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Traffic Impact Study

Conn Creek Winery Use Permit Major Modification P19-00317
Planning Commission Hearing April 21, 2021

Traffic Impact Study for the Conn Creek Winery

Prepared for the County of Napa
County of Napa File Number P19-00317

Submitted by
W-Trans

November 9, 2020

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Table of Contents

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Executive Summary

The proposed project is a Use Permit Modification to allow the Conn Creek Winery to increase the number of full-time employees from 15 to 20. The modification to the Conditional Use Permit (CUP) as proposed would not result in any change to the approved production or visitation program.

Based on the County's winery trip generation assumptions, the proposed project would be expected to generate an average of 15 new trips per day, including five during the weekday p.m. peak hour and four during the weekend midday peak hour.

The study area consisted of the project frontage along Silverado Trail, the project access point, and the intersections of Silverado Trail/SR 128-Conn Creek Road and Silverado Trail/SR 128-Sage Canyon Road.

Both study intersections are currently operating at LOS C or better overall, but at LOS E or F during one or both peak hours evaluated. With project traffic added these service levels would be unchanged, and as the project would be responsible for less than ten percent of the peak hour volumes on the minor street approach, the impact is considered acceptable under the County's standards.

Under anticipated future volumes both intersections are expected to continue operating acceptably overall with the exception of SR 128/Sage Canyon Road, which is expected to operate at LOS E during the weekday evening peak hour; side street approaches are all expected to operate at LOS F under future volumes. The addition of project-generated traffic would result in an acceptable impact as the project-related traffic would be less than five percent of the total volume on the side-street approaches.

The segment of Silverado Trail along the project frontage is operating at LOS E or better for both peak hours and would continue doing so with the addition of project-related volumes. Based on County policy, LOS E is considered acceptable at this location. Under anticipated future volumes, southbound Silverado Trail is expected to continue operating acceptably at LOS E during the weekend peak hour but degrade to LOS F during the weekday peak hour, with the LOS for both peaks remaining unchanged with the addition of project-generated traffic. For the weekday peak hour, since the project would contribute less than five percent of the anticipated increase in traffic along the segment, the impact is considered acceptable. The northbound study segment is expected to operate acceptably at LOS C during the weekday p.m. peak hour and LOS D during the weekend peak hour, and the LOS in both directions would remain the same with the addition of project-related traffic.

Pedestrian, bicycle, and transit facilities are adequate to serve the anticipated demand for the project given its location.

To reduce peak hour trips by employees and their associated VMT, the project should develop a carpooling program.

Introduction

This report presents an analysis of the potential traffic impacts that would be associated with the proposed modification to the existing Use Permit for the Conn Creek Winery located at 8711 Silverado Trail in the County of Napa. The traffic study was completed in accordance with the criteria established by the County of Napa, reflects a scope of work reviewed and approved by County staff, 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 they can use to make an informed decision regarding the potential traffic impacts of a proposed project, and any associated improvements that would be required to mitigate these impacts to a level of insignificance as defined by the County's General Plan or other policies. Vehicular traffic impacts are typically evaluated 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 existing travel patterns or anticipated travel patterns specific to the proposed project, then analyzing the impact the new traffic would be expected to have on critical intersections or roadway segments. Impacts relative to access for pedestrians, bicyclists, and to transit are also addressed.

Project Profile

The project is a proposed Use Permit Modification that would allow an increase in the number of full-time employees from 15 to 20 (five additional employees). The project as proposed would not increase the approved production or visitation program. The project site is located at 8711 Silverado Trail. The County of Napa file number for this project is P19-00317.

Transportation Setting

Operational Analysis

Study Area and Periods

The study area consists of the section of Silverado Trail fronting the project site, the project access point, and the following intersections:

1. Silverado Trail/SR 128-Conn Creek Rd
2. Silverado Trail/SR 128-Sage Canyon Rd

Operating conditions during the weekday p.m. 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 evaluated is between 3:00 and 4:00 p.m. and the weekend midday peak hour is between 1:45 and 2:45 p.m. These times were chosen to reflect the hours when wineries in the County of Napa have their highest trip generation.

A construction project to replace the Conn Creek Bridge is currently underway. Caltrans has estimated that the construction will be completed by the end of 2020. During construction, the left-turn and through lanes on northbound Silverado Trail will be combined into a single lane. The existing southbound left-turn lane approaching the Silverado Trail/Sage Canyon Road intersection will not be impacted by the construction. When completed, the new bridge will be wider than the existing bridge, which will enable it to better accommodate right-turning trucks from eastbound Conn Creek Road onto southbound Silverado Trail, but the lane configurations for the study intersection will remain the same.

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. The eastbound approach includes a flared right-turn lane. The westbound approach is a private driveway to the Rutherford Ranch Winery.

Silverado Trail/SR 128-Sage Canyon Road is a four-legged intersection with stop controls on the westbound Sage Canyon Road (SR 128) approach; the eastbound approach is the main private driveway to Conn Creek Winery. The westbound approach includes a flared right-turn lane.

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

Study Roadway

Silverado Trail has a posted speed limit of 55 miles per hour in the vicinity of the project site. Silverado Trail runs mostly north-south and has two 12-foot travel lanes. Count data collected in October 2019 indicates that the road has an average daily traffic (ADT) volume of approximately 13,500 on weekdays and 11,000 on weekends. The count data is included in Appendix A.

nax144.ai 11/19

Traffic Impact Study for the Conn Creek Winery

Figure 1 – Study Area and Existing Lane Configurations

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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 July 1, 2013 through June 30, 2018.

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 *2014 Collision Data on California State Highways*, California Department of Transportation (Caltrans). The intersection of Silverado Trail/SR 128-Conn Creek Road had a slightly higher collision rate than the statewide average for similar facilities, while the intersection of Silverado Trail/SR 128-Sage Canyon Road experienced no collisions during the most current five-year period. The collision rate calculations are provided in Appendix B.

Table 1 – Collision Rates at the Study Intersections

Study Intersection	Number of Collisions (2013-2018)	Calculated Collision Rate (c/mve)	Statewide Average Collision Rate (c/mve)
1. Silverado Tr/SR 128-Conn Creek Rd	6	**0.24**	0.23
2. Silverado Tr/SR 128-Sage Canyon Rd	0	0.00	0.23

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

Because the collision rate for the intersection of Silverado Trail/SR 128-Conn Creek Road was higher than the statewide average, the crashes at this location were reviewed in greater detail. Three of the six collisions were hit-object collisions with two attributed to improper turning and one where the driver was under the influence. The remaining collisions were classified as vehicle-pedestrian and broadside; both broadside collisions were attributed to improper turning. It is noted that the injury rate of 16.7 percent is much lower than the Statewide average of 40.4 percent. Due to the low injury rate, and as the collision rate for this intersection was only 0.01 c/mve above the average, no safety concern is indicated that would warrant remediation.

Alternative Modes

Pedestrian Facilities

Pedestrian facilities are more predominant in urban settings where they 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.

Bicycle Facilities

The *Highway Design Manual*, Caltrans, 2017, classifies bikeways into three 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.

In the project area, there are bike lanes on Conn Creek Road and Silverado Trail. According to the *2019 Napa Countywide Bicycle Plan*, bicycle facilities are also proposed for SR 128 from Silverado Trail to SR 29, as summarized in Table 2.

Table 2 – Bicycle Facility Summary

Status Facility	Class	Length (miles)	Begin Point	End Point
Existing				
Silverado Trail	II	26.9	SR 121 (Napa)	SR 29 (Calistoga)
Planned				
SR 128	III	1.3	Conn Creek Rd	Silverado Trail
SR 128	II	1.5	SR 29	Conn Creek Rd

Source: Napa Countywide Bicycle Plan, Napa Valley Transportation Authority, 2019

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.

Capacity Analysis

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* (HCM), Transportation Research Board, 2010. 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" methodology 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 3.

Table 3 – 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*, Transportation Research Board, 2010

Two-Lane Highway Segment Level of Service Methodology

The roadway segment Level of Service methodology found in Chapter 15, "Two-Lane Highways," of the *Highway Capacity Manual* is the basis of the automobile LOS analysis. The methodology considers traffic volumes, terrain, roadway cross-section, the proportion of heavy vehicles, and the availability of passing zones. Silverado Trail was defined as a Class I highway for the purposes of this analysis. Class I highways are typically long-distance routes connecting major traffic generators or national highway networks where motorists expect to travel at high speeds.

The measure of effectiveness by which Level of Service is determined on Class I highways is average travel speed (ATS) and percent time spent following (PTSF), or the proportion of time that drivers on the highway are limited in their speed by a driver in front of them. A summary of the ATS and PTSF breakpoints is shown in Table 4.

Table 4 – Automobile Level of Service Criteria

LOS	Class I Highways	
	ATS (mi/h)	PTSF (%)
A	>55	≤35
B	>50-55	>35-50
C	>45-50	>50-65
D	>40-45	>65-80
E	≤40	>80

Notes: LOS = Level of Service; ATS = Average Travel Speed
PTSF = Percent Time Spent Following
Reference: *Highway Capacity Manual*, Transportation Research Board, 2010

Traffic Operation Standards

Napa County

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 Highway Capacity Manual 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 G*uidelines for Interpretation of General Plan Circulation Policies on Significance Criteria* (Fehr & Peers, 2015). The document establishes thresholds of significance for road segments and different intersection control types. The memorandum states a project would cause an adverse impact requiring mitigation if, for existing conditions:

- *A signalized 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 trips; or*

- *A signalized intersection operates at LOS E or F during the selected peak hours without Project trips, and the addition of Project trips increases the total entering volume by one percent or more.*
  - *Project Contribution % = Project Trips ÷ Existing Volumes*

- *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 contributes one percent or more of the total entering traffic for all-way stop-controlled intersections, or ten percent or more of the traffic on a side-street approach for side-street stop-controlled intersections; the peak hour traffic signal criteria should also be evaluated and presented for informational purposes. Both of those volumes are for the stop-controlled approaches only. Each stop-controlled approach that operates at LOS E or F should be analyzed individually.*
  - *<u>All-Way Stop-Controlled Intersections</u> – The following equation should be used if the all-way stop-controlled intersection operates at LOS E or F without the Project:*
    - *Project Contribution % = Project Trips ÷ Existing Volumes*
  - *<u>Side-Street Stop-Controlled Intersections</u> – The following equation should be used if the side-street stop-controlled intersection operates at LOS E or F without the Project:*
    - *Project Contribution % = Project Trips ÷ Existing Volumes*

- *An arterial segment operates at LOS A, B, C or D during the selected peak hours without Project trips, and deteriorates to LOS E or F with the addition of Project trips; or*

- *An arterial segment operates at LOS E or F during the selected peak hours without Project trips, and the addition of Project trips increases the total segment volume by one percent or more. The following equation should be used if the arterial segment operates at LOS E or F without the Project:*

- *Project Contribution % = Project Trips ÷ Existing Volumes*

Further, a project would cause an adverse impact requiring mitigation if, for cumulative (future) conditions, the Project's volume is equal to, or greater than five percent of the difference between cumulative (future) and existing volumes.

- *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)*

Existing Conditions

The Existing Conditions scenario provides an evaluation of current operation based on existing traffic volumes during the p.m. peak periods on both weekdays and weekends. This condition does not include project-generated traffic volumes. Volume data was collected in October 2019 while local schools were in session. Two weeks of count data was collected, and the week with the higher recorded volumes was used to analyze the Existing Conditions scenario.

Intersection Levels of Service

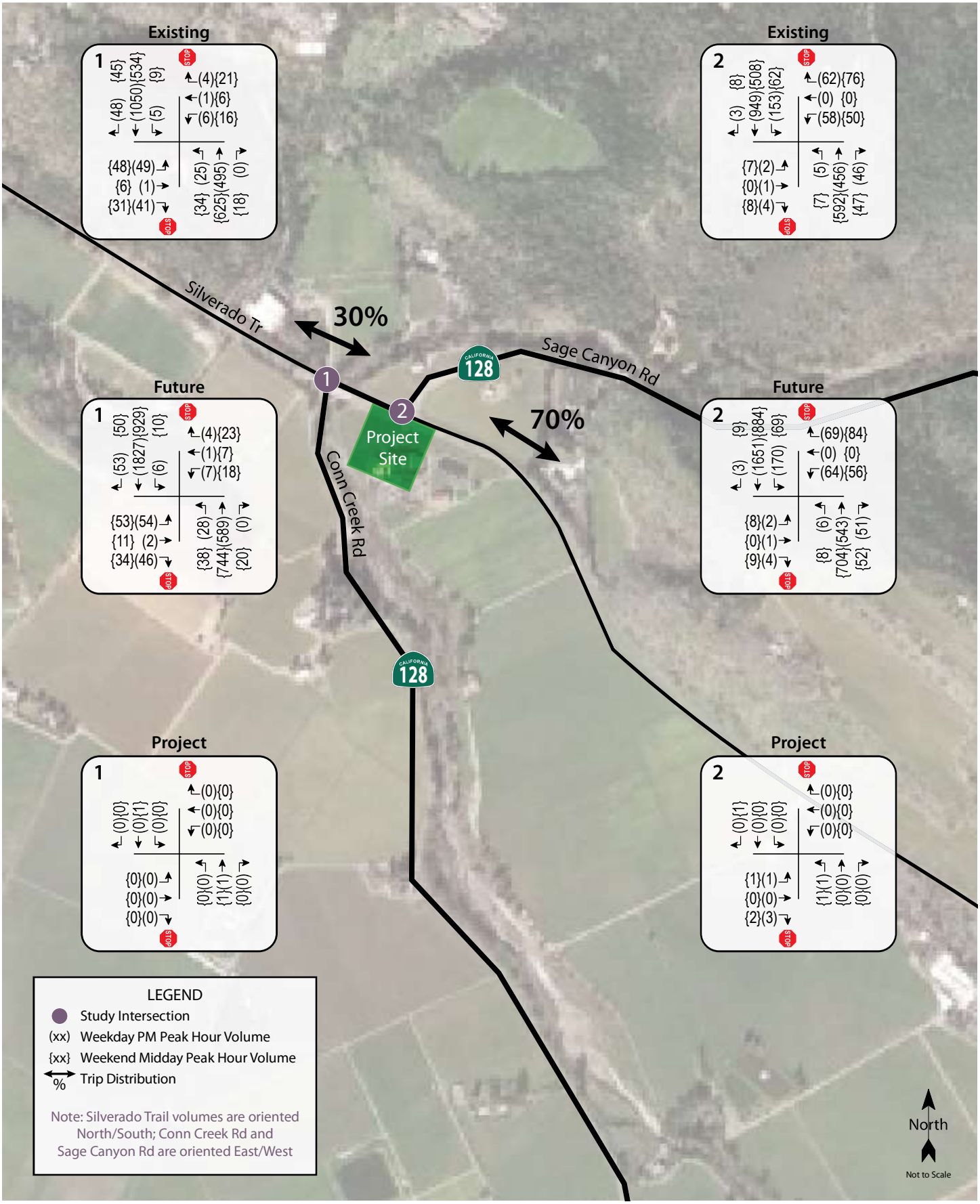
Under existing conditions, the study intersections are operating at LOS C or better overall during the weekday and weekend p.m. peak hours; however, Silverado Trail/SR 128-Conn Creek Road operates unacceptably at LOS F on the stop-controlled approach during both peaks. Silverado Trail/SR 128-Sage Canyon Road operates unacceptably at LOS F during the weekday p.m. peak hour on the stop-controlled approach. A summary of the intersection level of service calculations is contained in Table 5, and copies of the Level of Service calculations are provided in Appendix C. The existing traffic volumes are shown in Figure 2.

Table 5 – Existing Peak Hour Intersection Levels of Service

Study Intersection ***Approach***	**PM Weekday Peak**		**PM Weekend Peak**	
	Delay	**LOS**	**Delay**	**LOS**
1. Silverado Tr/SR 128-Conn Creek Rd	7.3	A	4.5	A
Eastbound (Conn Creek Rd) Approach	********	***F***	***52.1***	***F***
2. Silverado Tr/SR 128-Sage Canyon Rd	16.8	C	3.9	A
Westbound (Sage Canyon Rd) Approach	********	***F***	*33.3*	*D*

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

Although installation of traffic signals would be expected to address the deficient operation at both Silverado Trail/SR 128-Conn Creek Road and Silverado Trail/SR 128-Sage Canyon Road, it is understood that the County has a policy against installing any new traffic signals along Silverado Trail. Because this potential capacity improvement is not an option, other potential improvements, such as turn lanes and/or



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Traffic Impact Study for the Conn Creek Winery

Figure 2 – Existing, Future, and Project Traffic Volumes and Trip Distribution

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/SR 128-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-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/SR 128-Sage Canyon Road

- Turn Lanes: there are currently left-turn lanes in both directions on Silverado Trail and there is a flared right-turn lane on Sage Canyon Road; this reduces delays for right-turning vehicles by allowing them to queue up side-by-side with vehicles that are queued waiting to turn left onto Silverado Trail. Because the existing geometrics function as if there were a separate right-turn lane, no operational benefit would be derived from marking separate turn lanes.

- Acceleration/Deceleration Lanes: the shoulder on the east and west side of Silverado Trail is approximately ten feet wide, providing sufficient space for acceleration/deceleration for vehicles exiting/entering Sage Canyon Road and the Conn Creek Winery driveway.

Roadway Segment Levels of Service

Under existing conditions Silverado Trail between Conn Creek Road and Sage Canyon Road is a Class I facility and is operating at LOS E or better during both peak hours. Per the County of Napa standards, there is an exception to the LOS D standard on Silverado Trail between SR 128 and Yountville Cross Road, so LOS E is acceptable for the roadway segment. A summary of the roadway segment level of service calculations is shown in Table 6, and copies of the Level of Service calculations are provided in Appendix D.

Table 6 – Existing Peak Hour Roadway Segment Levels of Service

Study Segment Direction	PM Weekday Peak		PM Weekend Peak	
	PTSF (%)	LOS	PTSF (%)	LOS
Silverado Trail				
Southbound	80.4	E	63.7	C
Northbound	61.0	C	67.8	D

Notes: Speed is measured in miles per hour; LOS = Level of Service; PTSF = Percent Time Spent Following

Future Conditions

Future volumes for the horizon year 2040 were calculated based on output from the Napa Solano Travel Demand Model, maintained by the Solano Transportation Authority (STA). Base year (2015) and future (2040) segment volumes for the weekday p.m. peak period were used to calculate growth factors for the study intersections and roadway segment. The same growth factors used for the weekday p.m. peak hour were used for the weekend peak hour as the model does not contain information for weekend days.

Under the anticipated Future volumes, the study intersection of Silverado Trail/SR 128-Sage Canyon Road is expected to operate unacceptably at LOS F overall during the weekday p.m. peak hour. Additionally, the stop-controlled approaches of Silverado Trail/SR 128-Conn Creek Road and Silverado Trail/SR 128-Sage Canyon Road are expected to operate unacceptably at LOS F during both peak hours. Future volumes are shown in Figure 2 and operating conditions are summarized in Table 7.

Table 7 – Future Peak Hour Intersection Levels of Service

Study Intersection *Approach*	**PM Weekday Peak**		**PM Weekend Peak**	
	Delay	**LOS**	**Delay**	**LOS**
1. Silverado Tr/SR 128-Conn Creek Rd	36.3	A	13.3	B
Eastbound (Conn Creek Rd) Approach	********	***F***	********	***F***
2. Silverado Tr/SR 128-Sage Canyon Rd	**55.1**	**F**	8.3	A
Westbound (Sage Canyon Rd) Approach	********	***F***	***98.8***	***F***

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 Silverado Trail/SR 128-Conn Creek Road and Silverado Trail/SR 128-Sage Canyon Road is anticipated to deteriorate substantially with the projected increase in traffic over the next 21 years. As previously noted, the County has indicated that signalization is not an option for achieving better operation, but it is noted that, if signalized, both intersections would be expected to operate at LOS D or better.

Under projected future volumes, the southbound Silverado Trail roadway study segment is projected to operate at LOS F during the weekday p.m. peak hour. During the weekend p.m. peak hour, this segment is projected to operate at LOS E, which the County of Napa has defined as acceptable for this portion of Silverado Trail. During both peak hours, the northbound study segment of Silverado Trail is projected to operate at LOS D or C. These results are summarized in Table 8.

Table 8 – Future Peak Hour Roadway Segment Levels of Service				
Study Segment Direction	**PM Weekday Peak**		**PM Weekend Peak**	
	PTSF (%)	**LOS**	**PTSF (%)**	**LOS**
Silverado Trail				
Southbound	*	F	75.3	E
Northbound	63.0	C	69.9	D

Notes: Speed is measured in miles per hour; LOS = Level of Service; PTSF = Percent Time Spent Following; * = Volume exceeds capacity

Project Description

The project is a proposed Use Permit Modification that would allow an increase the number of full-time employees from 15 to 20 (five additional employees). The winery hosts 85 groups per month, with an average of five persons per group and a maximum of 20 guests. There are two events per year with a maximum of 60 guests. Marketing events are held between 10:00 a.m. to 8:00 pm. The project as proposed would not increase the approved production or visitation program.

Trip Generation

The County of Napa's Winery Traffic Information/Trip Generation Sheet was used to determine the anticipated trip generation for the existing and proposed conditions. The form estimates the number of daily trips for weekdays and Saturdays based on the number of full- and part-time employees, maximum daily visitors, and production. Copies of the worksheets for Existing and Proposed conditions are included in Appendix E.

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 weekday 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 midday peak-hour it was assumed that inbound and outbound trip ends would be evenly split.

Based on application of these assumptions, with the proposed increase in staff, the winery would be expected to generate a total of 241 trips during a typical weekday, with 88 trips occurring during the weekday evening peak hour. As shown in Table 9, this would result in a net increase of 15 trips per weekday, including five trips during the weekday p.m. peak hour compared to the existing conditions. On a typical weekend day, the winery would be expected to generate a total of 224 trips, with 113 trips occurring during the weekend midday peak hour. For weekend days, this would result in a net increase of 13 trips, including four trips during the weekend midday peak hour compared to the existing conditions. These trips represent the increase in trips based on the County's assumed peak hour ratios, which are substantially higher than would be expected based on data collected at numerous Napa County wineries. Application of lower percentages for the peak hour trips compared to daily volumes, such as have been documented at other wineries, would result in a lower increase in traffic volumes, making the analysis as presented conservative.

Table 9 – Trip Generation Summary								
Scenario	**Daily**		**Weekday PM Peak Hour**			**Weekend MD Peak Hour**		
	Weekday	**Weekend**	**Trips**	**In**	**Out**	**Trips**	**In**	**Out**
Existing	226	211	83	28	55	108	54	54
Proposed	241	224	88	29	59	112	56	56
Net increase	**15**	**13**	**5**	**1**	**4**	**4**	**2**	**2**

Note: Trip generation as estimated above does not include special events

Trip Distribution

The pattern used to allocate new project trips to the street network was determined based on familiarity with the area and surrounding region as well as likely origins and destinations for patrons of the project. Project trips were assigned with 70 percent from/to the south and 30 percent from/to the north.

Note that this trip generation estimate reflects the current proposed increase in the number of employees. The operational analysis was conducted based on a more intensive project proposal, making it conservative.

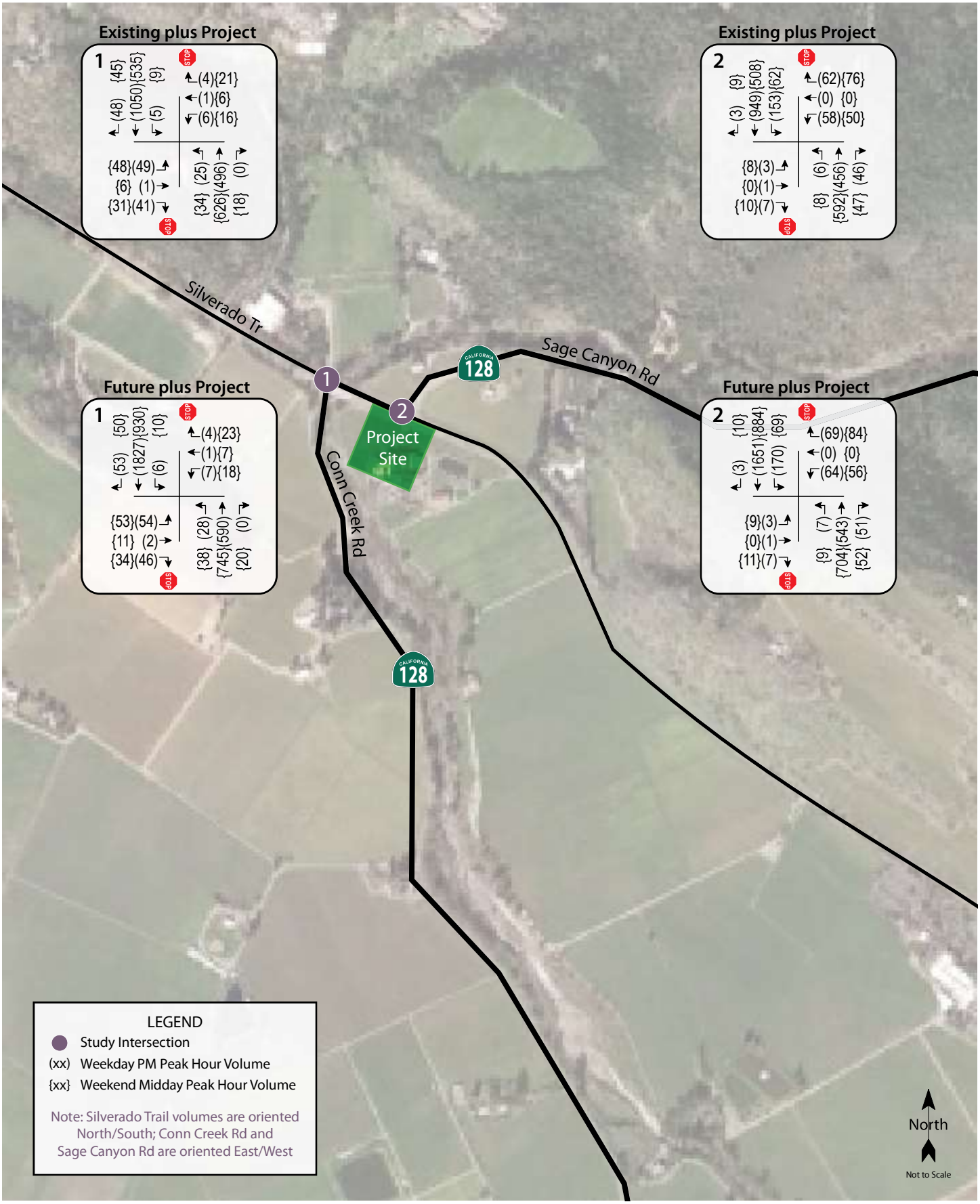
Intersection Operation

Existing plus Project Conditions

Upon the addition of project-related traffic to the Existing volumes, the stop-controlled approach at both study intersections are expected to continue operating at the same levels of service as without it. These results are summarized in Table 10. Project traffic volumes and Existing plus Project traffic volumes are shown in Figures 2 and 3, respectively.

Table 10 – Existing and Existing plus Project Peak Hour Intersection Levels of Service								
Study Intersection *Approach*	**Existing Conditions**				**Existing plus Project**			
	PM Weekday Peak		**PM Weekend Peak**		**PM Weekday Peak**		**PM Weekend Peak**	
	Delay	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**
1. Silverado Tr/SR 128-Conn Creek Rd	7.3	A	4.5	A	7.3	A	4.5	A
Eastbound (Conn Creek Rd) Approach	********	***F***	***52.1***	***F***	********	***F***	***52.1***	***F***
2. Silverado Tr/SR 128-Sage Canyon Rd	16.8	C	3.9	A	17.5	C	4.0	A
Westbound (Sage Canyon Rd) Approach	********	***F***	*33.3*	*D*	********	***F***	*33.7*	*D*

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



nax144.ai 11/19

Traffic Impact Study for the Conn Creek Winery

Figure 3 – Existing plus Project and Future plus Project Traffic Volumes

Finding – The study intersections of Silverado Trail/SR 128-Conn Creek Road and Silverado Trail/SR 128-Sage Canyon Road would continue to operate at the same levels of service during both peak hours upon the addition of project related traffic as without it. For unsignalized intersections currently operating at LOS F, the impact is considered adverse if the project would generate ten percent or more of the traffic on that approach. Since the project is expected to generate zero new trips on Conn Creek Road at Silverado Trail during the p.m. peak hour, the impact is acceptable. Similarly, the project is not expected to generate any trips on the stop-controlled Sage Canyon Road approach during either peak hour, so the impact at that intersection is also acceptable.

Future plus Project Conditions

Upon the addition of project-generated traffic to the anticipated Future volumes, the study intersections are expected to continue operating at the same levels of service as under Future Conditions. The Future plus Project operating conditions are summarized in Table 11. Future plus Project traffic volumes are shown in Figure 3.

Table 11 – Future and Future plus Project Peak Hour Intersection Levels of Service

Study Intersection ***Approach***		**Future Conditions**				**Future plus Project**			
		PM Weekday Peak		**PM Weekend Peak**		**PM Weekday Peak**		**PM Weekend Peak**	
		Delay	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**
1.	Silverado Tr/SR 128-Conn Creek Rd	36.3	A	13.3	B	36.3	A	13.3	B
	Eastbound (Conn Creek Rd) Approach	********	***F***	********	***F***	********	***F***	********	***F***
2.	Silverado Tr/SR 128-Sage Canyon Rd	**55.1**	**F**	8.3	A	**60.2**	**F**	8.3	A
	Westbound (Sage Canyon Rd) Approach	********	***F***	***98.8***	***F***	********	***F***	***98.8***	***F***

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

Finding – Silverado Trail/SR 128-Sage Canyon Road will continue operating unacceptably with project traffic added, at the same Levels of Service as without it, during the weekday p.m. peak hour. The stop-controlled approaches of Silverado Trail/SR 128-Conn Creek Road and Silverado Trail/SR 128-Sage Canyon Road will continue operating unacceptably at LOS F during both peak hours with the project traffic added.

- The study intersection of Silverado Trail/SR 128-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 0.1 percent of the difference between future and existing volumes at Silverado Trail/SR 128-Conn Creek Road during the weekday p.m. peak hour and 0.4 percent of the difference during the weekend peak hour. This is considered an acceptable impact based on the County's standards.

- Similarly, the intersection of Silverado Trail/SR 128-Sage Canyon Road would operate unacceptably on the minor street approach at LOS F during both peak hours, without and with project-generated trips added. During the weekday p.m. peak hour, the intersection would continue to experience

unacceptable operation of LOS F overall. The project volumes represent 0.6 and 1.0 percent of the increase during the weekday and weekend peak hours respectively; as the project would add less than five percent to the difference between future and existing volumes at this intersection, this is considered an acceptable impact under the County's standards.

Roadway Segment Operation

Existing plus Project Conditions

Under Existing plus Project volumes, the study roadway segment is expected to continue operating at LOS E or better, which is consistent with County of Napa significance criteria. These results are summarized in Table 12.

Table 12 – Existing and Existing plus Project Peak Hour Roadway Segment Levels of Service

Study Segment Direction	Existing Conditions				Existing plus Project			
	PM Weekday Peak		PM Weekend Peak		PM Weekday Peak		PM Weekend Peak	
	PTSF (%)	LOS	PTSF (%)	LOS	PTSF (%)	LOS	PTSF (%)	LOS
Silverado Trail								
Southbound	80.4	E	63.7	C	80.4	E	63.8	C
Northbound	61.0	C	67.8	D	61.1	C	67.8	D

Notes: Speed is measured in miles per hour; LOS = Level of Service; PTSF = Percent Time Spent Following

Finding – The study roadway segment is expected to continue operating acceptably at the same levels of service upon the addition of project-generated traffic as without it.

Future plus Project Conditions

With project-generated traffic added to the anticipated Future volumes, the study roadway is expected to continue operating at the same levels of service as under Future Conditions. The southbound segment of Silverado Trail is expected to operate at an unacceptable LOS F during the weekday p.m. peak hour. The Future plus Project operating conditions are summarized in Table 13.

Table 13 – Future and Future plus Project Peak Hour Roadway Segment Levels of Service

Study Segment Direction	Future Conditions				Future plus Project			
	PM Weekday Peak		PM Weekend Peak		PM Weekday Peak		PM Weekend Peak	
	PTSF (%)	LOS	PTSF (%)	LOS	PTSF (%)	LOS	PTSF (%)	LOS
Silverado Trail								
Southbound	*	F	75.3	E	*	F	75.4	E
Northbound	63.0	C	69.9	D	63.0	C	69.9	D

Notes: Speed is measured in miles per hour; LOS = Level of Service; PTSF = Percent Time Spent Following; * = Volume exceeds capacity

Finding – The roadway segment is expected to continue operating at the same levels of service upon the addition of project-generated traffic. The southbound segment of Silverado Trail would continue to experience unacceptable LOS F operation during the weekday p.m. peak hour. The project would not add any new trips to the southbound direction during the weekday p.m. peak hour, which is an increase of zero percent. As this is less than five percent of the increase in traffic between the existing volumes and future volumes; this impact is considered acceptable under the County's standards.

Alternative Modes

Pedestrian Facilities

Given its rural location, lack of existing facilities, and the nature of the project site, project patrons are not expected to walk to the site.

Finding – The lack of pedestrian facilities serving the project site on Silverado Trail and Conn Creek Road is consistent with the surrounding area and adequate for the type of land use.

Bicycle Facilities

Silverado Trail has bike lanes and is a major regional route, providing direct access to the project site. The planned facilities in the countywide bicycle and pedestrian plan would further enhance access, providing a connection to the SR 29 corridor.

Finding – Bicycle facilities serving the project site are adequate and will improve upon the completion of the proposed facilities.

Transit

The winery has been operating acceptably with the lack of transit facilities; the proposed expansion would not be expected to generate new transit demand.

Finding – The lack of transit facilities serving the project site is adequate for the demand.

Travel Demand Analysis

Senate Bill (SB) 743 established a change in the metric to be applied to determining traffic impacts associated with development projects. Rather than the delay-based criteria associated with a Level of Service analysis, the increase in vehicle-miles-travelled (VMT) as a result of a project will be the basis for determining impacts once this new metric is fully vetted and adopted. While the County has not yet adopted a policy regarding vehicle miles traveled (VMT), project related VMT was estimated for informational purposes only. Vehicle miles traveled associated with the project were calculated by multiplying the estimated number of employee trips and the average home-to-work trip distance for the Traffic Analysis Zone (TAZ) in which the project is located. Using the daily trips generated for the proposed five additional full-time employees as determined using the County's winery trip generation form, and an average distance of 16.2 miles traveled per daily trip in the project's location as available from the Caltrans Statewide Travel Demand Model, the estimated VMT for the project is 243 vehicle miles traveled. These results are shown in Table 14.

Table 14 – VMT Summary			
Land Use	**Daily Employee Trips**	**Average Trip Length**	**Calculated Daily VMT**
Winery	15	16.2	243

Again, as VMT thresholds have not yet been established by the County of Napa there is no standard against which to measure the significance of this information.

Vehicle Trip Reduction

The project should promote carpooling of employees (by adjusting work schedules, etc.) as well as the availability of the County's Guaranteed Ride Home (GRH) program. The County has adopted several measures in the General Plan to reduce vehicle trips through Transportation Demand Management (TDM) strategies: "The project should support programs to reduce single occupant vehicle use and encourage alternative travel modes."

The winery should incorporate measures to reduce the dependence on single vehicle occupancy trips to reduce project related VMT. Given its rural location, non-vehicle travel options are limited as there are few nearby destinations, no nearby access to public transportation and no sidewalks near the site. Depending on the distance employees live from the winery, bicycling may be an option, especially since Silverado Trail includes bike lanes. The greatest potential for trip reduction for employees would be through encouragement of carpooling. Additionally, the project could provide lunch on-site to reduce off-site trips.

Trip reduction strategies would not be limited to the five new project-related employees but would be directed to all employees. Therefore, the potential trip reduction benefits and VMT reductions were estimated based on the total number of Conn Creek Winery employees. TDM measures that could benefit employees at Conn Creek include:

- **Carpool Incentives:** In non-metropolitan areas, carpooling is often the most effective trip reduction measure. Financial incentives can be an effective way to encourage employees to do so. The applicant could provide a financial incentive to employees who agree to carpool to work a minimum of 50 percent of the time. This program could be offered to all project-related employees as well as existing winery employees.

- **Active Transportation Incentives:** Similarly, financial incentives could be provided to project-related and existing employees who agree to walk or bicycle to work a minimum of 50 percent of the time.

- **Guaranteed Ride Home:** One of the reasons that many employees do not carpool or commute via alternative modes 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. Napa Valley Transportation Authority's (NVTA) V Commute program includes a Guaranteed Ride Home program to enable employees who carpool or commute via alternative modes to be reimbursed for the cost of a taxi, rental car, Lyft, Uber, or other means to get home in an emergency and are reimbursed for the full cost of the service. Employees should be provided information about V-Commute and encouraged to register for this service.

Employee VMT Reduction

The expected VMT reductions associated with the various TDM measures were estimated based on information published in the California Air Pollution Officers Association (CAPCOA) report *Quantifying Greenhouse Gas Mitigation Measures*, CAPCOA, 2010, the location of the project site, and knowledge of transportation characteristics of Napa County.

CAPCOA estimates that the inclusion of voluntary commute trip reduction measures with incentives can reduce a project's VMT by approximately 1.0 to 6.2 percent; since Conn Creek would have only 20 full-time employees and one part-time employee (including those added by the project), inducing one employee to use an alternative transportation mode would result in a VMT reduction of just under five percent. This would place the program within the estimates established by CAPCOA and results in a readily achievable goal.

Based on the total of project-related and existing employees, the would be an estimated 63 employee trips per day associated with Conn Creek Winery. Applying the average trip length of 16.2 miles, this results in an employee VMT of 1,021 miles. Since the County's trip generation form estimates that each employee makes an average of three trips per day, each employee that would be induced to use a non-vehicle mode of transportation would yield a reduction of 48 VMT per day or 4.8 percent.

Recommendation – 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. On-site lunches could also be provided to employees to reduce off-site trips.

Recommendation – 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. On-site lunches could also be provided to employees to reduce off-site trips.

Conclusions and Recommendations

Conclusions

- The project is expected to generate 15 new trips per day on both the typical weekday and weekend day. This would include five trips during the weekday p.m. peak hour and four trips during the weekend peak hour.

- The intersection of Silverado Trail/SR 128-Conn Creek Road is currently operating unacceptably at LOS F on the minor street approach during both peak periods. Upon the addition of project-related traffic, this intersection is expected to continue to operate unacceptably. As the project would be responsible for less than ten percent of the total peak hour volumes on this approach, under the County's significance criteria, the impact is considered acceptable.

- Silverado Trail/SR 128-Conn Creek Road would be expected to continue operating unacceptably in the future on the minor street approach without and with the addition of project-related traffic. Since the project-related traffic is expected to be less than five percent of the total volume on this approach, the impact is considered acceptable.

- The stop-controlled Sage Canyon Road approach to Silverado Trail is currently operating at LOS F on during the weekday p.m. peak hour and at LOS D during the weekend peak hour. Upon the addition of project-related traffic to this intersection, this approach would be expected to remain at the same LOS during both peak hours. For the weekday peak hour, since the project would be responsible for less than ten percent of the total peak hour volumes on the stop-controlled westbound approach, the impact is considered acceptable.

- Under Future Conditions for Silverado Trail/SR 128-Sage Canyon Road, the stop-controlled Sage Canyon Road approach would be expected to operate at LOS F during both peak hours, without and with the addition of project-related traffic. Since the project would contribute less than five percent of the anticipated difference between existing and future volumes, the impact is considered acceptable under the County's criteria.

- Under Existing conditions, the study roadway segment is operating at LOS E or better for both the weekday p.m. peak hour and the weekend peak hour, which is considered acceptable under the County's policy. The study roadway segment is expected to continue operating at the same acceptable levels of service with the addition of project-generated trips to existing volumes.

- Under Future Conditions, southbound Silverado Trail is expected to operate at LOS F during the weekday p.m. peak hour, and it is expected to continue to operate unacceptably with the addition of project-related traffic. Since the project would contribute less than five percent of the anticipated difference between existing and future volumes, the impact is considered acceptable under the County's criteria. The southbound study segment is expected to operate at LOS E during the weekend peak hour, which is considered acceptable, and it is expected to continue to operate acceptably with the addition of project-related traffic.

- Northbound Silverado Trail is expected to operate at LOS C or D under Future Conditions during both the weekday p.m. peak hour and the weekend peak hour, which is considered acceptable. With the addition of project-related traffic, the northbound segment is expected to continue operating acceptably during both peak hours.

- Pedestrian, bicycle, and transit facilities are adequate to serve the anticipated demand.

Recommendations

- The applicant should establish an employee carpooling plan to reduce vehicle trips by promoting employee carpooling and providing employees with information regarding related County programs and services. On-site lunches could also be provided to employees to reduce off-site trips.

Study Participants and References

Study Participants

Principal in Charge	Dalene J. Whitlock, PE, PTOE
Transportation Planner	Barry Bergman, AICP
Assistant Engineer	Allison Woodworth, EIT
Graphics	Katia Wolfe
Editing/Formatting	Alex Scrobonia, Hannah Yung-Boxdell
Quality Control	Dalene J. Whitlock, PE, PTOE

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NAX144

Appendix A

Count Data

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Prepared by NDS/ATD

VOLUME

Silverado Trail Bet. Sage Canyon Rd & Conn Creek Rd

Day: Friday
Date: 10/18/2019

City: St Helena
Project #: CA19_8529_001

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	7,944	7,414	15,358

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			15		6		21		12:00			122		129		251	
00:15			9		6		15		12:15			106		115		221	
00:30			9		12		21		12:30			90		125		215	
00:45			4	37	6	30	10	67	12:45			128	446	146	515	274	961
01:00			5		12		17		13:00			104		112		216	
01:15			5		10		15		13:15			141		117		258	
01:30			8		11		19		13:30			124		124		248	
01:45			9	27	15	48	24	75	13:45			130	499	149	502	279	1001
02:00			6		5		11		14:00			129		112		241	
02:15			9		19		28		14:15			140		123		263	
02:30			7		4		11		14:30			189		111		300	
02:45			12	34	8	36	20	70	14:45			194	652	121	467	315	1119
03:00			11		5		16		15:00			267		136		403	
03:15			16		11		27		15:15			279		130		409	
03:30			20		17		37		15:30			275		115		390	
03:45			9	56	17	50	26	106	15:45			280	1101	136	517	416	1618
04:00			3		10		13		16:00			271		111		382	
04:15			20		4		24		16:15			305		105		410	
04:30			14		15		29		16:30			301		125		426	
04:45			7	44	19	48	26	92	16:45			235	1112	101	442	336	1554
05:00			14		15		29		17:00			227		124		351	
05:15			20		36		56		17:15			220		109		329	
05:30			32		66		98		17:30			237		130		367	
05:45			42	108	79	196	121	304	17:45			161	845	106	469	267	1314
06:00			22		97		119		18:00			142		91		233	
06:15			44		132		176		18:15			137		62		199	
06:30			45		141		186		18:30			96		54		150	
06:45			58	169	156	526	214	695	18:45			82	457	57	264	139	721
07:00			51		99		150		19:00			68		45		113	
07:15			81		114		195		19:15			71		36		107	
07:30			93		143		236		19:30			54		42		96	
07:45			75	300	159	515	234	815	19:45			49	242	40	163	89	405
08:00			71		122		193		20:00			30		42		72	
08:15			78		177		255		20:15			30		42		72	
08:30			72		182		254		20:30			23		21		44	
08:45			84	305	202	683	286	988	20:45			26	109	21	126	47	235
09:00			66		169		235		21:00			26		28		54	
09:15			94		180		274		21:15			27		24		51	
09:30			74		158		232		21:30			27		19		46	
09:45			79	313	144	651	223	964	21:45			35	115	25	96	60	211
10:00			86		128		214		22:00			28		21		49	
10:15			91		117		208		22:15			11		17		28	
10:30			102		101		203		22:30			23		13		36	
10:45			96	375	110	456	206	831	22:45			14	76	14	65	28	141
11:00			118		122		240		23:00			38		6		44	
11:15			108		129		237		23:15			18		10		28	
11:30			93		144		237		23:30			32		9		41	
11:45			105	424	123	518	228	942	23:45			10	98	6	31	16	129
TOTALS				2192		3757		5949	TOTALS				5752		3657		9409
SPLIT %				36.8%		63.2%		38.7%	SPLIT %				61.1%		38.9%		61.3%

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	7,944	7,414	15,358

AM Peak Hour			11:15	08:30	08:30	PM Peak Hour			15:45	15:00	15:45
AM Pk Volume			428	733	1049	PM Pk Volume			1157	517	1634
Pk Hr Factor			0.877	0.907	0.917	Pk Hr Factor			0.948	0.950	0.959
7 - 9 Volume	0	0	605	1198	1803	4 - 6 Volume	0	0	1957	911	2868
7 - 9 Peak Hour			07:15	08:00	08:00	4 - 6 Peak Hour			16:00	17:00	16:00
7 - 9 Pk Volume	0	0	320	683	988	4 - 6 Pk Volume	0	0	1112	469	1554
Pk Hr Factor	0.000	0.000	0.860	0.845	0.864	Pk Hr Factor	0.000	0.000	0.911	0.902	0.912

Prepared by NDS/ATD

VOLUME

Silverado Trail Bet. Sage Canyon Rd & Conn Creek Rd

Day: Saturday
Date: 10/19/2019

City: St Helena
Project #: CA19_8529_001

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	7,061	6,542	13,603

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			14		8		22		12:00			120		196		316	
00:15			12		14		26		12:15			122		158		280	
00:30			7		11		18		12:30			119		158		277	
00:45			6	39	7	40	13	79	12:45			131	492	168	680	299	1172
01:00			3		10		13		13:00			118		164		282	
01:15			5		5		10		13:15			133		186		319	
01:30			14		4		18		13:30			125		183		308	
01:45			16	38	6	25	22	63	13:45			127	503	166	699	293	1202
02:00			8		8		16		14:00			138		175		313	
02:15			2		10		12		14:15			160		145		305	
02:30			6		4		10		14:30			155		190		345	
02:45			4	20	3	25	7	45	14:45			177	630	137	647	314	1277
03:00			6		5		11		15:00			188		156		344	
03:15			2		7		9		15:15			196		121		317	
03:30			5		9		14		15:30			213		127		340	
03:45			5	18	3	24	8	42	15:45			244	841	114	518	358	1359
04:00			3		4		7		16:00			225		100		325	
04:15			0		3		3		16:15			257		102		359	
04:30			4		16		20		16:30			208		93		301	
04:45			15	22	9	32	24	54	16:45			245	935	98	393	343	1328
05:00			10		12		22		17:00			252		81		333	
05:15			12		17		29		17:15			224		72		296	
05:30			21		43		64		17:30			215		60		275	
05:45			32	75	38	110	70	185	17:45			200	891	68	281	268	1172
06:00			21		64		85		18:00			193		53		246	
06:15			24		70		94		18:15			139		52		191	
06:30			33		78		111		18:30			139		50		189	
06:45			30	108	69	281	99	389	18:45			94	565	45	200	139	765
07:00			43		40		83		19:00			62		38		100	
07:15			39		53		92		19:15			49		30		79	
07:30			30		48		78		19:30			40		28		68	
07:45			42	154	67	208	109	362	19:45			44	195	20	116	64	311
08:00			38		39		77		20:00			30		21		51	
08:15			50		70		120		20:15			28		28		56	
08:30			34		78		112		20:30			32		36		68	
08:45			34	156	115	302	149	458	20:45			42	132	29	114	71	246
09:00			49		87		136		21:00			31		28		59	
09:15			54		127		181		21:15			21		29		50	
09:30			66		118		184		21:30			25		18		43	
09:45			83	252	147	479	230	731	21:45			34	111	27	102	61	213
10:00			82		106		188		22:00			29		14		43	
10:15			83		110		193		22:15			38		27		65	
10:30			87		110		197		22:30			26		18		44	
10:45			75	327	119	445	194	772	22:45			24	117	27	86	51	203
11:00			77		126		203		23:00			26		16		42	
11:15			81		179		260		23:15			18		17		35	
11:30			98		193		291		23:30			29		12		41	
11:45			93	349	184	682	277	1031	23:45			18	91	8	53	26	144
TOTALS				1558		2653		4211	TOTALS				5503		3889		9392
SPLIT %				37.0%		63.0%		31.0%	SPLIT %				58.6%		41.4%		69.0%

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	7,061	6,542	13,603

AM Peak Hour			11:45	11:15	11:30	PM Peak Hour			16:15	13:15	15:30
AM Pk Volume			454	752	1164	PM Pk Volume			962	710	1382
Pk Hr Factor			0.930	0.959	0.921	Pk Hr Factor			0.936	0.954	0.962
7 - 9 Volume	0	0	310	510	820	4 - 6 Volume	0	0	1826	674	2500
7 - 9 Peak Hour			07:45	08:00	08:00	4 - 6 Peak Hour			16:15	16:00	16:15
7 - 9 Pk Volume	0	0	164	302	458	4 - 6 Pk Volume	0	0	962	393	1336
Pk Hr Factor	0.000	0.000	0.820	0.657	0.768	Pk Hr Factor	0.000	0.000	0.936	0.963	0.930

Prepared by NDS/ATD

VOLUME

Silverado Trail Bet. Sage Canyon Rd & Conn Creek Rd

Day: Sunday
Date: 10/20/2019

City: St Helena
Project #: CA19_8529_001

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	4,665	3,987	8,652

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			16		9		25		12:00			76		102		178	
00:15			12		7		19		12:15			89		75		164	
00:30			12		2		14		12:30			84		103		187	
00:45			17	57	4	22	21	79	12:45			88	337	109	389	197	726
01:00			15		6		21		13:00			92		95		187	
01:15			7		7		14		13:15			107		94		201	
01:30			9		3		12		13:30			122		117		239	
01:45			11	42	4	20	15	62	13:45			99	420	98	404	197	824
02:00			6		3		9		14:00			112		106		218	
02:15			4		2		6		14:15			140		86		226	
02:30			4		2		6		14:30			119		84		203	
02:45			3	17	1	8	4	25	14:45			137	508	105	381	242	889
03:00			4		1		5		15:00			112		76		188	
03:15			7		0		7		15:15			137		70		207	
03:30			3		2		5		15:30			146		72		218	
03:45			4	18	5	8	9	26	15:45			139	534	71	289	210	823
04:00			2		6		8		16:00			107		54		161	
04:15			3		1		4		16:15			135		53		188	
04:30			1		5		6		16:30			158		82		240	
04:45			4	10	7	19	11	29	16:45			133	533	63	252	196	785
05:00			9		6		15		17:00			131		67		198	
05:15			7		9		16		17:15			127		63		190	
05:30			9		21		30		17:30			125		59		184	
05:45			7	32	18	54	25	86	17:45			117	500	67	256	184	756
06:00			12		16		28		18:00			90		38		128	
06:15			19		28		47		18:15			86		50		136	
06:30			18		35		53		18:30			71		40		111	
06:45			16	65	36	115	52	180	18:45			55	302	30	158	85	460
07:00			21		22		43		19:00			54		37		91	
07:15			16		28		44		19:15			50		19		69	
07:30			23		36		59		19:30			38		28		66	
07:45			18	78	41	127	59	205	19:45			38	180	35	119	73	299
08:00			13		30		43		20:00			26		22		48	
08:15			27		29		56		20:15			34		44		78	
08:30			24		56		80		20:30			23		36		59	
08:45			27	91	75	190	102	281	20:45			18	101	18	120	36	221
09:00			24		68		92		21:00			21		25		46	
09:15			35		58		93		21:15			12		13		25	
09:30			38		49		87		21:30			16		15		31	
09:45			47	144	68	243	115	387	21:45			16	65	11	64	27	129
10:00			58		53		111		22:00			17		19		36	
10:15			46		68		114		22:15			13		15		28	
10:30			60		75		135		22:30			19		17		36	
10:45			53	217	101	297	154	514	22:45			12	61	10	61	22	122
11:00			65		76		141		23:00			21		6		27	
11:15			64		103		167		23:15			23		8		31	
11:30			62		83		145		23:30			14		3		17	
11:45			90	281	104	366	194	647	23:45			14	72	8	25	22	97
TOTALS				1052		1469		2521	TOTALS				3613		2518		6131
SPLIT %				41.7%		58.3%		29.1%	SPLIT %				58.9%		41.1%		70.9%

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	4,665	3,987	8,652

AM Peak Hour			11:45	11:15	11:45	PM Peak Hour			16:15	12:45	14:00
AM Pk Volume			339	392	723	PM Pk Volume			557	415	889
Pk Hr Factor			0.942	0.942	0.932	Pk Hr Factor			0.881	0.887	0.918
7 - 9 Volume	0	0	169	317	486	4 - 6 Volume	0	0	1033	508	1541
7 - 9 Peak Hour			08:00	08:00	08:00	4 - 6 Peak Hour			16:15	16:30	16:30
7 - 9 Pk Volume	0	0	91	190	281	4 - 6 Pk Volume	0	0	557	275	824
Pk Hr Factor	0.000	0.000	0.843	0.633	0.689	Pk Hr Factor	0.000	0.000	0.881	0.838	0.858

Prepared by NDS/ATD

VOLUME

Silverado Trail Bet. Sage Canyon Rd & Conn Creek Rd

Day: Monday
Date: 10/21/2019

City: St Helena
Project #: CA19_8529_001

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	6,766	6,097	12,863

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			11		7		18		12:00			102		113		215	
00:15			7		7		14		12:15			108		109		217	
00:30			9		7		16		12:30			91		84		175	
00:45			10	37	7	28	17	65	12:45			88	389	94	400	182	789
01:00			4		4		8		13:00			80		88		168	
01:15			6		7		13		13:15			133		103		236	
01:30			11		3		14		13:30			109		93		202	
01:45			4	25	3	17	7	42	13:45			103	425	94	378	197	803
02:00			4		5		9		14:00			136		69		205	
02:15			7		5		12		14:15			116		84		200	
02:30			3		12		15		14:30			144		89		233	
02:45			3	17	7	29	10	46	14:45			151	547	105	347	256	894
03:00			6		7		13		15:00			191		95		286	
03:15			6		9		15		15:15			168		96		264	
03:30			7		11		18		15:30			243		83		326	
03:45			5	24	9	36	14	60	15:45			254	856	94	368	348	1224
04:00			12		6		18		16:00			201		99		300	
04:15			10		10		20		16:15			204		103		307	
04:30			19		22		41		16:30			224		69		293	
04:45			28	69	22	60	50	129	16:45			201	830	89	360	290	1190
05:00			12		12		24		17:00			213		89		302	
05:15			16		32		48		17:15			207		78		285	
05:30			21		55		76		17:30			185		73		258	
05:45			46	95	71	170	117	265	17:45			142	747	70	310	212	1057
06:00			41		90		131		18:00			135		63		198	
06:15			61		140		201		18:15			122		54		176	
06:30			56		160		216		18:30			73		58		131	
06:45			57	215	163	553	220	768	18:45			69	399	37	212	106	611
07:00			52		142		194		19:00			54		28		82	
07:15			93		140		233		19:15			47		21		68	
07:30			102		140		242		19:30			43		40		83	
07:45			41	288	159	581	200	869	19:45			31	175	20	109	51	284
08:00			76		137		213		20:00			19		22		41	
08:15			71		153		224		20:15			27		28		55	
08:30			95		161		256		20:30			31		24		55	
08:45			108	350	180	631	288	981	20:45			21	98	33	107	54	205
09:00			63		98		161		21:00			14		31		45	
09:15			82		149		231		21:15			18		22		40	
09:30			64		138		202		21:30			14		9		23	
09:45			62	271	122	507	184	778	21:45			22	68	11	73	33	141
10:00			71		106		177		22:00			15		12		27	
10:15			92		75		167		22:15			20		18		38	
10:30			92		89		181		22:30			21		13		34	
10:45			104	359	89	359	193	718	22:45			22	78	5	48	27	126
11:00			76		110		186		23:00			20		8		28	
11:15			73		99		172		23:15			17		6		23	
11:30			88		89		177		23:30			20		9		29	
11:45			101	338	87	385	188	723	23:45			9	66	6	29	15	95
TOTALS				2088		3356		**5444**	**TOTALS**				4678		2741		**7419**
SPLIT %				38.4%		61.6%		**42.3%**	**SPLIT %**				63.1%		36.9%		**57.7%**

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	6,766	6,097	12,863

AM Peak Hour			11:45	08:00	**08:00**	**PM Peak Hour**			15:30	12:00	**15:30**
AM Pk Volume			402	631	**981**	**PM Pk Volume**			902	400	**1281**
Pk Hr Factor			0.931	0.876	**0.852**	**Pk Hr Factor**			0.888	0.885	**0.920**
7 - 9 Volume	0	0	638	1212	**1850**	**4 - 6 Volume**	0	0	1577	670	**2247**
7 - 9 Peak Hour			08:00	08:00	**08:00**	**4 - 6 Peak Hour**			16:30	16:00	**16:15**
7 - 9 Pk Volume	0	0	350	631	**981**	**4 - 6 Pk Volume**	0	0	845	360	**1192**
Pk Hr Factor	0.000	0.000	0.810	0.876	**0.852**	**Pk Hr Factor**	0.000	0.000	0.943	0.874	**0.971**

Prepared by NDS/ATD

VOLUME

Silverado Trail Bet. Sage Canyon Rd & Conn Creek Rd

Day: Tuesday
Date: 10/22/2019

City: St Helena
Project #: CA19_8529_001

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	6,945	6,267	13,212

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			5		5		10		12:00			94		104		198	
00:15			3		8		11		12:15			121		95		216	
00:30			12		6		18		12:30			97		95		192	
00:45			4	24	4	23	8	47	12:45			108	420	122	416	230	836
01:00			1		8		9		13:00			106		61		167	
01:15			5		7		12		13:15			138		68		206	
01:30			4		5		9		13:30			106		88		194	
01:45			5	15	6	26	11	41	13:45			100	450	93	310	193	760
02:00			6		8		14		14:00			108		86		194	
02:15			6		4		10		14:15			150		97		247	
02:30			9		5		14		14:30			140		106		246	
02:45			6	27	7	24	13	51	14:45			150	548	109	398	259	946
03:00			11		7		18		15:00			185		108		293	
03:15			5		10		15		15:15			175		83		258	
03:30			8		15		23		15:30			274		115		389	
03:45			11	35	11	43	22	78	15:45			255	889	111	417	366	1306
04:00			8		17		25		16:00			204		78		282	
04:15			9		16		25		16:15			162		86		248	
04:30			10		22		32		16:30			215		86		301	
04:45			18	45	23	78	41	123	16:45			185	766	82	332	267	1098
05:00			26		10		36		17:00			219		85		304	
05:15			27		31		58		17:15			243		78		321	
05:30			40		43		83		17:30			165		79		244	
05:45			35	128	85	169	120	297	17:45			172	799	77	319	249	1118
06:00			44		85		129		18:00			133		76		209	
06:15			62		142		204		18:15			109		46		155	
06:30			65		157		222		18:30			98		45		143	
06:45			29	200	184	568	213	768	18:45			73	413	41	208	114	621
07:00			85		138		223		19:00			66		33		99	
07:15			73		125		198		19:15			60		35		95	
07:30			66		142		208		19:30			36		34		70	
07:45			74	298	164	569	238	867	19:45			38	200	31	133	69	333
08:00			75		146		221		20:00			27		24		51	
08:15			81		170		251		20:15			28		35		63	
08:30			93		184		277		20:30			24		25		49	
08:45			86	335	165	665	251	1000	20:45			18	97	18	102	36	199
09:00			72		151		223		21:00			16		22		38	
09:15			87		139		226		21:15			17		22		39	
09:30			94		138		232		21:30			14		13		27	
09:45			71	324	111	539	182	863	21:45			24	71	15	72	39	143
10:00			86		113		199		22:00			27		15		42	
10:15			100		99		199		22:15			26		19		45	
10:30			94		78		172		22:30			24		15		39	
10:45			84	364	95	385	179	749	22:45			13	90	11	60	24	150
11:00			72		92		164		23:00			22		11		33	
11:15			84		73		157		23:15			21		11		32	
11:30			87		105		192		23:30			27		10		37	
11:45			81	324	101	371	182	695	23:45			13	83	8	40	21	123
TOTALS				2119		3460		**5579**	**TOTALS**				4826		2807		**7633**
SPLIT %				38.0%		62.0%		**42.2%**	**SPLIT %**				63.2%		36.8%		**57.8%**

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	6,945	6,267	13,212

AM Peak Hour				11:45		08:15		**08:15**	**PM Peak Hour**				15:15		14:15		**15:00**
AM Pk Volume				393		670		**1002**	**PM Pk Volume**				908		420		**1306**
Pk Hr Factor				0.812		0.910		**0.904**	**Pk Hr Factor**				0.828		0.963		**0.839**
7 - 9 Volume	0	0		633		1234		**1867**	**4 - 6 Volume**	0	0		1565		651		**2216**
7 - 9 Peak Hour				08:00		08:00		**08:00**	**4 - 6 Peak Hour**				16:30		16:15		**16:30**
7 - 9 Pk Volume	0	0		335		665		**1000**	**4 - 6 Pk Volume**	0	0		862		339		**1193**
Pk Hr Factor	0.000	0.000		0.901		0.904		**0.903**	**Pk Hr Factor**	0.000	0.000		0.887		0.985		**0.929**

Prepared by NDS/ATD

VOLUME

Silverado Trail Bet. Sage Canyon Rd & Conn Creek Rd

Day: Wednesday
Date: 10/23/2019

City: St Helena
Project #: CA19_8529_001

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	6,662	6,557	13,219

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			9		8		17		12:00			84		77		161	
00:15			5		5		10		12:15			84		101		185	
00:30			14		8		22		12:30			136		90		226	
00:45			10	38	4	25	14	63	12:45			90	394	76	344	166	738
01:00			6		7		13		13:00			111		99		210	
01:15			7		3		10		13:15			134		90		224	
01:30			4		8		12		13:30			94		110		204	
01:45			2	19	8	26	10	45	13:45			127	466	74	373	201	839
02:00			0		8		8		14:00			113		91		204	
02:15			11		8		19		14:15			102		94		196	
02:30			22		15		37		14:30			153		105		258	
02:45			19	52	5	36	24	88	14:45			169	537	78	368	247	905
03:00			9		8		17		15:00			201		95		296	
03:15			6		11		17		15:15			217		81		298	
03:30			8		6		14		15:30			255		90		345	
03:45			10	33	3	28	13	61	15:45			221	894	104	370	325	1264
04:00			7		14		21		16:00			225		58		283	
04:15			10		8		18		16:15			237		100		337	
04:30			11		23		34		16:30			211		107		318	
04:45			14	42	19	64	33	106	16:45			228	901	82	347	310	1248
05:00			10		15		25		17:00			212		73		285	
05:15			15		27		42		17:15			192		71		263	
05:30			32		63		95		17:30			187		84		271	
05:45			38	95	88	193	126	288	17:45			183	774	78	306	261	1080
06:00			30		99		129		18:00			117		66		183	
06:15			55		135		190		18:15			83		54		137	
06:30			51		167		218		18:30			86		45		131	
06:45			29	165	168	569	197	734	18:45			65	351	48	213	113	564
07:00			40		117		157		19:00			47		32		79	
07:15			46		129		175		19:15			49		37		86	
07:30			36		138		174		19:30			36		33		69	
07:45			42	164	126	510	168	674	19:45			21	153	27	129	48	282
08:00			43		147		190		20:00			26		33		59	
08:15			50		193		243		20:15			37		18		55	
08:30			79		244		323		20:30			23		25		48	
08:45			83	255	269	853	352	1108	20:45			21	107	34	110	55	217
09:00			80		243		323		21:00			31		13		44	
09:15			98		179		277		21:15			17		20		37	
09:30			86		164		250		21:30			22		19		41	
09:45			56	320	148	734	204	1054	21:45			19	89	11	63	30	152
10:00			82		122		204		22:00			32		17		49	
10:15			83		113		196		22:15			11		21		32	
10:30			62		98		160		22:30			19		14		33	
10:45			99	326	84	417	183	743	22:45			22	84	13	65	35	149
11:00			64		108		172		23:00			24		5		29	
11:15			70		93		163		23:15			23		13		36	
11:30			113		92		205		23:30			14		10		24	
11:45			80	327	84	377	164	704	23:45			15	76	9	37	24	113
TOTALS				1836		3832		**5668**	**TOTALS**				4826		2725		**7551**
SPLIT %				32.4%		67.6%		**42.9%**	**SPLIT %**				63.9%		36.1%		**57.1%**

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	6,662	6,557	13,219

AM Peak Hour			11:45	08:15	**08:30**	**PM Peak Hour**			15:30	12:45	**15:30**
AM Pk Volume			384	949	**1275**	**PM Pk Volume**			938	375	**1290**
Pk Hr Factor			0.706	0.882	**0.906**	**Pk Hr Factor**			0.920	0.852	**0.935**
7 - 9 Volume	0	0	419	1363	**1782**	**4 - 6 Volume**	0	0	1675	653	**2328**
7 - 9 Peak Hour			08:00	08:00	**08:00**	**4 - 6 Peak Hour**			16:00	16:15	**16:15**
7 - 9 Pk Volume	0	0	255	853	**1108**	**4 - 6 Pk Volume**	0	0	901	362	**1250**
Pk Hr Factor	0.000	0.000	0.768	0.793	**0.787**	**Pk Hr Factor**	0.000	0.000	0.950	0.846	**0.927**

Prepared by NDS/ATD

VOLUME

Silverado Trail Bet. Sage Canyon Rd & Conn Creek Rd

Day: Thursday
Date: 10/24/2019

City: St Helena
Project #: CA19_8529_001

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	6,785	6,138	12,923

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			14		4		18		12:00			74		88		162	
00:15			14		5		19		12:15			89		84		173	
00:30			10		6		16		12:30			107		92		199	
00:45			5	43	4	19	9	62	12:45			103	373	75	339	178	712
01:00			5		7		12		13:00			97		78		175	
01:15			5		10		15		13:15			112		105		217	
01:30			5		3		8		13:30			124		94		218	
01:45			12	27	8	28	20	55	13:45			100	433	82	359	182	792
02:00			6		8		14		14:00			100		80		180	
02:15			3		9		12		14:15			140		90		230	
02:30			2		6		8		14:30			185		94		279	
02:45			6	17	3	26	9	43	14:45			143	568	111	375	254	943
03:00			12		5		17		15:00			152		111		263	
03:15			7		8		15		15:15			194		98		292	
03:30			18		5		23		15:30			203		105		308	
03:45			7	44	11	29	18	73	15:45			192	741	104	418	296	1159
04:00			15		11		26		16:00			215		109		324	
04:15			4		14		18		16:15			202		97		299	
04:30			11		25		36		16:30			195		95		290	
04:45			17	47	26	76	43	123	16:45			205	817	86	387	291	1204
05:00			14		17		31		17:00			195		74		269	
05:15			15		38		53		17:15			217		107		324	
05:30			35		57		92		17:30			184		73		257	
05:45			25	89	74	186	99	275	17:45			156	752	90	344	246	1096
06:00			37		85		122		18:00			112		47		159	
06:15			52		155		207		18:15			121		47		168	
06:30			53		142		195		18:30			73		46		119	
06:45			59	201	169	551	228	752	18:45			73	379	49	189	122	568
07:00			56		106		162		19:00			61		35		96	
07:15			75		125		200		19:15			48		27		75	
07:30			79		136		215		19:30			45		34		79	
07:45			80	290	155	522	235	812	19:45			39	193	30	126	69	319
08:00			79		125		204		20:00			36		33		69	
08:15			73		187		260		20:15			37		47		84	
08:30			85		153		238		20:30			23		24		47	
08:45			84	321	156	621	240	942	20:45			36	132	26	130	62	262
09:00			76		124		200		21:00			26		28		54	
09:15			87		117		204		21:15			17		25		42	
09:30			103		135		238		21:30			24		15		39	
09:45			86	352	135	511	221	863	21:45			23	90	15	83	38	173
10:00			69		82		151		22:00			20		19		39	
10:15			90		89		179		22:15			15		18		33	
10:30			84		110		194		22:30			13		10		23	
10:45			98	341	88	369	186	710	22:45			17	65	14	61	31	126
11:00			101		84		185		23:00			16		13		29	
11:15			90		89		179		23:15			35		10		45	
11:30			100		83		183		23:30			17		7		24	
11:45			101	392	98	354	199	746	23:45			10	78	5	35	15	113
TOTALS				2164		3292		**5456**	**TOTALS**				4621		2846		**7467**
SPLIT %				39.7%		60.3%		**42.2%**	**SPLIT %**				61.9%		38.1%		**57.8%**

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	6,785	6,138	12,923

AM Peak Hour			11:00	08:00	**08:00**	**PM Peak Hour**			16:00	14:45	**15:30**
AM Pk Volume			392	621	**942**	**PM Pk Volume**			817	425	**1227**
Pk Hr Factor			0.970	0.830	**0.906**	**Pk Hr Factor**			0.950	0.957	**0.947**
7 - 9 Volume	0	0	611	1143	**1754**	**4 - 6 Volume**	0	0	1569	731	**2300**
7 - 9 Peak Hour			08:00	08:00	**08:00**	**4 - 6 Peak Hour**			16:00	16:00	**16:00**
7 - 9 Pk Volume	0	0	321	621	**942**	**4 - 6 Pk Volume**	0	0	817	387	**1204**
Pk Hr Factor	0.000	0.000	0.944	0.830	**0.906**	**Pk Hr Factor**	0.000	0.000	0.950	0.888	**0.929**

Prepared by NDS/ATD

VOLUME

Silverado Trail Bet. Sage Canyon Rd & Conn Creek Rd

Day: Friday
Date: 10/25/2019

City: St Helena
Project #: CA19_8529_001

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	7,681	6,876	14,557

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			17		8		25		12:00			108		129		237	
00:15			11		9		20		12:15			121		111		232	
00:30			11		6		17		12:30			109		137		246	
00:45			4	43	7	30	11	73	12:45			140	478	127	504	267	982
01:00			7		8		15		13:00			120		113		233	
01:15			10		13		23		13:15			141		101		242	
01:30			11		5		16		13:30			121		117		238	
01:45			15	43	8	34	23	77	13:45			140	522	124	455	264	977
02:00			9		7		16		14:00			151		97		248	
02:15			10		2		12		14:15			180		138		318	
02:30			10		7		17		14:30			160		88		248	
02:45			8	37	2	18	10	55	14:45			161	652	117	440	278	1092
03:00			8		9		17		15:00			170		122		292	
03:15			12		15		27		15:15			205		118		323	
03:30			11		14		25		15:30			289		128		417	
03:45			7	38	14	52	21	90	15:45			295	959	126	494	421	1453
04:00			9		13		22		16:00			291		101		392	
04:15			4		11		15		16:15			261		100		361	
04:30			12		14		26		16:30			235		68		303	
04:45			6	31	26	64	32	95	16:45			228	1015	79	348	307	1363
05:00			10		24		34		17:00			214		96		310	
05:15			23		26		49		17:15			217		103		320	
05:30			35		58		93		17:30			240		102		342	
05:45			32	100	92	200	124	300	17:45			196	867	97	398	293	1265
06:00			28		83		111		18:00			157		67		224	
06:15			56		117		173		18:15			111		60		171	
06:30			62		179		241		18:30			96		51		147	
06:45			47	193	166	545	213	738	18:45			68	432	52	230	120	662
07:00			70		108		178		19:00			71		45		116	
07:15			61		118		179		19:15			62		35		97	
07:30			66		148		214		19:30			47		28		75	
07:45			90	287	167	541	257	828	19:45			40	220	30	138	70	358
08:00			73		115		188		20:00			27		30		57	
08:15			92		151		243		20:15			28		30		58	
08:30			79		182		261		20:30			31		32		63	
08:45			74	318	186	634	260	952	20:45			38	124	29	121	67	245
09:00			86		155		241		21:00			28		41		69	
09:15			69		145		214		21:15			30		12		42	
09:30			87		142		229		21:30			16		18		34	
09:45			81	323	131	573	212	896	21:45			25	99	24	95	49	194
10:00			84		122		206		22:00			27		21		48	
10:15			85		94		179		22:15			30		23		53	
10:30			86		95		181		22:30			31		20		51	
10:45			91	346	126	437	217	783	22:45			32	120	12	76	44	196
11:00			59		104		163		23:00			26		14		40	
11:15			96		90		186		23:15			30		18		48	
11:30			94		97		191		23:30			21		14		35	
11:45			89	338	100	391	189	729	23:45			19	96	12	58	31	154
TOTALS				2097		3519		**5616**	**TOTALS**				5584		3357		**8941**
SPLIT %				37.3%		62.7%		**38.6%**	**SPLIT %**				62.5%		37.5%		**61.4%**

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	7,681	6,876	14,557

AM Peak Hour			11:45	08:15	**08:15**	**PM Peak Hour**			15:30	12:00	**15:30**
AM Pk Volume			427	674	**1005**	**PM Pk Volume**			1136	504	**1591**
Pk Hr Factor			0.882	0.906	**0.963**	**Pk Hr Factor**			0.963	0.920	**0.945**
7 - 9 Volume	0	0	605	1175	**1780**	**4 - 6 Volume**	0	0	1882	746	**2628**
7 - 9 Peak Hour			07:45	08:00	**08:00**	**4 - 6 Peak Hour**			16:00	17:00	**16:00**
7 - 9 Pk Volume	0	0	334	634	**952**	**4 - 6 Pk Volume**	0	0	1015	398	**1363**
Pk Hr Factor	0.000	0.000	0.908	0.852	**0.912**	**Pk Hr Factor**	0.000	0.000	0.872	0.966	**0.869**

Prepared by NDS/ATD

VOLUME

Silverado Trail Bet. Sage Canyon Rd & Conn Creek Rd

Day: Saturday
Date: 10/26/2019

City: St Helena
Project #: CA19_8529_001

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	6,770	5,582	12,352

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			8		13		21		12:00			105		108		213	
00:15			14		9		23		12:15			116		89		205	
00:30			9		12		21		12:30			121		108		229	
00:45			15	46	11	45	26	91	12:45			121	463	143	448	264	911
01:00			9		6		15		13:00			123		120		243	
01:15			19		10		29		13:15			118		112		230	
01:30			18		6		24		13:30			133		133		266	
01:45			14	60	6	28	20	88	13:45			140	514	138	503	278	1017
02:00			11		4		15		14:00			135		113		248	
02:15			10		6		16		14:15			148		126		274	
02:30			11		6		17		14:30			159		101		260	
02:45			5	37	8	24	13	61	14:45			161	603	118	458	279	1061
03:00			6		12		18		15:00			159		113		272	
03:15			3		10		13		15:15			189		85		274	
03:30			7		10		17		15:30			184		104		288	
03:45			6	22	6	38	12	60	15:45			186	718	96	398	282	1116
04:00			5		4		9		16:00			239		76		315	
04:15			13		6		19		16:15			197		61		258	
04:30			6		23		29		16:30			194		77		271	
04:45			14	38	16	49	30	87	16:45			204	834	82	296	286	1130
05:00			17		10		27		17:00			188		72		260	
05:15			14		11		25		17:15			191		82		273	
05:30			21		40		61		17:30			198		63		261	
05:45			10	62	77	138	87	200	17:45			180	757	66	283	246	1040
06:00			21		109		130		18:00			162		43		205	
06:15			27		109		136		18:15			128		34		162	
06:30			22		75		97		18:30			114		36		150	
06:45			29	99	76	369	105	468	18:45			67	471	35	148	102	619
07:00			36		53		89		19:00			89		36		125	
07:15			57		43		100		19:15			73		37		110	
07:30			31		66		97		19:30			68		38		106	
07:45			35	159	55	217	90	376	19:45			40	270	33	144	73	414
08:00			39		47		86		20:00			38		20		58	
08:15			47		68		115		20:15			30		30		60	
08:30			47		93		140		20:30			32		20		52	
08:45			66	199	96	304	162	503	20:45			35	135	33	103	68	238
09:00			46		76		122		21:00			30		19		49	
09:15			50		116		166		21:15			34		18		52	
09:30			70		115		185		21:30			37		26		63	
09:45			84	250	112	419	196	669	21:45			24	125	28	91	52	216
10:00			65		108		173		22:00			29		28		57	
10:15			69		111		180		22:15			37		31		68	
10:30			79		100		179		22:30			29		28		57	
10:45			84	297	105	424	189	721	22:45			25	120	32	119	57	239
11:00			89		95		184		23:00			35		25		60	
11:15			95		113		208		23:15			26		24		50	
11:30			99		123		222		23:30			28		19		47	
11:45			98	381	124	455	222	836	23:45			21	110	13	81	34	191
TOTALS				1650		2510		**4160**	**TOTALS**				5120		3072		**8192**
SPLIT %				39.7%		60.3%		**33.7%**	**SPLIT %**				62.5%		37.5%		**66.3%**

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	6,770	5,582	12,352

AM Peak Hour				11:45		11:15		**11:45**	**PM Peak Hour**				16:00		13:30		**15:15**
AM Pk Volume				440		468		**869**	**PM Pk Volume**				834		510		**1159**
Pk Hr Factor				0.909		0.944		**0.949**	**Pk Hr Factor**				0.872		0.924		**0.920**
7 - 9 Volume	0	0		358		521		**879**	**4 - 6 Volume**	0	0		1591		579		**2170**
7 - 9 Peak Hour				08:00		08:00		**08:00**	**4 - 6 Peak Hour**				16:00		16:30		**16:00**
7 - 9 Pk Volume	0	0		199		304		**503**	**4 - 6 Pk Volume**	0	0		834		313		**1130**
Pk Hr Factor	0.000	0.000		0.754		0.792		**0.776**	**Pk Hr Factor**	0.000	0.000		0.872		0.954		**0.897**

Prepared by National Data & Surveying Services

Conn Creek Rd/SR 128 & Silverado Trail

Peak Hour Turning Movement Count

ID: 19-08528-002
City: St. Helena

Day: Friday
Date: 10/18/2019

PEAK HOURS	COUNT PERIODS
NONE	NONE
NONE	NONE
03:45 PM - 04:45 PM	01:45 PM - 05:00 PM

Conn Creek Rd/SR 128 — SOUTHBOUND

AM	0	0	0	0	0	AM
NOON	0	0	0	0	0	NOON
PM	5	6	8	0	6	PM

EASTBOUND — Silverado Trail

AM	NOON	PM	
0	0	508	⇦
0	0	0	↶ 0
0	0	5	↱ 0
0	0	1109	→ 0
0	0	47	↴ 0
AM	NOON	PM	

WESTBOUND — Silverado Trail

PM	NOON	AM	
1	0	0	0 ↰
455	0	0	0 ←
17	0	0	0 ↰
0	0	0	0 ↶
1165	0	0	⇨
PM	NOON	AM	

CONTROL

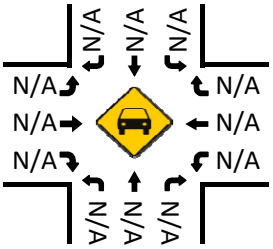
0

	AM	NOON	PM
TEV	0	0	1749
PHF			0.97

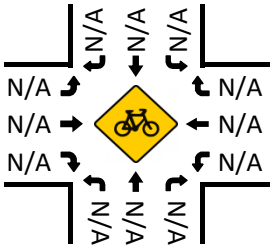
Conn Creek Rd/SR 128 — NORTHBOUND

PM	70	0	48	0	48	PM
NOON	0	0	0	0	0	NOON
AM	0	0	0	0	0	AM

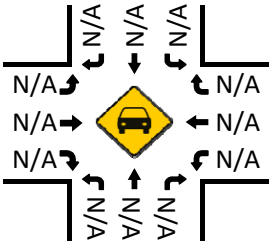
Total Vehicles (AM)



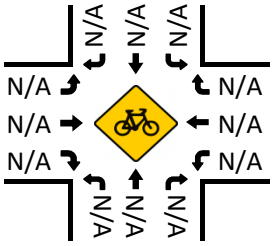
Bikes (AM)



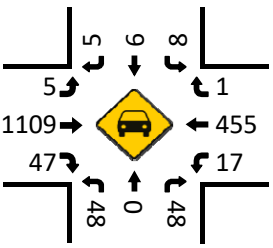
Total Vehicles (Noon)



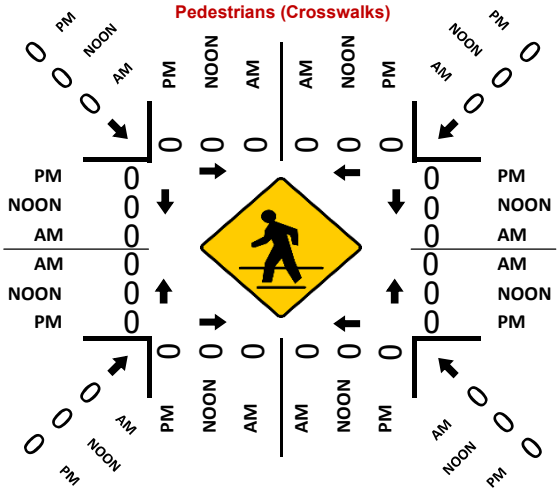
Bikes (NOON)



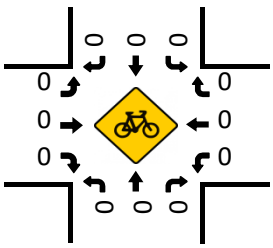
Total Vehicles (PM)



Pedestrians (Crosswalks)



Bikes (PM)



Prepared by National Data & Surveying Services

Sage Canyon Rd/Conn Creek Winery/SR 128 & Silverado Trail

Peak Hour Turning Movement Count

ID: 19-08528-001
City: St. Helena

Day: Friday
Date: 10/18/2019

Sage Canyon Rd/Conn Creek Winery/SR 128

SOUTHBOUND

PEAK HOURS							COUNT PERIODS
NONE	AM	0	0	0	0	0	AM	NONE
NONE	NOON	0	0	0	0	0	NOON	NONE
03:45 PM - 04:45 PM	PM	47	0	92	0	219	PM	01:45 PM - 05:00 PM

EASTBOUND (Silverado Trail)

AM	NOON	PM	
0	0	470	⇦
0	0	0	↶ 0
0	0	164	↱ 0
0	0	999	→ 0
0	0	0	↴ 0

WESTBOUND (Silverado Trail)

PM	NOON	AM	
54	0	0	0 ↰
419	0	0	0 ←
1	0	0	0 ↰
0	0	0	0 ↰
1101	0	0	⇨

CONTROL

0

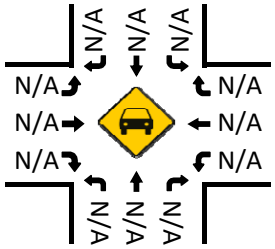
	AM	NOON	PM
TEV	0	0	1791
PHF			0.97

PM	1	0	4	1	10	PM
NOON	0	0	0	0	0	NOON
AM	0	0	0	0	0	AM

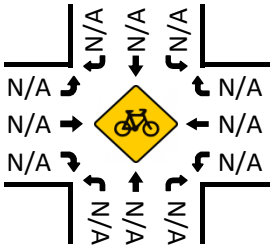
NORTHBOUND

e Canyon Rd/Conn Creek Winery/SR

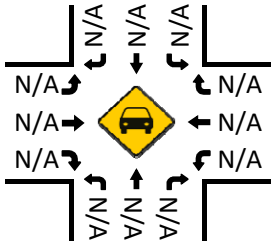
Total Vehicles (AM)



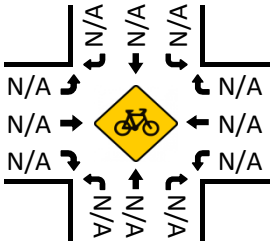
Bikes (AM)



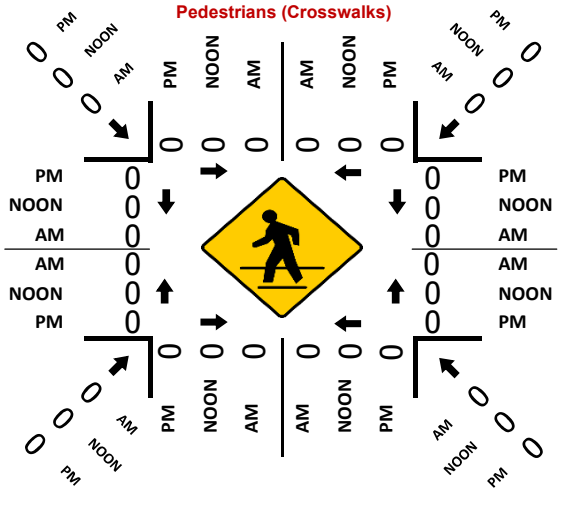
Total Vehicles (Noon)



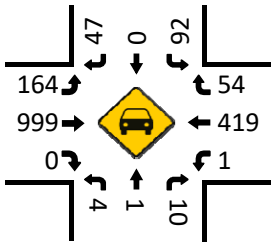
Bikes (NOON)



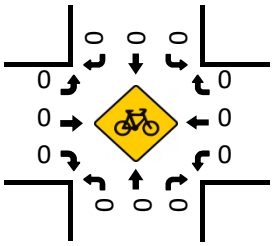
Pedestrians (Crosswalks)



Total Vehicles (PM)



Bikes (PM)



Prepared by National Data & Surveying Services

Conn Creek Rd/SR 128 & Silverado Trail

Peak Hour Turning Movement Count

ID: 19-08528-002
City: St. Helena

Day: Saturday
Date: 10/19/2019

PEAK HOURS	COUNT PERIODS
NONE	NONE
NONE	NONE
03:00 PM - 04:00 PM	01:45 PM - 04:00 PM

Conn Creek Rd/SR 128 — SOUTHBOUND

AM	0	0	0	0	0	AM
NOON	0	0	0	0	0	NOON
PM	11	3	38	0	25	PM

EASTBOUND — Silverado Trail

AM	NOON	PM	
0	0	557	⇦
0	0	0	↶ 0
0	0	11	↱ 0
0	0	772	→ 0
0	0	48	↴ 0
AM	NOON	PM	

WESTBOUND — Silverado Trail

PM	NOON	AM	
11	0	0	0 ↰
491	0	0	0 ←
16	0	0	0 ↰
0	0	0	0 ↰
841	0	0	⇨
PM	NOON	AM	

CONTROL

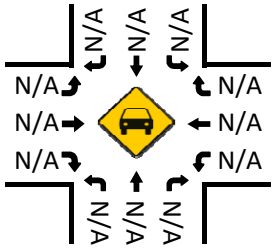
0

	AM	NOON	PM
TEV	0	0	1490
PHF			0.97

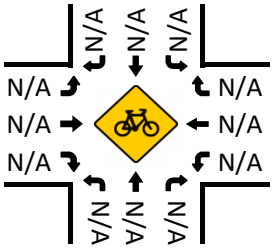
Conn Creek Rd/SR 128 — NORTHBOUND

PM	67	0	55	3	31	PM
NOON	0	0	0	0	0	NOON
AM	0	0	0	0	0	AM

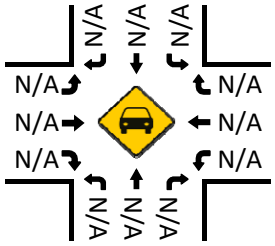
Total Vehicles (AM)



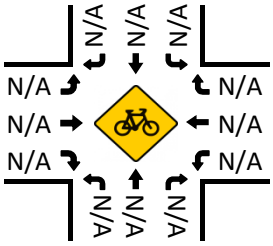
Bikes (AM)



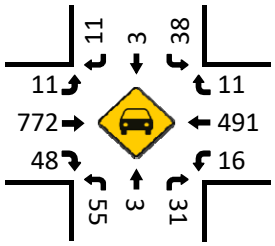
Total Vehicles (Noon)



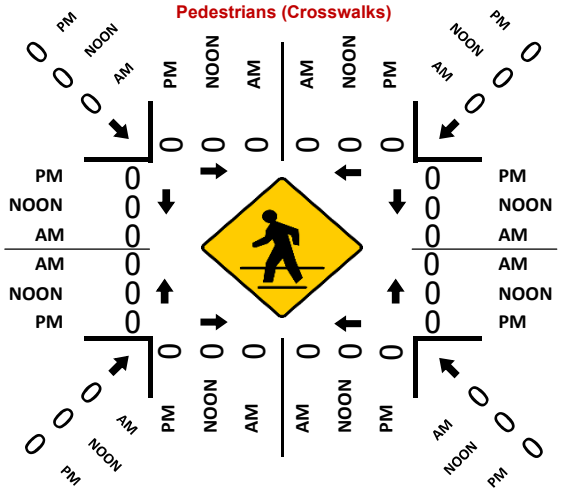
Bikes (NOON)



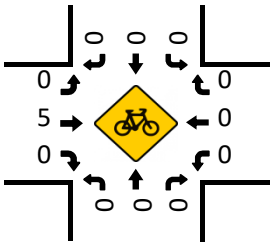
Total Vehicles (PM)



Pedestrians (Crosswalks)



Bikes (PM)



Prepared by National Data & Surveying Services

Sage Canyon Rd/Conn Creek Winery/SR 128 & Silverado Trail

Peak Hour Turning Movement Count

ID: 19-08528-001
City: St. Helena

Day: Saturday
Date: 10/19/2019

Sage Canyon Rd/Conn Creek Winery/SR 128

SOUTHBOUND

PEAK HOURS							COUNT PERIODS
NONE	AM	0	0	0	0	0	AM	NONE
NONE	NOON	0	0	0	0	0	NOON	NONE
03:00 PM - 04:00 PM	PM	53	0	49	0	102	PM	01:45 PM - 04:00 PM

EASTBOUND (Silverado Trail)

AM	NOON	PM	
0	0	520	⇦
0	0	0	↶ 0
0	0	68	↱ 0
0	0	764	→ 0
0	0	8	↴ 0
AM	NOON	PM	

WESTBOUND (Silverado Trail)

PM	NOON	AM	
33	0	0	↰ 0
460	0	0	← 0
5	0	0	↰ 0
0	0	0	↰ 0
822	0	0	⇨
PM	NOON	AM	

CONTROL

0

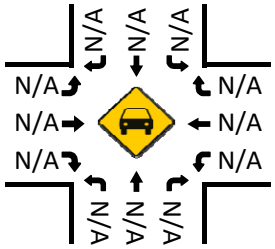
	AM	NOON	PM
TEV	0	0	1457
PHF			0.97

NORTHBOUND

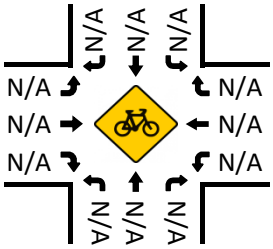
PM	13	0	7	1	9	PM
NOON	0	0	0	0	0	NOON
AM	0	0	0	0	0	AM

e Canyon Rd/Conn Creek Winery/SR

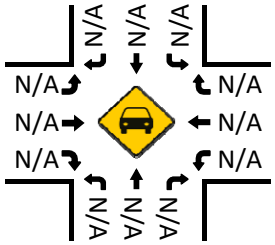
Total Vehicles (AM)



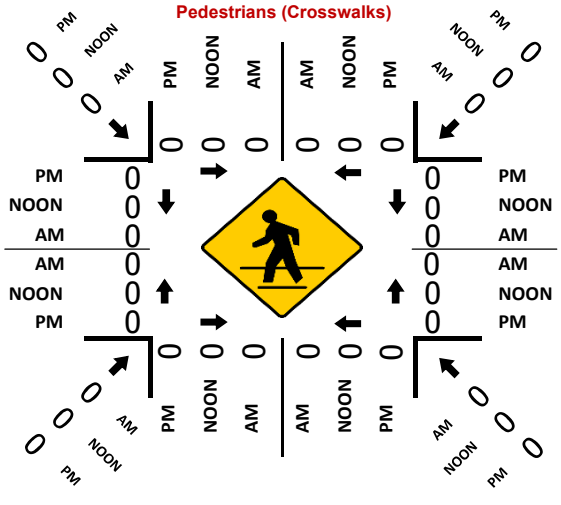
Bikes (AM)



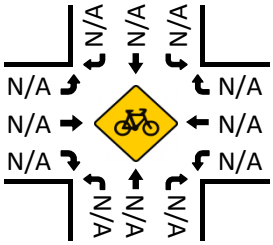
Total Vehicles (Noon)



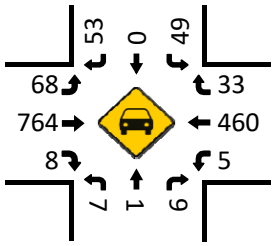
Pedestrians (Crosswalks)



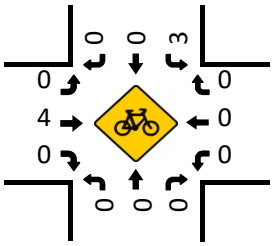
Bikes (NOON)



Total Vehicles (PM)



Bikes (PM)



Prepared by National Data & Surveying Services

Conn Creek Rd/SR 128 & Silverado Trail

Peak Hour Turning Movement Count

ID: 19-08528-002
City: St. Helena

Day: Friday
Date: 10/25/2019

PEAK HOURS	COUNT PERIODS
NONE	NONE
NONE	NONE
03:30 PM - 04:30 PM	01:45 PM - 05:00 PM

Conn Creek Rd/SR 128 — SOUTHBOUND

AM	0	0	0	0	0	AM
NOON	0	0	0	0	0	NOON
PM	6	3	11	0	7	PM

EASTBOUND — Silverado Trail

AM	NOON	PM	
0	0	480	⇦
0	0	0	↶ 0
0	0	3	↱ 0
0	0	1063	→ 0
0	0	80	↴ 0
AM	NOON	PM	

WESTBOUND — Silverado Trail

PM	NOON	AM	
2	0	0	0 ↰
424	0	0	0 ←
22	0	0	0 ↙
0	0	0	0 ↵
1132	0	0	⇨
PM	NOON	AM	

CONTROL

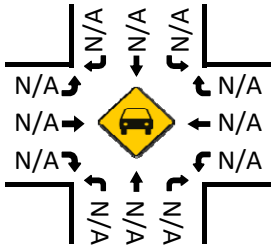
0

TEV	0 AM	0 NOON	1724 PM
PHF			0.89

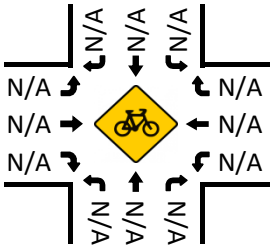
Conn Creek Rd/SR 128 — NORTHBOUND

PM	105	0	50	2	58	PM
NOON	0	0	0	0	0	NOON
AM	0	0	0	0	0	AM

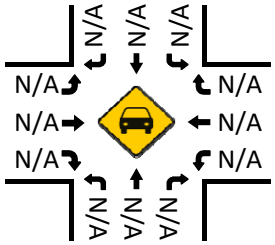
Total Vehicles (AM)



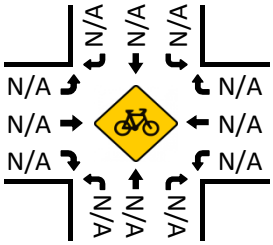
Bikes (AM)



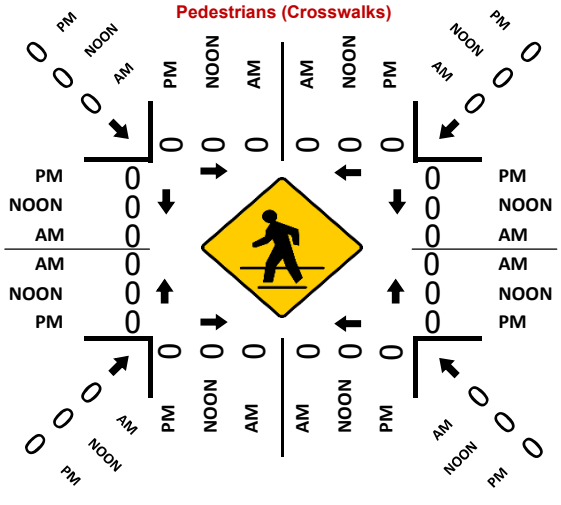
Total Vehicles (Noon)



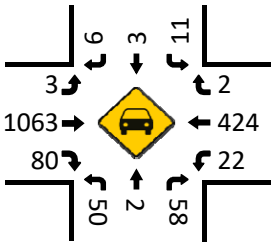
Bikes (NOON)



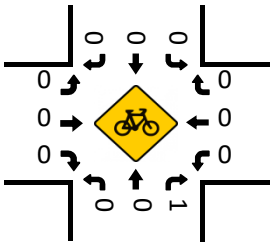
Pedestrians (Crosswalks)



Total Vehicles (PM)



Bikes (PM)



Prepared by National Data & Surveying Services

Sage Canyon Rd/Conn Creek Winery/SR 128 & Silverado Trail

Peak Hour Turning Movement Count

ID: 19-08528-001
City: St. Helena

Day: Friday
Date: 10/25/2019

PEAK HOURS	
AM	NONE
NOON	NONE
PM	03:30 PM - 04:30 PM

COUNT PERIODS	
AM	NONE
NOON	NONE
PM	01:45 PM - 05:00 PM

Sage Canyon Rd/Conn Creek Winery/SR 128 — SOUTHBOUND

	Right	Thru	Left	U-Turn	Total
AM	0	0	0	0	0
NOON	0	0	0	0	0
PM	59	1	71	0	209
(red)	0	0	0	0	

Silverado Trail — EASTBOUND

	AM	NOON	PM	(red)
Total	0	0	456	
U-Turn	0	0	1	0
Left	0	0	163	0
Thru	0	0	975	0
Right	0	0	3	0

Silverado Trail — WESTBOUND

	(red)	PM	NOON	AM
Right	0	44	0	0
Thru	0	396	0	0
Left	0	1	0	0
U-Turn	0	0	0	0
Total		1050	0	0

Sage Canyon Rd/Conn Creek Winery/SR — NORTHBOUND

	Total	U-Turn	Left	Thru	Right
(red)		0	0	0	0
PM	5	0	0	2	4
NOON	0	0	0	0	0
AM	0	0	0	0	0

CONTROL

0

	AM	NOON	PM
TEV	0	0	1720
PHF			0.93

Total Vehicles (AM)

SB: N/A, N/A, N/A; EB: N/A, N/A, N/A; WB: N/A, N/A, N/A; NB: N/A, N/A, N/A

Total Vehicles (Noon)

SB: N/A, N/A, N/A; EB: N/A, N/A, N/A; WB: N/A, N/A, N/A; NB: N/A, N/A, N/A

Total Vehicles (PM)

SB: 59, 1, 71; EB: 163, 975, 3; WB: 44, 396, 1; NB: 0, 2, 4

Bikes (AM)

SB: N/A, N/A, N/A; EB: N/A, N/A, N/A; WB: N/A, N/A, N/A; NB: N/A, N/A, N/A

Bikes (NOON)

SB: N/A, N/A, N/A; EB: N/A, N/A, N/A; WB: N/A, N/A, N/A; NB: N/A, N/A, N/A

Bikes (PM)

SB: 0, 0, 0; EB: 0, 1, 0; WB: 0, 0, 0; NB: 0, 0, 1

Pedestrians (Crosswalks)

Crosswalk	AM	NOON	PM
North leg (eastbound)	0	0	0
North leg (westbound)	0	0	0
West leg (southbound)	0	0	0
West leg (northbound)	0	0	0
East leg (southbound)	0	0	0
East leg (northbound)	0	0	0
South leg (eastbound)	0	0	0
South leg (westbound)	0	0	0
NW diagonal	0	0	0
NE diagonal	0	0	0
SW diagonal	0	0	0
SE diagonal	0	0	0

Prepared by National Data & Surveying Services

Conn Creek Rd/SR 128 & Silverado Trail

Peak Hour Turning Movement Count

ID: 19-08528-002
City: St. Helena

Day: Saturday
Date: 10/26/2019

Conn Creek Rd/SR 128

SOUTHBOUND

PEAK HOURS		COUNT PERIODS
NONE	AM	NONE
NONE	NOON	NONE
02:45 PM - 03:45 PM	PM	01:45 PM - 04:00 PM

AM	0	0	0	0	0	AM
NOON	0	0	0	0	0	NOON
PM	9	0	6	0	14	PM

Silverado Trail — **EASTBOUND**

AM	NOON	PM	
0	0	460	⇦
0	0	1	↶ 0
0	0	4	↱ 0
0	0	663	→ 0
0	0	49	↴ 0
AM	NOON	PM	

CONTROL

0

	AM	NOON	PM
TEV	0	0	1241
PHF			0.96

WESTBOUND — **Silverado Trail**

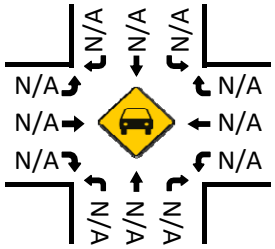
PM	NOON	AM	
9	0	0	↰ 0
395	0	0	← 0
21	0	0	↰ 0
0	0	0	↩ 0
697	0	0	⇨
PM	NOON	AM	

PM	70	0	55	1	28	PM
NOON	0	0	0	0	0	NOON
AM	0	0	0	0	0	AM

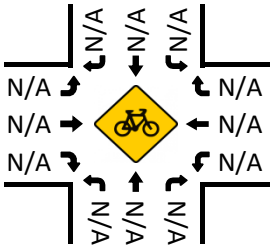
NORTHBOUND

Conn Creek Rd/SR 128

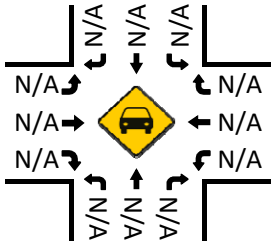
Total Vehicles (AM)



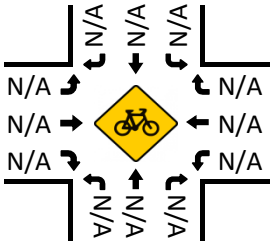
Bikes (AM)



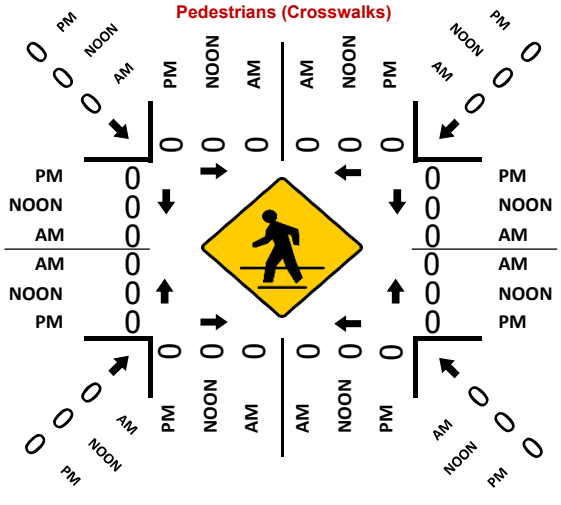
Total Vehicles (Noon)



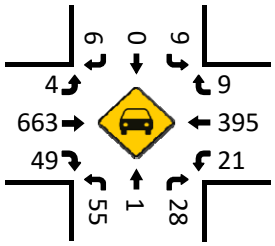
Bikes (NOON)



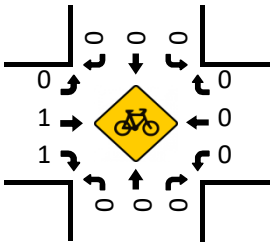
Pedestrians (Crosswalks)



Total Vehicles (PM)



Bikes (PM)



Prepared by National Data & Surveying Services

Sage Canyon Rd/Conn Creek Winery/SR 128 & Silverado Trail

Peak Hour Turning Movement Count

ID: 19-08528-001
City: St. Helena

Day: Saturday
Date: 10/26/2019

Sage Canyon Rd/Conn Creek Winery/SR 128

SOUTHBOUND

PEAK HOURS		COUNT PERIODS
NONE	AM	NONE
NONE	NOON	NONE
03:00 PM - 04:00 PM	PM	01:45 PM - 04:00 PM

AM	0	0	0	0	0	AM
NOON	0	0	0	0	0	NOON
PM	43	0	63	0	94	PM

EASTBOUND (Silverado Trail)

AM	NOON	PM	
0	0	402	⇦
0	0	0	↶ 0
0	0	69	↱ 0
0	0	644	→ 0
0	0	6	↴ 0
AM	NOON	PM	

WESTBOUND (Silverado Trail)

PM	NOON	AM	
23	0	0	0 ↰
354	0	0	0 ←
2	0	0	0 ↰
0	0	0	0 ↰
714	0	0	⇨
PM	NOON	AM	

CONTROL

0

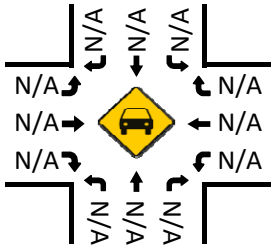
TEV	0 AM	0 NOON	1218 PM
PHF			0.97

PM	8	0	5	2	7	PM
NOON	0	0	0	0	0	NOON
AM	0	0	0	0	0	AM

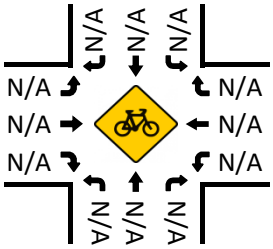
NORTHBOUND

e Canyon Rd/Conn Creek Winery/SR

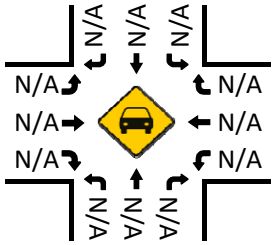
Total Vehicles (AM)



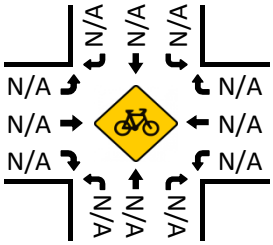
Bikes (AM)



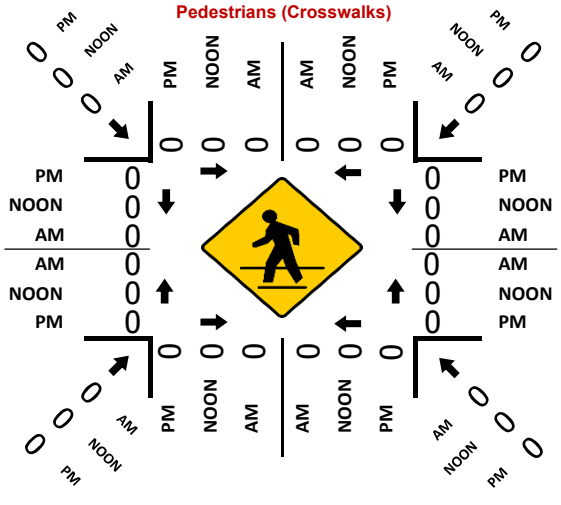
Total Vehicles (Noon)



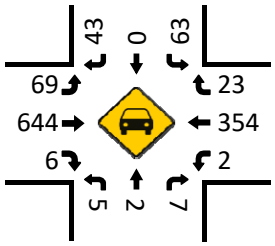
Bikes (NOON)



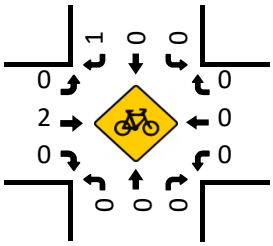
Pedestrians (Crosswalks)



Total Vehicles (PM)



Bikes (PM)



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Appendix B

Collision Rate Calculations

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Intersection Collision Rate Calculations

NAX144 - Conn Creek Winery

Intersection # 1: Silverado Trail & Sage Canyon Road

Date of Count: Friday, October 18, 2019

Number of Collisions: 0
Number of Injuries: 0
Number of Fatalities: 0
ADT: 13500
Start Date: July 1, 2013
End Date: June 30, 2018
Number of Years: 5

Intersection Type: Four-Legged
Control Type: Stop & Yield Controls
Area: Rural

$$\text{collision rate} = \frac{\text{Number of Collisions} \times 1 \text{ Million}}{\text{ADT} \times 365 \text{ Days per Year} \times \text{Number of Years}}$$

$$\text{collision rate} = \frac{0 \times 1{,}000{,}000}{13{,}500 \times 365 \times 5}$$

	Collision Rate	Fatality Rate	Injury Rate
Study Intersection	**0.00 c/mve**	**0.0%**	**0.0%**
Statewide Average*	**0.23 c/mve**	**2.0%**	**40.4%**

ADT = average daily total vehicles entering intersection
c/mve = collisions per million vehicles entering intersection
* 2013 Collision Data on California State Highways, Caltrans

Intersection # 2: Silverado Trail & Conn Creek Road

Date of Count: Friday, October 18, 2019

Number of Collisions: 6
Number of Injuries: 1
Number of Fatalities: 0
ADT: 13500
Start Date: July 1, 2013
End Date: June 30, 2018
Number of Years: 5

Intersection Type: Four-Legged
Control Type: Stop & Yield Controls
Area: Rural

$$\text{collision rate} = \frac{\text{Number of Collisions} \times 1 \text{ Million}}{\text{ADT} \times 365 \text{ Days per Year} \times \text{Number of Years}}$$

$$\text{collision rate} = \frac{6 \times 1{,}000{,}000}{13{,}500 \times 365 \times 5}$$

	Collision Rate	Fatality Rate	Injury Rate
Study Intersection	**0.24 c/mve**	**0.0%**	**16.7%**
Statewide Average*	**0.23 c/mve**	**2.0%**	**40.4%**

ADT = average daily total vehicles entering intersection
c/mve = collisions per million vehicles entering intersection
* 2013 Collision Data on California State Highways, Caltrans

SEGMENT COLLISION RATE CALCULATIONS

NAX144 - Conn Creek Winery

Location: Silverado Trail between SR 128-Conn Creek Roadd and SR 128-Sage Canyon Road
Date of Count: Friday, October 18, 2019
ADT: 13,500

Number of Collisions: 5
Number of Injuries: 1
Number of Fatalities: 0
Start Date: July 1, 2013
End Date: June 30, 2018
Number of Years: 5

Highway Type: Conventional 2 lanes or less
Area: Rural
Design Speed: ≤55
Terrain: Flat

Segment Length: 0.3 miles
Direction: East/West

$$\frac{\text{Number of Collisions x 1 Million}}{\text{ADT x 365 Days per Year x Segment Length x Number of Years}}$$

$$\frac{5 \times 1{,}000{,}000}{13{,}500 \times 365 \times 0.25 \times 5}$$

	Collision Rate	Fatality Rate	Injury Rate
Study Segment	**0.81 c/mvm**	**0.0%**	**20.0%**
Statewide Average*	**0.85 c/mvm**	**2.4%**	**40.1%**

ADT = average daily traffic volume
c/mvm = collisions per million vehicle miles
* 2013 Collision Data on California State Highways, Caltrans

Appendix C

Intersection Level of Service Calculations

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Intersection	
Int Delay, s/veh	7.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	1050	48	25	495	0	49	1	41	6	1	4
Future Vol, veh/h	5	1050	48	25	495	0	49	1	41	6	1	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	190	-	-	-	-	30	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	1154	53	27	544	0	54	1	45	7	1	4

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	544	0	0	1207	0	0	1792	1789	1181	1812	1815	544
Stage 1	-	-	-	-	-	-	1191	1191	-	598	598	-
Stage 2	-	-	-	-	-	-	601	598	-	1214	1217	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1025	-	-	578	-	-	63	81	231	61	78	539
Stage 1	-	-	-	-	-	-	229	261	-	489	491	-
Stage 2	-	-	-	-	-	-	487	491	-	222	253	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1025	-	-	578	-	-	59	77	231	47	74	539
Mov Cap-2 Maneuver	-	-	-	-	-	-	59	77	-	47	74	-
Stage 1	-	-	-	-	-	-	228	260	-	487	468	-
Stage 2	-	-	-	-	-	-	459	468	-	177	252	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.6	127	62.9
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	59	231	1025	-	-	578	-	-	74
HCM Lane V/C Ratio	0.931	0.195	0.005	-	-	0.048	-	-	0.163
HCM Control Delay (s)	211.2	24.3	8.5	-	-	11.5	-	-	62.9
HCM Lane LOS	F	C	A	-	-	B	-	-	F
HCM 95th %tile Q(veh)	4.3	0.7	0	-	-	0.1	-	-	0.5

Intersection	
Int Delay, s/veh	16.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	153	949	3	5	456	46	2	1	4	58	0	62
Future Vol, veh/h	153	949	3	5	456	46	2	1	4	58	0	62
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	200	-	-	125	-	-	-	-	-	-	-	30
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	168	1043	3	5	501	51	2	1	4	64	0	68

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	552	0	0	1046	0	0	1952	1943	1045	1920	1919	527
Stage 1	-	-	-	-	-	-	1381	1381	-	537	537	-
Stage 2	-	-	-	-	-	-	571	562	-	1383	1382	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1018	-	-	665	-	-	48	65	278	~ 51	67	551
Stage 1	-	-	-	-	-	-	178	211	-	528	523	-
Stage 2	-	-	-	-	-	-	506	510	-	178	211	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1018	-	-	665	-	-	37	54	278	~ 43	55	551
Mov Cap-2 Maneuver	-	-	-	-	-	-	37	54	-	~ 43	55	-
Stage 1	-	-	-	-	-	-	149	176	-	441	519	-
Stage 2	-	-	-	-	-	-	440	506	-	145	176	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.3	0.1	54.7	227.5
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	80	1018	-	-	665	-	-	43	551
HCM Lane V/C Ratio	0.096	0.165	-	-	0.008	-	-	1.482	0.124
HCM Control Delay (s)	54.7	9.2	-	-	10.5	-	-	$ 457.3	12.5
HCM Lane LOS	F	A	-	-	B	-	-	F	B
HCM 95th %tile Q(veh)	0.3	0.6	-	-	0	-	-	6.4	0.4

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

Intersection	
Int Delay, s/veh	4.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	9	534	45	34	625	18	48	6	31	16	6	21
Future Vol, veh/h	9	534	45	34	625	18	48	6	31	16	6	21
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	190	-	-	-	-	30	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	10	580	49	37	679	20	52	7	34	17	7	23

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	699	0	0	629	0	0	1403	1398	605	1408	1412	689
Stage 1	-	-	-	-	-	-	625	625	-	763	763	-
Stage 2	-	-	-	-	-	-	778	773	-	645	649	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	898	-	-	953	-	-	117	141	498	116	138	446
Stage 1	-	-	-	-	-	-	473	477	-	397	413	-
Stage 2	-	-	-	-	-	-	389	409	-	461	466	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	898	-	-	953	-	-	103	134	498	100	131	446
Mov Cap-2 Maneuver	-	-	-	-	-	-	103	134	-	100	131	-
Stage 1	-	-	-	-	-	-	468	472	-	393	397	-
Stage 2	-	-	-	-	-	-	349	393	-	419	461	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.4	52.1	34
HCM LOS			F	D

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	106	498	898	-	-	953	-	-	170
HCM Lane V/C Ratio	0.554	0.068	0.011	-	-	0.039	-	-	0.275
HCM Control Delay (s)	74.7	12.8	9.1	-	-	8.9	-	-	34
HCM Lane LOS	F	B	A	-	-	A	-	-	D
HCM 95th %tile Q(veh)	2.6	0.2	0	-	-	0.1	-	-	1.1

Intersection	
Int Delay, s/veh	3.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	62	508	8	7	592	47	7	0	8	50	0	76
Future Vol, veh/h	62	508	8	7	592	47	7	0	8	50	0	76
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	200	-	-	125	-	-	-	-	-	-	-	30
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	67	546	9	8	637	51	8	0	9	54	0	82

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	688	0	0	555	0	0	1405	1389	551	1368	1368	663
Stage 1	-	-	-	-	-	-	685	685	-	679	679	-
Stage 2	-	-	-	-	-	-	720	704	-	689	689	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	906	-	-	1015	-	-	117	142	534	124	147	461
Stage 1	-	-	-	-	-	-	438	448	-	441	451	-
Stage 2	-	-	-	-	-	-	419	440	-	436	446	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	906	-	-	1015	-	-	90	130	534	114	135	461
Mov Cap-2 Maneuver	-	-	-	-	-	-	90	130	-	114	135	-
Stage 1	-	-	-	-	-	-	406	415	-	408	447	-
Stage 2	-	-	-	-	-	-	342	436	-	397	413	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1	0.1	29.7	33.3
HCM LOS			D	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	162	906	-	-	1015	-	-	114	461
HCM Lane V/C Ratio	0.1	0.074	-	-	0.007	-	-	0.472	0.177
HCM Control Delay (s)	29.7	9.3	-	-	8.6	-	-	62	14.5
HCM Lane LOS	D	A	-	-	A	-	-	F	B
HCM 95th %tile Q(veh)	0.3	0.2	-	-	0	-	-	2.1	0.6

Intersection	
Int Delay, s/veh	36.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	6	1827	53	28	589	0	54	2	46	7	1	4
Future Vol, veh/h	6	1827	53	28	589	0	54	2	46	7	1	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	190	-	-	-	-	30	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	6	1827	53	28	589	0	54	2	46	7	1	4

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	589	0	0	1880	0	0	2514	2511	1854	2535	2537	589
Stage 1	-	-	-	-	-	-	1866	1866	-	645	645	-
Stage 2	-	-	-	-	-	-	648	645	-	1890	1892	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	986	-	-	319	-	-	~ 19	28	92	18	27	508
Stage 1	-	-	-	-	-	-	93	122	-	461	467	-
Stage 2	-	-	-	-	-	-	459	467	-	90	118	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	986	-	-	319	-	-	~ 17	25	92	8	24	508
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 17	25	-	8	24	-
Stage 1	-	-	-	-	-	-	92	121	-	458	426	-
Stage 2	-	-	-	-	-	-	414	426	-	44	117	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.8	$ 855.8	$ 604.2
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	17	92	986	-	-	319	-	-	13
HCM Lane V/C Ratio	3.294	0.5	0.006	-	-	0.088	-	-	0.923
HCM Control Delay (s)	$ 1494.7	78.1	8.7	-	-	17.4	-	-	$ 604.2
HCM Lane LOS	F	F	A	-	-	C	-	-	F
HCM 95th %tile Q(veh)	7.6	2.2	0	-	-	0.3	-	-	2.1

Notes

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

Intersection	
Int Delay, s/veh	55.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	170	1651	3	6	543	51	2	1	4	64	0	69
Future Vol, veh/h	170	1651	3	6	543	51	2	1	4	64	0	69
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	200	-	-	125	-	-	-	-	-	-	-	30
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	170	1651	3	6	543	51	2	1	4	64	0	69

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	594	0	0	1654	0	0	2608	2599	1653	2576	2575	569
Stage 1	-	-	-	-	-	-	1993	1993	-	581	581	-
Stage 2	-	-	-	-	-	-	615	606	-	1995	1994	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	982	-	-	390	-	-	16	25	122	~ 17	26	522
Stage 1	-	-	-	-	-	-	79	105	-	499	500	-
Stage 2	-	-	-	-	-	-	479	487	-	78	105	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	982	-	-	390	-	-	12	20	122	~ 14	21	522
Mov Cap-2 Maneuver	-	-	-	-	-	-	12	20	-	~ 14	21	-
Stage 1	-	-	-	-	-	-	65	87	-	413	493	-
Stage 2	-	-	-	-	-	-	409	480	-	~ 62	87	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.9	0.1	172	$ 1041.1
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	28	982	-	-	390	-	-	14	522
HCM Lane V/C Ratio	0.25	0.173	-	-	0.015	-	-	4.571	0.132
HCM Control Delay (s)	172	9.4	-	-	14.4	-	-	$ 2149.6	12.9
HCM Lane LOS	F	A	-	-	B	-	-	F	B
HCM 95th %tile Q(veh)	0.8	0.6	-	-	0	-	-	8.9	0.5

Notes

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

Intersection	
Int Delay, s/veh	13.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	10	929	50	38	744	20	53	11	34	18	7	23
Future Vol, veh/h	10	929	50	38	744	20	53	11	34	18	7	23
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	190	-	-	-	-	30	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	10	929	50	38	744	20	53	11	34	18	7	23

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	764	0	0	979	0	0	1819	1814	954	1827	1829	754
Stage 1	-	-	-	-	-	-	974	974	-	830	830	-
Stage 2	-	-	-	-	-	-	845	840	-	997	999	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	849	-	-	705	-	-	60	78	314	59	77	409
Stage 1	-	-	-	-	-	-	303	330	-	364	385	-
Stage 2	-	-	-	-	-	-	357	381	-	294	321	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	849	-	-	705	-	-	~ 50	73	314	44	72	409
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 50	73	-	44	72	-
Stage 1	-	-	-	-	-	-	299	326	-	360	364	-
Stage 2	-	-	-	-	-	-	313	360	-	250	317	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.5	213.4	92.1
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	53	314	849	-	-	705	-	-	85
HCM Lane V/C Ratio	1.208	0.108	0.012	-	-	0.054	-	-	0.565
HCM Control Delay (s)	$ 317.3	17.9	9.3	-	-	10.4	-	-	92.1
HCM Lane LOS	F	C	A	-	-	B	-	-	F
HCM 95th %tile Q(veh)	5.6	0.4	0	-	-	0.2	-	-	2.5

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

Intersection	
Int Delay, s/veh	8.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	69	884	9	8	704	52	8	0	9	56	0	84
Future Vol, veh/h	69	884	9	8	704	52	8	0	9	56	0	84
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	200	-	-	125	-	-	-	-	-	-	-	30
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	69	884	9	8	704	52	8	0	9	56	0	84

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	756	0	0	893	0	0	1815	1799	889	1777	1777	730
Stage 1	-	-	-	-	-	-	1027	1027	-	746	746	-
Stage 2	-	-	-	-	-	-	788	772	-	1031	1031	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	855	-	-	759	-	-	60	80	342	64	82	422
Stage 1	-	-	-	-	-	-	283	312	-	405	421	-
Stage 2	-	-	-	-	-	-	384	409	-	281	310	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	855	-	-	759	-	-	45	73	342	58	75	422
Mov Cap-2 Maneuver	-	-	-	-	-	-	45	73	-	58	75	-
Stage 1	-	-	-	-	-	-	260	287	-	372	416	-
Stage 2	-	-	-	-	-	-	304	405	-	252	285	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.7	0.1	59.2	98.8
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	83	855	-	-	759	-	-	58	422
HCM Lane V/C Ratio	0.205	0.081	-	-	0.011	-	-	0.966	0.199
HCM Control Delay (s)	59.2	9.6	-	-	9.8	-	-	223.7	15.6
HCM Lane LOS	F	A	-	-	A	-	-	F	C
HCM 95th %tile Q(veh)	0.7	0.3	-	-	0	-	-	4.5	0.7

Intersection	
Int Delay, s/veh	7.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	1050	48	25	496	0	49	1	41	6	1	4
Future Vol, veh/h	5	1050	48	25	496	0	49	1	41	6	1	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	190	-	-	-	-	30	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	1154	53	27	545	0	54	1	45	7	1	4

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	545	0	0	1207	0	0	1793	1790	1181	1813	1816	545
Stage 1	-	-	-	-	-	-	1191	1191	-	599	599	-
Stage 2	-	-	-	-	-	-	602	599	-	1214	1217	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1024	-	-	578	-	-	63	81	231	61	78	538
Stage 1	-	-	-	-	-	-	229	261	-	488	490	-
Stage 2	-	-	-	-	-	-	486	490	-	222	253	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1024	-	-	578	-	-	59	77	231	47	74	538
Mov Cap-2 Maneuver	-	-	-	-	-	-	59	77	-	47	74	-
Stage 1	-	-	-	-	-	-	228	260	-	486	467	-
Stage 2	-	-	-	-	-	-	458	467	-	177	252	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.6	127	62.9
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	59	231	1024	-	-	578	-	-	74
HCM Lane V/C Ratio	0.931	0.195	0.005	-	-	0.048	-	-	0.163
HCM Control Delay (s)	211.2	24.3	8.5	-	-	11.5	-	-	62.9
HCM Lane LOS	F	C	A	-	-	B	-	-	F
HCM 95th %tile Q(veh)	4.3	0.7	0	-	-	0.1	-	-	0.5

Intersection	
Int Delay, s/veh	17.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	153	949	3	6	456	46	3	1	7	58	0	62
Future Vol, veh/h	153	949	3	6	456	46	3	1	7	58	0	62
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	200	-	-	125	-	-	-	-	-	-	-	30
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	168	1043	3	7	501	51	3	1	8	64	0	68

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	552	0	0	1046	0	0	1956	1947	1045	1926	1923	527
Stage 1	-	-	-	-	-	-	1381	1381	-	541	541	-
Stage 2	-	-	-	-	-	-	575	566	-	1385	1382	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1018	-	-	665	-	-	48	65	278	~ 50	67	551
Stage 1	-	-	-	-	-	-	178	211	-	525	521	-
Stage 2	-	-	-	-	-	-	503	507	-	177	211	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1018	-	-	665	-	-	36	54	278	~ 42	55	551
Mov Cap-2 Maneuver	-	-	-	-	-	-	36	54	-	~ 42	55	-
Stage 1	-	-	-	-	-	-	149	176	-	438	515	-
Stage 2	-	-	-	-	-	-	436	501	-	143	176	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.3	0.1	52.9	236.4
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	87	1018	-	-	665	-	-	42	551
HCM Lane V/C Ratio	0.139	0.165	-	-	0.01	-	-	1.518	0.124
HCM Control Delay (s)	52.9	9.2	-	-	10.5	-	-	$ 475.7	12.5
HCM Lane LOS	F	A	-	-	B	-	-	F	B
HCM 95th %tile Q(veh)	0.5	0.6	-	-	0	-	-	6.4	0.4

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

Intersection	
Int Delay, s/veh	4.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	9	535	45	34	626	18	48	6	31	16	6	21
Future Vol, veh/h	9	535	45	34	626	18	48	6	31	16	6	21
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	190	-	-	-	-	30	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	10	582	49	37	680	20	52	7	34	17	7	23

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	700	0	0	631	0	0	1406	1401	607	1411	1415	690
Stage 1	-	-	-	-	-	-	627	627	-	764	764	-
Stage 2	-	-	-	-	-	-	779	774	-	647	651	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	897	-	-	951	-	-	117	140	496	116	137	445
Stage 1	-	-	-	-	-	-	471	476	-	396	413	-
Stage 2	-	-	-	-	-	-	389	408	-	460	465	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	897	-	-	951	-	-	103	133	496	100	130	445
Mov Cap-2 Maneuver	-	-	-	-	-	-	103	133	-	100	130	-
Stage 1	-	-	-	-	-	-	466	471	-	392	397	-
Stage 2	-	-	-	-	-	-	349	392	-	418	460	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.4	52.1	34
HCM LOS			F	D

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	106	496	897	-	-	951	-	-	170
HCM Lane V/C Ratio	0.554	0.068	0.011	-	-	0.039	-	-	0.275
HCM Control Delay (s)	74.7	12.8	9.1	-	-	8.9	-	-	34
HCM Lane LOS	F	B	A	-	-	A	-	-	D
HCM 95th %tile Q(veh)	2.6	0.2	0	-	-	0.1	-	-	1.1

Intersection	
Int Delay, s/veh	4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	62	508	9	8	592	47	8	0	10	50	0	76
Future Vol, veh/h	62	508	9	8	592	47	8	0	10	50	0	76
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	200	-	-	125	-	-	-	-	-	-	-	30
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	67	546	10	9	637	51	9	0	11	54	0	82

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	688	0	0	556	0	0	1407	1391	551	1372	1371	663
Stage 1	-	-	-	-	-	-	685	685	-	681	681	-
Stage 2	-	-	-	-	-	-	722	706	-	691	690	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	906	-	-	1015	-	-	117	142	534	123	146	461
Stage 1	-	-	-	-	-	-	438	448	-	440	450	-
Stage 2	-	-	-	-	-	-	418	439	-	435	446	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	906	-	-	1015	-	-	90	130	534	113	134	461
Mov Cap-2 Maneuver	-	-	-	-	-	-	90	130	-	113	134	-
Stage 1	-	-	-	-	-	-	406	415	-	407	446	-
Stage 2	-	-	-	-	-	-	341	435	-	395	413	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1	0.1	29.4	33.7
HCM LOS			D	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	167	906	-	-	1015	-	-	113	461
HCM Lane V/C Ratio	0.116	0.074	-	-	0.008	-	-	0.476	0.177
HCM Control Delay (s)	29.4	9.3	-	-	8.6	-	-	62.9	14.5
HCM Lane LOS	D	A	-	-	A	-	-	F	B
HCM 95th %tile Q(veh)	0.4	0.2	-	-	0	-	-	2.1	0.6

Intersection	
Int Delay, s/veh	36.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	6	1827	53	28	590	0	54	2	46	7	1	4
Future Vol, veh/h	6	1827	53	28	590	0	54	2	46	7	1	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	190	-	-	-	-	30	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	6	1827	53	28	590	0	54	2	46	7	1	4

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	590	0	0	1880	0	0	2515	2512	1854	2536	2538	590
Stage 1	-	-	-	-	-	-	1866	1866	-	646	646	-
Stage 2	-	-	-	-	-	-	649	646	-	1890	1892	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	985	-	-	319	-	-	~ 19	28	92	18	27	508
Stage 1	-	-	-	-	-	-	93	122	-	460	467	-
Stage 2	-	-	-	-	-	-	458	467	-	90	118	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	985	-	-	319	-	-	~ 17	25	92	8	24	508
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 17	25	-	8	24	-
Stage 1	-	-	-	-	-	-	92	121	-	457	426	-
Stage 2	-	-	-	-	-	-	414	426	-	44	117	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.8	$ 855.8	$ 604.2
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	17	92	985	-	-	319	-	-	13
HCM Lane V/C Ratio	3.294	0.5	0.006	-	-	0.088	-	-	0.923
HCM Control Delay (s)	$ 1494.7	78.1	8.7	-	-	17.4	-	-	$ 604.2
HCM Lane LOS	F	F	A	-	-	C	-	-	F
HCM 95th %tile Q(veh)	7.6	2.2	0	-	-	0.3	-	-	2.1

Notes

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

Intersection	
Int Delay, s/veh	60.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	170	1651	3	7	543	51	3	1	7	64	0	69
Future Vol, veh/h	170	1651	3	7	543	51	3	1	7	64	0	69
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	200	-	-	125	-	-	-	-	-	-	-	30
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	170	1651	3	7	543	51	3	1	7	64	0	69

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	594	0	0	1654	0	0	2610	2601	1653	2580	2577	569
Stage 1	-	-	-	-	-	-	1993	1993	-	583	583	-
Stage 2	-	-	-	-	-	-	617	608	-	1997	1994	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	982	-	-	390	-	-	16	25	122	~ 17	26	522
Stage 1	-	-	-	-	-	-	79	105	-	498	499	-
Stage 2	-	-	-	-	-	-	477	486	-	78	105	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	982	-	-	390	-	-	12	20	122	~ 13	21	522
Mov Cap-2 Maneuver	-	-	-	-	-	-	12	20	-	~ 13	21	-
Stage 1	-	-	-	-	-	-	65	87	-	412	490	-
Stage 2	-	-	-	-	-	-	407	477	-	~ 60	87	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.9	0.2	175	$ 1135
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	31	982	-	-	390	-	-	13	522
HCM Lane V/C Ratio	0.355	0.173	-	-	0.018	-	-	4.923	0.132
HCM Control Delay (s)	175	9.4	-	-	14.4	-	-	$ 2344.7	12.9
HCM Lane LOS	F	A	-	-	B	-	-	F	B
HCM 95th %tile Q(veh)	1.1	0.6	-	-	0.1	-	-	9	0.5

Notes

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

Intersection	
Int Delay, s/veh	13.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	10	930	50	38	745	20	53	11	34	18	7	23
Future Vol, veh/h	10	930	50	38	745	20	53	11	34	18	7	23
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	190	-	-	-	-	30	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	10	930	50	38	745	20	53	11	34	18	7	23

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	765	0	0	980	0	0	1821	1816	955	1829	1831	755
Stage 1	-	-	-	-	-	-	975	975	-	831	831	-
Stage 2	-	-	-	-	-	-	846	841	-	998	1000	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	848	-	-	704	-	-	60	78	313	59	76	409
Stage 1	-	-	-	-	-	-	303	330	-	364	384	-
Stage 2	-	-	-	-	-	-	357	380	-	294	321	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	848	-	-	704	-	-	~ 50	73	313	44	71	409
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 50	73	-	44	71	-
Stage 1	-	-	-	-	-	-	299	326	-	360	363	-
Stage 2	-	-	-	-	-	-	313	359	-	250	317	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.5	213.4	92.1
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	53	313	848	-	-	704	-	-	85
HCM Lane V/C Ratio	1.208	0.109	0.012	-	-	0.054	-	-	0.565
HCM Control Delay (s)	$ 317.3	17.9	9.3	-	-	10.4	-	-	92.1
HCM Lane LOS	F	C	A	-	-	B	-	-	F
HCM 95th %tile Q(veh)	5.6	0.4	0	-	-	0.2	-	-	2.5

Notes

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

Intersection	
Int Delay, s/veh	8.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	69	884	10	9	704	52	9	0	11	56	0	84
Future Vol, veh/h	69	884	10	9	704	52	9	0	11	56	0	84
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	200	-	-	125	-	-	-	-	-	-	-	30
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	69	884	10	9	704	52	9	0	11	56	0	84

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	756	0	0	894	0	0	1817	1801	889	1781	1780	730
Stage 1	-	-	-	-	-	-	1027	1027	-	748	748	-
Stage 2	-	-	-	-	-	-	790	774	-	1033	1032	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	855	-	-	759	-	-	60	80	342	64	82	422
Stage 1	-	-	-	-	-	-	283	312	-	404	420	-
Stage 2	-	-	-	-	-	-	383	408	-	281	310	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	855	-	-	759	-	-	45	73	342	58	74	422
Mov Cap-2 Maneuver	-	-	-	-	-	-	45	73	-	58	74	-
Stage 1	-	-	-	-	-	-	260	287	-	371	415	-
Stage 2	-	-	-	-	-	-	303	403	-	250	285	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.7	0.1	59.1	98.8
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	86	855	-	-	759	-	-	58	422
HCM Lane V/C Ratio	0.233	0.081	-	-	0.012	-	-	0.966	0.199
HCM Control Delay (s)	59.1	9.6	-	-	9.8	-	-	223.7	15.6
HCM Lane LOS	F	A	-	-	A	-	-	F	C
HCM 95th %tile Q(veh)	0.8	0.3	-	-	0	-	-	4.5	0.7

Appendix D

Roadway Segment Level of Service Calculations

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HCS7 Two-Lane Highway Report

Project Information

Analyst		Date	11/22/2019
Agency	W-Trans	Analysis Year	2019
Jurisdiction	Napa County	Time Period Analyzed	3:00 - 4:00 p.m.
Project Description	PM Weekday Existing Eastbound	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	522
Lane Width, ft	12	Shoulder Width, ft	6
Speed Limit, mi/h	55	Access Point Density, pts/mi	20.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	1205	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.91	Total Trucks, %	10.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.71

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	57.4
Speed Slope Coefficient	3.61801	Speed Power Coefficient	0.41674
PF Slope Coefficient	-1.41935	PF Power Coefficient	0.73149
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	18.1
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	522	-	-	53.6

Vehicle Results

Average Speed, mi/h	53.6	Percent Followers, %	80.4
Segment Travel Time, minutes	0.11	Followers Density, followers/mi/ln	18.1
Vehicle LOS	E		

HCS7 Two-Lane Highway Report

Project Information

Analyst		Date	11/22/2019
Agency	W-Trans	Analysis Year	2019
Jurisdiction	Napa County	Time Period Analyzed	3:00 - 4:00 p.m.
Project Description	PM Weekday Existing Westbound	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	522
Lane Width, ft	12	Shoulder Width, ft	6
Speed Limit, mi/h	55	Access Point Density, pts/mi	20.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	571	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.91	Total Trucks, %	10.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.34

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	57.4
Speed Slope Coefficient	3.61801	Speed Power Coefficient	0.41674
PF Slope Coefficient	-1.41935	PF Power Coefficient	0.73149
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	6.4
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	522	-	-	54.7

Vehicle Results

Average Speed, mi/h	54.7	Percent Followers, %	61.0
Segment Travel Time, minutes	0.11	Followers Density, followers/mi/ln	6.4
Vehicle LOS	C		

HCS7 Two-Lane Highway Report

Project Information

Analyst		Date	11/22/2019
Agency	W-Trans	Analysis Year	2019
Jurisdiction	Napa County	Time Period Analyzed	1:45 - 2:45 p.m.
Project Description	Weekend Existing Eastbound	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	522
Lane Width, ft	12	Shoulder Width, ft	6
Speed Limit, mi/h	55	Access Point Density, pts/mi	20.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	632	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.92	Total Trucks, %	10.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.37

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	57.4
Speed Slope Coefficient	3.61801	Speed Power Coefficient	0.41674
PF Slope Coefficient	-1.41935	PF Power Coefficient	0.73149
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	7.4
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	522	-	-	54.6

Vehicle Results

Average Speed, mi/h	54.6	Percent Followers, %	63.7
Segment Travel Time, minutes	0.11	Followers Density, followers/mi/ln	7.4
Vehicle LOS	C		

HCS7 Two-Lane Highway Report

Project Information

Analyst		Date	11/22/2019
Agency	W-Trans	Analysis Year	2019
Jurisdiction	Napa County	Time Period Analyzed	1:45 - 2:45 p.m.
Project Description	Weekend Existing Westbound	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	522
Lane Width, ft	12	Shoulder Width, ft	6
Speed Limit, mi/h	55	Access Point Density, pts/mi	20.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	734	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.92	Total Trucks, %	10.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.43

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	57.4
Speed Slope Coefficient	3.61801	Speed Power Coefficient	0.41674
PF Slope Coefficient	-1.41935	PF Power Coefficient	0.73149
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	9.1
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	522	-	-	54.4

Vehicle Results

Average Speed, mi/h	54.4	Percent Followers, %	67.8
Segment Travel Time, minutes	0.11	Followers Density, followers/mi/ln	9.1
Vehicle LOS	D		

HCS7 Two-Lane Highway Report

Project Information

Analyst		Date	11/22/2019
Agency	W-Trans	Analysis Year	2019
Jurisdiction	Napa County	Time Period Analyzed	3:00 - 4:00 p.m.
Project Description	PM Weekday Future Eastbound	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	522
Lane Width, ft	12	Shoulder Width, ft	6
Speed Limit, mi/h	55	Access Point Density, pts/mi	20.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	1880	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	1.00	Total Trucks, %	10.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	1.11

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	75.0
Speed Slope Coefficient	0.00000	Speed Power Coefficient	0.00000
PF Slope Coefficient	0.00000	PF Power Coefficient	0.00000
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.0
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	522	-	-	75.0

Vehicle Results

Average Speed, mi/h	75.0	Percent Followers, %	0.0
Segment Travel Time, minutes	0.00	Followers Density, followers/mi/ln	0.0
Vehicle LOS	F		

HCS7 Two-Lane Highway Report

Project Information

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Agency	W-Trans	Analysis Year	2019
Jurisdiction	Napa County	Time Period Analyzed	3:00 - 4:00 p.m.
Project Description	PM Weekday Future Westbound	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	522
Lane Width, ft	12	Shoulder Width, ft	6
Speed Limit, mi/h	55	Access Point Density, pts/mi	20.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	614	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	1.00	Total Trucks, %	10.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.36

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	57.4
Speed Slope Coefficient	3.61801	Speed Power Coefficient	0.41674
PF Slope Coefficient	-1.41935	PF Power Coefficient	0.73149
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	7.1
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	522	-	-	54.6

Vehicle Results

Average Speed, mi/h	54.6	Percent Followers, %	63.0
Segment Travel Time, minutes	0.11	Followers Density, followers/mi/ln	7.1
Vehicle LOS	C		

HCS7 Two-Lane Highway Report

Project Information

Analyst		Date	11/22/2019
Agency	W-Trans	Analysis Year	2019
Jurisdiction	Napa County	Time Period Analyzed	1:45 - 2:45 p.m.
Project Description	Weekend Future Eastbound	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	522
Lane Width, ft	12	Shoulder Width, ft	6
Speed Limit, mi/h	55	Access Point Density, pts/mi	20.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	981	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	1.00	Total Trucks, %	10.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.58

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	57.4
Speed Slope Coefficient	3.61801	Speed Power Coefficient	0.41674
PF Slope Coefficient	-1.41935	PF Power Coefficient	0.73149
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	13.7
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	522	-	-	53.9

Vehicle Results

Average Speed, mi/h	53.9	Percent Followers, %	75.3
Segment Travel Time, minutes	0.11	Followers Density, followers/mi/ln	13.7
Vehicle LOS	E		

HCS7 Two-Lane Highway Report

Project Information

Analyst		Date	11/22/2019
Agency	W-Trans	Analysis Year	2019
Jurisdiction	Napa County	Time Period Analyzed	1:45 - 2:45 p.m.
Project Description	Weekend Future Westbound	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	522
Lane Width, ft	12	Shoulder Width, ft	6
Speed Limit, mi/h	55	Access Point Density, pts/mi	20.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	796	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	1.00	Total Trucks, %	10.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.47

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	57.4
Speed Slope Coefficient	3.61801	Speed Power Coefficient	0.41674
PF Slope Coefficient	-1.41935	PF Power Coefficient	0.73149
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	10.3
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	522	-	-	54.3

Vehicle Results

Average Speed, mi/h	54.3	Percent Followers, %	69.9
Segment Travel Time, minutes	0.11	Followers Density, followers/mi/ln	10.3
Vehicle LOS	D		

HCS7 Two-Lane Highway Report

Project Information

Analyst		Date	11/22/2019
Agency	W-Trans	Analysis Year	2019
Jurisdiction	Napa County	Time Period Analyzed	3:00 - 4:00 p.m.
Project Description	PM Weekday Existing Plus Project Eastbound	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	522
Lane Width, ft	12	Shoulder Width, ft	6
Speed Limit, mi/h	55	Access Point Density, pts/mi	20.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	1205	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.91	Total Trucks, %	10.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.71

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	57.4
Speed Slope Coefficient	3.61801	Speed Power Coefficient	0.41674
PF Slope Coefficient	-1.41935	PF Power Coefficient	0.73149
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	18.1
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	522	-	-	53.6

Vehicle Results

Average Speed, mi/h	53.6	Percent Followers, %	80.4
Segment Travel Time, minutes	0.11	Followers Density, followers/mi/ln	18.1
Vehicle LOS	E		

HCS7 Two-Lane Highway Report

Project Information

Analyst		Date	11/22/2019
Agency	W-Trans	Analysis Year	2019
Jurisdiction	Napa County	Time Period Analyzed	3:00 - 4:00 p.m.
Project Description	PM Weekday Existing Plus Project Westbound	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	522
Lane Width, ft	12	Shoulder Width, ft	6
Speed Limit, mi/h	55	Access Point Density, pts/mi	20.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	573	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.91	Total Trucks, %	10.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.34

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	57.4
Speed Slope Coefficient	3.61801	Speed Power Coefficient	0.41674
PF Slope Coefficient	-1.41935	PF Power Coefficient	0.73149
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	6.4
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	522	-	-	54.7

Vehicle Results

Average Speed, mi/h	54.7	Percent Followers, %	61.1
Segment Travel Time, minutes	0.11	Followers Density, followers/mi/ln	6.4
Vehicle LOS	C		

HCS7 Two-Lane Highway Report

Project Information

Analyst		Date	11/22/2019
Agency	W-Trans	Analysis Year	2019
Jurisdiction	Napa County	Time Period Analyzed	1:45 - 2:45 p.m.
Project Description	Weekend Existing plus Project Eastbound	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	522
Lane Width, ft	12	Shoulder Width, ft	6
Speed Limit, mi/h	55	Access Point Density, pts/mi	20.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	633	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.92	Total Trucks, %	10.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.37

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	57.4
Speed Slope Coefficient	3.61801	Speed Power Coefficient	0.41674
PF Slope Coefficient	-1.41935	PF Power Coefficient	0.73149
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	7.4
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	522	-	-	54.6

Vehicle Results

Average Speed, mi/h	54.6	Percent Followers, %	63.8
Segment Travel Time, minutes	0.11	Followers Density, followers/mi/ln	7.4
Vehicle LOS	C		

HCS7 Two-Lane Highway Report

Project Information

Analyst		Date	11/22/2019
Agency	W-Trans	Analysis Year	2019
Jurisdiction	Napa County	Time Period Analyzed	1:45 - 2:45 p.m.
Project Description	Weekend Existing plus Project Westbound	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	522
Lane Width, ft	12	Shoulder Width, ft	6
Speed Limit, mi/h	55	Access Point Density, pts/mi	20.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	735	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.92	Total Trucks, %	10.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.43

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	57.4
Speed Slope Coefficient	3.61801	Speed Power Coefficient	0.41674
PF Slope Coefficient	-1.41935	PF Power Coefficient	0.73149
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	9.2
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	522	-	-	54.4

Vehicle Results

Average Speed, mi/h	54.4	Percent Followers, %	67.8
Segment Travel Time, minutes	0.11	Followers Density, followers/mi/ln	9.2
Vehicle LOS	D		

HCS7 Two-Lane Highway Report

Project Information

Analyst		Date	11/22/2019
Agency	W-Trans	Analysis Year	2019
Jurisdiction	Napa County	Time Period Analyzed	3:00 - 4:00 p.m.
Project Description	PM Weekday Future plus Project Eastbound	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	522
Lane Width, ft	12	Shoulder Width, ft	6
Speed Limit, mi/h	55	Access Point Density, pts/mi	20.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	1880	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	1.00	Total Trucks, %	10.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	1.11

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	75.0
Speed Slope Coefficient	0.00000	Speed Power Coefficient	0.00000
PF Slope Coefficient	0.00000	PF Power Coefficient	0.00000
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.0
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	522	-	-	75.0

Vehicle Results

Average Speed, mi/h	75.0	Percent Followers, %	0.0
Segment Travel Time, minutes	0.00	Followers Density, followers/mi/ln	0.0
Vehicle LOS	F		

HCS7 Two-Lane Highway Report

Project Information

Analyst		Date	11/22/2019
Agency	W-Trans	Analysis Year	2019
Jurisdiction	Napa County	Time Period Analyzed	3:00 - 4:00 p.m.
Project Description	PM Weekday Future plus Project Westbound	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	522
Lane Width, ft	12	Shoulder Width, ft	6
Speed Limit, mi/h	55	Access Point Density, pts/mi	20.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	615	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	1.00	Total Trucks, %	10.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.36

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	57.4
Speed Slope Coefficient	3.61801	Speed Power Coefficient	0.41674
PF Slope Coefficient	-1.41935	PF Power Coefficient	0.73149
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	7.1
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	522	-	-	54.6

Vehicle Results

Average Speed, mi/h	54.6	Percent Followers, %	63.0
Segment Travel Time, minutes	0.11	Followers Density, followers/mi/ln	7.1
Vehicle LOS	C		

HCS7 Two-Lane Highway Report

Project Information

Analyst		Date	11/22/2019
Agency	W-Trans	Analysis Year	2019
Jurisdiction	Napa County	Time Period Analyzed	1:45 - 2:45 p.m.
Project Description	Weekend Future plus Project Eastbound	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	522
Lane Width, ft	12	Shoulder Width, ft	6
Speed Limit, mi/h	55	Access Point Density, pts/mi	20.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	982	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	1.00	Total Trucks, %	10.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.58

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	57.4
Speed Slope Coefficient	3.61801	Speed Power Coefficient	0.41674
PF Slope Coefficient	-1.41935	PF Power Coefficient	0.73149
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	13.7
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	522	-	-	53.9

Vehicle Results

Average Speed, mi/h	53.9	Percent Followers, %	75.4
Segment Travel Time, minutes	0.11	Followers Density, followers/mi/ln	13.7
Vehicle LOS	E		

HCS7 Two-Lane Highway Report

Project Information

Analyst		Date	11/22/2019
Agency	W-Trans	Analysis Year	2019
Jurisdiction	Napa County	Time Period Analyzed	1:45 - 2:45 p.m.
Project Description	Weekend Future plus Project Westbound	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	522
Lane Width, ft	12	Shoulder Width, ft	6
Speed Limit, mi/h	55	Access Point Density, pts/mi	20.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	797	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	1.00	Total Trucks, %	10.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.47

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	57.4
Speed Slope Coefficient	3.61801	Speed Power Coefficient	0.41674
PF Slope Coefficient	-1.41935	PF Power Coefficient	0.73149
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	10.3
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	522	-	-	54.3

Vehicle Results

Average Speed, mi/h	54.3	Percent Followers, %	69.9
Segment Travel Time, minutes	0.11	Followers Density, followers/mi/ln	10.3
Vehicle LOS	D		

Appendix E

Trip Generation Spreadsheets

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Existing Conditions Winery Traffic Information / Trip Generation

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

Project Name: Conn Creek Winery **Project Scenario:** **Existing**

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

1.	Total number of FT employees:	15	x 3.05 one-way trips per employee		=	45.8	daily trips
2.	Total number of PT employees:	1	x 1.90 one-way trips per employee		=	1.9	daily trips
3.	Maximum weekday visitors:	225	/2.6 visitors per vehicle x 2 one-way trips		=	173.1	daily trips
4.	Gallons of production:	260000	/1,000 x 0.009 daily truck trips2 x 2 one-way trips		=	4.7	daily trips
5.				TOTAL	=	226	daily trips

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

6.	Total number of FT employees:	15	x 3.05 one-way trips per employee		=	45.8	daily trips
7.	Total number of PT employees:	1	x 1.90 one-way trips per employee		=	1.9	daily trips
8.	Maximum weekday visitors:	225	/2.6 visitors per vehicle x 2 one-way trips		=	173.1	daily trips
9.	Gallons of production:	260000	/1,000 x 0.009 daily truck trips2 x 2 one-way trips		=	4.7	daily trips
10.	Avg. annual tons of grape on-haul:	1576	/ 144 truck trips x 2 one-way trips		=	21.9	daily trips
11.				TOTAL	=	247	daily trips

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

12.	Total number of FT Sat. employees:	16	x 3.05 one-way trips per employee		=	48.8	daily trips
13.	Total number of PT Sat. employees:	1	x 1.90 one-way trips per employee		=	1.9	daily trips
14.	Maximum Saturday visitors:	225	/2.8 visitors per vehicle x 2 one-way trips		=	160.7	daily trips
15.	Gallons of Production:	0	/1,000 x 0.009 daily truck trips x 2 one-way trips		=	0.0	daily trips
16.				TOTAL	=	211	daily trips

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

17.	Total number of FT Sat. employees:	15	x 3.05 one-way trips per employee		=	45.8	daily trips
18.	Total number of PT Sat. employees:	16	x 1.90 one-way trips per employee		=	30.4	daily trips
19.	Maximum Saturday visitors:	225	/2.8 visitors per vehicle x 2 one-way trips		=	160.7	daily trips
20.	Gallons of production:	850000	/1,000 x 0.009 daily truck trips2 x 2 one-way trips		=	15.3	daily trips
21.	Avg. annual tons of grape on-haul:	1576	/ 144 truck trips x 2 one-way trips		=	21.9	daily trips
22.				TOTAL	=	274	daily trips

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

(Sum of daily trips from Sec. A, lines 3 and 4) x 0.38 + (No. of FTE) + (line 2 / 2) = 83 PM peak trips

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

(Sum of daily trips, Sec. B, lines 8, 9, 10) x 0.38 + (No. of FTE) + (line 7 / 2) = 91 PM peak trips

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

(Daily trips from Sec. C, line 14 and 15) x 0.57 + (No. of FTE) + (line 13 / 2) = 108 PM peak trips

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

(Sum of daily trips Sec. D, lines 19, 20, 21) x 0.57 + (No. of FTE) + (line 18 / 2) = 136 PM peak trips

Section I. Maximum Annual Trips

(Sec. A, line 5 x 206) + (Sec. B, line 11 x 55) + (Sec. C, line 16 x 82) + (Sec. D, line 22 x 22) = 83471 Annual trips

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: Conn Creek Winery **Project Scenario:** **Proposed**

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

1.	Total number of FT employees:	20	x 3.05 one-way trips per employee	=	61.0	daily trips
2.	Total number of PT employees:	1	x 1.90 one-way trips per employee	=	1.9	daily trips
3.	Maximum weekday visitors:	225	/2.6 visitors per vehicle x 2 one-way trips	=	173.1	daily trips
4.	Gallons of production:	260000	/1,000 x 0.009 daily truck trips2 x 2 one-way trips	=	4.7	daily trips
5.			TOTAL	=	241	daily trips

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

6.	Total number of FT employees:	20	x 3.05 one-way trips per employee	=	61.0	daily trips
7.	Total number of PT employees:	1	x 1.90 one-way trips per employee	=	1.9	daily trips
8.	Maximum weekday visitors:	225	/2.6 visitors per vehicle x 2 one-way trips	=	173.1	daily trips
9.	Gallons of production:	260000	/1,000 x 0.009 daily truck trips2 x 2 one-way trips	=	4.7	daily trips
10.	Avg. annual tons of grape on-haul:	1576	/ 144 truck trips x 2 one-way trips	=	21.9	daily trips
11.			TOTAL	=	263	daily trips

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

12.	Total number of FT Sat. employees:	20	x 3.05 one-way trips per employee	=	61.0	daily trips
13.	Total number of PT Sat. employees:	1	x 1.90 one-way trips per employee	=	1.9	daily trips
14.	Maximum Saturday visitors:	225	/2.8 visitors per vehicle x 2 one-way trips	=	160.7	daily trips
15.	Gallons of Production:	0	/1,000 x 0.009 daily truck trips x 2 one-way trips	=	0.0	daily trips
16.			TOTAL	=	224	daily trips

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

17.	Total number of FT Sat. employees:	20	x 3.05 one-way trips per employee	=	61.0	daily trips
18.	Total number of PT Sat. employees:	16	x 1.90 one-way trips per employee	=	30.4	daily trips
19.	Maximum Saturday visitors:	225	/2.8 visitors per vehicle x 2 one-way trips	=	160.7	daily trips
20.	Gallons of production:	850000	/1,000 x 0.009 daily truck trips2 x 2 one-way trips	=	15.3	daily trips
21.	Avg. annual tons of grape on-haul:	1576	/ 144 truck trips x 2 one-way trips	=	21.9	daily trips
22.			TOTAL	=	289	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) = 88 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) = 96 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) = 112 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) = 141 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) = 88837 Annual trips