A Tradition of Stewardship
A Commitment to Service

Department of Public Works

1195 Third Street, Suite 101
Napa, CA 94559-3092
www.countyofnapa.org/publicworks

Main: (707) 253-4351
Fax: (707) 253-4627

Steven Lederer
Director

MEMORANDUM

To:	PBES Staff	From:	Rick Marshall Deputy Director of Public Works
Date:	June 3, 2015	Re:	Girard Winery P14-00053

Thank you for the opportunity to review the subject permit application. I have reviewed the *Traffic Impact Study for the Girard Winery Project,* by W-Trans, dated December 18, 2014; the Initial Study prepared by your office; the letter from Ellison Folk and Laurel Impett, Shute Mihaly & Weinberger, dated January 20, 2015; and the response to the Folk & Impett letter by W-Trans, dated April 9, 2015.

I generally concur with the methods used, assumptions made, and conclusions reached by W-Trans in their original study and in their response to the Folk & Impett letter. I offer the following comments and recommendations:

Study area evaluated. The study area evaluated is appropriate for the proposed project, and is consistent with other project reviews conducted in the County of Napa. Traffic from the proposed project beyond the area studied in this analysis would be greatly diluted as it spreads throughout the roadway network and mixes with other traffic from the area.

Peak hour appropriate for analysis. I concur with W-Trans response that the scenarios evaluated in their analysis, weekday PM peak hour and weekend midday peak hour, are appropriate for this type of study, and this is consistent with other project reviews conducted in the County of Napa.

Thresholds of significance. W-Trans correctly identifies that the proposed project will add traffic to nearby roads and intersections which will operate at unacceptable levels of service under future conditions. However, they incorrectly conclude that because the Napa County General Plan includes a policy restricting the addition of traffic lanes, that this does not constitute a significant impact. In reality, it <u>does</u> constitute a significant cumulative impact, but evaluation of each project must consider alternatives other than just adding lanes in order to determine whether this impact can be mitigated to a less-than-significant level.

A recommendation that the project contribute to a traffic impact fee program would be appropriate if the County had one in place at this time. Since such a program is not yet developed, in order to move forward this proposed development must incorporate some other type of measure which could be found to adequately mitigate this impact, or else prepare an Environmental Impact Report to enable the adoption of overriding findings. It is my recommendation that the applicant modify their proposal so that the number of weekday afternoon or weekend midday peak hour trips generated by the project do not increase volumes on SR 29 or Silverado Trail by more than 1%. This is a threshold which is supported by other recent approvals in this County.

In order to reduce the number of peak hour trips added, the applicant could implement a Transportation Demand Management (TDM) plan such as is mentioned in W-Trans reports. In order to determine whether the TDM plan will adequately mitigate the cumulative impact as noted above, the traffic study should quantify the resulting number of trips which would be added to the impacted facilities, to demonstrate to decision makers whether the project would add more or less than a 1% increase with these measures in place.

Specific to the proposed TDM plan as described so far, I concur with Folk & Impett that the project applicant must provide more details about the proposed shuttle service. We need this information to determine whether there will be any secondary traffic or parking impacts at the location where visitors will gather to catch the shuttles.

Evaluation of special events. I concur with W-Trans position that the evaluation of weekday and weekend peaks, during regular operations, is what is appropriate for this analysis. It is the standard practice of our industry to assume that a small number of periods each year will have volumes which exceed these levels, and are not appropriate for analysis or design of facilities.

Left-Turn Lane not required. I concur with the determination by W-Trans that a left-turn lane at the project access location on Dunaweal Lane is not warranted.

Cumulative Impacts. By evaluating the volumes obtained from the countywide traffic forecasting model, the study has effectively included all recent approved projects and more. I do not recommend that further analysis along this line is needed.

Please contact me at Rick.Marshall@countyofnapa.org or call (707) 259-8381 if you have questions or need additional information.

Whitlock & Weinberger
Transportation, Inc.
490 Mendocino Avenue
Suite 201
Santa Rosa, CA 95401
voice 707.542.9500
fax 707.542.9590
web www.w-trans.com

December 18, 2014

Ms. Heather McCollister
1512 D Street
Napa, CA 94559

Traffic Impact Study for the Girard Winery Project

Dear Ms. McCollister;

Whitlock & Weinberger Transportation, Inc. (W-Trans) has completed a focused traffic analysis addressing potential traffic impacts and access needs for the proposed new winery to be located at 1077 Dunaweal Lane in the County of Napa. The traffic study was completed in accordance with the criteria established by the County of Napa, and is consistent with standard traffic engineering techniques. Comments from County staff have been addressed in preparing this final study.

Study Area

The project site is located on the east side of Dunaweal Lane between Silverado Trail and State Route (SR) 29, and is currently vacant. Dunaweal Lane is a two-lane roadway that runs north-south, and is designated as a local roadway. The posted speed limit on Dunaweal Lane is 45 miles per hour (mph).

Two intersections were identified by County staff for analysis.

Silverado Trail/Dunaweal Lane is a tee intersection with stop controls and flared right-turn lane on the northbound terminating Dunaweal Lane approach.

SR 29/Dunaweal Lane is stop-controlled with flared right-turn lanes on both the northbound and southbound Dunaweal Lane approaches.

Project Description

The proposed project would allow production of up to 200,000 gallons of wine annually, and operation of a tasting room for an average of 52 visitors on a weekday and 62 visitors on a weekend (or maximums of 75 and 90 visitors on a peak day, respectively. The project would have eight full-time employees and three part time employees on-site during weekdays as well as two full-time employees and four part-time employees on weekends. Vehicular access to the project site would be provided via a full access driveway on Dunaweal Lane. The most recent site plan, dated February 4, 2014 is enclosed.

Existing Volumes

Mechanical tube counts were collected on Dunaweal Lane near the project site on three consecutive days in March 2014 (Thursday through Saturday). Intersection counts were taken during the p.m. peak period in September 2014 at Silverado Trail/Dunaweal Lane and SR 29/Dunaweal Lane. The existing traffic volumes on Dunaweal Lane are summarized in Table 1. The volume of traffic ranged from 1,484 on Thursday to 1,691 vehicles on Saturday; this would be considered relatively low and reflects the volumes that would be generated by a residential subdivision having fewer than 20 homes.

Table 1
Existing Traffic Volumes

Study Segment	Friday		Saturday	
	Daily Trips NB/SB	PM Peak NB/SB	Daily Trips NB/SB	Midday Peak NB/SB
Dunaweal Ln	828/746	68/90	880/811	101/77
Total (NB+SB)	**1,574**	**158**	**1,691**	**178**

Existing Conditions

Intersections

Using the turning movement data collected at the two study intersections together with the current configurations, existing operating conditions at each intersection were evaluated. As shown in Table 2, both intersections are currently operating at LOS A or B overall and on all approaches. Copies of the calculations for all scenarios are enclosed.

Table 2
Existing PM Peak Hour Intersection Levels of Service

Study Intersection *Approach*	Existing Conditions		Existing plus Project	
	Delay	LOS	Delay	LOS
1. Silverado Trail/Dunaweal Ln	1.8	A	1.8	A
Westbound (Silverado) Left-turn	*7.6*	*A*	*7.6*	*A*
Northbound (Dunaweal) Approach	*8.9*	*A*	*8.9*	*A*
2. SR 29/Dunaweal Ln	0.9	A	0.9	A
Northbound (Dunaweal) Approach	*9.7*	*A*	*9.7*	*A*
Southbound (Dunaweal) Approach	*11.6*	*B*	*11.6*	*B*
Eastbound (SR 29) Left-turn	*8.9*	*A*	*8.9*	*A*
Westbound (SR 29) Left-turn	*8.1*	*A*	*8.1*	*A*

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service

According to Policy CIR-16 of the *Napa County General Plan*, 2008, "No single level of service standard is appropriate for un-signalized intersections, which shall be evaluated on a case-by-case basis to determine if signal warrants are met." For analysis purposes it was assumed that the impact would be significant if project-added traffic caused operation to fall to LOS E or F on an approach for which the Peak Hour Volume Signal Warrant is met.

With all approaches at LOS A or B, the current operation of both intersections would be considered acceptable. While weekend operation was not evaluated, given the similarity of volumes on a weekday versus a weekend day together with the very low average delays currently being encountered, it appears reasonable to conclude that operation during the weekend peak period is also low and therefore acceptable.

Roadways

Information in the *Napa County General Plan Update Draft Environmental Impact Report*, February 2007 (GPUDEIR), indicates that under 2003 volumes SR 29 was operating at LOS D between Lodi Lane and Deer Park Road (this is the nearest segment included in the analysis). Silverado Trail is identified in the same document as operating at LOS C under 2003 volumes.

Policy CIR-16 of the Napa County General Plan also provides guidance for roadways, indicating that, "The County shall seek to maintain an arterial Level of Service D or better on all county roadways, except where maintaining this desired level of service would require the installation of more travel lanes than shown on the Circulation Map." Both SR 29 and Silverado Trail are shown as 2-lane Rural Collectors on the Circulation Map (Figure CIR-1). As a result, the LOS D standard does not apply and operation is therefore considered acceptable regardless of the service level.

Collision History

The collision history along Dunaweal Lane between Silverado Trail and SR 29 was reviewed to determine any trends or patterns that may indicate a safety issue. Collision rates were calculated based on the collision data available from the California Highway Patrol as published in their *Statewide Integrated Traffic Records System* (SWITRS) reports during a five-year period between January 1, 2007, and December 31, 2011. The calculated collision rate for the study segment was compared to the average collision rate for similar facilities statewide, as indicated in *2010 Collision Data on California State Highways*, California Department of Transportation (Caltrans).

The statewide average collision rate for a rural two-lane, flat road with a speed limit of 55 mph or less is 1.05 collisions/million vehicle miles (c/mvm). Over the five-year study period, seven collisions were reported on Dunaweal Lane between Silverado Trail and SR 29, for a calculated collision rate of 0.90 c/mvm, which is lower than the statewide average for similar facilities. Further, no injuries or fatalities were reported during the five-year study period. The collision rate calculation spreadsheet is enclosed.

Future Volumes

Future projected traffic volumes were obtained from the Solano Transportation Authority (STA) who maintains the joint Napa County/Solano County 2010-2030 Travel Demand Forecasting Model. The data used included directional segment volumes along SR 29 and Silverado Trail for the p.m. peak hour. Using the 2030 and 2010 model volumes a growth factor of 1.45 was determined for SR 29. This growth factor was applied to turning movements to and from Dunaweal Lane and the remainder of the future increase was added to the volumes for the through movements. It is noted that the 78 vehicle trips added to Dunaweal Lane during the p.m. peak hour would adequately represent increases associated with three new wineries or expansions to existing wineries along Dunaweal Lane.

Future Conditions

Intersections

Based on these projected future volumes, the two study intersections are expected to operate acceptably overall, though the northbound Dunaweal approach to Silverado Trail is expected to operate at LOS E and the southbound Dunaweal Lane approach to SR 29 is expected to operate at LOS F. These results are shown in Table 3.

Table 3
Future PM Peak Hour Intersection Levels of Service

Study Intersection *Approach*	Future Conditions		Future plus Project	
	Delay	LOS	Delay	LOS
1. Silverado Trail/Dunaweal Ln	3.9	A	4.9	A
Westbound (Silverado) Left-turn	*9.5*	*A*	*9.6*	*A*
Northbound (Dunaweal) Approach	*38.7*	*E*	*45.7*	*E*
2. SR 29/Dunaweal Ln	9.6	A	12.4	B
Northbound (Dunaweal) Approach	*20.3*	*C*	*20.7*	*C*
Southbound (Dunaweal) Approach	**	*F*	**	*F*
Eastbound (SR 29) Left-turn	*11.4*	*B*	*11.4*	*B*
Westbound (SR 29) Left-turn	*8.7*	*A*	*8.7*	*A*

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service; ** = delay greater than 120 seconds

Roadways

According to the GPUDEIR, under projected 2030 volumes SR 29 is expected to operate at LOS F in the study area and, despite substantial increases in traffic, Silverado Trail is expected to continue operating at LOS C. As previously noted, the County has exempted both of these roads from their operational standard, so the projected operation is considered acceptable.

Trip Generation

The anticipated trip generation for a proposed project is typically estimated using standard rates published by the Institute of Transportation Engineers (ITE) in *Trip Generation Manual*, 9th Edition, 2012. However, the publication contains no such information for a winery. Therefore, the County of Napa's Winery Traffic Information/Trip Generation Sheet was used to determine the anticipated traffic that would be generated by the proposed tasting room. A copy of this worksheet is enclosed.

Employee-related trips will be minimized by scheduling employee shifts that reduce the number of trips generated during the p.m. peak period. Production employees will work Monday through Friday from 7 a.m. to 3 p.m., hospitality and/or tasting room employees will work seven days per week from 9 a.m. to 6 p.m. and administrative employees will work Monday through Friday from 8 a.m. to 5 p.m. The resulting weekday p.m. peak hour trips will be associated with administrative employees and tasting visitors only.

The County of Napa's Winery Traffic Information/Trip Generation Sheet does not include guidance on inbound versus outbound trips, so it was assumed that 75 percent of trips at the winery would be outbound during the weekday p.m. peak hour since most of the trips would be associated with employees and customers leaving at closure of the winery. For the weekend midday peak hour it was assumed that inbound and outbound trips would be evenly split. A summary of the project's trip generation potential is provided in Table 4.

Table 4
Project Trip Generation

Land Use	Daily Trips		Weekday PM Peak			Weekend Midday Peak		
	Weekday	Weekend	Trips	In	Out	Trips	In	Out
Proposed Project								
Winery plus Tasting Room	74	58	26	6	20	29	15	14
Total Trips on Driveway	**74**	**58**	**26**	**6**	**20**	**29**	**15**	**14**

Trip Distribution

The pattern used to allocate new project trips to the street network was determined by reviewing existing average daily traffic volumes on Dunaweal Lane. It is understood that the winery will direct employees to take SR 29 when their origin/destination is the north and take Silverado Trail when their origin/destination is the south. This results in right-turns from Dunaweal Lane to the regional network, further reducing impacts at the study intersections due to project-related trips. It is recommended that clear signage that directs tasting room visitors in the same fashion be installed at the project driveway for exiting vehicles and similar directions be posted on the winery's website.

Visitor traffic accessing the site from the north via Silverado Trail and from the south via SR 29 was assumed to have an even split, while all employee trips from the north take SR 29 and from the south were assumed to take Silverado Trail. Evening peak hour counts recently obtained at Dunaweal Lane together with the anticipated travel pattern specific to this project were used to estimate the splits at SR 29 and Silverado Trail. The resulting trip distribution is shown in Table 4.

Table 4
Trip Distribution Assumptions and Project-Added Trips

Origin/Destination	Percent of Trips	Daily/Weekend Trips	PM Peak Trips	Weekend Peak Trips
SR 29 south of Dunaweal				
Employee Trips	0	0/0	0	0
Visitor & Truck Trips	15	7/7	2	4
SR 29 north of Dunaweal				
Employee Trips	70	21/10	7	3
Visitor & Truck Trips	35	15/15	6	9
Silverado Trail south of Dunaweal				
Employee Trips	0	0/0	0	0
Visitor & Truck Trips	35	15/15	6	9
Silverado Trail north of Dunaweal				
Employee Trips	30	9/4	3	1
Visitor & Truck Trips	15	7/7	2	4
TOTAL		**74/58**	**26**	**30***

Note: * Value does not equal trip generation exactly due to rounding

Plus Project Conditions

Intersections

Upon adding project-generated trips to existing volumes, both study intersections are expected to continue operating at LOS A or B overall as well as on all approaches. Because operation will remain acceptable, the impact is considered less-than-significant.

Under Future plus Project conditions both study intersections are projected to continue operating at the same levels of service both overall and on individual approaches except that the overall operation at SR 29/ Dunaweal Lane changes from LOS A to LOS B.

Roadways

The additional traffic that the project would generate would reasonably be expected to be included in the growth projected by the County's traffic model. Further, since both study roadways are exempt from the County's operational standard, the added trips can be considered to have a less-than-significant impact.

Recommendation: Steps should be taken to direct winery traffic in such a way as to minimize impacts and support efforts to maintain LOS D operation on the SR 29 study intersection and roadway segments.

Site Access

Left-Turn Lane Warrants

The need for a left-turn lane on Dunaweal Lane at the proposed project driveway was evaluated based on criteria contained in the *Napa County Road and Street Standards*, 2011. Because future average daily traffic volumes on Dunaweal Lane are not available, recently obtained counts for both the weekday and weekend were used for this analysis.

Using the County's criteria, for the daily Friday traffic volume of 1575 vehicles and 1875 vehicles on a weekend, a left-turn lane would not be warranted for the projected driveway ADT of 74 vehicles on a weekday and 60 vehicles or more on a weekend. The proposed project would generate a weekday average of 74 trips and weekend average of 58 trips. Based on these traffic levels, a left-turn lane would not be warranted at the project driveway. The left-turn lane warrant graphs are enclosed for reference.

Sight Distance

At driveways, a substantially clear line of sight should be maintained between the driver of a vehicle waiting on the driveway and the driver of an approaching vehicle. Adequate time must be provided for the waiting vehicle to either cross, turn left, or turn right, without requiring the through traffic to radically alter their speed.

Sight distance along Dunaweal Lane at the proposed driveway was evaluated based on sight distance criteria contained in the *Highway Design Manual* published by Caltrans. The recommended sight distance for minor street approaches that are driveways is based on stopping sight distance, with the approach travel speeds as the basis for determining the recommended sight distance. For a 45-mph posted speed limit on Dunaweal Lane, the recommended stopping sight distance for a private driveway is 360 feet.

Dunaweal Lane is relatively flat and straight on both sides of the proposed driveway. Based on a review of the site plan, proposed driveway and Google Earth, sight lines are more than adequate and meet the recommended distance for the prevailing travel speeds.

Conclusions and Recommendations

- The proposed project would generate an average of 74 new daily trips, including 26 weekday p.m. peak hour trips and 29 weekend p.m. peak hour trips.
- The calculated collision rate for the study segment was lower than the statewide average for similar facilities.
- The study intersections and roadways are operating acceptably under existing volumes, and are expected to continue to do so with project trips added.
- Under projected future volumes the study intersections are expected to continue operating acceptably overall, though due to excessive delays anticipated at SR 29/Dunaweal Lane signalization may be warranted.
- SR 29 and Silverado Trail will continue to operate acceptably based on the applicable standards under projected Future volumes.
- It is recommended that the schedule for employee shifts be set to minimize the amount of traffic generated during the weekday p.m. peak hour.
- Clear signage that directs visitors to use SR 29 when destined to the north and Silverado Trail when destined to the south should be placed at the driveway. Similar information should be provided on the winery's website as well.
- A left-turn lane is not warranted at the project driveway based on Napa County's Left-Turn Lane Warrant criterion.
- Acceptable clear sight lines are available in both directions along Dunaweal Lane from the proposed driveway.
- The applicant should take steps to minimize traffic impacts and support efforts to maintain LOS D operation on SR 29 and its intersection with Dunaweal Lane.

Thank you for giving W-Trans the opportunity to provide these services. Please call if you have any questions.

Sincerely,

Dalene J. Whitlock, PE, PTOE
Principal

DJW/djw/NAX077.L2

Enclosures: Site Plan
Level of Service Calculations
Collision Rate Calculation Spreadsheet
Winery Traffic Information/Trip Generation Sheet
Napa County Left-Turn Lane Warrant

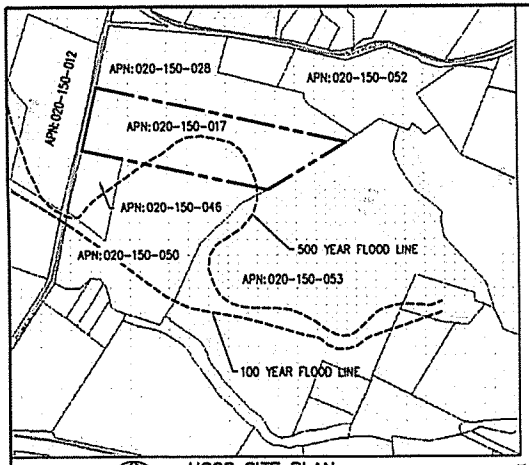
GIRARD WINERY

1077 Dunaweal Ln.

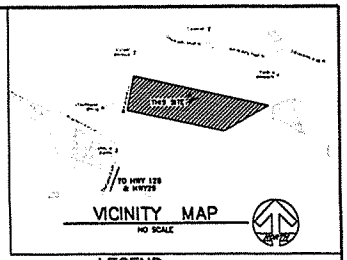
Calistoga, California 94515

APN 022-150-017

USE PERMIT APPLICATION



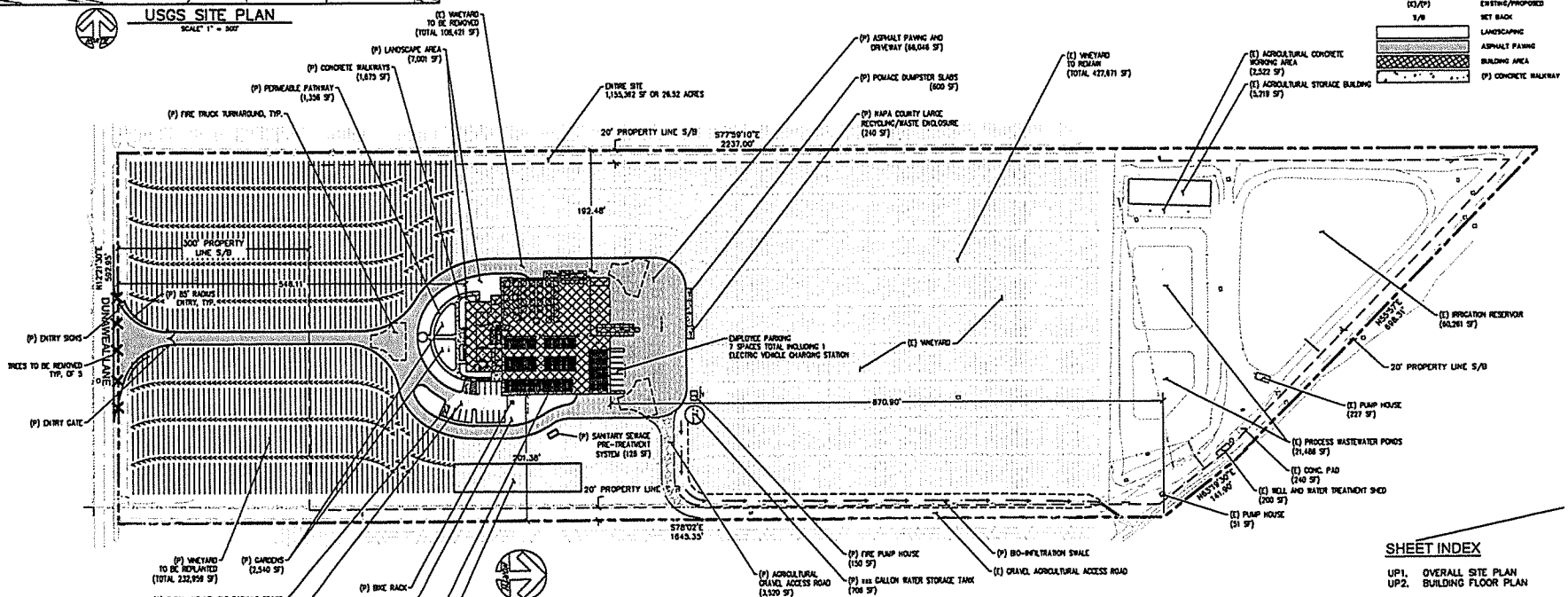
USGS SITE PLAN
SCALE: 1" = 500'



VICINITY MAP
NO SCALE

LEGEND

- APPROXIMATE PROPERTY LINE
- FENCE
- EDGE OF PAVEMENT
- EDGE OF GRAVEL DRIVEWAY
- DRAINAGE COURSE FLOWLINE
- VINEROW
- OVERHEAD UTILITIES
- SETBACK
- 100 YEAR FLOOD PLAIN
- 500 YEAR FLOOD PLAIN
- 5 FOOT INDEX 1' INTERVAL CONTOURS
- WELL
- (E)/(P) EXISTING/PROPOSED
- SET BACK
- LANDSCAPING
- ASPHALT PAVING
- BUILDING AREA
- (P) CONCRETE WALKWAY



PROPOSED OVERALL SITE PLAN
SCALE: 1" = 80'

OWNER/APPLICANT
VINTAGE WINE ESTATES
205 CONCOURSE BLVD.
SANTA ROSA, CA 95403
CONTACT: PAT MONEY
PH. (877) 299-9463

ARCHITECT
DEL STARRETT ARCHITECT
181 CONCOURSE BLVD., SUITE A
SANTA ROSA, CA 95403
CONTACT: DEL STARRETT
PH. (707) 526-9445

LANDSCAPE ARCHITECT
PARKER SMITH LANDSCAPE ARCHITECT
1810 PACIFIC AVE. #20
SANTA ROSA, CA 95403
PH. (707) 477-7502

ARCHITECT
ALWAYS ENGINEERING INC.
121 STORY CIRCLE, SUITE 1000
SANTA ROSA, CA 95401
CONTACT: RON MONROE
PH. (707) 542-8795

Grading Quantities:
Site Grading is based upon subgrade to existing grade. No account has been taken for stripping, expansion or contraction. Volumes should be verified and determined independently by the Contractor.

	CUT:	ENGINEERED FILL:	NET:
TOTAL EARTHWORK:	2,172 CY	4,834 CY	1,942 CY (FILL)

TOTAL DISTURBED AREA = 3.59 ACRES

Note: Excess spoils will be disposed of in a county approved site or spread in onsite vineyards. Temporary grading spoils will be stockpiled onsite in the unplanted vineyard area until ready for use.

SHEET INDEX

UP1. OVERALL SITE PLAN
UP2. BUILDING FLOOR PLAN

Always Engineering, Inc.
Civil Engineering & Topographic Surveying
2360 Professional Drive (707) 542-8795
Santa Rosa, CA 95403 Fax (707) 542-6147
www.alwaysengr.com

Prepared for: GIRARD WINERY
1077 DUNAWEAL LN., CALISTOGA, CA

Prepared on: February 4, 2014

USE PERMIT
OVERALL SITE PLAN
1077 DUNAWEAL LN., CALISTOGA, CA
APN:020-150-017

JOB # 13530
SHEET
UP1 OF UP2

COPYRIGHT © 2007 ALWAYS ENGINEERING, INC.

Winery Traffic Information / Trip Generation Sheet

Traffic during a Typical Weekday

Number of FT employees: 8 x 3.05 one-way trips per employee = 24 daily trips.

Number of PT employees: 3 x 1.90 one-way trips per employee = 6 daily trips.

Average number of weekday visitors: 52 / 2.6 visitors per vehicle x 2 one-way trips = 40 daily trips.

Gallons of production: 200,000 / 1,000 x .009 truck trips daily[3] x 2 one-way trips = 4 daily trips.

Total = 74 **daily trips.**

(№ of FT employees) + (№ of PT employees/2) + (sum of visitor and truck trips x .38) = 26 **PM peak trips.**

Traffic during a Typical Saturday

Number of FT employees (on Saturdays): 2 x 3.05 one-way trips per employee = 6 daily trips.

Number of PT employees (on Saturdays): 4 x 1.90 one-way trips per employee = 8 daily trips.

Average number of Saturday visitors: 62 / 2. 8 visitors per vehicle x 2 one-way trips = 44 daily trips.

Total = 58 **daily trips.**

(№ of FT employees) + (№ of PT employees/2) + (visitor trips x .57) = 29 **PM peak trips.**

Traffic during a Crush Saturday

Number of FT employees (during crush): 20 x 3.05 one-way trips per employee = 61 daily trips.

Number of PT employees (during crush): 10 x 1.90 one-way trips per employee = 19 daily trips.

Average number of Saturday visitors: 62 / 2. 8 visitors per vehicle x 2 one-way trips = 44 daily trips.

Gallons of production: 200,000 / 1,000 x .009 truck trips daily x 2 one-way trips = 4 daily trips.

Avg. annual tons of grape on-haul: 1,000 / 144 truck trips daily [4] x 2 one-way trips = 14 daily trips.

Total = 142 **daily trips.**

Largest Marketing Event- Additional Traffic

Number of event staff (largest event): 30 x 2 one-way trips per staff person = 60 trips.

Number of visitors (largest event): 500 / 2.8 visitors per vehicle x 2 one-way trips = 357 trips.

Number of special event truck trips (largest event): 10 x 2 one-way trips = 20 trips.

---

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

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

SEGMENT COLLISION RATE CALCULATIONS

Vintage Wine Estates Project

Location: 1077 Dunaweal Lane

Date of Count: Thursday, March 06, 2014
ADT: 1,500

Number of Collisions: 2
Number of Injuries: 0
Number of Fatalities: 0
Start Date: January 1, 2007
End Date: December 31, 2011
Number of Years: 5

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

Segment Length: 0.8 miles
Direction: North/South

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

$$\frac{2 \times 1{,}000{,}000}{1{,}500 \times 365 \times 0.81 \times 5}$$

	Collision Rate		Fatality Rate	Injury Rate
Study Segment	**0.90**	**c/mvm**	**0.0%**	**0.0%**
Statewide Average*	**1.05**	**c/mvm**	**2.4%**	**40.1%**

ADT = average daily traffic volume
c/mvm = collisions per million vehicle miles
* 2010 Collision Data on California State Highways, Caltrans

PM Peak Hour - Existing Conditions
Vintage Wine Estates TIS
County of Napa

Level Of Service Computation Report
2000 HCM Unsignalized Method (Base Volume Alternative)

Intersection #1 Silverado Trail/Dunaweal Ln

Average Delay (sec/veh): 1.8 Worst Case Level Of Service: A[8.9]

Street Name:	Dunaweal Ln						Silverado Trail					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	- T	- R	L	- T	- R	L	- T	- R	L	- T	- R
Control:	Stop Sign			Stop Sign			Uncontrolled			Uncontrolled		
Rights:	Include			Include			Include			Include		
Lanes:	0	0 1!	0 0	0	0 0 0	0	0	0 0 1	0	0	1 0 0	0
Volume Module: >> Count Date: 17 Sep 2014 << 4:45 - 5:45 pm												
Base Vol:	16	0	84	0	0	0	0	167	27	15	248	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	16	0	84	0	0	0	0	167	27	15	248	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
PHF Volume:	17	0	89	0	0	0	0	177	29	16	264	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	17	0	89	0	0	0	0	177	29	16	264	0
Critical Gap Module:												
Critical Gp:	6.4	6.5	6.2	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	4.1	xxxx	xxxxx
FollowUpTim:	3.5	4.0	3.3	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	2.2	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	487	487	192	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	206	xxxx	xxxxx
Potent Cap.:	543	484	855	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	1377	xxxx	xxxxx
Move Cap.:	538	478	855	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	1377	xxxx	xxxxx
Volume/Cap:	0.03	0.00	0.10	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	0.01	xxxx	xxxx
Level Of Service Module:												
2Way95thQ:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	0.0	xxxx	xxxxx
Control Del:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	7.6	xxxx	xxxxx
LOS by Move:	*	*	*	*	*	*	*	*	*	A	*	*
Movement:	LT -	LTR -	RT	LT -	LTR -	RT	LT -	LTR -	RT	LT -	LTR -	RT
Shared Cap.:	xxxx	1018	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:	xxxxx	0.3	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	0.0	xxxx	xxxxx
Shrd ConDel:	xxxxx	8.9	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	7.6	xxxx	xxxxx
Shared LOS:	*	A	*	*	*	*	*	*	*	A	*	*
ApproachDel:		8.9			xxxxxx			xxxxxx			xxxxxx	
ApproachLOS:		A			*			*			*	

Note: Queue reported is the number of cars per lane.

PM Peak Hour - Existing Conditions
Vintage Wine Estates TIS
County of Napa

Level Of Service Computation Report
2000 HCM Unsignalized Method (Base Volume Alternative)

Intersection #2 SR 29/Dunaweal Ln

Average Delay (sec/veh): 0.9 Worst Case Level Of Service: B[11.6]

Street Name:	Dunaweal Ln						SR 29					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	- T	- R	L	- T	- R	L	- T	- R	L	- T	- R
Control:	Stop Sign			Stop Sign			Uncontrolled			Uncontrolled		
Rights:	Include			Include			Include			Include		
Lanes:	0	0 1!	0 0	0	0 1!	0 0	1	0 0 1	0	1	0 0 1	0
Volume Module: >> Count Date: 16 Sep 2014 << 4:00 - 5:00 pm												
Base Vol:	2	0	2	47	0	25	14	382	2	2	558	64
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	2	0	2	47	0	25	14	382	2	2	558	64
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
PHF Volume:	2	0	2	51	0	27	15	412	2	2	601	69
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	2	0	2	51	0	27	15	412	2	2	601	69
Critical Gap Module:												
Critical Gp:	7.1	6.5	6.2	7.1	6.5	6.2	4.1	xxxx	xxxxx	4.1	xxxx	xxxxx
FollowUpTim:	3.5	4.0	3.3	3.5	4.0	3.3	2.2	xxxx	xxxxx	2.2	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	1096	1117	413	1084	1084	636	670	xxxx	xxxxx	414	xxxx	xxxxx
Potent Cap.:	192	209	644	196	219	482	930	xxxx	xxxxx	1156	xxxx	xxxxx
Move Cap.:	179	205	644	193	215	482	930	xxxx	xxxxx	1156	xxxx	xxxxx
Volume/Cap:	0.01	0.00	0.00	0.26	0.00	0.06	0.02	xxxx	xxxx	0.00	xxxx	xxxx
Level Of Service Module:												
2Way95thQ:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	0.0	xxxx	xxxxx	0.0	xxxx	xxxxx
Control Del:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	8.9	xxxx	xxxxx	8.1	xxxx	xxxxx
LOS by Move:	*	*	*	*	*	*	A	*	*	A	*	*
Movement:	LT -	LTR -	RT	LT -	LTR -	RT	LT -	LTR -	RT	LT -	LTR -	RT
Shared Cap.:	xxxx	769	xxxxx	xxxx	624	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:	xxxxx	0.0	xxxxx	xxxxx	0.4	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shrd ConDel:	xxxxx	9.7	xxxxx	xxxxx	11.6	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	A	*	*	B	*	*	*	*	*	*	*
ApproachDel:		9.7			11.6			xxxxxx			xxxxxx	
ApproachLOS:		A			B			*			*	

Note: Queue reported is the number of cars per lane.

PM Peak Hour - Existing plus Project Conditions
Vintage Wine Estates TIS
County of Napa

Level Of Service Computation Report
2000 HCM Unsignalized Method (Future Volume Alternative)

Intersection #1 Silverado Trail/Dunaweal Ln

Average Delay (sec/veh): 2.0 Worst Case Level Of Service: A[8.9]

Street Name:	Dunaweal Ln						Silverado Trail					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	- T	- R	L	- T	- R	L	- T	- R	L	- T	- R
Control:	Stop Sign			Stop Sign			Uncontrolled			Uncontrolled		
Rights:	Include			Include			Include			Include		
Lanes:	0 0	1! 0	0	0 0	0 0	0 0	0 0	0 1	0	0 1	0 0	0
Volume Module: >> Count Date: 17 Sep 2014 << 4:45 - 5:45 pm												
Base Vol:	16	0	84	0	0	0	0	167	27	15	248	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	16	0	84	0	0	0	0	167	27	15	248	0
Added Vol:	3	0	7	0	0	0	0	0	1	2	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	19	0	91	0	0	0	0	167	28	17	248	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
PHF Volume:	20	0	97	0	0	0	0	177	30	18	264	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	20	0	97	0	0	0	0	177	30	18	264	0
Critical Gap Module:												
Critical Gp:	6.4	6.5	6.2	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	4.1	xxxx	xxxxx
FollowUpTim:	3.5	4.0	3.3	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	2.2	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	492	492	192	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	207	xxxx	xxxxx
Potent Cap.:	540	481	854	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	1376	xxxx	xxxxx
Move Cap.:	534	474	854	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	1376	xxxx	xxxxx
Volume/Cap:	0.04	0.00	0.11	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	0.01	xxxx	xxxx
Level Of Service Module:												
2Way95thQ:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	0.0	xxxx	xxxxx
Control Del:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	7.7	xxxx	xxxxx
LOS by Move:	*	*	*	*	*	*	*	*	*	A	*	*
Movement:	LT -	LTR -	RT	LT -	LTR -	RT	LT -	LTR -	RT	LT -	LTR -	RT
Shared Cap.:	xxxx	1033	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:	xxxxx	0.4	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	0.0	xxxx	xxxxx
Shrd ConDel:	xxxxx	8.9	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	7.7	xxxx	xxxxx
Shared LOS:	*	A	*	*	*	*	*	*	*	A	*	*
ApproachDel:		8.9			xxxxxx			xxxxxx			xxxxxx	
ApproachLOS:		A			*			*			*	

Note: Queue reported is the number of cars per lane.

Traffix 8.0.0715 (c) 2008 Dowling Assoc. Licensed to W-TRANS, Santa Rosa, CA

PM Peak Hour - Existing plus Project Conditions
Vintage Wine Estates TIS
County of Napa

Level Of Service Computation Report
2000 HCM Unsignalized Method (Future Volume Alternative)

Intersection #2 SR 29/Dunaweal Ln

Average Delay (sec/veh): 1.0 Worst Case Level Of Service: B[11.3]

Street Name:	Dunaweal Ln						SR 29					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	- T	- R	L	- T	- R	L	- T	- R	L	- T	- R
Control:	Stop Sign			Stop Sign			Uncontrolled			Uncontrolled		
Rights:	Include			Include			Include			Include		
Lanes:	0 0	1! 0	0	0 0	1! 0	0	1 0	0 1	0	1 0	0 1	0
Volume Module: >> Count Date: 16 Sep 2014 << 4:00 - 5:00 pm												
Base Vol:	2	0	2	47	0	25	14	382	2	2	558	64
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	2	0	2	47	0	25	14	382	2	2	558	64
Added Vol:	0	0	0	3	0	7	2	0	0	0	0	1
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	2	0	2	50	0	32	16	382	2	2	558	65
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
PHF Volume:	2	0	2	54	0	34	17	412	2	2	601	70
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	2	0	2	54	0	34	17	412	2	2	601	70
Critical Gap Module:												
Critical Gp:	7.1	6.5	6.2	7.1	6.5	6.2	4.1	xxxx	xxxxx	4.1	xxxx	xxxxx
FollowUpTim:	3.5	4.0	3.3	3.5	4.0	3.3	2.2	xxxx	xxxxx	2.2	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	1105	1123	413	1089	1089	636	671	xxxx	xxxxx	414	xxxx	xxxxx
Potent Cap.:	190	207	644	195	217	481	929	xxxx	xxxxx	1156	xxxx	xxxxx
Move Cap.:	173	203	644	191	213	481	929	xxxx	xxxxx	1156	xxxx	xxxxx
Volume/Cap:	0.01	0.00	0.00	0.28	0.00	0.07	0.02	xxxx	xxxx	0.00	xxxx	xxxx
Level Of Service Module:												
2Way95thQ:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	0.1	xxxx	xxxxx	0.0	xxxx	xxxxx
Control Del:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	8.9	xxxx	xxxxx	8.1	xxxx	xxxxx
LOS by Move:	*	*	*	*	*	*	A	*	*	A	*	*
Movement:	LT -	LTR -	RT	LT -	LTR -	RT	LT -	LTR -	RT	LT -	LTR -	RT
Shared Cap.:	xxxx	753	xxxxx	xxxx	662	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:	xxxxx	0.0	xxxxx	xxxxx	0.5	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shrd ConDel:	xxxxx	9.8	xxxxx	xxxxx	11.3	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	A	*	*	B	*	*	*	*	*	*	*
ApproachDel:		9.8			11.3			xxxxxx			xxxxxx	
ApproachLOS:		A			B			*			*	

Note: Queue reported is the number of cars per lane.

Traffix 8.0.0715 (c) 2008 Dowling Assoc. Licensed to W-TRANS, Santa Rosa, CA

PM Peak Hour - Future Conditions
Vintage Wine Estates TIS
County of Napa

Level Of Service Computation Report
2000 HCM Unsignalized Method (Base Volume Alternative)

Intersection #1 Silverado Trail/Dunaweal Ln

Average Delay (sec/veh): 3.9 Worst Case Level Of Service: E[38.7]

Street Name:	Dunaweal Ln						Silverado Trail					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Uncontrolled			Uncontrolled		
Rights:	Include			Include			Include			Include		
Lanes:	0 0 1! 0 0			0 0 0 0 0			0 0 0 1 0			0 1 0 0 0		
Volume Module:												
Base Vol:	122	0	23	0	0	0	0	786	39	22	494	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	122	0	23	0	0	0	0	786	39	22	494	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	122	0	23	0	0	0	0	786	39	22	494	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	122	0	23	0	0	0	0	786	39	22	494	0
Critical Gap Module:												
Critical Gp:	6.4	6.5	6.2	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	4.1	xxxx	xxxxx
FollowUpTim:	3.5	4.0	3.3	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	2.2	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	1344	1344	806	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	825	xxxx	xxxxx
Potent Cap.:	169	153	385	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	814	xxxx	xxxxx
Move Cap.:	166	149	385	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	814	xxxx	xxxxx
Volume/Cap:	0.74	0.00	0.06	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	0.03	xxxx	xxxx
Level Of Service Module:												
2Way95thQ:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	0.1	xxxx	xxxxx
Control Del:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	9.5	xxxx	xxxxx
LOS by Move:	*	*	*	*	*	*	*	*	*	A	*	*
Movement:	LT -	LTR -	RT	LT -	LTR -	RT	LT -	LTR -	RT	LT -	LTR -	RT
Shared Cap.:	xxxx	246	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:	xxxxx	3.4	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	0.1	xxxx	xxxxx
Shrd ConDel:	xxxxx	38.7	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	9.5	xxxx	xxxxx
Shared LOS:	*	E	*	*	*	*	*	*	*	A	*	*
ApproachDel:		38.7			xxxxxx			xxxxxx			xxxxxx	
ApproachLOS:		E			*			*			*	

Note: Queue reported is the number of cars per lane.

PM Peak Hour - Future Conditions
Vintage Wine Estates TIS
County of Napa

Level Of Service Computation Report
2000 HCM Unsignalized Method (Base Volume Alternative)

Intersection #2 SR 29/Dunaweal Ln

Average Delay (sec/veh): 9.6 Worst Case Level Of Service: F[177.3]

Street Name:	Dunaweal Ln						SR 29					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Uncontrolled			Uncontrolled		
Rights:	Include			Include			Include			Include		
Lanes:	0 0 1! 0 0			0 0 1! 0 0			1 0 0 1 0			1 0 0 1 0		
Volume Module:												
Base Vol:	2	0	2	68	0	36	20	613	2	2	1113	93
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	2	0	2	68	0	36	20	613	2	2	1113	93
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	2	0	2	68	0	36	20	613	2	2	1113	93
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	2	0	2	68	0	36	20	613	2	2	1113	93
Critical Gap Module:												
Critical Gp:	7.1	6.5	6.2	7.1	6.5	6.2	4.1	xxxx	xxxxx	4.1	xxxx	xxxxx
FollowUpTim:	3.5	4.0	3.3	3.5	4.0	3.3	2.2	xxxx	xxxxx	2.2	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	1836	1864	614	1819	1819	1160	1206	xxxx	xxxxx	615	xxxx	xxxxx
Potent Cap.:	59	74	496	61	79	240	586	xxxx	xxxxx	974	xxxx	xxxxx
Move Cap.:	49	71	496	59	76	240	586	xxxx	xxxxx	974	xxxx	xxxxx
Volume/Cap:	0.04	0.00	0.00	1.16	0.00	0.15	0.03	xxxx	xxxx	0.00	xxxx	xxxx
Level Of Service Module:												
2Way95thQ:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	0.1	xxxx	xxxxx	0.0	xxxx	xxxxx
Control Del:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	11.4	xxxx	xxxxx	8.7	xxxx	xxxxx
LOS by Move:	*	*	*	*	*	*	B	*	*	A	*	*
Movement:	LT -	LTR -	RT	LT -	LTR -	RT	LT -	LTR -	RT	LT -	LTR -	RT
Shared Cap.:	xxxx	240	xxxxx	xxxx	101	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:	xxxxx	0.1	xxxxx	xxxxx	6.5	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shrd ConDel:	xxxxx	20.3	xxxxx	xxxxx	177	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	C	*	*	F	*	*	*	*	*	*	*
ApproachDel:		20.3			177.3			xxxxxx			xxxxxx	
ApproachLOS:		C			F			*			*	

Note: Queue reported is the number of cars per lane.

PM Peak Hour - Future plus Project Conditions
Vintage Wine Estates TIS
County of Napa

Level Of Service Computation Report
2000 HCM Unsignalized Method (Future Volume Alternative)

Intersection #1 Silverado Trail/Dunaweal Ln

Average Delay (sec/veh): 4.9 Worst Case Level Of Service: E[45.7]

Street Name:	Dunaweal Ln						Silverado Trail					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	- T	- R	L	- T	- R	L	- T	- R	L	- T	- R
Control:	Stop Sign			Stop Sign			Uncontrolled			Uncontrolled		
Rights:	Include			Include			Include			Include		
Lanes:	0 0	1! 0	0	0 0	0 0	0	0 0	0 1	0	0 1	0 0	0
Volume Module:												
Base Vol:	122	0	23	0	0	0	0	786	39	22	494	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	122	0	23	0	0	0	0	786	39	22	494	0
Added Vol:	3	0	7	0	0	0	0	0	1	2	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	125	0	30	0	0	0	0	786	40	24	494	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	125	0	30	0	0	0	0	786	40	24	494	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	125	0	30	0	0	0	0	786	40	24	494	0
Critical Gap Module:												
Critical Gp:	6.4	6.5	6.2	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	4.1	xxxx	xxxxx
FollowUpTim:	3.5	4.0	3.3	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	2.2	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	1348	1348	806	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	826	xxxx	xxxxx
Potent Cap.:	168	152	385	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	813	xxxx	xxxxx
Move Cap.:	164	148	385	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	813	xxxx	xxxxx
Volume/Cap:	0.76	0.00	0.08	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	0.03	xxxx	xxxx
Level Of Service Module:												
2Way95thQ:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	0.1	xxxx	xxxxx
Control Del:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	9.6	xxxx	xxxxx
LOS by Move:	*	*	*	*	*	*	*	*	*	A	*	*
Movement:	LT -	LTR -	RT	LT -	LTR -	RT	LT -	LTR -	RT	LT -	LTR -	RT
Shared Cap.:	xxxx	235	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:	xxxxx	4.1	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	0.1	xxxx	xxxxx
Shrd ConDel:	xxxxx	45.7	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	9.6	xxxx	xxxxx
Shared LOS:	*	E	*	*	*	*	*	*	*	A	*	*
ApproachDel:		45.7			xxxxxx			xxxxxx			xxxxxx	
ApproachLOS:		E			*			*			*	

Note: Queue reported is the number of cars per lane.

Traffix 8.0.0715 (c) 2008 Dowling Assoc. Licensed to W-TRANS, Santa Rosa, CA

PM Peak Hour - Future plus Project Conditions
Vintage Wine Estates TIS
County of Napa

Level Of Service Computation Report
2000 HCM Unsignalized Method (Future Volume Alternative)

Intersection #2 SR 29/Dunaweal Ln

Average Delay (sec/veh): 12.4 Worst Case Level Of Service: F[209.8]

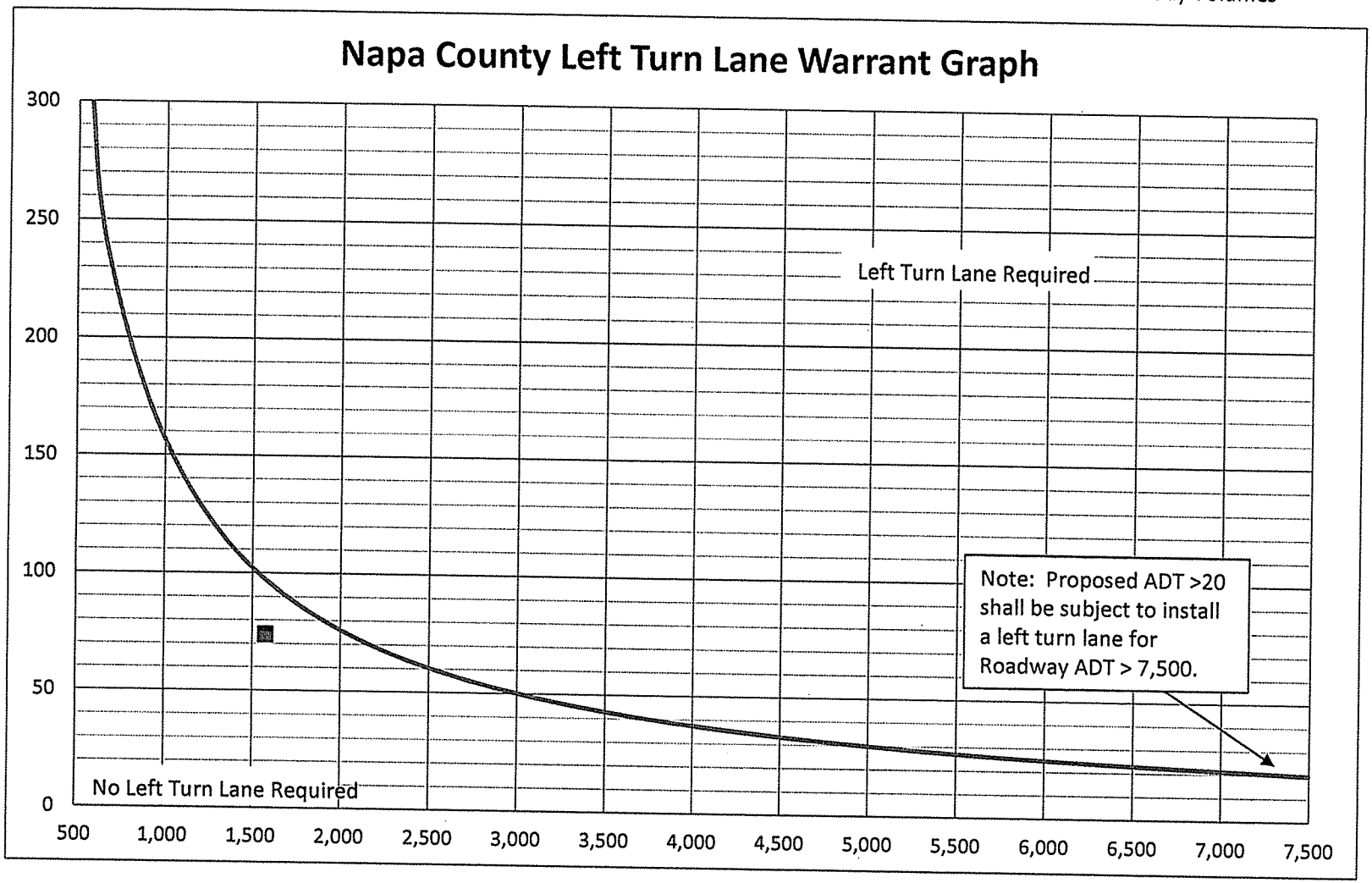
Street Name:	Dunaweal Ln						SR 29					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	- T	- R	L	- T	- R	L	- T	- R	L	- T	- R
Control:	Stop Sign			Stop Sign			Uncontrolled			Uncontrolled		
Rights:	Include			Include			Include			Include		
Lanes:	0 0	1! 0	0	0 0	1! 0	0	1 0	0 1	0	1 0	0 1	0
Volume Module:												
Base Vol:	2	0	2	68	0	36	20	613	2	2	1113	93
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	2	0	2	68	0	36	20	613	2	2	1113	93
Added Vol:	0	0	0	3	0	7	2	0	0	0	0	1
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	2	0	2	71	0	43	22	613	2	2	1113	94
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	2	0	2	71	0	43	22	613	2	2	1113	94
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	2	0	2	71	0	43	22	613	2	2	1113	94
Critical Gap Module:												
Critical Gp:	7.1	6.5	6.2	7.1	6.5	6.2	4.1	xxxx	xxxxx	4.1	xxxx	xxxxx
FollowUpTim:	3.5	4.0	3.3	3.5	4.0	3.3	2.2	xxxx	xxxxx	2.2	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	1844	1869	614	1823	1823	1160	1207	xxxx	xxxxx	615	xxxx	xxxxx
Potent Cap.:	58	73	496	60	78	240	585	xxxx	xxxxx	974	xxxx	xxxxx
Move Cap.:	46	70	496	58	75	240	585	xxxx	xxxxx	974	xxxx	xxxxx
Volume/Cap:	0.04	0.00	0.00	1.22	0.00	0.18	0.04	xxxx	xxxx	0.00	xxxx	xxxx
Level Of Service Module:												
2Way95thQ:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	0.1	xxxx	xxxxx	0.0	xxxx	xxxxx
Control Del:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	11.4	xxxx	xxxxx	8.7	xxxx	xxxxx
LOS by Move:	*	*	*	*	*	*	B	*	*	A	*	*
Movement:	LT -	LTR -	RT	LT -	LTR -	RT	LT -	LTR -	RT	LT -	LTR -	RT
Shared Cap.:	xxxx	233	xxxxx	xxxx	100	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:	xxxxx	0.1	xxxxx	xxxxx	7.4	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shrd ConDel:	xxxxx	20.7	xxxxx	xxxxx	210	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	C	*	*	F	*	*	*	*	*	*	*
ApproachDel:		20.7			209.8			xxxxxx			xxxxxx	
ApproachLOS:		C			F			*			*	

Note: Queue reported is the number of cars per lane.

Traffix 8.0.0715 (c) 2008 Dowling Assoc. Licensed to W-TRANS, Santa Rosa, CA

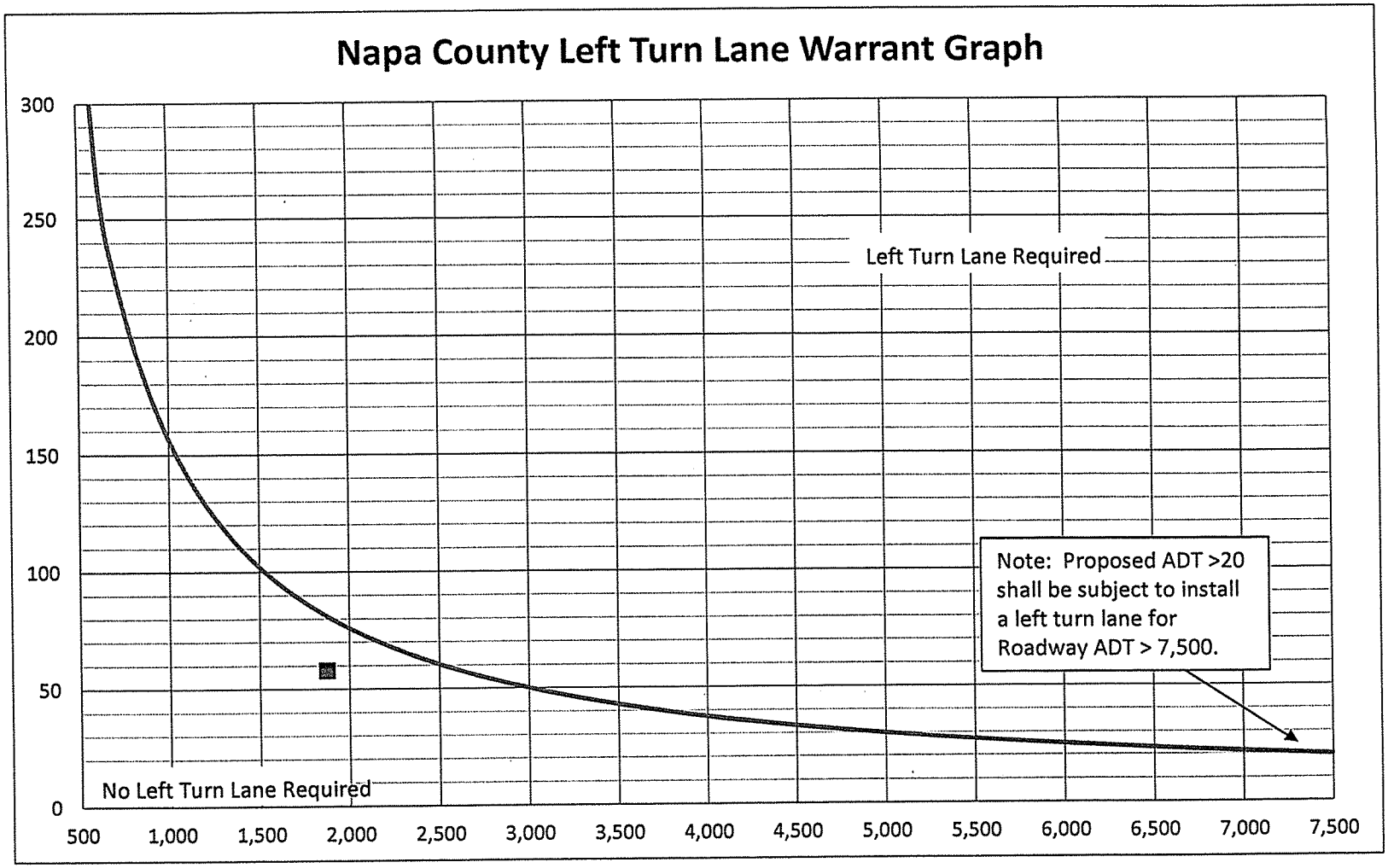
Project Name: Girard Winery

Scenario: Weekday Volumes



Project Name: Girard Winery

Scenario: Weekend Volumes



April 9, 2015

Whitlock & Weinberger
Transportation, Inc.
490 Mendocino Avenue
Suite 201
Santa Rosa, CA 95401
voice 707.542.9500
fax 707.542.9590
web www.w-trans.com

Mr. Pat Roney
205 Concourse Boulevard
Santa Rosa, CA 95403

Response to Comments on the "Traffic Impact Study for the Girard Winery Project"

Dear Mr. Roney;

As requested, Whitlock & Weinberger Transportation, Inc. (W-Trans) has reviewed comments relative to the "Traffic Study for the Girard Winery Project" as contained in a letter dated January 20, 2015, to David Morrison from Ellison Folk and Laurel L. Impett. These comments are found in Sections D and E of the letter. The comments are paraphrased and shown in *italics*, followed by our responses.

The IS concedes that the Project will have significant impacts relating to the increase in traffic, but fails to identify feasible mitigation.

The IS finds that the project would have **less-than-significant** impacts on traffic operation **with mitigation**, and mitigation is identified as part of the project description.

As noted in the traffic study, both study intersections are projected to operate acceptably at LOS C or better overall under Future plus Project volumes (worst case condition). As regards intersection operation, the project's impact is therefore less-than-significant, without any mitigation being needed.

The County's General Plan projects Future LOS F operation on SR 29, though the County's policy does not establish a threshold for this roadway as the General Plan prohibits widening the road to four lanes. Analysis was performed to determine the project's potential impact on operation of SR 29 under projected Future 2030 p.m. peak hour volumes. As indicated in the enclosed calculations, both with the maximum estimated project volumes added to anticipated 2030 volumes and without, operation would remain at LOS E both north and south of Dunaweal Lane, with no change in the volume-to-capacity (v/c) ratios. (Note that the volumes used may differ from those applied in the General Plan analysis, which is why LOS E operation results in this analysis compared to LOS F in the General Plan. The focus of the analysis is the difference in operation without and with the project, however.) The "percent time following" is expected to be 89 percent north of Dunaweal Lane and 93 percent south of this intersection both without and with the estimated trips from the project added.

Since the project will enact transportation demand management (TDM) measures to eliminate adding **any** peak hour trips, the evaluated conditions would only occur if there were employee and visitor trips as estimated without the benefit of the TDM program. Given that it is relatively easy for employee and visitor trips to be managed, as proposed, it appears reasonable to accept this TDM plan as a realistic and feasible option for addressing potential traffic impacts, even if they would be less-than-significant. Based on this analysis it was determined that even without the TDM program the project's trips would result in less-than-significant impacts.

The study area is inadequate; it should have addressed the distribution of trips along SR 29 and Silverado Trail.

The study area was selected to include the two locations where the project would generate the highest number of vehicle turning movements, which in turn would reflect the locations with the greatest potential transportation impacts. Beyond these two intersections the added trips would be almost entirely comprised of through movements, which would result in no change to the level of service or volume-to-capacity ratio of SR 29, as shown in the calculations discussed above. Further, the number of project-generated trips would be considerably lower at locations further from Dunaweal Lane as the trips disperse wherever paths diverge, such as at the intersections of Dunaweal Lane with SR 29 and Silverado Trail. As shown in Table 4 of the traffic study, the projected number of p.m. peak hour trips on SR 29 would vary from two south of Dunaweal Lane to 13 north of Dunaweal Lane.

It is noted that the projections of future LOS F operation along SR 29 are based on a substantial anticipated increase in traffic over current levels. These added future trips would reasonably be expected to include the project-generated trips, so any impacts associated with project traffic have already been accounted for in the General Plan and its associated EIR.

However, while the project's impact would not be significant even if it generated the number of trips estimated based on the County's standard winery trip generation calculations, the project description includes measures limiting activity during peak periods to minimize potential transportation impacts by essentially eliminating any new trips during peak periods.

The IS does not establish proper thresholds of significance that define when an increase is substantial in relation to the existing traffic load or capacity of the street system.

The traffic study relies on both the Caltrans and County standards of significance which indicate that operation at LOS C or better is acceptable. As noted in the traffic study, both intersections of Dunaweal Lane with SR 29 and Silverado Trail are projected to operate at LOS C or better overall under the highest volume scenario, which is Future plus Project. The CEQA checklist has traditionally been interpreted such that if acceptable operation is maintained, then the increase is not considered substantial in relation to the existing traffic load or capacity of the street system.

The IS asserts that project impacts could be mitigated by altering employee shifts and timing of events.

The IS does not assert that the project has significant impacts, therefore mitigation measure are not necessary. However, to minimize the project's potential to affect traffic the project description includes transportation demand management (TDM) measures to shift project-generated trips outside the periods of peak traffic and congestion. However, even if the TDM measures failed, as noted above, the project's traffic impact would still be less-than-significant.

The traffic analysis was based on the County's standard trip generation estimates, which overstate peak hour trips according to data collected by W-Trans. Although these added trips would be expected to have a less-than-significant impact, the proposed TDM program would reduce the number of trips added to the network below the 26 p.m. peak hour and 29 Saturday midday peak hour trips used for the analysis. The TDM program would shift most, if not all, of these trips outside the peak hours, resulting in minimal impact during periods of peak congestion.

The IS ignores the effect of event traffic, including a proposed 500-person event. Further, the impacts of truck traffic, especially the 242 daily truck trips during harvest, should be addressed since all of the wineries harvest during the same week or two.

Events occur on an infrequent basis (14 times per year, or less than two per month on average), so the traffic associated with them falls below the "30th highest hour" level that is typically the basis for design. Further, the TDM plan pushes these trips outside the peak hours on both weekdays and weekends, taking advantage of the excess roadway capacity available during these off-peak times rather than adding to peak period congestion.

It is unclear where the estimate of 242 daily truck trips came from. The trip generation sheet shows a maximum of 142 daily trips during harvest, of which 14 are trucks; 80 are for employees. Further, crush occurs over a six to eight week period, not one to two weeks and each individual winery receives grapes at various times depending on the varietals and the microclimate where they are grown.

Finally, it should be noted that the maximum-sized 500-person event occurs only once per year. To avoid facilities with excessive capacities, AASHTO recommends that designs be based on volumes during the 30th highest hour. Since trips associated with the single large event per year would represent only a few of the highest hourly volumes annually, these "plus Project" conditions would not abe appropriate for design purposes. Given that there is only one such event per year, analysis of conditions during the 500-person event are not warranted.

The potential impacts of weddings held at the Girard Winery must be evaluated.

The special events evaluated in the traffic study are based on typical traffic associated with a maximum number of attendees, regardless of what type of event it is. Weddings were not specifically evaluated in the traffic study as they are not proposed, nor will they be allowed.

The cumulative impacts that will result from the project and planned or recently approved projects in the County are not examined.

The cumulative impacts of all of the winery projects should be accounted for in the future traffic projections used in this analysis. These volumes reflect an 82.5 percent increase in traffic on SR 29 and more than a 200 percent increase on Silverado Trail. Given that the County is substantially more than half built out, it would appear that this magnitude of an increase is unlikely to actually be experienced, so these projections overstate the actual potential for traffic volumes to increase. It is therefore reasonable to conclude that the projected future traffic volumes include all of the trips associated with future winery development, including that which is currently envisioned and even that which is not.

The IS fails to consider parking-related impacts from the project, especially the largest event with a maximum of 500 persons.

It is intended that shuttles will be used during the 500-person event to transport guests from off-site parking areas to the winery. Event invitations will provide details about the parking and shuttle operation, and guests will be reminded to park off-site in any event-related communications. The amount of parking allowed on-site will be limited to the supply available. For a 200-person event the parking needed would be 71 spaces for attendees and ten for employees. With 37 marked spaces plus the ability to create about 90 informal spaces at the rear of the parcel as well as along vineyard rows, there is more than adequate space to park all of the vehicles associated with the special events having 200 attendees or less.

The IS further fails to identify or analyze transportation impacts that would result from shuttle buses.

If shuttles are used in lieu of personal vehicles, even assuming use of 14-passenger vans with only 12 passengers either arriving or departing and no passengers on the return trip, then a 500-person event would generate a total of 84 round trips, or 168 trip ends, over the course of several hours. This is less than half the number of trips that would be generated by personal vehicles, and therefore shuttles would result in less of an impact than personal vehicles were used. Since the 500-person event only occurs once per year, its impacts would not be considered as the basis for the environmental impact analysis.

We hope this information adequately addresses the comments received regarding the traffic analysis. Please call if you have any questions.

Sincerely,

Dalene J. Whitlock, PE, PTOE
Principal

DJW/djw/NAX077.L2

Enclosure: Two-Lane Highway Level of Service Calculations

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Dalene Whitlock
Agency/Co.	Napa County
Date Performed	2/11/15
Analysis Time Period	Weekday PM Peak Hour
Highway	SR 29
From/To	Calistoga to Dunaweal Lane
Jurisdiction	Caltrans
Analysis Year	2030
Description	Future Conditions

Input Data

Highway class	Class 3		Peak hour factor, PHF	1.00	
Shoulder width	6.0	ft	% Trucks and buses	5	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	1.3	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	2	%
Grade: Length	-	mi	% No-passing zones	90	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd 1062 veh/h
Opposing direction volume, Vo 1113 veh/h

Average Travel Speed

Direction	Analysis (d)		Opposing (o)	
PCE for trucks, ET	2.0*		2.0*	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor, (note-5) fHV	0.952		0.952	
Grade adj. factor, (note-1) fg	1.00		1.00	
Directional flow rate, (note-2) vi	1116	pc/h	1169	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed, (note-3) S FM	-	mi/h
Observed total demand, (note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed, (note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width, (note-3) fLS	0.0	mi/h
Adj. for access point density, (note-3) fA	2.0	mi/h
Free-flow speed, FFSd	43.0	mi/h
Adjustment for no-passing zones, fnp	0.9	mi/h
Average travel speed, ATSd	24.4	mi/h
Percent Free Flow Speed, PFFS	56.8	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor, (note-1) fg	1.00	1.00
Directional flow rate, (note-2) vi	1062 pc/h	1113 pc/h
Base percent time-spent-following, (note-4) BPTSFd	80.9 %	
Adjustment for no-passing zones, fnp	16.0	
Percent time-spent-following, PTSFd	88.7 %	

Level of Service and Other Performance Measures

Level of service, LOS	E	
Volume to capacity ratio, v/c	0.66	
Peak 15-min vehicle-miles of travel, VMT15	345	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1381	veh-mi
Peak 15-min total travel time, TT15	14.1	veh-h
Capacity from ATS, CdATS	1700	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.3	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	24.4	mi/h
Percent time-spent-following, PTSFd (from above)	88.7	
Level of service, LOSd (from above)	E	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Dalene Whitlock
Agency/Co.	Napa County
Date Performed	2/11/15
Analysis Time Period	Weekday PM Peak Hour
Highway	SR 29
From/To	Calistoga to Dunaweal Lane
Jurisdiction	Caltrans
Analysis Year	2030
Description	Future plus Project Conditions

Input Data

Highway class	Class 3		Peak hour factor, PHF	1.00	
Shoulder width	6.0	ft	% Trucks and buses	5	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	1.3	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	2	%
Grade: Length	-	mi	% No-passing zones	90	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd 1075 veh/h
Opposing direction volume, Vo 1113 veh/h

Average Travel Speed

Direction	Analysis (d)		Opposing (o)	
PCE for trucks, ET	2.0*		2.0*	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor, (note-5) fHV	0.952		0.952	
Grade adj. factor, (note-1) fg	1.00		1.00	
Directional flow rate, (note-2) vi	1129	pc/h	1169	pc/h

Free-Flow Speed from Field Measurement:			
Field measured speed, (note-3) S FM		-	mi/h
Observed total demand, (note-3) V		-	veh/h
Estimated Free-Flow Speed:			
Base free-flow speed, (note-3) BFFS		45.0	mi/h
Adj. for lane and shoulder width, (note-3)	fLS	0.0	mi/h
Adj. for access point density, (note-3)	fA	2.0	mi/h
Free-flow speed, FFSd		43.0	mi/h
Adjustment for no-passing zones, fnp		0.9	mi/h
Average travel speed, ATSd		24.3	mi/h
Percent Free Flow Speed, PFFS		56.5	%

Percent Time-Spent-Following

Direction	Analysis (d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor, (note-1) fg	1.00	1.00
Directional flow rate, (note-2) vi	1075 pc/h	1113 pc/h
Base percent time-spent-following, (note-4) BPTSFd	81.2 %	
Adjustment for no-passing zones, fnp	15.8	
Percent time-spent-following, PTSFd	89.0 %	

Level of Service and Other Performance Measures

Level of service, LOS	E	
Volume to capacity ratio, v/c	0.66	
Peak 15-min vehicle-miles of travel, VMT15	349	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1397	veh-mi
Peak 15-min total travel time, TT15	14.4	veh-h
Capacity from ATS, CdATS	1700	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.3	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	24.3	mi/h
Percent time-spent-following, PTSFd (from above)	89.0	
Level of service, LOSd (from above)	E	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Dalene Whitlock
Agency/Co.	Napa County
Date Performed	2/11/15
Analysis Time Period	Weekday PM Peak Hour
Highway	SR 29
From/To	Dunaweal Lane to Larkmead Lane
Jurisdiction	Caltrans
Analysis Year	2030
Description	Future Conditions

Input Data

Highway class	Class 3		Peak hour factor, PHF	1.00	
Shoulder width	6.0	ft	% Trucks and buses	5	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	2.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	2	%
Grade: Length	-	mi	% No-passing zones	90	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd 1361 veh/h
Opposing direction volume, Vo 1434 veh/h

Average Travel Speed

Direction	Analysis (d)		Opposing (o)	
PCE for trucks, ET	2.0*		2.0*	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor, (note-5) fHV	0.952		0.952	
Grade adj. factor, (note-1) fg	1.00		1.00	
Directional flow rate, (note-2) vi	1430	pc/h	1506	pc/h

Free-Flow Speed from Field Measurement:			
Field measured speed, (note-3) S FM		-	mi/h
Observed total demand, (note-3) V		-	veh/h
Estimated Free-Flow Speed:			
Base free-flow speed, (note-3) BFFS		45.0	mi/h
Adj. for lane and shoulder width, (note-3) fLS		0.0	mi/h
Adj. for access point density, (note-3) fA		2.0	mi/h
Free-flow speed, FFSd		43.0	mi/h
Adjustment for no-passing zones, fnp		0.6	mi/h
Average travel speed, ATSd		19.6	mi/h
Percent Free Flow Speed, PFFS		45.7	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor, (note-1) fg	1.00		1.00	
Directional flow rate, (note-2) vi	1361	pc/h	1434	pc/h
Base percent time-spent-following, (note-4) BPTSFd	88.8	%		
Adjustment for no-passing zones, fnp	9.0			
Percent time-spent-following, PTSFd	93.2	%		

Level of Service and Other Performance Measures

Level of service, LOS	E	
Volume to capacity ratio, v/c	0.84	
Peak 15-min vehicle-miles of travel, VMT15	681	veh-mi
Peak-hour vehicle-miles of travel, VMT60	2722	veh-mi
Peak 15-min total travel time, TT15	34.7	veh-h
Capacity from ATS, CdATS	1700	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	2.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	19.6	mi/h
Percent time-spent-following, PTSFd (from above)	93.2	
Level of service, LOSd (from above)	E	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Dalene Whitlock
Agency/Co.	Napa County
Date Performed	2/11/15
Analysis Time Period	Weekday PM Peak Hour
Highway	SR 29
From/To	Dunaweal Lane to Larkmead Lane
Jurisdiction	Caltrans
Analysis Year	2030
Description	Future plus Project Conditions

Input Data

Highway class	Class 3		Peak hour factor, PHF	1.00	
Shoulder width	6.0	ft	% Trucks and buses	5	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	2.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	2	%
Grade: Length	-	mi	% No-passing zones	90	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd 1363 veh/h
Opposing direction volume, Vo 1434 veh/h

Average Travel Speed

Direction	Analysis (d)		Opposing (o)	
PCE for trucks, ET	2.0*		2.0*	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor, (note-5) fHV	0.952		0.952	
Grade adj. factor, (note-1) fg	1.00		1.00	
Directional flow rate, (note-2) vi	1432	pc/h	1506	pc/h

Free-Flow Speed from Field Measurement:			
Field measured speed, (note-3) S FM		-	mi/h
Observed total demand, (note-3) V		-	veh/h
Estimated Free-Flow Speed:			
Base free-flow speed, (note-3) BFFS		45.0	mi/h
Adj. for lane and shoulder width, (note-3) fLS		0.0	mi/h
Adj. for access point density, (note-3) fA		2.0	mi/h
Free-flow speed, FFSd		43.0	mi/h
Adjustment for no-passing zones, fnp		0.6	mi/h
Average travel speed, ATSd		19.6	mi/h
Percent Free Flow Speed, PFFS		45.7	%

Percent Time-Spent-Following

Direction	Analysis (d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor, (note-1) fg	1.00	1.00
Directional flow rate, (note-2) vi	1363 pc/h	1434 pc/h

Base percent time-spent-following, (note-4)	BPTSFd	88.8	%
Adjustment for no-passing zones, fnp		9.0	
Percent time-spent-following, PTSFd		93.2	%

Level of Service and Other Performance Measures

Level of service, LOS	E	
Volume to capacity ratio, v/c	0.84	
Peak 15-min vehicle-miles of travel, VMT15	682	veh-mi
Peak-hour vehicle-miles of travel, VMT60	2726	veh-mi
Peak 15-min total travel time, TT15	34.7	veh-h
Capacity from ATS, CdATS	1700	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	2.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	19.6	mi/h
Percent time-spent-following, PTSFd (from above)	93.2	
Level of service, LOSd (from above)	E	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Bike Map, 2nd Edition, 2011

Bike Map

The City of Calistoga Bike Map shows two preferred bicycle loops in and around Calistoga. This map is designed to help riders choose the safest and most scenic routes. Always use caution and common sense when bicycling anywhere in Calistoga.

The 2nd Edition, 2011 City Bike Map is now available in PDF format. To view a PDF version of the bike map - click on one of the following Bicycle Map PDF links:

Bike Map - Front Page, Downtown, Calistoga and Vicinity, Back Page

For more Bicycle Map information please contact Erik V. Lundquist, Senior Planner at elundquist@ci.calistoga.ca.us

CITY OF CALISTOGA BIKE MAP

for Calistoga and Surrounding Area:

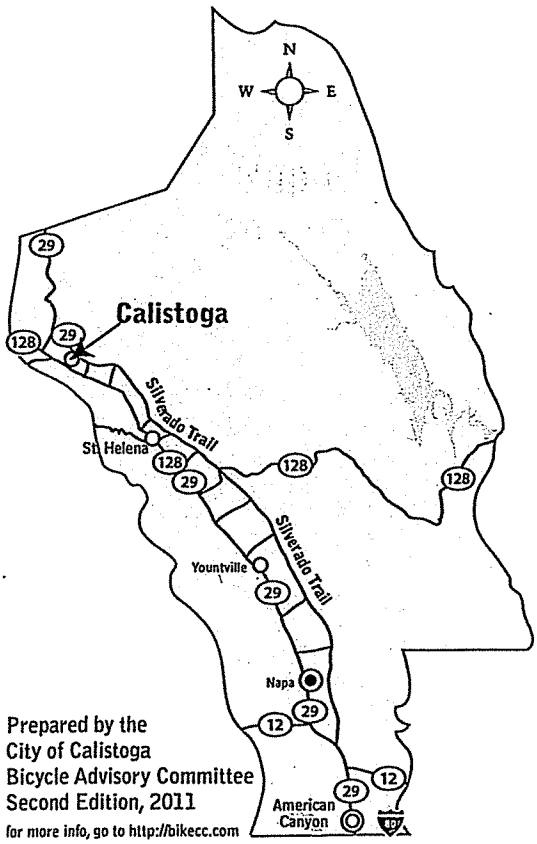
Calistoga Bicycle Loops

East Loop: Silverado Trail, Dunaweal Lane, Washington Street, Lake Street

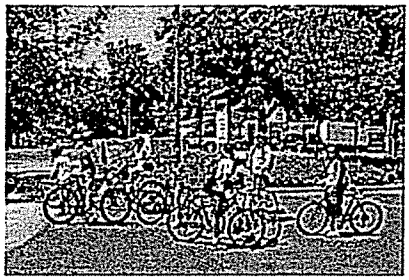
West Loop: Cedar Street, Mitzi Drive, Centennial Circle, Grant Street, Myrtledale Avenue, Tubbs Lane, Bennett Lane, Washington Street

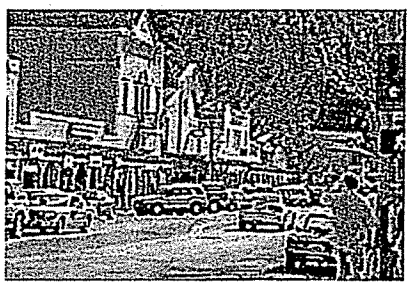
Plus hiking, driving and bike maps for:

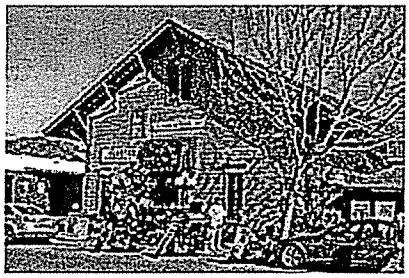
- Oat Hill Mine and Palisades Trails
- Kortum Canyon & Diamond Mountain Roads
- Over 40 Calistoga AVA and Area Wineries
- Historic Downtown Calistoga
- Bothe Napa Valley State Park, Tucker's Farm Center, Old Bale Grist Mill
- The Petrified Forest and Safari West

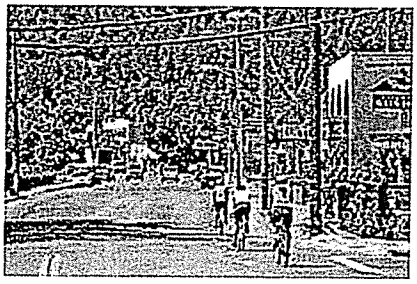


Prepared by the
City of Calistoga
Bicycle Advisory Committee
Second Edition, 2011
for more info, go to http://bikecc.com



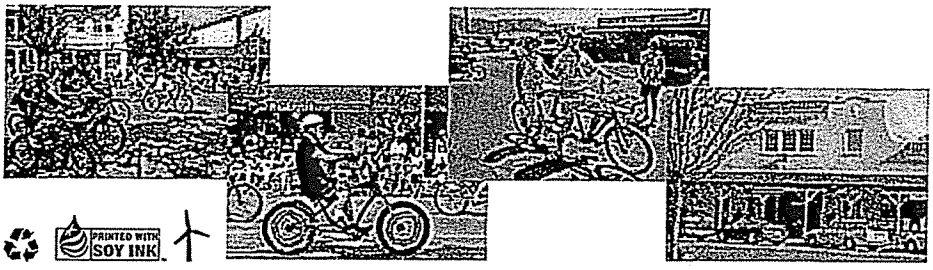






Calistoga is one of the best places to bicycle in the Napa Valley. The varied terrain accommodates all riders. Calistoga and the surrounding area offers smooth country roads with very little traffic and mountainous hard-core trails for the adrenaline junkies. Take a ride through our beautiful vineyards and historic locales on your own—or with an experienced tour guide. Bike rentals are available at the local bike shop in the downtown area. While you're out-and-about, check out some of our local attractions, shops, points of interest, and wonderful eating and dining establishments. Start your day with a breathtaking balloon ride at dawn and enjoy a mud bath, a massage, and a glass of wine at dusk.

Calistoga—Hot Springs, Cool Wines, Warm Welcomes!



PRINTED WITH SOY INK

THIS MAP HAS A WEBSITE!

Use your cell phone's web browser to find out more information at http://bikecc.com. Type in one of the many links shown on different parts of this map for in-depth information, pictures, Calistoga visitor info, and more!

BIKEWAY CLASSIFICATIONS

BIKE PATH (CLASS 1): a route intended solely for the purpose of bicycle and pedestrian traffic.

BIKE LANE (CLASS 2): a protected lane on a vehicular road intended for bicycle traffic only. Exercisie caution and common sense.

BIKE ROUTE (CLASS 3): motorists are supposed to share the road with bicycles. Exercise extreme caution and common sense.

BICYCLE SAFETY

This map is designed to help you choose the safest and most scenic routes in and around Calistoga. Always use caution and common-sense when bicycling anywhere in Calistoga.

OBEY ALL TRAFFIC SIGNS & SIGNALS

- Do not pass on the right
- Do not ride against traffic
- Use hand signals

RIDE IN A STRAIGHT LINE

- Always ride single-file on City Streets, Bike Routes and in Bike Lanes
- Do not weave between parked cars
- Follow lane markings
- Do not ride on sidewalks

RIDE DEFENSIVELY

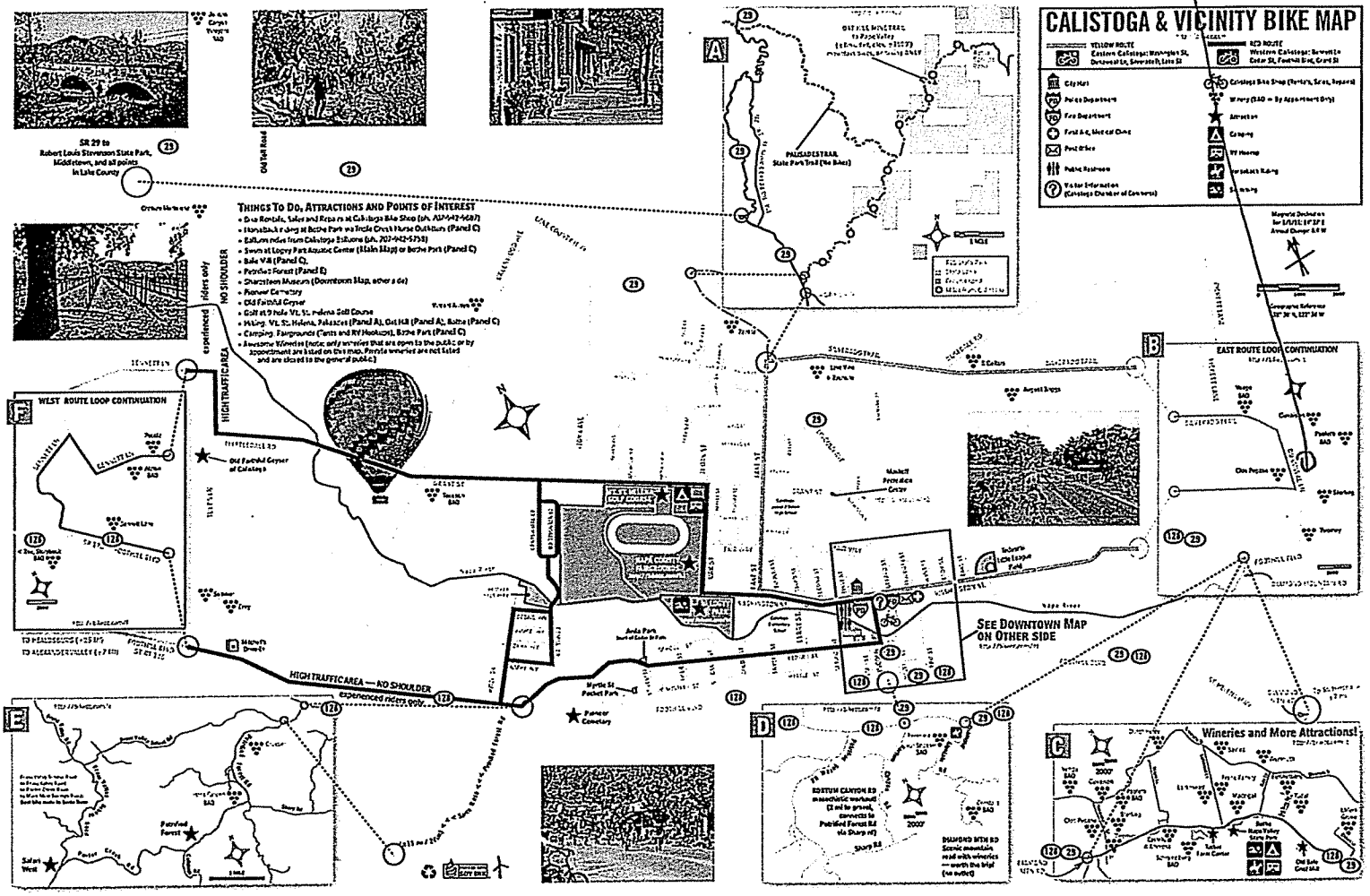
- Watch for cars pulling out
- Make eye contact with drivers making turns
- Scan the road behind you

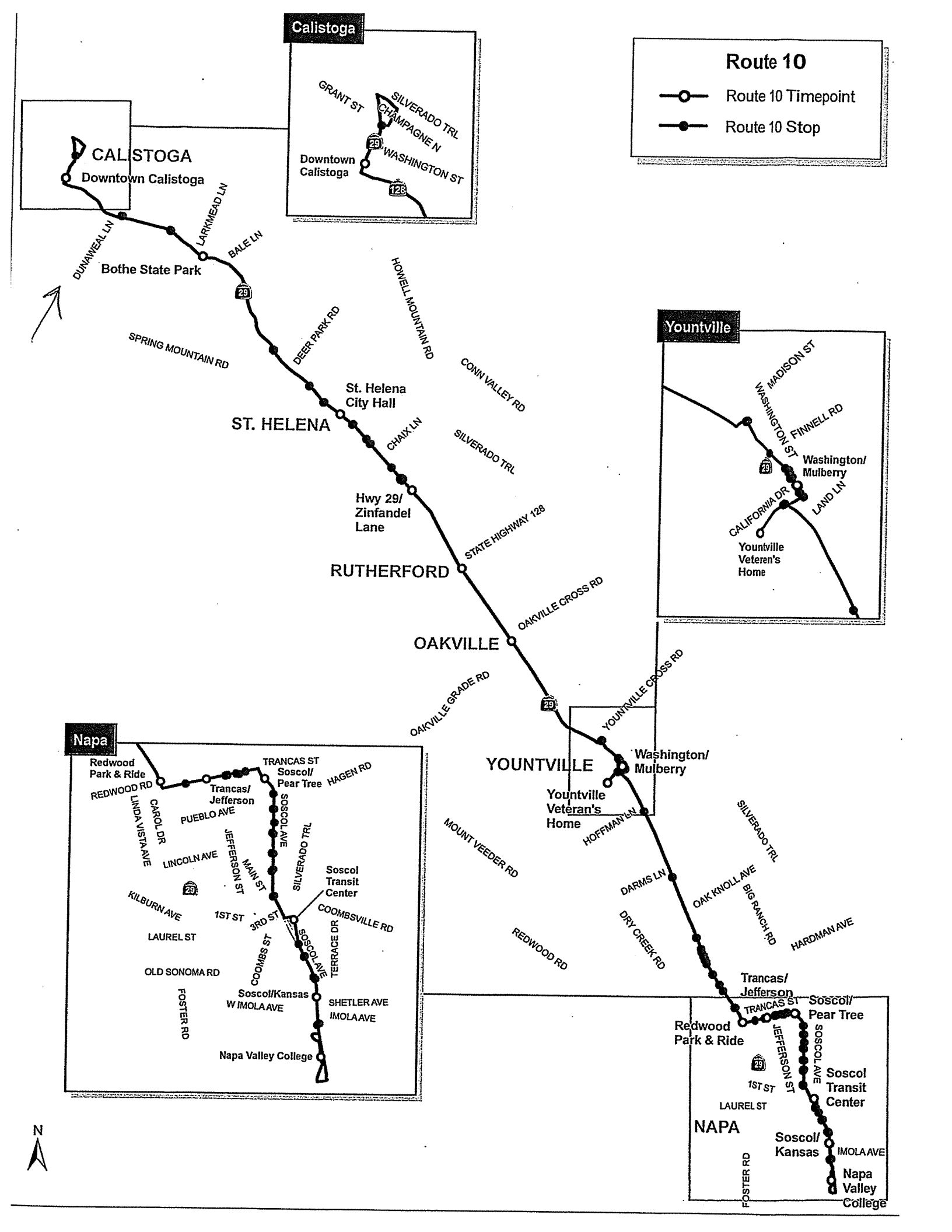
BE BIKE SAFE

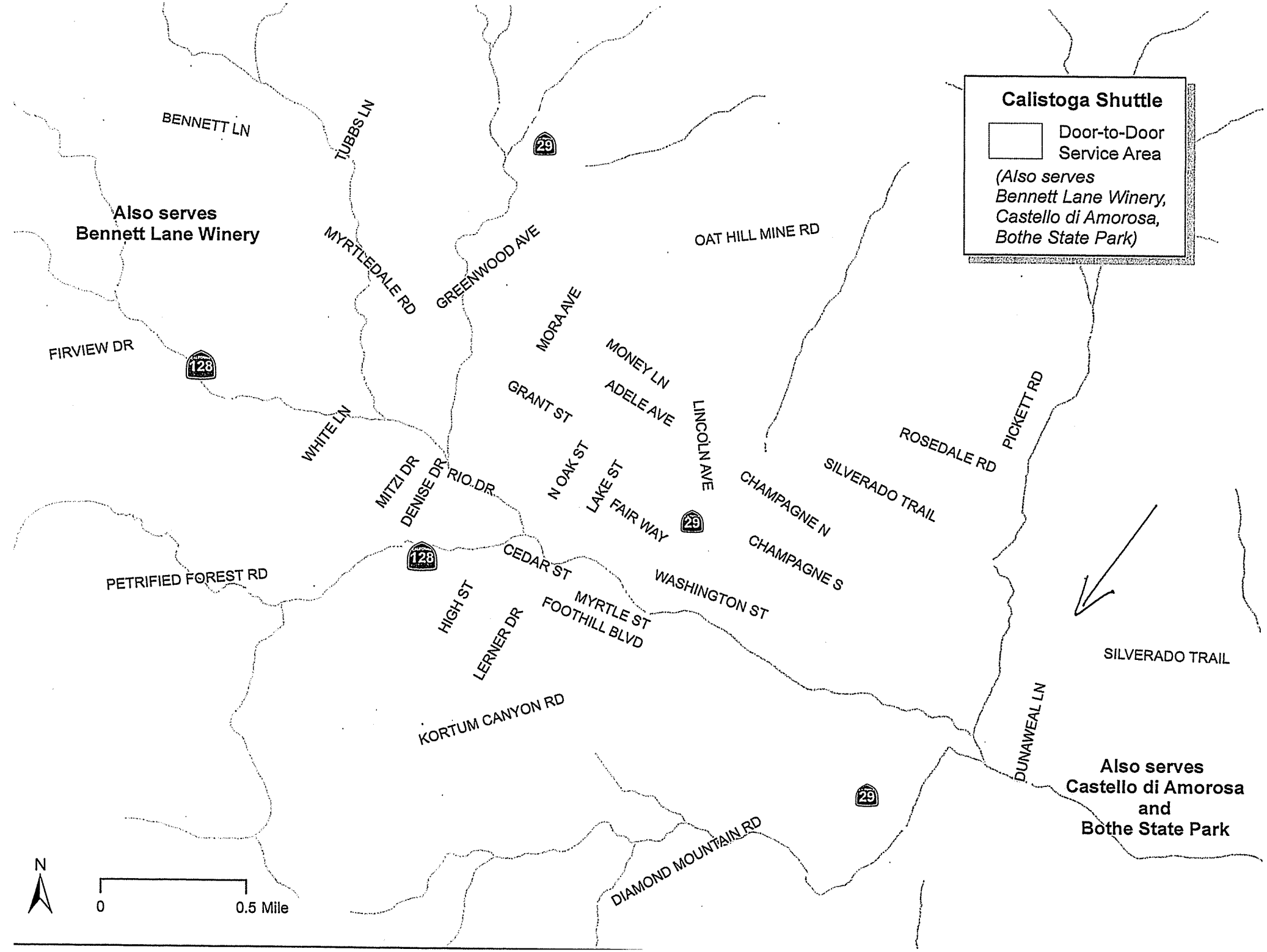
- Ride a well-equipped bike
- Inspect your bike regularly
- Use a helmet
- Wear light color clothing at night/bright colors during the day
- Have plenty of water/liquids and healthy road-snacks at the ready.

design, cartography, and website by winslow technology services & studio (http://www.wtsas.com)—a calistoga company—DUNS# 831755975

Project site




Route 10
Route 10 Timepoint
Route 10 Stop
Calistoga
GRANT ST
SILVERADO TRL
CHAMPAGNE N
WASHINGTON ST
Downtown Calistoga
CALISTOGA
Downtown Calistoga
DUNAWEAL LN
LARKMEAD LN
BALE LN
Bothe State Park
SPRING MOUNTAIN RD
DEER PARK RD
HOWELL MOUNTAIN RD
CONN VALLEY RD
St. Helena City Hall
ST. HELENA
CHAIX LN
SILVERADO TRL
Hwy 29/ Zinfandel Lane
STATE HIGHWAY 128
RUTHERFORD
OAKVILLE CROSS RD
OAKVILLE
OAKVILLE GRADE RD
YOUNTVILLE CROSS RD
Yountville
MADISON ST
WASHINGTON ST
FINNELL RD
Washington/ Mulberry
CALIFORNIA DR
LAND LN
Yountville Veteren's Home
YOUNTVILLE
Washington/ Mulberry
Yountville Veteran's Home
HOFFMAN LN
MOUNT VEEDER RD
SILVERADO TRL
DARMS LN
OAK KNOLL AVE
BIG RANCH RD
HARDMAN AVE
DRY CREEK RD
REDWOOD RD
Napa
Redwood Park & Ride
REDWOOD RD
TRANCAS ST
Soscol/ Pear Tree
HAGEN RD
Trancas/ Jefferson
LINDA VISTA AVE
CAROL DR
PUEBLO AVE
SOSCOL AVE
JEFFERSON ST
MAIN ST
LINCOLN AVE
SILVERADO TRL
Soscol Transit Center
KILBURN AVE
1ST ST
3RD ST
COOMBSVILLE RD
LAUREL ST
COOMBS ST
SOSCOL AVE
TERRACE DR
OLD SONOMA RD
FOSTER RD
Soscol/Kansas
W IMOLA AVE
SHETLER AVE
IMOLA AVE
Napa Valley College
Trancas/ Jefferson
TRANCAS ST
Soscol/ Pear Tree
Redwood Park & Ride
JEFFERSON ST
SOSCOL AVE
1ST ST
Soscol Transit Center
LAUREL ST
NAPA
Soscol/ Kansas
IMOLA AVE
FOSTER RD
Napa Valley College
N


Calistoga Shuttle
Door-to-Door Service Area
(Also serves Bennett Lane Winery, Castello di Amorosa, Bothe State Park)
Also serves Bennett Lane Winery
Also serves Castello di Amorosa and Bothe State Park
BENNETT LN
TUBBS LN
MYRTLEDALE RD
GREENWOOD AVE
OAT HILL MINE RD
MORA AVE
MONEY LN
ADELE AVE
GRANT ST
LINCOLN AVE
ROSEDALE RD
PICKETT RD
SILVERADO TRAIL
CHAMPAGNE N
CHAMPAGNE S
FIRVIEW DR
WHITE LN
MITZI DR
DENISE DR
RIO DR
N OAK ST
LAKE ST
FAIR WAY
CEDAR ST
WASHINGTON ST
MYRTLE ST
FOOTHILL BLVD
HIGH ST
LERNER DR
PETRIFIED FOREST RD
KORTUM CANYON RD
DUNAWEAL LN
DIAMOND MOUNTAIN RD
29
128
N
0
0.5 Mile