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Traffic Study

Yountville Washington Street Winery (P16-00083)
Planning Commission Hearing October 19, 2016

TRAFFIC IMPACT REPORT

YOUNTVILLE WASHINGTON STREET WINERY

June 9, 2016

Prepared for: **YOUNTVILLE WASHINGTON STREET WINERY**

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I. INTRODUCTION

This traffic report has been prepared at the request of the Napa County Public Works Department as authorized by the Yountville Washington Street Winery applicant. It has determined if traffic from the proposed Yountville Washington Street Winery will result in any significant impacts to the local circulation system and the need for any mitigation measures.

II. SCOPE OF SERVICES

The scope of service for this traffic study was approved by the Napa County Public Works Department. Evaluation was conducted for harvest Friday and Saturday PM peak hour traffic conditions. Existing, year 2020 and year 2030 (Cumulative – General Plan Buildout) horizons were evaluated both with and without project traffic. Operating conditions along California Drive and Washington Street as well as at the California Drive intersections with the SR 29 north and southbound ramps and Washington Street as well as the most southerly Washington Street connection to SR 29 were evaluated for all analysis scenarios based upon Town of Yountville and County significance criteria for traffic evaluations. In addition, sight line adequacy was evaluated at the new project driveway intersection with Washington Street. Significant impacts, if any, were identified and measures listed, if needed, to mitigate all impacts to a less than significant level.

III. SUMMARY OF FINDINGS

A. "WITHOUT PROJECT" OPERATING CONDITIONS

1. Existing Volumes – Harvest 2016

California Drive at its SR 29 interchange and Washington Street now has higher projected 2015 September harvest two-way traffic volumes during the Friday PM peak traffic hour compared to the Saturday PM peak traffic hour (about 2,430 two-way peak hour vehicles total passing through the three intersections from 3:00 to 4:00 PM on Friday versus about 2,315 two-way peak hour vehicles total passing through the three intersections from 3:30 to 4:30 PM on Saturday). Washington Street at the project entrance would be expected to have about 70 two-way vehicles during the Friday PM peak hour and about 80 vehicles during the Saturday PM peak hour.

2. Existing (Year 2015) Harvest – Circulation System Operation

- **California Drive/SR 29 Southbound Ramps** intersection – acceptable level of service during all time periods and volumes would not meet peak hour signal warrant criteria levels.

- **California Drive/SR 29 Northbound Ramps** intersection – acceptable level of service during all time periods and volumes would not meet peak hour signal warrant criteria levels.
- **California Drive/Washington Street** intersection – acceptable level of service during all time periods and volumes would not meet peak hour signal warrant criteria levels.
- **SR 29/Washington Street South Access** intersection – acceptable level of service during all time periods and volumes would not meet rural peak hour signal warrant criteria levels.

3. Year 2020 Harvest – Circulation System Operation

- **California Drive/SR 29 Southbound Ramps** intersection – acceptable level of service during all time periods and volumes would not meet peak hour signal warrant criteria levels.
- **California Drive/SR 29 Northbound Ramps** intersection – acceptable level of service during all time periods and volumes would not meet peak hour signal warrant criteria levels.
- **California Drive/Washington Street** intersection – acceptable level of service during all time periods and volumes would not meet peak hour signal warrant criteria levels.
- **SR 29/Washington Street South Access** intersection – unacceptable level of service on both the eastbound and westbound stop sign controlled approaches during the Friday PM peak hour, and unacceptable level of service on the westbound approach (from Washington Street) during the Saturday PM peak hour. Also, volumes would not meet rural peak hour signal warrant criteria levels.

4. Cumulative (Year 2030) Harvest – Circulation System Operation

- **California Drive/SR 29 Southbound Ramps** intersection – acceptable level of service during all time periods and volumes would not meet peak hour signal warrant criteria levels.
- **California Drive/SR 29 Northbound Ramps** intersection – acceptable level of service during all time periods and volumes would not meet peak hour signal warrant criteria levels.
- **California Drive/Washington Street** intersection – acceptable level of service during all time periods and volumes would not meet peak hour signal warrant criteria levels.
- **SR 29/Washington Street South Access** intersection – unacceptable level of service on both the eastbound and westbound stop sign controlled approaches during the Friday PM peak hour, and unacceptable level of service on the westbound approach (from Washington Street) during the Saturday PM peak hour. Also, volumes would not meet rural peak hour signal warrant criteria levels.

B. PROJECT IMPACTS

1. Project Trip Generation

The proposed project will result in the following trip generation during the Friday and Saturday PM peak traffic hours.

PROJECT TRIP GENERATION

HARVEST

FRIDAY PM PEAK HOURS*				SATURDAY PM PEAK HOUR*	
3:00-4:00		4:00-5:00		3:30-4:30	
INBOUND TRIPS	OUTBOUND TRIPS	INBOUND TRIPS	OUTBOUND TRIPS	INBOUND TRIPS	OUTBOUND TRIPS
2	1	1	2	2	1

* 3:00-4:00 is the peak hour at California Drive intersections in Yountville and 4:00-5:00 is the peak hour at the SR 29/Washington Street south connector road intersection.
Source: Yountville Washington Street Winery applicant; compiled by Crane Transportation Group

Trips during both the Friday and Saturday PM peak hours will be visitors by appointment only.

2. Project Site Access to Washington Street

The project will access Washington Street at a new driveway connection about a mile south of the California Drive intersection and about 200 feet north of the Hoffman Lane connection to SR 29.

3. Existing (Year 2015) Existing + Project Off-Site Circulation Impacts – Harvest

The proposed project would not result in any significant off-site circulation impacts to California Drive or SR 29 intersections. The project would not degrade operation from acceptable to unacceptable level of service at any analyzed location nor increase volumes to meet peak hour signal warrant criteria levels.

4. Year 2020 + Project Off-Site Circulation Impacts – Harvest

The proposed project would not result in any significant off-site circulation impacts to California Drive or SR 29 intersections. The project would not degrade operation from acceptable to unacceptable at any analyzed location nor increase volumes to meet peak hour signal warrant criteria levels.

5. Cumulative (Year 2030) + Project Off-Site Circulation Impacts – Harvest

The proposed project would not result in any significant off-site circulation impacts to California Drive or SR 29 intersections. The project would not degrade operation from acceptable to unacceptable at any analyzed location nor increase volumes to meet peak hour signal warrant criteria levels.

6. Sight Lines at Project Driveway

Sight lines at the proposed project's driveway connection to Washington Street will meet minimum stopping sight distance criteria based upon the Caltrans March 2014 *Highway Design Manual* assuming any vegetation/landscaping provided adjacent to the site frontage will be maintained at low levels both north and south of the driveway.

7. Marketing Events

Marketing events will be held at times that will not increase volumes along SR 29 or California Drive during times of peak traffic activity on weekday and weekend afternoons.

8. Mitigations

- Maintain any proposed landscaping along the project's Washington Street frontage north and south of the winery driveway connection at low heights in order to ensure acceptable sight lines for drivers exiting the site.

C. CONCLUSIONS & RECOMMENDATIONS

The project would result in no significant off-site circulation system operational impacts to California Drive intersections in Yountville or to the SR 29/Washington Street south intersection. In addition, sight lines to the north and south along Washington Street from the project driveway will meet Caltrans *Highway Design Manual* stopping sight distance criteria assuming any proposed vegetation/landscaping adjacent to the site frontage is maintained at low levels north and south of the driveway. Finally, marketing events will be scheduled to eliminate guest and event staff traffic from the local circulation system between 3:00 and 6:00 PM during any day of the week.

IV. PROJECT LOCATION & DESCRIPTION

The Yountville Washington Street Winery will be located on the east side of Washington Street with the proposed entrance about a mile south of California Drive in Yountville and about 200 feet north of the Hoffman Lane connection to SR 29 (see **Figure 1**). There is currently access to the property from Washington Street via a paved driveway at the south site boundary. Trucks now outhauling grapes from the existing on-site vineyards use this north driveway (see **Figure 2**, Site Plan).

The proposed Yountville Washington Street Winery will have the following yearly production, employees, visitors and marketing events.

- 30,000 gallons per year production.
- Full production 3 years from opening.
- Bottling on-site (2 times per year).

- On harvest weekdays: 1 full-time admin employee
  1 part-time admin employee
  1 full-time production employee
  1 part-time production employee
  2 full-time tours & tasting employees
  1 part-time tours & tasting employee
- On harvest Saturdays: 1 part-time admin employee
  1 part-time production employee
  2 full-time tours & tasting employees
  3 part-time tours & tasting employee
- 88 percent of the grapes will be transported to site (from the south on SR 29). This will result in about 30 inbound grape haul trucks per year. However, processing of grapes at the new winery now being grown on the property will eliminate about 15 existing grape haul trucks per year now leaving the site.
- Tours and tasting will be by appointment only – 7 days per week from 10:00 AM to 6:00 PM, maximum 25 visitors per day (resulting in about 9-10 vehicles).
- Marketing events – 10 per year: maximum 30 visitors each (11-12 vehicles) on any day other than Monday or Tuesday starting at 6:30 PM.
- Wine auction – 1 per year, maximum 100 visitors (36 vehicles) on a weekend day. No traffic will be on the circulation system between 3:00 and 6:00 PM.

V. EXISTING CIRCULATION SYSTEM EVALUATION PROCEDURES

A. ANALYSIS LOCATIONS

At County direction, the following locations have been evaluated.

1. **California Drive/SR 29 Southbound Ramps intersection in Yountville. (The southbound off-ramp is stop sign controlled.)**

2. **California Drive/SR 29 Northbound Ramps intersection in Yountville. (The northbound off-ramp is stop sign controlled.)**

3. **California Drive/Washington Street in Yountville (all way stop).**

4. **SR 29/Washington Street south connection about two and a half miles south of the California Drive interchange and about a mile and a half south of the project site. (The connector road is stop sign controlled on its eastbound and westbound approaches to SR 29. It extends west of the SR 29 Expressway to Solano Avenue.)**

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

B. VOLUMES

1. ANALYSIS SEASONS AND DAYS OF THE WEEK

At County request 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. 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%

Therefore, 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. Discussion with the Yountville Planning and Building Director[2] also indicated that Friday and Saturday (particularly Saturday) had the highest volumes in the Town. Therefore, Friday and Saturday peak traffic conditions were evaluated in this study.

2. COUNT RESULTS

Friday 3:00 to 6:00 PM as well as Saturday 1:00 to 6:00 PM turn movement counts were conducted by All Traffic Data under the direction of Crane Transportation Group (CTG) in May 2016 at the California Drive intersections with SR 29 Southbound Ramps, SR 29 Northbound Ramps and Washington Street. The peak traffic hours were determined to be 3:00-4:00 PM on Friday and 3:30-4:30 PM on Saturday, although many hours on Friday and Saturday afternoons had similar volumes. Friday and Saturday PM peak period counts had previously been conducted for Crane Transportation Group at the Washington Street south intersection with SR 29 in June 2014. The peak hours were determined to be 4:00-5:00 PM on Friday and 3:45-4:45 PM on Saturday. Resultant May 2016 peak hour counts along California Drive and June

[1] Fehr & Peers, December 8, 2014.
[2] Ms. Sandra Liston, May 2016.

2014 peak hour counts at the SR 29/Washington Street south intersection are presented in **Appendix Figures 1** and **2**. Overall, two-way volumes passing through the California Drive/Washington Street intersection were similar during the May 2016 Friday and Saturday PM peak traffic hours (about 800 vehicles on Friday versus about 815 vehicles on Saturday during the PM peak traffic hours), while volumes passing through the SR 29/Washington Street south intersection were also similar during the Friday and Saturday PM peak hours (about 2,870 vehicles on Friday versus about 2,775 vehicles on Saturday).

3. SEASONAL ADJUSTMENTS

May 2016 and June 2014 peak hour traffic counts were seasonally adjusted to reflect September 2015 harvest conditions based upon the Caltrans PeMS historical counts for SR 29 as well as monthly and day of week adjustment factors utilized in other Napa Valley jurisdictions. Overall, May weekday counts would be expected to increase by about 2.8 percent to reflect fall harvest conditions, while May Saturday counts would be expected to increase by about 0.3 percent. For June, weekday counts would be expected to increase by about 2.7 percent to reflect harvest conditions, while Saturday counts would be expected to increase by about 2.6 percent.

Resultant 2015 harvest Friday and Saturday (without project) PM peak hour volumes are presented in **Figures 4** and **5**, respectively.

C. ROADWAYS

Roadway descriptions are based upon the designation that SR 29 and Washington Street run in a general north-south direction through the project area, while California Drive runs in an east-west direction.

Washington Street is a two-lane frontage road running adjacent to and just east of the SR 29 expressway. It extends north of the project site about a mile into the Town of Yountville and south of the site for about two miles before ending. In the County it has centerline striping, no posted speed limit, an asphalt curb but no gutter along the west side of the road and a one-half to one-foot-wide paved shoulder on the east (project) side of the road. Pavement condition is adequate although resurfacing is required in numerous areas.

Washington Street south of the project has two connections to the SR 29 expressway: at Hoffman Lane just south of the project site and about 7,600 feet to the south. The connector roads from Washington Street to SR 29 are stop sign controlled on the westbound approaches to SR 29 at both locations. Both connector roads extend west of SR 29 to Solano Avenue.

Within Yountville, Washington Street is two lanes wide, has a posted speed limit of 25 miles per hour and has parking allowed on both sides of the street. Curb, gutter and sidewalk are provided in most areas. The Washington Street/California Drive intersection is all way stop controlled.

California Drive is a two-lane road in Yountville extending westerly from Washington Street to a tight diamond interchange with the SR 29 freeway and then farther west into the Yountville

Veterans Home. Both the SR 29 north and southbound single lane off-ramps are stop sign controlled on their approaches to California Drive. There are no left or right turn lanes on the California Drive approaches to either on-ramp. Class II bicycle lanes are striped and signed along both sides of California Drive.

State Route 29 (SR 29) is a four-lane divided expressway in the immediate project vicinity with a posted speed limit of 60 miles per hour. Left and right turn deceleration lanes or pavement area are provided on the north and southbound approaches to intersections providing connections to Washington Street and Solano Avenue south of Yountville. SR 29 becomes a freeway at the south end of Yountville and has a diamond interchange at California Drive. The Napa Wine Train single track runs along the west side of SR 29 in the project area.

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. **Table 1** summarizes the relationship between delay and LOS for unsignalized intersections.

2. MINIMUM ACCEPTABLE OPERATION

Napa County. Napa County is currently adopting new minimum acceptable operating condition standards for unsignalized intersections. Based upon the new standards, Level of Service D (LOS D) is the poorest acceptable operation for side street stop sign controlled approaches at two-way stop intersections and for all-way-stop intersections.

City of Yountville. Objective 1 of the current Yountville General Plan indicates that Level of Service C (LOS C) shall be the minimum level of service maintained at all intersections.

E. INTERSECTION SIGNAL WARRANT EVALUATION

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

There are 9 possible tests for determining whether a traffic signal should be considered for installation. These tests, called "warrants", consider criteria such as actual traffic volume, pedestrian volume, presence of school children, and accident history. The intersection volume data together with the available collision histories were compared to warrants contained in the *Manual on Uniform Traffic Control Devices* (MUTCD), Federal Highway Administration, 2012, California Supplement, which has been adopted by the State of California as a replacement for *Caltrans Traffic Manual*. Section 4C of the MUTCD provides guidelines, or warrants, which may indicate need for a traffic signal at an unsignalized intersection. As indicated in the MUTCD, satisfaction of one or more warrants does not necessarily require immediate installation of a traffic signal. It is merely an indication that the local jurisdiction should begin monitoring conditions at that location and that a signal may ultimately be required.

Warrant 3, the peak hour volume warrant, is often used as an initial check of signalization needs since peak hour volume data is typically available and this warrant is usually the first one to be met. Warrant 3 is based on a curve and takes only the hour with the highest volume of the day into account. Please see **Appendix Tables A-1** and **A-2** for the warrant charts.

It should be noted that a “rural” warrant chart is utilized when the uncontrolled intersection approaches have vehicle speeds greater than 40 miles per hour or when the intersection is in a community with less than 10,000 population. The rural chart has been utilized for evaluation of the SR 29 intersection, while the urban chart has been utilized to evaluate the California Drive intersections.

F. PLANNED IMPROVEMENTS

There are no planned and funded roadway improvements at any County or Town of Yountville location evaluated in this study.[3,4] However, the Vine Trail bicycle path is currently under construction on the west side of SR 29 from California Drive south to the City of Napa between Solano Avenue and the Napa Wine Train track.

[3] Mr. Rick Marshall, Napa County Public Works Department, April 2016.
[4] Ms. Sandra Liston, Town of Yountville Planning & Building Director, May 2016.

VI. FUTURE HORIZON TRAFFIC VOLUME PROJECTIONS

Traffic analysis has been conducted for harvest existing (2015), year 2020 and cumulative year 2030 horizons at County request. The 2030 horizon reflects the County General Plan Buildout year. Traffic modeling for the General Plan shows about a 17 percent growth in two-way weekday PM peak hour traffic along SR 29 in the project area between 2015 and 2030. Projecting straight line traffic growth for analysis purposes, this translates into about a 5.7 percent growth in PM peak hour traffic from 2015 to the year 2020. Since traffic modeling projections were only available for weekday PM peak hour conditions and not for the Saturday PM peak hour, Saturday two-way PM peak hour volumes on SR 29 were increased by the percentages found for the weekday PM peak hour.

There are County traffic model year 2030 projections for the California Drive interchange, Washington Street into downtown Yountville and California Drive serving the Veterans Home. Very little change is shown on the SR 29 freeway at the California Drive interchange between the model's year 2000 calibration run and the 2030 General Plan projections, indicating little expected growth in the south part of Yountville.

The Town of Yountville Planning Director provided a list of the only two currently approved but not built projects in the Town. They are:

- RH Project – 4,992 square feet of specialty retail/wine tasting at 6725 Washington Street.
- Handwritten Project – 4,449 square feet of specialty retail/wine tasting/limited service restaurant at 6494 Washington Street.

Trip generation projections for both projects are shown in **Appendix Table A-3**. During a Friday PM peak hour both projects combined would be expected to generate 11 inbound and 15 outbound trips and during a Saturday PM peak hour 21 inbound and 21 outbound trips. Some of these trips would be captured from the ambient flow of traffic along Washington Street. Less than half of these trips would be expected to pass through the California Drive interchange.

Based upon the traffic model projections and the current small list of projects, harvest traffic along California Drive corridor at SR 29 was projected to grow about 6 percent between 2015 and 2030. Projecting straight line growth for analysis purposes, this translates into about a 2 percent growth in PM peak hour harvest traffic from 2015 to 2020.

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

VII. OFF-SITE CIRCULATION SYSTEM OPERATION – WITHOUT PROJECT

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

A. HARVEST

1. INTERSECTION LEVEL OF SERVICE – Table 2

- **CALIFORNIA DRIVE/SR 29 SOUTHBOUND RAMPS**
  Friday & Saturday PM Peak Hours

Acceptable southbound off-ramp stop sign controlled operation: LOS C

- **CALIFORNIA DRIVE/SR 29 NORTHBOUND RAMPS**
  Friday & Saturday PM Peak Hours

Acceptable northbound off-ramp stop sign controlled operation: LOS B

- **CALIFORNIA DRIVE/WASHINGTON STREET**
  Friday & Saturday PM Peak Hours

Acceptable all way stop operation: LOS B

- **SR 29/WASHINGTON STREET SOUTH**
  Friday & Saturday PM Peak Hours

Acceptable Washington Street Connector Road stop sign controlled westbound approach operation: LOS D

2. INTERSECTION SIGNAL WARRANT EVALUATION – Table 3

- **CALIFORNIA DRIVE/SR 29 SOUTHBOUND RAMPS**
  Friday & Saturday PM Peak Hours

Volumes are below peak hour signal warrant criteria levels.

- **CALIFORNIA DRIVE/SR 29 NORTHBOUND RAMPS**
  Friday & Saturday PM Peak Hours

Volumes are below peak hour signal warrant criteria levels.

- **CALIFORNIA DRIVE/WASHINGTON STREET**
  Friday & Saturday PM Peak Hours

Volumes are below peak hour signal warrant criteria levels.

- **SR 29/WASHINGTON STREET SOUTH**
  Friday & Saturday PM Peak Hours

Volumes are below peak hour signal warrant criteria levels.

2. YEAR 2020 OPERATING CONDITIONS (WITHOUT PROJECT)

A. HARVEST

1. INTERSECTION LEVEL OF SERVICE – Table 2

- **CALIFORNIA DRIVE/SR 29 SOUTHBOUND RAMPS**
  Friday & Saturday PM Peak Hours

Acceptable southbound off-ramp stop sign controlled operation: LOS C

- **CALIFORNIA DRIVE/SR 29 NORTHBOUND RAMPS**
  Friday & Saturday PM Peak Hours

Acceptable northbound off-ramp stop sign controlled operation: LOS B

- **CALIFORNIA DRIVE/WASHINGTON STREET**
  Friday & Saturday PM Peak Hours

Acceptable all way stop operation: LOS B

- **SR 29/WASHINGTON STREET SOUTH**
  Friday & Saturday PM Peak Hours

Unacceptable Washington Street Connector Road stop sign controlled westbound approach operation: LOS E

2. INTERSECTION SIGNAL WARRANT EVALUATION – Table 3

- **CALIFORNIA DRIVE/SR 29 SOUTHBOUND RAMPS**
  Friday & Saturday PM Peak Hours

Volumes would be below peak hour signal warrant criteria levels.

- **CALIFORNIA DRIVE/SR 29 NORTHBOUND RAMPS**
  Friday & Saturday PM Peak Hours

Volumes would be below peak hour signal warrant criteria levels.

- **CALIFORNIA DRIVE/WASHINGTON STREET**
  Friday & Saturday PM Peak Hours

Volumes would be below peak hour signal warrant criteria levels.

- **SR 29/WASHINGTON STREET SOUTH**
  Friday & Saturday PM Peak Hours

Volumes would be below peak hour signal warrant criteria levels.

3. CUMULATIVE (YEAR 2030) OPERATING CONDITIONS (WITHOUT PROJECT)

A. HARVEST

1. INTERSECTION LEVEL OF SERVICE – Table 2

- **CALIFORNIA DRIVE/SR 29 SOUTHBOUND RAMPS**
  Friday & Saturday PM Peak Hours

Acceptable southbound off-ramp stop sign controlled operation: LOS C

- **CALIFORNIA DRIVE/SR 29 NORTHBOUND RAMPS**
  Friday & Saturday PM Peak Hours

Acceptable northbound off-ramp stop sign controlled operation: LOS B

- **CALIFORNIA DRIVE/WASHINGTON STREET**
  Friday & Saturday PM Peak Hours

Acceptable all way stop operation: LOS B

- **SR 29/WASHINGTON STREET SOUTH**
  Friday & Saturday PM Peak Hours

Unacceptable Washington Street Connector Road stop sign controlled westbound approach operation: LOS F

2. INTERSECTION SIGNAL WARRANT EVALUATION – Table 3

- **CALIFORNIA DRIVE/SR 29 SOUTHBOUND RAMPS**
  Friday & Saturday PM Peak Hours

Volumes would be below peak hour signal warrant criteria levels.

- **CALIFORNIA DRIVE/SR 29 NORTHBOUND RAMPS**
  Friday & Saturday PM Peak Hours

Volumes would be below peak hour signal warrant criteria levels.

- **CALIFORNIA DRIVE/WASHINGTON STREET**
  Friday & Saturday PM Peak Hours

Volumes would be below peak hour signal warrant criteria levels.

- **SR 29/WASHINGTON STREET SOUTH**
  Friday & Saturday PM Peak Hours

Volumes would be below peak hour signal warrant criteria levels.

VIII. PROJECT IMPACT EVALUATION

A. SIGNIFICANCE CRITERIA

1. COUNTY OF NAPA

The following criteria have recently been developed for traffic impact analyses in Napa County.

EXISTING + PROJECT CONDITIONS

A. ARTERIAL SEGMENTS

A project would cause a significant impact requiring mitigation if:

1. An arterial segment operates at LOS A, B, C or D during the selected peak hours without project trips, and deteriorates to LOS E or F with the addition of project trips, or
2. An arterial segment operates at LOS E or F during the selected peak hours without project trips, and the addition of project trips increases the total segment volume by one percent or more.

For the second criteria, the following equation should be used if the arterial operates at LOS E or F without the project:

$$\textit{Project Contribution \%} = \textit{Project Trips} \div \textit{Existing Volumes}$$

B. SIGNALIZED INTERSECTIONS

A project would cause a significant impact requiring mitigation if:

1. A signalized intersection operates at LOS A, B, C or D during the selected peak hours without project trips, and deteriorates to LOS E or F with the addition of project trips, or
2. A signalized intersection operates at LOS E or F during the selected peak hours without project trips, and the addition of project trips increases the total entering volume by one percent or more.

For the second criteria, the following equation should be used if the signalized intersection operates at LOS E or F without the project:

Project Contribution % = Project Trips ÷ Existing Volumes

Maintaining LOS D or better at all signalized intersections would sometimes require expanding the physical footprint of an intersection. In some locations around the County, expanding physical transportation infrastructure could be in direct conflict with the County's goals of preserving the area's rural character, improving safety, and sustaining the agricultural industry, making these potential improvements infeasible. The County's Circulation Element lists intersections that are slated for improvement or expansion in unincorporated Napa County.[5]

Transportation studies should individually consider the feasibility of potential mitigation measures with respect to right-of-way acquisition, regardless of the intersection's place in the Circulation Element's identified improvement lists, and present potential alternative mitigation measures that do not require right-of-way acquisition. County staff would then review that information and make the decision about the feasibility of the identified potential mitigations.

For intersections that cannot be improved without substantial additional right-of-way according to both the Circulation Element and the individual transportation impact study, and where other mitigations such as updating signal timing, signal phasing and operations, and/or signing and striping improvements do not improve the LOS, LOS E or F will be considered acceptable and the one percent threshold would not apply. Analysis of signalized intersection LOS should still be presented for informational purposes, and there should still be an evaluation of effects on safety and local access, per Policy CIR-18.

C. UNSIGNALIZED INTERSECTIONS (ALL WAY STOP AND SIDE STREET STOP SIGN CONTROLLED)

LOS for all way stop controlled intersections is defined as an average of the delay at all approaches. LOS for side street stop controlled intersections is defined by the delay and LOS for the worst case approach. The recommended interpretation of Policy CIR-16 regarding unsignalized intersection significance criteria is as follows:

1. An unsignalized intersection operates at LOS A, B, C or D during the selected peak hours without project trips, the LOS deteriorates to LOS E or F with the addition of project traffic, and the peak hour traffic signal warrant criteria are met, or

[5] According to the Circulation Element dated June 8, 2008, the following intersections can be altered or expanded as a mitigation measure: SR-12/Airport Boulevard/SR-29, SR-221/SR-12/Highway 29, and several intersections along SR-29 and SR-128 north of Napa. The significance criteria shown above should apply to facilities where appropriate based upon the most recent Circulation Element chapter of the General Plan.

2. An unsignalized intersection operates at LOS E or F during the selected peak hours without project trips, peak hour traffic signal warrant criteria are not met without project trips but would be met with the addition of project trips, and the project contributes one percent or more of the total entering traffic for all way stop controlled intersections, or 10 percent or more of the traffic on a side street approach for side street stop controlled intersections.

All Way Stop Controlled Intersections

For the second criteria at an all way stop controlled intersection, the following equation should be used if the all way stop controlled intersection operates at LOS E or F without the project.

Project Contribution % = Project Trips ÷ Existing Volumes

Side Street Stop Controlled Intersections

For the second criteria at a side street stop controlled intersection, the following equation should be used if the side street stop controlled intersection operates at LOS E or F without the project.

Project Contribution % = Project Trips ÷ Existing Volumes

Both of those volumes are for the stop controlled approaches only. Each stop controlled approach that operates at LOS E or F should be analyzed individually.

CUMULATIVE+ PROJECT CONDITIONS

A. ARTERIAL SEGMENTS, SIGNALIZED INTERSECTIONS AND UNSIGNALIZED INTERSECTIONS

A project would cause a significant cumulative impact requiring mitigation if:

1. The overall amount of expected traffic growth causes conditions to deteriorate such that any of the significance criteria described above for existing conditions are met, and
2. The project's contribution to a significant cumulative impact would be equal to or greater than five percent of the growth in traffic from existing conditions.

A project's contribution to a cumulative condition would be calculated as the project's percentage contribution to the total growth in traffic from existing conditions.

Project Contribution % = Project Trips ÷ (Cumulative Volumes - Existing Volumes)

2. TOWN OF YOUNTVILLE

The following significance criteria for traffic impacts are currently used in the Town of Yountville.

An impact is considered to be significant if: An intersection operating at Levels of Service A, B or C is degraded to LOS D, E or F operation with the addition of project traffic.

B. TRIP GENERATION

Friday and Saturday afternoon trip generation projections were developed with the assistance of the project applicant and their representative for all components of the employee, grape delivery and visitor activities at the proposed Yountville Washington Street Winery (see worksheets in the **Appendix**). Results are presented on an hourly basis in **Tables 4** and **5** for Friday and Saturday afternoon conditions. During the Friday PM peak traffic hour along California Drive (3:00-4:00), there would be a projected 2 inbound and 1 outbound project trips, while during the Friday PM peak traffic hour on SR 29 (4:00-5:00), there would be a projected 1 inbound and 2 outbound project trips. During the Saturday afternoon PM peak traffic hour, there would be a projected 2 inbound and 1 outbound project trips. All project trips during the local peak traffic hours would be visitors by appointment. Depending upon the scheduling of visitor tours, the number of inbound versus outbound vehicles could be the reverse of that listed above. As shown, winery administrative and production employees would not be expected on the local roadway network during either harvest Friday or Saturday PM peak hour conditions. The visitor-serving employees would also be working until 6:00 PM every day, as tours and tasting by appointment would close at 6:00 PM. In addition, the one expected grape delivery per day could be scheduled any time between 6:00 AM and noon. Therefore, the only winery-related traffic expected on the local roadway network during either the Friday or Saturday afternoon peak traffic hours would be visitor traffic related. Assuming average size groups of ± 3 to 5 people, this could result in up to 2 visitor-related vehicles accessing the winery during any given traffic hour between 10:00 AM and 6:00 PM.

C. TRIP DISTRIBUTION

Project traffic was distributed to Washington Street and SR 29 in a pattern reflective of existing distribution patterns at the California Drive/Washington Street and SR 29/Washington Street south intersections. Virtually all inbound traffic would be expected to arrive on SR 29 and use the Hoffman Lane connection to Washington Street just south of the project site. Outbound traffic heading south would either use one of the two Washington Street connections to SR 29 or travel north into Yountville to use the California Drive interchange. The Winery could offer the suggestion to use the interchange. For outbound traffic traveling north, right turning access to SR 29 would be available just south of the site at the Hoffman Avenue connection. The Friday and Saturday project traffic increments expected on local roadways during the times of ambient PM peak traffic flow are presented in **Figures 10** and **11**, while resultant harvest Friday and Saturday PM peak hour Existing (2015) + Project volumes are presented in **Figures 12** and **13**, year 2020 + Project volumes are presented in **Figures 14** and **15** and cumulative (year 2030) +

Project volumes are presented in **Figures 16** and **17**. Due to the heavy traffic volumes on SR 29 and the lengthy delay likely to be encountered by project drivers attempting to make left turns from either of the Washington Street Connector Roads to southbound SR 29, it was projected that visitors leaving the project would be provided information indicating that they should drive along Washington Street into Yountville for safe and minimum delay access to southbound SR 29 via the California Avenue interchange.

D. PLANNED ROADWAY IMPROVEMENTS

There are no planned and funded capacity increasing roadway improvements by Caltrans, the County or the Town of Yountville on the local roadway network serving the project site.[6]

E. PROJECT TRAFFIC IMPACTS DURING HARVEST

1. Existing (Year 2015) + Project

a. Intersections

Table 2 shows that harvest operation would remain an acceptable LOS B or C at all three analyzed intersections along California Drive in Yountville with the addition of project traffic during both the Friday and Saturday PM peak traffic hours. There would be no measurable increase in delay at either the California Drive/SR 29 Northbound Ramps or California Drive/Washington Street intersections, and at most a 0.1 second increase in delay for off-ramp traffic at the California Drive/SR 29 Southbound Ramps intersection. At the SR 29/Washington Street south intersection in the County, harvest operation of the westbound connector road stop sign controlled approach to SR 29 would remain an acceptable LOS D during both the Friday and Saturday PM peak traffic hours. Project traffic would result in no measurable change in delay.

Less than significant impact.

b. Signal Warrants

Table 3 shows that none of the three analyzed intersections along California Drive in Yountville or the SR 29/Washington Street south intersection in the County would have volumes increased to meet peak hour signal warrant criteria levels with the addition of project traffic during either the Friday or Saturday PM peak traffic hours.

Less than significant impact.

[6] Ms. Sandra Liston, Town of Yountville Planning & Building Director, May 2016 and Rick Marshall, Napa County Public Works Department, April 2016.

2. Year 2020 + Project

a. Intersections

Table 2 shows that harvest operation would remain an acceptable LOS B or C at all three analyzed intersections along California Drive in Yountville with the addition of project traffic during the Friday and Saturday PM peak traffic hours. There would be no measurable increase in delay at either the California Drive/SR 29 Northbound Ramps or California Drive/Washington Street intersections and at most a 0.1 second increase in delay for off-ramp traffic at the California Drive/SR 29 Southbound Ramps intersection. At the SR 29/Washington Street south intersection in the County, harvest operation of the westbound connector road stop sign controlled approach to SR 29 would be an unacceptable LOS E with or without project traffic during either the Friday or Saturday PM peak traffic hours. However, project traffic would only result in a 0.1 second increase in delay for the westbound approach during either peak hour. The addition of project trips would not result in the intersection meeting peak hour signal warrant criteria nor add 10 percent or more traffic to the westbound stop sign controlled approach.

Less than significant impact.

b. Signal Warrants

Table 3 shows that none of the three analyzed intersections along California Drive in Yountville or the SR 29/Washington Street south intersection in the County would have volumes increased to meet peak hour signal warrant criteria levels with the addition of project traffic during either the Friday or Saturday PM peak traffic hours.

Less than significant impact.

3. Cumulative (Year 2030) + Project

a. Intersections

Table 2 shows that harvest operation would remain an acceptable LOS B or C at all three analyzed intersections along California Drive in Yountville with the addition of project traffic during the Friday and Saturday PM peak traffic hours. There would be no measurable increase in delay at either the California Drive/SR 29 Northbound Ramps or California Drive/Washington Street intersections and at most a 0.1 second increase in delay for off-ramp traffic at the California Drive/SR 29 Southbound Ramps intersection. At the SR 29/Washington Street south intersection in the County, harvest operation of the westbound connector road stop sign controlled approach to SR 29 would be an unacceptable LOS E with or without project traffic during either the Friday or Saturday PM peak traffic hours. However, project traffic would only result in a 0.1 second increase in delay for the westbound approach during either peak hour. The addition of project trips would not result in the intersection meeting peak hour signal warrant criteria nor add 10 percent or more traffic to the westbound stop sign controlled approach.

Less than significant impact.

b. Signal Warrants

Table 3 shows that none of the three analyzed intersections along California Drive in Yountville or the SR 29/Washington Street south intersection in the County would have volumes increased to meet peak hour signal warrant criteria levels with the addition of project traffic during either the Friday or Saturday PM peak traffic hours.

Less than significant impact.

F. PROJECT DRIVEWAY SIGHT LINE ADEQUACY

Sight lines would be acceptable for drivers turning from the project driveway to Washington Street. Sight lines to the north would be about 500 feet and to the south about 230 feet (into the stop sign controlled Hoffman Lane connector road intersection providing access to SR 29). Based upon a northbound travel speed of 30 miles per hour at the site for vehicles having left the SR 29 connector road stop sign controlled intersection to the south, the required stopping sight distance for northbound drivers would be 200 feet. Based upon a southbound travel speed of 45 to 50 miles per hour for vehicles approaching the stop sign controlled intersection at the connection to SR 29, the required stopping sight distance for southbound drivers would be up to 430 feet (for a 50 mph speed).[7] Therefore, sight lines would be acceptable assuming that no landscaping is planted along the site frontage that would ultimately grow and block driver views.

Less than significant impact.

G. MARKETING EVENTS

Table 6 presents details of the number of guests, employees and hired event staffing that would likely be present for the project's proposed marketing events.

Typical marketing events with up to 30 people (11-12 vehicles) would be held 10 times per year starting after 6:00 PM on a Wednesday through Sunday evening, while one wine auction would be held yearly on a weekend day with up to 100 guests (and about 36 vehicles) at a time not adding traffic to the local roadway system between 3:00 and 6:00 PM. Hired event staffing for each of these 30-person events would result in an additional 5 vehicles accessing the winery and an additional 2 vehicles for the single large event.

There will be no regular visitation allowed during any marketing events.

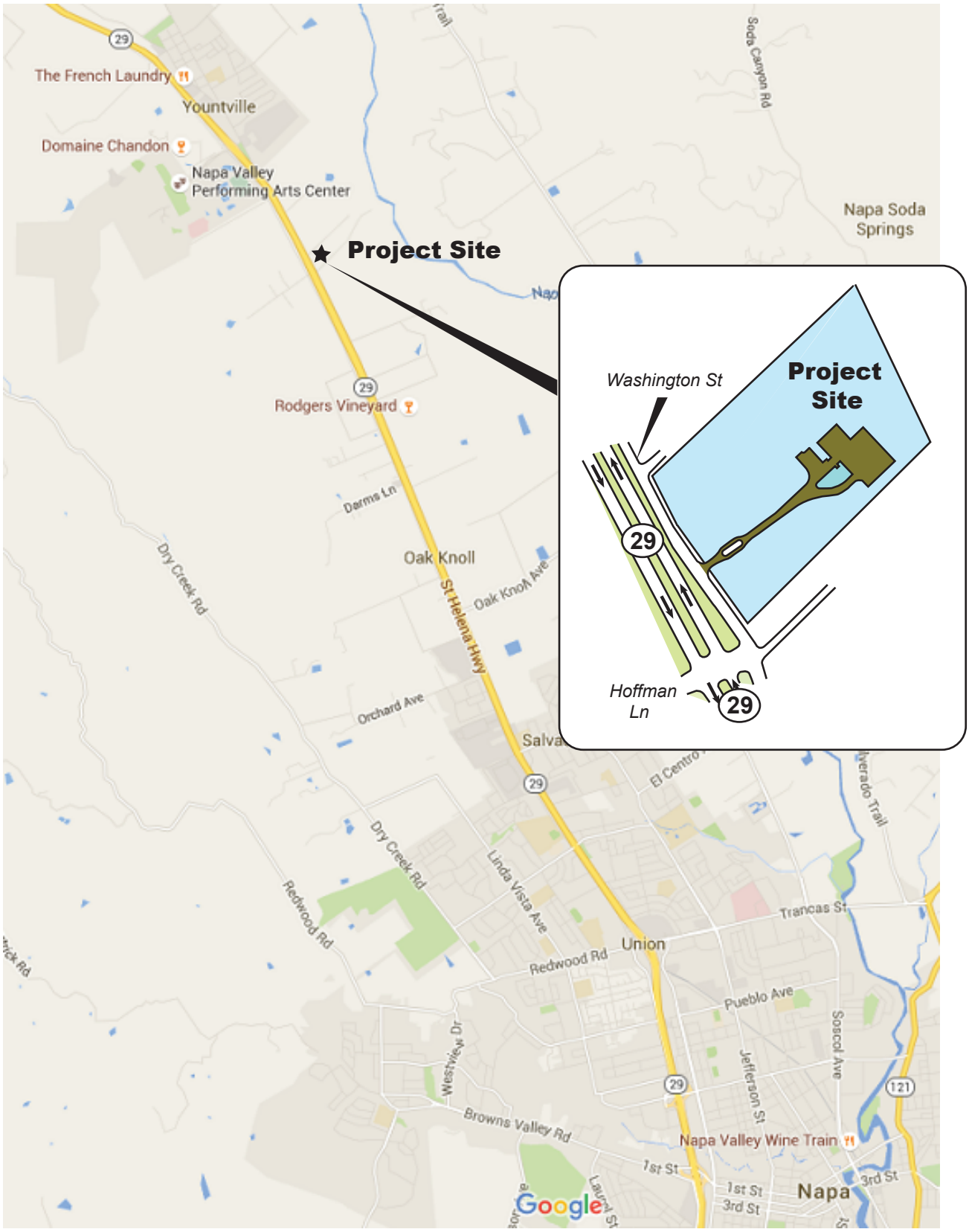
Less than significant impact.

[7] Caltrans *Highway Design Manual,* Sight Distance Standards, March 2014.

VIII. CONCLUSIONS & RECOMMENDATIONS

The project would result in no significant off-site circulation system operational impacts to California Drive intersections in Yountville or to the SR 29/Washington Street south intersection. In addition, sight lines to the north and south along Washington Street from the project driveway will meet Caltrans *Highway Design Manual* stopping sight distance criteria assuming any proposed vegetation/landscaping adjacent to the site frontage is maintained at low levels north and south of the driveway. Finally, marketing events will be scheduled to eliminate guest and event staff traffic from the local circulation system between 3:00 and 6:00 PM during any day of the week.

FIGURES



Map data @2015 Google

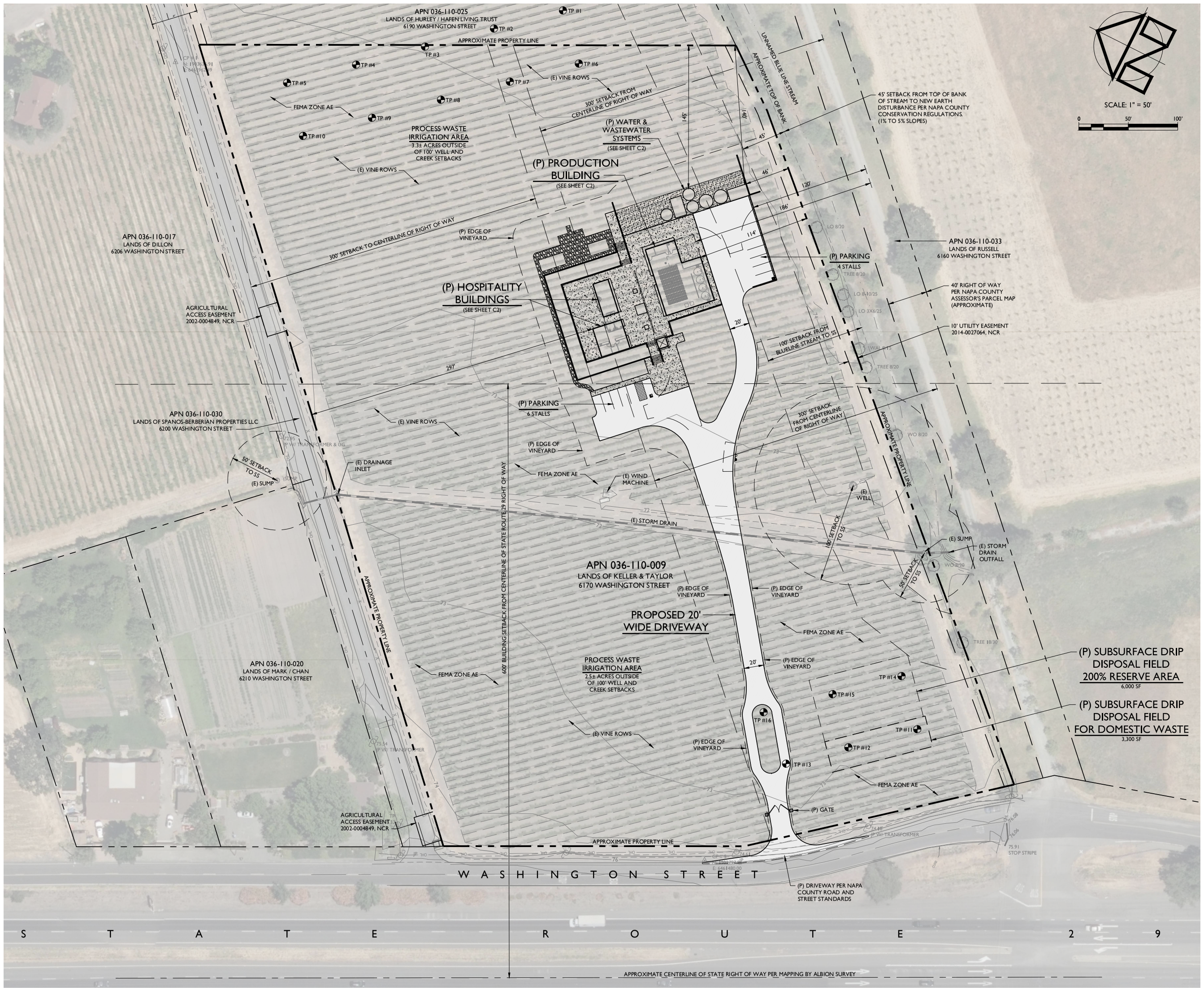
Figure 1

Area Map

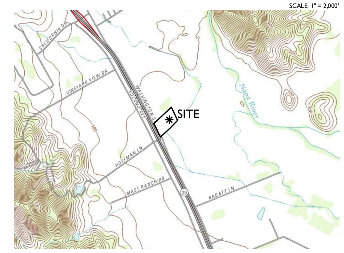
CRANE TRANSPORTATION GROUP

YOUNTVILLE WASHINGTON STREET WINERY

CONCEPTUAL SITE IMPROVEMENT PLANS



OVERALL SITE PLAN
SCALE: 1" = 50'



LOCATION MAP
SCALE: 1" = 2,000'

PROJECT INFORMATION:

PROPERTY OWNER & APPLICANT:
BILL AND DOTTIE KELLER &
GARY AND MARY TAYLOR
240 KAANAPALI DRIVE
NAPA, CA 94558

SITE ADDRESS:
6170 WASHINGTON STREET
NAPA, CA 94558

ASSESSOR'S PARCEL NUMBER:
036-110-009

PARCEL SIZE:
10.5 ± ACRES

PROJECT SIZE:
2.1± ACRES

ZONING:
AGRICULTURAL PRESERVE (AP)

DOMESTIC WATER SOURCE:
PRIVATE WELL

FIRE PROTECTION WATER SOURCE:
STORAGE TANK

WASTEWATER DISPOSAL:
ONSITE TREATMENT AND DISPOSAL

SHEET INDEX:

C1	OVERALL SITE PLAN
C2	CONCEPTUAL SITE GRADING & LAYOUT PLAN
C3	IMPERVIOUS SURFACE EXHIBIT
C4	STORMWATER CONTROL PLAN EXHIBIT

FLOOD HAZARD NOTE:

ACCORDING TO THE FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA) FLOOD INSURANCE RATE MAP (FIRM) MAP NUMBER 06055C0413E, EFFECTIVE SEPTEMBER 26, 2008, ALL OR A PORTION OF THE PROJECT SITE IS LOCATED IN A SPECIAL FLOOD HAZARD AREA SUBJECT TO INUNDATION BY THE 1% CHANCE ANNUAL FLOOD (100 YEAR FLOOD). THE APPROXIMATE FLOOD HAZARD BOUNDARY LINE IS SHOWN ON THIS PLAN. SEE FIRM FOR ADDITIONAL INFORMATION. THE BASE FLOOD ELEVATION HAS BEEN DETERMINED TO BE 80.7 AT THE BUILDING SITE. VERIFY BASE FLOOD ELEVATION WITH NAPA COUNTY PRIOR TO BUILDING PERMIT SUBMITTAL.

NOTES:

1. TEST PITS ONE THROUGH SIXTEEN (TP #1 - TP #16) WERE EXCAVATED BY GALUSHA CONSTRUCTION ON AUGUST 25, 2015 AND WERE WITNESSED BY MIKE MUELRATH OF APPLIED CIVIL ENGINEERING INCORPORATED AND KIM WITHROW OF THE NAPA COUNTY PLANNING, BUILDING AND ENVIRONMENTAL SERVICES DEPARTMENT - ENVIRONMENTAL HEALTH DIVISION.
2. FADED BACKGROUND REPRESENTS EXISTING TOPOGRAPHIC FEATURES. TOPOGRAPHIC INFORMATION WAS TAKEN FROM THE "MAP OF TOPOGRAPHY OF A PORTION OF THE LANDS OF KELLER" PREPARED BY ALBION SURVEYS, INC., DATED JULY 2015 REVISED AUGUST 5, 2015. APPLIED CIVIL ENGINEERING INCORPORATED ASSUMES NO LIABILITY REGARDING THE ACCURACY OR COMPLETENESS OF THE TOPOGRAPHIC INFORMATION.
3. AERIAL PHOTOGRAPH WAS OBTAINED FROM THE SAN FRANCISCO ESTUARY INSTITUTE (SFEI) SAN FRANCISCO BAY AREA ORTHOPHOTOS DATABASE, DATED JUNE 2014 AND MAY NOT REPRESENT CURRENT CONDITIONS.
4. CONTOUR INTERVAL: ONE (1) FOOT, HIGHLIGHTED EVERY FIVE (5) FEET.
5. BENCHMARK: VERTICAL DATUM BASED ON NAVD 88
HORIZONTAL DATUM BASED ON NAD 83
6. THE PROPERTY LINES SHOWN ON THESE PLANS DO NOT REPRESENT A BOUNDARY SURVEY. THEY ARE APPROXIMATE AND ARE PROVIDED FOR INFORMATIONAL PURPOSES ONLY.

VINEYARD STATISTICS

EXISTING VINEYARD	9.3± ACRES
PROPOSED VINEYARD	7.4± ACRES*

*APPROXIMATELY 1.9 ± ACRES OF VINES WILL BE REMOVED IN ORDER TO ACCOMMODATE DEVELOPMENT OF THE PROPOSED WINERY

APPLIED CIVIL ENGINEERING INCORPORATED
2074 West Lincoln Avenue
Napa, CA 94558
(707) 320-4968 (707) 320-2395 Fax
www.appliedcivil.com

YOUNTVILLE WASHINGTON STREET WINERY
CONCEPTUAL SITE IMPROVEMENT PLANS
OVERALL SITE PLAN

PREPARED UNDER THE DIRECTION OF:

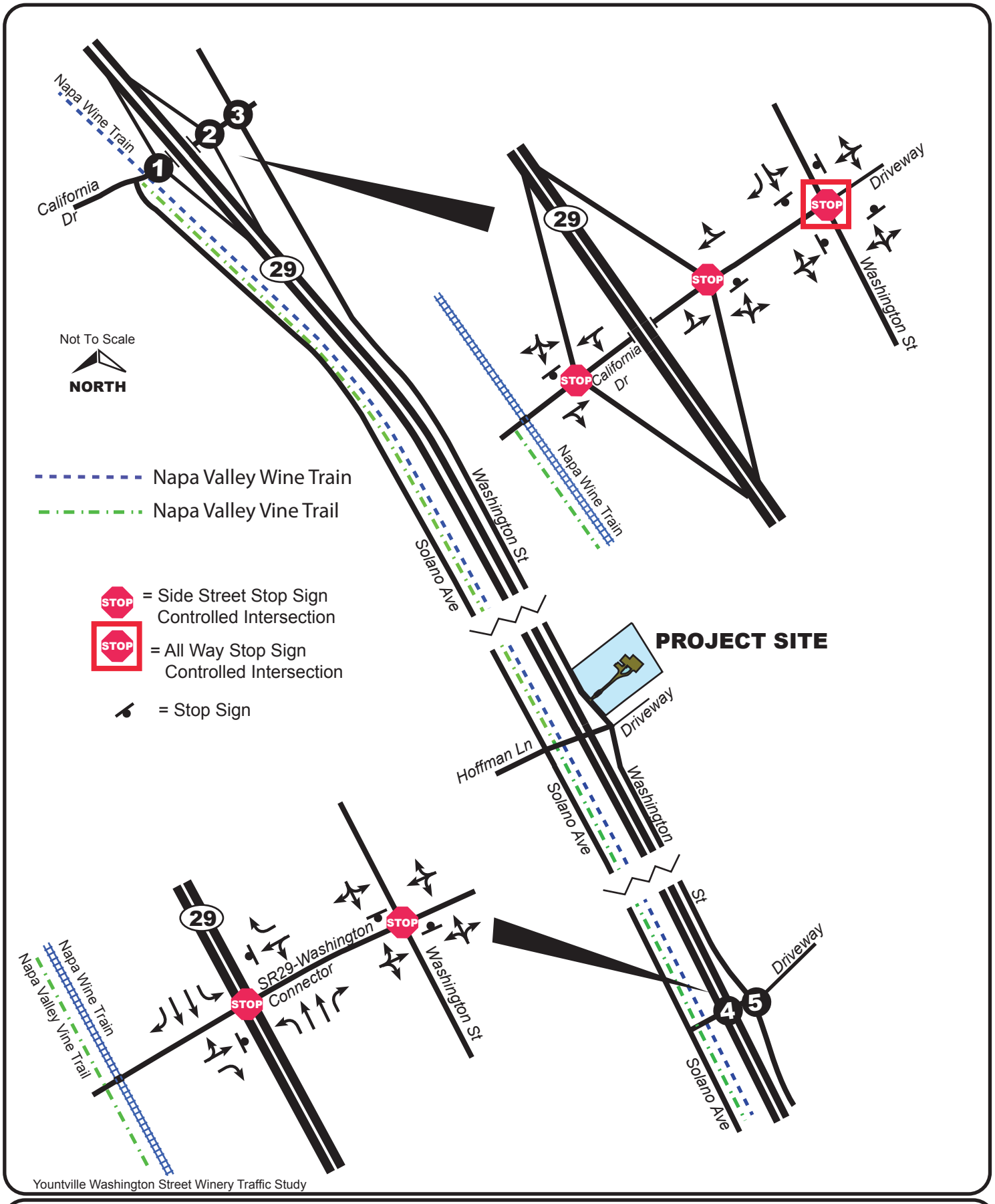
DRAWN BY: BT DRAFTING
CHECKED BY: MRM
DATE: JANUARY 28, 2016
REVISIONS: BY:

JOB NUMBER: 15-113
FILE: 15-113CONC_OSP.DWG
ORIGINAL SIZE: 24" X 36"
SHEET NUMBER: C1 OF 4

Figure 2

Site Plan

CRANE TRANSPORTATION GROUP



Yountville Washington Street Winery Traffic Study

CRANE TRANSPORTATION GROUP

Figure 3

Existing Lane Geometrics and Intersection Control

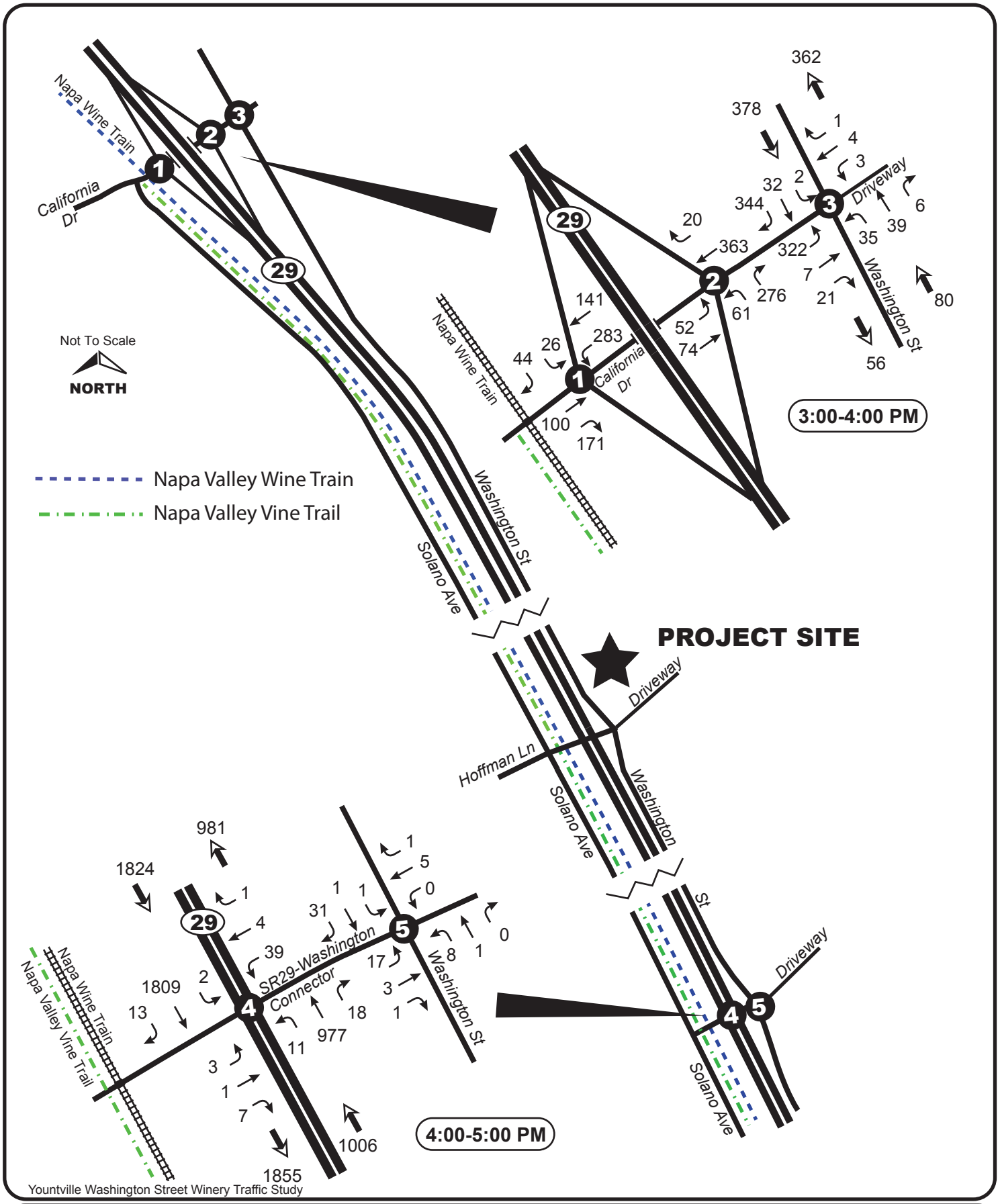


Figure 4
Existing (2015) Harvest Friday (without Project)
PM Peak Hour Traffic Volumes

CRANE TRANSPORTATION GROUP

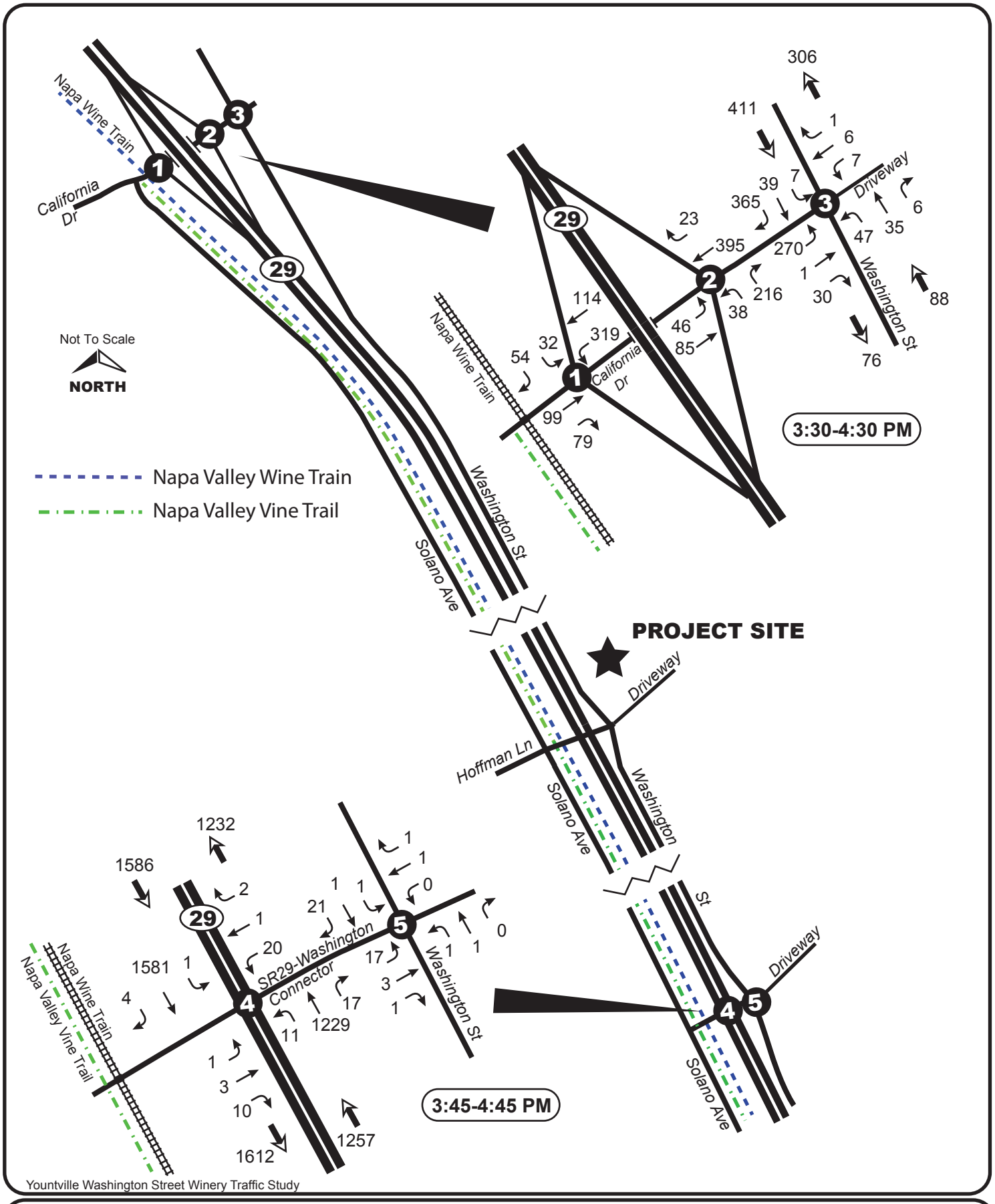


Figure 5

Existing (2015) Harvest Saturday (without Project)
PM Peak Hour Traffic Volumes

CRANE TRANSPORTATION GROUP

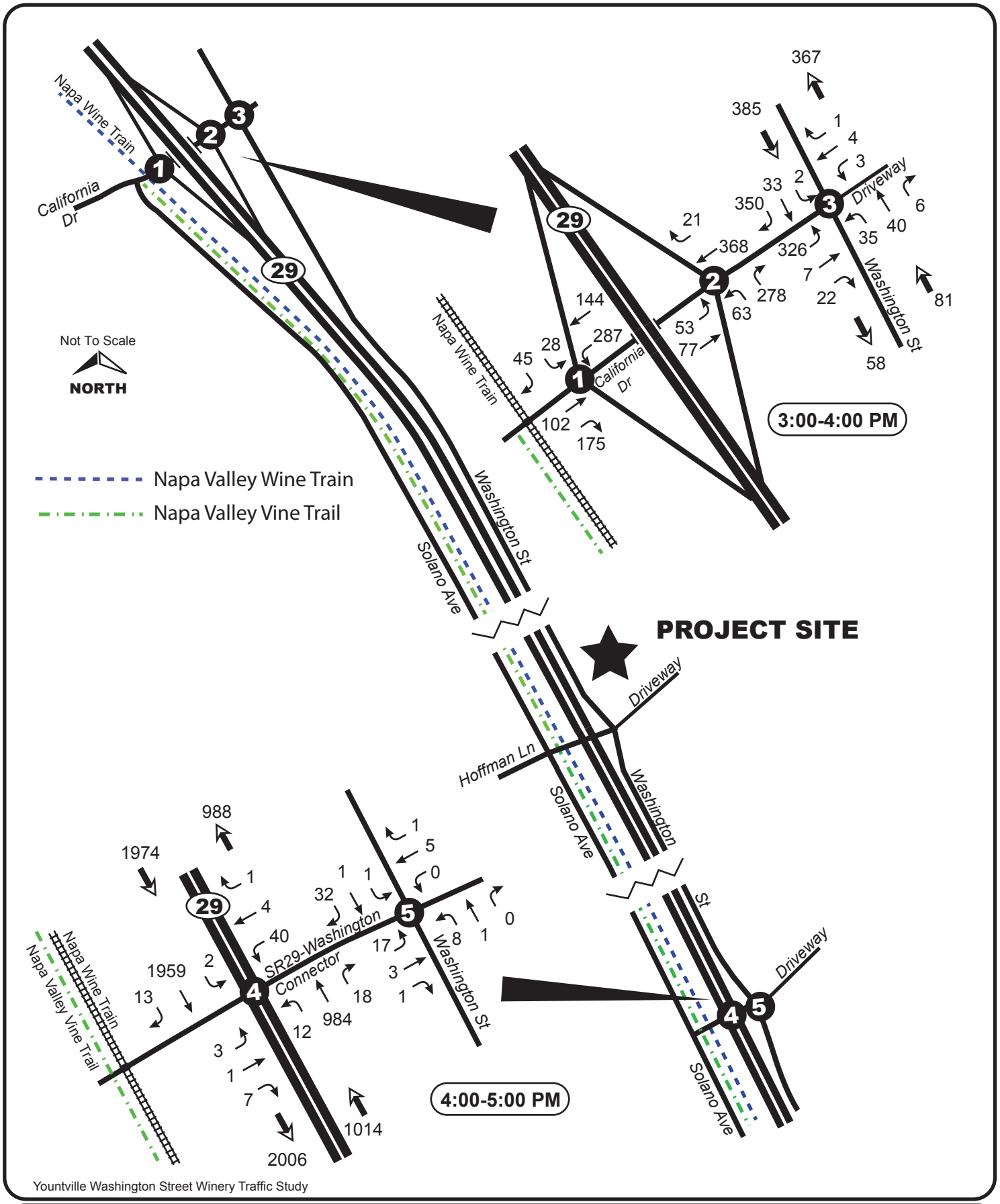


Figure 6

Year 2020 Harvest Friday (without Project)
PM Peak Hour Traffic Volumes

CRANE TRANSPORTATION GROUP

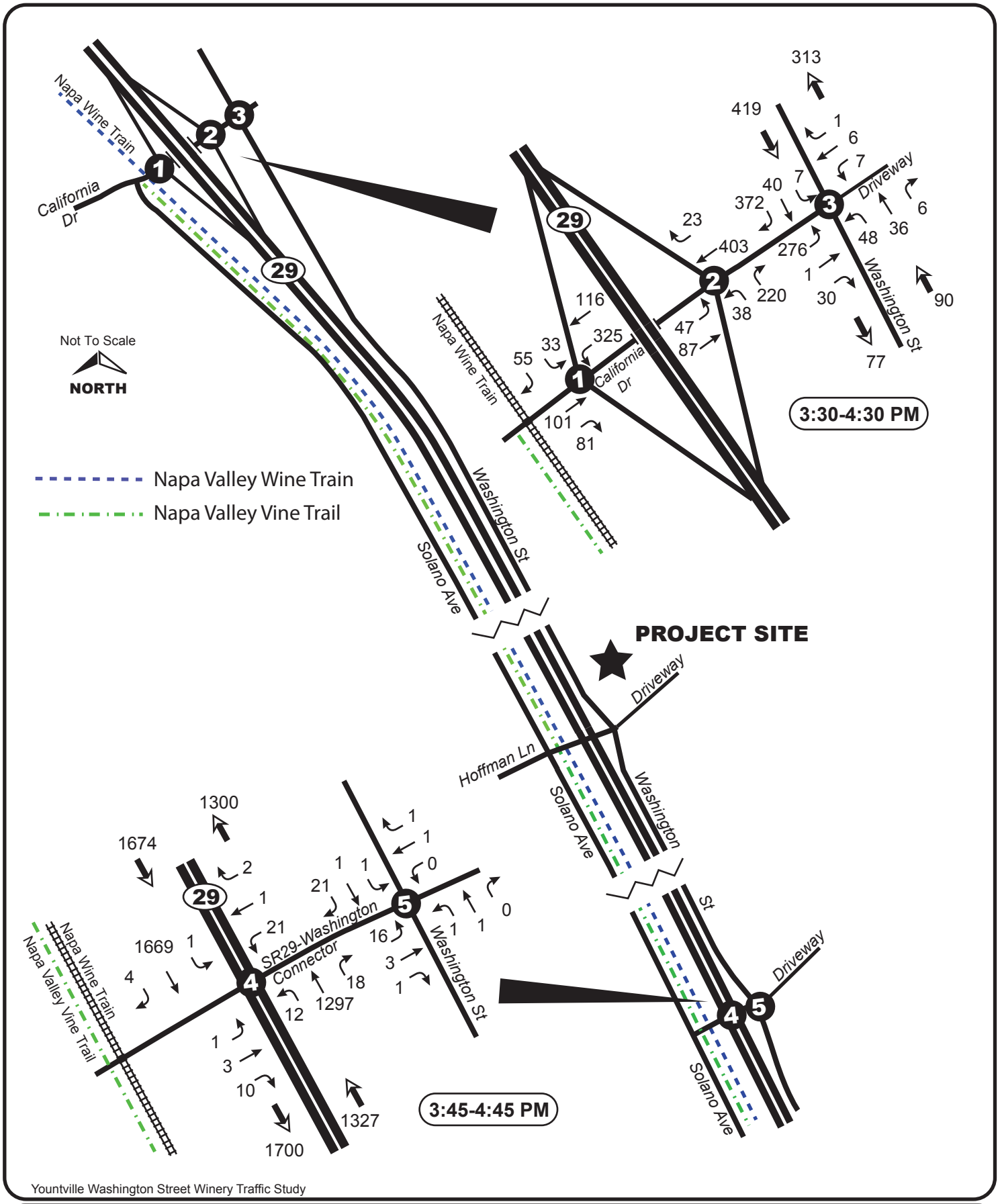
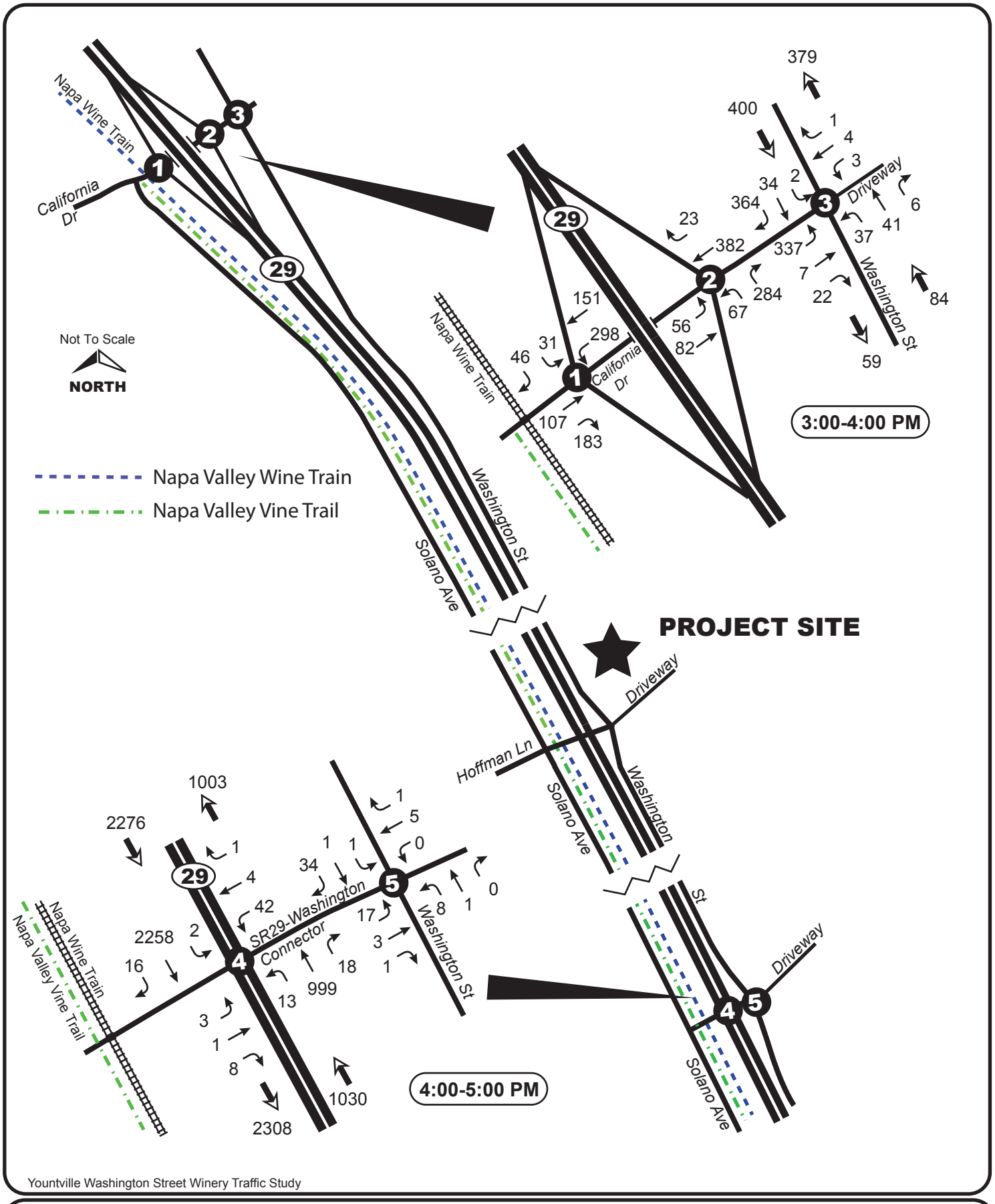


Figure 7

Year 2020 Harvest Saturday (without Project)
PM Peak Hour Traffic Volumes

CRANE TRANSPORTATION GROUP

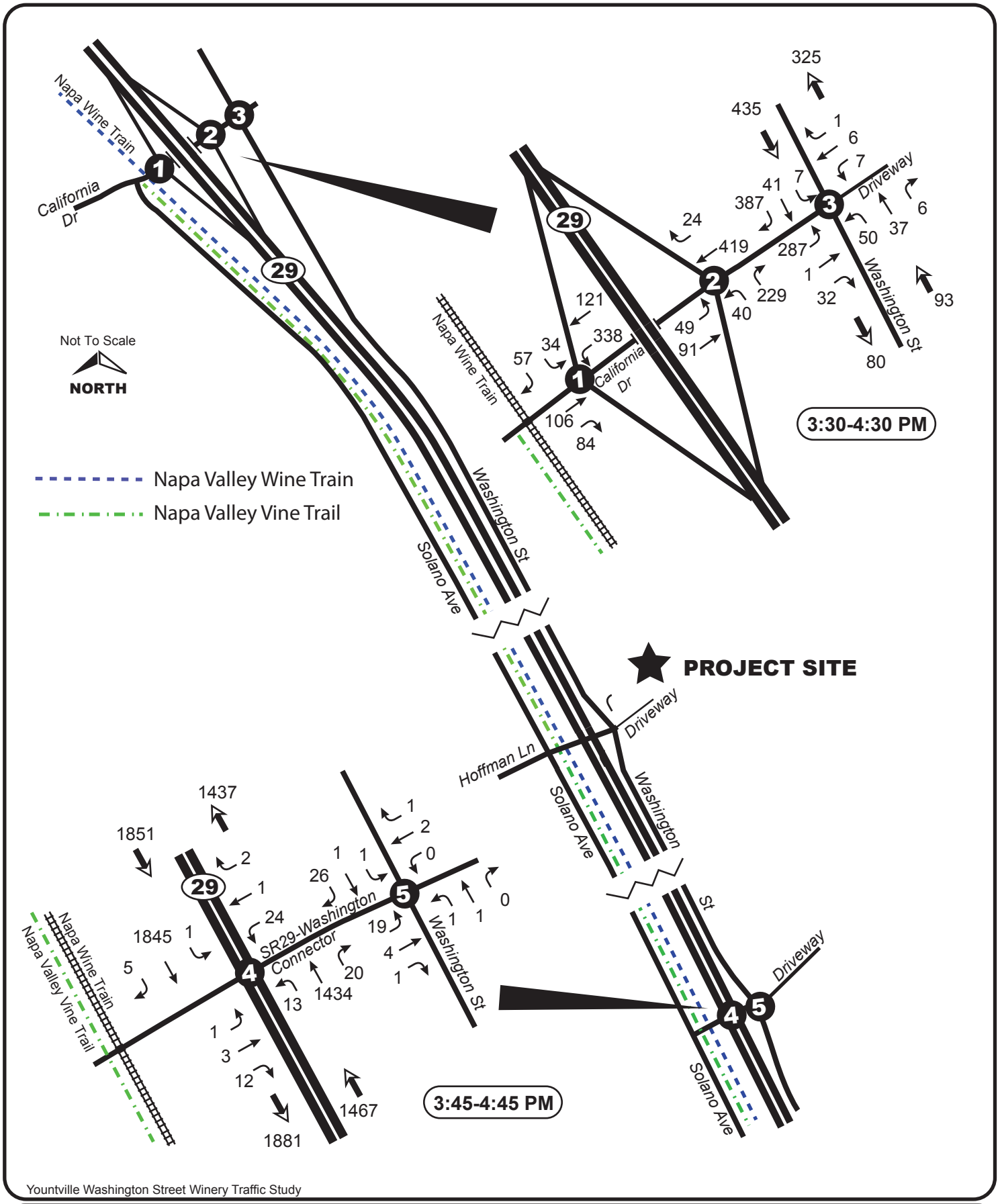


Yountville Washington Street Winery Traffic Study

Figure 8

Cumulative (Year 2030) Harvest Friday (without Project)
PM Peak Hour Traffic Volumes

CRANE TRANSPORTATION GROUP

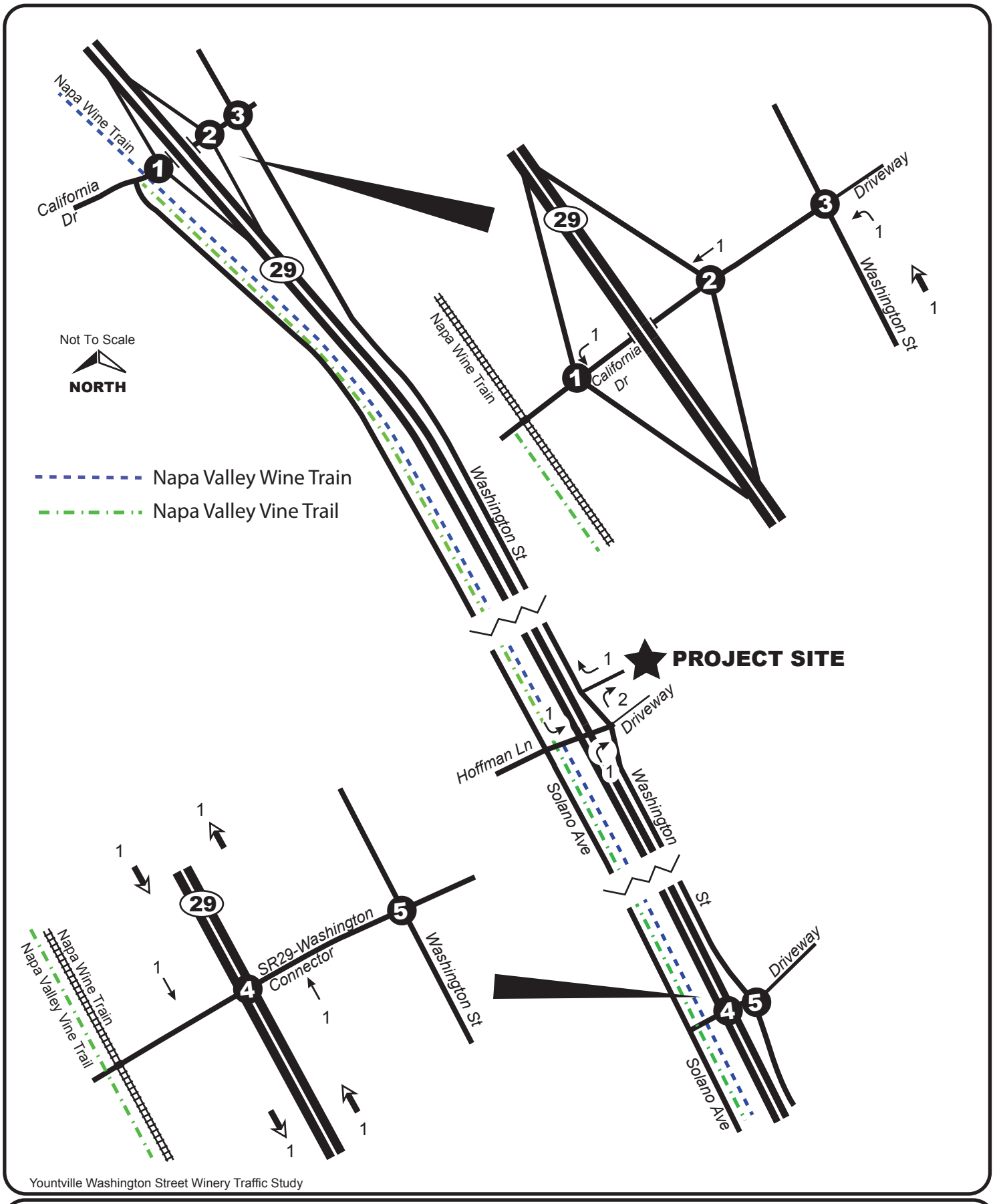


Yountville Washington Street Winery Traffic Study

Figure 9

Cumulative (Year 2030) Harvest Saturday (without Project)
PM Peak Hour Traffic Volumes

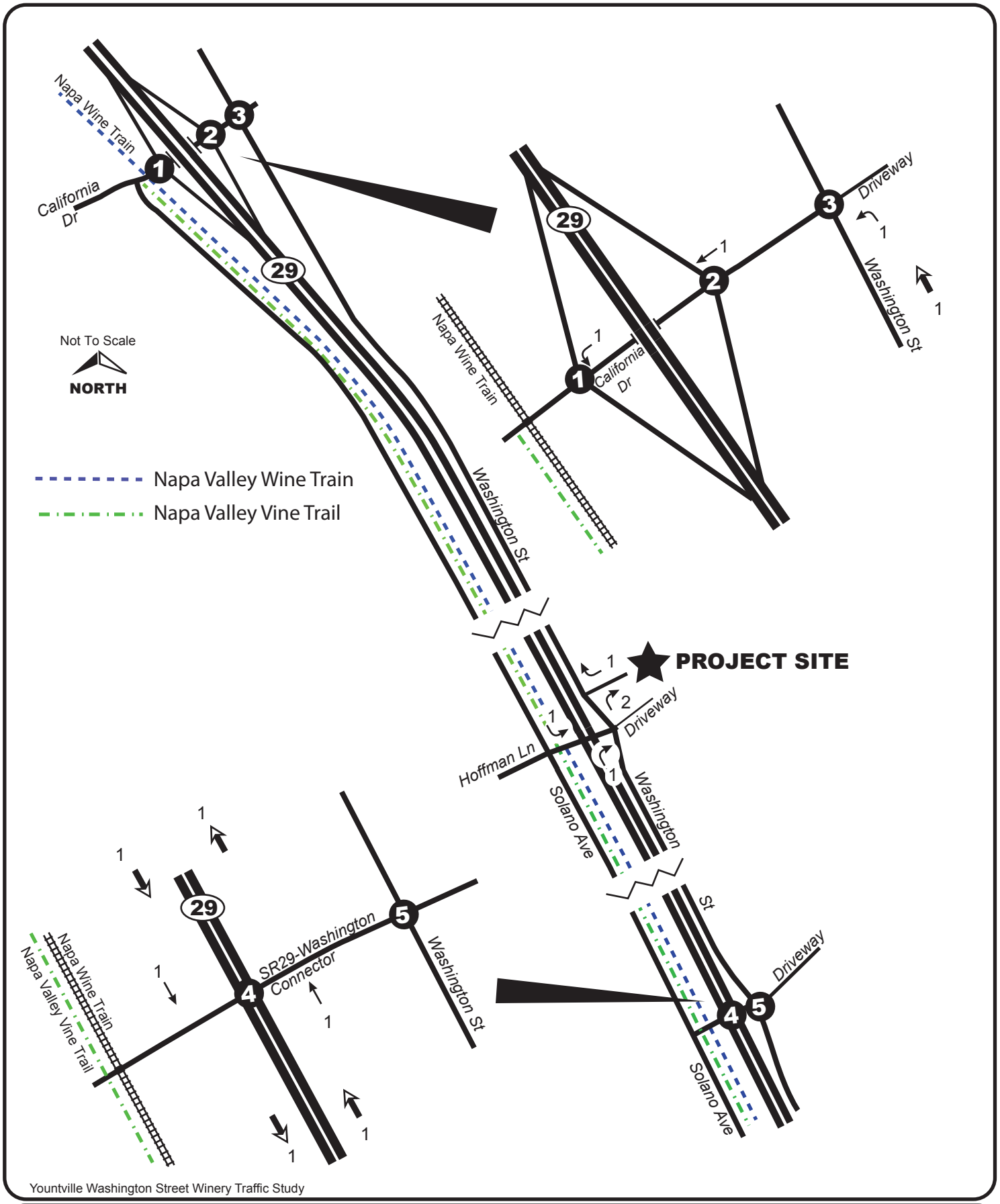
CRANE TRANSPORTATION GROUP



Yountville Washington Street Winery Traffic Study

Figure 10
Friday PM Peak Hour Project Increment

CRANE TRANSPORTATION GROUP



Yountville Washington Street Winery Traffic Study

Figure 11

Saturday PM Peak Hour Project Increment

CRANE TRANSPORTATION GROUP

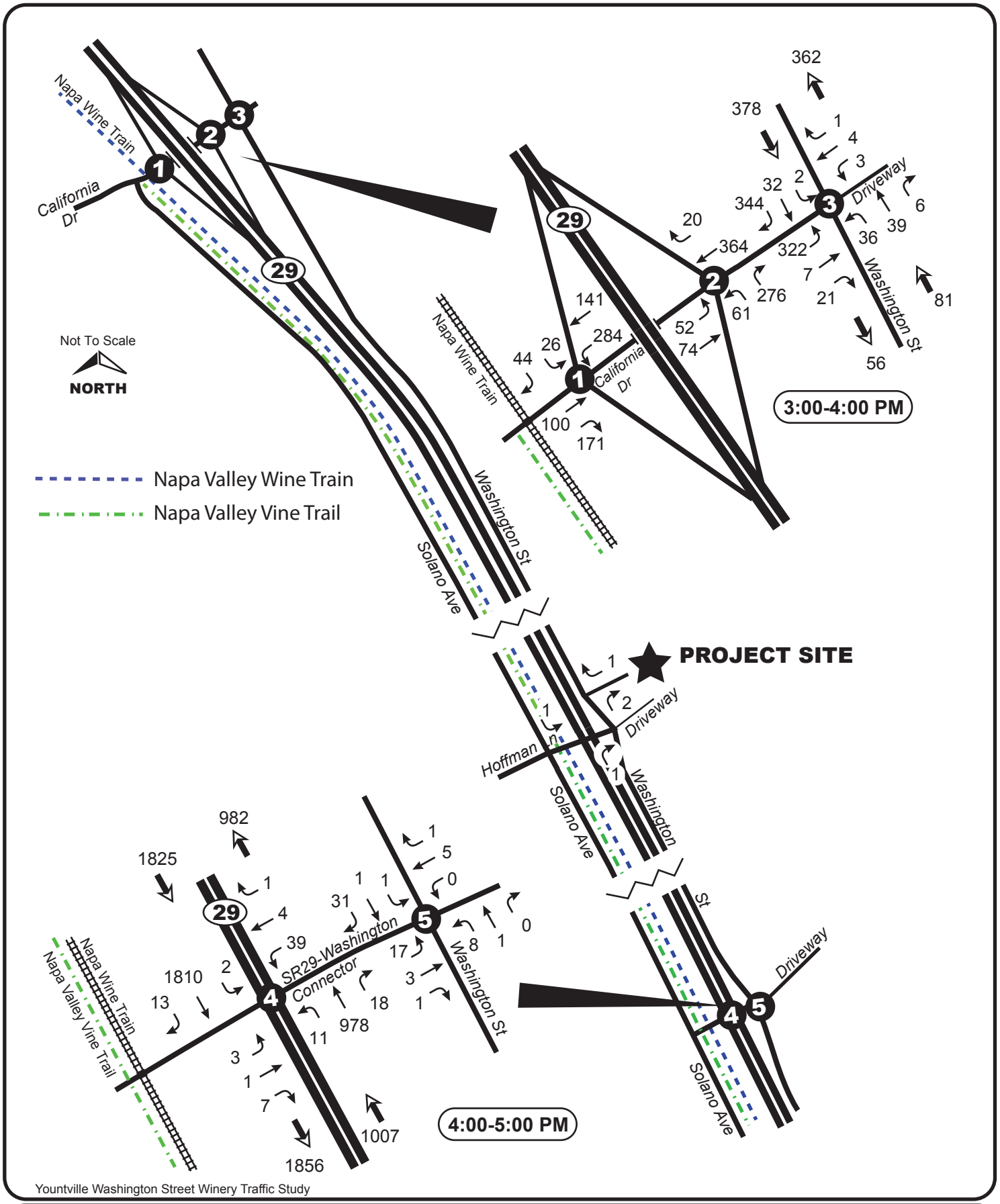
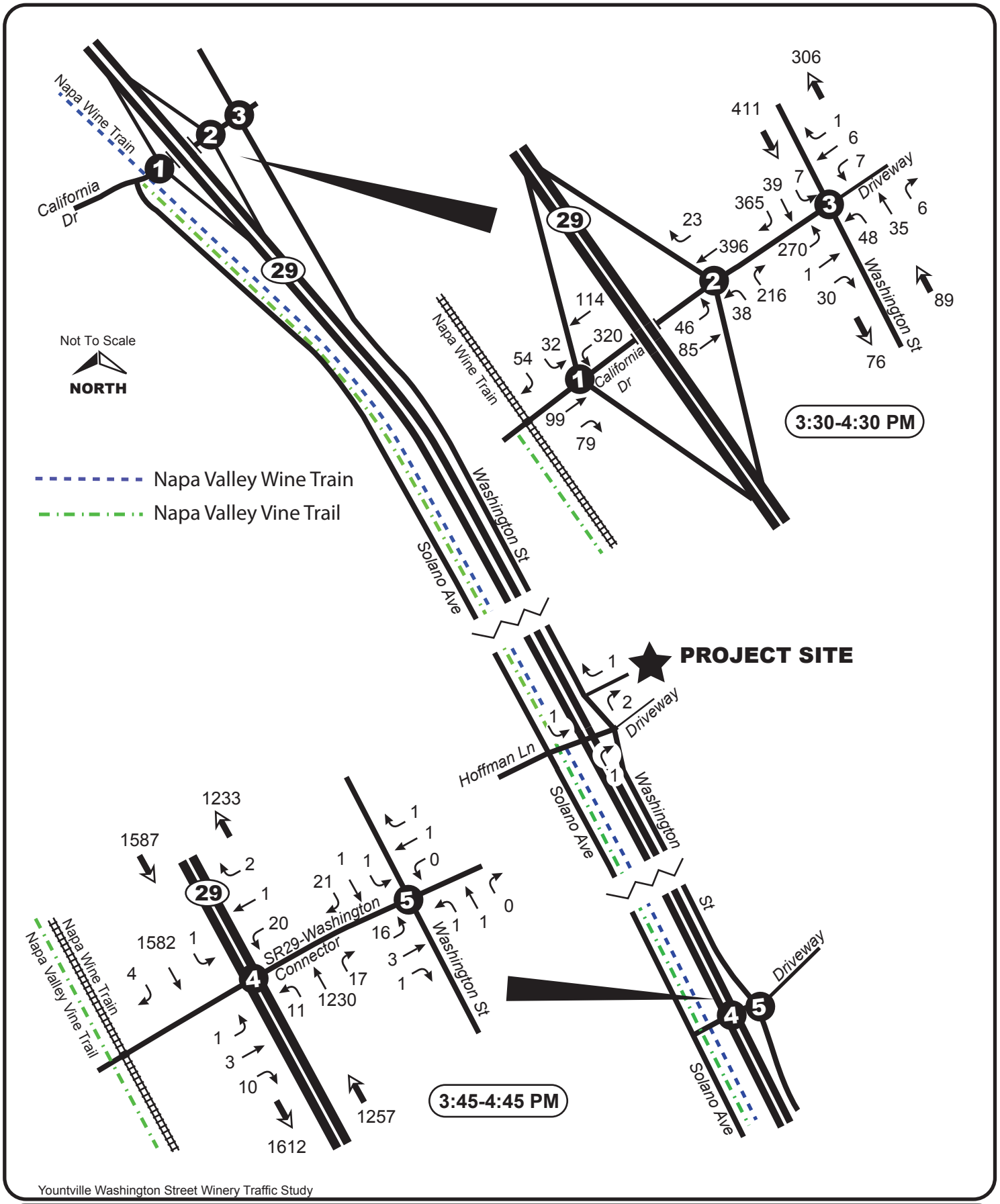


Figure 12

Existing (2015) Harvest Friday (with Project)
PM Peak Hour Traffic Volumes

CRANE TRANSPORTATION GROUP



Yountville Washington Street Winery Traffic Study

Figure 13

Existing (2015) Harvest Saturday (with Project)
PM Peak Hour Traffic Volumes

CRANE TRANSPORTATION GROUP

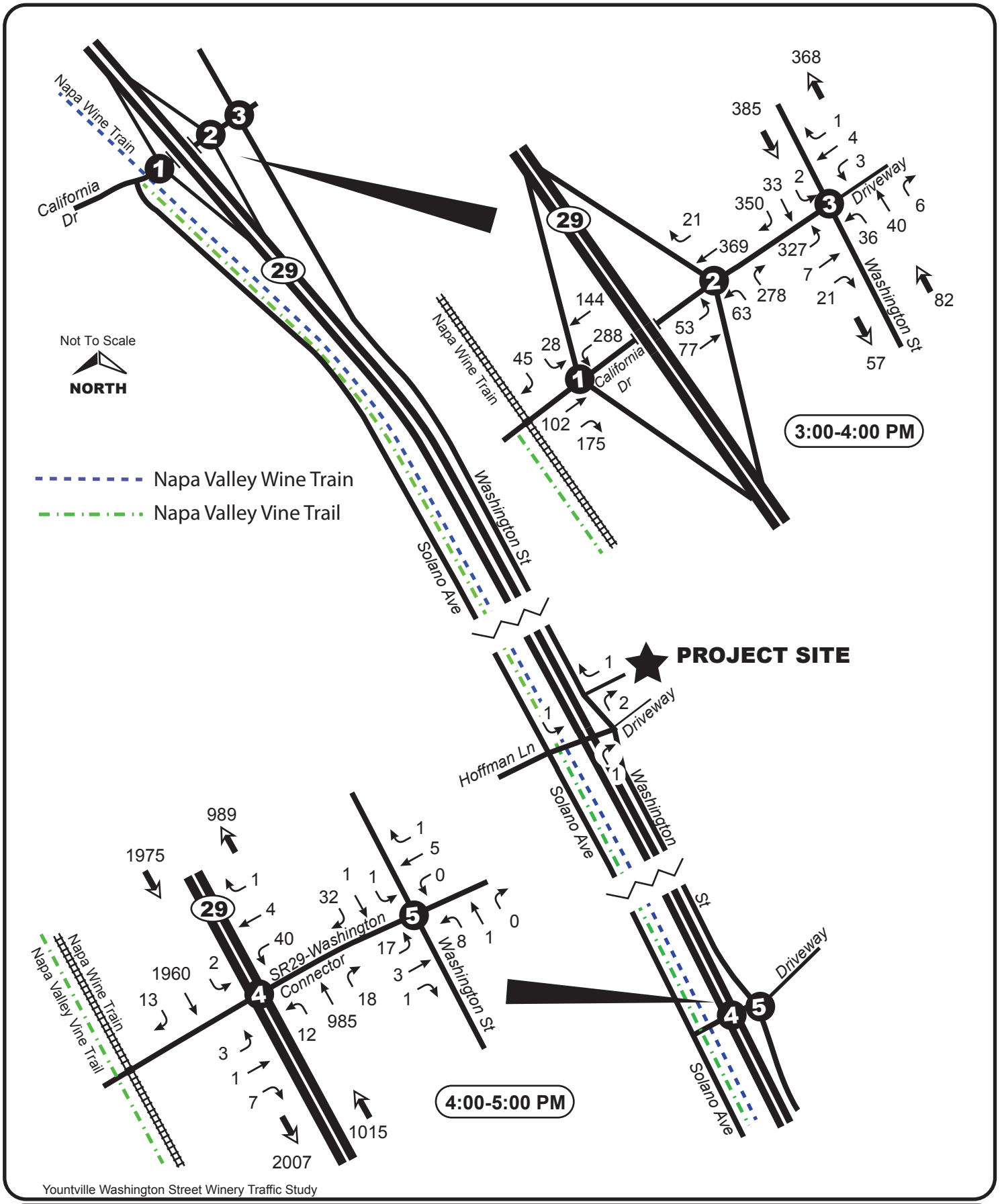
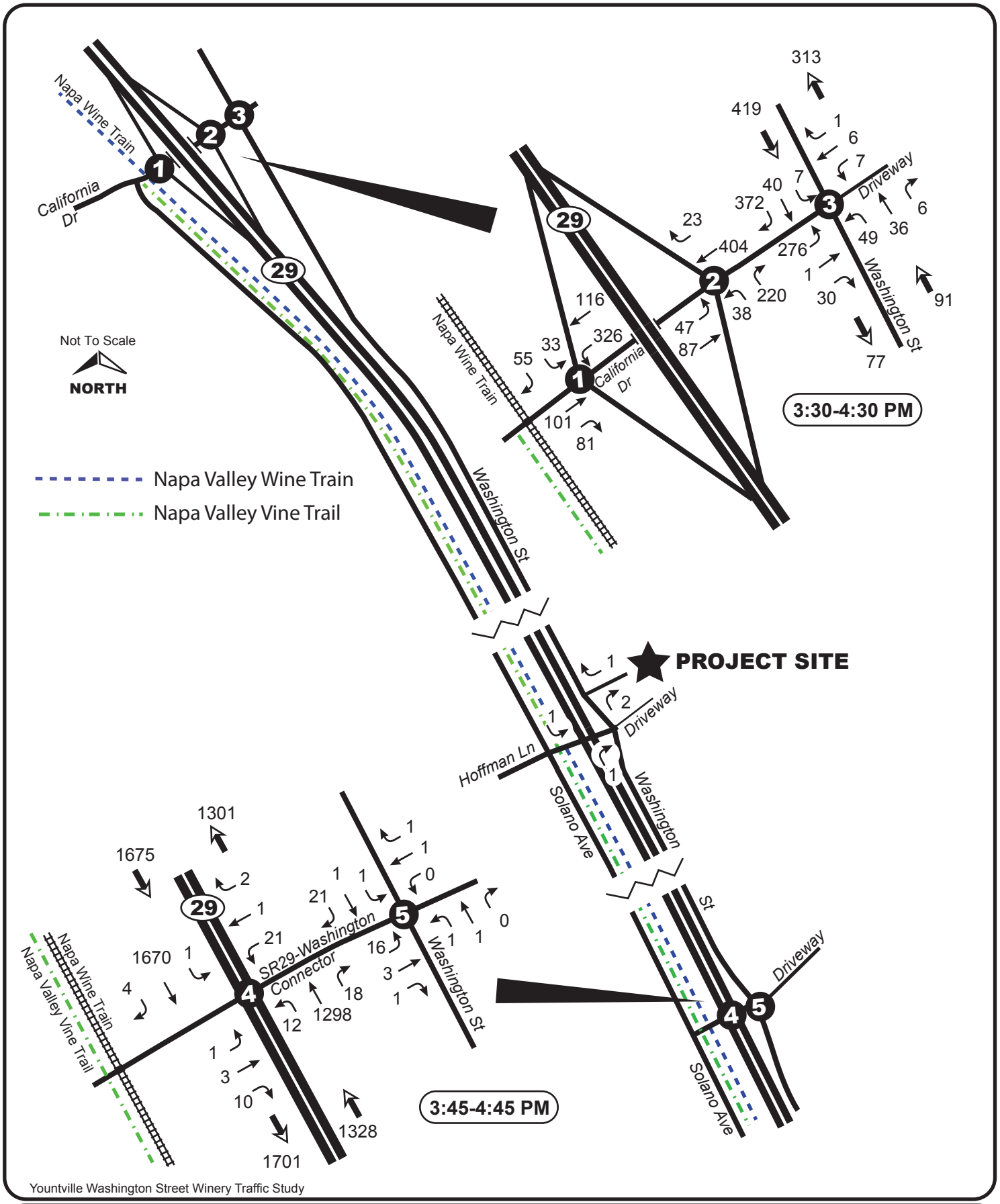


Figure 14

Year 2020 Harvest Friday (with Project)
PM Peak Hour Traffic Volumes

CRANE TRANSPORTATION GROUP



Yountville Washington Street Winery Traffic Study

Figure 15
Year 2020 Harvest Saturday (with Project)
PM Peak Hour Traffic Volumes

CRANE TRANSPORTATION GROUP

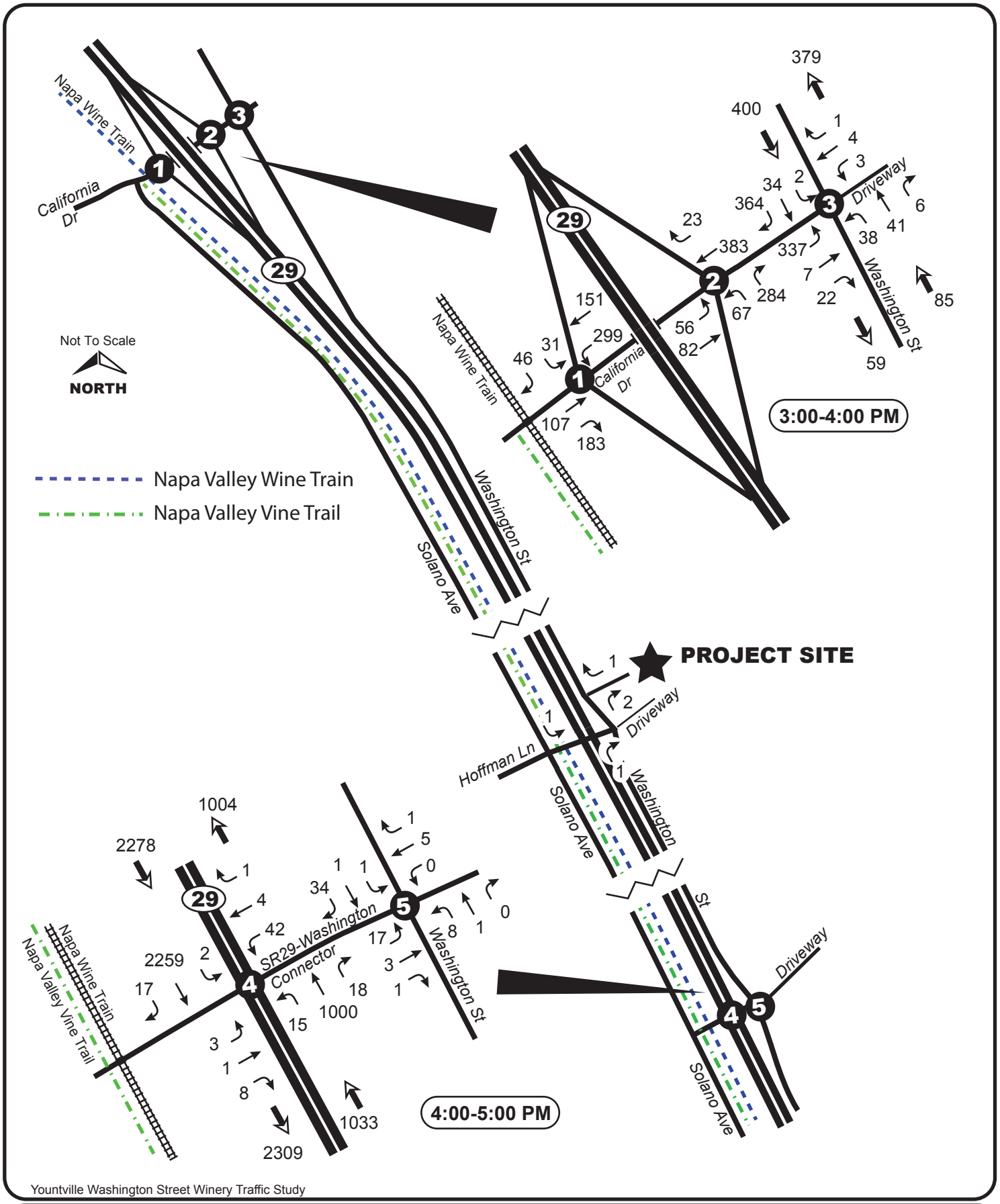


Figure 16

Cumulative (Year 2030) Harvest Friday (with Project)
PM Peak Hour Traffic Volumes

CRANE TRANSPORTATION GROUP

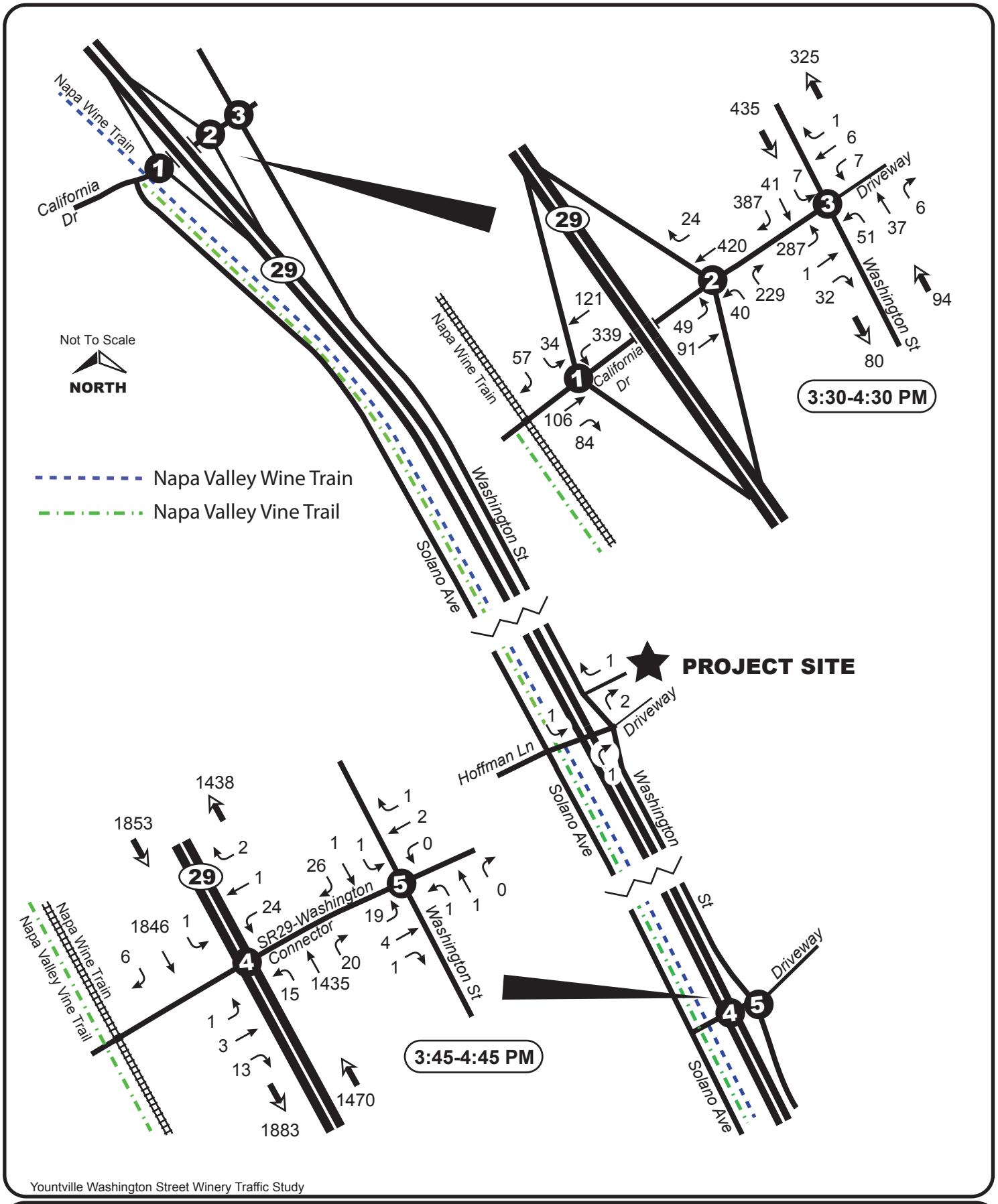


Figure 17

Cumulative (Year 2030) Harvest Saturday (with Project)
PM Peak Hour Traffic Volumes

CRANE TRANSPORTATION GROUP

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: 2000 Highway Capacity Manual (Transportation Research Board).

Table 2

INTERSECTION LEVEL OF SERVICE
HARVEST

EXISTING (YEAR 2015)

LOCATION	FRIDAY PM PEAK HOUR		SATURDAY PM PEAK HOUR	
	W/O PROJECT	WITH PROJECT	W/O PROJECT	WITH PROJECT
California Dr./SB Ramps	C-15.2[1]	C-15.3	C-15.3	C-15.4
California Dr./NB Ramps	B-10.9[2]	B-10.9	B-10.6	B-10.6
California Dr./Washington St.	B-13.3[3]	B-13.3	B-12.5	B-12.5
SR 29/Solano Ave.-Washington St. Connector Road	D-30.9/D-34.2[4]	D-30.9D-34.2	C-23.1/D-34.6	C-23.2/D-34.6

YEAR 2020

LOCATION	FRIDAY PM PEAK HOUR		SATURDAY PM PEAK HOUR	
	W/O PROJECT	WITH PROJECT	W/O PROJECT	WITH PROJECT
California Dr./SB Ramps	C-15.9[1]	C-15.9	C-15.7	C-15.8
California Dr./NB Ramps	B-11.0[2]	B-11.0	B-10.6	B-10.6
California Dr./Washington St.	B-13.5[3]	B-13.5	B-12.9	B-12.9
SR 29/Solano Ave.-Washington St. Connector Road	E-36.3/E-38.4[4]	E-36.4/E-38.5	D-25.0/E-39.1	D-25.0/E-39.2

CUMULATIVE (YEAR 2030)

LOCATION	FRIDAY PM PEAK HOUR		SATURDAY PM PEAK HOUR	
	W/O PROJECT	WITH PROJECT	W/O PROJECT	WITH PROJECT
California Dr./SB Ramps	C-17.2[1]	C-17.3	C-16.6	C-16.6
California Dr./NB Ramps	B-11.2[2]	B-11.2	B-10.7	B-10.8
California Dr./Washington St.	B-14.4[3]	B-14.4	B-13.5	B-13.5
SR 29/Solano Ave.-Washington St. Connector Road	E-48.3/E-49.9[4]	E-48.3/E-50.0	D-27.8/F-50.2	D-27.8/F-50.3

(1) HCM 2010 unsignalized level of service – control delay in seconds. SR 29 SB off-ramp stop sign controlled approach.
(2) HCM 2010 unsignalized level of service – control delay in seconds. SR 29 NB off-ramp stop sign controlled approach.
(3) HCM 2010 all way stop level of service – control delay in seconds.
(4) HCM 2000 unsignalized level of service – control delay in seconds. Solano Ave. Connector Road stop sign controlled approach/Washington Street Connector Road stop sign controlled approach. Year 2010 Software does not take into account benefits of median storage on SR 29 to assist left turns from the Connector Road.

Year 2000/2010 Highway Capacity Manual (HCM) Analysis Methodology
Source: Crane Transportation Group

Table 3

INTERSECTION SIGNAL WARRANT EVALUATION HARVEST

Do Volumes Exceed Warrant #3 Volume Criteria Levels?

EXISTING (YEAR 2015)

LOCATION	FRIDAY PM PEAK HOUR		SATURDAY PM PEAK HOUR	
	W/O PROJECT	WITH PROJECT	W/O PROJECT	WITH PROJECT
California Dr./SB Ramps	No	No	No	No
California Dr./NB Ramps	No	No	No	No
California Dr./Washington St.	No	No	No	No
SR 29/Solano Ave.- Washington St. Connector Road	No	No	No	No

YEAR 2020

LOCATION	FRIDAY PM PEAK HOUR		SATURDAY PM PEAK HOUR	
	W/O PROJECT	WITH PROJECT	W/O PROJECT	WITH PROJECT
California Dr./SB Ramps	No	No	No	No
California Dr./NB Ramps	No	No	No	No
California Dr./Washington St.	No	No	No	No
SR 29/Solano Ave.- Washington St. Connector Road	No	No	No	No

CUMULATIVE (YEAR 2030)

LOCATION	FRIDAY PM PEAK HOUR		SATURDAY PM PEAK HOUR	
	W/O PROJECT	WITH PROJECT	W/O PROJECT	WITH PROJECT
California Dr./SB Ramps	No	No	No	No
California Dr./NB Ramps	No	No	No	No
California Dr./Washington St.	No	No	No	No
SR 29/Solano Ave.- Washington St. Connector Road	No	No	No	No

Source: Crane Transportation Group

Table 4

YOUNTVILLE WASHINGTON STREET WINERY
TRIP GENERATION

HARVEST FRIDAY

CATEGORY	NUMBER	HOURS	TRIPS					
			3-4 PM*		4-5 PM**		5-6 PM	
			IN	OUT	IN	OUT	IN	OUT
Admin Employees – Full Time	1	10AM-6PM	0	0	0	0	0	0
Admin Employees – Part Time	1	Noon-6:PM	0	0	0	0	0	0
Production Employees – Full Time	1	10AM-6PM	0	0	0	0	0	0
Production Employees – Part Time	1	Noon-6PM	0	0	0	0	0	0
Tours/Tasting Employees – Full time	2	10AM-6PM	0	0	0	0	0	0
Tours/Tasting Employees – Part Time	1	Noon-6PM	0	0	0	0	0	0
Grape Delivery Trucks (88% grown off-site)	2/day	6AM-Noon	0	0	0	0	0	0
Reduction in Grape Outhaul Trucks (15 total)	(-1/day)	6AM-Noon	0	0	0	0	0	0
Visitors	25 total = 10 vehicles***	10AM-6PM	2****	1****	1****	2****	0	1

* Peak hour at SR 29/Washington Street south intersection.
** Peak hour at California Drive.
*** 2.6 visitors/vehicle average on weekdays per County data.
**** In and outbound visitor vehicle flow could be reversed; depends upon the individual day reservation schedule.

Employee/visitor source: Yountville Washington Street Winery applicant
Compiled by: Crane Transportation Group

Table 5

YOUNTVILLE WASHINGTON STREET WINERY
TRIP GENERATION

HARVEST SATURDAY

CATEGORY	NUMBER	HOURS	TRIPS									
			2-3 PM		3-4 PM		4-5 PM		5-6 PM		3:30-4:30*	
			IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
Admin Employees – Full Time	0		0	0	0	0	0	0	0	0	0	0
Admin Employees – Part Time	1	Noon-6PM	0	0	0	0	0	0	0	0	0	0
Production Employees – Full Time	0		0	0	0	0	0	0	0	0	0	0
Production Employees – Part Time	1	Noon-6PM	0	0	0	0	0	0	0	0	0	0
Tours/Tasting Employees – Full time	2	10AM-6PM	0	0	0	0	0	0	0	0	0	0
Tours/Tasting Employees – Part Time	3	Noon-6PM	0	0	0	0	0	0	0	0	0	0
Grape Delivery Trucks (88% grown off-site)	2/day	6AM-Noon	0	0	0	0	0	0	0	0	0	0
Reduction in Grape Outhaul Trucks (15 total)	(-1/day)	6AM-Noon	0	0	0	0	0	0	0	0	0	0
Visitors	25 total = 9 vehicles**	10AM-6PM	1	1	2	1	1	2	0	1	2***	1***

* Peak hour at California Drive and SR 29 intersections.
** 2.8 visitors/vehicle average on Saturdays per County data.
**** In and outbound visitor vehicle flow could be reversed; depends upon the individual day reservation schedule.

Employee/visitor source: Yountville Washington Street Winery applicant
Compiled by: Crane Transportation Group

Table 6

YOUNTVILLE WASHINGTON STREET WINERY
MARKETING EVENTTRAFFIC DETAILS

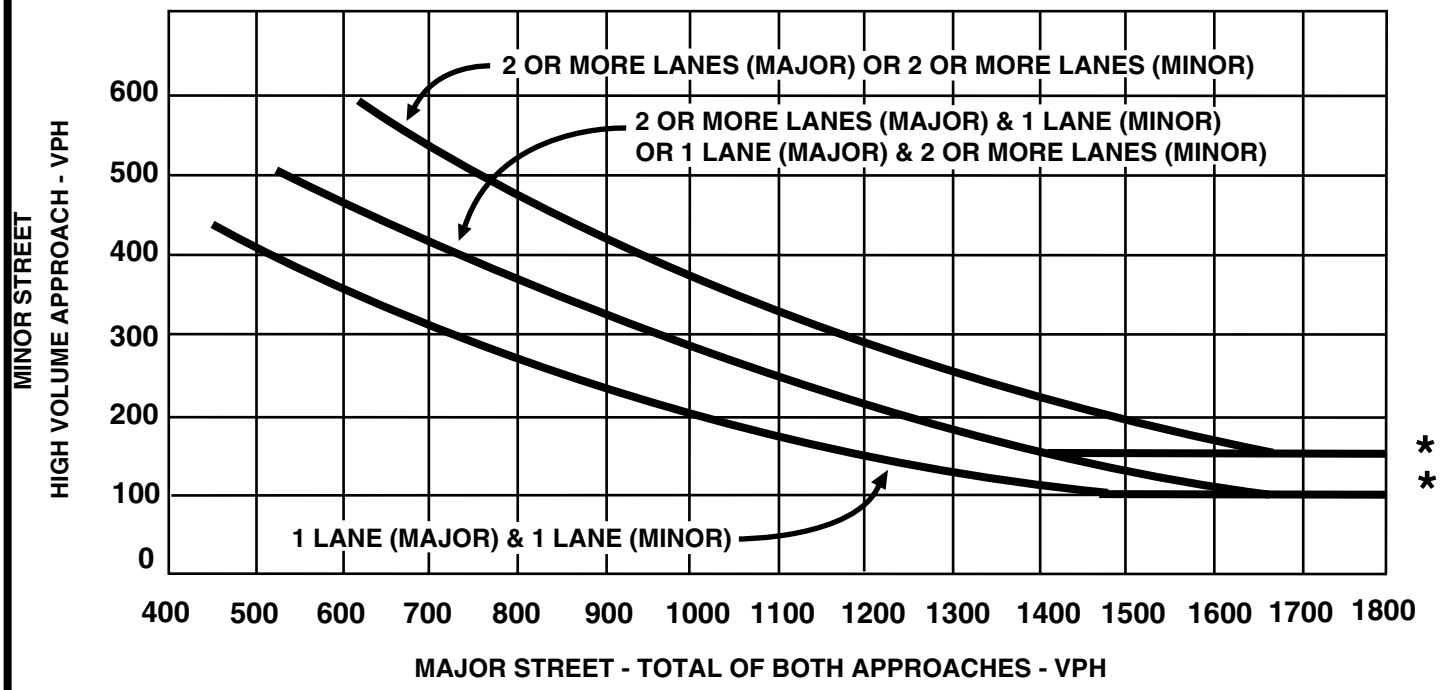
MARKETING EVENT	STAFF/GUEST CATEGORY	# OF PEOPLE	# OF VEHICLES	TIMES	REGULAR VISITATION ELIMINATED DURING MARKETING EVENT?
Marketing 10/year	Guests	30	11-12	Wed. to Sun. Start after 6:00 PM	Yes
	Extra Winery Staff	2	2		
	Caterers	2	2		
	Entertainers	0	0		
	Delivery vehicles	1	1		
	Other?				
Marketing 1/year	Guests	100	36	Weekend day No traffic on system 3:00-6:00 PM	Yes
	Extra Winery Staff	3	3		
	Caterers	2	2		
	Entertainers	1	1		
	Delivery vehicles	1	1		
	Other?				
Marketing	Guests				Yes ___ No ___
	Extra Winery Staff				
	Caterers				
	Entertainers				
	Delivery vehicles				
	Other?				
Other (please detail)	Guests				Yes ___ No ___
	Extra Winery Staff				
	Caterers				
	Entertainers				
	Delivery vehicles				
	Other?				

Source: Yountville Washington Street Winery applicant

APPENDIX

Appendix Table A-1

PEAK HOUR VOLUME WARRANT #3
(Urban Area)



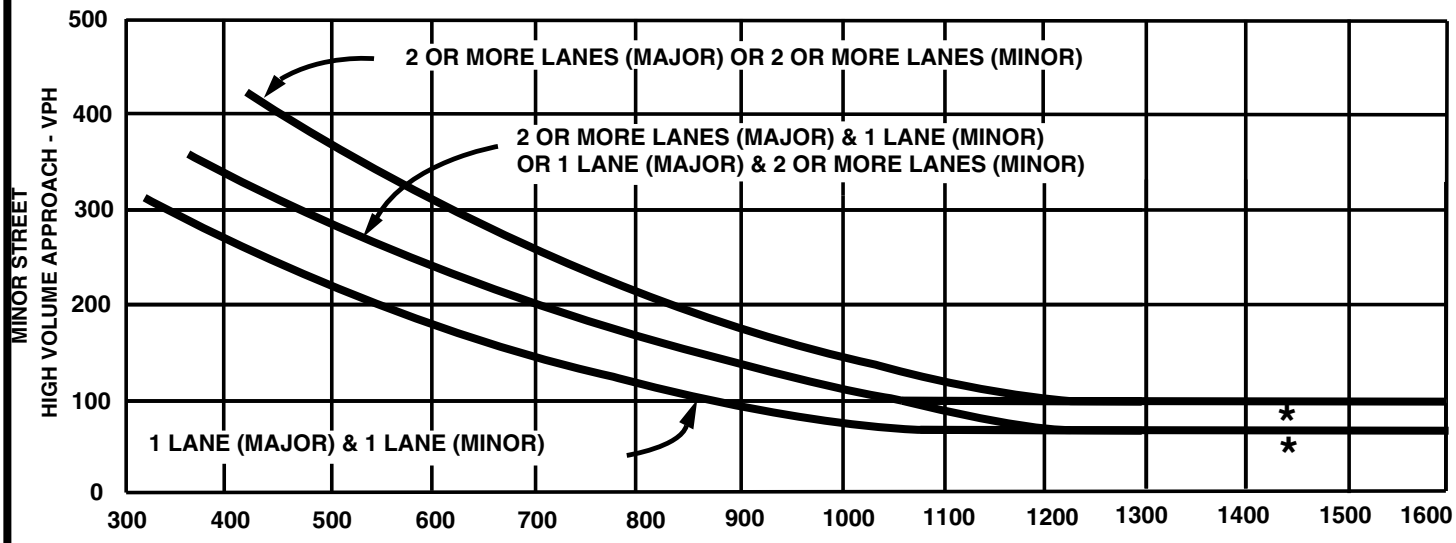
*** NOTE**

150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE

Source: California Manual on Uniform Traffic Control Devices, 2010

Appendix Table A-2

PEAK HOUR VOLUME WARRANT #3
(Rural Area)



*** NOTE**

100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 75 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE

Source: California Manual on Uniform Traffic Control Devices, 2010

Appendix Table A-3

TRIP GENERATION
YOUNTVILLE APPROVED & UNBUILT DEVELOPMENT

DEVELOPMENT	SIZE	WEEKDAY PM PEAK HOUR TRIPS				SATURDAY PM PEAK HOUR TRIPS			
		INBOUND		OUTBOUND		INBOUND		OUTBOUND	
		RATE*	VOL	RATE*	VOL	RATE*	VOL	RATE*	VOL
RH PROJECT (6725 Washington St.) Retail/Wine/Tasting Limited Service Restaurant	4992 SQ.FT.	1.19	6	1.52	8	2.1	11	2.1	11
HANDWRITTEN PROJECT (6494 Washington St.) Retail/Wine Tasting	4449 SQ.FT.	1.19	5	1.52	7	2.1	10	2.1	10

Project List Source: Town of Yountville Planning Dept., May 2016.

* Trips/1000 square feet.

Trip Rate Source: Trip Generation Manual, 9th Edition, by the Institute of Transportation Engineers, 2012.
Compiled by: Crane Transportation Group

Appendix

YOUNTVILLE WASHINGTON STREET WINERY
EXPECTED PROJECT TRAFFIC ACTIVITY DETAILS

GALLONS PER YEAR PRODUCTION

HARVEST CONDITIONS	
A. **Full-time admin employees** # on Weekdays __1__ # on Saturday __0_ # on Sunday __0_ Work hours: Weekday 10:00 AM to 6:00 PM Saturday 10:00 AM to 6:00 PM Sunday 10:00 AM to 6:00 PM	E. **Tours & tasting employees** # on Weekdays __2_ # on Saturday __2_ # on Sunday __2__ Work hours: Weekday 10:00 AM to 6:00 PM Saturday 10:00 AM to 6:00 PM Sunday 10:00 AM to 6:00 PM
B. **Part-time admin employees** # on Weekdays __1__ # on Saturday __1__ # on Sunday __1__ Work hours: Weekday 12:00 PM to 6:00 PM Saturday 12:00 PM to 6:00 PM Sunday 12:00 PM to 6:00 PM	F. **Other employees** # on Weekdays _1__ # on Saturday __3__ # on Sunday ___3_ Work hours: Weekday 12:00 PM to 6:00 PM Saturday 12:00 PM to 6:00 PM Sunday 12:00 PM to 6:00 PM
C. **Full-time production employees** # on Weekdays __1__ # on Saturday __0__ # on Sunday ___0_ Work hours: Weekday 10:00 AM to 6:00 PM Saturday NA Sunday NA	G, **Maximum tours/tasting visitors** # on Weekdays ___25_ # on Saturday _25_ # on Sunday __25_ Tasting hours: Weekday 10:00 AM to 6:00 PM Saturday 10:00 AM to 6:00 PM Sunday 10:00 AM to 6:00 PM
D. **Part-time production employees** # on Weekdays __1__ # on Saturday __1__ # on Sunday __1__ Work hours: Weekday 12:00 PM to 6:00 PM Saturday 12:00 PM to 6:00 PM Sunday 12:00 PM to 6:00 PM	H. **Grape delivery trucks** # on Weekdays __2__ # on Saturday __2__ # on Sunday __2__ Delivery hours: Weekday 6:00 AM to 12:00 PM Saturday 6:00 AM to 12:00 PM Sunday 6:00 AM to 12:00 PM # days of grape delivery: 30

Appendix

YOUNTVILLE WASHINGTON STREET WINERY
EXPECTED PROJECT TRAFFIC ACTIVITY DETAILS

	HARVEST CONDITIONS
I.	**Other trucks on regular basis** # on Weekdays _1_ # on Saturday __0__ # on Sunday __0__ Delivery hours: Weekday 10:00 AM to 3:00 PM Saturday 10:00 AM to 3:00 PM Sunday 10:00 AM to 3:00 PM

J. **Grape source**

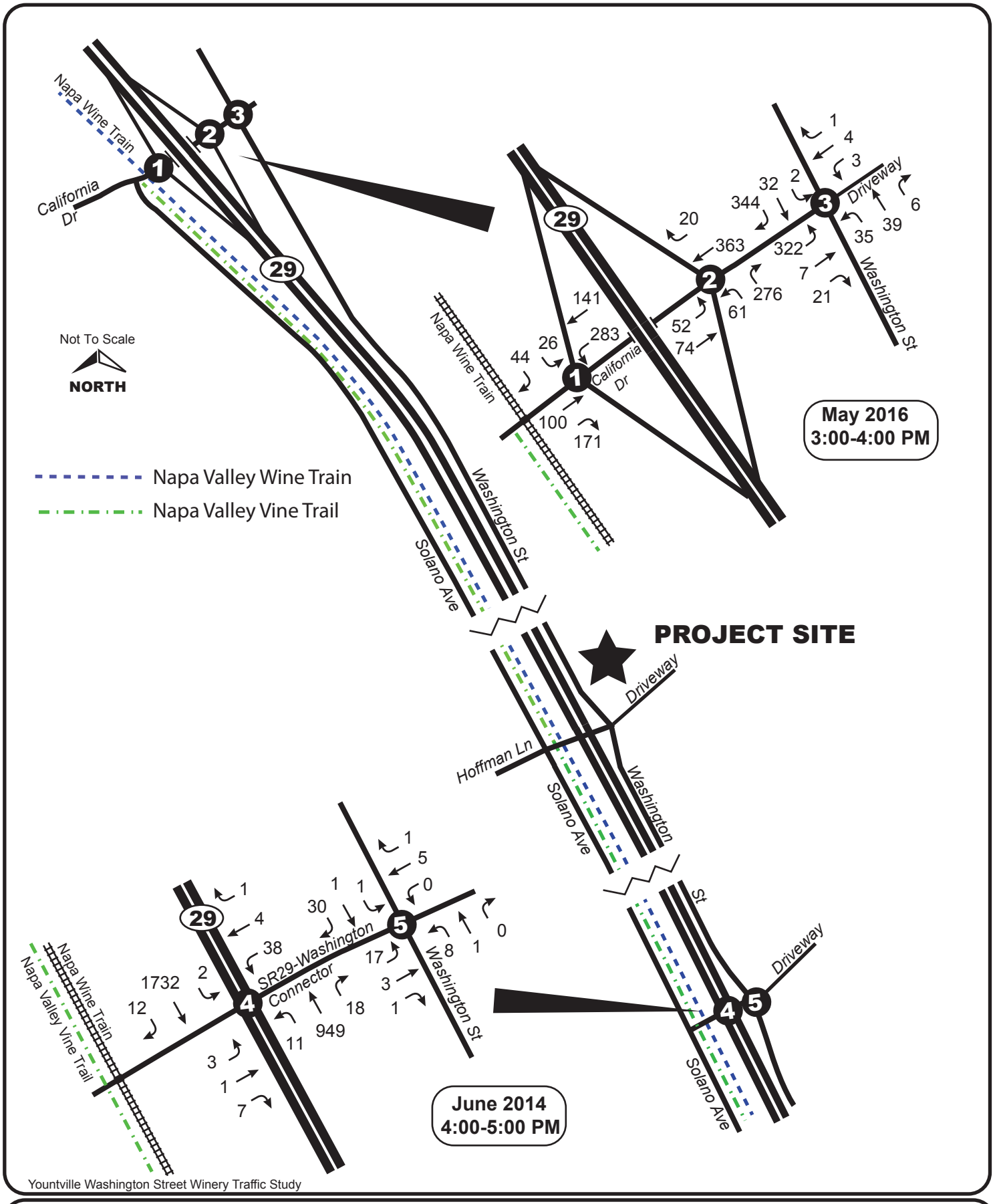
Percent grapes that will be grown on site: _12%
Percent grapes transported to the site from the north on SR 29: _0%
Percent grapes transported to the site from the south on SR 29: _100%

K. **Elimination of Existing Grape Haul Trucks from the Site**

existing grape outhaul trips eliminated due to proposed winery: __15_

L. **Marketing Events Details**

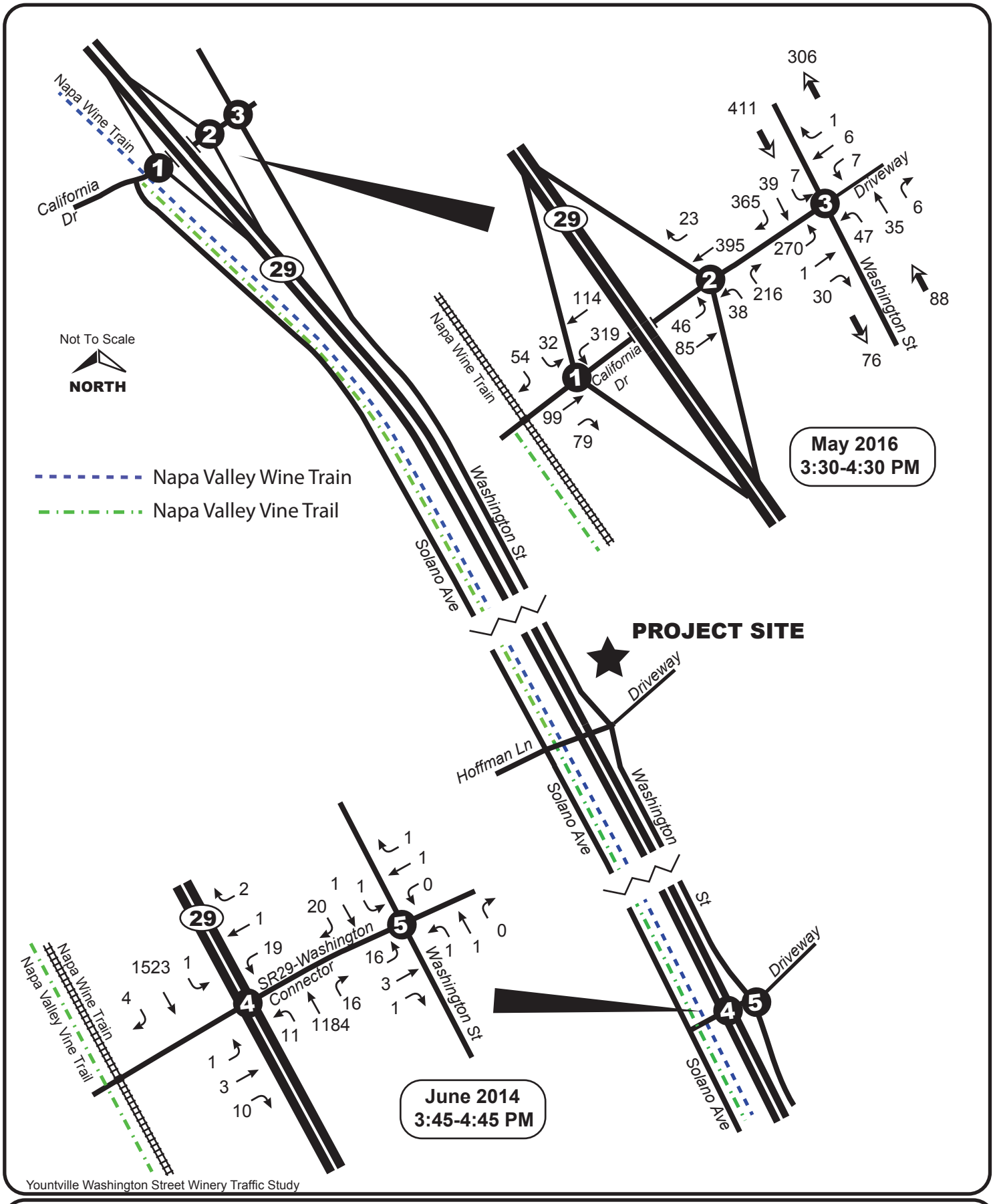
Wine auction –	# events/year: 1 # people/event: 100 typical days: weekend typical hours: 10:00 AM – 2:00 PM
Typical marketing – events	# events/year: 10 ANNUALLY # people/event: 30 typical days: Wednesday-Sunday typical hours: After afternoon peak traffic



Yountville Washington Street Winery Traffic Study

Figure A-1
June 2014 and May 2016
Friday PM Peak Hour Volumes

CRANE TRANSPORTATION GROUP



Yountville Washington Street Winery Traffic Study

Figure A-2

June 2014 and May 2016
Saturday PM Peak Hour Volumes

CRANE TRANSPORTATION GROUP