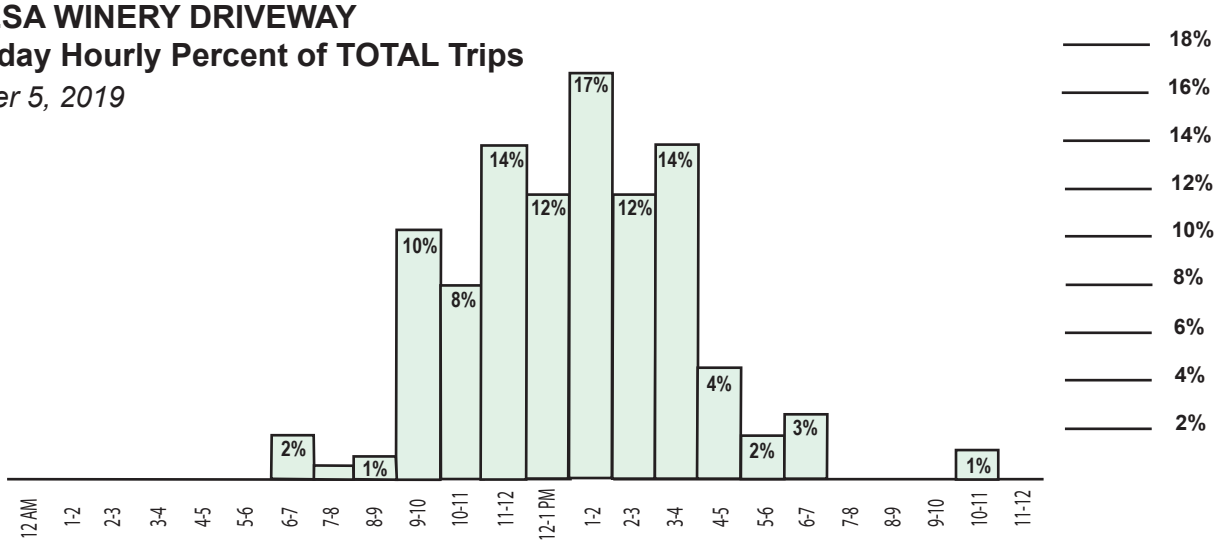
Friday Traffic Percentages
Artesa Winery (by Hour) - Sep 20 & Oct 4, 2019

ARTESA WINERY DRIVEWAY
Saturday Hourly Percent of TOTAL Trips
September 21, 2019



Saturday, September 21, 2019
Total In/Out - 441 Vehicles

ARTESA WINERY DRIVEWAY
Saturday Hourly Percent of TOTAL Trips
October 5, 2019



Saturday, October 5, 2019
Total In/Out - 468 Vehicles

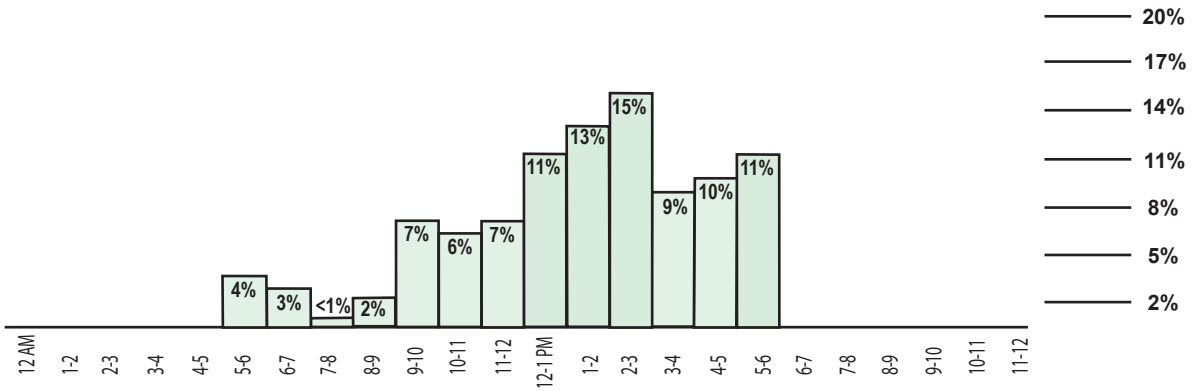
Source: CraneTransportation Group

Appendix E-4

Saturday Traffic Percentages
Artesa Winery (by Hour) - Sep 21 & Oct 5, 2019

ARTESA WINERY DRIVEWAY
Friday Hourly Percent of Total Trips

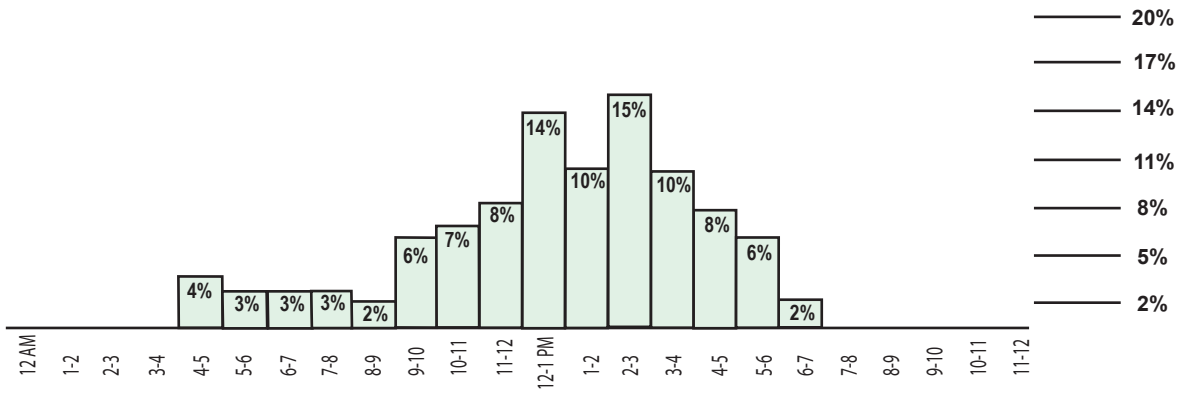
Friday, October 23, 2020



Total In/Out - 276 Vehicles

ARTESA WINERY DRIVEWAY
Friday Hourly Percent of Total Trips

Friday, October 30, 2020



Total In/Out - 249 Vehicles

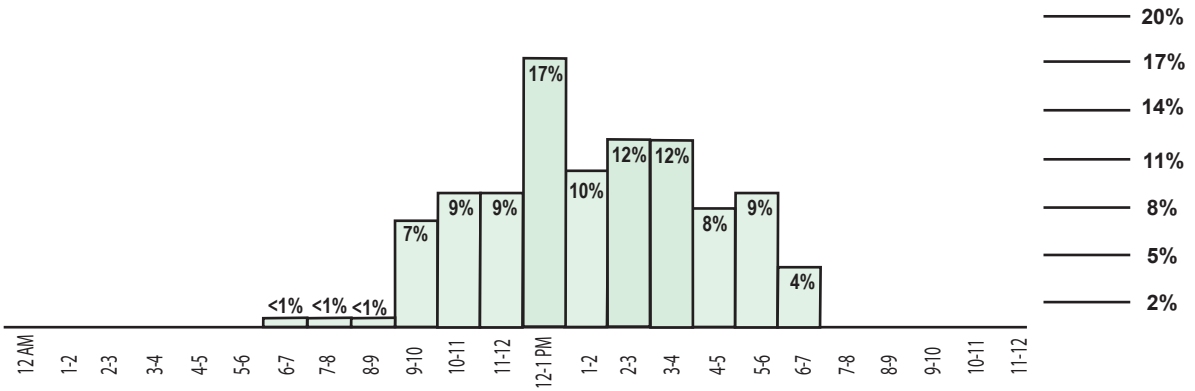
Source: CraneTransportation Group

Appendix E-5

Friday Traffic Totals and Percentages
Artesa Winery (by Hour) - Oct 23 & Oct 30, 2020

ARTESA WINERY DRIVEWAY
Saturday Hourly Percent of Total Trips

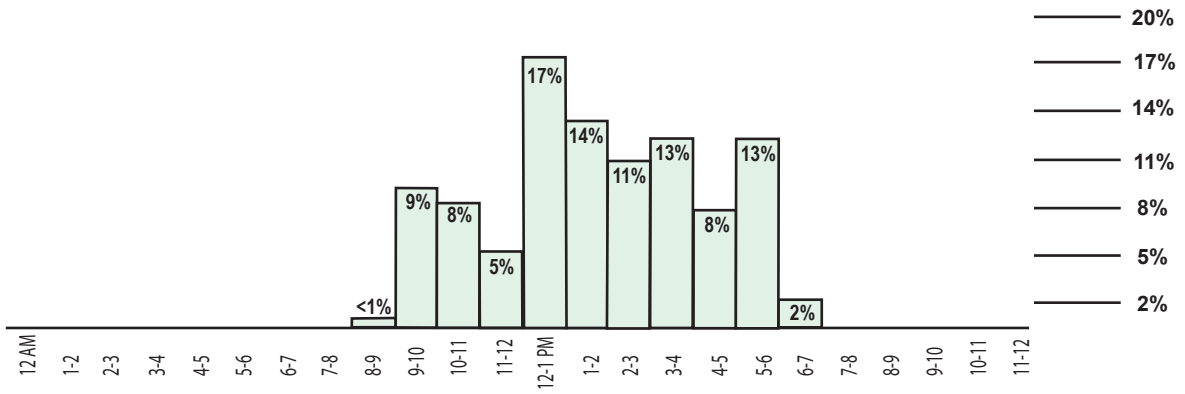
Saturday, October 24, 2020



Total In/Out - 325 Vehicles

ARTESA WINERY DRIVEWAY
Saturday Hourly Percent of Total Trips

Saturday, October 31, 2020



Total In/Out - 237 Vehicles

Source: CraneTransportation Group

Appendix E-6

Saturday Traffic Totals and Percentages
Artesa Winery (by Hour) - Oct 24 & Oct 31, 2020

WINERY TRIP GENERATION WORKSHEET

Planning, Building & Environmental Services
1195 Third Street, Suite 210
Napa, CA 94559-3082
(707) 253-4417

A Tradition of Stewardship
A Commitment to Service

Clear Form

PROJECT DESCRIPTION

Winery Name: BELLA UNION WINERY (Formerly Provenance Winery) **Date Prepared:** February 1, 2022

Existing Entitled Winery		Harvest	Non-Harvest
Number of Full Time Employees*	Weekday	12	12
	Weekend	12	12
Number of Part Time Employees*	Weekday	0	0
	Weekend	0	0
Maximum Daily Visitation	Weekday	25	25
	Weekend	25	25
Annual Gallons of Production		180,000	180,000
Annual Tons of Grape Haul		1,125.0	N/A
Number of Visitors at the Largest Event that occurs two or more times per month, on average	Weekday	50	50
	Weekend	50	50

Proposed Winery		Harvest	Non-Harvest
Number of Full Time Employees*	Weekday	38	28
	Weekend	13	13
Number of Part Time Employees*	Weekday	7	7
	Weekend	7	7
Maximum Daily Visitation	Weekday	175	175
	Weekend	225	225
Annual Gallons of Production		300,000	300,000
Annual Tons of Grape Haul		1,875.0	N/A
Number of Visitors at the Largest Event that occurs two or more times per month, on average	Weekday	50	50
	Weekend	50	50

*Number of full time and part time employees should represent the max number of employees that will be working on any given day (including all vendors and contractors employed for the largest event that occurs two or more times per month on average).

BELLA UNION WINERY (Formerly Provenance Winery)

TRIP GENERATION

Existing Winery					**Harvest**	**Non-Harvest**
Maximum Daily Weekday Traffic (Friday)						
	Harvest	*Non-Harvest*				
FT Employees	12	12	3.05 one way trips/employee	FT Employee Daily Trips	36.6	36.6
PT Employees	0	0	1.9 one way trips/employee	PT Employee Daily Trips	0.0	0.0
Max Visitors	25	25	2.6 visitors/vehicle for 2 one way trips	Max Visitor Daily Trips	19.2	19.2
Max Event	50	50	2.6 visitors/vehicle for 2 one way trips	Max Event Daily Trips	38.5	38.5
Gallons of Production	180,000		0.000018 truck trips	Production Daily Trips	3.2	3.2
Tons of Grape Haul#	1,125.0		0.013889 truck trips	Grape Haul Daily Trips	15.6	0.0
				Total Weekday Daily Trips	114	98
				Total Weekday Peak Hour Trips*	27	21
Maximum Daily Weekend Traffic (Saturday)						
	Harvest	*Non-Harvest*				
FT Employees	12	12	3.05 one way trips/employee	FT Employee Daily Trips	36.6	36.6
PT Employees	0	0	1.9 one way trips/employee	PT Employee Daily Trips	0.0	0.0
Max Visitors	25	25	2.8 visitors/vehicle for 2 one way trips	Max Visitor Daily Trips	17.9	17.9
Max Event	50	50	2.8 visitors/vehicle for 2 one way trips	Max Event Daily Trips	35.7	35.7
Gallons of Production	180,000		0.000018 truck trips	Production Daily Trips	3.2	3.2
Tons of Grape Haul#	1,125.0		0.013889 truck trips	Grape Haul Daily Trips	15.6	0.0
				Total Weekend Daily Trips	110	94
				Total Weekend Peak Hour Trips*	33	25
Maximum Annual Traffic						
				Total Annual Trips**	36,586	

Proposed Winery					**Harvest**	**Non-Harvest**
Maximum Daily Weekday Traffic (Friday)						
	Harvest	*Non-Harvest*				
FT Employees	38	28	3.05 one way trips/employee	FT Employee Daily Trips	115.9	85.4
PT Employees	7	7	1.9 one way trips/employee	PT Employee Daily Trips	13.3	13.3
Max Visitors	175	175	2.6 visitors/vehicle for 2 one way trips	Max Visitor Daily Trips	134.6	134.6
Max Event	50	50	2.6 visitors/vehicle for 2 one way trips	Max Event Daily Trips	38.5	38.5
Gallons of Production	300,000		0.000018 truck trips	Production Daily Trips	5.4	5.4
Tons of Grape Haul#	1,875.0		0.013889 truck trips	Grape Haul Daily Trips	26.0	0.0
				Total Weekday Daily Trips	334	278
				Total Weekday Peak Hour Trips*	105	85
Maximum Daily Weekend Traffic (Saturday)						
	Harvest	*Non-Harvest*				
FT Employees	13	13	3.05 one way trips/employee	FT Employee Daily Trips	39.6	39.6
PT Employees	7	7	1.9 one way trips/employee	PT Employee Daily Trips	13.3	13.3
Max Visitors	225	225	2.8 visitors/vehicle for 2 one way trips	Max Visitor Daily Trips	160.7	160.7
Max Event	50	50	2.8 visitors/vehicle for 2 one way trips	Max Event Daily Trips	35.7	35.7
Gallons of Production	300,000		0.000018 truck trips	Production Daily Trips	5.4	5.4
Tons of Grape Haul#	1,875.0		0.013889 truck trips	Grape Haul Daily Trips	26.0	0.0
				Total Weekend Daily Trips	281	255
				Total Weekend Peak Hour Trips*	127	112
Maximum Annual Traffic						
				Total Annual Trips**	102,730	

Net New Trips		**Harvest**	**Non-Harvest**
Maximum Weekday Traffic (Friday)			
If total net new daily trips is greater than 40, a TIS is required	**Net New Weekday Daily Trips**	220	180
	Net New Weekday Peak Hour Trips*	78	64
Maximum Weekend Traffic (Saturday)			
If total net new daily trips is greater than 40, a TIS is required	**Net New Weekend Daily Trips**	171	161
	Net New Weekend Peak Hour Trips*	94	87
Maximum Annual Traffic			
Please Prepare a Traffic Impact Study	**Net New Annual Trips****	66,144	

#Trips associated with Grape Haul represent harvest season only.

*Weekday peak hour trips are calculated as 38% of daily trips associated with visitors and production plus one trip per employee. Weekend peak hour trips are calculated as 57% of daily trips associated with visitors and production plus one trip per employee.

**Annual trips represent a conservative calculation that assumes 11 weeks of harvest, all weekdays are Fridays, all weekends are Saturdays, and assumes that the largest event that occurs two or more times per month on average occurs every day.

APPENDIX F

F-1 IDAX Radar Sample Speed Survey SR 29-128

Appendix F-1

IDAX Radar Sample Speed Survey

SR29-128 at Mee Lane

Location	1
Collector	Donovann
Roadway Surveyed	SR-29
Survey Limits	At Mee Ln
Date of Collection	2022-01-07
Survey Start Time	2:00:00 PM
Survey End Time	2:35:00 PM
Roadway Type	Arterial
Center Divider	Double Line
Total Number of Lanes	2
Road Condition	Fair
Weather	Cloudy
Posted Speed Limit	50

Northbound 85% Speed	58 mph
Northbound Max Speed	69 mph
Southbound 85% Speed	59 mph
Southbound Max Speed	66 mph

Northbound		Southbound	
32	52	36	53
36	52	38	53
38	52	39	53
38	52	42	53
39	52	43	53
40	52	43	53
41	52	43	53
41	52	43	53
42	52	44	54
42	52	44	54
42	53	45	54
43	53	45	54
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44	53	46	55
45	53	46	55
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49	59	51	60
49	59	51	60
49	61	51	61
49	61	51	61
49	62	51	61
49	62	51	61
50	62	52	63
51	63	52	64
51	65	52	65
51	65	52	65
51	**69**	53	66

APPENDIX G

G-1 Transportation Demand Management Plan

Bella Union Winery

Transportation Demand Management Plan

March 1, 2022

Winery management presents the following Transportation Demand Management (TDM) plan for Bella Union Winery located at 1695 St. Helena Highway, in Napa County (APN: 027-470-007). Individually or altogether, these actionable, meaningful, and measurable initiatives are proposed with Bella Union's use permit modification with the intent of reducing greenhouse gas emissions and Vehicle Miles Traveled (VMT) to/from the winery facility.

The TDM program will be administered by the winery's human resources manager in collaboration and committee with those responsible for facilities operations, direct to consumer business, winemaking, use permit compliance and others, all reporting to the winery CEO. All records of the TDM activities will be kept for comparison of the program's success to the baseline of no TDM program. These records will be available for County inspection, if requested.

As the site is developed, the following elements are proposed:

- Program private tours and tastings over the course of the workday by scheduling "start times" and "duration" of the guest experience. Guests will be encouraged to arrive within ten minutes of the start time. This calendarization of the visitation program will effectively and uniformly distribute guest arrivals and departures. The calendar will be developed to arrange as much travel as possible outside the peak traffic periods along Hwy 29. This practice will control the number of guests onsite and ensure vehicle movements and onsite parking demands are predictable, measurable, and generally steady over the course of the day. The program will reduce traffic congestion during peak traffic periods and provide a mechanism by which VMT impacts during peak traffic hours can be monitored and controlled.
- As required by BAAQMD regulation 14, the winery will adopt the Bay Area Commuter Benefits Program. Pursuant to 301.2, the winery will incentivize employees carpooling by providing a daily stipend (currently $3) to all employees who participate in a carpool.
    - All employees (including temporary) will be eligible to participate after 90 days of employment.
    - Monthly participation rates will be monitored.
    - Staff participation will be further encouraged by:
        - Openly recognizing those who carpool most by awarding gift certificates at company staff meetings.
        - The winery's participation in the Napa Commute Challenge offered by the Napa Valley Transportation Authority and BAAQMB. Representatives of these organizations will be invited to the company's annual health fair to inform staff of the benefits of carpooling and award gift cards.
- The winery will participate in the emergency/guaranteed ride home program, ensuring peace of mind that all commuters can get home in the event of an emergency.

- The winery will hire a contracted shuttle service to bring guests from pickup points close to hotels to larger events.
- The winery will rent SUV's for staff to convey groups of three-seven people from local hotels for business meetings.
    - The winery recognizes business meetings, as defined in Napa County Board of Supervisors Resolution 2010-48 (Guidance on winery marketing activities) will be counted as a subset of marketing events, with instances replacing one-for-one existing approved marketing events in agreement with winery entitlements.
- The winery will offer seasonal alternative work schedules for some employees or departments (e.g., Monday through Thursday), except for production and facilities operations staff during bottling and harvest periods.
- The winery will offer work-at-home or remote-work opportunities, when possible.
- The winery will adopt online conferencing to reduce the amount of onsite business meetings.
- The winery will adopt online product promotion along with customer-staff interactions to reduce the reliance upon onsite visits.
- The winery will require some staff, vendors, and contractors to carpool to onsite marketing events, reducing both VMT and the number of required parking spaces.
- The winery will install bike racks, or provide secured bike storage space, to encourage this mode of transportation to both employees and visitors.
- The winery will install electric car charging stations.
- The winery will incentivize employee usage of public transportation with a reimbursement program.
- The winery will promote the use of rideshare services, like Uber and Lyft, for visitors. While this does not reduce VMT or the onsite vehicle movements per visitor, it could promote the reduction of private vehicles on the road within the community (e.g.: one rideshare operator would service more than one visitor group or winery employee over the course of a given day). as well as provide other benefits (e.g., minimizes onsite parking demand, minimizes the risk of DWI, and potentially removes from the road visitors/drivers unfamiliar with local roads and destinations). Rideshare vendors incentivize their drivers to operate electric and hybrid vehicles, and therein lies the basis for the reduction of greenhouse gas emissions presented here.