

**UPDATED TRAFFIC STUDY
FOR THE PROPOSED**

**RAYMOND VINEYARDS WINERY
USE PERMIT MODIFICATION
#P11-00156**

Napa County, CA

April 5, 2013

Prepared by:
**Omni-Means, Ltd.
Engineers & Planners
1901 Olympic Blvd., Suite 120
Walnut Creek, CA 94596**

R1557TLA002 / 35-5629-01

RECEIVED

MAY 7 2013

Napa County Planning, Building
& Environmental Services



**UPDATED TRAFFIC STUDY FOR THE PROPOSED
RAYMOND VINEYARDS WINERY
USE PERMIT MODIFICATION #P11-00156**

APRIL 5, 2013

PREPARED BY:

**OMNI-MEANS, LTD.
ENGINEERS & PLANNERS
1901 OLYMPIC BOULEVARD, SUITE 120
WALNUT CREEK, CALIFORNIA 94596
(925) 935-2230**

**35-5629-01
(R1557TIA002.DOC)**

Table of Contents

| | |
|---|----|
| 1. INTRODUCTION..... | 2 |
| 2. SETTING | 4 |
| 3. EXISTING TRAFFIC CONDITIONS..... | 5 |
| 4. WINERY TRIP GENERATION METHODOLOGY..... | 12 |
| 5. CURRENT USE PERMIT CONDITIONS..... | 13 |
| 6. PROPOSED USE PERMIT MODIFICATION | 18 |
| 7. EXISTING PLUS PROJECT CONDITIONS..... | 22 |
| 8. NEAR TERM CONDITIONS (APPROVED DEVELOPMENTS) | 25 |
| 9. SITE ACCESS / DESIGN PARAMETERS | 29 |
| 10. CUMULATIVE CONDITIONS | 35 |
| 11. SUMMARY / RECOMMENDATIONS | 37 |

List of Figures

| | |
|--|----|
| Figure 1 - Project Vicinity Map..... | 3 |
| Figure 2 - Existing Traffic Volumes..... | 11 |
| Figure 3 - Existing Plus Current Use Permit Volumes | 17 |
| Figure 4 - Project Trips | 21 |
| Figure 5 - Existing Plus Project Volumes | 24 |
| Figure 6 - Existing Plus Approved Developments (Near Term) Volumes | 26 |
| Figure 7 - Near Term Plus Project Volumes | 28 |
| Figure 8 - Project Site Plan..... | 33 |
| Figure 9 - Parking Plan..... | 34 |

List of Tables

| | |
|--|----|
| Table 1 - Existing Conditions Intersection Levels-of-Service | 7 |
| Table 2 - Existing Conditions Winery Trip Generation..... | 10 |
| Table 3 - Current Use Permit Winery Trip Generation | 14 |
| Table 4 - Existing and Current Use Permit Net New Trips | 15 |
| Table 5 - Existing and Current Use Permit Intersection Levels-of-Service | 16 |
| Table 6 - Proposed Use Permit Modification Winery Trip Generation | 19 |
| Table 7 - Existing and Existing Plus Project Net New Trips..... | 20 |
| Table 8 - Existing Plus Project Intersection Levels-of-Service | 23 |
| Table 9 - Near Term and Near Term Plus Project Intersection Levels-of-Service..... | 27 |

April 5, 2013

Raymond Vineyards
c/o Mr. Jeff Redding, AICP
2423 Renfrew Street
Napa, CA 94558

Subject: *Updated Traffic Analysis for the Raymond Vineyards Winery Use Permit Modification P11-00156*

Dear Mr. Redding:

The enclosed report presents the findings of the updated traffic analysis conducted for the proposed use permit modification #P11-00156 for the Raymond Vineyards Winery located at 849 Zinfandel Lane in Napa County. The report has incorporated additional data and analyses regarding traffic operations that were obtained subsequent to the original report in regard to potential traffic issues as identified by County staff.

The scope of the analysis was expanded to include the evaluation of additional traffic generating scenarios, including existing, current permitted use, approved developments, and cumulative (buildout) conditions. The study determined that additional trips associated with the use permit modification above existing volumes would not significantly impact operations when combined with the infrastructure improvements that are planned as part of the use permit modification request, additional recommendations set forth herein, and participation in any future network improvement funding program that may be implemented by the County as outlined in the policies of the General Plan Update.

In addition to operational analyses, this report evaluated the Zinfandel Lane/Wheeler Lane intersection for installation of turn lanes. Based on the Napa County warrants, the existing and future volumes are above the threshold levels for installation of a left turn lane on Zinfandel Lane. It is our understanding that installation of a left turn lane is included as part of the modification request.

Several other recommendations to help reduce vehicle trips and address any potential parking issues associated with large events have also been presented.

Forecast cumulative volume increases based on the Napa County General Plan Update travel model are quite large. Historical volume data for previous years indicates volumes are not increasing at the forecasted rate. However, the County has adopted measures to proactively address potential volume growth. Such measures include trip reduction strategies and possible implementation of a traffic impact fee. If enacted, the project should contribute a fair share as determined within the guidelines of the measure towards future circulation improvements.

I trust that this report responds to your needs. Please feel free to call me with any questions or comments after your review.

Sincerely,



George W. Nickelson, P.E.
OMNI-MEANS, Ltd.
Engineers & Planners

R1557TIA002.doc/35-5629-01

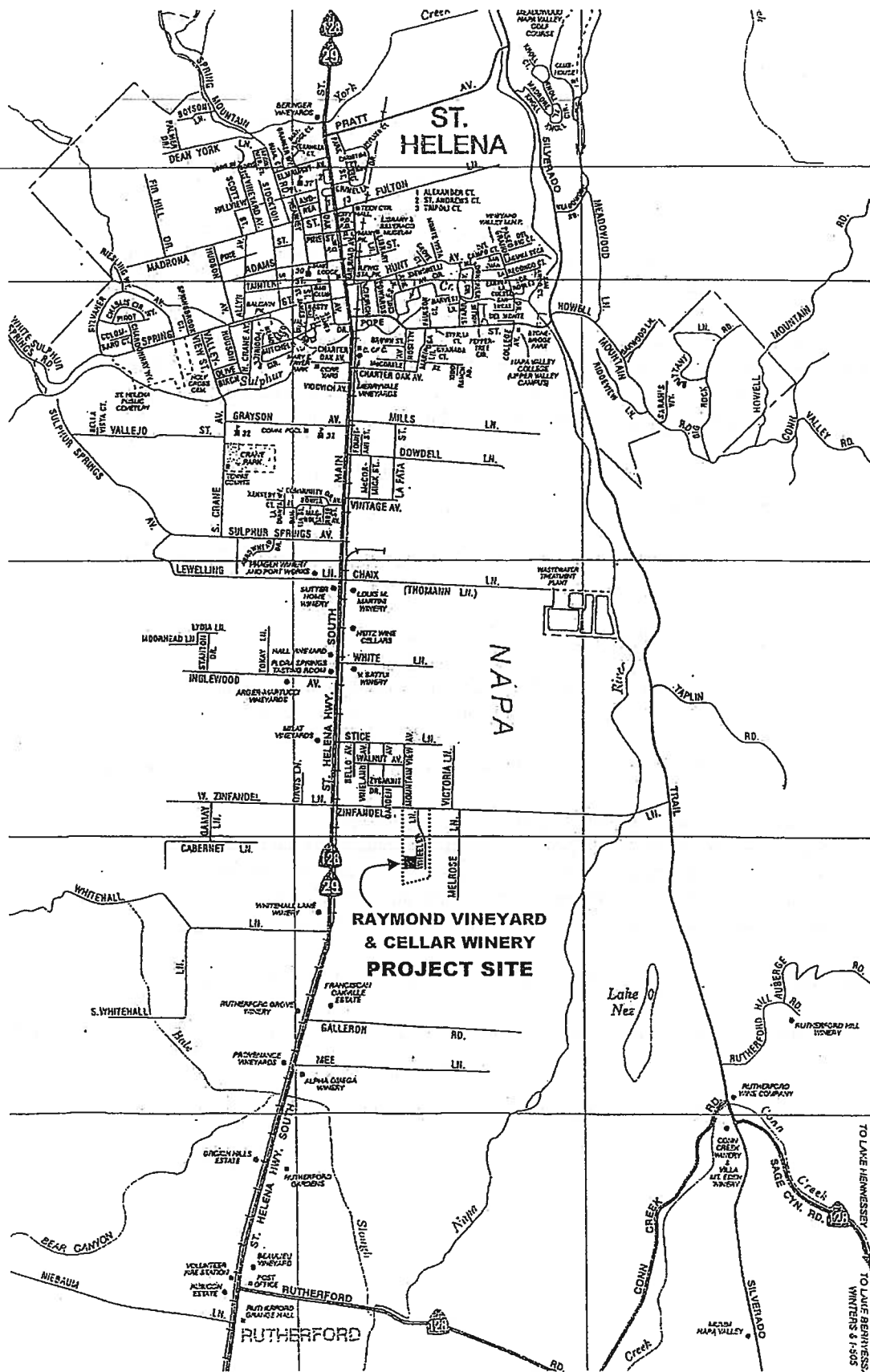
I. INTRODUCTION

This report presents a focused traffic analysis for the proposed Raymond Vineyards Winery Use Permit Modification (#P11-00156) to the current use permit for the winery located at 849 Zinfandel Lane in Napa County. (The site location and project vicinity is shown in Figure 1). This updated report reflects additional data and analyses based on further project information and comments received for the prior traffic study ("Traffic Analysis for the Raymond Vineyards Winery Expansion Project" dated November 16, 2011) submitted in November, 2011. This study also expands the analyses to include the additional scenarios of near term conditions (approved development) and cumulative (Buildout 2030) conditions, in addition to the existing conditions.

Information and data from the original study was supplemented with new information where available. The new information was derived from multiple sources, including a combination of Napa County guidelines, winery data, and field conducted surveys. The original information was substituted with new information when it was felt the new information provided more accurate or up-to-date data for the analysis.

The proposed use modification request (referred to as the "project") consists of modifying the current use permit to include the following primary traffic generating components:

- Increase visitation by 100 by-appointment to 500 total daily visitors (400 public and 100 by-appointment only);
- Increase the number of employees by 66 from 24 to 90;
- Increase production from 750,000 gallons per year as averaged over any consecutive three (3) year period not to exceed 900,000 gallons in any given year, to 1.5 million gallons per year;
- Modify an existing marketing plan for 50 additional events annually with a maximum of 8 per month to allow:
 - 2 events per year for up to 500 people (2 evening events);
 - 4 events per year for up to 250 people (3 evening events and 1 daytime event);
 - 6 events per year for up to 150 people (3 evening and 3 daytime events);
 - 12 events per year for up to 100 people (8 evening and 4 daytime events);
 - 26 per year for up to 50 people (18 evening and 8 daytime events).
- Increase the supply of permanent striped parking spaces to 130 total spaces.
- Construction of a left turn lane on Zinfandel Lane for the Wheeler Lane (winery access) intersection.



**RAYMOND VINEYARD
& CELLAR WINERY
PROJECT SITE**



omni-means

Project Vicinity Map



figure 1

2. SETTING

Site Location

The Raymond Vineyards Winery is located at 849 Zinfandel Lane, approximately one-third of a mile east of State Route 29-128 in Napa County. The winery is accessed via Wheeler Lane which extends south from Zinfandel Lane. In addition to the winery facility, Wheeler Lane serves four private residences located between Zinfandel Lane and the winery

Zinfandel Lane is a two lane undivided rural arterial road oriented in an east-west direction across the Napa Valley connecting State Route 29-128 and Silverado Trail. Zinfandel Lane is straight and flat with 11-12 foot wide travel lanes and 2-4 feet wide paved shoulders. The road is bordered by a combination of flat unpaved areas and sloped drainage swales. The speed limit for Zinfandel Lane is 45 mph (which has been reduced from a 55 mph speed limit that was active at the time of the original traffic study). The Zinfandel Lane/Wheeler Lane intersection consists of single lane approaches with stop sign control for the Wheeler Lane approach. There is a private residential driveway that forms the north leg of the intersection.

State Route 29-128 (referred to as SR 29) is the primary north-south vehicular route through the Napa Valley region. Within the project vicinity it is a flat, straight two lane rural arterial road with 12 foot wide lanes and interspersed with sections that are undivided (double yellow centerline) and sections containing a center turn lane and/or left turn lane pockets. The speed limit is 45 mph near the Zinfandel Lane intersection. The Zinfandel Lane/SR 29 intersection has single lane approaches on Zinfandel Lane which are stop sign controlled. SR 29 has separate left turn lane pockets on the approaches to the intersection.

In addition to the winery, the surrounding land uses are comprised of a mix of vineyards, other wineries, and private residences. To the west, a residential community of approximately 100 homes is located on the north side of Zinfandel Lane between the Raymond winery and SR 29. Properties to the east of Wheeler Lane are distributed individually along both sides of Zinfandel Lane with access via private driveways or access roads.

Level of Service Concept

Traffic operating conditions are measured by Level of Service (LOS), which applies a letter ranking to successive levels of roadway and intersection traffic performance. LOS 'A' represents optimum conditions with free-flow travel and no congestion. LOS 'F' represents congested conditions with longer delays. When applied to unsignalized intersections, the LOS measurements refer to the stop-controlled minor street approaches and the major street's turning movements. (A more detailed explanation of LOS definitions is provided in Table A-1 in the Appendix.)

Napa County Significance Criteria

The County of Napa's significance criteria has been based on a review of the Napa County Transportation & Planning Agency and Napa County General Plan documentation on roadway and intersection operations. Specifically, the Circulation Element of the County's General Plan outlines the following significance criteria specific to operations:

- 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.
- The County shall seek to maintain a Level of Service D or better at all signalized intersections, except where the level of service already exceeds this standard (i.e. Level of Service E or F) and where increased intersection capacity is not feasible without substantial additional right-of-way.
- 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.

Further significance criteria are based on County and CEQA guidelines and apply mainly to intersection operation and access. A significant impact occurs if project traffic would result in the following:

- Cause an increase in traffic which is substantial in relation to existing traffic load and capacity of the street system (i.e. result in a substantial increase in either the number of vehicle trips, the volume capacity ratio on roads, or congestion at intersections);
- Exceed either individually or cumulatively, an LOS standard established by the county congestion management agency for designated roads or highways;
- Result in a change of traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks;
- Substantially increase hazards due to a design feature (e.g. sharp curves or dangerous intersections) or incompatible uses (e.g. farm equipment);
- Result in inadequate emergency vehicle access;
- Project site or internal circulation on the site is not adequate to accommodate pedestrians and bicycles.

3. EXISTING TRAFFIC CONDITIONS

Existing Traffic Operations

In consultation with County staff, it was determined the traffic study would evaluate LOS operating conditions on Zinfandel Lane at the Zinfandel Lane/Wheeler Lane (project access) intersection and the Zinfandel Lane/SR 29 intersection. In order to evaluate existing conditions and establish baseline volumes for future traffic growth, daily traffic volume counts were conducted on Zinfandel Lane and peak period traffic counts were conducted on Zinfandel Lane at the study intersections. This updated study also included peak hour turning counts at the intersections between Wheeler Lane and SR 29.

The daily traffic volume counts (January 2011) identified a weekday average volume of 2,665 vehicles and a weekend average of 1,342 vehicles on Zinfandel Lane west of the project site.⁽¹⁾ A review of the California State Highway Department (Caltrans) volume data on SR 29 near Zinfandel Lane indicates year-to-year volumes have remained essentially unchanged for several years (or declined). Therefore it was determined that the daily counts remain applicable to the traffic study.

However, volumes within a single year are typically somewhat higher during the summer travel season. Based on the most recent Caltrans data for 2011, the peak month volumes were about 108% of an average month.⁽²⁾ Thus peak month daily volumes are likely closer to 2,880 on weekdays and 1,450 on weekends.

Napa County daily volume thresholds for LOS are provided in Table A-2 in the Appendix. The existing weekend daily volumes on Zinfandel Lane are equivalent to LOS 'A' conditions (less than 2,600 ADT) and the weekday volumes are just above the minimum level of the LOS 'B' range (2,600-5,300 ADT) for a rural arterial.

Daily volumes for SR 29 were derived from Caltran's most recent Caltrans records (Year 2011). State Route 29 north of Zinfandel Lane has an average daily traffic volume of 22,500 vehicles and a peak month daily traffic volume of 24,300 vehicles.⁽³⁾ These volumes are approaching the roadway's capacity based on the Napa County volume standards and would be categorized in the LOS 'E-F' range (greater than 22,300 ADT for a two lane rural arterial).

Although the volume levels indicate degraded levels of service, other factors contribute to the degraded conditions. At times, vehicle queuing of traffic on SR 29 extends south from downtown St. Helena to beyond Zinfandel Lane. At these times the queuing diminishes operating conditions at all intersections on SR 29, including Zinfandel Lane.

In order to identify peak hour conditions at the study intersections, traffic turning counts were conducted during a weekday PM commute period and a Saturday afternoon.⁽⁴⁾ The counts were originally conducted in October 2011. The counts occurred during the harvest season when there are increased employee and production vehicle trips. However, for comparison, new counts were also conducted during the summer season (August 2012) to account for summer season conditions. The new counts also surveyed turning volumes at the intersections on Zinfandel Lane between Wheeler Lane and SR 29. The new counts also differentiated the winery trips from the single family residence trips on Wheeler Lane.

The fall season and summer season volumes were within five percent of each other. The number of existing Raymond winery trips were also similar, but there were two to five additional peak hour winery trips observed during the summer counts compared to the autumn counts. Therefore, the more recent August 2012 counts were utilized for this study. The peak hour volumes within the weekday and weekend peak period counts were identified and are shown in Figure 2.

During the peak hour of the counts, no residential trips were observed for the four private residences located along Wheeler Lane. (There is a new unit under construction in addition to the three units identified in the original study.) Institute of Transportation Engineers (ITE) data for single family dwelling units identifies one peak hour trip per unit and 10 daily trips.⁽⁵⁾ Therefore, four peak hour trips were added to the surveyed peak hour volumes in order to account for potential private residence trips.

The existing peak hour LOS conditions at the study intersections are shown in Table 1. The Zinfandel Lane/Wheeler Lane intersection operates at LOS 'A' (9.8 seconds of delay) during the weekday and LOS 'B' (10.1 seconds of delay) during the weekend for the northbound Wheeler Lane approach. The intersection operates efficiently with minimal delays or vehicle queuing. (Vehicle queuing analyses were conducted for all scenarios and are provided in the Appendix.)

The Zinfandel Lane/SR 29 intersection has weekday p.m. peak hour operating conditions of LOS 'E' (38.7 seconds delay) for the stopped westbound approach and LOS 'D' (31.0 seconds delay) for the stopped eastbound Zinfandel Lane approach. During the Saturday peak hour, the intersection has calculated operating conditions of LOS 'F' for the Zinfandel Lane approaches (delays in excess of 50 seconds). The SR 29 northbound and southbound left turn movements operate at LOS 'B' (10 seconds delay) or better.

As described above, conditions at the Zinfandel Lane/SR 29 intersection result partially from the volumes on SR 29 and partially from vehicle queues that originate away from the intersection. During periods when traffic volumes on SR 29 are high but relatively free-flow, turning opportunities from Zinfandel Lane and all side streets along SR 29 can be limited. This can result in vehicle queues on westbound Zinfandel Lane occasionally increasing to five to nine vehicles. However, when stop-and-go conditions exist on SR 29, turning opportunities increase as a portion of drivers on SR 29 leave gaps for Zinfandel Lane motorists to turn

through. Therefore, there are also periods when actual conditions are better than the calculated conditions would indicate. The queuing analysis calculated a 95th percentile queue length of 64-99 feet (three to five vehicles) for westbound Zinfandel Lane.

Peak Hour Signalization Warrants

The existing Zinfandel Lane/SR 29 volumes were applied to California Manual on Uniform Traffic Control Devices (CAMUTCD) peak hour signal warrants.⁽⁶⁾ The peak hour warrants are one of several standards to help determine if installation of a traffic signal is appropriate. Qualifying for signalization using the peak hour warrants does not necessarily mean signals should be installed.

The Zinfandel Lane/SR 29 intersection qualifies for signalization under the peak hour warrants using existing weekday and Saturday peak hour volumes. (The warrant graphs are provided in the Appendix). With signalization, the intersection would operate at LOS 'B' (13 seconds delay or less) during the weekday and weekend peak hours.

Turn Lane Warrants (Existing Conditions)

The existing volumes were compared with the Napa County guidelines for installing a left turn lane in Zinfandel Lane.⁽⁷⁾ The warrant graphs for weekday and Saturday conditions are provided in the Appendix. With 203-339 daily trips on Wheeler Lane (including 40 private residence trips) and 1,450-2,880 daily trips on Zinfandel Lane, a left turn lane would be warranted based on existing volumes.

The right turn volumes were compared to Caltrans warrants for installation of right turn lanes.⁽⁸⁾ Volumes at the Zinfandel Lane/Wheeler Lane intersection are below minimum thresholds at which right turn lanes would be required (right turn lane warrant graphs are included in the Appendix).

**TABLE 1
EXISTING PEAK HOUR INTERSECTION OPERATIONS
LEVEL OF SERVICE (LOS) AND SECONDS OF DELAY**

| Intersection | Weekday PM Peak Hour | | Saturday Afternoon Peak Hour | |
|--|----------------------|----------------|------------------------------|----------------|
| | Existing LOS | Existing Delay | Existing LOS | Existing Delay |
| 1. Zinfandel Lane / Wheeler Lane <i>Unsignalized (minor street stop)</i> | | | | |
| Wheeler Lane northbound approach: | A | 9.8" | B | 10.1" |
| Zinfandel Lane westbound approach: | A | < 1" | A | < 1" |
| 2. Zinfandel Lane / SR 29 <i>Unsignalized (minor street stops)</i> | | | | |
| Zinfandel Lane westbound approach: | E | 38.7" | F | > 50" |
| Zinfandel Lane eastbound approach: | D | 31.0" | F | > 50" |
| SR 29 southbound approach: | A | < 1" | B | 10.1" |
| SR 29 northbound 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 an LOS and vehicle delay in seconds.

Existing Winery Traffic Generators

At the request of the County, the existing winery traffic volumes were identified by source for employee, visitor, and truck related traffic. The winery data was provided by winery personnel.⁽⁹⁾ The existing trip calculations are shown in Table 2.

The recent peak hour counts observed 32 weekday p.m. trips (4 in, 28 out) and 42 Saturday peak hour trips (16 in, 26 out) generated by winery. These are very similar to the previous counts which surveyed 30 weekday p.m. and 37 Saturday peak hour trips. (The proportion of inbound to outbound trips was different for the original weekday p.m. counts, with 11 inbound and 19 outbound trips, which is reflective of the increased evening crush season activity that was occurring at the time.) For this study, the daily total number of people onsite was obtained for when the counts were conducted. Applying the peak hour counts to the number of people results in peak hour trip rates ranging from 0.21-0.25 peak hour trips per person.

Winery Truck Trips

At the County's request, detailed truck trip information associated with the existing winery production was obtained for the traffic study. All truck related information was provided by Raymond Winery personnel.⁽¹⁰⁾ Truck traffic is generated by the winery throughout the year at a fairly consistent level for normal production processes and additional truck trips are generated during the shorter "crush" or harvest season.

Based on the data provided by the winery, truck traffic is generated by the following types of trucks with the following capacities:

Bottling trucks comprised of glass trucks (2,352 cases) and cased goods trucks (1,232 cases);
Bulk tanker trucks (6,500 gallons);
Grape trucks (15-24 tons);
Winery supply trucks (gas, nutrients, chemicals);
and miscellaneous Delivery trucks (small six wheeled vehicles or vans) for bottling supplies.

The winery has stated that production levels have varied historically, which necessarily influences the number of truck trips generated. For this study, the County has asked for the truck trips to be evaluated with the most recent winery production activity. The winery has provided the following annual truck trip generation data associated with just under 1,500,000 gallons produced in year 2012:

| | |
|-------------------------|--------------------------|
| # Bottling Trucks: | 776 |
| # Bulk Trucks: | 183 |
| Grape Trucks: | 191 |
| Supply Trucks: | 52 (1/week est.) |
| <u>Delivery Trucks:</u> | <u>208 (4/week est.)</u> |
| Total | 1,410 trucks annual |

General winery production trips occur throughout the year and additional trips are temporarily generated during the crush season when grapes are harvested and delivered to wineries. Based on the information provided by Raymond Winery, the seasonal truck trips were calculated as follows:

| | |
|---------------------|---|
| Non-Harvest: | 1,219 annual trucks / 260 days = 4.69 trucks/day x 2 trips = 9.38 daily trips |
| Additional Harvest: | 191 seasonal trucks / 36 days = 5.31 trucks/day x 2 trips = 10.62 daily trips |
| Total Harvest: | 10.00 trucks/day x 2 trips = 20.00 daily trips |

The historical truck trip generation is lower than some standard trip rate calculators would generate for the same production and grape on-haul figures. The winery utilizes larger capacity trucks compared to the sizes used in standard rate assumptions which are typically in the range of four to ten ton trucks.

Truck Travel Routes

The winery personnel stated that the travel routes of nearly all trucks to/from the winery are via SR 29 south of Zinfandel Lane, as the winery warehouse is located in the city of American Canyon. It is reasonable to assume a smaller number of trucks travel to/from the east via Zinfandel Lane and Silverado Trail as a result of delivery and supply trucks combining deliveries to the Raymond winery with other locations in the area to the east. It is noted that to the extent trucks make multiple stops, although they are new trips to the Raymond site, they are not new trips on the overall street network since they are already present making deliveries to other locations.

TABLE 2
EXISTING CONDITIONS TRIP GENERATION:
RAYMOND VINEYARDS WINERY

| | |
|---|-----------------------------------|
| <u>Typical Weekday Daily Traffic:</u> | |
| 80 visitors/2.6 per vehicle x 2 one-way trips | = 62 daily trips |
| 65 full time employees x 3.05 one-way trips | = 198 daily trips |
| 15 part time employees x 1.90 one-way trips | = 29 daily trips |
| 4.69 trucks x 2 one-way trips (winery data) ^a | = 10 daily trips |
| Typical Weekday Daily Trips | = 299 total daily trips |
| | |
| <u>Typical Weekday PM Peak Hour Traffic:</u> | |
| Typical Weekday Peak Hour Trips (survey data = 32 trips) | = 32 trips (4 in, 28 out) |
| | |
| <u>Typical Saturday Daily Traffic:</u> | |
| 180 visitors/2.8 per vehicle x 2 one-way trips | = 129 daily trips |
| 5 full time employee x 3.05 one-way trips | = 15 daily trips |
| 10 part time employees x 1.90 one-way trips | = 19 daily trips |
| Typical Saturday Daily Trips | = 163 total daily trips |
| | |
| <u>Typical Saturday Peak Hour Traffic:</u> | |
| Typical Saturday Peak Hour Trips (survey data = 42 trips) | = 42 trips (16 in, 26 out) |
| | |
| <u>Saturday Daily Traffic During Crush:</u> | |
| 180 visitors/2.8 per vehicle x 2 one-way trips | = 129 daily trips |
| 20 full time employees x 3.05 one-way trips | = 61 daily trips |
| 20 part time employees x 1.90 one-way trips | = 38 daily trips |
| 4.69 trucks x 2 one-way trips (winery data) | = 10 daily trips |
| 5.31 trucks x 2 one-way trips (2,530 tons on-haul) ^b | = 11 daily trips |
| Saturday Daily Harvest/Crush Trips | = 249 total daily trips |
| | |
| <u>Weekend (Saturday) Peak Hour Traffic During Crush:</u> | |
| Harvest Weekend Peak Hour Trips (220 persons x .25 trips/person) | = 55 trips (22 in, 33 out) |

Production, visitor, and employee. data provided by Raymond Winery personnel.

Truck data provided by Raymond Winery personnel.

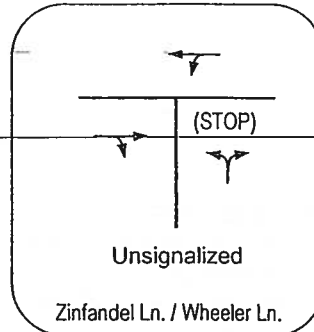
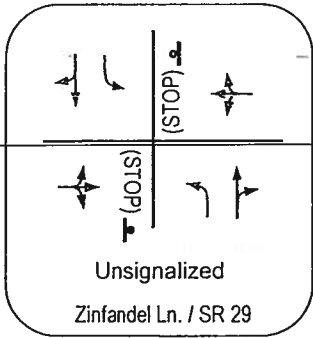
Trip equations for employee and visitor daily trips from Napa County, Conservation, Planning, & Development Department, "Use Permit Application Package", Napa County Winery Traffic Generation Characteristics, 2012.

Peak hour volumes based on surveyed turning movement counts.

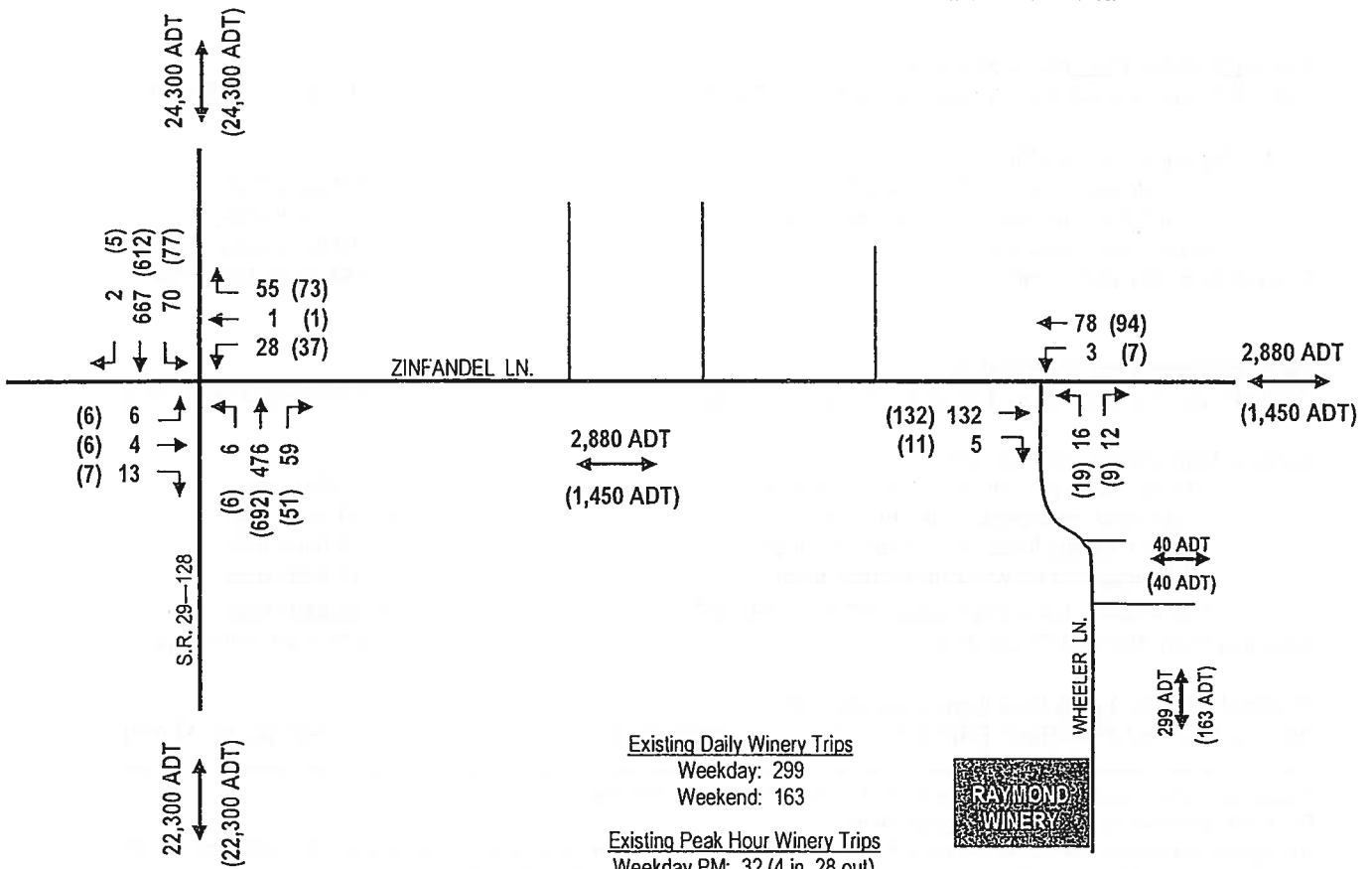
^a*Typical daily truck trips, based on provided winery data, equals 4.69 trucks.*

^b*Prior on-haul, based on provided winery data, equals 15-24 tons per truck.*

GEOMETRIES / CONTROLS



Existing geometries assumed for all future volume scenarios.



Existing Daily Winery Trips

Weekday: 299
Weekend: 163

Existing Peak Hour Winery Trips

Weekday PM: 32 (4 in, 28 out)
Weekend: 42 (16 in, 26 out)

NOT TO SCALE



Existing Weekday PM and (Weekend) Peak Hour Volumes



4. WINERY TRIP GENERATION METHODOLOGY FOR PROPOSED PROJECT

Trip Generation

In light of the updated traffic study and the additional data that was collected, vehicle trips for the project were calculated using Napa County standard trip rates as well as surveyed data and information provided by the winery.

The winery provided information regarding employees, visitors, and production for weekday and weekend conditions. The County's standard default trip rates were used for employee and visitor daily trip calculations. The peak hour trip rates were derived from the rates surveyed at the winery. The surveyed peak hour trip rates ranged from 0.21-0.25 trips per daily person onsite. In order to remain conservative, the highest rate of 0.25 trips per total daily people onsite was applied to calculate the use permit peak hour trips.

For the truck trips calculations, the winery's historic truck counts for year 2012 were used to identify the existing trips. The Raymond winery is a larger production facility whose historic data indicates it utilizes larger trucks capable of carrying more load than would be typical of smaller wineries. The bulk tanker trucks carry 6,500 gallons and grape truck sizes have ranged from 15-24 tons, which is considerably higher than standard rates of four tons per load. However, in order to conservatively provide for the possibility that a higher proportion of future deliveries could be via smaller trucks used by the winery, the size of the grape trucks was assumed to be the lowest value of 15 tons per truck for the future trip calculations.

Winery Trips Distribution

The distribution of the project trips on the street network was based on the existing peak hour turning movements at the Zinfandel Lane/Wheeler Lane intersection. Data from the counts in 2011 and 2012 for weekday and weekend were evaluated. Based on the observed turning percentages, the project trips were distributed with 70% to/from the west and 30% to/from the east on Silverado Trail. Turn distributions at the Zinfandel Lane/SR 29 intersection were based on the existing turning percentages.

5. CURRENT USE PERMIT CONDITIONS

Current Use Permit Description

Traffic volumes were generated and conditions analyzed for complete utilization of the current permitted use. The current use permit traffic generating components are summarized as follows:⁽¹¹⁾

- Maximum daily visitation of 400 visitors (public).
- Employment of 24 persons.
- Winery production:
750,000 gallons averaged over three years with a single year maximum of 900,000 gallons.
- Marketing Events: Largest event up to 250 people.

Total Current Use Permit Trip Generation

The vehicle trips calculated for the current use permit are listed in Table 3. With complete utilization of the current use permit, the winery would generate up to 205 weekday daily trips and 46 weekday peak hour trips (6 in, 40 out). On a typical Saturday the winery could generate 320 daily trips and 104 afternoon peak hour trips (40 in, 64 out). During the six-week harvest season with complete utilization of the current use permit, the winery could generate 414 daily trips and 110 peak hour trips (42 in, 68 out).

Net New Trips Above Existing Volumes With Current Use Permit

The existing volumes, total current use permit volumes, and net change in trips associated with complete utilization of the current use permit are shown in Table 4.

The net change in trips from existing conditions would be 94 *fewer* weekday trips and 157 new Saturday daily trips. There would be a small increase of 14 trips during the weekday p.m. peak hour and the Saturday peak hour would experience 62 new trips assuming complete utilization of the current use permit. The Saturday volumes would be higher due to the larger number of visitors.

**TABLE 3
TRIP GENERATION:
CURRENT USE PERMIT FOR RAYMOND WINERY**

| | |
|--|------------------------------------|
| <u>Typical Weekday Daily Traffic:</u> | |
| 160 visitors/2.6 per vehicle x 2 one-way trips | = 123 daily trips |
| 24 full time employees x 3.05 one-way trips | = 73 daily trips |
| 900,000 gallons single year maximum (winery data = 4.41 trucks/day x 2 trips) ^a | = <u>9 daily trips</u> |
| Typical Weekday Daily Trips | = 205 total daily trips |
| <u>Typical Weekday PM Peak Hour Traffic:</u> | |
| Typical Weekday PM Peak Hour Trips (184 persons x .25 trips/person) | = 46 trips (7 in, 39 out) |
| <u>Typical Saturday Daily Traffic:</u> | |
| 400 visitors/2.8 per vehicle x 2 one-way trips | = 286 daily trips |
| 5 full time employee x 3.05 one-way trips | = 15 daily trips |
| 10 part time employees x 1.90 one-way trips | = <u>19 daily trips</u> |
| Typical Saturday Daily Trips | = 320 total daily trips |
| <u>Typical Saturday Peak Hour Traffic:</u> | |
| Typical Saturday Peak Hour Trips (415 persons x .25 trips/person) | = 104 trips (40 in, 64 out) |
| <u>Saturday Daily Traffic During Crush:</u> | |
| 400 visitors/2.8 per vehicle x 2 one-way trips | = 286 daily trips |
| 20 full time employees x 3.05 one-way trips | = 61 daily trips |
| 20 part time employees x 1.90 one-way trips | = 38 daily trips |
| 900,000 gallons production single year (winery data = 4.41 trucks/day x 2 trips) | = 9 daily trips |
| 5,455 tons on-haul grapes / 15 tons per truck / 36 days x 2 trips ^b | = <u>20 daily trips</u> |
| Saturday Daily Harvest/Crush Trips | = 414 total daily trips |
| <u>Weekend (Saturday) Peak Hour Traffic During Crush:</u> | |
| Harvest Saturday Peak Hour Trips (440 persons x .25 trips/person) | = 110 trips (42 in, 68 out) |

Production, visitor, and employee data provided by Raymond Winery personnel.

Truck data provided by Raymond Winery personnel.

Trip equations for daily visitor and employee trips derived from Napa County, Conservation, Planning, & Development Department, "Use Permit Application Package", Napa County Winery Traffic Generation Characteristics, 2012.

Peak hour trip rate based on surveyed turning movement counts.

^a*Typical daily truck trips, based on provided winery data, equals 4.41 trucks for 900,000 gallons.*

^b*Prior on-haul, based on provided winery data, equals 15-24 tons per truck. (Calculated truck trips conservatively assumes a maximum of 15 tons per truck for future deliveries.)*

TABLE 4
RAYMOND WINERY TRIPS:
EXISTING, EXISTING + CURRENT USE PERMIT, AND NET NEW TRIPS

| Condition | Average Weekday | | Average Saturday | | Harvest Season Saturday Daily Trips |
|--------------------------|-----------------|-----------------------|------------------|--------------------|---|
| | Daily Trips | P.M. Pk. Hr. Trips | Daily Trips | Peak Hour Trips | |
| Existing Winery Trips | 299 | 32 (4, 28) | 163 | 42 (16, 26) | 249 |
| Current Use Permit Trips | 205 | 46 (7, 39) | 320 | 104 (40, 64) | 414 |
| Net Trips | -94 | 14 (3, 11) | 157 | 62 (24, 38) | 165 |

Existing Plus Current Use Permit Operating Conditions

Net new daily volumes based on the current use permit would result in fewer weekday trips on Zinfandel Road than are occurring now. The daily traffic would decrease from 2,825 trips to 2,731 trips. The Saturday daily volume would increase from 1,425 trips to 1,582 trips. The existing plus current use permit volumes are shown in Figure 3.

The levels of service would remain unchanged from existing conditions. Zinfandel Lane would continue to function at LOS 'B' on weekdays and LOS 'A' on weekends.

At the Zinfandel Lane/Wheeler Lane intersection, the Wheeler Lane approach would continue to operate at LOS 'A'-'B' during the weekday and weekend peak hours (10 seconds of delay).

At the Zinfandel Lane/SR 29 intersection, the Zinfandel Lane approaches would continue to operate at LOS 'E' weekdays and 'F' on Saturday. The SR 29 northbound and southbound left-turn lane movements would continue to operate at LOS 'A'-'B' (10 seconds of delay or less) or better during the weekday and weekend peak hours. The peak hour LOS are shown in Table 5.

The intersection volumes would qualify for signalization based on the peak hour warrants. With signalization the intersection would operate LOS 'B' (12-13 seconds of delay).

The current use permit volumes were compared with the Napa County guidelines for installing a left turn lane in Zinfandel Lane. With 245-360 daily trips on Wheeler Lane (including 40 private residence trips) and 1,560-2,851 daily trips on Zinfandel Lane, a left turn lane would be warranted based on volumes associated with complete utilization of the current use permit.

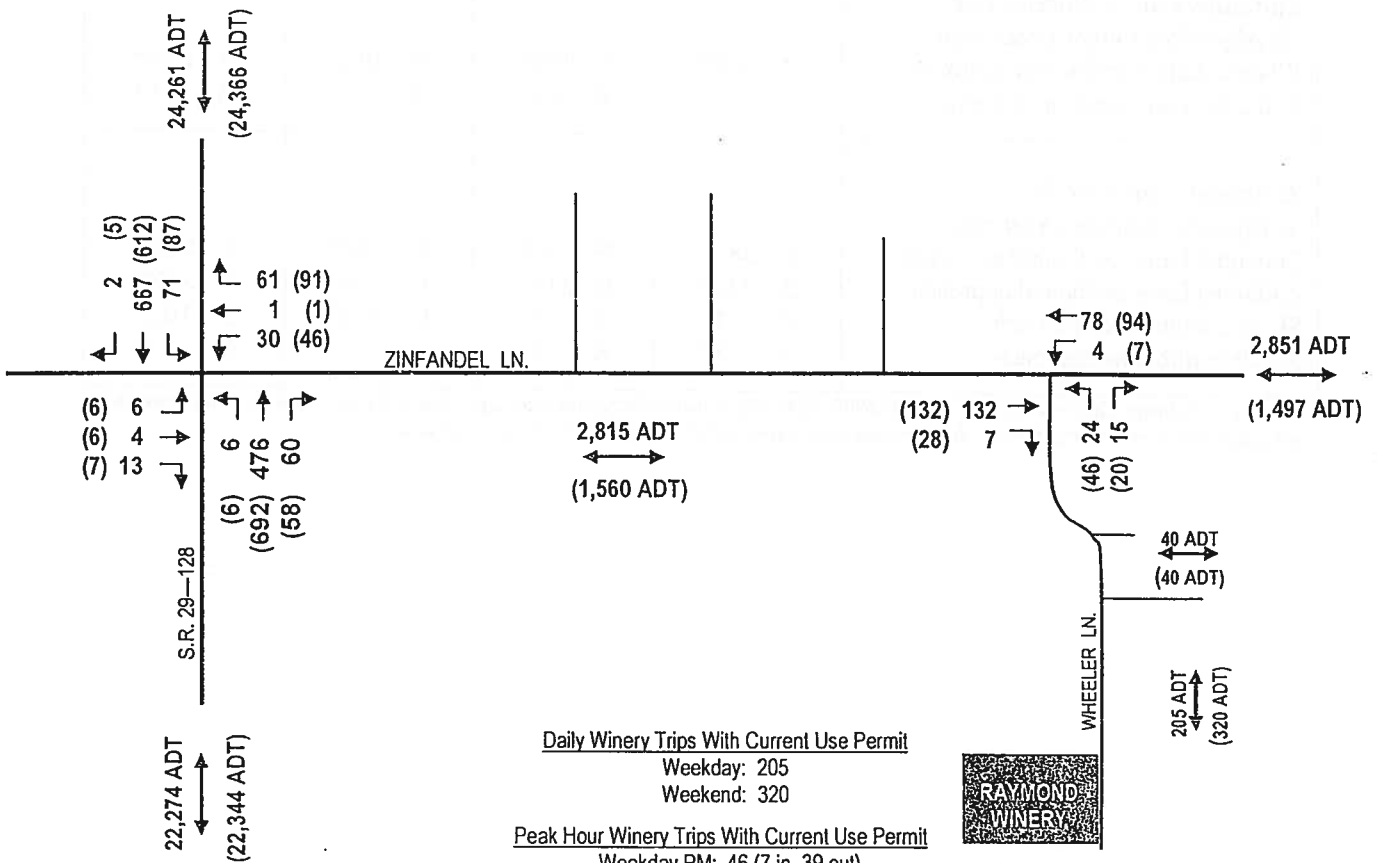
The projected right turn volumes at the site driveways would be below minimum thresholds at which right turn lanes would be required.

TABLE 5

EXISTING AND EXISTING + CURRENT USE PERMIT PEAK HOUR INTERSECTION OPERATIONS
LEVEL OF SERVICE (LOS) AND SECONDS OF DELAY

| Intersection | Weekday PM Peak Hour | | Saturday Afternoon Peak Hour | |
|---|--|--|---|--|
| | Existing LOS Delay | Existing + Current Use Permit LOS Delay | Existing LOS Delay | Existing + Current Use Permit LOS Delay |
| Zinfandel Lane / Wheeler Lane <i>Unsignalized (minor street stop)</i> Wheeler Lane northbound approach Zinfandel Lane westbound approach | A 9.8" A < 1" | A 10.0" A < 1" | B 10.1" A < 1" | B 10.6" A < 1" |
| Zinfandel Lane / SR 29 <i>Unsignalized (minor street stops)</i> Zinfandel Lane westbound approach Zinfandel Lane eastbound approach SR 29 southbound approach SR 29 northbound approach | E 38.7" D 31.0" A < 1" A < 1" | E 40.7" D 31.6" A < 1" A < 1" | F > 50" F > 50" B 10.0" A < 1" | F > 50" F > 50" B 10.1" A < 1" |

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



Daily Winery Trips With Current Use Permit
 Weekday: 205
 Weekend: 320

Peak Hour Winery Trips With Current Use Permit
 Weekday PM: 46 (7 in, 39 out)
 Weekend: 104 (40 in, 64 out)



NOT TO SCALE



Existing With Current Use Permit
 Weekday PM and (Weekend) Peak Hour Volumes



6. PROPOSED USE PERMIT MODIFICATION

Project Description

The traffic generating components of the proposed use permit modification request (the “project”) are summarized as follows.⁽¹²⁾

- Increase visitation by 100 by-appointment to 500 total daily visitors (400 public and 100 by-appointment only);
- Increase the number of employees by 66 from 24 to 90;
- Increase production from 750,000 gallons per year as averaged over any consecutive three (3) year period not to exceed 900,000 gallons in any given year, to 1.5 million gallons per year;
- Modify an existing marketing plan for 50 additional events annually with a maximum of 8 per month to allow:
 - 2 events per year for up to 500 people (2 evening events);
 - 4 events per year for up to 250 people (3 evening events and 1 daytime event);
 - 6 events per year for up to 150 people (3 evening and 3 daytime events);
 - 12 events per year for up to 100 people (8 evening and 4 daytime events);
 - 26 per year for up to 50 people (18 evening and 8 daytime events).
- Increase the supply of permanent striped parking spaces to 130 total spaces.
- Construction of a left turn lane on Zinfandel Lane for the Wheeler Lane (winery access) intersection.

Project Trip Generation

The proposed winery traffic generation has been calculated in Table 6. The project was calculated to generate a total of 410 weekday daily trips and 73 weekday peak hour trips (12 in, 61 out). On a Saturday the project would generate a total of 403 daily trips and 130 afternoon peak hour trips (49 in, 81 out). During the six-week harvest season, the project would generate 498 daily trips and 136 peak hour trips (52 in, 84 out).

The net increase from existing conditions has been calculated and is shown in Table 7. The project would result in 111 new weekday and 240 new Saturday daily trips. The typical weekday p.m. peak hour volumes would increase 41 trips and the Saturday peak hour would experience 88 new trips with complete utilization of the proposed use permit. If truck sizes remain comparable to past deliveries, there would be no change in wine production truck trips from existing conditions. The total project trips and net new project trips above existing conditions are illustrated in Figure 4.

TABLE 6
PROPOSED USE MODIFICATION FOR RAYMOND WINERY
TOTAL TRIP GENERATION

| | |
|---|------------------------------------|
| <u>Typical Weekday Daily Traffic:</u> | |
| 200 visitors/2.6 per vehicle x 2 one-way trips | =154 daily trips |
| 65 full time employees x 3.05 one-way trips | =198 daily trips |
| 25 part time employees x 1.90 one-way trips | = 48 daily trips |
| 1,500,000 gallons production (winery data = 4.69 trucks/day x 2 trips) ^a | = <u>10 daily trips</u> |
| Typical Weekday Daily Trips | = 410 total daily trips |
| <u>Typical Weekday PM Peak Hour Traffic:</u> | |
| Typical Weekday PM Peak Hour Trips (290 people x .25 trips/person) | = 73 trips (12 in, 61 out) |
| <u>Typical Saturday Daily Traffic:</u> | |
| 500 visitors/2.8 per vehicle x 2 one-way trips | = 357 daily trips |
| 7 full time employee x 3.05 one-way trips | = 21 daily trips |
| 13 part time employees x 1.90 one-way trips | = <u>25 daily trips</u> |
| Typical Saturday Daily Trips | = 403 total daily trips |
| <u>Typical Saturday Peak Hour Traffic:</u> | |
| Typical Saturday Peak Hour Trips (520 people x .25 trips/person) | = 130 trips (49 in, 81 out) |
| <u>Saturday Daily Traffic During Crush:</u> | |
| 500 visitors/2.8 per vehicle x 2 one-way trips | = 357 daily trips |
| 22 full time employees x 3.05 one-way trips | = 67 daily trips |
| 23 part time employees x 1.90 one-way trips | = 44 daily trips |
| 1,500,000 gallons production (winery data = 4.69 trucks/day x 2 trips) | = 10 daily trips |
| 5,455 tons on-haul grapes / 15 tons per truck / 36 days x 2 trips ^b | = <u>20 daily trips</u> |
| Saturday Daily Harvest/Crush Trips | = 498 total daily trips |
| <u>Weekend (Saturday) Peak Hour Traffic During Crush:</u> | |
| Total Weekend Peak Hour Harvest Trips (545 people x .25 trips/person) | = 136 trips (52 in, 84 out) |

Production, visitor, and employee data provided by Raymond Winery personnel.

Truck data provided by Raymond Winery personnel.

Trip equations for daily visitor and employee trips derived from Napa County, Conservation, Planning, & Development Department, "Use Permit Application Package", Napa County Winery Traffic Generation Characteristics, 2012.

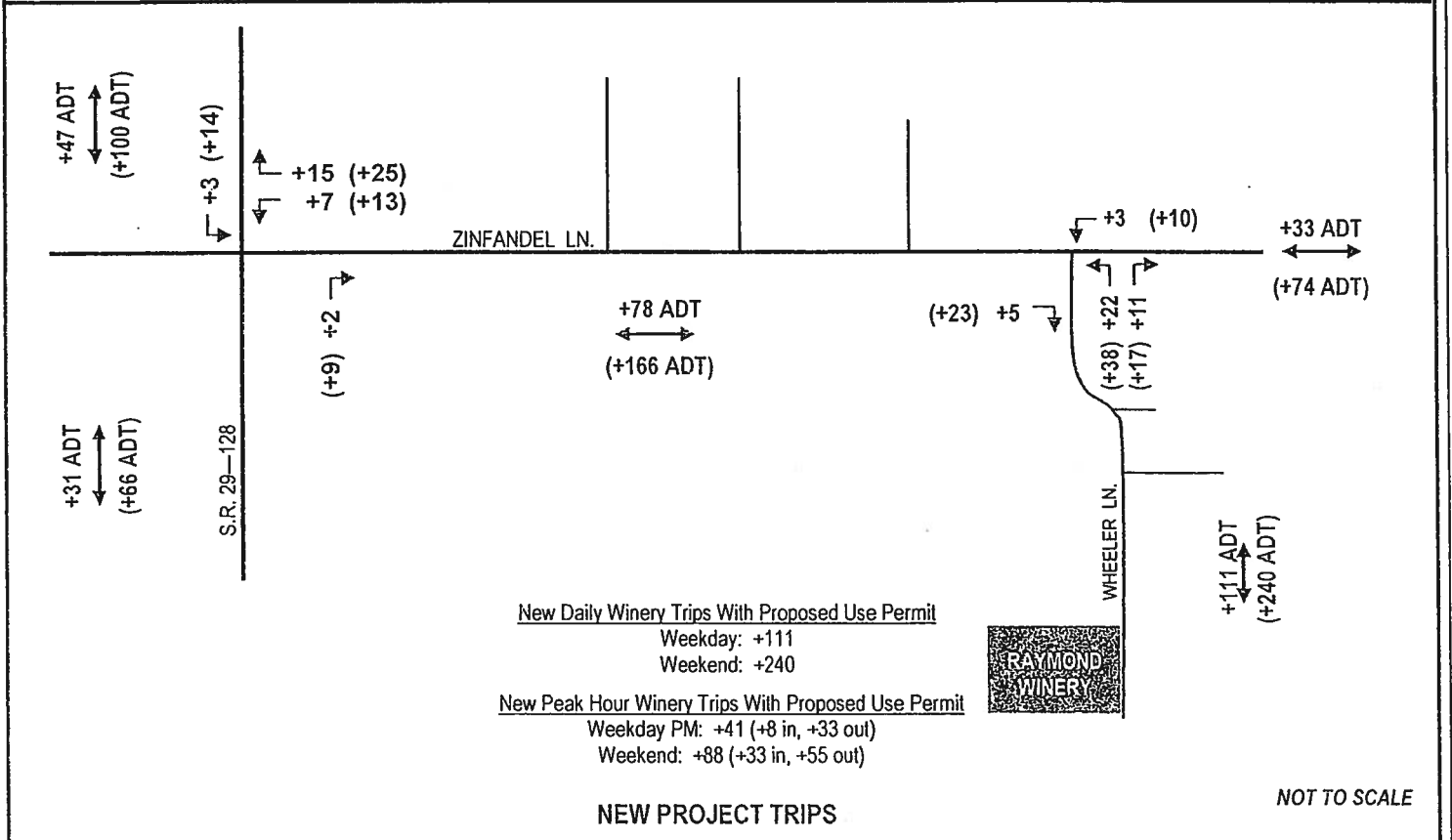
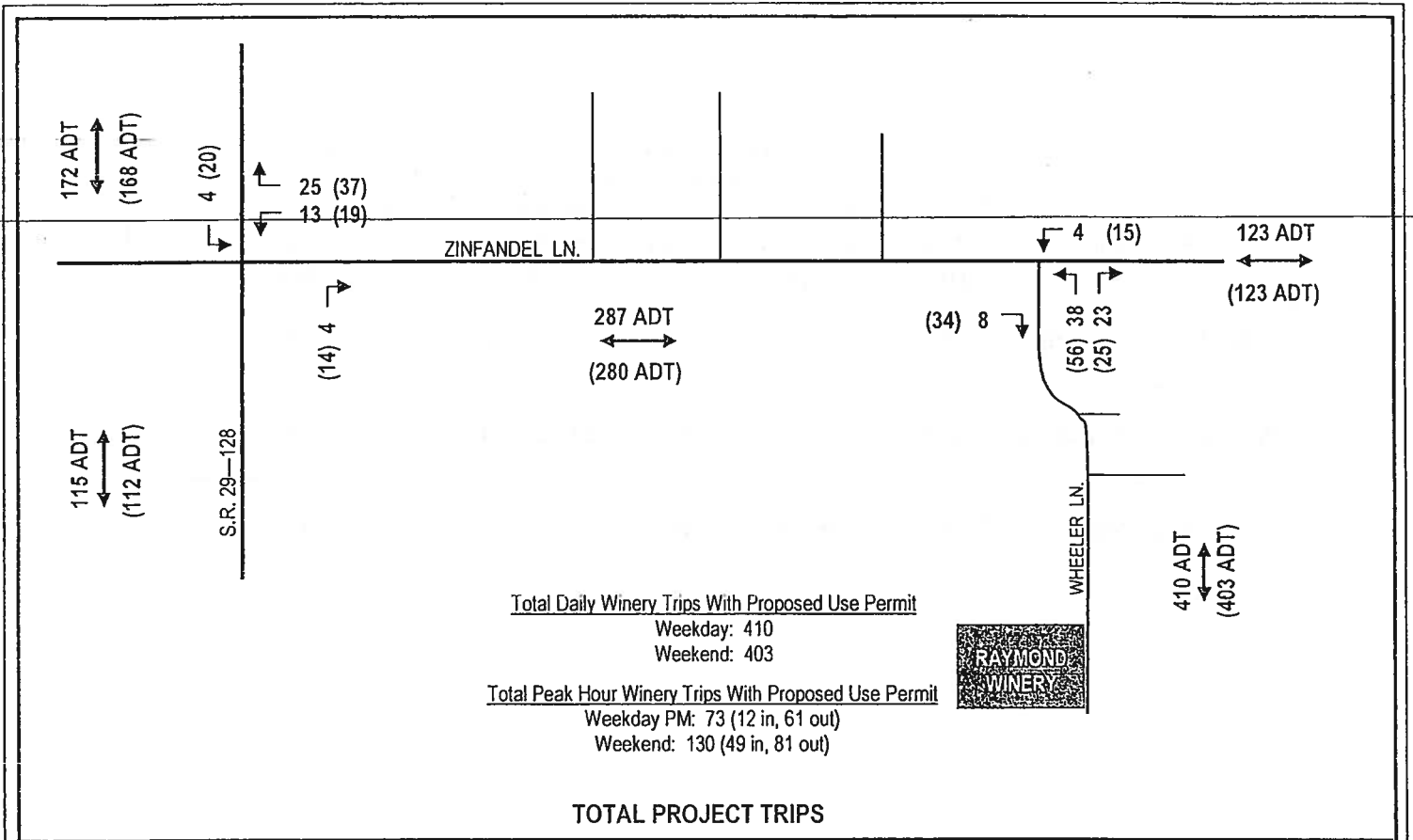
Peak hour volumes based on trip rates of surveyed turning movement counts.

^a*Typical daily truck trips, based on provided winery data, equals 4.69 trucks (10 trips).*

^b*Prior on-haul, based on provided winery data, equals 15-24 tons per truck. (Calculated truck trips conservatively assumes a maximum of 15 tons per truck for future deliveries.)*

**TABLE 7
RAYMOND WINERY TRIPS:
EXISTING, EXISTING + PROJECT, AND NET NEW TRIPS**

| Condition | Average Weekday | | Average Saturday | | Harvest Season Saturday |
|---------------------------|-----------------|--------------------|------------------|-----------------|-------------------------|
| | Daily Trips | P.M. Pk. Hr. Trips | Daily Trips | Peak Hour Trips | Daily Trips |
| Existing Winery Trips | 299 | 32 (4, 28) | 163 | 42 (16, 26) | 249 |
| Proposed Use Permit Trips | 410 | 73 (12, 61) | 403 | 130 (49, 81) | 498 |
| New Trips | 111 | 41 (8, 33) | 240 | 88 (33, 55) | 249 |



NOT TO SCALE



Total Project Trips and New Project Trips Above Existing Weekday PM and (Weekend) Peak Hour Volumes



7. EXISTING PLUS PROJECT CONDITIONS

Existing Plus Project Operating Conditions

The distribution of project trips would add 78 weekday and 166 Saturday daily trips onto Zinfandel Lane west of Wheeler Lane and 33 weekday and 74 Saturday daily trips onto Zinfandel Lane east of Wheeler Lane for typical days assuming 100% utilization of the proposed use permit modification. The Zinfandel Lane arterial levels of service would remain unchanged from existing conditions, functioning at LOS 'B' on weekdays and LOS 'A' on weekends.

The project would add 47 daily trips to SR 29 north of Zinfandel Lane and 31 trips south of Zinfandel Lane on typical weekdays. It would add 100 trips north and 66 trips south of Zinfandel Lane on typical Saturdays. LOS on SR 29 would remain unchanged from existing conditions, continuing to operate at LOS 'E'-'F'.

The peak hour conditions were evaluated for the study intersections on Zinfandel Lane and are listed in Table 8. At the Zinfandel Lane/Wheeler Lane intersection, the Wheeler Lane approach would operate at LOS 'B' during the weekday and weekend peak hours (11 seconds delay or less).

At the Zinfandel Lane/State Route 29 intersection, LOS would remain unchanged from existing conditions. The weekday Zinfandel Lane westbound approach would continue to operate at LOS 'E' and the eastbound approach would continue to operate at LOS 'D'. The Saturday peak hour Zinfandel Lane approaches would operate at LOS 'F' with increased delays. The northbound and southbound left-turn lane movements would continue to operate at LOS 'B' (10 seconds of delay) or better during the weekday and weekend peak hours. The existing plus project volumes are shown in Figure 5.

The intersection volumes would further qualify for signalization based on the peak hour warrants. With signalization the intersection would operate LOS 'B' (13 seconds of delay or better).

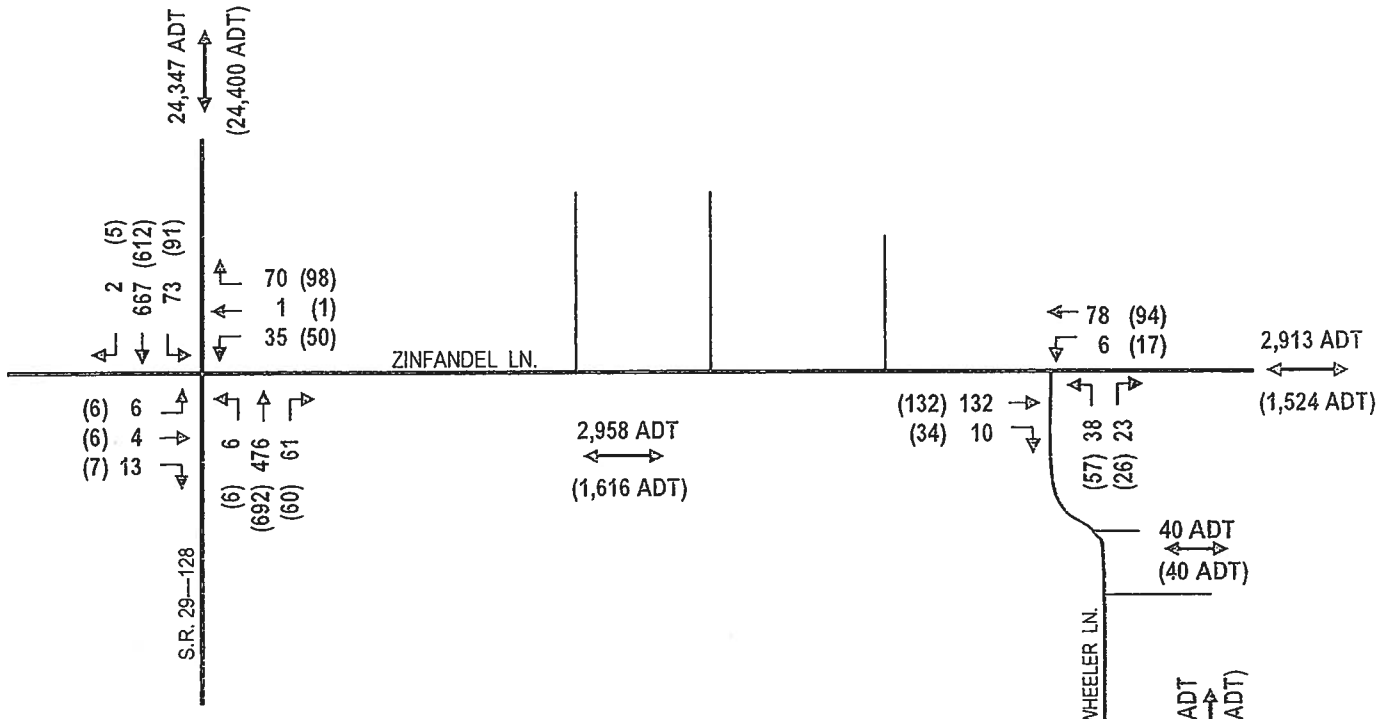
With 450 total daily trips (410 winery + 40 private residence) on Wheeler Lane and 2,958 daily trips on Zinfandel Lane, a left turn lane would be warranted on Zinfandel Lane.

The existing plus project right turn volumes would be less than the minimum thresholds at which right turn lanes would be required.

**TABLE 8—
EXISTING AND EXISTING + PROJECT PEAK HOUR INTERSECTION OPERATIONS
LEVEL OF SERVICE (LOS) AND SECONDS OF DELAY**

| Intersection | Weekday PM Peak Hour | | Saturday Afternoon Peak Hour | |
|---|--|--|---|---|
| | Existing LOS Delay | Existing + Project LOS Delay | Existing LOS Delay | Existing + Project LOS Delay |
| Zinfandel Lane / Wheeler Lane <i>Unsignalized (minor street stop)</i> Wheeler Lane northbound approach Zinfandel Lane westbound approach | A 9.8" A < 1" | B 10.2" A < 1" | B 10.1" A < 1" | B 11.0" A 1.3" |
| Zinfandel Lane / SR 29 <i>Unsignalized (minor street stops)</i> Zinfandel Lane westbound approach Zinfandel Lane eastbound approach SR 29 southbound approach SR 29 northbound approach | E 38.7" D 31.0" A < 1" A < 1" | E 47.5" D 32.5" A 9.0" A < 1" | F > 50" F > 50" B 10.3" A < 1" | F > 50" F > 50" B 10.3" A < 1" |

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



Existing + Project Daily Winery volumes
 Weekday: 410
 Weekend: 403

Existing + Project Peak Hour Winery Volumes
 Weekday PM: 73 (12 in, 61 out)
 Weekend: 130 (49 in, 81 out)



NOT TO SCALE



Existing Volumes Plus New Project Trips
 Weekday PM and (Weekend) Peak Hour



8. NEAR TERM CONDITIONS (APPROVED DEVELOPMENTS)

Approved Developments

Near term conditions reflect existing volumes plus any additional volumes expected to be generated by approved developments within the project study area. Approved developments include structures that are built but not fully occupied or are not yet built but are expected to be within the near term future.

The County of Napa planning department provided information regarding approved developments.⁽¹³⁾ The vehicle trips for these developments were generated based on the type of development and distributed onto the street network. The County identified six developments (all wineries). A list of the developments that have calculated trips on Zinfandel Lane is provided in Table A-3 the Appendix.

Near Term Without Project Operating Conditions

The approved developments were calculated to generate 342 weekday daily trips on Zinfandel Lane adjacent to the site. Added to the existing volumes on Zinfandel Lane results in 3,222 weekday daily trips for near term conditions. The approved developments would add approximately 272 Saturday daily trips on Zinfandel Lane, resulting in a total of 1,722 daily trips for near term conditions. It is noted that the approved development volumes are likely conservatively high since they assume all trips are new trips when it is reasonable to assume a portion of the trips are shared trips with other wineries in the area. The arterial level of service on Zinfandel Lane would remain unchanged from existing conditions, continuing to function at LOS 'B' on weekdays and LOS 'A' on weekends.

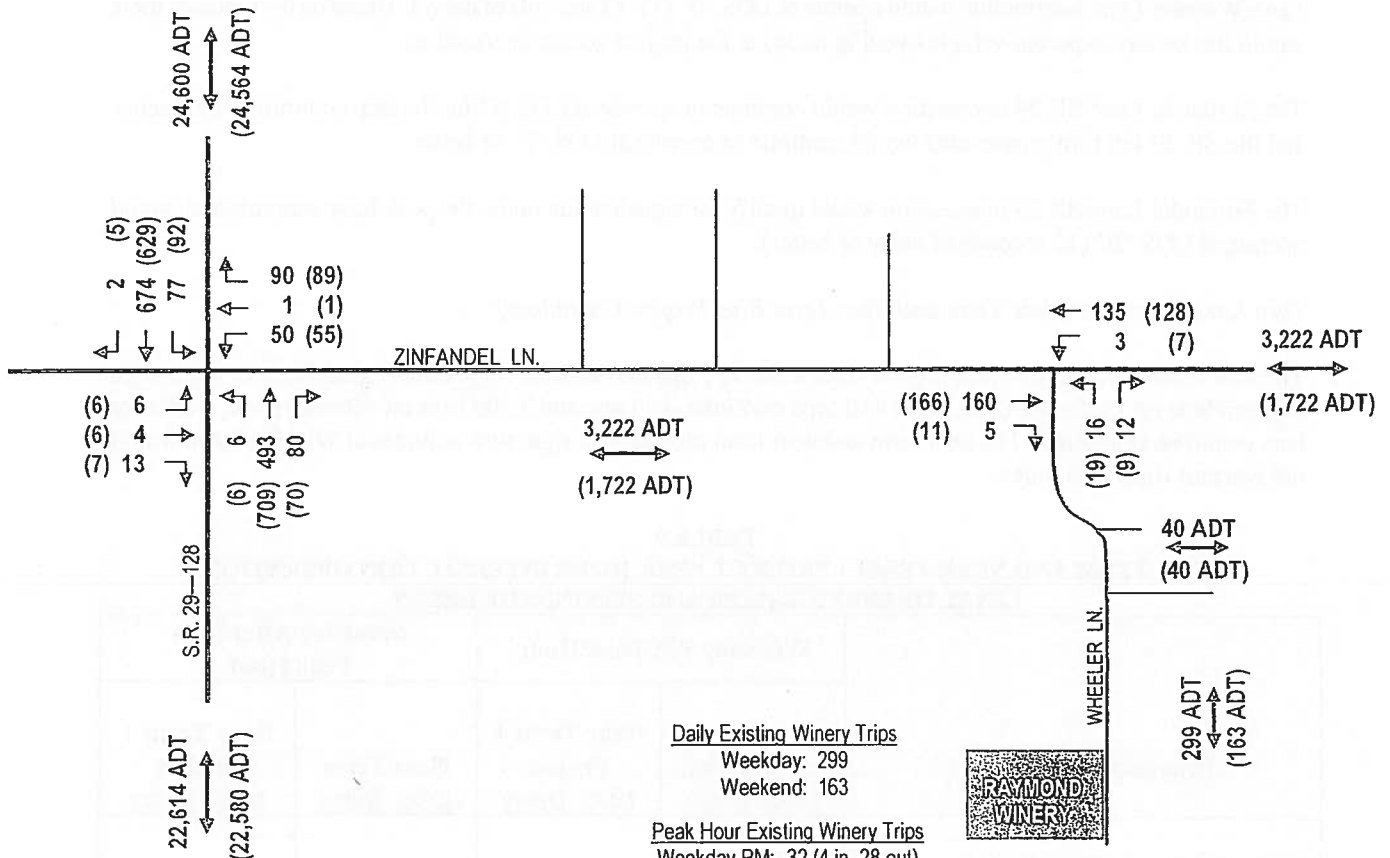
Daily volumes on SR 29 near Zinfandel Lane were calculated to increase approximately 300 trips from existing conditions, resulting in 22,600-24,600 daily trips on weekdays and weekends. LOS on SR 29 would be categorized as LOS 'F' based on the County standard for a rural two lane arterial.

The peak hour approved development trips were generated using a conservative rate of twenty five percent of the daily volumes. The approved developments would add approximately 85 weekday and 68 weekend peak hour trips to Zinfandel Lane. The near term volumes without the project are shown in Figure 6.

Near term levels of service are shown in Table 9. Under near term conditions the Zinfandel Lane/Wheeler Lane intersection would operate at LOS 'B' (11 seconds of delay or less) for the northbound approach during weekday and weekend peak hours. The westbound approach would operate at LOS 'A' (less than one second of delay). Operation would remain efficient and no vehicle queuing would be expected at the intersection.

At the Zinfandel Lane/State Route 29 intersection, delays for the Zinfandel Lane approaches (LOS 'E'-'F') would increase compared to existing conditions. The northbound and southbound left-turn lane movements would operate at LOS 'B' (10 seconds of delay) or better during the weekday and weekend peak hours.

The Zinfandel Lane/SR 29 intersection would qualify for signalization under the peak hour warrants based on the near term (existing plus approved development) volumes. With signalization the intersection would operate at LOS 'B' (13 seconds delay).



NOT TO SCALE



Existing + Approved Developments Without Project
 Weekday PM and (Weekend) Peak Hour Volumes



Near Term Plus Project Operating Conditions

New trips associated with the project would add 78 weekday and 166 Saturday daily trips on the highest volume segment of Zinfandel Lane, resulting in 3,300 weekday and 1,888 Saturday daily trips. Zinfandel Lane would continue to function at LOS 'B' on weekdays and LOS 'A' on weekends.

The project would add up to 47 weekday and 100 Saturday trips to SR 29, resulting in approximately 24,650 ADT north of Zinfandel Lane and 22,650 south of Zinfandel Lane. The near term plus project volumes are shown in Figure 7.

The peak hour intersection operating conditions were evaluated for near term plus project conditions and are shown in Table 9. LOS would remain unchanged from near term without project conditions. The Zinfandel Lane/Wheeler Lane intersection would operate at LOS 'B' (11-12 seconds of delay). Based on the volumes there would not be any expected vehicle queuing issues at the project access intersection.

The Zinfandel Lane/SR 29 intersection would continue to operate at LOS 'F' for the stop controlled approaches and the SR 29 left turn movements would continue to operate at LOS 'B' or better.

The Zinfandel Lane/SR 29 intersection would qualify for signalization under the peak hour warrants and would operate at LOS 'B' (16 seconds of delay or better).

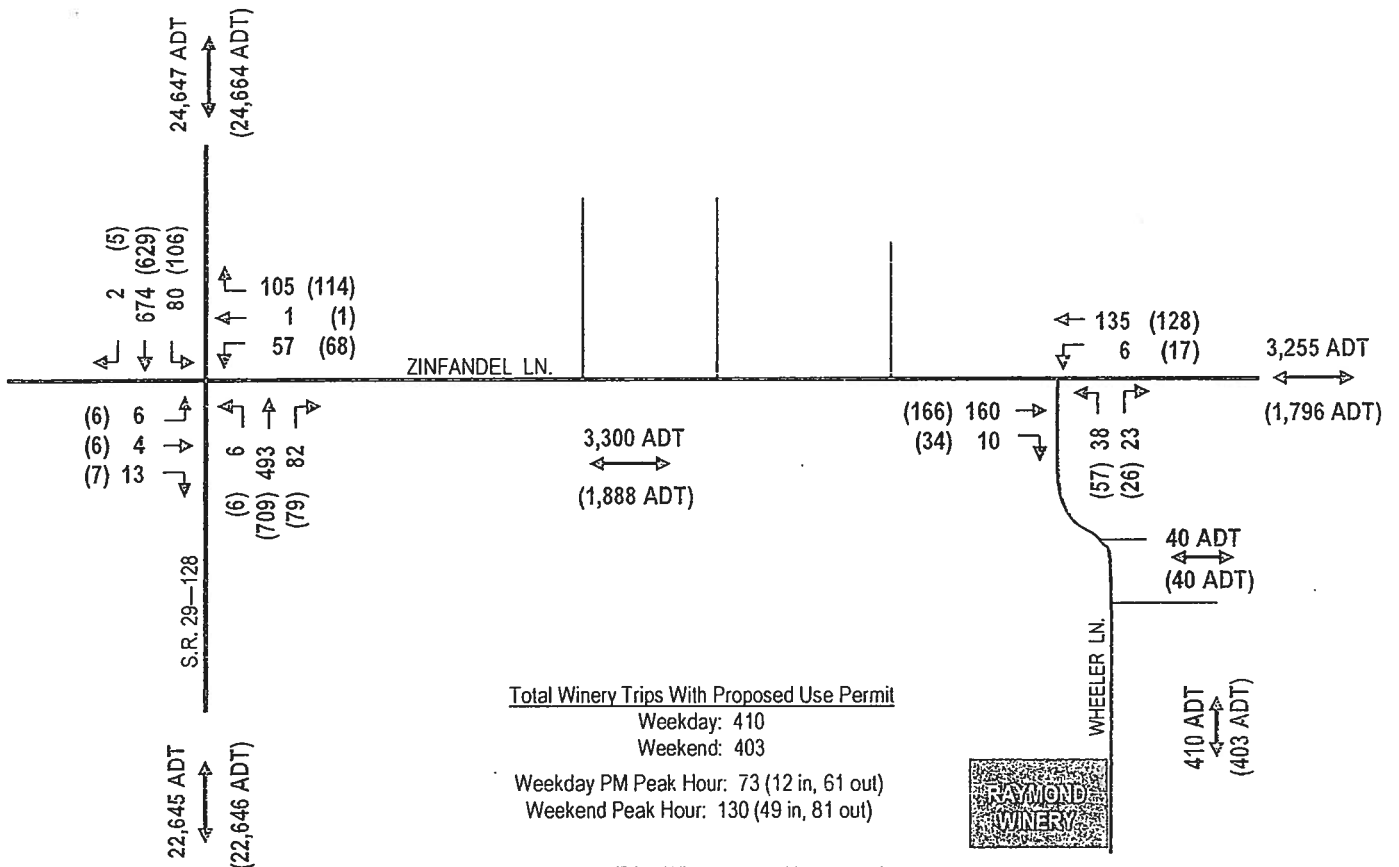
Turn Lane Warrants (Near Term and Near Term Plus Project Conditions)

The near term and near term plus project volumes were compared with the Napa County guidelines for installing a left turn lane on Zinfandel Lane. With 410 trips on Zinfandel Lane and 3,300 trips on Wheeler Lane, a left turn lane would be warranted. The near term and near term plus project right turn volumes at Wheeler Lane would not warrant right turn lanes.

**TABLE 9
NEAR TERM AND NEAR TERM + PROJECT PEAK HOUR INTERSECTION OPERATIONS
LEVEL OF SERVICE (LOS) AND SECONDS OF DELAY**

| Intersection | Weekday PM Peak Hour | | Saturday Afternoon Peak Hour | |
|---|--|--|---|---|
| | Near Term LOS Delay | Near Term + Project LOS Delay | Near Term LOS Delay | Near Term + Project LOS Delay |
| Zinfandel Lane / Wheeler Lane <i>Unsignalized (minor street stop)</i> Wheeler Lane northbound approach Zinfandel Lane westbound approach | B 10.4" A < 1" | B 10.9" A < 1" | B 10.7" A < 1" | B 11.7" A 1.0" |
| Zinfandel Lane / SR 29 <i>Unsignalized (minor street stops)</i> Zinfandel Lane westbound approach Zinfandel Lane eastbound approach SR 29 southbound approach SR 29 northbound approach | F > 50" E 36.4" A 9.2" A 9.2" | F > 50" E 38.4" A 9.2" A 9.2" | F > 50" F > 50" B 10.3" A 9.2" | F > 50" F > 50" B 10.5" A 9.1" |

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



Total Winery Trips With Proposed Use Permit

Weekday: 410

Weekend: 403

Weekday PM Peak Hour: 73 (12 in, 61 out)

Weekend Peak Hour: 130 (49 in, 81 out)

New Winery Trips With Proposed Use Permit

Weekday: +111

Weekend: +240

Weekday PM Peak Hour: +41 (+8 in, +33 out)

Weekend Peak Hour: +88 (+33 in, +55 out)

NOT TO SCALE



Existing + Approved Developments + Project
Weekday PM and (Weekend) Peak Hour Volumes



9. SITE ACCESS / DESIGN PARAMETERS

Sight Distances on Zinfandel Lane

Vehicle sight distances along Zinfandel Lane to/from Wheeler Lane were evaluated. The required vehicle visibility or "corner sight distance" is a function of travel speeds on Silverado Trail. Caltrans design standards indicate that for appropriate corner sight distance, "a substantially clear line of sight should be maintained between the driver of a vehicle waiting at the cross road and the driver of an approaching vehicle in the right lane of the main highway". Caltrans design guidelines also indicate that at private access intersections the minimum corner sight distance "shall be equal to the stopping sight distance".

Zinfandel Lane has a posted speed limit of 45 mph. This is a reduction from a 55 mph speed limit that was active for the original study. Radar speed surveys of Zinfandel Lane approaching the project site were conducted for the previous (higher) speed limit.⁽¹⁴⁾ The "critical" vehicle speed (the speed at which 85% of all surveyed vehicles travel at or below) along Zinfandel Lane was measured at 55-57 mph. Caltrans' design standards for 55 mph requires a stopping sight distance of 500-550 feet, measured along the travel lanes on Zinfandel Lane.⁽¹⁵⁾ The sight distances are well in excess of this distance in both directions on Zinfandel Lane, therefore the sight distance recommendations are met for the new 45 mph speed limit as well.

Site Access and Circulation

A project site plan is provided in Figure 8. The winery would continue to use Wheeler Lane as the access road, serving all employee, delivery and visitor trips.

As provided in previous sections, the winery access intersection was evaluated for a potential left turn lane based on Napa County daily volume warrants. The intersection qualifies for installation of a left turn lane in Zinfandel Lane for all scenarios (existing through near term conditions) without the project and with the project. Based on Caltrans design standards, only one vehicle would be expected to queue in the left turn lane. However, Caltrans recommends a minimum 50-foot left turn storage lane.⁽¹⁶⁾

The Zinfandel Lane/Wheeler Lane intersection qualifies for installation of a left turn lane on Zinfandel Lane under all scenarios based on the Napa County thresholds. As part of the use permit modification request, the winery will install a left turn lane with appropriate acceleration and deceleration tapers on Zinfandel Lane approved by the Napa County Public Works Department. This would mitigate the left turn condition to an acceptable state.

Vehicle queuing conflicts are not anticipated at the Wheeler Lane access. Vehicle queues on Zinfandel Lane from the SR 29 intersection would remain west of the nearest cross-street (Garden Avenue, located 700 feet to the east). Calculated near term westbound queues of approximately 120 feet could increase to approximately 160 feet with the project (one or two car increase) during the peak hour, but would remain well west of the cross-streets.

Internal Circulation

The Wheeler Lane road width is 18-20 feet which satisfies the Napa County standard of 18 feet. The access road would continue to adequately accommodate the expected volumes.

The onsite winery street network already exists and there are no changes in the types of vehicles, etc. anticipated with the project, so presumably the street network is adequate. Any alterations to the existing onsite street network or construction of new onsite roads as a result of the use permit modification should be designed to meet all the required design standards set forth under the County of Napa regulations.

Alternative Transportation Modes

The winery facility and adjacent public areas are located on Wheeler Lane approximately a quarter mile south of Zinfandel Lane. The distance is far enough that pedestrian travel to/from the winery is unlikely or very low. There are no sidewalk facilities on Wheeler Lane, but there are wide shoulder areas on both sides of the paved road providing a path for pedestrians to reach the winery if they choose to walk.

The Napa County Transportation & Planning Agency (NCTPA) in cooperation with Napa County and local City agencies is developing bicycle routes as outlined in the Napa Countywide Bicycle Plan.⁽¹⁷⁾ The plan encourages new developments to incorporate bicycle friendly design. Zinfandel Lane is a flat, straight crossroad making it a desirable choice for bicyclists who may be visiting wineries.

Some visitors may utilize bicycles to access the proposed project. The project should provide bicycle racks to serve visitors who choose to ride bicycles to the winery.

County policy also encourages developments to integrate the use of alternative fuels.

In keeping with the County policy, the project would provide an electric vehicle charging station.

Recommendation: The winery should also work with the employees to reduce vehicle trips, such as allowing scheduling options to facilitate carpooling.

Parking

The use permit modification request includes construction of 50 new parking spaces for a total of 130 parking spaces (plus four accessible spaces). (The site plan appears to show 81 existing spaces and 49 proposed for 130 total spaces.) The proposed parking supply would meet the typical daily demand for visitors, employees, and smaller events. Larger events with 150 or more people would utilize valet parking and/or shuttle service from offsite parking at The Ranch Winery according to Raymond Winery personnel.⁽¹⁸⁾ Up to 170 valet spaces would be provided for large events in addition to the fixed parking supply. (The proposed parking plan is shown in Figure 9.) With the ability to utilize valet parking and offsite parking for the large events, the proposed parking supply would adequately meet the demand.

Marketing Events

The use permit modification request includes modifying the existing marketing plan to the following:

- 2 evening events per year for up to 500 people;
- 4 events per year for up to 250 people: (three evening events, one daytime event);
- 6 events per year for up to 150 people: (three evening events, three daytime events);
- 12 events per year for up to 100 people (eight evening events, four daytime events);
- 26 events per year for up to 50 people (eighteen evening events, eight daytime events).

Based on standard automobile occupancy rates, the events would be expected to generate the following trips:

500 people : 426 trips
250 people : 237 trips
150 people : 163 trips
100 people : 107 trips
60 people : 60 trips

These events are typically of sufficient duration in length that the inbound and outbound trips occur in separate hours, thus the number of trips on the street network at one time are half of the total volume.

Of the 50 total events, eight are proposed during the daytime (one event up to 250 people, one event up to 150 people, and six for 100 people or less). The remaining events would be held in the evenings outside of typical peak traffic periods. Daytime events occurring during the middle of the day also would generate trips outside of typical peak hour periods.

It is our understanding the winery intends to provide a shuttle service and/or valet parking for the largest events (150+ people). In addition the following recommendations are suggested:

If the parking lot becomes full during a self-parked event when the winery is open to other visitors, the winery should place a sign at the entrance on Wheeler Lane stating the winery parking lot is full.

To the extent possible the winery should schedule event times to minimize vehicle trips during the weekday p.m. peak hour.

It is our understanding that self-parking for events is not allowed on Wheeler Lane (valet parking may be permitted). If so, the winery should be prepared to install temporary "No Parking" signs on the shoulder areas of Wheeler Lane when warranted.

The winery should provide valet parking service and/or shuttle service for events with parking demand in excess of the onsite parking supply.

The winery could consider placing a temporary sign on Wheeler Lane for motorists exiting the largest events directing drivers toward Silverado Trail to the east in order to minimize trips at the intersections west of Wheeler Lane.

Neighborhood Street Traffic

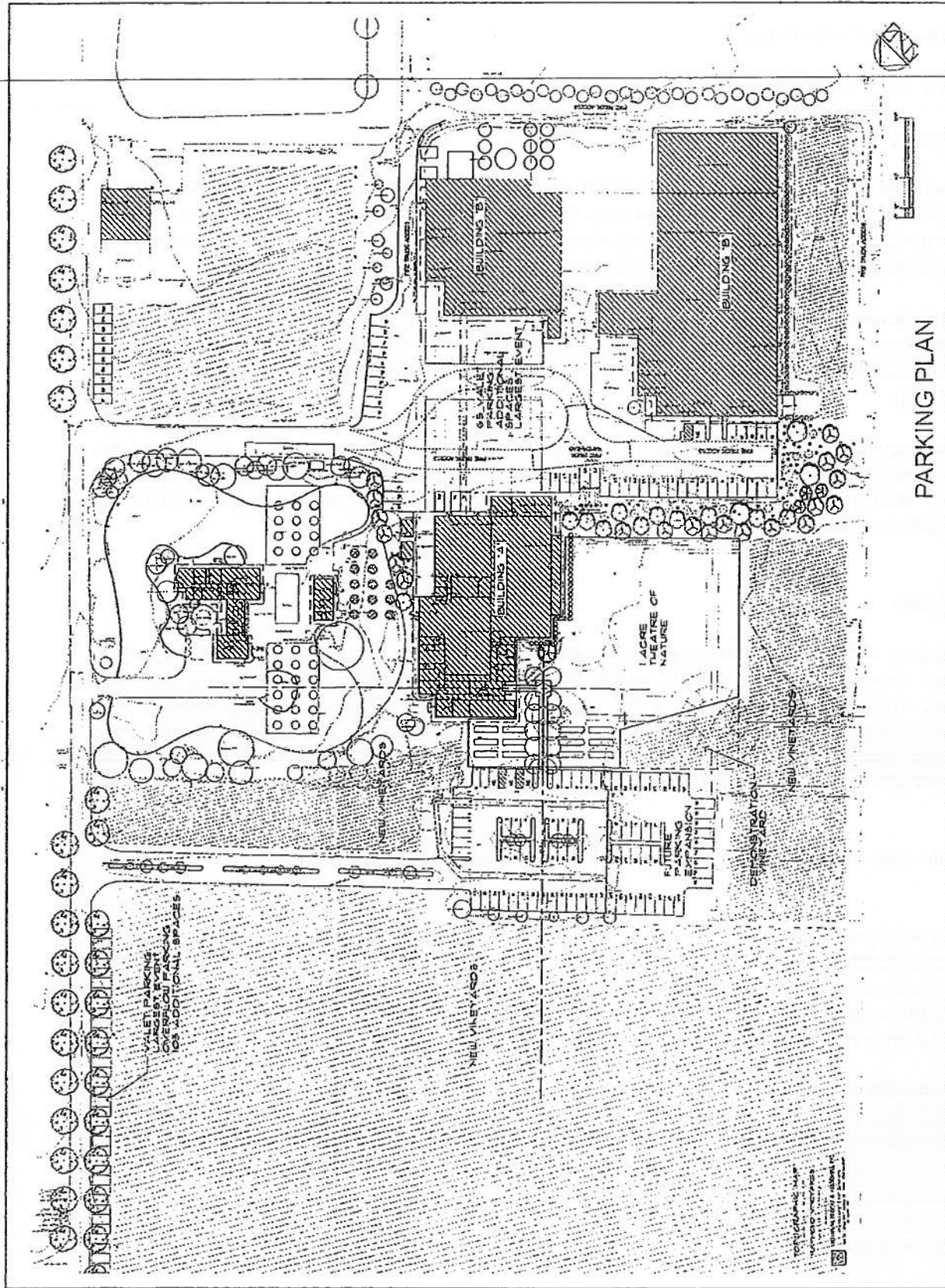
At the request of the County, existing and potential traffic levels associated with the project were qualitatively analyzed relative to the neighboring community of homes, in particular the area northwest of the winery bounded by Zinfandel Lane and Stice Lane. This is a neighborhood consisting of approximately 100 homes with two cross streets that connect Zinfandel Lane and Stice Lane (Garden Avenue and Mountain View Avenue).

When conditions at the Zinfandel Lane/SR 29 intersection reduce turning opportunities, the potential for “cut-through” trips exists. Motorists knowledgeable of the connector streets can utilize Stice Lane to/from SR 29 instead of Zinfandel Lane.

The peak hour counts conducted for this study also counted turning volumes at the cross streets. A figure illustrating the surveyed volumes is shown in Figure A-1 in the Appendix. The surveyed numbers reflected what would be expected for 100 homes, therefore significant cut-through volumes did not appear to be occurring during the counts. The counts may have represented “normal” conditions, with cut-through trips possibly not as prevalent as periods of greater congestion since normal turning opportunities exist at SR 29 to/from Zinfandel Lane.

An in-depth analysis of the prevailing conditions and potential traffic calming solutions is beyond the scope of this study. However, to the extent vehicle trips associated with the Raymond winery can be reduced to the west on Zinfandel Lane and through the neighborhood would be of benefit. It is noted that the largest traffic increases associated with the proposed use permit are derived from visitor trips. Visiting motorists are much less likely to be aware of an alternative route, such as Stice Lane and therefore unlikely to utilize the neighborhood streets. However, employees of the winery are more likely to know about the alternative routes. Therefore, although hard to enforce, the following measure is recommended:

Since winery employees are most likely to be aware of the alternate routes through the neighborhood, the winery should maintain a program of informing their employees of the issue and requesting them to avoid driving through the neighborhood. The winery should encourage employees to utilize Silverado Trail to the east whenever possible.



PARKING PLAN

RaymondVineyard_mod1.dwg

Miss County Conservation
Development and Planning Department

04-04-2012 8B MOD



omni-means

Parking Plan

figure 9



10. CUMULATIVE CONDITIONS

Cumulative Year 2030 Projections

Model Forecast

Cumulative (Year 2030) volume projections on Zinfandel Lane and SR 29 were derived from the Napa County Transportation & Planning Agency's traffic volume forecasts in the Napa County General Plan Update EIR.⁽¹⁹⁾ The forecast increase in volume-to-capacity (v/c) ratio from Year 2003 to Year 2030 in the project vicinity was applied to the provided Year 2003 peak hour two-way volumes on Zinfandel Lane and SR 29.

The v/c ratio increase yields a volume of 517 weekday p.m. peak hour trips on Zinfandel Lane in Year 2030. The future volume is 200% higher than the existing (Year 2012) peak hour volume of 256 peak hour trips. With the forecasted increase, the existing daily volume on Zinfandel Lane of 2,825 trips would increase to 5,650 daily trips.

The forecast increase on SR 29 near Zinfandel Lane yields a weekday peak hour volume of 3,759 trips. The projected cumulative volume represents a large (300%) increase compared to the existing peak hour volume of 1,249 trips. With the forecasted volumes, the existing daily volume on SR 29 would increase from 24,300 trips to 72,900 daily trips.

Historical Data

For comparison, average annual daily traffic volumes on SR 29 north of Zinfandel Lane over the previous twenty years were reviewed. The AADT on SR 29 in year 1992 was 20,000 trips and in year 2011 was 24,300 trips. The volumes were highest in year 2007, reaching 27,000 AADT. The daily volumes have declined since then and are lower today than they were in 1998. The increase in volumes between year 1992 and the highest year of 2007 equates to an annual increase of 2% per year. Applying the same annual increase to the current ADT on SR 29 of 24,300 results in about 34,700 ADT in year 2030 (2% per year added for 18 years).

Applying the same increase to the current ADT on Zinfandel Lane of 2,825 results in about 4,035 ADT in year 2030.

Cumulative volumes based on historical data are approximately 50% of the model forecast volumes on SR 29 and 70% on Zinfandel Lane. The large difference between the model numbers and historical growth trends indicates volumes are not increasing to the model's forecasted levels. However, in order to proactively address potential traffic volumes under cumulative conditions, the County has adopted several measures identified in the General Plan to improve the street network and also reduce vehicle trips.

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 valley. Several segments on SR 29 in the vicinity of the project were shown to have an average ratio of 0.76-0.80, indicating weekend peak hour volumes are expected to be about 80% of weekday volumes. Daily volumes on Zinfandel Lane counted for this study found weekend peak hour volumes to be about 50% of the weekday peak hour volumes. Therefore the future weekend peak hour volumes would be expected to remain roughly in the same ratio as the existing volumes and lower than the weekday volume projections.

Cumulative Operating Conditions

Although the cumulative model forecast volumes are tenuous, the volumes would yield acceptable LOS 'C' or better conditions on Zinfandel Lane. The cumulative volumes would, however, result in left turn lanes being warranted at all driveways with 28 or more daily trips.

The model forecast volumes on SR 29 are highly unlikely. A more reasonable projection based on historical growth suggests SR 29 would continue to operate at near capacity with increased congestion at peak times of the day and with longer peak periods during the day.

In order to address potential traffic increases in the longterm, the County has identified mitigation policies as outlined in the Napa County General Plan. Additional improvements to the street network are anticipated and have been included in the General Plan's Improved 2030 Network model. The County has also adopted several measures identified in the General Plan to reduce vehicle trips through public transit and Transportation Demand Management (TDM) strategies: "The project should support programs to reduce single occupant vehicle use and encourage alternative travel modes."

In keeping with the policy, the winery project will provide bicycle racks for visitors who may arrive by bike. The project should also promote the use of public transportation and carpooling of employees (by adjusting work schedules, etc.) to facilitate the use of other transportation modes.

The County has identified other mitigation policies, including development of a traffic impact fee (TIF) to be developed in cooperation with the NCTPA (Mitigation Measure 4.4.1C). This would require new projects to pay their "fair share" of countywide traffic improvements they contribute the need for. Examples of such improvements could include construction of two-way left turn lanes or installing signalized controls at select intersections along the SR 29 corridor. (The Zinfandel Lane/SR 29 intersection would operate at LOS 'C' with signalization using volume projections based on the historic growth rate.) The concept is under development but presumably the fee would be applied on a "per trip" basis if implemented.

11. SUMMARY AND RECOMMENDATIONS

Traffic conditions were evaluated for the proposed Raymond Winery use permit modification (#P11-00156). The analysis included evaluation of the conditions associated with existing, current permitted use, approved developments, and cumulative (buildout) conditions.

Based on surveys and provided winery information, the existing winery generates 299 daily weekday trips and 163 Saturday trips. The trips are comprised of visitor trips, employee trips, and truck trips associated with winery production.

Existing LOS conditions on Zinfandel Lane and at the Zinfandel Lane/Wheeler Lane (project access) intersection are LOS 'B' or better. Existing conditions on SR 29 and at the Zinfandel Lane/SR 29 intersection are at LOS 'E'- 'F'. Conditions on SR 29 are a function of volumes and, at times, vehicle queues extending from St. Helena to south of Zinfandel Lane. This results in degraded conditions at other intersections and driveways on SR 29 in addition to Zinfandel Lane.

LOS levels associated with complete utilization of the current use permit would remain the same as existing conditions. Based on the existing surveyed volumes and the calculated use permit volumes, the weekday daily trips would be somewhat lower (94 trips) while the Saturday daily trips (157 trips) and peak hour trips (14-62 trips) would be higher than existing conditions.

Conditions were evaluated for existing plus approved developments (near term) conditions. Vehicle trips associated with other pending projects in the project vicinity were calculated and distributed onto the street network. LOS levels would remain the same as existing conditions, with LOS 'B' or better at Zinfandel Lane and LOS 'E'- 'F' at SR 29, but delays would increase for some approaches.

The proposed use permit modification (the "project") was calculated to generate a total of 403-410 daily trips, 73 weekday peak hour, and 130 Saturday total peak hour trips. The number of net new trips (above the existing winery trips) that would be added to the street network are 111 weekday daily trips, 240 Saturday daily trips, 41 weekday peak hour trips, and 88 Saturday peak hour trips.

Existing plus project LOS levels would remain unchanged from existing conditions and near term plus project LOS levels would remain unchanged from near term conditions without the project, though delays would increase. Under near term plus project conditions, LOS on Zinfandel Lane and at the Wheeler Lane (project access) intersection would remain LOS 'B' or better. SR 29 and the Zinfandel Lane/SR 29 intersection would remain LOS 'E'- 'F' with longer delays for some approaches.

Although levels of service would not change with the added project trips, reducing winery trips to/from the west on Zinfandel Lane and SR 29 would minimize the delay increases. Redirecting a portion of the winery traffic to/from the east would result in lower winery volumes at the Zinfandel Lane/SR 29 intersection.

- Reducing vehicle trips to/from the west would benefit operating conditions at the Zinfandel Lane/SR 29 intersection. It is recommended that the winery establish a program of informing their employees of the traffic issue and requesting employees to utilize Zinfandel Lane to the east to the extent possible, particularly during peak traffic periods.
- Though more difficult to enact with visitors, consideration could be given to installing a sign for exiting visitors to use Silverado Trail to the east (such as a directional sign pointing toward Silverado Trail with mileage distances to nearby communities like Napa and St. Helena). Some visitors unfamiliar with alternative routes to SR 29 may be more likely to utilize Silverado Trail as a result.

Under County policy, unsignalized intersections are evaluated on an individual basis regarding potential improvements. The Zinfandel Lane/SR 29 intersection was analyzed for installation of a traffic signal based on peak hour volume warrants. The intersection volumes qualify for signalization for existing through near term plus project conditions. Qualifying does not necessarily mean a signal should be installed. The intersection would operate at LOS 'B' for each of those scenarios.

Based on an evaluation of the existing truck trips and the proposed production, there would be little to no expected increase in the number of typical daily production truck trips. The crush season grape delivery truck trips were conservatively calculated to increase by ten daily trips assuming maximum on-haul and all deliveries made using smaller trucks utilized by the winery.

Volumes at the Zinfandel Lane/Wheeler Lane intersection were evaluated for installation of a left turn lane on Zinfandel Lane. All scenarios (existing through near term plus project) qualify for installation of a left turn lane based on the County warrants.

- ⊙ The Zinfandel Lane/Wheeler Lane intersection qualifies for installation of a left turn lane on Zinfandel Lane under all scenarios based on the Napa County thresholds. As part of the proposed use permit modification, the winery will install a westbound left turn lane with appropriate acceleration and deceleration tapers on Zinfandel Lane approved by the Napa County Public Works department. This would mitigate conditions to an acceptable level.

The onsite vehicle circulation was evaluated. The existing Wheeler Lane road width is 18-20 feet which satisfies the Napa County standard.

- ⊙ The existing onsite street network would adequately serve the expected volumes. If any alterations are made to the existing onsite street network or new roads constructed as a result of the use permit modification they should be designed to meet all required standards set forth under the Napa County regulations.

Based on field observations, the available sight distances along Zinfandel Lane are adequate. (The project's Civil Engineer should confirm the adequacy of sight distances along Zinfandel Lane.)

The policies of the General Plan seek to proactively address potential volume increases by reducing vehicle trips from proposed projects by encouraging alternative transportation modes.

The winery has stated it will provide bicycle racks for visitors who may ride bikes to the winery. The winery will also provide an electric vehicle charging station.

- ⊙ In order to help reduce single occupant vehicle trips, it is recommended the winery encourage carpooling by employees and allow scheduling options to facilitate carpooling to the extent possible.

Parking demand associated with typical conditions and marketing events was evaluated. The parking supply of permanent striped spaces would be increased to 130 spaces with the proposed use permit modification. The supply would meet the typical demand for visitors, employees, and smaller events. The winery has stated that larger events with 150 or more people would utilize valet parking or shuttle bus service from offsite parking at The Ranch Winery. In addition, the following recommendations are suggested:

- If the parking lot becomes full during a self-parked event when the winery is open to other visitors, the winery should place a sign at the entrance on Wheeler Lane stating the winery parking lot is full.

- ~~● To the extent possible the winery should schedule event times to minimize vehicle trips during the weekday p.m. peak hour.~~
- It is our understanding that self-parking for events is not allowed on Wheeler Lane (valet parking may be permitted). If so, the winery should be prepared to install temporary “No Parking” signs on the shoulder areas of Wheeler Lane when warranted.
- The winery should provide valet parking service and/or shuttle service for events with parking demand in excess of the onsite parking supply.

Existing and potential traffic levels associated with the project were qualitatively analyzed relative to the nearby community of homes, in particular the neighborhood west of the winery bounded by Zinfandel Lane and Stice Lane. The cross streets of Garden Avenue and Mountain View Avenue connect Zinfandel Lane and Stice Lane. Motorists knowledgeable of the connector streets may utilize Stice Lane to “cut through” to/from SR 29 instead of using Zinfandel Lane.

To the extent vehicle trips associated with the Raymond winery can be reduced to the west on Zinfandel Lane and through the neighborhood would be of benefit. The largest traffic increases associated with the proposed use permit modification are derived from visitors, who are less likely to be aware of an alternative route such as Stice Lane and unlikely to utilize the neighborhood streets. However, employees of the winery are more likely to know about the alternative routes. Therefore, although hard to enforce, the following measures are recommended:

- Since winery employees are most likely to be aware of the alternate routes through the neighborhood, the winery should maintain a program of informing their employees of the neighborhood concerns regarding the cut-through issue and requesting the employees to avoid driving through the neighborhood. The winery should encourage employees to utilize Silverado Trail to the east whenever possible.

Cumulative (Year 2030) conditions were assessed based on a review of volume forecasts from the Napa County General Plan Update transportation model as well as historical volume data. The model forecast volumes are substantially higher than historical volume growth over the past twenty years would indicate. Therefore it is unlikely volumes will increase to the model’s forecasted levels. Future traffic projections based on historical growth suggests SR 29 would continue to operate at near capacity with increased congestion at peak times of the day and with longer peak periods during the day.

However, in order to address potential traffic increases in the longterm, the County has identified mitigation policies as outlined in the Napa County General Plan. These include additional improvements to the street network that are anticipated and have been included in the General Plan’s Improved 2030 Network model.

Other mitigation policies include development of a traffic impact fee (TIF) developed in cooperation with the NCTPA (Mitigation Measure 4.4.1C) which would require new projects to pay a “fair share” of countywide traffic improvements they contribute the need for (such as construction of two-way left turn lanes or installing signalized controls at select intersections along the SR 29 corridor). The concept is under development but presumably the fee would be applied on a “per trip” basis if/when implemented.

- A traffic impact fee may be adopted by the County to fund the General Plan improvements or other projects. If a TIF program were enacted, the proposed project could contribute a “fair share” towards such future circulation improvements as determined by the policy guidelines.

References:

- (1) Baymetrics Data Services, Daily traffic counts on Zinfandel Lane between Mountain View Avenue and Wheeler Lane, January 28, 2011 – February 3, 2011..
- (2) California Department of Transportation (Caltrans), Traffic Data Branch, Volumes on the California State Highway System, online database.
- (3) California Department of Transportation, *ibid*.
- (4) Omni-Means Engineers & Planners, traffic counts on October 29, 2011, November 2, 2011, August 25, 2012, & August 28, 2012.
- (5) Institute of Transportation Engineers, Trip Generation, 9th Edition, 2012; trip rates for single family detached unit (Land Use #210).
- (6) California Department of Transportation, California Manual on Uniform Traffic Control Devices, 2012 Edition..
- (7) Napa County, *Adopted Road and Street Standards*, revised November 21, 2006.
- (8) California Department of Transportation, *Guidelines for Reconstruction of Intersections*, August, 1985.
- (9) Production, employee, and visitor data provided by Raymond Winery personnel (Ms. Lisa Heisinger, Vice President, Operations, Boisset Family Estates).
- (10) Historic truck trip data provided by Raymond Winery personnel (Mr. Kirk Wrede, Production Manager, Raymond Vineyard & Cellar).
- (11) Current Use Permit information provided by Mr. Jeff Redding, AICP, project representative.
- (12) Proposed Use Permit Modification information provided by Mr. Jeff Redding, AICP, project representative.
- (13) Napa County, Planning Department, Ms. Kirsty Shelton, March 15, 2013.
- (14) Omni-Means Engineers & Planners, *ibid*.
- (15) California Department of Transportation, *Highway Design Manual*, - Fifth Edition, July 1, 2004.
- (16) California Department of Transportation, *Guidelines for Reconstruction of Intersections*, August, 1985.
- (17) Napa County, Countywide Bicycle Plan (2012), Planning Area-North Valley, May, 2012.
- (18) Event parking, employee, and visitor data provided by Raymond Winery personnel (Mr. Tom Blackwood, Director of Retail Operations, Boisset Family Estates).
- (19) Napa County, *The Napa County General Plan Update EIR*, prepared by Dowling Associates, Inc., February 9, 2007.

APPENDIX

**To Updated Traffic Study
For Raymond Vineyards Winery
Use Permit Modification # P11-00156**

- Level of Service Definitions
Table A-1: LOS Definitions
Table A-2: Napa County ADT LOS Thresholds
- Level of Service Calculations
Vehicle Queuing Worksheets
Approved Developments List
- Turn Lane Warrants
Napa County Left Turn Lane Warrants
Right Turn Lane Warrants
- Peak Hour Signal Warrants
- Existing Volume Counts
Figure A-1: Turning Volumes at Side Streets

TABLE A-1
LEVEL-OF-SERVICE CRITERIA FOR INTERSECTIONS

| LEVEL OF SERVICE | TYPE OF FLOW | DELAY | MANEUVERABILITY | | CONTROL DELAY (SECONDS/VEHICLE) | | ALL-WAY STOP |
|------------------|---------------------------|---|---|--|---------------------------------|-----------------|-----------------|
| | | | SIGNALIZED | UNSIGNALIZED | SIGNALIZED | UNSIGNALIZED | |
| 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. ≤ 0.60 v/c | ≤ 10.0 | ≤ 10.0 | ≤ 10.0 |
| 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. 0.61 – 0.70 v/c | > 10 and ≤ 15.0 | > 10 and ≤ 15.0 | > 10 and ≤ 15.0 |
| 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. 0.71 – 0.80 v/c | > 15 and ≤ 25.0 | > 15 and ≤ 25.0 | > 15 and ≤ 25.0 |
| 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. 0.81 – 0.90 v/c | > 25 and ≤ 35.0 | > 25 and ≤ 35.0 | > 25 and ≤ 35.0 |
| 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. 0.91 – 1.00 v/c | > 35 and ≤ 50.0 | > 35 and ≤ 50.0 | > 35 and ≤ 50.0 |
| 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. > 1.00 v/c | > 50.0 | > 50.0 | > 50.0 |

References: 1. Highway Capacity Manual, Fourth Edition, Transportation Research Board, 2000. Contra Costa Transportation Authority (CCTA). Technical Procedures Update, Final, July 9, 2006. For the purposes of this study, CCTA intersection methodology has been used for signalized intersections yielding an LOS and v/c ratio.

TABLE A-2

Napa County Roadway Segment Daily LOS Volume Thresholds

| Facility Class | Lanes | Area Type | LOS A | LOS B | LOS C | LOS D | LOS E |
|------------------------|-------|--------------------|--------|--------|---------|---------|---------|
| Freeway | 4 | All | 23,800 | 39,600 | 55,200 | 67,100 | 74,600 |
| | 6 | All | 36,900 | 61,100 | 85,300 | 103,600 | 115,300 |
| | 8 | All | 49,900 | 82,700 | 115,300 | 140,200 | 156,000 |
| Arterial ¹ | 2 | Rural ² | 2,600 | 5,300 | 8,600 | 13,800 | 22,300 |
| | 2 | Urban ³ | 1,000 | 1,900 | 11,200 | 15,400 | 16,300 |
| | 4 | Rural ² | 17,500 | 28,600 | 40,800 | 52,400 | 58,300 |
| | 4 | Urban ³ | 1,500 | 4,100 | 26,000 | 32,700 | 34,500 |
| | 6 | Urban ³ | 2,275 | 6,500 | 40,300 | 49,200 | 51,800 |
| Collector ¹ | 2 | All | 1,067 | 3,049 | 9,100 | 14,600 | 15,600 |
| | 4 | All | 2,509 | 7,169 | 21,400 | 31,100 | 32,900 |

Notes:

- ¹ All two-lane roads are assumed to be undivided. Four- and six-lane roads are assumed to be divided.
 - ² Rural roads are assumed as uninterrupted flow highways; FDOT Capacity Table 4-3.
 - ³ Urban arterials are assumed to be Class III with >4.5 signals per mile; FDOT Capacity Table 4.1
- Source: Adapted from Florida Department of Transportation 2002; and Fehr & Peers 2005