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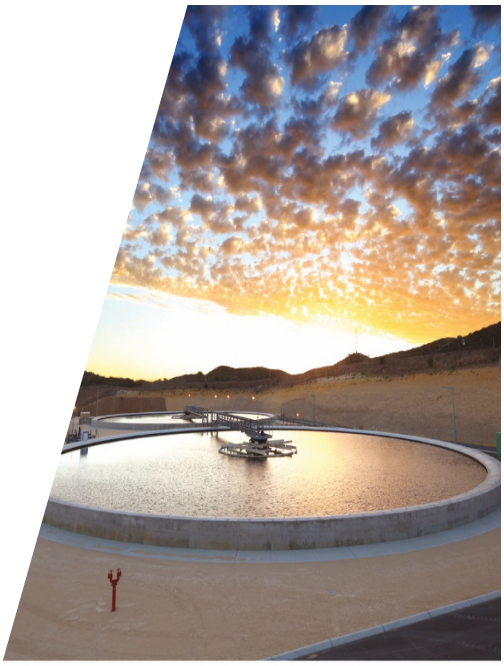
Traffic Impact Study

Ballentine Vineyards Use Permit Major Modification P18-00382 &
Variance P19-00006
Planning Commission Hearing September 2, 2020



Focused Traffic Analysis for the Proposed

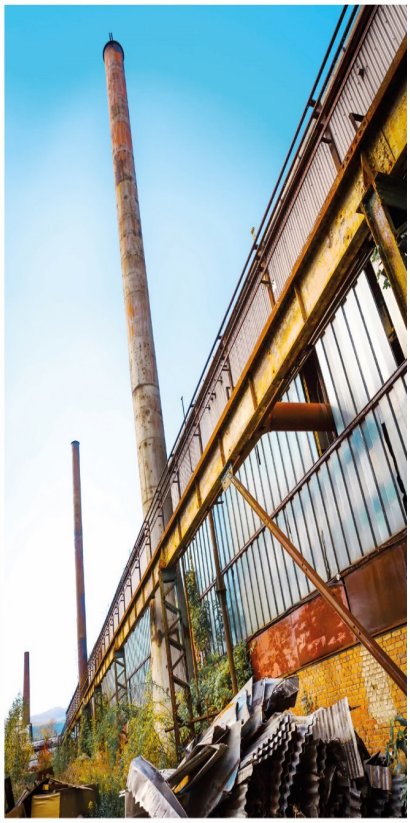
Ballentine Vineyards Use Modification

Prepared for:
The County of Napa

January 2020

Requested By:
Ballentine Vineyards Winery

Draft (Revised)



FOCUSED TRAFFIC ANALYSIS
PROPOSED BALLENTINE VINEYARDS WINERY USE MODIFICATION PROJECT

Prepared For:
COUNTY OF NAPA
At the request of:
Ballentine Vineyards Winery

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Draft Report (Revised)
JANUARY 17, 2020

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Executive Summary

Project Description

The proposed Ballentine Vineyards Use Modification project would consist an increase in winery production, employment, visitation, and marketing events compared to existing permitted operations. The project site is located at 2820 St. Helena Highway. Access is provided by two existing driveways east into the winery grounds via two project driveways (see Figure 5.1--- Proposed Project Site Plan). The proposed project would increase production from 50,000 gallons per year to 125,000 gallons per year. Relative to employment there would be 15 total employees (12 full-time, 3 part-time) on weekdays and 6 employees (4 full-time, 2 part-time) on the weekends. Visitation would include a maximum of 95 visitors per day (Saturday and Sunday) with the winery averaging 63 visitors on weekdays. Finally, there would be an increase from 2 annual marketing events per year to 13 events per year. The largest highest attended marketing event would include four (4) annual events for 100 guests.

Four intersections along State Route 29 (St. Helena Highway) at Lodi Lane, Ballentine Vineyards Winery (north and south driveways), and Deer Park Road were evaluated for existing and future operating conditions with and without the proposed project. In addition, the arterial segments of State Route 29 north and south of the project driveways as well as Lodi Lane and Deer Park Road were evaluated for peak hour weekday and weekend operating conditions.

Based on transportation analyses of Existing, Near-Term, and Cumulative traffic conditions with and without the project the following findings and recommendations are presented:

Existing (No Project) Conditions

The intersection of Deer Park Road/SR-29 currently operates at LOS F during both the weekday PM peak hour and Saturday midday peak hour for the outbound (westbound) left and right-turn movements from Deer Park Road onto SR-29. All other study intersections operate at acceptable (LOS D or better) conditions. Based on accident history analysis, all study intersections are experiencing collision rates lower than the statewide average for similar facilities. However, the Deer Park Road/SR-29 intersection does experience more “broadside” accidents likely due to the relatively high speeds on SR-29 combined with stop-sign controlled motorists from Deer Park Road attempting to merge left onto SR-29 with very small “gaps” in through-traffic. Based on the CAMUTCD for the peak hour signal warrant, the Deer Park Road/SR-29 intersection would qualify for signalization with existing (no project) weekday PM peak and Saturday midday peak hour volumes.

Arterial operation along SR-29 is calculated at LOS E during both the weekday PM peak hour and Saturday midday peak hour conditions. Arterial operation along Lodi Lane and Deer Park Road is currently LOS C or better during both the weekday and weekend peak periods. It is noted that field observations indicate that during the weekday PM peak hour period southbound traffic flow on SR-29 can vary from free-flow conditions to intermittent periods of slowed or stop-and-go conditions between approximately 4:50-5:30 p.m. (for typical weekday southbound direction traffic flow).

Near-Term (No Project) Conditions

Under Near-Term (No Project) conditions, existing traffic volumes were increased by 4.2% per year to the year 2021 to allow for local/regional traffic growth in the area. Near-term traffic growth factors are based on historical Caltrans traffic volumes along SR-29 for the past three years.

Based on increases in traffic volumes from Near-Term traffic growth, the Deer Park Road/SR-29 intersection would continue to operate at LOS F during the weekday PM peak hour and Saturday midday peak hour, as would the north-south arterial segments of SR-29. The remaining project study intersections along SR-29 at Lodi Lane and the Ballentine Vineyard driveways would operate at acceptable levels (LOS D or better). The Deer Park Road/SR-29 intersection would continue to meet the peak hour signal warrant with Near-Term (no project) volumes.

Existing plus Project Conditions.

A. Traffic

Proposed project daily and peak hour trip generation was conservatively based on Napa County Trip Generation ratios for winery production, employment, and visitation. Based on these County ratios, the project as modified is estimated to generate 93 daily trips with 33 weekday PM peak hour trips and 44 Saturday midday peak hour trips. However, the Winery is currently permitted to generate 19 daily trips with 7 weekday PM peak hour trips and 5 Saturday midday peak hour trips. Accounting for Ballentine Vineyards Winery permitted uses, the proposed project's net increase in vehicle trip generation would amount to 74 daily trips with 26 weekday PM peak hour trips and 39 Saturday midday peak hour trips.

The Deer Park Road/SR-29 intersection would continue to operate at LOS F during both the weekday PM and weekend mid-day peak hours with proposed project traffic. The remaining study intersections of Lodi Lane/SR-29 and Ballentine North and South Driveways/SR-29 Road would continue to operate acceptable levels (LOS D or better) during the same peak time periods.

Based on updated County significance criteria for unsignalized intersections the intersection of Deer Park Road/SR-29 has been evaluated for proposed project impacts since the LOS operates at an unacceptable level (LOS F) without proposed project trips during the weekday PM peak hour and weekend midday peak hour. County criteria indicate that a significant impact could occur if the proposed project contributes 1% or more of the total traffic at the intersection. Current County protocol go on to state "the peak hour signal warrant criteria should also be evaluated and presented for informational purposes."

During the weekday PM peak hour, the proposed project would add 20 trips to the intersection. During the weekend midday peak hour, the project would add 27 trips to the intersection. Based on existing peak hour volumes of 2,137 and 1,748 at the intersection during these PM and midday peak hours; proposed project contribution would be less than one percent (1%) during the Friday PM peak hour**. However, during the weekend (Saturday) midday peak hour the proposed project's contribution would total 1.5%**. Under the County significance criteria, this would be considered a significant impact. The Deer Park Road/SR-29 intersection would continue to meet the peak hour signal warrant with or without proposed project.

To address the potential project impacts on the Deer Park Road/SR-29 intersection during the Saturday midday peak hour, the applicant proposes the following mitigation measure is recommend to improve operations at the Deer Park Road/SR-29 intersection:

- Mitigation Alternative 1: At the Deer Park Road/SR-29 intersection, it is recommended that a signal be installed to allow the intersection to operate at acceptable levels during the weekday PM peak hour and weekend (Saturday) midday peak hour time periods. Under Existing plus Project conditions, the Deer Park Road/SR-29 intersection would operate at LOS D (54.7 seconds) during the weekday PM peak hour. During the weekend (Saturday) midday peak hour the intersection would operate at LOS B (16.6 seconds). In addition, it is recommended pursuant to policy CIR-19 of the Circulation Element that the proposed project contributes a "fair share" mitigation fee of 1.5% based on its total contribution to peak hour traffic volumes at the intersection. Installation of signal at the Deer Park Road/SR-29 would reduce overall project impacts to **less-than-significant** levels.

- Mitigation Alternative 2: As an alternative to the installation of a traffic signal at the intersection of Deer Park Road/SR-29, a reduction in the proposed project's Saturday midday peak hour trips would mitigate the impact at the Deer Park Road/SR-29 intersection. Based on the Napa County midday peak hour ratio of 57% for visitation, the project would currently generate 39 peak hour visitor trips with the proposed daily total of 95 guests. Peak hour visitor trips would have to be reduced to 21 midday peak hour trips (representing 50 daily visitors) during the peak midday hour to reduce project impacts to less-than-significant at the Deer Park Road/SR-29 intersection. However, recent discussions with County Traffic Engineering staff indicate that the County ratio of 57% for the midday peak hour is highly conservative given the overall winery visitation patterns and actual winery count data.

  To determine the actual Saturday midday peak hour ratio at the Winery, the applicant recently conducted winery visitation counts for consecutive Saturday midday peak hour periods to determine the actual number of visitors that arrived and departed during the Saturday peak hour travel period. Ballentine Vineyards Winery experiences approximately 28% of their total Saturday visitation during this time period.[1] Using actual winery visitation rates for Saturday midday peak hour, the winery generates 24 midday peak hour trips (see Appendices). Consequently, based upon actual field data, proposed project impacts would be reduced to **less-than-significant** at the Deer Park Road/SR-29 intersection. In addition, recent discussions with the applicant indicate that no production staff are on-site during the Saturday mid-day peak hour; and all administrative staff does not leave the winery until after 5:00 pm. (This would eliminate 5 midday peak hour trips). Therefore, it is recommended that winery visitation be limited to or remain consistent with their 28% midday peak hour ratio of the Saturday daily total of 68 daily visitor trips (or 24 midday total peak hour trips). Guests can be re-allocated to other time slots during the weekend hours.

With Existing plus Project traffic, the arterial north-south segments of SR-29 would continue to operate an unacceptable conditions (LOS E). The roadway segments on Lodi Lane and Deer Park Road would continue to operate at acceptable levels (LOS D or better). The addition of proposed project trips to directional (southbound only or northbound only) peak hour volumes on SR-29 would represent a **significant impact** based on the project adding more than one percent to the overall directional volumes. During the weekday PM peak hour project trips would represent 1.6% of directional southbound volumes and 1.5 % of directional northbound volumes**.**

- See Alternative Mitigation #2 (above). In addition to implementing alternative mitigation #2, it is recommended that the Ballentine Vineyards Winery institute a "flex-time" schedule for employees to reduce vehicle trips to/from the winery during the weekday PM peak hour and weekend (Saturday) midday peak hours as part of an overall TDM plan. (As noted, production staff is not working on Saturdays). An overall reduction of seven (7) weekday PM peak hour and five (5) weekend midday peak hour project trips would reduce overall project impacts to roadway segment operations to **less-than-significant** levels. As noted

under recommended project mitigation for the Deer Park Road/SR-29 intersection (above), the project's actual peak hour ratios for the both the Friday PM peak hour (10-15%) and Saturday midday peak hour (28%) are lower than Napa County peak hour ratios used to calculated the project trip generation. The reduction in peak hour project trip generation from these actual winery hourly ratios would be enough to mitigate project impacts to **less-than-significant** levels.

B. Project Access/Circulation

Vehicle access to the proposed Ballentine Vineyards Winery is provided by two existing driveways (north and south) extending east from SR-29 into the winery grounds (see Figure 5.1—Proposed Project Site Plan). As proposed, all visitors and guests would be required to use the northerly driveway for access to/from the Winery. The south driveway would be used for existing residential, employee, and truck uses. As noted, a two-way-left-turn-lane (TWLTLT) is present on SR-29 along the entire project frontage extending from Deer Park Road to 175-feet past the Ballentine Vineyards Winery driveway. The TWLTL on SR-29 allows motorists to gain access to the Winery and/or merge onto SR-29 from the Winery without delaying through-traffic on SR-29. Section 6.2 (Project Access/Circulation) describes vehicle access, parking, emergency access, design standards, pedestrian/bicycle circulation, and truck access/loading.

C. Marketing Events

In addition to normal tastings the project proposes to host 13 different sizes of marketing events that would range between 25-100 guests. These marketing events would include the following:

Proposed Ballentine Vineyards Winery Marketing Events

- 8 events monthly: maximum of 25 guests;
- 1 event monthly: maximum of 50 guests.
- 4 events yearly: maximum of 100 guests

Marketing events would typically be held outside of the peak commute periods starting in the middle of the day or early afternoon hours and extend beyond the weekday PM peak commute hour (4:00-6:00 p.m.). During weekends, events would start before or after the mid-day peak commute period (1:00-4:00 p.m.). As indicated in the trip generation sheets in Appendices, the largest marketing event would generate 87 daily trips (43 in, 42 out). As stated, the events are of sufficient length that the inbound and outbound trips occur in separate hours. Therefore, a large marketing event would generate 43 trips inbound during the hour prior to the event and 42 trips outbound during the hour directly after the event ends. Guests typically stay throughout the event and inbound/outbound traffic generation on a "per hour" basis is estimated to be very low (if any).

- As a suggested mitigation, it is recommended that large marketing events (100 guests) should not start/end during the weekday PM peak period (4:00-6:00 p.m.) nor weekend mid-day peak period (1:00-4:00 p.m.). In addition, the tasting room should suspend visitation related to wine tasting on the days when the facility hosts large marketing events that are held during the afternoon period. These measures would reduce any traffic impacts related to large marketing events to ***less-than-significant*** levels.

D. Vehicle Miles Traveled (VMT)/Transportation Demand Management (TDM) Plan

A VMT Reduction/TDM Plan has been developed for the proposed project that would reduce overall project trip generation and parking demand (too long to summarize in this section). Please refer to Section 8 (VMT Reduction/TDM Plan).

Near-Term plus Project Conditions

Same recommendations as Existing plus Project Conditions

Cumulative (No Project) Conditions

With year 2030 cumulative (no project) traffic volumes, the Deer Park Road/SR-29 intersection would continue to operate at LOS F during both the weekday PM and weekend mid-day peak hours with proposed project traffic. **However, both the Lodi Lane/SR-29 and Ballentine Vineyards North Driveway/SR-29 would be operating at unacceptable conditions (LOS E-F) during the weekday PM peak hour with year 2030 cumulative (no project) volumes**. Directional roadway segment operation along SR-29 would continue to operate at unacceptable levels (LOS F) with year 2030 cumulative (no project) volumes. The directional roadway segments of Lodi Lane and Deer Park Road would operate acceptably (LOS D or better).

Cumulative plus Project Conditions

With proposed project traffic, there would be slight increases in vehicle delays at study intersection locations and overall LOS would remain unchanged from year 2030 cumulative (no project) conditions.

Based on updated County significance criteria for unsignalized intersections the off-site intersections of Lodi Lane/SR-29 and Deer Park Road/SR-29 have been evaluated for proposed project impacts since the LOS operates at an unacceptable level (LOS F) without proposed project trips during the weekday PM peak hour and weekend midday peak hour. County criteria indicate that a significant impact could be found if the proposed project contributes 5% or more to the total cumulative traffic growth at these intersections. The guidelines go on to state “the peak hour signal warrant criteria should also be evaluated and presented for informational purposes.” During the weekday PM peak hour, the proposed project would add 13 trips to the Lodi Lane/SR-29 intersection. During the weekend (Saturday) midday peak hour the project would add 17 trips to the intersection. Based on total cumulative traffic growth at the intersection these proposed project trips would represent increases of 1.5% (13/833) and 2.4% (17/708), respectively. At the Deer Park Road/SR-29 intersection, the total cumulative traffic growth related to proposed project uses would be 1.9% (20/1,002) and 3.2% (27/830) during the weekday PM peak hour and weekend (Saturday) midday peak hour time periods. **Under the County significance criteria, the addition of proposed project trips to these intersections would be considered less-than-significant given that all project contributions would be under 5% of overall cumulative traffic growth.**

Related to arterial segment operation on SR-29, Lodi Lane, and Deer Park Road; the proposed project trips would be considered less-than-significant given that they represent less than a 5% increase in total cumulative traffic growth.

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Appendix B Intersection Level-of-Service Sheets

Appendix C Signal Warrant Sheets

Appendix D Arterial Segment LOS Definitions

Appendix E Ballentine Vineyards Winery Weekday and Weekend Peak Hour Ratios

Appendix F Napa County & Ballentine Winery Daily & Peak Hour Trip Generation Sheets

1. Introduction

The following report provides a focused traffic analysis for the proposed Ballentine Vineyards Winery project located at 2820 St. Helena Highway in St. Helena, Napa County--- (see Figure 1.1 for Project Vicinity Map and Figure 1.2 for Existing Project Site Plan). This traffic analysis is based on discussions with the proposed project's planning consultant (Mr. Jeffrey Redding) and other comparable winery studies conducted for Napa County by GHD. In addition, specific transportation analyses and comments outlined in the Napa County Public Works letters on the proposed use modification were included in the overall scope-of-work.[1] Project characteristics related to employment, visitation, production, and marketing have been evaluated relative to potential roadway and intersection impacts. Methodologies for analyzing the transportation impacts of proposed project uses are consistent with the Use Permit Modification (Supplemental Winery Uses) from Napa County Planning, Building, and Environmental Services.[2] The methodologies focus on both daily and peak hour trip generation associated with proposed employment, visitation, and production levels. Proposed marketing plans and/or special events are also included in overall analyses of trip generation characteristics. Finally, the County has recently adopted revised transportation significance criteria and policies established in the Traffic Impact Study Policies and the recently updated Circulation Element of the General Plan.[3] Key issues evaluated in this study include the following:

- Existing and future weekday (Friday) PM peak hour and weekend (Saturday) mid-day peak hour operations at the Lodi Lane/SR 29, Ballentine Vineyards Driveway(s)/SR 29, and Deer Park Road/SR 29 intersections as well as daily traffic volumes along SR 29;
- Collision history at the study intersections and project driveway areas for five-year period;
- Near-Term (2021) traffic conditions reflecting other approved/pending projects and/or historical traffic growth rates in the study area encompassing Napa County inclusive of St. Helena and Calistoga;
- Increase in proposed project trip generation relative to existing permit and baseline conditions from proposed project uses including employment, and marketing events;
- Project site access along SR 29 including other adjacent driveway(s) and circulation of vehicles within these areas;
- Cumulative year 2030 (no project) conditions along Lodi Lane, SR 29, and Deer Park Road based on the Napa Valley Transportation Authority (NVTA) model projections and/or Caltrans historical traffic growth.

The following sections outline existing and future conditions with and without the increase in traffic from proposed Ballentine Vineyards Winery project. Where necessary, measures have been recommended to ensure acceptable traffic flow, circulation and parking, and/or fair share mitigation consistent with significance thresholds outlined in the County's Traffic Impact Policies guidelines.

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[1] *Mr. Ahsan Kazmi, P.E., Senior Traffic Engineer, Napa County Public Works, Memorandum, Ballentine Vineyards (P18-00382), October 30, 2018, January 23, 2019.*

[2] *Napa County Planning, Building, and Environmental Services, Use Permit Application (Supplemental Application for Winery Uses, Revised June 11, 2015.*

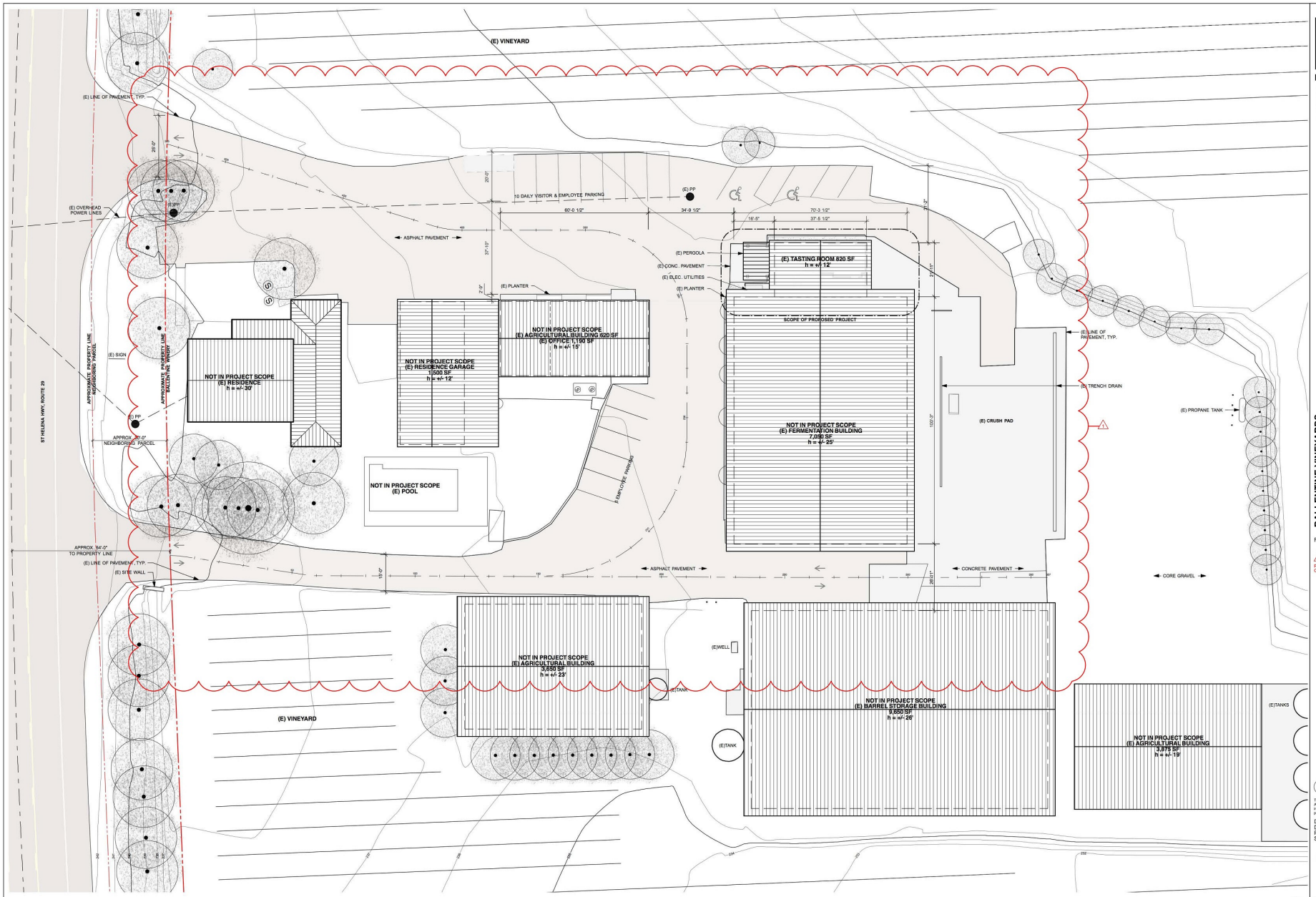
[3] *Napa County Department of Public Works, Traffic Impact Study Policies-Traffic Impact Study (TIS) Required Elements, March 25, 2016, Napa County Circulation Element, 2018 revision.*

GHD

PROJECT VICINITY MAP

North

FIGURE 1.1



EXISTING SITE PLAN
Scale: 1:200 01

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APN 022-200-003

REVISION	DATE
1 PLANNING DEPARTMENT, INITIAL COMPLETENESS LETTER	11.02.18

Date: 02.13.2019
Drawn by: CS
Project No: 1801
Scale: SEE DRAWING

EXISTING SITE PLAN

SHEET NO:
A1.00

GHD

Existing Site Plan Area

North

FIGURE 1.2

2. Existing Conditions

2.1 Proposed Project Site

The proposed Ballentine Vineyards Winery project is located at 2820 St. Helena Highway north of St. Helena in Napa Valley (Napa County). The proposed project would increase current (baseline) winery operations to include modified levels associated with employment, visitation, and production. A brief description of the roadways serving the site is as follows:

2.2 Roadways

St. Helena Highway (SR 29) extends in a primarily north-south direction between Deer Park Road past the project site to Lodi Lane. In the project study area, SR 29 is a two-lane semi-rural highway with 10-foot striped shoulder lanes, two 12-foot travel lanes, and a 12-foot two-way-left-turn-lane (TWLTL) and provides access to agricultural (vineyard) and residential uses. The posted speed limit on SR 29 is 45 mph from St. Helena north to Deer Park Road. North of Deer Park Road, the speed limit increases to 50 MPH extending through Lodi Lane.

Lodi Lane is located approximately 0.4 miles north of the project site and extends in an east-west direction between SR 29 and Silverado Trail. Lodi Lane is a two-lane semi-rural roadway with unimproved shoulders providing access to residential and agricultural areas east of First Avenue with a 45-mph speed limit.

Deer Park Road is located approximately 1,000 feet south of the project site and (like Lodi Lane) extends in an east-west from SR 29 to Silverado Trail. Deer Park Road is two-lane roadway with Class II bike lanes (on-road, striped) that provides access to residential and agricultural areas in the Napa Valley. The posted speed limit is 55 mph on Deer Park Road in the project study area.

2.3 Existing Intersection Volumes

In order to identify existing peak hour operating conditions, existing peak period traffic counts were conducted along SR 29 at the two primary (gateway) intersections north and south and at the project site location and project driveway(s) based on input from Napa County Transportation staff.[4] [5] These three intersection count locations are as follows:

1. Lodi Lane/SR 29 — Stop-control (Lodi Lane)
2. Ballentine Vineyard Driveway(s)/SR 29 — Stop-control (BV Driveways)
3. Deer Park Road/SR 29 — Stop-control (Deer Park Rd.)

Peak period vehicle counts were conducted on a weekday (Friday) late afternoon (3:00-6:00 p.m.) and Saturday afternoon (1:00-4:00 p.m.). The resultant "peak hour" of traffic flow on SR 29 occurs during 3:30-4:30 p.m. (Friday) and 2:00-3:00 p.m. (Saturday). Peak period counts were conducted during the month of January and do not fully reflect peak traffic conditions on SR 29 or adjacent Valley cross-streets. Peak traffic volumes usually occur in the months of August, September, and October. Consequently, existing peak hour count volumes were compared to Caltrans "peak month" historical

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[4] *Ahsan Kazmi, P.E., Senior Traffic Engineer, Comment letter on Ballentine Vineyard Use Modification Project (P18-00382), October 18, 2018.*

[5] *National Data Systems, Weekday (Friday) peak period (4:00-6:00 p.m.) and Weekend (Saturday) peak period (1:00-4:00 p.m.) vehicle turning movement counts at the Hagan Road and North Avenue intersections at Third Avenue, October 25 and 27, 2018.*

data for the most recent calendar year available (2017). Based on peak hour traffic flows (two-way) and daily volumes south of Lodi Lane, SR-29 experiences a peak hour volume of approximately 1,800 vehicles and 19,000 daily vehicles.[6] New peak hour and daily traffic volumes collected on SR-29 at the project driveways indicate a current peak hour two-way volume of 1,431 vehicles and a daily volume of approximately 15,827 vehicles. Caltrans peak month volumes are approximately 20-26% higher than counted volumes at the project driveway and off-site intersections in January. Therefore, peak hour intersection count volumes were increased by the overall average of the peak month/peak hour volumes (23%) to account for summer peak flow volumes on SR-29. Historical Caltrans volumes are not available for Lodi Lane and Deer Park Road. Therefore, new intersection count volumes were increased by the same percentage growth as a conservative measure.

Existing weekday PM peak hour and weekend mid-day peak hour intersection volumes have been shown in Figure 2.1

2.4 Existing Intersection Methodology/Description

Intersection operation is one of the primary factors in evaluating the carrying capacity of a roadway network. Traffic conditions are measured by Level of Service (LOS), which applies a letter ranking to successive levels of intersection performance. LOS 'A' represents optimum conditions with free-flow travel and no congestion. LOS 'F' represents severe congestion with long delays at the approaches. For intersections with minor street stop control, the LOS reflects the delays experienced by the minor street approach. Level of service definitions are shown in Table 2.4-1.

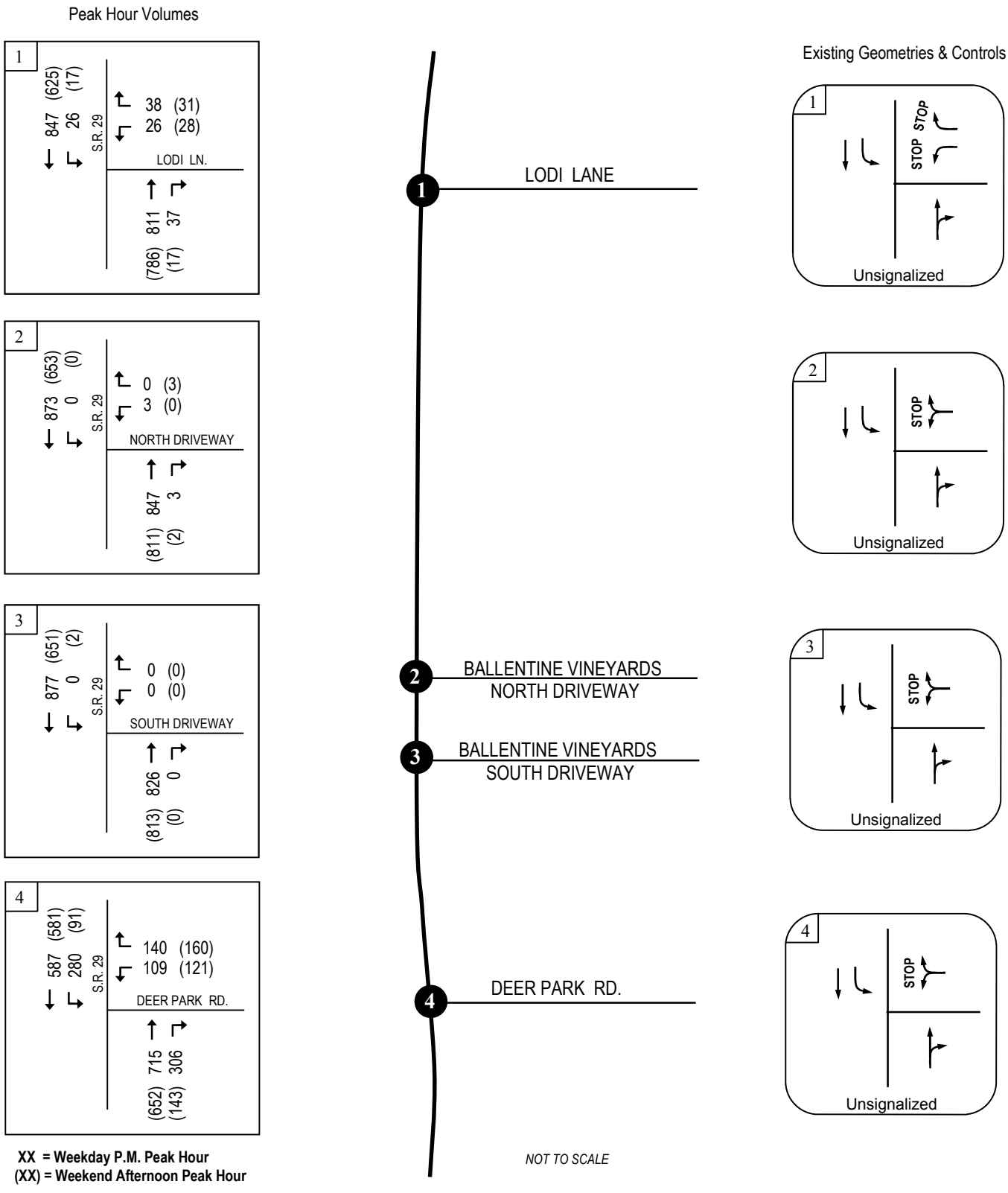
Intersection levels-of-service have been based on the most recent Highway Capacity Manual (*HCM 2010*) operations methodology for unsignalized intersections. In addition, peak hour factors (PHF's) for each intersection approach have been incorporated into all existing and future intersection LOS calculations. The PHF is a measure of the traffic flow rate at each intersection approach. Based on field count data, these PHF's ranged from .75 to .95 dependent on each intersection. Intersection approaches with lower approach volumes typically have lower (and more conservative) PHF's.

The Lodi Lane and Deer Park Road intersections are stop-sign controlled for the westbound minor street approaches at SR-29. The Ballentine Vineyards north and south driveways are also stop-controlled for the minor street (driveway) approaches. A two-way-left-turn-lane (TWLTL) exists on SR-29 starting approximately 120-feet north of the Ballentine Vineyards driveways and extending south past the project driveways all the way to Deer Park Road. A southbound left-turn lane exists on SR-29 at Lodi Lane and has approximately 85-feet of storage capacity.

2.5 Existing Intersection Operations Level-of-Service

Existing weekday PM peak and weekend mid-day peak hour existing (no project) level-of-service has been shown in Table 2.5-1. As calculated, the majority of the project study intersections are operating at LOS C during both the weekday PM peak hour and Saturday mid-day peak hour. **The exception would be the Deer Park Road/SR-29 intersection. At this location, intersection LOS is F for all stop-sign controlled movements from Deer Park Road onto SR-29 during both the weekday PM peak hour and weekend midday peak hour conditions.**

[6] *Caltrans, 2017 Traffic Volumes on California State Highways, Peak hour two-way volumes, SR-29 south of Lodi Lane.*



Existing
Weekday PM and (Weekend) Peak Hour Volumes

North

FIGURE 2.1

Table 2.4-1: Intersection Level of Service Definitions

Level of Service	Type of Flow	Delay	Maneuverability	Stopped Delay/Vehicle (sec)	
				Signalized/ Roundabouts	Unsignalized/ All-Way Stop
A	Stable Flow	Very slight delay. Progression is very favorable, with most vehicles arriving during the green phase not stopping at all.	Turning movements are easily made, and nearly all drivers find freedom of operation.	< 10.0	< 10.0
B	Stable Flow	Good progression and/or short cycle lengths. More vehicles stop than for LOS A, causing higher levels of average delay.	Vehicle platoons are formed. Many drivers begin to feel somewhat restricted within groups of vehicles.	>10.0 and < 20.0	>10.0 and < 15.0
C	Stable Flow	Higher delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant, although many still pass through the intersection without stopping.	Back-ups may develop behind turning vehicles. Most drivers feel somewhat restricted.	>20.0 and < 35.0	>15.0 and < 25.0
D	Approaching Unstable Flow	The influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high volume-to-capacity ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.	Maneuverability is severely limited during short periods due to temporary back-ups.	>35.0 and < 55.0	>25.0 and < 35.0
E	Unstable Flow	Generally considered to be the limit of acceptable delay. Indicative of poor progression, long cycle lengths, and high volume-to-capacity ratios. Individual cycle failures are frequent occurrences.	There are typically long queues of vehicles waiting upstream of the intersection.	>55.0 and < 80.0	>35.0 and < 50.0
F	Forced Flow	Generally considered to be unacceptable to most drivers. Often occurs with over saturation. May also occur at high volume-to-capacity ratios. There are many individual cycle failures. Poor progression and long cycle lengths may also be major contributing factors.	Jammed conditions. Back-ups from other locations restrict or prevent movement. Volumes may vary widely, depending principally on the downstream back-up conditions.	> 80.0	> 50.0

References: 2010 Highway Capacity Manual

Table 2.5-1: Existing (No Project) Intersection Level-of-Service

	Intersection	Control Type	Wkdy. PM LOS/Delay Existing (No Project)	Wknd. Mid-Day LOS/Delay Existing (No Project)
1	Lodi Lane/SR-29	TWSC	C 23.5	C 21.5
2	Ballentine N. Driveway/SR-29	TWSC	C 22.4	C 15.4
3	Ballentine S. Driveway/SR-29	TWSC	C 21.8	A 0.0
3	Deer Park Road/SR-29	TWSC	**F >300**	**F >300**

Based on Highway Capacity Manual (HCM) 2010, Operations methodology for stop-sign controlled (unsignalized) intersections using Synchro-Simtraffic software. Intersection calculation yields an LOS and vehicle delay in seconds. Stated LOS refers to the minor street (stop-sign) controlled movement. MSSC = Minor Street Stop Control

2.6 Existing Peak Hour Roadway Segment Level-of-Service

Peak hour roadway operation has been evaluated consistent with Napa County criteria for arterial level-of-service. Lodi Lane is currently operating at LOS B or better at 64 directional peak hour vehicles (uninterrupted flow highway). SR-29 experiences peak hour directional arterial flow (one-way) of approximately 873 vehicles during the weekday PM peak hour (southbound) and 803 during the Saturday mid-day peak hour (northbound). Based on an undivided Class I arterial over 40 mph this would yield LOS E during both time periods (see Appendices for Peak Hour Roadway LOS Table). It is noted that field observations indicate that during the weekday PM peak hour period southbound traffic flow on SR-29 can vary from free-flow conditions to intermittent periods of slowed or stop-and-go conditions between approximately 4:50-5:30 p.m. (for typical weekday southbound direction traffic flow). For this reason, peak hour arterial conditions reflect a progression of LOS E during this time period. Please note---traffic flow observations for southbound SR-29 may not necessarily coincide with the identified "peak hour" of traffic volumes.

It is noted that traffic observations along State Route 29 were conducted during entire weekday two-hour count period between 4:00-6:00 p.m. with the observer noting the various flows of traffic ranging at times from "free-flow" conditions to intermittent periods of slowed or stop-and-go conditions between "*approximately*" 4:30-5:30 p.m. in the southbound commute direction. As noted, these are observations conducted by the traffic technician and may not always coincide with recorded "peak hour" of traffic. Daily fluctuations in traffic flow are quite common and observed conditions may at times differ from the recorded peak hour due to external factors (accidents, roadway construction, or event traffic).

Deer Park Road experiences peak directional volumes of 586 vehicles (eastbound) during the weekday PM peak hour and 281 vehicles (westbound) during the weekend midday peak hour yielding a roadway LOS of C and LOS B, respectively (uninterrupted flow highway).

2.7 Signal Warrant Evaluation

Based on the California Manual on Uniform Traffic Control Devices (CAMUTCD) peak hour signal warrant criteria, the three unsignalized study intersections of Lodi Lane, Ballentine Winery driveway, and Deer Park road at SR-29 were evaluated for signalization.[7] The peak hour warrant(s) are one of several standards to help determine if installation of a traffic signal is appropriate. Qualifying for signalization using the peak hour warrants does not necessarily mean a signal should be installed. The decision to install a traffic signal should be based on further studies utilizing additional warrants as presented in the California MUTCD. At this time, the Lodi Lane and Ballentine Winery intersections at SR-29 not qualify for signalization under the peak hour warrant (the warrant graphs are provided in the Appendix). It is noted that the minor street volumes at the Ballentine Winery driveways are too low to consider for warrant evaluation (75 vehicles minor-street minimum volume required). However, the intersection of Deer Park Road/SR-29 would exceed the minimum volumes for peak hour signalization during both the weekday PM peak hour and weekend midday peak hour.

2.8 Pedestrian-Bicycle

As noted, pedestrian-bicycle facilities in the project study area are limited to Deer Park Road south of the project site with Class II bike lanes on both sides of the street. Given the rural nature of the area along SR-29, Lodi Lane, and Deer Park Road and relatively high vehicle speeds along the roadways; bicycle traffic is light. The Napa County Bicycle Plan indicates that SR-29 is a primary Class II bike route and is proposed Class II bike lanes as part the proposed Vine Trail Alignment extending north-south through the Valley.[8]

2.9 Collision History

A collision history for the study area was conducted to determine any trends or patterns that may indicate a safety issue. Collision rates are calculated based on records provided by the California Highway Patrol as published in their Statewide Integrated Traffic Records System (SWITRS) reports. The most current five (5) year period available is January 1, 2013 through December 31, 2017.

Collision rates for the Lodi Lane/SR-29 and Deer Park Road/SR-29 study intersections are shown in Table 2.9-1. In addition, the SR-29 segment between Lodi Lane and Deer Park Road has been evaluated for collision activity in the project driveway area. The calculated collision rates for the study locations were compared to the average collision rates for similar facilities statewide, as indicated in *2014 Collision Data on California State Highways* (Caltrans).

The calculated collision rate for the Lodi Lane/SR-29 is lower than the statewide average for similar facilities, indicating the intersection is generally operating safely. The majority of collisions at this intersection represent hitting fixed objects and/or rear-end accidents and total four collisions over a five-year period. The Deer Park Road/SR-29 intersection has experienced six collisions over a five-year period. Unlike vehicle collisions at the Lodi Lane/SR-29, collisions the Deer Park Road/SR-29 primarily involve “broadside” (4), “side-swipe” (1), or “fixed-object” crashes (1). These types of collisions are likely due to the relatively high speeds on SR-29 combined with stop-sign controlled motorists from Deer Park Road attempting to merge onto SR-29 with very small “gaps” in through-traffic. Even with

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[7] *California Manual on Uniform Traffic Control Devices (CAMUTCD), Chapter 4C, Peak hour signal warrant (#3), 2016.*

[8] *Napa County Bicycle Plan, Napa County Transportation & Planning Agency, January 2012.*

Table 2.9-1: Existing Collision Rates at Study Intersections & Roadway Segments

Study Intersection/Segment	Number of Collisions (2013-2017)	Calculated Collision Rate (c/mve)	Statewide Average Collision Rate (c/mve)
1. Lodi Lane./SR-29	4	0.10	0.23
3. Deer Park Road/SR-29	6	0.13	0.23
SR-29: Lodi Ln. to Deer Park Rd.	4	0.12	0.82

Source: California Highway Patrol, Statewide Integrated Traffic Records System (SWITRS), January 1, 2013—December 31, 2017.

Collision rates calculated based on c/mve or collisions per million vehicles entering.

these collisions, the Deer Park Road/SR-29 intersection collision rate is well below the statewide average for these facilities at 0.13 (statewide average is 0,23). Finally, the roadway segment of SR-29 between Lodi Land and Deer Park Road has a collision rate of 0.12 over the five-year period compared to a statewide average of 0.82 for the same facility. The total number of collisions (4) during the five-year period involve "sideswipes," "fixed objects," and "rear-end," accidents.

3. Near-Term Year 2021 (No Project) Conditions

3.1 Near-Term (Year 2021) Methodology

Future traffic conditions represent the next two years of potential traffic growth in the area and would include all approved projects situated in the Lodi Lane, Deer Park Road, and/or SR-29 study area. Based on discussions with Napa County Engineering staff, year 2021 near-term conditions have been based on historical Caltrans volume data for the last three full calendar years.[9] Based on historical average daily traffic data that includes peak hour two-way volumes, volumes on SR-29 have increased by 12.5% in the last three years or 4.2% per year. No historical volume data is available for Lodi Lane or Deer Park Road in the immediate project study area. Therefore, the same conservative yearly growth rate was applied for a two-year period to the highway and cross-roads to account for near-term (no project) conditions.

In addition to historical Caltrans volume growth projections, local approved projects in the immediate study area have been researched for overall traffic growth in the immediate study area at the request of Napa County Public Works staff. Based on research conducted by the Napa County Planning Department there are no short-term approved projects in the current study area that would add traffic volumes to adjacent roadways.[10]

Near-Term Year 2021 (No Project) AM and PM peak hour intersection volumes have been shown in Figure 3.

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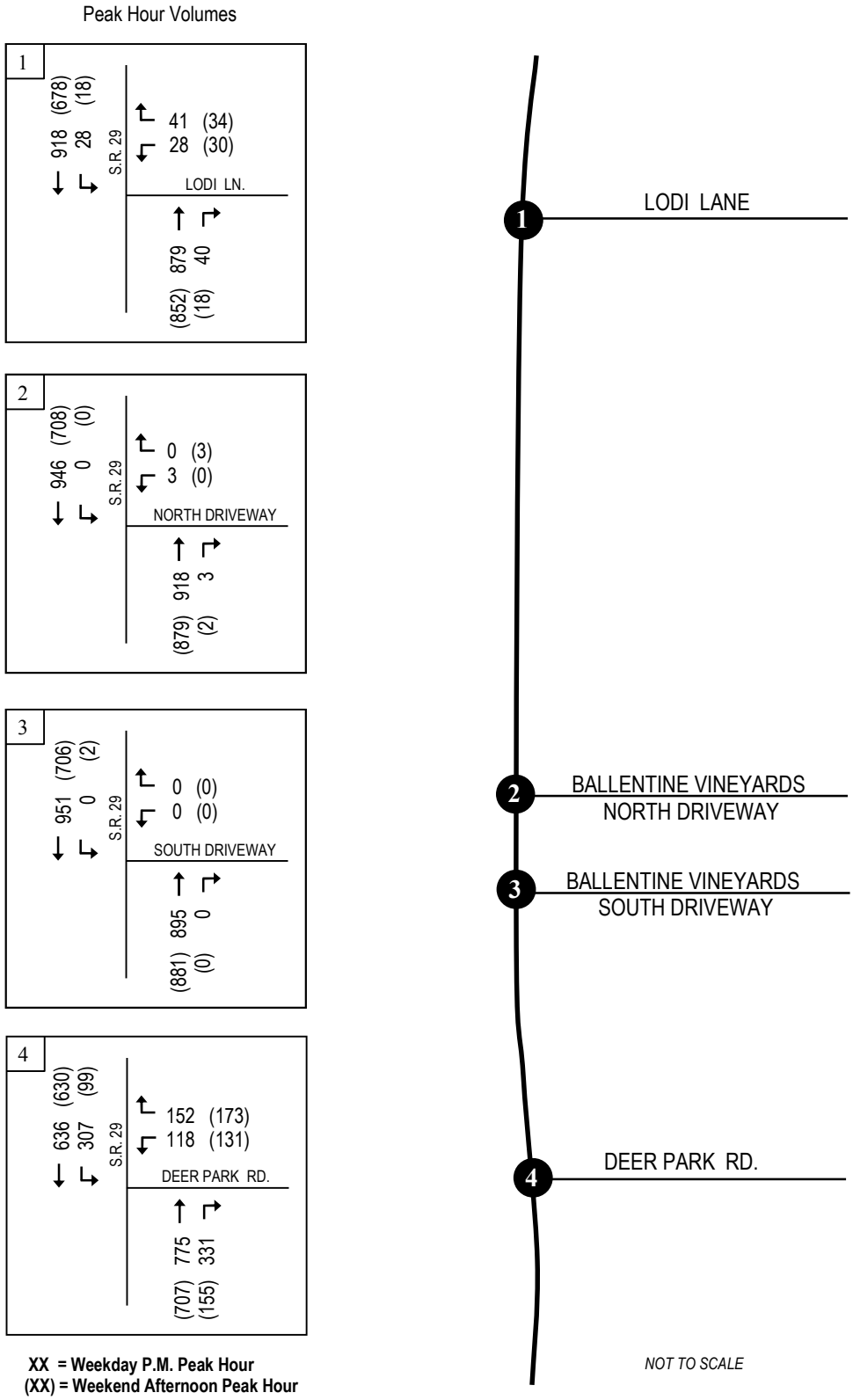
[9] *Caltrans, Traffic Volumes on California State Highways, State Route 29, 2015, 2016, 2017.*

[10] *Mr. Jason Hade, Associate Planner, County of Napa, Personal communication related to Napa County development projects in the Lodi Lane, Deer Park Road, and SR-29 segment at Ballentine Vineyards Winery, April 23, 2019.*



Near Term
Weekday PM and (Weekend) Peak Hour Volumes

North

FIGURE 3.1

3.2 Near-Term (Year 2021) Intersection Operation

Existing weekday PM peak and weekend mid-day peak hour near-term year 2021 (no project) level-of-service has been shown in Table 3.2-1. As calculated, Deer Park Road/SR-29 intersection would continue to operate at LOS F during the weekday PM peak hour and LOS F and weekend mid-day peak hour. Stated intersection LOS refer to the stop-sign controlled movements from Deer Park Road. The remaining intersections of Lodi Lane and the Ballentine Winery driveways at SR-29 would operate at acceptable levels (LOS D or better) during both the weekday PM peak hour and weekend (Saturday) mid-day peak hour under near-term year 2021 (no project) conditions.

Table 3.2-1 Near-Term Year 2021 (No Project) Conditions: Intersection Level-of-Service Weekday PM Peak and Weekend Midday Peak Hour

Intersection	Control Type	Wkdy. PM LOS/Delay Year 2021 (No Project)	Wknd. Mid-Day LOS/Delay Year 2021 (No Project)
1 Lodi Lane/SR-29	MSSC	D 27.2	C 24.5
2 Ballentine N. Driveway/SR-29	MSSC	C 24.4	C 16.5
3 Ballentine S. Driveway/SR-29	MSSC	C 23.7	C 20.5
3 Deer Park Road/SR-29	MSSC	**F >300**	**F >300**

(1) Based on Highway Capacity Manual (HCM) 2016, Operations methodology for stop-sign controlled (unsignalized) intersections using Synchro-Simtraffic software. Intersection calculation yields an LOS and vehicle delay in seconds. Stated LOS refers to the minor street (stop-sign) controlled movement. MSSC = Minor Street Stop Control

3.3 Near-Term Year 2021 (No Project) Arterial Operation

Peak hour roadway operation has been evaluated near-term year 2021 (no project) conditions for arterial level-of-service. Lodi Lane will continue to operate at LOS B or better at 69 directional peak hour vehicles. SR-29 will experience peak hour directional arterial flow (one-way) of approximately 951 vehicles during the weekday PM peak hour (southbound) and 881 during the Saturday mid-day peak hour (northbound). Based on an undivided Class I arterial over 40 mph this would yield LOS E during both time periods. Finally, Deer Park Road would experience volumes of 635 vehicles (eastbound) during the weekday PM peak hour and 304 vehicles (westbound) on a Saturday midday peak hour representing LOS C and LOS B, respectively.

3.4 Signal Warrant

Under near-term year 2021 (no project) conditions, the Lodi Lane and Ballentine Winery intersections at SR-29 would not qualify for signalization under the peak hour warrant (the warrant graphs are provided in the Appendix). However, the intersection of Deer Park Road/SR-29 would continue to exceed the minimum volumes for peak hour signalization during both the weekday PM peak hour and weekend midday peak hour.

4. Napa County Significance Criteria

The County of Napa's significance criteria has been based on a review of the Napa Valley Transportation Authority and Napa County General Plan documentation on roadway and

intersection operations. In addition, updated criteria for unsignalized intersections and arterial segments has been based on adopted criteria in the County's Traffic Impact Study Policies (Required Elements). Specifically, the Circulation Element of the County's General Plan and updated guidelines for significance criteria outline the following significance criteria specific to intersection operation:

- The County shall seek to maintain a Level of Service D or better at all intersections, except where the level of service already exceeds this standard (i.e. Level of Service E or F) and where increased intersection capacity is not feasible without substantial additional right-of-way;
- No single level of service standard is appropriate for un-signalized intersections, which shall be evaluated on a case-by-case basis to determine if signal warrants are met;
- 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, the peak hour signal warrant criteria should also be evaluated and presented for informational purposes; or
- Under Existing Conditions, an unsignalized intersection or roadway segment operates at LOS E or F during the selected peak hours without Project trips, and the project contributes one percent or more of the total entering traffic to that intersection/facility;
- Under Near-Term or Cumulative Conditions, an unsignalized intersection or roadway segment operates at LOS E or F during the selected peak hours without Project trips, and the project contributes five percent or more of the total traffic growth to that intersection/facility.

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

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

5. Proposed Project Impacts

5.1 Project Description

The proposed Ballentine Vineyards Use Modification project would consist of modest increases in winery production, employment, visitation, and marketing events compared to existing permitted operations. The project site is located at 2820 St. Helena Highway with access east into the winery grounds via two project driveways (see Figure 5.1—Proposed Project Site Plan). Based on discussions with the project applicant and most recent project Use Permit Modification submitted to the County; existing (permitted) and proposed are listed as follows:[11]

Project Components:	Existing (Permitted)	Proposed
• Winery Production (gallons)	50,000	125,000
• Employment (full-time, part-time)	5 F-T	12 F-T, 3 P-T
• Visitation (daily maximum)	10 (weekly not daily)	95 (Sat-Sun)
• Marketing Events (per month)	2 (5 attendees max)	9 (50 guests max)

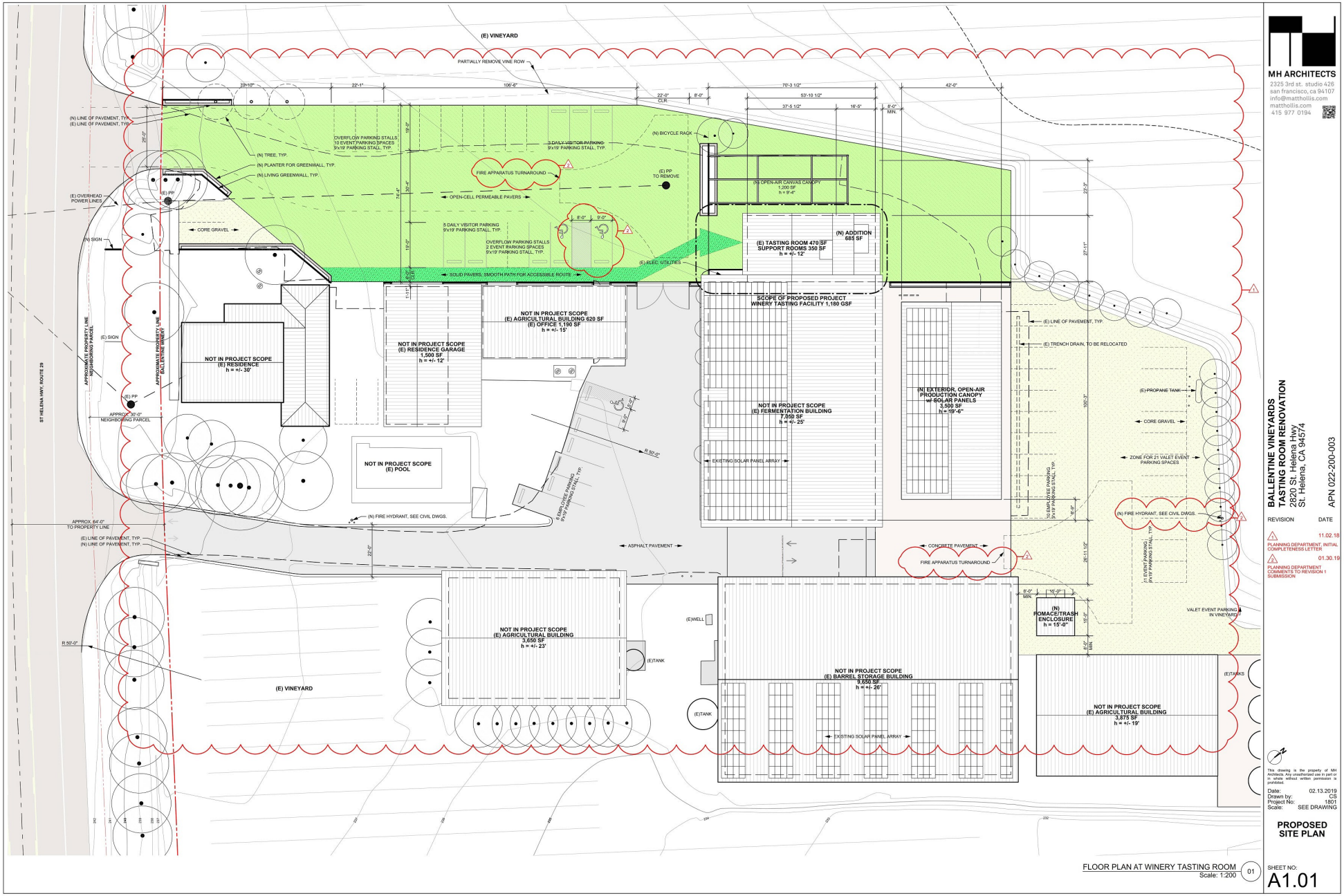
As shown above under the project components, the use modification proposes to increase annual winery production from 50,000 gallons to 125,000 gallons. Concerning employment, the project would increase existing employment from 5 full-time employees on the weekdays to 12 full-time and 3 part-time employees. During the weekends, there would be increase from 2 full-time and 1 part-time employee to 4 full-time and 2 part-time employees. Visitation is proposed to increase from 10 visitors per week to 95 visitors per day (maximum-weekend). The project would average 63 visitors during the weekdays. Finally, there would be an increase from 2 annual marketing events per year to 13 events per year. The highest attended marketing event would include 100 guests.

5.2 Project Trip Generation

Estimated daily, weekend PM peak hour, and Saturday midday peak hour project trip generation has been shown in Table 5.2-1. Proposed project trip generation has been based on the County of Napa's Winery Traffic/Trip Generation Sheet which contains daily and peak hour vehicle occupancy and trip generation ratios for associated winery activities. These include employment, visitation, and gallons of production for typical weekday and weekend activities (see Appendices—Napa County Winery Trip Generation Sheets). The calculations also quantify the expected truck trips associated with winery production (fruit, bottling, deliveries, etc.). However, there is no guidance for peak hour inbound/outbound vehicle flow. For this reason, a vehicle split of 25% inbound and 75% outbound has been used during the weekday PM peak hour. During the Saturday midday peak hour, a vehicle split of 50% inbound and 50% outbound has been applied. These weekday and Saturday peak hour vehicle splits are consistent with previous winery traffic analyses conducted in Napa County and observed driveway counts at other wineries. Typically, most wineries are closing between the 4:00-6:00 p.m. period during the weekday PM peak with employees and visitors outbound from the site. During the Saturday midday peak hour most employees remain on-site with primarily visitors coming/going from the site.

As shown in Table 5.2-1, the proposed project as modified would be expected to generate 93 daily trips, with 33 weekday PM peak hour trips and 44 Saturday midday peak hour trips. Accounting for permitted uses, the proposed project would be expected to generate 74 net new daily trips with 26 net new weekday PM peak hour and 39 net new Saturday midday peak hour trips. It is noted that few (if any) permitted winery trips were counted at the project driveway during data collection efforts

[11] *Napa County Conservation, Development, and Planning Department, Ballentine Vineyards Winery Use Modification, February 22, 2019.*



FLOOR PLAN AT WINERY TASTING ROOM
Scale: 1:200 (01)

SHEET NO: A1.01

MH ARCHITECTS
2325 3rd st. studio 426
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BALLENTINE VINEYARDS
TASTING ROOM RENOVATION
2820 St. Helena Hwy
St. Helena, CA 94574
APN 022-200-003

REVISION	DATE
1 PLANNING DEPARTMENT, INITIAL COMPLETENESS LETTER	11.02.18
2 PLANNING DEPARTMENT COMMENTS TO REVISION 1 SUBMISSION	01.30.19

Date: 02.13.2019
Drawn by: CS
Project No: 1801
Scale: SEE DRAWING

PROPOSED SITE PLAN

GHD

Proposed Project Site Plan Area

North

FIGURE 5.1

Table 5.2-1 Proposed Project Trip Generation

Land Use	Units	Daily		Weekday PM Peak			Weekend MD Peak		
	Wkdy/Wknd	Wkdy Trips	Wknd Trips	Trips	In	Out	Trips	In	Out
Permitted Winery Use (Ballentine Vineyards)									
F-T Winery Employees	5 / 2	15	6	5	0	5	2	1	1
P-T Winery Employees	0 / 1	0	2	0	0	0	1	1	0
Visitors	4 / 6	3	4	2	1	1	2	1	1
Trucks		1	0						
Total Permitted Winery Trips		19	12	7	1	6	5	3	2
Proposed Winery Use (Ballentine Vineyards)									
F-T Winery Employees	12 / 4	37	12	12	2	10	4	2	2
P-T Winery Employees	3 / 2	6	4	2	1	1	1	0	1
Visitors	63 / 95	48	68	19	5	14	39	19	20
Trucks		2	0						
Total Proposed Winery Trips		93	84	33	8	25	44	21	23
Net Added Project Trips		**74**	**72**	**26**	**7**	**19**	**39**	**18**	**21**

Source: Balletine Winery Use Permit Application (P18-00382), Napa County Conservation, Development, and Planning Department, Existing/Proposed Winery Traffic Information/Trip Generation Sheets, April 26, 2019

for the proposed winery. Therefore, all new proposed project trips were added to the street network to ensure a conservative analysis of project impacts.

5.3 Project Trip Assignment

Proposed project trip distribution has been based on the location of the project site and existing traffic flows in the immediate study area. SR-29 (Main Street) serves as the primary access roadway to/from the project site. Using vehicle count data at the proposed project driveway at Third Avenue, project trip assignments for the weekday PM peak hour and Saturday midday peak hour would be as follows:

SR-29 to/from the north: 40%
SR-29 to/from the south: 60%

For project trips coming to/from the north on SR-29, 5% would be to/from Lodi Lane with the remaining 35% remaining on SR-29. For project trips coming to/from the south, 15% would be to/from Deer Park Road with the remaining 45% remaining on SR-29.

Weekday PM peak hour and Saturday midday peak hour project trips (only) are shown in Figure 5.3-1. Existing plus project weekday PM peak hour and Saturday midday peak hour intersection

volumes are shown in Figure 5.3-2. Near-term plus project weekday PM peak hour and Saturday midday peak hour intersection volumes are shown in Figure 5.3-3.

5.4 Existing plus Project Intersection Operations Level-of-Service

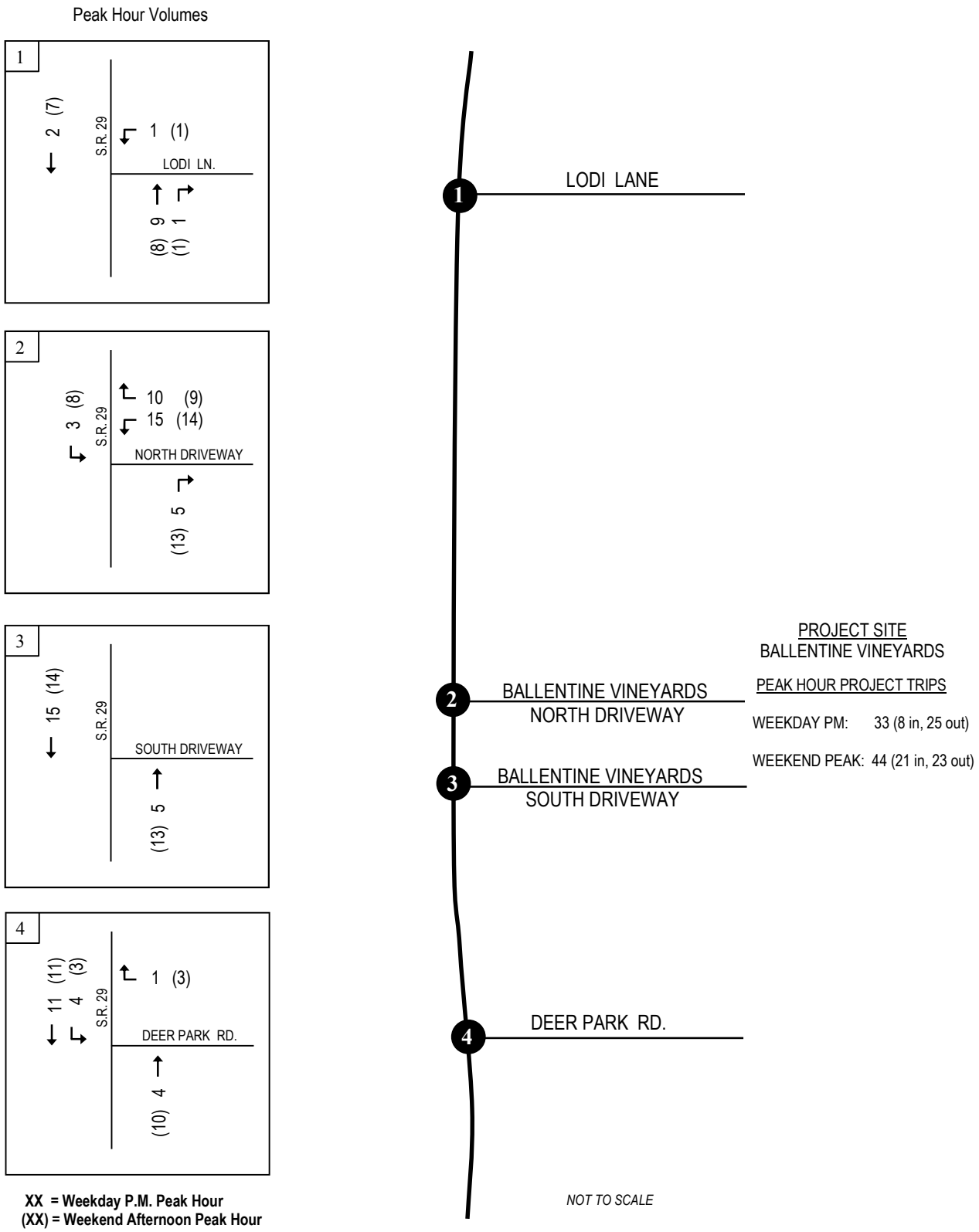
Existing plus Project weekday PM peak and weekend mid-day peak hour existing level-of-service has been shown in Table 5.4-1. The Deer Park Road/SR-29 intersection would continue to operate at LOS F during both the weekday PM and weekend mid-day peak hours with proposed project traffic. The remaining study intersections of Lodi Lane/SR-29 and Ballentine North and South Driveways/SR-29 Road would continue to operate acceptable levels (LOS D or better) during the same peak time periods.

Based on updated County significance criteria for unsignalized intersections the intersection of Deer Park Road/SR-29 has been evaluated for proposed project impacts since the LOS operates at an unacceptable level (LOS F) without proposed project trips during the weekday PM peak hour and weekend midday peak hour. County criteria indicate that a significant impact could be found if the proposed project contributes 1% or more of the total traffic at the intersection. The guidelines go on to state "the peak hour signal warrant criteria should also be evaluated and presented for informational purposes." During the weekday PM peak hour, the proposed project would add 20 trips to the intersection. During the weekend midday peak hour, the project would add 27 trips to the intersection. Based on existing peak hour volumes of 2,137 and 1,748 at the intersection during these PM and midday peak hours; proposed project contribution would be less than one percent (1%) during the Friday PM peak hour**. However, during the weekend (Saturday) midday peak hour the proposed project's contribution would total 1.5%**. Under the County significance criteria, this would be considered a significant impact. The Deer Park Road/SR-29 intersection would continue to meet the peak hour signal warrant with or without proposed project. In response, the following mitigation measure is recommend to improve operations at the Deer Park Road/SR-29 intersection:

Table 5.4-1: Existing and Near-Term Year 2021 with Project Conditions Intersection Level-of-Service

	Intersection	Control Type	Wkdy. PM LOS/Delay		Wknd. Mid-Day LOS/Delay	
			Existing (No Project)	Existing (W/ Project)	Existing (No Project)	Existing (W/ Project)
1	Lodi Lane/SR-29	MSSC	C 23.5	C 24.0	C 21.5	C 22.0
2	Ballentine N. Driveway/SR-29	MSSC	C 22.4	C 21.7	C 15.4	C 19.0
3	Ballentine S. Driveway/SR-29	MSSC	C 21.8	C 22.0	A 0.0	A 0.0
4	Deer Park Road/SR-29	MSSC	**F > 300**	**F >300**	**F >300**	**F >300**
	Intersection	**Control Type**	**Wkdy. PM LOS/Delay**		**Wknd. Mid-Day LOS/Delay**	
			N-T Yr. 2021 (No Project)	**N-T Yr. 2021 (W/ Project)**	**N-T Yr. 2021 (No Project)**	**N-T Yr. 2021 (W/ Project)**
1	Lodi Lane/SR-29	MSSC	D 27.2	D 27.9	C 24.5	C 24.9
2	Ballentine N. Driveway/SR-29	MSSC	C 24.4	C 23.8	C 16.5.	C 20.6
3	Ballentine S. Driveway/SR-29	MSSC	C 23.7	C 24.0	C 20.5	C 20.8
4	Deer Park Road/SR-29	MSSC	**F >300**	**F > 300**	**F > 300**	**F > 300**

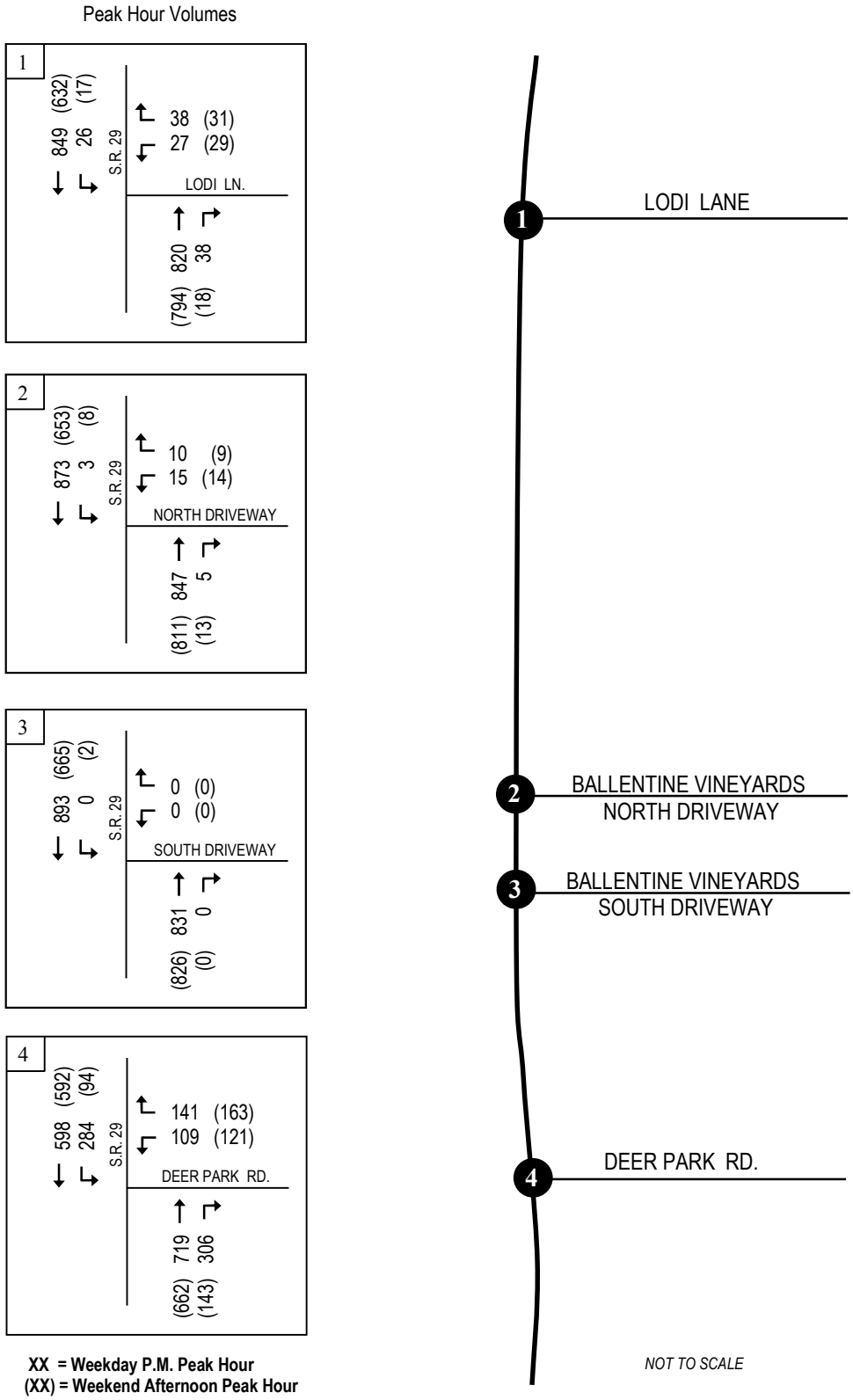
(1) Based on Highway Capacity Manual (HCM) 2010, Operations methodology for stop-sign controlled (unsignalized) intersections using Synchro-Simtraffic software. Intersection calculation yields an LOS and vehicle delay in seconds. Stated LOS refers to the minor street (stop-sign) controlled movement. MSSC = Minor Street Stop Control



Project Trips
Weekday PM and (Weekend) Peak Hour

North

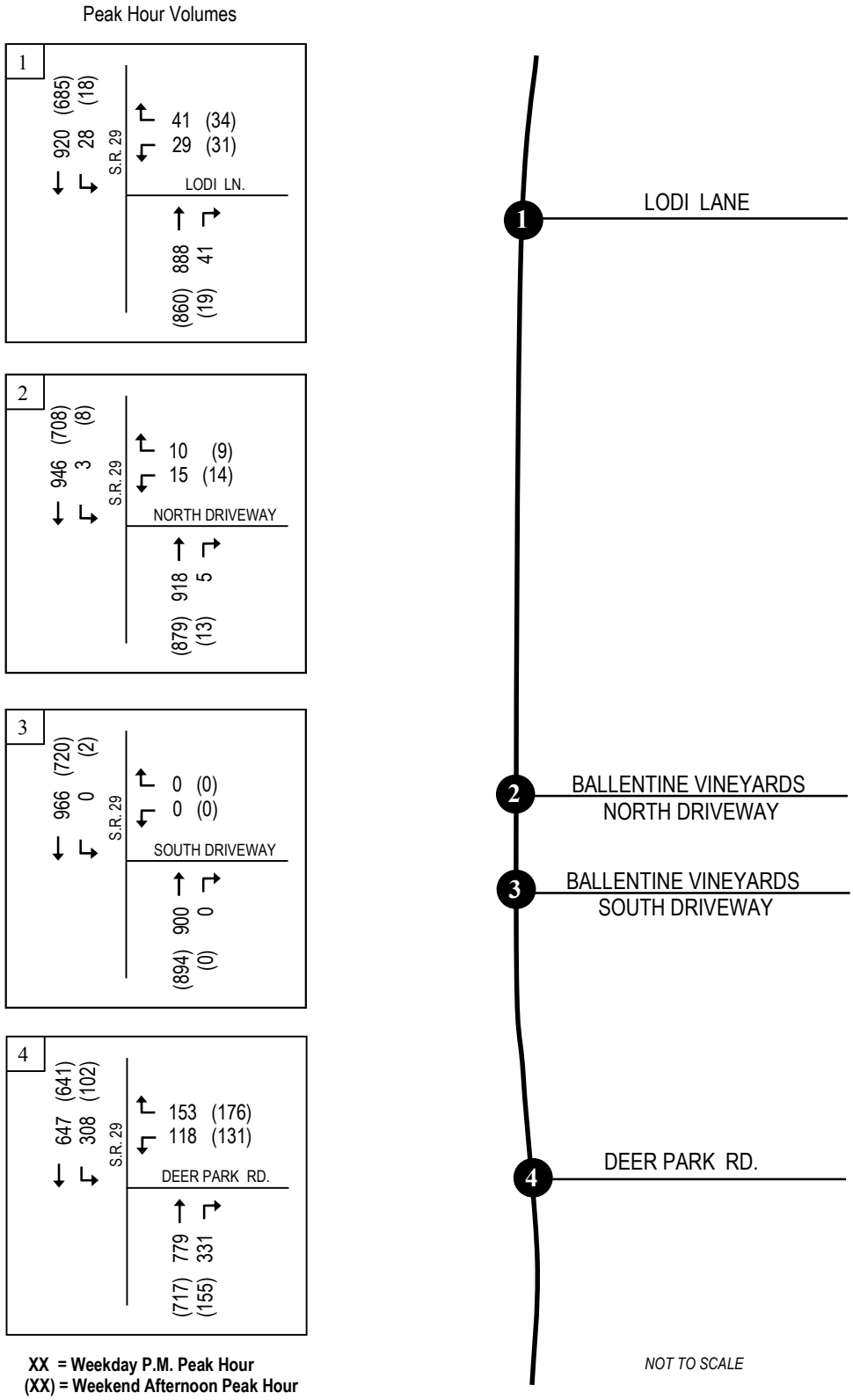
FIGURE 5.2



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

North

FIGURE 5.3



Near Term Plus Project
Weekday PM and (Weekend) Peak Hour Volumes

FIGURE 5.4

- At the Deer Park Road/SR-29 intersection, it is recommended that a signal be installed to allow the intersection to operate at acceptable levels during the weekday PM peak hour and weekend (Saturday) midday peak hour time periods. Under Existing plus Project conditions, the Deer Park Road/SR-29 intersection would operate at LOS D (54.7 seconds) during the weekday PM peak hour. During the weekend (Saturday) midday peak hour the intersection would operate at LOS B (16.6 seconds). In addition, it is recommended pursuant to policy CIR-19 of the Circulation Element that the proposed project contributes a "fair share" mitigation fee of 1.5% based on its total contribution to peak hour traffic volumes at the intersection. Installation of signal at the Deer Park Road/SR-29 would reduce overall project impacts to **less-than-significant** levels.
- An alternative mitigation measure to installing a traffic signal at the intersection of Deer Park Road/SR-29 would be to reduce proposed project Saturday midday peak hour project trips during this time period. Based on the Napa County midday peak hour ratio of 57% for visitation, the project would currently generate 39 peak hour visitor trips with the proposed daily total of 95 guests. Peak hour visitor trips would have to be reduced to 21 midday peak hour trips (representing 50 daily visitors) during the peak midday hour to reduce project impacts to less-than-significant at the Deer Park Road/SR-29 intersection. Discussions with County Traffic Engineering staff indicate that the County ratio of 57% for the midday peak hour is highly conservative given the overall winery visitation patterns and actual winery count data.

  Based on recent winery visitation data for consecutive Saturday midday peak hour periods, the Ballentine Vineyards experiences approximately 28% of their total Saturday visitation during this time period.[12] Using actual winery visitation rates for Saturday midday peak hour, the winery would generate 24 midday peak hour trips and proposed project impacts would be reduced to **less-than-significant** at the Deer Park Road/SR-29 intersection (see Appendices). In addition, recent discussions with the project applicant indicate that there are no production staff on-site during the Saturday mid-day peak hour and all administrative staff do not leave the winery until after 5:00 pm. (This would eliminate 5 midday peak hour trips). Therefore, it is recommended that winery visitation be limited to or remain consistent with their 28% midday peak hour ratio of the Saturday daily total of 68 visitor trips (or 24 midday total peak hour trips). Guests can be re-allocated to other time slots during the weekend hours.

5.5 Existing plus Project Roadway Segment Operation

With proposed project volumes, Lodi Lane would continue to operate at LOS B or better at 65 directional peak hour vehicles (uninterrupted flow highway). As noted, SR-29 experiences a peak hour directional arterial flow (one-way) of approximately 873 vehicles during the weekday PM peak hour (southbound) and 813 during the Saturday mid-day peak hour (northbound). With proposed project traffic, these directional volumes would increase to 888 vehicles (southbound) and 826 vehicles (northbound). Based on an undivided Class I arterial over 40 mph this would yield LOS E during both time periods (see Appendices for Peak Hour Roadway LOS Table). Deer Park Road would experience peak directional volumes of 590 vehicles (eastbound) during the weekday PM peak hour and 284 vehicles (westbound) during the weekend midday peak hour with proposed project traffic yielding a roadway LOS of C and LOS B, respectively (uninterrupted flow highway).

The addition of proposed project trips to directional peak hour volumes on SR-29 would represent a significant impact based on the project adding more than one percent to the

[12] Ballentine Vineyards Winery, Hourly visitation levels by group appointment, June 22 – July 10, 2019.

overall directional volumes. During the weekday PM peak hour project trips would represent 1.6% of directional southbound volumes and 1.5 % of directional northbound volumes.

- It is recommended that the Ballentine Vineyards Winery institute a “flex-time” schedule for employees to reduce vehicle trips to/from the winery during the weekday PM peak hour and weekend (Saturday) midday peak hours as part of an overall TDM plan. (As noted, production staff are not working on Saturdays). An overall reduction in seven (7) weekday PM peak hour and five (5) weekend midday peak hour project trips would reduce overall project impacts to roadway segment operations to **less-than-significant** levels. As noted under recommended project mitigation for the Deer Park Road/SR-29 intersection (above), the project’s actual peak hour ratios for the both the Friday PM peak hour (10-15%) and Saturday midday peak hour (28%) are lower than Napa County peak hour ratios used to calculated the project trip generation. The reduction in peak hour project trip generation from these actual winery hourly ratios would be enough to mitigate project impacts to **less-than-significant** levels.

5.6 Near-Term plus Project Intersection Operations

Near-term plus project conditions for intersection operations have been shown in Table 5.4-1. As with existing plus project conditions, the project study intersections at Lodi Lane and the Ballentine North and South Driveways would continue to operate at acceptable levels (LOS D or better). The Deer Park Road/SR-29 intersection would continue to operate at LOS F during both the weekday PM peak hour and weekend (Saturday) midday peak hour. Therefore, it is recommended that the same suggested mitigation for the Deer Park Road/SR-29 intersection (signalization) as in existing plus project conditions be applied to the location.

5.7 Near-Term plus Project Roadway Segment Operation

Under near-term plus project conditions, all directional roadway segments would continue to operate acceptably along Lodi Lane and Deer Park Road. However, as under existing plus project conditions the directional segments of SR-29 would continue to operate unacceptably (LOS E) with proposed project traffic. Therefore, it is recommended that the same suggested mitigation for the Ballentine Vineyards (employee flex-time) as recommended for existing plus project conditions be applied.

5.8 Signal Warrant Evaluation

Peak hour signal warrant satisfaction was evaluated for both existing plus project and near-term plus project conditions for all project study intersections. Under these “with project” conditions, the Lodi Lane/SR-29 and Ballentine Driveways (north and south) at SR-29 would not qualify for signalization under the “peak hour” warrant. As noted previously, the Deer Park Road/SR-29 would meet the peak hour warrant with existing traffic volumes and this would continue under existing plus project and near-term plus project conditions(see Appendices—Signal Warrant Sheets).

6. Site Access/Design Parameters

6.1 Sight Distance

Vehicle sight distance at the existing Ballentine Vineyards driveways (north and south) intersections were evaluated. The required vehicle visibility or "corner sight distance" is a function of travel speeds on SR-29. Caltrans design standards indicate that for appropriate corner sight distance, "a substantially clear line of sight should be maintained between the driver of a vehicle waiting at the cross road and the driver of an approaching vehicle in the right lane of the main highway". Caltrans design guidelines

also indicate that the minimum corner sight distance “shall be equal to the stopping sight distance” where possible.

The posted vehicle speed limit on SR-29 is 50 mph in the project area. The "critical" vehicle speed (the speed at which 85% of all surveyed vehicles travel at or below) along SR-29 has been conservatively estimated at 55-60 mph at the project driveways. Caltrans’ design standards indicate that these vehicle speeds require a stopping sight distance of 580 feet both north and south of the driveways measured along the travel lanes of SR-29.[13] Based on field measurements, sight distance from the Ballentine Vineyards north and south driveways exceeds 580 feet (at least 700 feet in each direction). **Therefore, the sight distance recommendations would be met for the speed limit and observed vehicle speeds.**

6.2 Project Access/Circulation

6.2.1 Access

The proposed Ballentine Winery Use Modification project would involve a re-design of the existing site plan to allow improved site circulation, increased parking, emergency vehicle enhancements to access/turnaround areas, and dedicated pedestrian/bicycle facilities for safety and storage. Currently, vehicle and truck access to the proposed Ballentine Vineyards Winery is gained by two existing driveways (north and south) extending east from SR-29 into the winery grounds (see Figure 5.1—Proposed Project Site Plan). Vehicle and truck access would continue from the two site driveways but would be modified to better serve guests and site circulation. The northern entry driveway and aisle would be enlarged to serve all visitors and guests. This driveway would be 25-feet wide upon initial entry and expand to 74-feet to provide areas for vehicle parking and ADA spaces, dedicated pedestrian paths, and emergency vehicle turnaround.

The southern Ballentine Winery driveway is located approximately 175-feet south of the northern driveway on SR 29 and would be used primarily for existing residential use, employees and truck access. The driveway extends east from SR 29 for approximately 200 feet with a 22-foot width (minimum County standard). At this juncture, the driveway has internal drive aisle extensions that continue north and further east. The northern drive aisle extension provides access to employee parking spaces and would also continue through an internal gated access to connect with the northerly Ballentine Driveway to complete a circular loop-access through the property. Continuing from SR 29, the southern driveway extends east between the existing fermentation and barrel storage buildings to the eastern-most portion of the project site. In this area, an additional parking field would be created to accommodate 21 parking spaces (valet event parking spaces) directly behind the open air production canopy and north of the agricultural building. There would also be a trash enclosure immediately east of the barrel storage building not in the direct line of vehicle traffic and/or parking access.

Based on intersection LOS calculations for the Ballentine Winery north and south driveways at State Route 29, vehicle queuing at the driveways would not be significant.

[13] *Caltrans, Highway Design Manual, Table 405.1A, Corner (Stopping) Sight Distance, March 7, 2014.*

6.2.2 Parking

Vehicle parking for daily operations would be provided by a combination of designated visitor and employee parking spaces accessible via the north or south driveways. Upon entering the northern driveway, visitors and guests would be able to park in three (3) standard parking spaces along the north-east area of the drive aisle and/or in five (5) parking spaces that would front the agricultural building office on the south side of the drive aisle. Two of the five parking spaces on the south side of the drive aisle would be ADA compatible. In addition to the standard and ADA parking spaces, there would 12 over-flow parking spaces (10 spaces along the north side and 2 spaces along the south side) to accommodate additional visitor demand or special event parking. Employee parking would be accessed from the south driveway (or through the internal gate via the north driveway) and would be located along the rear or southern edge of the agricultural-office building and west of the fermentation building. A total of six (6) standard parking spaces would be provided for employees including one (1) ADA compatible parking space. As noted, additional on-site parking spaces are available in the far eastern portion of the project site behind the open air production canopy. While not permanent parking spaces (paved, striped, bumper-stop), the 21 spaces would be available for increased parking demand due to special event activities.

6.2.3 Emergency Access

Emergency vehicle access would be gained from either the north or south Ballentine Winery driveways with adequate “standard hammerhead turnarounds” designed at the eastern terminus of each driveway within 50-feet of buildings for Napa County fire engines (see below).

6.2.4 Design Standards

Design of driveway access for truck turning radii, parking spaces, and emergency vehicle access have been reviewed based on the Napa County Road and Street Standards.[14] With regard to driveway access, the County requires a design radii of R20” for driveway/common drive connection to arterial roads. Both the north and south Ballentine Winery driveways would be designed for minimum R20 radius to accommodate truck turning radii from SR 29 (See Figure 6.2—Truck Turning Templates). All standard on-site parking spaces are designed to County standards of 9’x19’ with drive aisles in excess of 25-feet. ADA compliant parking spaces (three) are in excess of what the County would require based on the total number of parking spaces being provided on the project site. Finally, emergency vehicle access and turnarounds (standard hammerhead turnarounds) have been designed to meet the County minimum design requirements of 60 feet in width with R40 turning radius.

6.2.5 Pedestrian/Bicycle Circulation

Pedestrian and bicycle circulation would occur primarily in the northern half of the project site where daily visitor parking spaces and bicycle facilities are located associated with access through the primary north driveway entrance. A new dedicated solid-paver path would be constructed between the existing residence on the west side of the site and new tasting room/support rooms on the far eastern end of the site. The path would be constructed in an area along the frontage of the existing residential garage/agricultural building and new parking spaces on the south side of the internal drive aisle. By situating the path in this area pedestrians would be removed from having to walk back and forth in the drive aisle to access winery facilities in the eastern portion of the site. Bicycle racks would be located in the northeast quadrant of the site adjacent to the new tasting room.

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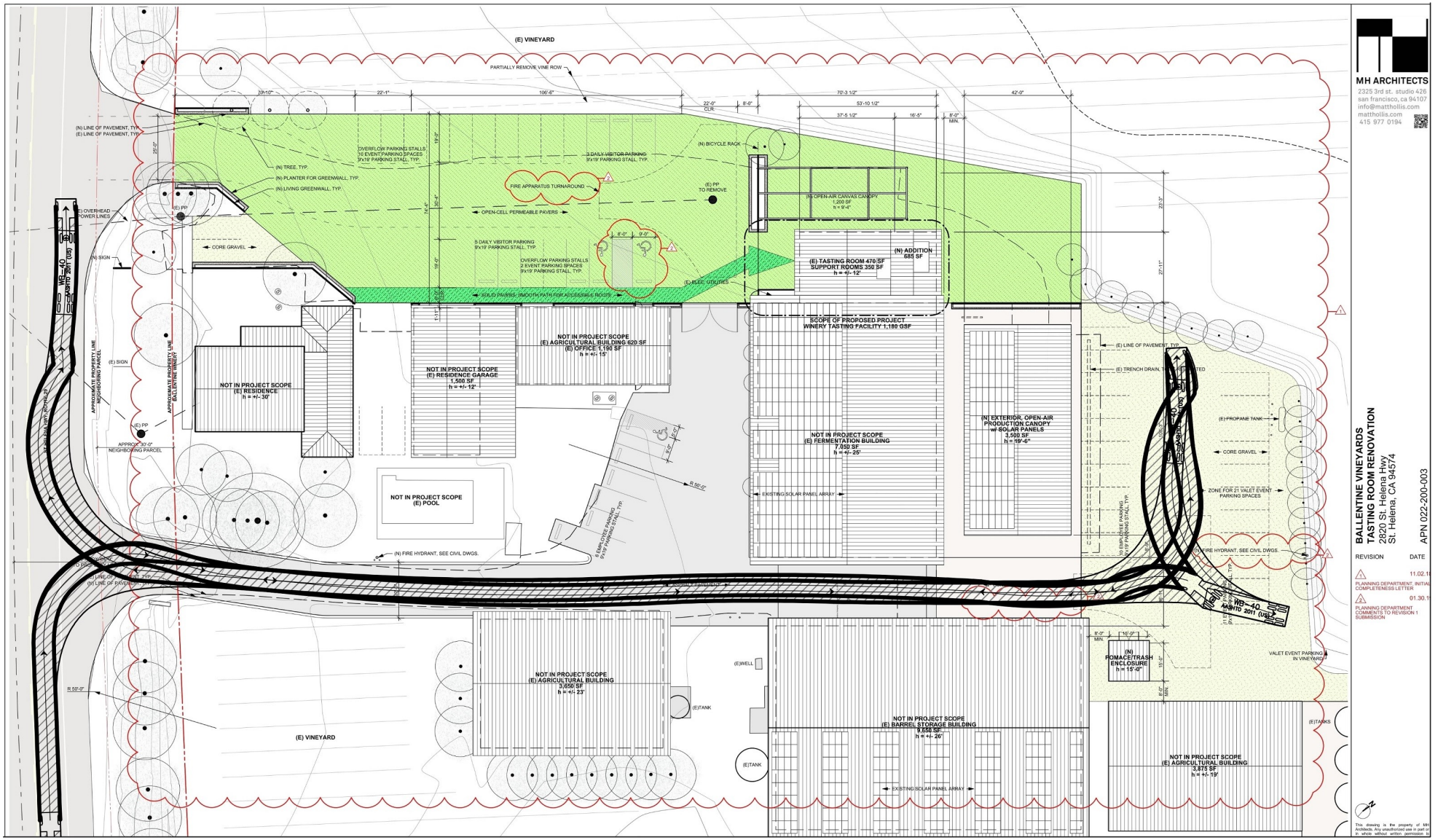
[14] *Napa County Road and Street Standards, Department of Planning, Building, & Environmental Services, September 26, 2017*



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TASTING ROOM RENOVATION
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St. Helena, CA 94574

APN 022-200-003

REVISION	DATE
PLANNING DEPARTMENT, INITIAL COMPLETENESS LETTER	11.02.11
PLANNING DEPARTMENT COMMENTS TO REVISION 1 SUBMISSION	01.30.12

GHD

Truck Turning Template – Project Site Access

North

FIGURE 6.2

6.2.6 Truck Access\Loading

Based on discussions with the project applicant, all trucks would be required to enter the winery via the south driveway entrance. Once on the property, drivers are requested to check in at the Ballentine Winery offices on the north side of the driveway and can stage their trucks alongside the agricultural and/or barrel storage buildings so as not to block the internal drive aisle. Loading docks are not part of the winery's improvement plans. However, winery staff is able to use both pallet jacks and forklifts to efficiently off-load/load trucks when necessary. No truck is allowed on the premises longer than 48-feet due to acceptable turning radii. In addition, all trucks leave the winery by turning around in the large "deadhead" area at the far eastern portion of the property north of the agricultural and east of the new open air production canopy.

Three types of deliveries to the winery occur during peak activity periods.. Deliveries can be categorized as casegoods, barrels and bulk wine in barrels, and bulk wine/on-haul grapes that occur in specific areas of the winery grounds. Casegoods loading occurs along the front roll-up doors of the agricultural (casegoods/agricultural building) on the southwest portion of the property via the south driveway. Barrels and bulk wine in barrels loading occurs further east on the property in front of the barrel storage building via the south driveway. Finally, bulk wine and on-haul grape deliveries occur at the open air production canopy/crush pad at the far east portion of the property behind the fermentation building.

Garbage trucks would access the winery property from the same southern driveway from SR-29. Upon picking up the trash adjacent to the winery office building and/or new trash enclosure at the far eastern portion of the property trucks would turn around in the deadhead area and exit back out to SR-29 via the same driveway.

As noted, a two-way-left-turn-lane (TWLTLT) is present on SR-29 along the entire project frontage extending from Deer Park Road to 120-feet past the Ballentine Vineyards Winery driveway. The TWLTL on SR-29 allows motorists to gain access to the Winery and/or merge onto SR-29 from the Winery without delaying through-traffic on SR-29.

6.3 Marketing Events

As noted in the project description, in addition to normal tastings the project proposes to host 13 different sizes of marketing events that would range between 25-100 guests. These marketing events would include the following:

Proposed Ballentine Vineyards Winery Marketing Events

- 8 events monthly: maximum of 25 guests;
- 1 event monthly: maximum of 50 guests.
- 4 events yearly: maximum of 100 guests

Marketing events would typically be held outside of the peak commute periods starting in the middle of the day or early afternoon hours and extend beyond the weekday PM peak commute hour (4:00-6:00 p.m.). During weekends, events would start before or after the mid-day peak commute period (1:00-4:00 p.m.). As indicated in the trip generation sheets in Appendices, the largest marketing event would generate 87 daily trips (43 in, 42 out). As stated, the events are of sufficient length that the inbound and outbound trips occur in separate hours. Therefore, a large marketing event would generate 43 trips inbound during the hour prior to the event and 42 trips outbound during the hour directly after the event ends. Guests typically stay throughout the event and inbound/outbound traffic generation on a "per hour" basis is estimated to be very low (if any).

- As a proposed project requirement, large marketing events (100 guests) should not start/end during the weekday PM peak period (4:00-6:00 p.m.) nor weekend mid-day peak period (1:00-4:00 p.m.). In addition, the tasting room should suspend visitation related to wine tasting on the days when the facility hosts large marketing events that are held during the afternoon period. These measures would reduce any traffic impacts related to large marketing events to ***less-than-significant*** levels.

7. Cumulative Year 2030 (No Project) Conditions

7.1 Model Forecast

Consistent with near-term (no project) traffic volume forecasts, year 2030 cumulative conditions have been based on historical Caltrans volume data for the last three full calendar years. Based on historical average daily traffic data that includes peak hour two-way volumes, volumes on SR-29 have increased by 12.5% in the last three years or 4.2% per year. Based on an 11-year growth period from collected data (year 2019) to year 2030 conditions, 46.2% was applied to existing peak hour volumes for background/regional growth along the three study roadways.

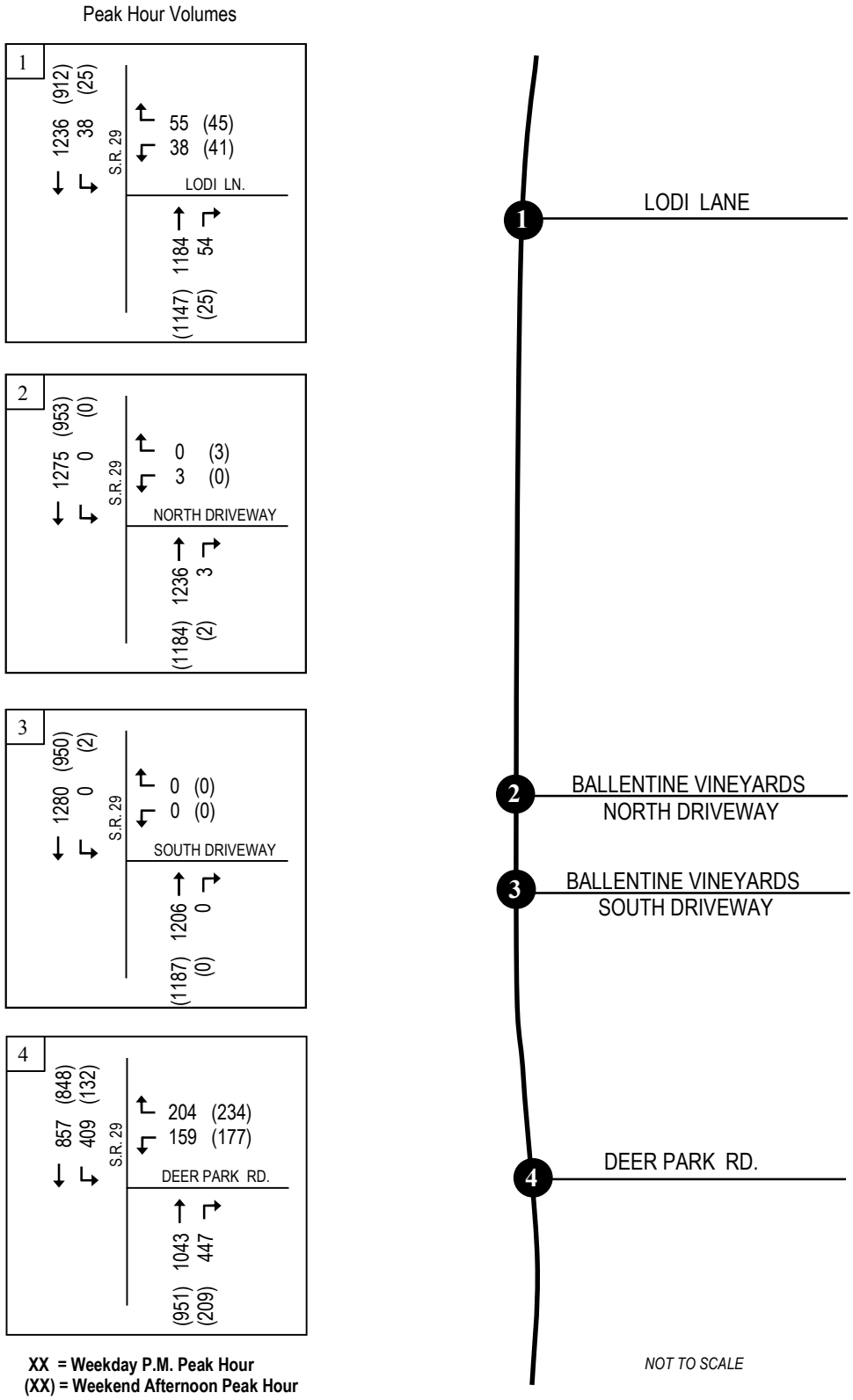
Since future volume traffic forecasts are only available for SR-29, the same year growth rates were uniformly applied to Lodi Lane and Deer Park Road above as a very conservative measure.

Cumulative year 2030 (no project) and plus project volumes and for weekday PM peak hour and weekend mid-day peak hour have been shown in Figures 7.1 and 7.2.

Table 7.1-1 Year 2030 and Year 2030 with Project Conditions: Intersection Levels-Of-Service Weekday PM Peak and Weekend Mid-Day Peak Hour[1]

	Intersection	Control Type	Wkdy. PM LOS/Delay		Wknd. Mid-Day LOS/Delay	
			Yr. 2030 (No Project)	Yr. 2030 (With Prj.)	Yr. 2030 (No Project)	Yr. 2030 (With Prj.)
1	Lodi Lane/SR-29	MSSC	**F 76.5**	**F 80.1**	**F 55.0**	**F 57.0**
2	Ballentine N. Driveway/SR-29	MSSC	E 36.1	E 37.7	C 22.9	D 30.3
3	Ballentine S. Driveway/SR-29	MSSC	D 34.5	E 35.0	A 0.0	A 0.0
4	Deer Park Road/SR-29		**F >300**	**F >300**	**F >300**	**F >300**

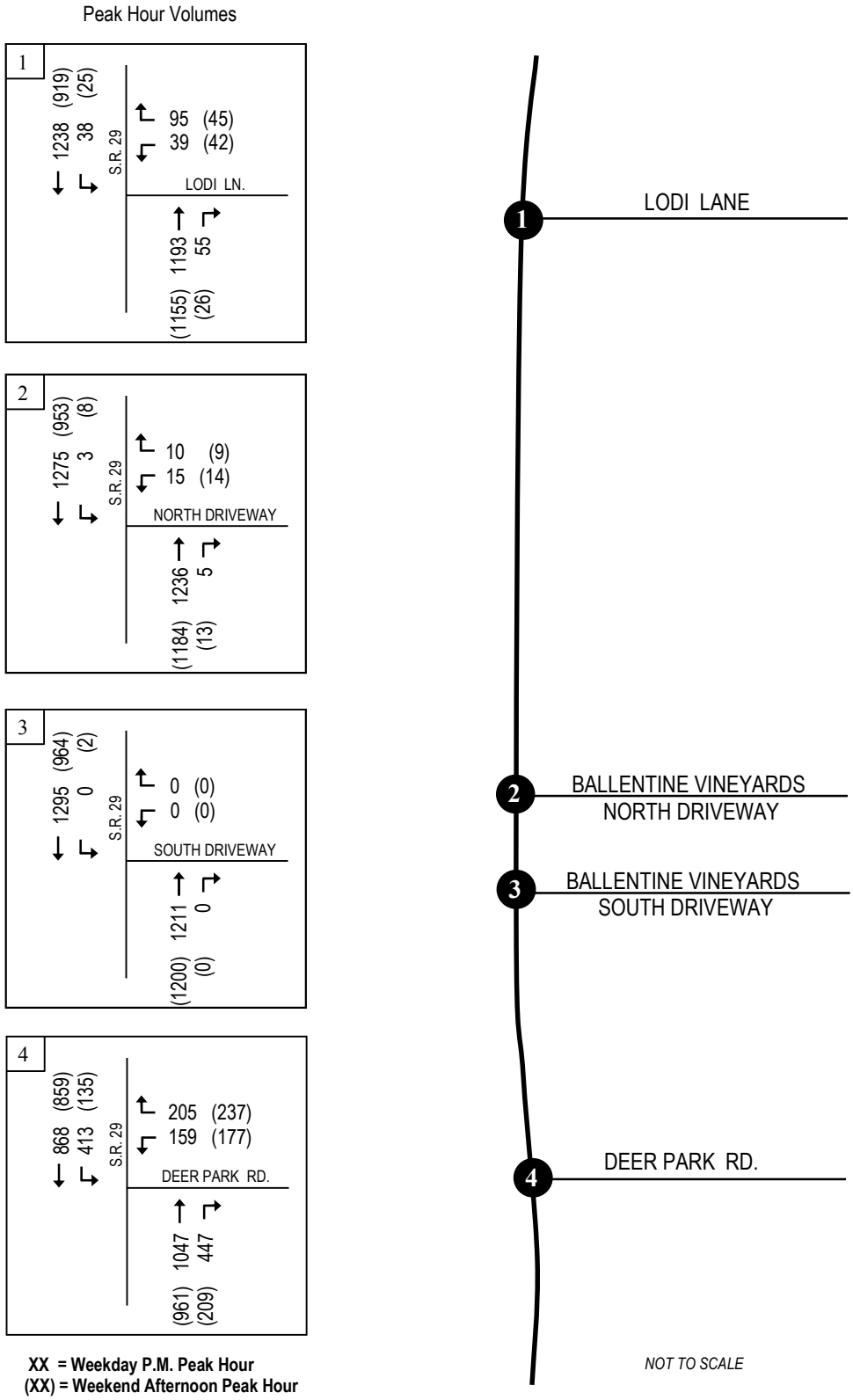
(1) Based on Highway Capacity Manual (HCM) 2010, Operations methodology for stop-sign controlled (unsignalized) intersections using Synchro-Simtraffic software. Intersection calculation yields an LOS and vehicle delay in seconds. Stated LOS refers to the minor street (stop-sign) controlled movement.



Cumulative
Weekday PM and (Weekend) Peak Hour Volumes

North

FIGURE 7.1



Cumulative Plus Project
Weekday PM and (Weekend) Peak Hour Volumes

FIGURE 7.2

7.2 Year 2030 Cumulative (No Project) Intersection Operating Conditions

With year 2030 cumulative (no project) traffic volumes, project study intersection operations have been calculated and shown in Table 7.1-1. The Deer Park Road/SR-29 intersection would continue to operate at LOS F during both the weekday PM and weekend mid-day peak hours with proposed project traffic. **However, both the Lodi Lane/SR-29 and Ballentine Vineyards North Driveway/SR-29 would be operating at unacceptable conditions (LOS E-F) during the weekday PM peak hour with year 2030 cumulative (no project) volumes**.

7.3 Year 2030 Cumulative (No Project) Roadway Segment Operation

Directional roadway segment operation along SR-29 would continue to operate at unacceptable levels (LOS F) with year 2030 cumulative (no project) volumes. Southbound volumes on SR-29 during the weekday PM peak hour would total 1,280 vehicles while during the weekend (Saturday) midday peak hour northbound volumes would increase to 1,184 vehicles. Lodi Lane would operate acceptably at B or better with 86-93 directional (westbound) vehicles. Deer Park Road would operate at LOS D with 856 vehicles (eastbound) during the weekday PM peak hour and LOS B or better during the weekend (Saturday) midday peak hour.

7.4 Year 2030 Cumulative plus Project Intersection Operations

With proposed project traffic, there would be slight increases in vehicle delays at study intersection locations and overall LOS would remain unchanged from year 2030 cumulative (no project) conditions.

Based on updated County significance criteria for unsignalized intersections the off-site intersections of Lodi Lane/SR-29 and Deer Park Road/SR-29 have been evaluated for proposed project impacts since the LOS operates at an unacceptable level (LOS F) without proposed project trips during the weekday PM peak hour and weekend midday peak hour. County criteria indicate that a significant impact could be found if the proposed project contributes 5% or more to the total cumulative traffic growth at these intersections. The guidelines go on to state “the peak hour signal warrant criteria should also be evaluated and presented for informational purposes.” During the weekday PM peak hour, the proposed project would add 13 trips to the Lodi Lane/SR-29 intersection. During the weekend (Saturday) midday peak hour the project would add 17 trips to the intersection. Based on total cumulative traffic growth at the intersection these proposed project trips would represent increases of 1.5% (13/833) and 2.4% (17/708), respectively. At the Deer Park Road/SR-29 intersection, the total cumulative traffic growth related to proposed project uses would be 1.9% (20/1,002) and 3.2% (27/830) during the weekday PM peak hour and weekend (Saturday) midday peak hour time periods. **Under the County significance criteria, the addition of proposed project trips to these intersections would be considered less-than-significant given that all project contributions would be under 5% of overall cumulative traffic growth.**

7.5 Year 2030 Cumulative plus Project Roadway Segment Operations

With proposed project traffic, directional roadway segment volumes on SR-29 would increase to 1,295 (southbound) during the weekday PM pea hour and 1,200 vehicle (northbound) during the weekend (Saturday) midday peak hour. The increase from proposed project trips would represent an approximate 3.6% increase in cumulative traffic growth during the weekday PM peak hour (15/418).

During the weekend (Saturday) midday peak hour, proposed project trips would represent a 3.3% increase in overall cumulative traffic growth (13/387). SR-29 would continue to operate at LOS F during both time periods. However, the proposed project trips would be considered less-than-significant given that they represent less than a 5% increase in total cumulative traffic growth.

8. VMT Reduction/TDM Plan

VMT Reduction: The County's Circulation policy (Policy CIR-13) provides several options (and mitigation measures) for achieving a reduction in project trip generation "if such development includes measures such as staggered work hours, provision of employee bus passes, provision of van pools/car pool/shuttle programs or the like .. . ."

The application of pass-by trips (as defined by the Institute of Transportation Engineers [ITE]) to proposed project daily and peak hour trip generation is estimated to reduce vehicle project trips and associated trip generation by a minimum of 10%. With the project site located immediately north of St. Helena (less than 1 mile) and adjacent to lodging, restaurant, retail, and winery uses; proposed project uses would complement these existing uses in the study area reducing primary vehicle trips to the project site. These trip factors are categorized as "pass-by" in nature. A brief discussion of these trip reduction factors could be described as follows:

Pass-By Trips: Peak hour trip generation calculated for the proposed project does not account for any "pass-by" vehicle trips. Pass-by trips are defined as vehicle trips already on the immediate adjacent street network (SR-29) travelling to a primary destination (winery, lodging, restaurant, etc.) and stopping at the project site on their way to that primary destination. A travel mode study was conducted for Napa County that included overall vehicle classification, estimates of daily winery trip generation, vehicle license plate surveys in/out of the County, visitor surveys at specific Napa County wineries, and mobile device survey..[15] One of the more interesting findings of the study was that the average winery visitor "planned" to visit approximately 3.1 wineries. Although it was noted that the actual number of wineries visited could have been lower; it is clear that overall winery trip generation in Napa Valley reflects multiple stops by the same winery visitors. Thus, while a winery would generate new vehicle trips at its driveway, the net increase on the adjacent roadways (SR-29) would be lower due to the linked or pass-by trips between wineries. The study suggests that (as a conservative measure) ---one in three vehicle trips to a winery is pass-by in nature. Stated another way; 25-30% of all winery trip generation in Napa Valley is related to pass-by trips from visitors already planning to visit other wineries or restaurants adjacent to the area.

TDM Plan

The applicant proposes a number of non-automobile use programs to further reduce the demand for parking and to ensure sufficiency of the on-site parking provided. These measures are consistent with Section 18.110.0404(G) of the zoning ordinance. These are described is some detail below.

Tasting Room Operations During Annual Events

As a proposed project requirement, large marketing events (100 guests) should not start/end during the weekday PM peak period (4:00-6:00 p.m.) nor weekend mid-day peak period (1:00-4:00 p.m.). In addition, the tasting room should suspend wine tasting on the days when the facility hosts the four (4) 100-person events. These measures would reduce any traffic impacts related to large marketing events to less than significant levels.

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[15] *Fehr & Peers, Napa County Travel Behaviour Study Survey Results and Data Analysis Report, December 8, 2014.*

Employee/Guest Incentives:

Due to its proximity to the Napa Valley Vine bus route and the Vine Trail bike path, the applicant will provide monthly bus passes and/or other incentives to its local employees to utilize these non-auto modes of transportation. In addition the applicant intends to stagger work hours, commensurate with the scheduling of larger guest tasting so employees would either arrive and/or depart outside of the peak commute periods (prior to 7:00 a.m. or after 9:00 a.m., before 4:00 p.m. or after 6:00 p.m.). Similar to voucher distribution; local tour guides, shuttle/hire car and/or limousine services, and lodging in St. Helena would be provided brochures/vouchers to encourage "car free" tourism and tasting to reduce overall parking demand. Much like the "car free" tourism program of the Napa Valley Destination Council and NVTA that provide information to guest/visitors to plan their trips without relying on car; when guests make an appointment for wine tasting project employees could inform them of this program. Dependent on the number of employees participating in the program, overall peak hour trip generation could be reduced by 14 peak hour trips.

Variable Visitation Plan

The project applicant will develop a tours and tastings schedule that would allow guests to arrive at the site prior to the weekday PM peak period (4:00-6:00 p.m.) and weekend (Saturday) midday peak period (1:00-3:00 p. m.) and leave after these peak commute periods. For example, during the weekday PM peak period all guest/visitors would be scheduled to arrive (via appointment booking) by 3:30-3:45 p.m. for late afternoon tours. Tours would then start during the peak commute period with guests exiting the site after 6:00 p.m. A similar practice would be instituted for the weekend (Saturday) midday peak hour.

As an alternative (referenced as Alternative Mitigation #2), the winery would currently limit the Saturday midday peak hour to its current 28% peak midday ratio (rather than 57% County ratio) for visitors to the reduce proposed project impacts along SR-29 and at the Deer Park Road/SR-29 intersection to less-than-significant levels. These peak hour visitation ratios would allow the winery to accommodate a maximum daily visitation of 95 guests (as proposed).

about GHD

GHD is one of the world's leading professional services companies operating in the global markets of water, energy and resources, environment, property and buildings, and transportation. We provide engineering, environmental, and construction services to private and public sector clients.

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Appendix A: Existing Weekday & Weekend Intersection /ADT Counts

Prepared by National Data & Surveying Services

St Helena Hwy (SR-29) & Lodi Ln

Peak Hour Turning Movement Count

ID: 19-08142-001
City: St Helena

Day: Friday
Date: 03/15/2019

PEAK HOURS	COUNT PERIODS
NONE	NONE
NONE	NONE
03:30 PM - 04:30 PM	03:00 PM - 06:00 PM

SOUTHBOUND — St Helena Hwy (SR-29)

AM	0	0	0	0	0	AM
NOON	0	0	0	0	0	NOON
PM	0	689	21	0	690	PM

EASTBOUND — Lodi Ln

AM	NOON	PM		
0	0	0	⇦	
0	0	0	↰	0
0	0	0	↑	0
0	0	0	→	0
0	0	0	↱	0
AM	NOON	PM		

WESTBOUND — Lodi Ln

PM	NOON	AM		
31	0	0	↱	0.5
0	0	0	←	0.5
21	0	0	↰	0
0	0	0	↰	0
51	0	0	⇨	
PM	NOON	AM		

NORTHBOUND — St Helena Hwy (SR-29)

PM	710	0	0	659	30	PM
NOON	0	0	0	0	0	NOON
AM	0	0	0	0	0	AM

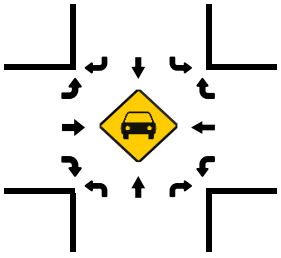
⇩	↰	↑	↱	
0	1	1	0	
	0	0	1	0

CONTROL

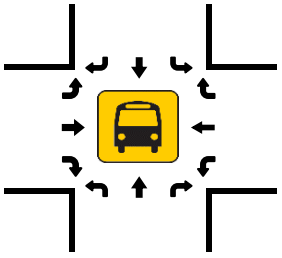
1-Way Stop(WB)

TEV	0 AM	0 NOON	### PM
PHF			0.92

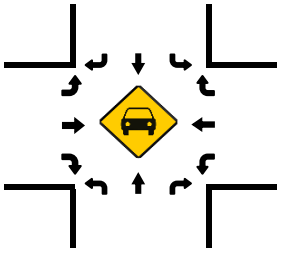
Total Vehicles (AM)



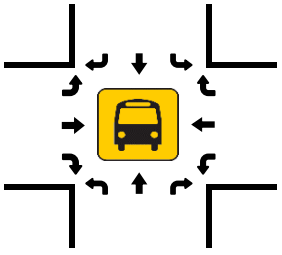
Total Vehicles (AM)



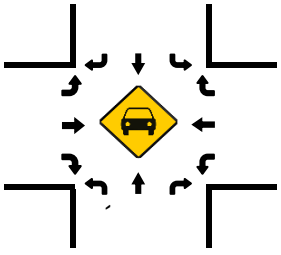
Total Vehicles (NOON)



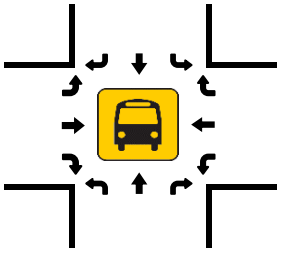
Total Vehicles (NOON)



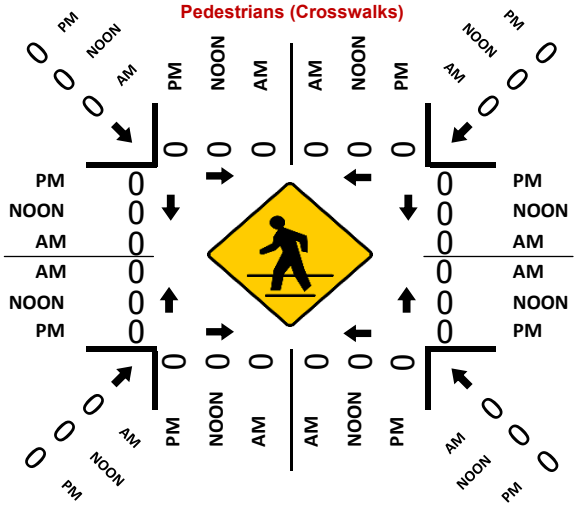
Total Vehicles (PM)



Total Vehicles (PM)



Pedestrians (Crosswalks)



Prepared by National Data & Surveying Services

St Helena Hwy/SR-29 & Ballentine Vineyards North Dwy

Peak Hour Turning Movement Count

ID: 19-08026-003A
City: St Helena

Day: Saturday
Date: 01/19/2019

PEAK HOURS

AM	NOON	PM
NONE	02:00 PM - 03:00 PM	NONE

COUNT PERIODS

AM	NOON	PM
NONE	01:00 PM - 03:00 PM	NONE

St Helena Hwy/SR-29 — SOUTHBOUND

AM	0	0	0	0	0	AM
NOON	0	531	0	0	662	NOON
PM	0	0	0	0	0	PM

Ballentine Vineyards Dwy 1 — EASTBOUND

AM	NOON	PM	
0	0	0	
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
AM	NOON	PM	

Ballentine Vineyards Dwy 1 — WESTBOUND

PM	NOON	AM	
0	3	0	0
0	0	0	1
0	0	0	0
0	0	0	0
0	2	0	
PM	NOON	AM	

St Helena Hwy/SR-29 — NORTHBOUND

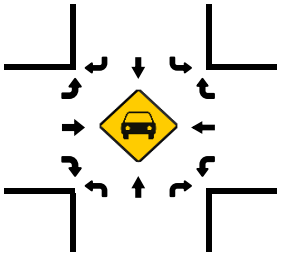
PM	0	0	0	0	0	PM
NOON	531	0	0	659	2	NOON
AM	0	0	0	0	0	AM

0	1	0	0	
			0	0	1	0

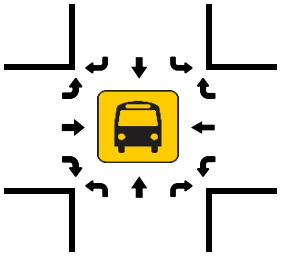
CONTROL: No Control

	AM	NOON	PM
TEV	0	###	0
PHF		0.93	

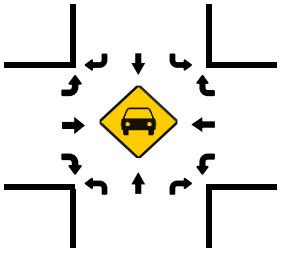
Total Vehicles (AM)



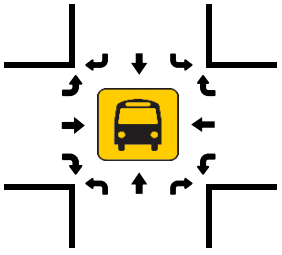
Total Vehicles (AM)



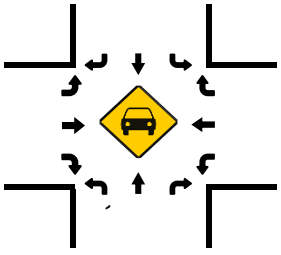
Total Vehicles (NOON)



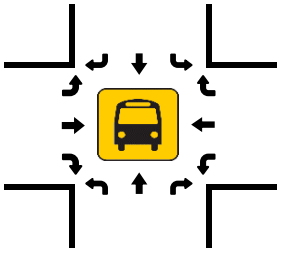
Total Vehicles (NOON)



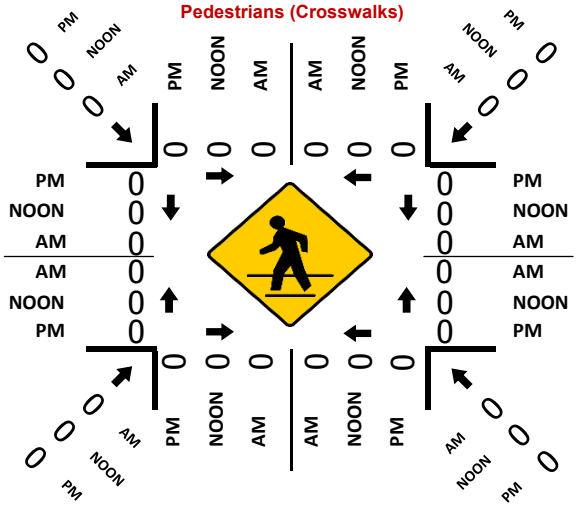
Total Vehicles (PM)



Total Vehicles (PM)



Pedestrians (Crosswalks)



Prepared by National Data & Surveying Services

St Helena Hwy/SR-29 & Ballentine Vineyards South Dwy

Peak Hour Turning Movement Count

ID: 19-08026-003B
City: St Helena

Day: Saturday
Date: 01/19/2019

PEAK HOURS

AM	NOON	PM
NONE	01:45 PM - 02:45 PM	NONE

COUNT PERIODS

AM	NOON	PM
NONE	01:00 PM - 03:00 PM	NONE

St Helena Hwy/SR-29

SOUTHBOUND

AM	0	0	0	0	0	AM
NOON	0	0	2	0	0	NOON
PM	0	0	0	0	0	PM

0 1 0 0

EASTBOUND — Ballentine Vineyards Dwy 2

AM	NOON	PM	
0	0	0	
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
AM	NOON	PM	

CONTROL

No Control

	AM	NOON	PM
TEV	0	2	0
PHF		0.50	

WESTBOUND — Ballentine Vineyards Dwy 2

	PM	NOON	AM
0	0	0	0
1	0	0	0
0	0	0	0
0	0	0	0
	0	2	0
	PM	NOON	AM

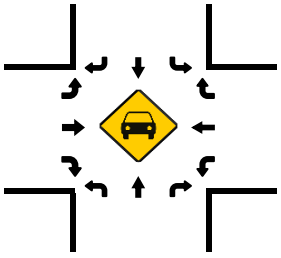
0 0 1 0

PM	0	0	0	0	0	PM
NOON	0	0	0	0	0	NOON
AM	0	0	0	0	0	AM

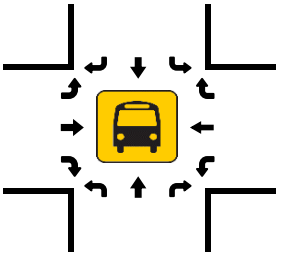
NORTHBOUND

St Helena Hwy/SR-29

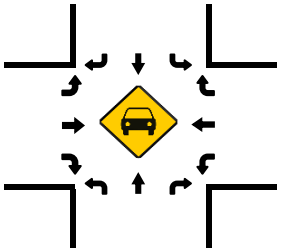
Total Vehicles (AM)



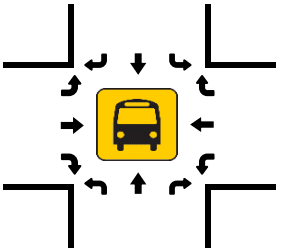
Total Vehicles (AM)



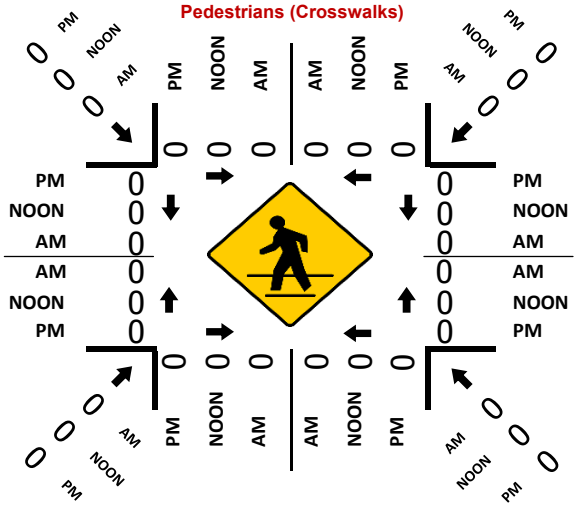
Total Vehicles (NOON)



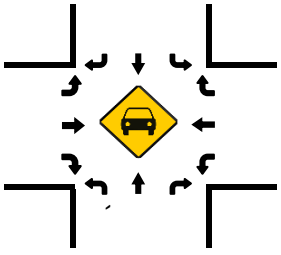
Total Vehicles (NOON)



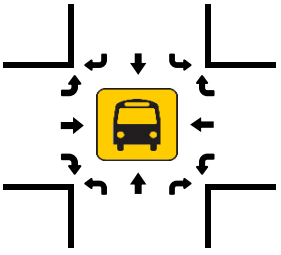
Pedestrians (Crosswalks)



Total Vehicles (PM)



Total Vehicles (PM)



Prepared by National Data & Surveying Services

St Helena Hwy (SR-29) & Deer Park Rd

Peak Hour Turning Movement Count

ID: 19-08142-002
City: St Helena

Day: Friday
Date: 03/15/2019

PEAK HOURS	COUNT PERIODS
NONE	NONE
NONE	NONE
03:30 PM - 04:30 PM	03:00 PM - 06:00 PM

SOUTHBOUND — St Helena Hwy (SR-29)

AM	0	0	0	0	0	AM
NOON	0	0	0	0	0	NOON
PM	0	477	228	0	695	PM

EASTBOUND — Deer Park Rd

AM	NOON	PM	
0	0	0	
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
AM	NOON	PM	

WESTBOUND — Deer Park Rd

PM	NOON	AM	
114	0	0	0.5
0	0	0	0.5
89	0	0	0
0	0	0	0
477	0	0	
PM	NOON	AM	

NORTHBOUND — St Helena Hwy (SR-29)

PM	566	0	0	581	249	PM
NOON	0	0	0	0	0	NOON
AM	0	0	0	0	0	AM

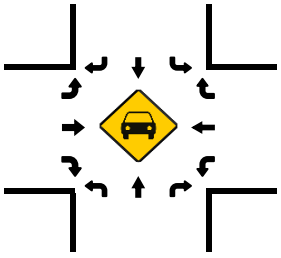
	0	1	1	0
	0	0	1	0

CONTROL

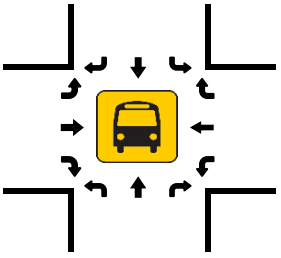
1-Way Stop(WB)

TEV	0 AM	0 NOON	### PM
PHF			0.93

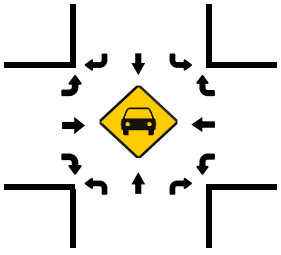
Total Vehicles (AM)



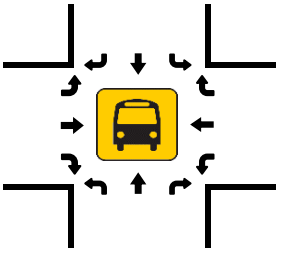
Total Vehicles (AM)



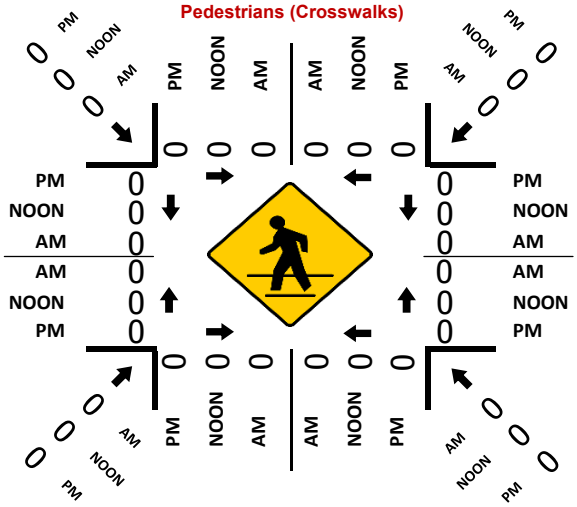
Total Vehicles (NOON)



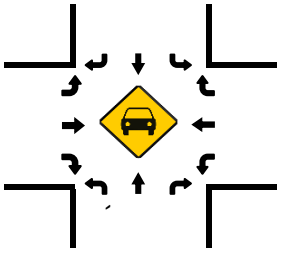
Total Vehicles (NOON)



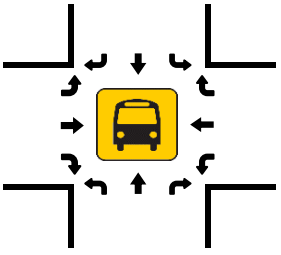
Pedestrians (Crosswalks)



Total Vehicles (PM)



Total Vehicles (PM)



Prepared by NDS/ATD

VOLUME

SR 29 S/O Ballentine Vineyards Winery Dwy

Day: Thursday
Date: 3/14/2019

City: St Helena
Project #: CA19_8143_001

DAILY TOTALS	NB	SB	EB	WB	Total
	7,635	7,075	0	0	14,710

AM Period	NB		SB		EB	WB	TOTAL		PM Period	NB		SB		EB	WB	TOTAL	
00:00	6		12				18		12:00	113		124				237	
00:15	6		6				12		12:15	135		93				228	
00:30	3		3				6		12:30	142		126				268	
00:45	5	20	3	24			8	44	12:45	117	507	106	449			223	956
01:00	3		6				9		13:00	122		131				253	
01:15	2		4				6		13:15	129		119				248	
01:30	4		3				7		13:30	116		114				230	
01:45	3	12	9	22			12	34	13:45	163	530	133	497			296	1027
02:00	2		5				7		14:00	135		104				239	
02:15	2		6				8		14:15	138		111				249	
02:30	5		3				8		14:30	138		100				238	
02:45	3	12	2	16			5	28	14:45	159	570	130	445			289	1015
03:00	2		6				8		15:00	142		137				279	
03:15	1		5				6		15:15	134		120				254	
03:30	1		3				4		15:30	177		136				313	
03:45	6	10	6	20			12	30	15:45	178	631	128	521			306	1152
04:00	4		10				14		16:00	172		143				315	
04:15	8		12				20		16:15	164		152				316	
04:30	8		13				21		16:30	162		151				313	
04:45	10	30	20	55			30	85	16:45	166	664	127	573			293	1237
05:00	17		19				36		17:00	179		132				311	
05:15	8		20				28		17:15	200		132				332	
05:30	39		37				76		17:30	174		127				301	
05:45	48	112	49	125			97	237	17:45	116	669	114	505			230	1174
06:00	78		63				141		18:00	129		107				236	
06:15	96		104				200		18:15	90		79				169	
06:30	134		138				272		18:30	88		78				166	
06:45	105	413	128	433			233	846	18:45	92	399	78	342			170	741
07:00	100		118				218		19:00	75		61				136	
07:15	112		109				221		19:15	61		57				118	
07:30	112		130				242		19:30	55		54				109	
07:45	110	434	183	540			293	974	19:45	52	243	39	211			91	454
08:00	109		122				231		20:00	46		37				83	
08:15	112		137				249		20:15	53		41				94	
08:30	121		144				265		20:30	45		49				94	
08:45	140	482	132	535			272	1017	20:45	45	189	25	152			70	341
09:00	100		123				223		21:00	43		33				76	
09:15	97		112				209		21:15	38		34				72	
09:30	106		111				217		21:30	38		36				74	
09:45	116	419	102	448			218	867	21:45	36	155	35	138			71	293
10:00	114		112				226		22:00	43		25				68	
10:15	117		101				218		22:15	30		38				68	
10:30	107		113				220		22:30	26		12				38	
10:45	124	462	123	449			247	911	22:45	31	130	13	88			44	218
11:00	113		108				221		23:00	18		13				31	
11:15	121		96				217		23:15	22		8				30	
11:30	126		137				263		23:30	10		11				21	
11:45	119	479	108	449			227	928	23:45	13	63	6	38			19	101
TOTALS		2885		3116				**6001**	**TOTALS**		4750		3959				**8709**
SPLIT %		48.1%		51.9%				**40.8%**	**SPLIT %**		54.5%		45.5%				**59.2%**

DAILY TOTALS	NB	SB	EB	WB	Total
	7,635	7,075	0	0	14,710

AM Peak Hour	11:45	07:45					**07:45**		**PM Peak Hour**	16:45	15:45					**15:30**		
AM Pk Volume	509	586					**1038**		**PM Pk Volume**	719	574					**1250**		
Pk Hr Factor	0.896	0.801					**0.886**		**Pk Hr Factor**	0.899	0.944					**0.989**		
7 - 9 Volume	916	1075	0	0			**1991**		**4 - 6 Volume**	1333	1078	0	0			**2411**		
7 - 9 Peak Hour	08:00	07:45					**07:45**		**4 - 6 Peak Hour**	16:45	16:00					**16:30**		
7 - 9 Pk Volume	482	586	0	0			**1038**		**4 - 6 Pk Volume**	719	573	0	0			**1249**		
Pk Hr Factor	0.861	0.801	0.000	0.000			**0.886**		**Pk Hr Factor**	0.899	0.942	0.000	0.000			**0.941**		

Prepared by NDS/ATD

VOLUME

SR 29 S/O Ballentine Vineyards Winery Dwy

Day: Friday
Date: 3/15/2019

City: St Helena
Project #: CA19_8143_001

DAILY TOTALS	NB	SB	EB	WB	Total
	8,176	7,651	0	0	15,827

AM Period	NB		SB		EB	WB	TOTAL		PM Period	NB		SB		EB	WB	TOTAL	
00:00	6		9				15		12:00	131		122				253	
00:15	12		4				16		12:15	157		124				281	
00:30	5		5				10		12:30	133		107				240	
00:45	6	29	3	21			9	50	12:45	136	557	121	474			257	1031
01:00	2		2				4		13:00	118		122				240	
01:15	7		6				13		13:15	133		140				273	
01:30	3		6				9		13:30	143		125				268	
01:45	6	18	6	20			12	38	13:45	169	563	145	532			314	1095
02:00	3		3				6		14:00	150		114				264	
02:15	3		3				6		14:15	141		137				278	
02:30	5		1				6		14:30	182		132				314	
02:45	4	15	5	12			9	27	14:45	165	638	138	521			303	1159
03:00	6		3				9		15:00	169		150				319	
03:15	4		6				10		15:15	209		148				357	
03:30	1		4				5		15:30	162		183				345	
03:45	3	14	16	29			19	43	15:45	198	738	177	658			375	1396
04:00	5		4				9		16:00	163		162				325	
04:15	1		11				12		16:15	190		196				386	
04:30	4		12				16		16:30	154		154				308	
04:45	9	19	23	50			32	69	16:45	188	695	168	680			356	1375
05:00	13		18				31		17:00	183		171				354	
05:15	11		19				30		17:15	176		148				324	
05:30	29		38				67		17:30	165		122				287	
05:45	45	98	53	128			98	226	17:45	144	668	116	557			260	1225
06:00	62		65				127		18:00	95		100				195	
06:15	110		115				225		18:15	127		103				230	
06:30	107		117				224		18:30	111		83				194	
06:45	115	394	133	430			248	824	18:45	98	431	81	367			179	798
07:00	71		127				198		19:00	87		59				146	
07:15	112		103				215		19:15	86		67				153	
07:30	101		113				214		19:30	77		55				132	
07:45	101	385	179	522			280	907	19:45	55	305	40	221			95	526
08:00	107		119				226		20:00	50		51				101	
08:15	103		149				252		20:15	59		44				103	
08:30	121		133				254		20:30	53		52				105	
08:45	103	434	142	543			245	977	20:45	54	216	53	200			107	416
09:00	120		101				221		21:00	41		33				74	
09:15	120		92				212		21:15	60		39				99	
09:30	120		135				255		21:30	71		19				90	
09:45	110	470	123	451			233	921	21:45	57	229	32	123			89	352
10:00	105		107				212		22:00	35		30				65	
10:15	136		128				264		22:15	31		31				62	
10:30	133		85				218		22:30	33		25				58	
10:45	110	484	118	438			228	922	22:45	26	125	20	106			46	231
11:00	127		114				241		23:00	38		20				58	
11:15	130		130				260		23:15	30		24				54	
11:30	142		112				254		23:30	19		15				34	
11:45	145	544	136	492			281	1036	23:45	20	107	17	76			37	183
TOTALS		2904		3136				6040	TOTALS		5272		4515				9787
SPLIT %		48.1%		51.9%				38.2%	SPLIT %		53.9%		46.1%				61.8%

DAILY TOTALS	NB	SB	EB	WB	Total
	8,176	7,651	0	0	15,827

AM Peak Hour	11:30	07:45					11:30		PM Peak Hour	15:00	15:30					15:30		
AM Pk Volume	575	580					1069		PM Pk Volume	738	718					1431		
Pk Hr Factor	0.916	0.810					0.951		Pk Hr Factor	0.883	0.916					0.927		
7 - 9 Volume	819	1065	0	0			1884		4 - 6 Volume	1363	1237			0	0	2600		
7 - 9 Peak Hour	08:00	07:45					07:45		4 - 6 Peak Hour	16:15	16:15					16:15		
7 - 9 Pk Volume	434	580	0	0			1012		4 - 6 Pk Volume	715	689			0	0	1404		
Pk Hr Factor	0.897	0.810	0.000	0.000			0.904		Pk Hr Factor	0.941	0.879			0.000	0.000	0.909		

Prepared by NDS/ATD

VOLUME

SR 29 S/O Ballentine Vineyards Winery Dwy

Day: Saturday
Date: 3/16/2019

City: St Helena
Project #: CA19_8143_001

DAILY TOTALS	NB	SB	EB	WB	Total
	7,303	6,844	0	0	14,147

AM Period	NB		SB		EB	WB	TOTAL		PM Period	NB		SB		EB	WB	TOTAL	
00:00	23		19				42		12:00	149		111				260	
00:15	20		18				38		12:15	147		135				282	
00:30	12		14				26		12:30	150		132				282	
00:45	4	59	11	62			15	121	12:45	147	593	126	504			273	1097
01:00	3		7				10		13:00	160		142				302	
01:15	4		5				9		13:15	179		131				310	
01:30	8		7				15		13:30	183		155				338	
01:45	8	23	10	29			18	52	13:45	166	688	119	547			285	1235
02:00	3		6				9		14:00	162		150				312	
02:15	10		8				18		14:15	176		157				333	
02:30	2		10				12		14:30	168		160				328	
02:45	4	19	8	32			12	51	14:45	178	684	149	616			327	1300
03:00	4		5				9		15:00	134		179				313	
03:15	1		4				5		15:15	181		150				331	
03:30	3		4				7		15:30	168		157				325	
03:45	2	10	4	17			6	27	15:45	138	621	150	636			288	1257
04:00	2		8				10		16:00	132		188				320	
04:15	2		12				14		16:15	132		150				282	
04:30	3		10				13		16:30	155		146				301	
04:45	6	13	11	41			17	54	16:45	140	559	161	645			301	1204
05:00	6		9				15		17:00	143		163				306	
05:15	13		10				23		17:15	109		159				268	
05:30	28		21				49		17:30	125		138				263	
05:45	17	64	27	67			44	131	17:45	102	479	144	604			246	1083
06:00	23		33				56		18:00	89		125				214	
06:15	46		49				95		18:15	79		125				204	
06:30	50		60				110		18:30	98		104				202	
06:45	38	157	56	198			94	355	18:45	96	362	98	452			194	814
07:00	36		43				79		19:00	65		70				135	
07:15	41		45				86		19:15	50		67				117	
07:30	47		47				94		19:30	67		71				138	
07:45	64	188	68	203			132	391	19:45	67	249	55	263			122	512
08:00	61		44				105		20:00	43		46				89	
08:15	88		74				162		20:15	57		44				101	
08:30	90		66				156		20:30	46		48				94	
08:45	97	336	77	261			174	597	20:45	52	198	47	185			99	383
09:00	93		76				169		21:00	43		38				81	
09:15	87		66				153		21:15	57		38				95	
09:30	104		113				217		21:30	59		28				87	
09:45	130	414	81	336			211	750	21:45	54	213	26	130			80	343
10:00	118		77				195		22:00	48		40				88	
10:15	135		75				210		22:15	50		33				83	
10:30	125		96				221		22:30	30		10				40	
10:45	135	513	98	346			233	859	22:45	26	154	34	117			60	271
11:00	154		99				253		23:00	32		23				55	
11:15	154		131				285		23:15	20		18				38	
11:30	168		118				286		23:30	27		16				43	
11:45	135	611	126	474			261	1085	23:45	17	96	22	79			39	175
TOTALS		2407		2066				4473	TOTALS		4896		4778				9674
SPLIT %		53.8%		46.2%				31.6%	SPLIT %		50.6%		49.4%				68.4%

DAILY TOTALS	NB	SB	EB	WB	Total
	7,303	6,844	0	0	14,147

AM Peak Hour	10:45	11:45					11:15		PM Peak Hour	13:15	14:15					14:15	
AM Pk Volume	611	504					1092		PM Pk Volume	690	645					1301	
Pk Hr Factor	0.909	0.933					0.955		Pk Hr Factor	0.943	0.901					0.977	
7 - 9 Volume	524	464	0	0			988		4 - 6 Volume	1038	1249	0	0			2287	
7 - 9 Peak Hour	08:00	08:00					08:00		4 - 6 Peak Hour	16:15	16:00					16:00	
7 - 9 Pk Volume	336	261	0	0			597		4 - 6 Pk Volume	570	645	0	0			1204	
Pk Hr Factor	0.866	0.847	0.000	0.000			0.858		Pk Hr Factor	0.919	0.858	0.000	0.000			0.941	

Prepared by NDS/ATD

VOLUME

Deer Park Rd E/O SR 29

Day: Thursday
Date: 3/14/2019

City: St Helena
Project #: CA19_8143_002

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	3,934	2,920	6,854

AM Period	NB		SB		EB		WB		TOTAL	
00:00					6		2		8	
00:15					5		1		6	
00:30					4		2		6	
00:45					4	19	2	7	6	26
01:00					4		0		4	
01:15					1		1		2	
01:30					2		0		2	
01:45					0	7	1	2	1	9
02:00					2		0		2	
02:15					0		1		1	
02:30					1		2		3	
02:45					0	3	1	4	1	7
03:00					0		1		1	
03:15					1		0		1	
03:30					1		1		2	
03:45					1	3	0	2	1	5
04:00					1		0		1	
04:15					1		1		2	
04:30					8		4		12	
04:45					4	14	4	9	8	23
05:00					8		5		13	
05:15					8		3		11	
05:30					19		16		35	
05:45					20	55	19	43	39	98
06:00					29		28		57	
06:15					58		31		89	
06:30					75		57		132	
06:45					44	206	52	168	96	374
07:00					57		43		100	
07:15					38		58		96	
07:30					56		62		118	
07:45					65	216	65	228	130	444
08:00					63		83		146	
08:15					57		70		127	
08:30					63		57		120	
08:45					59	242	78	288	137	530
09:00					55		50		105	
09:15					52		49		101	
09:30					45		37		82	
09:45					38	190	44	180	82	370
10:00					57		58		115	
10:15					42		56		98	
10:30					50		42		92	
10:45					50	199	54	210	104	409
11:00					43		45		88	
11:15					45		51		96	
11:30					47		54		101	
11:45					46	181	47	197	93	378
TOTALS						1335		1338		2673
SPLIT %						49.9%		50.1%		39.0%

PM Period	NB		SB		EB		WB		TOTAL	
12:00					48		60		108	
12:15					41		58		99	
12:30					69		33		102	
12:45					40	198	36	187	76	385
13:00					51		57		108	
13:15					55		46		101	
13:30					79		37		116	
13:45					55	240	57	197	112	437
14:00					57		52		109	
14:15					67		47		114	
14:30					68		52		120	
14:45					65	257	50	201	115	458
15:00					68		49		117	
15:15					72		68		140	
15:30					124		56		180	
15:45					120	384	57	230	177	614
16:00					114		62		176	
16:15					97		42		139	
16:30					99		55		154	
16:45					92	402	52	211	144	613
17:00					118		51		169	
17:15					109		59		168	
17:30					95		51		146	
17:45					83	405	44	205	127	610
18:00					79		35		114	
18:15					54		34		88	
18:30					54		31		85	
18:45					53	240	24	124	77	364
19:00					44		23		67	
19:15					27		22		49	
19:30					32		16		48	
19:45					30	133	23	84	53	217
20:00					35		18		53	
20:15					30		12		42	
20:30					38		11		49	
20:45					26	129	8	49	34	178
21:00					28		10		38	
21:15					28		8		36	
21:30					15		7		22	
21:45					28	99	6	31	34	130
22:00					18		9		27	
22:15					30		11		41	
22:30					11		6		17	
22:45					14	73	7	33	21	106
23:00					13		5		18	
23:15					8		10		18	
23:30					14		10		24	
23:45					4	39	5	30	9	69
TOTALS						2599		1582		4181
SPLIT %						62.2%		37.8%		61.0%

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	3,934	2,920	6,854

AM Peak Hour		07:45	08:00	08:00	
AM Pk Volume		248	288	530	
Pk Hr Factor		0.954	0.867	0.908	
7 - 9 Volume	0 0	458	516	974	
7 - 9 Peak Hour		07:45	08:00	08:00	
7 - 9 Pk Volume	0 0	248	288	530	
Pk Hr Factor	0.000 0.000	0.954	0.867	0.908	

PM Peak Hour		15:30	15:15	15:15	
PM Pk Volume		455	243	673	
Pk Hr Factor		0.917	0.893	0.935	
4 - 6 Volume	0 0	807	416	1223	
4 - 6 Peak Hour		16:30	16:30	16:30	
4 - 6 Pk Volume	0 0	418	217	635	
Pk Hr Factor	0.000 0.000	0.886	0.919	0.939	

Prepared by NDS/ATD

VOLUME

Deer Park Rd E/O SR 29

Day: Friday
Date: 3/15/2019

City: St Helena
Project #: CA19_8143_002

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	4,144	2,913	7,057

AM Period	NB	SB	EB	WB	TOTAL	PM Period	NB	SB	EB	WB	TOTAL
00:00			3	2	5	12:00			51	54	105
00:15			1	1	2	12:15			47	58	105
00:30			1	1	2	12:30			55	50	105
00:45			1	6 1 5	2 11	12:45			61	214 59 221	120 435
01:00			4	1	5	13:00			52	58	110
01:15			5	1	6	13:15			62	55	117
01:30			2	1	3	13:30			60	52	112
01:45			1	12 2 5	3 17	13:45			73	247 64 229	137 476
02:00			3	0	3	14:00			66	53	119
02:15			1	1	2	14:15			69	63	132
02:30			1	1	2	14:30			70	66	136
02:45			0	5 3 5	3 10	14:45			64	269 63 245	127 514
03:00			1	1	2	15:00			84	56	140
03:15			2	1	3	15:15			78	65	143
03:30			2	0	2	15:30			137	41	178
03:45			1	6 1 3	2 9	15:45			134	433 49 211	183 644
04:00			1	3	4	16:00			102	58	160
04:15			1	2	3	16:15			122	53	175
04:30			3	1	4	16:30			98	36	134
04:45			5	10 3 9	8 19	16:45			103	425 48 195	151 620
05:00			1	7	8	17:00			114	42	156
05:15			1	2	3	17:15			121	55	176
05:30			15	16	31	17:30			120	42	162
05:45			19	36 16 41	35 77	17:45			84	439 36 175	120 614
06:00			31	19	50	18:00			68	22	90
06:15			73	31	104	18:15			73	37	110
06:30			70	44	114	18:30			42	27	69
06:45			59	233 53 147	112 380	18:45			48	231 32 118	80 349
07:00			46	41	87	19:00			49	24	73
07:15			54	44	98	19:15			36	17	53
07:30			39	42	81	19:30			38	13	51
07:45			50	189 56 183	106 372	19:45			36	159 14 68	50 227
08:00			45	69	114	20:00			32	16	48
08:15			52	66	118	20:15			30	11	41
08:30			68	57	125	20:30			27	8	35
08:45			66	231 66 258	132 489	20:45			34	123 14 49	48 172
09:00			54	44	98	21:00			29	12	41
09:15			45	49	94	21:15			23	11	34
09:30			52	62	114	21:30			44	11	55
09:45			31	182 63 218	94 400	21:45			41	137 6 40	47 177
10:00			51	40	91	22:00			28	11	39
10:15			50	63	113	22:15			25	14	39
10:30			48	49	97	22:30			20	11	31
10:45			48	197 42 194	90 391	22:45			17	90 6 42	23 132
11:00			60	49	109	23:00			19	7	26
11:15			54	59	113	23:15			17	11	28
11:30			49	51	100	23:30			22	14	36
11:45			43	206 57 216	100 422	23:45			6	64 4 36	10 100
TOTALS				1313 1284	**2597**	**TOTALS**				2831 1629	**4460**
SPLIT %				50.6% 49.4%	**36.8%**	**SPLIT %**				63.5% 36.5%	**63.2%**

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	4,144	2,913	7,057

AM Peak Hour			06:15	08:00	**08:00**	**PM Peak Hour**			15:30	14:30	**15:30**
AM Pk Volume			248	258	**489**	**PM Pk Volume**			495	250	**696**
Pk Hr Factor			0.849	0.935	**0.926**	**Pk Hr Factor**			0.903	0.947	**0.951**
7 - 9 Volume	0	0	420	441	**861**	**4 - 6 Volume**	0	0	864	370	**1234**
7 - 9 Peak Hour			08:00	08:00	**08:00**	**4 - 6 Peak Hour**			16:45	16:00	**16:45**
7 - 9 Pk Volume	0	0	231	258	**489**	**4 - 6 Pk Volume**	0	0	458	195	**645**
Pk Hr Factor	0.000	0.000	0.849	0.935	**0.926**	**Pk Hr Factor**	0.000	0.000	0.946	0.841	**0.916**

Prepared by NDS/ATD

VOLUME

Deer Park Rd E/O SR 29

Day: Saturday
Date: 3/16/2019

City: St Helena
Project #: CA19_8143_002

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	3,132	2,643	5,775

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			8		6		14		12:00			41		70		111	
00:15			6		3		9		12:15			40		74		114	
00:30			7		5		12		12:30			46		63		109	
00:45			5	26	3	17	8	43	12:45			63	190	64	271	127	461
01:00			2		1		3		13:00			75		75		150	
01:15			1		2		3		13:15			63		73		136	
01:30			3		2		5		13:30			58		77		135	
01:45			3	9	3	8	6	17	13:45			58	254	56	281	114	535
02:00			1		1		2		14:00			63		63		126	
02:15			1		0		1		14:15			68		51		119	
02:30			1		0		1		14:30			66		70		136	
02:45			1	4	1	2	2	6	14:45			87	284	75	259	162	543
03:00			2		1		3		15:00			61		48		109	
03:15			3		0		3		15:15			86		65		151	
03:30			0		1		1		15:30			76		77		153	
03:45			3	8	1	3	4	11	15:45			72	295	61	251	133	546
04:00			0		0		0		16:00			64		48		112	
04:15			3		3		6		16:15			73		36		109	
04:30			1		0		1		16:30			84		42		126	
04:45			6	10	4	7	10	17	16:45			62	283	62	188	124	471
05:00			2		0		2		17:00			99		41		140	
05:15			2		4		6		17:15			78		38		116	
05:30			7		5		12		17:30			72		35		107	
05:45			9	20	7	16	16	36	17:45			69	318	28	142	97	460
06:00			18		12		30		18:00			61		28		89	
06:15			25		12		37		18:15			37		21		58	
06:30			32		9		41		18:30			50		36		86	
06:45			34	109	15	48	49	157	18:45			53	201	23	108	76	309
07:00			17		17		34		19:00			48		21		69	
07:15			25		11		36		19:15			33		21		54	
07:30			25		25		50		19:30			40		15		55	
07:45			20	87	23	76	43	163	19:45			38	159	19	76	57	235
08:00			18		23		41		20:00			32		18		50	
08:15			30		34		64		20:15			25		22		47	
08:30			23		31		54		20:30			34		14		48	
08:45			37	108	35	123	72	231	20:45			23	114	12	66	35	180
09:00			16		35		51		21:00			22		15		37	
09:15			32		42		74		21:15			19		13		32	
09:30			43		47		90		21:30			32		7		39	
09:45			35	126	53	177	88	303	21:45			26	99	12	47	38	146
10:00			40		41		81		22:00			24		10		34	
10:15			37		46		83		22:15			12		12		24	
10:30			31		45		76		22:30			26		6		32	
10:45			33	141	40	172	73	313	22:45			16	78	4	32	20	110
11:00			42		55		97		23:00			19		9		28	
11:15			28		59		87		23:15			8		6		14	
11:30			39		61		100		23:30			12		9		21	
11:45			51	160	66	241	117	401	23:45			10	49	8	32	18	81
TOTALS				808		890		1698	TOTALS				2324		1753		4077
SPLIT %				47.6%		52.4%		29.4%	SPLIT %				57.0%		43.0%		70.6%

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	3,132	2,643	5,775

AM Peak Hour				11:45		11:45		11:45	PM Peak Hour				16:30		12:45		14:45
AM Pk Volume				178		273		451	PM Pk Volume				323		289		575
Pk Hr Factor				0.873		0.922		0.964	Pk Hr Factor				0.816		0.938		0.887
7 - 9 Volume	0	0		195		199		394	4 - 6 Volume	0	0		601		330		931
7 - 9 Peak Hour				08:00		08:00		08:00	4 - 6 Peak Hour				16:30		16:00		16:30
7 - 9 Pk Volume	0	0		108		123		231	4 - 6 Pk Volume	0	0		323		188		506
Pk Hr Factor	0.000	0.000		0.730		0.879		0.802	Pk Hr Factor	0.000	0.000		0.816		0.758		0.904

Appendix B: Intersection LOS Sheets

Intersection	
Int Delay, s/veh	1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	26	38	811	37	26	847
Future Vol, veh/h	26	38	811	37	26	847
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	150	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	28	41	882	40	28	921

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1859	882	0	0	922	0
Stage 1	882	-	-	-	-	-
Stage 2	977	-	-	-	-	-
Critical Hdwy	6.45	6.25	-	-	4.15	-
Critical Hdwy Stg 1	5.45	-	-	-	-	-
Critical Hdwy Stg 2	5.45	-	-	-	-	-
Follow-up Hdwy	3.545	3.345	-	-	2.245	-
Pot Cap-1 Maneuver	79	341	-	-	728	-
Stage 1	400	-	-	-	-	-
Stage 2	360	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	76	341	-	-	728	-
Mov Cap-2 Maneuver	197	-	-	-	-	-
Stage 1	385	-	-	-	-	-
Stage 2	360	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	23.5	0	0.3
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	263	728	-
HCM Lane V/C Ratio	-	-	0.265	0.039	-
HCM Control Delay (s)	-	-	23.5	10.1	-
HCM Lane LOS	-	-	C	B	-
HCM 95th %tile Q(veh)	-	-	1	0.1	-

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	3	0	847	3	0	873
Future Vol, veh/h	3	0	847	3	0	873
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	250	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	5	2	2	5
Mvmt Flow	3	0	921	3	0	949

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1872	923	0	0	924	0
Stage 1	923	-	-	-	-	-
Stage 2	949	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	79	327	-	-	739	-
Stage 1	387	-	-	-	-	-
Stage 2	376	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	79	327	-	-	739	-
Mov Cap-2 Maneuver	210	-	-	-	-	-
Stage 1	387	-	-	-	-	-
Stage 2	376	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	22.4	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	210	739	-
HCM Lane V/C Ratio	-	-	0.016	-	-
HCM Control Delay (s)	-	-	22.4	0	-
HCM Lane LOS	-	-	C	A	-
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	1	0	826	1	0	877
Future Vol, veh/h	1	0	826	1	0	877
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	275	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	5	2	2	5
Mvmt Flow	1	0	888	1	0	943

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1832	889	0	0	889	0
Stage 1	889	-	-	-	-	-
Stage 2	943	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	84	342	-	-	762	-
Stage 1	402	-	-	-	-	-
Stage 2	379	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	84	342	-	-	762	-
Mov Cap-2 Maneuver	216	-	-	-	-	-
Stage 1	402	-	-	-	-	-
Stage 2	379	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	21.8	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	216	762	-
HCM Lane V/C Ratio	-	-	0.005	-	-
HCM Control Delay (s)	-	-	21.8	0	-
HCM Lane LOS	-	-	C	A	-
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Int Delay, s/veh	240.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	109	140	715	306	280	587
Future Vol, veh/h	109	140	715	306	280	587
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	300	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	118	152	777	333	304	638

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2190	944	0	0	1110	0
Stage 1	944	-	-	-	-	-
Stage 2	1246	-	-	-	-	-
Critical Hdwy	6.45	6.25	-	-	4.15	-
Critical Hdwy Stg 1	5.45	-	-	-	-	-
Critical Hdwy Stg 2	5.45	-	-	-	-	-
Follow-up Hdwy	3.545	3.345	-	-	2.245	-
Pot Cap-1 Maneuver	~ 49	314	-	-	618	-
Stage 1	374	-	-	-	-	-
Stage 2	267	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 25	314	-	-	618	-
Mov Cap-2 Maneuver	~ 25	-	-	-	-	-
Stage 1	190	-	-	-	-	-
Stage 2	267	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	$ 2048.5	0	5.3
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	52	618	-
HCM Lane V/C Ratio	-	-	5.205	0.492	-
HCM Control Delay (s)	-	-	$ 2048.5	16.3	-
HCM Lane LOS	-	-	F	C	-
HCM 95th %tile Q(veh)	-	-	30.6	2.7	-

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

Intersection	
Int Delay, s/veh	1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	28	31	786	17	17	625
Future Vol, veh/h	28	31	786	17	17	625
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	150	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	31	35	883	19	19	702

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1623	883	0	0	902	0
Stage 1	883	-	-	-	-	-
Stage 2	740	-	-	-	-	-
Critical Hdwy	6.45	6.25	-	-	4.15	-
Critical Hdwy Stg 1	5.45	-	-	-	-	-
Critical Hdwy Stg 2	5.45	-	-	-	-	-
Follow-up Hdwy	3.545	3.345	-	-	2.245	-
Pot Cap-1 Maneuver	111	341	-	-	741	-
Stage 1	399	-	-	-	-	-
Stage 2	466	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	108	341	-	-	741	-
Mov Cap-2 Maneuver	239	-	-	-	-	-
Stage 1	389	-	-	-	-	-
Stage 2	466	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	21.5	0	0.3
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	284	741	-
HCM Lane V/C Ratio	-	-	0.233	0.026	-
HCM Control Delay (s)	-	-	21.5	10	-
HCM Lane LOS	-	-	C	A	-
HCM 95th %tile Q(veh)	-	-	0.9	0.1	-

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	3	811	2	0	653
Future Vol, veh/h	0	3	811	2	0	653
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	250	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	5	2	2	5
Mvmt Flow	0	3	872	2	0	702

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1575	873	0	0	874	0
Stage 1	873	-	-	-	-	-
Stage 2	702	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	121	349	-	-	772	-
Stage 1	409	-	-	-	-	-
Stage 2	491	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	121	349	-	-	772	-
Mov Cap-2 Maneuver	258	-	-	-	-	-
Stage 1	409	-	-	-	-	-
Stage 2	491	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	15.4	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	349	772	-
HCM Lane V/C Ratio	-	-	0.009	-	-
HCM Control Delay (s)	-	-	15.4	0	-
HCM Lane LOS	-	-	C	A	-
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	813	0	2	651
Future Vol, veh/h	0	0	813	0	2	651
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	275	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	5	2	2	5
Mvmt Flow	0	0	874	0	2	700

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1578	874	0	0	874	0
Stage 1	874	-	-	-	-	-
Stage 2	704	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	120	349	-	-	772	-
Stage 1	408	-	-	-	-	-
Stage 2	490	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	120	349	-	-	772	-
Mov Cap-2 Maneuver	257	-	-	-	-	-
Stage 1	407	-	-	-	-	-
Stage 2	490	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	-	772	-
HCM Lane V/C Ratio	-	-	-	0.003	-
HCM Control Delay (s)	-	-	0	9.7	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-

Intersection	
Int Delay, s/veh	57.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	121	160	652	143	91	581
Future Vol, veh/h	121	160	652	143	91	581
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	300	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	127	168	686	151	96	612

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1566	762	0	0	837	0
Stage 1	762	-	-	-	-	-
Stage 2	804	-	-	-	-	-
Critical Hdwy	6.45	6.25	-	-	4.15	-
Critical Hdwy Stg 1	5.45	-	-	-	-	-
Critical Hdwy Stg 2	5.45	-	-	-	-	-
Follow-up Hdwy	3.545	3.345	-	-	2.245	-
Pot Cap-1 Maneuver	~ 120	400	-	-	784	-
Stage 1	456	-	-	-	-	-
Stage 2	435	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 105	400	-	-	784	-
Mov Cap-2 Maneuver	~ 105	-	-	-	-	-
Stage 1	400	-	-	-	-	-
Stage 2	435	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	$ 354.6	0	1.4
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	181	784	-
HCM Lane V/C Ratio	-	-	1.634	0.122	-
HCM Control Delay (s)	-	-	$ 354.6	10.2	-
HCM Lane LOS	-	-	F	B	-
HCM 95th %tile Q(veh)	-	-	19.9	0.4	-

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

Intersection	
Int Delay, s/veh	1.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	28	41	879	40	28	918
Future Vol, veh/h	28	41	879	40	28	918
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	150	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	30	45	955	43	30	998

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2013	955	0	0	998	0
Stage 1	955	-	-	-	-	-
Stage 2	1058	-	-	-	-	-
Critical Hdwy	6.45	6.25	-	-	4.15	-
Critical Hdwy Stg 1	5.45	-	-	-	-	-
Critical Hdwy Stg 2	5.45	-	-	-	-	-
Follow-up Hdwy	3.545	3.345	-	-	2.245	-
Pot Cap-1 Maneuver	63	309	-	-	682	-
Stage 1	369	-	-	-	-	-
Stage 2	329	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	60	309	-	-	682	-
Mov Cap-2 Maneuver	175	-	-	-	-	-
Stage 1	353	-	-	-	-	-
Stage 2	329	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	27.2	0	0.3
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	236	682	-
HCM Lane V/C Ratio	-	-	0.318	0.045	-
HCM Control Delay (s)	-	-	27.2	10.5	-
HCM Lane LOS	-	-	D	B	-
HCM 95th %tile Q(veh)	-	-	1.3	0.1	-

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	3	0	918	3	0	946
Future Vol, veh/h	3	0	918	3	0	946
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	250	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	5	2	2	5
Mvmt Flow	3	0	998	3	0	1028

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2028	1000	0	0	1001	0
Stage 1	1000	-	-	-	-	-
Stage 2	1028	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	63	295	-	-	692	-
Stage 1	356	-	-	-	-	-
Stage 2	345	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	63	295	-	-	692	-
Mov Cap-2 Maneuver	189	-	-	-	-	-
Stage 1	356	-	-	-	-	-
Stage 2	345	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	24.4	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	189	692	-
HCM Lane V/C Ratio	-	-	0.017	-	-
HCM Control Delay (s)	-	-	24.4	0	-
HCM Lane LOS	-	-	C	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	1	0	895	1	0	951
Future Vol, veh/h	1	0	895	1	0	951
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	275	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	5	2	2	5
Mvmt Flow	1	0	962	1	0	1023

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1986	963	0	0	963	0
Stage 1	963	-	-	-	-	-
Stage 2	1023	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	67	310	-	-	715	-
Stage 1	370	-	-	-	-	-
Stage 2	347	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	67	310	-	-	715	-
Mov Cap-2 Maneuver	194	-	-	-	-	-
Stage 1	370	-	-	-	-	-
Stage 2	347	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	23.7	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	194	715	-
HCM Lane V/C Ratio	-	-	0.006	-	-
HCM Control Delay (s)	-	-	23.7	0	-
HCM Lane LOS	-	-	C	A	-
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Int Delay, s/veh	429.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	118	152	775	331	304	636
Future Vol, veh/h	118	152	775	331	304	636
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	300	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	128	165	842	360	330	691

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2373	1022	0	0	1202	0
Stage 1	1022	-	-	-	-	-
Stage 2	1351	-	-	-	-	-
Critical Hdwy	6.45	6.25	-	-	4.15	-
Critical Hdwy Stg 1	5.45	-	-	-	-	-
Critical Hdwy Stg 2	5.45	-	-	-	-	-
Follow-up Hdwy	3.545	3.345	-	-	2.245	-
Pot Cap-1 Maneuver	~ 37	283	-	-	570	-
Stage 1	343	-	-	-	-	-
Stage 2	238	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 16	283	-	-	570	-
Mov Cap-2 Maneuver	~ 16	-	-	-	-	-
Stage 1	144	-	-	-	-	-
Stage 2	238	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	$ 3661	0	6.4
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	34	570	-
HCM Lane V/C Ratio	-	-	8.632	0.58	-
HCM Control Delay (s)	-	-	$ 3661	19.7	-
HCM Lane LOS	-	-	F	C	-
HCM 95th %tile Q(veh)	-	-	35.5	3.7	-

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

Intersection	
Int Delay, s/veh	1.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	30	34	852	18	18	678
Future Vol, veh/h	30	34	852	18	18	678
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	150	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	34	38	957	20	20	762

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1759	957	0	0	977	0
Stage 1	957	-	-	-	-	-
Stage 2	802	-	-	-	-	-
Critical Hdwy	6.45	6.25	-	-	4.15	-
Critical Hdwy Stg 1	5.45	-	-	-	-	-
Critical Hdwy Stg 2	5.45	-	-	-	-	-
Follow-up Hdwy	3.545	3.345	-	-	2.245	-
Pot Cap-1 Maneuver	91	308	-	-	694	-
Stage 1	368	-	-	-	-	-
Stage 2	436	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	88	308	-	-	694	-
Mov Cap-2 Maneuver	215	-	-	-	-	-
Stage 1	357	-	-	-	-	-
Stage 2	436	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	24.5	0	0.3
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	256	694	-
HCM Lane V/C Ratio	-	-	0.281	0.029	-
HCM Control Delay (s)	-	-	24.5	10.3	-
HCM Lane LOS	-	-	C	B	-
HCM 95th %tile Q(veh)	-	-	1.1	0.1	-

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	3	879	2	0	708
Future Vol, veh/h	0	3	879	2	0	708
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	250	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	5	2	2	5
Mvmt Flow	0	3	945	2	0	761

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1707	946	0	0	947	0
Stage 1	946	-	-	-	-	-
Stage 2	761	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	100	317	-	-	725	-
Stage 1	377	-	-	-	-	-
Stage 2	461	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	100	317	-	-	725	-
Mov Cap-2 Maneuver	234	-	-	-	-	-
Stage 1	377	-	-	-	-	-
Stage 2	461	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	16.5	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	317	725	-
HCM Lane V/C Ratio	-	-	0.01	-	-
HCM Control Delay (s)	-	-	16.5	0	-
HCM Lane LOS	-	-	C	A	-
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	1	0	881	0	2	706
Future Vol, veh/h	1	0	881	0	2	706
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	275	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	5	2	2	5
Mvmt Flow	1	0	947	0	2	759

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1710	947	0	0	947	0
Stage 1	947	-	-	-	-	-
Stage 2	763	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	100	317	-	-	725	-
Stage 1	377	-	-	-	-	-
Stage 2	460	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	100	317	-	-	725	-
Mov Cap-2 Maneuver	234	-	-	-	-	-
Stage 1	376	-	-	-	-	-
Stage 2	460	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	20.5	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	234	725	-
HCM Lane V/C Ratio	-	-	0.005	0.003	-
HCM Control Delay (s)	-	-	20.5	10	-
HCM Lane LOS	-	-	C	A	-
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Int Delay, s/veh	91.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	131	173	707	155	99	630
Future Vol, veh/h	131	173	707	155	99	630
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	300	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	138	182	744	163	104	663

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1697	826	0	0	907	0
Stage 1	826	-	-	-	-	-
Stage 2	871	-	-	-	-	-
Critical Hdwy	6.45	6.25	-	-	4.15	-
Critical Hdwy Stg 1	5.45	-	-	-	-	-
Critical Hdwy Stg 2	5.45	-	-	-	-	-
Follow-up Hdwy	3.545	3.345	-	-	2.245	-
Pot Cap-1 Maneuver	~ 100	367	-	-	738	-
Stage 1	425	-	-	-	-	-
Stage 2	405	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 86	367	-	-	738	-
Mov Cap-2 Maneuver	~ 86	-	-	-	-	-
Stage 1	365	-	-	-	-	-
Stage 2	405	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	$ 567.7	0	1.5
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	152	738	-
HCM Lane V/C Ratio	-	-	2.105	0.141	-
HCM Control Delay (s)	-	-	$ 567.7	10.7	-
HCM Lane LOS	-	-	F	B	-
HCM 95th %tile Q(veh)	-	-	25.7	0.5	-

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

Intersection	
Int Delay, s/veh	1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	27	38	820	38	26	849
Future Vol, veh/h	27	38	820	38	26	849
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	150	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	29	41	891	41	28	923

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1870	891	0	0	932	0
Stage 1	891	-	-	-	-	-
Stage 2	979	-	-	-	-	-
Critical Hdwy	6.45	6.25	-	-	4.15	-
Critical Hdwy Stg 1	5.45	-	-	-	-	-
Critical Hdwy Stg 2	5.45	-	-	-	-	-
Follow-up Hdwy	3.545	3.345	-	-	2.245	-
Pot Cap-1 Maneuver	78	337	-	-	722	-
Stage 1	396	-	-	-	-	-
Stage 2	359	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	75	337	-	-	722	-
Mov Cap-2 Maneuver	196	-	-	-	-	-
Stage 1	381	-	-	-	-	-
Stage 2	359	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	24	0	0.3
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	259	722	-
HCM Lane V/C Ratio	-	-	0.273	0.039	-
HCM Control Delay (s)	-	-	24	10.2	-
HCM Lane LOS	-	-	C	B	-
HCM 95th %tile Q(veh)	-	-	1.1	0.1	-

Intersection	
Int Delay, s/veh	0.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	15	10	847	5	3	873
Future Vol, veh/h	15	10	847	5	3	873
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	250	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	5	2	2	5
Mvmt Flow	16	11	921	5	3	949

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1879	924	0	0	926	0
Stage 1	924	-	-	-	-	-
Stage 2	955	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	78	327	-	-	738	-
Stage 1	387	-	-	-	-	-
Stage 2	374	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	78	327	-	-	738	-
Mov Cap-2 Maneuver	208	-	-	-	-	-
Stage 1	385	-	-	-	-	-
Stage 2	374	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	21.7	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	243	738	-
HCM Lane V/C Ratio	-	-	0.112	0.004	-
HCM Control Delay (s)	-	-	21.7	9.9	-
HCM Lane LOS	-	-	C	A	-
HCM 95th %tile Q(veh)	-	-	0.4	0	-

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	1	0	831	1	0	893
Future Vol, veh/h	1	0	831	1	0	893
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	275	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	5	2	2	5
Mvmt Flow	1	0	894	1	0	960

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1855	895	0	0	895	0
Stage 1	895	-	-	-	-	-
Stage 2	960	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	81	339	-	-	758	-
Stage 1	399	-	-	-	-	-
Stage 2	372	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	81	339	-	-	758	-
Mov Cap-2 Maneuver	213	-	-	-	-	-
Stage 1	399	-	-	-	-	-
Stage 2	372	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	22	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	213	758	-
HCM Lane V/C Ratio	-	-	0.005	-	-
HCM Control Delay (s)	-	-	22	0	-
HCM Lane LOS	-	-	C	A	-
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Int Delay, s/veh	264.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	109	141	719	306	284	598
Future Vol, veh/h	109	141	719	306	284	598
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	300	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	118	153	782	333	309	650

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2217	949	0	0	1115	0
Stage 1	949	-	-	-	-	-
Stage 2	1268	-	-	-	-	-
Critical Hdwy	6.45	6.25	-	-	4.15	-
Critical Hdwy Stg 1	5.45	-	-	-	-	-
Critical Hdwy Stg 2	5.45	-	-	-	-	-
Follow-up Hdwy	3.545	3.345	-	-	2.245	-
Pot Cap-1 Maneuver	~ 47	312	-	-	615	-
Stage 1	372	-	-	-	-	-
Stage 2	261	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 23	312	-	-	615	-
Mov Cap-2 Maneuver	~ 23	-	-	-	-	-
Stage 1	185	-	-	-	-	-
Stage 2	261	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	$ 2265	0	5.3
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	48	615	-
HCM Lane V/C Ratio	-	-	5.661	0.502	-
HCM Control Delay (s)	-	-	$ 2265	16.6	-
HCM Lane LOS	-	-	F	C	-
HCM 95th %tile Q(veh)	-	-	31.2	2.8	-

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

Intersection	
Int Delay, s/veh	1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	29	31	794	18	17	632
Future Vol, veh/h	29	31	794	18	17	632
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	150	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	33	35	892	20	19	710

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1640	892	0	0	912	0
Stage 1	892	-	-	-	-	-
Stage 2	748	-	-	-	-	-
Critical Hdwy	6.45	6.25	-	-	4.15	-
Critical Hdwy Stg 1	5.45	-	-	-	-	-
Critical Hdwy Stg 2	5.45	-	-	-	-	-
Follow-up Hdwy	3.545	3.345	-	-	2.245	-
Pot Cap-1 Maneuver	108	336	-	-	735	-
Stage 1	395	-	-	-	-	-
Stage 2	462	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	105	336	-	-	735	-
Mov Cap-2 Maneuver	236	-	-	-	-	-
Stage 1	385	-	-	-	-	-
Stage 2	462	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	22	0	0.3
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	279	735	-
HCM Lane V/C Ratio	-	-	0.242	0.026	-
HCM Control Delay (s)	-	-	22	10	-
HCM Lane LOS	-	-	C	B	-
HCM 95th %tile Q(veh)	-	-	0.9	0.1	-

Intersection	
Int Delay, s/veh	0.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	14	9	811	13	8	653
Future Vol, veh/h	14	9	811	13	8	653
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	250	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	5	2	2	5
Mvmt Flow	15	10	872	14	9	702

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1599	879	0	0	886	0
Stage 1	879	-	-	-	-	-
Stage 2	720	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	117	347	-	-	764	-
Stage 1	406	-	-	-	-	-
Stage 2	482	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	116	347	-	-	764	-
Mov Cap-2 Maneuver	251	-	-	-	-	-
Stage 1	401	-	-	-	-	-
Stage 2	482	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	19	0	0.1
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	281	764	-
HCM Lane V/C Ratio	-	-	0.088	0.011	-
HCM Control Delay (s)	-	-	19	9.8	-
HCM Lane LOS	-	-	C	A	-
HCM 95th %tile Q(veh)	-	-	0.3	0	-

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	826	0	2	665
Future Vol, veh/h	0	0	826	0	2	665
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	275	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	5	2	2	5
Mvmt Flow	0	0	888	0	2	715

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1607	888	0	0	888	0
Stage 1	888	-	-	-	-	-
Stage 2	719	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	116	343	-	-	763	-
Stage 1	402	-	-	-	-	-
Stage 2	483	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	116	343	-	-	763	-
Mov Cap-2 Maneuver	252	-	-	-	-	-
Stage 1	401	-	-	-	-	-
Stage 2	483	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	-	763	-
HCM Lane V/C Ratio	-	-	-	0.003	-
HCM Control Delay (s)	-	-	0	9.7	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-

Intersection	
Int Delay, s/veh	61.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	121	163	662	143	94	592
Future Vol, veh/h	121	163	662	143	94	592
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	300	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	127	172	697	151	99	623

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1594	773	0	0	848	0
Stage 1	773	-	-	-	-	-
Stage 2	821	-	-	-	-	-
Critical Hdwy	6.45	6.25	-	-	4.15	-
Critical Hdwy Stg 1	5.45	-	-	-	-	-
Critical Hdwy Stg 2	5.45	-	-	-	-	-
Follow-up Hdwy	3.545	3.345	-	-	2.245	-
Pot Cap-1 Maneuver	~ 116	394	-	-	777	-
Stage 1	450	-	-	-	-	-
Stage 2	427	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 101	394	-	-	777	-
Mov Cap-2 Maneuver	~ 101	-	-	-	-	-
Stage 1	393	-	-	-	-	-
Stage 2	427	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	$ 383.5	0	1.4
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	176	777	-
HCM Lane V/C Ratio	-	-	1.699	0.127	-
HCM Control Delay (s)	-	-	$ 383.5	10.3	-
HCM Lane LOS	-	-	F	B	-
HCM 95th %tile Q(veh)	-	-	20.8	0.4	-

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

Intersection	
Int Delay, s/veh	1.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	29	41	888	41	28	920
Future Vol, veh/h	29	41	888	41	28	920
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	150	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	32	45	965	45	30	1000

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2025	965	0	0	1010	0
Stage 1	965	-	-	-	-	-
Stage 2	1060	-	-	-	-	-
Critical Hdwy	6.45	6.25	-	-	4.15	-
Critical Hdwy Stg 1	5.45	-	-	-	-	-
Critical Hdwy Stg 2	5.45	-	-	-	-	-
Follow-up Hdwy	3.545	3.345	-	-	2.245	-
Pot Cap-1 Maneuver	62	305	-	-	675	-
Stage 1	365	-	-	-	-	-
Stage 2	329	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	59	305	-	-	675	-
Mov Cap-2 Maneuver	174	-	-	-	-	-
Stage 1	349	-	-	-	-	-
Stage 2	329	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	27.9	0	0.3
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	232	675	-
HCM Lane V/C Ratio	-	-	0.328	0.045	-
HCM Control Delay (s)	-	-	27.9	10.6	-
HCM Lane LOS	-	-	D	B	-
HCM 95th %tile Q(veh)	-	-	1.4	0.1	-

Intersection	
Int Delay, s/veh	0.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	15	10	918	5	3	946
Future Vol, veh/h	15	10	918	5	3	946
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	250	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	5	2	2	5
Mvmt Flow	16	11	998	5	3	1028

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2035	1001	0	0	1003	0
Stage 1	1001	-	-	-	-	-
Stage 2	1034	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	63	295	-	-	690	-
Stage 1	355	-	-	-	-	-
Stage 2	343	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	63	295	-	-	690	-
Mov Cap-2 Maneuver	187	-	-	-	-	-
Stage 1	354	-	-	-	-	-
Stage 2	343	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	23.8	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	219	690	-
HCM Lane V/C Ratio	-	-	0.124	0.005	-
HCM Control Delay (s)	-	-	23.8	10.2	-
HCM Lane LOS	-	-	C	B	-
HCM 95th %tile Q(veh)	-	-	0.4	0	-

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	1	0	900	1	0	966
Future Vol, veh/h	1	0	900	1	0	966
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	275	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	5	2	2	5
Mvmt Flow	1	0	968	1	0	1039

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2008	969	0	0	969	0
Stage 1	969	-	-	-	-	-
Stage 2	1039	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	65	308	-	-	711	-
Stage 1	368	-	-	-	-	-
Stage 2	341	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	65	308	-	-	711	-
Mov Cap-2 Maneuver	191	-	-	-	-	-
Stage 1	368	-	-	-	-	-
Stage 2	341	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	24	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	191	711	-
HCM Lane V/C Ratio	-	-	0.006	-	-
HCM Control Delay (s)	-	-	24	0	-
HCM Lane LOS	-	-	C	A	-
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Int Delay, s/veh	458.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	118	153	779	331	308	647
Future Vol, veh/h	118	153	779	331	308	647
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	300	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	128	166	847	360	335	703

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2400	1027	0	0	1207	0
Stage 1	1027	-	-	-	-	-
Stage 2	1373	-	-	-	-	-
Critical Hdwy	6.45	6.25	-	-	4.15	-
Critical Hdwy Stg 1	5.45	-	-	-	-	-
Critical Hdwy Stg 2	5.45	-	-	-	-	-
Follow-up Hdwy	3.545	3.345	-	-	2.245	-
Pot Cap-1 Maneuver	~ 36	281	-	-	568	-
Stage 1	341	-	-	-	-	-
Stage 2	232	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 15	281	-	-	568	-
Mov Cap-2 Maneuver	~ 15	-	-	-	-	-
Stage 1	140	-	-	-	-	-
Stage 2	232	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	$ 3932	0	6.5
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	32	568	-
HCM Lane V/C Ratio	-	-	9.205	0.589	-
HCM Control Delay (s)	-	-	$ 3932	20	-
HCM Lane LOS	-	-	F	C	-
HCM 95th %tile Q(veh)	-	-	35.9	3.8	-

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

Intersection	
Int Delay, s/veh	1.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	31	34	860	19	18	685
Future Vol, veh/h	31	34	860	19	18	685
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	150	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	35	38	966	21	20	770

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1776	966	0	0	987	0
Stage 1	966	-	-	-	-	-
Stage 2	810	-	-	-	-	-
Critical Hdwy	6.45	6.25	-	-	4.15	-
Critical Hdwy Stg 1	5.45	-	-	-	-	-
Critical Hdwy Stg 2	5.45	-	-	-	-	-
Follow-up Hdwy	3.545	3.345	-	-	2.245	-
Pot Cap-1 Maneuver	89	305	-	-	688	-
Stage 1	365	-	-	-	-	-
Stage 2	432	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	86	305	-	-	688	-
Mov Cap-2 Maneuver	213	-	-	-	-	-
Stage 1	354	-	-	-	-	-
Stage 2	432	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	24.9	0	0.3
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	253	688	-
HCM Lane V/C Ratio	-	-	0.289	0.029	-
HCM Control Delay (s)	-	-	24.9	10.4	-
HCM Lane LOS	-	-	C	B	-
HCM 95th %tile Q(veh)	-	-	1.2	0.1	-

Intersection	
Int Delay, s/veh	0.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	14	9	879	13	8	708
Future Vol, veh/h	14	9	879	13	8	708
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	250	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	5	2	2	5
Mvmt Flow	15	10	945	14	9	761

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1731	952	0	0	959	0
Stage 1	952	-	-	-	-	-
Stage 2	779	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	97	315	-	-	717	-
Stage 1	375	-	-	-	-	-
Stage 2	452	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	96	315	-	-	717	-
Mov Cap-2 Maneuver	227	-	-	-	-	-
Stage 1	370	-	-	-	-	-
Stage 2	452	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	20.6	0	0.1
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	255	717	-
HCM Lane V/C Ratio	-	-	0.097	0.012	-
HCM Control Delay (s)	-	-	20.6	10.1	-
HCM Lane LOS	-	-	C	B	-
HCM 95th %tile Q(veh)	-	-	0.3	0	-

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	1	0	894	0	2	720
Future Vol, veh/h	1	0	894	0	2	720
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	275	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	5	2	2	5
Mvmt Flow	1	0	961	0	2	774

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1739	961	0	0	961	0
Stage 1	961	-	-	-	-	-
Stage 2	778	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	96	311	-	-	716	-
Stage 1	371	-	-	-	-	-
Stage 2	453	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	96	311	-	-	716	-
Mov Cap-2 Maneuver	229	-	-	-	-	-
Stage 1	370	-	-	-	-	-
Stage 2	453	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	20.8	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	229	716	-
HCM Lane V/C Ratio	-	-	0.005	0.003	-
HCM Control Delay (s)	-	-	20.8	10	-
HCM Lane LOS	-	-	C	B	-
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Int Delay, s/veh	98.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	131	176	717	155	102	641
Future Vol, veh/h	131	176	717	155	102	641
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	300	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	138	185	755	163	107	675

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1726	837	0	0	918	0
Stage 1	837	-	-	-	-	-
Stage 2	889	-	-	-	-	-
Critical Hdwy	6.45	6.25	-	-	4.15	-
Critical Hdwy Stg 1	5.45	-	-	-	-	-
Critical Hdwy Stg 2	5.45	-	-	-	-	-
Follow-up Hdwy	3.545	3.345	-	-	2.245	-
Pot Cap-1 Maneuver	~ 96	362	-	-	731	-
Stage 1	420	-	-	-	-	-
Stage 2	397	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 82	362	-	-	731	-
Mov Cap-2 Maneuver	~ 82	-	-	-	-	-
Stage 1	359	-	-	-	-	-
Stage 2	397	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	$ 610.5	0	1.5
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	147	731	-
HCM Lane V/C Ratio	-	-	2.198	0.147	-
HCM Control Delay (s)	-	-	$ 610.5	10.8	-
HCM Lane LOS	-	-	F	B	-
HCM 95th %tile Q(veh)	-	-	26.6	0.5	-

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

Intersection	
Int Delay, s/veh	2.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	38	55	1184	54	38	1236
Future Vol, veh/h	38	55	1184	54	38	1236
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	150	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	41	60	1287	59	41	1343

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2712	1287	0	0	1346	0
Stage 1	1287	-	-	-	-	-
Stage 2	1425	-	-	-	-	-
Critical Hdwy	6.45	6.25	-	-	4.15	-
Critical Hdwy Stg 1	5.45	-	-	-	-	-
Critical Hdwy Stg 2	5.45	-	-	-	-	-
Follow-up Hdwy	3.545	3.345	-	-	2.245	-
Pot Cap-1 Maneuver	~ 23	198	-	-	502	-
Stage 1	255	-	-	-	-	-
Stage 2	218	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 21	198	-	-	502	-
Mov Cap-2 Maneuver	101	-	-	-	-	-
Stage 1	234	-	-	-	-	-
Stage 2	218	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	76.5	0	0.4
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	142	502	-
HCM Lane V/C Ratio	-	-	0.712	0.082	-
HCM Control Delay (s)	-	-	76.5	12.8	-
HCM Lane LOS	-	-	F	B	-
HCM 95th %tile Q(veh)	-	-	4.1	0.3	-

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

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	3	0	1236	3	0	1275
Future Vol, veh/h	3	0	1236	3	0	1275
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	250	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	5	2	2	5
Mvmt Flow	3	0	1343	3	0	1386

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2731	1345	0	0	1346	0
Stage 1	1345	-	-	-	-	-
Stage 2	1386	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	23	185	-	-	512	-
Stage 1	243	-	-	-	-	-
Stage 2	232	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	23	185	-	-	512	-
Mov Cap-2 Maneuver	119	-	-	-	-	-
Stage 1	243	-	-	-	-	-
Stage 2	232	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	36.1	0	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	119	512	-
HCM Lane V/C Ratio	-	-	0.027	-	-
HCM Control Delay (s)	-	-	36.1	0	-
HCM Lane LOS	-	-	E	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	1	0	1206	1	0	1280
Future Vol, veh/h	1	0	1206	1	0	1280
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	275	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	5	2	2	5
Mvmt Flow	1	0	1297	1	0	1376

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2674	1298	0	0	1298	0
Stage 1	1298	-	-	-	-	-
Stage 2	1376	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	25	198	-	-	534	-
Stage 1	256	-	-	-	-	-
Stage 2	234	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	25	198	-	-	534	-
Mov Cap-2 Maneuver	123	-	-	-	-	-
Stage 1	256	-	-	-	-	-
Stage 2	234	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	34.5	0	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	123	534	-
HCM Lane V/C Ratio	-	-	0.009	-	-
HCM Control Delay (s)	-	-	34.5	0	-
HCM Lane LOS	-	-	D	A	-
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Int Delay, s/veh	88.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	159	204	1043	447	409	857
Future Vol, veh/h	159	204	1043	447	409	857
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	300	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	173	222	1134	486	445	932

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	3199	1377	0	0	1620	0
Stage 1	1377	-	-	-	-	-
Stage 2	1822	-	-	-	-	-
Critical Hdwy	6.45	6.25	-	-	4.15	-
Critical Hdwy Stg 1	5.45	-	-	-	-	-
Critical Hdwy Stg 2	5.45	-	-	-	-	-
Follow-up Hdwy	3.545	3.345	-	-	2.245	-
Pot Cap-1 Maneuver	~ 11	~ 175	-	-	~ 394	-
Stage 1	231	-	-	-	-	-
Stage 2	~ 139	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	0	~ 175	-	-	~ 394	-
Mov Cap-2 Maneuver	0	-	-	-	-	-
Stage 1	0	-	-	-	-	-
Stage 2	~ 139	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	$ 625	0	37.8
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	175	~ 394	-
HCM Lane V/C Ratio	-	-	2.255	1.128	-
HCM Control Delay (s)	-	-	$ 625	117	-
HCM Lane LOS	-	-	F	F	-
HCM 95th %tile Q(veh)	-	-	32.1	16.5	-

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

Intersection	
Int Delay, s/veh	2.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	41	45	1147	25	25	912
Future Vol, veh/h	41	45	1147	25	25	912
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	150	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	46	51	1289	28	28	1025

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2370	1289	0	0	1317	0
Stage 1	1289	-	-	-	-	-
Stage 2	1081	-	-	-	-	-
Critical Hdwy	6.45	6.25	-	-	4.15	-
Critical Hdwy Stg 1	5.45	-	-	-	-	-
Critical Hdwy Stg 2	5.45	-	-	-	-	-
Follow-up Hdwy	3.545	3.345	-	-	2.245	-
Pot Cap-1 Maneuver	~ 38	197	-	-	515	-
Stage 1	255	-	-	-	-	-
Stage 2	321	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 36	197	-	-	515	-
Mov Cap-2 Maneuver	137	-	-	-	-	-
Stage 1	241	-	-	-	-	-
Stage 2	321	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	55	0	0.3
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	163	515	-
HCM Lane V/C Ratio	-	-	0.593	0.055	-
HCM Control Delay (s)	-	-	55	12.4	-
HCM Lane LOS	-	-	F	B	-
HCM 95th %tile Q(veh)	-	-	3.2	0.2	-

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

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	3	1184	2	0	953
Future Vol, veh/h	0	3	1184	2	0	953
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	250	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	5	2	2	5
Mvmt Flow	0	3	1273	2	0	1025

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2299	1274	0	0	1275	0
Stage 1	1274	-	-	-	-	-
Stage 2	1025	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	43	204	-	-	545	-
Stage 1	263	-	-	-	-	-
Stage 2	346	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	43	204	-	-	545	-
Mov Cap-2 Maneuver	156	-	-	-	-	-
Stage 1	263	-	-	-	-	-
Stage 2	346	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	22.9	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	204	545	-
HCM Lane V/C Ratio	-	-	0.016	-	-
HCM Control Delay (s)	-	-	22.9	0	-
HCM Lane LOS	-	-	C	A	-
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	1187	0	2	950
Future Vol, veh/h	0	0	1187	0	2	950
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	275	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	5	2	2	5
Mvmt Flow	0	0	1276	0	2	1022

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2302	1276	0	0	1276	0
Stage 1	1276	-	-	-	-	-
Stage 2	1026	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	42	204	-	-	544	-
Stage 1	262	-	-	-	-	-
Stage 2	346	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	42	204	-	-	544	-
Mov Cap-2 Maneuver	154	-	-	-	-	-
Stage 1	261	-	-	-	-	-
Stage 2	346	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	-	544	-
HCM Lane V/C Ratio	-	-	-	0.004	-
HCM Control Delay (s)	-	-	0	11.6	-
HCM Lane LOS	-	-	A	B	-
HCM 95th %tile Q(veh)	-	-	-	0	-

Intersection	
Int Delay, s/veh	438.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	177	234	951	209	132	848
Future Vol, veh/h	177	234	951	209	132	848
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	300	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	186	246	1001	220	139	893

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2282	1111	0	0	1221	0
Stage 1	1111	-	-	-	-	-
Stage 2	1171	-	-	-	-	-
Critical Hdwy	6.45	6.25	-	-	4.15	-
Critical Hdwy Stg 1	5.45	-	-	-	-	-
Critical Hdwy Stg 2	5.45	-	-	-	-	-
Follow-up Hdwy	3.545	3.345	-	-	2.245	-
Pot Cap-1 Maneuver	~ 43	251	-	-	561	-
Stage 1	311	-	-	-	-	-
Stage 2	291	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 32	251	-	-	561	-
Mov Cap-2 Maneuver	~ 32	-	-	-	-	-
Stage 1	234	-	-	-	-	-
Stage 2	291	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	$ 2717.6	0	1.8
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	64	561	-
HCM Lane V/C Ratio	-	-	6.76	0.248	-
HCM Control Delay (s)	-	-	$ 2717.6	13.5	-
HCM Lane LOS	-	-	F	B	-
HCM 95th %tile Q(veh)	-	-	49.4	1	-

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

Intersection	
Int Delay, s/veh	3.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	39	55	1193	55	38	1238
Future Vol, veh/h	39	55	1193	55	38	1238
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	150	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	42	60	1297	60	41	1346

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2725	1297	0	0	1357	0
Stage 1	1297	-	-	-	-	-
Stage 2	1428	-	-	-	-	-
Critical Hdwy	6.45	6.25	-	-	4.15	-
Critical Hdwy Stg 1	5.45	-	-	-	-	-
Critical Hdwy Stg 2	5.45	-	-	-	-	-
Follow-up Hdwy	3.545	3.345	-	-	2.245	-
Pot Cap-1 Maneuver	~ 22	195	-	-	497	-
Stage 1	252	-	-	-	-	-
Stage 2	218	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 20	195	-	-	497	-
Mov Cap-2 Maneuver	100	-	-	-	-	-
Stage 1	231	-	-	-	-	-
Stage 2	218	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	80.1	0	0.4
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	140	497	-
HCM Lane V/C Ratio	-	-	0.73	0.083	-
HCM Control Delay (s)	-	-	80.1	12.9	-
HCM Lane LOS	-	-	F	B	-
HCM 95th %tile Q(veh)	-	-	4.3	0.3	-

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

Intersection	
Int Delay, s/veh	0.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	15	10	1236	5	3	1275
Future Vol, veh/h	15	10	1236	5	3	1275
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	250	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	5	2	2	5
Mvmt Flow	16	11	1343	5	3	1386

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2738	1346	0	0	1348	0
Stage 1	1346	-	-	-	-	-
Stage 2	1392	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	22	185	-	-	511	-
Stage 1	242	-	-	-	-	-
Stage 2	230	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	22	185	-	-	511	-
Mov Cap-2 Maneuver	117	-	-	-	-	-
Stage 1	241	-	-	-	-	-
Stage 2	230	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	37.7	0	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	137	511	-
HCM Lane V/C Ratio	-	-	0.198	0.006	-
HCM Control Delay (s)	-	-	37.7	12.1	-
HCM Lane LOS	-	-	E	B	-
HCM 95th %tile Q(veh)	-	-	0.7	0	-

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	1	0	1211	1	0	1295
Future Vol, veh/h	1	0	1211	1	0	1295
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	275	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	5	2	2	5
Mvmt Flow	1	0	1302	1	0	1392

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2695	1303	0	0	1303	0
Stage 1	1303	-	-	-	-	-
Stage 2	1392	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	24	196	-	-	531	-
Stage 1	254	-	-	-	-	-
Stage 2	230	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	24	196	-	-	531	-
Mov Cap-2 Maneuver	121	-	-	-	-	-
Stage 1	254	-	-	-	-	-
Stage 2	230	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	35	0	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	121	531	-
HCM Lane V/C Ratio	-	-	0.009	-	-
HCM Control Delay (s)	-	-	35	0	-
HCM Lane LOS	-	-	E	A	-
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Int Delay, s/veh	89.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	159	205	1047	447	413	868
Future Vol, veh/h	159	205	1047	447	413	868
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	300	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	173	223	1138	486	449	943

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	3222	1381	0	0	1624	0
Stage 1	1381	-	-	-	-	-
Stage 2	1841	-	-	-	-	-
Critical Hdwy	6.45	6.25	-	-	4.15	-
Critical Hdwy Stg 1	5.45	-	-	-	-	-
Critical Hdwy Stg 2	5.45	-	-	-	-	-
Follow-up Hdwy	3.545	3.345	-	-	2.245	-
Pot Cap-1 Maneuver	~ 10	~ 174	-	-	~ 392	-
Stage 1	230	-	-	-	-	-
Stage 2	~ 136	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	0	~ 174	-	-	~ 392	-
Mov Cap-2 Maneuver	0	-	-	-	-	-
Stage 1	0	-	-	-	-	-
Stage 2	~ 136	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	$ 633.7	0	39.7
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	174	~ 392	-
HCM Lane V/C Ratio	-	-	2.274	1.145	-
HCM Control Delay (s)	-	-	$ 633.7	123	-
HCM Lane LOS	-	-	F	F	-
HCM 95th %tile Q(veh)	-	-	32.3	17	-

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

Intersection	
Int Delay, s/veh	2.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	42	45	1155	26	25	919
Future Vol, veh/h	42	45	1155	26	25	919
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	150	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	47	51	1298	29	28	1033

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2387	1298	0	0	1327	0
Stage 1	1298	-	-	-	-	-
Stage 2	1089	-	-	-	-	-
Critical Hdwy	6.45	6.25	-	-	4.15	-
Critical Hdwy Stg 1	5.45	-	-	-	-	-
Critical Hdwy Stg 2	5.45	-	-	-	-	-
Follow-up Hdwy	3.545	3.345	-	-	2.245	-
Pot Cap-1 Maneuver	~ 37	195	-	-	511	-
Stage 1	252	-	-	-	-	-
Stage 2	318	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 35	195	-	-	511	-
Mov Cap-2 Maneuver	135	-	-	-	-	-
Stage 1	238	-	-	-	-	-
Stage 2	318	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	57	0	0.3
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	161	511	-
HCM Lane V/C Ratio	-	-	0.607	0.055	-
HCM Control Delay (s)	-	-	57	12.5	-
HCM Lane LOS	-	-	F	B	-
HCM 95th %tile Q(veh)	-	-	3.3	0.2	-

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

Intersection	
Int Delay, s/veh	0.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	14	9	1184	13	8	953
Future Vol, veh/h	14	9	1184	13	8	953
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	250	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	5	2	2	5
Mvmt Flow	15	10	1273	14	9	1025

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2323	1280	0	0	1287	0
Stage 1	1280	-	-	-	-	-
Stage 2	1043	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	41	202	-	-	539	-
Stage 1	261	-	-	-	-	-
Stage 2	339	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	40	202	-	-	539	-
Mov Cap-2 Maneuver	150	-	-	-	-	-
Stage 1	257	-	-	-	-	-
Stage 2	339	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	30.3	0	0.1
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	167	539	-
HCM Lane V/C Ratio	-	-	0.148	0.016	-
HCM Control Delay (s)	-	-	30.3	11.8	-
HCM Lane LOS	-	-	D	B	-
HCM 95th %tile Q(veh)	-	-	0.5	0	-

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	1200	0	2	964
Future Vol, veh/h	0	0	1200	0	2	964
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	275	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	5	2	2	5
Mvmt Flow	0	0	1290	0	2	1037

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2331	1290	0	0	1290	0
Stage 1	1290	-	-	-	-	-
Stage 2	1041	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	41	200	-	-	538	-
Stage 1	258	-	-	-	-	-
Stage 2	340	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	41	200	-	-	538	-
Mov Cap-2 Maneuver	152	-	-	-	-	-
Stage 1	257	-	-	-	-	-
Stage 2	340	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	-	538	-
HCM Lane V/C Ratio	-	-	-	0.004	-
HCM Control Delay (s)	-	-	0	11.7	-
HCM Lane LOS	-	-	A	B	-
HCM 95th %tile Q(veh)	-	-	-	0	-

Intersection	
Int Delay, s/veh	457.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	177	237	961	209	135	859
Future Vol, veh/h	177	237	961	209	135	859
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	300	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	186	249	1012	220	142	904

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2310	1122	0	0	1232	0
Stage 1	1122	-	-	-	-	-
Stage 2	1188	-	-	-	-	-
Critical Hdwy	6.45	6.25	-	-	4.15	-
Critical Hdwy Stg 1	5.45	-	-	-	-	-
Critical Hdwy Stg 2	5.45	-	-	-	-	-
Follow-up Hdwy	3.545	3.345	-	-	2.245	-
Pot Cap-1 Maneuver	~ 41	~ 247	-	-	555	-
Stage 1	307	-	-	-	-	-
Stage 2	285	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 31	~ 247	-	-	555	-
Mov Cap-2 Maneuver	~ 31	-	-	-	-	-
Stage 1	228	-	-	-	-	-
Stage 2	285	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	$ 2842.1	0	1.9
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	62	555	-
HCM Lane V/C Ratio	-	-	7.029	0.256	-
HCM Control Delay (s)	-	-	$ 2842.1	13.7	-
HCM Lane LOS	-	-	F	B	-
HCM 95th %tile Q(veh)	-	-	50	1	-

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

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	109	141	719	306	284	598
Future Volume (veh/h)	109	141	719	306	284	598
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	117	152	773	329	305	643
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	5	5	5	5	5	5
Cap, veh/h	196	175	742	316	310	1500
Arrive On Green	0.11	0.11	0.61	0.61	0.18	0.82
Sat Flow, veh/h	1739	1547	1215	517	1739	1826
Grp Volume(v), veh/h	117	152	0	1102	305	643
Grp Sat Flow(s),veh/h/ln	1739	1547	0	1733	1739	1826
Q Serve(g_s), s	8.8	13.3	0.0	83.9	24.0	13.3
Cycle Q Clear(g_c), s	8.8	13.3	0.0	83.9	24.0	13.3
Prop In Lane	1.00	1.00		0.30	1.00	
Lane Grp Cap(c), veh/h	196	175	0	1058	310	1500
V/C Ratio(X)	0.60	0.87	0.00	1.04	0.98	0.43
Avail Cap(c_a), veh/h	229	204	0	1058	310	1500
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	58.0	60.0	0.0	26.8	56.3	3.4
Incr Delay (d2), s/veh	3.1	28.0	0.0	39.1	46.5	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.1	6.6	0.0	44.1	14.5	4.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	61.1	88.0	0.0	65.9	102.8	3.6
LnGrp LOS	E	F	A	F	F	A
Approach Vol, veh/h	269		1102			948
Approach Delay, s/veh	76.3		65.9			35.5
Approach LOS	E		E			D

Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	29.0	88.4			117.4	20.0
Change Period (Y+Rc), s	4.5	4.5			4.5	4.5
Max Green Setting (Gmax), s	24.5	83.9			112.9	18.1
Max Q Clear Time (g_c+I1), s	26.0	85.9			15.3	15.3
Green Ext Time (p_c), s	0.0	0.0			5.3	0.2

Intersection Summary	
HCM 6th Ctrl Delay	54.7
HCM 6th LOS	D

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	121	163	662	143	94	592
Future Volume (veh/h)	121	163	662	143	94	592
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	130	175	712	154	101	637
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	5	5	5	5	5	5
Cap, veh/h	263	234	805	174	129	1281
Arrive On Green	0.15	0.15	0.55	0.55	0.07	0.70
Sat Flow, veh/h	1739	1547	1455	315	1739	1826
Grp Volume(v), veh/h	130	175	0	866	101	637
Grp Sat Flow(s),veh/h/ln	1739	1547	0	1769	1739	1826
Q Serve(g_s), s	4.2	6.6	0.0	26.1	3.5	9.8
Cycle Q Clear(g_c), s	4.2	6.6	0.0	26.1	3.5	9.8
Prop In Lane	1.00	1.00		0.18	1.00	
Lane Grp Cap(c), veh/h	263	234	0	980	129	1281
V/C Ratio(X)	0.49	0.75	0.00	0.88	0.79	0.50
Avail Cap(c_a), veh/h	516	459	0	1215	185	1583
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.8	24.8	0.0	11.9	27.8	4.2
Incr Delay (d2), s/veh	1.4	4.7	0.0	6.8	13.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	0.3	0.0	9.8	1.8	2.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	25.2	29.5	0.0	18.7	40.8	4.5
LnGrp LOS	C	C	A	B	D	A
Approach Vol, veh/h	305		866			738
Approach Delay, s/veh	27.7		18.7			9.4
Approach LOS	C		B			A

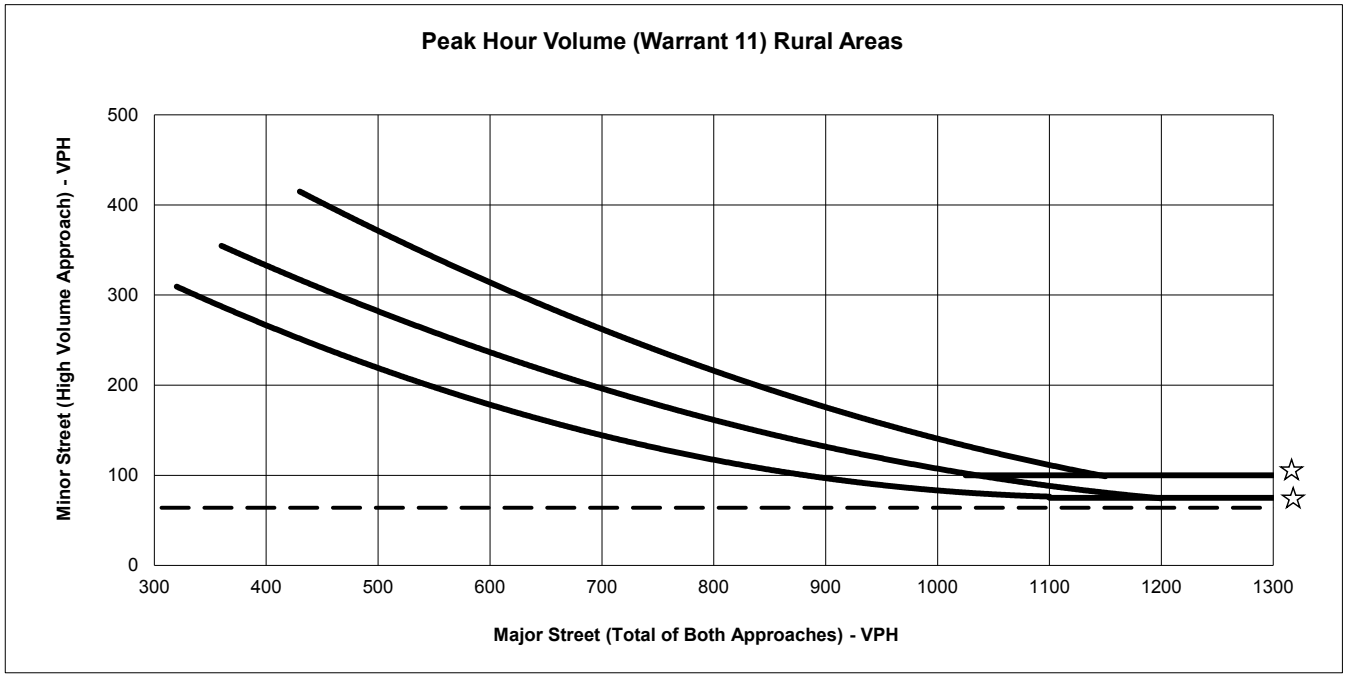
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	9.0	38.3			47.3	13.7
Change Period (Y+Rc), s	4.5	4.5			4.5	4.5
Max Green Setting (Gmax), s	6.5	41.9			52.9	18.1
Max Q Clear Time (g_c+I1), s	5.5	28.1			11.8	8.6
Green Ext Time (p_c), s	0.0	5.7			5.1	0.7

Intersection Summary	
HCM 6th Ctrl Delay	16.6
HCM 6th LOS	B

Appendix C: Signal Warrant Sheets

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
370	280				
400	270	460	297	430	410
500	215	500	290	500	380
600	185	600	230	600	310
700	140	700	198	700	265
800	115	800	170	800	210
900	99	900	125	900	180
1000	85	1000	105	1000	140
1100	75	1100	90	1100	110
1200	75	1200	75	1150	100
1300	75	1300	75	1300	100

** Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation*

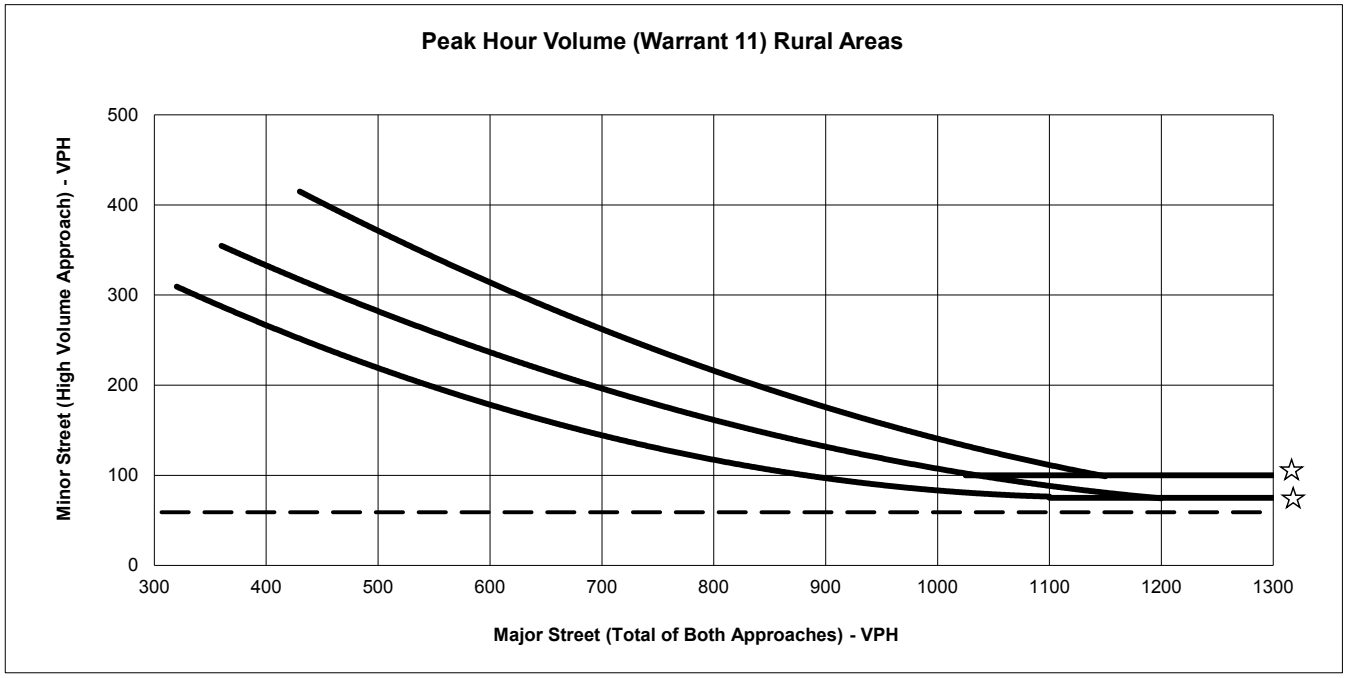


☆ NOTE:
100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 75 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Intersection: Lodi Lane / State Route 29
Scenario: Existing Weekday PM Peak Hour Conditions
Minor St. Volume: 64
Major St. Volume: 1721
Warrant Met?: **NO**

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
370	280				
400	270	460	297	430	410
500	215	500	290	500	380
600	185	600	230	600	310
700	140	700	198	700	265
800	115	800	170	800	210
900	99	900	125	900	180
1000	85	1000	105	1000	140
1100	75	1100	90	1100	110
1200	75	1200	75	1150	100
1300	75	1300	75	1300	100

** Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation*

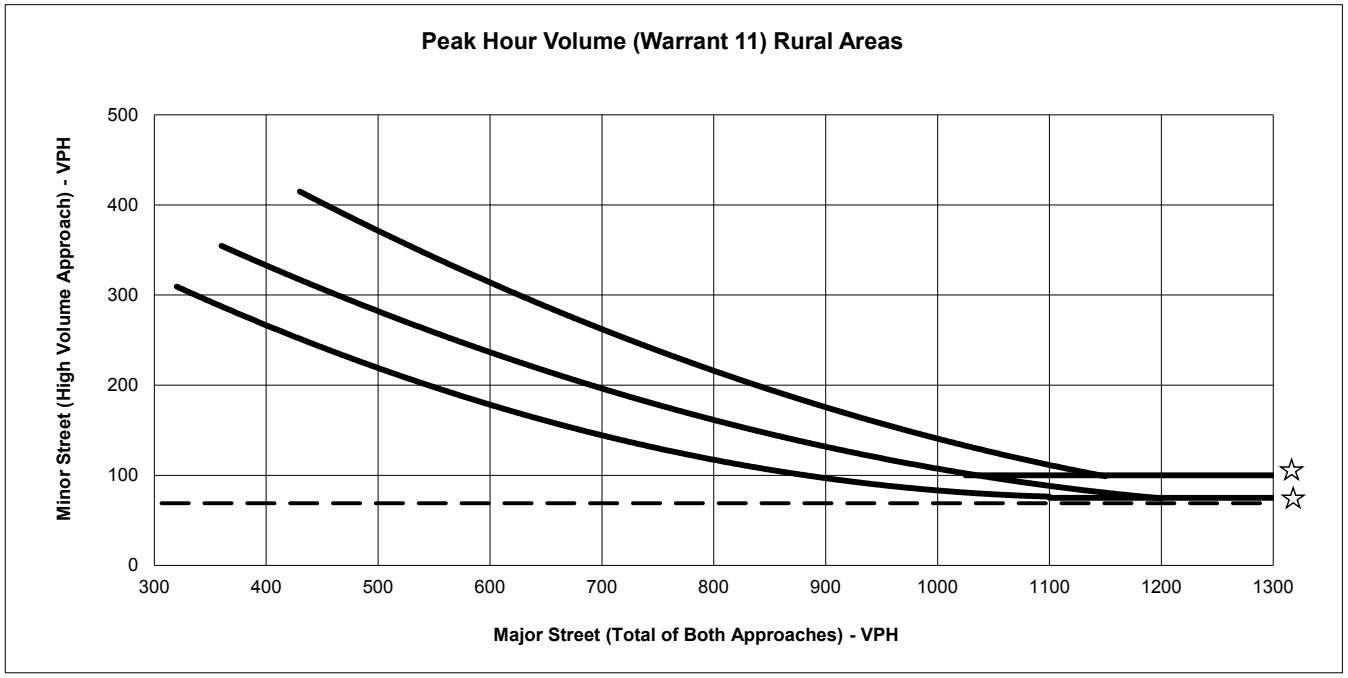


☆ NOTE:
100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 75 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Intersection:	Lodi Lane / State Route 29
Scenario:	Existing Weekdend Saturday MD Peak Hour Conditions
Minor St. Volume:	59
Major St. Volume:	1445
Warrant Met?:	**NO**

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
370	280				
400	270	460	297	430	410
500	215	500	290	500	380
600	185	600	230	600	310
700	140	700	198	700	265
800	115	800	170	800	210
900	99	900	125	900	180
1000	85	1000	105	1000	140
1100	75	1100	90	1100	110
1200	75	1200	75	1150	100
1300	75	1300	75	1300	100

** Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation*

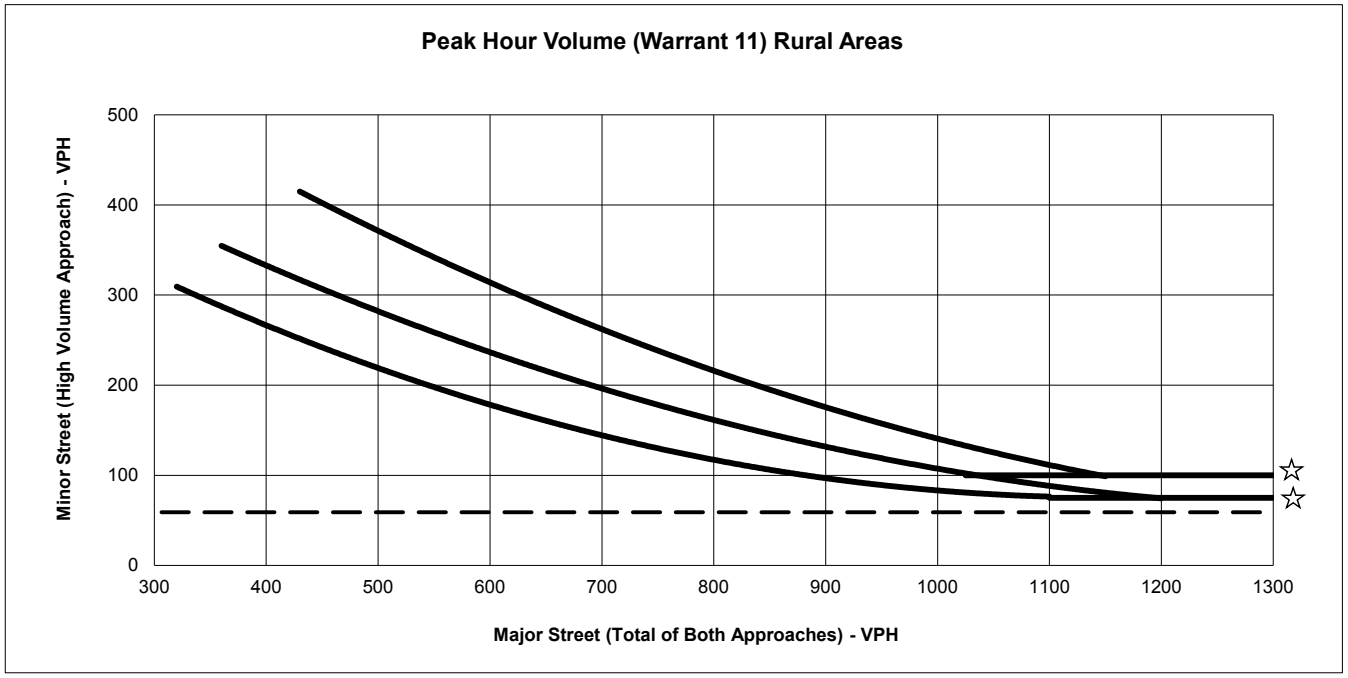


☆ NOTE:
100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 75 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Intersection:	Lodi Lane / State Route 29
Scenario:	Near-Term (NP) Weekday PM Peak Hour Conditions
Minor St. Volume:	69
Major St. Volume:	1865
Warrant Met?:	**NO**

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
370	280				
400	270	460	297	430	410
500	215	500	290	500	380
600	185	600	230	600	310
700	140	700	198	700	265
800	115	800	170	800	210
900	99	900	125	900	180
1000	85	1000	105	1000	140
1100	75	1100	90	1100	110
1200	75	1200	75	1150	100
1300	75	1300	75	1300	100

** Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation*

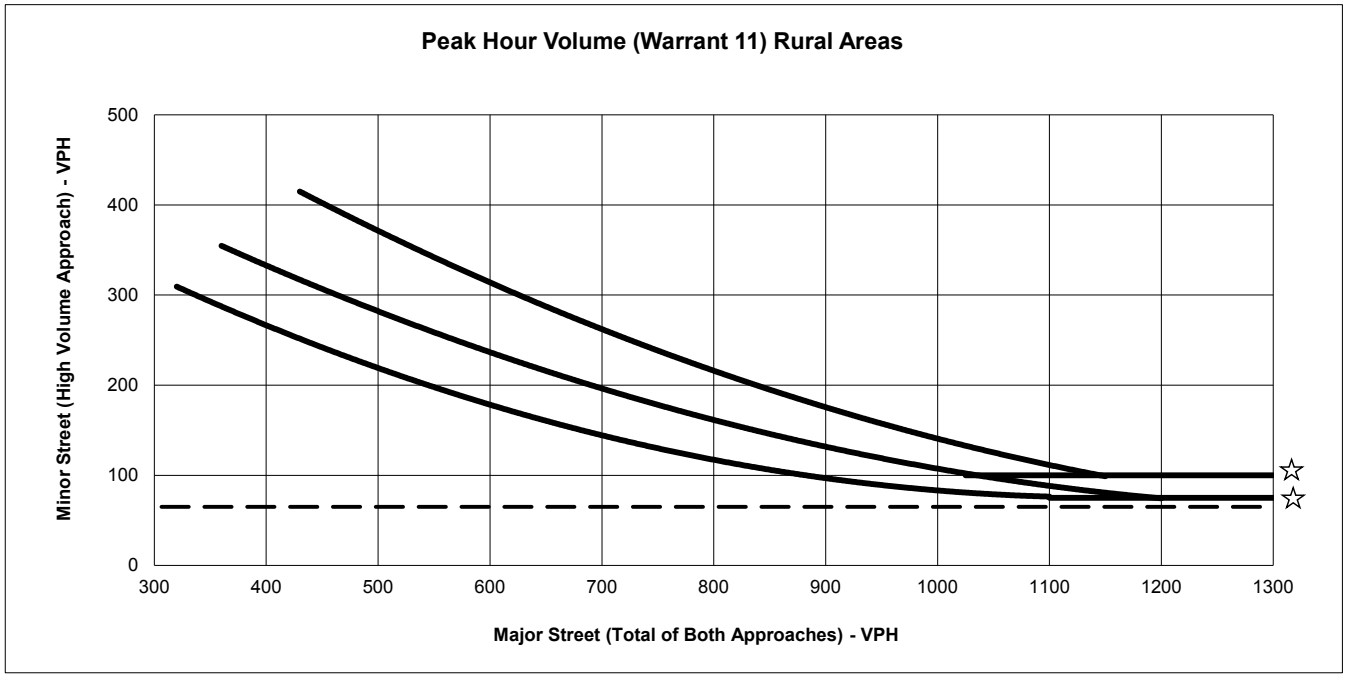


☆ NOTE:
100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 75 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Intersection:	Lodi Lane / State Route 29
Scenario:	Near-Term Weekdend Saturday MD Peak Hour Conditions
Minor St. Volume:	59
Major St. Volume:	1445
Warrant Met?:	**NO**

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
370	280				
400	270	460	297	430	410
500	215	500	290	500	380
600	185	600	230	600	310
700	140	700	198	700	265
800	115	800	170	800	210
900	99	900	125	900	180
1000	85	1000	105	1000	140
1100	75	1100	90	1100	110
1200	75	1200	75	1150	100
1300	75	1300	75	1300	100

** Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation*



☆ NOTE:
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Intersection:	Lodi Lane / State Route 29
Scenario:	Existing plus Project Weekday PM Peak Hour Conditions
Minor St. Volume:	65
Major St. Volume:	1733
Warrant Met?:	**NO**

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
370	280				
400	270	460	297	430	410
500	215	500	290	500	380
600	185	600	230	600	310
700	140	700	198	700	265
800	115	800	170	800	210
900	99	900	125	900	180
1000	85	1000	105	1000	140
1100	75	1100	90	1100	110
1200	75	1200	75	1150	100
1300	75	1300	75	1300	100

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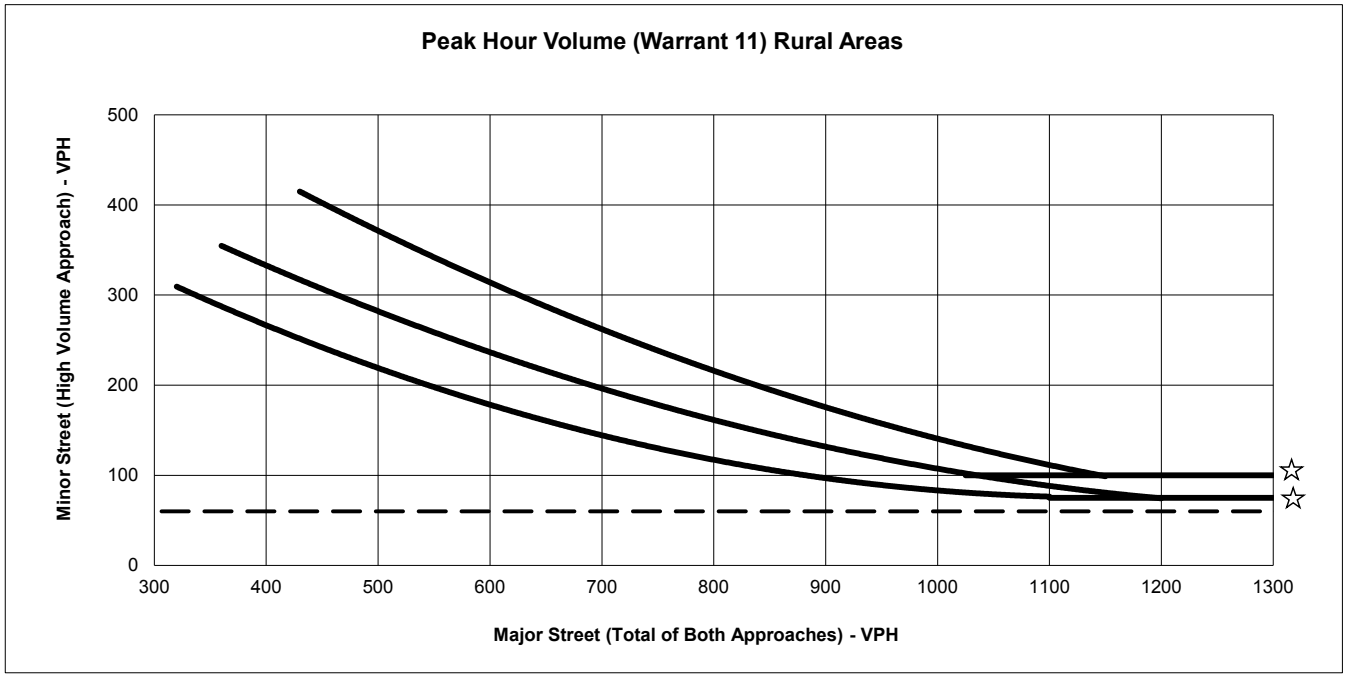

☆ NOTE:
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Intersection: Lodi Lane / State Route 29
Scenario: Existing plus Project Weekdend Saturday MD Peak Hour Conditions
Minor St. Volume: 60
Major St. Volume: 1461
Warrant Met?: **NO**

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
370	280				
400	270	460	297	430	410
500	215	500	290	500	380
600	185	600	230	600	310
700	140	700	198	700	265
800	115	800	170	800	210
900	99	900	125	900	180
1000	85	1000	105	1000	140
1100	75	1100	90	1100	110
1200	75	1200	75	1150	100
1300	75	1300	75	1300	100

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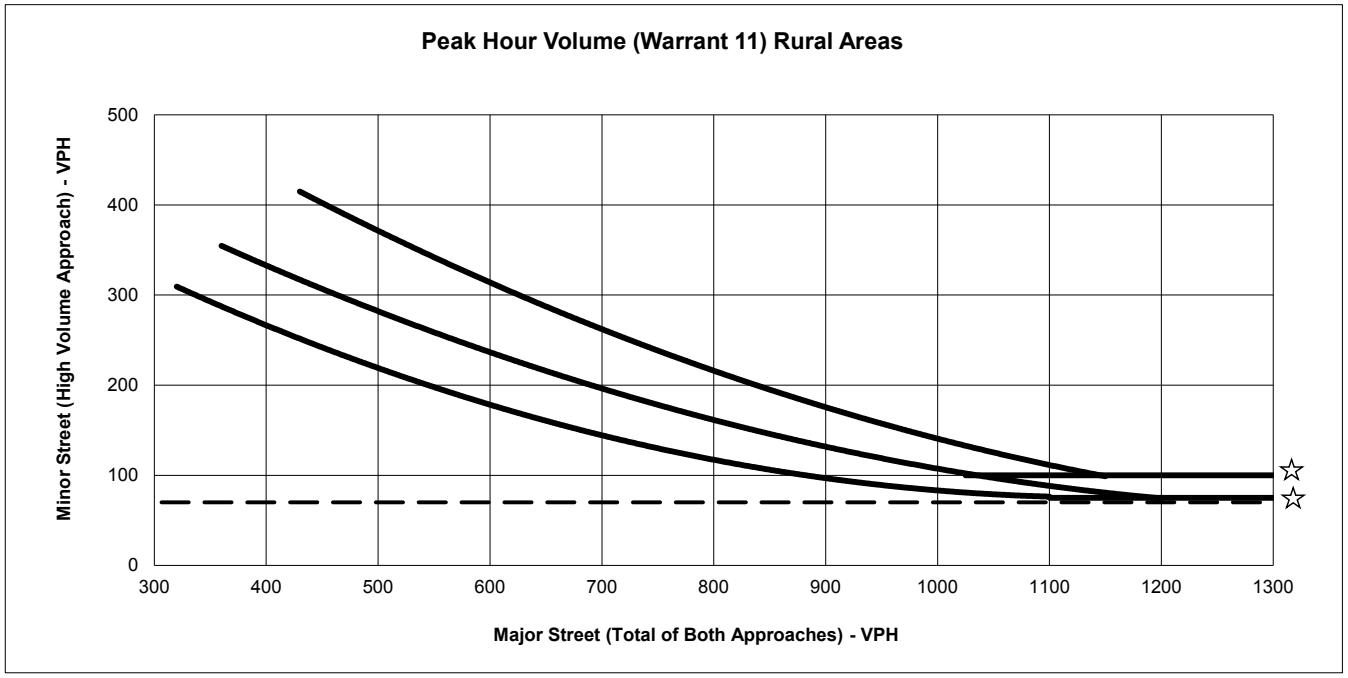

☆ NOTE:
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Intersection:	Lodi Lane / State Route 29
Scenario:	Near-Term plus Project Weekday PM Peak Hour Conditions
Minor St. Volume:	70
Major St. Volume:	1877
Warrant Met?:	**NO**

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
370	280				
400	270	460	297	430	410
500	215	500	290	500	380
600	185	600	230	600	310
700	140	700	198	700	265
800	115	800	170	800	210
900	99	900	125	900	180
1000	85	1000	105	1000	140
1100	75	1100	90	1100	110
1200	75	1200	75	1150	100
1300	75	1300	75	1300	100

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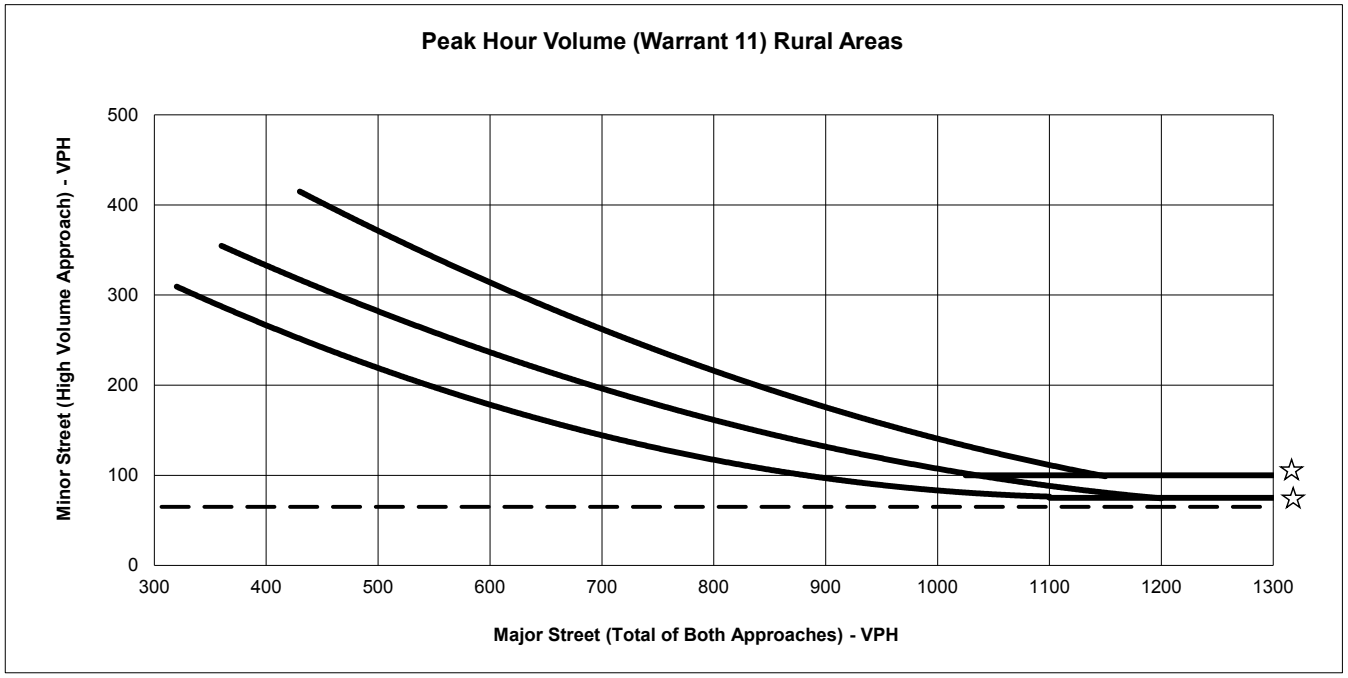

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Intersection:	Lodi Lane / State Route 29
Scenario:	Near-Term plus Project Weekdend Saturday MD Peak Hour Conditions
Minor St. Volume:	65
Major St. Volume:	1582
Warrant Met?:	**NO**

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
370	280				
400	270	460	297	430	410
500	215	500	290	500	380
600	185	600	230	600	310
700	140	700	198	700	265
800	115	800	170	800	210
900	99	900	125	900	180
1000	85	1000	105	1000	140
1100	75	1100	90	1100	110
1200	75	1200	75	1150	100
1300	75	1300	75	1300	100

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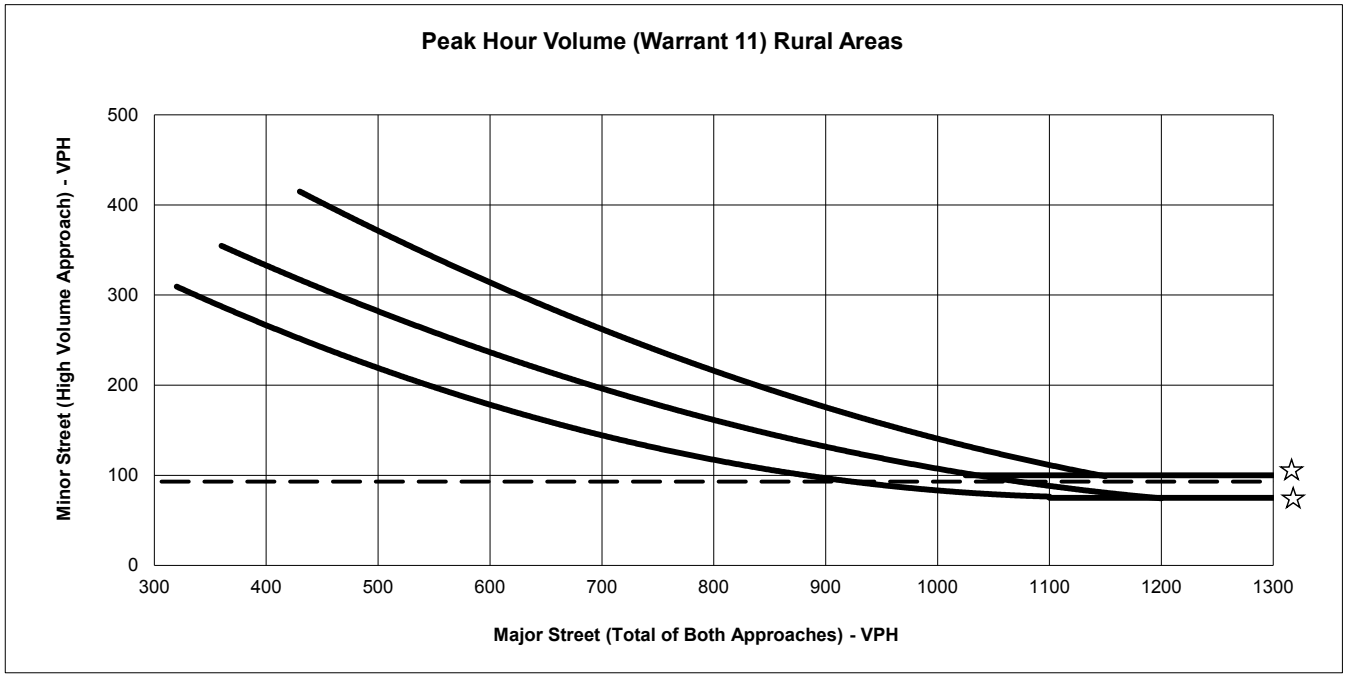

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Intersection:	Lodi Lane / State Route 29
Scenario:	Cumulative Yr. 2030 (NP) Weekday PM Peak Hour Conditions
Minor St. Volume:	93
Major St. Volume:	2512
Warrant Met?:	**YES**

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
370	280				
400	270	460	297	430	410
500	215	500	290	500	380
600	185	600	230	600	310
700	140	700	198	700	265
800	115	800	170	800	210
900	99	900	125	900	180
1000	85	1000	105	1000	140
1100	75	1100	90	1100	110
1200	75	1200	75	1150	100
1300	75	1300	75	1300	100

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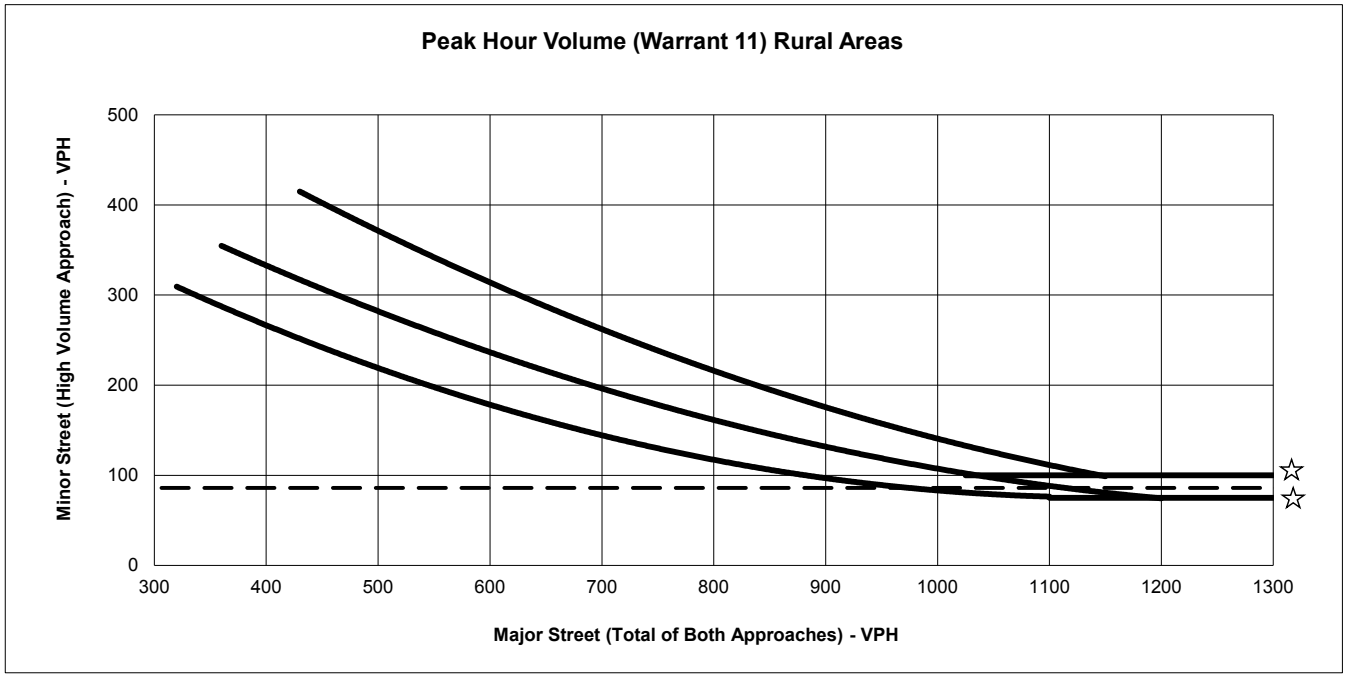

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Intersection:	Lodi Lane / State Route 29
Scenario:	Cumulative Yr. 2030 (NP) Weekend Saturday MD Peak Hour Conditions
Minor St. Volume:	86
Major St. Volume:	2109
Warrant Met?:	**YES**

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
370	280				
400	270	460	297	430	410
500	215	500	290	500	380
600	185	600	230	600	310
700	140	700	198	700	265
800	115	800	170	800	210
900	99	900	125	900	180
1000	85	1000	105	1000	140
1100	75	1100	90	1100	110
1200	75	1200	75	1150	100
1300	75	1300	75	1300	100

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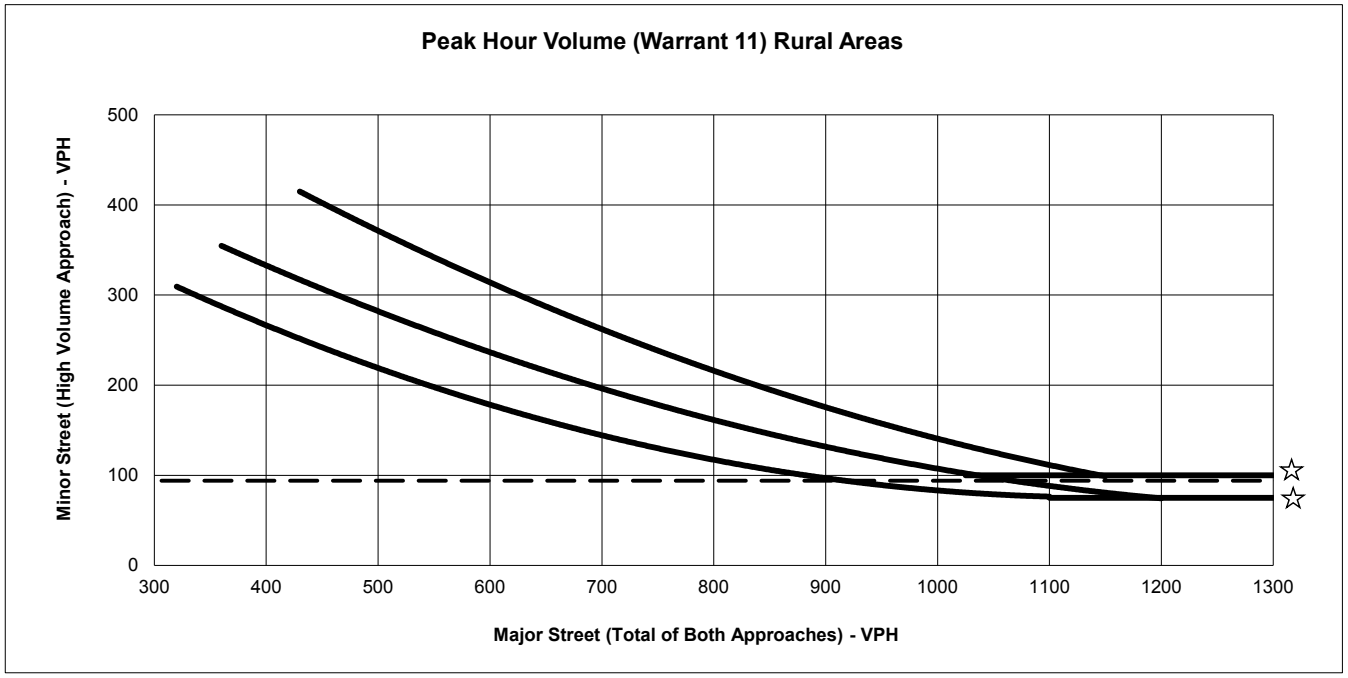

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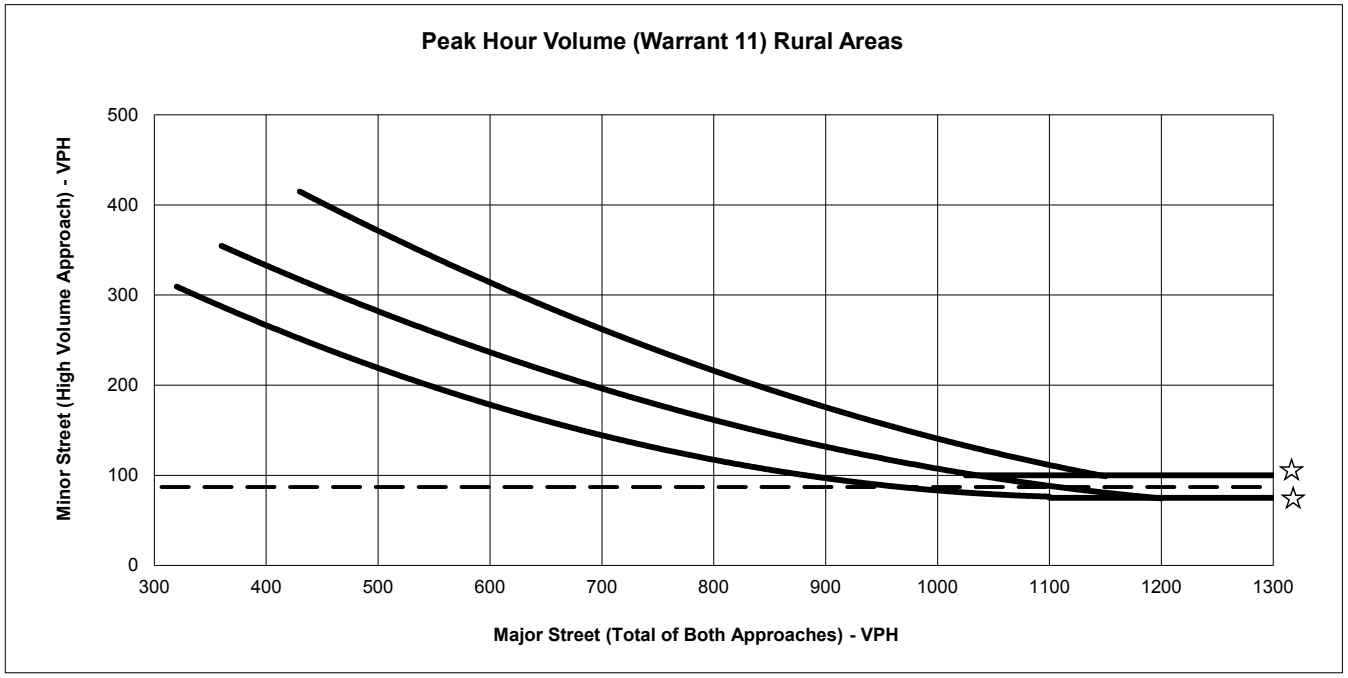
Intersection:	Lodi Lane / State Route 29
Scenario:	Cumulative Yr. 2030 plus Project Weekday PM Peak Hour Conditions
Minor St. Volume:	94
Major St. Volume:	2524
Warrant Met?:	**YES**

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
370	280				
400	270	460	297	430	410
500	215	500	290	500	380
600	185	600	230	600	310
700	140	700	198	700	265
800	115	800	170	800	210
900	99	900	125	900	180
1000	85	1000	105	1000	140
1100	75	1100	90	1100	110
1200	75	1200	75	1150	100
1300	75	1300	75	1300	100

** Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation*



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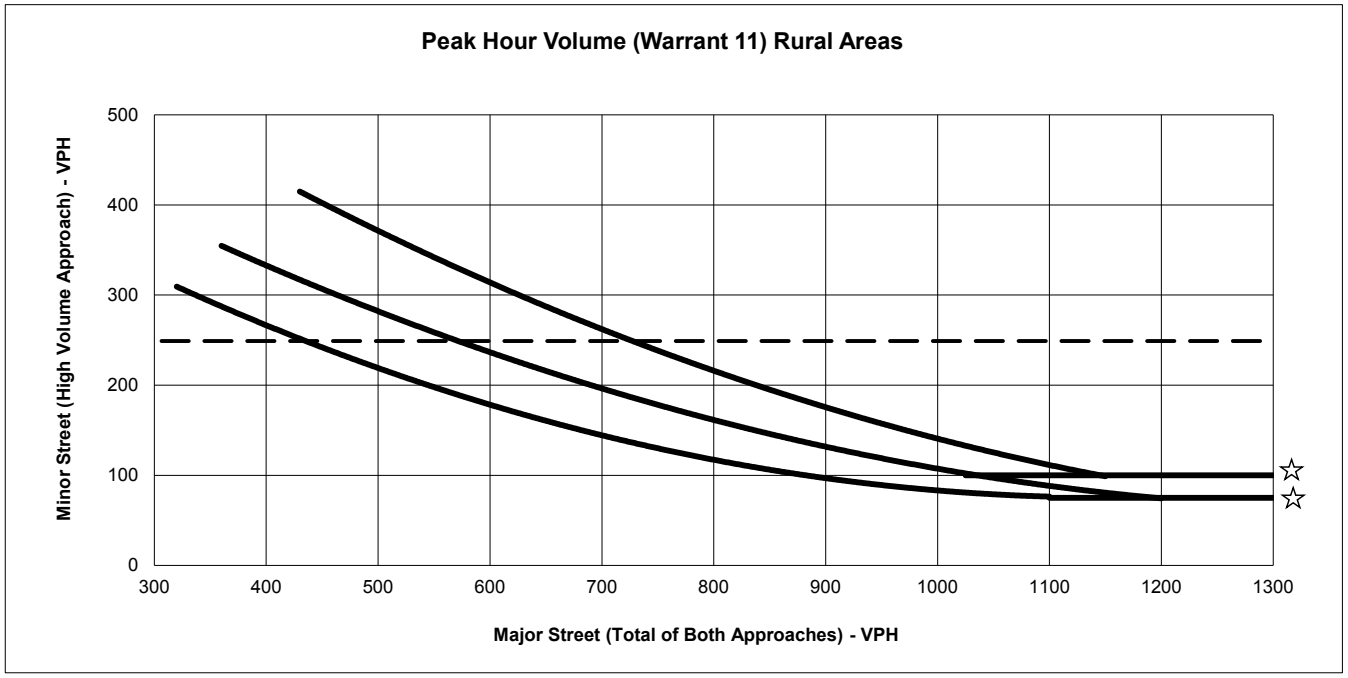
Intersection:	Lodi Lane / State Route 29
Scenario:	Cumulative Yr. 2030 (NP) Weekend Saturday MD Peak Hour Conditions
Minor St. Volume:	87
Major St. Volume:	2125
Warrant Met?:	**YES**

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
370	280				
400	270	460	297	430	410
500	215	500	290	500	380
600	185	600	230	600	310
700	140	700	198	700	265
800	115	800	170	800	210
900	99	900	125	900	180
1000	85	1000	105	1000	140
1100	75	1100	90	1100	110
1200	75	1200	75	1150	100
1300	75	1300	75	1300	100

** Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation*



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Intersection:	Deer Park Road / SR-29
Scenario:	Existing Weekday PM Peak Hour Conditions
Minor St. Volume:	249
Major St. Volume:	1888
Warrant Met?:	**YES**

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
370	280				
400	270	460	297	430	410
500	215	500	290	500	380
600	185	600	230	600	310
700	140	700	198	700	265
800	115	800	170	800	210
900	99	900	125	900	180
1000	85	1000	105	1000	140
1100	75	1100	90	1100	110
1200	75	1200	75	1150	100
1300	75	1300	75	1300	100

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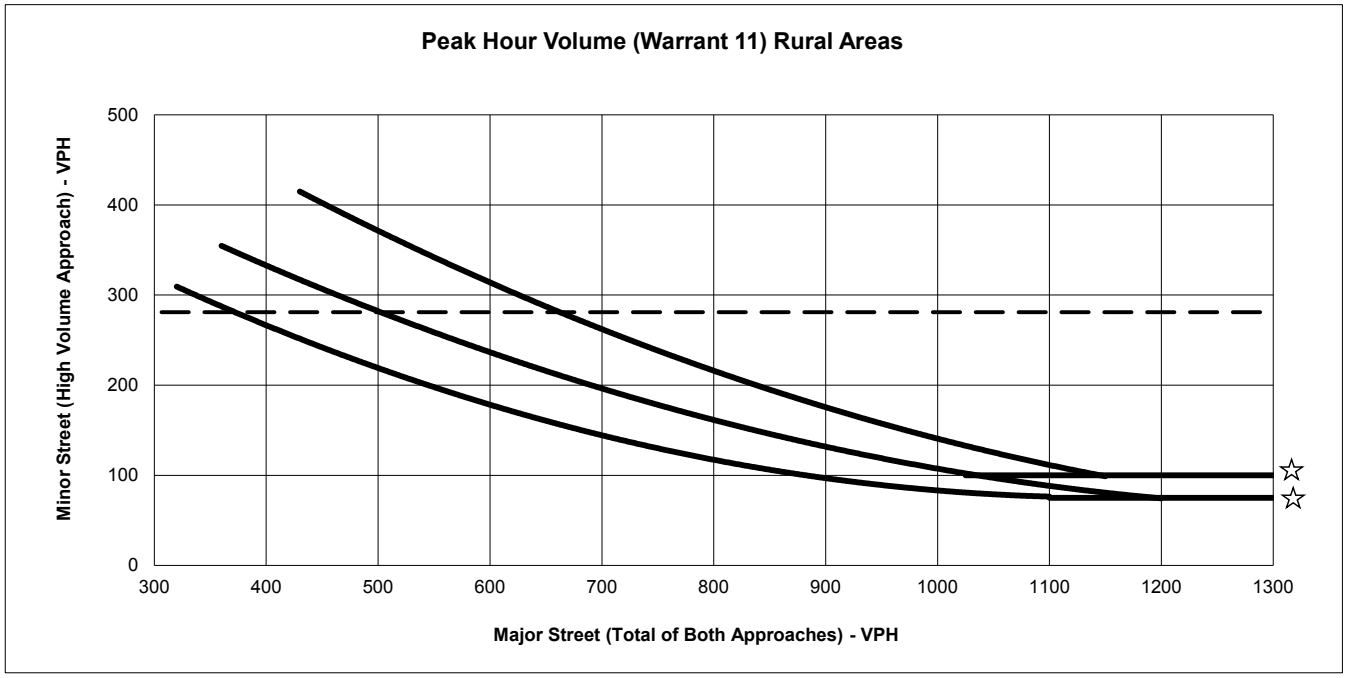

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Intersection:	Deer Park Road / SR-29
Scenario:	Existing Weekdend Saturday MD Peak Hour Conditions
Minor St. Volume:	281
Major St. Volume:	1467
Warrant Met?:	**YES**

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
370	280				
400	270	460	297	430	410
500	215	500	290	500	380
600	185	600	230	600	310
700	140	700	198	700	265
800	115	800	170	800	210
900	99	900	125	900	180
1000	85	1000	105	1000	140
1100	75	1100	90	1100	110
1200	75	1200	75	1150	100
1300	75	1300	75	1300	100

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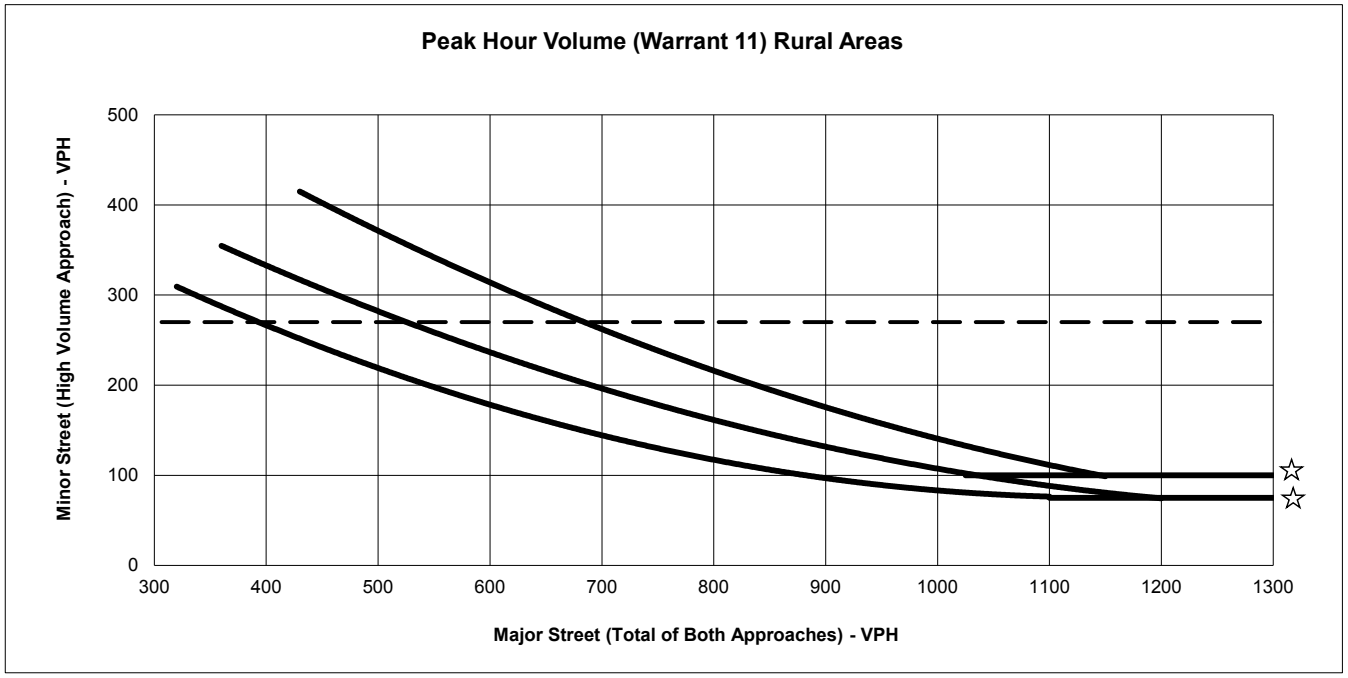

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Intersection: Deer Park Road / SR-29
Scenario: Near-Term (NP) Weekday PM Peak Hour Conditions
Minor St. Volume: 270
Major St. Volume: 2046
Warrant Met?: **YES**

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
370	280				
400	270	460	297	430	410
500	215	500	290	500	380
600	185	600	230	600	310
700	140	700	198	700	265
800	115	800	170	800	210
900	99	900	125	900	180
1000	85	1000	105	1000	140
1100	75	1100	90	1100	110
1200	75	1200	75	1150	100
1300	75	1300	75	1300	100

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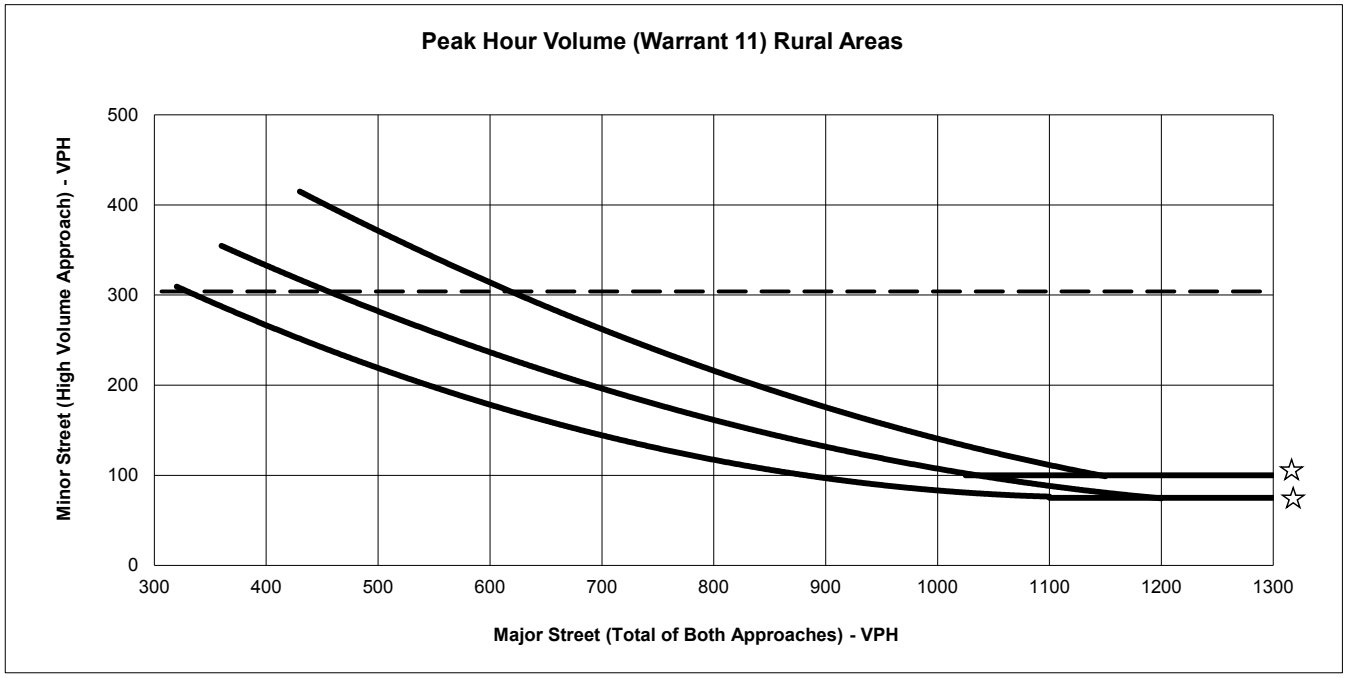

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Intersection:	Deer Park Road / SR-29
Scenario:	Near-Term (NP) Weekdend Saturday MD Peak Hour Conditions
Minor St. Volume:	304
Major St. Volume:	1591
Warrant Met?:	**YES**

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
370	280				
400	270	460	297	430	410
500	215	500	290	500	380
600	185	600	230	600	310
700	140	700	198	700	265
800	115	800	170	800	210
900	99	900	125	900	180
1000	85	1000	105	1000	140
1100	75	1100	90	1100	110
1200	75	1200	75	1150	100
1300	75	1300	75	1300	100

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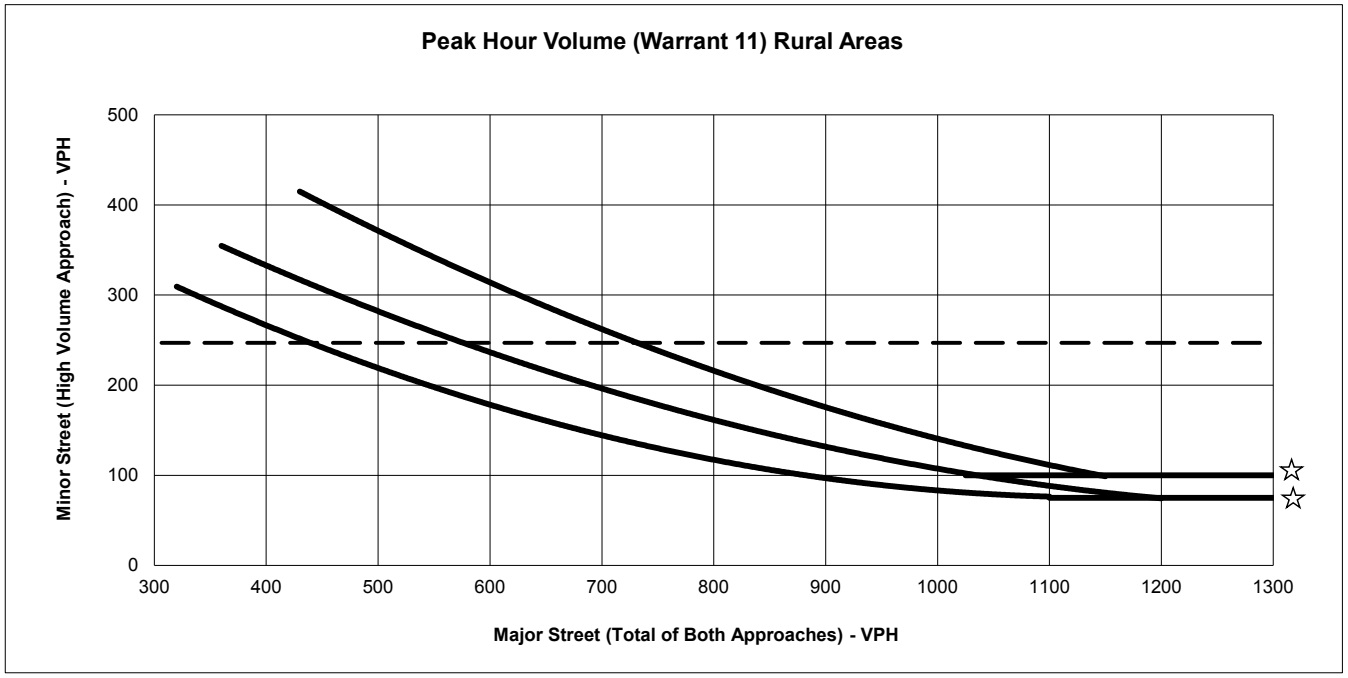

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Intersection:	Deer Park Road / SR-29
Scenario:	Existing plus Project Weekday PM Peak Hour Conditions
Minor St. Volume:	247
Major St. Volume:	1907
Warrant Met?:	**YES**

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
370	280				
400	270	460	297	430	410
500	215	500	290	500	380
600	185	600	230	600	310
700	140	700	198	700	265
800	115	800	170	800	210
900	99	900	125	900	180
1000	85	1000	105	1000	140
1100	75	1100	90	1100	110
1200	75	1200	75	1150	100
1300	75	1300	75	1300	100

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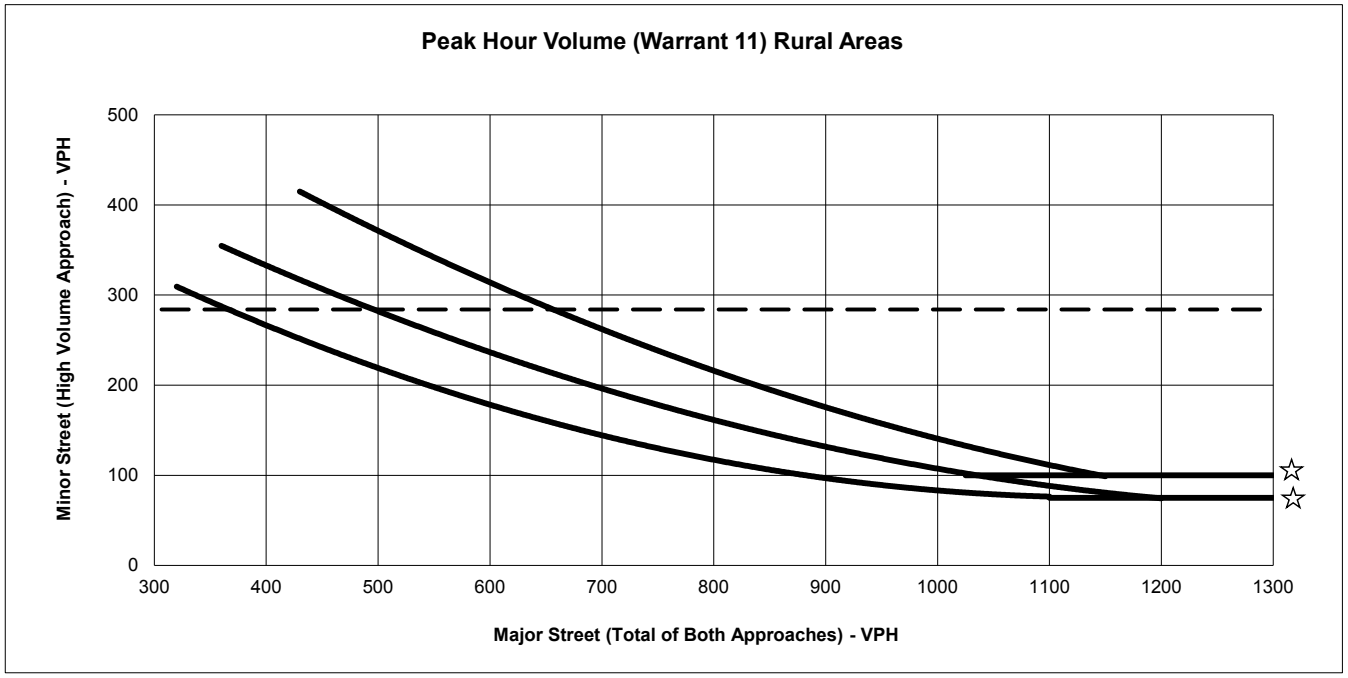

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Intersection:	Deer Park Road / SR-29
Scenario:	Existing plus Project Weekdend Saturday MD Peak Hour Conditions
Minor St. Volume:	284
Major St. Volume:	1491
Warrant Met?:	**YES**

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
370	280				
400	270	460	297	430	410
500	215	500	290	500	380
600	185	600	230	600	310
700	140	700	198	700	265
800	115	800	170	800	210
900	99	900	125	900	180
1000	85	1000	105	1000	140
1100	75	1100	90	1100	110
1200	75	1200	75	1150	100
1300	75	1300	75	1300	100

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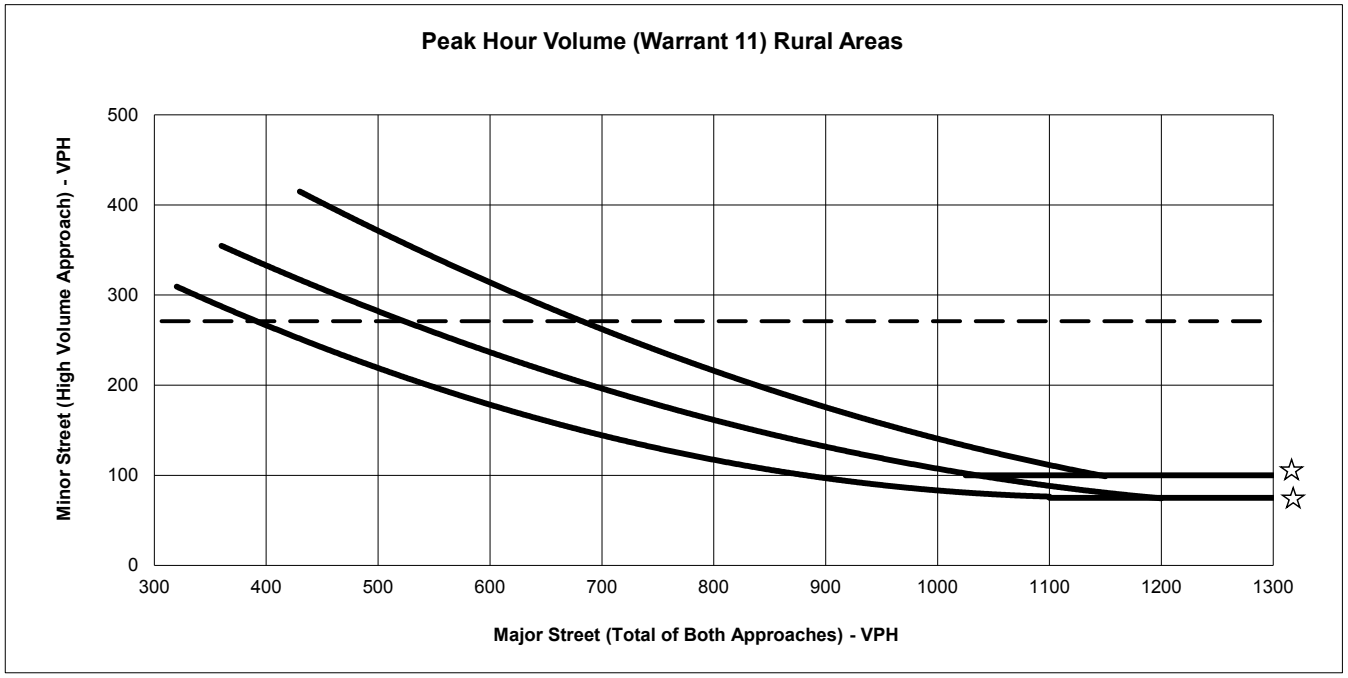

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Intersection:	Deer Park Road / SR-29
Scenario:	Near-Term plus Project PM Weekday Conditions
Minor St. Volume:	271
Major St. Volume:	2065
Warrant Met?:	**YES**

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
370	280				
400	270	460	297	430	410
500	215	500	290	500	380
600	185	600	230	600	310
700	140	700	198	700	265
800	115	800	170	800	210
900	99	900	125	900	180
1000	85	1000	105	1000	140
1100	75	1100	90	1100	110
1200	75	1200	75	1150	100
1300	75	1300	75	1300	100

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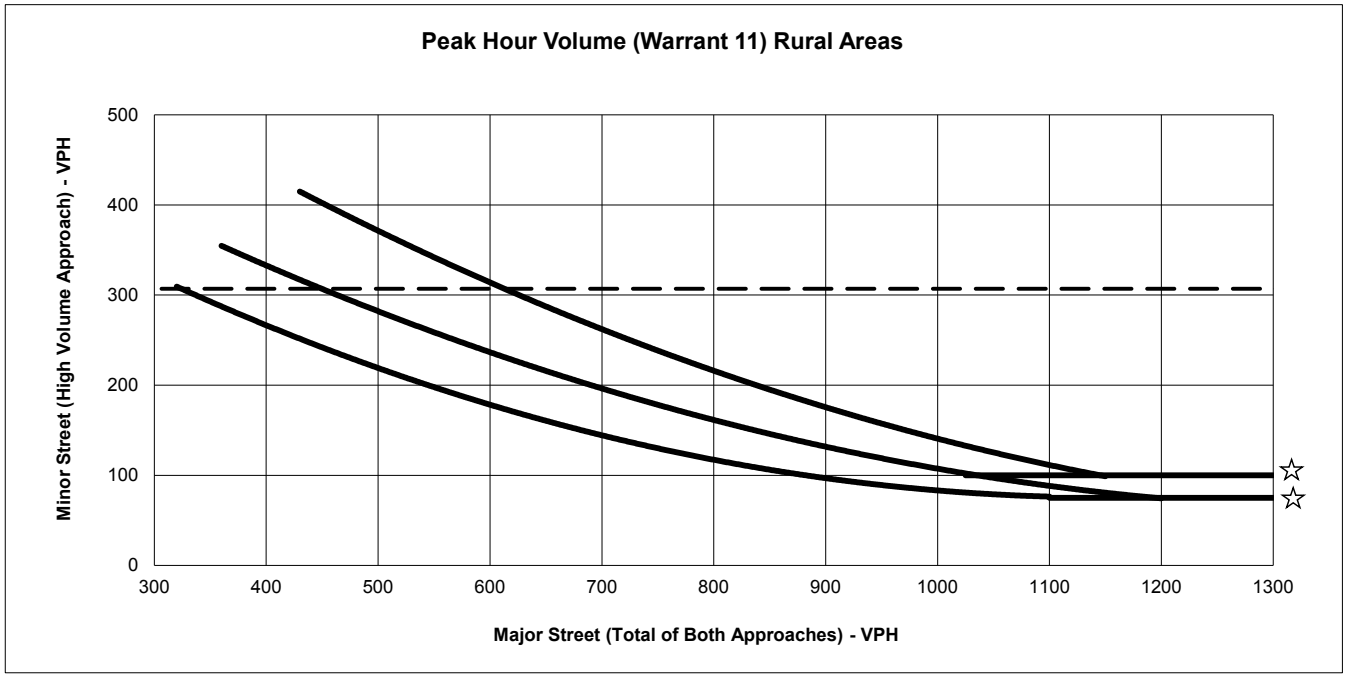

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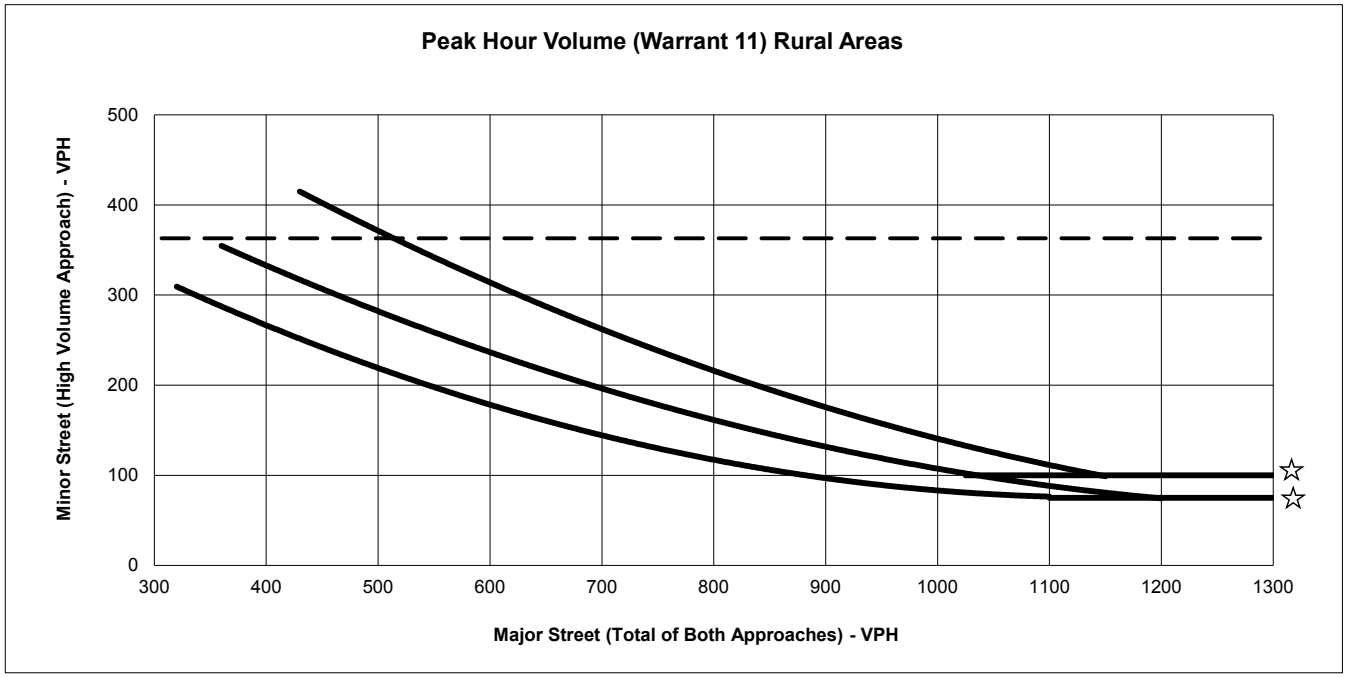
Intersection:	Deer Park Road / SR-29
Scenario:	Near-Term plus Project Weekdend Saturday MD Peak Hour Conditions
Minor St. Volume:	307
Major St. Volume:	1615
Warrant Met?:	**YES**

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
370	280				
400	270	460	297	430	410
500	215	500	290	500	380
600	185	600	230	600	310
700	140	700	198	700	265
800	115	800	170	800	210
900	99	900	125	900	180
1000	85	1000	105	1000	140
1100	75	1100	90	1100	110
1200	75	1200	75	1150	100
1300	75	1300	75	1300	100

** Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation*

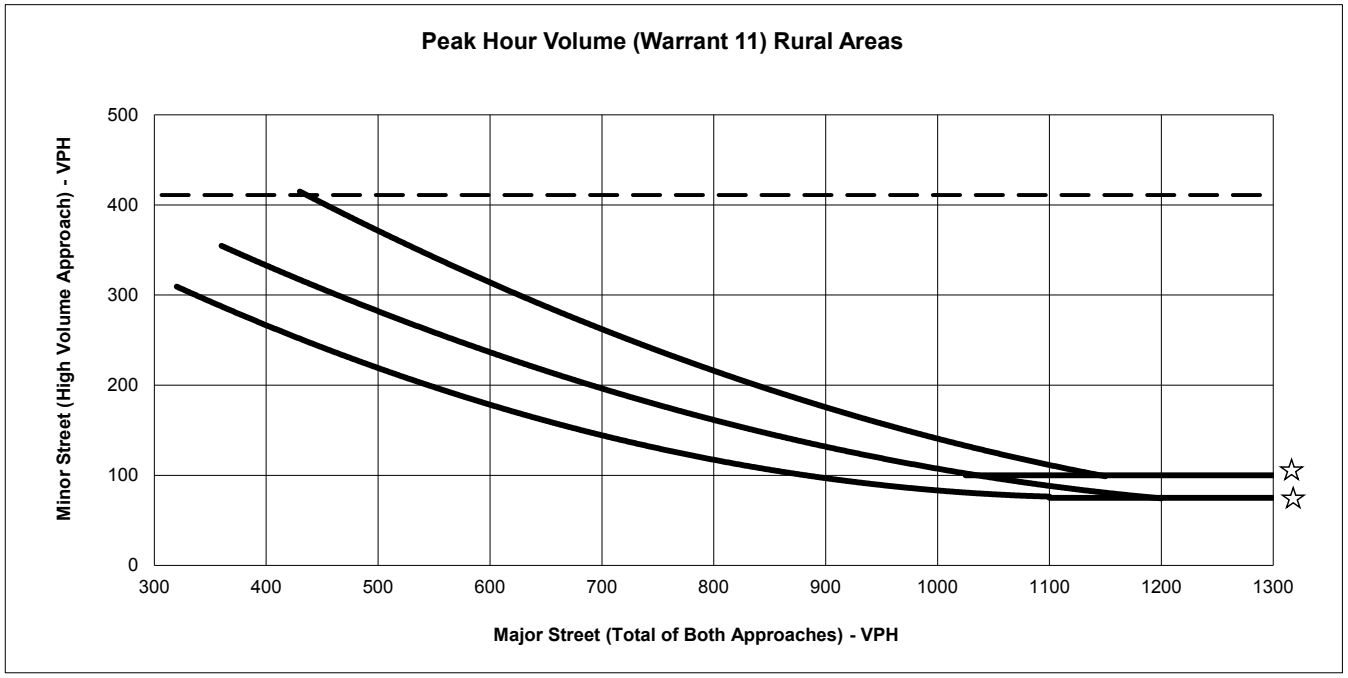


☆ NOTE:
100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 75 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Intersection:	Deer Park Road / SR-29
Scenario:	Cumulative (NP) Weekday PM Peak Hour
Minor St. Volume:	363
Major St. Volume:	2756
Warrant Met?:	**YES**

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
370	280				
400	270	460	297	430	410
500	215	500	290	500	380
600	185	600	230	600	310
700	140	700	198	700	265
800	115	800	170	800	210
900	99	900	125	900	180
1000	85	1000	105	1000	140
1100	75	1100	90	1100	110
1200	75	1200	75	1150	100
1300	75	1300	75	1300	100

** Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation*

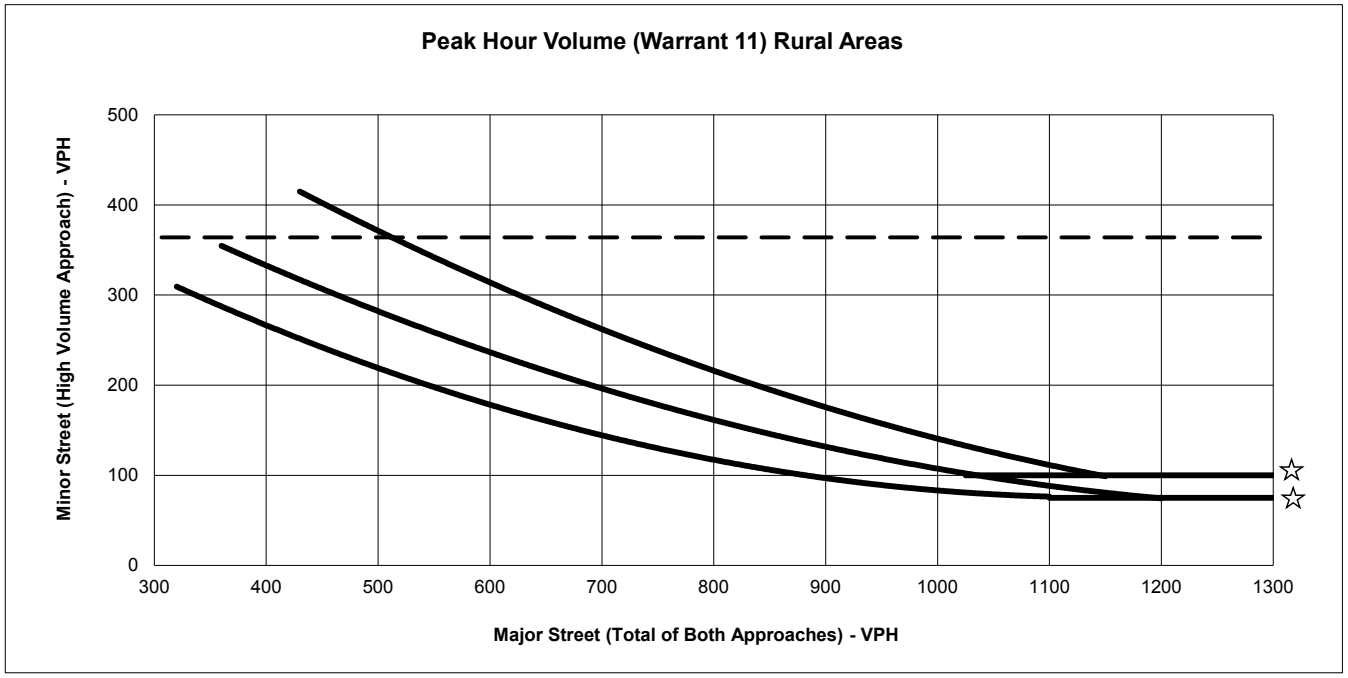


☆ NOTE:
100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 75 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Intersection: Deer Park Road / SR-29
Scenario: Cumulative (NP) Weekend MiddayPeak Hour
Minor St. Volume: 411
Major St. Volume: 2140
Warrant Met?: **YES**

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
370	280				
400	270	460	297	430	410
500	215	500	290	500	380
600	185	600	230	600	310
700	140	700	198	700	265
800	115	800	170	800	210
900	99	900	125	900	180
1000	85	1000	105	1000	140
1100	75	1100	90	1100	110
1200	75	1200	75	1150	100
1300	75	1300	75	1300	100

** Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation*

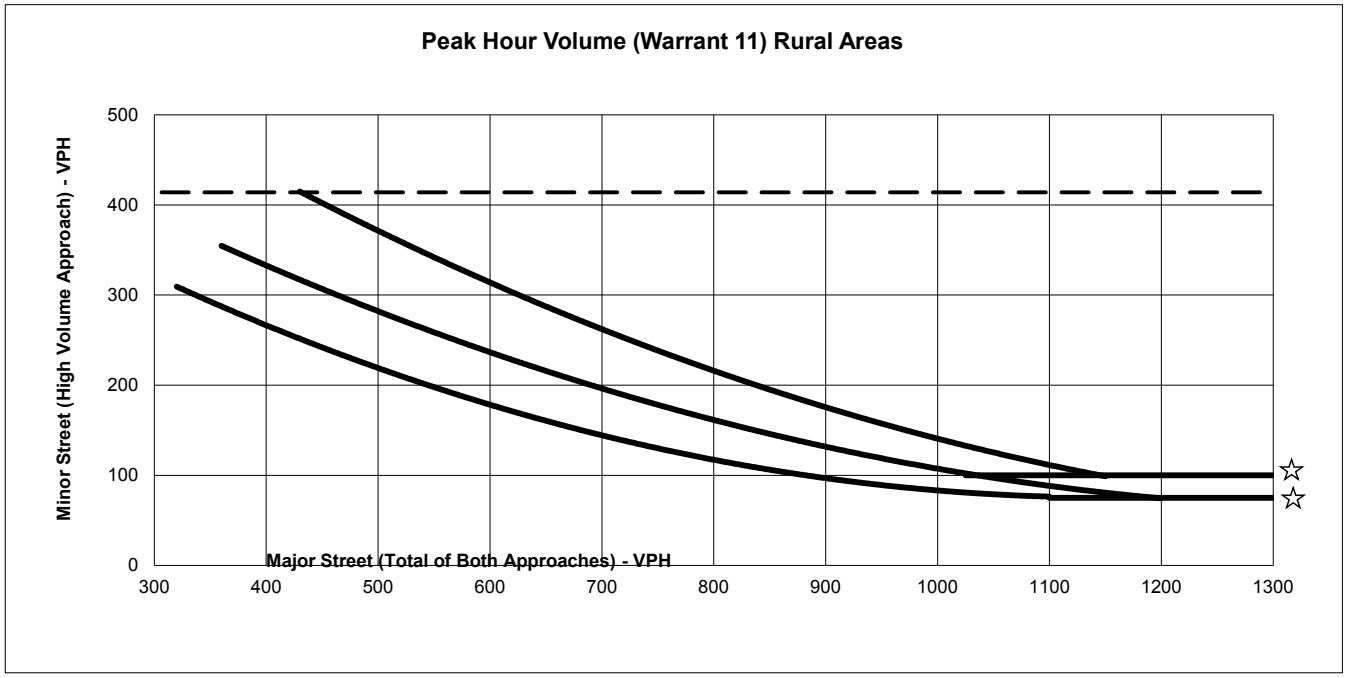


☆ NOTE:
100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 75 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Intersection:	Deer Park Road / SR-29
Scenario:	Cumulative plus Project Weekday PM Peak Hour
Minor St. Volume:	364
Major St. Volume:	2775
Warrant Met?:	**YES**

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
370	280				
400	270	460	297	430	410
500	215	500	290	500	380
600	185	600	230	600	310
700	140	700	198	700	265
800	115	800	170	800	210
900	99	900	125	900	180
1000	85	1000	105	1000	140
1100	75	1100	90	1100	110
1200	75	1200	75	1150	100
1300	75	1300	75	1300	100

** Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation*



☆ NOTE:
100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR 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.

Intersection:	Deer Park Road / SR-29
Scenario:	Cumulative plus Project Weekend Midday Peak Hour
Minor St. Volume:	414
Major St. Volume:	2164
Warrant Met?:	**YES**

Appendix D: Arterial Segment LOS Capacities

TABLE 8

Generalized **Peak Hour Directional** Volumes for Florida's **Transitioning** and **Areas Over 5,000 Not In Urbanized Areas**[1]

12/18/12

INTERRUPTED FLOW FACILITIES

STATE SIGNALIZED ARTERIALS

Class I (40 mph or higher posted speed limit)

Lanes	Median	B	C	D	E
1	Undivided	*	710	800	**
2	Divided	*	1,740	1,820	**
3	Divided	*	2,670	2,740	**

Class II (35 mph or slower posted speed limit)

Lanes	Median	B	C	D	E
1	Undivided	*	330	680	720
2	Divided	*	500	1,460	1,600
3	Divided	*	810	2,280	2,420

Non-State Signalized Roadway Adjustments

(Alter corresponding state volumes by the indicated percent.)

Non-State Signalized Roadways - 10%

Median & Turn Lane Adjustments

Lanes	Median	Exclusive Left Lanes	Exclusive Right Lanes	Adjustment Factors
1	Divided	Yes	No	+5%
2	Undivided	No	No	-20%
Multi	Undivided	Yes	No	-5%
Multi	Undivided	No	No	-25%
–	–	–	Yes	+ 5%

One-Way Facility Adjustment

Multiply the corresponding directional volumes in this table by 1.2

BICYCLE MODE[2]

(Multiply motorized vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)

Paved Shoulder/Bicycle Lane Coverage	B	C	D	E
0-49%	*	140	320	1,000
50-84%	100	280	940	>1,000
85-100%	380	1,000	>1,000	**

PEDESTRIAN MODE[2]

(Multiply motorized vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)

Sidewalk Coverage	B	C	D	E
0-49%	*	*	140	480
50-84%	*	80	440	800
85-100%	200	540	880	>1,000

BUS MODE (Scheduled Fixed Route)[3]

(Buses in peak hour in peak direction)

Sidewalk Coverage	B	C	D	E
0-84%	> 5	≥ 4	≥ 3	≥ 2
85-100%	> 4	≥ 3	≥ 2	≥ 1

UNINTERRUPTED FLOW FACILITIES

FREEWAYS

Lanes	B	C	D	E
2	2,200	2,880	3,440	3,580
3	3,260	4,280	5,100	5,540
4	4,260	5,680	6,760	7,500
5	5,300	7,080	8,440	9,440

Freeway Adjustments

Auxiliary Lane	Ramp Metering
+ 1,000	+ 5%

UNINTERRUPTED FLOW HIGHWAYS

Lanes	Median	B	C	D	E
1	Undivided	450	850	1,200	1,640
2	Divided	1,740	2,450	3,110	3,440
3	Divided	2,610	3,680	4,660	5,170

Uninterrupted Flow Highway Adjustments

Lanes	Median	Exclusive left lanes	Adjustment factors
1	Divided	Yes	+5%
Multi	Undivided	Yes	-5%
Multi	Undivided	No	-25%

[1] Values shown are presented as peak hour directional volumes for levels of service and are for the automobile/truck modes unless specifically stated. This table does not constitute a standard and should be used only for general planning applications. The computer models from which this table is derived should be used for more specific planning applications. The table and deriving computer models should not be used for corridor or intersection design, where more refined techniques exist. Calculations are based on planning applications of the Highway Capacity Manual and the Transit Capacity and Quality of Service Manual.

[2] Level of service for the bicycle and pedestrian modes in this table is based on number of motorized vehicles, not number of bicyclists or pedestrians using the facility.

[3] Buses per hour shown are only for the peak hour in the single direction of the higher traffic flow.

* Cannot be achieved using table input value defaults.

** Not applicable for that level of service letter grade. For the automobile mode, volumes greater than level of service D become F because intersection capacities have been reached. For the bicycle mode, the level of service letter grade (including F) is not achievable because there is no maximum vehicle volume threshold using table input value defaults.

Source:
Florida Department of Transportation
Systems Planning Office
www.dot.state.fl.us/planning/systems/sm/los/default.shtm

Appendix E: Ballentine Vineyards Weekday & Weekend Peak Hour Ratios

Ballentine Vineyards Peak Hour Ratio; Weekday PM & Weekend Midday

Date	Time In	# Group	Ride Share or Personal Car
6/22/19	10:00	2	Ride Share
6/22/19	12:15	1	Personal Car
6/22/19	1:15	2	Personal Car
6/22/19	2:40	2	Personal Car
6/23/19	10:30	1	Personal Car
6/23/19	11:00	1	Personal Car
6/23/19	11:30	2	Ride Share
6/23/19	12:30	2	Personal Car
6/23/19	1:30	8	Personal Car
6/23/19	2:00	1	Personal Car
6/23/19	3:00	2	Personal Car
6/24/19	11:30	2	Ride Share
6/25/19	4:00	3	Personal Car
6/26/19	11:00	10	Ride Share
6/26/19	12:30	4	Personal Car
6/26/19	3:50	3	Personal Car
6/27/19	12:00	2	Personal Car
6/28/19	12:30	2	Personal Car
6/28/19	2:20	2	Personal Car
6/28/19	2:10	2	Personal Car
6/28/19	2:00	7	Ride Share
6/29/19	10:30	1	Personal Car
6/29/19	10:45	3	Personal Car
6/29/19	10:50	7	Ride Share
6/29/19	11:50	3	Personal Car
6/29/19	2:00	3	Personal Car
6/29/19	2:30	2	Personal Car
6/29/19	4:15	2	Personal Car
6/30/19	11:30	2	Personal Car
7/1/19	11:00	2	Personal Car
7/1/19	12:00	2	Personal Car
7/1/19	2:00	2	Ride Share
7/2/19	1:45	4	Personal Car
7/3/19	12:30	2	Personal Car
7/4/19	11:00	10	Ride Share
7/4/19	12:45	2	Personal Car
7/4/19	12:00	8	Ride Share
7/4/19	1:50	2	Personal Car
7/4/19	3:30	2	Ride Share
7/4/19	3:35	2	Personal Car
7/4/19	4:00	1	Personal Car
7/5/19	11:15	14	Ride Share
7/5/19	2:30	2	Personal Car
7/5/19	2:30	2	Personal Car
7/5/19	2:30	3	Personal Car
7/5/19	4:00	2	Personal Car
7/6/19	10:30	2	Personal Car
7/6/19	12:30	10	Ride Share
7/6/19	2:50	2	Personal Car
7/6/19	3:00	3	Personal Car
7/6/19	2:45	8	Ride Share
7/6/19	2:00	2	Personal Car
7/6/19	2:00	2	Personal Car
7/6/19	3:00	6	Personal Car
7/6/19	3:45	3	Personal Car
7/6/19	4:30	3	Personal Car
7/6/19	4:00	2	Personal Car
7/7/19	11:15	4	Ride Share
7/8/19	2:00	6	Ride Share
7/8/19	1:00	10	Personal Car
7/8/19	3:00	2	Personal Car
7/9/19	10:00	2	Personal Car
7/9/19	11:00	10	Ride Share
7/9/19	2:00	1	Personal Car
7/10/19	11:00	10	Ride Share
19 Days		**65 Groups**	**17 Ride Share, 48 Personal Car**
		234 Guests	

cxd=e

Appendix F: Napa County & Ballentine Vineyards Trip Generation Sheets; Permitted, Proposed, & Winery Peak Hour Ratios

BALLENTINE WINERY: EXIST

Proposed Project Winery Traffic Information / Trip Generation Sheet

Maximum Daily Weekday Traffic (non-harvest season)

Total number of FT employees: 5 x 3.05 one-way trips per employee = 15 daily trips.

Total number of PT employees: 0 x 1.90 one-way trips per employee = Ø daily trips.

Anticipated weekday visitors: 4 / 2.6 visitors per vehicle x 2 one-way trips = 3 daily trips.

Gallons of production: 50,000 / 1,000 x .009 truck trips daily[3] x 2 one-way trips = 1 daily trips.

Total = 19 **daily trips.**

5 0 4x.38

(№ of FT employees) + (№ of PT employees/2) + (sum of visitor and truck trips x .38) = 7(1,6) **PM peak trips.**

Maximum Daily Weekend Traffic (non-harvest Saturday)

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

Number of PT employees (on Saturdays): 1 x 1.90 one-way trips per employee = 2 daily trips.

Anticipated Saturday visitors: 6 / 2.8 visitors per vehicle x 2 one-way trips = 4 daily trips.

Total = 12 **daily trips.**

2 0.50 2

(№ of FT employees) + (№ of PT employees/2) + (visitor trips x .57) = 5(3,2) **PM peak trips.**

Maximum Daily Weekend Traffic – Saturday Harvest Season

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

Number of PT employees (during crush): 1 x 1.90 one-way trips per employee = 2 daily trips.

Anticipated Saturday visitors: 6 / 2.8 visitors per vehicle x 2 one-way trips = 4 daily trips.

Gallons of production: 50,000 / 1,000 x .009 truck trips daily x 2 one-way trips = 1 daily trips.

Avg. annual tons of grape on-haul: 108 / 144 truck trips daily[4] x 2 one-way trips = 2 daily trips.

Total = 15 **daily trips.**

Largest Marketing Event- Additional Traffic

Number of event staff (largest event): 3 x 2 one-way trips per staff person = 6 trips.

Number of visitors (largest event): 5 / 2.8 visitors per vehicle x 2 one-way trips = 4 trips.

Number of special event truck trips (largest event): 1 x 2 one-way trips = 2 trips.

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

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

BALLENTINE WINERY: PROPOSED

Winery Traffic Information / Trip Generation Sheet

Traffic during a Typical Weekday

Number of FT employees: 12 x 3.05 one-way trips per employee = 36.60 daily trips.

Number of PT employees: 3 x 1.90 one-way trips per employee = 5.70 daily trips.

Average number of weekday visitors: 63 / 2.6 visitors per vehicle x 2 one-way trips = 48.46 daily trips.

Gallons of production: 125,000 / 1,000 x .009 truck trips daily[3] x 2 one-way trips = 2.25 daily trips.

Total = 93.01 **daily trips.**

(№ of FT employees) + (№ of PT employees/2) + (sum of visitor and truck trips x .38) = 32.77 **PM peak trips.**

Traffic during a Typical Saturday

Number of FT employees (on Saturdays): 4 x 3.05 one-way trips per employee = 12.20 daily trips.

Number of PT employees (on Saturdays): 2 x 1.90 one-way trips per employee = 3.80 daily trips.

Average number of Saturday visitors: 95 / 2. 8 visitors per vehicle x 2 one-way trips = 67.86 daily trips.

Total = 83.86 **daily trips.**

(№ of FT employees) + (№ of PT employees/2) + (visitor trips x .57) = 43.68 **PM peak trips.**

Traffic during a Crush Saturday

Number of FT employees (during crush): 8 x 3.05 one-way trips per employee = 24.40 daily trips.

Number of PT employees (during crush): 4 x 1.90 one-way trips per employee = 7.60 daily trips.

Average number of Saturday visitors: 50 / 2. 8 visitors per vehicle x 2 one-way trips = 35.71 daily trips.

Gallons of production: 125,000 / 1,000 x .009 truck trips daily x 2 one-way trips = 2.25 daily trips.

Avg. annual tons of grape on-haul: 271 / 144 truck trips daily[4] x 2 one-way trips = 3.76 daily trips.

Total = 73.72 **daily trips.**

Largest Marketing Event- Additional Traffic

Number of event staff (largest event): 6 x 2 one-way trips per staff person = 12 trips.

Number of visitors (largest event): 100 / 2.8 visitors per vehicle x 2 one-way trips = 71 trips.

Number of special event truck trips (largest event): 2 x 2 one-way trips = 4 trips.

---

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

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

BALLENTINE WINERY: SURVEYED RATIOS

Proposed Project Winery Traffic Information / Trip Generation Sheet

Maximum Daily Weekday Traffic (non-harvest season)

Total number of FT employees: 12 x 3.05 one-way trips per employee = 36.6 daily trips.

Total number of PT employees: 3 x 1.90 one-way trips per employee = 5.7 daily trips.

Anticipated weekday visitors: 63 / 2.6 visitors per vehicle x 2 one-way trips = 48.46 daily trips.

Gallons of production: 125,000 / 1,000 x .009 truck trips daily[3] x 2 one-way trips = 2.25 daily trips.

Total = 93.01 daily trips.

12 (№ of FT employees) + 1.5 (№ of PT employees/2) + 7.6 (sum of visitor and truck trips x 15%) = 21.1 PM peak trips.

Maximum Daily Weekend Traffic (non-harvest Saturday)

Number of FT employees (on Saturdays): 4 x 3.05 one-way trips per employee = 12.20 daily trips.

Number of PT employees (on Saturdays): 2 x 1.90 one-way trips per employee = 3.80 daily trips.

Anticipated Saturday visitors: 95 / 2.8 visitors per vehicle x 2 one-way trips = 67.86 daily trips.

Total = 83.86 daily trips.

4 (№ of FT employees) + 1 (№ of PT employees/2) + 15 (visitor trips x 28%) = 24.0 PM peak trips.

Maximum Daily Weekend Traffic – Saturday Harvest Season

Number of FT employees (during crush): 8 x 3.05 one-way trips per employee = 24.4 daily trips.

Number of PT employees (during crush): 4 x 1.90 one-way trips per employee = 7.6 daily trips.

Anticipated Saturday visitors: 50 / 2.8 visitors per vehicle x 2 one-way trips = 35.71 daily trips.

Gallons of production: 125,000 / 1,000 x .009 truck trips daily x 2 one-way trips = 2.25 daily trips.

Avg. annual tons of grape on-haul: 271 / 144 truck trips daily[4] x 2 one-way trips = 3.76 daily trips.

Total = 73.72 daily trips.

Largest Marketing Event- Additional Traffic

Number of event staff (largest event): 6 x 2 one-way trips per staff person = 12 trips.

Number of visitors (largest event): 100 / 2.8 visitors per vehicle x 2 one-way trips = 71 trips.

Number of special event truck trips (largest event): 2 x 2 one-way trips = 4 trips.

---

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

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