

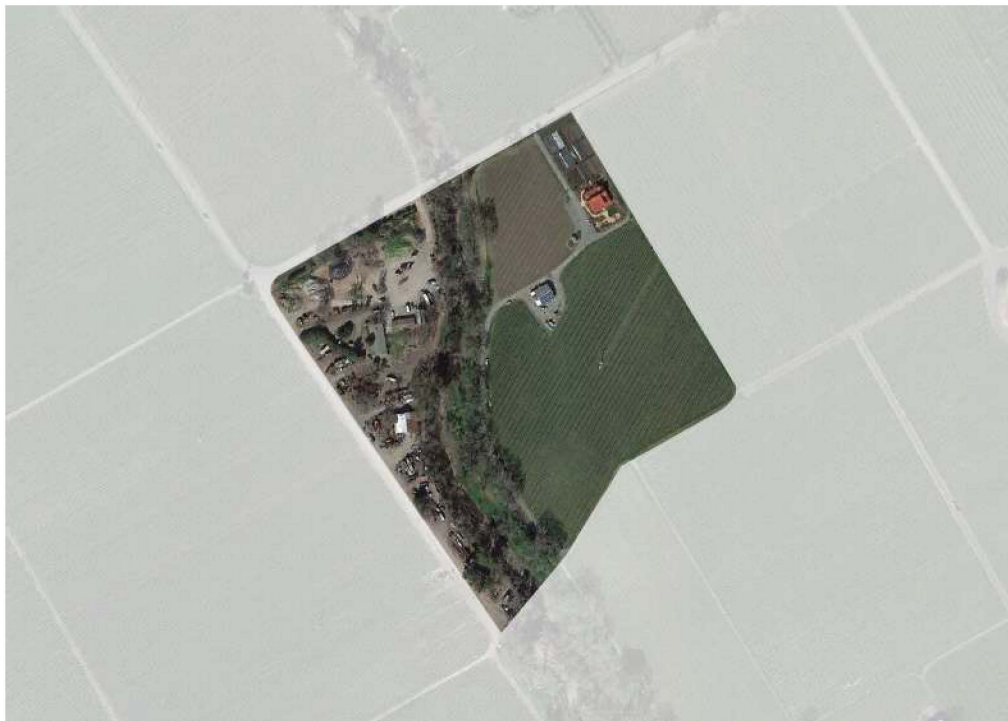
“H”

Final Transportation Impact Study

Bonny's Vineyard P22-00002
Planning Commission Hearing Date
December 18, 2024



Transportation Impact Study for Bonny's Vineyard



Prepared for the County of Napa

File Number: P22-00002

Submitted by

W-Trans

October 17, 2022



**TRAFFIC ENGINEERING
TRANSPORTATION PLANNING**
Balancing Functionality and Livability since 1995
w-trans.com



This page intentionally left blank

Table of Contents

Executive Summary.....	1
Introduction	2
Transportation Setting	6
Project Data	9
Circulation System	12
Vehicle Miles Traveled (VMT)	15
Safety Issues.....	19
Emergency Access.....	21
Capacity Analysis.....	22
Parking	33
Conclusions and Recommendations	34
Study Participants and References	36

Figures

1. Study Area and Existing Lane Configurations	5
2. Site Plan	10
3. Existing Traffic Volumes.....	24
4. Future Traffic Volumes	27
5. Project Traffic Volumes.....	29

Tables

1. Collision Rates at the Study Intersections	7
2. Trip Generation Summary.....	9
3. Trip Distribution Assumptions	11
4. Bicycle Facility Summary.....	13
5. Estimated Vehicle Trips Per Day	15
6. 95 th Percentile Left-Turn Queues Exceeding Available Storage.....	20
7. Two-Way Stop-Controlled Intersection Level of Service Criteria	22
8. Existing PM Peak Hour and Weekend Peak Hour Intersection Levels of Service	23
9. Existing Peak Hour Roadway Segment Levels of Service	25
10. Future PM Peak Hour and Weekend Peak Hour Intersection Levels of Service	26
11. Future Peak Hour Roadway Segment Levels of Service.....	28

12. Existing and Existing plus Project PM Peak Hour Intersection Levels of Service	28
13. Future and Future plus Project PM Peak Hour Intersection Levels of Service	30
14. Existing and Existing plus Project Peak Hour Roadway Segment Levels of Service	31
15. Future and Future plus Project Peak Hour Roadway Segment Levels of Service	32

Appendices

- A. Collision Rate Calculations
- B. Trip Generation Spreadsheets
- C. Left Turn Lane Warrant Graph
- D. Intersection Level of Service Calculations
- E. Peak Hour Signal Warrants
- F. Roadway Segment Level of Service Calculations

Executive Summary

The proposed Bonny's Vineyard Project would include a new 30,000-gallon winery at 1555 Skellenger Lane in the County of Napa. The winery would have a maximum of 45 daily visitors during both harvest and non-harvest periods, with four employees for typical operation and six employees during harvest. Events would include nine per year with up to 80 people and two per year with up to 150 people.

Based on the County's winery trip generation assumptions, the project would be expected to generate an average of 48 daily trips on Fridays and 45 trips on Saturdays during non-harvest periods, with 18 trips during the Friday p.m. peak hour and 23 trips during the Saturday p.m. peak hour. The anticipated daily trips for a Friday and Saturday during harvest season would be 57 and 54, respectively, with 21 trips during the Friday p.m. peak hour and 27 trips during the Saturday p.m. peak hour. This equates to an average of 51 trips per day average over the whole year, which is less than the "small-project" threshold of 110 trips per day published by OPR. Thus, the VMT impact would be considered less-than-significant. While not required to mitigate a VMT impact, the winery should implement a TDM Plan to support the reduction of vehicle trips.

Pedestrian, bicycle, and transit facilities are adequate to serve the anticipated demand for the project given its location, and no apparent safety concerns were noted based on a review of collision history, site access and available sight distance along Skellenger Lane at the project driveway.

The study area consisted of the section of Skellenger Lane fronting the project site and the intersections of Silverado Trail/SR 128-Conn Creek Road, SR 29/Rutherford Road, and Silverado Trail/Skellenger Lane. The study intersections are all currently operating at LOS A overall, but at LOS F on the minor street approaches during both peak hours evaluated. With project traffic added these service levels would be unchanged at all intersections. At the Silverado Trail/ SR 128-Conn Creek Road and SR 29/Rutherford Road intersections, project effects on traffic operation are considered acceptable. However, as the project would be responsible for an increase in delay exceeding five seconds at Silverado Trail/Skellenger Lane, under the County's criteria the effect is considered potentially adverse at that intersection.

Under anticipated future volumes the study intersections are expected to continue operating unacceptably on the minor street approach without and with the project-related traffic. The project does not represent more than five percent of the increase in volumes from Existing to Future Conditions at the Silverado Trail/ SR 128-Conn Creek Road and SR 29/Rutherford Road intersections, and therefore project effects are considered acceptable. At the Silverado Trail/Skellenger Lane intersection, the project would add more than five percent to the difference between future and existing volumes during the weekend peak hour, which is considered a potentially adverse effect on traffic operation.

To address the project's potentially adverse effect on traffic operation at the Silverado Trail/Skellenger Lane intersection, an acceleration lane should be striped in the northbound direction leaving the intersection. No roadway widening would be anticipated to accommodate the restriping.

The segment of Skellenger Lane fronting the project site would be expected to operate acceptably at LOS A or B without or with the addition of project traffic under both Existing and Future Conditions.

The proposed on-site parking supply would be adequate for the anticipated peak demand during typical operations, and overflow parking would be adequate to accommodate periodic events.

Introduction

This report presents an analysis of the potential transportation impacts that would be associated with development of the proposed Bonny's Vineyard winery to be located at 1555 Skellenger Lane in the County of Napa. The traffic study was completed in accordance with the criteria established by the County and is consistent with standard traffic engineering techniques.

Prelude

The purpose of a traffic impact study is to provide County staff and policy makers with data that they can use to make an informed decision regarding the potential transportation impacts of a proposed project, and any associated improvements that would be required to mitigate these impacts to an acceptable level under CEQA, the County's General Plan, or other policies. This report provides an analysis of those items that are identified as areas of environmental concern under the California Environmental Quality Act (CEQA) and that, if significant, require an EIR. Impacts associated with access for pedestrians, bicyclists, and to transit; the vehicle miles traveled (VMT) generated by the project; potential safety concerns such as increased queuing in dedicated turn lanes, adequacy of sight distance, need for turn lanes, and need for additional right-of-way controls; and emergency access are addressed in the context of the CEQA criteria. While no longer a part of the CEQA review process, vehicular traffic service levels at key intersections were evaluated for consistency with General Plan policies by determining the number of new trips that the proposed use would be expected to generate, distributing these trips to the surrounding street system based on anticipated travel patterns specific to the proposed project, then analyzing the effect the new traffic would be expected to have on the study intersections and need for improvements to maintain acceptable operation. Adequacy of parking is also addressed as a policy issue.

Applied Standards and Criteria

The report is organized to provide background data that supports the various aspects of the analysis, followed by the assessment of CEQA issues and then evaluation of policy-related issues. The CEQA criteria evaluated are as follows.

Would the project:

- a. Conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities?
- b. Conflict or be inconsistent with CEQA Guidelines § 15064.3, subdivision (b)?
- c. Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?
- d. Result in inadequate emergency access?

The project was also evaluated against the County's policies, which provide guidance relative to potential traffic impacts as well as adverse effects caused by traffic associated with new development. Based on the most recent criteria published by the County, the project would have a significant impact or an adverse effect on traffic operation based on the following criteria.

In the Circulation Element of the *Napa County General Plan*, the following policies have been adopted:

- **Policy CIR-31** – The County seeks to provide a roadway system that maintains current roadway capacities in most locations and is efficient in providing local access.
- **Policy CIR-38** – The County seeks to maintain operations of roads and intersections in the unincorporated County area that minimize travel delays and promote safe access for all users. Operational analysis shall be conducted according to the latest version of the HCM and as described in the current version of the County’s Transportation Impact Study Guidelines. In general, the County seeks to maintain Level of Service (LOS) D on arterial roadways and at signalized intersections, as the service level that best aligns with the County’s desire to balance its rural character with the needs of supporting economic vitality and growth.

In situations where the County determines that achieving LOS D would cause an unacceptable conflict with other goals and objectives, minimizing collisions and the adequacy of local access will be the County’s priorities. Mitigating operational impacts should first focus on reducing the project’s vehicular trips through modifying the project definition, applying TDM strategies, and/or applying new technologies that could reduce vehicular travel and associated delays; then secondarily should consider physical infrastructure changes. Proposed mitigations will be evaluated for their effect on collisions and local access, and for their effectiveness in achieving the maximum potential reduction in the project’s operational impacts (see the County’s Transportation Impact Study Guidelines for a list of potential mitigation measures).

The following roadway segments are exceptions to the LOS D standard described above:

- *State Route 29 in the unincorporated areas between Yountville and Calistoga: LOS F is acceptable.*
- *Silverado Trail between State Route 128 and Yountville Cross Road: LOS E is acceptable.*
- *State Route 12/121 between the Napa/Sonoma county line and Carneros Junction: LOS F is acceptable.*
- *American Canyon Road from I-80 to American Canyon City Limit: LOS E is acceptable.*

To provide a more quantitative method of adhering to the above standards, the County refers to a memorandum titled *Guidelines for Application of Updated General Plan Circulation Policies on Significance Criteria Related to Vehicle Level of Service* (Fehr & Peers, 2020). The document establishes thresholds for road segments and different intersection control types. For unsignalized intersections, the memorandum states a project would cause an adverse effect requiring mitigation if, for Existing Conditions:

- An unsignalized intersection operates at LOS A, B, C, or D during the selected peak hours without Project trips, and the LOS deteriorates to LOS E or F with the addition of Project traffic; the peak hour traffic signal warrant criteria should also be evaluated and presented for informational purposes; or
- An unsignalized intersection operates at LOS E or F during the selected peak hours without Project trips, and the Project increases the delay by **five seconds** or more; the peak hour traffic signal warrant criteria should also be evaluated and presented for informational purposes.
 - *All-Way Stop-Controlled Intersections* – *The increase in delay should be calculated based on the overall average delay for the intersection.*
 - *Side-Street Stop-Controlled Intersections* – *The increase in delay should be calculated based on the delay for the worst-case approach(es). Each stop-controlled approach that operates at LOS E or F should be analyzed individually.*

A project would cause an adverse effect requiring mitigation if, for Future (Cumulative) Conditions, the Project's volume is equal to, or greater than **one percent** of the difference between Future and Existing volumes for an arterial, signalized intersection, or stop-controlled intersection. If the intersection is already failing, a **5 percent or greater** project contribution percentage is considered an adverse effect.

- Cumulative Conditions – A Project's contribution to a cumulative condition would be calculated as the Project's percentage contribution to the total growth in traffic. This calculation applies to arterials, signalized intersections, and unsignalized intersections.
 - *Project Contribution % = Project Trips ÷ (Cumulative Volumes – Existing Volumes)*

The County of Napa does not prescribe thresholds of significance regarding queue lengths. However, an increase in queue length due to project traffic was considered a potentially significant impact if the increase would cause the queue to extend out of a dedicated turn lane into a through traffic lane, or the back of queue into a visually restricted area, such as a blind corner. If queues would already be expected to extend past a dedicated turn lane or into a visually restricted area without project traffic, the addition to the queue length due to project traffic was considered to constitute a significant impact only if that would result in inadequate sight distance.

Project Profile

The proposed project is a new 30,000-gallon winery to be located at 1555 Skellenger Lane in the County of Napa. The winery would have a maximum of 45 daily visitors during both harvest and non-harvest periods. There would be four employees for typical operation and six employees during harvest. Promotional events would include nine per year with up to 80 people and two per year with up to 150 people. The County of Napa file number for this project is P22-00002. The location of the project site is shown in Figure 1.



Transportation Impact Study for Bonny's Vineyard
Figure 1 – Study Area and Existing Lane Configurations

Transportation Setting

Study Area and Periods

The study area varies depending on the topic. For pedestrian trips it generally consists of all streets within a half-mile of the project site that would lie along primary routes of pedestrian travel, though given the rural setting of the project site there is limited potential for pedestrian trips to occur. For bicycle trips it consists of all streets within one mile of the project site that would lie along primary routes of bicycle travel. For the safety and operational analyses, it consists of the project frontage and the following intersections:

1. Silverado Trail/Conn Creek Road
2. SR 29/Rutherford Road
3. Silverado Trail/Skellenger Lane

Operating conditions during the weekday and weekend p.m. peak periods were evaluated as these time periods reflect the highest traffic volumes areawide and for the proposed project. The weekday evening peak hour occurs between 4:00 and 6:00 p.m. and typically reflects the highest level of congestion of the day during the homeward bound commute, while the weekend midday peak occurs between 1:00 and 3:00 p.m. on Saturday. Counts for the study intersections were obtained from February 25 through March 5, 2022. To account for reduced volumes due to the COVID-19 pandemic, counts that were collected in 2019 at the Silverado Trail/Conn Creek Road intersection were used as a “control” to establish an adjustment factor to normalize the volumes.

Study Intersections

Silverado Trail/SR 128-Conn Creek Road is a four-legged intersection stop-controlled at the eastbound Conn Creek Road (SR 128) approach and the westbound approach, which is a private driveway to the Rutherford Ranch Winery. The northbound and southbound approaches include left-turn lanes. The eastbound approach includes a flare that is used as a *de facto* right-turn lane.

SR 29/Rutherford Road is a four-legged intersection, stop-controlled at the westbound Rutherford Road approach and the eastbound approach, which is a private driveway to the Inglenook Winery and is offset from the westbound leg. There are flared right-turn lanes on the eastbound and westbound approaches. The eastbound approach crosses the tracks for the Napa Wine train, which runs parallel to and along the west side of SR 29.

Silverado Trail/Skellenger Lane is a three-legged intersection with stop controls on the terminating eastbound Skellenger Lane approach. The Skellenger Lane approach has a flared right-turn lane. There is a deceleration lane on the southbound Silverado Trail approach and an acceleration lane on southbound Silverado Trail. There is a left-turn lane on the northbound Silverado Trail approach.

The locations of the study intersections and the existing lane configurations and controls are shown in Figure 1.

Study Roadway

Skellenger Lane is a two-lane roadway generally running east-west, approximately 24 feet wide with a *prima facie* speed limit of 55 mph. Count data collected in 2022 indicates that the road has an average daily traffic (ADT) volume of approximately 1,260 on weekdays and 470 on weekends.

Collision History

The collision history for the study area was reviewed to determine any trends or patterns that may indicate a safety issue. Collision rates were calculated based on records available from the California Highway Patrol as published in their Statewide Integrated Traffic Records System (SWITRS) reports. The most current five-year period available is December 1, 2016, through November 30, 2021.

As presented in Table 1, the calculated collision rates for the study intersections were compared to average collision rates for similar facilities statewide, as indicated in *2018 Collision Data on California State Highways*, California Department of Transportation (Caltrans). These average rates statewide are for intersections in the same environment (urban, suburban, or rural), with the same number of approaches (three or four), and the same controls (all-way stop, two-way stop, or traffic signal). The collision rate calculations are provided in Appendix A.

Table 1 – Collision Rates at the Study Intersections

Study Intersection	Number of Collisions (2016-2021)	Calculated Collision Rate (c/mve)	Statewide Average Collision Rate (c/mve)
1. Silverado Tr/SR 128-Conn Creek Rd	11	0.40	0.25
2. SR 29/Rutherford Rd	9	0.30	0.25
3. Silverado Trail/Skellenger Ln	6	0.23	0.19

Note: c/mve = collisions per million vehicles entering; **Bold** text indicates an above-average collision rate

Because the collision rates for the three study intersections were higher than the statewide average, the crashes at these locations were reviewed in greater detail.

At Silverado Trail/SR 128-Conn Creek Road, three of the collisions were rear-end and three were hit object. In addition, there were two sideswipes, two broadsides, and one overturned vehicle. A review of the primary collision factors indicated that five of the collisions were attributed to improper turning and two to right-of-way violations. Despite the elevated collision rate, the injury rate was 27.3 percent, substantially below the statewide average of 44.7 percent. Due to the low injury rate and lack of a clear collision pattern, a specific safety concern requiring remediation is not indicated.

At the SR 29/Rutherford Road intersection, four of the nine collisions were broadside, and three of these were attributed to auto right-of-way violations. The remaining collisions included three rear-end crashes that had a primary collision factor of unsafe speed, and there were two hit object collisions attributed to improper turning. The collision rate was only 0.05 c/mve higher than the statewide average for similar facilities and the injury rate was only 0.3 percent higher than the statewide average. Given the nominal amount over the average as well as the lack of a clear pattern, no remedial action appears necessary.

There were six collisions reported at the Silverado Trail/Skellenger Lane intersection, including three rear end, two hit object, and one sideswipe. The rear end collisions were all attributed to unsafe speed and the hit object collisions were due to improper turning. Given the small number of collisions at this location, if there were one fewer collision the rate would have been at the statewide average. Since there were no injuries reported in any of the collisions, a safety concern requiring remediation was not indicated.

Project Data

The project consists of a new 30,000-gallon winery with a maximum of 45 daily visitors during both harvest and non-harvest periods. There would be four employees for typical operation and six employees during harvest. Promotional events would include nine per year with up to 80 people and two per year with up to 150 people. The proposed project site plan is shown in Figure 2.

Trip Generation

The County of Napa's Winery Traffic Information/Trip Generation Sheet was used to determine the anticipated trip generation for the proposed conditions. The form estimates the number of daily trips for Fridays and Saturdays based on the number of full- and part-time employees, maximum daily visitors, and production. A copy of the worksheet is provided in Appendix B.

As the County of Napa's Winery Traffic Information/Trip Generation Sheet does not include guidance on inbound versus outbound trips during the peak hours, it was assumed that two-thirds of trip ends at the winery would be outbound during the Friday p.m. peak hour since most of the trips would be associated with employees and customers leaving at closure of the winery. For the Saturday p.m. peak hour it was assumed that inbound and outbound trip ends would be evenly split.

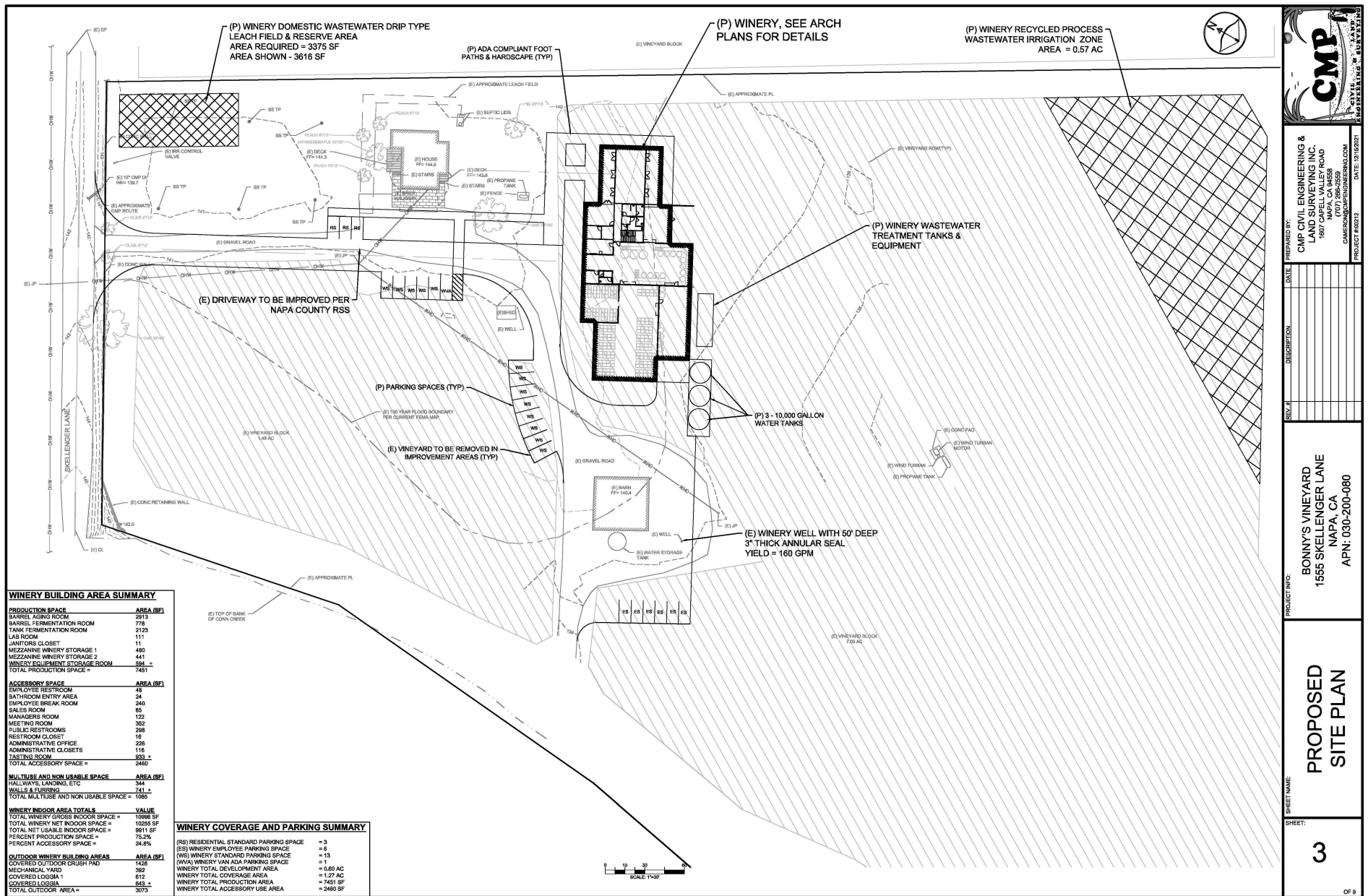
Based on application of these assumptions, the proposed winery would be expected to generate an average of 48 daily trips on Fridays and 45 trips on Saturdays during non-harvest periods, with 18 trips during the Friday p.m. peak hour and 23 trips during the Saturday p.m. peak hour. The anticipated daily trips for a Friday and Saturday during harvest season would be 57 and 54, respectively, with 21 trips during the Friday p.m. peak hour and 27 trips during the Saturday p.m. peak hour. These results are shown in Table 2.

Table 2 – Trip Generation Summary									
Land Use	Annual	Daily		Friday PM Peak Hour			Saturday PM Peak Hour		
		Friday	Saturday	Trips	In	Out	Trips	In	Out
Proposed Winery	13,248	48 (57)	45 (54)	18 (21)	6(7)	12(14)	23 (27)	11 (13)	12(14)

Note: Trips for harvest conditions are shown in parentheses.

Trip Distribution

The pattern used to allocate new project trips to the street network was determined based on familiarity with the area and anticipated travel patterns for patrons. Because the winery is located on the east side of the Napa Valley, it is likely that project-related trips would occur primarily via Silverado Trail. The applied trip distribution assumptions are shown in Table 3.



Transportation Impact Study for Bonny's Vineyard
Figure 2 – Site Plan



Table 3 – Trip Distribution Assumptions

Route	Percent
Silverado Tr (To/From North)	40%
Silverado Tr (To/From South)	40%
SR 128 (To/From West)	20%
TOTAL	100%

Circulation System

This section addresses the first bullet point on the CEQA checklist, which relates to the potential for a project to conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities.

Pedestrian Facilities

Existing and Planned Pedestrian Facilities

Pedestrian facilities include sidewalks, crosswalks, pedestrian signal phases, curb ramps, curb extensions, and various streetscape amenities such as lighting, benches, etc. As might be expected given the rural location of the project site, a connected pedestrian network is lacking, though such facilities would not be appropriate in this setting.

Pedestrian Safety

The collision history for the study area was reviewed to determine any trends or patterns that may indicate a safety issue for pedestrians. Collision records available from the California Highway Patrol as published in their Statewide Integrated Traffic Records System (SWITRS) reports were reviewed for the most current five-year period available, which was December 1, 2016, through November 30, 2021, at the time of the analysis. During the five-year study period there were no reported collisions involving pedestrians at the study intersections.

Finding – Pedestrian facilities serving the project site are adequate given the rural location.

Bicycle Facilities

Existing and Planned Bicycle Facilities

The *Highway Design Manual*, Caltrans, 2017, classifies bikeways into four categories:

- **Class I Multi-Use Path** – a completely separated right-of-way for the exclusive use of bicycles and pedestrians with cross flows of motorized traffic minimized.
- **Class II Bike Lane** – a striped and signed lane for one-way bike travel on a street or highway.
- **Class III Bike Route** – signing only for shared use with motor vehicles within the same travel lane on a street or highway.
- **Class IV Bikeway** – also known as a separated bikeway, a Class IV Bikeway is for the exclusive use of bicycles and includes a separation between the bikeway and the motor vehicle traffic lane. The separation may include, but is not limited to, grade separation, flexible posts, inflexible physical barriers, or on-street parking.

In the project area, Skellenger Lane is designated as Class III bike route, and there are bike lanes on Conn Creek Road and Silverado Trail. The *Napa Countywide Bicycle Plan* lists numerous planned bicycle facilities in the vicinity of the project, including planned bike lanes on Skellenger Lane, SR 128, a local path connection, and the regional Napa Valley Vine Trail, as summarized in Table 4.

Table 4 – Bicycle Facility Summary

Status Facility	Class	Length (miles)	Begin Point	End Point
Existing				
Skellenger Ln	III	0.9	Conn Creek Rd	Silverado Tr
Conn Creek Rd	II	0.9	SR 128	Skellenger Ln
Silverado Tr	II	26.9	SR 121 (Napa)	SR 29 (Calistoga)
Planned				
Napa Valley Vine Trail*	I	47	Vallejo	Calistoga
SR 128	III	1.3	Conn Creek Rd	Silverado Tr
SR 128	II	1.5	SR 29	Conn Creek Rd
Skellenger Ln	II	0.9	Conn Creek Rd	Silverado Tr
Multi-Use Path	I	0.9	Skellenger Ln	Oakville Cross Rd

Source: *Napa Countywide Bicycle Plan*, 2019; * segments in Calistoga and south of Yountville have been completed

Bicyclist Safety

Collision records for the study area were reviewed to determine if there had been any bicyclist-involved crashes. During the five-year study period between December 1, 2016, through November 30, 2021, there was one reported collision involving a bicyclist south of the Silverado Trail/Conn Creek Road intersection, which was the result of the driver traveling at an unsafe speed.

Project Impacts on Bicycle Facilities

Existing bicycle facilities, including bike lanes on Silverado Trail, together with shared use of minor streets provide adequate access for bicyclists.

Bicycle Storage

To provide short-term bicycle parking, the project includes five bicycle racks to be installed on-site, each rack accommodating two bicycles.

The County does not have specific bicycle parking requirements for wineries; however, the project should provide bicycle parking consistent with the requirements outlined in Chapter 18.110.040 of the Napa County Code of Ordinances which states that ten bicycle parking spaces should be provided for all nonresidential uses where ten or more automobile parking spaces are required. With a proposed supply of 22 permanent vehicle parking spaces, the project would need to provide ten bicycle spaces on-site, as is proposed.

Finding – Bicycle facilities serving the project site are adequate.

Transit Facilities

Existing Transit Facilities

Transit services throughout Napa County are provided by Napa Valley Transit (VINE). There are no VINE stops within one-quarter of a mile of the project site. VineGo provides paratransit service for people with disabilities certified as eligible; VineGo serves locations within three-quarters of a mile from fixed route transit services, which does not include the project site.

Impact on Transit Facilities

Given the rural location of the project site, it is not expected that there would be a demand for transit trips.

Finding – Transit facilities serving the project site are adequate given the rural setting.

Vehicle Miles Traveled (VMT)

The potential for the project to conflict or be inconsistent with CEQA Guidelines § 15064.3, subdivision (b) was evaluated based the project's anticipated Vehicle Miles Traveled (VMT).

Small Project Screening

Under guidance provided by the California Governor's Office of Planning and Research (OPR) in the publication *Transportation Impacts (SB 743) CEQA Guidelines Update and Technical Advisory*, 2018, and guidance published in the *Napa County Traffic Impact Study Guidelines*, 2021, several criteria are identified that may be used by jurisdictions to identify certain types of projects that are unlikely to have a VMT impact and can be "screened" from further VMT analysis. One of these screening criteria pertains to small projects, which both OPR and Napa County identify as generating fewer than 110 vehicle trips per day.

Using the data from the County's trip generation form for the harvest and non-harvest periods, and assuming that the Friday trip generation applies to all weekdays while the Saturday trip generation applies to all weekend days, the project would generate a total of 17,853 trips per year.

The project includes events that are not accounted for in the trip generation form as none would occur two or more times per month on average, which is the minimum threshold for the trip generation form. Nine events with a total of 80 guests each, as well as two events per year with up to 150 guests each are proposed. Applying the assumption of 2.8 persons per vehicle used in the County's trip generation form, these events would generate an estimated 738 trips per year, or an average of two trips per day. Including the event-related trips, the project would generate an estimated 18,591 trips per year, or 51 trips per day. As this is less than the 110 trips per day threshold established by OPR for small projects, the VMT impact of the project would be less-than-significant. This information is summarized in Table 5.

Table 5 – Estimated Vehicle Trips Per Day

Day/Events	Non-Harvest (41 weeks)		Harvest (11 weeks)		Events	
	Per Day	Annual	Per Day	Annual	Per Day	Annual
Typical Operations						
Weekday Trips	48	9,840	57	3,135		
Weekend Trips	45	3,690	54	1,188		
Events						
80-person events (9 events/year)					58	522
150-person events (2 events/year)					108	216
Subtotal		13,530		4,323		738
Total Trips, Annual	18,591					
Average Trips per Day	51					

Recommended Employee TDM Measures

Transportation Demand Management (TDM) measures aim to reduce single-occupancy vehicle trips, parking demand, and total vehicle miles traveled (VMT) through use of alternative modes of transportation and more efficiently planned trips. While not required to mitigate project-related VMT impacts, a TDM program would support county and state goals to reduce vehicle trips and greenhouse gas emissions and would minimize any effects of the project on traffic operations. It is noted that although the measures described below are intended for employees and can be implemented relatively easily, a substantial portion of the VMT and greenhouse gas (GHG) emissions associated with wineries are generated by visitors, as tourists can travel throughout Napa County from long distances and visit multiple wineries across the region, typically in a private vehicle. Visitors therefore represent a greater opportunity for reductions, but measures can be more challenging to employ in a rural, vehicle-dependent environment such as Napa County.

The winery is expected to have four to six full-time employees, as well as up to 45 daily visitors so there is limited potential to reduce vehicular trips and parking demand with implementation of a TDM program. The County has established metrics for estimating the number of trips generated by wineries, as indicated in its trip generation form. This adopted standard includes 3.05 trips per day for full-time employees, and visitor vehicle occupancy rates of 2.6 persons per vehicle on weekdays and 2.8 persons per vehicle on weekends. To achieve a 15 percent reduction in vehicle miles traveled, a 15 percent reduction in trips is suggested. This would translate to full-time employees making an average of 2.59 trips per day and a guest vehicle occupancy averaging 2.99 persons per vehicle on weekdays and 3.22 on weekends.

The focus of the project's TDM Program would be to provide information, encouragement, and access to travel options to reduce the number of vehicle trips during peak hours and overall, thus reducing VMT. The following measures are suggested and are consistent with the goals of Caltrans' *Smart Mobility 2010: A Call to Action for the New Decade* as well as the information published in the California Air Pollution Officers Association (CAPCOA) report *Handbook for Analyzing Greenhouse Gas Emission Reductions, Assessing Climate Vulnerabilities, and Advancing Health and Equity*, CAPCOA, 2021. It is recommended that the incentives offered as part of the program be available for the first two years of operation, after which the effectiveness of the program should be reevaluated and modified, if needed. The following measures are quantifiable strategies intended to reduce the project's employee-based VMT.

Ridesharing Program

Carpooling is one of the most common and cost-effective alternative modes of transportation and one that commuters can adopt part-time. There are numerous benefits to ridesharing. Carpooling can reduce peak-period vehicle trips and increase commuters' travel choices. Further, it reduces congestion, road and parking facility costs and pollution emissions. Carpooling tends to have the lowest cost per passenger-mile of any motorized mode of transportation, since it makes use of a vehicle seat that would otherwise be empty. Carpooling also provides consumer financial savings by decreasing fuel and parking costs.

Ridematching

The greatest barrier to workplace carpooling is often simply being able to identify and travel with other nearby employees. Fortunately, there are many services that can assist in pairing employees within the

same organization or across organizations. The most basic publicly available service is 511.org's free ridematching service. There are also various private ridematching providers (e.g. Zimride, RideAmigos, Via, Scoop) that can effectively create carpool networks while making them safe and convenient for their users. The Napa Valley Transportation Authority (NVTa) uses RideAmigos as a resource for local employers as part of its V-Commute program.

Tele-Work/Compressed/Flex Schedules

Telework (i.e., working from home) and compressed schedules (i.e., working more than eight hours each day and shortening the work week) are among the most commonly employed scheduling means to reduce vehicle trips. While many winery employees are required to be on-site to perform their jobs, some staff may be able to take advantage of these options.

Guaranteed Ride Home Program

One of the reasons that many employees do not carpool to work is the fear of being stranded should they need to leave in an emergency. Employees who carpool to work should be guaranteed a ride home in the case of an emergency or unique situation. The Napa Valley Transportation Authority (NVTa) offers a Guaranteed Ride Home (GRH) program, which is available to employees who carpool or commute via alternative modes. Participants are able to use a taxi, rental car, Lyft, Uber, or other means to get home in an emergency – such as taking care of a sick child or other unexpected need – and are reimbursed for the full cost of the service. The program is available to all who work or attend college in Napa County and is free to join, but registration is required. As part of the project's TDM program, employees would be provided information about V-Commute and would be encouraged to register for the service.

Education, Outreach & Marketing

Transportation Coordinator

The presence of a staff person dedicated part-time to overseeing and managing the TDM program is helpful in ensuring the ongoing success of these programs. This would not be a distinct position, but instead would be a role that is integrated into the on-site manager. The duties for this position could include the following:

- Create and distribute employee transportation information welcome packets
- Maintain and update a bulletin board or other physical source of transportation information
- Distribute Napa Bicycle Coalition maps
- Monitor bicycle facilities
- Administer the cash-out program
- Promote the ride-matching program

Welcome Packet for New Employees

New employees should be provided with a welcome packet containing relevant transportation information. The packet could include information about NVTa's V-Commute program, which offers resources related to non-automobile transportation options, such as bicycle transportation information, ride-matching services, and the guaranteed ride home program. Transit maps for Vine Transit service could also be provided.

Visitor Transportation Information

Providing guests with on-line information regarding transportation options for travel to the winery can help encourage guests to consider non-auto or rideshare options. This information should be emailed or mailed to guests as part of their registration confirmation process to assist in their logistics planning. Guests making appointments for four or more persons should be encouraged to use private vans or a shuttle for their entire group.

Monitor Performance

It is important to continually monitor the performance of a TDM program and adjust measures as necessary to ensure its success. Employers should conduct mode split and VMT surveys before the implementation of a TDM program and each year thereafter to both make adjustments and use as a marketing material. Employee satisfaction surveys are also an effective way of ensuring a quality TDM program.

Bicycle Benefits

Bicycle Parking

The provision of both short-term and long-term bicycle parking is important. Secure long-term parking (e.g. bike lockers) is a critical component in encouraging employees to bike to work as the lack of secure parking is often cited by employees as a deterrent. Short-term parking (e.g. bike racks) can be utilized by employees or visitors and is generally an inexpensive way to accommodate visitors traveling between wineries.

Shared Bicycles & Maintenance Tools

Many businesses have experience in providing one or more vehicles on-site for employee use during work hours. Today, many employers are offering the same benefit in the form of shared bicycles for employee or guest use. These bicycles are ideal for short trips and are a cost-effective way of providing a new mobility option to nearby wineries or other destinations during the workday. Bicycles that are shared or used by individuals can be serviced with simple tools such as a pump and tire patches that are kept on-site.

Recommendation – Although not required to offset a VMT impact, It is recommended that the winery implement a TDM plan to reduce vehicle trips by promoting employee carpooling and providing employees with information regarding related County programs and services.

Safety Issues

The potential for the project to impact safety was evaluated in terms of the adequacy of sight distance and need for turn lanes at the project access as well as the adequacy of stacking space in dedicated turn lanes at the study intersections to accommodate additional queuing due to adding project-generated trips and need for additional right-of-way controls. This section addresses the third bullet on the CEQA checklist which is whether or not the project would substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment).

Site Access

The project would be accessed from an existing driveway on Skellenger Lane. The driveway would be widened to establish a 20-foot wide travelway.

Sight Distance

Sight distance along Skellenger Lane at the project driveway was evaluated based on sight distance criteria contained in the *Highway Design Manual* published by Caltrans. The recommended sight distance for a driveway is based on stopping sight distance, with the approach travel speed used as the basis for determining the recommended sight distance. Additionally, the stopping sight distance needed for a following driver to stop if there is a vehicle waiting to turn into a side street or driveway is evaluated based on stopping sight distance criterion and the approach speed on the major street.

Since there are no speed limit signs posted along Skellenger Lane, the *prima facie* speed limit of 55 mph was used to assess the sight distance. Based on a design speed of 55 mph, the minimum stopping sight distance needed is 500 feet. Skellenger Lane is straight and flat and the sight distances at the driveway extends more than 500 feet in both directions. However, sight lines could potentially be impeded by overgrown landscaping, so care should be taken to ensure that open sight lines are maintained.

Finding – Sight distance at the project driveway would be adequate.

Recommendation – Any landscaping or vegetation near the area encompassed by the sight lines along Skellenger Lane should be low-lying and maintained to ensure that sight lines are not obstructed.

Access Analysis

Left-Turn Lane Warrants

The need for left-turn channelization in the form of a left-turn pocket on Skellenger Lane at the driveway for Bonny's Vineyard was evaluated using the criteria published by the County in the *Napa County Road and Street Standards*, February 4, 2020. Based on Existing plus Project peak hour volumes and Future Plus Project peak hour volumes, and using the graph on Page 21, a left-turn lane is not warranted on Skellenger Lane at the driveway for Bonny's Vineyard during either of the peak periods evaluated. The left-turn lane warrant graph is provided in Appendix C.

Queuing

Under each scenario, the projected 95th percentile queues in left-turn pockets at the study intersections were determined using the Vistro application. Summarized in Table 6 are these predicted queue lengths. Copies of the queuing calculations are provided in Appendix D.

Table 6 – 95th Percentile Left-Turn Queues Exceeding Available Storage

Study Intersection Approach	Available Storage	95 th Percentile Queues							
		Weekday PM Peak Hour				Weekend Midday Peak Hour			
		E	E+P	F	F+P	E	E+P	F	F+P
Silverado Tr/Conn Creek Rd Northbound Left-Turn	175	6	6	9	9	2	2	3	4
Silverado Tr/Conn Creek Rd Southbound Left-Turn	130	9	9	10	10	10	11	16	17
Silverado Tr/Skellenger Ln Northbound Left-Turn	135	1	2	2	2	2	2	2	3

Notes: All distances are measured in feet; E = existing conditions; E+P = existing plus project conditions; F = future conditions; F+P = future plus project conditions

Under both Existing and Future scenarios, including project trips, 95th percentile left-turn queue lengths at all study intersections are not expected to exceed the available storage provided by the existing left-turn pockets. Therefore, it is reasonable to conclude that impact of the additional trips generated by the project is not significant.

Finding – The project does not cause any left-turn queues to exceed available storage, so the impact is considered less-than-significant.

Emergency Access

The final bullet on the CEQA checklist requires an evaluation as to whether the project would result in inadequate emergency access or not.

Adequacy of Site Access

The project site as designed has a driveway and drive aisles that are of sufficient width to accommodate emergency response vehicles, including fire trucks. The site would serve truck traffic and has a circulation system that would allow a fire truck to turn around and exit. The primary drive aisle would connect to all the new buildings, with sufficient space between the buildings to stage fire suppression equipment. The site would therefore have adequate emergency access.

Off-Site Impacts

Given the project's nominal trip generation, it is anticipated that it would have no discernible impact on emergency response times considering the emergency responders employing their lights and sirens are given the right-of-way over all other traffic.

Finding – The proposed project would be expected to have a less-than-significant impact on emergency response.

Capacity Analysis

Although traffic operation is no longer a CEQA issue, under the County’s policies the project’s effect on traffic operation must still be evaluated.

Intersection Level of Service Methodologies

Level of Service (LOS) is used to rank traffic operation on various types of facilities based on traffic volumes and roadway capacity using a series of letter designations ranging from A to F. Generally, Level of Service A represents free flow conditions and Level of Service F represents forced flow or breakdown conditions. A unit of measure that indicates a level of delay generally accompanies the LOS designation.

The study intersections were analyzed using the unsignalized (two-way stop-controlled) methodology published in the *Highway Capacity Manual 6th Edition* (HCM), Transportation Research Board, 2018. This source contains methodologies for various types of intersection control, all of which are related to a measurement of delay in average number of seconds per vehicle. The “Two-Way Stop-Controlled” intersection capacity method determines a level of service for each minor turning movement by estimating the level of average delay in seconds per vehicle. Results are presented for individual movements together with the weighted overall average delay for the intersection.

The ranges of delay associated with the various levels of service are indicated in Table 7.

Table 7 – Two-Way Stop-Controlled Intersection Level of Service Criteria

LOS A	Delay of 0 to 10 seconds. Gaps in traffic are readily available for drivers exiting the minor street.
LOS B	Delay of 10 to 15 seconds. Gaps in traffic are somewhat less readily available than with LOS A, but no queuing occurs on the minor street.
LOS C	Delay of 15 to 25 seconds. Acceptable gaps in traffic are less frequent, and drivers may approach while another vehicle is already waiting to exit the side street.
LOS D	Delay of 25 to 35 seconds. There are fewer acceptable gaps in traffic, and drivers may enter a queue of one or two vehicles on the side street.
LOS E	Delay of 35 to 50 seconds. Few acceptable gaps in traffic are available, and longer queues may form on the side street.
LOS F	Delay of more than 50 seconds. Drivers may wait for long periods before there is an acceptable gap in traffic for exiting the side streets, creating long queues.

Reference: *Highway Capacity Manual 6th Edition*, Transportation Research Board, 2016

Existing Conditions

The Existing Conditions scenario provides an evaluation of current operation based on existing traffic volumes during the weekday and weekend p.m. peak periods. This condition does not include project-generated traffic volumes. Volume data was collected while local schools were in session. Because the counts were collected in February and March, they were factored up by 15 percent to reflect harvest conditions. Due to the Covid-19 pandemic, it is expected that counts reflect volumes that are less than “normal” volumes. Therefore, counts collected at Silverado Trail/Conn Creek Road in 2019 were used as

a “control” to establish adjustment factors to be applied to the 2022 counts. This led to an additional factor of 5 percent being applied to counts obtained during the Friday p.m. peak and 37 percent being applied to the counts obtained during the weekend midday peak.

Intersection Levels of Service

Under existing conditions, all three study intersections have one approach that operates at LOS E or F during one or both of the peak periods evaluated. As LOS F is acceptable for SR 29 and LOS E is accepted for Silverado Trail, these conditions are considered acceptable except for the eastbound approaches to Silverado Trail on Conn Creek Road and Skellenger Lane during the weekday p.m. peak hour, which operate at LOS F.

The applied existing traffic volumes are shown in Figure 3. A summary of the intersection Level of Service calculations is contained in Table 8, and copies of the calculations are provided in Appendix D.

Table 8 – Existing PM Peak Hour and Weekend Peak Hour Intersection Levels of Service

Study Intersection <i>Approach</i>	Friday		Saturday	
	Delay	LOS	Delay	LOS
1. Silverado Tr/Conn Creek Rd	5.0	A	3.4	A
<i>Eastbound (Conn Creek Rd) Approach</i>	88.9	F	39.7	E
<i>Westbound (driveway) Approach</i>	42.4	E	19.8	C
2. SR 29/Rutherford Rd	40.5	E	85.3	F
<i>Westbound (Rutherford Rd) Approach</i>	473.0	F	1264.2	F
3. Silverado Tr/Skellenger Ln	26.5	D	0.8	A
<i>Eastbound (Skellenger Ln) Approach</i>	120.3	F	14.7	B

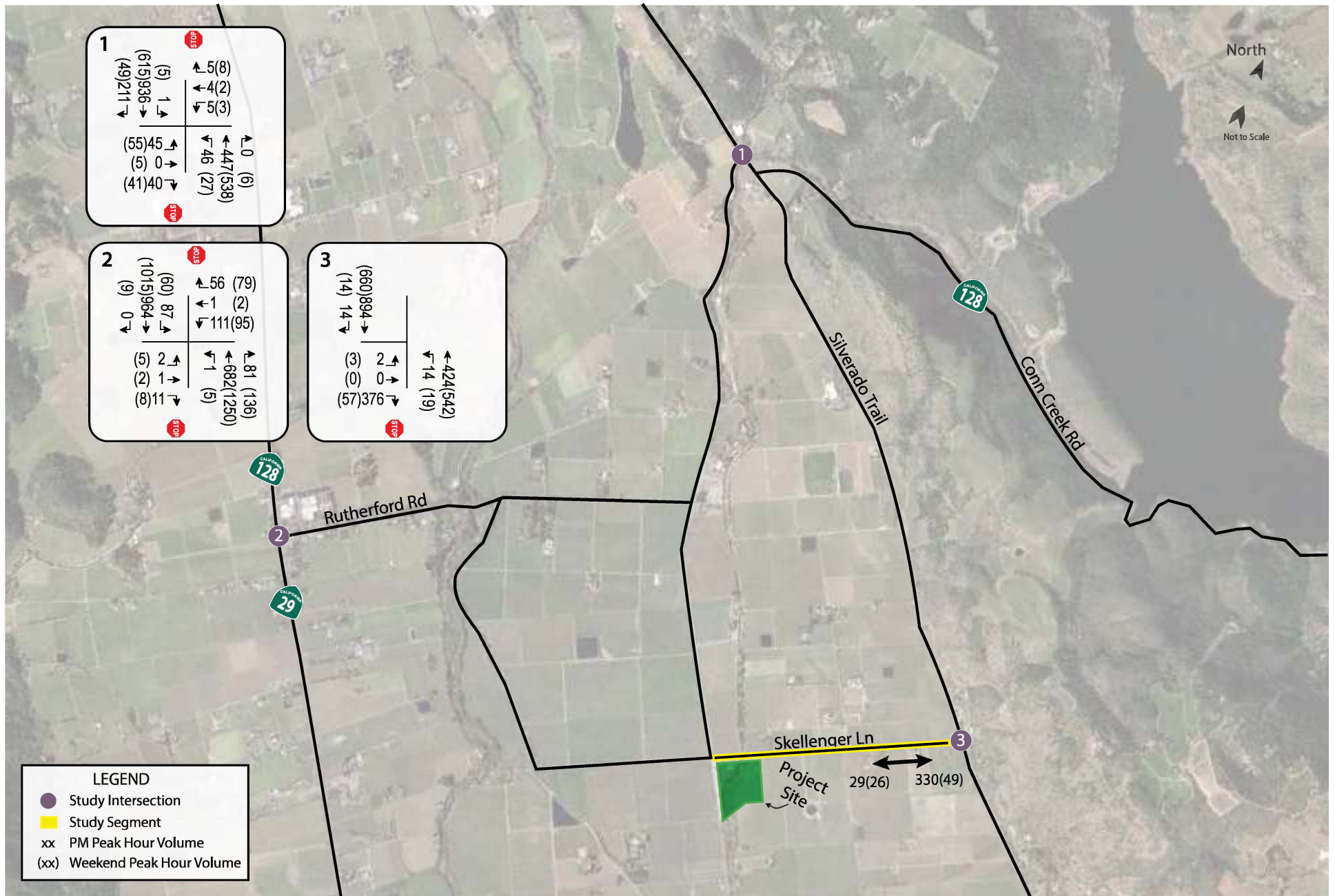
Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service; Results for minor approaches to two-way stop-controlled intersections are indicated in *italics*; **Bold** text = deficient operation

Although installation of traffic signals would be expected to address the deficient operation at these study intersections, the County has a policy against installing any new traffic signals along Silverado Trail or SR 29. For informational purposes it is noted that, if signalized, all study intersections would operate at LOS D or better. Further, the SR 29/Rutherford Road and Silverado Trail/Skellenger Lane intersections meet the peak hour warrant for signalization under Existing Conditions. Signal warrant outputs are provided in Appendix E for informational purposes.

Because signalization is not an option, other potential improvements, such as turn lanes and/or acceleration/deceleration lanes, were considered. Following is a discussion of the potential improvement options at both study intersections to address the existing unacceptable operation.

Silverado Trail/Conn Creek Road

- Turn Lanes: there are currently left-turn lanes in both directions on Silverado Trail. There is not currently a separate left-turn lane on the eastbound Conn Creek Road approach, though the lane is wide enough that there are two stop legends, indicating that drivers are expected to queue up side-



Transportation Impact Study for Bonny's Vineyard
Figure 3 – Existing Traffic Volumes

by-side. Given the proximity to a creek, additional widening appears infeasible within the existing right-of-way.

- **Acceleration/Deceleration Lanes:** the existing gravel shoulder along the southbound lane on Silverado Trail provides some space for vehicles to decelerate prior to turning right onto Conn Creek Road and some space for vehicles to accelerate onto Silverado Trail southbound. However, the existing bridge structure limits the potential for providing additional acceleration space. As there are left-turn lanes in both directions, there is no space for acceleration when turning left onto Silverado Trail.

Silverado Trail/Skellenger Lane

- **Turn Lanes:** there is currently a left-turn lane on Silverado Trail in the northbound direction. There is not currently a separate left-turn lane on the eastbound Skellenger Lane approach, though there is a flared right-turn lane provided. The existing width of Skellenger Lane appears infeasible to provide separate turn lanes on the eastbound approach.
- **Acceleration/Deceleration Lanes:** the existing shoulder along the southbound lane on Silverado Trail provides some space for vehicles to decelerate prior to turning right onto Skellenger Lane and some space for vehicles to accelerate onto Silverado Trail southbound. The northbound travel lane on Silverado Trail is approximately 20 feet wide through the intersection. Given the existing wide shoulders and travel lanes in the vicinity of the intersection, reallocating space to provide a northbound acceleration lane for left-turning vehicles from Skellenger Lane appears feasible for at least 150 feet north of the intersection with no roadway widening.

Roadway Segment Levels of Service

Under Existing volumes, the study roadway segment is operating acceptably at LOS A or B. These results are summarized in Table 9 and copies of the calculations are presented in Appendix F.

Table 9 – Existing Peak Hour Roadway Segment Levels of Service

Study Segment Direction	Weekday PM Peak		Weekend MD Peak	
	FD	LOS	FD	LOS
Skellenger Ln				
Eastbound	2.7	B	0.1	A
Westbound	0.0	A	0.0	A

Notes: Speed is measured in miles per hour; LOS = Level of Service; FD = Follower Density

Finding – The segment of Skellenger Lane fronting the project site is operating acceptably at LOS A or B under Existing Conditions. While all study intersections are operating at acceptable service levels overall, the eastbound approaches to the Silverado Trail/Conn Creek Road and Silverado Trail/Skellenger Lane intersections are operating unacceptably at LOS F during the Friday peak hour.

Future Conditions

Segment volumes for the horizon year of 2040 were obtained from the Napa Solano Travel Demand model maintained by the Solano Transportation Authority (STA). Model-generated segment volumes were translated to turning movement volumes at each of the study intersections using a combination of the “Furness” method and factoring, depending on how the model was configured at each intersection. The Furness method is an iterative process that employs existing turn movement data, existing link volumes and future link volumes to project likely turning future movement volumes at intersections. As Future weekend volumes are not available in the model, future volumes for the weekend midday peak hour were estimated by applying growth rates of 1.28 to the existing volumes at Silverado Trail/Conn Creek Road, 1.18 to SR-29/Rutherford Road, and 1.26 to Silverado Trail/Skellenger Lane; it is noted that these growth rates were developed by comparing the existing and calculated future volumes for weekday peak hours.

Intersection Levels of Service

Under the anticipated Future volumes, two of the three study intersections are expected to operate unacceptably due to unacceptable LOS levels (LOS E or F) at side street approaches. Future volumes are shown in Figure 4 and operating conditions are summarized in Table 10.

Table 10 – Future PM Peak Hour and Weekend Peak Hour Intersection Levels of Service

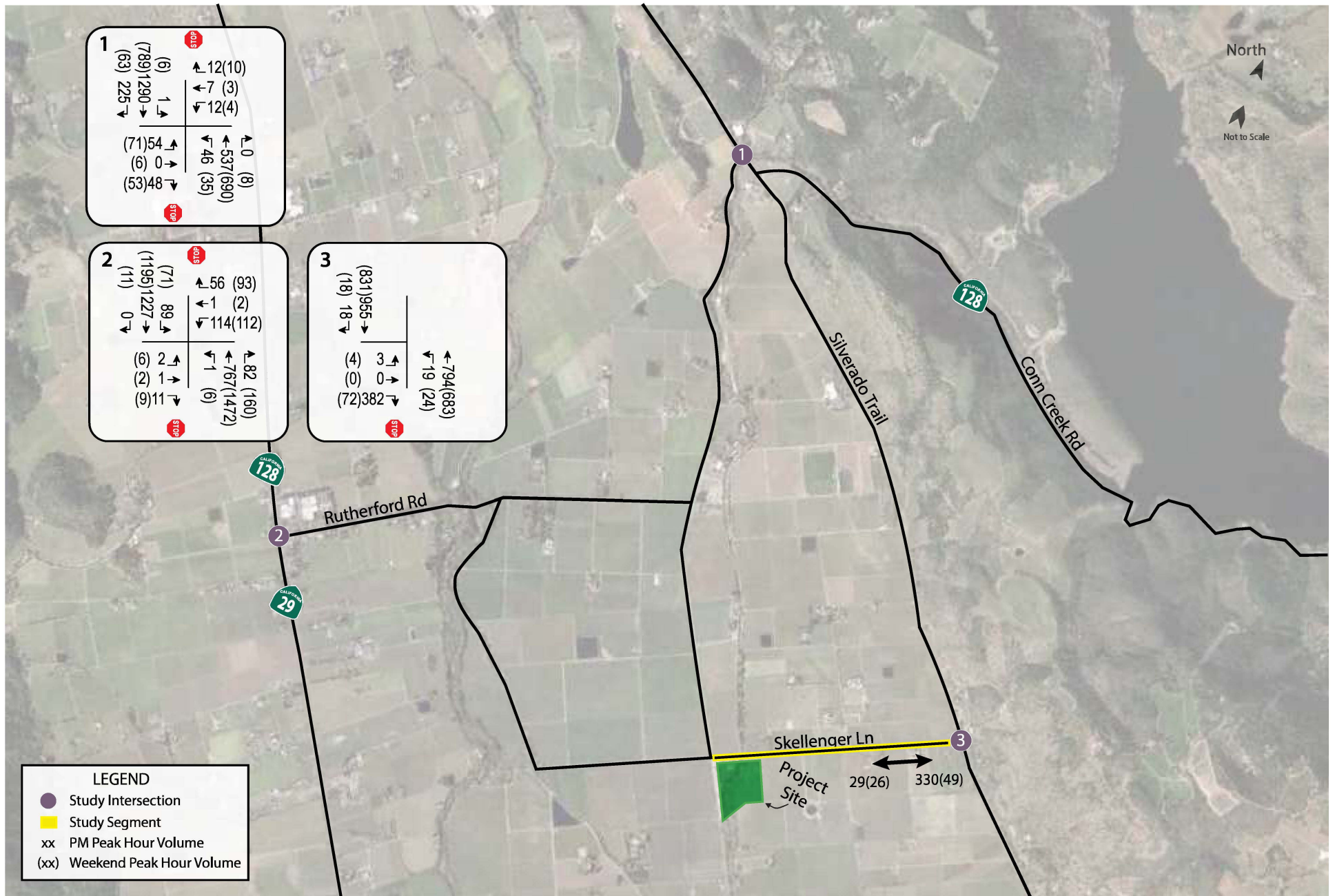
Study Intersection <i>Approach</i>	Friday		Saturday	
	Delay	LOS	Delay	LOS
1. Silverado Tr/Conn Creek Rd	30.0	D	14.6	B
<i>Eastbound (Conn Creek Rd) Approach</i>	601.0	F	187.2	F
<i>Westbound (driveway) Approach</i>	161.4	F	32.6	E
2. SR 29/Rutherford Rd	83.1	F	261.9	F
<i>Westbound (Rutherford Rd) Approach</i>	1132.8	F	3832.7	F
3. Silverado Tr/Skellenger Ln	30.8	D	1.0	A
<i>Eastbound (Skellenger Ln) Approach</i>	173.1	F	19.0	C

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service; Results for minor approaches to two-way stop-controlled intersections are indicated in *italics*; ** = delay greater than 120 seconds; **Bold** text = deficient operation

As might be expected with no changes to the intersections’ geometries or controls, the operation of the study intersections is anticipated to deteriorate substantially with the projected increase in traffic over the next 18 years. As previously noted, the County has indicated that signalization is not an option for achieving better operation. While there are no feasible options for substantially improving operation at Silverado Trail/Conn Creek Road, adding acceleration/deceleration lanes at Silverado Trail/Skellenger Lane would improve operation.

Roadway Segment Levels of Service

Under projected future volumes, the roadway study segment would be expected to operate acceptably at LOS A or B. These results are summarized in Table 11.



Transportation Impact Study for Bonny's Vineyard
Figure 4 – Future Traffic Volumes

Table 11 – Future Peak Hour Roadway Segment Levels of Service

Study Segment Direction	Weekday PM Peak		Weekend MD Peak	
	FD	LOS	FD	LOS
Skellenger Ln				
Eastbound	2.8	B	0.1	A
Westbound	0.0	A	0.0	A

Notes: Speed is measured in miles per hour; LOS = Level of Service; FD = Follower Density

Finding – The segment of Skellenger Lane fronting the project site is expected to continue operating acceptably at LOS A or B under Future Conditions. The eastbound approaches to the Silverado Trail/Conn Creek Road and Silverado Trail/Skellenger Lane intersections are expected to continue operating unacceptably.

Project Conditions

Intersection Operation

Existing plus Project Conditions

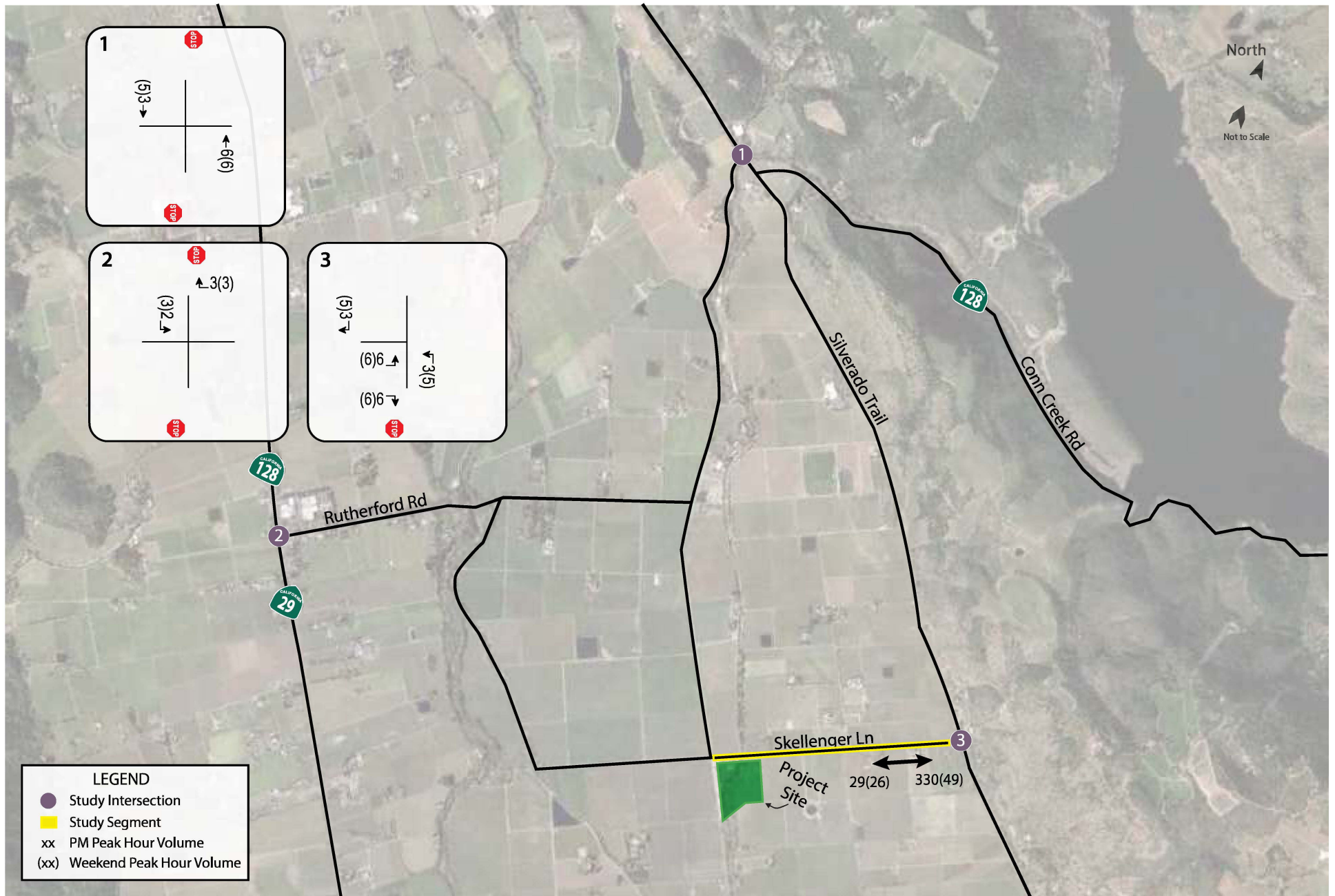
Upon the addition of project-related traffic to the Existing volumes, the study intersections are expected to operate at the same Level of Service as without the project volumes. The only exception is the Skellenger Lane approach to the Silverado Trail/Skellenger Lane intersection. Under existing conditions, the approach operates acceptably at LOS B during the Saturday midday peak hour, and with the addition of project volumes the approach operates acceptably at LOS C. These results are summarized in Table 12. Project traffic volumes are shown in Figure 5.

Table 12 – Existing and Existing plus Project PM Peak Hour Intersection Levels of Service

Study Intersection Approach	Existing Conditions				Existing plus Project			
	Friday		Saturday		Friday		Saturday	
	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1. Silverado Tr/Conn Creek Rd	5.0	A	3.4	A	5.1	A	3.4	A
EB (Conn Creek Rd) Approach	88.9	F	39.7	E	91.4	F	40.8	E
WB (driveway) Approach	42.4	E	19.8	C	43.0	E	20.1	C
2. SR 29/Rutherford Rd	40.5	E	85.3	F	40.9	E	86.9	F
WB (Rutherford Rd) Approach	473.0	F	1264.2	F	471.1	F	1267.5	F
3. Silverado Tr/Skellenger Ln	26.5	D	0.8	A	31.4	D	1.1	A
EB (Skellenger Ln) Approach	120.3	F	14.7	B	140.0	F	16.3	C

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service; Results for minor approaches to two-way stop-controlled intersections are indicated in *italics*; **Bold** text = deficient operation

For unsignalized intersections currently operating at LOS F, the effect of additional project traffic is considered adverse if the project would generate an additional five seconds of delay per vehicle at the



Transportation Impact Study for Bonny's Vineyard
Figure 5 – Project Traffic Volumes

side street approach. At Silverado Trail/Conn Creek Road, the project is anticipated to add 2.5 seconds of delay to the Conn Creek Road approach during the Friday p.m. peak, which is acceptable. At the SR 29/Rutherford Road intersection, the project is anticipated to add 3.3 seconds of delay to the Rutherford Road approach during the Saturday midday peak, which is also acceptable. At Silverado Trail/Skellenger Lane, the project is anticipated to add 19.7 seconds of delay, which is considered an adverse effect since it is greater than five seconds.

Finding – All three study intersections are expected to continue operating at the same Levels of Service upon the addition of project-generated traffic as without it. Additional delays due to the addition of project traffic at Silverado Trail/Conn Creek Road are less than five seconds per vehicle and are considered acceptable. However, during the Friday p.m. peak hour, additional delays on the minor street approach at Silverado Trail/Skellenger Lane are more than five seconds and therefore considered an adverse effect.

Recommendation – It is recommended that Silverado Trail be restriped to allocate space for an acceleration lane in the northbound direction leaving the intersection.

Future plus Project Conditions

Upon the addition of project-generated traffic to the anticipated Future volumes, all three study intersections would continue operating at LOS E or F on the side street approaches during one or both peak hours. The Future plus Project operating conditions are summarized in Table 13.

Table 13 – Future and Future plus Project PM Peak Hour Intersection Levels of Service

Study Intersection <i>Approach</i>	Future Conditions				Future plus Project			
	Friday		Saturday		Friday		Saturday	
	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1. Silverado Tr/Conn Creek Rd	30.0	D	14.6	B	30.6	D	15.0	C
<i>EB (Conn Creek Rd) Approach</i>	601.0	F	187.2	F	615.8	F	195.0	F
<i>WB (driveway) Approach</i>	161.4	F	32.6	E	165.6	F	33.2	E
2. SR 29/Rutherford Rd	83.1	F	261.9	F	83.9	F	267.6	F
<i>WB (Rutherford Rd) Approach</i>	1132.8	F	3832.7	F	1126.0	F	3859.9	F
4. Silverado Tr/Skellenger Ln	30.8	D	1.0	A	38.2	E	1.4	A
<i>EB (Skellenger Ln) Approach</i>	173.1	F	19.0	C	209.8	F	22.2	C

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service; Results for minor approaches to two-way stop-controlled intersections are indicated in *italics*; **Bold** text = deficient operation

Finding – With project traffic added to Future volumes the side street approaches to Silverado Trail are expected to continue operating unacceptably. As LOS F operation is acceptable along SR 29, the project has an acceptable effect on operation at SR 29/Rutherford Road.

- The study intersection of Silverado Trail/Conn Creek Road would continue to experience unacceptable LOS F operation on the minor street approach during both peak hours without and with project-related traffic. The project's impact would be adverse if it contributes five percent or more of the increase in traffic over existing volumes; this project would add 1.8 percent of the difference between future and existing volumes at Silverado Trail/Conn Creek Road during the weekday p.m. peak hour

and 2.8 percent of the difference during the weekend peak hour. This is considered an acceptable effect based on the County's standards.

- Similarly, the intersection of Silverado Trail/Skellenger Lane would operate unacceptably on the minor street approach at LOS F during the Friday p.m. peak hour, without and with project-generated trips added. The project volumes represent 3.9 and 6.1 percent of the increase during the weekday and weekend peak hours respectively. Since the project would add more than five percent to the difference between future and existing volumes at this intersection during the weekend peak hour, this is considered an adverse effect under the County's standards and requires improvements.

Recommendation – As indicated for Existing plus Project Conditions, striping modifications should be made at the Silverado Trail/Skellenger Lane intersection to delineate a northbound acceleration lane.

Roadway Segment Operation

Existing plus Project Conditions

Under Existing plus Project volumes, the study roadway segment is expected to operate acceptably at LOS A or B. These results are summarized in Table 14.

Table 14 – Existing and Existing plus Project Peak Hour Roadway Segment Levels of Service

Study Segment Direction	Existing Conditions				Existing plus Project			
	WD PM Peak		WE MD Peak		WD PM Peak		WE MD Peak	
	FD	LOS	FD	LOS	FD	LOS	FD	LOS
Skellenger Ln								
Eastbound	2.7	B	0.1	A	3.0	B	0.2	A
Westbound	0.0	A	0.0	A	0.1	A	0.0	A

Notes: WD = Weekday; WE = Weekend; Speed is measured in miles per hour; LOS = Level of Service; FD = Follower Density

Finding – Skellenger Lane is expected to continue operating acceptably at LOS A or B upon the addition of project-generated traffic.

Future plus Project Conditions

With project-generated traffic added to the anticipated Future volumes, the study roadway is expected to operate acceptably at LOS A or B. The Future plus Project operating conditions are summarized in Table 15.

Table 15 – Future and Future plus Project Peak Hour Roadway Segment Levels of Service

Study Segment Direction	Future Conditions				Future plus Project			
	WD PM Peak		WE MD Peak		WD PM Peak		WE MD Peak	
	FD	LOS	FD	LOS	FD	LOS	FD	LOS
Skellenger Ln								
Eastbound	2.8	B	0.1	A	3.1	B	0.2	A
Westbound	0.0	A	0.0	A	0.1	A	0.0	A

Notes: WD = Weekday; WE = Weekend; Speed is measured in miles per hour; LOS = Level of Service; FD = Follower Density

Finding – Skellenger Lane will continue to operate acceptably with project traffic added to Future volumes.

Parking

The project was analyzed to determine whether the proposed parking supply would be sufficient for the anticipated daily demand during harvest conditions. The project site, as proposed, would have a total of 22 parking spaces plus an accessible van parking space.

Napa County does not currently have parking requirements for winery projects. Applying guidelines employed in other Napa County winery traffic studies, daily parking demand for the winery and tasting room could be accommodated by providing at least one space for every employee, as well as parking stalls for vehicles needed to transport about 25 percent of the expected daily tasting room visitors. During typical operation, there would be a maximum of six employees on site at any one time, which would be monitored through the scheduling of shifts. The use permit would allow for a maximum of 45 daily visitors to the tasting room. Assuming the County's standard occupancy rate of 2.8 guests per vehicle, a total of 16 guest vehicles would visit the site over the course of the day; to accommodate 25 percent of the visitors at one time, four parking spaces would be required. Including the six spaces needed to accommodate employee parking needs and four spaces for guest parking, a total of 10 spaces would meet the demand during typical operations; the proposed on-site parking supply of 22 spaces would therefore be sufficient.

The County's standard vehicle occupancies of one employee or 2.8 visitors per vehicle was also used to calculate the number of on-site spaces needed to accommodate employees and visitors during marketing events. The project proposes to host two 150-person marketing events and nine 80-person events each year, so the number of parking spaces needed on-site to accommodate employees and visitors during the larger events was estimated. During marketing events, the tasting room would not be open, and the estimated six staff required for the event is included in the 150-person maximum. For a 150-person event, 51 spaces for visitors and six spaces for employees would be needed, for a total of 57 spaces. Given the infrequent nature of these events, a formal parking lot would not be developed to accommodate the necessary spaces, which would be provided as overflow parking. There is sufficient space available in the area surrounding the barn and in the vineyard avenues to provide overflow parking for these vehicles; these areas are indicated in the site plan.

Finding – The proposed parking supply would be adequate to accommodate the anticipated peak parking demand during typical operations, and overflow parking could be provided on-site to accommodate the proposed 150-person events.

Conclusions and Recommendations

Conclusions

- The proposed winery would be expected to generate 41 daily trips on a Friday during harvest season, including 15 new trips during the p.m. peak hour, and 54 daily trips on a Saturday during harvest season, with 27 new trips during the p.m. peak hour.
- While there are no pedestrian facilities serving the project site, pedestrian trips to and from the site are not expected given the rural context of the project site, so this condition is acceptable.
- Bicycle facilities serving the project site are adequate to serve the project site.
- Transit facilities serving the project site are adequate considering the lack of any anticipated demand.
- Adequate sight distance is available at the project driveway in both travel directions.
- The project would be expected to generate an average of 51 trips per day; since this is less than the “small-project” threshold of 110 trips per day, the VMT impact would be considered less-than-significant.
- Based on a review of the collision history and injury rates at the study intersections, there are no apparent safety concerns.
- The intersection of Silverado Trail/SR 128-Conn Creek Road is currently operating unacceptably at LOS F on the eastbound Conn Creek Road approach during the Friday p.m. peak period. Upon the addition of project-related traffic, this intersection is expected to continue to operate unacceptably during the Friday p.m. peak period. As the project would not cause delay to increase by more than five seconds, the effect is not considered adverse under the County’s criteria.
- The intersection SR 29/Rutherford Road is currently operating at LOS F on the westbound Conn Creek Road approach during both study periods, which is considered acceptable under the County’s standards. This intersection is expected to continue operating acceptably at the same LOS with project traffic added.
- The intersection of Silverado Trail/Skellenger Lane is expected to operate unacceptably at LOS F on the side street approach during the Friday p.m. peak period without or with the addition of project traffic. The project would cause delay to increase by more than five seconds, which is considered to be an adverse effect. While the addition of turn lanes on the eastbound approach appears to be infeasible, a northbound acceleration lane was recommended on Silverado Trail to improve operations.
- Under Future Conditions, the study intersection of Silverado Trail/Conn Creek Road would continue to experience unacceptable LOS F operation on the minor street approach during both peak hours without and with project-related traffic. The project would add 1.8 percent of the difference between future and existing volumes at Silverado Trail/Conn Creek Road during the weekday p.m. peak hour

and 2.8 percent of the difference during the weekend peak hour. This is considered acceptable based on the County's standards.

- The intersection of Silverado Trail/Skellenger Lane would operate unacceptably on the minor street approach at LOS F during the Friday p.m. peak hour under Future Conditions, without and with project-generated trips added. The project volumes represent 3.9 and 6.1 percent of the increase during the weekday and weekend peak hours respectively. Since the project would add more than five percent to the difference between future and existing volumes at this intersection during the weekend peak hour, this is considered an adverse effect on traffic operations.
- The segment of Skellenger Lane fronting the project site would be expected to operate acceptably at LOS A or B without or with the addition of project traffic under both Existing and Future Conditions.
- The proposed on-site parking supply would be adequate for the anticipated peak demand during typical operations, and overflow parking would be adequate to accommodate periodic events.

Recommendations

- While not required to mitigate a VMT impact, the winery should implement a TDM Plan to support the reduction of vehicle trips.
- At the Silverado Trail/Skellenger Lane intersection, an acceleration lane should be striped in the northbound direction leaving the intersection. No roadway widening would be anticipated to accommodate the restriping.
- At the project driveway, any landscaping or vegetation near the area encompassed by the sight lines along Skellenger Lane should be low-lying and maintained to ensure that sight lines are not obstructed.

Study Participants and References

Study Participants

Principal in Charge	Dalene J. Whitlock, PE, PTOE
Transportation Planner	Barry Bergman, AICP
Assistant Engineer	Nick Brunetto, EIT
Graphics	Cameron Wong
Editing/Formatting	Alex Scrobonia
Quality Control	Dalene J. Whitlock, PE, PTOE

References

2018 Collision Data on California State Highways, California Department of Transportation, 2020

Guidelines for Application of Updated General Plan Circulation Policies on Significance Criteria Related to Vehicle Level of Service, Fehr & Peers, 2020

Guidelines for Interpretation of General Plan Circulation Policies on Significance Criteria, Fehr & Peers, 2015

Handbook for Analyzing Greenhouse Gas Emission Reductions, Assessing Climate Vulnerabilities, and Advancing Health and Equity, CAPCOA, 2021

Highway Capacity Manual, 6th Edition, Transportation Research Board, 2018

Highway Design Manual, 6th Edition, California Department of Transportation, 2017

Intersection Channelization Design Guide, National Cooperative Highway Research Program (NCHRP) Report No. 279, Transportation Research Board, 1985

Napa County Code, Municipal Code Corporation, 2017

Napa County General Plan, County of Napa, 2013

Napa County Road and Street Standards, County of Napa, 2020

Napa County Traffic Impact Study (TIS) Guidelines, County of Napa, 2021

Napa Countywide Bicycle Plan, Napa Valley Transportation Authority, 2019

Smart Mobility 2010: A Call to Action for the New Decade, California Department of Transportation, 2010

Statewide Integrated Traffic Records System (SWITRS), California Highway Patrol, 2016-2021

Technical Advisory on Evaluating Transportation Impacts in CEQA, Governor's Office of Planning and Research, 2018

VINE Transit, <http://www.ridethevine.com>

NAX158



Appendix A

Collision Rate Calculations



This page intentionally left blank

Intersection Collision Rate Worksheet

Bonny's Vineyard

Intersection # 1: Silverado Trail & Conn Creek Road

Date of Count: Friday, February 25, 2022

Number of Collisions: 11

Number of Injuries: 3

Number of Fatalities: 0

Average Daily Traffic (ADT): 15000

Start Date: December 1, 2016

End Date: November 30, 2021

Number of Years: 5

Intersection Type: Four-Legged

Control Type: Stop & Yield Controls

Area: Rural

$$\text{Collision Rate} = \frac{\text{Number of Collisions} \times 1 \text{ Million}}{\text{ADT} \times \text{Days per Year} \times \text{Number of Years}}$$

$$\text{Collision Rate} = \frac{11}{15,000} \times \frac{1,000,000}{365 \times 5}$$

	Collision Rate	Fatality Rate	Injury Rate
Study Intersection	0.40 c/mve	0.0%	27.3%
Statewide Average*	0.25 c/mve	2.5%	44.1%

Notes

ADT = average daily total vehicles entering intersection

c/mve = collisions per million vehicles entering intersection

* 2018 Collision Data on California State Highways, Caltrans

Intersection # 2: SR 29 & Rutherford Rd

Date of Count: Friday, February 25, 2022

Number of Collisions: 9

Number of Injuries: 4

Number of Fatalities: 0

Average Daily Traffic (ADT): 16200

Start Date: December 1, 2016

End Date: November 30, 2021

Number of Years: 5

Intersection Type: Four-Legged

Control Type: Stop & Yield Controls

Area: Rural

$$\text{Collision Rate} = \frac{\text{Number of Collisions} \times 1 \text{ Million}}{\text{ADT} \times \text{Days per Year} \times \text{Number of Years}}$$

$$\text{Collision Rate} = \frac{9}{16,200} \times \frac{1,000,000}{365 \times 5}$$

	Collision Rate	Fatality Rate	Injury Rate
Study Intersection	0.30 c/mve	0.0%	44.4%
Statewide Average*	0.25 c/mve	2.5%	44.1%

Notes

ADT = average daily total vehicles entering intersection

c/mve = collisions per million vehicles entering intersection

* 2018 Collision Data on California State Highways, Caltrans

Intersection Collision Rate Worksheet

Bonny's Vineyard

Intersection # 3: Silverado Trail & Skellenger Lane

Date of Count: Friday, February 25, 2022

Number of Collisions: 6

Number of Injuries: 0

Number of Fatalities: 0

Average Daily Traffic (ADT): 14400

Start Date: December 1, 2016

End Date: November 30, 2021

Number of Years: 5

Intersection Type: Tee

Control Type: Stop & Yield Controls

Area: Rural

$$\text{Collision Rate} = \frac{\text{Number of Collisions} \times 1 \text{ Million}}{\text{ADT} \times \text{Days per Year} \times \text{Number of Years}}$$

$$\text{Collision Rate} = \frac{6}{14,400} \times \frac{1,000,000}{365 \times 5}$$

	Collision Rate	Fatality Rate	Injury Rate
Study Intersection	0.23 c/mve	0.0%	0.0%
Statewide Average*	0.19 c/mve	1.7%	39.8%

Notes

ADT = average daily total vehicles entering intersection

c/mve = collisions per million vehicles entering intersection

* 2018 Collision Data on California State Highways, Caltrans

Appendix B

Trip Generation Spreadsheets



This page intentionally left blank

Proposed Project Winery Traffic Information / Trip Generation

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

Project Name: Meyer Family Winery **Project Scenario:** Proposed

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

1.	Total number of FT employees:	<u>4</u>	x 3.05 one-way trips per employee	=	<u>12.2</u>	daily trips
2.	Total number of PT employees:	<u>0</u>	x 1.90 one-way trips per employee	=	<u>0.0</u>	daily trips
3.	Maximum weekday visitors:	<u>25</u>	/2.6 visitors per vehicle x 2 one-way trips	=	<u>19.2</u>	daily trips
4.	Gallons of production:	<u>30000</u>	/1,000 x 0.009 daily truck trips2 x 2 one-way trips	=	<u>0.5</u>	daily trips
5.			TOTAL	=	<u>32</u>	daily trips

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

6.	Total number of FT employees:	<u>6</u>	x 3.05 one-way trips per employee	=	<u>18.3</u>	daily trips
7.	Total number of PT employees:	<u>0</u>	x 1.90 one-way trips per employee	=	<u>0.0</u>	daily trips
8.	Maximum weekday visitors:	<u>25</u>	/2.6 visitors per vehicle x 2 one-way trips	=	<u>19.2</u>	daily trips
9.	Gallons of production:	<u>30000</u>	/1,000 x 0.009 daily truck trips2 x 2 one-way trips	=	<u>0.5</u>	daily trips
10.	Avg. annual tons of grape on-haul:	<u>0</u>	/ 144 truck trips x 2 one-way trips	=	<u>0.0</u>	daily trips
11.			TOTAL	=	<u>38</u>	daily trips

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

12.	Total number of FT Sat. employees:	<u>3</u>	x 3.05 one-way trips per employee	=	<u>9.2</u>	daily trips
13.	Total number of PT Sat. employees:	<u>0</u>	x 1.90 one-way trips per employee	=	<u>0.0</u>	daily trips
14.	Maximum Saturday visitors:	<u>45</u>	/2.8 visitors per vehicle x 2 one-way trips	=	<u>32.1</u>	daily trips
15.	Gallons of Production:	<u>30000</u>	/1,000 x 0.009 daily truck trips x 2 one-way trips	=	<u>0.5</u>	daily trips
16.			TOTAL	=	<u>42</u>	daily trips

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

17.	Total number of FT Sat. employees:	<u>6</u>	x 3.05 one-way trips per employee	=	<u>18.3</u>	daily trips
18.	Total number of PT Sat. employees:	<u>0</u>	x 1.90 one-way trips per employee	=	<u>0.0</u>	daily trips
19.	Maximum Saturday visitors:	<u>45</u>	/2.8 visitors per vehicle x 2 one-way trips	=	<u>32.1</u>	daily trips
20.	Gallons of production:	<u>30000</u>	/1,000 x 0.009 daily truck trips2 x 2 one-way trips	=	<u>0.5</u>	daily trips
21.	Avg. annual tons of grape on-haul:	<u>0</u>	/ 144 truck trips x 2 one-way trips	=	<u>0.0</u>	daily trips
22.			TOTAL	=	<u>51</u>	daily trips

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

(Sum of daily trips from Sec. J, lines 3 and 4) x 0.38 + (No. of FTE) + (line 2 / 2)	=	<u>11</u>	PM peak trips
--	---	-----------	---------------

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

(Sum of daily trips, Sec. K, lines 8, 9, 10) x 0.38 + (No. of FTE) + (line 7 / 2)	=	<u>13</u>	PM peak trips
---	---	-----------	---------------

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

(Daily trips from Sec. L, line 14 and 15) x 0.57 + (No. of FTE) + (line 13 / 2)	=	<u>22</u>	PM peak trips
---	---	-----------	---------------

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

(Sum of daily trips Sec. M, lines 19, 20, 21) x 0.57 + (No. of FTE) + (line 18 / 2)	=	<u>25</u>	PM peak trips
---	---	-----------	---------------

Section R. Maximum Annual Trips

(Sec. J, line 5 x 206) + (Sec. K, line 11 x 55) + (Sec. L, line 16 x 82) + (Sec. M, line 22 x 22)	=	<u>13248</u>	Annual trips
---	---	--------------	--------------



This page intentionally left blank

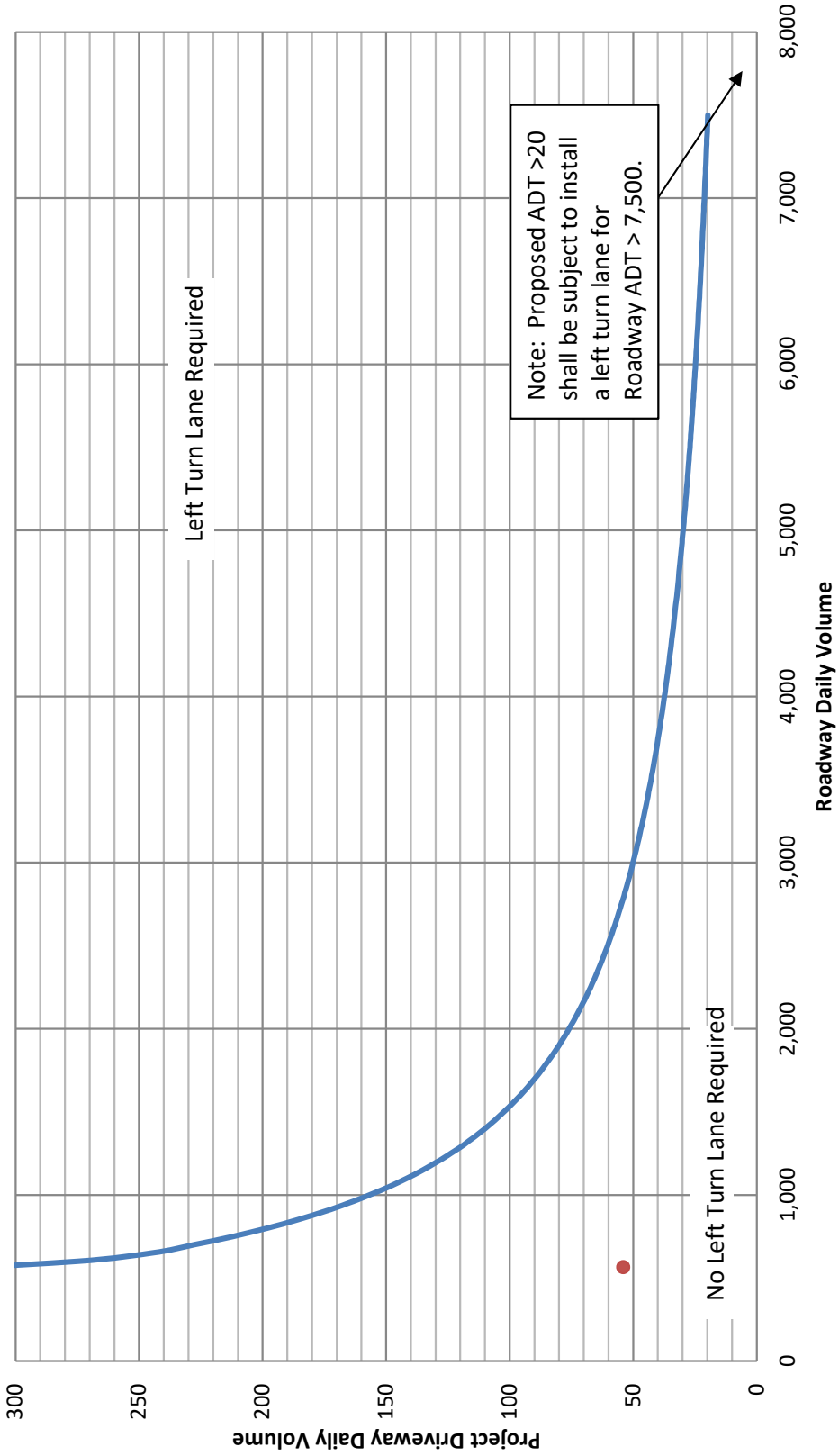
Appendix C

Left Turn Lane Warrant Graph



This page intentionally left blank

Napa County Left Turn Lane Warrant Graph





This page intentionally left blank

Appendix D

Intersection Level of Service Calculations



This page intentionally left blank

Intersection Level Of Service Report
Intersection 1: Silverado Trail/Conn Creek Road

Control Type:	Two-way stop	Delay (sec / veh):	104.4
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.572

Intersection Setup

Name	Conn Creek Road			Conn Creek Road			Silverado Trail			Silverado Trail		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	18.00	12.00	12.00	18.00	12.00	11.00	12.00	12.00	11.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	150.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			55.00			55.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	Conn Creek Road			Conn Creek Road			Silverado Trail			Silverado Trail		
Base Volume Input [veh/h]	45	0	40	5	4	5	1	936	211	46	447	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	45	0	40	5	4	5	1	936	211	46	447	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	11	0	10	1	1	1	0	234	53	12	112	0
Total Analysis Volume [veh/h]	45	0	40	5	4	5	1	936	211	46	447	0
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No	No		
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.57	0.00	0.14	0.07	0.05	0.01	0.00	0.01	0.00	0.08	0.00	0.00
d_M, Delay for Movement [s/veh]	104.41	94.52	71.54	62.14	51.36	15.60	8.24	0.00	0.00	11.39	0.00	0.00
Movement LOS	F	F	F	F	F	C	A	A	A	B	A	A
95th-Percentile Queue Length [veh/ln]	3.91	3.91	3.91	0.42	0.42	0.42	0.00	0.00	0.00	0.24	0.00	0.00
95th-Percentile Queue Length [ft/ln]	97.86	97.86	97.86	10.56	10.56	10.56	0.07	0.00	0.00	6.11	0.00	0.00
d_A, Approach Delay [s/veh]	88.94			42.44			0.01			1.06		
Approach LOS	F			E			A			A		
d_I, Intersection Delay [s/veh]	4.99											
Intersection LOS	F											

Intersection Level Of Service Report
Intersection 2: SR 29/Rutherford Road

Control Type:	Two-way stop	Delay (sec / veh):	702.6
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	2.143

Intersection Setup

Name	Driveway			Rutherford Rd			SR 29			SR 29		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	20.00	12.00	10.00	10.00	10.00	11.00	12.00	12.00	11.00	12.00	11.00
No. of Lanes in Entry Pocket	0	0	0	0	0	1	1	0	0	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	85.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			55.00			55.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Driveway			Rutherford Rd			SR 29			SR 29		
Base Volume Input [veh/h]	2	1	11	111	1	56	87	964	0	1	682	81
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	2	1	11	111	1	56	87	964	0	1	682	81
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	0	3	28	0	14	22	241	0	0	171	20
Total Analysis Volume [veh/h]	2	1	11	111	1	56	87	964	0	1	682	81
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No			
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.05	0.02	0.04	2.14	0.01	0.12	0.10	0.01	0.00	0.00	0.01	0.00
d_M, Delay for Movement [s/veh]	92.50	66.15	19.40	702.65	685.12	14.14	9.72	0.00	0.00	10.05	0.00	0.00
Movement LOS	F	F	C	F	F	B	A	A	A	B	A	A
95th-Percentile Queue Length [veh/ln]	0.32	0.32	0.32	11.25	11.25	0.42	0.34	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	8.06	8.06	8.06	281.15	281.15	10.57	8.53	0.00	0.00	0.11	0.00	0.00
d_A, Approach Delay [s/veh]	33.18			473.04			0.80			0.01		
Approach LOS	D			F			A			A		
d_I, Intersection Delay [s/veh]	40.46											
Intersection LOS	F											

Intersection Level Of Service Report
Intersection 3: Silverado Trail/Skellenger Lane

Control Type:	Two-way stop	Delay (sec / veh):	131.6
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.012

Intersection Setup

Name	Skellenger Lane		Silverado Trail		Silverado Trail	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	20.00	20.00	12.00	13.00	11.00	12.00
No. of Lanes in Entry Pocket	0	0	0	1	1	0
Entry Pocket Length [ft]	100.00	100.00	100.00	200.00	75.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	25.00		55.00		55.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Skellenger Lane		Silverado Trail		Silverado Trail	
Base Volume Input [veh/h]	2	376	894	14	14	424
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	2	376	894	14	14	424
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	94	224	4	4	106
Total Analysis Volume [veh/h]	2	376	894	14	14	424
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	Yes		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	1.11	0.01	0.00	0.02	0.00
d_M, Delay for Movement [s/veh]	131.59	120.19	0.00	0.00	9.89	0.00
Movement LOS	F	F	A	A	A	A
95th-Percentile Queue Length [veh/ln]	14.67	14.67	0.00	0.00	0.06	0.00
95th-Percentile Queue Length [ft/ln]	366.75	366.75	0.00	0.00	1.43	0.00
d_A, Approach Delay [s/veh]	120.26		0.00		0.32	
Approach LOS	F		A		A	
d_I, Intersection Delay [s/veh]	26.45					
Intersection LOS	F					

Intersection Level Of Service Report
Intersection 1: Silverado Trail/Conn Creek Road

Control Type:	Two-way stop	Delay (sec / veh):	107.2
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.581

Intersection Setup

Name	Conn Creek Road			Conn Creek Road			Silverado Trail			Silverado Trail		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	18.00	12.00	12.00	18.00	12.00	11.00	12.00	12.00	11.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	150.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			55.00			55.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	Conn Creek Road			Conn Creek Road			Silverado Trail			Silverado Trail		
Base Volume Input [veh/h]	45	0	40	5	4	5	1	939	211	46	453	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	45	0	40	5	4	5	1	939	211	46	453	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	11	0	10	1	1	1	0	235	53	12	113	0
Total Analysis Volume [veh/h]	45	0	40	5	4	5	1	939	211	46	453	0
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No	No		
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.58	0.00	0.14	0.07	0.05	0.01	0.00	0.01	0.00	0.08	0.00	0.00
d_M, Delay for Movement [s/veh]	107.17	97.05	73.66	63.09	52.04	15.79	8.25	0.00	0.00	11.41	0.00	0.00
Movement LOS	F	F	F	F	F	C	A	A	A	B	A	A
95th-Percentile Queue Length [veh/ln]	3.98	3.98	3.98	0.43	0.43	0.43	0.00	0.00	0.00	0.24	0.00	0.00
95th-Percentile Queue Length [ft/ln]	99.43	99.43	99.43	10.72	10.72	10.72	0.07	0.00	0.00	6.12	0.00	0.00
d_A, Approach Delay [s/veh]	91.40			43.04			0.01			1.05		
Approach LOS	F			E			A			A		
d_I, Intersection Delay [s/veh]	5.09											
Intersection LOS	F											

Intersection Level Of Service Report
Intersection 2: SR 29/Rutherford Road

Control Type:	Two-way stop	Delay (sec / veh):	712.0
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	2.162

Intersection Setup

Name	Driveway			Rutherford Rd			SR 29			SR 29		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	20.00	12.00	10.00	10.00	10.00	11.00	12.00	12.00	11.00	12.00	11.00
No. of Lanes in Entry Pocket	0	0	0	0	0	1	1	0	0	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	85.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			55.00			55.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Driveway			Rutherford Rd			SR 29			SR 29		
Base Volume Input [veh/h]	2	1	11	111	1	59	89	964	0	1	682	81
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	2	1	11	111	1	59	89	964	0	1	682	81
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	0	3	28	0	15	22	241	0	0	171	20
Total Analysis Volume [veh/h]	2	1	11	111	1	59	89	964	0	1	682	81
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No			
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.05	0.02	0.04	2.16	0.01	0.13	0.10	0.01	0.00	0.00	0.01	0.00									
d_M, Delay for Movement [s/veh]	94.16	66.70	19.46	711.99	694.30	14.21	9.73	0.00	0.00	10.05	0.00	0.00									
Movement LOS	F	F	C	F	F	B	A	A	A	B	A	A									
95th-Percentile Queue Length [veh/ln]	0.33	0.33	0.33	11.29	11.29	0.45	0.35	0.00	0.00	0.00	0.00	0.00									
95th-Percentile Queue Length [ft/ln]	8.15	8.15	8.15	282.19	282.19	11.22	8.74	0.00	0.00	0.11	0.00	0.00									
d_A, Approach Delay [s/veh]	33.50			471.13			0.82			0.01											
Approach LOS	D			F			A			A											
d_I, Intersection Delay [s/veh]	40.91																				
Intersection LOS	F																				

Intersection Level Of Service Report
Intersection 3: Silverado Trail/Skellenger Lane

Control Type:	Two-way stop	Delay (sec / veh):	151.4
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.049

Intersection Setup

Name	Skellenger Lane		Silverado Trail		Silverado Trail	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	20.00	20.00	12.00	13.00	11.00	12.00
No. of Lanes in Entry Pocket	0	0	0	1	1	0
Entry Pocket Length [ft]	100.00	100.00	100.00	200.00	75.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	25.00		55.00		55.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Skellenger Lane		Silverado Trail		Silverado Trail	
Base Volume Input [veh/h]	8	382	894	17	17	424
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	8	382	894	17	17	424
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	96	224	4	4	106
Total Analysis Volume [veh/h]	8	382	894	17	17	424
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	Yes		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.05	1.12	0.01	0.00	0.02	0.00
d_M, Delay for Movement [s/veh]	151.40	139.73	0.00	0.00	9.93	0.00
Movement LOS	F	F	A	A	A	A
95th-Percentile Queue Length [veh/ln]	16.22	16.22	0.00	0.00	0.07	0.00
95th-Percentile Queue Length [ft/ln]	405.54	405.54	0.00	0.00	1.74	0.00
d_A, Approach Delay [s/veh]	139.97		0.00		0.38	
Approach LOS	F		A		A	
d_I, Intersection Delay [s/veh]	31.43					
Intersection LOS	F					

Intersection Level Of Service Report
Intersection 1: Silverado Trail/Conn Creek Road

Control Type:	Two-way stop	Delay (sec / veh):	47.1
Analysis Method:	HCM 6th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.386

Intersection Setup

Name	Conn Creek Road			Conn Creek Road			Silverado Trail			Silverado Trail		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	18.00	12.00	12.00	18.00	12.00	11.00	12.00	12.00	11.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	150.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			55.00			55.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	Conn Creek Road			Conn Creek Road			Silverado Trail			Silverado Trail		
Base Volume Input [veh/h]	55	5	41	3	2	8	5	615	49	27	538	6
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	55	5	41	3	2	8	5	615	49	27	538	6
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	14	1	10	1	1	2	1	154	12	7	135	2
Total Analysis Volume [veh/h]	55	5	41	3	2	8	5	615	49	27	538	6
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No	No		
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.39	0.03	0.09	0.02	0.01	0.01	0.00	0.01	0.00	0.03	0.01	0.00
d_M, Delay for Movement [s/veh]	47.12	43.32	29.39	34.19	27.90	12.40	8.53	0.00	0.00	9.01	0.00	0.00
Movement LOS	E	E	D	D	D	B	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	2.52	2.52	2.52	0.16	0.16	0.16	0.01	0.00	0.00	0.09	0.00	0.00
95th-Percentile Queue Length [ft/ln]	63.03	63.03	63.03	3.99	3.99	3.99	0.37	0.00	0.00	2.25	0.00	0.00
d_A, Approach Delay [s/veh]	39.73			19.82			0.06			0.43		
Approach LOS	E			C			A			A		
d_I, Intersection Delay [s/veh]	3.37											
Intersection LOS	E											

Intersection Level Of Service Report Intersection 2: SR 29/Rutherford Road

Control Type:	Two-way stop	Delay (sec / veh):	2,269.2
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	5.064

Intersection Setup

Name	Driveway			Rutherford Rd			SR 29			SR 29		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	+			+			+			+		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	20.00	12.00	10.00	10.00	10.00	11.00	12.00	12.00	11.00	12.00	11.00
No. of Lanes in Entry Pocket	0	0	0	0	0	1	1	0	0	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	85.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			55.00			55.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Driveway			Rutherford Rd			SR 29			SR 29		
Base Volume Input [veh/h]	5	2	8	95	2	79	60	1015	9	5	1250	136
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	5	2	8	95	2	79	60	1015	9	5	1250	136
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	1	2	24	1	20	15	254	2	1	313	34
Total Analysis Volume [veh/h]	5	2	8	95	2	79	60	1015	9	5	1250	136
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No			
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.49	0.08	0.03	5.06	0.07	0.37	0.12	0.01	0.00	0.01	0.01	0.00
d_M, Delay for Movement [s/veh]	481.59	282.70	143.71	2269.1	2201.9	31.97	13.29	0.00	0.00	10.35	0.00	0.00
Movement LOS	F	F	F	F	F	D	B	A	A	B	A	A
95th-Percentile Queue Length [veh/ln]	1.83	1.83	1.83	12.64	12.64	1.64	0.41	0.00	0.00	0.02	0.00	0.00
95th-Percentile Queue Length [ft/ln]	45.63	45.63	45.63	316.01	316.01	40.89	10.29	0.00	0.00	0.56	0.00	0.00
d_A, Approach Delay [s/veh]	274.87			1264.21			0.74			0.04		
Approach LOS	F			F			A			A		
d_I, Intersection Delay [s/veh]	85.32											
Intersection LOS	F											

Intersection Level Of Service Report
Intersection 3: Silverado Trail/Skellenger Lane

Control Type:	Two-way stop	Delay (sec / veh):	25.3
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.016

Intersection Setup

Name	Skellenger Lane		Silverado Trail		Silverado Trail	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	20.00	20.00	12.00	13.00	11.00	12.00
No. of Lanes in Entry Pocket	0	0	0	1	1	0
Entry Pocket Length [ft]	100.00	100.00	100.00	200.00	75.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	25.00		55.00		55.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Skellenger Lane		Silverado Trail		Silverado Trail	
Base Volume Input [veh/h]	3	57	660	14	19	542
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	3	57	660	14	19	542
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	14	165	4	5	136
Total Analysis Volume [veh/h]	3	57	660	14	19	542
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	Yes		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.12	0.01	0.00	0.02	0.01
d_M, Delay for Movement [s/veh]	25.35	14.12	0.00	0.00	9.01	0.00
Movement LOS	D	B	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.48	0.48	0.00	0.00	0.06	0.00
95th-Percentile Queue Length [ft/ln]	11.98	11.98	0.00	0.00	1.59	0.00
d_A, Approach Delay [s/veh]	14.68		0.00		0.31	
Approach LOS	B		A		A	
d_I, Intersection Delay [s/veh]	0.81					
Intersection LOS	D					

Intersection Level Of Service Report
Intersection 1: Silverado Trail/Conn Creek Road

Control Type:	Two-way stop	Delay (sec / veh):	48.3
Analysis Method:	HCM 6th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.393

Intersection Setup

Name	Conn Creek Road			Conn Creek Road			Silverado Trail			Silverado Trail		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	18.00	12.00	12.00	18.00	12.00	11.00	12.00	12.00	11.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	150.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			55.00			55.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	Conn Creek Road			Conn Creek Road			Silverado Trail			Silverado Trail		
Base Volume Input [veh/h]	55	5	41	3	2	8	5	620	49	27	544	6
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	55	5	41	3	2	8	5	620	49	27	544	6
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	14	1	10	1	1	2	1	155	12	7	136	2
Total Analysis Volume [veh/h]	55	5	41	3	2	8	5	620	49	27	544	6
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No	No		
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.39	0.03	0.09	0.02	0.01	0.01	0.00	0.01	0.00	0.03	0.01	0.00
d_M, Delay for Movement [s/veh]	48.32	44.40	30.19	34.75	28.26	12.48	8.55	0.00	0.00	9.03	0.00	0.00
Movement LOS	E	E	D	D	D	B	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	2.58	2.58	2.58	0.16	0.16	0.16	0.01	0.00	0.00	0.09	0.00	0.00
95th-Percentile Queue Length [ft/ln]	64.47	64.47	64.47	4.05	4.05	4.05	0.37	0.00	0.00	2.26	0.00	0.00
d_A, Approach Delay [s/veh]	40.76			20.05			0.06			0.42		
Approach LOS	E			C			A			A		
d_I, Intersection Delay [s/veh]	3.42											
Intersection LOS	E											

Intersection Level Of Service Report
Intersection 2: SR 29/Rutherford Road

Control Type:	Two-way stop	Delay (sec / veh):	2,312.9
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	5.147

Intersection Setup

Name	Driveway			Rutherford Rd			SR 29			SR 29		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	+			+			+			+		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	20.00	12.00	10.00	10.00	10.00	11.00	12.00	12.00	11.00	12.00	11.00
No. of Lanes in Entry Pocket	0	0	0	0	0	1	1	0	0	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	85.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			55.00			55.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Driveway			Rutherford Rd			SR 29			SR 29		
Base Volume Input [veh/h]	5	2	8	95	2	82	63	1015	9	5	1250	136
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	5	2	8	95	2	82	63	1015	9	5	1250	136
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	1	2	24	1	21	16	254	2	1	313	34
Total Analysis Volume [veh/h]	5	2	8	95	2	82	63	1015	9	5	1250	136
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No			
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.51	0.09	0.03	5.15	0.07	0.39	0.13	0.01	0.00	0.01	0.01	0.00
d_M, Delay for Movement [s/veh]	506.08	284.74	153.31	2312.9	2244.5	32.55	13.35	0.00	0.00	10.35	0.00	0.00
Movement LOS	F	F	F	F	F	D	B	A	A	B	A	A
95th-Percentile Queue Length [veh/ln]	1.87	1.87	1.87	12.67	12.67	1.73	0.43	0.00	0.00	0.02	0.00	0.00
95th-Percentile Queue Length [ft/ln]	46.68	46.68	46.68	316.79	316.79	43.13	10.87	0.00	0.00	0.56	0.00	0.00
d_A, Approach Delay [s/veh]	289.76			1267.52			0.77			0.04		
Approach LOS	F			F			A			A		
d_I, Intersection Delay [s/veh]	86.87											
Intersection LOS	F											

Intersection Level Of Service Report
Intersection 3: Silverado Trail/Skellenger Lane

Control Type:	Two-way stop	Delay (sec / veh):	26.5
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.048

Intersection Setup

Name	Skellenger Lane		Silverado Trail		Silverado Trail	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	20.00	20.00	12.00	13.00	11.00	12.00
No. of Lanes in Entry Pocket	0	0	0	1	1	0
Entry Pocket Length [ft]	100.00	100.00	100.00	200.00	75.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	25.00		55.00		55.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Skellenger Lane		Silverado Trail		Silverado Trail	
Base Volume Input [veh/h]	9	63	660	19	24	542
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	9	63	660	19	24	542
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	16	165	5	6	136
Total Analysis Volume [veh/h]	9	63	660	19	24	542
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	Yes		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.05	0.14	0.01	0.00	0.03	0.01
d_M, Delay for Movement [s/veh]	26.46	14.85	0.00	0.00	9.05	0.00
Movement LOS	D	B	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.67	0.67	0.00	0.00	0.08	0.00
95th-Percentile Queue Length [ft/ln]	16.69	16.69	0.00	0.00	2.02	0.00
d_A, Approach Delay [s/veh]	16.30		0.00		0.38	
Approach LOS	C		A		A	
d_I, Intersection Delay [s/veh]	1.08					
Intersection LOS	D					

Intersection Level Of Service Report
Intersection 1: Silverado Trail/Conn Creek Road

Control Type:	Two-way stop	Delay (sec / veh):	642.7
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.645

Intersection Setup

Name	Conn Creek Road			Conn Creek Road			Silverado Trail			Silverado Trail		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	18.00	12.00	12.00	18.00	12.00	11.00	12.00	12.00	11.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	150.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			55.00			55.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	Conn Creek Road			Conn Creek Road			Silverado Trail			Silverado Trail		
Base Volume Input [veh/h]	54	0	48	12	7	12	1	1290	225	46	537	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	54	0	48	12	7	12	1	1290	225	46	537	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	14	0	12	3	2	3	0	323	56	12	134	0
Total Analysis Volume [veh/h]	54	0	48	12	7	12	1	1290	225	46	537	0
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No	No		
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	1.65	0.00	0.28	0.45	0.16	0.02	0.00	0.01	0.00	0.10	0.01	0.00
d_M, Delay for Movement [s/veh]	642.69	603.55	554.01	222.17	171.26	94.80	8.49	0.00	0.00	14.11	0.00	0.00
Movement LOS	F	F	F	F	F	F	A	A	A	B	A	A
95th-Percentile Queue Length [veh/ln]	9.97	9.97	9.97	2.46	2.46	2.46	0.00	0.00	0.00	0.35	0.00	0.00
95th-Percentile Queue Length [ft/ln]	249.16	249.16	249.16	61.43	61.43	61.43	0.07	0.00	0.00	8.67	0.00	0.00
d_A, Approach Delay [s/veh]	600.96			161.37			0.01			1.11		
Approach LOS	F			F			A			A		
d_I, Intersection Delay [s/veh]	30.00											
Intersection LOS	F											

**Intersection Level Of Service Report
Intersection 2: SR 29/Rutherford Road**

Control Type:	Two-way stop	Delay (sec / veh):	1,677.3
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	4.067

Intersection Setup

Name	Driveway			Rutherford Rd			SR 29			SR 29		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	20.00	12.00	10.00	10.00	10.00	11.00	12.00	12.00	11.00	12.00	11.00
No. of Lanes in Entry Pocket	0	0	0	0	0	1	1	0	0	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	85.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			55.00			55.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Driveway			Rutherford Rd			SR 29			SR 29		
Base Volume Input [veh/h]	2	1	11	114	1	56	89	1227	0	1	767	82
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	2	1	11	114	1	56	89	1227	0	1	767	82
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	0	3	29	0	14	22	307	0	0	192	21
Total Analysis Volume [veh/h]	2	1	11	114	1	56	89	1227	0	1	767	82
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No			
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.09	0.03	0.05	4.07	0.02	0.14	0.11	0.01	0.00	0.00	0.01	0.00
d_M, Delay for Movement [s/veh]	170.20	112.36	29.79	1677.2	1636.7	15.39	10.14	0.00	0.00	11.35	0.00	0.00
Movement LOS	F	F	D	F	F	C	B	A	A	B	A	A
95th-Percentile Queue Length [veh/ln]	0.56	0.56	0.56	13.95	13.95	0.48	0.38	0.00	0.00	0.01	0.00	0.00
95th-Percentile Queue Length [ft/ln]	13.97	13.97	13.97	348.81	348.81	12.00	9.50	0.00	0.00	0.13	0.00	0.00
d_A, Approach Delay [s/veh]	55.75			1132.81			0.69			0.01		
Approach LOS	F			F			A			A		
d_I, Intersection Delay [s/veh]	83.12											
Intersection LOS	F											

Intersection Level Of Service Report
Intersection 3: Silverado Trail/Skellenger Lane

Control Type:	Two-way stop	Delay (sec / veh):	202.8
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.034

Intersection Setup

Name	Skellenger Lane		Silverado Trail		Silverado Trail	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	20.00	20.00	12.00	13.00	11.00	12.00
No. of Lanes in Entry Pocket	0	0	0	1	1	0
Entry Pocket Length [ft]	100.00	100.00	100.00	200.00	75.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	25.00		55.00		55.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Skellenger Lane		Silverado Trail		Silverado Trail	
Base Volume Input [veh/h]	3	382	955	18	19	794
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	3	382	955	18	19	794
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	96	239	5	5	199
Total Analysis Volume [veh/h]	3	382	955	18	19	794
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	Yes		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	1.22	0.01	0.00	0.03	0.01
d_M, Delay for Movement [s/veh]	202.77	172.88	0.00	0.00	10.22	0.00
Movement LOS	F	F	A	A	B	A
95th-Percentile Queue Length [veh/ln]	17.83	17.83	0.00	0.00	0.08	0.00
95th-Percentile Queue Length [ft/ln]	445.78	445.78	0.00	0.00	2.06	0.00
d_A, Approach Delay [s/veh]	173.11		0.00		0.24	
Approach LOS	F		A		A	
d_I, Intersection Delay [s/veh]	30.79					
Intersection LOS	F					

Intersection Level Of Service Report
Intersection 1: Silverado Trail/Conn Creek Road

Control Type:	Two-way stop	Delay (sec / veh):	658.4
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.674

Intersection Setup

Name	Conn Creek Road			Conn Creek Road			Silverado Trail			Silverado Trail		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	18.00	12.00	12.00	18.00	12.00	11.00	12.00	12.00	11.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	150.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			55.00			55.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	Conn Creek Road			Conn Creek Road			Silverado Trail			Silverado Trail		
Base Volume Input [veh/h]	54	0	48	12	7	12	1	1293	225	46	543	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	54	0	48	12	7	12	1	1293	225	46	543	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	14	0	12	3	2	3	0	323	56	12	136	0
Total Analysis Volume [veh/h]	54	0	48	12	7	12	1	1293	225	46	543	0
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No	No		
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	1.67	0.00	0.28	0.45	0.16	0.02	0.00	0.01	0.00	0.10	0.01	0.00
d_M, Delay for Movement [s/veh]	658.38	618.30	567.89	227.50	175.46	97.93	8.51	0.00	0.00	14.14	0.00	0.00
Movement LOS	F	F	F	F	F	F	A	A	A	B	A	A
95th-Percentile Queue Length [veh/ln]	10.04	10.04	10.04	2.49	2.49	2.49	0.00	0.00	0.00	0.35	0.00	0.00
95th-Percentile Queue Length [ft/ln]	250.96	250.96	250.96	62.25	62.25	62.25	0.07	0.00	0.00	8.70	0.00	0.00
d_A, Approach Delay [s/veh]	615.79			165.59			0.01			1.10		
Approach LOS	F			F			A			A		
d_I, Intersection Delay [s/veh]	30.61											
Intersection LOS	F											

Intersection Level Of Service Report
Intersection 2: SR 29/Rutherford Road

Control Type:	Two-way stop	Delay (sec / veh):	1,696.2
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	4.104

Intersection Setup

Name	Driveway			Rutherford Rd			SR 29			SR 29		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	20.00	12.00	10.00	10.00	10.00	11.00	12.00	12.00	11.00	12.00	11.00
No. of Lanes in Entry Pocket	0	0	0	0	0	1	1	0	0	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	85.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			55.00			55.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Driveway			Rutherford Rd			SR 29			SR 29		
Base Volume Input [veh/h]	2	1	11	114	1	59	91	1227	0	1	767	82
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	2	1	11	114	1	59	91	1227	0	1	767	82
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	0	3	29	0	15	23	307	0	0	192	21
Total Analysis Volume [veh/h]	2	1	11	114	1	59	91	1227	0	1	767	82
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No			
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.09	0.03	0.05	4.10	0.02	0.15	0.12	0.01	0.00	0.00	0.01	0.00
d_M, Delay for Movement [s/veh]	173.62	113.46	30.01	1696.1	1655.2	15.48	10.16	0.00	0.00	11.35	0.00	0.00
Movement LOS	F	F	D	F	F	C	B	A	A	B	A	A
95th-Percentile Queue Length [veh/ln]	0.57	0.57	0.57	13.98	13.98	0.51	0.39	0.00	0.00	0.01	0.00	0.00
95th-Percentile Queue Length [ft/ln]	14.15	14.15	14.15	349.46	349.46	12.74	9.74	0.00	0.00	0.13	0.00	0.00
d_A, Approach Delay [s/veh]	56.49			1126.04			0.70			0.01		
Approach LOS	F			F			A			A		
d_I, Intersection Delay [s/veh]	83.90											
Intersection LOS	F											

Intersection Level Of Service Report
Intersection 3: Silverado Trail/Skellenger Lane

Control Type:	Two-way stop	Delay (sec / veh):	239.5
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.105

Intersection Setup

Name	Skellenger Lane		Silverado Trail		Silverado Trail	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	20.00	20.00	12.00	13.00	11.00	12.00
No. of Lanes in Entry Pocket	0	0	0	1	1	0
Entry Pocket Length [ft]	100.00	100.00	100.00	200.00	75.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	25.00		55.00		55.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Skellenger Lane		Silverado Trail		Silverado Trail	
Base Volume Input [veh/h]	9	388	955	21	22	794
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	9	388	955	21	22	794
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	97	239	5	6	199
Total Analysis Volume [veh/h]	9	388	955	21	22	794
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	Yes		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.10	1.24	0.01	0.00	0.03	0.01
d_M, Delay for Movement [s/veh]	239.52	209.08	0.00	0.00	10.26	0.00
Movement LOS	F	F	A	A	B	A
95th-Percentile Queue Length [veh/ln]	20.09	20.09	0.00	0.00	0.10	0.00
95th-Percentile Queue Length [ft/ln]	502.18	502.18	0.00	0.00	2.41	0.00
d_A, Approach Delay [s/veh]	209.77		0.00		0.28	
Approach LOS	F		A		A	
d_I, Intersection Delay [s/veh]	38.15					
Intersection LOS	F					

Intersection Level Of Service Report
Intersection 1: Silverado Trail/Conn Creek Road

Control Type:	Two-way stop	Delay (sec / veh):	202.6
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.910

Intersection Setup

Name	Conn Creek Road			Conn Creek Road			Silverado Trail			Silverado Trail		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	18.00	12.00	12.00	18.00	12.00	11.00	12.00	12.00	11.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	150.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			55.00			55.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	Conn Creek Road			Conn Creek Road			Silverado Trail			Silverado Trail		
Base Volume Input [veh/h]	71	6	53	4	3	10	6	789	63	35	690	8
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	71	6	53	4	3	10	6	789	63	35	690	8
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	18	2	13	1	1	3	2	197	16	9	173	2
Total Analysis Volume [veh/h]	71	6	53	4	3	10	6	789	63	35	690	8
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No	No		
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.91	0.06	0.14	0.06	0.03	0.02	0.01	0.01	0.00	0.04	0.01	0.00
d_M, Delay for Movement [s/veh]	202.61	192.28	166.08	63.92	45.40	16.30	9.03	0.00	0.00	9.79	0.00	0.00
Movement LOS	F	F	F	F	E	C	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	7.84	7.84	7.84	0.38	0.38	0.38	0.02	0.00	0.00	0.14	0.00	0.00
95th-Percentile Queue Length [ft/ln]	196.02	196.02	196.02	9.57	9.57	9.57	0.50	0.00	0.00	3.49	0.00	0.00
d_A, Approach Delay [s/veh]	187.24			32.64			0.06			0.47		
Approach LOS	F			D			A			A		
d_I, Intersection Delay [s/veh]	14.55											
Intersection LOS	F											

**Intersection Level Of Service Report
Intersection 2: SR 29/Rutherford Road**

Control Type:	Two-way stop	Delay (sec / veh):	6,915.9
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	14.196

Intersection Setup

Name	Driveway			Rutherford Rd			SR 29			SR 29		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	+			+			+			+		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	20.00	12.00	10.00	10.00	10.00	11.00	12.00	12.00	11.00	12.00	11.00
No. of Lanes in Entry Pocket	0	0	0	0	0	1	1	0	0	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	85.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			55.00			55.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Driveway			Rutherford Rd			SR 29			SR 29		
Base Volume Input [veh/h]	6	2	9	112	2	93	71	1195	11	6	1472	160
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	6	2	9	112	2	93	71	1195	11	6	1472	160
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	1	2	28	1	23	18	299	3	2	368	40
Total Analysis Volume [veh/h]	6	2	9	112	2	93	71	1195	11	6	1472	160
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No			
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	2.16	0.18	0.04	14.20	0.14	0.60	0.18	0.01	0.00	0.01	0.01	0.00
d_M, Delay for Movement [s/veh]	2404.3	1433.3	1126.5	6915.8	6715.1	57.52	16.01	0.00	0.00	11.29	0.00	0.00
Movement LOS	F	F	F	F	F	F	C	A	A	B	A	A
95th-Percentile Queue Length [veh/ln]	3.21	3.21	3.21	15.94	15.94	3.16	0.64	0.00	0.00	0.03	0.00	0.00
95th-Percentile Queue Length [ft/ln]	80.35	80.35	80.35	398.46	398.46	79.12	16.05	0.00	0.00	0.79	0.00	0.00
d_A, Approach Delay [s/veh]	1613.61			3832.65			0.89			0.04		
Approach LOS	F			F			A			A		
d_I, Intersection Delay [s/veh]	261.87											
Intersection LOS	F											

Intersection Level Of Service Report
Intersection 3: Silverado Trail/Skellenger Lane

Control Type:	Two-way stop	Delay (sec / veh):	38.3
Analysis Method:	HCM 6th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.034

Intersection Setup

Name	Skellenger Lane		Silverado Trail		Silverado Trail	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	20.00	20.00	12.00	13.00	11.00	12.00
No. of Lanes in Entry Pocket	0	0	0	1	1	0
Entry Pocket Length [ft]	100.00	100.00	100.00	200.00	75.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	25.00		55.00		55.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Skellenger Lane		Silverado Trail		Silverado Trail	
Base Volume Input [veh/h]	4	72	831	18	24	683
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	4	72	831	18	24	683
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	18	208	5	6	171
Total Analysis Volume [veh/h]	4	72	831	18	24	683
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	Yes		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.19	0.01	0.00	0.03	0.01
d_M, Delay for Movement [s/veh]	38.33	17.92	0.00	0.00	9.71	0.00
Movement LOS	E	C	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.86	0.86	0.00	0.00	0.09	0.00
95th-Percentile Queue Length [ft/ln]	21.61	21.61	0.00	0.00	2.35	0.00
d_A, Approach Delay [s/veh]	18.99		0.00		0.33	
Approach LOS	C		A		A	
d_I, Intersection Delay [s/veh]	1.03					
Intersection LOS	E					

Intersection Level Of Service Report
Intersection 1: Silverado Trail/Conn Creek Road

Control Type:	Two-way stop	Delay (sec / veh):	210.7
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.927

Intersection Setup

Name	Conn Creek Road			Conn Creek Road			Silverado Trail			Silverado Trail		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	18.00	12.00	12.00	18.00	12.00	11.00	12.00	12.00	11.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	150.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			55.00			55.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	Conn Creek Road			Conn Creek Road			Silverado Trail			Silverado Trail		
Base Volume Input [veh/h]	71	6	53	4	3	10	6	794	63	35	696	8
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	71	6	53	4	3	10	6	794	63	35	696	8
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	18	2	13	1	1	3	2	199	16	9	174	2
Total Analysis Volume [veh/h]	71	6	53	4	3	10	6	794	63	35	696	8
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No	No		
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.93	0.06	0.14	0.06	0.03	0.02	0.01	0.01	0.00	0.04	0.01	0.00
d_M, Delay for Movement [s/veh]	210.67	200.05	173.34	65.14	46.10	16.48	9.06	0.00	0.00	9.81	0.00	0.00
Movement LOS	F	F	F	F	E	C	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	7.98	7.98	7.98	0.39	0.39	0.39	0.02	0.00	0.00	0.14	0.00	0.00
95th-Percentile Queue Length [ft/ln]	199.45	199.45	199.45	9.74	9.74	9.74	0.51	0.00	0.00	3.50	0.00	0.00
d_A, Approach Delay [s/veh]	194.96			33.16			0.06			0.46		
Approach LOS	F			D			A			A		
d_I, Intersection Delay [s/veh]	15.04											
Intersection LOS	F											

Intersection Level Of Service Report
Intersection 2: SR 29/Rutherford Road

Control Type:	Two-way stop	Delay (sec / veh):	7,063.9
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	14.483

Intersection Setup

Name	Driveway			Rutherford Rd			SR 29			SR 29		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	20.00	12.00	10.00	10.00	10.00	11.00	12.00	12.00	11.00	12.00	11.00
No. of Lanes in Entry Pocket	0	0	0	0	0	1	1	0	0	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	85.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			55.00			55.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Driveway			Rutherford Rd			SR 29			SR 29		
Base Volume Input [veh/h]	6	2	9	112	2	96	74	1195	11	6	1472	160
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	6	2	9	112	2	96	74	1195	11	6	1472	160
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	1	2	28	1	24	19	299	3	2	368	40
Total Analysis Volume [veh/h]	6	2	9	112	2	96	74	1195	11	6	1472	160
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No			
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	2.31	0.18	0.04	14.48	0.14	0.62	0.19	0.01	0.00	0.01	0.01	0.00
d_M, Delay for Movement [s/veh]	2595.9	1536.1	1223.1	7063.9	6858.7	59.47	16.11	0.00	0.00	11.29	0.00	0.00
Movement LOS	F	F	F	F	F	F	C	A	A	B	A	A
95th-Percentile Queue Length [veh/ln]	3.25	3.25	3.25	15.96	15.96	3.33	0.67	0.00	0.00	0.03	0.00	0.00
95th-Percentile Queue Length [ft/ln]	81.24	81.24	81.24	398.88	398.88	83.25	16.87	0.00	0.00	0.79	0.00	0.00
d_A, Approach Delay [s/veh]	1744.48			3859.92			0.93			0.04		
Approach LOS	F			F			A			A		
d_I, Intersection Delay [s/veh]	267.57											
Intersection LOS	F											

Intersection Level Of Service Report
Intersection 3: Silverado Trail/Skellenger Lane

Control Type:	Two-way stop	Delay (sec / veh):	40.8
Analysis Method:	HCM 6th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.086

Intersection Setup

Name	Skellenger Lane		Silverado Trail		Silverado Trail	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	20.00	20.00	12.00	13.00	11.00	12.00
No. of Lanes in Entry Pocket	0	0	0	1	1	0
Entry Pocket Length [ft]	100.00	100.00	100.00	200.00	75.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	25.00		55.00		55.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Skellenger Lane		Silverado Trail		Silverado Trail	
Base Volume Input [veh/h]	10	78	831	23	29	683
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	10	78	831	23	29	683
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	20	208	6	7	171
Total Analysis Volume [veh/h]	10	78	831	23	29	683
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	Yes		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.09	0.21	0.01	0.00	0.04	0.01
d_M, Delay for Movement [s/veh]	40.83	19.78	0.00	0.00	9.76	0.00
Movement LOS	E	C	A	A	A	A
95th-Percentile Queue Length [veh/ln]	1.21	1.21	0.00	0.00	0.11	0.00
95th-Percentile Queue Length [ft/ln]	30.23	30.23	0.00	0.00	2.87	0.00
d_A, Approach Delay [s/veh]	22.17		0.00		0.40	
Approach LOS	C		A		A	
d_I, Intersection Delay [s/veh]			1.35			
Intersection LOS			E			

Appendix E

Peak Hour Signal Warrants



This page intentionally left blank

Warrant 1: Eight-Hour Vehicular Volume

Silverado Trail & Conn Creek Road

Napa County

Project Name: NAX 158 - Bonny's Vineyard**Intersection:** 1**Scenario:** Existing Friday p.m.**Date of Count:** Friday, January 14, 2022

	Major Street	Minor Street
Street Name:	Silverado Trail	Conn Creek Road
Direction:	E-W	N-S
Number of Lanes:	2	1
Approach Speed:	55	55

Community with population < 10,000? No**WARRANT MET?****No**

Condition A — Minimum Vehicle Volume:
 Condition B — Interruption of Continuous Traffic:
 Combination of Conditions A & B:

Warrant Met	Num. Hrs Met	8th Highest Hr	
		Major	Minor
No	0	N/A	N/A
No	1	N/A	N/A
No			

Table 4C-1 of MUTCD. Warrant 1, Eight-Hour Vehicular Volume

Condition A - Minimum Vehicular Volume									
Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on higher-volume minor-street approach (one direction only)			
Major Street	Minor Street	100% ^a	80% ^b	70% ^c	56% ^d	100% ^a	80% ^b	70% ^c	56% ^d
1	1	500	400	350	280	150	120	105	84
2 or more ..	1	600	480	420	336	150	120	105	84
2 or more	2 or more ..	600	480	420	336	200	160	140	112
1	2 or more ..	500	400	350	280	200	160	140	112

Condition B - Interruption of Continuous Traffic									
Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on higher-volume minor-street approach (one direction only)			
Major Street	Minor Street	100% ^a	80% ^b	70% ^c	56% ^d	100% ^a	80% ^b	70% ^c	56% ^d
1	1	750	600	525	420	75	60	53	42
2 or more ..	1	900	720	630	504	75	60	53	42
2 or more ..	2 or more ..	900	720	630	504	100	80	70	56
1	2 or more ..	750	600	525	420	100	80	70	56

^a Basic minimum hourly volume.^b Used for combination of Conditions A and B after adequate trial of other remedial measures.^c May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000.^d May be used for combination of Conditions A and B after adequate trial of other remedial measures when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000.

Warrant 2: Four-Hour Vehicular Volume

Silverado Trail & Conn Creek Road

Napa County

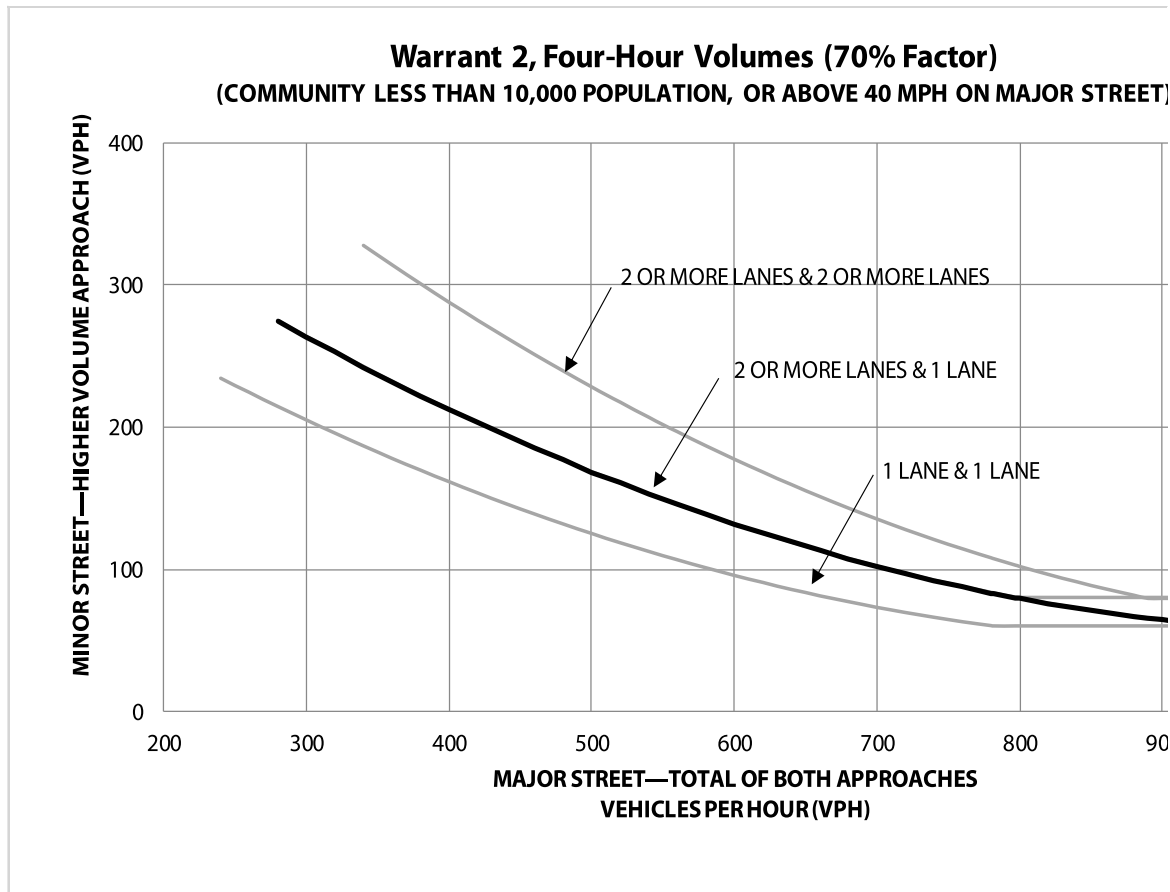
Project Name: NAX 158 - Bonny's Vineyard**Intersection:** 1**Scenario:** Existing Friday p.m.**Date of Count:** 1/14/2022

	Major Street	Minor Street
Street Name:	Silverado Trail	Conn Creek Road
Direction:	E-W	N-S
Number of Lanes:	2	1
Approach Speed:	55	55
Community with population < 10,000?	No	

WARRANT MET?

No

Hour	Both Approaches	Highest Approach
	Major Street	Minor Street
1	1249	75
2	—	—
3	—	—
4	—	—



Warrant 3: Peak-Hour Volumes and Delay

Silverado Trail & Conn Creek Road
Napa County

Project Name: NAX 158 - Bonny's Vineyard

Intersection: 1

	Major Street	Minor Street
Street Name	Silverado Trail	Conn Creek Road
Direction	E-W	N-S
Number of Lanes	2	1
Approach Speed	55	55

Population less than 10,000? No
Date of Count: Friday, February 25, 2022
Scenario: Existing

Warrant 3 Met?: Met when either Condition A or B is met

Condition A: Met when conditions A1, A2, and A3 are met

Condition A1

The total delay experienced by traffic on one minor street approach (one direction only) controlled by a STOP sign equals or exceeds four vehicle-hours for a one lane approach, or five vehicle-hours for a two-lane approach

Minor Approach Delay: 1.73 vehicle-hours

Condition A2

The volume on the same minor street approach (one direction only) equals or exceeds 100 vph for one moving lane of traffic of 150 vph for two moving lanes

Minor Approach Volume: 70 vph

Condition A3

The total entering volume serviced during the hour equals or exceeds 800 vph for intersections with four or more approaches or 650 vph for intersections with three approaches

Total Entering Volume: 1438 vph

Condition B

The plotted point falls above the curve

No

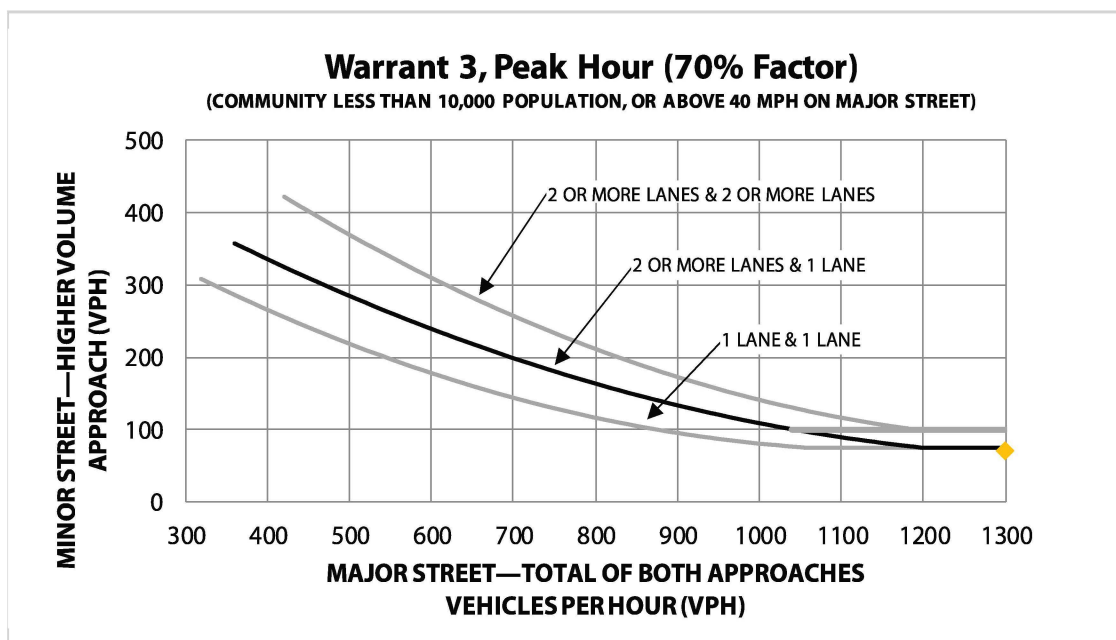
Not Met

Not Met

Not Met

Met

Not Met



Warrant 1: Eight-Hour Vehicular Volume

SR 29 & Rutherford Road

Napa County

Project Name: NAX 158 - Bonny's Vineyard**Intersection:** 2**Scenario:** Existing Friday p.m.**Date of Count:** Friday, February 25, 2022

	Major Street	Minor Street
Street Name:	SR 29	Rutherford Road
Direction:	E-W	N-S
Number of Lanes:	2	1
Approach Speed:	55	55

Community with population < 10,000? No**WARRANT MET?****No**

Condition A — Minimum Vehicle Volume:
 Condition B — Interruption of Continuous Traffic:
 Combination of Conditions A & B:

Warrant Met	Num. Hrs Met	8th Highest Hr	
		Major	Minor
No	1	N/A	N/A
No	2	N/A	N/A
No			

Table 4C-1 of MUTCD. Warrant 1, Eight-Hour Vehicular Volume

Condition A - Minimum Vehicular Volume									
Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on higher-volume minor-street approach (one direction only)			
Major Street	Minor Street	100% ^a	80% ^b	70% ^c	56% ^d	100% ^a	80% ^b	70% ^c	56% ^d
1	1	500	400	350	280	150	120	105	84
2 or more ..	1	600	480	420	336	150	120	105	84
2 or more	2 or more ..	600	480	420	336	200	160	140	112
1	2 or more ..	500	400	350	280	200	160	140	112

Condition B - Interruption of Continuous Traffic									
Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on higher-volume minor-street approach (one direction only)			
Major Street	Minor Street	100% ^a	80% ^b	70% ^c	56% ^d	100% ^a	80% ^b	70% ^c	56% ^d
1	1	750	600	525	420	75	60	53	42
2 or more ..	1	900	720	630	504	75	60	53	42
2 or more ..	2 or more ..	900	720	630	504	100	80	70	56
1	2 or more ..	750	600	525	420	100	80	70	56

^a Basic minimum hourly volume.^b Used for combination of Conditions A and B after adequate trial of other remedial measures.^c May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000.^d May be used for combination of Conditions A and B after adequate trial of other remedial measures when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000.

Warrant 2: Four-Hour Vehicular Volume

SR 29 & Rutherford Road

Napa County

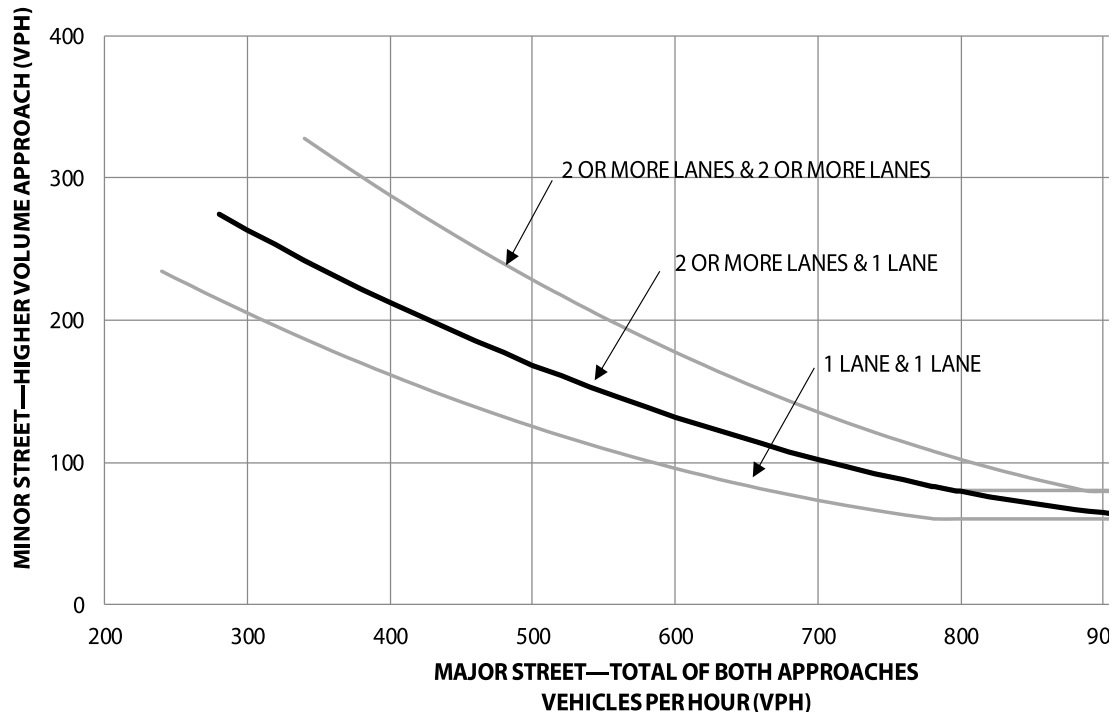
Project Name: NAX 158 - Bonny's Vineyard**Intersection:** 2**Scenario:** Existing Friday p.m.**Date of Count:** 2/25/2022

	Major Street	Minor Street
Street Name:	SR 29	Rutherford Road
Direction:	E-W	N-S
Number of Lanes:	2	1
Approach Speed:	55	55

Community with population < 10,000? No**WARRANT MET?****No**

Hour	Both Approaches	Highest Approach
	Major Street	Minor Street
1	1116	103
2	1025	58
3	—	—
4	—	—

Warrant 2, Four-Hour Volumes (70% Factor)
(COMMUNITY LESS THAN 10,000 POPULATION, OR ABOVE 40 MPH ON MAJOR STREET)



Warrant 3: Peak-Hour Volumes and Delay

SR 29 & Rutherford Road
Napa County

Project Name: NAX 158 - Bonny's Vineyard

Intersection: 2

	Major Street	Minor Street
Street Name	SR 29	Rutherford Road
Direction	E-W	N-S
Number of Lanes	2	1
Approach Speed	55	55

Population less than 10,000? No
Date of Count: Friday, February 25, 2022
Scenario: Existing

Warrant 3 Met?: Met when either Condition A or B is met

Condition A: Met when conditions A1, A2, and A3 are met

Condition A1

The total delay experienced by traffic on one minor street approach (one direction only) controlled by a STOP sign equals or exceeds four vehicle-hours for a one lane approach, or five vehicle-hours for a two-lane approach

Minor Approach Delay: 18.07 vehicle-hours

Condition A2

The volume on the same minor street approach (one direction only) equals or exceeds 100 vph for one moving lane of traffic of 150 vph for two moving lanes

Minor Approach Volume: 137.5 vph

Condition A3

The total entering volume serviced during the hour equals or exceeds 800 vph for intersections with four or more approaches or 650 vph for intersections with three approaches

Total Entering Volume: 1650.5 vph

Condition B

The plotted point falls above the curve

Yes

Met

Met

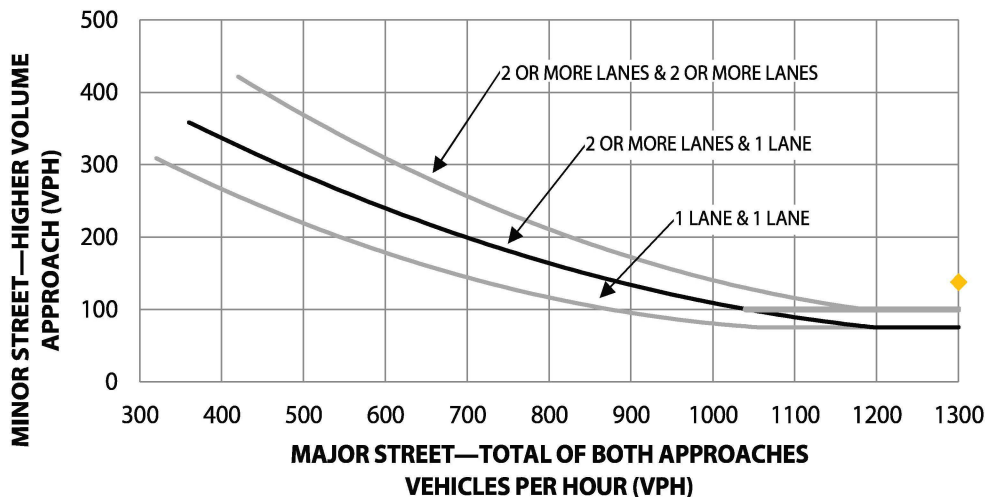
Met

Met

Met

Warrant 3, Peak Hour (70% Factor)

(COMMUNITY LESS THAN 10,000 POPULATION, OR ABOVE 40 MPH ON MAJOR STREET)



Warrant 1: Eight-Hour Vehicular Volume

Silverado Trail & Skellenger Lane

Napa County

Project Name: NAX 158 - Bonny's Vineyard**Intersection:** 3**Scenario:** Existing Friday p.m.**Date of Count:** Friday, February 25, 2022

	Major Street	Minor Street
Street Name:	Silverado Trail	Skellenger Lane
Direction:	E-W	N-S
Number of Lanes:	2	1
Approach Speed:	55	55

Community with population < 10,000? No**WARRANT MET?****No**

Condition A — Minimum Vehicle Volume:
 Condition B — Interruption of Continuous Traffic:
 Combination of Conditions A & B:

Warrant Met	Num. Hrs Met	8th Highest Hr	
		Major	Minor
No	2	N/A	N/A
No	2	N/A	N/A
No			

Table 4C-1 of MUTCD. Warrant 1, Eight-Hour Vehicular Volume

Condition A - Minimum Vehicular Volume									
Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on higher-volume minor-street approach (one direction only)			
Major Street	Minor Street	100% ^a	80% ^b	70% ^c	56% ^d	100% ^a	80% ^b	70% ^c	56% ^d
1	1	500	400	350	280	150	120	105	84
2 or more ..	1	600	480	420	336	150	120	105	84
2 or more	2 or more ..	600	480	420	336	200	160	140	112
1	2 or more ..	500	400	350	280	200	160	140	112

Condition B - Interruption of Continuous Traffic									
Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on higher-volume minor-street approach (one direction only)			
Major Street	Minor Street	100% ^a	80% ^b	70% ^c	56% ^d	100% ^a	80% ^b	70% ^c	56% ^d
1	1	750	600	525	420	75	60	53	42
2 or more ..	1	900	720	630	504	75	60	53	42
2 or more ..	2 or more ..	900	720	630	504	100	80	70	56
1	2 or more ..	750	600	525	420	100	80	70	56

^a Basic minimum hourly volume.^b Used for combination of Conditions A and B after adequate trial of other remedial measures.^c May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000.^d May be used for combination of Conditions A and B after adequate trial of other remedial measures when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000.

Warrant 2: Four-Hour Vehicular Volume

Silverado Trail & Skellenger Lane

Napa County

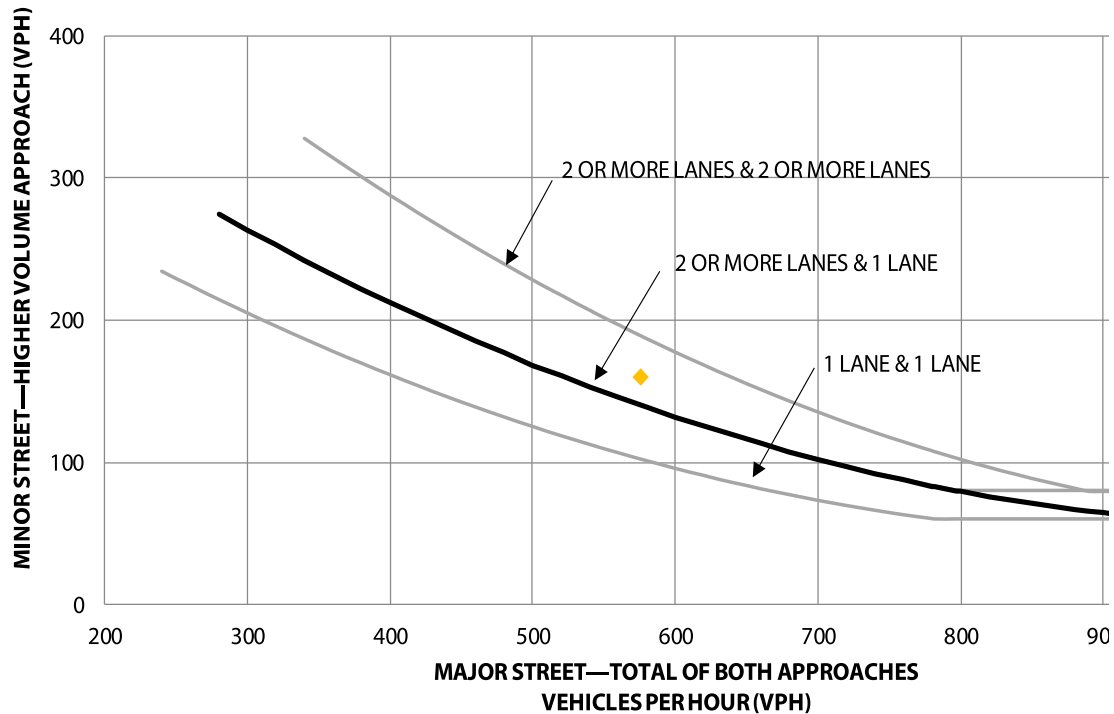
Project Name: NAX 158 - Bonny's Vineyard**Intersection:** 3**Scenario:** Existing Friday p.m.**Date of Count:** 2/25/2022

	Major Street	Minor Street
Street Name:	Silverado Trail	Skellenger Lane
Direction:	E-W	N-S
Number of Lanes:	2	1
Approach Speed:	55	55

Community with population < 10,000? No**WARRANT MET?****No**

Hour	Both Approaches	Highest Approach
	Major Street	Minor Street
1	1089	237
2	576	160
3	—	—
4	—	—

Warrant 2, Four-Hour Volumes (70% Factor)
(COMMUNITY LESS THAN 10,000 POPULATION, OR ABOVE 40 MPH ON MAJOR STREET)



Warrant 3: Peak-Hour Volumes and Delay

Silverado Trail & Skellenger Lane
Napa County

Project Name: NAX 158 - Bonny's Vineyard

Intersection: 3

	Major Street	Minor Street
Street Name	Silverado Trail	Skellenger Lane
Direction	E-W	N-S
Number of Lanes	2	1
Approach Speed	55	55

Population less than 10,000? No
Date of Count: Friday, February 25, 2022
Scenario: Existing

Warrant 3 Met?: Met when either Condition A or B is met

Condition A: Met when conditions A1, A2, and A3 are met

Condition A1

The total delay experienced by traffic on one minor street approach (one direction only) controlled by a STOP sign equals or exceeds four vehicle-hours for a one lane approach, or five vehicle-hours for a two-lane approach

Minor Approach Delay: 10.43 vehicle-hours

Condition A2

The volume on the same minor street approach (one direction only) equals or exceeds 100 vph for one moving lane of traffic of 150 vph for two moving lanes

Minor Approach Volume: 312 vph

Condition A3

The total entering volume serviced during the hour equals or exceeds 800 vph for intersections with four or more approaches or 650 vph for intersections with three approaches

Total Entering Volume: 1426 vph

Condition B

The plotted point falls above the curve

Yes

Met

Met

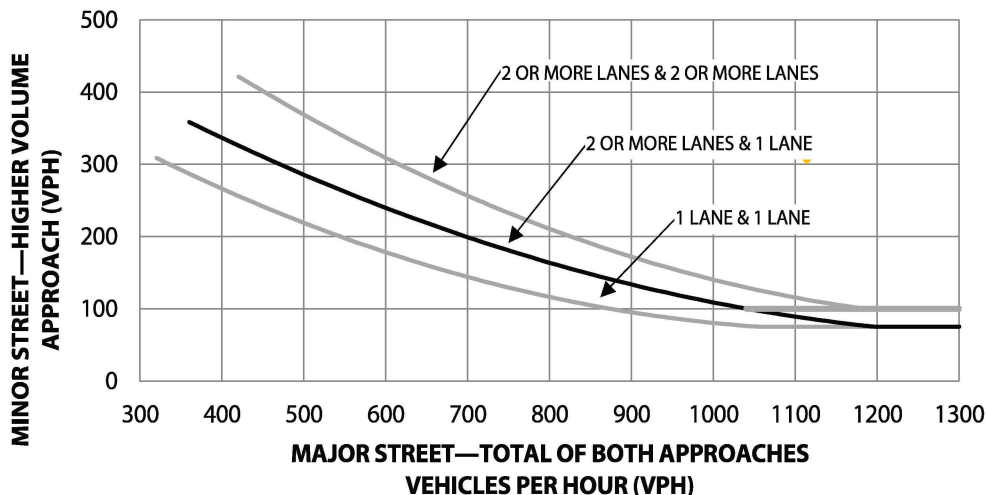
Met

Met

Met

Warrant 3, Peak Hour (70% Factor)

(COMMUNITY LESS THAN 10,000 POPULATION, OR ABOVE 40 MPH ON MAJOR STREET)





This page intentionally left blank

Appendix F

Roadway Segment Level of Service Calculations



This page intentionally left blank

HCS Two-Lane Highway Report						
Project Information						
Analyst	NGB	Date	4/25/2022			
Agency	W-Trans	Analysis Year	2022			
Jurisdiction	Napa County	Time Analyzed	Eastbound Existing Friday PM			
Project Description	NAX158	Units	U.S. Customary			
Segment 1						
Vehicle Inputs						
Segment Type	Passing Zone	Length, ft	5280			
Lane Width, ft	12	Shoulder Width, ft	5			
Speed Limit, mi/h	55	Access Point Density, pts/mi	12.2			
Demand and Capacity						
Directional Demand Flow Rate, veh/h	384	Opposing Demand Flow Rate, veh/h	34			
Peak Hour Factor	0.86	Total Trucks, %	0.00			
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.23			
Intermediate Results						
Segment Vertical Class	1	Free-Flow Speed, mi/h	59.0			
Speed Slope Coefficient (m)	3.41398	Speed Power Coefficient (p)	0.61387			
PF Slope Coefficient (m)	-1.15078	PF Power Coefficient (p)	0.82711			
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	2.7			
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0			
Subsegment Data						
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h	
1	Tangent	5280	-	-	57.4	
Vehicle Results						
Average Speed, mi/h	57.4	Percent Followers, %	40.6			
Segment Travel Time, minutes	1.05	Follower Density (FD), followers/mi/ln	2.7			
Vehicle LOS	B					
Facility Results						
T	VMT veh-mi/p	VHD veh-h/p	Follower Density, followers/ mi/ln	LOS		
1	83	0.04	2.7	B		
Copyright © 2022 University of Florida. All Rights Reserved. HCS900 Highways Version 2022 Highway1.xuf Generated: 04/25/2022 16:33:54						

HCS Two-Lane Highway Report						
Project Information						
Analyst	NGB	Date	4/25/2022			
Agency	W-Trans	Analysis Year	2040			
Jurisdiction	Napa County	Time Analyzed	Westbound Existing Friday PM			
Project Description	NAX158	Units	U.S. Customary			
Segment 1						
Vehicle Inputs						
Segment Type	Passing Zone	Length, ft	5280			
Lane Width, ft	12	Shoulder Width, ft	5			
Speed Limit, mi/h	55	Access Point Density, pts/mi	3.3			
Demand and Capacity						
Directional Demand Flow Rate, veh/h	36	Opposing Demand Flow Rate, veh/h	413			
Peak Hour Factor	0.80	Total Trucks, %	0.00			
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.02			
Intermediate Results						
Segment Vertical Class	1	Free-Flow Speed, mi/h	61.2			
Speed Slope Coefficient (m)	3.68451	Speed Power Coefficient (p)	0.49481			
PF Slope Coefficient (m)	-1.24242	PF Power Coefficient (p)	0.80002			
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.0			
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0			
Subsegment Data						
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h	
1	Tangent	5280	-	-	61.2	
Vehicle Results						
Average Speed, mi/h		61.2	Percent Followers, %		8.4	
Segment Travel Time, minutes		0.98	Follower Density (FD), followers/mi/ln		0.0	
Vehicle LOS		A				
Facility Results						
T	VMT veh-mi/p	VHD veh-h/p	Follower Density, followers/ mi/ln		LOS	
1	7	0.00	0.0		A	
Copyright © 2022 University of Florida. All Rights Reserved. HCS Highway Version 202.2 Highways1.xuf						

HCS Two-Lane Highway Report						
Project Information						
Analyst	NGB	Date	4/25/2022			
Agency	W-Trans	Analysis Year	2022			
Jurisdiction	Napa County	Time Analyzed	Eastbound Existing Saturday MD			
Project Description	NAX158	Units	U.S. Customary			
Segment 1						
Vehicle Inputs						
Segment Type	Passing Zone	Length, ft	5280			
Lane Width, ft	12	Shoulder Width, ft	5			
Speed Limit, mi/h	55	Access Point Density, pts/mi	12.2			
Demand and Capacity						
Directional Demand Flow Rate, veh/h	61	Opposing Demand Flow Rate, veh/h	33			
Peak Hour Factor	0.80	Total Trucks, %	0.00			
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.04			
Intermediate Results						
Segment Vertical Class	1	Free-Flow Speed, mi/h	59.0			
Speed Slope Coefficient (m)	3.41288	Speed Power Coefficient (p)	0.61493			
PF Slope Coefficient (m)	-1.14986	PF Power Coefficient (p)	0.82739			
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.1			
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0			
Subsegment Data						
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h	
1	Tangent	5280	-	-	59.0	
Vehicle Results						
Average Speed, mi/h	59.0	Percent Followers, %		10.8		
Segment Travel Time, minutes	1.02	Follower Density (FD), followers/mi/ln		0.1		
Vehicle LOS	A					
Facility Results						
T	VMT veh-mi/p	VHD veh-h/p	Follower Density, followers/ mi/ln	LOS		
1	12	0.00	0.1	A		
Copyright © 2022 University of Florida. All Rights Reserved. HCS900 Highways Version 2022 Highway1.xut Generated: 04/25/2022 16:35:17						

HCS Two-Lane Highway Report						
Project Information						
Analyst	NGB	Date	4/25/2022			
Agency	W-Trans	Analysis Year	2040			
Jurisdiction	Napa County	Time Analyzed	Westbound Existing Saturday MD			
Project Description	NAX158	Units	U.S. Customary			
Segment 1						
Vehicle Inputs						
Segment Type	Passing Zone	Length, ft	5280			
Lane Width, ft	12	Shoulder Width, ft	5			
Speed Limit, mi/h	55	Access Point Density, pts/mi	3.3			
Demand and Capacity						
Directional Demand Flow Rate, veh/h	33	Opposing Demand Flow Rate, veh/h	61			
Peak Hour Factor	0.80	Total Trucks, %	0.00			
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.02			
Intermediate Results						
Segment Vertical Class	1	Free-Flow Speed, mi/h	61.2			
Speed Slope Coefficient (m)	3.55510	Speed Power Coefficient (p)	0.59425			
PF Slope Coefficient (m)	-1.15853	PF Power Coefficient (p)	0.82842			
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.0			
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0			
Subsegment Data						
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h	
1	Tangent	5280	-	-	61.2	
Vehicle Results						
Average Speed, mi/h	61.2	Percent Followers, %			6.6	
Segment Travel Time, minutes	0.98	Follower Density (FD), followers/mi/ln			0.0	
Vehicle LOS	A					
Facility Results						
T	VMT veh-mi/p	VHD veh-h/p	Follower Density, followers/ mi/ln		LOS	
1	7	0.00	0.0		A	
Copyright © 2022 University of Florida. All Rights Reserved. HCS 1000 Highways Version 2022 Highways1.xuf Generated: 04/25/2022 17:15:24						

HCS Two-Lane Highway Report						
Project Information						
Analyst	NGB	Date	4/25/2022			
Agency	W-Trans	Analysis Year	2040			
Jurisdiction	Napa County	Time Analyzed	Eastbound Future Friday PM			
Project Description	NAX158	Units	U.S. Customary			
Segment 1						
Vehicle Inputs						
Segment Type	Passing Zone	Length, ft	5280			
Lane Width, ft	12	Shoulder Width, ft	5			
Speed Limit, mi/h	55	Access Point Density, pts/mi	3.3			
Demand and Capacity						
Directional Demand Flow Rate, veh/h	399	Opposing Demand Flow Rate, veh/h	35			
Peak Hour Factor	1.00	Total Trucks, %	0.00			
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.23			
Intermediate Results						
Segment Vertical Class	1	Free-Flow Speed, mi/h	61.2			
Speed Slope Coefficient (m)	3.53530	Speed Power Coefficient (p)	0.61278			
PF Slope Coefficient (m)	-1.14258	PF Power Coefficient (p)	0.83343			
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	2.8			
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0			
Subsegment Data						
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h	
1	Tangent	5280	-	-	59.5	
Vehicle Results						
Average Speed, mi/h	59.5	Percent Followers, %	41.2			
Segment Travel Time, minutes	1.01	Follower Density (FD), followers/mi/ln	2.8			
Vehicle LOS	B					
Facility Results						
T	VMT veh-mi/p	VHD veh-h/p	Follower Density, followers/ mi/ln	LOS		
1	100	0.05	2.8	B		
Copyright © 2022 University of Florida. All Rights Reserved. HCS999 Highways Version 2022 Highway1.x1uf Generated: 04/25/2022 17:43:04						

HCS Two-Lane Highway Report						
Project Information						
Analyst	NGB	Date	4/25/2022			
Agency	W-Trans	Analysis Year	2040			
Jurisdiction	Napa County	Time Analyzed	Westbound Future Friday PM			
Project Description	NAX158	Units	U.S. Customary			
Segment 1						
Vehicle Inputs						
Segment Type	Passing Zone	Length, ft	5280			
Lane Width, ft	12	Shoulder Width, ft	5			
Speed Limit, mi/h	55	Access Point Density, pts/mi	3.3			
Demand and Capacity						
Directional Demand Flow Rate, veh/h	35	Opposing Demand Flow Rate, veh/h	399			
Peak Hour Factor	1.00	Total Trucks, %	0.00			
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.02			
Intermediate Results						
Segment Vertical Class	1	Free-Flow Speed, mi/h	61.2			
Speed Slope Coefficient (m)	3.68104	Speed Power Coefficient (p)	0.49699			
PF Slope Coefficient (m)	-1.24068	PF Power Coefficient (p)	0.80072			
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.0			
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0			
Subsegment Data						
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h	
1	Tangent	5280	-	-	61.2	
Vehicle Results						
Average Speed, mi/h		61.2	Percent Followers, %		8.1	
Segment Travel Time, minutes		0.98	Follower Density (FD), followers/mi/ln		0.0	
Vehicle LOS		A				
Facility Results						
T	VMT veh-mi/p	VHD veh-h/p	Follower Density, followers/ mi/ln		LOS	
1	9	0.00	0.0		A	
Copyright © 2022 University of Florida. All Rights Reserved. HCS Highway Version 202.2 Highways1.xuf Generated: 04/25/2022 17:37:30						

HCS Two-Lane Highway Report						
Project Information						
Analyst	NGB	Date	4/25/2022			
Agency	W-Trans	Analysis Year	2040			
Jurisdiction	Napa County	Time Analyzed	Eastbound Future Saturday MD			
Project Description	NAX158	Units	U.S. Customary			
Segment 1						
Vehicle Inputs						
Segment Type	Passing Zone	Length, ft	5280			
Lane Width, ft	12	Shoulder Width, ft	5			
Speed Limit, mi/h	55	Access Point Density, pts/mi	3.3			
Demand and Capacity						
Directional Demand Flow Rate, veh/h	59	Opposing Demand Flow Rate, veh/h	31			
Peak Hour Factor	1.00	Total Trucks, %	0.00			
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.03			
Intermediate Results						
Segment Vertical Class	1	Free-Flow Speed, mi/h	61.2			
Speed Slope Coefficient (m)	3.53169	Speed Power Coefficient (p)	0.61626			
PF Slope Coefficient (m)	-1.13959	PF Power Coefficient (p)	0.83436			
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.1			
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0			
Subsegment Data						
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h	
1	Tangent	5280	-	-	61.2	
Vehicle Results						
Average Speed, mi/h	61.2	Percent Followers, %		10.2		
Segment Travel Time, minutes	0.98	Follower Density (FD), followers/mi/ln		0.1		
Vehicle LOS	A					
Facility Results						
T	VMT veh-mi/p	VHD veh-h/p	Follower Density, followers/ mi/ln		LOS	
1	15	0.00	0.1		A	
Copyright © 2022 University of Florida. All Rights Reserved. HCS900 Highways Version 2022 Highway1.xut Generated: 04/25/2022 17:42:31						

HCS Two-Lane Highway Report						
Project Information						
Analyst	NGB	Date	4/25/2022			
Agency	W-Trans	Analysis Year	2040			
Jurisdiction	Napa County	Time Analyzed	Westbound Future Saturday MD			
Project Description	NAX158	Units	U.S. Customary			
Segment 1						
Vehicle Inputs						
Segment Type	Passing Zone	Length, ft	5280			
Lane Width, ft	12	Shoulder Width, ft	5			
Speed Limit, mi/h	55	Access Point Density, pts/mi	3.3			
Demand and Capacity						
Directional Demand Flow Rate, veh/h	31	Opposing Demand Flow Rate, veh/h	59			
Peak Hour Factor	1.00	Total Trucks, %	0.00			
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.02			
Intermediate Results						
Segment Vertical Class	1	Free-Flow Speed, mi/h	61.2			
Speed Slope Coefficient (m)	3.55360	Speed Power Coefficient (p)	0.59563			
PF Slope Coefficient (m)	-1.15734	PF Power Coefficient (p)	0.82879			
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.0			
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0			
Subsegment Data						
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h	
1	Tangent	5280	-	-	61.2	
Vehicle Results						
Average Speed, mi/h		61.2	Percent Followers, %		6.3	
Segment Travel Time, minutes		0.98	Follower Density (FD), followers/mi/ln		0.0	
Vehicle LOS		A				
Facility Results						
T	VMT, veh-mi/p	VHD, veh-h/p	Follower Density, followers/mi/ln		LOS	
1	8	0.00	0.0		A	
Copyright © 2022 University of Florida. All Rights Reserved. HCS Highway Version 2022 Generated: 04/25/2022 17:38:15 Highways .xuf						

HCS Two-Lane Highway Report					
Project Information					
Analyst	NGB	Date	4/25/2022		
Agency	W-Trans	Analysis Year	2022		
Jurisdiction	Napa County	Time Analyzed	Eastbound Existing Plus Project Friday PM		
Project Description	NAX158	Units	U.S. Customary		
Segment 1					
Vehicle Inputs					
Segment Type	Passing Zone	Length, ft	5280		
Lane Width, ft	12	Shoulder Width, ft	5		
Speed Limit, mi/h	55	Access Point Density, pts/mi	12.2		
Demand and Capacity					
Directional Demand Flow Rate, veh/h	403	Opposing Demand Flow Rate, veh/h	38		
Peak Hour Factor	0.86	Total Trucks, %	0.00		
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.24		
Intermediate Results					
Segment Vertical Class	1	Free-Flow Speed, mi/h	59.0		
Speed Slope Coefficient (m)	3.41800	Speed Power Coefficient (p)	0.61003		
PF Slope Coefficient (m)	-1.15414	PF Power Coefficient (p)	0.82609		
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	3.0		
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0		
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	57.3
Vehicle Results					
Average Speed, mi/h	57.3	Percent Followers, %	42.0		
Segment Travel Time, minutes	1.05	Follower Density (FD), followers/mi/ln	3.0		
Vehicle LOS	B				
Facility Results					
T	VMT veh-mi/p	VHD veh-h/p	Follower Density, followers/ mi/ln	LOS	
1	87	0.04	3.0	B	
Copyright © 2022 University of Florida. All Rights Reserved. HCS900 Highways Version 2022 Highway1.xut Generated: 04/25/2022 16:31:47					

HCS Two-Lane Highway Report					
Project Information					
Analyst	NGB	Date	4/25/2022		
Agency	W-Trans	Analysis Year	2040		
Jurisdiction	Napa County	Time Analyzed	Westbound Existing Plus Project Friday PM		
Project Description	NAX158	Units	U.S. Customary		
Segment 1					
Vehicle Inputs					
Segment Type	Passing Zone	Length, ft	5280		
Lane Width, ft	12	Shoulder Width, ft	5		
Speed Limit, mi/h	55	Access Point Density, pts/mi	3.3		
Demand and Capacity					
Directional Demand Flow Rate, veh/h	41	Opposing Demand Flow Rate, veh/h	434		
Peak Hour Factor	0.80	Total Trucks, %	0.00		
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.02		
Intermediate Results					
Segment Vertical Class	1	Free-Flow Speed, mi/h	61.2		
Speed Slope Coefficient (m)	3.68987	Speed Power Coefficient (p)	0.49151		
PF Slope Coefficient (m)	-1.24504	PF Power Coefficient (p)	0.79895		
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.1		
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0		
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	61.2
Vehicle Results					
Average Speed, mi/h	61.2	Percent Followers, %	9.3		
Segment Travel Time, minutes	0.98	Follower Density (FD), followers/mi/ln	0.1		
Vehicle LOS	A				
Facility Results					
T	VMT veh-mi/p	VHD veh-h/p	Follower Density, followers/ mi/ln	LOS	
1	8	0.00	0.1	A	

Copyright © 2022 University of Florida. All Rights Reserved.
HCS Highways Version 202.2
Highways1.xuf
Generated: 04/25/2022 16:47:14

HCS Two-Lane Highway Report						
Project Information						
Analyst	NGB	Date	4/25/2022			
Agency	W-Trans	Analysis Year	2022			
Jurisdiction	Napa County	Time Analyzed	Eastbound Existing Plus Project Saturday MD			
Project Description	NAX158	Units	U.S. Customary			
Segment 1						
Vehicle Inputs						
Segment Type	Passing Zone	Length, ft	5280			
Lane Width, ft	12	Shoulder Width, ft	5			
Speed Limit, mi/h	55	Access Point Density, pts/mi	12.2			
Demand and Capacity						
Directional Demand Flow Rate, veh/h	89	Opposing Demand Flow Rate, veh/h	39			
Peak Hour Factor	0.80	Total Trucks, %	0.00			
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.05			
Intermediate Results						
Segment Vertical Class	1	Free-Flow Speed, mi/h	59.0			
Speed Slope Coefficient (m)	3.41832	Speed Power Coefficient (p)	0.60973			
PF Slope Coefficient (m)	-1.15440	PF Power Coefficient (p)	0.82601			
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.2			
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0			
Subsegment Data						
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h	
1	Tangent	5280	-	-	59.0	
Vehicle Results						
Average Speed, mi/h		59.0	Percent Followers, %		14.5	
Segment Travel Time, minutes		1.02	Follower Density (FD), followers/mi/ln		0.2	
Vehicle LOS		A				
Facility Results						
T	VMT veh-mi/p	VHD veh-h/p	Follower Density, followers/ mi/ln		LOS	
1	18	0.00	0.2		A	
Copyright © 2022 University of Florida. All Rights Reserved. HCS900 Highways Version 2022 Highway1.x1uf Generated: 04/25/2022 16:34:41						

HCS Two-Lane Highway Report						
Project Information						
Analyst	NGB	Date	4/25/2022			
Agency	W-Trans	Analysis Year	2040			
Jurisdiction	Napa County	Time Analyzed	Westbound Existing Plus Project Saturday MD			
Project Description	NAX158	Units	U.S. Customary			
Segment 1						
Vehicle Inputs						
Segment Type	Passing Zone	Length, ft	5280			
Lane Width, ft	12	Shoulder Width, ft	5			
Speed Limit, mi/h	55	Access Point Density, pts/mi	3.3			
Demand and Capacity						
Directional Demand Flow Rate, veh/h	39	Opposing Demand Flow Rate, veh/h	89			
Peak Hour Factor	0.80	Total Trucks, %	0.00			
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.02			
Intermediate Results						
Segment Vertical Class	1	Free-Flow Speed, mi/h	61.2			
Speed Slope Coefficient (m)	3.57163	Speed Power Coefficient (p)	0.57946			
PF Slope Coefficient (m)	-1.17127	PF Power Coefficient (p)	0.82441			
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.0			
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0			
Subsegment Data						
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h	
1	Tangent	5280	-	-	61.2	
Vehicle Results						
Average Speed, mi/h		61.2	Percent Followers, %		7.7	
Segment Travel Time, minutes		0.98	Follower Density (FD), followers/mi/ln		0.0	
Vehicle LOS		A				
Facility Results						
T	VMT veh-mi/p	VHD veh-h/p	Follower Density, followers/ mi/ln		LOS	
1	8	0.00	0.0		A	

Copyright © 2022 University of Florida. All Rights Reserved.
HCS Highway Version 202.2
Highways1.xuf
Generated: 04/25/2022 17:13:04

HCS Two-Lane Highway Report						
Project Information						
Analyst	NGB	Date	4/25/2022			
Agency	W-Trans	Analysis Year	2040			
Jurisdiction	Napa County	Time Analyzed	Eastbound Future Friday PM			
Project Description	NAX158	Units	U.S. Customary			
Segment 1						
Vehicle Inputs						
Segment Type	Passing Zone	Length, ft	5280			
Lane Width, ft	12	Shoulder Width, ft	5			
Speed Limit, mi/h	55	Access Point Density, pts/mi	12.2			
Demand and Capacity						
Directional Demand Flow Rate, veh/h	416	Opposing Demand Flow Rate, veh/h	39			
Peak Hour Factor	1.00	Total Trucks, %	0.00			
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.24			
Intermediate Results						
Segment Vertical Class	1	Free-Flow Speed, mi/h	59.0			
Speed Slope Coefficient (m)	3.41853	Speed Power Coefficient (p)	0.60953			
PF Slope Coefficient (m)	-1.15457	PF Power Coefficient (p)	0.82596			
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	3.1			
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0			
Subsegment Data						
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h	
1	Tangent	5280	-	-	57.3	
Vehicle Results						
Average Speed, mi/h		57.3	Percent Followers, %		42.9	
Segment Travel Time, minutes		1.05	Follower Density (FD), followers/mi/ln		3.1	
Vehicle LOS		B				
Facility Results						
T	VMT veh-mi/p	VHD veh-h/p	Follower Density, followers/ mi/ln		LOS	
1	104	0.05	3.1		B	
Generated: 04/25/2022 16:43:35 Copyright © 2022 University of Florida. All Rights Reserved. HCS900 Highways Version 2022 Highway1.xuf						

HCS Two-Lane Highway Report						
Project Information						
Analyst	NGB	Date	4/25/2022			
Agency	W-Trans	Analysis Year	2040			
Jurisdiction	Napa County	Time Analyzed	Westbound Future Friday PM			
Project Description	NAX158	Units	U.S. Customary			
Segment 1						
Vehicle Inputs						
Segment Type	Passing Zone	Length, ft	5280			
Lane Width, ft	12	Shoulder Width, ft	5			
Speed Limit, mi/h	55	Access Point Density, pts/mi	3.3			
Demand and Capacity						
Directional Demand Flow Rate, veh/h	39	Opposing Demand Flow Rate, veh/h	416			
Peak Hour Factor	1.00	Total Trucks, %	0.00			
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.02			
Intermediate Results						
Segment Vertical Class	1	Free-Flow Speed, mi/h	61.2			
Speed Slope Coefficient (m)	3.68540	Speed Power Coefficient (p)	0.49426			
PF Slope Coefficient (m)	-1.24286	PF Power Coefficient (p)	0.79984			
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.1			
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0			
Subsegment Data						
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h	
1	Tangent	5280	-	-	61.2	
Vehicle Results						
Average Speed, mi/h		61.2	Percent Followers, %		8.9	
Segment Travel Time, minutes		0.98	Follower Density (FD), followers/mi/ln		0.1	
Vehicle LOS		A				
Facility Results						
T	VMT, veh-mi/p	VHD, veh-h/p	Follower Density, followers/mi/ln		LOS	
1	10	0.00	0.1		A	

Copyright © 2022 University of Florida. All Rights Reserved.
HCS Highway Version 2022
Highways .xuf
Generated: 04/25/2022 16:46:14

HCS Two-Lane Highway Report						
Project Information						
Analyst	NGB	Date	4/25/2022			
Agency	W-Trans	Analysis Year	2040			
Jurisdiction	Napa County	Time Analyzed	Eastbound Future Saturday MD			
Project Description	NAX158	Units	U.S. Customary			
Segment 1						
Vehicle Inputs						
Segment Type	Passing Zone	Length, ft	5280			
Lane Width, ft	12	Shoulder Width, ft	5			
Speed Limit, mi/h	55	Access Point Density, pts/mi	12.2			
Demand and Capacity						
Directional Demand Flow Rate, veh/h	81	Opposing Demand Flow Rate, veh/h	36			
Peak Hour Factor	1.00	Total Trucks, %	0.00			
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.05			
Intermediate Results						
Segment Vertical Class	1	Free-Flow Speed, mi/h	59.0			
Speed Slope Coefficient (m)	3.41599	Speed Power Coefficient (p)	0.61195			
PF Slope Coefficient (m)	-1.15246	PF Power Coefficient (p)	0.82660			
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.2			
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0			
Subsegment Data						
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h	
1	Tangent	5280	-	-	59.0	
Vehicle Results						
Average Speed, mi/h	59.0	Percent Followers, %	13.4			
Segment Travel Time, minutes	1.02	Follower Density (FD), followers/mi/ln	0.2			
Vehicle LOS	A					
Facility Results						
T	VMT veh-mi/p	VHD veh-h/p	Follower Density, followers/ mi/ln	LOS		
1	20	0.00	0.2	A		
Copyright © 2022 University of Florida. All Rights Reserved. HCS900 Highways Version 2022 Highway1.xluf Generated: 04/25/2022 16:44:10						

HCS Two-Lane Highway Report						
Project Information						
Analyst	NGB	Date	4/25/2022			
Agency	W-Trans	Analysis Year	2040			
Jurisdiction	Napa County	Time Analyzed	Westbound Future Saturday MD			
Project Description	NAX158	Units	U.S. Customary			
Segment 1						
Vehicle Inputs						
Segment Type	Passing Zone	Length, ft	5280			
Lane Width, ft	12	Shoulder Width, ft	5			
Speed Limit, mi/h	55	Access Point Density, pts/mi	3.3			
Demand and Capacity						
Directional Demand Flow Rate, veh/h	36	Opposing Demand Flow Rate, veh/h	81			
Peak Hour Factor	1.00	Total Trucks, %	0.00			
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.02			
Intermediate Results						
Segment Vertical Class	1	Free-Flow Speed, mi/h	61.2			
Speed Slope Coefficient (m)	3.56727	Speed Power Coefficient (p)	0.58330			
PF Slope Coefficient (m)	-1.16796	PF Power Coefficient (p)	0.82546			
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.0			
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0			
Subsegment Data						
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h	
1	Tangent	5280	-	-	61.2	
Vehicle Results						
Average Speed, mi/h		61.2	Percent Followers, %		7.2	
Segment Travel Time, minutes		0.98	Follower Density (FD), followers/mi/ln		0.0	
Vehicle LOS		A				
Facility Results						
T	VMT veh-mi/p	VHD veh-h/p	Follower Density, followers/ mi/ln		LOS	
1	9	0.00	0.0		A	
Copyright © 2022 University of Florida. All Rights Reserved. HCS Highway Version 202.2 Highways1.xuf Generated: 04/25/2022 16:45:43						