

TRAFFIC IMPACT REPORT (Revised)
PROPOSED CASTELLUCCI FAMILY WINERY
ALONG SILVERADO TRAIL
AND ZINFANDEL LANE IN
NAPA VALLEY

February 22, 2014

Prepared for: Castellucci Winery

Prepared by: Mark D. Crane, P.E.
California Registered Traffic Engineer (#1381)
CRANE TRANSPORTATION GROUP
2621 E. Windrim Court
Elk Grove, CA 95758
(916) 647-3406

I. INTRODUCTION

This report has been prepared at the request of the Napa County Public Works Department as authorized by the Castellucci Family Winery applicant to determine if the proposed Castellucci Family Winery along Silverado Trail and Zinfandel Lane will result in any significant circulation system impacts at the project entrance or at the nearby Silverado Trail/Zinfandel Lane intersection. Analysis has been provided for harvest Friday and Saturday PM peak hour conditions for existing, year 2018 (first year of full project production) and year 2030 (general plan buildout) horizons. This study has been revised to include seven approved projects in the vicinity of Castellucci Winery.

II. SUMMARY OF FINDINGS

A. "WITHOUT PROJECT" OPERATING CONDITIONS

1. Zinfandel Lane adjacent to the proposed project site now has similar two-way June traffic volumes during both the Friday and Saturday PM peak traffic hours (285 two-way peak hour vehicles from 4:15 to 5:15 on Friday versus 289 two-way peak hour vehicles from 2:15 to 3:15 on Saturday). Along Silverado Trail, two-way volumes north of Zinfandel Lane are higher during the Friday PM peak hour compared to the Saturday PM peak hour (1,515 versus 1,227 two-way vehicles). There were no vehicles using the driveway serving the single family residence on the project site during either the Friday or Saturday peak traffic hours at the Silverado Trail/Zinfandel Lane intersection.
2. The Silverado Trail/Zinfandel Lane intersection would have unacceptable operation (levels of service) during both the harvest 2013 Friday and Saturday PM peak traffic hours. The intersection would also have volumes exceeding both rural and urban peak hour signal warrant #3 criteria levels during the harvest Friday and Saturday PM peak traffic hours.
3. The Silverado Trail/Zinfandel intersection will be experiencing unacceptable levels of service during the harvest Friday and Saturday PM peak traffic hours in 2018 and 2030.
4. The Silverado Trail/Zinfandel intersection will have volumes exceeding both rural and urban peak hour signal warrant criteria levels during Friday and Saturday PM peak traffic hours in 2018 and 2030.
5. Daily two-way volumes along Zinfandel Lane adjacent to the project site now average 3,512 vehicles over a three-day period (Tuesday to Thursday in mid August 2013).

B. PROJECT IMPACTS

1. The project will result in 0 inbound and 5 outbound trips during the harvest Friday PM peak traffic hour at the Silverado Trail/Zinfandel Lane intersection (4:15 to 5:15), with

about 4 inbound and 5 outbound trips during the harvest Saturday PM peak traffic hour (2:15 to 3:15). Project trips during the Friday PM peak traffic hour will be employees, while during the Saturday afternoon peak traffic hour these trips will primarily be associated with visitors by appointment.

2. Daily volumes along Zinfandel Lane at the project entrance in combination with daily traffic volumes on the project driveway will meet County warrant criteria for provision of a left turn lane on the eastbound Zinfandel Lane approach to the project entrance.
3. Project traffic during harvest will not produce any significant operational impacts (level of service or signalization needs) at the Silverado Trail/Zinfandel Lane intersection during harvest Friday or Saturday PM peak traffic conditions for the near term (year 2018) or long term (year 2030) analysis horizons.
4. Sight lines will be adequate at the project's proposed driveway connection to Zinfandel Lane.

C. CONCLUSIONS & RECOMMENDATIONS

The project would result in no significant off-site circulation system operational impacts at the Silverado Trail/Zinfandel Lane intersection nor any sight line impacts at the proposed project driveway connection to Zinfandel Lane. Therefore, no mitigations are needed for these issues. However, project traffic (with up to 50 visitors per day) in combination with ambient traffic volumes along Zinfandel Lane will meet County warrant criteria for provision of a left turn lane on the eastbound Zinfandel Lane approach to the project entrance. Therefore, the applicant should either provide a left turn lane designed to County criteria, or should reduce average visitor totals to 30 or less for near term horizon conditions and 26 or less for long term horizon conditions.

III. PROJECT LOCATION & DESCRIPTION

The Castellucci Family Winery will be located in the northwest corner of the Silverado Trail/Zinfandel Lane intersection (see **Figure 1**). The project driveway will be on the north side of Zinfandel Lane about 270 feet west of Silverado Trail where there is already an existing paved driveway serving a single family residential unit. There are no driveways on the south side of Zinfandel Lane in the vicinity of the project access.

The proposed Castellucci Family Winery will have the following yearly production and visitor/special event levels.

- 30,000 gallons per year production.
- Bottling on-site.
- 45 percent of the grapes will be transported to site (with about two-thirds accessing the winery from the south on Silverado Trail and one-third from the west on Zinfandel Lane).

- Tours and tasting by appointment only – 7 days per week from 10:00 AM to 4:00 PM, maximum 50 visitors per day.
- Food and wine pairing events – 12 per year, maximum 25 visitors per event (between 10:00 AM and 11:00 PM).
- Marketing events – 2 per year, maximum 125 visitors per event & 3 per year, maximum 60 visitors per event (between 10:00 AM and 11:00 PM).
- Harvest party – 2 per year, maximum 50 visitors per event (between 10:00 AM and 11:00 PM).
- A left turn lane is proposed on the eastbound Zinfandel Lane approach to the project entrance.

IV. EXISTING CIRCULATION SYSTEM OPERATION

A. ANALYSIS LOCATIONS

At County request, the following two locations have been evaluated.

- Silverado Trail/Zinfandel Lane intersection
- Zinfandel Lane/Project Driveway intersection

Figure 2 presents approach geometrics and control at each analysis intersection.

B. VOLUMES

Friday 3:00 to 6:00 PM and Saturday 1:00 to 6:00 PM turn movement counts were conducted by Crane Transportation Group (CTG) in June 2013 at the Silverado Trail/Zinfandel Lane and Zinfandel Lane/Property access driveway intersections. The property driveway is currently paved and serves a residential unit on the property site. The peak traffic hours were determined to be 4:15-5:15 PM on Friday and 2:15-3:15 PM on Saturday. Resultant peak hour counts are presented in **Figure 3**. Overall, two-way volumes along Zinfandel Lane at the project entrance were similar during the Friday and Saturday PM peak traffic hours (285 vehicles per hour [vph] on Friday versus 289 vph on Saturday). Along Silverado Trail, two-way volumes north of Zinfandel Lane were higher during the Friday PM peak hour compared to the Saturday PM peak hour (1,515 two-way vehicles versus 1,227 two-way vehicles). Daily two-way counts were also conducted along Zinfandel Lane adjacent to the project site on Tuesday, Wednesday and Thursday, August 20-22, 2013. Daily volumes were 3,421, 3,455 and 3,660 vehicles, respectively, with a three-day daily average of 3,512 vehicles.

June peak hour traffic counts were seasonally adjusted to reflect September harvest conditions based upon monthly and day of week adjustment factors utilized in the Napa Valley jurisdictions. Overall, June counts would be expected to increase by about 7 percent to reflect fall harvest conditions. Resultant projected 2013 Friday and Saturday peak hour harvest volumes are presented in **Figure 4**.

C. ROADWAYS

Zinfandel Lane will provide the only access to the winery. Adjacent to the project site it has two well-paved 12-foot travel lanes and 1- to 2-foot paved shoulders, with the exception of a wide paved shoulder area on the north (project) side of the road near Silverado Trail. The posted speed limit is 45 miles per hour and the roadway is level and straight. However, west of the project it traverses a narrow historic bridge with stone railings over the Napa River. Travel lanes are 9 feet wide on the bridge and there are 35 miles per hour warning signs on both the east and westbound approaches to a curve just west of the bridge. Zinfandel Lane is stop sign controlled on its single lane eastbound approach to Silverado Trail. A residential driveway is the fourth (easterly) leg of the Silverado Trail/Zinfandel Lane intersection.

Silverado Trail in the project vicinity has two well-paved 12-foot travel lanes and wide paved shoulders that are utilized as Class II bicycle lanes. A left turn lane is provided on the northbound Silverado Trail approach to Zinfandel Lane. The posted speed limit is 55 miles per hour at Zinfandel Lane, but lowers to 45 miles per hour northbound and 40 miles per hour southbound north of Zinfandel Lane.

D. INTERSECTION LEVEL OF SERVICE

1. Analysis Methodology

Transportation engineers and planners commonly use a grading system called level of service (LOS) to measure and describe the operational status of the local roadway network. LOS is a description of the quality of a roadway facility's operation, ranging from LOS A (indicating free-flow traffic conditions with little or no delay) to LOS F (representing oversaturated conditions where traffic flows exceed design capacity, resulting in long queues and delays). Intersections, rather than roadway segments between intersections, are almost always the capacity controlling locations for any circulation system.

Signalized Intersections. For signalized intersections, the 2010 *Highway Capacity Manual* (Transportation Research Board, National Research Council) methodology was utilized. With this methodology, operations are defined by the level of service and average control delay per vehicle (measured in seconds) for the entire intersection. For a signalized intersection, control delay is the portion of the total delay attributed to traffic signal operation. This includes delay associated with deceleration, acceleration, stopping, and moving up in the queue. **Table 1** summarizes the relationship between delay and LOS for signalized intersections.

Unsignalized Intersections. For unsignalized (all-way stop-controlled and side-street stop-controlled) intersections, the 2010 *Highway Capacity Manual* (Transportation Research Board, National Research Council) methodology for unsignalized intersections was utilized. For side-street stop-controlled intersections, operations are defined by the level of service and average control delay per vehicle (measured in seconds), with delay reported for the stop sign controlled approaches or turn movements, although overall delay is also typically reported for intersections along state highways. For all-way stop-controlled intersections, operations are defined by the average control delay for the entire intersection (measured in seconds per vehicle). The delay at

an unsignalized intersection incorporates delay associated with deceleration, acceleration, stopping, and moving up in the queue. **Table 2** summarizes the relationship between delay and LOS for unsignalized intersections.

2. Minimum Acceptable Operation

Napa County has no published minimum level of service standards for unsignalized public road or private driveway intersections. The County General Plan (Policy CIR-16) states 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 installation of more travel lanes than shown on the Circulation Map. For this study, LOS D has been used for unsignalized intersections as the poorest acceptable operation for the entire intersection, with LOS E as the poorest acceptable operation for a side street stop sign controlled intersection approach. The reason for use of LOS E as the criteria for individual movements and LOS D as the criteria for the overall intersection is that the poorest operation at an unsignalized intersection is typically a specific stop sign controlled movement, unless side street volumes are high, in which case both the overall intersection and stop sign controlled movement are LOS F. Stop sign controlled intersections along Silverado Trail with low volumes of side street traffic tend to have poor stop sign controlled levels of service, but good to acceptable overall operation. As side street volumes increase, overall intersection operation also tends to degrade, but will usually remain one to two or more levels of service better than the stop sign controlled movement. When overall operation also degrades to LOS F operation, it is an indication of large volumes on the stop sign controlled approach, and the potential need for intersection signalization. The combined use of both criteria allows the County to identify those stop sign controlled intersections that have unacceptable delay for side street traffic as well as a sufficient amount of side street traffic that may meet signal warrant criteria levels.

3. Existing Harvest Operation

Table 3 shows that during harvest season, operation of the entire Silverado Trail/Zinfandel Lane intersection would be at an unacceptable LOS E during a Friday PM peak hour, and at an acceptable LOS B during the Saturday peak traffic hour. However, the stop sign controlled Zinfandel Lane approach to Silverado Trail would be operating unacceptably at LOS F conditions during both the Friday and Saturday PM peak hours.

E. INTERSECTION PEAK HOUR SIGNAL WARRANT EVALUATION

1. Analysis Methodology

Traffic signals are used to provide an orderly flow of traffic through an intersection. Many times they are needed to offer side street traffic an opportunity to access a major road where high volumes and/or high vehicle speeds block crossing or turn movements. They do not, however, increase the capacity of an intersection (i.e., increase the overall intersection's ability to accommodate additional vehicles) and, in fact, often slightly reduce the number of total vehicles that can pass through an intersection in a given period of time. Signals can also cause an increase in traffic accidents if installed at inappropriate locations.

There are 9 possible tests for determining whether a traffic signal should be considered for installation. These tests, called "warrants", consider criteria such as actual traffic volume, pedestrian volume, presence of school children, and accident history. The intersection volume data together with the available collision histories were compared to warrants contained in the *Manual on Uniform Traffic Control Devices* (MUTCD), Federal Highway Administration, 2010, California Supplement, which has been adopted by the State of California as a replacement for *Caltrans Traffic Manual*. Section 4C of the MUTCD provides guidelines, or warrants, which may indicate need for a traffic signal at an unsignalized intersection. As indicated in the MUTCD, satisfaction of one or more warrants does not necessarily require immediate installation of a traffic signal. It is merely an indication that the local jurisdiction should begin monitoring conditions at that location and that a signal may ultimately be required.

Warrant 3, the peak hour volume warrant, is often used as an initial check of signalization needs since peak hour volume data is typically available and this warrant is usually the first one to be met. Warrant 3 is based on a curve and takes only the hour with the highest volume of the day into account. To meet this warrant, a minimum of 100 vehicles per hour must approach the intersection on one of the side streets. It should also be noted that Warrant 3 has a second set of criteria based upon a combination of vehicle delay and volumes. This is typically referred to as the peak hour delay warrant.

In areas where there are less than 10,000 people in the immediate vicinity of an intersection or where the travel speeds on the uncontrolled intersection approaches are greater than 40 miles per hour, "rural" warrant criteria apply. They require only 70 percent of the volume levels of "urban" warrant criteria.

Please see the **Appendix** for the warrant charts.

2. Signalization Needs Based Upon Warrant Criteria

Table 4 shows that currently, the Silverado Trail/Zinfandel Lane intersection has both Friday and Saturday harvest peak hour volumes exceeding both rural and urban peak hour signal warrant #3 criteria levels.

F. PLANNED IMPROVEMENTS

There are no planned and funded improvements at any location evaluated in this study.¹

¹ Mr. Paul Wilkinson, Napa County Public Works Department, June 2013.

V. FUTURE HORIZON CIRCULATION SYSTEM OPERATION WITHOUT THE PROJECT

Project traffic impacts have been determined for near and long term horizons. The near term horizon reflects the first year that the project will be at full production. Based upon input from the project applicant, the expected first year of full production will be 2018. The long term horizon reflects the County's general plan buildout year, which is 2030. Future horizon year volumes have been determined based upon traffic modeling projections for the year 2030 from the County's General Plan Circulation Element. This document showed an approximate 67 percent growth in weekday PM peak hour traffic along Silverado Trail adjacent to the project site between the years 2000 and 2030, with about a 60 percent growth along Zinfandel Lane during the same 30-year time period. Projecting straight-line traffic growth for analysis purposes, this translated into about an 8 percent growth in harvest PM peak hour traffic from 2013 to the year 2018, and about a 28 percent growth in harvest traffic from 2013 to 2030 along Silverado Trail. Along Zinfandel Lane, growth in PM peak hour harvest traffic has been determined based upon a list of approved projects provided by the County as shown in the Updated Traffic Study for Raymond Winery (Use Permit Modification # PH-00156). The approved projects include Raymond Winery, Kelham Winery, The Ranch Winery, Del Dotto Family Winery, Sullivan Family Estate and Franciscan Winery.

Since traffic modeling projections were available for a weekday PM peak hour only and not for a Saturday peak hour, north and southbound Saturday volumes on Silverado Trail were increased by the percentages above. However, due to the greater detail available for weekday volumes which showed higher increases in southbound versus northbound traffic on Silverado Trail, Friday PM peak hour volumes were adjusted directionally, with the guidance that the two-way volume percent increases should be as listed above.

A. YEAR 2018 WITHOUT PROJECT EVALUATION

1. Volumes

Year 2018 "Without Project" Friday and Saturday PM peak hour harvest volumes are presented in **Figure 5**.

2. Intersection Level of Service

Table 3 shows that in 2018 during harvest season, "Without Project" operation of the entire Silverado Trail/Zinfandel Lane intersection would be at an unacceptable LOS F during the Friday and Saturday PM peak traffic hours. During both the Friday and Saturday PM peak hours the stop sign controlled Zinfandel Lane approach to Silverado Trail would be operating unacceptably at LOS F.

3. Intersection Signalization Needs

Table 4 shows that in 2018 during harvest season, the Silverado Trail/Zinfandel Lane intersection would have both Friday and Saturday PM peak hour “Without Project” volumes exceeding both rural and urban peak hour signal warrant #3 criteria levels.

B. YEAR 2030 WITHOUT PROJECT EVALUATION

1. Volumes

Year 2030 “Without Project” Friday and Saturday PM peak hour harvest volumes are presented in Figure 6.

2. Intersection Level of Service

Table 3 shows that in 2030 during harvest season, “Without Project” operation of the entire Silverado Trail/Zinfandel Lane intersection would be at unacceptable LOS F conditions during both the Friday and Saturday PM peak traffic hours. In addition, during both the Friday and Saturday PM peak hours the stop sign controlled Zinfandel Lane approach to Silverado Trail would be operating unacceptably at LOS F.

3. Intersection Signalization Needs

Table 4 shows that in 2030 during the harvest season, the Silverado Trail/Zinfandel Lane intersection would have both Friday and Saturday PM peak hour volumes exceeding both rural and urban peak hour signal warrant #3 criteria levels.

VI. PROJECT IMPACTS

A. SIGNIFICANCE CRITERIA

The following criteria were developed for recent traffic impact analyses in the County. These same criteria have been utilized in this study to determine the significance of impacts due to the project. An impact is considered to be significant if any of the following conditions are met.

- If an unsignalized intersection has “Without Project” overall LOS A, B, C or D operation and deteriorates to LOS E or F operation with the addition of project traffic – or – has a stop sign controlled movement operating at LOS A, B, C, D or E and deteriorates to LOS F with the additional project traffic, the impact is considered significant and would require mitigation.
- If an unsignalized intersection already has “Without Project” overall LOS E or F operation – or – if a stop sign controlled movement or approach is already operating

at LOS F, an increase in traffic passing through the intersection of 1 percent or more due to the project is considered to be significant and would require mitigation.

- If the addition of project traffic to an unsignalized intersection increases “Without Project” volumes to meet peak hour signal warrant criteria levels, the impact is considered significant and would require mitigation.
- If “Without Project” volumes at an unsignalized intersection already meet peak hour signal warrant criteria levels and the level of service is already at an unacceptable level, an increase in traffic of 1 percent or more due to the project is considered significant and would require mitigation.
- If projected daily volumes on the project driveway in combination with volumes on the roadway providing access to the project driveway meet County warrant criteria for provision of a left turn lane on the approach to the project entrance.

B. TRIP GENERATION

Friday and Saturday afternoon trip generation projections were developed with the assistance of the project applicant and their representative for all components of the employee, grape delivery and visitor activities at the proposed Castellucci Family Winery (see worksheets in the **Appendix**). Results are presented on an hourly basis in **Tables 5A** and **5B** for Friday and Saturday afternoon conditions. During the Friday PM peak traffic hour, there would be a projected 0 inbound and 5 outbound project trips, while during the Saturday afternoon PM peak traffic hour, there would be a projected 4 inbound and 5 outbound project trips. As shown, winery administrative and production employees would be expected on the local roadway network during harvest Friday PM peak traffic conditions, but not during Saturday afternoon peak hour conditions. Visitor-serving employees would also be working until 5:00 PM every day, as tours and tasting by appointment would close at 4:00 PM. In addition, the one expected grape delivery per day could be scheduled any time between 8:00 AM and 5:00 PM. Therefore, the only winery-related traffic expected on the local roadway network during the Friday PM peak traffic hour would be employee related, while during a Saturday afternoon peak traffic hour it would primarily be visitor traffic related, with the possible addition of one grape haul truck along Silverado Trail and Zinfandel Lane. Assuming average size groups of ± 12 to 13 people entering and leaving the winery at about 2:00 PM and the final visitor group of the day leaving about 4:00 PM, this could result in about 4 to 5 visitor-related vehicles accessing the winery during any given traffic hour between 10:00 AM and 4:00 PM.

C. TRIP DISTRIBUTION

Project traffic was distributed to Zinfandel Lane and Silverado Trail in a pattern reflective of existing distribution patterns at the Silverado Trail/Zinfandel Lane intersection as well as an expected difference in employee traffic distribution (primarily to/from Silverado Trail) versus visitor traffic distribution (split about evenly between Silverado Trail and Zinfandel Lane to the west for access to SR 29). Grape truck traffic would be expected to primarily use Silverado Trail to the south of Zinfandel Lane. The Friday and Saturday project traffic increments expected on

Zinfandel Lane and Silverado Trail during the times of ambient PM peak traffic flow are presented in **Figure 7**, while Friday and Saturday “With Project” PM peak hour volumes for the years 2018 and 2030 are presented in **Figures 8 and 9**, respectively.

D. PLANNED ROADWAY IMPROVEMENTS

The Castellucci Family Winery is proposing construction of a left turn lane on the eastbound Zinfandel Lane approach to the project access intersection (see **Figure 10**). An initial review of the proposed left turn pocket design is acceptable to the County pending submittal of the final design plans for review and approval.

E. YEAR 2018 INTERSECTION IMPACTS

1. Level of Service

Project traffic would not produce a significant level of service impact at the Silverado Trail/Zinfandel Lane intersection during either the Friday or Saturday year 2018 PM peak traffic hours along Silverado Trail and Zinfandel Lane. Project traffic would not change any acceptable operation to unacceptable conditions, nor would it increase volumes by 1 percent or more when “Without Project” operation would be unacceptable. Project PM peak hour volume increases would be 0.1 to 0.2 percent or less at this location.

2. Signalization Needs

Project traffic would not produce a significant signalization needs impact at the Silverado Trail/Zinfandel Lane intersection during either the Friday or Saturday year 2018 PM peak traffic hours along Silverado Trail and Zinfandel Lane. Project traffic would not increase volumes to meet signal warrant #3 criteria nor would it increase volumes by 1 percent or more when “Without Project” volumes would already meet peak hour signal warrant criteria levels. Project PM peak hour volume increases would be 0.1 to 0.2 percent or less at this location.

F. YEAR 2030 INTERSECTION IMPACTS

1. Level of Service

Project traffic would not produce a significant level of service impact at the Silverado Trail/Zinfandel Lane intersection during either Friday or Saturday year 2030 PM peak traffic hours along Silverado Trail and Zinfandel Lane. Project traffic would not change any acceptable operation to unacceptable conditions, nor would it increase volumes by 1 percent or more when “Without Project” operation would be unacceptable. Project PM peak hour volume increases would be 0.1 to 0.2 percent or less at this location.

2. Signalization Needs

Project traffic would not produce a significant signalization needs impact at the Silverado Trail/Zinfandel Lane intersection during either Friday or Saturday year 2030 PM peak traffic

hours along Silverado Trail and Zinfandel Lane. Project traffic would not increase volumes to meet signal warrant #3 criteria nor would it increase volumes by 1 percent or more when “Without Project” volumes would already meet peak hour signal warrant criteria levels. Project PM peak hour volume increases would be 0.1 to 0.2 percent or less at this location.

G. SIGHT LINE ADEQUACY

Sight lines would be acceptable for drivers turning from the project driveway to Zinfandel Lane. Sight lines to the west would be 600+ feet, while sight lines to the east would be about 270 feet (to the Silverado Trail intersection). Based upon westbound travel speeds along Zinfandel Lane of 25 to 30 miles per hour by vehicles just turning from Silverado Trail, and an eastbound travel speed of 45 miles per hour (10 miles per hour higher than the posted eastbound speed at the narrow bridge across the Napa River), the required stopping sight distances would be 200 feet for westbound drivers and 360 feet for eastbound drivers. These distances would be well under available sight lines.²

H. PROJECT ENTRANCE LEFT TURN LANE REQUIREMENT

Table 6 shows that average two-way daily traffic volumes along Zinfandel Lane in combination with projected weekday two-way daily volumes on the project driveway will meet County warrant criteria for provision of a left turn lane on the eastbound Zinfandel Lane intersection approach. Please see the warrant evaluation worksheet in the **Appendix**. This assumes 50 visitors per day accessing the winery. Should average visitor totals be reduced from 50 down to a maximum of about 30 per day, County left turn lane warrant criteria would not be met.

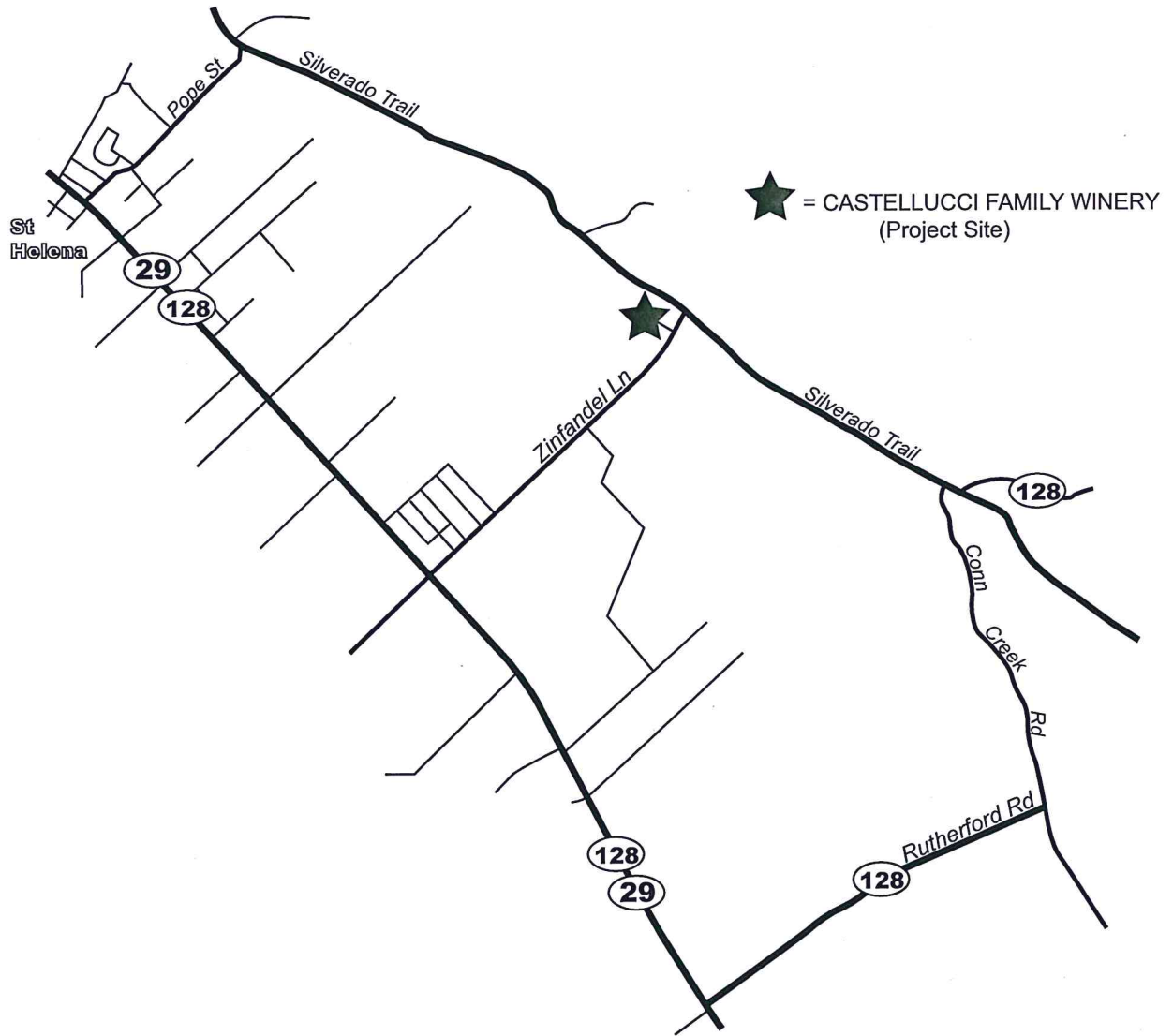
VII. CONCLUSIONS & RECOMMENDATIONS

The project would result in no significant off-site circulation system operational impacts at the Silverado Trail/Zinfandel Lane intersection nor any sight line impacts at the proposed project driveway connection to Zinfandel Lane. Therefore, no mitigations are needed for these issues. In addition, the applicant is providing a left turn lane on the eastbound Zinfandel Lane approach to the project entrance that will meet County design criteria.

This Report is intended for presentation and use in its entirety, together with all of its supporting exhibits, schedules, and appendices. Crane Transportation Group will have no liability for any use of the Report other than in its entirety, such as providing an excerpt to a third party or quoting a portion of the Report. If you provide a portion of the Report to a third party, you agree to hold CTG harmless against any liability to such third parties based upon their use of or reliance upon a less than complete version of the Report.

² A Policy on Geometric Design of Highways and Streets, 2011, AASHTO.

Not To Scale



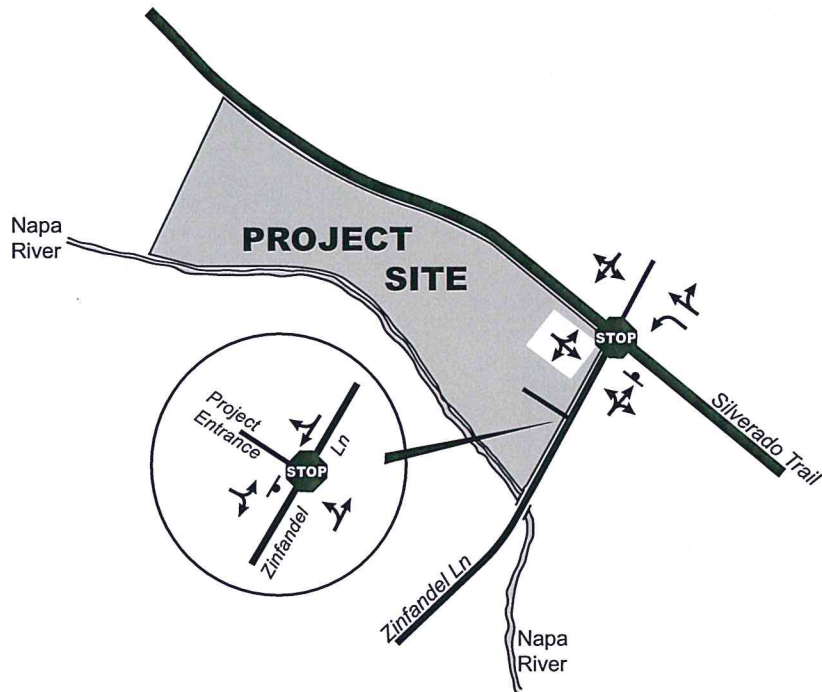
Castellucci Family Winery Traffic Study

Figure 1
Area Map



CRANE TRANSPORTATION GROUP

Not To Scale
NORTH

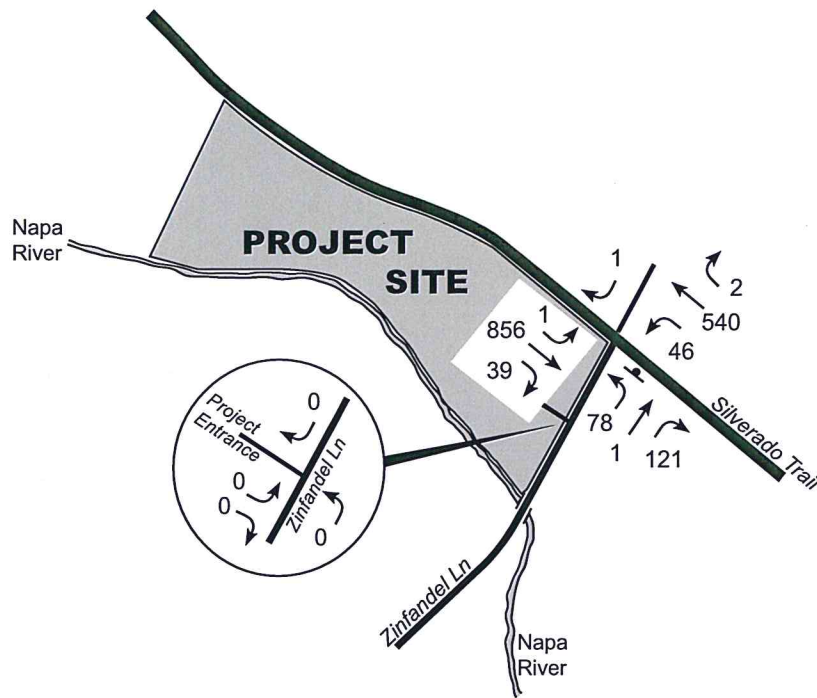


 = Side Street Stop Sign Controlled Intersection

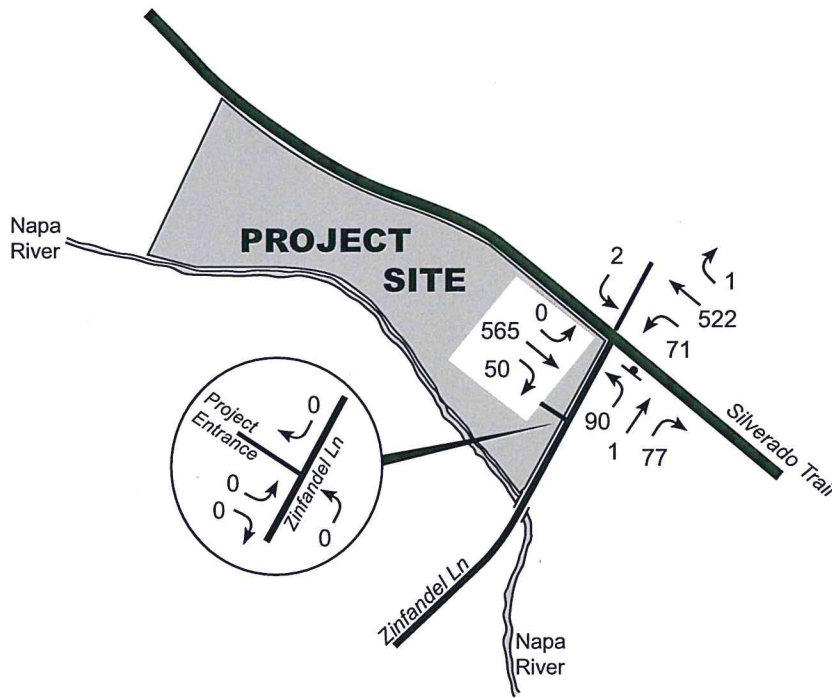


Figure 2
Existing and Proposed
Lane Geometrics and Intersection Control

Not To Scale



Friday
4:15-5:15 PM



Saturday
2:15-3:15 PM

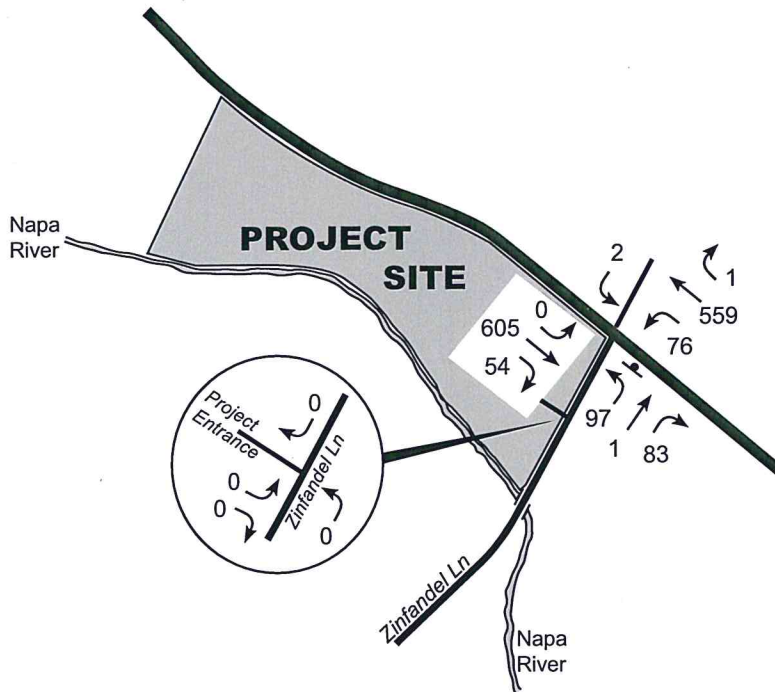
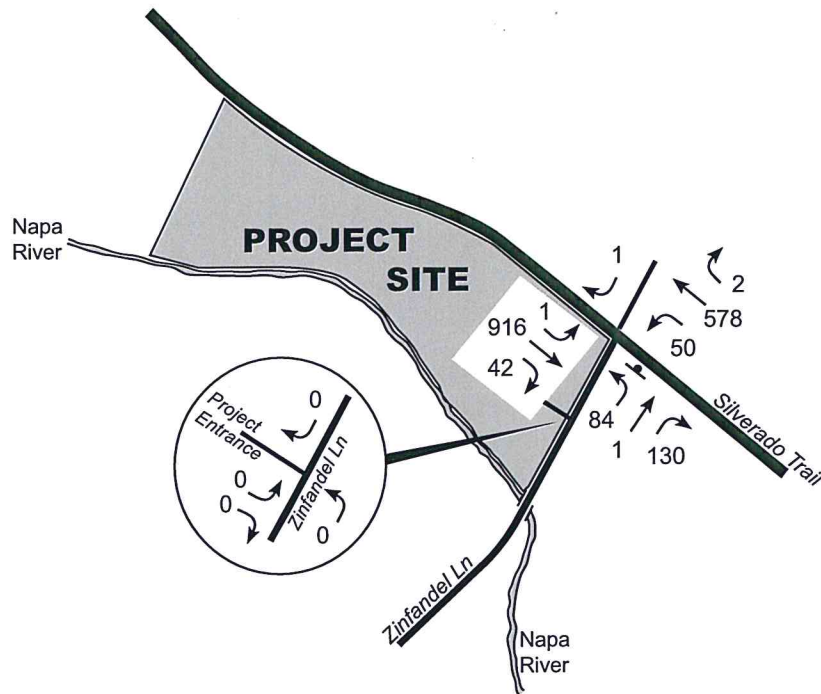
Castellucci Family Winery Traffic Study



CRANE TRANSPORTATION GROUP

Figure 3
Existing
June Friday and Saturday
PM Peak Hour Volumes

Not To Scale



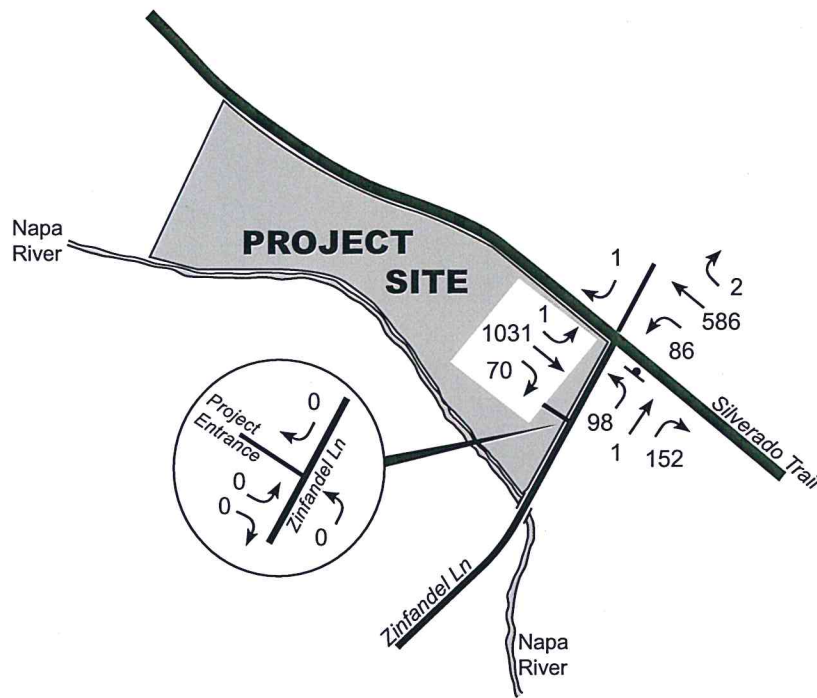
Castellucci Family Winery Traffic Study



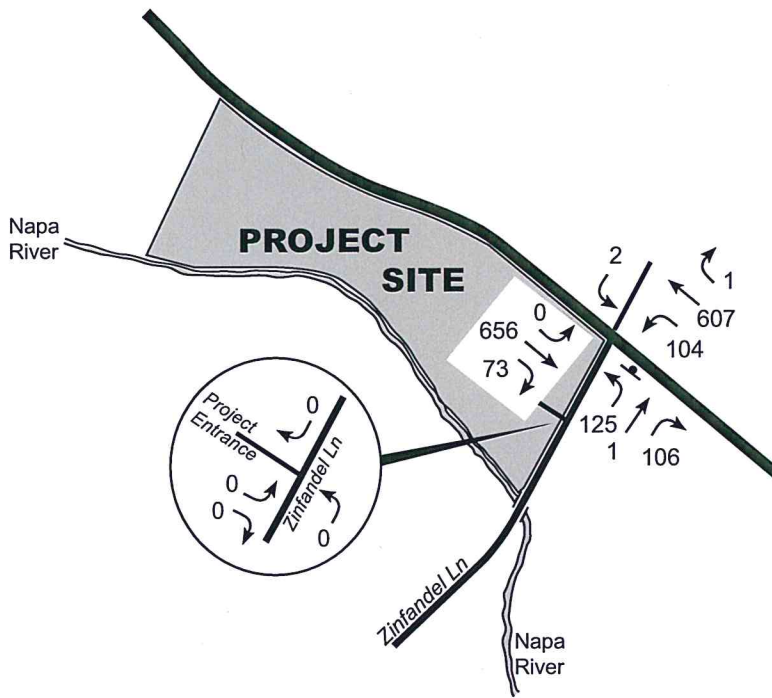
CRANE TRANSPORTATION GROUP

Figure 4
Existing
(Harvest) Friday and Saturday
PM Peak Hour Volumes

Not To Scale



Friday
4:15-5:15 PM



Saturday
2:15-3:15 PM

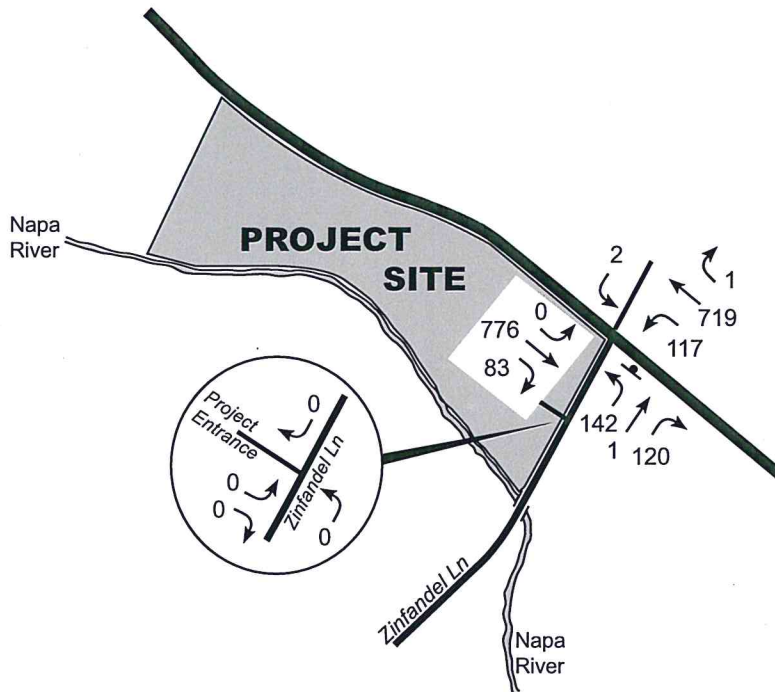
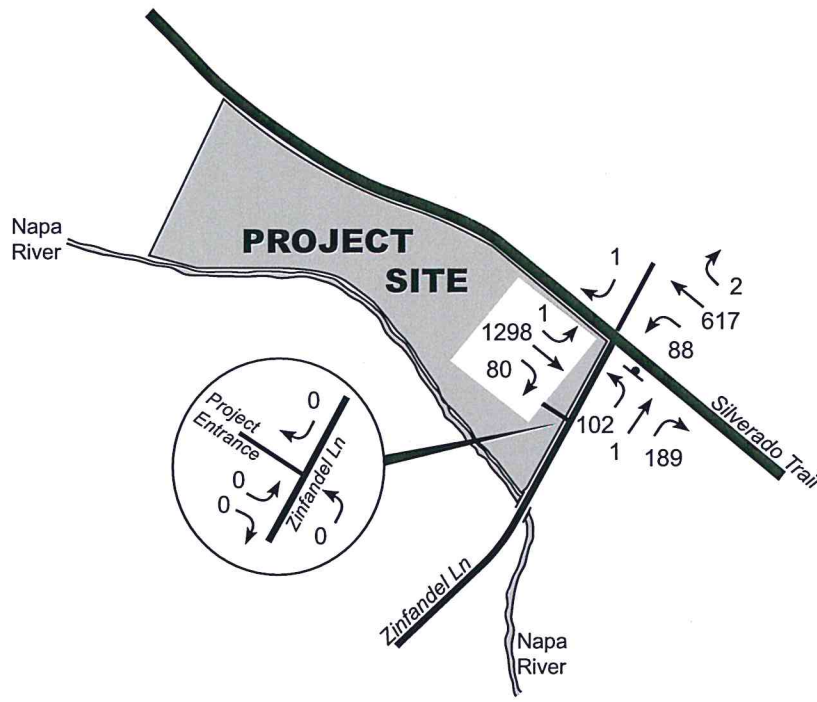
Castellucci Family Winery Traffic Study



CRANE TRANSPORTATION GROUP

Figure 5
Year 2018 without Project
(Harvest) Friday and Saturday
PM Peak Hour Volumes

Not To Scale



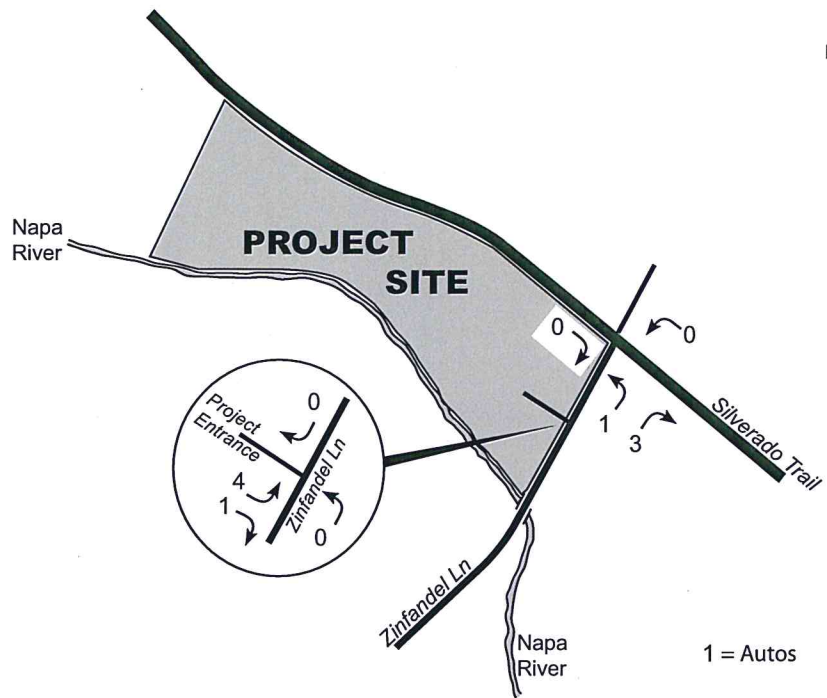
Castellucci Family Winery Traffic Study



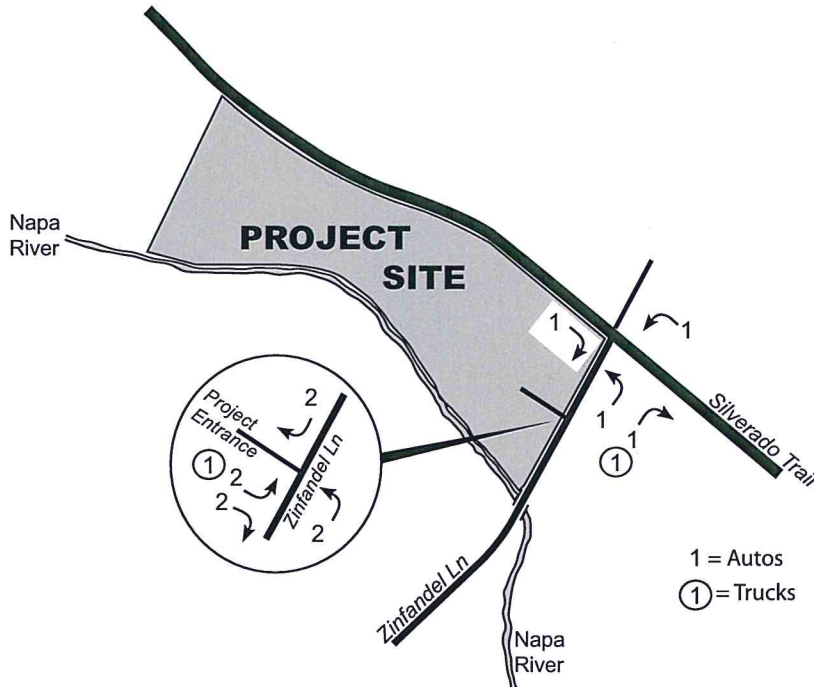
CRANE TRANSPORTATION GROUP

Figure 6
Year 2030 without Project
(Harvest) Friday and Saturday
PM Peak Hour Volumes

Not To Scale



Friday
4:15-5:15 PM



Saturday
2:15-3:15 PM

Castellucci Family Winery Traffic Study

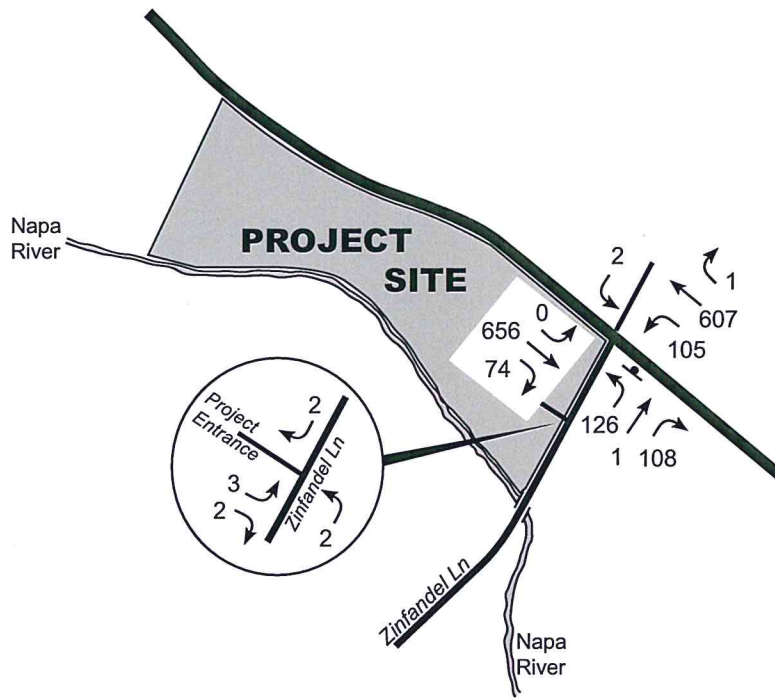
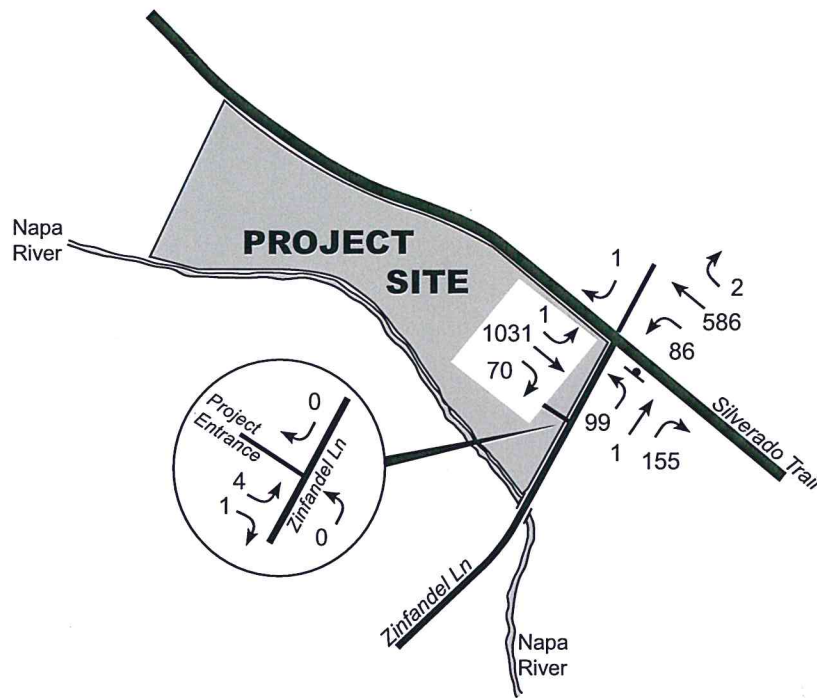


CRANE TRANSPORTATION GROUP

Figure 7

Harvest Friday and Saturday
PM Peak Hour Project Increment

Not To Scale



Castellucci Family Winery Traffic Study

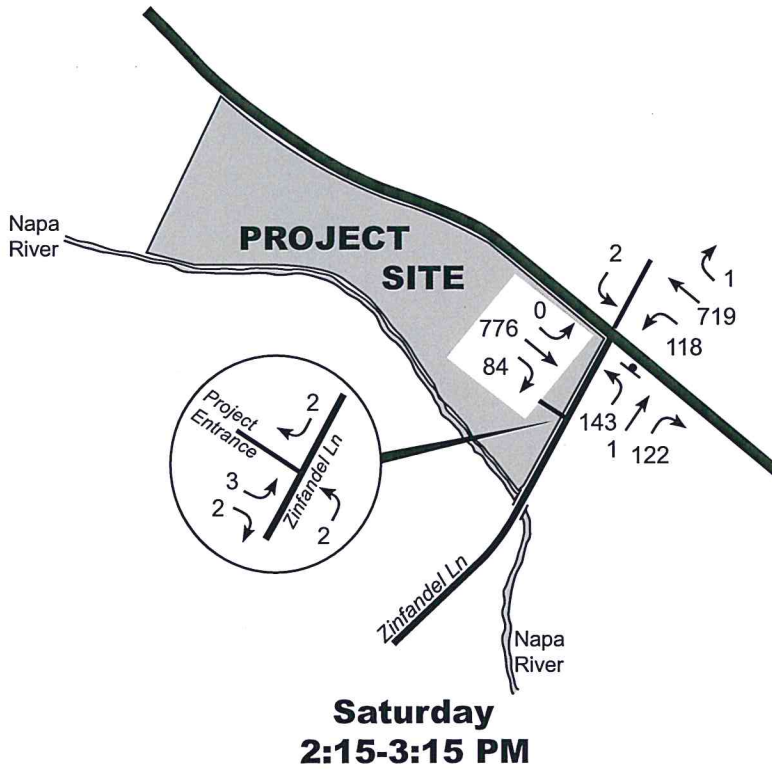
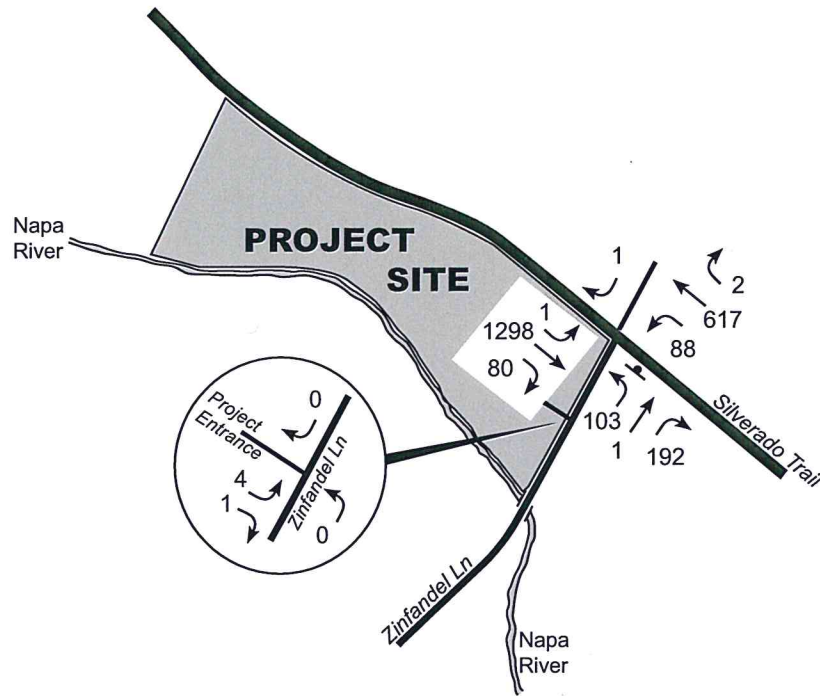


CRANE TRANSPORTATION GROUP

Figure 8
Year 2018 with Project
(Harvest) Friday and Saturday
PM Peak Hour Volumes

Not To Scale

NORTH

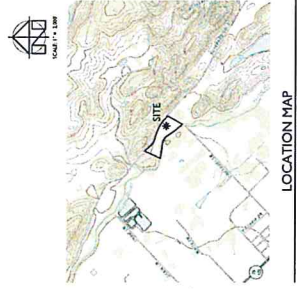


Castellucci Family Winery Traffic Study

Figure 9
Year 2030 with Project
(Harvest) Friday and Saturday
PM Peak Hour Volumes

CASTELLUCCI FAMILY WINERY

LEFT TURN LANE EXHIBIT



PROJECT INFORMATION
 PROPERTY OWNER & APPLICANT:
 ANTONIO CASTELLUCCI
 6500 ZINFANDEL LANE
 BELVEDERE, CA 94720
 SITE ADDRESS:
 3 ZINFANDEL LANE
 BELVEDERE, CA 94724
 ASSESSOR'S PARCEL NUMBER:
 025-160-006
 PARCEL SIZE:
 19.3± ACRES

- NOTES:**
1. AERIAL, BACKGROUND, AERIAL PHOTO, EXISTING, TOPOGRAPHIC, EXISTING, AND PROPOSED INFORMATION LISTED ON THIS MAP WAS OBTAINED FROM THE COUNTY OF CONTRA COSTA, CALIFORNIA, AND DOES NOT REPRESENT A WARRANTY OF ANY KIND. THE USER SHALL BE RESPONSIBLE FOR VERIFYING THE ACCURACY OF THE INFORMATION.
 2. CONTOUR INTERVAL TWO (2) FEET. HIGHLIGHTED DOTTED LINE (SITE).
 3. BACKGROUND PHOTOGRAPHY WAS OBTAINED FROM THE NAPA COUNTY GEOGRAPHIC INFORMATION SYSTEM (GIS) DATABASE PHOTO DATE (MAY 8 2011).
 4. THE INFORMATION LISTED ON THIS MAP WAS OBTAINED FROM THE COUNTY OF CONTRA COSTA, CALIFORNIA, AND DOES NOT REPRESENT A WARRANTY OF ANY KIND. THE USER SHALL BE RESPONSIBLE FOR VERIFYING THE ACCURACY OF THE INFORMATION.
 5. BACKGROUND PHOTOGRAPHY WAS OBTAINED FROM THE NAPA COUNTY GEOGRAPHIC INFORMATION SYSTEM (GIS) DATABASE PHOTO DATE (MAY 8 2011).
 6. CONTOUR INTERVAL TWO (2) FEET. HIGHLIGHTED DOTTED LINE (SITE).
 7. THE INFORMATION LISTED ON THIS MAP WAS OBTAINED FROM THE COUNTY OF CONTRA COSTA, CALIFORNIA, AND DOES NOT REPRESENT A WARRANTY OF ANY KIND. THE USER SHALL BE RESPONSIBLE FOR VERIFYING THE ACCURACY OF THE INFORMATION.

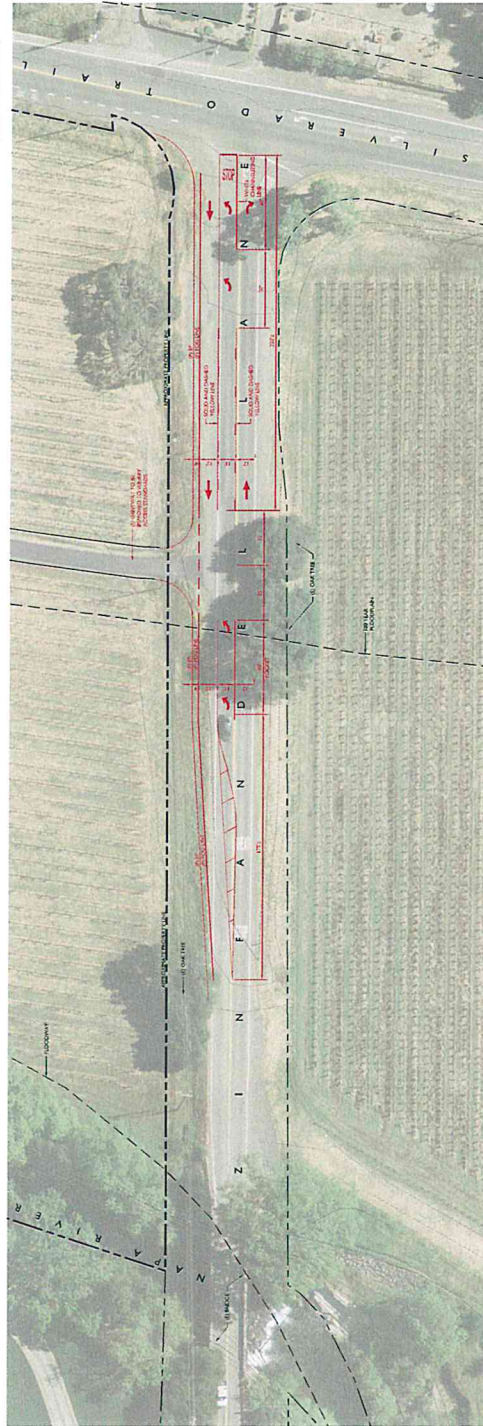
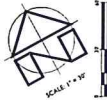


Figure 10
Proposed Left Turn Lane on Eastbound Zinfandel Approach to Project Entrance

Table 1

SIGNALIZED INTERSECTION LOS CRITERIA

Level of Service	Description	Average Control Delay (Seconds Per Vehicle)
A	Operations with very low delay occurring with favorable progression and/or short cycle lengths.	≤ 10.0
B	Operations with low delay occurring with good progression and/or short cycle lengths.	10.1 to 20.0
C	Operations with average delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures begin to appear.	20.1 to 35.0
D	Operations with longer delays due to a combination of unfavorable progression, long cycle lengths, and/or high volume-to-capacity (V/C) ratios. Many vehicles stop and individual cycle failures are noticeable.	35.1 to 55.0
E	Operations with high delay values indicating poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences. This is considered to be the limit of acceptable delay.	55.1 to 80.0
F	Operation with delays unacceptable to most drivers occurring due to oversaturation, poor progression, or very long cycle lengths.	> 80.0

Source: 2010 Highway Capacity Manual (Transportation Research Board).

Table 2

UNSIGNALIZED INTERSECTION LOS CRITERIA

Level of Service	Description	Average Control Delay (Seconds Per Vehicle)
A	Little or no delays	≤ 10.0
B	Short traffic delays	10.1 to 15.0
C	Average traffic delays	15.1 to 25.0
D	Long traffic delays	25.1 to 35.0
E	Very long traffic delays	35.1 to 50.0
F	Extreme traffic delays with intersection capacity exceeded (for an all-way stop), or with approach/turn movement capacity exceeded (for a side street stop controlled intersection)	> 50.0

Source: 2010 Highway Capacity Manual (Transportation Research Board).

Table 3

INTERSECTION LEVEL OF SERVICE

SILVERADO TRAIL/ZINFANDEL LANE

HARVEST FRIDAY PM PEAK HOUR

EXISTING	YEAR 2018		YEAR 2030	
	W/O PROJECT	WITH PROJECT	W/O PROJECT	WITH PROJECT
F-400/B-10.6 ⁽¹⁾ E-35.3 ⁽²⁾	F-913/B-11.8 F-104.5	F-932/B-11.8 F-108.2 (0.1%)*	F-1839/B-13.9 F-215.3	F-1868/B-13.9 F-220.9 (0.1%)*

⁽¹⁾ Unsignalized level of service – vehicle control delay in seconds: Zinfandel Lane EB stop sign controlled approach to Silverado Trail/Silverado Trail NB approach left turn to Zinfandel Lane.

⁽²⁾ Unsignalized level of service – vehicle control delay in seconds (entire intersection).

HARVEST SATURDAY PM PEAK HOUR

EXISTING	YEAR 2018		YEAR 2030	
	W/O PROJECT	WITH PROJECT	W/O PROJECT	WITH PROJECT
F-183/A-9.4 ⁽¹⁾ B-12.7 ⁽²⁾	F-534/A-9.9 F-62.5	F-537/A-9.9 F-65.2 (0.1%)*	F-1255/B-10.7 F-140.7	F-1272/B-10.7 F-144.6 (0.2%)*

⁽¹⁾ Unsignalized level of service – vehicle control delay in seconds: Zinfandel Lane EB stop sign controlled approach to Silverado Trail/Silverado Trail NB approach left turn to Zinfandel Lane.

⁽²⁾ Unsignalized level of service – vehicle control delay in seconds (entire intersection).

* (Percent project traffic.) Less than a 1% increase is not considered a significant impact.

*Year 2010 Highway Capacity Manual (HCM) Analysis Methodology – individual approach or turn movement results
Year 2000 HCM results for overall intersection operation. No overall intersection operation results obtainable from 2010 software.*

Source: Crane Transportation Group

Table 4

INTERSECTION SIGNAL WARRANT EVALUATION

SILVERADO TRAIL/ZINFANDEL LANE

**Do volumes meet peak hour signal
Warrant #3 rural condition criteria?**

FRIDAY PM PEAK HOUR

EXISTING	YEAR 2018		YEAR 2030	
	W/O PROJECT	WITH PROJECT	W/O PROJECT	WITH PROJECT
Yes*	Yes	Yes (0.2%)**	Yes	Yes (0.2%)**

SATURDAY PM PEAK HOUR

EXISTING	YEAR 2018		YEAR 2030	
	W/O PROJECT	WITH PROJECT	W/O PROJECT	WITH PROJECT
Yes*	Yes	Yes (0.3%)**	Yes	Yes (0.3%)**

* Also meets urban peak hour warrant for all conditions.

** (Percent project traffic.) Less than a 1% increase is not considered a significant impact.

Source: Crane Transportation Group

Table 5A

**PROJECT TRIP GENERATION
CASTELLUCCI FAMILY WINERY**

HARVEST FRIDAY

	TOTAL EMPL.	HOURS	TRIPS						PEAK HOUR TRIPS*	
			3-4 PM		4-5 PM		5-6 PM		4:15-5:15	
			IN	OUT	IN	OUT	IN	OUT	IN	OUT
Admin Employees	1	9AM-5PM	0	0	0	0	0	1	0	1
Production Employees – Full Time	2	7AM-5PM	0	0	0	0	0	2	0	2
Production Employees – Part Time	1	7AM-5PM	0	0	0	0	0	1	0	1
Tours/ Tasting Employees	1	9AM-5PM	0	0	0	0	0	1	0	1
Grape Delivery Trucks	1/day	8AM-5PM	0	1	0	0	0	0	0	0
Other Trucks	1	8AM-5PM	0	0	0	0	0	0	0	0
Visitors	50 total = 20 vehicles**	10AM-4PM	0	5	0	0	0	0	0	0
TOTAL			0	6	0	0	0	5	0	5

* Hour of peak traffic at Silverado Trail/Zinfandel Lane intersection.

** 2.6 visitors/vehicle average on weekdays per County data.

Table 5B

**PROJECT TRIP GENERATION
CASTELLUCCI FAMILY WINERY**

HARVEST SATURDAY

	TOTAL EMPL.	HOURS	TRIPS								PEAK HOUR TRIPS*		
			2-3 PM		3-4 PM		4-5 PM		5-6 PM		2:15-3:15		
			IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	
Admin Employees	1	9AM-5PM	0	0	0	0	0	0	0	0	1	0	0
Production Employees – Full Time	2	7AM-5PM	0	0	0	0	0	0	0	0	2	0	0
Production Employees – Part Time	1	7AM-5PM	0	0	0	0	0	0	0	0	1	0	0
Tours/ Tasting Employees	1	9AM-5PM	0	0	0	0	0	0	0	0	1	0	0
Grape Delivery Trucks	1/day	8AM-5PM	0	1	0	0	0	0	0	0	0	0	0
Other Trucks	1	8AM-5PM	0	0	0	0	0	0	0	0	0	0	1
Visitors	50 total = 18 vehicles**	10AM-4PM	4	4	0	4	0	0	0	0	0	4	4
TOTAL			4	5	0	4	0	0	0	5	4	5	

* Hour of peak traffic at Silverado Trail/Zinfandel Lane intersection.

** 2.8 visitors/vehicle average on Saturdays per County data.

Source: Crane Transportation Group

Table 6

**INTERSECTION LEFT TURN LANE WARRANT
EVALUATION
(COUNTY OF NAPA CRITERIA)**

ZINFANDEL LANE/PROJECT ACCESS

**Do daily volumes meet left turn warrant criteria levels
with 50 visitors per day?**

EXISTING WEEKDAY	YEAR 2030 WEEKDAY
Yes	Yes

Source: Crane Transportation Group