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Traffic Study

Raymond-Ticen Ranch Winery, P15-00307-MOD
Planning Commission Hearing, February 1, 2017

TRAFFIC IMPACT REPORT

RAYMOND-TICEN RANCH WINERY

August 26, 2016

Prepared for: **RAYMOND-TICEN RANCH WINERY**

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I. INTRODUCTION

This report has been prepared at the request of the proposed Raymond-Ticen Ranch Winery to determine whether proposed changes to the existing Raymond Vineyards Winery will result in any significant circulation impacts to the local roadway network. The Raymond Vineyards Winery will be changing names to the Raymond-Ticen Ranch Winery as part of the project. The scope of analysis has been discussed with and approved by County staff and includes evaluation of major intersections as well as SR 29, Silverado Trail and Zinfandel Lane operation near the project site for Existing, Year 2020 and year 2030 horizons (see **Figure 1**).

II. PROPOSED PROJECT SUMMARY

The proposed project will be comprised of the following three components.

- Provision of a new winery entrance on the east side of SR 29 about 600 feet south of the Whitehall Lane intersection at the existing Ticen Family Vineyard driveway connection to the state highway. This entrance will connect internally to the existing Raymond Vineyards driveway along Zinfandel Lane.
- Traffic impacts due to 64 employees. These staff are already working at Raymond Vineyards Winery. However, they exceed the currently permitted 26 employee level. Therefore, their traffic impact has been included as part of the project.
- Construction of a left turn lane on the westbound Zinfandel Lane approach to the existing Raymond driveway.

There will be no change in production level, number of trucks, number of visitors by appointment or marketing events with the proposed project.

III. SCOPE OF SERVICES

The scope of service for this traffic study was developed in consultation with the Napa County Public Works and Planning, Building & Environmental Sciences departments to determine the extent of any significant circulation impacts (positive or negative) due to the proposed project. Evaluation was conducted for harvest Friday AM and PM commute and Saturday afternoon peak traffic conditions. Historical traffic count information for SR 29 indicates that there are higher volumes during this time period than during all other times of the year. Existing, year 2020 and year 2030 (Cumulative – General Plan Buildout) operating conditions were evaluated both with and without project traffic along State Route 29-128 (SR 29), Zinfandel Lane and Silverado Trail. In addition, operating conditions were also evaluated at the project driveway intersections with SR 29 and Zinfandel Lane as well as at the Zinfandel Lane intersections with SR 29 and Silverado Trail based upon significance criteria contained in the General Plan and/or utilized in all recent County traffic studies. Finally, sight line adequacy was evaluated at the project

driveway intersections with SR 29 and Zinfandel Lane. Significant impacts, if any, were identified and measures listed, if needed, to mitigate all impacts to a less than significant level.

IV. SUMMARY OF FINDINGS

A. "WITHOUT PROJECT" OPERATING CONDITIONS

1. Existing Volumes – Harvest 2015

SR 29 adjacent to the proposed project site now has higher September harvest two-way traffic volumes during the Saturday PM peak traffic hour compared to either the Friday AM or Friday PM peak traffic hours (about 1,985 two-way peak hour vehicles from 3:15 to 4:15 PM on Saturday versus 1,470 two-way peak hour vehicles from 8:00 to 9:00 AM on Friday or 1,845 two-way peak hour vehicles from 3:15 to 4:15 PM on Friday). Zinfandel Lane adjacent to the project site now has higher September harvest two-way traffic volumes during the Friday PM peak traffic hour compared to either the Friday AM or Saturday PM peak traffic hours (about 405 two-way peak hour vehicles from 3:15 to 4:15 PM on Friday versus 295 two-way peak hour vehicles from 8:00 to 9:00 AM on Friday or 365 two-way peak hour vehicles from 3:15 to 4:15 PM on Saturday). The driveway serving the project site on Zinfandel Lane had a total of 47 vehicles during the Friday AM peak hour, 66 vehicles during the Friday PM peak hour and 78 vehicles during the Saturday PM peak hour.

2. Planned & Ongoing Roadway Improvements

Caltrans is currently widening SR 29 between Mee Lane and Charter Oak Avenue in St. Helena (including along the proposed project frontage). This improvement will provide a continuous two-way left turn lane in the median that will be used by southbound traffic turning left into the project driveway and as a median refuge area for vehicles turning left from the project driveway.

3. Year 2015 Harvest "Without Project" Circulation System Operation

- **SR 29/Zinfandel Lane** intersection – unacceptable level of service during the Friday AM & PM and Saturday PM peak hours.
- **Silverado Trail/Zinfandel Lane** intersection – unacceptable level of service during the Friday and Saturday PM peak hours.
- **SR 29 roadway segments** – Friday AM peak hour acceptable operation at all locations, but unacceptable Friday and Saturday PM peak hour southbound operation north of Zinfandel Lane and south of the project driveway as well as unacceptable Saturday PM peak hour northbound operation south of the project entrance.
- **Silverado Trail roadway segments** – Friday AM and Saturday PM peak hour acceptable operation at all locations, but unacceptable Friday PM peak hour southbound operation north and south of Zinfandel Lane.
- **Zinfandel Lane roadway segments** – acceptable operation during all time periods at all locations.

4. Year 2020 Harvest Without Project Circulation System Operation

- **SR 29/Zinfandel Lane** intersection – unacceptable level of service during the Friday AM & PM and Saturday PM peak hours.
- **Silverado Trail/Zinfandel Lane** intersection – unacceptable level of service during the Friday and Saturday PM peak hours.
- **SR 29 roadway segments** – Friday AM peak hour unacceptable northbound operation south of the project driveway. Friday PM peak hour unacceptable operation on all segments except northbound north of Zinfandel Lane and Saturday PM peak hour unacceptable operation on all segments.
- **Silverado Trail roadway segments** – Friday AM and Saturday PM peak hour acceptable operation at all locations, but unacceptable Friday PM peak hour southbound operation north and south of Zinfandel Lane.
- **Zinfandel Lane roadway segments** – acceptable operation during all time periods at all locations.

5. Year 2030 Cumulative Harvest Without Project Circulation System Operation

- **SR 29/Zinfandel Lane** intersection – unacceptable level of service during the Friday AM & PM and Saturday PM peak hours.
- **Silverado Trail/Zinfandel Lane** intersection – unacceptable level of service during the Friday AM & PM and Saturday PM peak hours.
- **SR 29 roadway segments** – Friday AM peak hour unacceptable northbound operation south of the project driveway and north of Zinfandel Lane; Friday and Saturday PM peak hours unacceptable operation on all segments.
- **Silverado Trail roadway segments** – Friday AM peak hour acceptable operation at all locations. Friday PM peak hour unacceptable operation at all locations except northbound to the south of Zinfandel Lane and Saturday PM peak hour acceptable operation at all locations except southbound south of Zinfandel Lane.
- **Zinfandel Lane roadway segments** – acceptable operation during all time periods at all locations.

B. PROJECT IMPACTS

1. Project Trip Generation

The 64 employees now considered part of the project would add traffic to the local roadway network. However, shift change schedules would significantly reduce additional traffic during the harvest Friday and Saturday peak traffic hours.

Harvest project trip generation expected during the peak traffic hours on the local circulation system is as follows.

FRIDAY AM PEAK HOUR TRIPS		FRIDAY PM PEAK HOUR TRIPS		SATURDAY AFTERNOON PEAK HOUR TRIPS	
IN	OUT	IN	OUT	IN	OUT
7	5	3	7	0	5

2. New Project Access to SR 29

The project is proposing access to SR 29 on the east side of the highway about 600 feet south of the Whitehall Lane intersection at the existing Ticen Family Vineyard driveway connection to the state highway. Opening access to the Raymond-Ticen Ranch operation from SR 29 should reduce existing Raymond peak hour traffic along Zinfandel Lane and Silverado Trail as well as SR 29 just north of the new entrance. Overall, the combination of the project's new employees and the new SR 29 access will result in the following changes in peak hour traffic along Zinfandel Lane.

CHANGE IN TRAFFIC ALONG ZINFANDEL LANE DUE TO THE PROPOSED PROJECT

TIME	NEAR SR 29	NEAR SILVERADO TRAIL
Friday AM Peak Hour	-2 vehicles	+5 vehicles
Friday PM Peak Hour	-17 vehicles	no change
Saturday PM Peak Hour	-14 vehicles	+1 vehicle

3. Year 2015 Existing + Project Off-Site Circulation Impacts

The proposed project would not result in any significant off-site circulation impacts to SR 29, Silverado Trail or Zinfandel Lane or to the SR 29/Zinfandel Lane or Silverado Trail/Zinfandel Lane intersections. The project would not degrade operation from acceptable to unacceptable at any analyzed location or increase peak hour volumes by 1 percent or greater at any location already experiencing unacceptable "Without Project" operation.

4. Year 2020 + Project Off-Site Circulation Impacts

The proposed project would not result in any significant off-site circulation impacts to SR 29, Silverado Trail or Zinfandel Lane or to the SR 29/Zinfandel Lane or Silverado Trail/Zinfandel Lane intersections. The project would not degrade operation from acceptable to unacceptable at any analyzed location or increase peak hour volumes by 1 percent or greater at any location already experiencing unacceptable "Without Project" operation.

5. Year 2030 Cumulative + Project Off-Site Circulation Impacts

The proposed project would not result in any significant off-site circulation impacts to SR 29, Silverado Trail or Zinfandel Lane or to the SR 29/Zinfandel Lane or Silverado

Trail/Zinfandel Lane intersections. The project would not degrade operation from acceptable to unacceptable at any analyzed location or increase peak hour volumes by 1 percent or greater at any location already experiencing unacceptable "Without Project" operation.

6. **Sight Lines at Project Driveways**
Sight lines at the proposed project's driveway connections to SR 29 and at the existing driveway connection to Zinfandel Lane meet minimum stopping sight distance criteria based upon the Caltrans March 2014 *Highway Design Manual*.

7. **Mitigations**
No mitigations are required.

C. CONCLUSIONS & RECOMMENDATIONS

The project will result in no significant off-site circulation system operational impacts to SR 29, Silverado Trail or Zinfandel Lane nor to the Zinfandel Lane intersections with SR 29 and Silverado Trail. Left turn lanes will be provided on the Zinfandel Lane and SR 29 approaches to both project driveways, and a refuge area will be provided in the SR 29 median to assist left turns from the new project driveway. In addition, sight lines at the project driveway connections to SR 29 and Zinfandel Lane are acceptable and meet Caltrans stopping sight distance criteria.

V. PROJECT LOCATION & DESCRIPTION

The proposed Raymond-Ticen Ranch Winery (currently the Raymond Vineyards Winery) is located on the south side of Zinfandel Lane about a third of a mile east of SR 29. As part of the project, the existing property will expand and extend to the south and west and will border the east side of SR 29 just south of Whitehall Lane (see **Figure 2**). The three components of the project for the traffic analysis are as follows:

- A winery entrance will be provided along SR 29 and will connect internally to the existing Raymond Vineyards driveway along Zinfandel Lane. The entrance will be at the existing Ticen Family Vineyard driveway connection to the state highway. Caltrans is currently widening SR 29 along the project frontage to provide a median continuous two-way left turn lane which will be used by winery traffic.

- For analysis purposes, in addition to the new entrance along SR 29, 64 of the existing 90 employees now at the Raymond Vineyards winery will also be considered part of "The Project" as they exceed the currently permitted 26 employees.

- A left turn lane will be provided on the westbound Zinfandel Lane approach to the existing Raymond driveway.

The number of new employees by category and their proposed work schedule on a Friday and Saturday during harvest are presented below.

PROJECT NEW EMPLOYEES DURING HARVEST
(FOR ANALYSIS PURPOSES)

EMPLOYEE CATEGORY (FULL & PART TIME)	FRIDAY		SATURDAY	
	#	SCHEDULE	#	SCHEDULE
Administration & Marketing	19	8:00 AM-5:00 PM	0	NA
Production	28	6:00 AM-2:30 PM	28	6:00 AM-2:30 PM
Hospitality	17	9:30 AM-6:00 PM	17	9:30 AM-6:00 PM
TOTAL	64		45	

Source: Raymond-Ticen Ranch applicant

It should be noted that "The Project" does not include any increase in production, daily visitation by appointment, truck traffic or new marketing events.

VI. EXISTING CIRCULATION SYSTEM EVALUATION PROCEDURES

A. ANALYSIS LOCATIONS

The following locations have been evaluated.

1. **SR 29/Zinfandel Lane intersection (The Zinfandel Lane approaches are stop sign controlled.)**

2. **Silverado Trail/Zinfandel Lane intersection (The Zinfandel Lane eastbound approach is stop sign controlled.)**

3. **SR 29/Project Driveway intersection (proposed)**

4. **Zinfandel Lane/Project Driveway intersection**

5. **SR 29 two-lane highway segments just north of Zinfandel Lane and south of the Project Driveway**

6. **Silverado Trail two-lane highway segments just north and south of Zinfandel Lane**

7. **Zinfandel Lane roadway segments east of SR 29 and west of Silverado Trail.**

Figure 3 presents a schematic of approach lane geometrics and control at each analysis intersection.

B. VOLUMES

1. ANALYSIS SEASONS AND DAYS OF THE WEEK

Project traffic impacts have been evaluated during harvest conditions. Based upon more than four years of historical information from Caltrans PeMS (Performance Measurement System) count surveys along SR 29 in the Napa Valley, September has the highest daily volumes of the year (during harvest), with August having the highest summer non-harvest daily volumes of the year. Since August counts were almost as high as September counts, only harvest conditions were selected for evaluation.

In regards to the peak traffic days of the week, the recently released Napa County Travel Behavioral Study[1] shows that the highest weekday volumes in Napa Valley occur on a Friday, with the highest weekend volumes occurring on a Saturday. In addition, historical count data from the City of Napa show that Friday has the highest volumes of any weekday, while Caltrans historical counts for SR 29 between St. Helena and Napa also show that weekday AM and PM peak hour volumes are higher on a Friday than on either a Wednesday or Thursday. Therefore, Friday and Saturday peak traffic conditions were evaluated in this study.

2. COUNT RESULTS

Friday 7:00 to 9:00 AM and 3:00 to 6:00 PM as well as Saturday 1:00 to 6:00 PM turn movement counts were conducted by Crane Transportation Group (CTG) in August 2015 at the SR 29/Zinfandel Lane, Silverado Trail/Zinfandel Lane, Zinfandel Lane/Raymond Vineyards entrance and SR 29/existing site access intersections. The peak traffic hours for the system were determined to be 8:00 to 9:00 AM and 3:00 to 4:00 PM on Friday and 3:15 to 4:15 PM on Saturday. Resultant August 2015 peak hour counts are presented in **Appendix Figures 1** and **2**. Overall, two-way volumes along SR 29 at the future project entrance were highest during the August Saturday PM peak traffic hour (1,985 vehicles on Saturday versus 1,470 vehicles during the Friday AM peak hour and 1,845 vehicles during the Friday PM peak hour). Volumes along Zinfandel Lane at the existing Raymond Vineyards entrance were highest during the August Friday PM peak traffic hour (405 vehicles on Friday versus 295 vehicles during the Friday AM peak hour and 365 vehicles during the Saturday PM peak hour). The peak traffic hours at each analysis location occasionally varied by 15 to 30 minutes. In these cases the highest volumes in the same general time period were used for analysis purposes.

[1] Fehr & Peers, December 8, 2014.

3. SEASONAL ADJUSTMENTS

August 2015 peak hour traffic counts were seasonally adjusted to reflect September harvest conditions. Historical traffic count data from Caltrans PeMS system as well as past studies, extending back to the Wine Train EIR in 1992, were utilized to determine the seasonal difference in August versus September weekday and weekend peak hour volumes. While some sources showed August volumes at a few locations in the Napa Valley being the same or a little higher than those in September, overall it was determined that September volumes at the vast majority of locations were slightly higher than August volumes by the following factors.

	September Compared to August Peak Hour Volumes
Weekday	+ 1%
Saturday	+ 2%

4. ADJUSTMENTS REFLECTING ONLY 26, NOT 90, EMPLOYEES

For analysis purposes Raymond Vineyards traffic volumes were adjusted to reflect trip generation only from the permitted 26 employees, and not the 90 employees currently working at the winery. The increment of traffic from the 64 employees that will become part of "The Project" was removed from the existing 2015 harvest projections to reflect traffic activity with current levels of visitation, but only 26 employees.

Resultant 2015 Friday AM and PM and Saturday PM peak hour harvest volumes with only 26 winery employees are presented in **Figures 4** and **5**.

C. ROADWAYS

Roadway descriptions are based upon the designation that SR 29 and Silverado Trail run in a general north-south direction through the project area and Zinfandel Lane runs in an east-west direction. The project site is along the east side of the state highway and south side of Zinfandel Lane.

State Route 29-128 (SR 29) is an arterial roadway extending the length of Napa County. It has two travel lanes from the City of Yountville to the Lake County line and four lanes to the south of Yountville. Adjacent to the project site it has two well-paved 12-foot travel lanes and eight-foot-wide paved shoulders. The posted speed limit is 50 miles per hour and the roadway is level and straight. About 300 feet north of the proposed site access there is the beginning of a gentle curve to the west just south of Whitehall Lane where the Napa Wine Train has an at-grade crossing that is protected by gates and flashing lights. Farther north SR 29 maintains its level and straight alignment through the Zinfandel Lane intersection. SR 29 is not controlled on its approaches to Zinfandel Lane, although left turn lanes are provided on both intersection approaches.

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.

Zinfandel Lane is a two-lane rural collector roadway extending westerly from Silverado Trail to the west of SR 29. It is stop sign controlled on its eastbound approach to Silverado Trail and on both approaches to SR 29. The posted speed limit is 45 miles per hour. The Napa Wine Train has an at-grade crossing of Zinfandel Lane just east of SR 29. Its crossing is protected by gates and flashing lights.

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.

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. It should be noted that the 2010 analysis software for unsignalized intersections does not report overall intersection delay. However, the year 2000 software does report overall delay and was utilized to report overall intersection operation. **Table 1** 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 or more levels of service better than the stop sign controlled movement. When overall operation also degrades to LOS E or 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.

E. ROADWAY SEGMENT LEVEL OF SERVICE

1. ANALYSIS METHODOLOGY

Roadway segment operation for SR 29, Silverado Trail and Zinfandel Lane has been evaluated based upon criteria developed for Napa County roadways as part of the County General Plan Update in 2007: Napa County General Plan Update EIR – Technical Memorandum for Traffic and Circulation Supporting the Findings and Recommendations by Dowling Associates, February 2007. Table 5 in this report, "Peak Hour Roadway Capacities," shows the following directional capacity limit-level of service relationships for a two-lane rural highway (such as SR 29 or Silverado Trail) as well as for a two-lane collector roadway (such as Zinfandel Lane).

		LOS A	LOS B	LOS C	LOS D	LOS E
2-Lane Rural Highway (SR 29 & Silverado Trail)	Maximum Peak Direction Volumes	100	330	620	870	1200
	Volume/Capacity Ratio	(.08)	(.28)	(.52)	(.73)	(1.00)
2-Lane Collector (Zinfandel Lane)	Maximum Peak Direction Volumes	73	97	480	760	810
	Volume/Capacity Ratio	(.09)	(.12)	(.59)	(.94)	(1.00)

2. MINIMUM ACCEPTABLE OPERATION

Level of service D (LOS D) is the poorest acceptable roadway segment operation in Napa County.

F. PLANNED IMPROVEMENTS

There are no planned and funded improvements at any location evaluated in this study[2] other than the current widening of SR 29 from Mee Lane to Charter Oak Avenue in St. Helena that will provide a continuous two-way left turn lane along the project frontage.

VII. FUTURE HORIZON TRAFFIC VOLUME PROJECTIONS

Traffic analysis has been conducted for existing (2015), year 2020 and cumulative year 2030 horizons at County request. The 2030 cumulative horizon reflects the County General Plan Buildout year. Traffic modeling for the General Plan shows the following growths in two-way traffic between 2015 and 2030 for the following roadways.

Route	2015 to 2030 Projected Growth in Weekday Traffic	
SR 29	AM peak hour = 22-23%	PM peak hour = 27-28%
Silverado Trail	AM peak hour = 36%	PM peak hour = 27%
Zinfandel Lane	AM peak hour = 12-13%	PM peak hour = 18-21%

Projecting straight line traffic growth for analysis purposes, this translates into the following growths in two-way traffic between 2015 and 2020 for the same roadways.

Route	2015 to 2020 Projected Growth in Weekday Traffic	
SR 29	AM peak hour = 7-8%	PM peak hour = 9-10%
Silverado Trail	AM peak hour = 12%	PM peak hour = 9%
Zinfandel Lane	AM peak hour = 4-5%	PM peak hour = 6-7%

Since traffic modeling projections were only available for weekday AM and PM peak hour conditions and not for the Saturday PM peak hour, Saturday two-way PM peak hour volumes were increased by the percentages found for the weekday PM peak hour.

Resultant year 2020 harvest "Without Project" Friday and Saturday peak hour volumes are presented in **Figures 6** and **7**, respectively, while year 2030 harvest "Without Project" Friday and Saturday peak hour volumes are presented in **Figures 8** and **9**, respectively.

[2] Mr. Paul Wilkinson, Napa County Public Works Department, February 2015.

VIII. OFF-SITE CIRCULATION SYSTEM OPERATION – WITHOUT PROJECT

1. EXISTING (2015) OPERATING CONDITIONS (WITHOUT PROJECT)

A. HARVEST

1. INTERSECTION LEVEL OF SERVICE – Table 2

a) SR 29/ZINFANDEL LANE

1) Friday AM Peak Hour

Acceptable overall intersection operation: LOS A
Acceptable Zinfandel Lane stop sign controlled westbound approach: LOS E

2) Friday PM Peak Hour

Unacceptable overall intersection operation: LOS E
Unacceptable Zinfandel Lane stop sign controlled eastbound and westbound approaches: LOS F

3) Saturday PM Peak Hour

Unacceptable overall intersection operation: LOS E
Unacceptable Zinfandel Lane stop sign controlled eastbound and westbound approaches: LOS F

b) SILVERADO TRAIL/ZINFANDEL LANE

1) Friday AM Peak Hour

Acceptable overall intersection operation: LOS A
Acceptable Zinfandel Lane stop sign controlled eastbound approach: LOS D

2) Friday PM Peak Hour

Unacceptable overall intersection operation: LOS F
Unacceptable Zinfandel Lane stop sign controlled eastbound approach: LOS F

3) Saturday PM Peak Hour

Acceptable overall intersection operation: LOS C
Unacceptable Zinfandel Lane stop sign controlled eastbound approach: LOS F

2. ROADWAY SEGMENT LEVEL OF SERVICE – Table 3

a) SR 29

1) Friday AM Peak Hour

Acceptable operation north of Zinfandel Lane and south of proposed project driveway: LOS D northbound and LOS C southbound.

2) Friday PM Peak Hour

Acceptable operation northbound both north of Zinfandel Lane and south of the new project entrance, but unacceptable operation southbound: LOS D northbound and LOS E southbound.

3) Saturday PM Peak Hour

Acceptable operation north of Zinfandel Lane northbound, but unacceptable operation southbound: LOS D northbound and LOS E southbound. Unacceptable operation south of the new project entrance both northbound and southbound: LOS E.

b) SILVERADO TRAIL

1) Friday AM Peak Hour

Acceptable operation both north and south of Zinfandel Lane: LOS C northbound and LOS C southbound.

2) Friday PM Peak Hour

Acceptable operation northbound both north and south of Zinfandel Lane, but unacceptable operation southbound: LOS D northbound and LOS E southbound.

3) Saturday PM Peak Hour

Acceptable operation both north and south of Zinfandel Lane: LOS C northbound and LOS D southbound.

c) ZINFANDEL LANE

1) Friday AM Peak Hour

Acceptable operation both near SR 29 and Silverado Trail: LOS C eastbound and westbound.

2) Friday PM Peak Hour

Acceptable operation both near SR 29 and Silverado Trail: LOS C eastbound and westbound.

3) Saturday PM Peak Hour

Acceptable operation both near SR 29 and Silverado Trail: LOS C eastbound and westbound.

2. YEAR 2020 OPERATING CONDITIONS (WITHOUT PROJECT)

A. HARVEST

1. INTERSECTION LEVEL OF SERVICE – Table 4

a) SR 29/ZINFANDEL LANE

1) Friday AM Peak Hour

Acceptable overall intersection operation: LOS A
Unacceptable Zinfandel Lane stop sign controlled westbound approach: LOS F

2) Friday PM Peak Hour

Unacceptable overall intersection operation: LOS F
Unacceptable Zinfandel Lane stop sign controlled eastbound and westbound approaches: LOS F

3) Saturday PM Peak Hour

Unacceptable overall intersection operation: LOS F
Unacceptable Zinfandel Lane stop sign controlled eastbound and westbound approaches: LOS F

b) SILVERADO TRAIL/ZINFANDEL LANE

1) Friday AM Peak Hour

Acceptable overall intersection operation: LOS A
Acceptable Zinfandel Lane stop sign controlled eastbound approach: LOS E

2) Friday PM Peak Hour

Unacceptable overall intersection operation: LOS F
Unacceptable Zinfandel Lane stop sign controlled eastbound approach: LOS F

3) Saturday PM Peak Hour

Acceptable overall intersection operation: LOS D
Unacceptable Zinfandel Lane stop sign controlled eastbound approach: LOS F

2. ROADWAY SEGMENT LEVEL OF SERVICE – Table 5

a) SR 29

1) Friday AM Peak Hour

Acceptable operation north of Zinfandel Lane in both directions: LOS D northbound and southbound. Unacceptable operation northbound and acceptable operation southbound south of the proposed project entrance: LOS E northbound and LOS D southbound.

2) Friday PM Peak Hour

Acceptable operation north of Zinfandel Lane northbound and unacceptable southbound: LOS D northbound and LOS E southbound & unacceptable operation in both directions south of the proposed project entrance: LOS E northbound and southbound.

3) Saturday PM Peak Hour

Unacceptable operation in both directions north of Zinfandel Lane and south of the proposed project driveway: LOS E northbound and LOS E southbound.

b) SILVERADO TRAIL

1) Friday AM Peak Hour

Acceptable operation both north and south of Zinfandel Lane: LOS D northbound and LOS C southbound.

2) Friday PM Peak Hour

Acceptable operation northbound both north and south of Zinfandel Lane, but unacceptable operation southbound: LOS D northbound and LOS E southbound.

3) Saturday PM Peak Hour

Acceptable operation both north and south of Zinfandel Lane: LOS D northbound and southbound north of Zinfandel Lane & LOS C northbound and LOS D southbound south of Zinfandel Lane.

c) ZINFANDEL LANE

1) Friday AM Peak Hour

Acceptable operation both near SR 29 and Silverado Trail: LOS C eastbound and westbound.

2) Friday PM Peak Hour

Acceptable operation both near SR 29 and Silverado Trail: LOS C eastbound and westbound.

3) Saturday PM Peak Hour

Acceptable operation both near SR 29 and Silverado Trail: LOS C eastbound and westbound.

3. YEAR 2030 CUMULATIVE OPERATING CONDITIONS (WITHOUT PROJECT)

A. HARVEST

1. INTERSECTION LEVEL OF SERVICE – Table 6

a) SR 29/ZINFANDEL LANE

1) Friday AM Peak Hour

Acceptable overall intersection operation: LOS B
Unacceptable Zinfandel Lane stop sign controlled eastbound and westbound approaches: LOS F

2) Friday PM Peak Hour

Unacceptable overall intersection operation: LOS F
Unacceptable Zinfandel Lane stop sign controlled eastbound and westbound approaches: LOS F

3) Saturday PM Peak Hour

Unacceptable overall intersection operation: LOS F
Unacceptable Zinfandel Lane stop sign controlled eastbound and westbound approaches: LOS F

b) SILVERADO TRAIL/ZINFANDEL LANE

1) Friday AM Peak Hour

Acceptable overall intersection operation: LOS C
Unacceptable Zinfandel Lane stop sign controlled eastbound approach: LOS F

2) Friday PM Peak Hour

Unacceptable overall intersection operation: LOS F
Unacceptable Zinfandel Lane stop sign controlled eastbound approach: LOS F

3) Saturday PM Peak Hour

Unacceptable overall intersection operation: LOS F
Unacceptable Zinfandel Lane stop sign controlled eastbound approach: LOS F

2. ROADWAY SEGMENT LEVEL OF SERVICE – Table 7

a) SR 29

1) Friday AM Peak Hour

Unacceptable operation northbound and acceptable operation southbound both north of Zinfandel Lane and south of the new project entrance: LOS E northbound and LOS D southbound.

2) Friday PM Peak Hour

Unacceptable operation in both directions both north of Zinfandel Lane and south of the new project entrance: LOS E northbound and LOS F southbound.

3) Saturday PM Peak Hour

Unacceptable operation in both directions both north of Zinfandel Lane and south of the new project entrance: LOS E northbound and LOS F southbound.

b) SILVERADO TRAIL

1) Friday AM Peak Hour

Acceptable operation both north and south of Zinfandel Lane: LOS D northbound and LOS C southbound.

2) Friday PM Peak Hour

Unacceptable operation in both directions north of Zinfandel Lane: LOS E northbound and southbound, and unacceptable operation southbound south of Zinfandel Lane: LOS D northbound and LOS F southbound.

3) Saturday PM Peak Hour

Acceptable operation in both directions north of Zinfandel Lane: LOS D northbound and southbound & unacceptable operation southbound south of Zinfandel Lane: LOS D northbound and LOS E southbound.

c) ZINFANDEL LANE

1) Friday AM Peak Hour

Acceptable operation both near SR 29 and Silverado Trail: LOS C eastbound and westbound.

2) Friday PM Peak Hour

Acceptable operation both near SR 29 and Silverado Trail: LOS C eastbound and westbound.

3) Saturday PM Peak Hour

Acceptable operation both near SR 29 and Silverado Trail: LOS C eastbound and westbound.

IX. PROJECT IMPACT EVALUATION SIGNIFICANCE CRITERIA

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 a roadway directional segment has "Without Project" LOS A, B, C or D operation and deteriorates to LOS E or F operation with the addition of project traffic (and increases volumes by 1 percent or more), the impact is significant and would require mitigation.

- If a roadway directional segment already has "Without Project" unacceptable LOS E or F operation, an increase in directional traffic of 1 percent or greater is considered significant and would require mitigation.

- 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 (and increases volumes by 1 percent or more) – 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 (and increases volumes passing through the intersection by 1 percent or more), 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 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.

- If sight lines at project access driveways do not meet Caltrans stopping sight distance criteria based upon prevailing vehicle speeds.

X. PROJECT TRIP GENERATION & DISTRIBUTION

A. TRIP GENERATION

Provision of a new driveway connection to the project site on SR 29 would not result in any net new vehicles on the local roadway system; only a redistribution of some winery traffic away from the Zinfandel Lane driveway to the new SR 29 driveway.

The 64 employees now considered part of the project would, however, add traffic to the local roadway network, but only minor amounts during the Friday and Saturday peak traffic hours during harvest. The peak hours of ambient traffic on the local circulation system are as follows.

Friday AM Peak Hour	Friday PM Peak Hour	Saturday Afternoon Peak Hour
8:00-9:00	3:00-4:00	3:15-4:15

The work schedules of the 64 employees are or will be designed to preclude, to the maximum extent possible, vehicle trips during the peak traffic hours.

PROJECT EMPLOYEES AND WORK SCHEDULES DURING HARVEST FOR ANALYSIS PURPOSES

EMPLOYEE CATEGORY (FULL & PART TIME)	FRIDAY		SATURDAY	
	#	SCHEDULE	#	SCHEDULE
Administration & Marketing	19	8:00 AM-5:00 PM	0	NA
Production	28	6:00 AM-2:30 PM	28	6:00 AM-2:30 PM
Hospitality	17	9:30 AM-6:00 PM	17	9:30 AM-6:00 PM
TOTAL	64		45	

Source: Raymond-Ticen Ranch Winery applicant

Based upon review of existing traffic counts at the Raymond access along Zinfandel Lane, it was apparent that a few admin and marketing employees leave the Raymond site during the AM peak hour. In addition, a few production and/or admin employees enter the Raymond site during the Friday AM peak hour and leave the site during the Friday and Saturday PM peak hours at times other than according to current scheduling. Based upon these observations, it was projected that there would also be a minor amount of traffic from the 64 "Project" employees on the system during the on-street peak traffic hours, even if their scheduling would not indicate this occurrence. Conservative adjustments for this traffic were as follows.

PROJECT PEAK HOUR HARVEST TRIP GENERATION
DURING AMBIENT ON-STREET PEAK TRAFFIC HOURS
(64 NEW EMPLOYEES)

FRIDAY

	AM PEAK HOUR (8:00-9:00)				PM PEAK HOUR (3:00-4:00)			
	BASED UPON 100% SCHEDULED TIMES		BASED UPON SOME EARLY & LATE ARRIVALS		BASED UPON 100% SCHEDULED TIMES		BASED UPON SOME EARLY & LATE ARRIVALS	
	IN	OUT	IN	OUT	IN	OUT	IN	OUT
Admin/Marketing (8:00 AM-5:00 PM)	0	5*	5**	5*	3*	2*	3*	2*
Production (6:00 AM-2:30 PM)	0	0	0	0	0	0	0	5**
Hospitality (9:30 AM-6:00 PM)	0	0	2***	0	0	0	0	0
TOTAL	0	5	7	5	3	2	3	7

SATURDAY

	PM PEAK HOUR (3:15-4:15)			
	BASED UPON 100% SCHEDULED TIMES		BASED UPON SOME EARLY & LATE ARRIVALS	
	IN	OUT	IN	OUT
Admin/Marketing (8:00 AM-5:00 PM)	0	0	0	0
Production (6:00 AM-2:30 PM)	0	0	0	5**
Hospitality (9:30 AM-6:00 PM)	0	0	0	0
TOTAL	0	0	0	5

* Marketing
** Late arrival or departure
*** Early arrival
Source: Crane Transportation Group

It should also be noted that the new project access along SR 29 would potentially result in some additional visitor "without appointment" traffic turning to/from the site than is occurring today due to the higher volume levels passing the site on SR 29 than is currently the case on Zinfandel Lane. These additional visitors should be attracted from the vehicle flow already on SR 29 and would therefore not be newly added vehicles to the local circulation system, only to the Raymond-Ticen Ranch internal circulation system. An added 10 inbound and outbound visitor "without appointment" vehicles have also been projected at the new SR 29 driveway during both the Friday and Saturday PM peak traffic hours.

B. TRIP DISTRIBUTION

There are two traffic distribution components due to the project.

- Redistribution of traffic from existing visitors and the 26 permit allowable employees due to the new entrance along SR 29.
- Distribution of traffic from the 64 employees now considered part of the project to the local roadway network via both the SR 29 and Zinfandel Lane entrances.

Figures 10 and **11** show the Friday AM & PM peak hour and Saturday PM peak hour redistribution of existing Raymond Vineyards traffic (with 26 employees) due to the new entrance on SR 29 as well as the separate increment of traffic due to the 64 employees considered part of the project distributed to the two project entrances.

Overall, traffic from the 64 employees would be expected to distribute about 75 percent to/from the south on SR 29 and Silverado Trail, with the remaining 25 percent to/from the north. There would be about equal use of both driveways during the peak traffic hours by the net new employee traffic.

Redistribution of existing traffic due to the new entrance on SR 29 would result in increased traffic on SR 29 south of the new entrance and a corresponding decrease on Silverado Trail south of Zinfandel Lane and on Zinfandel Lane between the Raymond driveway and Silverado Trail. There would be a major decrease in site traffic on Zinfandel Lane between SR 29 and the Raymond entrance as well as on SR 29 between Zinfandel Lane and the new winery entrance, while there would be no measurable change in traffic on SR 29 or Silverado Trail north of Zinfandel Lane.

Resultant 2015 harvest "With Project" volumes are presented in **Figure 12** for Friday AM & PM peak hour conditions, and in **Figure 13** for Saturday PM peak hour conditions. Resultant 2020 harvest "With Project" volumes are presented in **Figure 14** for Friday AM & PM peak hour conditions, and in **Figure 15** for Saturday PM peak hour conditions, while resultant cumulative 2030 harvest "With Project" volumes are presented in **Figure 16** for Friday AM & PM peak hour conditions, and in **Figure 17** for Saturday PM peak hour conditions.

C. PLANNED ROADWAY IMPROVEMENTS

There are no capacity increasing roadway improvements planned by the County on the local roadway network serving the project site.[3] However, the applicant is proposing construction of a left turn lane on the westbound Zinfandel Lane approach to the Raymond Vineyards driveway.

[3] Rick Marshall, Napa County Public Works Department, December 2015.

XI. PROJECT IMPACTS

A. EXISTING (2015) WITH PROJECT CONDITIONS

1. HARVEST

a) Summary

Project traffic would not result in any significant level of service impacts at the Zinfandel Lane intersections with SR 29 or Silverado Trail, or any significant level of service impacts along any analyzed SR 29, Silverado Trail or Zinfandel Lane roadway segments during any harvest Friday or Saturday peak traffic hours. ***Less than Significant***.

b) Intersection Level of Service (ZINFANDEL LANE/ SILVERADO TRAIL & ZINFANDEL LANE/SR 29) – Table 2

At the **SR 29/Zinfandel Lane** intersection operation would remain unacceptable during the Friday AM & PM and Saturday PM peak traffic hours with the change in traffic due to the project. However, the project would result in no net change in volume during the Friday AM peak hour, and reductions in traffic during both the Friday and Saturday PM peak hours (-.55 percent during the Friday PM peak and -.48 percent during the Saturday PM peak). ***Less than Significant.***

At the **Silverado Trail/Zinfandel Lane** intersection operation would remain acceptable during the Friday AM peak hour, and unacceptable during the Friday and Saturday PM peak traffic hours with the change in traffic due to the project. However, the project would result in no net change in volume during the Friday PM peak hour, and an increase of only .07 percent during the Saturday PM peak hour, which would be less than the minimum 1 percent traffic added significance criteria limit. ***Less than Significant.***

c) Roadway Segments (SR 29, SILVERADO TRAIL & ZINFANDEL LANE) – Table 3

Zinfandel Lane would maintain acceptable LOS C operation during the Friday AM & PM and Saturday PM peak traffic hours with the change in traffic due to the proposed project. Peak hour volumes would decline due to the project between SR 29 and the Raymond entrance, and remain about the same between the Raymond entrance and Silverado Trail. ***Less than Significant***.

Silverado Trail would maintain acceptable operation during the Friday AM and Saturday PM peak hours with the change in traffic due to the proposed project. During the Friday PM peak hour when "Without Project" operation would be an unacceptable LOS E in the southbound direction, there will be no change in southbound volume due to the project north of Zinfandel Lane, and a 0.1 percent reduction in southbound traffic due to the project to the south of Zinfandel Lane. ***Less than Significant***.

SR 29 would maintain acceptable operation during the Friday AM peak hour with the change in traffic due to the proposed project. During the Friday PM peak hour when "Without Project" operation would be an unacceptable LOS E in the southbound direction, the change in traffic due to the proposed project would result in a 0.1 percent increase to the north of Zinfandel Lane and a 0.6 percent increase to the south of the new project driveway, which would be less than the minimum 1 percent traffic added significance criteria limit. During the Saturday PM peak hour when "Without Project" operation would be an unacceptable LOS E in both directions south of the new project entrance, there would be no change in northbound traffic and a + .4 percent increase in southbound traffic, which would be less than the minimum 1 percent traffic added significance criteria limit. To the north of Zinfandel Lane, when "Without Project" operation would be an unacceptable LOS E in the southbound direction, the project would not result in any change in traffic. ***Less than Significant.***

B. YEAR 2020 "WITH PROJECT" CONDITIONS

1. HARVEST

a) Summary

Project traffic would not result in any significant level of service impacts at the Zinfandel Lane intersections with SR 29 or Silverado Trail, or any significant level of service impacts along any analyzed SR 29, Silverado Trail or Zinfandel Lane roadway segments during any harvest Friday or Saturday peak traffic hours. ***Less than Significant***.

b) Intersection Level of Service (ZINFANDEL LANE/ SILVERADO TRAIL & ZINFANDEL LANE/SR 29) – Table 4

At the **SR 29/Zinfandel Lane** intersection operation would remain unacceptable during the Friday AM & PM and Saturday PM peak traffic hours with the change in traffic due to the project. However, the project would result in no net change in volume during the Friday AM peak hour, and reductions in traffic during both the Friday and Saturday PM peak hours (-.55 percent during the Friday PM peak and -.48 percent during the Saturday PM peak). ***Less than Significant***.

At the **Silverado Trail/Zinfandel Lane** intersection operation would remain acceptable during the Friday AM peak hour, and unacceptable during the Friday and Saturday PM peak traffic hours with the change in traffic due to the proposed project. However, the project would result in no net change in volume during the Friday PM peak hour, and an increase of only .07 percent during the Saturday PM peak hour, which would be less than the minimum 1 percent traffic added significance criteria limit. ***Less than Significant.***

c) Roadway Segments (SR 29, SILVERADO TRAIL & ZINFANDEL LANE) – Table 5

Zinfandel Lane would maintain acceptable LOS C operation during the Friday AM & PM and Saturday PM peak traffic hours with the change in traffic due to the proposed project. Peak hour volumes would decline due to the project between SR 29 and the Raymond entrance, and remain about the same between the Raymond entrance and Silverado Trail. ***Less than Significant***.

Silverado Trail would maintain acceptable operation during the Friday AM and Saturday PM peak hours with the change in traffic due to the proposed project. During the Friday PM peak hour when "Without Project" operation would be an unacceptable LOS E in the southbound direction, there would be no change in southbound volume due to the project north of Zinfandel Lane, and a 0.1 percent reduction in southbound traffic due to the project to the south of Zinfandel Lane. ***Less than Significant***.

SR 29 would maintain acceptable operation during the Friday AM peak hour north of Zinfandel Lane with the change in traffic due to the proposed project, while south of the project entrance "Without Project" operation would be an unacceptable LOS E in the northbound direction, the change in traffic due to the proposed project would result in a 0.3 percent increase, which would be less than the minimum 1 percent traffic added significance criteria limit. During the Friday PM peak hour when "Without Project" operation would be an unacceptable LOS E in the southbound direction, the change in traffic due to the proposed project would result in a 0.1 percent increase to the north of Zinfandel Lane and a 0.6 percent increase to the south of the new project driveway, which would be less than the minimum 1 percent traffic added significance criteria limit. During the Saturday PM peak hour when "Without Project" operation will be an unacceptable LOS E in both directions south of the new project entrance, there would be no change in northbound traffic and a + 0.3 percent increase in southbound traffic, which would be less than the minimum 1 percent traffic added significance criteria limit. To the north of Zinfandel Lane, when "Without Project" operation would be an unacceptable LOS E in both directions, the project would not result in any change in traffic. ***Less than Significant.***

C. YEAR 2030 CUMULATIVE "WITH PROJECT" CONDITIONS

1. HARVEST

a) Summary

Project traffic would not result in any significant level of service impacts at the Zinfandel Lane intersections with SR 29 or Silverado Trail, or any level of service impacts along any analyzed SR 29, Silverado Trail or Zinfandel Lane roadway segments during any harvest Friday or Saturday peak traffic hour. ***Less than Significant***.

b) Intersection Level of Service (ZINFANDEL LANE/ SILVERADO TRAIL & ZINFANDEL LANE/SR 29) – Table 6

At the **SR 29/Zinfandel Lane** intersection operation would remain unacceptable during the Friday AM & PM and Saturday PM peak traffic hours with the change in traffic due to the project. However, the project would result in no net change in volume during the Friday AM peak hour, and reductions in traffic during both the Friday and Saturday PM peak hours (-.43 percent during the Friday PM peak and -.36 percent during the Saturday PM peak). ***Less than Significant***.

At the **Silverado Trail/Zinfandel Lane** intersection operation would remain unacceptable during the Friday AM & PM and Saturday PM peak traffic hours with the change in traffic due to the proposed project. However, the project would only result in an increase of 0.35 percent during the Friday AM peak hour, no net change in volume during the Friday PM peak hour, and an increase of only .06 percent during the Saturday PM peak hour, which would be less than the minimum 1 percent traffic added significance criteria limit. ***Less than Significant.***

c) Roadway Segments (SR 29, SILVERADO TRAIL & ZINFANDEL LANE) – Table 7

Zinfandel Lane would maintain acceptable LOS C operation during the Friday AM & PM and Saturday PM peak traffic hours with the change in traffic due to the proposed project. Peak hour volumes will decline due to the project between SR 29 and the Raymond entrance, and remain about the same between the Raymond entrance and Silverado Trail. ***Less than Significant***.

Silverado Trail would maintain acceptable operation during the Friday AM peak hour with the change in traffic due to the proposed project. During the Friday PM peak hour when "Without Project" operation would be an unacceptable LOS E in the northbound direction, there would be no change in southbound volume due to the project north of Zinfandel Lane, and a 0.1 percent reduction in southbound traffic due to the project to the south of Zinfandel Lane. During the Saturday PM peak hour operation would remain acceptable north of Zinfandel Lane. South of Zinfandel Lane, when "Without Project" operation would be an unacceptable LOS E in the southbound direction, there would be no change in volume due to the project. ***Less than Significant***.

SR 29 would maintain acceptable operation during the Friday AM peak hour with the change in traffic due to the proposed project. In the northbound direction when "Without Project" operation would be an unacceptable LOS E, the change in traffic due to the proposed project would result in a 0.1 percent increase north of Zinfandel Lane and a 0.3 percent increase south of the project entrance, which would be less than the minimum 1 percent traffic added significance criteria limit. During the Friday PM peak hour when "Without Project" operation would be an unacceptable LOS E in the northbound direction and LOS F in the southbound direction, the change in traffic due to the proposed project to the north of Zinfandel Lane would result in a 0.1 percent increase in both north and southbound traffic, while to the south of the project driveway the change in traffic due to the proposed project would result in a 0.2 percent increase northbound and a 0.5 percent increase southbound, which would be less than the minimum 1

percent traffic added significance criteria limit. During the Saturday PM peak hour when "Without Project" operation would be an unacceptable LOS E in the northbound direction and LOS F in the southbound direction south of the new project entrance, there would be no change in northbound traffic and a + 0.3 percent increase in southbound traffic, which would be less than the minimum 1 percent traffic added significance criteria limit. To the north of Zinfandel Lane, when "Without Project" operation would be an unacceptable LOS E in the northbound direction and LOS F in the southbound direction, the project would not result in any change in traffic. ***Less than Significant.***

XII. PROJECT ACCESS IMPACTS

A. SIGHT LINE ADEQUACY AT PROJECT DRIVEWAYS

1. Project Driveway Connection to Zinfandel Lane

Zinfandel Lane is level and straight at the project entrance. It has a posted speed limit of 45 miles per hour. Observed speeds on Zinfandel Lane at the project entrance ranged from 40 to 55 mph in both directions. Sight lines for drivers turning from the Zinfandel Lane driveway are greater than 1,000 feet to the east and west.

2. Project Driveway Connection to SR 29 (With Project)

SR 29 is level and straight at the project entrance. It has a posted speed limit of 50 miles per hour and observed speeds ranged from 40 to 60 mph in both directions. Sight lines for drivers turning from the new SR 29 intersection would be about 700 feet to the north (to see and be seen by southbound traffic) and more than 800 feet to the south (to see and be seen by northbound traffic).

3. Sight Line Criteria

Corner sight line criteria at a private driveway connection to a public road are based upon minimum stopping sight distance. Shown below are Caltrans minimum stopping sight distance Highway Design Manual criteria.[4]

SPEED (MPH)	MINIMUM STOPPING SIGHT DISTANCE
40	300'
45	360'
50	430'
55	500'
60	580'

Based upon available sight lines and observed vehicle speeds along Zinfandel Lane and SR 29 at the project entrances, sight lines are acceptable at both locations. ***Less than Significant.***

[4] Caltrans *Highway Design Manual*, 2014.

B. ACCESS TO TICEN PROPERTY ALONG SR 29

The project access driveway along the east side of SR 29 will be located at the same location of the existing driveway now serving the Ticen Vineyards property. The driveway on the west side of SR 29 opposite the existing Ticen driveway will remain and will continue to provide access to a single family residence and for vineyard access. Existing peak period counts showed minimal traffic volumes associated with this west side driveway.

The continuous two-way left turn lane now being provided by Caltrans along SR 29 will serve the Raymond-Ticen Ranch Winery as well as the driveway on the west side of the state highway.

XIII. LEFT TURN LANE WARRANT EVALUATION

The project will be providing a left turn lane on the westbound Zinfandel Lane approach to the existing Raymond driveway as part of the project. In addition, Caltrans is now widening SR 29 along the project frontage and providing a continuous two-way left turn lane at the project entrance. This median turn lane will allow safe deceleration and storage of southbound vehicles turning into the site as well as a median refuge area for drivers making left turns from the project driveway. ***Less than Significant***.

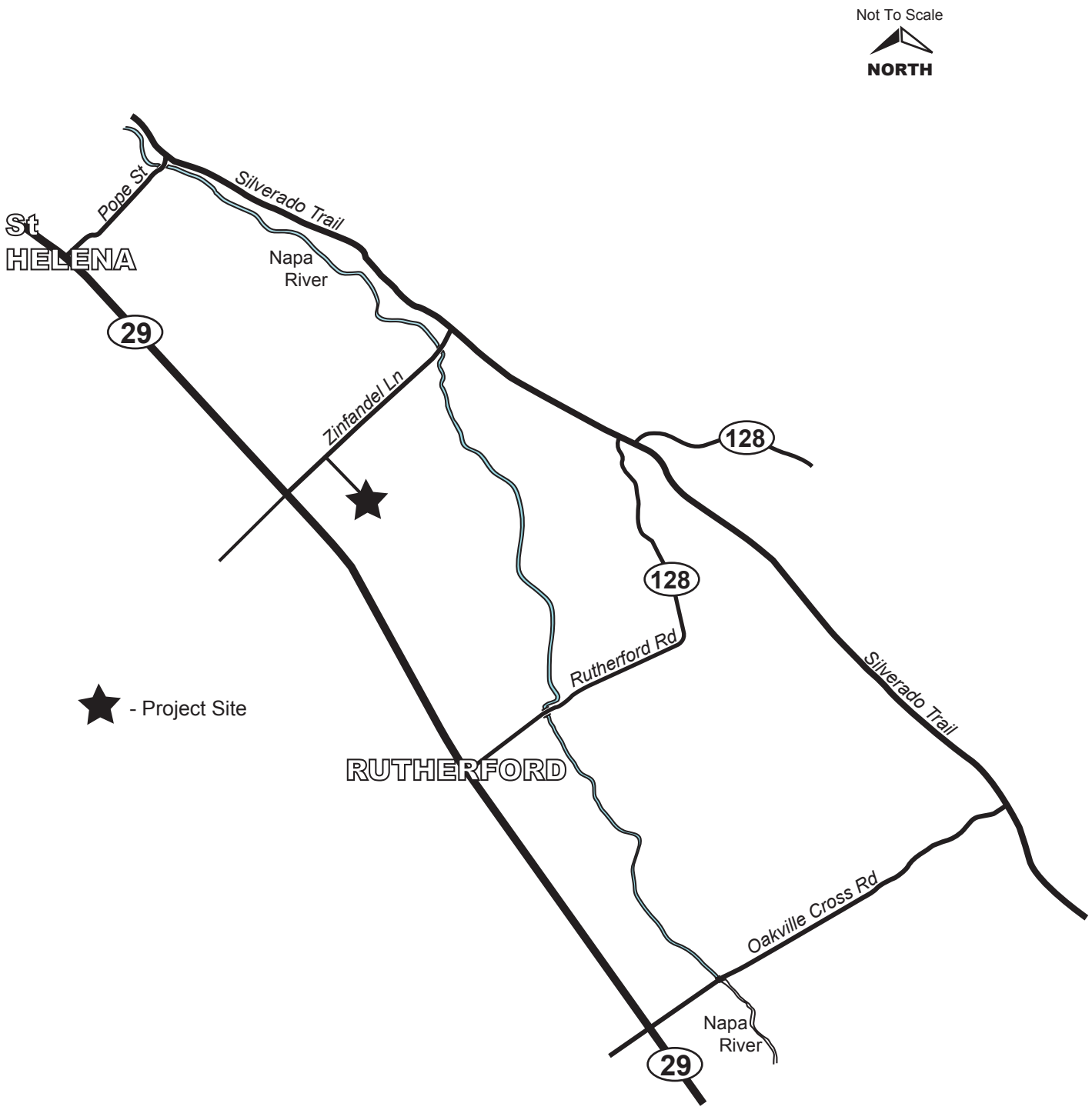
XIV. MARKETING EVENTS

No new marketing events are included in the proposed project. ***Less than Significant.***

XV. CONCLUSIONS & RECOMMENDATIONS

The project will result in no significant off-site circulation system operational impacts to SR 29, Silverado Trail or Zinfandel Lane nor to the Zinfandel Lane intersections with SR 29 and Silverado Trail. Left turn lanes will be provided on the Zinfandel Lane and SR 29 approaches to both project driveways, and a refuge area will be provided in the SR 29 median to assist left turns from the new project driveway. In addition, sight lines at the project driveway connections to SR 29 and Zinfandel Lane are acceptable and meet Caltrans stopping sight distance criteria.

Figures

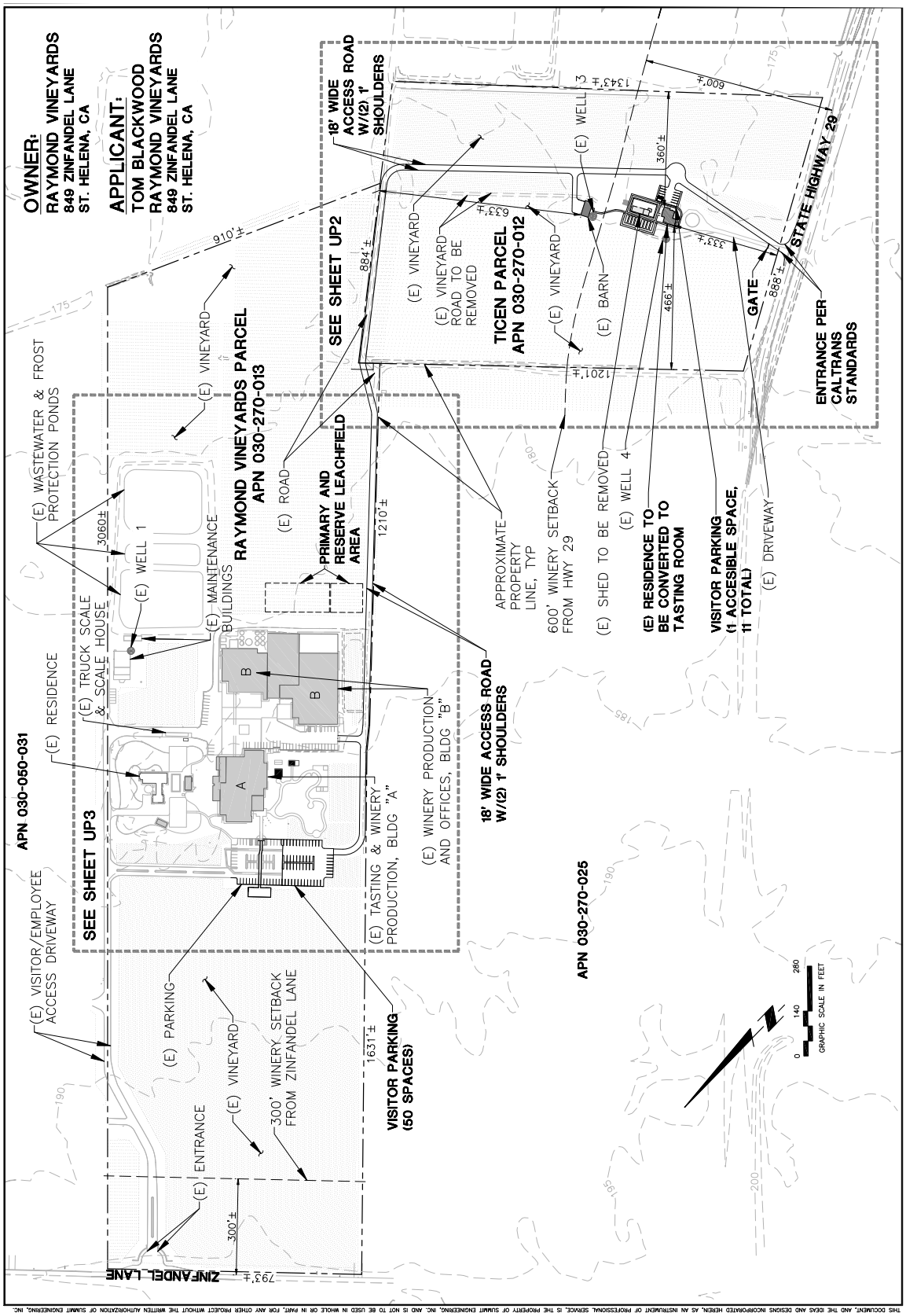


Raymond-Ticen Ranch Winery Traffic Study

CRANE TRANSPORTATION GROUP

Figure 1

Area Map



Raymond-Ticen Ranch Winery Traffic Study

Figure 2
Site Plan

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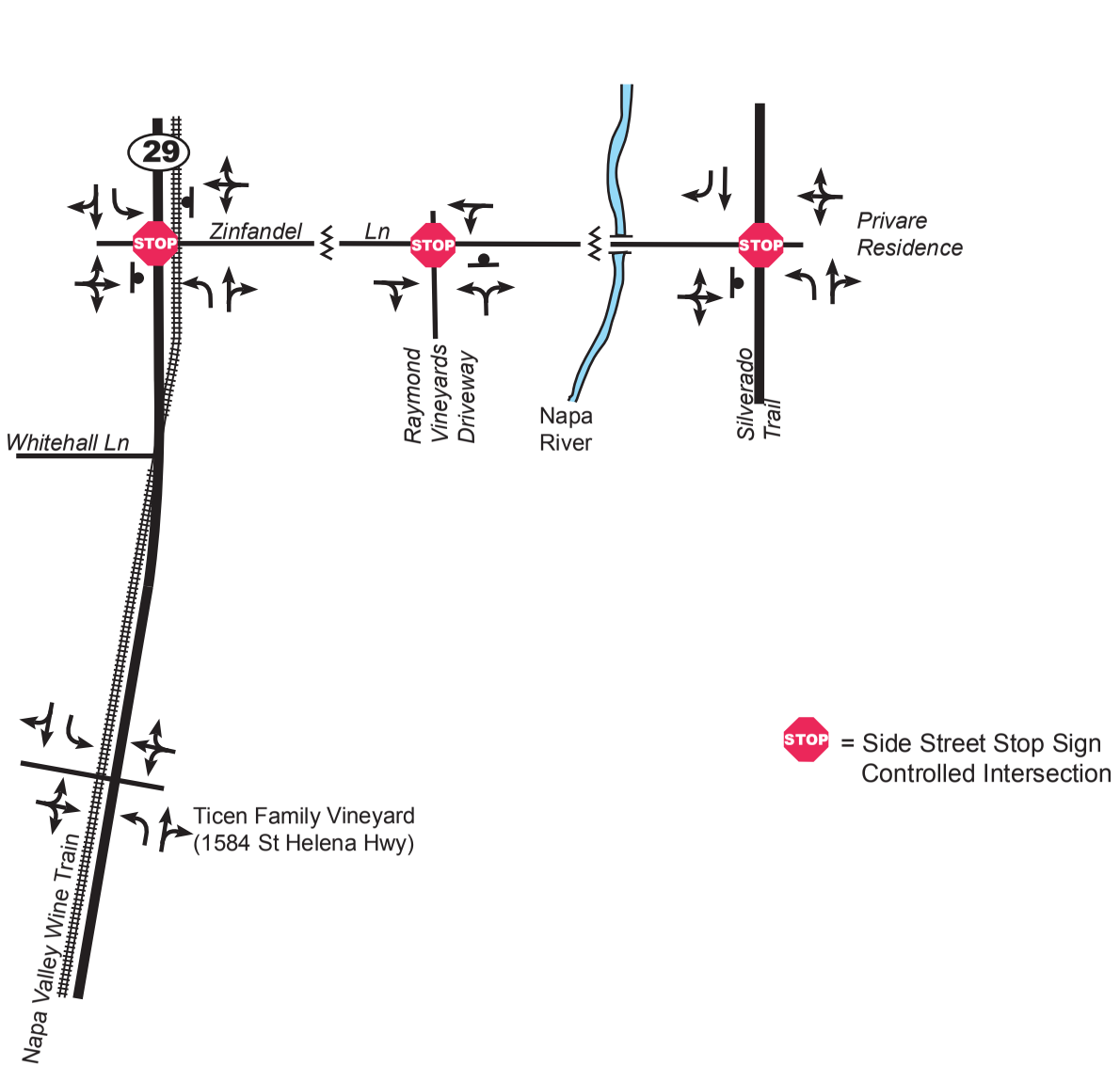

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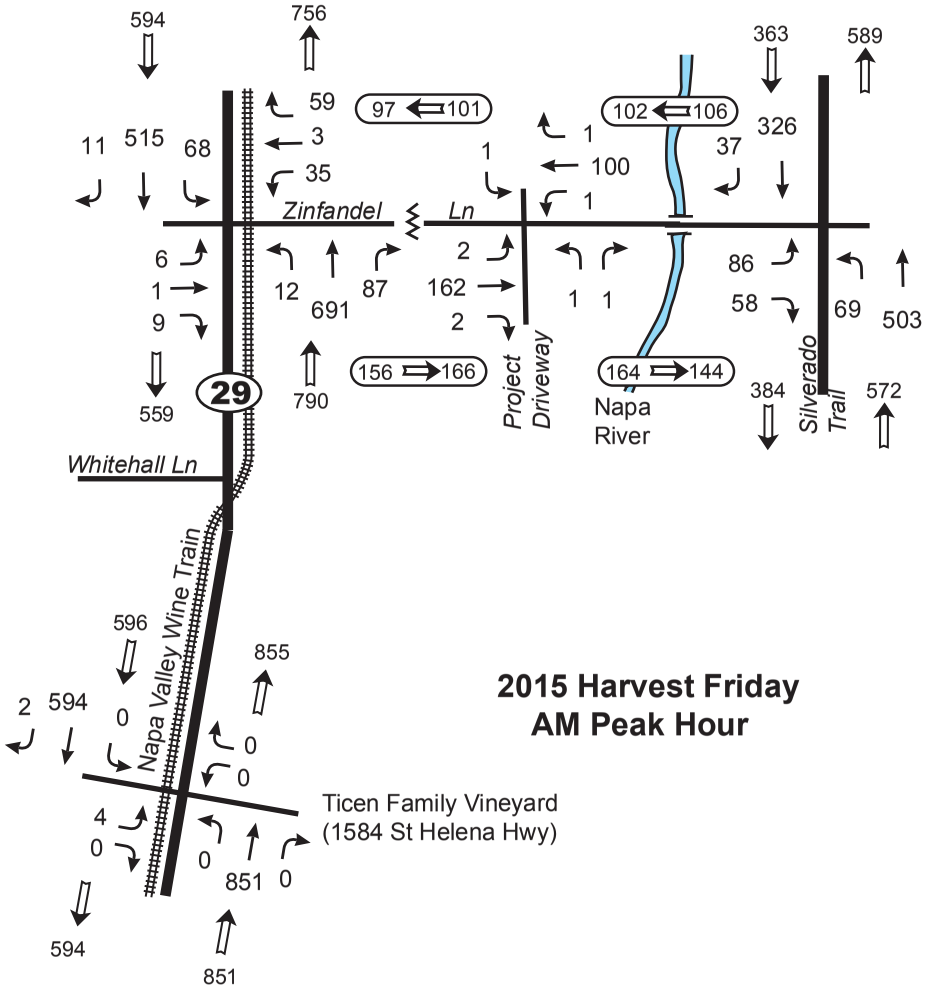
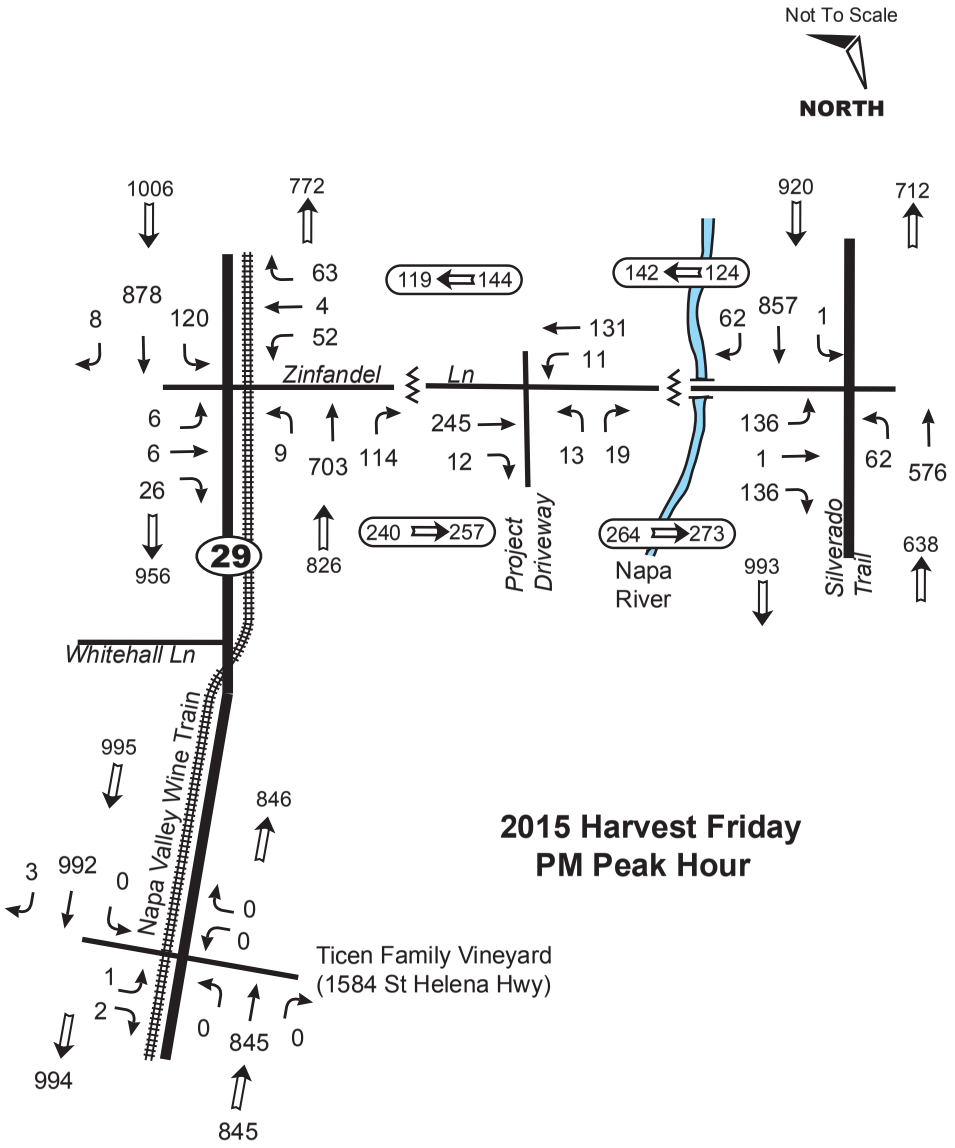
Figure 3

Lane Geometrics and Intersection Control





Raymond-Ticen Ranch Winery Traffic Study

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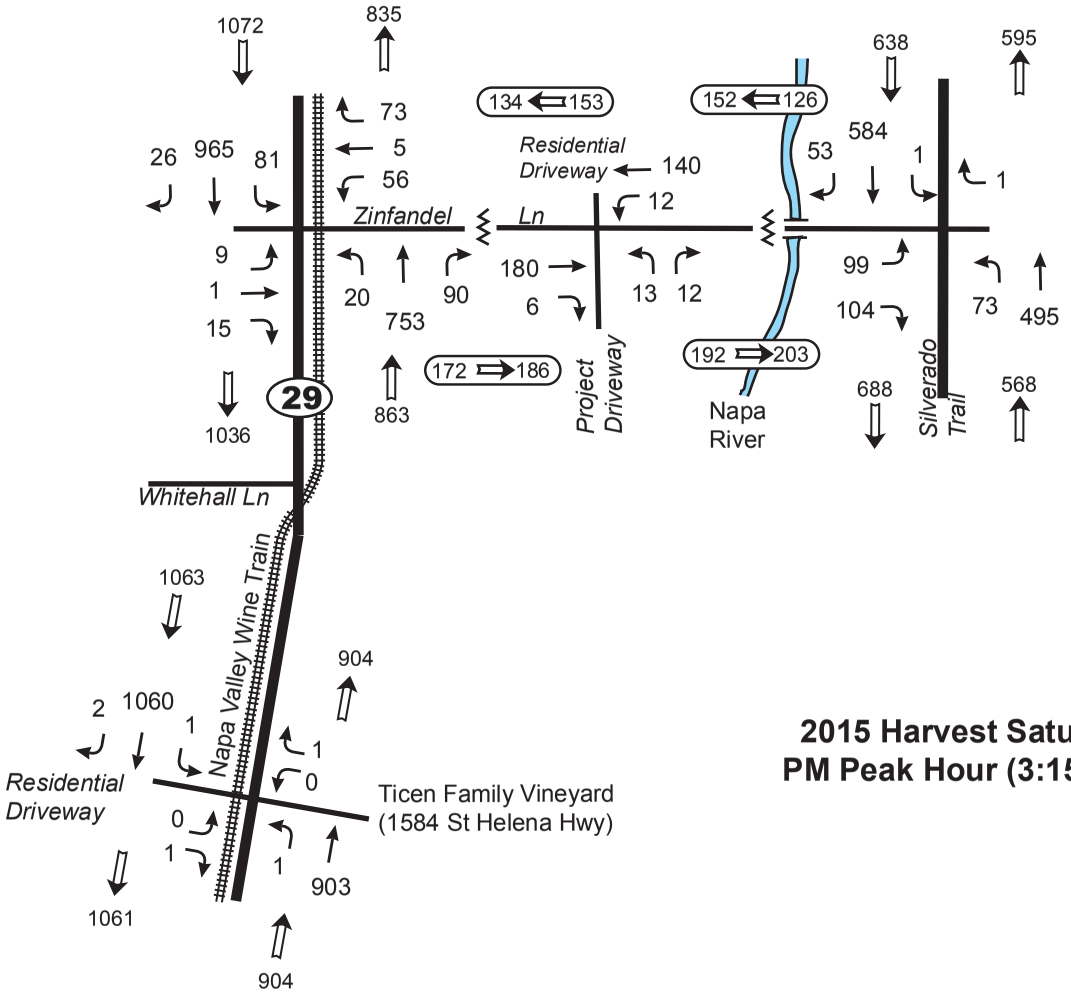
Figure 4

2015 Harvest (without Project)
Friday AM & PM Peak Hour Volumes



2015 Harvest Saturday
PM Peak Hour (3:15-4:15)

Raymond-Ticen Ranch Winery Traffic Study

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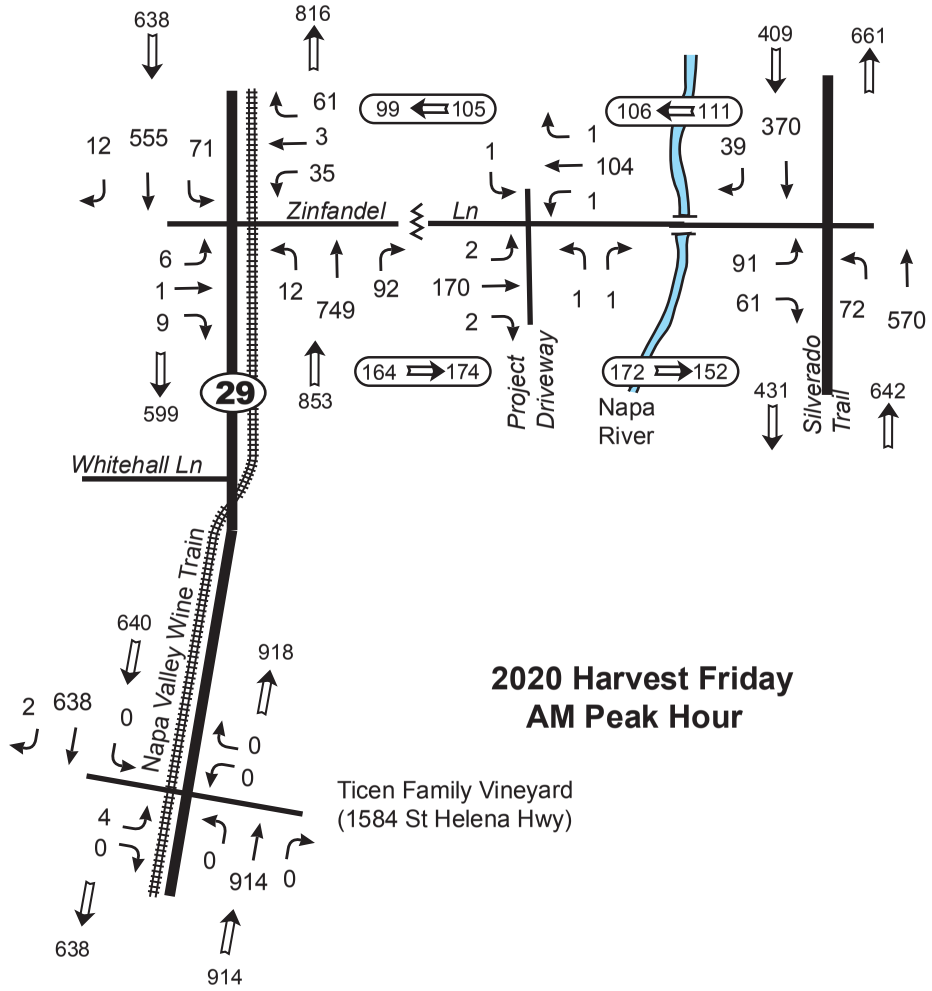
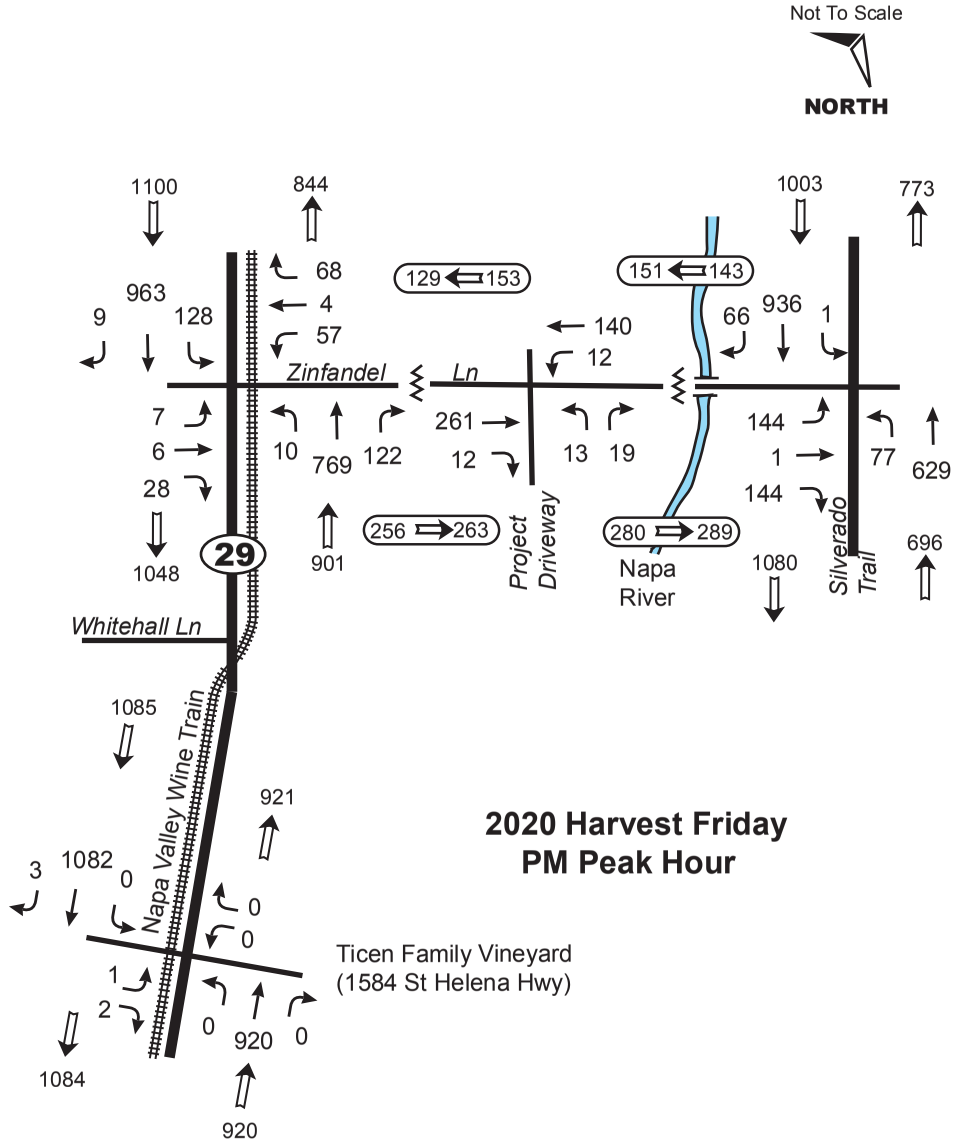
Figure 5

2015 Harvest (without Project)
Saturday PM Peak Hour Volumes





Raymond-Ticen Ranch Winery Traffic Study

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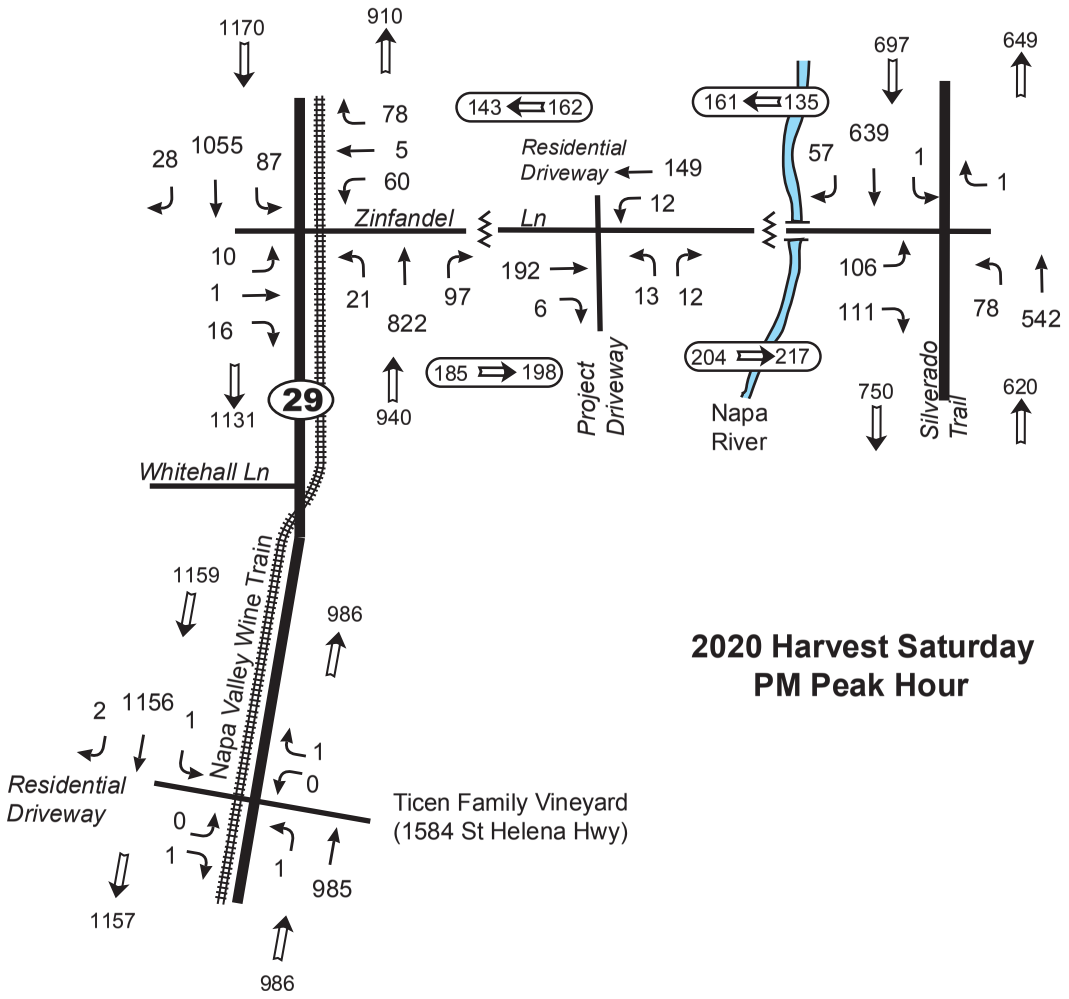
Figure 6

2020 Harvest (without Project)
Friday AM & PM Peak Hour Volumes



Raymond-Ticen Ranch Winery Traffic Study

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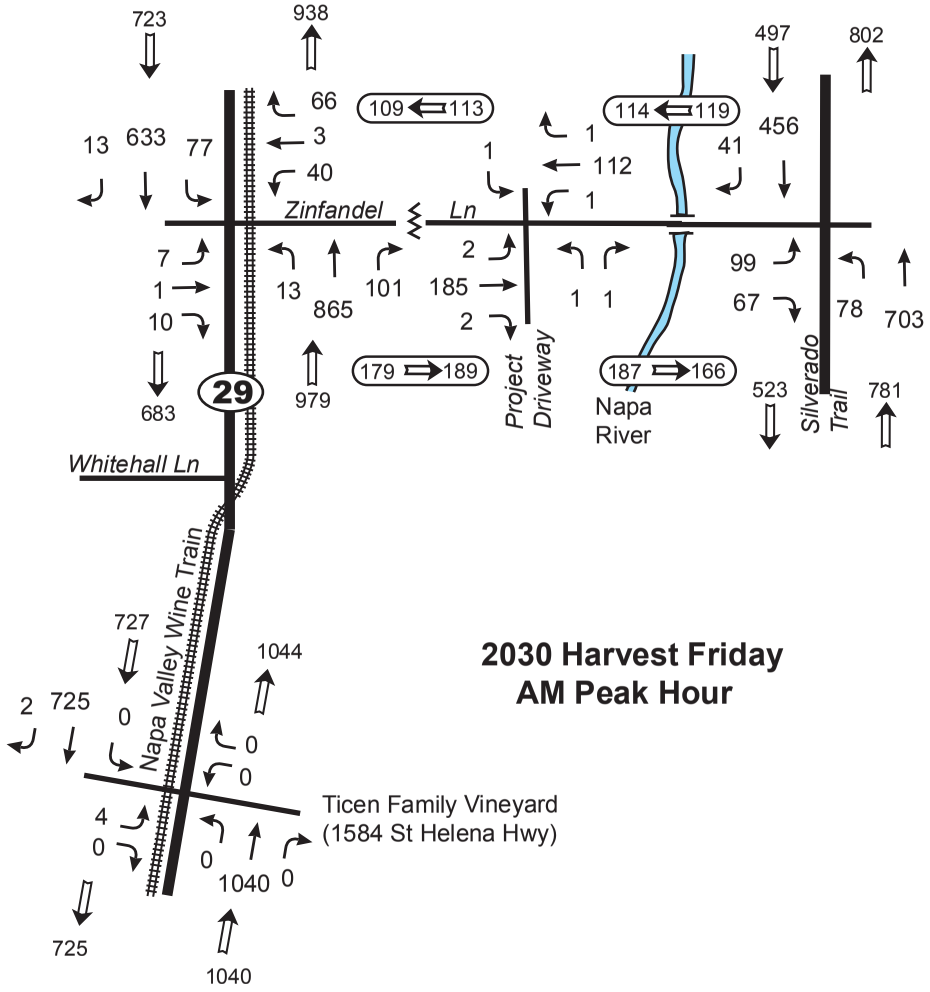
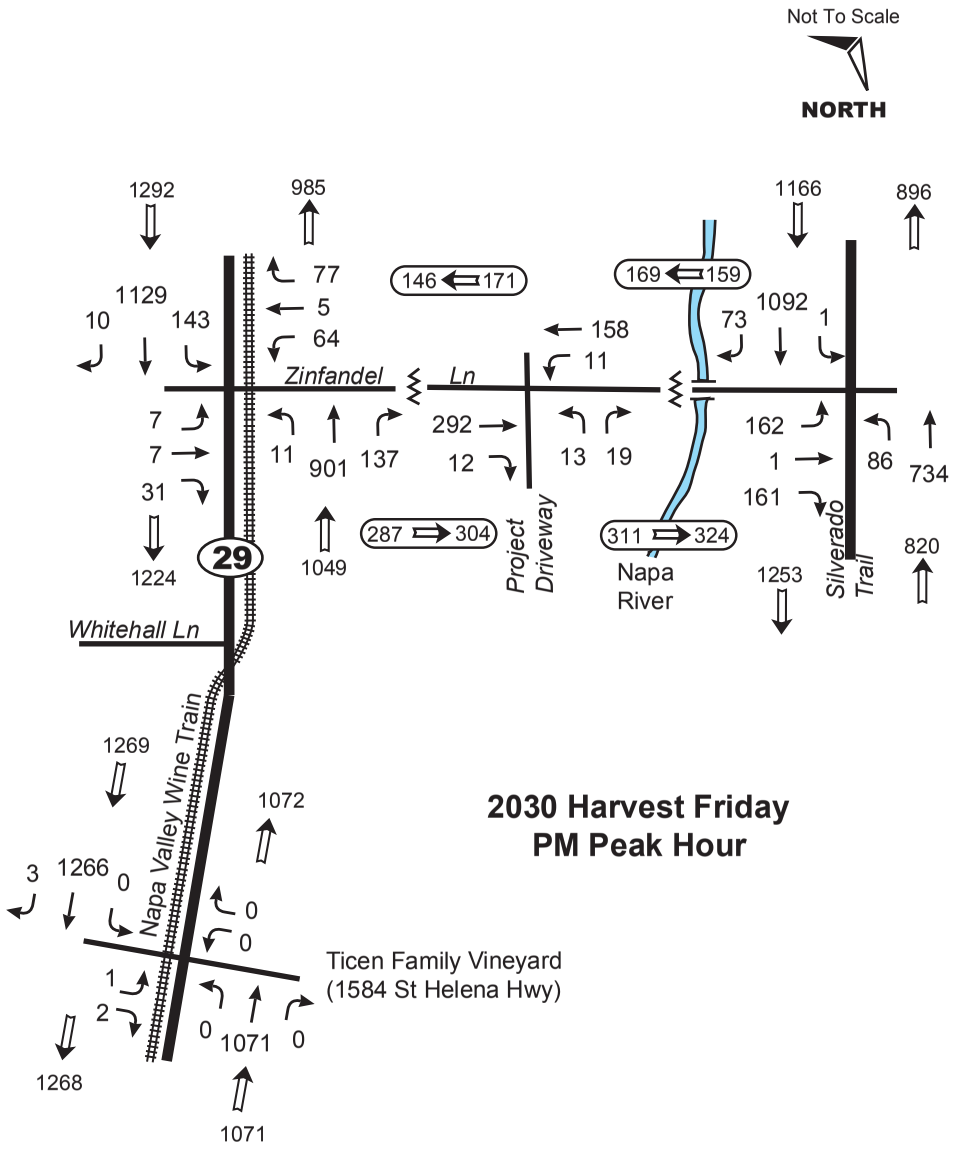
Figure 7

2020 Harvest (without Project)
Saturday PM Peak Hour Volumes



2030 Harvest Friday
AM Peak Hour



2030 Harvest Friday
PM Peak Hour

Raymond-Ticen Ranch Winery Traffic Study

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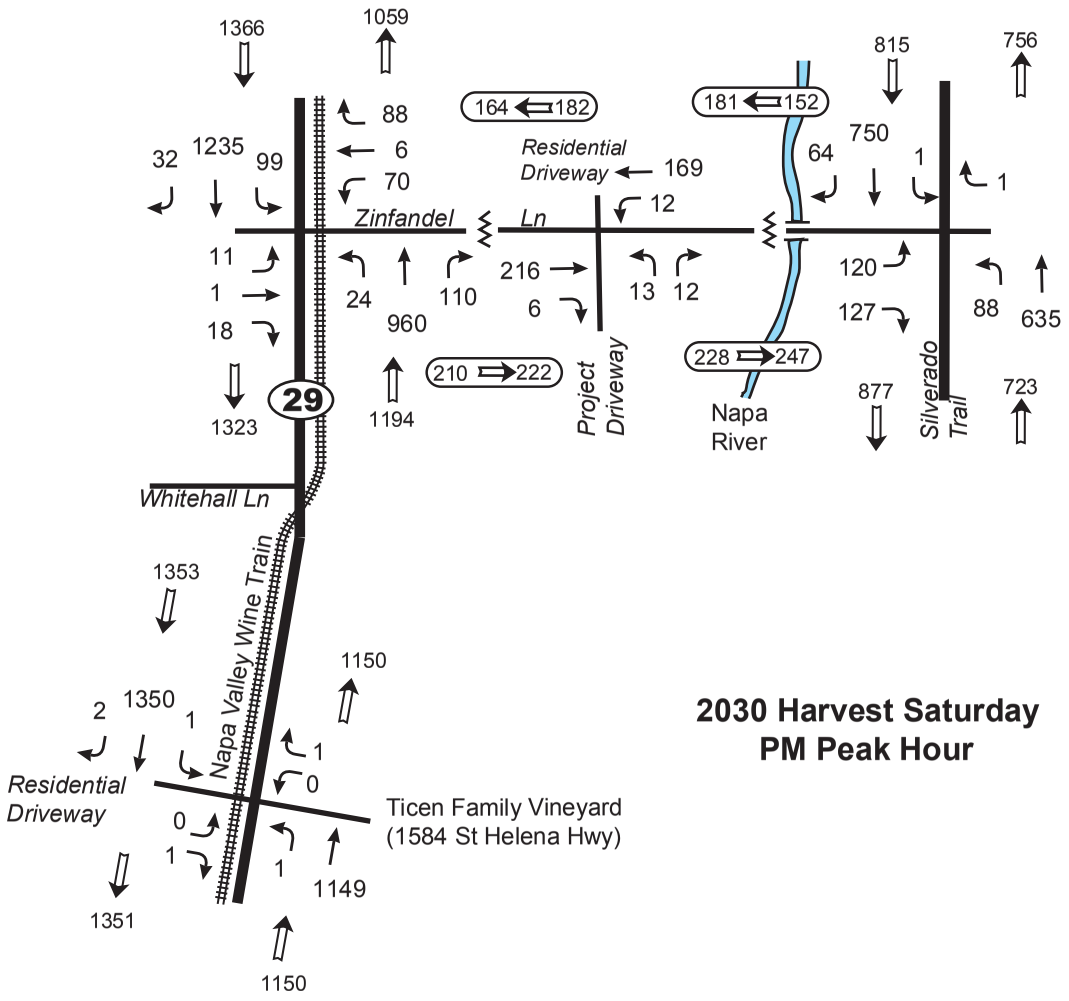
Figure 8

2030 Harvest (without Project)
Friday AM & PM Peak Hour Volumes

Not To Scale

NORTH



2030 Harvest Saturday
PM Peak Hour

Raymond-Ticen Ranch Winery Traffic Study

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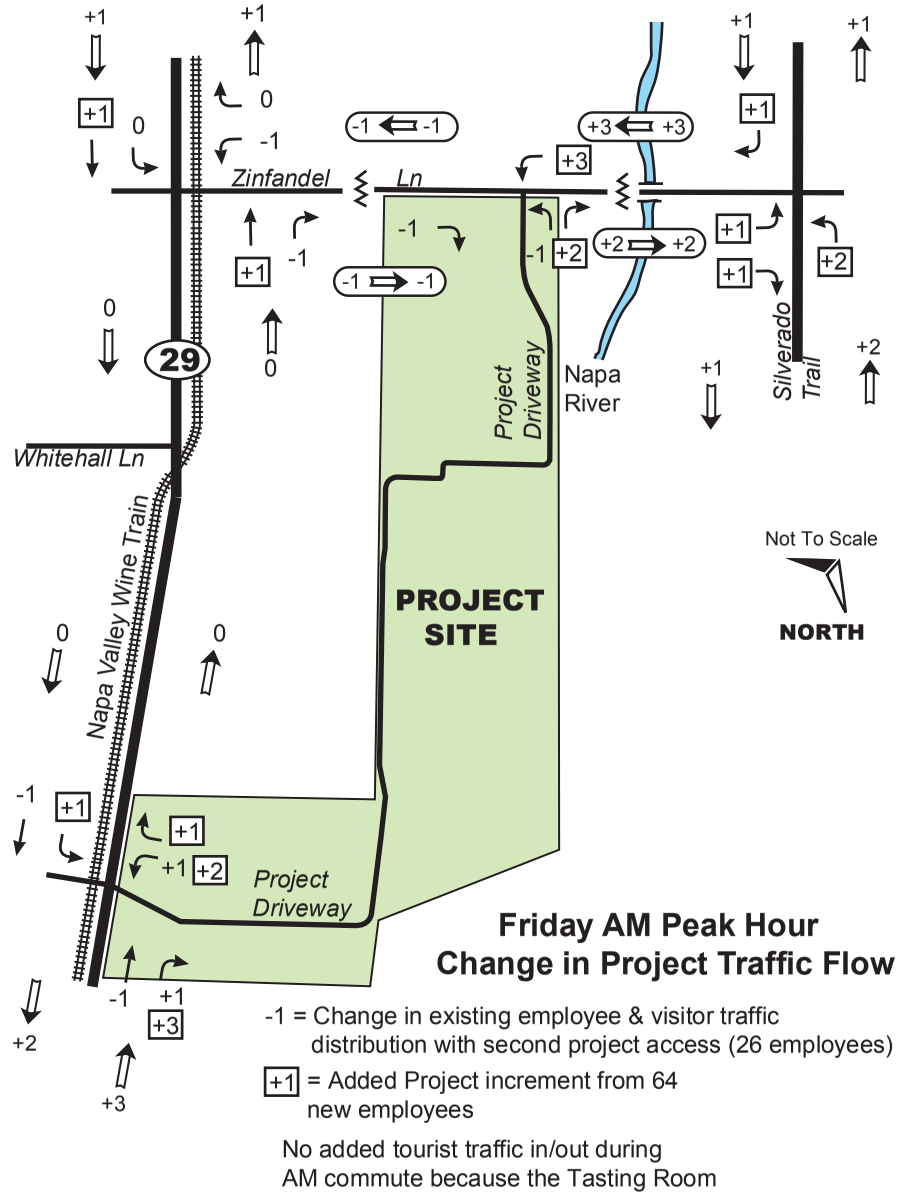
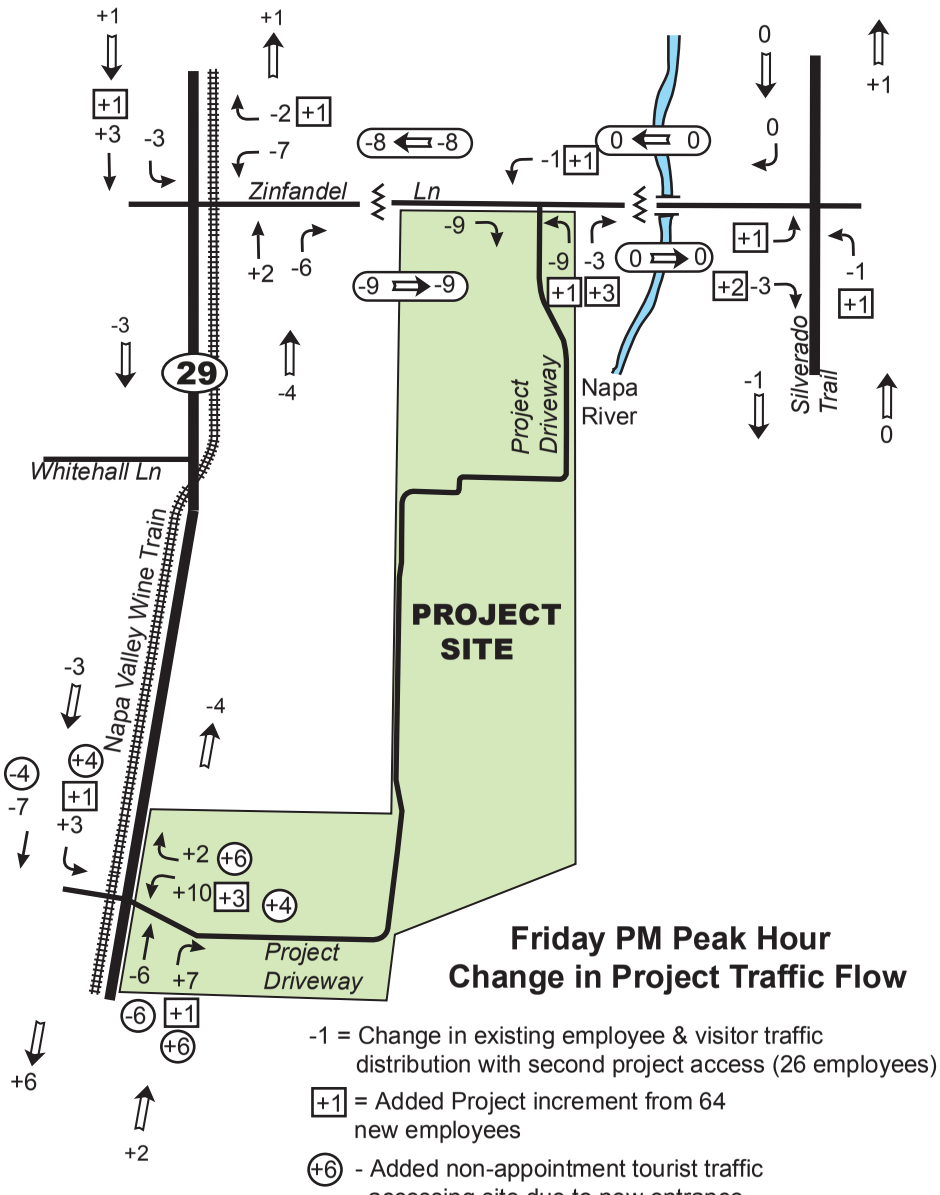
Figure 9

2030 Harvest (without Project)
Saturday PM Peak Hour Volumes



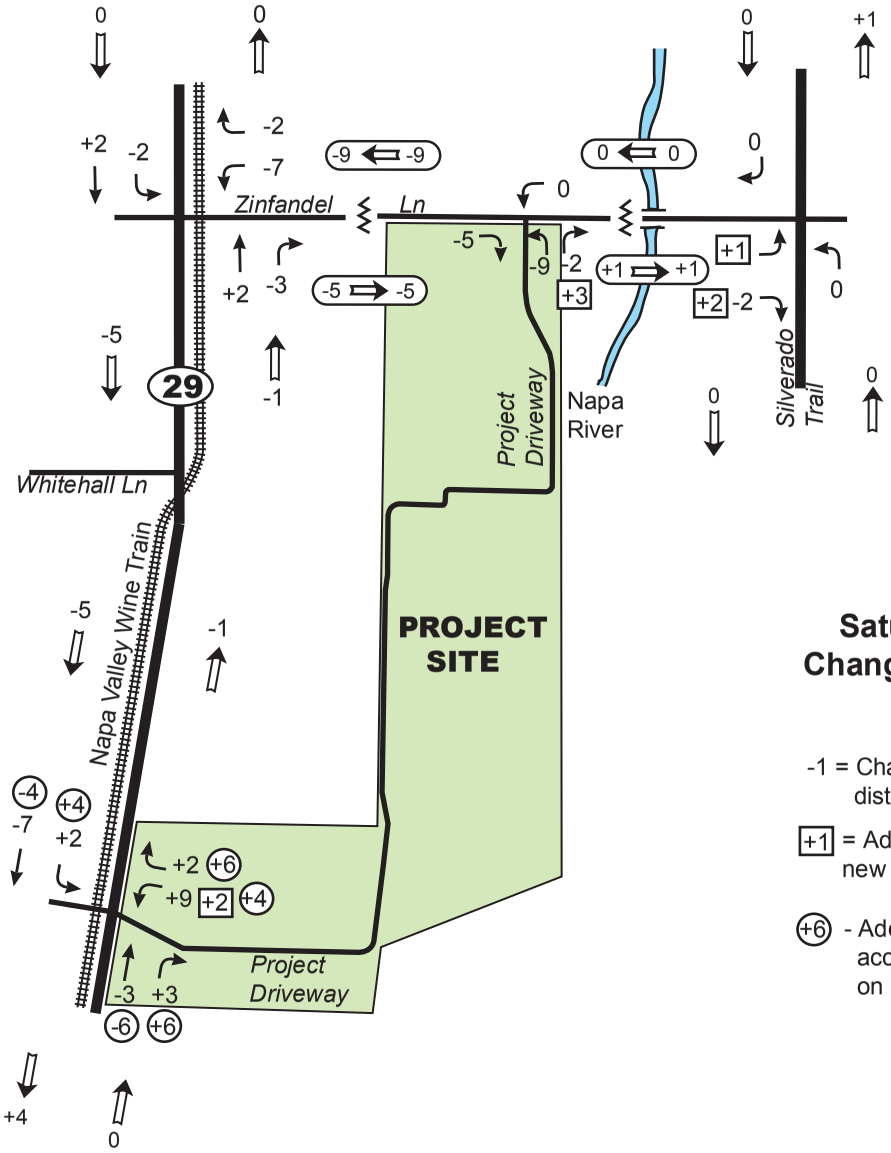


Raymond-Ticen Ranch Winery Traffic Study

CRANE TRANSPORTATION GROUP

Figure 10

Project Traffic Increment Due to New Employees and New Entrance on SR29 Harvest Friday AM & PM Peak Hour Volumes



Saturday PM Peak Hour
Change in Project Traffic Flow

-1 = Change in existing employee & visitor traffic distribution with second project access (26 employees)

[+1] = Added Project increment from 64 new employees

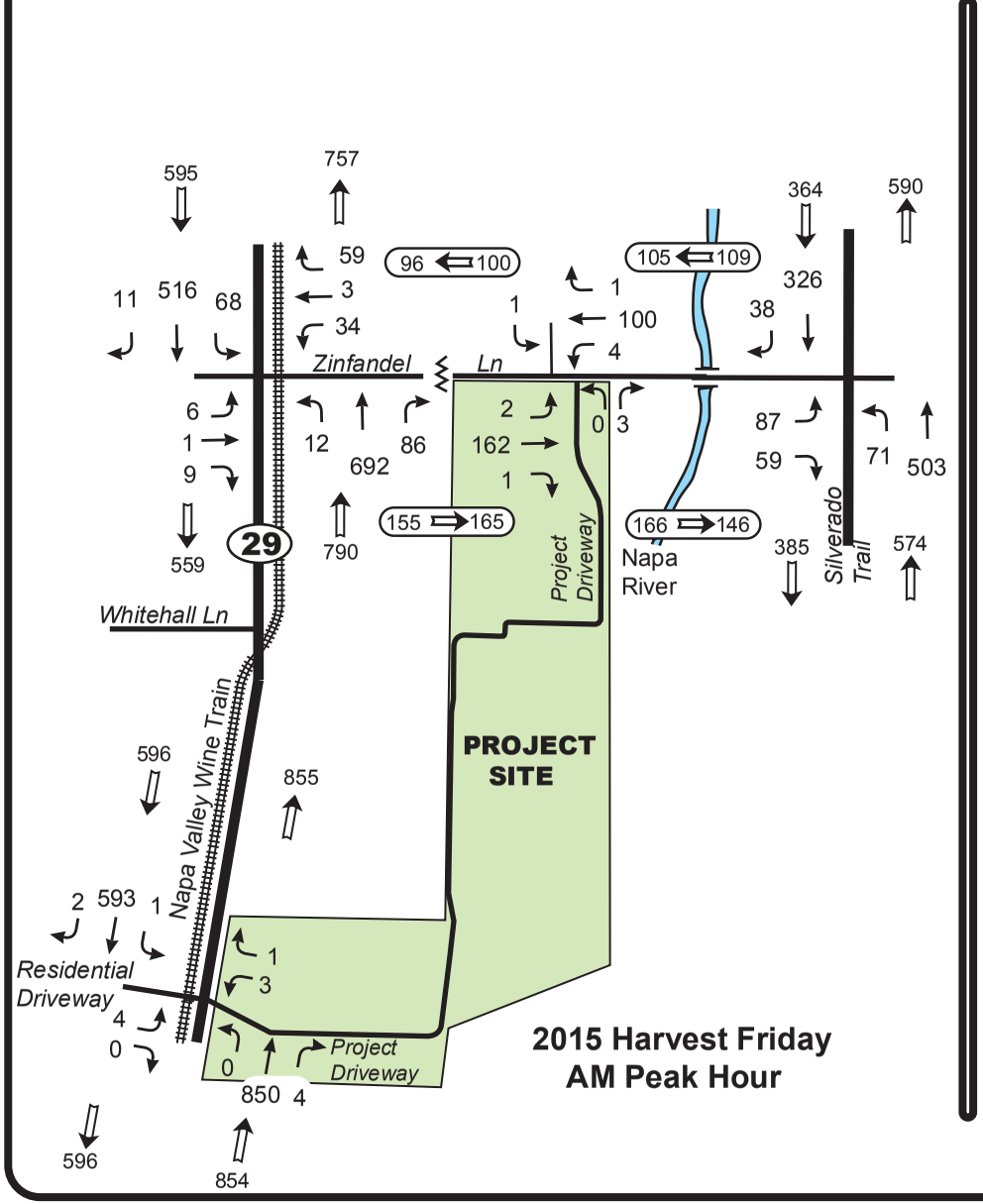
(+6) - Added non-appointment tourist traffic accessing site due to new entrance on SR29 - captured from existing traffic flow.

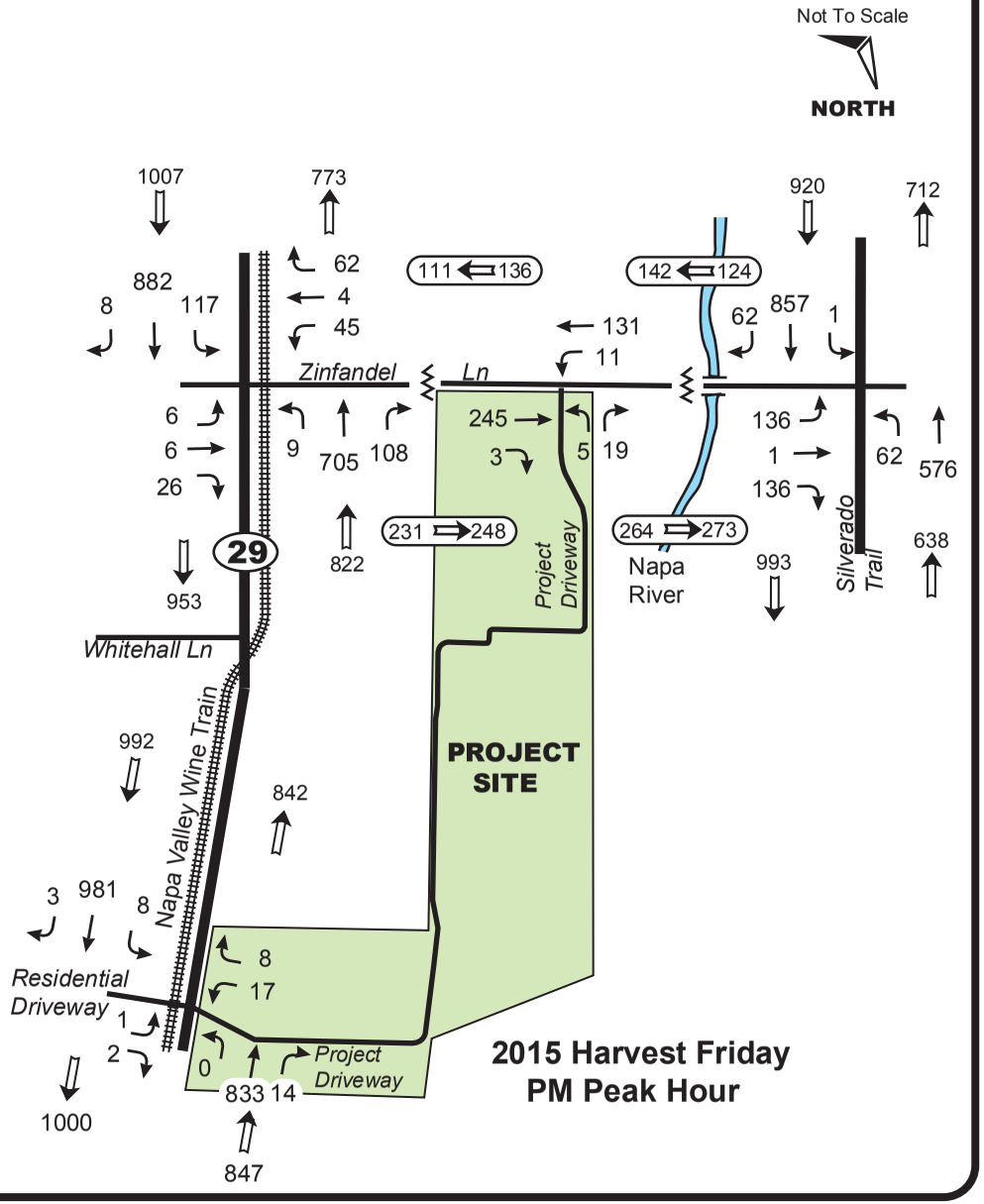
Raymond-Ticen Ranch Winery Traffic Study

CRANE TRANSPORTATION GROUP

Figure 11

Project Traffic Increment Due to New Employees and New Entrance on SR29
Harvest Saturday PM Peak Hour Volumes





Raymond-Ticen Ranch Winery Traffic Study

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Figure 12

2015 Harvest (with Project)
Friday AM & PM Peak Hour Volumes

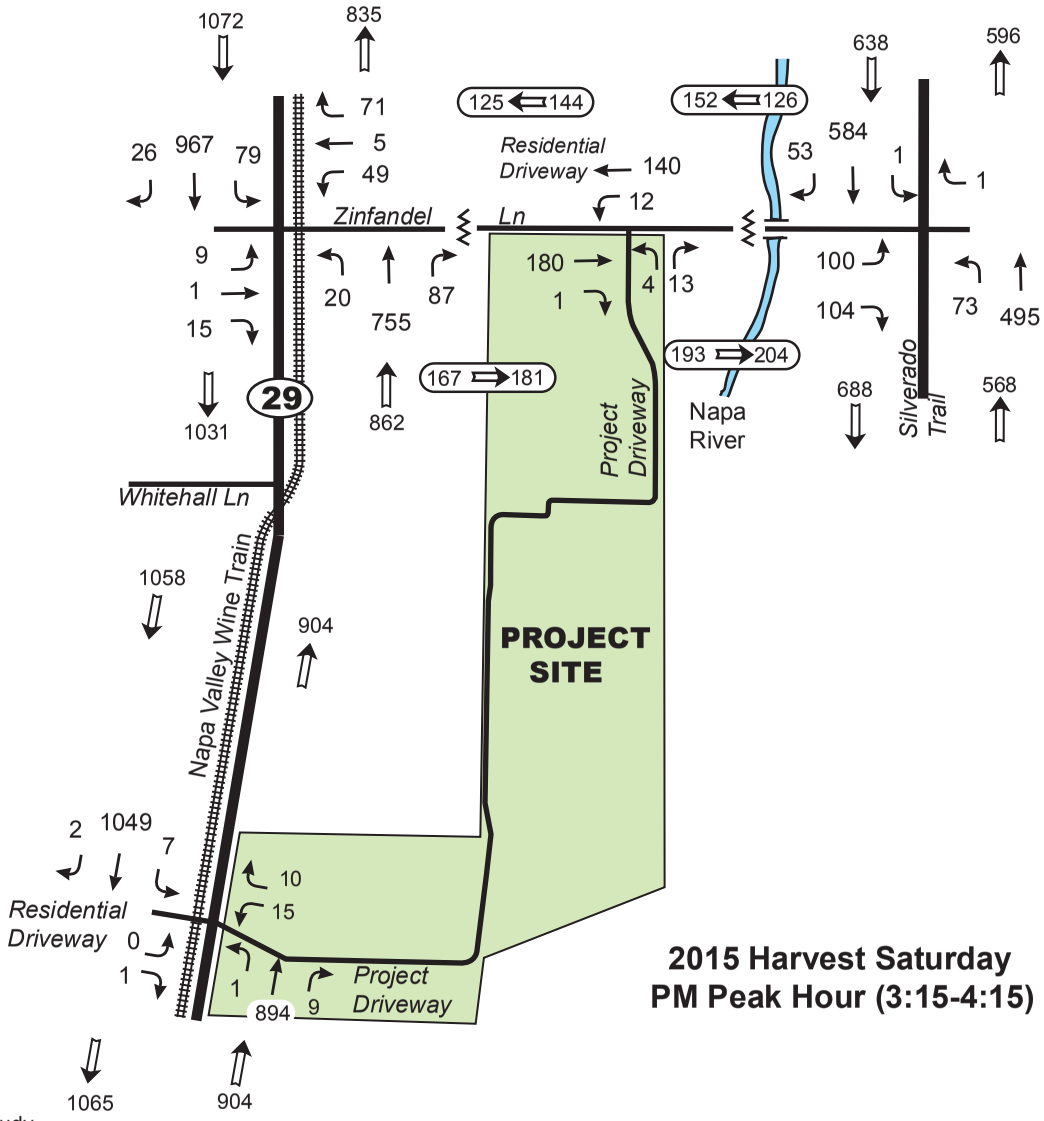

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Figure 13

2015 Harvest (with Project)
Saturday PM Peak Hour Volumes

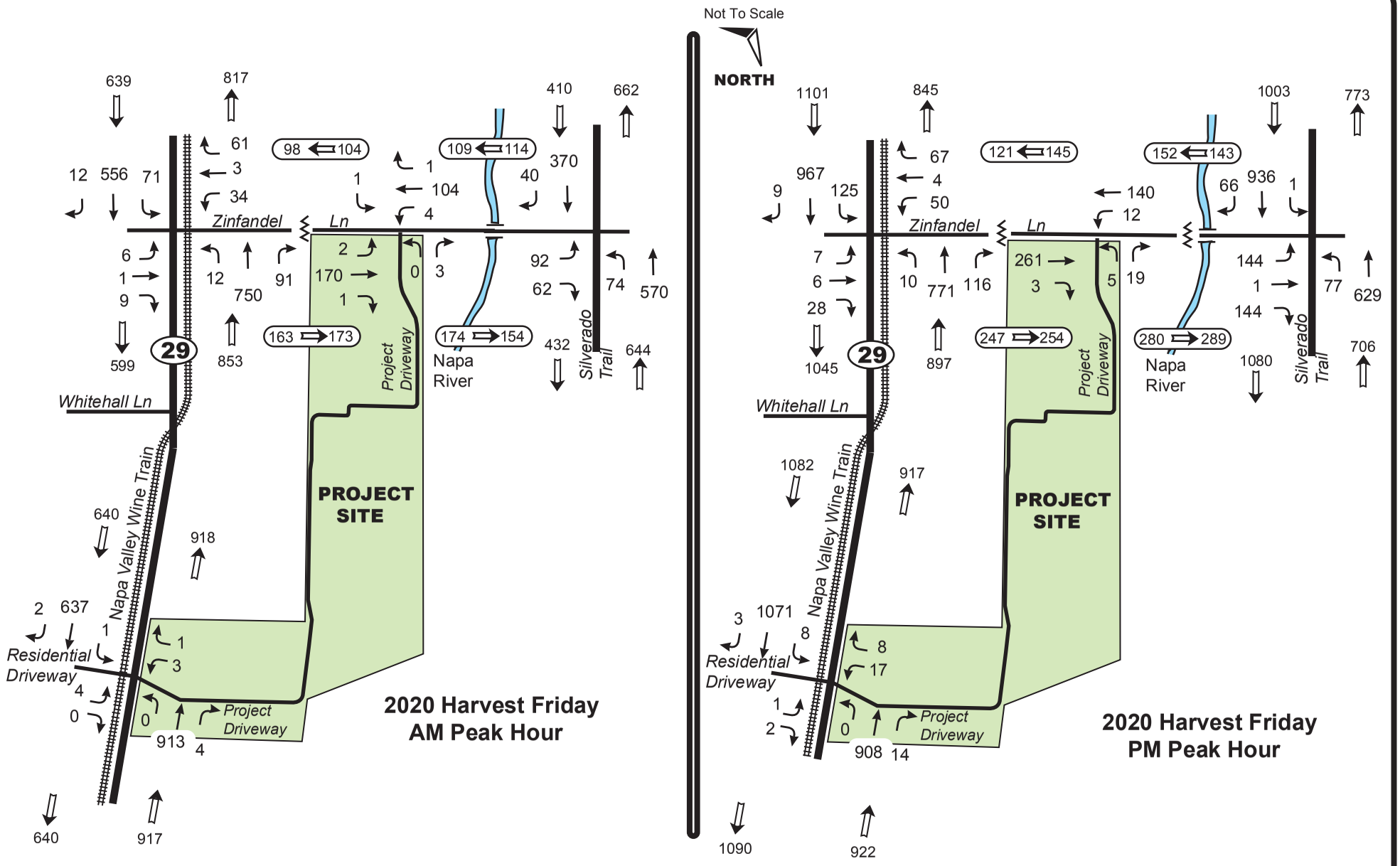

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Figure 14

2020 Harvest (with Project)
Friday AM & PM Peak Hour Volumes

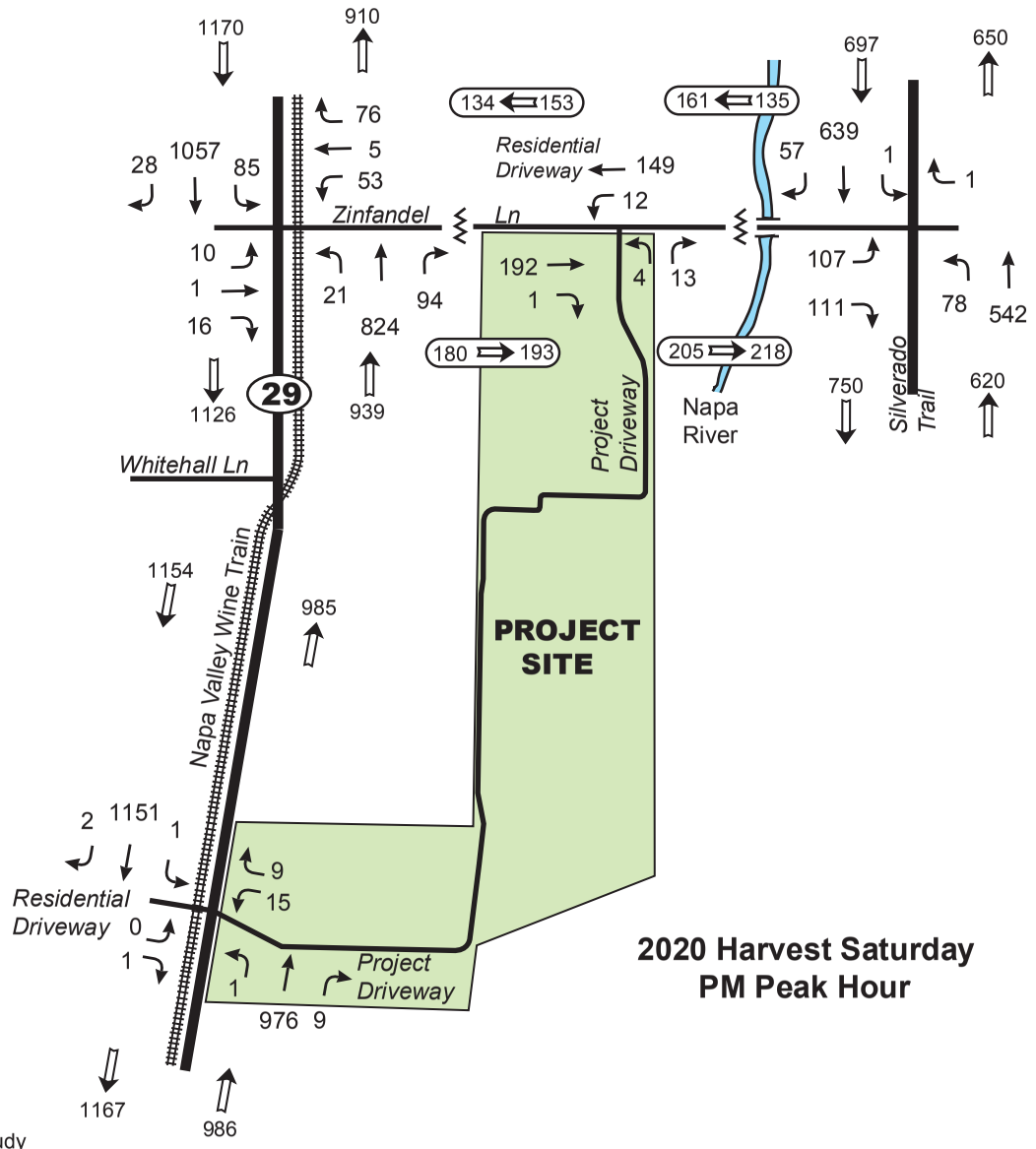

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Figure 15

2020 Harvest (with Project)
Saturday PM Peak Hour Volumes

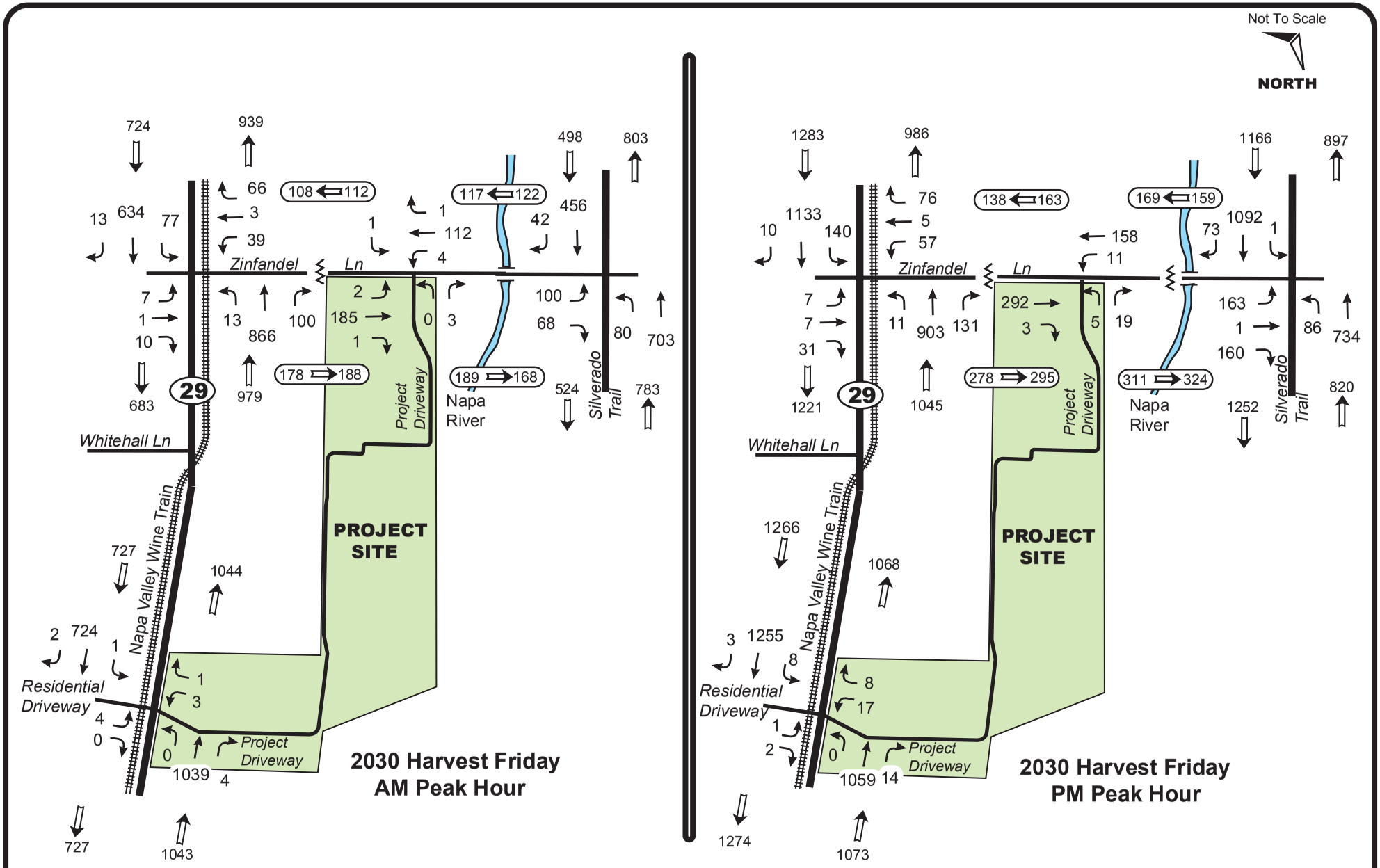

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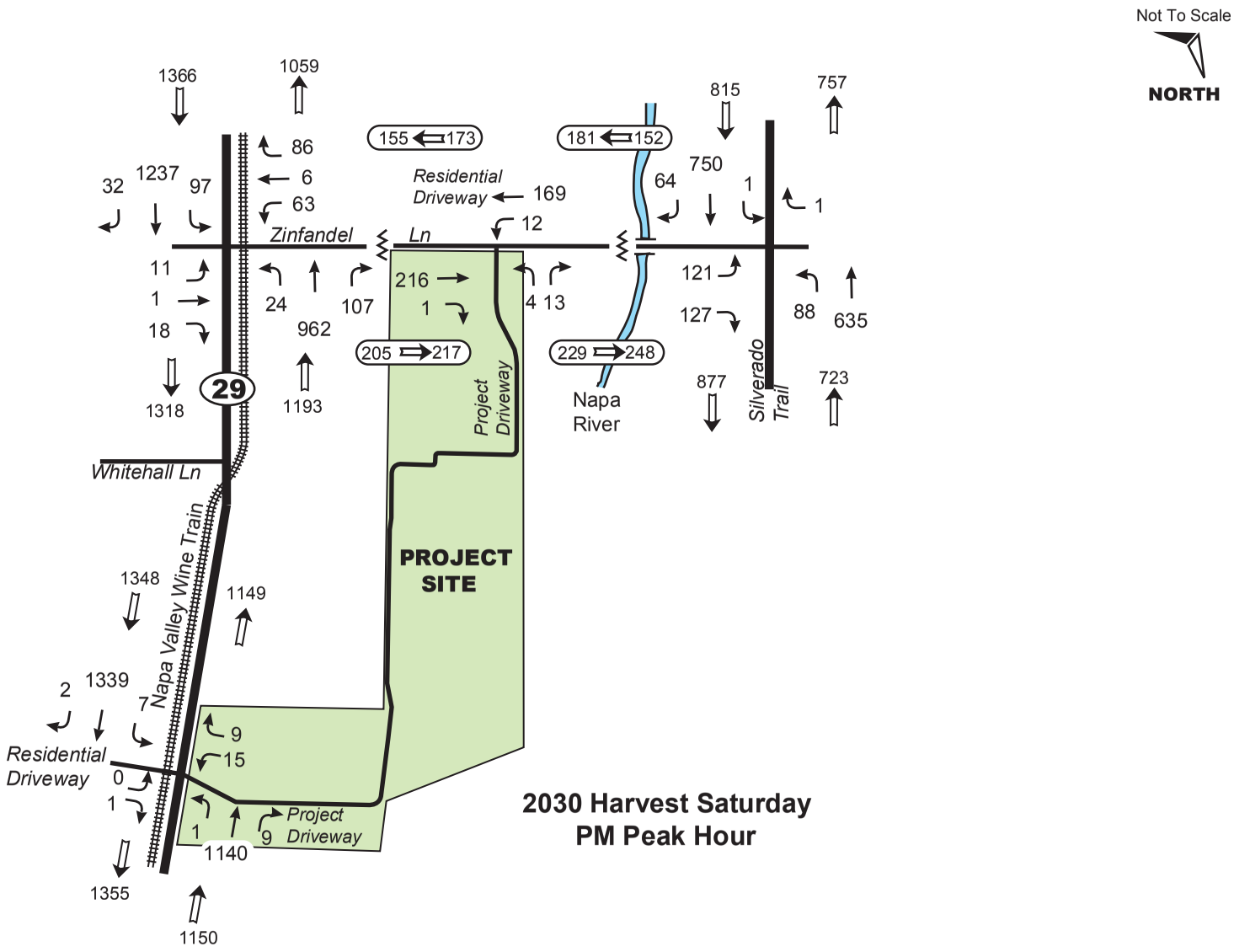
Figure 16

2030 Harvest (with Project)
Friday AM & PM Peak Hour Volumes



Raymond-Ticen Ranch Winery Traffic Study

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Figure 17

2030 Harvest (with Project)
Saturday PM Peak Hour Volumes

Tables

Table 1

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 2

INTERSECTION LEVEL OF SERVICE

EXISTING – 2015

HARVEST

LOCATION	FRIDAY AM PEAK HOUR		FRIDAY PM PEAK HOUR		SATURDAY PM PEAK HOUR	
	W/O PROJECT	WITH PROJECT	W/O PROJECT	WITH PROJECT	W/O PROJECT	WITH PROJECT
SR 29/Zinfandel Lane (unsignalized)	E-59.8/D-33.3[(1)] [A-4.8]	F-56.3/D-33.1 [A-4.5] +.0%	F-659/F-72.0 [E-41.5]	F-523/F-72.0 [D-31.4] -.55%	F-568/F-109.5 [E-38.1]	F-477/F-106.8 [E-30.4] -.48%
Silverado Trail/ Zinfandel Lane (unsignalized)	D-31.9[(2)] [A-4.8]	D-32.7 [A-4.9] +.46%	F-681 [F-101.9]	F-681 [F-101.9] +0%	F-116.4 [C-17.2]	F-119.6 [C-17.8] +.07%

(1) Unsignalized intersection level of service – control delay in seconds. Stop sign controlled Zinfandel Lane westbound approach/eastbound approach.

(2) Unsignalized intersection level of service – control delay in seconds. Stop sign controlled Zinfandel Lane eastbound approach.

[ ] = Overall intersection level of service.
XXX% = Increase in total intersection volume due to project

Year 2010 Highway Capacity Manual (HCM) Analysis Methodology
Source: Crane Transportation Group

Table 3

ROADWAY SEGMENT LEVEL OF SERVICE

EXISTING – 2015

HARVEST

LOCATION	DIRECTION	DIRECTIONAL CAPACITY (VEH/HR)	FRIDAY AM PEAK HOUR				FRIDAY PM PEAK HOUR				SATURDAY PM PEAK HOUR			
			W/O PROJECT		WITH PROJECT		W/O PROJECT		WITH PROJECT		W/O PROJECT		WITH PROJECT	
			VOL[1]	LOS (V/C)[2]	VOL	LOS (V/C)	VOL	LOS (V/C)	VOL	LOS (V/C)	VOL	LOS (V/C)	VOL	LOS (V/C)
SR 29 north of Zinfandel Lane	NB	1200	756	D	757	D	772	D	773	D	835	D	835	D
	SB	1200	594	C	595	C	1006	E (.838)	1007	E (.839) [+.1%]	1072	E (.893)	1072	E (.893) [+0%]
SR 29 south of Project Entrance	NB	1200	851	D	854	D	845	D	847	D	904	E (.753)	904	E (.753) [+0%]
	SB	1200	594	C	596	C	994	E (.828)	1000	E (.833) [+.6%]	1061	E (.884)	1065	E (.888) [+.4%]
Silverado Trail north of Zinfandel Lane	NB	1200	589	C	590	C	712	D	713	D	595	C	596	C
	SB	1200	363	C	364	C	920	E (.767)	920	E (.767) [0%]	638	D	638	D
Silverado Trail south of Zinfandel Lane	NB	1200	572	C	574	C	638	D	638	D	568	C	568	C
	SB	1200	384	C	385	C	993	E (.828)	992	E (.827) [-.1%]	688	D	688	D
Zinfandel Lane just east of SR 29	EB	810	156	C	155	C	240	C	231	C	172	C	171	C
	WB	810	97	C	96	C	119	C	111	C	134	C	133	C
Zinfandel Lane just west of Silverado Trail	EB	810	144	C	146	C	273	C	273	C	203	C	205	C
	WB	810	106	C	109	C	124	C	124	C	126	C	128	C

(1) Vol = volume

(2) LOS (V/C) = level of service (volume to capacity ratio) at locations with unacceptable "Without Project" operation.

(3) [ ] = % project traffic added to road segment at locations with unacceptable "Without Project" operation. Less than a 1% increase is not considered a significant impact.

Analysis Methodology Source: Napa County General Plan Update EIR Technical Memorandum for Traffic and Circulation Supporting the Findings and recommendations, Dowling Associates, February 9, 2007. *Compiled by: Crane Transportation Group*

Table 4

INTERSECTION LEVEL OF SERVICE

YEAR 2020

HARVEST

LOCATION	FRIDAY AM PEAK HOUR		FRIDAY PM PEAK HOUR		SATURDAY PM PEAK HOUR	
	W/O PROJECT	WITH PROJECT	W/O PROJECT	WITH PROJECT	W/O PROJECT	WITH PROJECT
SR 29/Zinfandel Lane (unsignalized)	F-85.1/E-40.2[(1)] [A-6.2]	F-82.5/E-40.2[(1)] [A-6.0] +0%	F-1231/F-129.1 [F-76.3]	F-1005/F-129.1 [F-59.5] -.51%	F-996/F-208 [F-65.4]	F-869/F-191.8 [F-54.1] -.44%
Silverado Trail/ Zinfandel Lane (unsignalized)	E-47.3[(2)] [A-6.5]	E-49.1 [A-6.8] +.41%	F-1087 [F-158.0]	F-1087 [F-157.7] +0%	F-221 [D-31.7]	F-226 [D-32.6] +.07%

(1) Unsignalized intersection level of service – control delay in seconds. Stop sign controlled Zinfandel Lane westbound approach/eastbound approach.

(2) Unsignalized intersection level of service – control delay in seconds. Stop sign controlled Zinfandel Lane eastbound approach.

[ ] = Overall intersection level of service.
XXX% = Increase in total intersection volume due to project

Year 2010 Highway Capacity Manual (HCM) Analysis Methodology
Source: Crane Transportation Group

Table 5

ROADWAY SEGMENT LEVEL OF SERVICE

YEAR 2020

HARVEST

LOCATION	DIRECTION	DIRECTIONAL CAPACITY (VEH/HR)	FRIDAY AM PEAK HOUR				FRIDAY PM PEAK HOUR				SATURDAY PM PEAK HOUR			
			W/O PROJECT		WITH PROJECT		W/O PROJECT		WITH PROJECT		W/O PROJECT		WITH PROJECT	
			VOL[1]	LOS (V/C)[2]	VOL	LOS (V/C)	VOL	LOS (V/C)	VOL	LOS (V/C)	VOL	LOS (V/C)	VOL	LOS (V/C)
SR 29 north of Zinfandel Lane	NB	1200	816	D	817	D	844	D	845	D	910	E (.758)	910	E (.758) [+0%]
	SB	1200	638	D	639	D	1100	E (.917)	1101	E (.918) [+.1%]	1170	E (.975)	1170	E (.975)
SR 29 south of Project Entrance	NB	1200	914	E (.761)	917	E (.764) [+.3%]	920	E (.767)	922	E (.768) [+.2%]	986	E (.822)	986	E (.822) [+0%]
	SB	1200	638	D	640	D	1084	E (.903)	1090	E (.908) [+.6%]	1157	E (.964)	1161	E (.968) [+.3%]
Silverado Trail north of Zinfandel Lane	NB	1200	661	D	662	D	773	D	774	D	649	D	650	D
	SB	1200	409	C	410	C	1003	E (.836)	1003	E (.836) [+0%]	697	D	697	D
Silverado Trail south of Zinfandel Lane	NB	1200	642	D	644	D	696	D	696	D	620	C	620	C
	SB	1200	431	C	432	C	1080	E (.900)	1079	E (.899) [-.1%]	750	D	750	D
Zinfandel Lane just east of SR 29	EB	810	164	C	163	C	256	C	247	C	185	C	180	C
	WB	810	99	C	98	C	129	C	121	C	143	C	134	C
Zinfandel Lane just west of Silverado Trail	EB	810	152	C	154	C	289	C	289	C	217	C	218	C
	WB	810	111	C	114	C	143	C	143	C	135	C	135	C

(1) Vol = volume

(2) LOS (V/C) = level of service (volume to capacity ratio) at locations with unacceptable "Without Project" operation.

(3) [ ] = % project traffic added to road segment at locations with unacceptable "Without Project" operation. Less than a 1% increase is not considered a significant impact.

Analysis Methodology Source: Napa County General Plan Update EIR Technical Memorandum for Traffic and Circulation Supporting the Findings and recommendations, Dowling Associates, February 9, 2007. *Compiled by: Crane Transportation Group*

Table 6

INTERSECTION LEVEL OF SERVICE

YEAR 2030 (CUMULATIVE)

HARVEST

LOCATION	FRIDAY AM PEAK HOUR		FRIDAY PM PEAK HOUR		SATURDAY PM PEAK HOUR	
	W/O PROJECT	WITH PROJECT	W/O PROJECT	WITH PROJECT	W/O PROJECT	WITH PROJECT
SR 29/Zinfandel Lane (unsignalized)	F-220.3/F-62.4[(1)] [B-14.3]	F-212/F-64.2 [B-13.7] +0%	F-3513/F-419 [F-212]	F-3132/F-419 [F-180.4] -.43%	F-2627/F-785 [F-171.7]	F-2275/F-785 [F-142.8] -.36%
Silverado Trail/ Zinfandel Lane (unsignalized)	F-132.9[(2)] [C-15.8]	F-138.7 [C-16.6] +.35%	F-2148 [F-302]	F-2148 [F-302] +0%	F-546 [F-75.9]	F-549 [F-76.7] +.06%

(1) Unsignalized intersection level of service – control delay in seconds. Stop sign controlled Zinfandel Lane westbound approach/eastbound approach.

(2) Unsignalized intersection level of service – control delay in seconds. Stop sign controlled Zinfandel Lane eastbound approach.

[ ] = Overall intersection level of service.
XXX% = Increase in total intersection volume due to project

Year 2010 Highway Capacity Manual (HCM) Analysis Methodology
Source: Crane Transportation Group

Table 7

ROADWAY SEGMENT LEVEL OF SERVICE
YEAR 2030 (CUMULATIVE)
HARVEST

LOCATION	DIRECTION	DIRECTIONAL CAPACITY (VEH/HR)	FRIDAY AM PEAK HOUR				FRIDAY PM PEAK HOUR				SATURDAY PM PEAK HOUR			
			W/O PROJECT		WITH PROJECT		W/O PROJECT		WITH PROJECT		W/O PROJECT		WITH PROJECT	
			VOL[1]	LOS (V/C)[2]	VOL	LOS (V/C)	VOL	LOS (V/C)	VOL	LOS (V/C)	VOL	LOS (V/C)	VOL	LOS (V/C)
SR 29 north of Zinfandel Lane	NB	1200	938	E (.782)	939	E (.783) [+.1%]	985	E (.821)	986	E (.822) [+.1%]	1059	E (.883)	1059	E (.883) [+0%]
	SB	1200	723	D	24	D	1292	F (1.077)	1293	F (1.078) [+.1%]	1366	F (1.138)	1366	F (1.138) [+.0%]
SR 29 south of Project Entrance	NB	1200	1040	E (.867)	1043	E (.869) [+.3%]	1071	E (.893)	1073	E (.894) [+.2%]	1150	E (.958)	1150	E (.958) [+.0%]
	SB	1200	725	D	727	D	1268	F (1.057)	1274	F (1.062) [+.5%]	1351	F (1.126)	1355	F (1.129) [+.3%]
Silverado Trail north of Zinfandel Lane	NB	1200	802	D	803	D	896	E (.747)	897	E (.748) [+.1%]	756	D	757	D
	SB	1200	497	C	498	C	1166	E (.972)	1166	E (.972) [+0%]	815	D	815	D
Silverado Trail south of Zinfandel Lane	NB	1200	781	D	783	D	820	D	820	D	723	D	723	D
	SB	1200	523	C	524	C	1253	F (1.044)	1252	F (1.043) [-.1%]	877	E (.731)	877	E (.731) [+0%]
Zinfandel Lane just east of SR 29	EB	810	179	C	178	C	287	C	278	C	210	C	205	C
	WB	810	109	C	108	C	146	C	138	C	164	C	155	C
Zinfandel Lane just west of Silverado Trail	EB	810	166	C	168	C	324	C	324	C	247	C	248	C
	WB	810	119	C	122	C	159	C	159	C	152	C	152	C

(1) Vol = volume

(2) LOS (V/C) = level of service (volume to capacity ratio) at locations with unacceptable "Without Project" operation.

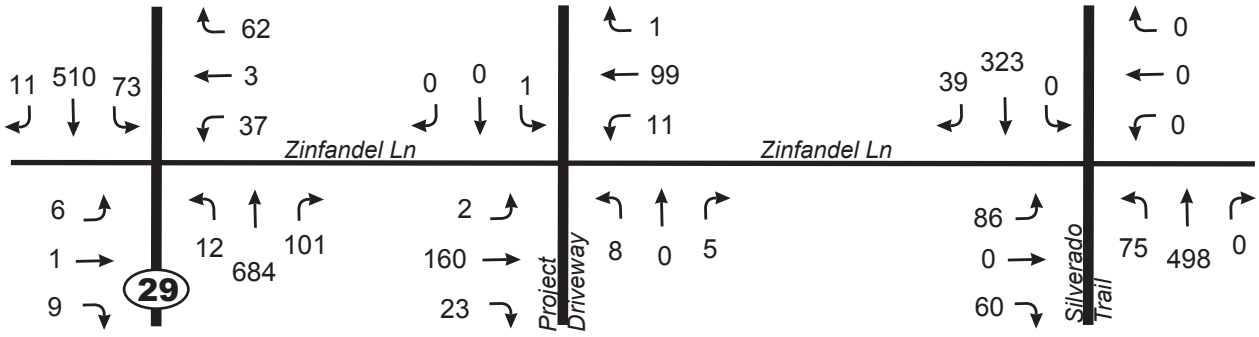
(3) [ ] = % project traffic added to road segment at locations with unacceptable "Without Project" operation. Less than a 1% increase is not considered a significant impact.

Analysis Methodology Source: Napa County General Plan Update EIR Technical Memorandum for Traffic and Circulation Supporting the Findings and recommendations, Dowling Associates, February 9, 2007. *Compiled by: Crane Transportation Group*

Appendix

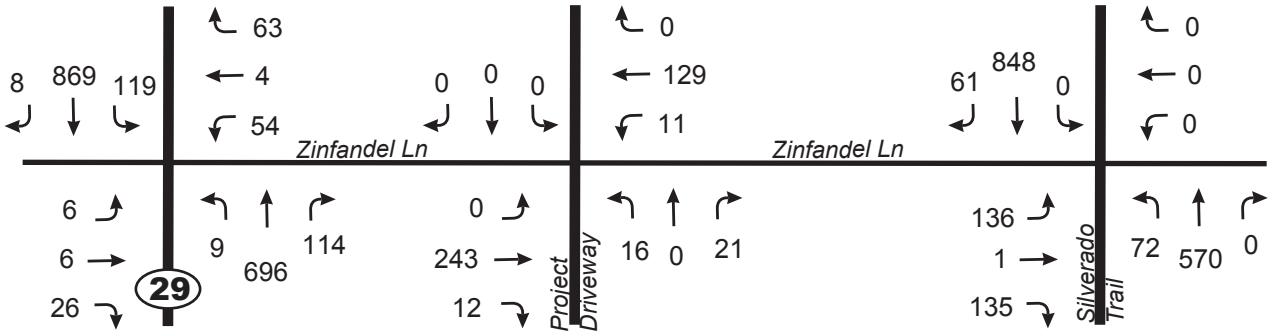
FRIDAY AM PEAK HOUR
August 21, 2015

8:00-9:00 AM



FRIDAY PM PEAK HOUR
August 21, 2015

3:00 - 4:00 PM



Raymond-Ticen Ranch Winery Traffic Study

Appendix Figure 1

Friday AM & PM, August 21 - 2015
Peak Hour Traffic Volumes

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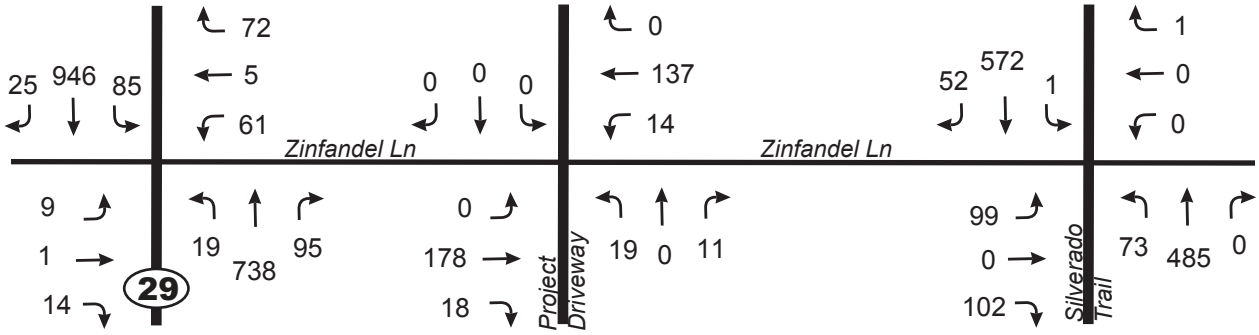
SATURDAY PM PEAK HOUR
August 22, 2015

3:15 - 4:15 PM



Raymond-Ticen Ranch Winery Traffic Study

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Appendix Figure 2

Saturday, August 22 - 2015
Peak Hour Traffic Volumes
3:15-4:15 PM

TECHNICAL APPENDIX

Capacity Worksheets

Intersection	
Int Delay, s/veh	4.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	6	1	9	35	3	59	12	691	87	68	515	11
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	75	-	-	125	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	5	5	5	14	66	10	15	10	5	10	13	5
Mvmt Flow	6	1	9	37	3	62	13	727	92	72	542	12

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1522	1535	548	1494	1495	773	554	0	0	819	0	0
Stage 1	691	691	-	798	798	-	-	-	-	-	-	-
Stage 2	831	844	-	696	697	-	-	-	-	-	-	-
Critical Hdwy	7.15	6.55	6.25	7.24	7.16	6.3	4.25	-	-	4.2	-	-
Critical Hdwy Stg 1	6.15	5.55	-	6.24	6.16	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.15	5.55	-	6.24	6.16	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4.045	3.345	3.626	4.594	3.39	2.335	-	-	2.29	-	-
Pot Cap-1 Maneuver	95	114	530	95	90	386	954	-	-	776	-	-
Stage 1	430	441	-	362	319	-	-	-	-	-	-	-
Stage 2	360	375	-	413	359	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	71	102	530	85	81	386	954	-	-	776	-	-
Mov Cap-2 Maneuver	71	102	-	85	81	-	-	-	-	-	-	-
Stage 1	424	400	-	357	315	-	-	-	-	-	-	-
Stage 2	295	370	-	367	326	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	33.3	59.8	0.1	1.2
HCM LOS	D	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	954	-	-	144	161	776	-	-
HCM Lane V/C Ratio	0.013	-	-	0.117	0.634	0.092	-	-
HCM Control Delay (s)	8.8	-	-	33.3	59.8	10.1	-	-
HCM Lane LOS	A	-	-	D	F	B	-	-
HCM 95th %tile Q(veh)	0	-	-	0.4	3.5	0.3	-	-

Intersection	
Int Delay, s/veh	4.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	86	0	58	0	0	0	69	503	0	0	326	37
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	-	-	100
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	6	10	13	5	5	5	16	4	5	5	6	8
Mvmt Flow	91	0	61	0	0	0	73	529	0	0	343	39

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1018	1018	343	1049	1018	529	343	0	0	529	0	0
Stage 1	343	343	-	675	675	-	-	-	-	-	-	-
Stage 2	675	675	-	374	343	-	-	-	-	-	-	-
Critical Hdwy	7.16	6.6	6.33	7.15	6.55	6.25	4.26	-	-	4.15	-	-
Critical Hdwy Stg 1	6.16	5.6	-	6.15	5.55	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.16	5.6	-	6.15	5.55	-	-	-	-	-	-	-
Follow-up Hdwy	3.554	4.09	3.417	3.545	4.045	3.345	2.344	-	-	2.245	-	-
Pot Cap-1 Maneuver	212	230	675	203	234	544	1142	-	-	1023	-	-
Stage 1	664	623	-	439	449	-	-	-	-	-	-	-
Stage 2	437	441	-	641	632	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	202	215	675	176	219	544	1142	-	-	1023	-	-
Mov Cap-2 Maneuver	202	215	-	176	219	-	-	-	-	-	-	-
Stage 1	622	623	-	411	420	-	-	-	-	-	-	-
Stage 2	409	413	-	583	632	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	31.9	0	1	0
HCM LOS	D	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1142	-	-	281	-	1023	-	-
HCM Lane V/C Ratio	0.064	-	-	0.539	-	-	-	-
HCM Control Delay (s)	8.4	-	-	31.9	0	0	-	-
HCM Lane LOS	A	-	-	D	A	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	3	-	0	-	-

Intersection	
Int Delay, s/veh	41.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	6	6	26	52	4	63	9	703	114	120	878	8
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	75	-	-	125	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	5	5	5	15	0	2	20	4	4	8	5	5
Mvmt Flow	6	6	27	54	4	66	9	732	119	125	915	8

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2014	2039	919	1995	1983	792	923	0	0	851	0	0
Stage 1	1169	1169	-	810	810	-	-	-	-	-	-	-
Stage 2	845	870	-	1185	1173	-	-	-	-	-	-	-
Critical Hdwy	7.15	6.55	6.25	7.25	6.5	6.22	4.3	-	-	4.18	-	-
Critical Hdwy Stg 1	6.15	5.55	-	6.25	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.15	5.55	-	6.25	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4.045	3.345	3.635	4	3.318	2.38	-	-	2.272	-	-
Pot Cap-1 Maneuver	43	56	325	~ 41	62	389	671	-	-	762	-	-
Stage 1	232	264	-	355	396	-	-	-	-	-	-	-
Stage 2	353	365	-	217	268	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	29	46	325	~ 29	51	389	671	-	-	762	-	-
Mov Cap-2 Maneuver	29	46	-	~ 29	51	-	-	-	-	-	-	-
Stage 1	229	221	-	350	391	-	-	-	-	-	-	-
Stage 2	286	360	-	162	224	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	72	$ 658.8	0.1	1.3
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	671	-	-	91	59	762	-	-
HCM Lane V/C Ratio	0.014	-	-	0.435	2.101	0.164	-	-
HCM Control Delay (s)	10.4	-	-	72	$ 658.8	10.6	-	-
HCM Lane LOS	B	-	-	F	F	B	-	-
HCM 95th %tile Q(veh)	0	-	-	1.8	12	0.6	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	101.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	136	1	136	0	0	0	62	576	0	1	857	62
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	-	-	100
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	7	10	7	5	5	5	5	2	5	5	3	5
Mvmt Flow	142	1	142	0	0	0	65	600	0	1	893	65

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1624	1624	893	1695	1624	600	893	0	0	600	0	0
Stage 1	895	895	-	729	729	-	-	-	-	-	-	-
Stage 2	729	729	-	966	895	-	-	-	-	-	-	-
Critical Hdwy	7.17	6.6	6.27	7.15	6.55	6.25	4.15	-	-	4.15	-	-
Critical Hdwy Stg 1	6.17	5.6	-	6.15	5.55	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.17	5.6	-	6.15	5.55	-	-	-	-	-	-	-
Follow-up Hdwy	3.563	4.09	3.363	3.545	4.045	3.345	2.245	-	-	2.245	-	-
Pot Cap-1 Maneuver	~ 80	98	333	72	101	495	747	-	-	963	-	-
Stage 1	329	348	-	410	424	-	-	-	-	-	-	-
Stage 2	407	416	-	302	355	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 75	89	333	38	92	495	747	-	-	963	-	-
Mov Cap-2 Maneuver	~ 75	89	-	38	92	-	-	-	-	-	-	-
Stage 1	300	347	-	374	387	-	-	-	-	-	-	-
Stage 2	372	380	-	173	354	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	$ 681.3	0	1	0
HCM LOS	F	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	747	-	-	122	-	963	-	-
HCM Lane V/C Ratio	0.086	-	-	2.331	-	0.001	-	-
HCM Control Delay (s)	10.3	-	-	$ 681.3	0	8.7	0	-
HCM Lane LOS	B	-	-	F	A	A	A	-
HCM 95th %tile Q(veh)	0.3	-	-	24.6	-	0	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	38.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	9	1	15	56	5	73	20	753	90	81	965	26
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	75	-	-	125	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	5	5	5	1	0	1	1	1	1	1	1	0
Mvmt Flow	9	1	15	58	5	75	21	776	93	84	995	27

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2079	2085	1008	2048	2053	823	1022	0	0	869	0	0
Stage 1	1175	1175	-	864	864	-	-	-	-	-	-	-
Stage 2	904	910	-	1184	1189	-	-	-	-	-	-	-
Critical Hdwy	7.15	6.55	6.25	7.11	6.5	6.21	4.11	-	-	4.11	-	-
Critical Hdwy Stg 1	6.15	5.55	-	6.11	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.15	5.55	-	6.11	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4.045	3.345	3.509	4	3.309	2.209	-	-	2.209	-	-
Pot Cap-1 Maneuver	38	52	288	~ 42	56	375	683	-	-	780	-	-
Stage 1	230	262	-	350	374	-	-	-	-	-	-	-
Stage 2	327	349	-	232	264	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	25	45	288	~ 35	48	375	683	-	-	780	-	-
Mov Cap-2 Maneuver	25	45	-	~ 35	48	-	-	-	-	-	-	-
Stage 1	223	234	-	339	363	-	-	-	-	-	-	-
Stage 2	250	338	-	195	236	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	109.5	$ 567.9	0.2	0.8
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	683	-	-	58	71	780	-	-
HCM Lane V/C Ratio	0.03	-	-	0.444	1.946	0.107	-	-
HCM Control Delay (s)	10.4	-	-	109.5	$ 567.9	10.2	-	-
HCM Lane LOS	B	-	-	F	F	B	-	-
HCM 95th %tile Q(veh)	0.1	-	-	1.7	12.5	0.4	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	17.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	99	0	104	0	0	1	73	495	0	1	584	53
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	-	-	100
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	3	1	1	5	5	5	1	1	0	0	1	8
Mvmt Flow	104	0	109	0	0	1	77	521	0	1	615	56

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1292	1292	615	1347	1292	521	615	0	0	521	0	0
Stage 1	617	617	-	675	675	-	-	-	-	-	-	-
Stage 2	675	675	-	672	617	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.51	6.21	7.15	6.55	6.25	4.11	-	-	4.1	-	-
Critical Hdwy Stg 1	6.13	5.51	-	6.15	5.55	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.51	-	6.15	5.55	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.009	3.309	3.545	4.045	3.345	2.209	-	-	2.2	-	-
Pot Cap-1 Maneuver	139	164	493	126	161	550	970	-	-	1056	-	-
Stage 1	476	483	-	439	449	-	-	-	-	-	-	-
Stage 2	442	455	-	440	477	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	130	151	493	92	148	550	970	-	-	1056	-	-
Mov Cap-2 Maneuver	130	151	-	92	148	-	-	-	-	-	-	-
Stage 1	438	482	-	404	413	-	-	-	-	-	-	-
Stage 2	406	419	-	342	476	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	116.4	11.6	1.2	0
HCM LOS	F	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	970	-	-	209	550	1056	-	-
HCM Lane V/C Ratio	0.079	-	-	1.022	0.002	0.001	-	-
HCM Control Delay (s)	9	-	-	116.4	11.6	8.4	0	-
HCM Lane LOS	A	-	-	F	B	A	A	-
HCM 95th %tile Q(veh)	0.3	-	-	9.2	0	0	-	-

Intersection	
Int Delay, s/veh	4.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	6	1	9	34	3	59	12	692	86	68	516	11
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	75	-	-	125	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	5	5	5	14	16	10	15	10	5	10	13	5
Mvmt Flow	6	1	9	36	3	62	13	728	91	72	543	12

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1524	1536	549	1496	1497	774	555	0	0	819	0	0
Stage 1	692	692	-	799	799	-	-	-	-	-	-	-
Stage 2	832	844	-	697	698	-	-	-	-	-	-	-
Critical Hdwy	7.15	6.55	6.25	7.24	6.66	6.3	4.25	-	-	4.2	-	-
Critical Hdwy Stg 1	6.15	5.55	-	6.24	5.66	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.15	5.55	-	6.24	5.66	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4.045	3.345	3.626	4.144	3.39	2.335	-	-	2.29	-	-
Pot Cap-1 Maneuver	95	114	530	95	114	386	953	-	-	776	-	-
Stage 1	429	441	-	362	378	-	-	-	-	-	-	-
Stage 2	359	375	-	413	422	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	72	102	530	85	102	386	953	-	-	776	-	-
Mov Cap-2 Maneuver	72	102	-	85	102	-	-	-	-	-	-	-
Stage 1	423	400	-	357	373	-	-	-	-	-	-	-
Stage 2	295	370	-	367	383	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	33.1	56.3	0.1	1.2
HCM LOS	D	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	953	-	-	145	165	776	-	-
HCM Lane V/C Ratio	0.013	-	-	0.116	0.612	0.092	-	-
HCM Control Delay (s)	8.8	-	-	33.1	56.3	10.1	-	-
HCM Lane LOS	A	-	-	D	F	B	-	-
HCM 95th %tile Q(veh)	0	-	-	0.4	3.3	0.3	-	-

Intersection	
Int Delay, s/veh	4.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	87	0	59	0	0	0	71	503	0	0	326	38
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	-	-	100
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	6	10	13	5	5	5	16	4	0	0	6	8
Mvmt Flow	92	0	62	0	0	0	75	529	0	0	343	40

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1022	1022	343	1053	1022	529	343	0	0	529	0	0
Stage 1	343	343	-	679	679	-	-	-	-	-	-	-
Stage 2	679	679	-	374	343	-	-	-	-	-	-	-
Critical Hdwy	7.16	6.6	6.33	7.15	6.55	6.25	4.26	-	-	4.1	-	-
Critical Hdwy Stg 1	6.16	5.6	-	6.15	5.55	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.16	5.6	-	6.15	5.55	-	-	-	-	-	-	-
Follow-up Hdwy	3.554	4.09	3.417	3.545	4.045	3.345	2.344	-	-	2.2	-	-
Pot Cap-1 Maneuver	211	228	675	202	233	544	1142	-	-	1048	-	-
Stage 1	664	623	-	437	447	-	-	-	-	-	-	-
Stage 2	435	439	-	641	632	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	200	213	675	174	218	544	1142	-	-	1048	-	-
Mov Cap-2 Maneuver	200	213	-	174	218	-	-	-	-	-	-	-
Stage 1	620	623	-	408	418	-	-	-	-	-	-	-
Stage 2	406	410	-	582	632	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	32.7	0	1	0
HCM LOS	D	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1142	-	-	279	-	1048	-	-
HCM Lane V/C Ratio	0.065	-	-	0.551	-	-	-	-
HCM Control Delay (s)	8.4	-	-	32.7	0	0	-	-
HCM Lane LOS	A	-	-	D	A	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	3.1	-	0	-	-

Intersection	
Int Delay, s/veh	31.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	6	6	26	45	4	62	9	705	108	117	882	8
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	75	-	-	125	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	5	5	5	15	0	2	20	4	4	8	5	5
Mvmt Flow	6	6	27	47	4	65	9	734	112	122	919	8

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2011	2033	923	1992	1980	791	927	0	0	847	0	0
Stage 1	1167	1167	-	809	809	-	-	-	-	-	-	-
Stage 2	844	866	-	1183	1171	-	-	-	-	-	-	-
Critical Hdwy	7.15	6.55	6.25	7.25	6.5	6.22	4.3	-	-	4.18	-	-
Critical Hdwy Stg 1	6.15	5.55	-	6.25	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.15	5.55	-	6.25	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4.045	3.345	3.635	4	3.318	2.38	-	-	2.272	-	-
Pot Cap-1 Maneuver	43	56	323	~ 42	62	390	669	-	-	765	-	-
Stage 1	233	264	-	356	396	-	-	-	-	-	-	-
Stage 2	354	366	-	218	269	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	29	46	323	~ 30	51	390	669	-	-	765	-	-
Mov Cap-2 Maneuver	29	46	-	~ 30	51	-	-	-	-	-	-	-
Stage 1	230	222	-	351	391	-	-	-	-	-	-	-
Stage 2	288	361	-	163	226	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	72	$ 523.2	0.1	1.2
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	669	-	-	91	64	765	-	-
HCM Lane V/C Ratio	0.014	-	-	0.435	1.807	0.159	-	-
HCM Control Delay (s)	10.5	-	-	72	$ 523.2	10.6	-	-
HCM Lane LOS	B	-	-	F	F	B	-	-
HCM 95th %tile Q(veh)	0	-	-	1.8	10.6	0.6	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	101.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	137	1	135	0	0	0	62	576	0	1	857	62
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	-	-	100
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	7	10	7	5	5	5	5	2	5	5	3	5
Mvmt Flow	143	1	141	0	0	0	65	600	0	1	893	65

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1624	1624	893	1695	1624	600	893	0	0	600	0	0
Stage 1	895	895	-	729	729	-	-	-	-	-	-	-
Stage 2	729	729	-	966	895	-	-	-	-	-	-	-
Critical Hdwy	7.17	6.6	6.27	7.15	6.55	6.25	4.15	-	-	4.15	-	-
Critical Hdwy Stg 1	6.17	5.6	-	6.15	5.55	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.17	5.6	-	6.15	5.55	-	-	-	-	-	-	-
Follow-up Hdwy	3.563	4.09	3.363	3.545	4.045	3.345	2.245	-	-	2.245	-	-
Pot Cap-1 Maneuver	~ 80	98	333	72	101	495	747	-	-	963	-	-
Stage 1	329	348	-	410	424	-	-	-	-	-	-	-
Stage 2	407	416	-	302	355	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 75	89	333	38	92	495	747	-	-	963	-	-
Mov Cap-2 Maneuver	~ 75	89	-	38	92	-	-	-	-	-	-	-
Stage 1	300	347	-	374	387	-	-	-	-	-	-	-
Stage 2	372	380	-	174	354	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	$ 681.3	0	1	0
HCM LOS	F	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	747	-	-	122	-	963	-	-
HCM Lane V/C Ratio	0.086	-	-	2.331	-	0.001	-	-
HCM Control Delay (s)	10.3	-	-	$ 681.3	0	8.7	0	-
HCM Lane LOS	B	-	-	F	A	A	A	-
HCM 95th %tile Q(veh)	0.3	-	-	24.6	-	0	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	30.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	9	1	15	49	5	71	20	755	87	79	967	26
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	75	-	-	125	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	5	5	5	1	0	1	1	1	1	1	1	0
Mvmt Flow	9	1	15	51	5	73	21	778	90	81	997	27

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2077	2082	1010	2045	2051	823	1024	0	0	868	0	0
Stage 1	1173	1173	-	864	864	-	-	-	-	-	-	-
Stage 2	904	909	-	1181	1187	-	-	-	-	-	-	-
Critical Hdwy	7.15	6.55	6.25	7.11	6.5	6.21	4.11	-	-	4.11	-	-
Critical Hdwy Stg 1	6.15	5.55	-	6.11	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.15	5.55	-	6.11	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4.045	3.345	3.509	4	3.309	2.209	-	-	2.209	-	-
Pot Cap-1 Maneuver	39	52	287	~ 42	56	375	682	-	-	780	-	-
Stage 1	231	263	-	350	374	-	-	-	-	-	-	-
Stage 2	327	350	-	233	264	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	26	45	287	~ 35	49	375	682	-	-	780	-	-
Mov Cap-2 Maneuver	26	45	-	~ 35	49	-	-	-	-	-	-	-
Stage 1	224	236	-	339	362	-	-	-	-	-	-	-
Stage 2	251	339	-	197	237	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	106.8	$ 477.3	0.2	0.7
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	682	-	-	59	74	780	-	-
HCM Lane V/C Ratio	0.03	-	-	0.437	1.741	0.104	-	-
HCM Control Delay (s)	10.4	-	-	106.8	$ 477.3	10.2	-	-
HCM Lane LOS	B	-	-	F	F	B	-	-
HCM 95th %tile Q(veh)	0.1	-	-	1.7	11.2	0.3	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	17.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	100	0	104	0	0	1	73	495	0	1	584	53
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	-	-	100
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	3	1	1	5	5	5	1	1	0	0	1	8
Mvmt Flow	105	0	109	0	0	1	77	521	0	1	615	56

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1292	1292	615	1347	1292	521	615	0	0	521	0	0
Stage 1	617	617	-	675	675	-	-	-	-	-	-	-
Stage 2	675	675	-	672	617	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.51	6.21	7.15	6.55	6.25	4.11	-	-	4.1	-	-
Critical Hdwy Stg 1	6.13	5.51	-	6.15	5.55	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.51	-	6.15	5.55	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.009	3.309	3.545	4.045	3.345	2.209	-	-	2.2	-	-
Pot Cap-1 Maneuver	139	164	493	126	161	550	970	-	-	1056	-	-
Stage 1	476	483	-	439	449	-	-	-	-	-	-	-
Stage 2	442	455	-	440	477	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	130	151	493	92	148	550	970	-	-	1056	-	-
Mov Cap-2 Maneuver	130	151	-	92	148	-	-	-	-	-	-	-
Stage 1	438	482	-	404	413	-	-	-	-	-	-	-
Stage 2	406	419	-	342	476	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	119.6	11.6	1.2	0
HCM LOS	F	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	970	-	-	208	550	1056	-	-
HCM Lane V/C Ratio	0.079	-	-	1.032	0.002	0.001	-	-
HCM Control Delay (s)	9	-	-	119.6	11.6	8.4	0	-
HCM Lane LOS	A	-	-	F	B	A	A	-
HCM 95th %tile Q(veh)	0.3	-	-	9.4	0	0	-	-

Intersection	
Int Delay, s/veh	6.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	6	1	9	35	3	61	12	749	92	71	555	12
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	75	-	-	125	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	5	5	5	14	66	10	15	10	5	10	13	5
Mvmt Flow	6	1	9	37	3	64	13	788	97	75	584	13

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1636	1651	591	1607	1608	837	597	0	0	885	0	0
Stage 1	740	740	-	862	862	-	-	-	-	-	-	-
Stage 2	896	911	-	745	746	-	-	-	-	-	-	-
Critical Hdwy	7.15	6.55	6.25	7.24	7.16	6.3	4.25	-	-	4.2	-	-
Critical Hdwy Stg 1	6.15	5.55	-	6.24	6.16	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.15	5.55	-	6.24	6.16	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4.045	3.345	3.626	4.594	3.39	2.335	-	-	2.29	-	-
Pot Cap-1 Maneuver	79	97	501	79	75	355	919	-	-	732	-	-
Stage 1	404	419	-	333	296	-	-	-	-	-	-	-
Stage 2	331	349	-	388	339	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	57	86	501	70	66	355	919	-	-	732	-	-
Mov Cap-2 Maneuver	57	86	-	70	66	-	-	-	-	-	-	-
Stage 1	398	376	-	328	292	-	-	-	-	-	-	-
Stage 2	264	344	-	341	304	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	40.2	85.1	0.1	1.2
HCM LOS	E	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	919	-	-	119	138	732	-	-
HCM Lane V/C Ratio	0.014	-	-	0.142	0.755	0.102	-	-
HCM Control Delay (s)	9	-	-	40.2	85.1	10.5	-	-
HCM Lane LOS	A	-	-	E	F	B	-	-
HCM 95th %tile Q(veh)	0	-	-	0.5	4.5	0.3	-	-

Intersection	
Int Delay, s/veh	6.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	91	0	61	0	0	0	72	570	0	0	370	39
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	-	-	100
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	6	10	13	5	5	5	16	4	5	5	6	8
Mvmt Flow	96	0	64	0	0	0	76	600	0	0	389	41

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1141	1141	389	1174	1141	600	389	0	0	600	0	0
Stage 1	389	389	-	752	752	-	-	-	-	-	-	-
Stage 2	752	752	-	422	389	-	-	-	-	-	-	-
Critical Hdwy	7.16	6.6	6.33	7.15	6.55	6.25	4.26	-	-	4.15	-	-
Critical Hdwy Stg 1	6.16	5.6	-	6.15	5.55	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.16	5.6	-	6.15	5.55	-	-	-	-	-	-	-
Follow-up Hdwy	3.554	4.09	3.417	3.545	4.045	3.345	2.344	-	-	2.245	-	-
Pot Cap-1 Maneuver	175	194	636	166	198	495	1097	-	-	963	-	-
Stage 1	627	595	-	398	414	-	-	-	-	-	-	-
Stage 2	396	406	-	604	603	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	166	181	636	141	184	495	1097	-	-	963	-	-
Mov Cap-2 Maneuver	166	181	-	141	184	-	-	-	-	-	-	-
Stage 1	584	595	-	370	385	-	-	-	-	-	-	-
Stage 2	369	378	-	543	603	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	47.3	0	1	0
HCM LOS	E	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1097	-	-	236	-	963	-	-
HCM Lane V/C Ratio	0.069	-	-	0.678	-	-	-	-
HCM Control Delay (s)	8.5	-	-	47.3	0	0	-	-
HCM Lane LOS	A	-	-	E	A	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	4.3	-	0	-	-

Intersection	
Int Delay, s/veh	76.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	7	6	28	57	4	68	10	769	122	128	963	9
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	75	-	-	125	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	5	5	5	15	0	2	20	4	4	8	5	5
Mvmt Flow	7	6	29	59	4	71	10	801	127	133	1003	9

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2197	2223	1008	2177	2164	865	1013	0	0	928	0	0
Stage 1	1274	1274	-	885	885	-	-	-	-	-	-	-
Stage 2	923	949	-	1292	1279	-	-	-	-	-	-	-
Critical Hdwy	7.15	6.55	6.25	7.25	6.5	6.22	4.3	-	-	4.18	-	-
Critical Hdwy Stg 1	6.15	5.55	-	6.25	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.15	5.55	-	6.25	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4.045	3.345	3.635	4	3.318	2.38	-	-	2.272	-	-
Pot Cap-1 Maneuver	32	42	288	~ 31	48	353	619	-	-	713	-	-
Stage 1	202	235	-	322	366	-	-	-	-	-	-	-
Stage 2	319	335	-	188	239	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	20	34	288	~ 20	38	353	619	-	-	713	-	-
Mov Cap-2 Maneuver	20	34	-	~ 20	38	-	-	-	-	-	-	-
Stage 1	199	191	-	317	360	-	-	-	-	-	-	-
Stage 2	248	330	-	133	194	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	129.1	$ 1231.4	0.1	1.3
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	619	-	-	66	41	713	-	-
HCM Lane V/C Ratio	0.017	-	-	0.647	3.277	0.187	-	-
HCM Control Delay (s)	10.9	-	-	129.1	$ 1231.4	11.2	-	-
HCM Lane LOS	B	-	-	F	F	B	-	-
HCM 95th %tile Q(veh)	0.1	-	-	2.8	15	0.7	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	157.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	144	1	144	0	0	0	77	629	0	1	936	66
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	-	-	100
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	7	10	7	5	5	5	5	2	5	5	3	5
Mvmt Flow	150	1	150	0	0	0	80	655	0	1	975	69

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1793	1793	975	1869	1793	655	975	0	0	655	0	0
Stage 1	977	977	-	816	816	-	-	-	-	-	-	-
Stage 2	816	816	-	1053	977	-	-	-	-	-	-	-
Critical Hdwy	7.17	6.6	6.27	7.15	6.55	6.25	4.15	-	-	4.15	-	-
Critical Hdwy Stg 1	6.17	5.6	-	6.15	5.55	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.17	5.6	-	6.15	5.55	-	-	-	-	-	-	-
Follow-up Hdwy	3.563	4.09	3.363	3.545	4.045	3.345	2.245	-	-	2.245	-	-
Pot Cap-1 Maneuver	~ 61	77	299	54	79	461	696	-	-	918	-	-
Stage 1	295	319	-	367	386	-	-	-	-	-	-	-
Stage 2	364	379	-	270	325	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 56	68	299	24	70	461	696	-	-	918	-	-
Mov Cap-2 Maneuver	~ 56	68	-	24	70	-	-	-	-	-	-	-
Stage 1	261	318	-	325	342	-	-	-	-	-	-	-
Stage 2	322	335	-	134	324	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	$ 1087.3	0	1.2	0
HCM LOS	F	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	696	-	-	94	-	918	-	-
HCM Lane V/C Ratio	0.115	-	-	3.203	-	0.001	-	-
HCM Control Delay (s)	10.8	-	-	$ 1087.3	0	8.9	0	-
HCM Lane LOS	B	-	-	F	A	A	A	-
HCM 95th %tile Q(veh)	0.4	-	-	29.7	-	0	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	65.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	10	1	16	60	5	78	21	822	97	87	1055	28
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	75	-	-	125	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	5	5	5	1	0	1	1	1	1	1	1	0
Mvmt Flow	10	1	16	62	5	80	22	847	100	90	1088	29

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2265	2272	1102	2231	2237	897	1116	0	0	947	0	0
Stage 1	1281	1281	-	941	941	-	-	-	-	-	-	-
Stage 2	984	991	-	1290	1296	-	-	-	-	-	-	-
Critical Hdwy	7.15	6.55	6.25	7.11	6.5	6.21	4.11	-	-	4.11	-	-
Critical Hdwy Stg 1	6.15	5.55	-	6.11	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.15	5.55	-	6.11	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4.045	3.345	3.509	4	3.309	2.209	-	-	2.209	-	-
Pot Cap-1 Maneuver	28	39	254	~ 31	43	340	630	-	-	729	-	-
Stage 1	200	233	-	317	345	-	-	-	-	-	-	-
Stage 2	295	320	-	202	234	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	17	33	254	~ 25	36	340	630	-	-	729	-	-
Mov Cap-2 Maneuver	17	33	-	~ 25	36	-	-	-	-	-	-	-
Stage 1	193	204	-	306	333	-	-	-	-	-	-	-
Stage 2	214	309	-	165	205	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	207.9	$ 995.8	0.2	0.8
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	630	-	-	40	52	729	-	-
HCM Lane V/C Ratio	0.034	-	-	0.696	2.835	0.123	-	-
HCM Control Delay (s)	10.9	-	-	207.9	$ 995.8	10.6	-	-
HCM Lane LOS	B	-	-	F	F	B	-	-
HCM 95th %tile Q(veh)	0.1	-	-	2.6	15.5	0.4	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	31.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	106	0	111	0	0	1	78	542	0	1	639	57
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	-	-	100
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	3	1	1	5	5	5	1	1	0	0	1	8
Mvmt Flow	112	0	117	0	0	1	82	571	0	1	673	60

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1410	1410	673	1468	1410	571	673	0	0	571	0	0
Stage 1	675	675	-	735	735	-	-	-	-	-	-	-
Stage 2	735	735	-	733	675	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.51	6.21	7.15	6.55	6.25	4.11	-	-	4.1	-	-
Critical Hdwy Stg 1	6.13	5.51	-	6.15	5.55	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.51	-	6.15	5.55	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.009	3.309	3.545	4.045	3.345	2.209	-	-	2.2	-	-
Pot Cap-1 Maneuver	115	139	457	104	136	515	923	-	-	1012	-	-
Stage 1	442	455	-	407	421	-	-	-	-	-	-	-
Stage 2	410	427	-	408	449	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 107	126	457	72	124	515	923	-	-	1012	-	-
Mov Cap-2 Maneuver	~ 107	126	-	72	124	-	-	-	-	-	-	-
Stage 1	403	454	-	371	384	-	-	-	-	-	-	-
Stage 2	373	389	-	303	448	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	220.7	12	1.2	0
HCM LOS	F	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	923	-	-	176	515	1012	-	-
HCM Lane V/C Ratio	0.089	-	-	1.298	0.002	0.001	-	-
HCM Control Delay (s)	9.3	-	-	220.7	12	8.6	0	-
HCM Lane LOS	A	-	-	F	B	A	A	-
HCM 95th %tile Q(veh)	0.3	-	-	13.1	0	0	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	6	1	9	34	3	61	12	750	91	71	556	12
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	75	-	-	125	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	5	5	5	14	66	10	15	10	5	10	13	5
Mvmt Flow	6	1	9	36	3	64	13	789	96	75	585	13

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1637	1652	592	1609	1610	837	598	0	0	885	0	0
Stage 1	741	741	-	863	863	-	-	-	-	-	-	-
Stage 2	896	911	-	746	747	-	-	-	-	-	-	-
Critical Hdwy	7.15	6.55	6.25	7.24	7.16	6.3	4.25	-	-	4.2	-	-
Critical Hdwy Stg 1	6.15	5.55	-	6.24	6.16	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.15	5.55	-	6.24	6.16	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4.045	3.345	3.626	4.594	3.39	2.335	-	-	2.29	-	-
Pot Cap-1 Maneuver	79	97	501	79	75	355	918	-	-	732	-	-
Stage 1	403	418	-	333	295	-	-	-	-	-	-	-
Stage 2	331	349	-	388	339	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	57	86	501	70	66	355	918	-	-	732	-	-
Mov Cap-2 Maneuver	57	86	-	70	66	-	-	-	-	-	-	-
Stage 1	397	375	-	328	291	-	-	-	-	-	-	-
Stage 2	264	344	-	341	304	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	40.2	82.5	0.1	1.2
HCM LOS	E	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	918	-	-	119	139	732	-	-
HCM Lane V/C Ratio	0.014	-	-	0.142	0.742	0.102	-	-
HCM Control Delay (s)	9	-	-	40.2	82.5	10.5	-	-
HCM Lane LOS	A	-	-	E	F	B	-	-
HCM 95th %tile Q(veh)	0	-	-	0.5	4.4	0.3	-	-

Intersection	
Int Delay, s/veh	6.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	92	0	62	0	0	0	74	570	0	0	370	40
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	-	-	100
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	6	10	13	5	5	5	16	4	5	5	6	8
Mvmt Flow	97	0	65	0	0	0	78	600	0	0	389	42

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1145	1145	389	1178	1145	600	389	0	0	600	0	0
Stage 1	389	389	-	756	756	-	-	-	-	-	-	-
Stage 2	756	756	-	422	389	-	-	-	-	-	-	-
Critical Hdwy	7.16	6.6	6.33	7.15	6.55	6.25	4.26	-	-	4.15	-	-
Critical Hdwy Stg 1	6.16	5.6	-	6.15	5.55	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.16	5.6	-	6.15	5.55	-	-	-	-	-	-	-
Follow-up Hdwy	3.554	4.09	3.417	3.545	4.045	3.345	2.344	-	-	2.245	-	-
Pot Cap-1 Maneuver	173	193	636	165	197	495	1097	-	-	963	-	-
Stage 1	627	595	-	396	412	-	-	-	-	-	-	-
Stage 2	394	405	-	604	603	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	164	179	636	140	183	495	1097	-	-	963	-	-
Mov Cap-2 Maneuver	164	179	-	140	183	-	-	-	-	-	-	-
Stage 1	582	595	-	368	383	-	-	-	-	-	-	-
Stage 2	366	376	-	542	603	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	49.1	0	1	0
HCM LOS	E	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1097	-	-	234	-	963	-	-
HCM Lane V/C Ratio	0.071	-	-	0.693	-	-	-	-
HCM Control Delay (s)	8.5	-	-	49.1	0	0	-	-
HCM Lane LOS	A	-	-	E	A	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	4.5	-	0	-	-

Intersection	
Int Delay, s/veh	59.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	7	6	28	50	4	67	10	771	116	125	967	9
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	75	-	-	125	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	5	5	5	15	0	2	20	4	4	8	5	5
Mvmt Flow	7	6	29	52	4	70	10	803	121	130	1007	9

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2193	2217	1012	2174	2161	864	1017	0	0	924	0	0
Stage 1	1272	1272	-	884	884	-	-	-	-	-	-	-
Stage 2	921	945	-	1290	1277	-	-	-	-	-	-	-
Critical Hdwy	7.15	6.55	6.25	7.25	6.5	6.22	4.3	-	-	4.18	-	-
Critical Hdwy Stg 1	6.15	5.55	-	6.25	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.15	5.55	-	6.25	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4.045	3.345	3.635	4	3.318	2.38	-	-	2.272	-	-
Pot Cap-1 Maneuver	32	43	287	~ 31	48	354	617	-	-	715	-	-
Stage 1	203	235	-	323	366	-	-	-	-	-	-	-
Stage 2	320	337	-	189	239	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	20	35	287	~ 21	39	354	617	-	-	715	-	-
Mov Cap-2 Maneuver	20	35	-	~ 21	39	-	-	-	-	-	-	-
Stage 1	200	192	-	318	360	-	-	-	-	-	-	-
Stage 2	250	332	-	134	196	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	129.1	$ 1005	0.1	1.3
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	617	-	-	66	45	715	-	-
HCM Lane V/C Ratio	0.017	-	-	0.647	2.801	0.182	-	-
HCM Control Delay (s)	10.9	-	-	129.1	$ 1005	11.2	-	-
HCM Lane LOS	B	-	-	F	F	B	-	-
HCM 95th %tile Q(veh)	0.1	-	-	2.8	13.6	0.7	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	157.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	145	1	143	0	0	0	77	629	0	1	936	66
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	-	-	100
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	7	10	7	5	5	5	5	2	5	5	3	5
Mvmt Flow	151	1	149	0	0	0	80	655	0	1	975	69

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1793	1793	975	1868	1793	655	975	0	0	655	0	0
Stage 1	977	977	-	816	816	-	-	-	-	-	-	-
Stage 2	816	816	-	1052	977	-	-	-	-	-	-	-
Critical Hdwy	7.17	6.6	6.27	7.15	6.55	6.25	4.15	-	-	4.15	-	-
Critical Hdwy Stg 1	6.17	5.6	-	6.15	5.55	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.17	5.6	-	6.15	5.55	-	-	-	-	-	-	-
Follow-up Hdwy	3.563	4.09	3.363	3.545	4.045	3.345	2.245	-	-	2.245	-	-
Pot Cap-1 Maneuver	~ 61	77	299	54	79	461	696	-	-	918	-	-
Stage 1	295	319	-	367	386	-	-	-	-	-	-	-
Stage 2	364	379	-	270	325	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 56	68	299	24	70	461	696	-	-	918	-	-
Mov Cap-2 Maneuver	~ 56	68	-	24	70	-	-	-	-	-	-	-
Stage 1	261	318	-	325	342	-	-	-	-	-	-	-
Stage 2	322	335	-	135	324	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	$ 1087.3	0	1.2	0
HCM LOS	F	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	696	-	-	94	-	918	-	-
HCM Lane V/C Ratio	0.115	-	-	3.203	-	0.001	-	-
HCM Control Delay (s)	10.8	-	-	$ 1087.3	0	8.9	0	-
HCM Lane LOS	B	-	-	F	A	A	A	-
HCM 95th %tile Q(veh)	0.4	-	-	29.7	-	0	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	54.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	10	1	16	53	5	76	21	824	94	85	1057	28
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	75	-	-	125	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	1	1	1	1	0	1	1	1	1	1	1	0
Mvmt Flow	10	1	16	55	5	78	22	849	97	88	1090	29

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2262	2269	1104	2229	2235	898	1119	0	0	946	0	0
Stage 1	1279	1279	-	941	941	-	-	-	-	-	-	-
Stage 2	983	990	-	1288	1294	-	-	-	-	-	-	-
Critical Hdwy	7.11	6.51	6.21	7.11	6.5	6.21	4.11	-	-	4.11	-	-
Critical Hdwy Stg 1	6.11	5.51	-	6.11	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.11	5.51	-	6.11	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.509	4.009	3.309	3.509	4	3.309	2.209	-	-	2.209	-	-
Pot Cap-1 Maneuver	29	41	258	~ 31	43	339	628	-	-	730	-	-
Stage 1	205	238	-	317	345	-	-	-	-	-	-	-
Stage 2	301	326	-	202	235	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	18	35	258	~ 25	36	339	628	-	-	730	-	-
Mov Cap-2 Maneuver	18	35	-	~ 25	36	-	-	-	-	-	-	-
Stage 1	198	209	-	306	333	-	-	-	-	-	-	-
Stage 2	220	315	-	165	207	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	191.8	$ 869.1	0.2	0.8
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	628	-	-	42	54	730	-	-
HCM Lane V/C Ratio	0.034	-	-	0.663	2.558	0.12	-	-
HCM Control Delay (s)	10.9	-	-	191.8	$ 869.1	10.6	-	-
HCM Lane LOS	B	-	-	F	F	B	-	-
HCM 95th %tile Q(veh)	0.1	-	-	2.5	14.2	0.4	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	32.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	107	0	111	0	0	1	78	542	0	1	639	57
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	-	-	100
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	3	1	1	5	5	5	1	1	0	0	1	8
Mvmt Flow	113	0	117	0	0	1	82	571	0	1	673	60

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1410	1410	673	1468	1410	571	673	0	0	571	0	0
Stage 1	675	675	-	735	735	-	-	-	-	-	-	-
Stage 2	735	735	-	733	675	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.51	6.21	7.15	6.55	6.25	4.11	-	-	4.1	-	-
Critical Hdwy Stg 1	6.13	5.51	-	6.15	5.55	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.51	-	6.15	5.55	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.009	3.309	3.545	4.045	3.345	2.209	-	-	2.2	-	-
Pot Cap-1 Maneuver	115	139	457	104	136	515	923	-	-	1012	-	-
Stage 1	442	455	-	407	421	-	-	-	-	-	-	-
Stage 2	410	427	-	408	449	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 107	126	457	72	124	515	923	-	-	1012	-	-
Mov Cap-2 Maneuver	~ 107	126	-	72	124	-	-	-	-	-	-	-
Stage 1	403	454	-	371	384	-	-	-	-	-	-	-
Stage 2	373	389	-	303	448	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	226.2	12	1.2	0
HCM LOS	F	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	923	-	-	175	515	1012	-	-
HCM Lane V/C Ratio	0.089	-	-	1.311	0.002	0.001	-	-
HCM Control Delay (s)	9.3	-	-	226.2	12	8.6	0	-
HCM Lane LOS	A	-	-	F	B	A	A	-
HCM 95th %tile Q(veh)	0.3	-	-	13.3	0	0	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	14.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	7	1	10	40	3	66	13	865	101	77	633	13
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	75	-	-	125	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	5	5	5	14	66	10	15	10	5	10	13	5
Mvmt Flow	7	1	10	42	3	69	14	901	105	80	659	14

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1844	1860	666	1813	1814	954	673	0	0	1006	0	0
Stage 1	827	827	-	981	981	-	-	-	-	-	-	-
Stage 2	1017	1033	-	832	833	-	-	-	-	-	-	-
Critical Hdwy	7.15	6.55	6.25	7.24	7.16	6.3	4.25	-	-	4.2	-	-
Critical Hdwy Stg 1	6.15	5.55	-	6.24	6.16	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.15	5.55	-	6.24	6.16	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4.045	3.345	3.626	4.594	3.39	2.335	-	-	2.29	-	-
Pot Cap-1 Maneuver	57	72	454	56	55	303	860	-	-	658	-	-
Stage 1	361	382	-	285	256	-	-	-	-	-	-	-
Stage 2	283	306	-	347	306	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	38	62	454	48	48	303	860	-	-	658	-	-
Mov Cap-2 Maneuver	38	62	-	48	48	-	-	-	-	-	-	-
Stage 1	355	336	-	280	252	-	-	-	-	-	-	-
Stage 2	213	301	-	297	269	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	62.4	220.3	0.1	1.2
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	860	-	-	81	98	658	-	-
HCM Lane V/C Ratio	0.016	-	-	0.231	1.159	0.122	-	-
HCM Control Delay (s)	9.3	-	-	62.4	220.3	11.2	-	-
HCM Lane LOS	A	-	-	F	F	B	-	-
HCM 95th %tile Q(veh)	0	-	-	0.8	7.6	0.4	-	-

Intersection	
Int Delay, s/veh	15.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	99	0	67	0	0	0	78	703	0	0	456	41
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	-	-	100
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	6	10	13	5	5	5	16	4	5	5	6	8
Mvmt Flow	103	0	70	0	0	0	81	732	0	0	475	43

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1370	1370	475	1405	1370	732	475	0	0	732	0	0
Stage 1	475	475	-	895	895	-	-	-	-	-	-	-
Stage 2	895	895	-	510	475	-	-	-	-	-	-	-
Critical Hdwy	7.16	6.6	6.33	7.15	6.55	6.25	4.26	-	-	4.15	-	-
Critical Hdwy Stg 1	6.16	5.6	-	6.15	5.55	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.16	5.6	-	6.15	5.55	-	-	-	-	-	-	-
Follow-up Hdwy	3.554	4.09	3.417	3.545	4.045	3.345	2.344	-	-	2.245	-	-
Pot Cap-1 Maneuver	121	141	568	115	144	416	1018	-	-	859	-	-
Stage 1	563	544	-	331	355	-	-	-	-	-	-	-
Stage 2	330	348	-	541	552	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	114	130	568	95	133	416	1018	-	-	859	-	-
Mov Cap-2 Maneuver	114	130	-	95	133	-	-	-	-	-	-	-
Stage 1	518	544	-	305	327	-	-	-	-	-	-	-
Stage 2	304	320	-	475	552	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	132.9	0	0.9	0
HCM LOS	F	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1018	-	-	168	-	859	-	-
HCM Lane V/C Ratio	0.08	-	-	1.029	-	-	-	-
HCM Control Delay (s)	8.8	-	-	132.9	0	0	-	-
HCM Lane LOS	A	-	-	F	A	A	-	-
HCM 95th %tile Q(veh)	0.3	-	-	8.4	-	0	-	-

Intersection	
Int Delay, s/veh	211.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	7	7	31	64	5	77	11	901	137	143	1129	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	75	-	-	125	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	5	5	5	15	0	2	20	4	4	8	5	5
Mvmt Flow	7	7	32	66	5	79	11	929	141	147	1164	10

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2528	2557	1169	2506	2491	999	1174	0	0	1070	0	0
Stage 1	1464	1464	-	1022	1022	-	-	-	-	-	-	-
Stage 2	1064	1093	-	1484	1469	-	-	-	-	-	-	-
Critical Hdwy	7.15	6.55	6.25	7.25	6.5	6.22	4.3	-	-	4.18	-	-
Critical Hdwy Stg 1	6.15	5.55	-	6.25	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.15	5.55	-	6.25	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4.045	3.345	3.635	4	3.318	2.38	-	-	2.272	-	-
Pot Cap-1 Maneuver	18	26	232	~ 18	30	295	535	-	-	629	-	-
Stage 1	157	190	-	269	316	-	-	-	-	-	-	-
Stage 2	266	287	-	145	194	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	9	20	232	~ 9	23	295	535	-	-	629	-	-
Mov Cap-2 Maneuver	9	20	-	~ 9	23	-	-	-	-	-	-	-
Stage 1	154	146	-	263	310	-	-	-	-	-	-	-
Stage 2	187	281	-	91	149	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	$ 419.4	$ 3512.9	0.1	1.4
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	535	-	-	36	19	629	-	-
HCM Lane V/C Ratio	0.021	-	-	1.289	7.922	0.234	-	-
HCM Control Delay (s)	11.9	-	-	$ 419.4	$ 3512.9	12.5	-	-
HCM Lane LOS	B	-	-	F	F	B	-	-
HCM 95th %tile Q(veh)	0.1	-	-	4.9	19.4	0.9	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	301.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	162	1	161	0	0	0	86	734	0	1	1092	73
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	-	-	100
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	7	10	7	5	5	5	5	2	5	5	3	5
Mvmt Flow	167	1	166	0	0	0	89	757	0	1	1126	75

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2062	2062	1126	2145	2062	757	1126	0	0	757	0	0
Stage 1	1128	1128	-	934	934	-	-	-	-	-	-	-
Stage 2	934	934	-	1211	1128	-	-	-	-	-	-	-
Critical Hdwy	7.17	6.6	6.27	7.15	6.55	6.25	4.15	-	-	4.15	-	-
Critical Hdwy Stg 1	6.17	5.6	-	6.15	5.55	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.17	5.6	-	6.15	5.55	-	-	-	-	-	-	-
Follow-up Hdwy	3.563	4.09	3.363	3.545	4.045	3.345	2.245	-	-	2.245	-	-
Pot Cap-1 Maneuver	~ 39	52	243	34	54	403	609	-	-	841	-	-
Stage 1	243	270	-	315	341	-	-	-	-	-	-	-
Stage 2	312	334	-	220	276	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 35	44	243	9	46	403	609	-	-	841	-	-
Mov Cap-2 Maneuver	~ 35	44	-	9	46	-	-	-	-	-	-	-
Stage 1	207	269	-	269	291	-	-	-	-	-	-	-
Stage 2	266	285	-	69	275	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	$ 2147.9	0	1.2	0
HCM LOS	F	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	609	-	-	61	-	841	-	-
HCM Lane V/C Ratio	0.146	-	-	5.476	-	0.001	-	-
HCM Control Delay (s)	11.9	-	-	$ 2147.9	0	9.3	0	-
HCM Lane LOS	B	-	-	F	A	A	A	-
HCM 95th %tile Q(veh)	0.5	-	-	37.5	-	0	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	171.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	11	1	18	70	6	88	24	960	110	99	1235	32
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	75	-	-	125	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	98	98	98	98	98	98	98	98	98	98	98	98
Heavy Vehicles, %	1	1	1	1	0	1	1	1	1	1	1	0
Mvmt Flow	11	1	18	71	6	90	24	980	112	101	1260	33

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2612	2620	1277	2573	2580	1036	1293	0	0	1092	0	0
Stage 1	1479	1479	-	1085	1085	-	-	-	-	-	-	-
Stage 2	1133	1141	-	1488	1495	-	-	-	-	-	-	-
Critical Hdwy	7.11	6.51	6.21	7.11	6.5	6.21	4.11	-	-	4.11	-	-
Critical Hdwy Stg 1	6.11	5.51	-	6.11	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.11	5.51	-	6.11	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.509	4.009	3.309	3.509	4	3.309	2.209	-	-	2.209	-	-
Pot Cap-1 Maneuver	16	24	204	~ 17	26	282	539	-	-	643	-	-
Stage 1	157	190	-	264	295	-	-	-	-	-	-	-
Stage 2	248	277	-	156	188	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 7	19	204	~ 13	21	282	539	-	-	643	-	-
Mov Cap-2 Maneuver	~ 7	19	-	~ 13	21	-	-	-	-	-	-	-
Stage 1	150	160	-	252	282	-	-	-	-	-	-	-
Stage 2	158	265	-	119	158	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	$ 784.5	$ 2626.9	0.3	0.8
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	539	-	-	18	27	643	-	-
HCM Lane V/C Ratio	0.045	-	-	1.701	6.198	0.157	-	-
HCM Control Delay (s)	12	-	-	$ 784.5	$ 2626.9	11.6	-	-
HCM Lane LOS	B	-	-	F	F	B	-	-
HCM 95th %tile Q(veh)	0.1	-	-	4.3	20.6	0.6	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	75.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	120	0	127	0	0	1	88	635	0	1	750	64
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	-	-	100
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	3	1	1	5	5	5	1	1	0	0	1	8
Mvmt Flow	125	0	132	0	0	1	92	661	0	1	781	67

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1628	1628	781	1694	1628	661	781	0	0	661	0	0
Stage 1	783	783	-	845	845	-	-	-	-	-	-	-
Stage 2	845	845	-	849	783	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.51	6.21	7.15	6.55	6.25	4.11	-	-	4.1	-	-
Critical Hdwy Stg 1	6.13	5.51	-	6.15	5.55	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.51	-	6.15	5.55	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.009	3.309	3.545	4.045	3.345	2.209	-	-	2.2	-	-
Pot Cap-1 Maneuver	~ 81	102	396	72	100	457	841	-	-	937	-	-
Stage 1	385	406	-	353	375	-	-	-	-	-	-	-
Stage 2	356	380	-	351	400	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 74	91	396	44	89	457	841	-	-	937	-	-
Mov Cap-2 Maneuver	~ 74	91	-	44	89	-	-	-	-	-	-	-
Stage 1	343	405	-	314	334	-	-	-	-	-	-	-
Stage 2	316	338	-	233	399	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	$ 545.5	12.9	1.2	0
HCM LOS	F	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	841	-	-	127	457	937	-	-
HCM Lane V/C Ratio	0.109	-	-	2.026	0.002	0.001	-	-
HCM Control Delay (s)	9.8	-	-	$ 545.5	12.9	8.8	0	-
HCM Lane LOS	A	-	-	F	B	A	A	-
HCM 95th %tile Q(veh)	0.4	-	-	20.9	0	0	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	13.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	7	1	10	39	3	66	13	866	100	77	634	13
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	75	-	-	125	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	5	5	5	14	66	10	15	10	5	10	13	5
Mvmt Flow	7	1	10	41	3	69	14	902	104	80	660	14

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1845	1861	667	1814	1815	954	674	0	0	1006	0	0
Stage 1	828	828	-	981	981	-	-	-	-	-	-	-
Stage 2	1017	1033	-	833	834	-	-	-	-	-	-	-
Critical Hdwy	7.15	6.55	6.25	7.24	7.16	6.3	4.25	-	-	4.2	-	-
Critical Hdwy Stg 1	6.15	5.55	-	6.24	6.16	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.15	5.55	-	6.24	6.16	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4.045	3.345	3.626	4.594	3.39	2.335	-	-	2.29	-	-
Pot Cap-1 Maneuver	56	72	454	56	54	303	859	-	-	658	-	-
Stage 1	361	381	-	285	256	-	-	-	-	-	-	-
Stage 2	283	306	-	346	306	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	37	62	454	48	47	303	859	-	-	658	-	-
Mov Cap-2 Maneuver	37	62	-	48	47	-	-	-	-	-	-	-
Stage 1	355	335	-	280	252	-	-	-	-	-	-	-
Stage 2	213	301	-	296	269	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	64.2	211.8	0.1	1.2
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	859	-	-	79	99	658	-	-
HCM Lane V/C Ratio	0.016	-	-	0.237	1.136	0.122	-	-
HCM Control Delay (s)	9.3	-	-	64.2	211.8	11.2	-	-
HCM Lane LOS	A	-	-	F	F	B	-	-
HCM 95th %tile Q(veh)	0	-	-	0.8	7.4	0.4	-	-

Intersection	
Int Delay, s/veh	16.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	100	0	68	0	0	0	80	703	0	0	456	42
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	-	-	100
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	6	10	13	5	5	5	16	4	5	5	6	8
Mvmt Flow	104	0	71	0	0	0	83	732	0	0	475	44

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1374	1374	475	1409	1374	732	475	0	0	732	0	0
Stage 1	475	475	-	899	899	-	-	-	-	-	-	-
Stage 2	899	899	-	510	475	-	-	-	-	-	-	-
Critical Hdwy	7.16	6.6	6.33	7.15	6.55	6.25	4.26	-	-	4.15	-	-
Critical Hdwy Stg 1	6.16	5.6	-	6.15	5.55	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.16	5.6	-	6.15	5.55	-	-	-	-	-	-	-
Follow-up Hdwy	3.554	4.09	3.417	3.545	4.045	3.345	2.344	-	-	2.245	-	-
Pot Cap-1 Maneuver	120	140	568	114	143	416	1018	-	-	859	-	-
Stage 1	563	544	-	329	354	-	-	-	-	-	-	-
Stage 2	328	347	-	541	552	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	113	129	568	94	131	416	1018	-	-	859	-	-
Mov Cap-2 Maneuver	113	129	-	94	131	-	-	-	-	-	-	-
Stage 1	517	544	-	302	325	-	-	-	-	-	-	-
Stage 2	301	319	-	474	552	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	138.7	0	0.9	0
HCM LOS	F	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1018	-	-	167	-	859	-	-
HCM Lane V/C Ratio	0.082	-	-	1.048	-	-	-	-
HCM Control Delay (s)	8.9	-	-	138.7	0	0	-	-
HCM Lane LOS	A	-	-	F	A	A	-	-
HCM 95th %tile Q(veh)	0.3	-	-	8.6	-	0	-	-

Intersection	
Int Delay, s/veh	180.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	7	7	31	57	5	76	11	903	131	140	1133	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	75	-	-	125	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	5	5	5	15	0	2	20	4	4	8	5	5
Mvmt Flow	7	7	32	59	5	78	11	931	135	144	1168	10

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2525	2551	1173	2502	2488	998	1178	0	0	1066	0	0
Stage 1	1462	1462	-	1021	1021	-	-	-	-	-	-	-
Stage 2	1063	1089	-	1481	1467	-	-	-	-	-	-	-
Critical Hdwy	7.15	6.55	6.25	7.25	6.5	6.22	4.3	-	-	4.18	-	-
Critical Hdwy Stg 1	6.15	5.55	-	6.25	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.15	5.55	-	6.25	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4.045	3.345	3.635	4	3.318	2.38	-	-	2.272	-	-
Pot Cap-1 Maneuver	18	26	231	~ 18	30	296	533	-	-	631	-	-
Stage 1	158	190	-	270	316	-	-	-	-	-	-	-
Stage 2	266	288	-	146	194	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	9	20	231	~ 9	23	296	533	-	-	631	-	-
Mov Cap-2 Maneuver	9	20	-	~ 9	23	-	-	-	-	-	-	-
Stage 1	155	147	-	264	309	-	-	-	-	-	-	-
Stage 2	188	282	-	92	150	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	$ 419.4	$ 3131.6	0.1	1.4
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	533	-	-	36	20	631	-	-
HCM Lane V/C Ratio	0.021	-	-	1.289	7.113	0.229	-	-
HCM Control Delay (s)	11.9	-	-	$ 419.4	$ 3131.6	12.4	-	-
HCM Lane LOS	B	-	-	F	F	B	-	-
HCM 95th %tile Q(veh)	0.1	-	-	4.9	18.2	0.9	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	301.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	163	1	160	0	0	0	86	734	0	1	1092	73
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	-	-	100
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	7	10	7	5	5	5	5	2	5	5	3	5
Mvmt Flow	168	1	165	0	0	0	89	757	0	1	1126	75

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2062	2062	1126	2145	2062	757	1126	0	0	757	0	0
Stage 1	1128	1128	-	934	934	-	-	-	-	-	-	-
Stage 2	934	934	-	1211	1128	-	-	-	-	-	-	-
Critical Hdwy	7.17	6.6	6.27	7.15	6.55	6.25	4.15	-	-	4.15	-	-
Critical Hdwy Stg 1	6.17	5.6	-	6.15	5.55	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.17	5.6	-	6.15	5.55	-	-	-	-	-	-	-
Follow-up Hdwy	3.563	4.09	3.363	3.545	4.045	3.345	2.245	-	-	2.245	-	-
Pot Cap-1 Maneuver	~ 39	52	243	34	54	403	609	-	-	841	-	-
Stage 1	243	270	-	315	341	-	-	-	-	-	-	-
Stage 2	312	334	-	220	276	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 35	44	243	9	46	403	609	-	-	841	-	-
Mov Cap-2 Maneuver	~ 35	44	-	9	46	-	-	-	-	-	-	-
Stage 1	207	269	-	269	291	-	-	-	-	-	-	-
Stage 2	266	285	-	70	275	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	$ 2147.9	0	1.2	0
HCM LOS	F	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	609	-	-	61	-	841	-	-
HCM Lane V/C Ratio	0.146	-	-	5.476	-	0.001	-	-
HCM Control Delay (s)	11.9	-	-	$ 2147.9	0	9.3	0	-
HCM Lane LOS	B	-	-	F	A	A	A	-
HCM 95th %tile Q(veh)	0.5	-	-	37.5	-	0	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	142.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	11	1	18	63	6	86	24	962	107	97	1237	32
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	75	-	-	125	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	98	98	98	98	98	98	98	98	98	98	98	98
Heavy Vehicles, %	1	1	1	1	0	1	1	1	1	1	1	0
Mvmt Flow	11	1	18	64	6	88	24	982	109	99	1262	33

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2609	2617	1279	2571	2578	1036	1295	0	0	1091	0	0
Stage 1	1477	1477	-	1085	1085	-	-	-	-	-	-	-
Stage 2	1132	1140	-	1486	1493	-	-	-	-	-	-	-
Critical Hdwy	7.11	6.51	6.21	7.11	6.5	6.21	4.11	-	-	4.11	-	-
Critical Hdwy Stg 1	6.11	5.51	-	6.11	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.11	5.51	-	6.11	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.509	4.009	3.309	3.509	4	3.309	2.209	-	-	2.209	-	-
Pot Cap-1 Maneuver	16	24	204	~ 17	26	282	539	-	-	643	-	-
Stage 1	158	191	-	264	295	-	-	-	-	-	-	-
Stage 2	248	277	-	156	188	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 7	19	204	~ 13	21	282	539	-	-	643	-	-
Mov Cap-2 Maneuver	~ 7	19	-	~ 13	21	-	-	-	-	-	-	-
Stage 1	151	162	-	252	282	-	-	-	-	-	-	-
Stage 2	160	265	-	119	159	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	$ 784.5	$ 2275.4	0.3	0.8
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	539	-	-	18	29	643	-	-
HCM Lane V/C Ratio	0.045	-	-	1.701	5.454	0.154	-	-
HCM Control Delay (s)	12	-	-	$ 784.5	$ 2275.4	11.6	-	-
HCM Lane LOS	B	-	-	F	F	B	-	-
HCM 95th %tile Q(veh)	0.1	-	-	4.3	19.2	0.5	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	76.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	121	0	127	0	0	1	88	635	0	1	750	64
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	-	-	100
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	3	1	1	5	5	5	1	1	0	0	1	8
Mvmt Flow	126	0	132	0	0	1	92	661	0	1	781	67

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1628	1628	781	1694	1628	661	781	0	0	661	0	0
Stage 1	783	783	-	845	845	-	-	-	-	-	-	-
Stage 2	845	845	-	849	783	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.51	6.21	7.15	6.55	6.25	4.11	-	-	4.1	-	-
Critical Hdwy Stg 1	6.13	5.51	-	6.15	5.55	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.51	-	6.15	5.55	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.009	3.309	3.545	4.045	3.345	2.209	-	-	2.2	-	-
Pot Cap-1 Maneuver	~ 81	102	396	72	100	457	841	-	-	937	-	-
Stage 1	385	406	-	353	375	-	-	-	-	-	-	-
Stage 2	356	380	-	351	400	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 74	91	396	44	89	457	841	-	-	937	-	-
Mov Cap-2 Maneuver	~ 74	91	-	44	89	-	-	-	-	-	-	-
Stage 1	343	405	-	314	334	-	-	-	-	-	-	-
Stage 2	316	338	-	233	399	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	$ 549	12.9	1.2	0
HCM LOS	F	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	841	-	-	127	457	937	-	-
HCM Lane V/C Ratio	0.109	-	-	2.034	0.002	0.001	-	-
HCM Control Delay (s)	9.8	-	-	$ 549	12.9	8.8	0	-
HCM Lane LOS	A	-	-	F	B	A	A	-
HCM 95th %tile Q(veh)	0.4	-	-	21	0	0	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

RAYMOND-TICEN RANCH EIR
ADDENDUM RESPONSES TO TRAFFIC COMMENTS
FROM DANA AYERS, COUNTY OF NAPA PLANNING DEPT.

Comment 1: *"The traffic study accounts for traffic from the "proposed" 64-employee increase but does not appear to include trips from the requested extension of visitor hours. Previously-adopted conditions of approval for the winery require the tasting room to close at 4:00 p.m. in order to eliminate vehicle trips during the peak hour of the afternoon commute. However, the hours for the tasting room are currently proposed to be extended through 6:30 p.m. This extension of hours, if approved with this use permit request, would add visitor trips to the peak commute and the evening peak hour of traffic, but these trips appear to be missing from project description and the corresponding analysis of level of service with project."*

Response 1: When it was determined from the August 2015 traffic counts that the peak traffic hours along SR 29, Zinfandel Lane and Silverado Trail were 3:00-4:00 PM on Friday and 3:15-4:15 on Saturday afternoon, the direction for the traffic study was that the visitor by appointment ending hour would stay 4:00 PM for analysis purposes. Based upon the project description that the visitation by appointment numbers during the day would stay the same with or without the project, a more conservative evaluation was conducted for the Friday and Saturday PM peak traffic hours with the assumption that visitation would end at 4:00 PM rather than extend to 6:30 PM. If visitation by appointment were extended to 6:30 PM for analysis purposes, there would be fewer visitors per hour during the actual PM peak traffic hours than with the assumption that all visitation stop at 4:00 PM.

Comment 2: *"Traffic volumes in the text of the document appear to differ from those in the figures. For example, the count results written in section B.2 on page 7 of the study do not match the sum of the traffic movements depicted in Figures 4 and 5 of the study. I realize that there might be some rounding off of numbers to the next highest five or ten, in order to be conservative, but some of the numbers seem to be either higher or lower by 20 or more vehicles in some instances."*

Response 2: The peak hour volumes referenced in the text on page 7 reflect <u>August 2015</u> conditions with 90 employees working at Raymond Vineyards and all employee traffic accessing Zinfandel Lane. However, the Friday AM & PM peak hour and Saturday PM peak hour volumes referenced in Figures 4 and 5 reflect <u>harvest 2015</u> conditions with a theoretical reduction from 90 down to 26 employees working at Raymond Vineyards, again with all employee traffic accessing Zinfandel Lane. Therefore, while there is projected to be a very minor increase in overall traffic from August to harvest (September), the reduction in employees produces an overall minor net reduction in volumes. Therefore, the theoretical volume projections presented in Figures 4 and 5 (reflecting 26 employees during 2015 harvest conditions) are slightly lower than those presented in the text (reflecting 90 employees during the August 2015 counts).

Comment 3: *"Please clarify how the peak hour of traffic, as described in this traffic study, is different from the LMR traffic study (2014). The Raymond-Ticen study identifies the PM peak hours as 3:00-4:00 p.m. on Friday and 3:15-4:15 p.m. on Saturday. The LMR traffic study identifies the Friday peak hour one hour later on Friday (4:00-5:00 p.m.) and 15 minutes later on Saturday (3:30-4:30 p.m.). (I selected the LMR study because the winery is in the vicinity of Raymond, it is fairly recent, and it was also prepared by CTG.)"*

Response 3: The SR 29 traffic counts for the LMR traffic study were conducted in early December 2013, whereas the counts for the Raymond-Ticen Ranch traffic study were conducted in August 2015. The peak Friday and Saturday traffic hours from the much newer counts, taken at almost the peak traffic time of the year, were considered the more appropriate to use for the Raymond-Ticen Ranch traffic study. Also, it is considered unlikely that Caltrans would have approved use of any information that was almost three years old.