



Fantesca Winery
c/o Ms. Donna Oldford
Plans 4 Wine
2620 Pinot Way
St. Helena, CA 94574

February 19, 2013

Subject: ***Traffic Analysis of the Spring Mountain Road at Rockland Road (Fantesca Winery Access Road) Intersection in Napa County, CA.***

Dear Ms. Oldford:

This letter report presents our analysis of the Spring Mountain Road at Rockland Road (Fantesca Winery access road) intersection. The analysis is based on field surveys of the existing roadway/intersection conditions including traffic volumes, vehicle speeds, and sight distances. The data was evaluated relative to Napa County, Caltrans, and other standards for access design. The analysis reflects the existing winery production of 30,000 gallons annually and the proposed use modification for 18 daily visitors by appointment and six full-time employees (plus four part-time employees during crush season). (Refer to Figure 1 for vicinity map and Figure 2 for aerial photograph of the intersection.)

The surveyed existing volumes on Spring Mountain Road and Rockland Road are low and the intersection operates efficiently at level of service 'A' with minimal delays and no vehicle queues. As outlined in the report, the project would generate a maximum of 31-34 new daily trips and 8-12 peak hour trips. The intersection would continue to operate at LOS 'A' (with delays less than 10 seconds), indicating efficient operation and no vehicle queuing. The combination of daily volumes on Spring Mountain Road and the winery access road would not warrant a left turn lane based on Napa County standards. Volumes would also be well below the thresholds at which a right turn lane would be needed.

Sight distances at the Spring Mountain Road/Rockland Road intersection were measured and compared to Caltrans recommended distances based on vehicle speeds. From a standard setback location on the crossroad of 13 feet from the edge of Spring Mountain Road, the sight distance looking south is 500 feet which exceeds the recommended distance of 300 feet. However, the view to the north is obstructed by a portion of the hillside next to the intersection which limits sight distance to approximately 50 feet, which is less than the recommended 250 feet. The sight distance increases to 350 feet when a motorist is positioned at the east side edge of Spring Mountain Road where the hillside does not encroach.

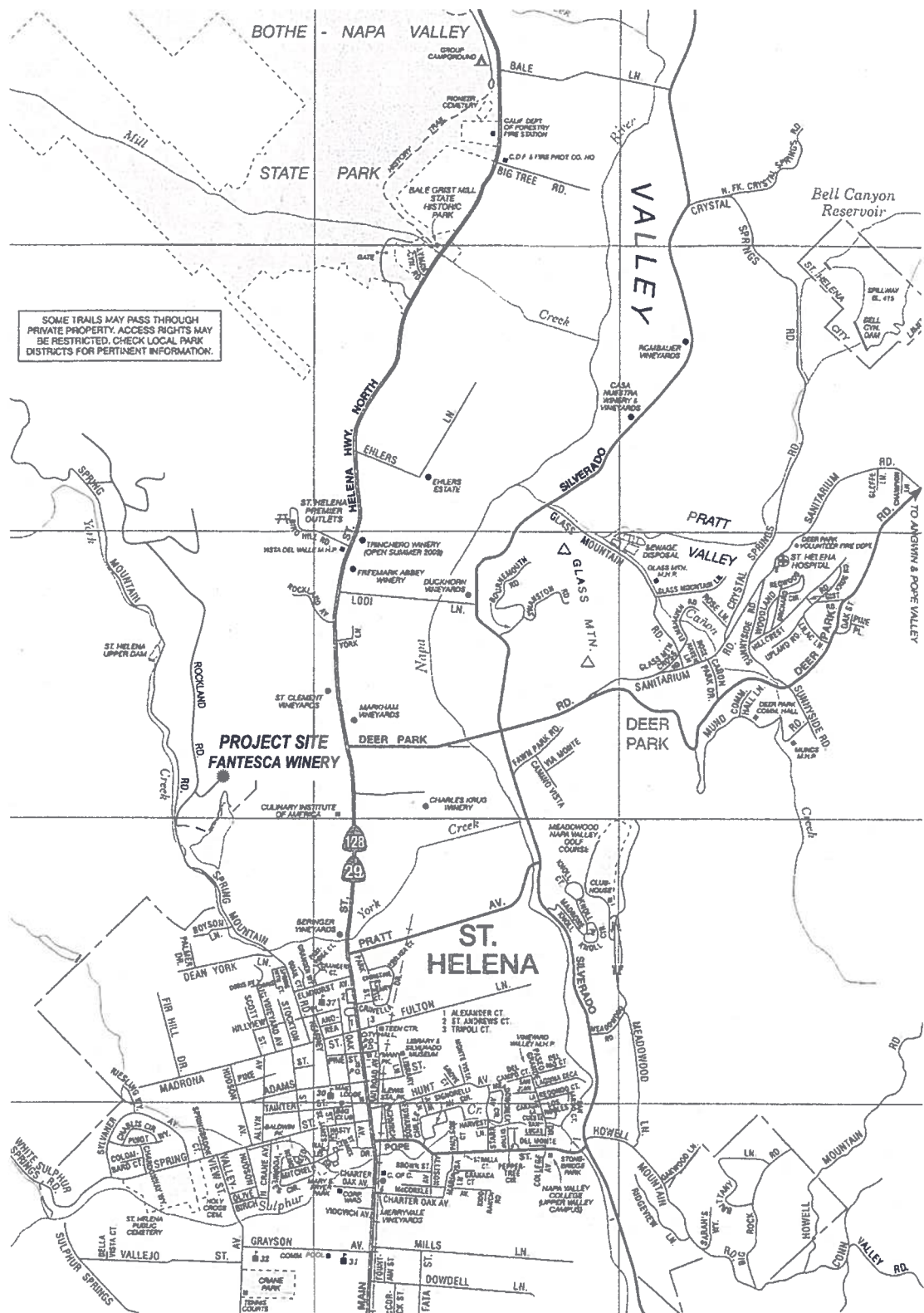
Due to the low volumes and adequate visibility to the south, our field observations indicate drivers can move forward to the east side edge of Spring Mountain Road in order to adequately see to the north. However, in order to maximize driver safety and awareness, several recommendations have been presented, including installing a convex mirror at the intersection and installing advance warning signs on Spring Mountain Road to alert drivers of the intersection's presence.

I trust that this report responds to your needs. Please feel free to contact us with any questions or comments.

Sincerely,

A handwritten signature in dark ink, appearing to read "George W. Nickelson".

George W. Nickelson, P.E.
OMNI-MEANS, Ltd.
Engineers & Planners
rt / R1585TIA003.doc / 35-5137-02



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Project Vicinity Map



figure 1

I. EXISTING CONDITIONS

1. Site Location

The Fantesca Winery is located on the east side of Spring Mountain Road north of the city of St. Helena in Napa County. The property access road (Rockland Road) intersects Spring Mountain Road approximately one mile north of Elmhurst Avenue. Spring Mountain Road is a rural two lane road that winds through curved and hilly terrain between St. Helena and Santa Rosa. Spring Mountain Road near the project access intersection is relatively straight for 300 feet to the north and 500 feet to the south before curving. In this area it is also relatively flat, but there is little to no shoulder area. The adjacent hillside slants downward from east to west with Spring Mountain Road cut into the hillside. It is bordered by the hillside to the east and a river with dense foliage to the west.

The Fantesca Winery shares access via Rockland Road with several other properties (#2900, 3000, and 3100). Rockland Road is a private road extending from Spring Mountain Road up a moderately steep grade for approximately 400 feet and then splits into several directions at the top of the hill including the Fantesca Winery gate. Rockland Road does not intersect with Spring Mountain Road at a 90-degree (perpendicular) angle, but rather enters at a 25-30 degree angle. Our field surveys measured Rockland Road to be approximately 20 feet wide. The road is paved and there are two speed humps on the incline between Spring Mountain Road and the winery gate.

The Spring Mountain Road/Rockland Road intersection has single lane approaches (no separate turning lanes). There are no speed limit signs near the intersection. There is a yellow warning 25-mph speed limit sign ("Narrow Winding Road Next 5 Miles") on Spring Mountain Road further to the south.

2. Existing LOS Operations

In order to identify existing peak hour conditions, traffic counts were conducted at the Spring Mountain Road/Rockland Road intersection during a weekday PM commute period.⁽¹⁾ The peak hour volumes for all the approaches are low. Spring Mountain Road had 57 total trips (23 northbound and 34 southbound) during the peak hour. The Rockland Road volumes were very low, with 8 trips (5 westbound and 3 eastbound). The volumes represent the combined total peak hour traffic generated by all of the properties on Rockland Road. The existing volumes are shown in Figure 3.

Traffic conditions are measured by Level of Service (LOS), which applies a letter ranking to successive levels of intersection performance. LOS 'A' represents optimum conditions with free-flow travel and no congestion. LOS 'F' represents severe congestion with long delays at the approaches. For intersections with minor street stop control, the LOS reflects the delays experienced by the minor street approach. The LOS were analyzed based on HCM 2000 methodology using Synchro-Simtraffic software. (LOS definitions and calculation worksheets are provided in the Appendix.)

All approaches operate at LOS 'A', with less than ten seconds of delay. (LOS conditions are shown in Table 1.) The existing Rockland Road volumes are very low. The intersection operates with minimal delays and no vehicle queuing. It is reasonable to assume that volumes and operating conditions during the weekend peak hour are similar to the weekday conditions.

Daily volumes on Spring Mountain Road at the access road intersection would be expected to be approximately 570 trips (using a standard multiplier of ten times the PM peak hour). These volumes are low and indicative of LOS 'A' conditions.



II. PROPOSED PROJECT CONDITIONS

1. Project Description

Existing winery operations consist of 30,000 gallons annual wine production with no formal public services. There is no planned increase in winery production from the existing 30,000 annual gallons. Traffic generating components of the project comprise the following:⁽²⁾

- Employees: 6 Full-time during non-harvest;
4 Part-time additional during harvest;
- Visitors: 18 daily visitors maximum (by appointment);
- Hospitality and Events: Four per month with up to 20 people; Six per year with 75 people;
Two per year with up to 125 people (offsite parking and shuttle buses utilized).

2. LOS Operations With The Project

The winery's traffic was generated using standard Napa County use permit calculations.⁽³⁾ The calculated trips are shown in Table 2. The winery's existing wine production generates a small number of truck trips. Since no winery-related truck trips were observed during the intersection counts, they have been added to the project trip calculations to ensure they are accounted for in the LOS analysis. We have added one truck per day to remain conservative, but the calculation equates to one truck per week.

The project would be expected to generate a maximum of 31-34 daily trips and 8-12 peak hour trips during a typical weekday/weekend peak hour. During the harvest season, a maximum of 43 daily trips and 11 peak hour trips would be expected. The project trips were distributed at the Spring Mountain Road intersection based on existing volumes, with 75% to/from the south and 25% to/from the north. The project volumes are shown in Figure 3. It is noted that the added project volumes are likely conservatively high, since there is some existing informal visitation/winery activity occurring which would already be included in the existing volume counts.

Project conditions would be essentially unchanged from existing conditions, with all intersection approaches continuing to operate at LOS 'A' and delays remaining less than ten seconds during the peak hour. The volumes would remain low and no vehicle queuing would be expected. The existing plus project LOS are shown in Table 1.

The daily volume of 604 trips (570 existing + 34 project trips) on Spring Mountain Road at the site access road would remain well within the capacity of a two lane rural road with conditions equivalent to LOS 'A'.

TABLE 1
PEAK HOUR INTERSECTION LEVEL OF SERVICE AND DELAY

Intersection	Weekday PM Peak Hour	
	Existing LOS Delay	Existing + Project LOS Delay
Spring Mountain Road / Rockland Road <i>Unsignalized (Rockland Road stop control)</i>		
Rockland Road Westbound approach:	A 8.7"	A 8.8"
Spring Mountain Road southbound approach:	A < 1"	A < 1"

Based on Highway Capacity Manual (HCM) 2000, Operations methodology for stop-sign controlled (unsignalized) intersections using Synchro-Simtraffic software. Intersection calculation yields a Level-of-Service (LOS) and vehicle delay (in seconds).

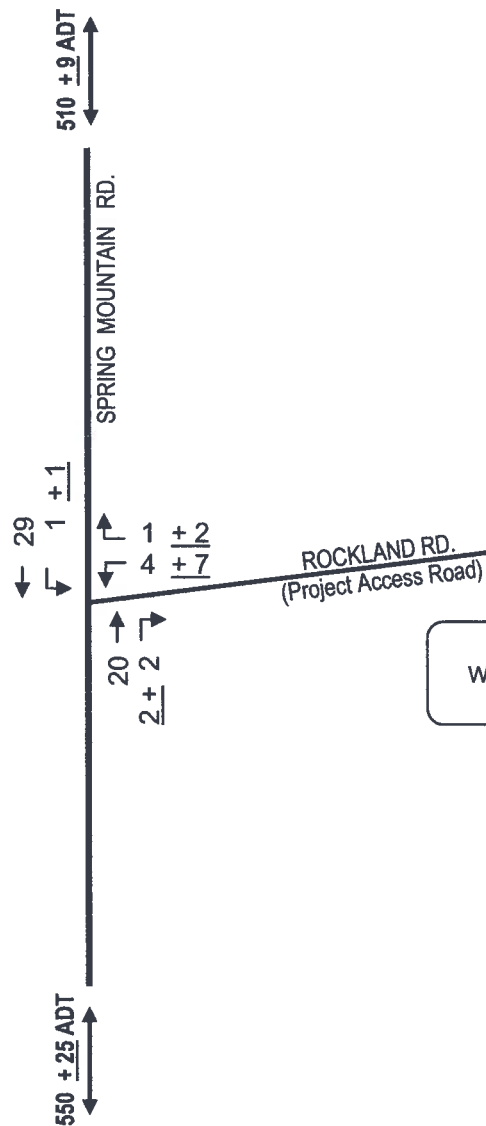
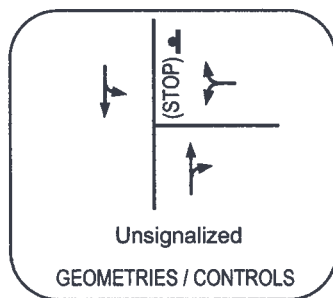


TABLE 2
TRIP GENERATION:
PROPOSED FANTESCA WINERY EXPANSION

<u>Typical Weekday Daily Traffic:</u>	
18 visitors/2.6 per vehicle x 2 one-way trips	= 14 daily trips
6 full time employees x 3.05 one-way trips	= 18 daily trips
30,000 glns / 1,000 x .009 truck trips daily x 2 one-way trips	= 2 daily trips*
(*Conservatively assumes 1 truck per day; calculation equates to 1 truck per week.)	
Total Weekday Daily Trips	= 34 daily trips
<u>Typical Weekday PM Peak Hour Traffic:</u>	
(14 daily visitor trips + 2 daily truck trips) x .38	= 6 peak hour trips
6 full time employees	= 6 peak hour trips
Total Weekday Peak Hour Trips	= 12 total trips (3 in, 9 out)
<u>Typical Weekend (Saturday) Daily Traffic:</u>	
Project: 18 visitors/2.8 per vehicle x 2 one-way trips	= 13 daily trips
6 full time employees x 3.05 one-way trips	= 18 daily trips
Total Weekend (Saturday) Daily Trips	= 31 daily trips
<u>Typical Weekend (Saturday) Peak Hour Traffic:</u>	
Total Weekend Peak Hour Trips (31 daily trips x 25%)	= 8 total trips (4 in, 4 out)
<u>Weekend (Saturday) Daily Traffic During Crush:</u>	
Project: 18 visitors/2.8 per vehicle x 2 one-way trips	= 13 daily trips
6 full time employees x 3.05 one-way trips	= 18 daily trips
4 part time employees x 1.90 one-way trips	= 8 daily trips
1 service truck:	= 2 daily trips*
23 tons on-haul grapes/144 truck trips daily x 2 trips	= 2 daily trips*
Assumes 10% offsite grapes (23 tons out of 225 tons total grapes);	
(*Conservatively assumes 1 truck per day; calculations equate to 1 truck per week.)	
Total Weekend (Saturday) Daily Harvest/Crush Trips	= 43 total daily trips
<u>Weekend (Saturday) Peak Hour Traffic During Crush:</u>	
Total Weekend Peak Hour Harvest Trips (43 daily trips x 25%)	= 11 total trips (5 in, 6 out)

*Production, visitor, and employee data provided by Ms. Donna Oldford (project representative).
Trip equations for daily and weekday peak hour derived from Napa County, Conservation, Planning, & Development
Department, "Use Permit Application Package", Napa County Winery Traffic Generation Characteristics, 2012. Trip equation
for weekend peak hour based on conservative assumption that 25% of daily trips occur in peak hour.*





PROJECT TRIPS
Weekday PM Peak Hour
12 (3 in, 9 out)



Existing and + Project Volumes
Weekday PM Peak Hour



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figure 3

III. SITE ACCESS

1. Sight Distances

Vehicle sight distance at the Spring Mountain Road/Rockland Road intersection was evaluated. The recommended vehicle visibility or "corner sight distance" is a function of speeds on Spring Mountain Road.

As stated above, Spring Mountain Road has a 25 mph speed limit through the area due to curves and grades. Radar speed surveys were also conducted as a part of this study which identified 85th percentile speeds (the speed at which 85% of all surveyed vehicles travel at or below) of 38 mph northbound and 35 mph southbound.⁽⁴⁾ Based on Caltrans' design standards, a sight distance of about 300 feet is recommended for northbound vehicles and 250 feet is recommended for southbound vehicles.⁽⁵⁾

Caltrans guidelines use a standard setback distance for the vehicle waiting at the crossroad of 13 feet from the edge of the main road. From this location on the access road, our field measurements indicate the sight distance looking south from the driveway is approximately 500 feet, which exceeds the 300 feet recommendation for that direction. The sight distance looking to the north from the setback location is obstructed by the hillside slope next to the intersection and is limited to approximately 50 feet, which is less than the recommended 250 feet. However, as the driver on the crossroad moves forward to the east side edge of Spring Mountain Road, the sight distance increases to 350 feet (where the hillside no longer obstructs and a curve in Spring Mountain Road defines the maximum obtainable sight distance). Volumes are very low on Spring Mountain Road and the motorists we observed were able to move forward in order to see to the north and complete the turning maneuver.

The Caltrans setback distance is conservative and acknowledges that providing the recommended sight distance may not always be possible. Our experience indicates a driver within a vehicle can be located six or seven feet from the main road without encroaching into the approaching lane of travel. From a six-to-seven foot setback on Rockland Road the sight distance to the north is about 100 feet.

Based on the low volumes on Spring Mountain Road, our observations found that drivers on Rockland Road can first look to the south, then safely move forward when the northbound Spring Mountain Road approach is clear and look to the north with adequate sight distance to complete a turn. Nevertheless, any improvements to maximize sight distance and/or increase driver awareness of an intersection are always desirable if possible. Therefore several improvements are recommended as follows (and shown in Figure 4):

1a. Sight Distance Recommendations

- Installing a convex mirror on the west side of Spring Mountain Road facing east toward drivers on the Rockland Road approach would allow drivers on Rockland Road to see to the north (via the mirror) while still at the setback location east of the intersection.
- Installing advance "intersection ahead" symbol signs (Type W2-3 per CaMUTCD) on Spring Mountain Road north and south of the intersection would give drivers notice of the intersection's presence. (An existing sign of this type is located on Spring Mountain Road for a different intersection further south.) Consideration could be given to adding supplemental warning plaques (Type W16-2P) stating the distance is "___ feet ahead" to the intersection.
- If signs advertising the winery are allowed, such signs could be posted on Spring Mountain Road to the north and south instructing motorists to turn at the intersection.
- Maintaining low level vegetation on the north side of the intersection within the line of sight would maximize available sight distance.



2. Left-turn Lane

The access road intersects Spring Mountain Road at a point where no left turn lane exists.

The intersection was evaluated for a potential left turn lane on Spring Mountain Road based on Napa County design guidelines.⁽⁶⁾ The Napa County standards utilize daily traffic volumes on the major road and access driveway. The existing and calculated daily volumes associated with the project are below the Napa County minimum thresholds. Therefore a left turn lane would not be warranted (a left turn lane warrant graph is provided in the Appendix).

The projected right turn volumes at the intersection are also well below minimum thresholds at which right turn lanes would be required (a right turn lane warrant graph is included in the Appendix.)⁽⁷⁾

3. Project Access Road (Rockland Road) Vehicle Circulation

The access road is sloped (eastbound uphill) for approximately 400 feet to the top of the hill where the winery entrance is located. It is paved and was field measured to be approximately 20 feet in width. This appears to meet the Napa County standard of 18 feet of pavement for two-way traffic flow.⁽⁸⁾

There is no proposed increase in winery production, and therefore no anticipated increase in truck trips to/from the project site. Presumably the access road's turning radius paths are adequately serving existing truck traffic.

There are two speed humps located on the sloped portion of the access road. However, there are no signs or pavement markings advising motorists of the speed humps' presence. Existing traffic is low and limited mostly to the local residents who are aware of the speed humps. The winery project would be visited by drivers unfamiliar with the access road, therefore the following is recommended:

3a. Access Road Recommendation

- Installing warning signs and/or pavement markings on Rockland Road to alert motorists of the speed humps would increase awareness for visitors unfamiliar with the access road.



Install W2-3 Sign
With or w/out W16-2P distance plaque

500
FEET



Install Winery Sign With
Turn Instructions/Arrow

Install Convex Mirror

SPRING MOUNTAIN RD.

Maintain Low Vegetation On Hillside Next to Road To
Maximize Sight Distance On North Side.

Install Signs and/or Pavement Markings
For Existing Speed Humps

ROCKLAND RD.

Install Winery Sign With
Turn Instructions/Arrow



500
FEET

Install W2-3 Sign
With or w/out W16-2P distance plaque



Project Recommendations at Spring Mountain Road / Rockland Road Intersection



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figure 4

IV. SUMMARY AND PROJECT RECOMMENDATIONS

The winery access road (Rockland Road) at Spring Mountain Road intersection was evaluated for operating and safety/sight distance conditions in light of the proposed Fantesca Winery expansion project.

Existing volumes are low on Spring Mountain Road (57 weekday PM peak hour trips) and the winery access road (8 peak hour trips). The project would add a maximum of 34 daily trips and 12 peak hour trips on typical days. The Spring Mountain Road/Rockland Road intersection operates at LOS 'A' conditions (less than 10 seconds delay) and would continue to operate at LOS 'A' (less than 10 seconds delay) with the project trips.

The winery's volumes would not warrant a left turn lane on Spring Mountain Road based on Napa County standards. The volumes would also be below the thresholds at which right turn lanes would be needed.

Vehicle sight distance at the Spring Mountain Road/Rockland Road intersection was evaluated. Based on the surveyed vehicle speeds, a sight distance of about 300 feet looking south (northbound vehicles) and 250 feet looking north (southbound vehicles) is recommended. Using the standard Caltrans setback distance of 13 feet for a vehicle waiting at the crossroad, our field measurements indicate the sight distance looking south from the driveway is approximately 500 feet, which exceeds the recommendation of 300 feet. Sight distance looking to the north from the setback location is obstructed by a portion of the hillside adjacent to the intersection which limits visibility to approximately 50 feet. However, as a driver on the crossroad moves forward to the east side edge of Spring Mountain Road, the sight distance is clear of the hillside and increases to 350 feet, which exceeds the recommended minimum sight distance.

Volumes are low on Spring Mountain Road and our observations indicate drivers on the Rockland Road approach were able to move forward, look north, and complete the turning maneuver. Although the intersection appears to function adequately, it is desirable to maximize sight distances and/or driver awareness of an intersection whenever possible. Therefore several recommendations are presented:

- Installing a convex mirror on the west side of Spring Mountain Road would allow drivers on Rockland Road to see toward the north from the setback location on the east side of the intersection.
- Installing "intersection ahead" signs (Type W2-3 and W16-2P) on Spring Mountain Road would alert motorists of the approaching intersection.
- Signs advertising the winery (if allowed) could also be posted on Spring Mountain Road north and south of the intersection directing drivers to turn at the intersection.
- Maintaining low level vegetation within the line of sight north of the intersection would maximize available sight distance.
- There are two existing speed humps on Rockland Road. Installing warning signs and/or pavement markings on Rockland Road for the speed humps would increase awareness for winery visitors unfamiliar with the access road.



References:

- (1) Omni-Means Engineers & Planners, traffic counts (4:00-6:00 pm), speed surveys, and field measurements on December 13, 2012.
- (2) Production, employee, and visitor data provided by Ms. Donna Oldford, project representative.
- (3) Napa County, Conservation, Planning, & Development Department, "Use Permit Application Package", Napa County Traffic Generation Characteristics, 2012.
- (4) Omni-Means, *ibid.*
- (5) Caltrans, *Highway Design Manual – Fifth Edition*, July 1, 2004.
- (6) Napa County, *Adopted Road and Street Standards*, revised November 21, 2006.
- (7) Transportation Research Board, National Cooperative Highway Research Program Report 279, "Intersection Channelization Design Guide", November, 1985.
- (8) Napa County, *ibid.*

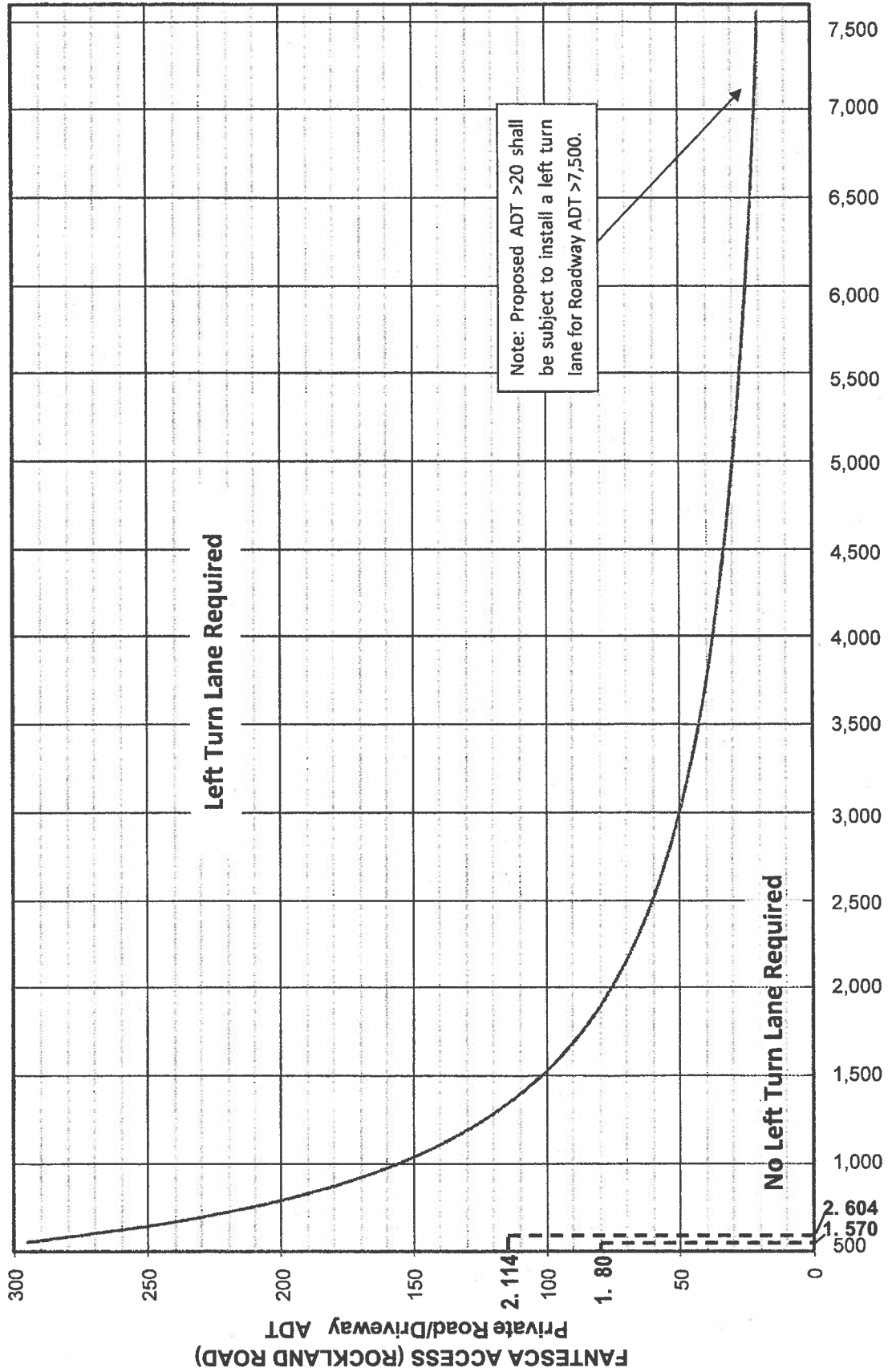


APPENDIX

- Turn Lane Warrant Graphs
- Speed Summary Worksheets
- Existing Count Worksheet
- Level of Service Definitions
- Level of Service Calculations



LEFT TURN LANE WARRANT GRAPH



Weekday

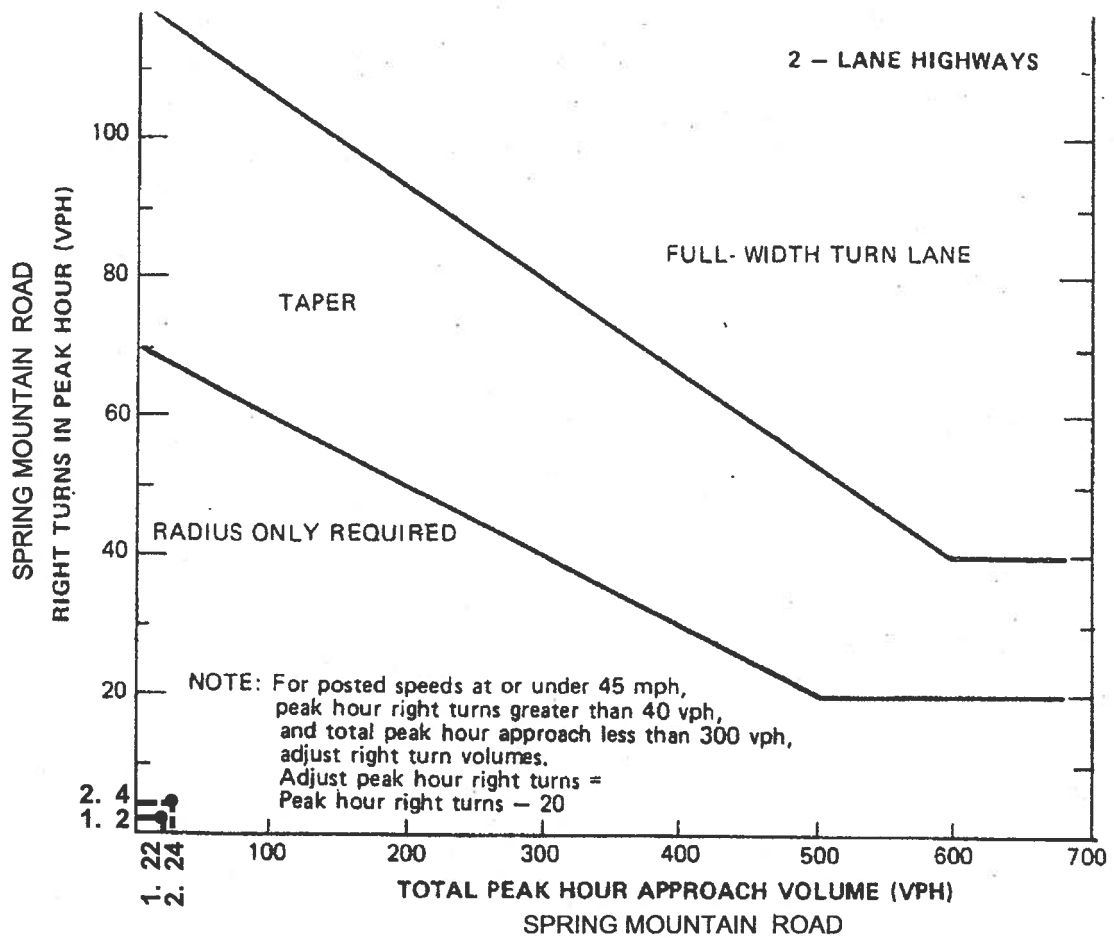
1. Existing Conditions

2. Existing + Project Conditions

Left Turn Lane Not Warranted

Roadway ADT

SPRING MOUNTAIN ROAD



1. Existing Weekday PM Peak Hour Volumes

Right Turn Lane Not Warranted

2. Existing + Project Weekday PM Peak Hour Volumes

Right Turn Lane Not Warranted

Spring Mountain Road / Fantesca Winery Access (Rockland Road) Intersection

RADAR SPEED SURVEY

OMNI-MEANS LTD.

Spring Mountain Road approaching Rockland Road

DATE: 12/13/12 TIME START: 3:30 TIME END: 5:45 pm WEATHER: Dry ROAD TYPE: 2 lanes; rural

DIRECTION: Northbound

SPEED LIMIT: 25 mph

OBSERVER: o-m

CALIBRATION TEST: Yes

SPEED	FREQUENCY	ACUM %	PERCENTAGE BREAKDOWN
			0-----10-----20-----30-----40-----50-----60-----70-----80-----90-----100
30	1	2.0	***
31	1	4.0	****
32	5	14.0	*****
33	4	22.0	*****2**
34	6	34.0	*****2****5***3***
35	7	48.0	*****2****5****3****5****4****5***
36	8	64.0	*****2****5****3****5****4****5****5****5****6****
37	6	76.0	*****2****5****3****5****4****5****5****5****6****5****7****5*
38	5	86.0	*****2****5****3****5****4****5****5****5****6****5****7****5****8****5*
39	2	90.0	*****2****5****3****5****4****5****5****5****6****5****7****5****8****5****9
40	1	92.0	*****2****5****3****5****4****5****5****5****6****5****7****5****8****5****9**
41	1	94.0	*****2****5****3****5****4****5****5****5****6****5****7****5****8****5****9***
42	1	96.0	*****2****5****3****5****4****5****5****5****6****5****7****5****8****5****9****x
43	2	100.0	*****2****5****3****5****4****5****5****5****6****5****7****5****8****5****9****5****x0
			0-----10-----20-----30-----40-----50-----60-----70-----80-----90-----100

50

AVERAGE SPEED = 35.7
 50th PERCENTILE = 35.1
 85th PERCENTILE = 37.9
 90th PERCENTILE = 39
 95th PERCENTILE = 41.5

PACE = 30 - 39
 % IN PACE = 90
 VEHICLES IN PACE = 45

SAMPLE VARIANCE = 8.66486
 STANDARD DEVIATION = 2.943613
 RANGE 1*S = 72
 RANGE 2*S = 94
 RANGE 3*S = 100

RADAR SPEED SURVEY

OMNI-MEANS LTD.

Spring Mountain Road approaching Rockland Road

DATE: 12/13/12 TIME START: 3:30 pm TIME END: 5:45 pm WEATHER: Dry ROAD TYPE: 2 lanes; rural

DIRECTION: Southbound

SPEED LIMIT: 25 mph

OBSERVER: o-m

CALIBRATION TEST: Yes

SPEED	FREQUENCY	ACUM %	PERCENTAGE BREAKDOWN
			0-----10-----20-----30-----40-----50-----60-----70-----80-----90-----100
27	1	2.0	! **
28	1	4.0	! ****
29	5	14.0	! ****5****! ****
30	6	26.0	! ****5****! ****5****2****5*
31	4	34.0	! ****5****! ****5****2****5****3****
32	5	44.0	! ****5****! ****5****2****5****3****5****4****
33	6	56.0	! ****5****! ****5****2****5****3****5****4****5****5****5*
34	7	70.0	! ****5****! ****5****2****5****3****5****4****5****5****5****6****5****7
35	8	86.0	! ****5****! ****5****2****5****3****5****4****5****5****5****6****5****7****5****8****5*
36	3	92.0	! ****5****! ****5****2****5****3****5****4****5****5****5****6****5****7****5****8****5****9**
37	2	96.0	! ****5****! ****5****2****5****3****5****4****5****5****5****6****5****7****5****8****5****9****5*
38	1	98.0	! ****5****! ****5****2****5****3****5****4****5****5****5****6****5****7****5****8****5****9****5****
39	0	98.0	! ****5****! ****5****2****5****3****5****4****5****5****5****6****5****7****5****8****5****9****5****
40	1	100.0	! ****5****! ****5****2****5****3****5****4****5****5****5****6****5****7****5****8****5****9****5****0
			0-----10-----20-----30-----40-----50-----60-----70-----80-----90-----100

50

AVERAGE SPEED = 32.8
 50th PERCENTILE = 32.5
 85th PERCENTILE = 34.9
 90th PERCENTILE = 35.6
 95th PERCENTILE = 36.7

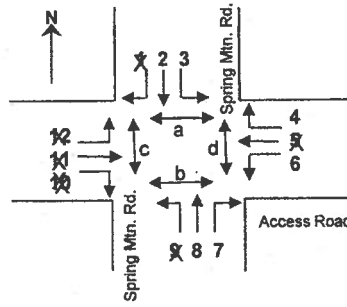
PACE = 28 - 37
 % IN PACE = 94
 VEHICLES IN PACE = 47

SAMPLE VARIANCE = 7.877551
 STANDARD DEVIATION = 2.806698
 RANGE 1*S = 72
 RANGE 2*S = 96
 RANGE 3*S = 100

Intersection Volume Worksheet

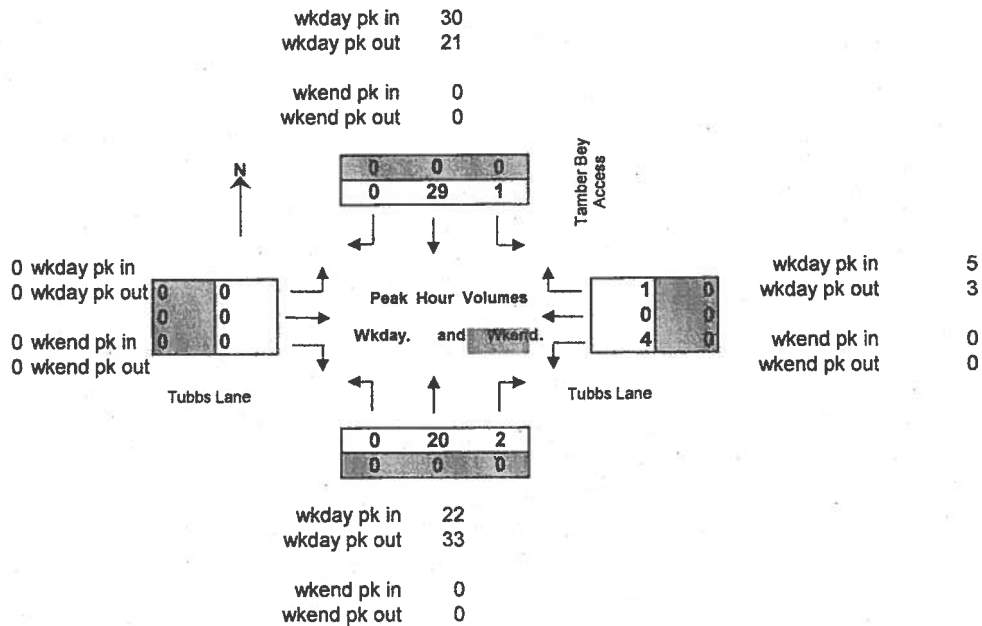
Location:
Spring Mountain Road at Rockland Road
(Fantasca Winery Access Road and #'s 2900, 3000, 3100)

12/13/12, Thursday
Weather: Clear



A = Adult
T = Teen
C = Child
B = Bike

Weekday PM	1	2	3	4	5	6	7	8	9	10	11	12	15 MIN.	60 MIN.	Peds. & Bikes a - b / c - d
4:00-4:15		5	0	0		1	0	6					12		0
4:15-4:30		8	0	1		1	0	5					15		0
4:30-4:45		9	0	1		1	0	4					15		0
4:45-5:00		8	0	0		0	2	4					14	56	0
5:00-5:15		4	1	0		1	0	6					12	56	0
5:15-5:30		8	0	0		2	0	6					16	57	0
5:30-5:45		3	0	0		0	0	5					8	50	0
5:45-6:00		10	0	0		0	0	3					13	49	0
Peak Hour: 4:30-5:30		29	1	1		4	2	20					57	57	0
													phf = 0.89		












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LEVEL OF SERVICE	TYPE OF FLOW	DELAY	MANEUVERABILITY	CONTROL DELAY (SECONDS/VEHICLE)		
				SIGNALIZED	UNSIGNALIZED	ALL-WAY STOP
A	Stable Flow	Very slight delay. Progression is very favorable, with most vehicles arriving during the green phase not stopping at all.	Turning movements are easily made, and nearly all drivers find freedom of operation.	≤ 10.0 secs.	≤ 10.0	≤ 10.0
				≤ 0.60 v/c		
B	Stable Flow	Good progression and/or short cycle lengths. More vehicles stop than for LOS A, causing higher levels of average delay.	Vehicle platoons are formed. Many drivers begin to feel somewhat restricted within groups of vehicles.	>10 and ≤ 20.0 secs.	>10 and ≤ 15.0	>10 and ≤ 15.0
				$0.61 - 0.70$ v/c		
C	Stable Flow	Higher delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant, although many still pass through the intersection without stopping.	Back-ups may develop behind turning vehicles. Most drivers feel somewhat restricted.	>20 and ≤ 35.0 secs.	>15 and ≤ 25.0	>15 and ≤ 25.0
				$0.71 - 0.80$ v/c		
D	Approaching Unstable Flow	The influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high volume-to-capacity ratios. Many vehicles stop, and the proportion of vehicles of stopping declines. Individual cycle failures are noticeable.	Maneuverability is severely limited during short periods due to temporary back-ups.	>35 and ≤ 55.0 secs.	>25 and ≤ 35.0	>25 and ≤ 35.0
				$0.81 - 0.90$ v/c		
E	Unstable Flow	Generally considered to be the limit of acceptable delay. Indicative of poor progression, long cycle lengths, and high volume-to-capacity ratios. Individual cycle failures are frequent occurrences.	There are typically long queues of vehicles waiting upstream of the intersection.	>55 and ≤ 80.0 secs.	>35 and ≤ 50.0	>35 and ≤ 50.0
				$0.91 - 1.00$ v/c		
F	Forced Flow	Generally considered to be unacceptable to most drivers. Often occurs with over saturation. May also occur at high volume-to-capacity ratios. There are many individual cycle failures. Poor progression and long cycle lengths may also be major contributing factors.	Jammed conditions. Back-ups from other locations restrict or prevent movement. Volumes may vary widely, depending principally on the downstream back-up conditions.	> 80.0 secs.	> 50.0	> 50.0
				> 1.00 v/c		

References: 1. Highway Capacity Manual, Fourth Edition, Transportation Research Board, 2000, Contra Costa Transportation Authority (CCTA), Technical Procedures Update, Final, July 9, 2006.







HCM Unsignalized Intersection Capacity Analysis 1: Rockland Road & Spring Mountain Road

Existing PM Weekday

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	4	1	20	2	1	29
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	4	1	22	2	1	33
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	58	24			25	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	58	24			25	
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)	948	1053			1590	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	6	25	34			
Volume Left	4	0	1			
Volume Right	1	2	0			
cSH	967	1700	1590			
Volume to Capacity	0.01	0.01	0.00			
Queue Length 95th (ft)	0	0	0			
Control Delay (s)	8.7	0.0	0.2			
Lane LOS	A		A			
Approach Delay (s)	8.7	0.0	0.2			
Approach LOS	A					
Intersection Summary						
Average Delay		0.9				
Intersection Capacity Utilization		13.3%		ICU Level of Service	A	
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis
1: Rockland Road & Spring Mountain Road

Existing+Project PM Weekday

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		T			T
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	11	3	20	4	2	29
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	12	3	22	4	2	33
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	62	25			27	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	62	25			27	
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	100			100	
cM capacity (veh/h)	943	1052			1587	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	16	27	35			
Volume Left	12	0	2			
Volume Right	3	4	0			
cSH	964	1700	1587			
Volume to Capacity	0.02	0.02	0.00			
Queue Length 95th (ft)	1	0	0			
Control Delay (s)	8.8	0.0	0.5			
Lane LOS	A		A			
Approach Delay (s)	8.8	0.0	0.5			
Approach LOS	A					
Intersection Summary						
Average Delay	2.0					
Intersection Capacity Utilization	13.3%		ICU Level of Service		A	
Analysis Period (min)	15					



omni-means

Spring Mountain Road / Rockland Road
(Fantesca Winery Access Road) Intersection



figure 2



Fantesca Winery
c/o Ms. Donna Oldford
Plans 4 Wine
2620 Pinot Way
St. Helena, CA 94574

May 2, 2013

Subject: ***Traffic Analysis of Cumulative (Year 2030) Conditions for the Fantesca Winery on Spring Mountain Road in Napa County, CA.***

Dear Ms. Oldford:

The following letter supplements our previous traffic report for the Fantesca Winery on Spring Mountain Road and Rockland Road in Napa County. At the County of Napa's request, this analysis has evaluated cumulative Year 2030 traffic conditions for the project. The analysis has evaluated conditions based on the forecast County model projections on Spring Mountain Road as well as historical volume trends. Operating conditions would remain acceptable on Spring Mountain Road and Rockland Road under cumulative without the project and cumulative with project conditions.

Transportation Model Forecast Volumes

The cumulative (Year 2030) volume projections on Spring Mountain Road were developed from the Napa County Transportation & Planning Agency's traffic volume forecasts in the Napa County General Plan Update EIR.¹ The forecast increase in volume-to-capacity (v/c) ratio from Year 2003 to Year 2030 on Spring Mountain Road in the project vicinity was applied to the provided Year 2003 peak hour two-way volume of 76 trips on Spring Mountain Road. The resulting increase yields a cumulative Year 2030 volume of 1,155 weekday p.m. peak hour trips and 12,705 daily trips on Spring Mountain Road in Year 2030.

Projected Cumulative Volumes Based On Historical Data

Historical volume data on Spring Mountain Road from several years was obtained in order to identify historical volume growth (or decline) patterns. The County transportation model identified a Year 2003 weekday p.m. peak hour volume of 76 trips. Counts conducted by Napa County in Year 2006 identified a weekday p.m. peak hour volume of 92 trips and a daily volume of 1,015 trips near the St. Helena city limit.²

The counts conducted for the Fantesca Winery study in Year 2012 identified 57 p.m. peak hour trips, which is lower than the Year 2003 and Year 2006 volumes. Comparing only the years when volumes increased (Year 2003 to Year 2006), the volume growth equates to an annual increase of 6.7% per year. Conservatively applying the same annual increase to the current p.m. peak hour volume on Spring Mountain Road of 57 trips, results in approximately 183 p.m. peak hour trips and 2,015 daily trips in Year 2030.

It is noted that the volumes between Year 2003 and Year 2012 have declined. The historical growth calculations evaluated only the years when traffic volumes increased. Therefore, even the historical growth projections are likely conservatively high.

¹ Napa County, *The Napa County General Plan Update EIR*, prepared by Dowling Associates, Inc., February 9, 2007.

² Napa County, *Traffic Volume Counts on Spring Mountain Road* conducted March 29-30, 2006.

In order to identify weekend cumulative conditions, the General Plan Update provides a ratio of weekday to weekend peak hour volumes on key streets within the County. Spring Mountain Road in the vicinity of the project was shown to have an average ratio of 0.70, indicating weekend peak hour volumes are expected to be about 70% of weekday volumes. Therefore the future weekend volumes would be expected to be approximately 128 peak hour and 1,410 daily trips.

Cumulative Operating Conditions

The model forecast volumes yield conditions of LOS 'D' or better during the peak hour and LOS 'C' for the total daily volumes on Spring Mountain Road based on the Napa County volume thresholds for a rural two lane arterial road.³ Cumulative conditions based on the evaluated historical volume trends yields operating conditions of LOS 'A' on Spring Mountain Road. Therefore conditions would remain acceptable under cumulative without project conditions.

The proposed project would add 8-12 peak hour trips and 31-34 daily trips (weekends and weekdays) to Spring Mountain Road. Conditions with the project would remain unchanged from cumulative conditions without the project, continuing to operate at acceptable conditions (LOS 'D' or better). The Spring Mountain Road/Rockland Road intersection would also continue to operate at acceptable conditions (LOS 'C' or better) under cumulative and cumulative plus project conditions.

Although volumes may not increase to the model forecast levels, the County has adopted several measures to address potential volume increases identified in the General Plan to improve the street network and also reduce vehicle trips: "The project should support programs to reduce single occupant vehicle use and encourage alternative travel modes." In keeping with the policy, the winery should promote the use of carpooling by employees to the extent possible (by adjusting work schedules, etc.) in order to reduce single vehicle occupancy.

The County has identified other mitigation policies, including development of a traffic impact fee (TIF) to be developed in cooperation with the Napa County Transportation Planning Agency (Mitigation Measure 4.4.1C). This would require new projects to pay their "fair share" of countywide traffic improvements they contribute the need for. The concept is under development, but presumably the fee would be applied on a "per trip" basis if implemented.

Summary

Cumulative Year 2030 volumes were calculated from the County transportation model forecasts and from historical count data on Spring Mountain Road. Operating conditions would remain acceptable on Spring Mountain Road and Rockland Road under cumulative without the project conditions (operating at LOS 'D' or better) and would remain unchanged under cumulative with project conditions.

Sincerely,



George W. Nickelson, P.E.
OMNI-MEANS, Ltd.
Engineers & Planners
rt / R1585TIA004.doc / 35-5137-02

³ Napa County, LOS Volume Thresholds, Baseline Data Report, Chapter 11 Transportation and Circulation, November 2005.



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Cumulative Operating Conditions

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