“I”

Traffic Study

Cuvaison Winery P16-00146
Planning Commission Hearing January 17, 2018

Traffic Impact Study for Cuvaison Winery

Final Report

Prepared for the County of Napa

Submitted by
W-Trans

September 21, 2017

Table of Contents

Executive Summary

The Cuvaison Winery project is a proposed modification to the Use Permit of an existing winery to increase daily visitation to a maximum of 180 people per day and add marketing events as small as 60 people and as large as 200 people. The project's anticipated trip generation based on application of the County's standard trip generation rates includes 136 net new daily trips on average during a weekday and 130 new trips on average during a weekend day, with 51 new trips during the weekday p.m. peak hour and 74 during the weekend midday peak hour. However, since this is an existing winery, the ratio of peak hour traffic to daily traffic was estimated using past experience, and this ratio was applied to daily trips to achieve the peak hour volumes used for the analysis. Under the applied assumptions the project is expected to generate on 24 additional trips during the weekday p.m. peak hour and 39 during the weekend midday peak hour. As is typically the case, even though tasting room visitors routinely visit multiple wineries during a single trip, each visitor was treated as if generating a new trip.

The study area was established by the County and includes the intersection of SR 12-121/Duhig Road and SR 12-121/Old Sonoma Road. The intersection of SR 12-121/Old Sonoma Road experienced a collision rate that is higher than the statewide average during the five-year period reviewed. Most of the collisions were rear-end or broadside types, likely attributable to the congested conditions that occur on SR 12-121 and as are typical on approaches to a signalized intersection.

Analysis indicates that SR 12-121/Duhig Road is operating unacceptably at LOS F on the Duhig Road approach during both peak periods under Existing, Existing plus Approved, and Future conditions. Upon adding project-generated trips, and with the proposed improvements to provide separate left-turn and right-turn lanes on the Duhig Road approach, delays would be less with the project than without it, resulting in a less-than-significant impact.

The intersection of SR 12-121/Old Sonoma Road is operating unacceptably during the weekday p.m. peak hour at LOS E and acceptably during the weekend midday peak hour at LOS D under Existing and Existing plus Approved conditions, with and without project-added trips. The intersection is expected to operate unacceptably at LOS F during the weekday p.m. peak hour and at LOS E during the weekend midday peak hour under Future and Future plus Project conditions. The project would have a less-than-significant impact under all scenarios, including those where the study intersection is operating unacceptably without project-added volumes, as the project-added volumes represent less than one percent of existing or existing plus approved volumes and less than five percent of the difference between existing and projected future volumes.

Queuing on northbound Duhig Road at SR 12 is expected to increase to 220 feet under existing weekend midday peak hour volumes plus special event traffic. The distance on Duhig Road between SR 12 and the nearest driveway is 650 feet, so existing space is adequate for the projected queue lengths. Queuing in the westbound SR 12 direction is expected to remain within the existing storage length of the left-turn pocket, which is 200 feet.

Vehicles will continue to access the project via Duhig Road. Any new plantings or signs should be designed to ensure that adequate sight lines will be maintained.

Introduction

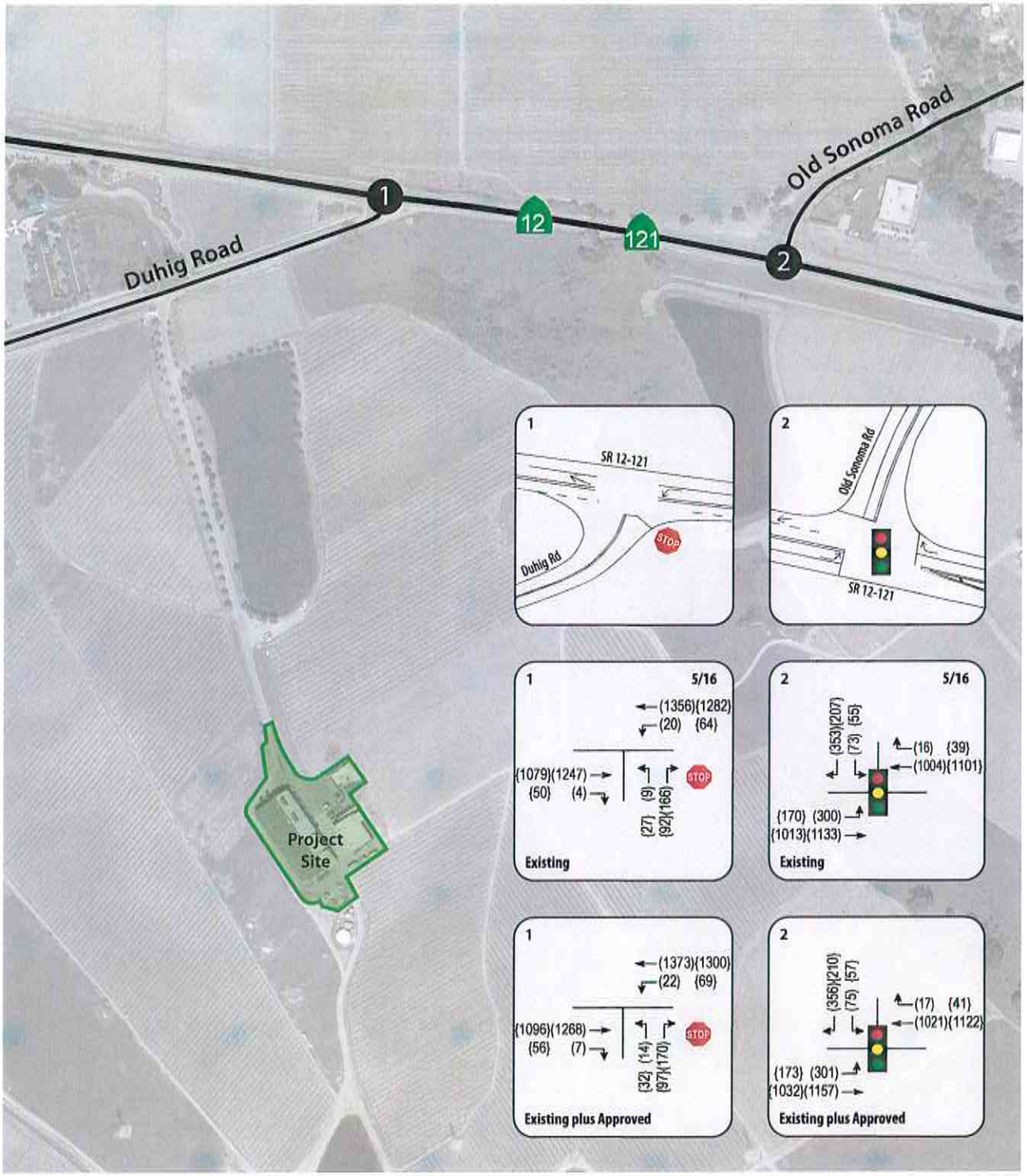
This report presents an analysis of the potential traffic impacts that would be associated with a proposed modification to the Cuvaison Estate Winery Use Permit to install offices within the barrel building, update the number of events, modify its tasting program, increase the number of employees, and add a parking lot for the additional employees. The winery is located at 1221 Duhig Road 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 approved by County of Napa 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 that 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 in order 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.

Project Profile

The existing Cuvaison Estate Winery is proposing to increase their daily visitation, number of employees, and special events, and provide additional offices and parking on-site. This change is proposed due to a shift in activities from their former facility in Calistoga to the winery on Duhig Road. The project site is shown in Figure 1.



LEGEND
- Study Intersection
- (xx) PM Peak Hour Volume
- (xx) Saturday PM Peak Hour Volume

North

Not to Scale

104nax.ai 4/17

Traffic Impact Study for Cuvaison Winery

Figure 1 – Study Area, Lane Configurations, and Existing and Existing plus Approved Traffic Volumes

W-Trans

Transportation Setting

Operational Analysis

Study Area and Periods

The study area consists of the intersections of SR 12-121/Duhig Road and SR 12-121/Old Sonoma Road. Operating conditions during the weekday p.m. and weekend midday peak periods were evaluated as these time periods reflect the highest traffic volumes area-wide and for the proposed project. The evening peak hour occurs between 4:00 and 6:00 p.m. and typically reflects the highest level of congestion of the day during the homeward bound commute, while the weekend midday peak evaluated was 12:00 noon to 2:00 p.m.

Study Intersections

While SR 12 is generally oriented in an east-west direction and SR 121 in a north-south direction, for the purposes of this analysis, SR 12-121 was considered to be the east-west roadway at the study intersections.

SR 12-121/Duhig Road is a "tee" intersection with the northbound Duhig Road approach stop-controlled.

SR 12-121/Old Sonoma Road is a signalized "tee" intersection with protected left-turn phasing on the eastbound SR 12-121 approach and a right-turn overlap on the southbound Old Sonoma Road approach.

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 October 1, 2011 through September 30, 2016.

As presented in Table 1, the calculated collision rates for the study intersections were compared to the average collision rates for similar facilities statewide, as indicated in *2013 Collision Data on California State Highways*, California Department of Transportation (Caltrans). The collision rate for the unsignalized intersection of SR 12-121/Duhig Road was less than the statewide average for the five-year study period. The intersection of SR 12-121/Old Sonoma Road was 0.28 collisions per million vehicles entering (c/mve) for the five-year study period, which is approximately equal to the statewide collision rate of 0.27 c/mve for similar facilities, however, the overall injury rate at SR 12-121/Old Sonoma Road is much less than the statewide average for similar facilities. Most of the collisions at the intersection were either rear-ends or hitting objects. Rear-ends are primarily caused by drivers following too closely behind another vehicle as they approach the intersection, and are common at signalized intersections that experience periods of congestion. The collision rate calculations are provided in Appendix A.

Table 1 – Collision Rate at the Study Intersections

Study Intersection	Number of Collisions (2010-2015)	Calculated Collision Rate (c/mve)	Statewide Average Collision Rate (c/mve)
1. SR 12-121/Duhig Rd	6	0.12	0.14
2. SR 12-121/Old Sonoma Rd	15	0.28	0.27

Note: c/mve = collisions per million vehicles entering

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 intersection was analyzed using methodologies 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 Levels of Service for SR 12-121/Duhig Road were analyzed using the "Two-Way Stop-Controlled" intersection capacity method from the HCM. This 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 intersection of SR 12-121/Old Sonoma Road was evaluated using the signalized methodology from the HCM. This methodology is based on factors including traffic volumes, green time for each movement, phasing, whether or not the signals are coordinated, truck traffic, and pedestrian activity. Average stopped delay per vehicle in seconds is used as the basis for evaluation in this LOS methodology. Signal timing provided by Caltrans was used as the basis for the analysis.

The ranges of delay associated with the various levels of service are indicated in Table 2.

Table 2 – Intersection Level of Service Criteria

LOS	Two-Way Stop-Controlled	Signalized
A	Delay of 0 to 10 seconds. Gaps in traffic are readily available for drivers exiting the minor street.	Delay of 0 to 10 seconds. Most vehicles arrive during the green phase, so do not stop at all.
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.	Delay of 10 to 20 seconds. More vehicles stop than with LOS A, but many drivers still do not have to stop.
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.	Delay of 20 to 35 seconds. The number of vehicles stopping is significant, although many still pass through without stopping.
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.	Delay of 35 to 55 seconds. The influence of congestion is noticeable, and most vehicles have to stop.
E	Delay of 35 to 50 seconds. Few acceptable gaps in traffic are available, and longer queues may form on the side street.	Delay of 55 to 80 seconds. Most, if not all, vehicles must stop and drivers consider the delay excessive.
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.	Delay of more than 80 seconds. Vehicles may wait through more than one cycle to clear the intersection.

Reference: *Highway Capacity Manual,* Transportation Research Board, 2010

Traffic Operation Standards

Napa County

Policy CIR-13 in the *Napa County General Plan* states, "The County seeks to provide a roadway system that maintains current roadway capacities in most locations and is both safe and efficient in terms of providing local access."

Policy CIR-16 of the *Napa County General Plan* provides guidance for roadways, indicating that, "The County shall seek to maintain an arterial Level of Service D or better on all county roadways, except where maintaining this desired level of service would require the installation of more travel lanes than shown on the Circulation Map. SR 29 is shown as a 2-lane Rural Throughway on the Circulation Map (Figure CIR-1).

Policy CIR-18 of the *Napa County General Plan* states, "Traffic safety and adequate local access will be priorities on roadway segments and at signalized intersections where Level of Service D or better cannot be achieved. Therefore, proposed capital improvements and development projects in these areas shall be evaluated to determine their effect on safety or local access. Projects that improve safety, improve local access, or alleviate congestion will be prioritized."

The County published *Guidelines for Interpretation of General Plan Circulation Policies on Significance Criteria* on December 1, 2015, Fehr & Peers, in an effort to provide a more quantitative method of adhering to the above standards. The document establishes thresholds of significance for road segments and different intersection control types. The memorandum states a project would cause a significant impact requiring mitigation if, for existing conditions:

1. *A signalized intersection operates at LOS A, B, C, or D during the selected peak hours without Project trips, the LOS deteriorates to LOS E or F with the addition of Project trips; or*
2. *A signalized intersection operates at LOS E or F during the selected peak hours without Project trips, and the addition of Project trips increases the total entering volume by one percent or more.*
3. *An unsignalized intersection operates at LOS A, B, C, or D during the selected peak hours without Project trips, the LOS deteriorates to LOS E or F with the addition of Project traffic; the peak hour traffic signal warrant criteria should also be evaluated and presented for informational purposes; or*
4. *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.*

Further, a project would cause a significant 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.

Caltrans

Although the study intersections are within Napa County limits, Caltrans has jurisdiction over any intersection that includes a State Route, such as both study intersections. Caltrans indicates that they endeavor to maintain operation at the transition from LOS C to LOS D. Based on previous discussions with Caltrans staff, it is understood that the standard is to be applied to the overall average intersection delay and *not* that associated with any single movement or approach. Under this approach, if one movement experiences very high delay and also has moderate to high traffic volumes, the overall delay and level of service should reflect the critical nature of the condition. However, if one movement is expected to experience high delay, but has very low traffic volumes, the overall intersection operation will likely still meet Caltrans standards.

Existing Conditions

The Existing Conditions scenario provides an evaluation of current operation based on existing traffic volumes during the weekday p.m. and weekend midday peak periods. This condition does not include project-generated traffic volumes. Volume data was collected on Thursday April 21, 2016 and Saturday, April 30, 2016. Counts taken on Duhig Road in September 2016 were lower than the volumes obtained in May of that same year. Given that the Duhig Road approach is most critical, the higher volumes from May were used and no seasonal adjustment was made. Copies of the counts are provided in Appendix B.

Intersection Levels of Service

Under existing conditions, the intersection of SR12-121/Duhig Road is operating acceptably overall at LOS A during the weekday p.m. and weekend midday peak hours, though delays indicating LOS F conditions are experienced on the stop-controlled approach during both peak periods. The intersection of SR 12-121/Old Sonoma Road is operating unacceptably at LOS E during the weekday p.m. peak hour and acceptably (under County standards) during the weekend midday peak hour at LOS D under existing conditions. The existing traffic volumes are shown in Figure 1. A summary of the intersection level of service calculations is contained in Table 3, and copies of the Level of Service calculations are provided in Appendix C.

Table 3 – Existing Peak Hour Intersection Levels of Service

Study Intersection *Approach*	Weekday PM Peak		Weekend Midday Peak	
	Delay	LOS	Delay	LOS
1. SR 12-121/Duhig Rd	5.4	A	2.8	A
Northbound Approach	***85.4***	***F***	***54.5***	***F***
2. SR 12-121/Old Sonoma Rd	**56.0**	**E**	44.2	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;* **Bold** text = deficient operation

Existing plus Approved Conditions

Existing plus Approved volumes were developed to include trips from other approved and pending projects that would add traffic to the study intersections. As directed by County staff, the following projects were included to evaluate Existing plus Approved conditions:

- **Hyde Winery** – 30,000 gallon winery at 1044 Los Carneros Avenue, south of SR 12-121 with up to 20 visitors per day and three employees.
- **Hudson Vineyards Winery** – 80,000 gallon winery at 5398 Sonoma Highway, north of SR 12-121 with up to 120 visitors per day and 16 employees.
- **Mahoney Vineyards** – 30,000 gallon winery at 1134 Dealy Lane, with 15 visitors and two employees per day, located north of SR 12-121 and east of Old Sonoma Road.
- **Sleeping Giant** – 30,000 gallon winery at 2258 Las Amigas Road, south of SR 12-121 with eight visitors and 10 employees.

Under Existing plus Approved conditions, SR 12-121/Duhig Road is expected to operate acceptably at LOS A during the weekday p.m. and weekend midday peak hours. The northbound approach will continue to experience high delays during both peak periods. SR 12-121/Old Sonoma Road is expected to continue operating at LOS E during the weekday p.m. peak hour and LOS D during the weekend midday peak hour. A summary of the intersection level of service calculations is contained in Table 4, volumes are shown in Figure 1, and copies of the Level of Service calculations are provided in Appendix C.

Table 4 – Existing plus Approved Peak Hour Intersection Levels of Service

Study Intersection *Approach*	Weekday PM Peak		Weekend Midday Peak	
	Delay	LOS	Delay	LOS
1. SR 12-121/Duhig Rd	7.2	A	3.6	A
Northbound Approach	***110.5***	***F***	***68.1***	***F***
2. SR 12-121/Old Sonoma Rd	**56.6**	**E**	49.5	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;* **Bold** text = deficient operation

Future Conditions

Future volumes for the horizon year of 2030 were calculated from data contained in the Napa-Solano Travel Demand Model, which was created and is maintained by the Solano Transportation Authority and the Napa Valley Transportation Authority. The model was built using local land use databases as well as countywide and regional travel models. Growth factors were developed from the model and applied to both study intersections. Volumes on SR 12-121 are expected to grow by a factor of 1.1 and volumes on Old Sonoma Road and Duhig Road are expected to grow by a factor of 1.4. Because the model does not include information for weekend volumes, the same growth factors were applied to the Saturday midday peak turning movement counts.

Under the anticipated Future volumes, SR 12-121/Duhig Road is expected to operate acceptably at LOS C or better during both peak hours, though delay on the stop-controlled Duhig Road approach are expected to continue increasing. The intersection of SR 12-121/Old Sonoma Road is expected to operate unacceptably at LOS E or F during both peak periods under future conditions. Future volumes are shown in Figure 2 and operating conditions are summarized in Table 5.

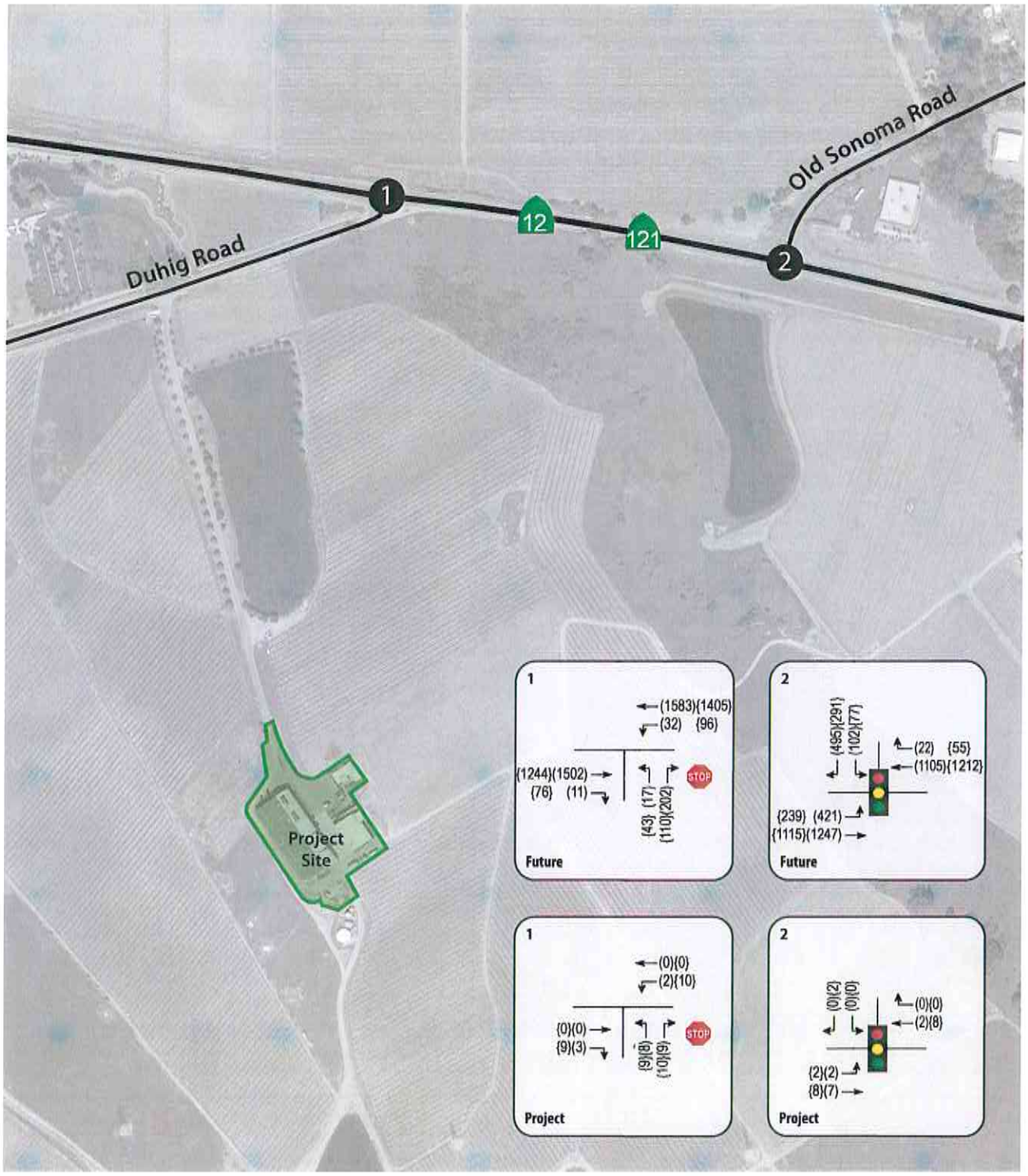
Table 5 – Future Peak Hour Intersection Levels of Service

Study Intersection *Approach*	Weekday PM Peak		Weekend Midday Peak	
	Delay	LOS	Delay	LOS
1. SR 12-121/Duhig Rd	22.6	C	7.3	A
Northbound Approach	**	***F***	**	***F***
2. SR 12-121/Old Sonoma Rd	**102.1**	**F**	**65.5**	**E**

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

Project Description

The Cuvaison Winery at 1221 Duhig Road in the County of Napa is proposing a Use Permit Modification to install offices within the barrel building, update the number of events, modify its tasting program, increase the number of employees, and add a parking lot for the additional employees. This change is proposed due to a shift in activities from their former facility in Calistoga to the winery on Duhig Road. While all of the events and visitation have occurred in the past at the Calistoga location, these trips will now be generated at the Duhig Road winery and will affect a different part of the County's roadway infrastructure, so they were treated as if they are all new trips.



LEGEND
- Study Intersection
- (xx) PM Peak Hour Volume
- {xx} Saturday PM Peak Hour Volume

North

Not to Scale

104nax.ai 9/17

Traffic Impact Study for Cuvaison Winery

Figure 2 – Future and Project Traffic Volumes

W-Trans

Cuvaison Winery is currently permitted for 10 regular season employees, 12 during harvest season, and 75 visitors per day up to a maximum of 525 per week. The requested amendment to the Use Permit proposes 28 regular season employees, 34 during harvest season, and a maximum of 180 visitors per day up to a maximum of 840 per week. The winery is also proposing 38 special events per year, including 24 events with no more than 60 people and 14 events per year for up to 200 guests. As noted above, these changes partially reflect a shift in location for the activity, rather than new activity.

As part of the project Cuvaison Winery is proposing to construct improvements at the intersection of SR 12-121/Duhig Road to provide separate left-turn and right-turn lanes on the Duhig Road approach.

Trip Generation

The County of Napa's Winery Traffic Information/Trip Generation Sheet was used to determine the anticipated traffic generated by the current staff as well as both production that is already permitted at the site and with the proposed changes to the Use Permit. Copies of the worksheets are provided in Appendix D.

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. The trip generation estimates for the current operation as well as with the proposed project are shown in Table 6.

Table 6 – Trip Generation Summary – General Assumptions

Scenario	Daily		Weekday PM Peak Hour			Weekend MD Peak Hour		
	Weekday	Weekend	Trips	In	Out	Trips	In	Out
Permitted	94	84	36	12	24	48	24	24
Proposed	230	214	87	29	58	122	61	61
Net New Trips	**136**	**130**	**51**	**17**	**34**	**74**	**37**	**37**

Note: Trip generation as estimated above based on Napa County's ratios; does not include special events

As this winery is already in operation, counts were performed for a two-week period in September 2016 to determine actual ratios between peak hour traffic and daily volumes. Additionally, actual visitor and employee counts provided by Cuvaison Winery were reviewed. The Napa County trip generation form assumes 38 percent of weekday trips occur during the weekday p.m. peak hour and 57 percent of Saturday trips occur during the midday peak hour; thdata obtained at and from Cuvaison Winery shows much lower ratios.

Because Cuvaison schedules few tastings to end during the weekday p.m. peak period, their tasting trips are generally concentrated during midday. Therefore, during the weekday p.m. peak hour, and based on actual site data, it was assumed there would be one trip per employee plus seven percent of visitor trips. This is conservative, as there were usually no visitors between 4 and 5 p.m. for the days of visitation and employment data provided, and the seven percent was the average of all trips on the eight days for which data was collected. Further, while the counts showed that seven percent of all weekday trips occurred during the weekday peak hour, this approach results in an assumed 15 percent of daily trips occurring during the p.m. peak hour, which remains conservative. The inbound versus outbound ratio for the weekday p.m. peak hour was also reviewed based on the actual driveway counts, and it was determined that 80 percent of trips during the evening peak hour are outbound, while 20 percent are inbound.

For the weekend midday peak hour, there would be one trip per employee plus 28 percent of visitor trips. This is also conservative, because 1) even though the weekend peak hour varies in terms of time of day between 11 a.m. and 5 p.m., the average of the weekend peak hour, regardless of what time it occurred, was used to determine the

percent of daily and 2) all of the employees for each of the Saturdays recorded were on-site during the highest hour of the day, and therefore not creating trips. The site-specific data was applied rather than the general, theoretical rates typically used. The site-specific trip generation is shown in Table 7 and the data on which the percentages of daily are based is provided in Appendix D.

Table 7 – Trip Generation Summary – Site Specific

Scenario	Daily		Weekday PM Peak Hour			Weekend MD Peak Hour		
	Weekday	Weekend	Trips	In	Out	Trips	In	Out
Permitted	95	85	14	3	11	25	13	12
Proposed	229	214	38	8	30	64	33	31
Net New Trips	**134**	**129**	**24**	**5**	**19**	**39**	**20**	**19**

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

Based on application of these assumptions, the proposed project is expected to generate an increase of 134 trips ends per day compared to existing permitted conditions, including an increase of 24 trips during the weekday p.m. peak hour and 39 trips during the Saturday p.m. peak hour.

Although most winery tasting room visitors taste/tour at an average of four wineries per trip, for purposes of the evaluation is was assumed that each visitor creates new inbound and outbound trips. Given the proximity of other wineries, it is likely that visitors to Cuvaison Winery will also visit other nearby wineries, so many of the visitor trips will result in new turning movements at the driveway, but not new trips on the network. The applied approach of assuming that all of these trips are new trips results in a more conservative analysis.

Trip Distribution

The pattern used to allocate new project trips to the street network was based on turning movements at the intersections of SR 12-121/Duhig Road and SR 12-121/Old Sonoma Road. The applied distribution assumptions and resulting trips are shown in Table 8.

Table 8 – Trip Distribution Assumptions

Route	Percent	Daily Trips	Weekend Trips	Weekday PM Trips	Weekend Midday Trips
To/from SR 12-121 East	40%	54	52	10	16
To/from SR 12-121 West	45%	60	58	11	18
To/from Old Sonoma Rd North	10%	13	13	2	4
To/from Duhig Rd South	5%	7	6	1	1
TOTAL	**100%**	**134**	**129**	**24**	**39**

Special Events

The proposed Use Permit modification includes 38 annual agricultural promotion events, with 24 events for up to 60 guests, and 14 events for up to 200 guests. It was assumed that a maximum-sized 200-person event would require a staff of 10 in addition to any winery staff that would assist with the event. Using the County-established occupancy of 2.8 persons per vehicle for guests and solo occupancy for staff, a maximum sized 200-person event would be expected to generate 163 trips ends including 81 inbound trips and 82 outbound trips. Given that special events are not part of typical daily operation, and often occur outside the peak period for traffic, special event traffic was not included in the daily trip generation and resulting intersection operation analysis.

Existing plus Project Conditions

Upon the addition of project-related traffic to the Existing volumes, and with the proposed improvements at SR 12-121/Duhig Road, both study intersections would be expected to operate unacceptably during one or both peak hours. The northbound approach on Duhig Road would be expected to continue operating at LOS F, but with lower delays than without the project due to the addition of the separate turn lanes. The intersection of SR 12-121/Old Sonoma Road would be expected to continue operating at LOS E during the weekday p.m. peak hour and LOS D during the weekend midday peak hour. These results are summarized in Table 9. Project traffic volumes are shown in Figure 2.

Table 9 – Existing and Existing plus Project Peak Hour Intersection Levels of Service

	Study Intersection *Approach*	**Existing Conditions**				**Existing plus Project**			
		Weekday PM Peak		**Weekend Midday Peak**		**Weekday PM Peak**		**Weekend Midday Peak**	
		Delay	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**
1.	SR 12-121/Duhig Rd	5.4	A	2.8	A	5.1	A	2.4	A
	Northbound Approach	***85.4***	***F***	***54.5***	***F***				
	Northbound Left Turn					***40.3***	***E***	***54.0***	***F***
	Northbound Right Turn					***77.6***	***F***	***32.4***	***D***
2.	SR 12-121/Old Sonoma Rd	**56.0**	**E**	44.2	D	**56.4**	**E**	46.2	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

Finding – Upon the addition of the project-related traffic to the Existing volumes, and with the proposed improvements at SR 12-121/Duhig Road, both study intersections would be expected to continue operating at LOS F during one or both peak hours, but traffic delays on the northbound Duhig Road approach to SR 12-121 would be reduced due to the addition of the separate turn lanes.. Project trips at SR 12-121/Old Sonoma Road would comprise 0.42 percent of the total entering volumes during the p.m. peak hour, which does not meet the one percent threshold. Therefore, the impact at this location is less-than-significant.

Existing plus Approved plus Project Conditions

With the addition of project trips to Existing plus Approved conditions, the intersection of SR 12-121/Duhig Road would be expected to continue operating at LOS F during both peak hours on the northbound approach. SR 12-121/Old Sonoma Road would be expected to operate at LOS E during the weekday p.m. peak period and LOS D during the weekend midday peak period with the addition of project trips. These results are summarized in Table 10.

Table 10 – Existing plus Approved and Existing plus Approved plus Project Peak Hour Levels of Service

Study Intersection *Approach*	Existing plus Approved Conditions				Existing plus Approved plus Project			
	Weekday PM Peak		Weekend Midday Peak		Weekday PM Peak		Weekend Midday Peak	
	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1. SR 12-121/Duhig Rd	7.2	A	3.6	A	5.9	A	2.7	A
Northbound Approach	***110.5***	***F***	***68.1***	***F***				
Northbound Left Turn					***43.7***	***E***	***61.4***	***F***
Northbound Right Turn					***88.4***	***F***	***35.0***	***E***
2. SR 12-121/Old Sonoma Rd	**56.6**	**E**	49.5	D	**57.0**	**E**	51.6	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

Finding – Delays on the northbound approach to the intersection of SR 12-121/Duhig Road would be expected to decrease with the addition of project generated trips as well as the proposed improvements, resulting in a less-than-significant impact. The intersection of SR 12-121/Old Sonoma Road would be expected to continue operating at LOS E during the weekday p.m. peak hour and LOS D during the weekend midday peak hour with the addition of project trips. Project generated trips would be 0.41 percent of the total entering volumes during the weekday p.m. peak hour and would therefore cause a less-than-significant impact under the applicable standards.

Future plus Project Conditions

Upon the addition of project-generated traffic to the anticipated Future volumes, the intersection of SR 12-121/Duhig Road would be expected to operate at LOS F on the stop-controlled Duhig Road approach during both peak hours studied. The intersection of SR 12-121/Old Sonoma Road would be expected to continue to operate at LOS F during both peak periods. The Future plus Project operating conditions are summarized in Table 11.

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

Study Intersection *Approach*	Future Conditions				Future plus Project			
	Weekday PM Peak		Weekend Midday Peak		Weekday PM Peak		Weekend Midday Peak	
	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1. SR 12-121/Duhig Rd	22.6	C	7.3	A	18.3	C	3.9	A
Northbound Approach	***343***	***F***	***134***	***F***				
Northbound Left Turn					***63.2***	***F***	***89.4***	***F***
Northbound Right Turn					***282.5***	***F***	***46.4***	***E***
2. SR 12-121/Old Sonoma Rd	**102.1**	**F**	**65.5**	**E**	**102.7**	**F**	**67.8**	**E**

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

Finding – The intersection of SR 12-121/Duhig Road would be expected to operate with lower delays upon adding both the project generated trips and planned improvements, resulting in a less-than-significant impact.

Finding – The intersection of SR 12-121/Old Sonoma Road would continue to operate unacceptably at LOS F during the weekday p.m. peak hour and at LOS E during the weekend midday peak hour with the addition of project-generated trips. The project's impact would be significant if it contributes five percent or more of the increase in traffic over existing volumes, and this project's trips are equal to 2.34 percent of the difference between cumulative and existing volumes at 12-121/Old Sonoma Road during the weekday p.m. peak hour and 4.72 percent during the weekend midday peak hour. This is considered a less-than-significant impact under the County's standards.

Queuing

Unsignalized Intersection

Westbound left-turn and northbound approach storage at SR 12/Duhig Road were determined using a methodology contained in "Estimating Maximum Queue Length at Unsignalized Intersections," John T. Gard, *ITE Journal*, November 2001. With weekend midday existing volumes, the northbound queue is estimated to be seven vehicles, or about 175 feet in length and the westbound left-turn queue is three vehicles, or 75 feet in length. Based on weekend midday peak hour volumes with guests leaving a special event in the same hour, the maximum queue on northbound Duhig Road was determined to be 11 vehicles, or about a 275-foot queue. The closest driveways on Duhig Road to SR 12 are 650 feet from the intersection, so the existing space is adequate for the maximum queues. For the other worst-case scenario of guests arriving at a special event in a single hour, the maximum queue on westbound SR 12-121 is expected to remain at three vehicles, or 75 feet in length. The left-turn pocket is more than 200 feet in length and long enough to accommodate a queue of about eight vehicles. It should be noted that the end of an event would likely be later in the day, when the through volumes on SR 12 would be lower, resulting in more opportunities for both westbound and northbound vehicles to find a gap in traffic and make a left turn. The queuing analysis is included in Appendix C.

Finding – The northbound queue length is expected to increase by 100 feet on a weekend during the midday with the addition of special-event traffic from the project. The distance along Duhig Road between SR 12 and the first driveways is 650 feet, so there is more than adequate space for queuing without impacting any driveways. For the westbound left-turn queues, the 200-foot left-turn pocket is adequate for the maximum projected queue length of 75 feet.

Access and Circulation

Site Access

Cuvaison Winery is currently accessed by an existing private driveway that connects to Duhig Road.

Sight Distance

At unsignalized intersections a substantially clear line of sight should be maintained between the driver of a vehicle waiting at the crossroad and the driver of an approaching vehicle. Adequate time must be provided for the waiting vehicle to either cross, turn left, or turn right, without requiring the through traffic to radically alter their speed. Sight distance should be measured from a 3.5-foot height at the location of the driver on the minor road to a 4.25-foot object height in the center of the approaching lane of the major road. Set-back for the driver on the crossroad shall be a minimum of 15 feet, measured from the edge of the traveled way.

Sight distance along Duhig Road at the project driveway was evaluated based on sight distance criteria contained in the *Highway Design Manual* published by Caltrans. The recommended sight distance for minor street approaches that are either a private road or a driveway is based on stopping sight distance for the approach travel speeds. Additionally, the stopping sight distance needed for a following driver to stop if there is a vehicle waiting to turn into a side street or driveway is evaluated based on the stopping sight distance criterion and the approach speed on the major street.

Sight distance along Duhig Road in both directions from the driveway is clear for more than 600 feet, which exceeds the minimum sight distance required for vehicles traveling 50 mph. Similarly, drivers on Duhig Road will have visibility of a vehicle stopped to turn left into the driveway for more than 600 feet, which is also adequate.

Finding – Stopping sight distance at the project driveway is adequate to meet the applied criteria from the HDM for both entering and exiting movements.

Recommendation – Because landscaping and signs can impede clear sight lines, any new plantings or signs should be designed to ensure that adequate sight lines will be maintained.

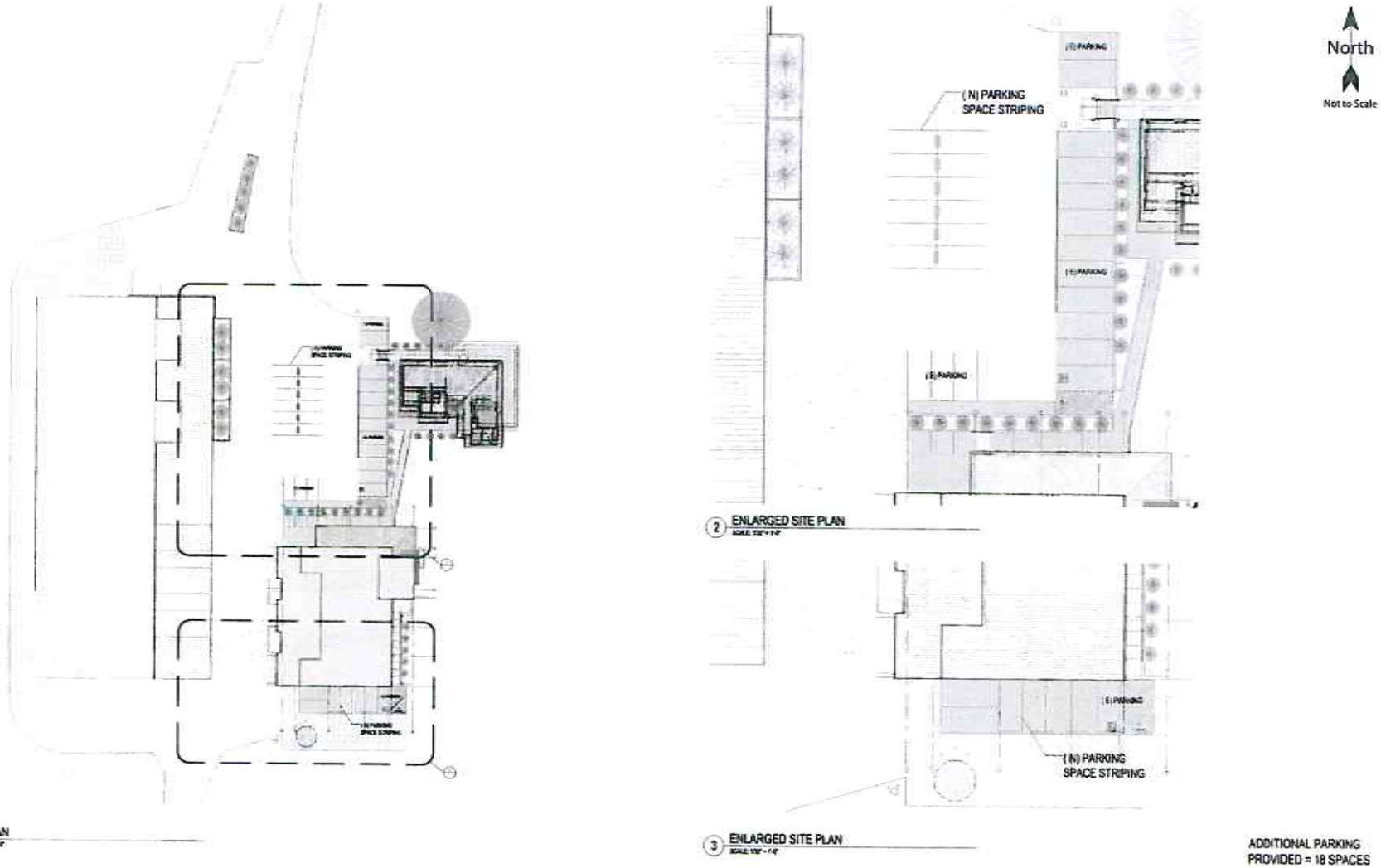
On-Site Circulation

The site layout is not changing with the addition of tasting room visitors or special events. A review of the site plan indicates adequate space for vehicle and truck circulation. The site plan is provided in Figure 3.

Access Analysis

Left-Turn Lane Warrant

The need for a left-turn lane on Duhig Road at the project driveway was evaluated based on criteria contained in the *Napa County Road and Street Standards*, 2016. Duhig Road near the project driveway has an approximate daily volume (ADT) on weekdays of 1,952. The Cuvaison winery is expected to experience a driveway ADT of 229 on weekdays. Using the County's criteria, a left-turn lane is warranted on Duhig Road at the project driveway. However, an exception is being pursued that includes provision of separate left- and right-turn lanes on the Duhig Road approach to SR 12/121 that will improve operation of that intersection. The left-turn lane warrant calculations are provided in Appendix E.



Source: Gould Evans 10/15

104nax.ai 5/16

Traffic Impact Study for Cuvaison Winery

Figure 3 – Site Plan

W-Trans

Conclusions and Recommendations

Conclusions

- The intersection of SR 121-Old Sonoma Road experienced collisions at a rate slightly higher than the statewide average. The limited number of trips that would be added by the project can reasonably be expected to have no impact on the crash rate or frequency as the average delay increases by a maximum of two seconds – a change that would be imperceptible to drivers.

- The proposed winery would be expected to generate an average of 134 new daily trips on weekdays, including 24 trips during the weekday p.m. peak hour, and 129 new trips on a Saturday, including 39 trips during the peak hour.

- A total of 38 annual wine marketing and agricultural promotion events are proposed as part of the project, including 24 events for 60 guests and 14 events for 200 guests. It was assumed that a maximum-sized 200-person event would require a staff of 10 in addition to any winery staff that would also assist with the event.

- As part of the project, improvements at the intersection of SR 12-121/Duhig Road are proposed to provide separate left-turn and right-turn lanes on the Duhig Road approach.

- The study intersection of SR 12-121/Duhig Road is currently operating unacceptably at LOS F on the Duhig Road approach during both peak periods. SR 12-121/Old Sonoma Road is operating unacceptably under Existing conditions at LOS E during the weekday p.m. peak hour and acceptably during the weekend midday peak hour at LOS D.

- Under Existing plus Project conditions, delay would decrease at SR 12-121/Duhig Road. Project trips at SR 12-121/Old Sonoma Road would make up 0.42 percent of the total entering volumes during the p.m. peak hour, which is a less-than-significant impact under the County's policies.

- Under Existing plus Approved conditions, both study intersections are expected to continue to operate at the same levels of service as under Existing conditions. With the addition of project-generated trips, SR 12-12/Duhig Road would be expected to operate with lower delays during both peak hours due to the addition of the separate turn lanes on Duhig Road. The intersection of SR 12-121/Old Sonoma Road would be expected to operate at LOS E during the weekday p.m. peak hour and LOS D during the weekend midday peak hour.

- Under Existing plus Approved plus Project conditions, project trips at SR 12-121/Old Sonoma Road would make up 0.41 percent of the total entering volumes during the p.m. peak hour, which is a less-than-significant impact under the County's policies.

- Under Future conditions, the intersection of SR 12-121/Duhig Road is expected to operate at LOS F on the Duhig Road approach. With the addition of project generated trips, the intersection is expected to operate at lower delays due to the additional capacity that would be added by the project.

- The intersection of SR 12-121/Old Sonoma Road is expected to operate at LOS E during the weekday p.m. peak hour and LOS F during the weekend midday peak hour under Future conditions. With the addition of project-generated trips, the intersection is expected to continue operating at the same levels of service as without.

- The project would have a less-than-significant impact at SR 12-121/Old Sonoma Road during the weekday p.m. peak period, with the project trips being 2.34 percent of the difference between Future and Existing

volumes. The project would also have a less-than-significant impact during the weekend midday peak period with the project trips being 4.72 percent of the difference between Future and Existing volumes.

- Queuing on Duhig Road at SR 12 is expected to extend to 250 feet under weekend midday existing plus special event volumes, leaving about 400 feet between the end of the queue and the closest driveways. The westbound left-turn pocket on SR 12-121 is expected to accommodate the maximum queue with event-added traffic.

- Stopping sight distance at the project driveway is adequate to meet the applied criteria from HDM for both entering and exiting movements.

Recommendations

- Because landscaping and signs can impede clear sight lines, any new plantings or signs should be designed to ensure that adequate sight lines will be maintained.

Study Participants and References

Study Participants

Principal in Charge	Dalene J. Whitlock, PE, PTOE
Assistant Engineer	Lauren Davini, PE
Editing/Formatting/Graphics	Angela McCoy

References

2013 Collision Data on California State Highways, California Department of Transportation, 2016
Guidelines for Interpretation of General Plan Circulation Policies on Significance Criteria, Fehr & Peers, 2015
Highway Capacity Manual, Transportation Research Board, 2010
Highway Design Manual, 6th Edition, California Department of Transportation, 2012
Napa County General Plan, County of Napa, 2013
Napa County Road and Street Standards, County of Napa, 2016
Statewide Integrated Traffic Records System (SWITRS), California Highway Patrol, 2010-2015

NAX104

Appendix A

Collision Rate Calculations

Intersection Collision Rate Calculations

Proposed Cuvaison Winery

Intersection # 1: SR 12-121 & Duhig Road
Date of Count: Saturday, April 30, 2016

Number of Collisions: 6
Number of Injuries: 3
Number of Fatalities: 0
ADT: 28300
Start Date: October 1, 2011
End Date: September 30, 2016
Number of Years: 5

Intersection Type: Tee
Control Type: Stop & Yield Controls
Area: Suburban

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

$$\text{collision rate} = \frac{6 \times 1{,}000{,}000}{28{,}300 \times 365 \times 5}$$

	Collision Rate	Fatality Rate	Injury Rate
Study Intersection	0.12 c/mve	0.0%	50.0%
Statewide Average*	0.14 c/mve	0.7%	38.0%

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: SR 12-121 & Old Sonoma Road
Date of Count: Saturday, April 30, 2016

Number of Collisions: 15
Number of Injuries: 3
Number of Fatalities: 0
ADT: 28900
Start Date: October 1, 2011
End Date: September 30, 2016
Number of Years: 5

Intersection Type: Tee
Control Type: Signals
Area: Suburban

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

$$\text{collision rate} = \frac{15 \times 1{,}000{,}000}{28{,}900 \times 365 \times 5}$$

	Collision Rate	Fatality Rate	Injury Rate
Study Intersection	0.28 c/mve	0.0%	20.0%
Statewide Average*	0.27 c/mve	0.6%	37.3%

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

Appendix B

Duhig Road ADT Counts

Prepared by NDS/ATD

VOLUME

Dughig Rd E/O Dwy to Cuvaison Winery

Day: Saturday
Date: 9/17/2016

City: Napa
Project #: CA16_7643_001

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	1,239	1,294	2,533

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			2		4		6		12:00			38		34		72	
00:15			3		7		10		12:15			27		28		55	
00:30			1		6		7		12:30			34		35		69	
00:45			1	7	1	18	2	25	12:45			26	125	28	125	54	250
01:00			0		1		1		13:00			27		27		54	
01:15			0		2		2		13:15			29		27		56	
01:30			2		1		3		13:30			36		30		66	
01:45			0	2	0	4	0	6	13:45			28	120	42	126	70	246
02:00			0		0		0		14:00			24		28		52	
02:15			0		2		2		14:15			37		30		67	
02:30			1		1		2		14:30			36		30		66	
02:45			1	2	2	5	3	7	14:45			31	128	27	115	58	243
03:00			2		8		10		15:00			21		24		45	
03:15			0		10		10		15:15			26		35		61	
03:30			3		6		9		15:30			24		34		58	
03:45			4	9	10	34	14	43	15:45			32	103	47	140	79	243
04:00			2		15		17		16:00			30		44		74	
04:15			2		5		7		16:15			38		41		79	
04:30			2		3		5		16:30			24		31		55	
04:45			4	10	2	25	6	35	16:45			13	105	38	154	51	259
05:00			6		3		9		17:00			13		28		41	
05:15			8		4		12		17:15			15		32		47	
05:30			9		10		19		17:30			14		34		48	
05:45			26	49	2	19	28	68	17:45			6	48	34	128	40	176
06:00			11		5		16		18:00			4		41		45	
06:15			5		3		8		18:15			8		34		42	
06:30			11		5		16		18:30			4		39		43	
06:45			13	40	5	18	18	58	18:45			3	19	6	120	9	139
07:00			5		4		9		19:00			2		8		10	
07:15			3		7		10		19:15			4		2		6	
07:30			15		5		20		19:30			4		2		6	
07:45			3	26	5	21	8	47	19:45			3	13	4	16	7	29
08:00			5		5		10		20:00			1		5		6	
08:15			10		10		20		20:15			3		1		4	
08:30			4		7		11		20:30			8		4		12	
08:45			14	33	3	25	17	58	20:45			3	15	3	13	6	28
09:00			23		6		29		21:00			18		0		18	
09:15			15		3		18		21:15			14		3		17	
09:30			37		9		46		21:30			0		4		4	
09:45			20	95	9	27	29	122	21:45			2	34	2	9	4	43
10:00			22		8		30		22:00			5		0		5	
10:15			29		7		36		22:15			0		2		2	
10:30			37		15		52		22:30			3		1		4	
10:45			33	121	12	42	45	163	22:45			2	10	0	3	2	13
11:00			28		26		54		23:00			1		1		2	
11:15			24		25		49		23:15			1		1		2	
11:30			30		25		55		23:30			3		1		4	
11:45			36	118	24	100	60	218	23:45			2	7	4	7	6	14
TOTALS				512		338		850	TOTALS				727		956		1683
SPLIT %				60.2%		39.8%		33.6%	SPLIT %				43.2%		56.8%		66.4%

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	1,239	1,294	2,533

AM Peak Hour	11:45	11:45	11:45	PM Peak Hour	14:00	15:30	15:30
AM Pk Volume	135	121	256	PM Pk Volume	128	166	290
Pk Hr Factor	0.888	0.864	0.889	Pk Hr Factor	0.865	0.883	0.918
7 - 9 Volume	59	46	105	4 - 6 Volume	153	282	435
7 - 9 Peak Hour	07:30	07:45	07:30	4 - 6 Peak Hour	16:00	16:00	16:00
7 - 9 Pk Volume	33	27	58	4 - 6 Pk Volume	105	154	259
Pk Hr Factor	0.550	0.675	0.725	Pk Hr Factor	0.691	0.875	0.820

Prepared by NDS/ATD

VOLUME

Dughig Rd E/O Dwy to Cuvaison Winery

Day: Sunday
Date: 9/18/2016

City: Napa
Project #: CA16_7643_001

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	949	1,049	1,998

AM Period	NB	SB	EB		WB		TOTAL	
00:00			2		0		2	
00:15			0		1		1	
00:30			0		1		1	
00:45			0	2	0	2	0	4
01:00			0		0		0	
01:15			1		0		1	
01:30			2		2		4	
01:45			1	4	5	7	6	11
02:00			0		15		15	
02:15			1		17		18	
02:30			0		1		1	
02:45			1	2	0	33	1	35
03:00			0		6		6	
03:15			7		2		9	
03:30			4		1		5	
03:45			0	11	0	9	0	20
04:00			0		0		0	
04:15			0		0		0	
04:30			0		1		1	
04:45			0		0	1	0	1
05:00			1		0		1	
05:15			0		0		0	
05:30			0		1		1	
05:45			9	10	2	3	11	13
06:00			2		0		2	
06:15			3		1		4	
06:30			3		0		3	
06:45			12	20	0	1	12	21
07:00			4		2		6	
07:15			3		2		5	
07:30			5		6		11	
07:45			6	18	3	13	9	31
08:00			4		2		6	
08:15			6		5		11	
08:30			2		5		7	
08:45			11	23	7	19	18	42
09:00			6		5		11	
09:15			15		3		18	
09:30			21		6		27	
09:45			16	58	3	17	19	75
10:00			15		3		18	
10:15			26		8		34	
10:30			27		12		39	
10:45			16	84	11	34	27	118
11:00			19		12		31	
11:15			27		16		43	
11:30			24		13		37	
11:45			14	84	15	56	29	140
TOTALS				316		195		511
SPLIT %				61.8%		38.2%		25.6%

PM Period	NB	SB	EB		WB		TOTAL	
12:00			16		24		40	
12:15			20		28		48	
12:30			23		22		45	
12:45			15	74	17	91	32	165
13:00			24		26		50	
13:15			25		13		38	
13:30			23		19		42	
13:45			33	105	18	76	51	181
14:00			22		18		40	
14:15			24		30		54	
14:30			27		19		46	
14:45			19	92	20	87	39	179
15:00			19		29		48	
15:15			21		26		47	
15:30			21		24		45	
15:45			20	81	27	106	47	187
16:00			18		24		42	
16:15			18		29		47	
16:30			23		25		48	
16:45			15	74	22	100	37	174
17:00			15		26		41	
17:15			12		23		35	
17:30			5		19		24	
17:45			5	37	37	105	42	142
18:00			4		25		29	
18:15			10		43		53	
18:30			10		25		35	
18:45			27	51	32	125	59	176
19:00			17		36		53	
19:15			14		29		43	
19:30			4		39		43	
19:45			3	38	14	118	17	156
20:00			4		12		16	
20:15			5		11		16	
20:30			12		5		17	
20:45			4	25	0	28	4	53
21:00			13		0		13	
21:15			12		2		14	
21:30			6		0		6	
21:45			8	39	4	6	12	45
22:00			0		3		3	
22:15			3		1		4	
22:30			2		2		4	
22:45			1	6	1	7	2	13
23:00			2		2		4	
23:15			3		2		5	
23:30			2		0		2	
23:45			4	11	1	5	5	16
TOTALS				633		854		1487
SPLIT %				42.6%		57.4%		74.4%

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	949	1,049	1,998

AM Peak Hour	10:30	11:45	11:45	PM Peak Hour	13:45	18:15	18:15
AM Pk Volume	89	89	162	PM Pk Volume	106	136	200
Pk Hr Factor	0.824	0.795	0.844	Pk Hr Factor	0.803	0.791	0.847
7 - 9 Volume	41	32	73	4 - 6 Volume	111	205	316
7 - 9 Peak Hour	08:00	08:00	08:00	4 - 6 Peak Hour	16:00	17:00	16:00
7 - 9 Pk Volume	23	19	42	4 - 6 Pk Volume	74	105	174
Pk Hr Factor	0.523	0.679	0.583	Pk Hr Factor	0.804	0.709	0.906

Prepared by NDS/ATD

VOLUME

Dughig Rd E/O Dwy to Cuvaison Winery

Day: Monday
Date: 9/19/2016

City: Napa
Project #: CA16_7643_001

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	910	929	1,839

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			3		0		3		12:00			14		19		33	
00:15			0		0		0		12:15			13		17		30	
00:30			1		3		4		12:30			21		15		36	
00:45			0	4	0	3	0	7	12:45			17	65	21	72	38	137
01:00			1		0		1		13:00			18		12		30	
01:15			1		2		3		13:15			17		21		38	
01:30			0		12		12		13:30			14		14		28	
01:45			0	2	7	21	7	23	13:45			15	64	12	59	27	123
02:00			0		9		9		14:00			9		17		26	
02:15			4		3		7		14:15			20		10		30	
02:30			1		7		8		14:30			15		15		30	
02:45			2	7	2	21	4	28	14:45			9	53	17	59	26	112
03:00			1		9		10		15:00			17		22		39	
03:15			4		14		18		15:15			15		19		34	
03:30			3		23		26		15:30			7		17		24	
03:45			0	8	7	53	7	61	15:45			19	58	27	85	46	143
04:00			1		2		3		16:00			15		29		44	
04:15			1		2		3		16:15			12		21		33	
04:30			1		1		2		16:30			8		15		23	
04:45			4	7	3	8	7	15	16:45			15	50	29	94	44	144
05:00			6		5		11		17:00			17		29		46	
05:15			5		9		14		17:15			9		24		33	
05:30			13		8		21		17:30			14		23		37	
05:45			22	46	9	31	31	77	17:45			11	51	21	97	32	148
06:00			14		4		18		18:00			5		20		25	
06:15			7		5		12		18:15			13		5		18	
06:30			22		9		31		18:30			16		11		27	
06:45			21	64	3	21	24	85	18:45			22	56	2	38	24	94
07:00			11		4		15		19:00			18		3		21	
07:15			5		11		16		19:15			14		5		19	
07:30			14		5		19		19:30			5		5		10	
07:45			3	33	8	28	11	61	19:45			3	40	3	16	6	56
08:00			6		2		8		20:00			4		2		6	
08:15			16		8		24		20:15			0		1		1	
08:30			10		11		21		20:30			4		1		5	
08:45			11	43	6	27	17	70	20:45			8	16	2	6	10	22
09:00			7		7		14		21:00			12		5		17	
09:15			12		7		19		21:15			11		1		12	
09:30			21		6		27		21:30			2		1		3	
09:45			24	64	9	29	33	93	21:45			0	25	0	7	0	32
10:00			22		9		31		22:00			1		1		2	
10:15			16		19		35		22:15			1		0		1	
10:30			16		26		42		22:30			3		3		6	
10:45			11	65	17	71	28	136	22:45			6	11	2	6	8	17
11:00			25		20		45		23:00			0		2		2	
11:15			10		15		25		23:15			2		1		3	
11:30			24		15		39		23:30			1		1		2	
11:45			14	73	23	73	37	146	23:45			2	5	0	4	2	9
TOTALS				416		386		802	TOTALS				494		543		1037
SPLIT %				51.9%		48.1%		43.6%	SPLIT %				47.6%		52.4%		56.4%

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	910	929	1,839

AM Peak Hour	09:30	10:15	10:15	PM Peak Hour	12:30	16:45	16:45
AM Pk Volume	83	82	150	PM Pk Volume	73	105	160
Pk Hr Factor	0.865	0.788	0.833	Pk Hr Factor	0.869	0.905	0.870
7 - 9 Volume	76	55	131	4 - 6 Volume	101	191	292
7 - 9 Peak Hour	08:00	07:45	08:00	4 - 6 Peak Hour	16:45	16:45	16:45
7 - 9 Pk Volume	43	29	70	4 - 6 Pk Volume	55	105	160
Pk Hr Factor	0.672	0.659	0.729	Pk Hr Factor	0.809	0.905	0.870

Prepared by NDS/ATD

VOLUME

Dughig Rd E/O Dwy to Cuvaison Winery

Day: Tuesday
Date: 9/20/2016

City: Napa
Project #: CA16_7643_001

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	950	1,049	1,999

AM Period	NB	SB	EB		WB		TOTAL	
00:00			0		0		0	
00:15			0		0		0	
00:30			0		0		0	
00:45			3	3	0		3	3
01:00			2		0		2	
01:15			8		4		12	
01:30			6		1		7	
01:45			0	16	2	7	2	23
02:00			1		8		9	
02:15			2		14		16	
02:30			1		8		9	
02:45			0	4	5	35	5	39
03:00			0		14		14	
03:15			2		19		21	
03:30			1		5		6	
03:45			2	5	4	42	6	47
04:00			1		6		7	
04:15			1		1		2	
04:30			7		5		12	
04:45			4	13	3	15	7	28
05:00			4		5		9	
05:15			8		12		20	
05:30			14		6		20	
05:45			24	50	12	35	36	85
06:00			12		8		20	
06:15			7		10		17	
06:30			12		8		20	
06:45			22	53	7	33	29	86
07:00			11		4		15	
07:15			8		7		15	
07:30			8		12		20	
07:45			12	39	11	34	23	73
08:00			12		12		24	
08:15			9		4		13	
08:30			8		7		15	
08:45			13	42	5	28	18	70
09:00			11		9		20	
09:15			8		9		17	
09:30			15		12		27	
09:45			27	61	3	33	30	94
10:00			18		13		31	
10:15			11		12		23	
10:30			22		12		34	
10:45			15	66	15	52	30	118
11:00			18		11		29	
11:15			13		9		22	
11:30			18		17		35	
11:45			16	65	24	61	40	126
TOTALS				417		375		792
SPLIT %				52.7%		47.3%		39.6%

PM Period	NB	SB	EB		WB		TOTAL	
12:00			13		15		28	
12:15			17		13		30	
12:30			24		21		45	
12:45			24	78	19	68	43	146
13:00			21		19		40	
13:15			22		20		42	
13:30			14		8		22	
13:45			18	75	16	63	34	138
14:00			14		26		40	
14:15			18		13		31	
14:30			21		31		52	
14:45			12	65	19	89	31	154
15:00			14		22		36	
15:15			13		18		31	
15:30			18		28		46	
15:45			17	62	22	90	39	152
16:00			9		48		57	
16:15			17		37		54	
16:30			8		45		53	
16:45			12	46	31	161	43	207
17:00			8		30		38	
17:15			12		20		32	
17:30			14		25		39	
17:45			16	50	18	93	34	143
18:00			7		18		25	
18:15			7		14		21	
18:30			13		29		42	
18:45			22	49	9	70	31	119
19:00			15		1		16	
19:15			11		0		11	
19:30			4		4		8	
19:45			5	35	3	8	8	43
20:00			5		3		8	
20:15			8		4		12	
20:30			7		4		11	
20:45			6	26	0	11	6	37
21:00			19		1		20	
21:15			13		3		16	
21:30			2		2		4	
21:45			3	37	1	7	4	44
22:00			3		1		4	
22:15			3		4		7	
22:30			1		3		4	
22:45			0	7	1	9	1	16
23:00			0		1		1	
23:15			0		1		1	
23:30			3		3		6	
23:45			0	3	0	5	0	8
TOTALS				533		674		1207
SPLIT %				44.2%		55.8%		60.4%

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	950	1,049	1,999

AM Peak Hour	09:45	11:45	11:45	PM Peak Hour	12:30	16:00	16:00
AM Pk Volume	78	73	143	PM Pk Volume	91	161	207
Pk Hr Factor	0.722	0.760	0.794	Pk Hr Factor	0.948	0.839	0.908
7 - 9 Volume	81	62	143	4 - 6 Volume	96	254	350
7 - 9 Peak Hour	08:00	07:15	07:15	4 - 6 Peak Hour	17:00	16:00	16:00
7 - 9 Pk Volume	42	42	82	4 - 6 Pk Volume	50	161	207
Pk Hr Factor	0.808	0.875	0.854	Pk Hr Factor	0.781	0.839	0.908

Prepared by NDS/ATD

VOLUME

Dughig Rd E/O Dwy to Cuvaison Winery

Day: Wednesday
Date: 9/21/2016

City: Napa
Project #: CA16_7643_001

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	840	939	1,779

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			0		0		0		12:00			15		18		33	
00:15			2		2		4		12:15			11		12		23	
00:30			1		3		4		12:30			9		20		29	
00:45			2	5	0	5	2	10	12:45			18	53	9	59	27	112
01:00			7		0		7		13:00			18		19		37	
01:15			1		2		3		13:15			18		17		35	
01:30			3		2		5		13:30			19		10		29	
01:45			0	11	8	12	8	23	13:45			13	68	11	57	24	125
02:00			4		3		7		14:00			21		18		39	
02:15			2		8		10		14:15			11		18		29	
02:30			1		4		5		14:30			19		21		40	
02:45			1	8	5	20	6	28	14:45			20	71	15	72	35	143
03:00			3		1		4		15:00			11		14		25	
03:15			4		6		10		15:15			14		10		24	
03:30			3		5		8		15:30			13		29		42	
03:45			3	13	27	39	30	52	15:45			11	49	26	79	37	128
04:00			0		11		11		16:00			9		20		29	
04:15			1		4		5		16:15			16		25		41	
04:30			2		5		7		16:30			14		30		44	
04:45			6	9	10	30	16	39	16:45			14	53	24	99	38	152
05:00			6		12		18		17:00			10		22		32	
05:15			4		16		20		17:15			6		29		35	
05:30			16		6		22		17:30			5		33		38	
05:45			25	51	3	37	28	88	17:45			4	25	18	102	22	127
06:00			13		5		18		18:00			7		20		27	
06:15			13		9		22		18:15			0		20		20	
06:30			21		2		23		18:30			5		8		13	
06:45			24	71	11	27	35	98	18:45			3	15	5	53	8	68
07:00			13		16		29		19:00			5		6		11	
07:15			12		11		23		19:15			3		2		5	
07:30			6		6		12		19:30			6		1		7	
07:45			8	39	7	40	15	79	19:45			4	18	4	13	8	31
08:00			7		6		13		20:00			2		0		2	
08:15			20		6		26		20:15			4		1		5	
08:30			13		11		24		20:30			5		2		7	
08:45			17	57	10	33	27	90	20:45			9	20	1	4	10	24
09:00			9		5		14		21:00			12		2		14	
09:15			14		12		26		21:15			8		1		9	
09:30			17		12		29		21:30			1		1		2	
09:45			11	51	18	47	29	98	21:45			1	22	0	4	1	26
10:00			17		7		24		22:00			1		0		1	
10:15			16		10		26		22:15			1		2		3	
10:30			14		8		22		22:30			2		2		4	
10:45			16	63	8	33	24	96	22:45			1	5	1	5	2	10
11:00			17		19		36		23:00			0		0		0	
11:15			15		18		33		23:15			0		0		0	
11:30			11		14		25		23:30			2		0		2	
11:45			16	59	17	68	33	127	23:45			2	4	1	1	3	5
TOTALS				437		391		828	TOTALS				403		548		951
SPLIT %				52.8%		47.2%		46.5%	SPLIT %				42.4%		57.6%		53.5%

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	840	939	1,779

AM Peak Hour	05:45	11:00	11:00	PM Peak Hour	12:45	16:45	16:15
AM Pk Volume	72	68	127	PM Pk Volume	73	108	155
Pk Hr Factor	0.720	0.895	0.882	Pk Hr Factor	0.961	0.818	0.881
7 - 9 Volume	96	73	169	4 - 6 Volume	78	201	279
7 - 9 Peak Hour	08:00	07:00	08:00	4 - 6 Peak Hour	16:15	16:45	16:15
7 - 9 Pk Volume	57	40	90	4 - 6 Pk Volume	54	108	155
Pk Hr Factor	0.713	0.625	0.833	Pk Hr Factor	0.844	0.818	0.881

Prepared by NDS/ATD

VOLUME

Dughig Rd E/O Dwy to Cuvaison Winery

Day: Thursday
Date: 9/22/2016

City: Napa
Project #: CA16_7643_001

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	895	957	1,852

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			0		0		0		12:00			18		23		41	
00:15			0		0		0		12:15			21		19		40	
00:30			0		0		0		12:30			17		12		29	
00:45			0		0		0		12:45			31	87	13	67	44	154
01:00			5		0		5		13:00			20		20		40	
01:15			2		7		9		13:15			23		27		50	
01:30			0		1		1		13:30			21		24		45	
01:45			0	7	1	9	1	16	13:45			17	81	20	91	37	172
02:00			1		0		1		14:00			11		14		25	
02:15			0		0		0		14:15			16		24		40	
02:30			1		1		2		14:30			16		21		37	
02:45			0	2	1	2	1	4	14:45			19	62	16	75	35	137
03:00			1		2		3		15:00			10		22		32	
03:15			3		0		3		15:15			19		16		35	
03:30			0		3		3		15:30			20		23		43	
03:45			2	6	2	7	4	13	15:45			11	60	27	88	38	148
04:00			0		2		2		16:00			16		29		45	
04:15			4		2		6		16:15			16		20		36	
04:30			5		2		7		16:30			10		28		38	
04:45			3	12	7	13	10	25	16:45			12	54	32	109	44	163
05:00			4		5		9		17:00			12		29		41	
05:15			6		6		12		17:15			12		34		46	
05:30			11		3		14		17:30			7		41		48	
05:45			21	42	7	21	28	63	17:45			3	34	29	133	32	167
06:00			10		6		16		18:00			4		18		22	
06:15			12		4		16		18:15			7		19		26	
06:30			14		10		24		18:30			8		14		22	
06:45			26	62	5	25	31	87	18:45			5	24	11	62	16	86
07:00			9		5		14		19:00			7		4		11	
07:15			6		6		12		19:15			7		0		7	
07:30			14		7		21		19:30			3		7		10	
07:45			5	34	8	26	13	60	19:45			3	20	4	15	7	35
08:00			9		10		19		20:00			5		5		10	
08:15			10		10		20		20:15			6		3		9	
08:30			14		12		26		20:30			11		2		13	
08:45			11	44	6	38	17	82	20:45			3	25	1	11	4	36
09:00			9		8		17		21:00			13		0		13	
09:15			11		11		22		21:15			8		2		10	
09:30			16		6		22		21:30			0		2		2	
09:45			15	51	17	42	32	93	21:45			4	25	3	7	7	32
10:00			15		5		20		22:00			1		4		5	
10:15			21		18		39		22:15			3		2		5	
10:30			22		14		36		22:30			1		2		3	
10:45			19	77	15	52	34	129	22:45			2	7	0	8	2	15
11:00			16		12		28		23:00			1		2		3	
11:15			18		10		28		23:15			1		2		3	
11:30			22		9		31		23:30			0		3		3	
11:45			20	76	17	48	37	124	23:45			1	3	1	8	2	11
TOTALS				413		283		696	TOTALS				482		674		1156
SPLIT %				59.3%		40.7%		37.6%	SPLIT %				41.7%		58.3%		62.4%

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	895	957	1,852

AM Peak Hour	11:30	11:45	11:30	PM Peak Hour	12:45	16:45	12:45
AM Pk Volume	81	71	149	PM Pk Volume	95	136	179
Pk Hr Factor	0.920	0.772	0.909	Pk Hr Factor	0.766	0.829	0.895
7 - 9 Volume	78	64	142	4 - 6 Volume	88	242	330
7 - 9 Peak Hour	08:00	07:45	08:00	4 - 6 Peak Hour	16:00	16:45	16:45
7 - 9 Pk Volume	44	40	82	4 - 6 Pk Volume	54	136	179
Pk Hr Factor	0.786	0.833	0.788	Pk Hr Factor	0.844	0.829	0.932

Prepared by NDS/ATD

VOLUME

Dughig Rd E/O Dwy to Cuvaison Winery

Day: Friday
Date: 9/23/2016

City: Napa
Project #: CA16_7643_001

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	1,174	1,348	2,522

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			1		1		2		12:00			40		19		59	
00:15			0		2		2		12:15			21		41		62	
00:30			1		4		5		12:30			22		35		57	
00:45			2	4	2	9	4	13	12:45			37	120	25	120	62	240
01:00			1		2		3		13:00			28		24		52	
01:15			0		0		0		13:15			23		32		55	
01:30			0		0		0		13:30			16		20		36	
01:45			0	1	0	2	0	3	13:45			17	84	17	93	34	177
02:00			1		0		1		14:00			26		28		54	
02:15			6		0		6		14:15			27		28		55	
02:30			0		2		2		14:30			25		27		52	
02:45			0	7	0	2	0	9	14:45			15	93	34	117	49	210
03:00			0		1		1		15:00			18		30		48	
03:15			0		1		1		15:15			15		42		57	
03:30			0		1		1		15:30			22		36		58	
03:45			2	2	5	8	7	10	15:45			15	70	41	149	56	219
04:00			2		4		6		16:00			19		41		60	
04:15			2		2		4		16:15			16		41		57	
04:30			4		3		7		16:30			15		35		50	
04:45			10	18	10	19	20	37	16:45			27	77	31	148	58	225
05:00			4		3		7		17:00			21		43		64	
05:15			4		4		8		17:15			12		47		59	
05:30			10		5		15		17:30			10		50		60	
05:45			28	46	14	26	42	72	17:45			7	50	48	188	55	238
06:00			14		5		19		18:00			8		44		52	
06:15			8		10		18		18:15			11		39		50	
06:30			12		8		20		18:30			15		32		47	
06:45			25	59	10	33	35	92	18:45			20	54	13	128	33	182
07:00			7		7		14		19:00			22		12		34	
07:15			10		10		20		19:15			14		12		26	
07:30			11		7		18		19:30			7		9		16	
07:45			13	41	10	34	23	75	19:45			3	46	3	36	6	82
08:00			10		4		14		20:00			3		1		4	
08:15			13		5		18		20:15			3		1		4	
08:30			7		11		18		20:30			7		0		7	
08:45			17	47	8	28	25	75	20:45			7	20	1	3	8	23
09:00			17		12		29		21:00			16		3		19	
09:15			27		8		35		21:15			3		2		5	
09:30			16		13		29		21:30			6		1		7	
09:45			13	73	9	42	22	115	21:45			1	26	1	7	2	33
10:00			23		11		34		22:00			2		2		4	
10:15			32		9		41		22:15			1		1		2	
10:30			32		10		42		22:30			3		0		3	
10:45			37	124	11	41	48	165	22:45			2	8	3	6	5	14
11:00			16		20		36		23:00			4		0		4	
11:15			27		20		47		23:15			1		3		4	
11:30			32		30		62		23:30			2		1		3	
11:45			21	96	33	103	54	199	23:45			1	8	2	6	3	14
TOTALS				518		347		865	TOTALS				656		1001		1657
SPLIT %				59.9%		40.1%		34.3%	SPLIT %				39.6%		60.4%		65.7%

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	1,174	1,348	2,522

AM Peak Hour	10:00	11:45	11:30	PM Peak Hour	12:00	17:15	16:45
AM Pk Volume	124	128	237	PM Pk Volume	120	189	241
Pk Hr Factor	0.838	0.780	0.956	Pk Hr Factor	0.750	0.945	0.941
7 - 9 Volume	88	62	150	4 - 6 Volume	127	336	463
7 - 9 Peak Hour	07:30	07:00	07:00	4 - 6 Peak Hour	16:15	17:00	16:45
7 - 9 Pk Volume	47	34	75	4 - 6 Pk Volume	79	188	241
Pk Hr Factor	0.904	0.850	0.815	Pk Hr Factor	0.731	0.940	0.941

Appendix C

Intersection Level of Service and Queuing Calculations

Intersection	
Int Delay, s/veh	5.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1247	4	20	1356	9	166
Future Vol, veh/h	1247	4	20	1356	9	166
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	215	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	99	99	99	99	99	99
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1260	4	20	1370	9	168

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1264	0	2672	1262
Stage 1	-	-	-	-	1262	-
Stage 2	-	-	-	-	1410	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	550	-	25	207
Stage 1	-	-	-	-	266	-
Stage 2	-	-	-	-	226	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	550	-	24	207
Mov Cap-2 Maneuver	-	-	-	-	120	-
Stage 1	-	-	-	-	266	-
Stage 2	-	-	-	-	218	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	85.4
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	200	-	-	550	-
HCM Lane V/C Ratio	0.884	-	-	0.037	-
HCM Control Delay (s)	85.4	-	-	11.8	-
HCM Lane LOS	F	-	-	B	-
HCM 95th %tile Q(veh)	6.8	-	-	0.1	-

Intersection	
Int Delay, s/veh	2.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1079	50	64	1282	27	92
Future Vol, veh/h	1079	50	64	1282	27	92
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	215	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1136	53	67	1349	28	97

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1188	0	2646	1162
Stage 1	-	-	-	-	1162	-
Stage 2	-	-	-	-	1484	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	588	-	~ 26	237
Stage 1	-	-	-	-	298	-
Stage 2	-	-	-	-	208	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	588	-	~ 23	237
Mov Cap-2 Maneuver	-	-	-	-	114	-
Stage 1	-	-	-	-	298	-
Stage 2	-	-	-	-	184	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.6	54.5
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	190	-	-	588	-
HCM Lane V/C Ratio	0.659	-	-	0.115	-
HCM Control Delay (s)	54.5	-	-	11.9	-
HCM Lane LOS	F	-	-	B	-
HCM 95th %tile Q(veh)	3.9	-	-	0.4	-

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

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	300	1133	1004	16	73	353
Future Volume (veh/h)	300	1133	1004	16	73	353
Number	5	2	6	16	7	14
Initial Q (Qb), veh	8	5	21	1	4	7
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	303	1144	1014	14	74	281
Adj No. of Lanes	1	1	1	1	1	1
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	257	1516	1196	996	223	446
Arrive On Green	0.16	0.81	0.63	0.63	0.13	0.13
Sat Flow, veh/h	1774	1863	1863	1583	1774	1583
Grp Volume(v), veh/h	303	1144	1014	14	74	281
Grp Sat Flow(s),veh/h/ln	1774	1863	1863	1583	1774	1583
Q Serve(g_s), s	24.0	44.6	66.3	0.5	5.7	19.0
Cycle Q Clear(g_c), s	24.0	44.6	66.3	0.5	5.7	19.0
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	257	1516	1196	996	223	446
V/C Ratio(X)	1.18	0.75	0.85	0.01	0.33	0.63
Avail Cap(c_a), veh/h	285	1713	1371	1165	225	455
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	70.8	7.2	24.5	10.5	61.1	49.4
Incr Delay (d2), s/veh	112.9	1.7	4.6	0.0	0.9	2.7
Initial Q Delay(d3),s/veh	89.1	0.3	14.6	0.0	3.5	4.8
%ile BackOfQ(50%),veh/ln	27.8	25.4	48.5	0.4	3.9	23.6
LnGrp Delay(d),s/veh	272.7	9.2	43.7	10.5	65.5	56.9
LnGrp LOS	F	A	D	B	E	E
Approach Vol, veh/h		1447	1028		355	
Approach Delay, s/veh		64.4	43.3		58.7	
Approach LOS		E	D		E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		127.5		22.0	27.5	100.0		
Change Period (Y+Rc), s		6.0		3.0	3.5	6.0		
Max Green Setting (Gmax), s		137.5		19.0	24.0	110.0		
Max Q Clear Time (g_c+I1), s		46.6		21.0	26.0	68.3		
Green Ext Time (p_c), s		36.8		0.0	0.0	25.7		

Intersection Summary	
HCM 2010 Ctrl Delay	56.0
HCM 2010 LOS	E

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	170	1013	1101	39	55	207
Future Volume (veh/h)	170	1013	1101	39	55	207
Number	5	2	6	16	7	14
Initial Q (Qb), veh	8	9	20	0	2	4
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	179	1066	1159	39	58	139
Adj No. of Lanes	1	1	1	1	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	226	1566	1238	1091	167	335
Arrive On Green	0.12	0.84	0.70	0.70	0.09	0.09
Sat Flow, veh/h	1774	1863	1863	1583	1774	1583
Grp Volume(v), veh/h	179	1066	1159	39	58	139
Grp Sat Flow(s),veh/h/ln	1774	1863	1863	1583	1774	1583
Q Serve(g_s), s	13.7	29.1	67.8	1.0	4.2	10.5
Cycle Q Clear(g_c), s	13.7	29.1	67.8	1.0	4.2	10.5
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	226	1566	1238	1091	167	335
V/C Ratio(X)	0.79	0.68	0.94	0.04	0.35	0.42
Avail Cap(c_a), veh/h	310	1862	1490	1266	245	402
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	64.3	4.8	27.7	7.3	59.3	48.1
Incr Delay (d2), s/veh	9.2	0.8	10.2	0.0	1.2	0.8
Initial Q Delay(d3),s/veh	42.9	0.7	29.4	0.0	1.6	1.8
%ile BackOfQ(50%),veh/ln	12.0	19.2	69.7	0.5	2.6	11.1
LnGrp Delay(d),s/veh	116.4	5.3	67.4	7.4	62.1	50.6
LnGrp LOS	F	A	E	A	E	D
Approach Vol, veh/h		1245	1198		197	
Approach Delay, s/veh		22.1	65.4		54.0	
Approach LOS		C	E		D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		121.8		15.8	19.4	102.4		
Change Period (Y+Rc), s		6.0		3.0	3.5	6.0		
Max Green Setting (Gmax), s		137.5		19.0	24.0	110.0		
Max Q Clear Time (g_c+I1), s		31.1		12.5	15.7	69.8		
Green Ext Time (p_c), s		42.7		0.3	0.3	26.6		

Intersection Summary	
HCM 2010 Ctrl Delay	44.2
HCM 2010 LOS	D

Intersection	
Int Delay, s/veh	7.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1268	7	22	1373	14	170
Future Vol, veh/h	1268	7	22	1373	14	170
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	215	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	99	99	99	99	99	99
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1281	7	22	1387	14	172

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1288	0	2715	1284
Stage 1	-	-	-	-	1284	-
Stage 2	-	-	-	-	1431	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	536	-	23	201
Stage 1	-	-	-	-	260	-
Stage 2	-	-	-	-	220	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	536	-	22	201
Mov Cap-2 Maneuver	-	-	-	-	116	-
Stage 1	-	-	-	-	260	-
Stage 2	-	-	-	-	211	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	110.5
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	190	-	-	536	-
HCM Lane V/C Ratio	0.978	-	-	0.041	-
HCM Control Delay (s)	110.5	-	-	12	-
HCM Lane LOS	F	-	-	B	-
HCM 95th %tile Q(veh)	8.1	-	-	0.1	-

Intersection	
Int Delay, s/veh	3.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1096	56	69	1300	32	97
Future Vol, veh/h	1096	56	69	1300	32	97
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	215	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1154	59	73	1368	34	102

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1213	0	2697	1183
Stage 1	-	-	-	-	1183	-
Stage 2	-	-	-	-	1514	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	575	-	~ 24	231
Stage 1	-	-	-	-	291	-
Stage 2	-	-	-	-	201	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	575	-	~ 21	231
Mov Cap-2 Maneuver	-	-	-	-	109	-
Stage 1	-	-	-	-	291	-
Stage 2	-	-	-	-	175	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.6	58.1
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	181	-	-	575	-
HCM Lane V/C Ratio	0.75	-	-	0.126	-
HCM Control Delay (s)	68.1	-	-	12.2	-
HCM Lane LOS	F	-	-	B	-
HCM 95th %tile Q(veh)	4.8	-	-	0.4	-

Notes

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

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	301	1157	1021	17	75	356
Future Volume (veh/h)	301	1157	1021	17	75	356
Number	5	2	6	16	7	14
Initial Q (Qb), veh	8	5	21	1	4	7
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	304	1169	1031	15	76	284
Adj No. of Lanes	1	1	1	1	1	1
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	257	1521	1205	1005	220	440
Arrive On Green	0.16	0.82	0.63	0.63	0.13	0.13
Sat Flow, veh/h	1774	1863	1863	1583	1774	1583
Grp Volume(v), veh/h	304	1169	1031	15	76	284
Grp Sat Flow(s),veh/h/ln	1774	1863	1863	1583	1774	1583
Q Serve(g_s), s	24.0	47.2	68.8	0.5	5.9	19.0
Cycle Q Clear(g_c), s	24.0	47.2	68.8	0.5	5.9	19.0
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	257	1521	1205	1005	220	440
V/C Ratio(X)	1.18	0.77	0.86	0.01	0.35	0.65
Avail Cap(c_a), veh/h	280	1686	1349	1147	222	448
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	70.8	7.3	24.6	10.3	62.3	50.6
Incr Delay (d2), s/veh	114.3	2.0	5.2	0.0	0.9	3.1
Initial Q Delay(d3),s/veh	88.8	0.3	15.2	0.0	3.7	5.1
%ile BackOfQ(50%),veh/ln	27.9	27.1	50.5	0.4	4.0	24.2
LnGrp Delay(d),s/veh	273.9	9.6	45.1	10.3	66.9	58.8
LnGrp LOS	F	A	D	B	E	E
Approach Vol, veh/h		1473	1046		360	
Approach Delay, s/veh		64.2	44.6		60.5	
Approach LOS		E	D		E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		129.9		22.0	27.5	102.4		
Change Period (Y+Rc), s		6.0		3.0	3.5	6.0		
Max Green Setting (Gmax), s		137.5		19.0	24.0	110.0		
Max Q Clear Time (g_c+I1), s		49.2		21.0	26.0	70.8		
Green Ext Time (p_c), s		38.7		0.0	0.0	25.6		

Intersection Summary	
HCM 2010 Ctrl Delay	56.6
HCM 2010 LOS	E

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	173	1032	1122	41	57	210
Future Volume (veh/h)	173	1032	1122	41	57	210
Number	5	2	6	16	7	14
Initial Q (Qb), veh	8	9	20	0	2	4
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	182	1086	1181	41	60	142
Adj No. of Lanes	1	1	1	1	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	228	1569	1238	1092	168	338
Arrive On Green	0.12	0.84	0.70	0.70	0.09	0.09
Sat Flow, veh/h	1774	1863	1863	1583	1774	1583
Grp Volume(v), veh/h	182	1086	1181	41	60	142
Grp Sat Flow(s),veh/h/ln	1774	1863	1863	1583	1774	1583
Q Serve(g_s), s	14.4	31.3	73.7	1.1	4.5	11.1
Cycle Q Clear(g_c), s	14.4	31.3	73.7	1.1	4.5	11.1
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	228	1569	1238	1092	168	338
V/C Ratio(X)	0.80	0.69	0.95	0.04	0.36	0.42
Avail Cap(c_a), veh/h	298	1794	1435	1220	236	395
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	65.8	5.0	27.7	7.5	61.4	49.6
Incr Delay (d2), s/veh	10.8	1.0	13.3	0.0	1.3	0.8
Initial Q Delay(d3),s/veh	43.5	0.8	37.4	0.0	1.6	1.7
%ile BackOfQ(50%),veh/ln	12.5	20.6	73.5	0.5	2.7	11.6
LnGrp Delay(d),s/veh	120.0	6.7	78.4	7.5	64.2	52.2
LnGrp LOS	F	A	E	A	E	D
Approach Vol, veh/h		1268	1222		202	
Approach Delay, s/veh		23.0	76.0		55.8	
Approach LOS		C	E		E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		126.4		16.4	20.2	106.2		
Change Period (Y+Rc), s		6.0		3.0	3.5	6.0		
Max Green Setting (Gmax), s		137.5		19.0	24.0	110.0		
Max Q Clear Time (g_c+I1), s		33.3		13.1	16.4	75.7		
Green Ext Time (p_c), s		45.1		0.3	0.3	24.5		

Intersection Summary	
HCM 2010 Ctrl Delay	49.5
HCM 2010 LOS	D

Intersection	
Int Delay, s/veh	22.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↰	↑	↱	
Traffic Vol, veh/h	1502	11	32	1583	17	202
Future Vol, veh/h	1502	11	32	1583	17	202
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	215	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1502	11	32	1583	17	202

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1513	0	3155	1508
Stage 1	-	-	-	-	1508	-
Stage 2	-	-	-	-	1647	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	442	-	~ 12	~ 148
Stage 1	-	-	-	-	202	-
Stage 2	-	-	-	-	172	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	442	-	~ 11	~ 148
Mov Cap-2 Maneuver	-	-	-	-	86	-
Stage 1	-	-	-	-	202	-
Stage 2	-	-	-	-	160	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	$ 342.7
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	140	-	-	442	-
HCM Lane V/C Ratio	1.564	-	-	0.072	-
HCM Control Delay (s)	$ 342.7	-	-	13.8	-
HCM Lane LOS	F	-	-	B	-
HCM 95th %tile Q(veh)	15.3	-	-	0.2	-

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

Intersection	
Int Delay, s/veh	7.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↰	↑	↱	
Traffic Vol, veh/h	1244	76	96	1405	43	110
Future Vol, veh/h	1244	76	96	1405	43	110
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	215	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1244	76	96	1405	43	110

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1320	0	2879	1282
Stage 1	-	-	-	-	1282	-
Stage 2	-	-	-	-	1597	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	524	-	~ 18	202
Stage 1	-	-	-	-	260	-
Stage 2	-	-	-	-	183	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	524	-	~ 15	202
Mov Cap-2 Maneuver	-	-	-	-	93	-
Stage 1	-	-	-	-	260	-
Stage 2	-	-	-	-	149	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.9	133.8
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	152	-	-	524	-
HCM Lane V/C Ratio	1.007	-	-	0.183	-
HCM Control Delay (s)	133.8	-	-	13.4	-
HCM Lane LOS	F	-	-	B	-
HCM 95th %tile Q(veh)	7.6	-	-	0.7	-

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

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	421	1247	1105	22	102	495
Future Volume (veh/h)	421	1247	1105	22	102	495
Number	5	2	6	16	7	14
Initial Q (Qb), veh	8	5	21	1	4	7
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	421	1247	1105	20	102	420
Adj No. of Lanes	1	1	1	1	1	1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	257	1537	1230	1034	210	411
Arrive On Green	0.15	0.82	0.65	0.65	0.12	0.12
Sat Flow, veh/h	1774	1863	1863	1583	1774	1583
Grp Volume(v), veh/h	421	1247	1105	20	102	420
Grp Sat Flow(s),veh/h/ln	1774	1863	1863	1583	1774	1583
Q Serve(g_s), s	24.0	56.7	80.9	0.7	8.6	19.0
Cycle Q Clear(g_c), s	24.0	56.7	80.9	0.7	8.6	19.0
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	257	1537	1230	1034	210	411
V/C Ratio(X)	1.64	0.81	0.90	0.02	0.49	1.02
Avail Cap(c_a), veh/h	266	1602	1282	1089	211	426
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	70.8	7.9	26.2	9.8	67.0	61.2
Incr Delay (d2), s/veh	303.4	3.2	8.5	0.0	1.7	49.3
Initial Q Delay(d3),s/veh	64.2	0.4	20.7	0.0	5.1	58.0
%ile BackOfQ(50%),veh/ln	41.4	32.6	60.5	0.5	5.4	45.5
LnGrp Delay(d),s/veh	438.3	11.4	55.4	9.8	73.9	168.5
LnGrp LOS	F	B	E	A	E	F
Approach Vol, veh/h		1668	1125		522	
Approach Delay, s/veh		119.2	54.6		150.0	
Approach LOS		F	D		F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		137.9		22.0	27.5	110.4		
Change Period (Y+Rc), s		6.0		3.0	3.5	6.0		
Max Green Setting (Gmax), s		137.5		19.0	24.0	110.0		
Max Q Clear Time (g_c+I1), s		58.7		21.0	26.0	82.9		
Green Ext Time (p_c), s		44.4		0.0	0.0	21.4		

Intersection Summary	
HCM 2010 Ctrl Delay	102.1
HCM 2010 LOS	F

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	239	1115	1212	55	77	291
Future Volume (veh/h)	239	1115	1212	55	77	291
Number	5	2	6	16	7	14
Initial Q (Qb), veh	8	9	20	0	2	4
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	239	1115	1212	53	77	216
Adj No. of Lanes	1	1	1	1	1	1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	257	1547	1238	1052	204	412
Arrive On Green	0.15	0.83	0.66	0.66	0.12	0.12
Sat Flow, veh/h	1774	1863	1863	1583	1774	1583
Grp Volume(v), veh/h	239	1115	1212	53	77	216
Grp Sat Flow(s),veh/h/ln	1774	1863	1863	1583	1774	1583
Q Serve(g_s), s	22.0	41.8	103.3	1.9	6.6	19.0
Cycle Q Clear(g_c), s	22.0	41.8	103.3	1.9	6.6	19.0
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	257	1547	1238	1052	204	412
V/C Ratio(X)	0.93	0.72	0.98	0.05	0.38	0.52
Avail Cap(c_a), veh/h	258	1551	1241	1055	204	412
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	70.8	6.6	27.7	9.6	68.0	53.1
Incr Delay (d2), s/veh	37.4	1.7	20.6	0.0	1.2	1.2
Initial Q Delay(d3),s/veh	80.0	0.9	48.7	0.0	1.1	1.4
%ile BackOfQ(50%),veh/ln	20.1	26.1	79.9	0.8	3.8	18.8
LnGrp Delay(d),s/veh	188.1	9.1	97.0	9.7	70.2	55.7
LnGrp LOS	F	A	F	A	E	E
Approach Vol, veh/h		1354	1265		293	
Approach Delay, s/veh		40.7	93.3		59.5	
Approach LOS		D	F		E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		143.2		22.0	27.5	115.7		
Change Period (Y+Rc), s		6.0		3.0	3.5	6.0		
Max Green Setting (Gmax), s		137.5		19.0	24.0	110.0		
Max Q Clear Time (g_c+I1), s		43.8		21.0	24.0	105.3		
Green Ext Time (p_c), s		47.1		0.0	0.0	4.3		

Intersection Summary	
HCM 2010 Ctrl Delay	65.5
HCM 2010 LOS	E

Intersection	
Int Delay, s/veh	7.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱		↰	↑	↰↱	
Traffic Vol, veh/h	1247	8	24	1356	16	174
Future Vol, veh/h	1247	8	24	1356	16	174
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	215	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	99	99	99	99	99	99
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1260	8	24	1370	16	176

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1268	0	2682	1264
Stage 1	-	-	-	-	1264	-
Stage 2	-	-	-	-	1418	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	548	-	24	207
Stage 1	-	-	-	-	266	-
Stage 2	-	-	-	-	224	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	548	-	23	207
Mov Cap-2 Maneuver	-	-	-	-	119	-
Stage 1	-	-	-	-	266	-
Stage 2	-	-	-	-	214	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	110.4
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	195	-	-	548	-
HCM Lane V/C Ratio	0.984	-	-	0.044	-
HCM Control Delay (s)	110.4	-	-	11.9	-
HCM Lane LOS	F	-	-	B	-
HCM 95th %tile Q(veh)	8.3	-	-	0.1	-

Intersection	
Int Delay, s/veh	4.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱		↰	↑	↰↱	
Traffic Vol, veh/h	1079	59	74	1282	36	102
Future Vol, veh/h	1079	59	74	1282	36	102
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	215	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1136	62	78	1349	38	107

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1198	0	2672	1167
Stage 1	-	-	-	-	1167	-
Stage 2	-	-	-	-	1505	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	583	-	~ 25	236
Stage 1	-	-	-	-	296	-
Stage 2	-	-	-	-	203	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	583	-	~ 22	236
Mov Cap-2 Maneuver	-	-	-	-	110	-
Stage 1	-	-	-	-	296	-
Stage 2	-	-	-	-	176	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.7	75.1
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	182	-	-	583	-
HCM Lane V/C Ratio	0.798	-	-	0.134	-
HCM Control Delay (s)	75.1	-	-	12.1	-
HCM Lane LOS	F	-	-	B	-
HCM 95th %tile Q(veh)	5.4	-	-	0.5	-

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

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	302	1139	1007	16	73	354
Future Volume (veh/h)	302	1139	1007	16	73	354
Number	5	2	6	16	7	14
Initial Q (Qb), veh	8	5	21	1	4	7
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	305	1151	1017	14	74	282
Adj No. of Lanes	1	1	1	1	1	1
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	257	1517	1198	998	222	445
Arrive On Green	0.16	0.81	0.63	0.63	0.13	0.13
Sat Flow, veh/h	1774	1863	1863	1583	1774	1583
Grp Volume(v), veh/h	305	1151	1017	14	74	282
Grp Sat Flow(s),veh/h/ln	1774	1863	1863	1583	1774	1583
Q Serve(g_s), s	24.0	45.3	66.7	0.5	5.7	19.0
Cycle Q Clear(g_c), s	24.0	45.3	66.7	0.5	5.7	19.0
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	257	1517	1198	998	222	445
V/C Ratio(X)	1.19	0.76	0.85	0.01	0.33	0.63
Avail Cap(c_a), veh/h	284	1708	1366	1161	225	454
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	70.8	7.2	24.6	10.4	61.4	49.6
Incr Delay (d2), s/veh	115.7	1.8	4.7	0.0	0.9	2.8
Initial Q Delay(d3),s/veh	88.6	0.3	14.6	0.0	3.5	4.9
%ile BackOfQ(50%),veh/ln	28.0	25.9	48.9	0.4	3.9	23.8
LnGrp Delay(d),s/veh	275.1	9.3	43.9	10.4	65.7	57.3
LnGrp LOS	F	A	D	B	E	E
Approach Vol, veh/h		1456	1031		356	
Approach Delay, s/veh		65.0	43.5		59.1	
Approach LOS		E	D		E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		128.0		22.0	27.5	100.5		
Change Period (Y+Rc), s		6.0		3.0	3.5	6.0		
Max Green Setting (Gmax), s		137.5		19.0	24.0	110.0		
Max Q Clear Time (g_c+I1), s		47.3		21.0	26.0	68.7		
Green Ext Time (p_c), s		37.3		0.0	0.0	25.7		

Intersection Summary	
HCM 2010 Ctrl Delay	56.4
HCM 2010 LOS	E

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	172	1021	1109	39	55	209
Future Volume (veh/h)	172	1021	1109	39	55	209
Number	5	2	6	16	7	14
Initial Q (Qb), veh	8	9	20	0	2	4
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	181	1075	1167	39	58	141
Adj No. of Lanes	1	1	1	1	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	228	1567	1238	1091	168	337
Arrive On Green	0.12	0.84	0.70	0.70	0.09	0.09
Sat Flow, veh/h	1774	1863	1863	1583	1774	1583
Grp Volume(v), veh/h	181	1075	1167	39	58	141
Grp Sat Flow(s),veh/h/ln	1774	1863	1863	1583	1774	1583
Q Serve(g_s), s	14.0	30.1	70.3	1.1	4.3	10.8
Cycle Q Clear(g_c), s	14.0	30.1	70.3	1.1	4.3	10.8
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	228	1567	1238	1091	168	337
V/C Ratio(X)	0.79	0.69	0.94	0.04	0.35	0.42
Avail Cap(c_a), veh/h	304	1830	1464	1245	241	399
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	65.0	4.9	27.7	7.4	60.2	48.7
Incr Delay (d2), s/veh	10.0	0.9	11.3	0.0	1.2	0.8
Initial Q Delay(d3),s/veh	43.1	0.8	32.3	0.0	1.6	1.7
%ile BackOfQ(50%),veh/ln	12.3	19.7	71.1	0.5	2.6	11.4
LnGrp Delay(d),s/veh	118.2	6.5	71.4	7.4	63.0	51.3
LnGrp LOS	F	A	E	A	E	D
Approach Vol, veh/h		1256	1206		199	
Approach Delay, s/veh		22.6	69.3		54.7	
Approach LOS		C	E		D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		123.9		16.1	19.8	104.1		
Change Period (Y+Rc), s		6.0		3.0	3.5	6.0		
Max Green Setting (Gmax), s		137.5		19.0	24.0	110.0		
Max Q Clear Time (g_c+I1), s		32.1		12.8	16.0	72.3		
Green Ext Time (p_c), s		43.7		0.3	0.3	25.8		

Intersection Summary	
HCM 2010 Ctrl Delay	46.2
HCM 2010 LOS	D

Intersection	
Int Delay, s/veh	9.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1268	11	26	1373	21	178
Future Vol, veh/h	1268	11	26	1373	21	178
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	215	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	99	99	99	99	99	99
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1281	11	26	1387	21	180

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1292	0	2725	1286
Stage 1	-	-	-	-	1286	-
Stage 2	-	-	-	-	1439	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	537	-	23	201
Stage 1	-	-	-	-	259	-
Stage 2	-	-	-	-	218	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	537	-	22	201
Mov Cap-2 Maneuver	-	-	-	-	115	-
Stage 1	-	-	-	-	259	-
Stage 2	-	-	-	-	207	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	141.2
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	186	-	-	537	-
HCM Lane V/C Ratio	1.081	-	-	0.049	-
HCM Control Delay (s)	141.2	-	-	12	-
HCM Lane LOS	F	-	-	B	-
HCM 95th %tile Q(veh)	9.7	-	-	0.2	-

Intersection	
Int Delay, s/veh	5.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1096	65	79	1300	41	107
Future Vol, veh/h	1096	65	79	1300	41	107
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	215	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1154	68	83	1368	43	113

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1222	0	2723	1188
Stage 1	-	-	-	-	1188	-
Stage 2	-	-	-	-	1535	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	570	-	~ 23	229
Stage 1	-	-	-	-	289	-
Stage 2	-	-	-	-	196	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	570	-	~ 20	229
Mov Cap-2 Maneuver	-	-	-	-	105	-
Stage 1	-	-	-	-	289	-
Stage 2	-	-	-	-	167	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.7	97.9
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	173	-	-	570	-
HCM Lane V/C Ratio	0.901	-	-	0.146	-
HCM Control Delay (s)	97.9	-	-	12.4	-
HCM Lane LOS	F	-	-	B	-
HCM 95th %tile Q(veh)	6.6	-	-	0.5	-

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

HCM 2010 Signalized Intersection Summary
2: SR 12-121 & Old Sonoma Rd

04/11/2017

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	303	1163	1024	17	75	357
Future Volume (veh/h)	303	1163	1024	17	75	357
Number	5	2	6	16	7	14
Initial Q (Qb), veh	8	5	21	1	4	7
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	306	1175	1034	15	76	285
Adj No. of Lanes	1	1	1	1	1	1
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	257	1522	1206	1007	219	439
Arrive On Green	0.16	0.82	0.64	0.64	0.12	0.12
Sat Flow, veh/h	1774	1863	1863	1583	1774	1583
Grp Volume(v), veh/h	306	1175	1034	15	76	285
Grp Sat Flow(s),veh/h/ln	1774	1863	1863	1583	1774	1583
Q Serve(g_s), s	24.0	47.8	69.2	0.5	6.0	19.0
Cycle Q Clear(g_c), s	24.0	47.8	69.2	0.5	6.0	19.0
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	257	1522	1206	1007	219	439
V/C Ratio(X)	1.19	0.77	0.86	0.01	0.35	0.65
Avail Cap(c_a), veh/h	280	1682	1345	1143	221	447
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	70.8	7.3	24.8	10.3	62.5	50.8
Incr Delay (d2), s/veh	117.2	2.1	5.3	0.0	0.9	3.2
Initial Q Delay(d3),s/veh	88.3	0.3	15.3	0.0	3.7	5.2
%ile BackOfQ(50%),veh/ln	28.1	27.6	50.7	0.4	4.0	24.4
LnGrp Delay(d),s/veh	276.2	9.8	45.3	10.3	67.1	59.2
LnGrp LOS	F	A	D	B	E	E
Approach Vol, veh/h		1481	1049		361	
Approach Delay, s/veh		64.8	44.8		60.9	
Approach LOS		E	D		E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		130.3		22.0	27.5	102.8		
Change Period (Y+Rc), s		6.0		3.0	3.5	6.0		
Max Green Setting (Gmax), s		137.5		19.0	24.0	110.0		
Max Q Clear Time (g_c+I1), s		49.8		21.0	26.0	71.2		
Green Ext Time (p_c), s		39.1		0.0	0.0	25.6		

Intersection Summary	
HCM 2010 Ctrl Delay	57.1
HCM 2010 LOS	E

HCM 2010 Signalized Intersection Summary
2: SR 12-121 & Old Sonoma Rd

04/11/2017

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	175	1040	1130	41	57	212
Future Volume (veh/h)	175	1040	1130	41	57	212
Number	5	2	6	16	7	14
Initial Q (Qb), veh	8	9	20	0	2	4
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	184	1095	1189	41	60	144
Adj No. of Lanes	1	1	1	1	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	230	1569	1238	1092	170	340
Arrive On Green	0.12	0.84	0.70	0.70	0.09	0.09
Sat Flow, veh/h	1774	1863	1863	1583	1774	1583
Grp Volume(v), veh/h	184	1095	1189	41	60	144
Grp Sat Flow(s),veh/h/ln	1774	1863	1863	1583	1774	1583
Q Serve(g_s), s	14.8	32.4	76.3	1.1	4.6	11.4
Cycle Q Clear(g_c), s	14.8	32.4	76.3	1.1	4.6	11.4
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	230	1569	1238	1092	170	340
V/C Ratio(X)	0.80	0.70	0.96	0.04	0.35	0.42
Avail Cap(c_a), veh/h	294	1767	1414	1202	233	394
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	66.4	5.1	27.7	7.6	62.2	50.2
Incr Delay (d2), s/veh	11.5	1.1	14.6	0.0	1.2	0.8
Initial Q Delay(d3),s/veh	43.7	0.8	40.3	0.0	1.5	1.7
%ile BackOfQ(50%),veh/ln	12.7	21.1	74.9	0.5	2.8	11.9
LnGrp Delay(d),s/veh	121.6	6.9	82.6	7.6	65.0	52.8
LnGrp LOS	F	A	F	A	E	D
Approach Vol, veh/h		1279	1230		204	
Approach Delay, s/veh		23.4	80.1		56.3	
Approach LOS		C	F		E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		128.3		16.7	20.5	107.7		
Change Period (Y+Rc), s		6.0		3.0	3.5	6.0		
Max Green Setting (Gmax), s		137.5		19.0	24.0	110.0		
Max Q Clear Time (g_c+I1), s		34.4		13.4	16.8	78.3		
Green Ext Time (p_c), s		46.0		0.3	0.3	23.4		

Intersection Summary	
HCM 2010 Ctrl Delay	51.6
HCM 2010 LOS	D

Intersection	
Int Delay, s/veh	27.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↑	↑	↱	
Traffic Vol, veh/h	1502	15	36	1583	24	210
Future Vol, veh/h	1502	15	36	1583	24	210
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	215	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1502	15	36	1583	24	210

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1517	0	3165	1510
Stage 1	-	-	-	-	1510	-
Stage 2	-	-	-	-	1655	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	440	-	~ 12	~ 148
Stage 1	-	-	-	-	202	-
Stage 2	-	-	-	-	171	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	440	-	~ 11	~ 148
Mov Cap-2 Maneuver	-	-	-	-	86	-
Stage 1	-	-	-	-	202	-
Stage 2	-	-	-	-	157	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	$ 398.3
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	138	-	-	440	-
HCM Lane V/C Ratio	1.696	-	-	0.082	-
HCM Control Delay (s)	$ 398.3	-	-	13.9	-
HCM Lane LOS	F	-	-	B	-
HCM 95th %tile Q(veh)	17.1	-	-	0.3	-

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

Intersection	
Int Delay, s/veh	11.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↑	↑	↱	
Traffic Vol, veh/h	1244	85	106	1405	52	120
Future Vol, veh/h	1244	85	106	1405	52	120
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	215	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1244	85	106	1405	52	120

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1329	0	2904	1287
Stage 1	-	-	-	-	1287	-
Stage 2	-	-	-	-	1617	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	519	-	~ 17	201
Stage 1	-	-	-	-	259	-
Stage 2	-	-	-	-	178	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	519	-	~ 14	201
Mov Cap-2 Maneuver	-	-	-	-	90	-
Stage 1	-	-	-	-	259	-
Stage 2	-	-	-	-	142	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1	190.9
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	146	-	-	519	-
HCM Lane V/C Ratio	1.178	-	-	0.204	-
HCM Control Delay (s)	190.9	-	-	13.7	-
HCM Lane LOS	F	-	-	B	-
HCM 95th %tile Q(veh)	9.8	-	-	0.8	-

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

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	423	1253	1108	22	102	496
Future Volume (veh/h)	423	1253	1108	22	102	496
Number	5	2	6	16	7	14
Initial Q (Qb), veh	8	5	21	1	4	7
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	423	1253	1108	20	102	421
Adj No. of Lanes	1	1	1	1	1	1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	257	1538	1231	1035	209	411
Arrive On Green	0.15	0.83	0.65	0.65	0.12	0.12
Sat Flow, veh/h	1774	1863	1863	1583	1774	1583
Grp Volume(v), veh/h	423	1253	1108	20	102	421
Grp Sat Flow(s),veh/h/ln	1774	1863	1863	1583	1774	1583
Q Serve(g_s), s	24.0	57.5	81.5	0.7	8.6	19.0
Cycle Q Clear(g_c), s	24.0	57.5	81.5	0.7	8.6	19.0
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	257	1538	1231	1035	209	411
V/C Ratio(X)	1.64	0.81	0.90	0.02	0.49	1.02
Avail Cap(c_a), veh/h	266	1599	1279	1087	210	425
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	70.8	7.9	26.3	9.8	67.1	61.2
Incr Delay (d2), s/veh	306.8	3.3	8.7	0.0	1.8	50.1
Initial Q Delay(d3),s/veh	63.9	0.4	21.0	0.0	5.1	57.8
%ile BackOfQ(50%),veh/ln	41.6	33.2	61.1	0.5	5.4	45.6
LnGrp Delay(d),s/veh	441.4	11.6	56.1	9.8	74.0	169.2
LnGrp LOS	F	B	E	A	E	F
Approach Vol, veh/h		1676	1128		523	
Approach Delay, s/veh		120.1	55.3		150.6	
Approach LOS		F	E		F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		138.2		22.0	27.5	110.7		
Change Period (Y+Rc), s		6.0		3.0	3.5	6.0		
Max Green Setting (Gmax), s		137.5		19.0	24.0	110.0		
Max Q Clear Time (g_c+I1), s		59.5		21.0	26.0	83.5		
Green Ext Time (p_c), s		44.6		0.0	0.0	21.2		

Intersection Summary	
HCM 2010 Ctrl Delay	102.9
HCM 2010 LOS	F

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	241	1123	1220	55	77	293
Future Volume (veh/h)	241	1123	1220	55	77	293
Number	5	2	6	16	7	14
Initial Q (Qb), veh	8	9	20	0	2	4
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	241	1123	1220	53	77	218
Adj No. of Lanes	1	1	1	1	1	1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	257	1547	1238	1052	204	412
Arrive On Green	0.15	0.83	0.66	0.66	0.11	0.11
Sat Flow, veh/h	1774	1863	1863	1583	1774	1583
Grp Volume(v), veh/h	241	1123	1220	53	77	218
Grp Sat Flow(s),veh/h/ln	1774	1863	1863	1583	1774	1583
Q Serve(g_s), s	22.2	42.5	105.3	1.9	6.6	19.0
Cycle Q Clear(g_c), s	22.2	42.5	105.3	1.9	6.6	19.0
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	257	1547	1238	1052	204	412
V/C Ratio(X)	0.94	0.73	0.99	0.05	0.38	0.53
Avail Cap(c_a), veh/h	257	1549	1239	1053	204	412
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	70.8	6.7	27.7	9.6	68.1	53.2
Incr Delay (d2), s/veh	39.2	1.7	22.0	0.0	1.2	1.3
Initial Q Delay(d3),s/veh	83.5	0.9	51.6	0.0	1.1	1.4
%ile BackOfQ(50%),veh/ln	20.5	26.4	81.4	0.8	3.8	19.0
LnGrp Delay(d),s/veh	193.5	9.3	101.3	9.7	70.3	55.9
LnGrp LOS	F	A	F	A	E	E
Approach Vol, veh/h		1364	1273		295	
Approach Delay, s/veh		41.8	97.5		59.7	
Approach LOS		D	F		E	

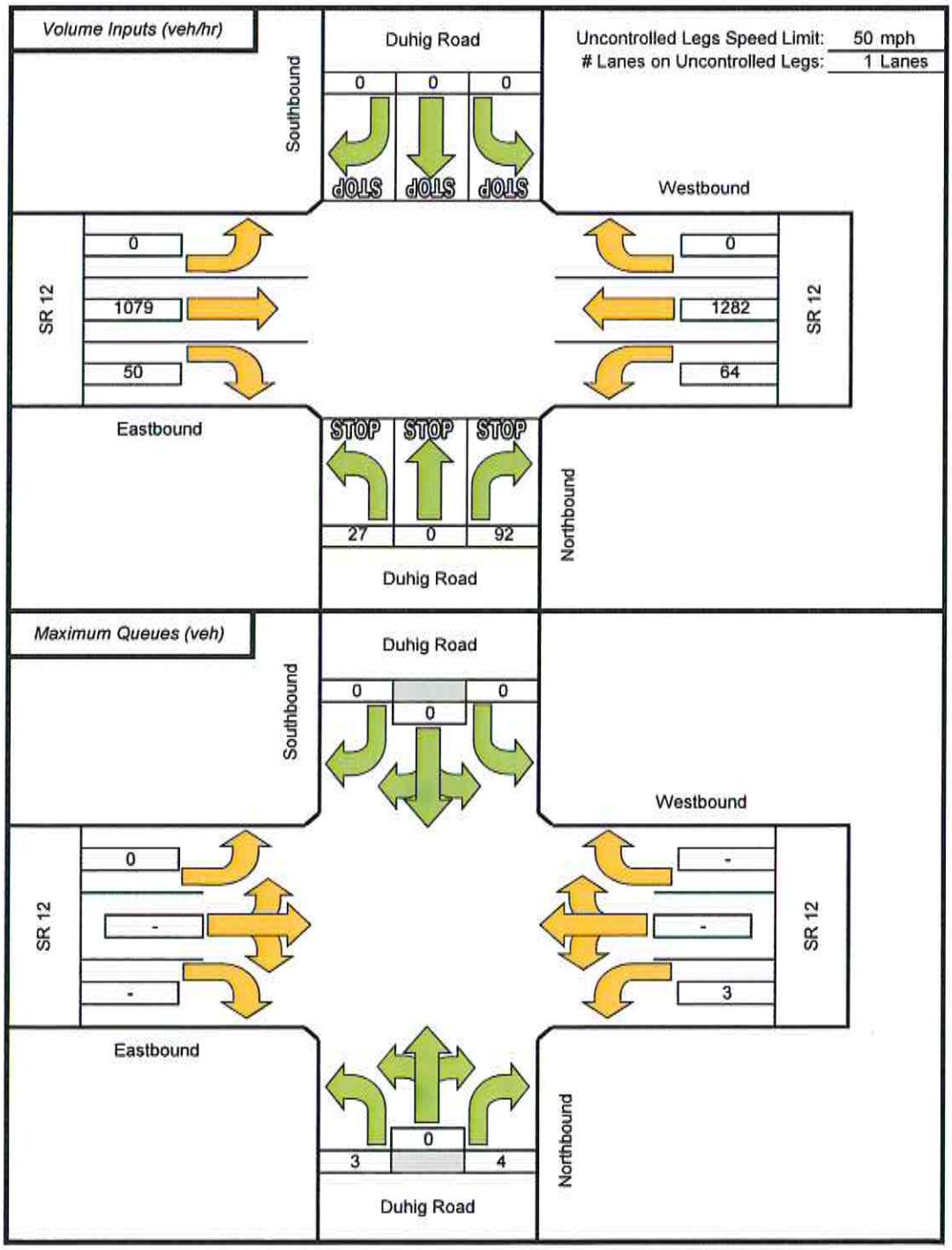
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		143.4		22.0	27.5	115.9		
Change Period (Y+Rc), s		6.0		3.0	3.5	6.0		
Max Green Setting (Gmax), s		137.5		19.0	24.0	110.0		
Max Q Clear Time (g_c+I1), s		44.5		21.0	24.2	107.3		
Green Ext Time (p_c), s		47.9		0.0	0.0	2.5		

Intersection Summary	
HCM 2010 Ctrl Delay	67.8
HCM 2010 LOS	E

Maximum Queue Length
Two-Way Stop-Controlled Intersections

Through Street: SR 12
Side Street: Duhig Road

Scenario: Weekend MD
Stop Controlled Legs: North/South

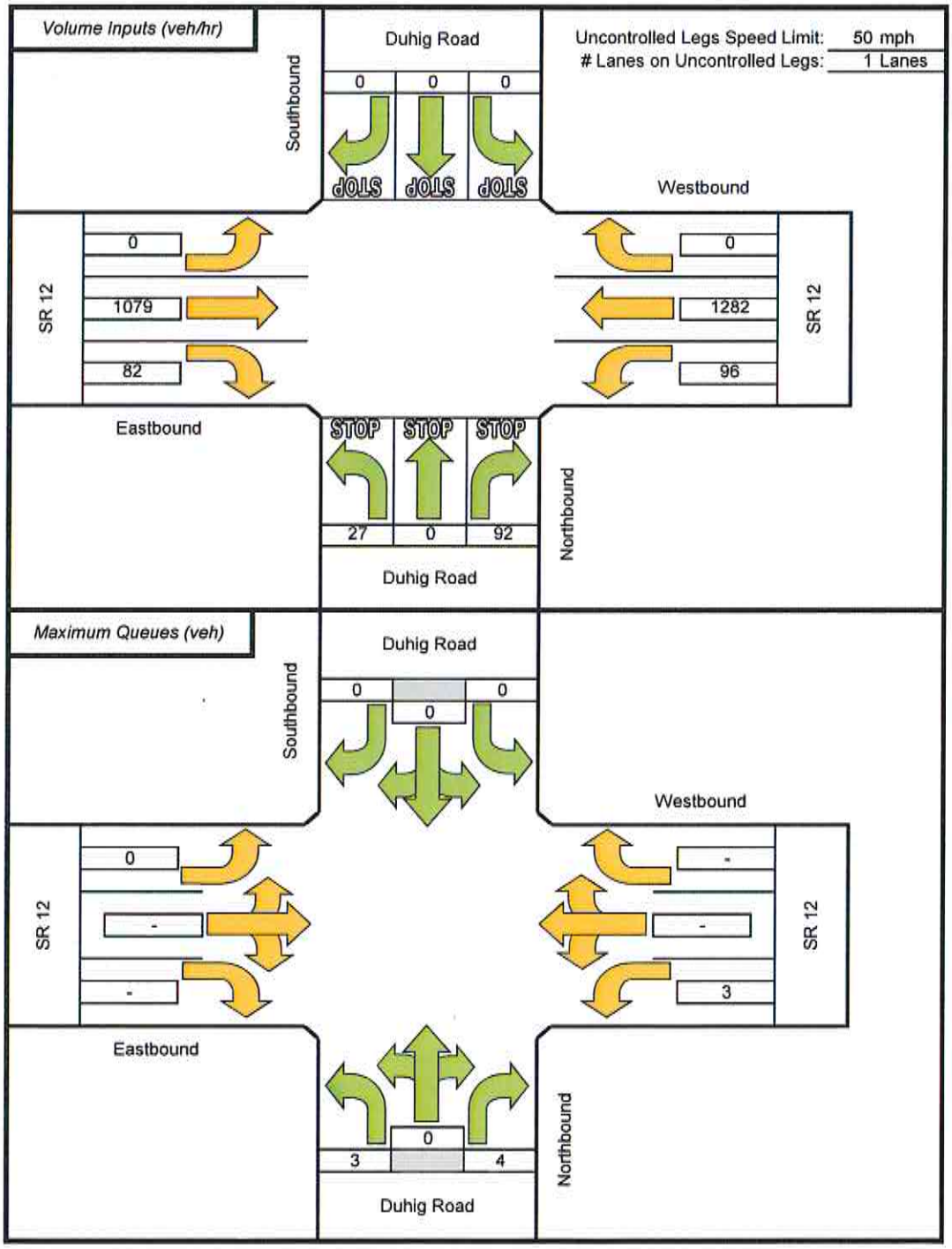


Source: John T. Gard, ITE Journal, November 2001, "Estimating Maximum Queue Length at Unsignalized Intersections"

Maximum Queue Length
Two-Way Stop-Controlled Intersections

Through Street: SR 12
Side Street: Duhig Road

Scenario: Weekend MD + Event (In)
Stop Controlled Legs: North/South

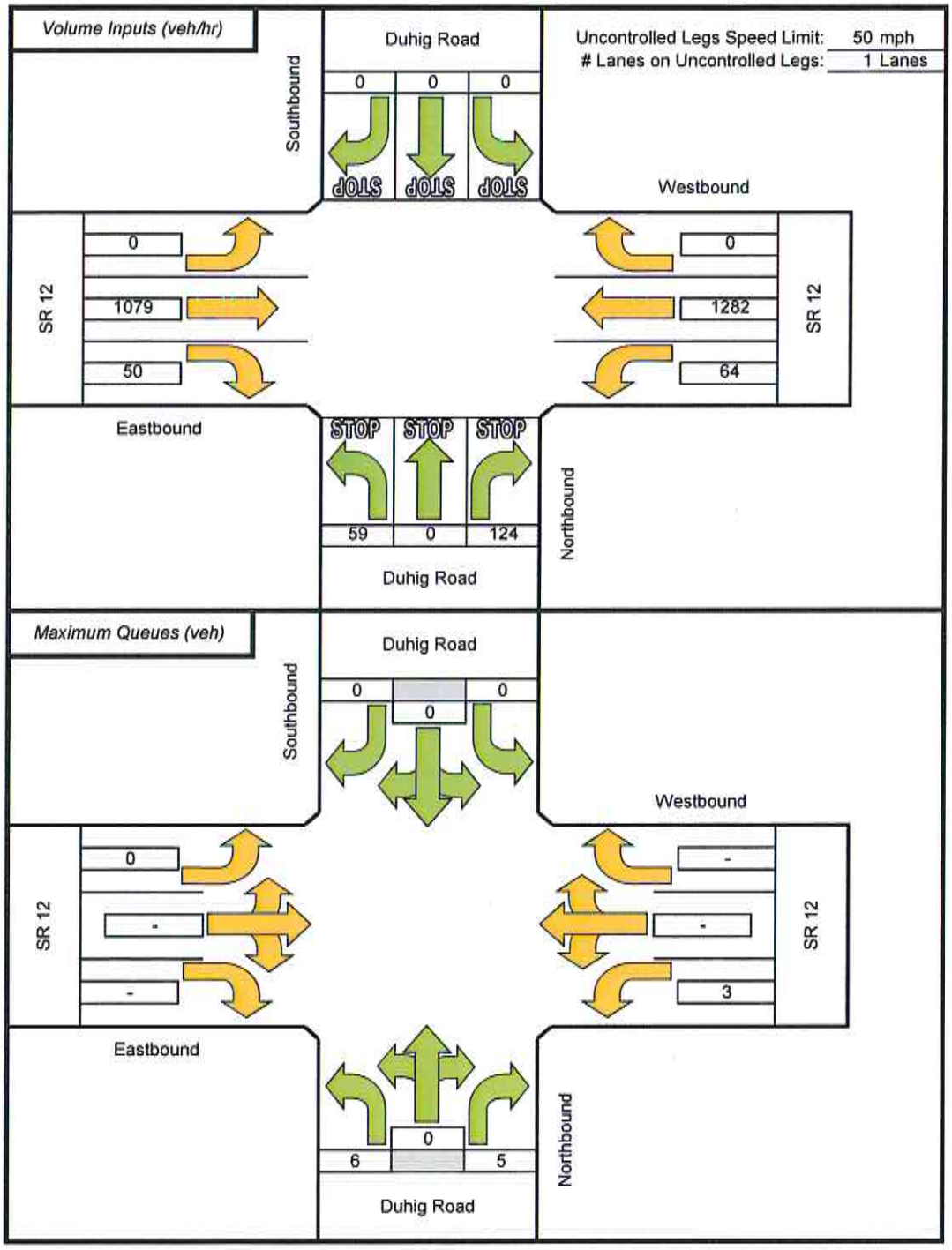


Source: John T. Gard, ITE Journal, November 2001, "Estimating Maximum Queue Length at Unsignalized Intersections"

Maximum Queue Length
Two-Way Stop-Controlled Intersections

Through Street: SR 12
Side Street: Duhig Road

Scenario: Weekend MD + Event (Out)
Stop Controlled Legs: North/South



Source: John T. Gard, ITE Journal, November 2001, "Estimating Maximum Queue Length at Unsignalized Intersections"

Appendix D

Winery Trip Generation Worksheet

Winery Traffic Information / Trip Generation Sheet

Project Name: Cuvaison Winery Project Scenario: Permitted

Traffic during a Typical Weekday

Number of FT employees: 10	x 3.05 one-way trips per employee	=	31	daily trips.
Number of PT employees: 0	x 1.90 one-way trips per employee	=	0	daily trips.
Average number of weekday visitors: 75	/ 2.6 visitors per vehicle x 2 one-way trips	=	58	daily trips.
Gallons of production: 340000	/ 1,000 x .009 truck trips daily[3] x 2 one-way trips	=	6	daily trips.
	Total	=	94	**daily trips.**
	Number of total weekday trips x .38	=	36	**PM peak trips.**

Traffic during a Typical Saturday

Number of FT employees (on Saturdays): 10	x 3.05 one-way trips per employee	=	31	daily trips.
Number of PT employees (on Saturdays): 0	x 1.90 one-way trips per employee	=	0	daily trips.
Average number of weekend visitors: 75	/ 2.8 visitors per vehicle x 2 one-way trips	=	54	daily trips.
	Total	=	84	**daily trips.**
	Number of total Saturday trips x .57	=	48	**PM peak trips.**

Traffic during a Crush Saturday

Number of FT employees (during crush): 12	x 3.05 one-way trips per employee	=	37	daily trips.
Number of PT employees (during crush): 0	x 1.90 one-way trips per employee	=	0	daily trips.
Average number of weekend visitors: 75	/ 2.8 visitors per vehicle x 2 one-way trips	=	54	daily trips.
Gallons of production: 340000	/ 1,000 x .009 truck trips daily x 2 one-way trips	=	6	daily trips.
Avg. annual tons of grape on-haul: 2304	x .11 truck trips daily[4] x 2 one-way trips	=	32	daily trips.
	Total	=	128	**daily trips.**
	Number of total Saturday trips x .57	=	73	**PM peak trips.**

Largest Marketing Event- Additional Traffic

Number of event staff (largest event): 0	x 2 one-way trips per staff person	=	0	trips.
Number of visitors (largest event): 0	/ 2.8 visitors per vehicle x 2 one-way trips	=	0	trips.
Number of special event truck trips (largest event): 0	x 2 one-way trips	=	0	trips.

[3] Assumes 1.47 materials & supplies trips + 0.8 case goods trips per 1,000 gallons of production / 250 days per year (see *Traffic Information Sheet Addendum* for reference).

[4] Assumes 4 tons per trip / 36 crush days per year (see *Traffic Information Sheet Addendum* for reference).

Winery Traffic Information / Trip Generation Sheet

Project Name: Cuvaison Winery Project Scenario: Proposed

Traffic during a Typical Weekday

Number of FT employees: 28	x 3.05 one-way trips per employee	=	85 daily trips.
Number of PT employees: 0	x 1.90 one-way trips per employee	=	0 daily trips.
Average number of weekday visitors: 180	/ 2.6 visitors per vehicle x 2 one-way trips	=	138 daily trips.
Gallons of production: 340000	/ 1,000 x .009 truck trips daily[3] x 2 one-way trips	=	6 daily trips.
	Total	=	230 **daily trips.**
	Number of total weekday trips x .38	=	87 **PM peak trips.**

Traffic during a Typical Saturday

Number of FT employees (on Saturdays): 28	x 3.05 one-way trips per employee	=	85 daily trips.
Number of PT employees (on Saturdays): 0	x 1.90 one-way trips per employee	=	0 daily trips.
Average number of weekend visitors: 180	/ 2.8 visitors per vehicle x 2 one-way trips	=	129 daily trips.
	Total	=	214 **daily trips.**
	Number of total Saturday trips x .57	=	122 **PM peak trips.**

Traffic during a Crush Saturday

Number of FT employees (during crush): 34	x 3.05 one-way trips per employee	=	104 daily trips.
Number of PT employees (during crush): 0	x 1.90 one-way trips per employee	=	0 daily trips.
Average number of weekend visitors: 200	/ 2.8 visitors per vehicle x 2 one-way trips	=	143 daily trips.
Gallons of production: 340000	/ 1,000 x .009 truck trips daily x 2 one-way trips	=	6 daily trips.
Avg. annual tons of grape on-haul: 2304	x .11 truck trips daily[4] x 2 one-way trips	=	32 daily trips.
	Total	=	285 **daily trips.**
	Number of total Saturday trips x .57	=	162 **PM peak trips.**

Largest Marketing Event- Additional Traffic

Number of event staff (largest event): 10	x 2 one-way trips per staff person	=	20 trips.
Number of visitors (largest event): 200	/ 2.8 visitors per vehicle x 2 one-way trips	=	143 trips.
Number of special event truck trips (largest event): 2	x 2 one-way trips	=	4 trips.

[3] Assumes 1.47 materials & supplies trips + 0.8 case goods trips per 1,000 gallons of production / 250 days per year (see *Traffic Information Sheet Addendum* for reference).
[4] Assumes 4 tons per trip / 36 crush days per year (see *Traffic Information Sheet Addendum* for reference).

Cuvaison Winery
Driveway Counts

Weekday - PM Peak Hour						
	Day	Date	Peak Hour	Peak Hour Vol	Daily Vol	Peak Hour % of Daily
Week 1	Monday	9/19/2016	4:30 PM	17	237	7.17%
	Tuesday	9/20/2016	4:00 PM	20	279	7.17%
	Wednesday	9/21/2016	4:00 PM	11	289	3.81%
	Thursday	9/22/2016	4:00 PM	21	247	8.50%
Week 2	Monday	9/26/2016	5:00 PM	17	208	8.17%
	Tuesday	9/27/2016	5:00 PM	18	211	8.53%
	Wednesday	9/28/2016	5:00 PM	19	215	8.84%
	Thursday	9/29/2016	4:45 PM	15	211	7.11%
Average						**7.41%**

Weekday - PM Peak Hour						
	Day	Date	Peak Hour	Outbound	Inbound	Percent Outbound
Week 1	Monday	9/19/2016	4:30 PM	15	2	88.24%
	Tuesday	9/20/2016	4:00 PM	17	3	85.00%
	Wednesday	9/21/2016	4:00 PM	7	4	63.64%
	Thursday	9/22/2016	4:00 PM	13	8	61.90%
Week 2	Monday	9/26/2016	5:00 PM	15	2	88.24%
	Tuesday	9/27/2016	5:00 PM	15	3	83.33%
	Wednesday	9/28/2016	5:00 PM	17	2	89.47%
	Thursday	9/29/2016	4:45 PM	13	2	86.67%
Average						**80.81%**

Saturday - Midday Peak Hour						
	Day	Date	Peak Hour	Peak Hour Vol	Daily Vol	Peak Hour % of Daily
	Saturday	9/17/2016	3:30 PM	43	345	12.46%
	Saturday	9/24/2016	2:00 PM	47	350	13.43%
	Saturday	10/1/2016	4:00 PM	42	307	13.68%
Average						**13.19%**

Prepared by NDS/ATD

VOLUME

The Cuvaison Winery Dwy S/O Dughig Rd

Day: Monday
Date: 9/19/2016

City: Napa
Project #: CA16_7643_003

DAILY TOTALS	NB	SB	EB	WB	Total
	123	114	0	0	237

AM Period	NB		SB		EB	WB	TOTAL		PM Period	NB		SB		EB	WB	TOTAL	
00:00	0		2				2		12:00	2		1				3	
00:15	0		2				2		12:15	3		1				4	
00:30	2		1				3		12:30	2		2				4	
00:45	0	2	1	6			1	8	12:45	2	9	3	7			5	16
01:00	0		0				0		13:00	1		1				2	
01:15	1		0				1		13:15	5		5				10	
01:30	2		0				2		13:30	1		1				2	
01:45	0	3	0				0	3	13:45	1	8	1	8			2	16
02:00	0		0				0		14:00	2		1				3	
02:15	0		0				0		14:15	1		3				4	
02:30	3		0				3		14:30	3		2				5	
02:45	1	4	2	2			3	6	14:45	1	7	2	8			3	15
03:00	4		0				4		15:00	2		1				3	
03:15	5		0				5		15:15	1		0				1	
03:30	11		1				12		15:30	2		1				3	
03:45	3	23	0	1			3	24	15:45	4	9	3	5			7	14
04:00	0		1				1		16:00	2		1				3	
04:15	1		1				2		16:15	0		1				1	
04:30	1		0				1		16:30	2		0				2	
04:45	3	5	0	2			3	7	16:45	7	11	1	3			8	14
05:00	0		0				0		17:00	4		1				5	
05:15	1		0				1		17:15	2		0				2	
05:30	0		0				0		17:30	2		0				2	
05:45	1	2	1	1			2	3	17:45	1	9	0	1			1	10
06:00	0		2				2		18:00	0		0				0	
06:15	1		0				1		18:15	0		0				0	
06:30	0		6				6		18:30	0		0				0	
06:45	1	2	7	15			8	17	18:45	0		1	1			1	1
07:00	0		3				3		19:00	0		0				0	
07:15	0		0				0		19:15	0		0				0	
07:30	0		1				1		19:30	0		0				0	
07:45	1	1	0	4			1	5	19:45	0		0				0	
08:00	0		0				0		20:00	0		0				0	
08:15	1		3				4		20:15	0		0				0	
08:30	1		3				4		20:30	0		2				2	
08:45	2	4	1	7			3	11	20:45	0		4	6			4	6
09:00	2		2				4		21:00	0		5				5	
09:15	1		1				2		21:15	1		7				8	
09:30	3		1				4		21:30	0		0				0	
09:45	0	6	0	4			0	10	21:45	0	1	0	12			0	13
10:00	3		5				8		22:00	0		0				0	
10:15	5		4				9		22:15	0		0				0	
10:30	1		1				2		22:30	0		0				0	
10:45	2	11	2	12			4	23	22:45	1	1	1	1			2	2
11:00	0		2				2		23:00	0		0				0	
11:15	0		0				0		23:15	0		0				0	
11:30	2		5				7		23:30	0		0				0	
11:45	3	5	1	8			4	13	23:45	0		0				0	
TOTALS		68		62				130	TOTALS		55		52				107
SPLIT %		52.3%		47.7%				54.9%	SPLIT %		51.4%		48.6%				45.1%

DAILY TOTALS	NB	SB	EB	WB	Total
	123	114	0	0	237

AM Peak Hour	03:00	06:15	02:45	PM Peak Hour	16:30	20:30	12:30
AM Pk Volume	23	16	24	PM Pk Volume	15	18	21
Pk Hr Factor	0.523	0.571	0.500	Pk Hr Factor	0.536	0.643	0.525
7 - 9 Volume	5	11	16	4 - 6 Volume	20	4	24
7 - 9 Peak Hour	08:00	08:00	08:00	4 - 6 Peak Hour	16:30	16:00	16:30
7 - 9 Pk Volume	4	7	11	4 - 6 Pk Volume	15	3	17
Pk Hr Factor	0.500	0.583	0.688	Pk Hr Factor	0.536	0.750	0.531

Prepared by NDS/ATD

VOLUME

The Cuvaison Winery Dwy S/O Dughig Rd

Day: Tuesday
Date: 9/20/2016

City: Napa
Project #: CA16_7643_003

DAILY TOTALS	NB	SB	EB	WB	Total
	126	153	0	0	279

AM Period	NB		SB		EB		WB		TOTAL		PM Period	NB		SB		EB		WB		TOTAL	
00:00	0		0						0		12:00	1		1						2	
00:15	0		0						0		12:15	1		3						4	
00:30	0		0						0		12:30	4		2						6	
00:45	0		0						0		12:45	1	7	8	14					9	21
01:00	0		0						0		13:00	5		2						7	
01:15	0		0						0		13:15	1		5						6	
01:30	0		2						2		13:30	0		7						7	
01:45	0		0	2					0	2	13:45	7	13	4	18					11	31
02:00	0		0						0		14:00	6		4						10	
02:15	0		0						0		14:15	2		2						4	
02:30	0		0						0		14:30	6		2						8	
02:45	0		0						0		14:45	3	17	2	10					5	27
03:00	0		0						0		15:00	1		2						3	
03:15	1		2						3		15:15	4		1						5	
03:30	0		0						0		15:30	4		4						8	
03:45	0	1	0	2					0	3	15:45	3	12	2	9					5	21
04:00	1		1						2		16:00	4		1						5	
04:15	3		1						4		16:15	7		1						8	
04:30	2		2						4		16:30	6		0						6	
04:45	1	7	0	4					1	11	16:45	0	17	1	3					1	20
05:00	1		2						3		17:00	3		0						3	
05:15	5		0						5		17:15	2		1						3	
05:30	4		3						7		17:30	0		0						0	
05:45	5	15	2	7					7	22	17:45	1	6	0	1					1	7
06:00	2		0						2		18:00	0		0						0	
06:15	1		0						1		18:15	0		0						0	
06:30	0		1						1		18:30	0		0						0	
06:45	1	4	7	8					8	12	18:45	1	1	0						1	1
07:00	1		3						4		19:00	0		0						0	
07:15	0		1						1		19:15	0		0						0	
07:30	1		0						1		19:30	0		0						0	
07:45	2	4	1	5					3	9	19:45	0		1	1					1	1
08:00	1		2						3		20:00	0		1						1	
08:15	0		3						3		20:15	0		4						4	
08:30	2		0						2		20:30	0		6						6	
08:45	0	3	3	8					3	11	20:45	0		5	16					5	16
09:00	0		2						2		21:00	0		16						16	
09:15	4		1						5		21:15	0		11						11	
09:30	3		2						5		21:30	0		1						1	
09:45	1	8	3	8					4	16	21:45	0		0	28					0	28
10:00	2		1						3		22:00	0		1						1	
10:15	0		2						2		22:15	0		1						1	
10:30	1		2						3		22:30	0		0						0	
10:45	1	4	0	5					1	9	22:45	0		0	2					0	2
11:00	0		0						0		23:00	0		0						0	
11:15	0		1						1		23:15	0		0						0	
11:30	3		0						3		23:30	1		0						1	
11:45	2	5	1	2					3	7	23:45	1	2	0						1	2
TOTALS		51		51						102	TOTALS		75		102						177
SPLIT %		50.0%		50.0%						36.6%	SPLIT %		42.4%		57.6%						63.4%

DAILY TOTALS	NB	SB	EB	WB	Total
	126	153	0	0	279

AM Peak Hour	05:15	06:30	05:00	PM Peak Hour	13:45	20:30	20:30
AM Pk Volume	16	12	22	PM Pk Volume	21	38	38
Pk Hr Factor	0.800	0.429	0.786	Pk Hr Factor	0.750	0.594	0.594
7 - 9 Volume	7	13	20	4 - 6 Volume	23	4	27
7 - 9 Peak Hour	07:45	08:00	07:45	4 - 6 Peak Hour	16:00	16:00	16:00
7 - 9 Pk Volume	5	8	11	4 - 6 Pk Volume	17	3	20
Pk Hr Factor	0.625	0.667	0.917	Pk Hr Factor	0.607	0.750	0.625

Prepared by NDS/ATD

VOLUME

The Cuvaison Winery Dwy S/O Dughig Rd

Day: Wednesday
Date: 9/21/2016

City: Napa
Project #: CA16_7643_003

DAILY TOTALS	NB	SB	EB	WB	Total
	162	127	0	0	289

AM Period	NB		SB		EB	WB	TOTAL		PM Period	NB		SB		EB	WB	TOTAL	
00:00	0		0				0		12:00	3		3				6	
00:15	0		0				0		12:15	3		1				4	
00:30	0		0				0		12:30	6		2				8	
00:45	0		0				0		12:45	4	16	3	9			7	25
01:00	0		0				0		13:00	3		2				5	
01:15	0		0				0		13:15	2		1				3	
01:30	0		0				0		13:30	2		4				6	
01:45	0		0				0		13:45	1	8	3	10			4	18
02:00	0		1				1		14:00	1		0				1	
02:15	0		0				0		14:15	3		1				4	
02:30	0		0				0		14:30	3		3				6	
02:45	0		0	1			0	1	14:45	1	8	3	7			4	15
03:00	0		3				3		15:00	0		1				1	
03:15	1		2				3		15:15	3		3				6	
03:30	2		1				3		15:30	8		0				8	
03:45	10	13	0	6			10	19	15:45	8	19	2	6			10	25
04:00	6		0				6		16:00	4		2				6	
04:15	1		0				1		16:15	0		0				0	
04:30	1		0				1		16:30	2		1				3	
04:45	3	11	1	1			4	12	16:45	1	7	1	4			2	11
05:00	9		2				11		17:00	2		0				2	
05:15	10		3				13		17:15	1		0				1	
05:30	0		3				3		17:30	1		0				1	
05:45	1	20	3	11			4	31	17:45	2	6	0				2	6
06:00	3		0				3		18:00	0		0				0	
06:15	2		0				2		18:15	0		0				0	
06:30	0		2				2		18:30	0		0				0	
06:45	2	7	8	10			10	17	18:45	0		0				0	
07:00	0		3				3		19:00	0		0				0	
07:15	3		2				5		19:15	0		0				0	
07:30	2		0				2		19:30	0		0				0	
07:45	0	5	0	5			0	10	19:45	0		1	1			1	1
08:00	2		1				3		20:00	0		0				0	
08:15	3		5				8		20:15	0		0				0	
08:30	1		1				2		20:30	0		0				0	
08:45	4	10	7	14			11	24	20:45	0		2	2			2	2
09:00	1		6				7		21:00	0		5				5	
09:15	4		1				5		21:15	0		4				4	
09:30	2		3				5		21:30	0		0				0	
09:45	4	11	3	13			7	24	21:45	0		0	9			0	9
10:00	0		1				1		22:00	0		0				0	
10:15	0		3				3		22:15	0		1				1	
10:30	1		0				1		22:30	2		0				2	
10:45	1	2	2	6			3	8	22:45	0	2	0	1			0	3
11:00	8		3				11		23:00	0		0				0	
11:15	1		4				5		23:15	0		0				0	
11:30	3		3				6		23:30	0		0				0	
11:45	5	17	1	11			6	28	23:45	0		0				0	
TOTALS		96		78				174	TOTALS		66		49				115
SPLIT %		55.2%		44.8%				60.2%	SPLIT %		57.4%		42.6%				39.8%

DAILY TOTALS	NB	SB	EB	WB	Total
	162	127	0	0	289

AM Peak Hour	04:30	08:15	04:45	PM Peak Hour	15:15	20:30	15:15
AM Pk Volume	23	19	31	PM Pk Volume	23	11	30
Pk Hr Factor	0.575	0.679	0.596	Pk Hr Factor	0.719	0.550	0.750
7 - 9 Volume	15	19	34	4 - 6 Volume	13	4	17
7 - 9 Peak Hour	08:00	08:00	08:00	4 - 6 Peak Hour	16:00	16:00	16:00
7 - 9 Pk Volume	10	14	24	4 - 6 Pk Volume	7	4	11
Pk Hr Factor	0.625	0.500	0.545	Pk Hr Factor	0.438	0.500	0.458

Prepared by NDS/ATD

VOLUME

The Cuvaison Winery Dwy S/O Dughig Rd

Day: Thursday
Date: 9/22/2016

City: Napa
Project #: CA16_7643_003

DAILY TOTALS	NB	SB	EB	WB	Total
	125	122	0	0	247

AM Period	NB		SB		EB	WB	TOTAL		PM Period	NB		SB		EB	WB	TOTAL	
00:00	0		0				0		12:00	6		0				6	
00:15	0		0				0		12:15	3		3				6	
00:30	0		0				0		12:30	2		2				4	
00:45	0		0				0		12:45	1	12	5	10			6	22
01:00	0		2				2		13:00	2		3				5	
01:15	1		3				4		13:15	4		6				10	
01:30	0		0				0		13:30	1		4				5	
01:45	0	1	0	5			0	6	13:45	1	8	4	17			5	25
02:00	0		1				1		14:00	5		0				5	
02:15	0		0				0		14:15	5		4				9	
02:30	0		0				0		14:30	1		1				2	
02:45	1	1	0	1			1	2	14:45	3	14	2	7			5	21
03:00	1		2				3		15:00	6		5				11	
03:15	1		0				1		15:15	3		3				6	
03:30	0		0				0		15:30	1		2				3	
03:45	0	2	0	2			0	4	15:45	2	12	2	12			4	24
04:00	0		0				0		16:00	5		4				9	
04:15	0		0				0		16:15	2		1				3	
04:30	0		0				0		16:30	4		1				5	
04:45	0		0				0		16:45	2	13	2	8			4	21
05:00	0		0				0		17:00	4		1				5	
05:15	0		0				0		17:15	4		0				4	
05:30	1		4				5		17:30	4		1				5	
05:45	3	4	2	6			5	10	17:45	5	17	0	2			5	19
06:00	5		0				5		18:00	0		0				0	
06:15	0		1				1		18:15	0		0				0	
06:30	7		1				8		18:30	3		0				3	
06:45	1	13	6	8			7	21	18:45	0	3	1	1			1	4
07:00	1		2				3		19:00	1		0				1	
07:15	0		1				1		19:15	0		0				0	
07:30	0		2				2		19:30	1		0				1	
07:45	0	1	0	5			0	6	19:45	1	3	1	1			2	4
08:00	3		0				3		20:00	1		0				1	
08:15	0		2				2		20:15	0		0				0	
08:30	0		1				1		20:30	0		2				2	
08:45	1	4	2	5			3	9	20:45	0	1	2	4			2	5
09:00	1		0				1		21:00	0		6				6	
09:15	0		2				2		21:15	0		3				3	
09:30	0		1				1		21:30	0		0				0	
09:45	2	3	1	4			3	7	21:45	0		0	9			0	9
10:00	1		0				1		22:00	0		0				0	
10:15	5		1				6		22:15	0		0				0	
10:30	1		3				4		22:30	1		0				1	
10:45	1	8	4	8			5	16	22:45	0	1	0				0	1
11:00	0		1				1		23:00	0		0				0	
11:15	1		2				3		23:15	0		0				0	
11:30	0		3				3		23:30	0		0				0	
11:45	3	4	1	7			4	11	23:45	0		0				0	
TOTALS		41		51				92	TOTALS		84		71				155
SPLIT %		44.6%		55.4%				37.2%	SPLIT %		54.2%		45.8%				62.8%

DAILY TOTALS	NB	SB	EB	WB	Total
	125	122	0	0	247

AM Peak Hour	05:45	06:45	06:00	PM Peak Hour	17:00	12:45	14:15
AM Pk Volume	15	11	21	PM Pk Volume	17	18	27
Pk Hr Factor	0.536	0.458	0.656	Pk Hr Factor	0.850	0.750	0.614
7 - 9 Volume	5	10	15	4 - 6 Volume	30	10	40
7 - 9 Peak Hour	08:00	07:00	08:00	4 - 6 Peak Hour	17:00	16:00	16:00
7 - 9 Pk Volume	4	5	9	4 - 6 Pk Volume	17	8	21
Pk Hr Factor	0.333	0.625	0.750	Pk Hr Factor	0.850	0.500	0.583

Prepared by NDS/ATD

VOLUME

The Cuvaison Winery dwy S/O Dughig Rd

Day: Monday
Date: 9/26/2016

City: Napa
Project #: CA16_7643_003

DAILY TOTALS	NB	SB	EB	WB	Total
	114	94	0	0	208

AM Period	NB		SB		EB	WB	TOTAL		PM Period	NB		SB		EB	WB	TOTAL	
00:00	0		0				0		12:00	2		2				4	
00:15	0		0				0		12:15	1		5				6	
00:30	0		0				0		12:30	2		0				2	
00:45	1	1	0				1	1	12:45	5	10	5	12			10	22
01:00	0		3				3		13:00	1		0				1	
01:15	0		0				0		13:15	3		1				4	
01:30	0		1				1		13:30	0		5				5	
01:45	0		0	4			0	4	13:45	3	7	3	9			6	16
02:00	0		0				0		14:00	0		3				3	
02:15	0		0				0		14:15	3		0				3	
02:30	0		0				0		14:30	2		2				4	
02:45	0		0				0		14:45	0	5	1	6			1	11
03:00	0		0				0		15:00	3		2				5	
03:15	0		1				1		15:15	1		0				1	
03:30	6		0				6		15:30	5		4				9	
03:45	0	6	1	2			1	8	15:45	1	10	3	9			4	19
04:00	1		1				2		16:00	6		1				7	
04:15	2		0				2		16:15	2		2				4	
04:30	4		0				4		16:30	0		0				0	
04:45	3	10	0	1			3	11	16:45	2	10	1	4			3	14
05:00	1		2				3		17:00	1		0				1	
05:15	1		0				1		17:15	0		0				0	
05:30	2		1				3		17:30	7		0				7	
05:45	1	5	0	3			1	8	17:45	7	15	2	2			9	17
06:00	3		0				3		18:00	1		0				1	
06:15	1		0				1		18:15	0		0				0	
06:30	1		1				2		18:30	0		0				0	
06:45	0	5	8	9			8	14	18:45	0	1	0				0	1
07:00	0		4				4		19:00	0		0				0	
07:15	1		4				5		19:15	0		0				0	
07:30	1		2				3		19:30	0		0				0	
07:45	2	4	0	10			2	14	19:45	0		0				0	
08:00	1		0				1		20:00	0		0				0	
08:15	2		2				4		20:15	0		0				0	
08:30	1		2				3		20:30	0		1				1	
08:45	1	5	1	5			2	10	20:45	0		1	2			1	2
09:00	0		3				3		21:00	1		0				1	
09:15	2		0				2		21:15	0		0				0	
09:30	1		1				2		21:30	0		0				0	
09:45	0	3	1	5			1	8	21:45	0	1	0				0	1
10:00	0		0				0		22:00	0		0				0	
10:15	2		3				5		22:15	0		0				0	
10:30	1		1				2		22:30	2		1				3	
10:45	0	3	2	6			2	9	22:45	0	2	0	1			0	3
11:00	3		1				4		23:00	0		0				0	
11:15	3		1				4		23:15	0		0				0	
11:30	1		1				2		23:30	0		0				0	
11:45	4	11	1	4			5	15	23:45	0		0				0	
TOTALS		53		49				102	TOTALS		61		45				106
SPLIT %		52.0%		48.0%				49.0%	SPLIT %		57.5%		42.5%				51.0%

DAILY TOTALS	NB	SB	EB	WB	Total
	114	94	0	0	208

AM Peak Hour	11:00	06:45	06:45	PM Peak Hour	17:00	12:00	15:30
AM Pk Volume	11	18	20	PM Pk Volume	15	12	24
Pk Hr Factor	0.688	0.563	0.625	Pk Hr Factor	0.536	0.600	0.667
7 - 9 Volume	9	15	24	4 - 6 Volume	25	6	31
7 - 9 Peak Hour	07:30	07:00	07:00	4 - 6 Peak Hour	17:00	16:00	17:00
7 - 9 Pk Volume	6	10	14	4 - 6 Pk Volume	15	4	17
Pk Hr Factor	0.750	0.625	0.700	Pk Hr Factor	0.536	0.500	0.472

Prepared by NDS/ATD

VOLUME

The Cuvaison Winery dwy S/O Dughig Rd

Day: Tuesday
Date: 9/27/2016

City: Napa
Project #: CA16_7643_003

DAILY TOTALS	NB	SB	EB	WB	Total
	96	115	0	0	211

AM Period	NB		SB		EB	WB	TOTAL		PM Period	NB		SB		EB	WB	TOTAL	
00:00	0		0				0		12:00	4		0				4	
00:15	0		0				0		12:15	2		2				4	
00:30	0		0				0		12:30	1		2				3	
00:45	0		0				0		12:45	2	9	3	7			5	16
01:00	0		0				0		13:00	2		2				4	
01:15	0		0				0		13:15	2		1				3	
01:30	0		0				0		13:30	1		1				2	
01:45	0		0				0		13:45	2	7	1	5			3	12
02:00	1		0				1		14:00	1		2				3	
02:15	0		1				1		14:15	2		1				3	
02:30	1		0				1		14:30	1		2				3	
02:45	0	2	0	1			0	3	14:45	2	6	0	5			2	11
03:00	0		1				1		15:00	2		2				4	
03:15	2		1				3		15:15	2		3				5	
03:30	0		1				1		15:30	1		1				2	
03:45	1	3	1	4			2	7	15:45	2	7	1	7			3	14
04:00	0		1				1		16:00	0		2				2	
04:15	1		1				2		16:15	4		2				6	
04:30	1		0				1		16:30	0		0				0	
04:45	0	2	1	3			1	5	16:45	4	8	1	5			5	13
05:00	1		0				1		17:00	2		1				3	
05:15	0		0				0		17:15	3		1				4	
05:30	0		0				0		17:30	4		1				5	
05:45	0	1	0				0	1	17:45	6	15	0	3			6	18
06:00	0		0				0		18:00	2		0				2	
06:15	0		2				2		18:15	1		0				1	
06:30	0		1				1		18:30	0		0				0	
06:45	1	1	8	11			9	12	18:45	1	4	0				1	4
07:00	0		4				4		19:00	0		0				0	
07:15	2		1				3		19:15	0		0				0	
07:30	0		1				1		19:30	0		0				0	
07:45	3	5	1	7			4	12	19:45	0		0				0	
08:00	0		0				0		20:00	0		0				0	
08:15	2		4				6		20:15	0		2				2	
08:30	2		0				2		20:30	0		2				2	
08:45	0	4	3	7			3	11	20:45	0		2	6			2	6
09:00	1		1				2		21:00	1		8				9	
09:15	0		4				4		21:15	0		4				4	
09:30	1		0				1		21:30	0		2				2	
09:45	1	3	2	7			3	10	21:45	0	1	0	14			0	15
10:00	0		5				5		22:00	0		0				0	
10:15	4		3				7		22:15	0		0				0	
10:30	1		2				3		22:30	0		0				0	
10:45	2	7	2	12			4	19	22:45	0		0				0	
11:00	4		3				7		23:00	0		1				1	
11:15	4		4				8		23:15	0		0				0	
11:30	1		0				1		23:30	0		1				1	
11:45	2	11	2	9			4	20	23:45	0		0	2			0	2
TOTALS		39		61				100	TOTALS		57		54				111
SPLIT %		39.0%		61.0%				47.4%	SPLIT %		51.4%		48.6%				52.6%

DAILY TOTALS	NB	SB	EB	WB	Total
	96	115	0	0	211

AM Peak Hour	10:15	06:15	10:30	PM Peak Hour	17:00	20:30	17:00
AM Pk Volume	11	15	22	PM Pk Volume	15	16	18
Pk Hr Factor	0.688	0.469	0.688	Pk Hr Factor	0.625	0.500	0.750
7 - 9 Volume	9	14	23	4 - 6 Volume	23	8	31
7 - 9 Peak Hour	07:45	07:00	07:00	4 - 6 Peak Hour	17:00	16:00	17:00
7 - 9 Pk Volume	7	7	12	4 - 6 Pk Volume	15	5	18
Pk Hr Factor	0.583	0.438	0.750	Pk Hr Factor	0.625	0.625	0.750

Prepared by NDS/ATD

VOLUME

The Cuvaison Winery dwy S/O Dughig Rd

Day: Wednesday
Date: 9/28/2016

City: Napa
Project #: CA16_7643_003

DAILY TOTALS	NB	SB	EB	WB	Total
	110	105	0	0	215

AM Period	NB		SB		EB		WB		TOTAL		PM Period	NB		SB		EB		WB		TOTAL	
00:00	0		0						0		12:00	1		2						3	
00:15	0		0						0		12:15	5		2						7	
00:30	0		0						0		12:30	3		3						6	
00:45	0		0						0		12:45	3	12	5	12					8	24
01:00	0		0						0		13:00	3		1						4	
01:15	0		0						0		13:15	0		2						2	
01:30	0		0						0		13:30	3		1						4	
01:45	0		1	1					1	1	13:45	2	8	3	7					5	15
02:00	0		0						0		14:00	1		0						1	
02:15	0		0						0		14:15	3		1						4	
02:30	0		0						0		14:30	1		3						4	
02:45	0		0						0		14:45	1	6	3	7					4	13
03:00	0		0						0		15:00	1		2						3	
03:15	0		2						2		15:15	3		0						3	
03:30	0		0						0		15:30	3		2						5	
03:45	2	2	0	2					2	4	15:45	2	9	0	4					2	13
04:00	0		0						0		16:00	0		1						1	
04:15	0		1						1		16:15	1		1						2	
04:30	1		0						1		16:30	0		3						3	
04:45	0	1	2	3					2	4	16:45	2	3	1	6					3	9
05:00	1		0						1		17:00	2		1						3	
05:15	2		1						3		17:15	2		0						2	
05:30	0		0						0		17:30	10		0						10	
05:45	4	7	0	1					4	8	17:45	3	17	1	2					4	19
06:00	0		0						0		18:00	3		0						3	
06:15	5		2						7		18:15	0		0						0	
06:30	4		2						6		18:30	1		1						2	
06:45	2	11	11	15					13	26	18:45	0	4	0	1					0	5
07:00	1		3						4		19:00	1		0						1	
07:15	0		2						2		19:15	0		0						0	
07:30	1		0						1		19:30	0		0						0	
07:45	4	6	0	5					4	11	19:45	0	1	0						0	1
08:00	2		2						4		20:00	0		0						0	
08:15	0		2						2		20:15	1		2						3	
08:30	0		1						1		20:30	0		4						4	
08:45	2	4	1	6					3	10	20:45	0	1	5	11					5	12
09:00	0		0						0		21:00	0		5						5	
09:15	1		1						2		21:15	0		2						2	
09:30	6		1						7		21:30	0		1						1	
09:45	0	7	0	2					0	9	21:45	0		0	8					0	8
10:00	2		1						3		22:00	0		0						0	
10:15	1		0						1		22:15	0		0						0	
10:30	0		3						3		22:30	1		0						1	
10:45	0	3	1	5					1	8	22:45	0	1	0						0	1
11:00	0		1						1		23:00	0		1						1	
11:15	0		1						1		23:15	1		0						1	
11:30	0		2						2		23:30	0		0						0	
11:45	6	6	2	6					8	12	23:45	0	1	0	1					0	2
TOTALS		47		46						93	TOTALS		63		59						122
SPLIT %		50.5%		49.5%						43.3%	SPLIT %		51.6%		48.4%						56.7%

DAILY TOTALS	NB	SB	EB	WB	Total
	110	105	0	0	215

AM Peak Hour	11:45	06:15	06:15	PM Peak Hour	17:15	20:15	12:15
AM Pk Volume	15	18	30	PM Pk Volume	18	16	25
Pk Hr Factor	0.625	0.409	0.577	Pk Hr Factor	0.450	0.800	0.781
7 - 9 Volume	10	11	21	4 - 6 Volume	20	8	28
7 - 9 Peak Hour	07:15	08:00	07:00	4 - 6 Peak Hour	17:00	16:00	17:00
7 - 9 Pk Volume	7	6	11	4 - 6 Pk Volume	17	6	19
Pk Hr Factor	0.438	0.750	0.688	Pk Hr Factor	0.425	0.500	0.475

Prepared by NDS/ATD

VOLUME

The Cuvaison Winery dwy S/O Dughig Rd

Day: Thursday
Date: 9/29/2016

City: Napa
Project #: CA16_7643_003

DAILY TOTALS	NB	SB	EB	WB	Total
	110	101	0	0	211

AM Period	NB		SB		EB	WB	TOTAL		PM Period	NB		SB		EB	WB	TOTAL	
00:00	0		0				0		12:00	1		2				3	
00:15	0		0				0		12:15	0		2				2	
00:30	0		0				0		12:30	2		2				4	
00:45	0		0				0		12:45	0	3	1	7			1	10
01:00	0		0				0		13:00	2		0				2	
01:15	0		0				0		13:15	2		1				3	
01:30	0		0				0		13:30	1		1				2	
01:45	0		0				0		13:45	3	8	2	4			5	12
02:00	0		0				0		14:00	1		1				2	
02:15	0		0				0		14:15	1		3				4	
02:30	1		0				1		14:30	1		4				5	
02:45	6	7	0				6	7	14:45	5	8	4	12			9	20
03:00	1		0				1		15:00	3		1				4	
03:15	0		2				2		15:15	0		0				0	
03:30	0		0				0		15:30	1		2				3	
03:45	2	3	0	2			2	5	15:45	4	8	0	3			4	11
04:00	1		0				1		16:00	3		3				6	
04:15	1		0				1		16:15	1		1				2	
04:30	0		0				0		16:30	2		0				2	
04:45	0	2	0				0	2	16:45	2	8	2	6			4	14
05:00	0		1				1		17:00	2		0				2	
05:15	1		2				3		17:15	1		0				1	
05:30	2		0				2		17:30	8		0				8	
05:45	0	3	1	4			1	7	17:45	3	14	1	1			4	15
06:00	0		0				0		18:00	2		0				2	
06:15	1		2				3		18:15	0		0				0	
06:30	2		3				5		18:30	1		1				2	
06:45	1	4	11	16			12	20	18:45	1	4	1	2			2	6
07:00	1		2				3		19:00	0		0				0	
07:15	2		1				3		19:15	0		0				0	
07:30	1		0				1		19:30	0		1				1	
07:45	1	5	0	3			1	8	19:45	1	1	0	1			1	2
08:00	1		2				3		20:00	0		2				2	
08:15	0		2				2		20:15	0		8				8	
08:30	1		3				4		20:30	0		4				4	
08:45	3	5	4	11			7	16	20:45	1	1	0	14			1	15
09:00	6		5				11		21:00	0		0				0	
09:15	3		2				5		21:15	0		1				1	
09:30	0		0				0		21:30	1		0				1	
09:45	1	10	1	8			2	18	21:45	0	1	0	1			0	2
10:00	2		1				3		22:00	0		0				0	
10:15	0		0				0		22:15	0		0				0	
10:30	3		2				5		22:30	0		0				0	
10:45	1	6	1	4			2	10	22:45	0		0				0	
11:00	0		0				0		23:00	0		0				0	
11:15	2		2				4		23:15	0		0				0	
11:30	4		0				4		23:30	0		0				0	
11:45	3	9	0	2			3	11	23:45	0		0				0	
TOTALS		54		50				104	TOTALS		56		51				107
SPLIT %		51.9%		48.1%				49.3%	SPLIT %		52.3%		47.7%				50.7%

DAILY TOTALS	NB	SB	EB	WB	Total
	110	101	0	0	211

AM Peak Hour	08:30	06:15	08:30	PM Peak Hour	17:00	19:45	14:15
AM Pk Volume	13	18	27	PM Pk Volume	14	14	22
Pk Hr Factor	0.542	0.409	0.614	Pk Hr Factor	0.438	0.438	0.611
7 - 9 Volume	10	14	24	4 - 6 Volume	22	7	29
7 - 9 Peak Hour	07:00	08:00	08:00	4 - 6 Peak Hour	17:00	16:00	16:45
7 - 9 Pk Volume	5	11	16	4 - 6 Pk Volume	14	6	15
Pk Hr Factor	0.625	0.688	0.571	Pk Hr Factor	0.438	0.500	0.469

Trip Generation Data - Cuvaison Winery

Weekday (Wednesday)

Visitors

Date	# of Visitors during 4-5 PM	Total Daily Visitors	% of Daily
8.5.2015	2	22	9.1%
8.12.2015	0	14	0.0%
8.19.2015	0	17	0.0%
8.26.2015	0	9	0.0%
1.6.16	0	13	0.0%
1.13.2016	0	8	0.0%
1.20.2016	0	27	0.0%
1.27.2016	0	2	0.0%
5.4.2016	0	9	0.0%
5.11.2016	1	19	5.3%
5.18.2016	0	22	0.0%
5.25.2016	0	6	0.0%
Weekday		Avg	1.2%

Employees

Date	# of Employees during 4-5 PM	Total Daily Employees	% of Daily
8.3.2016	4	10	40.0%
8.10.2016	3	9	33.3%
8.17.2016	5	17	29.4%
8.24.2016	3	3	100.0%
1.6.16	1	8	12.5%
1.13.2016	1	9	11.1%
1.20.2016	1	4	25.0%
1.27.2016	1	5	20.0%
5.4.2016	1	8	12.5%
5.11.2016	5	7	71.4%
5.18.2016	1	7	14.3%
5.25.2016	2	8	25.0%
Weekday		Avg	32.9%

Visitors and Employees

	Avg # of Emp+ Visitors during PM Peak Hour	Average Daily Emp+ Visitors	% of Daily
Average	**1**	**11**	**9.1%**

Weekend (Saturday)

Visitors

Date	Weekend Peak Hour	# of Visitors During Peak Hour	Total Daily Visitors	% of Daily
8.1.2015	11:00-12:00	30	71	42.3%
8.8.2015	2:00-3:00	25	79	31.6%
8.15.2015	3:00-4:00	26	48	54.2%
8.22.2015	1:00-2:00	29	74	39.2%
8.29.2015	3:00-4:00	19	72	26.4%
1.2.2016	2:00-3:00	12	60	20.0%
1.9.2016	2:00-3:00	16	55	29.1%
1.16.2016	11:00-12:00	16	72	22.2%
1.23.2016	3:00-4:00	17	92	18.5%
1.30.2016	3:00-4:00	23	78	29.5%
5.7.2016	3:00-4:00	18	96	18.8%
5.14.2016	3:00-4:00	17	96	17.7%
5.21.2016	1:00-2:00	17	75	22.7%
5.28.2016	3:00-4:00	19	80	23.8%
Weekend (Saturday)			Avg	28.3%

Employees

Date	Weekend Peak Hour	# of Employees During Peak Hour	Total Daily Visitors	% of Daily
8.6.2016	11:00-12:00	7	7	100.0%
8.13.2016	2:00-3:00	7	7	100.0%
8.20.2016	3:00-4:00	7	7	100.0%
8.27.2016	1:00-2:00	7	7	100.0%
1.2.2016	2:00-3:00	5	5	100.0%
1.9.2016	2:00-3:00	4	4	100.0%
1.16.2016	11:00-12:00	5	5	100.0%
1.23.2016	3:00-4:00	3	3	100.0%
1.30.2016	3:00-4:00	9	9	100.0%
5.7.2016	3:00-4:00	5	5	100.0%
5.14.2016	3:00-4:00	5	5	100.0%
5.21.2016	1:00-2:00	5	5	100.0%
5.28.2016	3:00-4:00	5	5	100.0%
Weekend (Saturday)			Avg	100.0%

Visitors and Employees

	Avg # of Emp+ Visitors during PM Peak Hour	Average Daily Emp+ Visitors	% of Daily
Average	**13**	**42**	**31.0%**

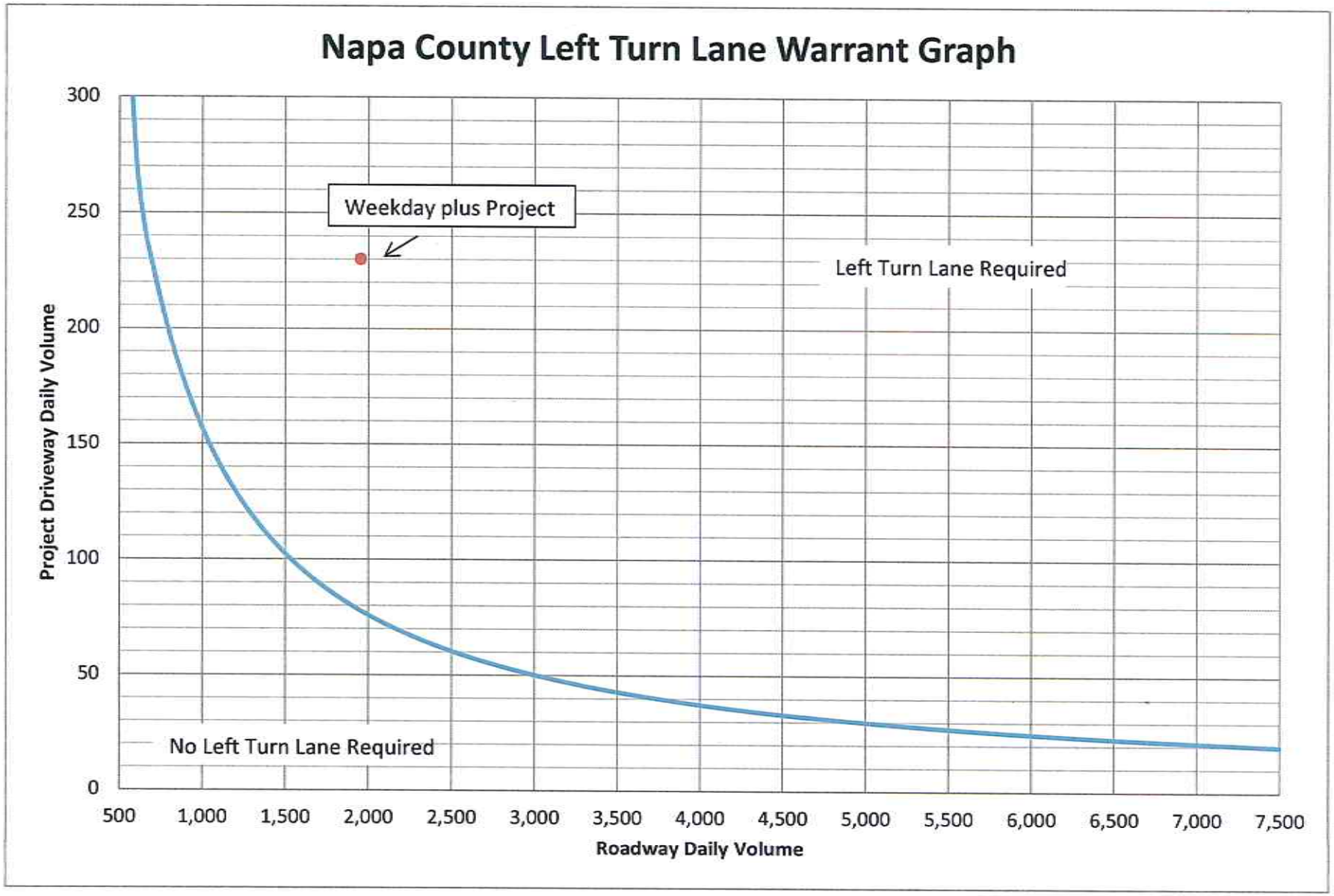
Typical Weekday	Rate	Permitted Value	Permitted Trips	Proposed Value	Proposed Trips	Net New	In	Out
FT Employees	3.05	10	31	28	85			
PT Employees	1.9	0	0	0	0			
Avg # of wkday visitors	2.6	75	58	180	138			
Gallons of production	0.02	340000	6	340000	6			
Daily			95		229	**134**		
PM Peak Trips - Napa County rate (38% of daily)	38%		36		87			
PM Peak Trips - Assume 9% of daily	9%		9		21			
PM Peak Trips - Site Specific (Assume 1 trip per employee + 7% of visitor trips)	7%		14		38	**24**	**5**	**19**

Typical Saturday	Rate	Permitted Value	Permitted Trips	Proposed Value	Proposed Trips	Net New	In	Out
FT Employees	3.05	10	31	28	85			
PT Employees	1.9	0	0	0	0			
Avg # weekend visitors	2.8	75	54	180	129			
Daily			85		214	**129**		
MD Peak Trips - Napa County rate (57% of daily)	57%		48		122			
MD Peak Trips - Assume 31% of daily	31%		26		66			
MD Peak Trips - Site Specific (Assume 1 trip per employee + 28% of visitor trips)	28%		25		64	**39**	**20**	**19**

Crush Saturday	Rate	Permitted Value	Permitted Trips	Proposed Value	Proposed Trips	Net New	In	Out
FT Employees	3.05	12	37	34	104			
PT Employees	1.9	0	0	0	0			
Avg # weekend visitors	2.8	75	54	200	143			
Gallons of production	0.02	340000	6	340000	6			
Daily			97		253	**156**		
MD Peak Trips - Napa County rate (57% of daily)	57%		55		144	**89**		
MD Peak Trips - Assume 31% of daily	31%		30		78	**48**		
MD Peak Trips - Site Specific (Assume 1 trip per employee + 28% of visitor trips)	28%		27		74	**47**	**24**	**23**

Appendix E

Left-Turn Warrant Calculations


Napa County Left Turn Lane Warrant Graph
300
250
200
150
100
50
0
Project Driveway Daily Volume
Weekday plus Project
Left Turn Lane Required
No Left Turn Lane Required
500
1,000
1,500
2,000
2,500
3,000
3,500
4,000
4,500
5,000
5,500
6,000
6,500
7,000
7,500
Roadway Daily Volume