



May 8, 2015

Mr. Remmelt Reigersman
Tench Winery, LLC
7631 Silverado Trail
Napa, CA 94558-9745
via email only: rem@tenchvineyards.com

Subject: Focused Traffic Analysis for Tench Winery Project

Dear Mr. Reigersman:

Transpedia Consulting Engineers (TCE) has prepared a focused traffic analysis that addresses the anticipated traffic impacts associated with the development of the Tench Winery Project. The following presents the results of this traffic analysis.

PROJECT DESCRIPTION

The Tench Winery will be located at 7631 Silverado Trail in the County of Napa (southwesterly of Oakville Cross Road/Silverado Trail intersection). Project access will be via an already existing paved driveway off of Silverado Trail serving an existing single family house, which will stay and continue having access via the same existing driveway. The existing vineyard (42 acres in production), which is located just south of project driveway, is being currently accessed via a driveway about 550 feet south of project driveway. A copy of the site plan is attached.

The winery will utilize the project site as a combination of a winery tasting room, administrative office, wine production and storage. The winery will also participate in industry wide promotional events and host private functions. The Tench Winery will have the following operations:

- 42,840 gallons of per year production.
- Bottling onsite.
- 34 percent of the grapes will be imported and transported to the site; existing onsite vineyard will provide the rest.
- Tours and tasting- 6 full time employees, 1 part time employee, a maximum of 14 visitors per non-harvest day, 305 days per year; and 6 full time employees, 4 part time employees, a maximum of 10 visitors per harvest day, 60 days per year.
- Non-harvest events- 3 per year, 50 visitors per event during non-harvest days.

APPROACH AND METHODOLOGY

Traffic operations were evaluated in terms of intersection operations. Intersection operations were evaluated for weekday PM and weekend peak hours at the study intersections using the criteria and methodology described below.

Level of Service Concept

Intersections are evaluated in terms of “level of service” (LOS), which is a measure of driving conditions and vehicle delay. Levels of service range from A (best) to F (poorest). Levels of service A, B and C indicate conditions where traffic can move relatively freely. Level of service D describes conditions where delay is more noticeable. Level of service E describes conditions where traffic volumes are at or close to capacity, resulting in significant delays. Level of service F characterizes conditions where traffic demand exceeds available capacity, with very slow speeds (stop-and-go) and long delays (over a minute).

Unsignalized Intersection Analysis Methodology

The unsignalized study intersections were evaluated with the Synchro software using the methodology from Chapter 17 of the 2000 Highway Capacity Manual. This methodology separately evaluates each turning movement that yields to an opposing movement and assigns a LOS. The LOS is based on the average total delays of traffic on the minor approach waiting for an adequate gap in conflicting traffic flows. Under this methodology, the LOS is not defined for the intersection as a whole for an all-way stop controlled intersection. The LOS is reported for the intersection as a whole and minor street approach for one-way and two-way stop controlled intersections. The LOS criteria for unsignalized intersections are shown in Table 1

Table 1- Level of Service Definitions for Unsignalized Intersections

Level of Service	Vehicle Delay (Seconds)	Description
A	0 - 10.0	Little or no delay
B	10.1 - 15.0	Short traffic delay
C	15.1 - 25.0	Average traffic delays
D	25.1 - 35.0	Long traffic delays
E	35.1 - 50.0	Very long traffic delays
F	> 50.0	Extreme delays potentially affecting other traffic movements in the intersection

Source: *Transportation Research Board, Highway Capacity Manual, 2000.*

Standards of Significance

Study intersection levels of service and delay are provided to determine the magnitude of proposed development related impacts. Napa County hasn't established minimum level of service standards for unsignalized intersections in the County General Plan. The significance criteria that were applied in the Napa Pipe Transportation Impact Analysis (Fehr & Peers, September 2009) was used in this study. Impacts at an unsignalized intersection would be significant if:

- The proposed project would degrade the AM or PM peak hour LOS from an acceptable D or better to LOS E or F and the worse-case approach would experience total delay of more than 4.0 vehicle-hours (for a single lane approach) or more than 5.0 vehicle hours (for multiple-lane approach); or
- The proposed project would increase traffic volumes at an intersection already operating at LOS E or F by more than 50 vehicles per hour in the AM or PM peak hour.

EXISTING ROADS

Silverado Trail is a regional route that runs generally parallel to SR-29/128 on the east side of the Napa Valley, and becomes SR-128 near Rutherford. It connects Calistoga to the cities of St. Helena, Yountville, and Napa. Silverado Trail in the project vicinity has two paved 12-foot travel lanes and wide paved shoulders that are utilized as Class II bicycle lanes. The posted speed limit on Silverado Trail near the project is 55 miles per hour.

Oakville Cross Road is a rural collector route (2 lanes). It runs generally east-west and connects SR-29 to Silverado Trail. Oakville Cross Road has two paved 12-foot travel lanes and narrow paved shoulders in the project vicinity. It is also utilized as Class III bicycle route (Napa Bikeway Feasibility Study, 2009). There is no posted speed limit on Oakville Cross Road; however, there 30 miles per hour advisory speed in the vicinity of Oakville Cross Road/Silverado Trail intersection.

Daily weekday and weekend two-way traffic counts were conducted along Silverado Trail adjacent to the project access driveway on Tuesday, December 9, 2014 and Saturday, December 6, 2014 by National Data & Surveying Services (NDS) for TCE.

Silverado Trail carries approximately 10,777 vehicles per weekday, with a peak of 1,310 vehicles per hour during the weekday p.m. peak hour (3:30 p.m.-4:30 p.m.); and carries approximately 8,780 vehicles per weekend day (Saturday), with a peak of 927 vehicles per hour during the weekend peak hour (3:45 p.m.-4:45 p.m.).

EXISTING SCENARIO

Turning movement counts were also collected at Silverado Trail/Oakville Cross Road and Silverado Trail/Tench Winery Driveway study intersections during weekday p.m. and weekend peak hours on March 10, 2015 and March 7, 2015, respectively.

Under “Existing Scenario”, the study intersections operate at acceptable level of service during weekday p.m. and weekend peak hours. The Eastbound Approach of Silverado Trail/Oakville Cross Road intersection would experience approximately a total delay of 2.19 vehicle-hours during PM peak hour (worse-case), which is less than the 4.0 vehicle-hours threshold for a single lane approach specified in the “Standards of Significance” subsection. However, the Silverado Trail/Oakville Cross Road intersection is expected to operate at acceptable level of service during p.m. peak hour (worse-case) under “Existing Scenario”.

The study intersections level of service analysis results are summarized in Table 2; and capacity analysis worksheets are attached.

Table 2- Intersections Operations- “Existing” Scenario

Intersection		Control	Existing	
			LOS	Delay
PM Peak Hour				
1	Silverado Trail/Oakville Cross Road	1-Way Stop	A	4.6
	Eastbound Approach		(F)	62.5
2	Silverado Trail/Tench Winery Driveway	1-Way Stop	A	0.0
	Eastbound Approach		A	0.0
Weekend Peak Hour				
1	Silverado Trail/Oakville Cross Road	1-Way Stop	A	1.4
	Eastbound Approach		(C)	16.7
2	Silverado Trail/Tench Winery Driveway	1-Way Stop	A	0.0
	Eastbound Approach		(B)	10.6

Source: Transpedia Consulting Engineers, 2015.

Notes: Delay is average control delay per vehicle (seconds/vehicle), LOS = Level of Service, (X) = minor street LOS, (X.X) = minor street delay.

TRIP GENERATION

Trip generation for project site’s current land uses was estimated based on the rate provided in the Trip Generation, Institute of Transportation Engineers (ITE), 9th Edition, 2012 for single-family housing. The project site would currently generate approximately 10 trips daily, of which one (1) trip (0 inbound and 1 outbound) during weekday p.m. peak hour and one (1) trip (0 inbound and 1 outbound) during weekend peak hour, as shown in Table 3.

The project is expected to generate an average of 32 trips daily, of which 10 trips (1 inbound and 9 outbound) during weekday p.m. peak hour and 9 trips (1 inbound and 8 outbound) during weekend peak hour. The existing house and proposed project are expected to generate an average of 42 trips daily, of which 11 trips (2 inbound and 9 outbound) during weekday p.m. peak hour and 10 trips (1 inbound and 9 outbound) during weekend peak hour.

Table 3- Project Trip Generation

Trip Type	Units	Daily		Weekday PM Peak Hour			Weekend Peak Hour		
		Rate	Trips	Trips	In	Out	Trips	In	Out
<u>Existing Trips</u>									
Single-Family House	1	9.57	10	1	1	0	1	0	1
Total Existing Trips			10	1	1	0	1	0	1
<u>Proposed Project</u>									
Full Time Employees	6	3.05	18	6	0	6	6	0	6
Part Time Employees	1	1.9	2	1	0	1	1	0	1
Tasting Room Visitors	14	0.77	11	2	1	1	2	1	1
Gallon of Production (Truck Traffic)	42,840	N/A	1	1	0	1	0	0	0
Total Project Trips			32	10	1	9	9	1	8
Total Site Trips			42	11	2	9	10	1	9

Source: Napa County Trip Generation Methodology, August 22, 2011; Trip Generation, Institute of Transportation Engineers, 9th Edition, 2012; and Transpedia Consulting Engineers, 2015.

Notes: N/A = not applicable; average weekday visitor trips = (visitors/2.6 visitors per vehicle) x 2 one-way trips = 11;
 Average weekend visitors trips = (visitors/2.8 visitors per vehicle) x 2 one-way trips = 10;
 Truck trips = (gallons production/1,000) x 0.009 truck trips daily x 2 one-way trips;
 15% of tasting room traffic occurs during PM or weekend peak hours; and
 15% of truck traffic occurs during PM peak hour.

TRIP DISTRIBUTION

Trip distribution simulates the geographical pattern of travel, matching trips generated by one type of land use (e.g., residential or commercial) with trips attracted by other types of land uses (e.g., employment, shopping, and education). This traffic study assumed trips generated by the project would follow existing trip distribution patterns similar to nearby existing developments, as shown in Table 4.

Table 4- Project Trip Distribution

Route	Distribution (%)	Weekday PM Peak			Weekend Peak		
		Trips	In	Out	Trips	In	Out
Silverado Trail North of Oakville Cross Road	42	4	0	4	3	0	3
Silverado Trail South of Oakville Cross Road	52	5	1	4	5	1	4
Oakville Cross Road East of Silverado Trail	6	1	0	1	1	0	1
Total	100	10	1	9	9	1	8

Source: Transpedia Consulting Engineers, 2015.

EXISTING PLUS PROJECT SCENARIO

Net traffic trips that would be generated by the project were added to the “Existing Scenario” traffic. Under “Existing Plus Project Scenario”, the study intersections are expected to continue to operate at acceptable levels of services during weekday p.m. and weekend peak hours. The Eastbound Approach of Silverado Trail/Oakville Cross Road intersection would experience approximately a total delay of 2.21 vehicle-hours during PM peak hour (worse-case scenario), which is less than the 4.0 vehicle-hours threshold for a single lane approach as specified in the “Standards of Significance” subsection. However, the Silverado Trail/Oakville Cross Road intersection is expected to continue to operate at acceptable level of service (LOS A) during p.m. peak hour (worse-case) under “Existing Plus Project Scenario”.

On the other hand, the Eastbound Approach of Silverado Trail/Tench Winery Driveway intersection would experience approximately a total delay of 0.10 vehicle-hours during PM peak hour (worse-case scenario), which is also less than the 4.0 vehicle-hours threshold for a single lane approach as specified in the “Standards of Significance” subsection. However, the Silverado Trail/Tench Winery Driveway intersection is also expected to continue to operate at acceptable level of service (LOS A) during p.m. peak hour (worse-case) under “Existing Scenario Plus Project Scenario”.

The level of service analysis results for the study intersection is summarized in Table 5, analysis worksheets are attached. The project’s is expected to have a less-than-significant impact on the study intersections operation.

Table 5- Intersections Operations- “Existing” and “Existing Plus Project” Scenarios

Intersection		Control	Existing		Existing + Project	
			LOS	Delay	LOS	Delay
PM Peak Hour						
1	Silverado Trail/Oakville Cross Road	1-Way Stop	A	4.6	A	4.6
	Eastbound Approach		(F)	62.5	(F)	63.0
2	Silverado Trail/Tench Winery Driveway	1-Way Stop	A	0.0	A	0.2
	Eastbound Approach		A	0.0	E	35.6
Weekend Peak Hour						
1	Silverado Trail/Oakville Cross Road	1-Way Stop	A	1.4	A	1.4
	Eastbound Approach		(C)	16.7	(C)	16.6
2	Silverado Trail/Tench Winery Driveway	1-Way Stop	A	0.0	(A)	0.2
	Eastbound Approach		(B)	10.6	(B)	13.7

Source: Transpedia Consulting Engineers, 2015.

Notes: Delay is average control delay per vehicle (seconds/vehicle); and
 LOS = Level of Service, (X) = minor street LOS, (X.X) = minor street delay.

CUMULATIVE SCENARIO

Cumulative scenario was calculated by adding traffic of pending or approved projects in the project vicinity to existing traffic volumes. The pending or approved projects list was provided by Napa County staff. The list includes the following projects:

- Frank's Family Vineyards Winery- located at 8895 Conn Creek in the St. Helena area unincorporated with 475,000 gallons annual production, 14 full-time and 5 part-time employees and 50 visitors per day (Caymus Winery Traffic Impact Study, December 31, 2014).
- Tera Del Lago (Harrison Vineyards) Winery- located at 1553 Sage Canyon Road in the St. Helena unincorporated area with 15,000 gallons annual production, 2 full-time and 1 part-time employees and 11 visitors per day (Harrison Vineyards Winery Use Permit, October 28, 2004).
- Swanson Winery- located at 7711 Money Road in the Oakville unincorporated area with 100,000 gallons annual production, 30 full-time employees, no part-time employees and 200 visitors per day (Swanson Winery Use Permit Application, Napa County Planning Commission, May 6, 2012).
- Lodestone Vineyard Winery- located at 200 Long Ranch Road in the St. Helena unincorporated area with 20,000 gallons annual production, 10 full-time employees, no part-time employees and 35 visitors per day (Lodestone Vineyard Winery Conditions of Approval, Napa County Planning Commission, November 11, 2011).
- Yountville Hill Winery- located at 7400 State Route 29 in Napa County with 100,000 gallons annual production, 14 full-time employees, no part-time employees and 110 visitors per day (Focused Traffic Analysis for the Proposed Yountville Hill Winery, June 6, 2014).
- Ca'Nani Winery- located at 7466 St Helena Highway (State Route 29) in Napa County with 48,000 gallons annual production, 13 full-time employees, no part-time employees and 49 visitors per weekday and 75 visitors on a Saturday or Sunday (Traffic Analysis for a Proposed Ca'Nani Winery Project, June 23, 2010).
- Frog's Leap Winery- located at 8815 Conn Creek Road in Napa County with 240,000 gallons annual production, 30 full-time and 5 part-times employees during weekdays, 10 full-time and 5 part-times employees during weekends, 125 visitors per weekday and 300 visitors on a Saturday or Sunday (Focused Traffic Analysis for the Proposed Frog's Leap Winery Modifications Project, December 15, 2014).
- Caymus Winery- located at 8700 Conn Creek Road in Napa County with 1.8 million gallons annual production, 346 visitors per weekday and 589 visitors on a Saturday or Sunday (Caymus Winery Traffic Impact Study, December 31, 2014).

Cumulative volumes generated by the pending or approved projects are summarized in Table 6. The pending or approved projects are expected to generate an average of 1,177 trips per weekday, of which 291 trips (61 inbound and 230 outbound) during weekday p.m. peak hour; and 1,227 trips on a Saturday or Sunday, of which 430 trips (212 inbound and 218 outbound) during weekend peak hour.

Table 6- Pending or Approved Projects Trip Generation

Pending or Approved Project	Daily Trips		Weekday PM Peak Hour			Weekend Peak Hour		
	Weekday	Weekend	Trips	In	Out	Trips	In	Out
Frank's Family Vineyards Winery	99	88	26	3	23	23	11	12
Tera Del Lago (Harrison Vineyards) Winery	17	16	4	0	4	4	1	3
Swanson Winery	247	234	53	11	42	51	25	26
Lodestone Vineyard Winery	58	56	14	2	12	14	7	7
Yountville Hill Winery	129	121	22	0	22	26	13	13
Ca'Nani Winery	59	82	12	6	6	16	10	6
Frog's Leap Winery	202	255	30	6	24	86	40	46
Caymus Winery	366	375	130	33	97	210	105	105
Total Trips	1177	1227	291	61	230	430	212	218

Source: Transpedia Consulting Engineers, 2015.

Pending or approved projects traffic trips were added to “Existing Scenario” traffic to obtain “Cumulative Scenario” traffic. Under “Cumulative Scenario”, the study intersections continue to operate at acceptable level of service during weekday p.m. and weekend peak hours.

The Eastbound Approach of Silverado Trail/Oakville Cross Road intersection would experience approximately a total delay of 4.99 vehicle-hours during PM peak hour (worse-case scenario), which is greater than the 4.0 vehicle-hours threshold for a single lane approach as specified in the “Standards of Significance” subsection. However, the Silverado Trail/Oakville Cross Road intersection is expected to continue to operate at acceptable level of service (LOS A) during p.m. peak hour (worse-case) under “Cumulative Scenario”.

The study intersections level of service analysis results are summarized in Table 7; and capacity analysis worksheets are attached.

Table 7- Intersections Operations- “Existing” and “Cumulative” Scenarios

Intersection		Control	Existing		Cumulative	
			LOS	Delay	LOS	Delay
PM Peak Hour						
1	Silverado Trail/Oakville Cross Road	1-Way Stop	A	4.6	A	9.8
	Eastbound Approach		(F)	62.5	(F)	113.7
2	Silverado Trail/Tench Winery Driveway	1-Way Stop	A	0.0	A	0.0
	Eastbound Approach		A	0.0	A	0.0
Weekend Peak Hour						
1	Silverado Trail/Oakville Cross Road	1-Way Stop	A	1.4	A	1.9
	Eastbound Approach		(C)	16.7	(C)	19.3
2	Silverado Trail/Tench Winery Driveway	1-Way Stop	A	0.0	(A)	0.0
	Eastbound Approach		(B)	10.6	(B)	11.0

Source: Transpedia Consulting Engineers, 2015.

Notes: Delay is average control delay per vehicle (seconds/vehicle); and
 LOS = Level of Service, (X) = minor street LOS, (X.X) = minor street delay.

CUMULATIVE PLUS PROJECT SCENARIO

Net traffic trips that would be generated by the project were added to the “Cumulative Scenario” traffic. Under “Cumulative Plus Project Scenario”, the study intersections would continue to operate at acceptable levels of services during weekday p.m. and weekend peak hours. The Eastbound Approach of Silverado Trail/Oakville Cross Road intersection would experience approximately a total delay of 5.04 vehicle-hours during PM peak hour (worse-case scenario), which is greater than the 4.0 vehicle-hours threshold for a single lane approach as indicated in the “Standards of Significance” subsection. However, the Silverado Trail/Oakville Cross Road intersection is expected to continue to operate at acceptable level of service (LOS A) during p.m. peak hour (worse-case) under “Cumulative Plus Project Scenario”.

On the other hand, the Eastbound Approach of Silverado Trail/Tench Winery Driveway intersection would experience approximately a total delay of 0.11 vehicle-hours during PM peak hour (worse-case scenario), which is also less than the 4.0 vehicle-hours threshold for a single lane approach as specified in the “Standards of Significance” subsection. However, the Silverado Trail/Tench Winery Driveway intersection is also expected to continue to operate at acceptable level of service (LOS A) during p.m. peak hour (worse-case) under “Existing Scenario Plus Project Scenario”.

The level of service analysis results for the study intersections is summarized in Table 8, analysis worksheets are attached. The project’s is expected to have a less-than-significant impact on the study intersections operation under this scenario.

Table 8- Intersections Operations- “Cumulative” and “Cumulative Plus Project” Scenarios

Intersection		Control	Cumulative		Cumulative Plus Project	
			LOS	Delay	LOS	Delay
PM Peak Hour						
1	Silverado Trail/Oakville Cross Road	1-Way Stop	A	9.8	A	9.9
	Eastbound Approach		(F)	113.7	(F)	114.9
2	Silverado Trail/Tench Winery Driveway	1-Way Stop	A	0.0	A	0.2
	Eastbound Approach		A	0.0	E	38.7
Weekend Peak Hour						
1	Silverado Trail/Oakville Cross Road	1-Way Stop	A	1.9	A	1.9
	Eastbound Approach		(C)	19.3	(C)	19.4
2	Silverado Trail/Tench Winery Driveway	1-Way Stop	A	0.0	(A)	0.1
	Eastbound Approach		(B)	11.0	(C)	15.3

Source: Transpedia Consulting Engineers, 2015.

Notes: Delay is average control delay per vehicle (seconds/vehicle); and

LOS = Level of Service, (X) = minor street LOS, (X.X) = minor street delay.

LEFT-TURN LANE ANALYSIS

The need for left-turn channelization on Silverado Trail at the project driveway was evaluated using the Left-Turn Lane Warrant Graph contained in the County of Napa Road & Standards, August 9, 2011. The Graph is based on road average daily trips (ADT) and the projected ADT of the proposed project. The chart is a representation of probable conflicts between turning traffic and advancing traffic. Private road or driveway ADT is the total average daily traffic utilizing the facility.

As mentioned earlier, the existing house and proposed project are expected to generate an average of 42 trips per day (ADT); and the average daily traffic on Silverado Trail in the vicinity of the access driveway is 10,206 vehicles per day (ADT).

As noted on the chart, attached, if the proposed ADT is greater than 20 vehicles and the roadway ADT is greater than 7,500 vehicles, a left-turn lane is warranted. Because the proposed project is expected to generate traffic trips greater than 20 trips per day and the ADT on Silverado Trail in the project vicinity is greater than 7,500 vehicles per day, a left-turn lane is warranted or recommended under "Existing Plus Project Scenario" or "Cumulative Plus Project Scenario".

COLLISION HISTORY

The collision history for the segment of Silverado Trail within one-quarter mile in each direction from the access driveway was reviewed to determine any trends or patterns that could indicate a safety issue. Collision rates were calculated based on records for January 1, 2012, through available 2014, obtained from the California Highway Patrol. During this three-year time period, two (2) collisions were reported in the project vicinity. The collision rate at the study roadway segment was calculated utilizing the methodology contained in Caltrans 2007 Collision Data on California State Highways Manual, using the following equation:

$$\text{Collision Rate} = \frac{\text{Number of Collisions} \times 1 \text{ Million}}{\text{Average Daily Traffic} \times 365 \text{ Days Per Year} \times \text{Segment Length} \times \text{Number of Years}}$$

$$\text{Collision Rate} = \frac{2 \times 1,000,000}{10,206 \times 365 \times 0.5 \times 3} = 0.36 \text{ c/mvm}$$

The Average Daily Traffic was calculated using the traffic counts and the following equation:

$$\text{Average Daily Traffic} = \frac{(5 \times \text{weekday ADT}) + (2 \times \text{weekend ADT})}{7}$$

$$\text{Average Daily Traffic} = \frac{(5 \times 10,777) + (2 \times 8,780)}{7} = 10,206 \text{ vehicles per day}$$

The collision rate for the study segment was then compared to statewide average collision rate to assess safety at this roadway segment. The calculated collision rate equates to an average of 0.36 collisions per million vehicle miles (c/mvm) which is less than the statewide average of 1.18 c/mvm for similar facilities, i.e. 2-lanes rural highways with design speed of greater than or equal to 55 mph (2007 Collision Data on California State Highways, Caltrans).

The collision history for the Silverado Trail/Oakville Cross Road intersection within one-quarter mile in each direction from each intersection was also reviewed to determine any trends or patterns that could indicate a safety issue. Collision rates were calculated based on records for January 1, 2012, through available 2014, obtained from the California Highway Patrol. During this three-year time period, fourteen (14) collisions were reported.

The collision rate at the study intersection was calculated utilizing the methodology contained in Caltrans 2007 Collision Data on California State Highways Manual, using the following equation:

$$\text{Collision Rate} = \frac{\text{Number of Collisions} \times 1 \text{ Million}}{\text{Average Daily Traffic} \times 365 \text{ Days Per Year} \times \text{Number of Years}}$$

As mentioned earlier, there were 14 reported collisions within a quarter mile of the Oakville Cross Road/Silverado Trail intersection during the three-year period; however, none of these collisions occurred at the intersection. This translates to a calculated collision rate of 0.00 collisions per million vehicle miles entering (mve).

The calculated collision rate was then compared to the statewide average collision rate for similar facilities to assess safety at the Silverado Trail/Oakville Cross Road intersection. The calculated collision rate of 0.00 c/mve is less than the statewide average collision rate of 0.22 c/mve for similar facilities (a rural, tee intersection), as indicated in the Caltrans Manual referenced above.

SIGHT DISTANCE

Sight distance at the proposed access driveway off of Silverado Trail was evaluated based on sight distance criteria contained in the Caltrans Highway Design Manual, March 7, 2014. The applicable criterion for a private driveway is based on stopping sight distance.

As mentioned earlier, the speed limit of Silverado Trail in the project vicinity is 55 mph. The Manual requires a minimum stopping sight distance of 500 feet for a 55-mph design speed. The sight distance currently provided at the proposed driveway location is greater than 1,350 feet when looking to the north and is greater than 950 feet when looking to the south, which exceed Caltrans minimum sight distance requirements of 500 feet. No vegetation or building along the project frontage shall be located within the minimum sight distance envelope so as not to obstruct the visibility of vehicles entering or exiting the proposed driveway.

PARKING AND CIRCULATION

The project site plan indicates 15 parking spaces proposed. The winery is expected to employ six (6) full-time and one (1) part time employees during non-harvest tasting days (305 days per year). Napa County winery traffic generation assumes employee auto occupancy of 1.05 employees per auto. 6.67 parking spaces would be needed to accommodate employee parking needs. The winery tasting room is expected to serve a maximum of 14 daily tasting visitors. Napa County winery traffic characteristics also assumes tasting visitor auto occupancy of 2.6 visitors per auto on weekdays and 2.8 visitors per auto on weekends.

Assuming a weekday worse-case scenario, 5.38 parking spaces would be needed to meet the parking demand of 14 daily tasting visitors. As a worse-case scenario, 12 parking spaces would be needed to meet employee and visitor daily parking needs. The proposed 15 parking spaces will meet winery daily parking demand during non-harvest tasting days (305 days).

The winery is expected to employ six (6) full-time and four (4) part time employees during harvest tasting days (60 days per year). Napa County winery traffic generation assumes employee auto occupancy of 1.05 employees per auto. 9.52 parking spaces would be needed to accommodate employee parking needs.

The winery tasting room is expected to serve a maximum of 10 daily tasting visitors during harvest days. Assuming a weekday worse-case scenario, 3.84 parking spaces would be needed to meet the parking demand of 10 daily tasting visitors. As a worse-case scenario, 14 parking spaces would be needed to meet employee and visitor daily parking needs during harvest days. The proposed parking supply (15 parking spaces) will meet winery daily parking demand during harvest tasting days (60 days).

The winery would have three (3) special events during non-harvest tasting days with a maximum of 50 visitors at each event. As worse-case scenario, 20 additional parking spaces will be needed to meet winery special events parking demand during harvest tasting days. Valet parking will be provided for the planned events. Valets will use parking by the residence and along the vineyard roads. Using a combination of these areas, adequate parking to accommodate the maximum number of guests and staff would be available.

The onsite circulation pattern appears to be adequate and typical of a winery development.

CONCLUSIONS AND RECOMMENDATIONS

- The proposed project would generate an average of 32 new daily trips, of which 10 during week p.m. peak hour and 9 during weekend peak hour.
- The pending or approved projects would generate an average of 1,177 trips per weekday, of which 291 trips during p.m. peak hour; and 1,227 trips on a Saturday or Sunday, of which 430 trips during weekend peak hour.
- Project trips represent less than 0.30 percent increase in the daily traffic volumes on Silverado Trail.
- The two study intersections (Silverado Trail/Oakville Cross Road and Silverado Trail/Tench Winery Driveway) are expected to operate at acceptable level of service during weekday p.m. and weekend peak hours under all study scenarios.
- The project is expected to have less-than-significant impacts on the study intersections or Silverado Trail operations.
- The collision rate at Silverado Trail in the project vicinity (0.36 collisions per million vehicle miles, c/mvm) is lower than the statewide average for similar facilities (1.18 c/mvm). During the three-year time period evaluated in this study, only two (2) collisions were reported at this location. This collision rate does not show any trends or patterns that could indicate a safety issue at this location.
- The collision rate at Silverado Trail/Oakville Cross Road intersection (0.00 collisions per million vehicle miles, c/mvm) is lower than the statewide average for similar facilities (0.22 c/mvm). During the three-year time period evaluated in this study, no collisions were reported at this intersection. This collision rate does not show any trends or patterns that could indicate a safety issue at this intersection.
- The sight distance currently provided at the location of the proposed driveway is greater than 1,650 feet when looking to the north and is greater than 950 feet when looking to the south. These sight distances exceed Caltrans minimum sight distance standards of 500 feet. Any landscaping, foliage or signage along the project frontage shall be designed to maintain clear lines of sight from the proposed driveway along Silverado Trail.
- The daily trips that would be generated by proposed project and the average daily traffic on Silverado Trail in the project vicinity exceed threshold indicated in Napa County Left-Turn Lane Warrant Graph under “Existing Plus Project Scenario” or “Cumulative Plus Project Scenario”
- The installation of a left-turn lane at Silverado Trail/Tench Winery Driveway is warranted and recommended.
- The proposed parking supply (15 parking spaces) will meet winery daily parking demand during non-harvest tasting days (305 days) and harvest days (60 days).

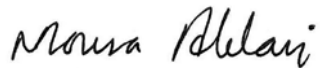
Mr. Remmelt Reigersman
May 8, 2015
Page 15 of 15

- Twenty (20) additional parking spaces will be needed to meet winery special events parking demand. Valet parking, using space by the residence and along the vineyard roads, will be provided to adequately accommodate additional parking needs of guests and staff during special events.
- The onsite circulation pattern appears to be adequate and typical of a winery development.

If you have any questions about this letter report, please contact me at (707) 527-6300 or at mousa@transpediaone.com.

Sincerely,

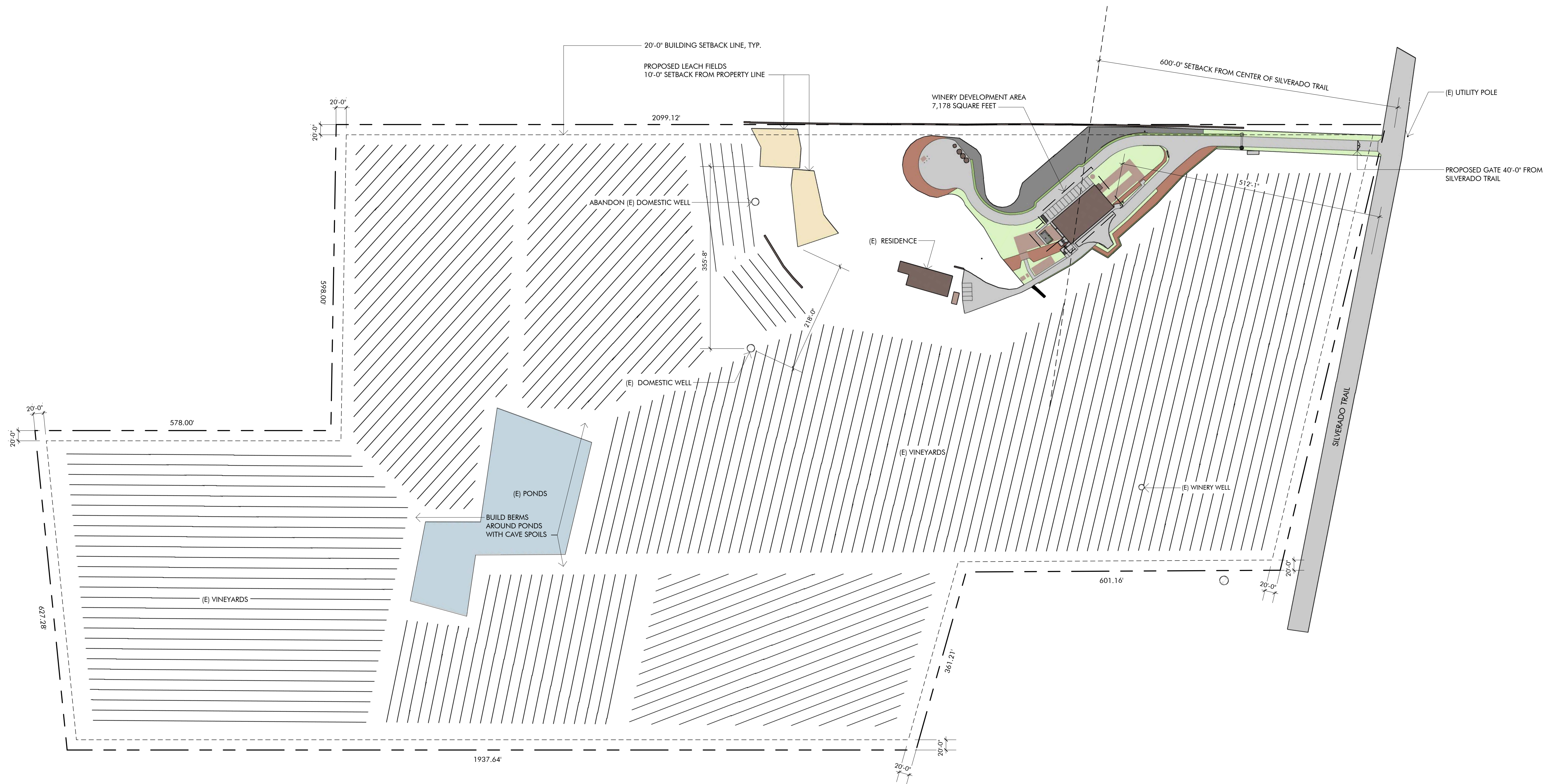
Transpedia Consulting Engineers



Mousa Abbasi, Principal
Ph.D., P.E., T.E., P.T.O.E.
California Professional Civil Engineer No. 67935
California Professional Traffic Engineer No. 2324
Professional Traffic Operations Engineer No. 1297

enclosure: Site Plan
Level of Service Analysis Worksheets
Left-Turn Warrant Graph

cc: Erich Rauber, LACO Associates



PRELIMINARY - NOT FOR CONSTRUCTION



HCM Unsignalized Intersection Capacity Analysis
 1: Oakville Cross Road & Silverado Trail



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	24	92	8	321	1137	21
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	26	100	9	349	1236	23
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1614	1247	1259			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1614	1247	1259			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	77	53	98			
cM capacity (veh/h)	113	212	552			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	126	9	349	1259
Volume Left	26	9	0	0
Volume Right	100	0	0	23
cSH	179	552	1700	1700
Volume to Capacity	0.70	0.02	0.21	0.74
Queue Length 95th (ft)	108	1	0	0
Control Delay (s)	62.5	11.6	0.0	0.0
Lane LOS	F	B		
Approach Delay (s)	62.5	0.3		0.0
Approach LOS	F			

Intersection Summary			
Average Delay		4.6	
Intersection Capacity Utilization		74.8%	ICU Level of Service D
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis

2: Tench Winery Drive & Silverado Trail

Tench Winery Project
3/17/2015



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	0	0	0	329	1229	1
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	358	1336	1
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1694	1336	1337			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1694	1336	1337			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	102	187	516			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	0	358	1337			
Volume Left	0	0	0			
Volume Right	0	0	1			
cSH	1700	516	1700			
Volume to Capacity	0.00	0.00	0.79			
Queue Length 95th (ft)	0	0	0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			68.1%	ICU Level of Service		C
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
 1: Oakville Cross Road & Silverado Trail



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	33	27	38	439	349	30
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	36	29	41	477	379	33
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	955	396	412			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	955	396	412			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	87	96	96			
cM capacity (veh/h)	276	654	1147			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	65	41	477	412
Volume Left	36	41	0	0
Volume Right	29	0	0	33
cSH	373	1147	1700	1700
Volume to Capacity	0.17	0.04	0.28	0.24
Queue Length 95th (ft)	16	3	0	0
Control Delay (s)	16.7	8.3	0.0	0.0
Lane LOS	C	A		
Approach Delay (s)	16.7	0.7		0.0
Approach LOS	C			

Intersection Summary			
Average Delay		1.4	
Intersection Capacity Utilization		37.0%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
2: Tench Winery Drive & Silverado Trail



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	0	1	0	477	376	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	1	0	518	409	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	927	409	409			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	927	409	409			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	298	643	1150			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	1	518	409			
Volume Left	0	0	0			
Volume Right	1	0	0			
cSH	643	1150	1700			
Volume to Capacity	0.00	0.00	0.24			
Queue Length 95th (ft)	0	0	0			
Control Delay (s)	10.6	0.0	0.0			
Lane LOS	B					
Approach Delay (s)	10.6	0.0	0.0			
Approach LOS	B					
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			35.1%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
 1: Oakville Cross Road & Silverado Trail



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	24	92	9	325	1137	21
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	26	100	10	353	1236	23
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1620	1247	1259			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1620	1247	1259			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	77	53	98			
cM capacity (veh/h)	111	212	552			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	126	10	353	1259
Volume Left	26	10	0	0
Volume Right	100	0	0	23
cSH	178	552	1700	1700
Volume to Capacity	0.71	0.02	0.21	0.74
Queue Length 95th (ft)	109	1	0	0
Control Delay (s)	63.0	11.6	0.0	0.0
Lane LOS	F	B		
Approach Delay (s)	63.0	0.3		0.0
Approach LOS	F			

Intersection Summary			
Average Delay		4.6	
Intersection Capacity Utilization		74.8%	ICU Level of Service D
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis

2: Tench Winery Drive & Silverado Trail

Tench Winery Project
3/23/2015



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	5	4	1	329	1229	1
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	4	1	358	1336	1
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1696	1336	1337			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1696	1336	1337			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	95	98	100			
cM capacity (veh/h)	102	187	516			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	10	359	1337			
Volume Left	5	1	0			
Volume Right	4	0	1			
cSH	128	516	1700			
Volume to Capacity	0.08	0.00	0.79			
Queue Length 95th (ft)	6	0	0			
Control Delay (s)	35.6	0.1	0.0			
Lane LOS	E	A				
Approach Delay (s)	35.6	0.1	0.0			
Approach LOS	E					
Intersection Summary						
Average Delay			0.2			
Intersection Capacity Utilization			74.7%		ICU Level of Service	D
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
 1: Oakville Cross Road & Silverado Trail



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	33	27	39	442	349	30
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	36	29	42	480	379	33
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	961	396	412			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	961	396	412			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	87	96	96			
cM capacity (veh/h)	274	654	1147			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	65	42	480	412
Volume Left	36	42	0	0
Volume Right	29	0	0	33
cSH	371	1147	1700	1700
Volume to Capacity	0.18	0.04	0.28	0.24
Queue Length 95th (ft)	16	3	0	0
Control Delay (s)	16.8	8.3	0.0	0.0
Lane LOS	C	A		
Approach Delay (s)	16.8	0.7		0.0
Approach LOS	C			

Intersection Summary			
Average Delay		1.4	
Intersection Capacity Utilization		37.0%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis

2: Tench Winery Drive & Silverado Trail

Tench Winery Project
3/23/2015



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	4	5	1	477	376	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	5	1	518	409	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	929	409	409			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	929	409	409			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	99	100			
cM capacity (veh/h)	297	643	1150			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	10	520	409			
Volume Left	4	1	0			
Volume Right	5	0	0			
cSH	423	1150	1700			
Volume to Capacity	0.02	0.00	0.24			
Queue Length 95th (ft)	2	0	0			
Control Delay (s)	13.7	0.0	0.0			
Lane LOS	B	A				
Approach Delay (s)	13.7	0.0	0.0			
Approach LOS	B					
Intersection Summary						
Average Delay			0.2			
Intersection Capacity Utilization		35.9%		ICU Level of Service		A
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis
 1: Oakville Cross Road & Silverado Trail



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	30	115	13	335	1180	21
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	33	125	14	364	1283	23
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1686	1294	1305			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1686	1294	1305			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	68	37	97			
cM capacity (veh/h)	100	199	530			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	158	14	364	1305
Volume Left	33	14	0	0
Volume Right	125	0	0	23
cSH	165	530	1700	1700
Volume to Capacity	0.95	0.03	0.21	0.77
Queue Length 95th (ft)	181	2	0	0
Control Delay (s)	113.7	12.0	0.0	0.0
Lane LOS	F	B		
Approach Delay (s)	113.7	0.4		0.0
Approach LOS	F			

Intersection Summary			
Average Delay		9.8	
Intersection Capacity Utilization		78.8%	ICU Level of Service D
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
 2: Tench Winery Drive & Silverado Trail



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	0	0	0	343	1272	1
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	373	1383	1
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type						
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1756	1383	1384			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1756	1383	1384			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	93	176	495			
Direction, Lane #						
	EB 1	NB 1	SB 1			
Volume Total	0	373	1384			
Volume Left	0	0	0			
Volume Right	0	0	1			
cSH	1700	495	1700			
Volume to Capacity	0.00	0.00	0.81			
Queue Length 95th (ft)	0	0	0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			70.3%	ICU Level of Service		C
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
 1: Oakville Cross Road & Silverado Trail



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	37	41	52	487	398	34
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	40	45	57	529	433	37
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1093	451	470			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1093	451	470			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	82	93	95			
cM capacity (veh/h)	225	608	1092			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	85	57	529	470
Volume Left	40	57	0	0
Volume Right	45	0	0	37
cSH	336	1092	1700	1700
Volume to Capacity	0.25	0.05	0.31	0.28
Queue Length 95th (ft)	25	4	0	0
Control Delay (s)	19.3	8.5	0.0	0.0
Lane LOS	C	A		
Approach Delay (s)	19.3	0.8		0.0
Approach LOS	C			

Intersection Summary			
Average Delay		1.9	
Intersection Capacity Utilization		40.9%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis

2: Tench Winery Drive & Silverado Trail

Tench Winery Project
3/19/2015



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	0	1	0	525	425	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	1	0	571	462	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1033	462	462			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1033	462	462			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	258	600	1099			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	1	571	462			
Volume Left	0	0	0			
Volume Right	1	0	0			
cSH	600	1099	1700			
Volume to Capacity	0.00	0.00	0.27			
Queue Length 95th (ft)	0	0	0			
Control Delay (s)	11.0	0.0	0.0			
Lane LOS	B					
Approach Delay (s)	11.0	0.0	0.0			
Approach LOS	B					
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			37.6%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
 1: Oakville Cross Road & Silverado Trail



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	30	115	14	339	1180	21
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	33	125	15	368	1283	23
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1693	1294	1305			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1693	1294	1305			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	67	37	97			
cM capacity (veh/h)	99	199	530			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	158	15	368	1305
Volume Left	33	15	0	0
Volume Right	125	0	0	23
cSH	165	530	1700	1700
Volume to Capacity	0.96	0.03	0.22	0.77
Queue Length 95th (ft)	182	2	0	0
Control Delay (s)	114.9	12.0	0.0	0.0
Lane LOS	F	B		
Approach Delay (s)	114.9	0.5		0.0
Approach LOS	F			

Intersection Summary			
Average Delay		9.9	
Intersection Capacity Utilization		78.8%	ICU Level of Service D
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis

2: Tench Winery Drive & Silverado Trail

Tench Winery Project
3/23/2015



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	5	4	1	345	1276	1
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	4	1	375	1387	1
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1765	1388	1388			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1765	1388	1388			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	94	98	100			
cM capacity (veh/h)	92	175	493			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	10	376	1388			
Volume Left	5	1	0			
Volume Right	4	0	1			
cSH	117	493	1700			
Volume to Capacity	0.08	0.00	0.82			
Queue Length 95th (ft)	7	0	0			
Control Delay (s)	38.7	0.1	0.0			
Lane LOS	E	A				
Approach Delay (s)	38.7	0.1	0.0			
Approach LOS	E					
Intersection Summary						
Average Delay			0.2			
Intersection Capacity Utilization			77.2%		ICU Level of Service	D
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
 1: Oakville Cross Road & Silverado Trail



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	37	41	53	490	398	34
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	40	45	58	533	433	37
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1099	451	470			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1099	451	470			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	82	93	95			
cM capacity (veh/h)	223	608	1092			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	85	58	533	470
Volume Left	40	58	0	0
Volume Right	45	0	0	37
cSH	334	1092	1700	1700
Volume to Capacity	0.25	0.05	0.31	0.28
Queue Length 95th (ft)	25	4	0	0
Control Delay (s)	19.4	8.5	0.0	0.0
Lane LOS	C	A		
Approach Delay (s)	19.4	0.8		0.0
Approach LOS	C			

Intersection Summary			
Average Delay		1.9	
Intersection Capacity Utilization		40.9%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis

2: Tench Winery Drive & Silverado Trail

Tench Winery Project
3/23/2015



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	4	4	1	529	427	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	4	1	575	464	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1041	464	464			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1041	464	464			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	98	99	100			
cM capacity (veh/h)	254	598	1097			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	9	576	464			
Volume Left	4	1	0			
Volume Right	4	0	0			
cSH	357	1097	1700			
Volume to Capacity	0.02	0.00	0.27			
Queue Length 95th (ft)	2	0	0			
Control Delay (s)	15.3	0.0	0.0			
Lane LOS	C	A				
Approach Delay (s)	15.3	0.0	0.0			
Approach LOS	C					
Intersection Summary						
Average Delay			0.1			
Intersection Capacity Utilization			38.6%		ICU Level of Service	A
Analysis Period (min)			15			

LEFT TURN LANE WARRANT GRAPH

