

“H”

Traffic Study

Focused Traffic Analysis for the
MATHEW BRUNO WINES
TASTING ROOM
County of Napa

Prepared for:

The County of Napa

At the Request of:

Mathew Bruno Wines

Final Report

June, 2019

Prepared by:



**FOCUSED TRAFFIC ANALYSIS
PROPOSED BRUNO WINES TASTING ROOM PROJECT**

**Prepared For:
COUNTY OF NAPA
At the request of:
Mathew Bruno Wines**

**Prepared By:
GHD Inc.
2300 Clayton Road, Suite 920
Concord, CA 94520
925.894.1000**

**Final Report
JUNE 26, 2019**

**11153617
R2464TIA009.docx**

TABLE OF CONTENTS

1. Introduction	1
2. Existing Conditions.....	3
Proposed Project Site	3
Roadways	3
Existing Intersection Volumes	4
Existing Intersection Methodology/Description	4
Existing Intersection Operations Level-of-Service	7
Existing Peak Hour Arterial Level-of Service	8
Signal Warrant Evaluation	8
Bicycle and Pedestrians Facilities	9
Collision History	9
3. Year 2020 Near-Term (No Project) Conditions.....	10
Near-Term Year 2020 Methodology	10
Near-Term Year 2020 (No Project) Intersection Operation	11
Near-Term Year 2020 (No Project) Arterial Operation	13
4. Napa County Significance Criteria.....	13
Intersections/Roadway Segments	13
5. Proposed Project Impacts	14
Proposed Project Description	14
Existing Site Uses	16
Project Trip Generation/Distribution	17
Project Effects on Intersection/Roadway Segment Operations	21
6. Site Access/Design Parameters.....	23
Sight Distance	23
Project Access and Circulation	23

Marketing Events	24
Parking Demand and Supply	25
Left-Turn Lane Warrant	26
7. VMT Reduction/TDM Plan.....	28
8. Cumulative Conditions	30
Cumulative Year 2030 Projections	30

LIST OF FIGURES

Figure 1 Project Vicinity Map.....	2
Figure 2 PM Weekday and Mid-Day Weekend Peak Hour Intersection Volumes	5
Figure 3 Near-Term (No Project) Weekday PM and Weekend Mid-Day Peak Hour Volumes....	12
Figure 4 Proposed Project Site Plan	15
Figure 5 Proposed Weekday PM and Weekend Mid-Day Peak Hour Project Trips (Only) and Distribution	18
Figure 6 Existing plus Project; Weekday PM and Weekend Mid-Day Peak Hour Volumes.....	19
Figure 7 Near-Term plus Project; Weekday PM and Weekend Mid-Day Peak Hour Volumes ...	20
Figure 8 Proposed Project First Floor Site Plan.....	27
Figure 9 Year 2030 (No Project) Weekday PM and Weekend Mid-Day Peak Hour Volumes	32
Figure 10 Year 2030 plus Project Weekday PM and Weekend Mid-Day Peak Hour Volumes...	33

LIST OF TABLES

Table 1 Intersection Level-of-Service Definitiiions.....	6
Table 2 Existing (No Project) Conditions: Intersection Levels-Of-Service Weekday PM Peak and Weekend Mid-Day Peak Hour1, 2.....	8
Table 3: Existing Collision Rates at Study Intersections/Roadway Segments	10
Table 3 Near-Term Year 2020 (No Project) Conditions: Intersection Levels-Of-Service Weekday PM Peak and Weekend Mid-Day Peak Hour1, 2.....	13
Table 4: Proposed Project Daily and Peak Hour Trip Generation; Net Increase	17

Table 5 Existing and Near-Term with Project Conditions: Intersection Levels-Of-Service21
 Weekday PM Peak and Weekend Mid-Day Peak Hour¹.....21
 Table 6 Weekend (Saturday) Large Marketing Events; Daily Project Trips.....25
 Table 7 Year 2030 and Year 2030 with Project Conditions: Intersection Levels-Of-Service31
 Weekday PM Peak and Weekend Mid-Day Peak Hour¹.....31

APPENDIX

Weekday PM and Weekend Mid-Day Peak Hour Intersection Counts
 Weekday PM and Weekend Mid-Day Intersection LOS Calculation Sheets
 Arterial LOS Thresholds
 Napa County Trip Generation Sheets/Traffic Information
 Signal Warrant Sheets
 Left-Turn Lane Warrant Graph

Executive Summary

The proposed Mathew Bruno Wine Tasting Room project would consist of converting an existing 1890's residence into a stand-alone wine tasting facility (room). There would be no on-site wine production. The project site is a 0.38 acre parcel located at 1151 Rutherford Road with historical vehicular access from Grape Lane (see Figure 4—Project Site Plan). The parcel is currently zoned C-L (Commercial Limited). The proposed project would have two (2) full-time employees. Visitation associated with tasting would include up to 56 guests per day (maximum) on either a weekday or weekend for a total of 392 weekly visitors. In addition, the proposed tasting room project has included a marketing plan with up to 24 events per year. The proposed project site would have seven (7) parking spaces for guests/employees. Three intersections along Rutherford Road at SR-29, Grape Lane, and Conn Creek Road were evaluated for existing and future operating conditions with and without the proposed project. In addition, the arterial segments of SR-29 north and south of Rutherford Road and arterial segments of Rutherford Road east of SR-29 were evaluated for peak hour weekday and weekend operating conditions.

Based on 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 study intersection of Rutherford Road/SR-29 is currently operating at LOS F during both the weekday PM hour and Saturday midday peak hour for outbound left and right-turn movements from Rutherford Road onto SR-29. Based on an accident history analysis, the intersection also experiences an accident rate slightly higher than the State average for similar facilities based on the number of “rear-end” and “broadside” accidents.

Arterial operation on SR-29 is calculated at LOS F during both the weekday PM peak and midday peak hours. Arterial operation on Rutherford Road is acceptable (LOS C or better). However, westbound traffic volumes on Rutherford Road at the approach to SR-29 can queue back towards Grape Lane during peak summer periods and cause delays for outbound/inbound traffic at Grape Lane. These traffic conditions along Rutherford Road were discussed during a neighborhood meeting. the Rutherford Road/Grape Lane intersection meets the Napa County Left-Turn Lane warrant under existing (no project) conditions.

Near-Term (No Project) Conditions

Under Near-Term (No Project) conditions, existing traffic volumes were increased by 1.23% per year to the year 2020 based historical traffic volume growth. In addition, specific approved projects in the local study area were added to background growth.

Based on increases in traffic volumes from Near-Term traffic growth, the Rutherford 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 of Rutherford Road/Grape Lane and Rutherford Road/Conn Creek Road would continue to operate at acceptable levels during the weekday PM and weekend midday peak hours (LOS B or better).

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 employment and visitation. Based on these County ratios, the project is estimated to generate 49 daily trips with 18 weekday PM peak hour trips and 25 Saturday midday peak hour trips. However, the existing building on the project site is currently being used by Elizabeth Spencer Winery staff and is currently generating vehicle trips. Accounting for Elizabeth Spencer Winery activities on the project site, the proposed project's net increase in vehicle trip generation would amount to 20 daily trips with 9 weekday PM peak hour trips and 16 Saturday midday peak hour trips.

Based on County significance criteria for intersection and arterial roadway segment operation, the proposed project would have a significant impact if it is adding 1% or more to the total traffic at an impacted intersection (LOS E-F) or directional roadway segment. Based on the addition of project traffic to the Rutherford Road/SR-29 intersection and SR-29 roadways segments the project's contribution would be less than one percent (6 trips during the weekday PM peak hour and 10 trips during the Saturday midday peak hour). Under Napa County significance criteria the addition of proposed project traffic would be considered less-than-significant.

Napa County guidelines indicate potential mitigation could include adding a signal if conditions are appropriate, geometric modifications to the intersection configuration, or changes to the Project to reduce its peak hour trip generation, or converting an intersection to a roundabout per Policy CIR-31. In addition, the County of Napa has updated their Circulation Element and TIS guidelines with recommendations towards improving overall vehicle delays along SR-29, reducing vehicle miles traveled (VMT), and potentially implementing a traffic impact fees.^{1 2} The proposed project will be implementing a VMT Reduction/TDM Plan (section 6) as part of their overall development plan.

- Consistent with Napa County Engineering staff recommendations, there is approximately 19-feet of approach width on Rutherford Road at SR-29. It is recommended that the Rutherford Road westbound approach be re-stripped and/or widened to provide separate right and left-turn lanes. The proposed project's fair share towards this improvement would equal less than one percent should Napa County implement this circulation improvement. Due to the accident history analysis indicating "broadside" and "rear-end" collisions at the intersection it is recommended that installation of "feedback signs" (i.e. speed limits indicators) be installed on SR-29 670-feet prior to Rutherford Road on each north and south approach. Again, should Napa County implement these circulation improvements on SR-29 the proposed project's fair share would be less than one percent.³

B. Marketing Events

The proposed project would have 26 marketing events annually with 24 events of 30-guests (maximum) and 2 events of 250 guests (maximum). Based on standard County auto occupancy

¹ County of Napa, *General Plan Circulation Element, Adopted February, 2019.*

² Fehr and Peers, *Guidelines for Application of Updated General Plan Circulation Policies on Significance Criteria Related to Vehicle Level of Service, Memorandum, April 20, 2018.*

³ Mr. Ahsan Kazmi, P.E., *Senior Traffic Engineer, County of Napa, Mathew Bruno Project P17-00387, Comments on Revised Draft TIS Report (GHD, 4-2019), Memorandum, June 12, 2019.*

rates, the largest annual event of 250 guests is expected to generate approximately 197 daily trips (99 in, 98 out) including visitors, staff, and delivery trucks. This trip generation assumes that all event attendees arrive by private automobile. Again, accounting for existing site uses the largest proposed event would generate 168 net new daily trips (85 in, 83 out). Note that daily tastings would be curtailed during the two (2) annual events. **In addition the project applicant has developed a TDM plan to reduce overall vehicle trip generation, VMT, and associated parking demand (see TDM Plan Section**

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 section, the largest marketing event would generate 197 daily trips (99 in, 98 out), assuming all event attendees arrive by private automobile and without the measures contained in the TDM Plan Section. 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 98 trips inbound during the hour prior to the event and 98 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 noted in the project description section, the project applicant would reduce tastings visitation by 30 guests when small marketing events (30-guests maximum) are held.

C. Parking

The proposed project would provide seven (7) on-site parking spaces and this would exactly match Napa County code requirements governing restaurants and other food and beverage serving facilities (as per Napa County Planning staff direction).

D. Left-Turn Lane Warrant

Left-turn warrant checks have been conducted for the Rutherford Road/Grape Lane intersection. **Under existing (no project) conditions, current ADT volumes on Grape Lane exceed the County’s minimum volume requirements for installation of a left-turn lane based on seven (7) single-family homes and existing winery facility generating 70-80 ADT (10 daily trips per home) and 2,400 ADT on Rutherford Road.**

It is noted that the installation of a left-turn lane at a “shared use” driveway and/or roadway is typically not required by Napa County based on past transportation analyses.⁴ Since existing uses on the shared driveway and/or roadway are already generating the minimum volumes to meet the County’s left-turn lane warrant; proposed project uses would merely be adding to the existing warrant and “fair share” mitigation fees have been imposed based on their contribution to driveway/roadway ADT volumes.

The proposed project would add 20 net new daily trips to these roadways or about 1% of the total daily traffic volume should the County determine a southbound left-turn lane is needed on Rutherford Road at Grape Lane. It is noted that due to the physical characteristics of Rutherford Road at Grape Lane the installation of a left-turn lane would not be practical. In addition, there are

⁴ *Omni-Means Engineering Solutions, Focused Traffic Analysis for the Proposed Benessere Vineyards Winery Use Modification Project, County of Napa, Left-turn Lane/Right-Turn Lane Warrants (Section 6), October 2017.*

many other adjacent commercial, restaurant, and winery driveways along Rutherford Road in the immediate project vicinity generating higher ADT volumes than Grape Lane with no left-turn lanes. However, should the County determine mitigation for Rutherford Road (left-turn lane) is required the following measure is recommended:

- The proposed project should contribute a “fair share” contribution of 1% towards circulation improvements on Rutherford Road (left-turn lane) should the County determine circulation improvements are necessary for vehicle access to Grape Lane

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

An exhaustive 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 7 (VMT Reduction/TDM Plan).

Near-Term Plus Project Conditions

Same recommendations as Existing plus Project Conditions

Cumulative (No Project) Conditions

Under Cumulative (No Project) conditions, the intersection of Rutherford Road/SR-29 would continue to operate at LOS F during the weekday PM peak hour and Saturday midday peak hour. This would also be true for the southbound segment of SR-29 (PM weekday) and northbound segment of SR-29 (Saturday midday peak hour). The remaining study intersections of Rutherford Road/Grape Lane and Rutherford Road/Conn Creek Road would operate at LOS B or better. The arterial segment of Rutherford Road would operate at LOS C or better.

Cumulative Plus Project Conditions

Same recommendations as Existing plus Project Conditions.

1. Introduction

The following report provides a focused traffic analysis for the proposed Mathew Bruno Wines Tasting Room project located at 1151 Rutherford Road in Rutherford, Napa County--- (see Figure 1 for Project Vicinity Map). This most recent draft traffic analysis is a result of constructive discussions and correspondence with Napa County Planning Department (Ms. Dana Ayers), Napa County Senior Traffic Engineer (Mr. Ahsan Kazmi, P.E.),⁵ and the project's planning consultant (Mr. Jeffrey Redding). Comments were received on the initial draft traffic analysis related to daily and peak hour traffic volumes, near-term and long-term traffic growth projections, consistency of project description between traffic analyses and project application, and proposed project "fair share" contributions toward potential County mitigation measures on Rutherford Road and its intersection with State Highway 29. In addition, meetings were held with neighborhood stakeholders related to concerns relating to project traffic, driveway access, and shared use of Grape Lane.⁶ Proposed project characteristics related to changes in existing employment, visitation, and parking as well as the overall traffic scope/analysis were refined. Methodologies for analyzing the potential impacts of proposed project uses are consistent with the Use Permit Modification (Supplemental Winery Uses) from Napa County Planning, Building, and Environmental Services.⁷ Methodologies focus on both daily and peak hour trip generation associated with employment and visitation levels. Potential impacts of the proposed marketing events are also included in overall analyses of trip generation characteristics. Finally, this report conforms to the County's revised transportation significance criteria established in the Traffic Impact Study Policies.⁸ Key issues evaluated in this study include the following:

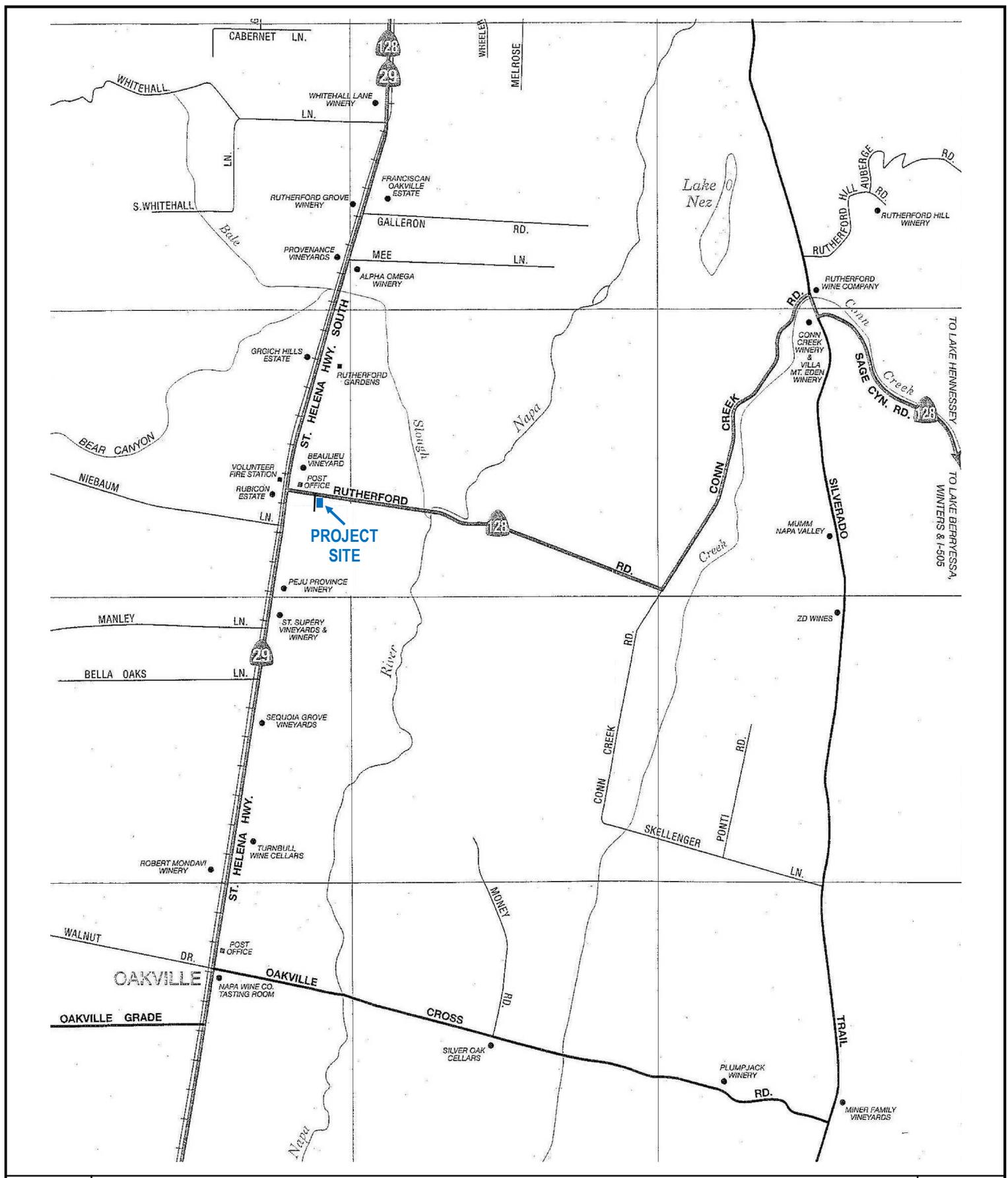
- Existing and future weekday PM peak hour and weekend (Saturday) mid-day peak hour operations at the Rutherford Road/State Route 29 (SR-29), Rutherford Road/Grape Lane, and Rutherford Road/Conn Creek Road intersections as well as daily traffic volumes along Rutherford Road and SR-29 using new count data and Caltrans historical volume data;
- Near-Term (2020) traffic conditions reflecting other approved/pending projects in the study area encompassing Napa County inclusive of St. Helena, Zinfandel, Rutherford, Oakville, and Yountville based on County input and Caltrans historical traffic volume growth;
- Increase in proposed project trip generation relative to existing conditions from proposed project uses including visitation, employment, and marketing events;
- Project access from Grape Lane to Rutherford Road and circulation of vehicles within these areas;
- Project parking supply, estimated parking demand, and recommendations for parking demand management;
- Cumulative year 2030 (no project) conditions along SR-29 and Rutherford Road based on the Napa County General Plan Update EIR.

⁵ Meeting with Napa County Transportation Planning and Traffic Engineering Staff (Ms. Dana Ayers and Mr. Ahsan Kazmi, P.E.) with Mr. Jeffrey Redding (Planning Consultant) and Mr. Peter Galloway (GHD), Comments on initial draft Traffic Impact Study Report (October, 2018), January 14, 2019.

⁶ Meeting with Randy Bryant (Grape Lane neighbor) and Elizabeth Spencer Winery staff, Rutherford, March 19, 2019.

⁷ Napa County Planning, Building, and Environmental Services, Use Permit Application (Supplemental Application for Winery Uses, Revised June 11, 2015).

⁸ Napa County Department of Public Works, Traffic Impact Study (TIS) Policies and TIS Required Elements, Updated March 25, 2016.



Project Vicinity Map



figure 1

The following sections outline existing and future conditions with and without traffic from proposed Mathew Bruno Wines Tasting Room project. Where necessary, measures are 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 Study (TIS) Required Elements and the Napa County General Plan.

2. Existing Conditions

Proposed Project Site

The proposed Rutherford Tasting Room project would be located at 1151 Rutherford Road approximately 375 feet east of SR-29 along the south side of the roadway. The proposed project would convert an existing 1890's residence, currently used as an office by Elizabeth Spencer Wines to a stand-alone wine tasting room. A brief description of the roadways serving the site is as follows:

Roadways

State Route 29 (SR-29) extends in a north-south direction between the incorporated cities of Yountville, St. Helena and Calistoga in the project study area. In the Rutherford area, SR-29 is classified as a two-lane rural throughway based on the Napa County General Plan. The highway provides access north through St. Helena, and Calistoga and into Lake County to Middleton and Lower Lake. South of Rutherford, the highway provides access to Oakville, Yountville, Napa, American Canyon, and Vallejo. In the immediate project site area, SR-29 has one travel lane in each direction with a two-way-left-turn-lane (left-turn pockets at Rutherford Road). A wide (12-15 feet) paved shoulder exists on the west side of the highway. On the east side of SR-29 there is an 8-foot paved shoulder with a mixture of residential, winery, and commercial development that extends for approximately 0.30 miles both north and south of Rutherford Road. The speed limit on SR-29 is 40 mph in the project area.

Rutherford Road (State Route 128) extends in an easterly direction from SR-29 for approximately 1.5 miles before intersecting Conn Creek Road. A two-lane roadway, Rutherford Road provides access to commercial, restaurant, residential and agricultural winery uses immediately east of SR-29. This roadway segment just east of SR-29 has a width of approximately 36 feet and allows on-street parking in designated areas with curb, gutter, and pedestrian sidewalks. Approximately 800 feet east of the highway the roadway narrows to 24-feet as it extends towards more residential and winery areas to Conn Creek Road. The speed limit on Rutherford Road is 30 mph in the commercial-residential segment east of SR-29.

Grape Lane is a two-lane roadway that extends approximately 800 feet south from Rutherford Road that currently provides direct access to the project site. Grape Lane (while not a maintained County road) serves as access to seven (7) parcels located both west and south of the project site. Based on information volunteered at the neighborhood meeting, many of these existing residences along Grape Lane are used as second homes. In addition, the tenants of the existing project site (Elizabeth Spencer Winery) building currently use Grape Lane to access the property and existing parking area.

Conn Creek Road (State Route 128) is located east of the proposed project site and extends in north-south direction at Rutherford Road. Providing access to agricultural/vineyard areas, Conn Creek Road is a state highway (State Route 128) between Silverado Trail and Rutherford Road. Conn Creek Road is a rural, two-lane arterial roadway.

Existing Intersection Volumes

In order to identify existing peak hour operating conditions, existing peak period traffic counts were conducted along Rutherford Road at the three primary (gateway) access intersections.⁹ Intersection count locations are as follows:

- | | |
|---|-------------------------------|
| 1. State Route 29/Rutherford Road (State Route 128) | Stop-control (Rutherford Rd.) |
| 2. Grape Lane/Rutherford Road | Stop-control (Grape Lane) |
| 3. Conn Creek Road/Rutherford Road | Stop-control (Conn Creek Rd.) |

Peak period vehicle counts were conducted on a weekday late afternoon (4:00-6:00 p.m.) and Saturday afternoon (1:00-4:00 p.m.) on February 8, 10, and 12, 2018. The resultant “peak hour” of traffic flow on Rutherford Road occurs during 4:0-5:00 p.m. (Thursday) and 1:45-2:45 p.m. (Saturday). Peak period counts were conducted during the non-harvest/crush season (February) and do not fully reflect peak traffic conditions on SR-29 during the peak season (i.e., August-September). In addition, through traffic on SR-29 is dynamic and can experience reduced flows due to large volumes and/or traffic control north or south of the area. In order to address this data gap, county staff required the use of the most recent Caltrans peak hour and daily volumes on Rutherford Road (SR-128) and SR-29 were to adjust recorded peak hour turning movements and intersection counts to reflect peak month activity (Caltrans Highway Volumes, 2017). Peak hour flow on SR-29 at Rutherford Road is approximately 2,700-2,800 vehicles (two-way) while Rutherford Road experiences peak hour flows of approximately 310 vehicles. In addition, existing peak hour intersection volumes to/from Grape Lane have been increased to reflect summer peak flow volumes based on the number of single-family homes along the roadway. This amounted to an additional seven (7) peak hour trips (4 in, 3 out) during both the weekday PM peak hour and weekend midday peak hour periods. These summer volumes for Grape Lane were added on top of existing count volumes for conservative analysis of traffic operations at Grape Lane. Existing weekday PM peak hour and weekend mid-day peak hour intersection volumes have been shown in Figure 2.

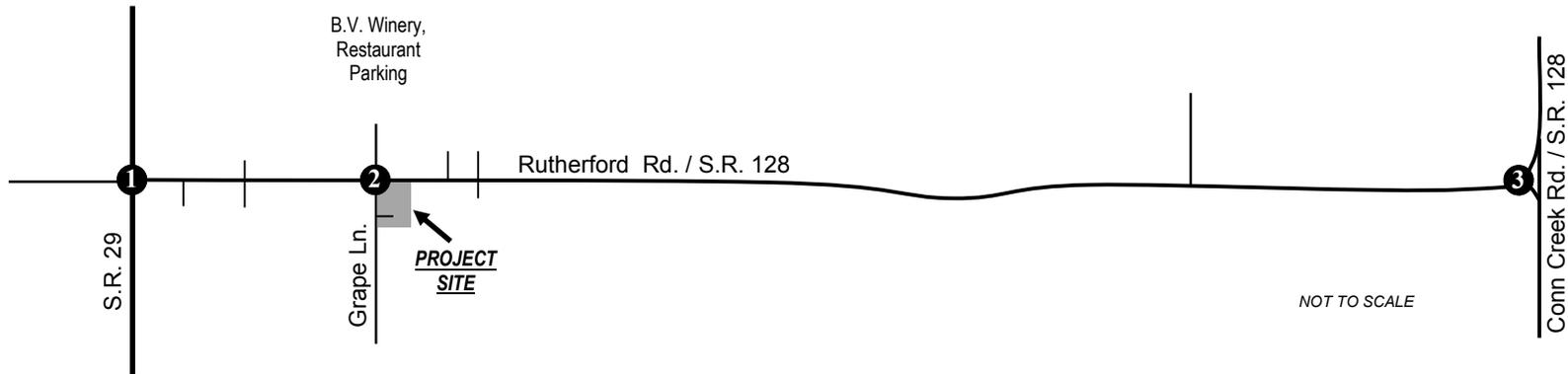
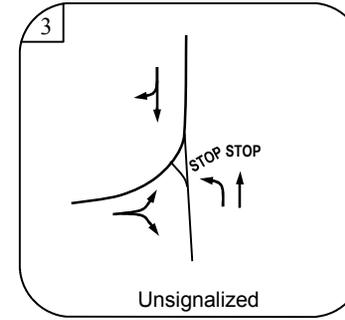
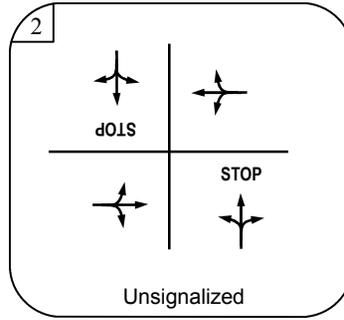
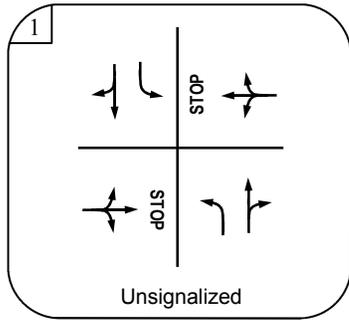
Existing Intersection Methodology/Description

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 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.

⁹ Baymetrics Traffic Resources, Weekday 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 Rutherford Road/Conn Creek Road intersection, February 8, 10, & 13, 2018.

GEOMETRIES / CONTROLS:



PEAK HOUR VOLUMES:

1		S.R. 29		Rutherford Rd. / S.R. 128	
↑	0 (6)	↑	40 (46)	↑	69 (59)
↓	1508 (1014)	↓	0 (5)	↓	69 (59)
↙	105 (45)	↙	69 (59)	↙	69 (59)
↘		↘		↘	
Inglenook Winery		Rutherford Rd. / S.R. 128		Rutherford Rd. / S.R. 128	
↑	(5)	↑	3	↑	(12)
↓	0	↓	1058	↓	(1421)
↙	(3)	↙	85	↙	(158)
↘	(1)	↘		↘	

2		B.V. Winery		Rutherford Rd. / S.R. 128	
↑	8 (18)	↑	0 (8)	↑	100 (105)
↓	0 (0)	↓	0 (0)	↓	0 (0)
↙	6 (10)	↙	0 (0)	↙	0 (0)
↘		↘		↘	
Grape Ln.		Rutherford Rd. / S.R. 128		Rutherford Rd. / S.R. 128	
↑	(11)	↑	4	↑	(1)
↓	(203)	↓	200	↓	(1)
↙	(1)	↙	5	↙	(1)
↘		↘	0	↘	(0)

3		Conn Creek Rd. / S.R. 128		Rutherford Rd. / S.R. 128	
↑	55 (89)	↑	44	↑	33
↓	63 (37)	↓	148	↓	12
↙		↙		↙	
↘		↘		↘	
Conn Creek Rd.		Rutherford Rd. / S.R. 128		Rutherford Rd. / S.R. 128	
↑	(31)	↑	33	↑	(21)
↓	(52)	↓	148	↓	12
↙		↙		↙	
↘		↘		↘	

XX = Weekday P.M. Peak Hour
 (XX) = Weekend Peak Hour



Existing Weekday P.M. and (Weekend) Peak Hour Volumes



figure 2

**TABLE 1
INTERSECTION LEVEL-OF-SERVICE DEFINITIIONS**

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

Reference: 2010 Highway Capacity Manual

The SR-29/Rutherford Road intersection is stop-sign controlled for the eastbound and westbound turning movements at SR-29. Westbound Rutherford Road does not have striped separate westbound right or left-turn lanes at SR-29. However, the westbound approach is wide enough to allow separate turning movements based on its width (19-feet) and the red-curb striping on the north side of the street that extends for approximately 60-75 feet. The eastbound approach at SR-29 is a private road (Inglenook Winery) with shared left-through-right turn lane. The intersection's east-west approaches are slightly offset but the intersection does function as a standard four-way (minor street stopped) facility based on field observations.

The Rutherford Road/Grape Lane intersection is located approximately 370 feet east of SR-29 and is stop-sign controlled for the north-south approaches (Grape Lane and BV driveway). There are no turn lanes on either Rutherford Road or the minor street approaches.

The Rutherford Road/Conn Creek Road intersection is non-standard in its configuration. Northbound Conn Creek Road splits into two separate approaches where it intersects Rutherford Road consisting of one westbound approach and one northbound approach that create a triangular median between the two Conn Creek Road approach lanes and Rutherford Road. Both are stop-sign controlled at Rutherford Road.

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. As calculated, the State Route 29 (SR-29)/Rutherford Road intersection is operating at LOS F (>300 seconds) during both the weekday PM peak hour and the weekend mid-day peak hour. It is noted that unsignalized intersections along SR-29 can experience major delays for minor street stop-sign controlled traffic due to existing traffic components along the State highway. Specifically, factors influencing delays on SR-29 include higher vehicle speeds, higher traffic volumes, and the lack of "gaps" in north-south traffic to allow safe access to/from SR-29. These conditions are very pronounced during the weekday and Saturday peak traffic flow periods when commute/tourist traffic is leaving or arriving in the Napa Valley. Through-traffic on SR-29 can cause long delays for stop-sign controlled westbound left and right-turn movements from Rutherford Road during these time periods. The presence of left-turn lanes on SR-29 at Rutherford Road (and a two-way-left-turn lane) extending north and south along SR-29 does provide some relief to minor street stopped motorists who wish to access the highway by allowing a refuge lane for motorists to turn left and/or merge into traffic flows. (Suggested mitigation for the State Route 29/Rutherford Road intersection has been recommended in the Project Impact section).

The Rutherford Road/Grape Lane intersection operates at LOS B without the proposed project during these same time periods. Similarly, the Rutherford Road/Conn Creek Road intersection operates at LOS B during both of these peak time periods. At this time, no significant vehicle congestion was observed at either of the Grape Lane and Conn Creek Road intersections at Rutherford Road during data collection periods. It is noted that westbound traffic volumes on Rutherford Road at the approach to SR-29 can queue back towards Grape Lane during peak Summer periods and cause delays for outbound/inbound traffic at Grape Lane.

**TABLE 2
EXISTING (NO PROJECT) CONDITIONS: INTERSECTION LEVELS-OF-SERVICE
WEEKDAY PM PEAK AND WEEKEND MID-DAY PEAK HOUR^{1, 2}**

Intersection	Control Type	Wkdy. PM LOS/Delay	Wknd. Mid-Day LOS/Delay
		Existing (No Project)	Existing (No Project)
1 Rutherford Road/State Route 29	MSSC	F >300	F >300
2 Rutherford Rd./Grape Ln.	MSSC	B 10.7	B 10.9
3 Rutherford Rd./Conn Creek Rd.	MSSC	B 10.8	B 10.6

(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

These traffic conditions along Rutherford Road were a topic of discussion during the neighborhood meeting.¹⁰ Potential mitigation measures to address these conditions are included as part of this traffic analysis.

Existing Peak Hour Arterial Level-of Service

Peak hour roadway operation has been evaluated consistent with Napa County criteria for arterial level-of-service. Rutherford Road is currently operating at LOS C at 215 directional peak hour vehicles (Class II Arterial 35 mph or less). SR-29 experiences peak hour directional arterial flow (one-way) of approximately 1,613 vehicles during the weekday PM peak hour (southbound) and 1,591 during the Saturday mid-day peak hour (northbound). Based on an undivided Class I arterial over 40 mph this would yield LOS F 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 F 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).

Signal Warrant Evaluation

Based on the California Manual on Uniform Traffic Control Devices (CAMUTCD) peak hour signal warrant criteria, the Rutherford Road/SR-29 and Rutherford Road/Conn Creek Road unsignalized

¹⁰Meeting with Randy Bryant-Grape Lane resident and Elizabeth Spencer Wi., Rutherford, March 19, 2019

study intersections were evaluated for signalization.¹¹ 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 Rutherford Road/SR-29 intersection would qualify for signalization under the peak hour warrant (the warrant graphs are provided in the Appendix). The Rutherford Road/Conn Creek Road intersection would not qualify for signalization with existing volumes at this time. It is noted that the minor street volumes at Grape Lane are too low to consider for warrant evaluation (75 vehicles or greater is the minimum minor-street volume).

Bicycle and Pedestrians Facilities

Existing facilities in the project study area for bicycles and pedestrians include pedestrian sidewalks on Rutherford Road and SR-29 (east side) and stop-sign intersection controls at the Rutherford Road/SR-29 intersection. There are no “official” bike lane facilities on either State Route 29 or Rutherford Road. However, bicyclists were observed using the relatively wide striped shoulder areas (6-8 feet) on SR-29 travelling north-south through the study area. Lesser bicycle activity was observed on Rutherford Road in an east-west direction. Pedestrian activity in the area was light with most pedestrians focused along Rutherford Road and the associated winery/restaurant/hotel uses within the proximity of SR-29. No pedestrians were observed crossing SR-29 (east-west) and there are no pedestrian crosswalks on either SR-29 or Rutherford Road in the project vicinity area.

The Napa County Bicycle Plan identifies both SR-29 and Rutherford Road as “Primary Class II Route” and “Class II Bike Lane—Proposed.” However, the Bicycle Plan goes on to qualify “All proposed bike routes shown on the map are for study purposes only. Designation of a route as proposed does not imply any actual plans or project will be considered along the route.”¹²

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 Rutherford Road/SR-29 and Rutherford Road/Conn Creek Road study intersections are shown in Table 3. In addition, the Rutherford Road segment between SR-29 and Conn Creek Road has been evaluated for collision activity. 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 Rutherford Road/SR-29 primarily matches the statewide average for similar facilities, indicating the intersection is generally operating safely. However, the majority of collisions at this intersection represent “broadside” or “rear-end” crashes. These types of collisions are likely due to the relatively high speeds on SR-29 combined with motorists turning

¹¹ *California Manual on Uniform Traffic Control Devices (CAMUTCD), Chapter 4C, Peak hour signal warrant (#3), 2016.*

¹² *Napa Countywide Bicycle Plan, Planning Area—Mid Valley, Figure 4, January 2012.*

from the highway (rear-end) and/or stop-sign controlled motorists from Rutherford Road attempting to merge onto SR-29 with very small “gaps” in through-traffic. The Rutherford Road/Conn Creek Road intersection has experienced three (3) collisions over a five-year period. However, the calculated collision rate (0.46) exceeds the state average for this facility primarily due to ROW issues for motorists at stop-sign controlled approaches at the junction of Rutherford Road and Conn Creek Road. Finally, the roadway segment of Rutherford Road between SR-29 and Conn Creek Road has a collision rate slightly higher than the state average. The majority of collisions (6) involve hitting objects and have occurred east of the project site in the narrower section of the roadway. (Suggested mitigation for the State Route 29 roadway segment has been recommended in the Project Impact section).

TABLE 3: 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. Rutherford Rd./SR-29	13	0.24	0.23
3. Rutherford Rd./Conn Creek Rd.	3	0.46	0.23
Rutherford Rd.: SR-29 to C.C. Rd.	6	0.91	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.

3. Year 2020 Near-Term (No Project) Conditions

Near-Term Year 2020 Methodology

Based on direction from the County Traffic Engineer, year 2020 near-term conditions have been based on historical Caltrans volume data for the last three full calendar years.¹³ Based on historical average daily traffic data that includes peak hour two-way volumes, volumes on SR-29 have increased by 3.7% in the last three years or 1.23% per year. On Rutherford Road, daily and peak hour volumes are virtually unchanged over the past three years remaining static between SR-29 and Silverado Trail. Therefore, the yearly growth rate used for SR-29 (1.23% per year) is being used for Rutherford Road volumes as a conservative measure. Based on a two-year growth period from collected data (year 2018) to year 2020 near-term conditions, 2.46% was applied to existing peak hour volumes for background/regional growth along the two study roadways.

In addition to historical Caltrans volume growth projections, local approved/pending projects in the immediate study area have been included in overall traffic growth at the request of Napa County Public Works staff.¹⁴ Ongoing development projects occurring within Napa County include the following:

- **Scarlett Winery** – 1052 Ponti Road, Napa County, approximately 3.5 miles east of the project site off Silverado Trail-Ponti Road; new winery with annual production of 30,000

¹³ Caltrans, *Traffic Volumes on California State Highways, State Route 29 and State Route 128 (Rutherford Road), 2015, 2016, 2017.*

¹⁴ Ms. Dana Ayers, *Planner III, County of Napa, personal communication related to County development projects, May 5, 2017.*

gallons; 6 full-time employees and 5 part-time employees; average of 15 visitors per day; average of 25 guests at 27 annual events;

- **LMR Winery** – 1790 St. Helena Highway, approximately 0.5 miles north of the project site off SR-29; use permit modification increasing annual production of 100,000 gallons; 6 full-time employee and 3 part-time employees; average of 50 visitors per day; average of 44 guests at 32 annual events;
- **Beaulieu Vineyards** – 1960 St. Helena Highway, immediately north of the proposed project site; No production increases. Use permit update to include 19 full-time employees and a reduction of 51 part-time employees; average increase in daily visitation of 100 guests; net increase of 9,650 guests at 196 annual events (please note--annual events would occur twice-weekly with an addition of 50 guests per event. These guest have been added to daily visitation numbers);
- **WHL Winery** – 1561 S. Whitehall Lane, approximately 2.00 miles northwest of the project site; use permit update to increase production to 100,000 gallons annually; 4 full-time employees and 2 part-time employees; No visitation and no marketing events;
- **Nickel & Nickel Winery** -- 8164 St. Helena Highway, approximately 1.5 miles south of the project site off SR-29. Use permit application to increase production to 100,000 gallons; 56 full-time employees (no part-time employees); average of 185 daily visitors; No change in marketing events;
- **Frank Family Rutherford Winery** – 8895 Conn Creek Road, new winery location located approximately 1.2 miles east of the project site via Rutherford Road-Conn Creek Road. Annual proposed production of 475,000 gallons; 14 full-time employees (no part-time employees); average of 50 daily visitors; net increase of 1,248 guests at 104 annual events (please note---annual events would occur twice-weekly with an addition of 50 guests per event. These guest have been added to daily visitation numbers);¹⁵

Daily, weekday PM peak hour, and Saturday mid-day peak traffic volumes were generated for the above near-term projects based on the employee peaking factors and auto occupancy rates for visitors using recent winery research conducted by the Napa County Planning, Building, and Environmental Services Department...¹⁶

As noted, a two-year horizon window to the Year 2020 has been assumed. Based on the approved/pending projects reviewed by County staff, both weekday PM peak hour and weekend mid-day peak hour traffic volumes resulting from these projects were added to the street network.

Near-term (no project) volumes for weekday PM peak hour and weekend mid-day peak hour have been shown in Figure 3.

Near-Term Year 2020 (No Project) Intersection Operation

Existing weekday PM peak and weekend mid-day peak hour near-term year 2020 (no project) level-of-service has been shown in Table 3. As calculated, the State Route 29 (SR-29)/Rutherford Road 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 Rutherford Road and opposing winery driveway. Both the

¹⁵ Ms. Dana Ayers, Planner III, Napa County, Approved/Pending project list for Bruno Wine Tasting Room project, February 22, 2018.

¹⁶County of Napa, Conservation, Development, and Planning Department, "Use Permit Application Package," Napa County Winery Traffic Generation Characteristics, 2012.

**TABLE 3
NEAR-TERM YEAR 2020 (NO PROJECT) CONDITIONS: INTERSECTION LEVELS-OF-SERVICE
WEEKDAY PM PEAK AND WEEKEND MID-DAY PEAK HOUR^{1, 2}**

Intersection	Control Type	Wkdy. PM LOS/Delay	Wknd. Mid-Day LOS/Delay
		Year 2020 (No Project)	Year 2020 (No Project)
1 Rutherford Road/State Route 29	MSSC	F >300	F >300
2 Rutherford Rd./Grape Ln.	MSSC	B 11.1	B 11.4
3 Rutherford Rd./Conn Creek Rd.	MSSC	B 11.0	B 10.9

(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

Rutherford Road/Grape Lane and Rutherford Road/Conn Creek Road intersections would continue to operate at acceptable levels (LOS B) during both the weekday PM peak hour and weekend (Saturday) mid-day peak hour under near-term year 2020 (no project) conditions.

Based on CAMUTCD peak hour signal warrant criteria (Warrant #3), the Rutherford Road/SR-29 intersection would continue to qualify for signalization under the peak hour warrant (the warrant graphs are provided in the Appendix). The Rutherford Road/Conn Creek Road intersection would not qualify for signalization with near-term (no project) volumes at this time. It is noted that the minor street volumes at Grape Lane are too low to consider for warrant evaluation (75 vehicles minor-street minimum volume required).

Near-Term Year 2020 (No Project) Arterial Operation

Peak hour arterial operation has also been evaluated with near-term year 2020 (no project) conditions. Rutherford Road would continue to operate at LOS B with 240 directional peak hour vehicles (Class II Arterial 35 mph or less). SR-29 would experience peak hour directional arterial flow (one-way) of approximately 1,706 vehicles during the weekday PM peak hour (southbound) and 1,697 during the Saturday mid-day peak hour (northbound). Based on an undivided Class I arterial over 40 mph this would yield LOS F during both time periods.

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:

Intersections/Roadway Segments

- 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.

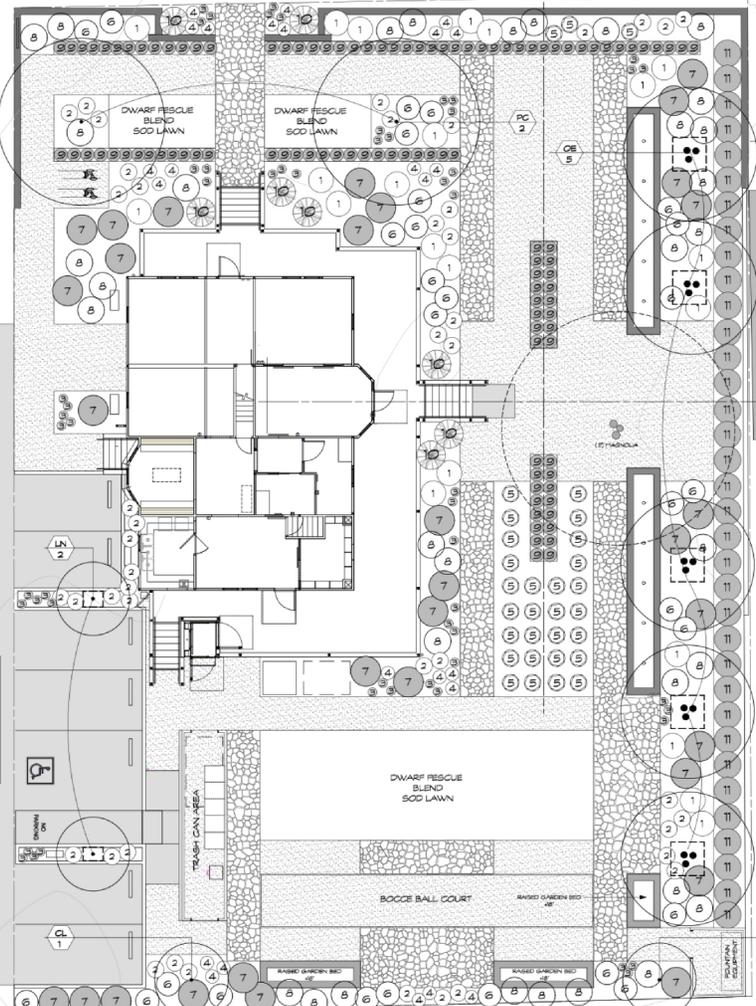
Further significance criteria are based on County and CEQA guidelines and apply mainly to intersection operation and access. A significant impact occurs if project traffic would result in the following:

- 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

Proposed Project Description

The proposed Mathew Bruno Wine Tasting Room project would consist of converting an existing 1890's residence into a stand-alone wine tasting facility (room). There would be no on-site wine production. The project site is a 0.38 acre parcel located at 1151 Rutherford Road with historical vehicular access from Grape Lane (see Figure 4—Project Site Plan). The parcel is currently zoned C-L (Commercial Limited). The proposed project would have two (2) full-time employees. Visitation associated with tasting would include up to 56 guests per day (maximum) on either a weekday or weekend for a total of 392 weekly visitors. In addition, the proposed tasting room project has included a marketing plan with up to 24 events per year. Proposed project components can be described as follows:



NOTE:
 PROVIDE ROOT BARRIERS AT ALL TREE LOCATIONS THAT ARE WITHIN 3' OF ANY CONCRETE OR PAVED SURFACE. PL-35 BY NDS (WWW.NDSPRO.COM)
 A MINIMUM OF 3" OF MULCH SHALL BE APPLIED TO ALL SHRUB PLANTING AREAS. SOIL AMENDMENTS SHALL BE INCORPORATED ACCORDING TO THE RECOMMENDATIONS OF THE SOIL REPORT AND WHAT IS APPROPRIATE FOR THE PLANTS SELECTED.

NOTE: ALL TREES AND SHRUBS LOW WATER-USE

PLANT LEGEND

TREES

Symbol	Botanical Name	Common Name	Size	Water/Use	QTY	Comments
GL	Quercus Dwarf Loran	Dwarf Loran	24 in.	Moderate	2	Evergreen, Green Foliage
LN	Leucis nolla Sarragei	Box Tree	24 in.	Low	2	Evergreen, Single Trunk
CE	Clea arvensis	Clea	Specimen Low	5	15-20' height	Evergreen, Gray/Green Foliage
PC	Phoenix Conspicua	Canary Island Palm	Specimen Low	2	15-20' Trunk Height	

SHRUBS

Symbol	Botanical Name	Common Name	Size	Water/Use	QTY	Comments
1	Ceanothus hybridus	White Rock Rose	5 gal	Low	36	3-4' Tall, White Flower
2	Dianella Little River	Dianella	1 gal	Low	57	Grassy Leaves, Gray/Green
3	Persea indica	Dwarf Ficus	1 gal	Low	62	Silver Ornamental Grass
4	He Bearded Purple	Bearded He	1 gal	Low	57	Gray/Green Foliage, Purple Flower
5	Lonicera s. 'Hydora'	Dwarf Lavender	5 gal	Low	72	Gray/Green Foliage, Purple Flower
6	Lonicera Plum Beauty	Dwarf Plum Bush	5 gal	Low	62	Variegated Green/White Grass-Like
7	Leucosiphum Silver Gaud	Texas Ranger	5 gal	Low	39	Gray/Green Foliage, Purple Flower
8	Placochilus 'Merry Light'	Hydrangea	5 gal	Low	30	Variegated Green/White Ornamental Grass
9	Phytolacca americana	Dwarf Phytolacca	5 gal	Low	149	Crisp as Low Hedge
10	Phytolacca americana	New Zealand Flax	5 gal	Low	6	Bronze Spiky Foliage
11	Prunus caroliniana	Carolina Cherry	15 gal	Low	39	Dark Green Foliage, Tall Hedge



REVISIONS	BY

Ken Westfall
 Landscape Architect #139
 PO Box 1731
 Malibu, CA 90233
 kenwestfall@wbkglobal.net



MATHEW BRUNO WINES
 1151 RUTHERFORD ROAD
 NAPA, CA 94573
 PLANTING PLAN

DRAWN BY:	NEW
DATE:	02/16/19
SCALE:	1/8"=1'-0"
JOB NUMBER:	2017-29
SHEET:	L-3
OF SHEETS	3



Project Site Plan



figure 4

Project Components (Tasting Room Operations):

- Production Gallons: 0 (annually)
- Employees Weekday: 2 full-time
 Weekend: 2 full-time
- Visitors: Weekday: 56 visitors
 Weekend: 56 visitors
- Trucks: Weekday: 1 trucks per day
 Weekend: 0 trucks per day

Daily operations for the proposed Mathew Bruno Wines Tasting Room project would involve on-site tasting for groups between 2-15 guests (drop-in). There would be no on-site food preparation. A maximum of up to 56 daily visitors are expected both weekdays and on weekends. Visitor hours would be limited between 10:00 a.m. – 6:00 p.m., seven days per week. The planned duration of visits for daily guests would last between 90-120 minutes in length. Therefore, the daily turnover of guests to/from the project site is expected to be less than other typical wine tasting rooms with the goal of reducing overall vehicle trips and parking demand to the extent possible.

The proposed project's marketing plan can be described as follows:¹⁷

- 24 events annually: maximum of 30 guests;
- Two (2) events annually: maximum of 250 guests.

Since the smaller marketing events would be held on a weekly basis (24-events per year), associated visitation and tasting would be reduced by 30-guests on the days these smaller marketing events are held. Shuttle service would be provided for attendees at the largest marketing events. Pick-up and drop-offs would be from hotels with points of origin in Napa and St. Helena.

The proposed project would provide seven (7) on-site parking spaces located off Grape Lane adjacent to the tasting room. Two (2) on-site parking spaces would be dedicated for employees only and the remaining five (5) spaces would be for guests. On-street parking (approximately 5 public on-street parking spaces) is also available in front of the project site along Rutherford Road.

Existing Site Uses

Based on discussions with the staff of the Elizabeth Spencer Winery office who currently occupies the existing building, there are currently 11 employees using the project site building for administrative/office uses associated with the Winery. These employees include 7 full-time and 4 part-time personnel. Tenant parking is currently on-site to the south of the existing building. Access to this parking area is from Grape Lane. Elizabeth Spencer employees located in the project site building are currently generating weekday and weekend traffic volumes. Therefore, should the proposed project gain approval, overall trip generation would represent the net increase in daily and peak hour vehicle trips between existing uses and proposed project uses.

¹⁷ Project Application, Project Description, Mathew Bruno Wines Tasting Room (APN 030-169-007), 1151 Rutherford Road, Napa County, 2017.

Project Trip Generation/Distribution

The increase in weekday and weekend peak hour and daily traffic volumes from the proposed Mathew Bruno Wine Tasting Room has been calculated and is shown in Table 4. Daily and peak hour trip generation has been based on employee peaking factors and auto occupancy rates for employees and visitors using the most recent winery research conducted by the Napa County Planning, Building, and Environmental Services Department.¹⁸ Based on maximum employee and visitor/guest data the proposed project would be expected to generate 49 daily trips with 18 PM peak hour trips (4 in, 14 out). During a typical weekend (Saturday), the project would be expected to generate 25 mid-day (afternoon) peak hour trips (12 in, 13 out). Accounting for existing on-site Elizabeth Spencer Winery administrative uses, the net increase in vehicle trips on the street network would total 20 daily trips with 9 weekday PM peak hour and 16 weekend midday peak hour trips (see Appendices---Napa County Trip Generation Sheets).

Based on the largest marketing event attendance of 250 persons, there would total trip generation of 197 daily event trips assuming that all guests arrive by private vehicle. The project includes several measures to reduce individual vehicle trips including shuttle service and off-site parking for use during special events. More detail on these traffic management measures is provided in section 6 (VMT Reduction/TDM Plan).

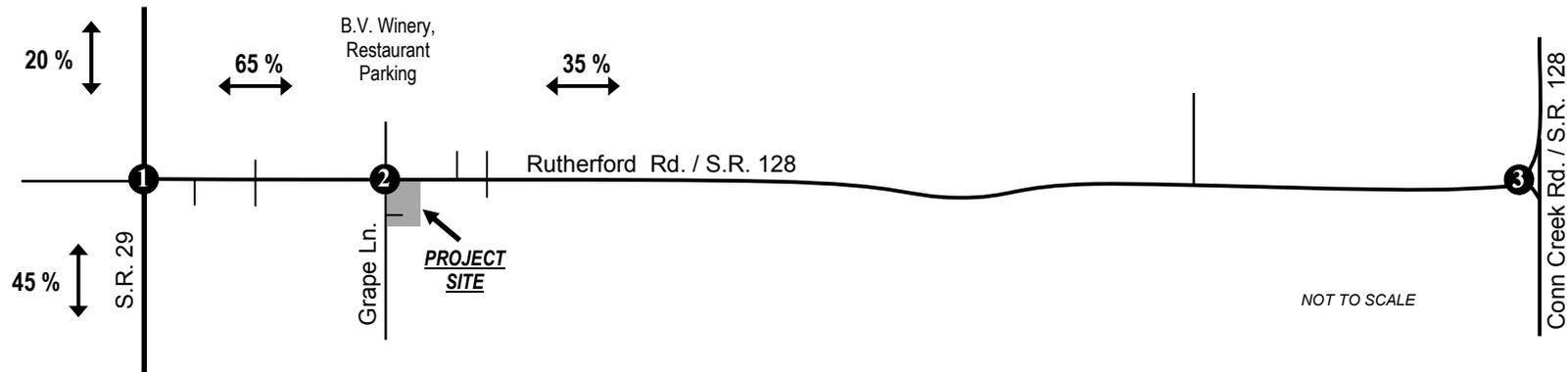
To determine traffic impacts associated with the proposed project, the net increase in project trips was added to existing volumes. Based on observed travel patterns on Rutherford Road and SR-29, the weekday PM and weekend mid-day peak hour project trips were distributed 65% to/from the west and 35% to/from the east on Rutherford Road. From the 65% to/from the west on Rutherford Road, 70% would be to/from the south on SR-29 and 30% to/from the north. Proposed AM and PM peak hour project trips (only) and distribution have been shown in Figure 5. Existing plus project and near-term plus project volumes have been shown in Figures 6 and 7.

TABLE 4: PROPOSED PROJECT DAILY AND PEAK HOUR TRIP GENERATION; NET INCREASE

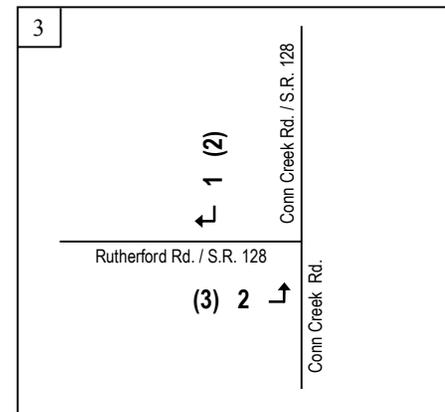
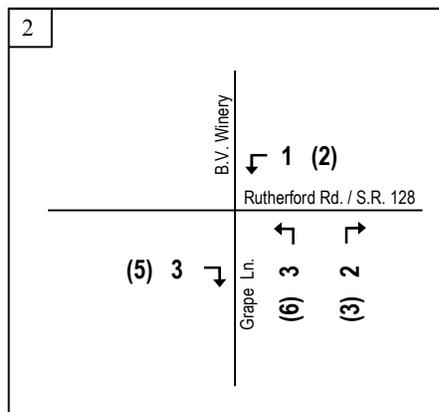
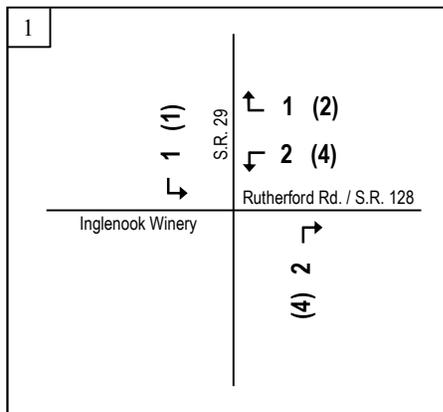
Land Use	Units	Daily		Weekday PM Peak			Weekend MD Peak		
		Rate	Trips	Trips	In	Out	Trips	In	Out
Existing Winery Use (Elizabeth Spencer)									
F-T Winery Employees	7	3.05	21	7	0	7	7	4	3
P-T Winery Employees	4	1.9	8	2	0	2	2	1	1
			-29	-9	0	-9	-9	-5	-4
Non-Harvest Season									
Proposed Project (Mathew Bruno)									
F-T Winery Employees	2	3.05	6	2	0	2	2	1	1
Tasting Room Visitors	56	0.77	43	16	4	12	23	11	12
			49	18	4	14	25	12	13
Net Added Project Trips			20	9	4	5	16	7	9

Source: Production, employee, and visitor data provided by Mr. Jeffery Redding (applicant representative), Use Permit Application, Mathew Bruno Wine Tasting Room, 2019. Daily and peak hour calculations based on County of Napa, Conservation, Development, and Planning Department, "Use Permit Application Package," Napa County Winery Traffic Generation Characteristics, 2019. F-T = Full-Time, P-T = Part-Time

¹⁸County of Napa, Conservation, Development, and Planning Department, "Use Permit Application Package," Napa County Proposed Project Winery Traffic Information/Trip Generation Sheet, February 22, 2019.



PEAK HOUR VOLUMES:



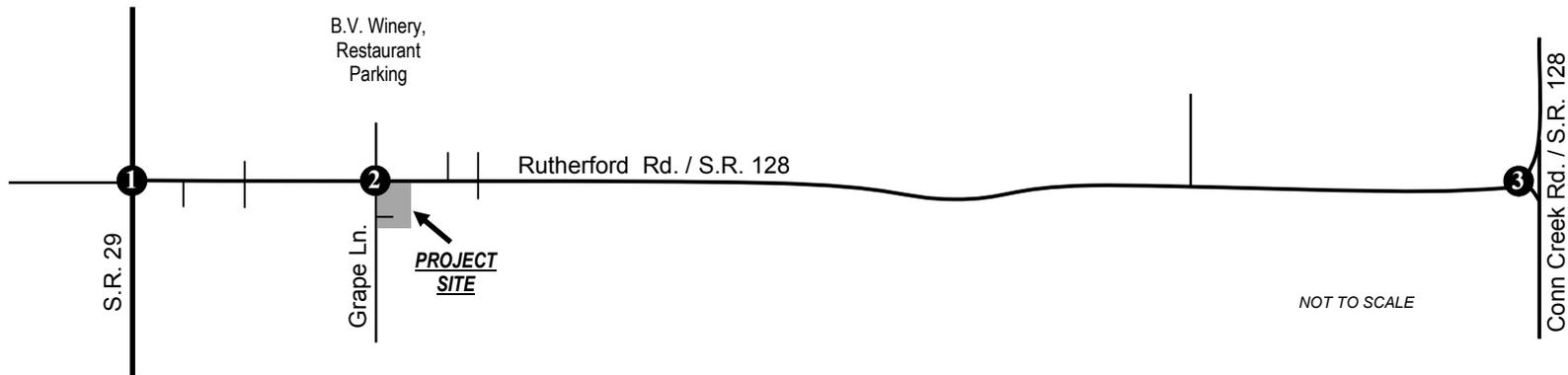
XX = Weekday P.M. Peak Hour
 (XX) = Weekend Peak Hour



Weekday P.M. and (Weekend) Peak Hour Project Trips and Distribution



figure 5



PEAK HOUR VOLUMES:

1	<p>(6) 0</p> <p>1598 (1090)</p> <p>109 (51)</p>	<p>S.R. 29</p> <p>↑ 46 (53)</p> <p>↑ 0 (5)</p> <p>↓ 92 (80)</p>	<p>Rutherford Rd. / S.R. 128</p>
	<p>Inglenook Winery</p> <p>(5) 0</p> <p>(3) 0</p> <p>(1) 6</p>	<p>↑</p> <p>↓</p>	<p>↑</p> <p>↓</p>
	<p>(12)</p> <p>(1507)</p> <p>(182)</p>	<p>3</p> <p>1101</p> <p>97</p>	<p>↑</p> <p>↓</p>

2	<p>14 (22)</p> <p>0 (0)</p> <p>6 (10)</p>	<p>B.V. Winery</p> <p>↑ 0 (8)</p> <p>↑ 120 (124)</p> <p>↓ 2 (3)</p>	<p>Rutherford Rd. / S.R. 128</p>
	<p>(15) 6</p> <p>(224) 211</p> <p>(9) 7</p>	<p>↑</p> <p>↓</p>	<p>↑</p> <p>↓</p>
	<p>(9)</p> <p>(0)</p> <p>(4)</p>	<p>10</p> <p>0</p> <p>4</p>	<p>↑</p> <p>↓</p>

3	<p>74 (109)</p> <p>65 (38)</p>	<p>Conn Creek Rd. / S.R. 128</p> <p>↑</p> <p>↓</p>	<p>Rutherford Rd. / S.R. 128</p>
	<p>(153) 53</p> <p>(53) 152</p>	<p>↑</p> <p>↓</p>	<p>↑</p> <p>↓</p>
	<p>(32)</p> <p>(22)</p>	<p>34</p> <p>12</p>	<p>↑</p> <p>↓</p>

XX = Weekday P.M. Peak Hour
 (XX) = Weekend Peak Hour



Near-Term Plus Project
 Weekday P.M. and (Weekend) Peak Hour Volumes



figure 7

Project Effects on Intersection/Roadway Segment Operations

Existing plus Project Conditions

During the peak activity periods, the tasting room would be expected to generate 9 net new weekday PM peak hour trips and 16 net new Saturday mid-day peak hour project trips. Weekday PM peak hour and weekend mid-day peak hour intersection levels of service were evaluated with proposed project traffic and are shown in Table 5.

**TABLE 5
EXISTING AND NEAR-TERM WITH PROJECT CONDITIONS: INTERSECTION LEVELS-OF-SERVICE
WEEKDAY PM PEAK AND WEEKEND MID-DAY PEAK HOUR¹**

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 Rutherford Road/State Route 29	MSSC	F >300	F >300	F >300	F >300
2 Rutherford Rd./Grape Ln.	MSSC	B 10.7	B 10.7	B 10.9	B 11.0
2 Rutherford Rd./Conn Creek Rd.	MSSC	B 10.8	B 10.8	B 10.6	B 10.7
Intersection	Control Type	Wkdy. PM LOS/Delay		Wknd. Mid-Day LOS/Delay	
		N-T Yr. 2020 (No Project)	N-T Yr. 2020 (W/ Project)	N-T 2020 (No Project)	Yr. N-T Yr. 2020 (W/ Project)
1 Rutherford Road/State Route 29	MSSC	F >300	F >300	F >300	F >300
2 Rutherford Rd./Grape Ln.	MSSC	B 11.1	B 11.1	B 11.4	B 11.5
3 Rutherford Rd./Conn Creek Rd.	MSSC	B 11.0	B 11.1	B 10.9	B 10.9

(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.

With existing plus project traffic volumes, operations at these study intersections would remain unchanged from existing conditions during the weekday and weekend peak periods. The Rutherford 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 Rutherford Road/Grape Lane and Rutherford Road/Conn Creek Road would continue to operate acceptable levels (LOS B or better) during the same peak time periods.

Based on updated County significance criteria for unsignalized intersections the intersection of Rutherford 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 six (6) trips to the intersection. During the weekend midday peak hour, the project would add 10 trips to the intersection. Based on existing peak hour volumes of 2,874 and 2,775 at the intersection during these PM and midday peak hours; proposed project contribution would be less than one percent (1%). Under the County significance criteria, this impact is less than significant. The Rutherford Road/SR-29 intersection would continue to meet the peak hour signal warrant with or without proposed project.

Napa County guidelines indicate potential mitigation could include adding a signal if conditions are appropriate, geometric modifications to the intersection configuration, or changes to the Project to reduce its peak hour trip generation, or converting an intersection to a roundabout per Policy CIR-31. In addition, the County of Napa has updated their Circulation Element and TIS guidelines with recommendations towards improving overall vehicle delays along SR-29, reducing vehicle miles traveled (VMT), and potentially implementing a traffic impact fees.^{19 20} The proposed project will be implementing a VMT Reduction/TDM Plan (section 6) as part of their overall development plan. As noted in existing conditions, there is approximately 19-feet of approach width on Rutherford Road at SR-29. It is recommended that the Rutherford Road westbound approach be re-striped and/or widened to provide separate right and left-turn lanes. The proposed project's fair share would equal less than one percent should Napa County implement this circulation improvement.

Rutherford Road would continue to operate at LOS C at 218 directional peak hour vehicles at Grape Lane (Class II Arterial 35 mph or less) with the addition of project traffic to existing traffic conditions. SR-29 would experience peak hour directional arterial flow (one-way) of approximately 1,614 vehicles during the weekday PM peak hour (southbound) and 1,595 during the Saturday mid-day peak hour (northbound) representing LOS F conditions. Proposed project increases in directional arterial segment volumes would represent less than one percent (1%) during these time periods (project increases of one southbound trip and four northbound trips). Under the County significance criteria, this impact is less than significant. However, due to the accident history analysis indicating "broadside" and "rear-end" collisions at the intersection it is recommended that installation of "feedback signs" (i.e. speed limits indicators) be installed on SR-29 670-feet prior to Rutherford Road on each north and south approach.

Near-Term plus Project Conditions

Near-term year 2020 weekday PM peak hour and weekend mid-day peak hour intersection levels of service were evaluated with proposed project traffic and are shown in Table 5.

With near-term plus project traffic volumes, project study intersection operations would remain unchanged from near-term (no project) conditions during the weekday and weekend peak periods. The Rutherford 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 Rutherford Road/Grape Lane and Rutherford Road/Conn Creek Road would continue to operate acceptable levels (LOS B or better) during the same peak time periods.

Based on updated County significance criteria for unsignalized intersections; the intersection of Rutherford 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. County criteria indicate that a significant impact could be found if the proposed project contributes 5% or more to the amount of traffic growth at the intersection. The guidelines go on to state "the peak hour signal warrant criteria should also be evaluated and presented for informational purposes." With near-term plus proposed project traffic, the project would contribute six (6) weekday PM peak hour trips to the intersection. Based on a total growth in volume of 178 vehicles this would equate to 3.3% increase and is therefore a less than significant impact. During the weekend midday peak hour, the project would contribute ten (10) trips to the intersection. Based on

¹⁹ County of Napa, General Plan Circulation Element, Adopted February, 2019.

²⁰ Fehr and Peers, Guidelines for Application of Updated General Plan Circulation Policies on Significance Criteria Related to Vehicle Level of Service, Memorandum, April 20, 2018.

a total growth in volume of 220 vehicles this would equate to 4.5% increase and is a less than significant impact. The Rutherford Road/SR-29 intersection would continue to meet the peak hour signal warrant with or without proposed project.

As under existing plus project conditions, Napa County guidelines indicate potential mitigation could include adding a signal if conditions are appropriate, geometric modifications to the intersection configuration, changes to the Project to reduce its peak hour trip generation, or converting an intersection to a roundabout per Policy CIR-13.5. As noted, the project applicant has developed a TDM plan to reduce overall vehicle trip generation, VMT, and associated parking demand (see VMT Reduction/TDM Plan Section).

6. Site Access/Design Parameters

Sight Distance

Vehicle sight distance at the existing Rutherford Road/Grape Lane intersection was evaluated. The required vehicle visibility or "corner sight distance" is a function of travel speeds on Rutherford Road. 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 Rutherford Road at Grape Lane is 30 mph in the project area. The "critical" vehicle speed (the speed at which 85% of all surveyed vehicles travel at or below) along Rutherford Road was observed at approximately 30-35 mph at the project driveway during free-flow conditions. Caltrans' design standards indicate that these vehicle speeds require a stopping sight distance of 250 feet both east and west of Grape Lane measured along the travel lanes.²¹ Based on field measurements, sight distance from Grape Lane Road to the east and west is in excess of 350+ feet. Therefore, the sight distance recommendations would be met for the speed limit and observed vehicle speeds

Project Access and Circulation

Vehicular access to the proposed Mathew Bruno Wine Tasting Room is from Grape Lane (see Project Site Plan---Figure 4). The main project driveway (Grape Lane) is a private driveway easement that currently provides access to seven (7) single-family homes and the Elizabeth Spencer winery office that currently occupies the building. Parking for the winery office is located south (rear) of the existing building. (Note that Elizabeth Spencer staff has occupied this building for the last 11 years). Grape Lane is paved with a 10-12 foot width with gravel shoulder and parking areas along its length of 800 feet. The County is requiring that Grape Lane be improved to a commercial driveway as part of this project.

As proposed, the project would provide seven (7) perpendicular parking spaces on the southwest side of the project along Grape Lane as well as existing parallel parking (approximately 5 public on-street parking spaces). Tasting room guests would access the tasting room via the north entrance by using the pathway shown in Figure 4. Use of this on-site pathway avoids potential conflict with

²¹ Caltrans, *Highway Design Manual, Table 405.1A, Corner (Stopping) Sight Distance, March 7, 2014.*

vehicles using Grape Lane. Project parking spaces on Grape Lane would be in-set towards the building approximately 14-feet so guest would not block through-traffic on the Grape Lane driveway when backing out of their spaces. Landscaping is shown both north and south of the seven project parking spaces. In addition, two (2) bicycle racks would be provided on the north side of the parking spaces adjacent to landscaped areas.

Napa Countywide Bicycle Plan has been completed and adopted by the Napa Valley Transportation Authority (NVTA) and the County.²² In the project site vicinity, Rutherford Road is proposed for Class II bike lanes (on-street bike lanes). As noted, the project would provide bicycle racks (2 racks) for visitors to the proposed tasting room located on the north side of the vehicle parking area. A review of the Napa Countywide Pedestrian Plan indicates that no specific pedestrian improvements are identified for the Rutherford Road area (Appendix UNC-C—Detailed Project List, Unincorporated Napa County).²³

Marketing Events

As noted in the project description, in addition to normal tastings the project proposes to host 26 marketing events that would range between 30-250 guests. These marketing events would include the following:

Proposed Mathew Bruno Wine Tasting Room Marketing Events

- 24 events annually: maximum of 30 guests;
- Two (2) events annually: maximum of 250 guests.

Daily and peak hour trip generation for proposed project marketing events has been shown in Table 6. During a typical Saturday, the proposed project is expected to generate 46 daily trips when the 30-person event is hosted. Accounting for existing Elizabeth Spencer Winery uses, the net increase project trip generation would result in 17 net new daily trips.

Based on standard County auto occupancy rates, the largest annual event of 250 guests is expected to generate approximately 197 daily trips (99 in, 98 out) including visitors, staff, and delivery trucks. This trip generation assumes that all event attendees arrive by private automobile. Again, accounting for existing site uses the largest proposed event would generate 168 net new daily trips (85 in, 83 out). Note that daily tastings would be curtailed during the two (2) annual events. In addition the project applicant has developed a TDM plan to reduce overall vehicle trip generation, VMT, and associated parking demand (see TDM Plan Section

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 section, the largest marketing event would generate 197 daily trips (99 in, 98 out), assuming all event attendees arrive by private automobile and without the measures contained in the TDM Plan Section. 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 98 trips inbound during the hour prior to the event and 98 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”

²² Napa County, *Countywide Bicycle Plan (2012), Planning Area-Mid Valley, January 2012.*

²³ Napa County, *Countywide Pedestrian Plan, Unincorporated Napa County Area, NVTA, August 2016.*

basis is estimated to be very low (if any). As noted in the project description section, the project applicant would reduce tasting visitation by 30 guests when small marketing events (30-guests maximum) are held.

TABLE 6 WEEKEND (SATURDAY) LARGE MARKETING EVENTS; DAILY PROJECT TRIPS

Land Use	Units	Daily		Trips	Daily	
		Rate	Trips		In	Out
Existing Winery Use						
(Elizabeth Spencer)						
F-T Winery Employees	7	3.05	21	21	10	11
P-T Winery Employees	4	1.9	8	8	4	4
			-29	-29	-14	-15
Harvest Season						
Proposed Project						
(Mathew Bruno)						
F-T Winery Employees	2	3.05	6	6	3	3
Tasting Room Visitors	56	0.71	40	40	20	20
			46	46	23	23
Net Added Daily Harvest Season Trips:			17	17	9	8
Largest Marketing Event						
Proposed Project						
(Mathew Bruno)						
Event Staff	6	2.0	12	12	6	6
Visitors	250	0.71	179	179	90	89
Event Trucks	3	2.0	6	6	3	3
			197	197	99	98
Net Added Daily Event Trips			168	168	85	83

Source: Production, employee, and visitor data provided by Mr. Jeffery Redding (applicant representative), Use Permit Application, Mathew Bruno Wine Tasting Room, 2019. Daily and peak hour calculations based on County of Napa, Conservation, Development, and Planning Department, "Use Permit Application Package," Napa County Winery Traffic Generation Characteristics, 2019.
F-T = Full-Time, P-T = Part-Time

Parking Demand and Supply

The proposed project would provide seven (7) on-site perpendicular parking spaces located on the east side of Grape Lane adjacent to the renovated 1890's house/tasting room. These spaces would include two (2) standard parking spaces, four (4) compact spaces, and one (1) ADA parking space. In addition, existing on-street public parking is available along Rutherford Road in front of the project site. However, existing on-street parking spaces are not credited to overall proposed project supply.

A comparison of the proposed project's overall parking demand has been evaluated based on the maximum expected visitation rate and County code requirements using restaurant uses. It is suggested that the proposed project would not generate the expected parking demand of a typical quality and/or high-turnover restaurant as specified by County code due to its unique characteristics (wine tasting) and length of tasting appointments (90-120 minutes).

Using the County's auto occupancy rate of 2.8 persons per vehicle and maximum daily visitation of 56 guests (Saturday) would yield a total daily count of 20 vehicles (56 guests / 2.8 person per

vehicle = 20 vehicles). Over the course of the 8-hour tasting period (10:00 a.m.-6:00 p.m.) this would yield an average parking demand of 2.5 parking spaces. Allowing for the peak overlapping parking demand for a two-hour period; it is reasonable to suggest the maximum parking demand would be five (5) parking spaces (2.5 space demand x 2 hours = 5 spaces) for proposed project uses matching proposed supply.

County staff has concluded that the parking requirements for the proposed use should be evaluated using standards governing restaurants and other food and beverage-serving facilities. Based on recent comments received from County Planning staff; the parking code requirements for the proposed project would be based on the actual floor area devoted to tasting and office/storage areas within the building. The common areas of the building (e.g. vestibule, restrooms, greeting area) would not be included in the parking demand calculations.²⁴ As shown in Figure 8, the proposed project's new first floor plan indicates a total tasting area of 767 square feet with office/storage areas of 187 square feet. The County's parking code rate is based on restaurant use (and any other establishment selling food and beverages for consumption on-site—including bars and taverns, nightclubs w/o live entertainment).²⁵ Using County restaurant code requirements the project parking demand could be calculated as follows based on 187 square feet of office/storage area and 767 square feet of tasting area:

187 sq. ft. office/storage area @ 1 space/250 sq. ft.	= 0.748 parking spaces
767 sq. ft. tasting area @ 1 space/120 sq. ft.	= 6.390 parking spaces
Total Parking Spaces:	= 7.138 parking spaces

The square footage of both the vestibule and greeting area are excluded from the calculations to determine the number of required parking spaces. These two areas of the building will not be used for retail sales or display of wine. Further per the County parking ordinance (18.110) fractional spaces of less than 1/3 may be disregarded when calculating parking requirements.

As calculated above, the proposed project would require seven (7) on-site parking spaces per section 18.110.030 of the zoning code.²⁶ While the proposed level of parking provided is consistent with Section 18.110, the county's parking ordinance provides several options for achieving a reduction in the otherwise required parking. These include section 18.110.040(G) that provides a protocol for a ten percent (10%) reduction in the parking requirements "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 minded measures." Compliance with these suggested protocols are discussed in the VMT Reduction/TDM Plan below.

Left-Turn Lane Warrant

Left-turn warrant checks have been conducted for the Rutherford Road/Grape Lane intersection. **Under existing (no project) conditions, current ADT volumes on Grape Lane exceed the County's minimum volume requirements for installation of a left-turn lane based on seven (7) single-family homes and existing winery facility generating 70-80 ADT (10 daily trips per home) and 2,400 ADT on Rutherford Road (see Appendices---Left-Turn Lane Warrant**

²⁴ Ms. Dana Ayers, Planner, Napa County, Parking Requirements for Mathew Bruno Wines Tasting Room, Correspondence (email), August 17, 2018.

²⁵ Napa County, Zoning Ordinance, Chapter 18.110—Off-Street Parking and Loading Facilities

²⁶ Pursuant to Chapter 19.110.030, where the computation of required parking spaces produces a fractional result, fractions of one-third or greater shall require on full parking space.

CONSULTANT

OWNER

MATHEW BRUNO WINES
 1151 RUTHERFORD ROAD
 NAPA, CALIFORNIA 94558
 MATHEW BRUNO
 P.O. BOX 549
 RUTHERFORD, California 94573

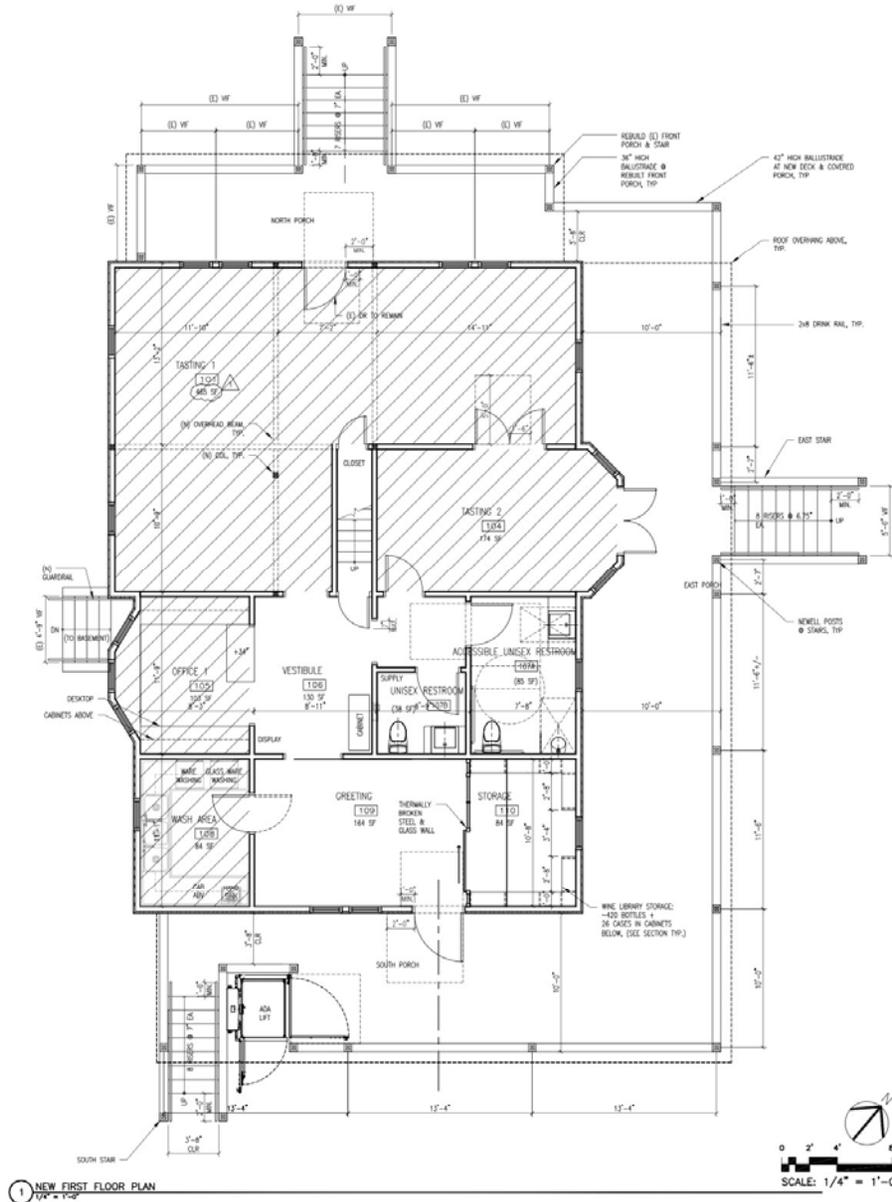
MATHEW BRUNO WINES SQUARE FOOTAGE ASSIGNMENTS

RM	TASTING-RELATED AREA	Area (SF)
101	TASTING 1	593
104	TASTING 2	174
105	OFFICE 1	103
108	WASH AREA	84
Total		954

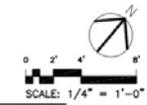
RM	NON-TASTING AREA	Area (SF)
106	VESTIBULE	130
107A	ACCESSIBLE UNISEX RESTROOM	85
107B	UNISEX RESTROOM	38
109	GREETING	164
110	STORAGE	84
TOTAL		501

LEGEND

-  TASTING-RELATED SPACE
-  NON-TASTING-RELATED SPACE



1 NEW FIRST FLOOR PLAN
 1/4" = 1'-0"



NO.	DATE	DESCRIPTION
1	08-20-18	ISSUE FOR PERMIT SUBMITTAL #1
2	08-31-18	ISSUE FOR PERMIT SUBMITTAL #2
3	11-28-17	ISSUE FOR PERMIT SUBMITTAL

PROJECT NO: 1729
 CAD DWG FILE: A-211 NEW FIRST FLOOR & BASEMENT PLANING
 DRAWN BY: -
 CHECK'D BY: -
 COPYRIGHT: -

SHEET TITLE
 NEW FIRST FLOOR PLAN

A-211
 SHEET - OF -



Proposed Project New First Floor Plan



figure 8

Graph). It is noted that the installation of a left-turn lane at a “shared use” driveway and/or roadway is typically not required by Napa County based on past transportation analyses.²⁷ Since existing uses on the shared driveway and/or roadway are already generating the minimum volumes to meet the County’s left-turn lane warrant; proposed project uses would merely be adding to the existing warrant and “fair share” mitigation fees have been imposed based on their contribution to driveway/roadway ADT volumes.

The proposed project would add 20 net new daily trips to these roadways or about 1% of the total daily traffic volume should the County determine a southbound left-turn lane is needed on Rutherford Road at Grape Lane. It is noted that due to the physical characteristics of Rutherford Road at Grape Lane the installation of a left-turn lane would not be practical. In addition, there are many other adjacent commercial, restaurant, and winery driveways along Rutherford Road in the immediate project vicinity generating higher ADT volumes than Grape Lane with no left-turn lanes. However, should the County determine mitigation for Rutherford Road (left-turn lane) is required the following measure is recommended:

- The proposed project should contribute a “fair share” contribution of 1% towards circulation improvements on Rutherford Road (left-turn lane) should the County determine circulation improvements are necessary for vehicle access to Grape Lane.

7. VMT Reduction/TDM Plan

VMT Reduction: The County’s parking ordinance provides several options for achieving a reduction in the otherwise required parking. Section 18.110.040(G) provides a protocol for a ten percent (10%) reduction in the parking requirements “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 internal trips and 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 parking demand by a minimum of 10%. With the project site located immediately 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 “internal” and/or “pass-by” in nature. A brief discussion of these trip reduction factors could be described as follows:

Internal Trips: The proposed Mathew Bruno Wines Tasting Room project in Rutherford would very likely be functioning in some capacity as a “complimentary” establishment to other adjacent uses in the immediate area. Unlike a “destination” winery that focuses on wine production, agriculture, and tours---the proposed “tasting room” only project would tend to attract a portion of its customers from the adjacent uses within the immediate Rutherford Road area. These uses would include the Rutherford Grill, BV Winery, Elizabeth Spencer Winery, Alex Italian Restaurant, and Rancho Caymus Hotel (to name a few). All of these establishments are within walking distance of the proposed project site. These associated vehicle trips are typically classified as “internal trips”. An example would be guests having lunch at the Rutherford Grill and then walking over to the proposed project to do some wine tasting. These internal trips

²⁷ *Omni-Means Engineering Solutions, Focused Traffic Analysis for the Proposed Benessere Vineyards Winery Use Modification Project, County of Napa, Left-turn Lane/Right-Turn Lane Warrants (Section 6), October 2017.*

reduce the amount of overall traffic in the immediate Rutherford Road area east of SR-29 and the proposed project. The Institute of Transportation Engineers (ITE) research on internal trip reduction indicates that between various restaurant, retail, or lodging uses located within a geographic area, mixed-use development, and/or convenient walking distance ranges from 16-17% to as high as 68% depending on specific uses (hotel to restaurant).²⁸

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 (Rutherford Road and/or 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 outlined the overall vehicle classification, estimates of daily winery trip generation, and vehicle license plate surveys in/out of the County, visitor surveys at specific Napa County wineries, and mobile device survey.²⁹ 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 (Rutherford Road and/or 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 in some detail below.

Connectivity:

As noted above, it is expected that visitors to the proposed tasting room will likely visit or plan to visit the many other businesses in Rutherford. Rutherford is a pedestrian-oriented community with existing connectivity between existing parking lots and businesses of both sides of Rutherford Road.

Vouchers:

The project applicant plans to provide vouchers/tasting chips to adjacent businesses along Rutherford Road to facilitate joint use of existing parking spaces in the Rutherford area. For example, the applicant plans to participate in the Rancho Caymus Inn’s winery partner program as well as other hotels that offer similar programs. In addition to providing vouchers/referral cards to nearby businesses (including Rutherford Grill, Beaulieu Vineyards, and Elizabeth Spencer), the applicant plans to provide vouchers to fellow Rutherford Dust Society tasting

²⁸ *Institute of Transportation Engineers (ITE), Trip Generation Handbook, 3rd Edition, Mixed-Use Development, Internal Capture Rates, September, 2017*

²⁹ *Fehr & Peers, Napa County Travel Behavior Study Survey Results and Data Analysis Report, December 8, 2014.*

rooms and others in the area.

Event Parking:

Unlike typical production wineries, marketing events are infrequent and would not typically require additional and designated parking arrangements. With regard to the two larger annual marketing events, an agreement has been reached with the Oliver family, owners of Star Vineyards that abuts the project site to the south to work with the applicant to provide overflow parking for the two larger annual events. In addition, the applicant is working with larger lodging facilities in Napa, Yountville, and St. Helena to arrange shuttles to/from event locations for out-of-town guests and local residents who can utilize lodge parking facilities and shuttle to event locations. Shuttle opportunities will be promoted on all event invitations and the applicant's website.

Tasting Room Operations During Annual Events

As a proposed project requirement, large marketing events (250 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. In addition, a TDM plan should be developed to reduce overall project trip generation, VMT, and parking demand (see TDM Plan). These measures would reduce any traffic impacts related to large marketing events to less than significant levels.

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 with 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 and Yountville 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.

8. Cumulative Conditions

Cumulative Year 2030 Projections

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.³⁰ Based

³⁰ Caltrans, *Traffic Volumes on California State Highways, State Route 29 and State Route 128 (Rutherford Road), 2015, 2016, 2017.*

on historical average daily traffic data that includes peak hour two-way volumes, volumes on SR-29 have increased by 3.7% in the last three years or 1.23% per year. On Rutherford Road, daily and peak hour volumes are virtually unchanged over the past three years remaining static between SR-29 and Silverado Trail. Therefore, the yearly growth rate used for SR-29 (1.23% per year) is being used for Rutherford Road volumes as a conservative measure. Based on a 12-year growth period from collected data (year 2018) to year 2020 near-term conditions, 14.76% was applied to existing peak hour volumes for background/regional growth along the two study roadways.

Since future volume traffic forecasts are only available for the weekday PM peak hour and not for a Saturday mid-day peak hour, volumes on SR-29 were uniformly increased by the same percentage as listed above as a 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 9 and 10.

**TABLE 7
YEAR 2030 AND YEAR 2030 WITH PROJECT CONDITIONS: INTERSECTION LEVELS-OF-SERVICE
WEEKDAY PM PEAK AND WEEKEND MID-DAY PEAK HOUR¹**

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 Rutherford Road/State Route 29	MSSC	F >300	F >300	F >300	F >300
2 Rutherford Rd./Grape Ln.	MSSC	B 11.1	B 11.1	B 11.4	B 11.5
2 Rutherford Rd./Conn Creek Rd.	MSSC	B 11.2	B 11.3	B 11.1	B 11.1

(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 (No Project) Intersection/Roadway Segment Operating Conditions

With year 2030 cumulative (no project) traffic volumes, project study intersection operations have been calculated and shown in Table 7. The Rutherford 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 Rutherford Road/Grape Lane and Rutherford Road/Conn Creek Road would continue to operate acceptable levels (LOS B or better) during the same peak time periods.

During the weekday PM and Saturday mid-day peak hours, cumulative (no project) arterial volumes on SR-29 would increase to 1,885 vehicles during the weekday PM peak hour (southbound) and 1,826 vehicles during the Saturday mid-day peak hour (northbound). Arterial operations would be at LOS F during both the weekday PM peak hour and Saturday mid-day peak hour. Rutherford Road would continue to operate at LOS C with 250 vehicles (eastbound) at Grape Lane.

Year 2030 Cumulative plus Project Intersection/Roadway Segment Operating Conditions

With year 2030 cumulative plus project traffic volumes, project study intersection operations have been calculated and shown in Table 7. With project traffic, the Rutherford 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 Rutherford Road/Grape Lane and Rutherford Road/Conn Creek Road would continue to operate acceptable levels (LOS B or better) during the same peak time periods.

Based on updated County significance criteria for unsignalized intersections; the intersection of Rutherford 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 5% or more of the total traffic growth 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 six (6) trips to the intersection. During the weekend midday peak hour, the project would add 10 trips to the intersection. Based on the growth in cumulative traffic volumes of 432 vehicles and 413 vehicles (PM weekday and midday weekend); proposed project contribution would be less than one percent and be considered less than significant. The Rutherford Road/SR-29 intersection would continue to meet the peak hour signal warrant with or without proposed project.

Based on updated County significance criteria for arterial segment operation, the segment(s) of SR-29 at Rutherford Road has been evaluated for proposed project impacts since it would be operating at LOS F under cumulative conditions without proposed project trips (based on peak hour directional volumes). Under cumulative conditions, County guidelines indicate that a significant impact would be found if the proposed project contributes five percent or more to the total growth in cumulative traffic.

During the weekday PM and Saturday mid-day peak hours, cumulative plus project arterial volumes on SR-29 would increase by 1 trip to 1,851 vehicles (southbound) during the weekday PM peak hour and by 4 trips to 1,830 vehicles (northbound) during the Saturday mid-day peak hour. The addition of proposed project trips during these time periods would be less than five percent. Therefore, proposed project impact to arterial operations on SR-29 would be considered less than significant.

The Rutherford Road/SR-29 intersection does meet the peak hour signal warrant under existing (no project) conditions and would continue to do so under any “with project” development conditions (existing, near-term or cumulative conditions). As with project impacts found under existing plus project and near-term plus project conditions; Napa County guidelines indicate potential mitigation could include adding a signal if conditions are appropriate, geometric modifications to the intersection configuration, changes to the Project to reduce its peak hour trip generation, or converting an intersection to a roundabout per Policy CIR-13.5. It is recommended that the proposed project strive to reduce visitor and employee trips during peak traffic flow periods (see TDM Plan) to reduce proposed project impacts. As noted, the County has also adopted several measures identified in the General Plan to reduce vehicle trips through public transit and Transportation Demand Management (TDM) strategies: “The project should support programs to reduce single occupant vehicle use and encourage alternative travel modes.”

- In keeping with the above policy, the tasting room project would provide bicycle racks (two bicycle racks) for visitors who may arrive by bike. (Class II bike lanes are proposed for Rutherford Road as part of the Napa County Bicycle Plan). The project should also promote the use of public transportation and carpooling of employees (by adjusting work schedules, etc.) to facilitate the use of other transportation modes. The use of existing Napa County shuttle, limousine, or hire-car by guests could help to reduce project trips at the Rutherford Road/SR-29 intersection.

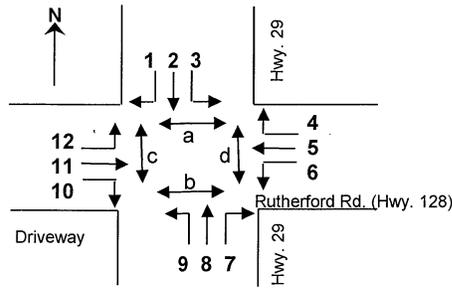
Technical Appendices: Mathew Bruno Wines Tasting Project

- Intersection Count Data: Weekday PM and Weekend (Saturday) Mid-Day Peak Hour
- Intersection Level-of-Service (LOS) Calculation Sheets
- Arterial LOS Thresholds
- Napa County Trip Generation/Information Sheets
- Signal Warrant Sheets
- Napa County Left-Turn Lane Warrant Sheet

Intersection Volume Worksheet

Hwy. 29 / Rutherford Rd. (Hwy. 128)

Counts: Feb. 8 & 10, 2018
Weather: Clear



A = Adult
T = Teen
C = Child
B = Bike
Pds&Bicy

Weekday PM

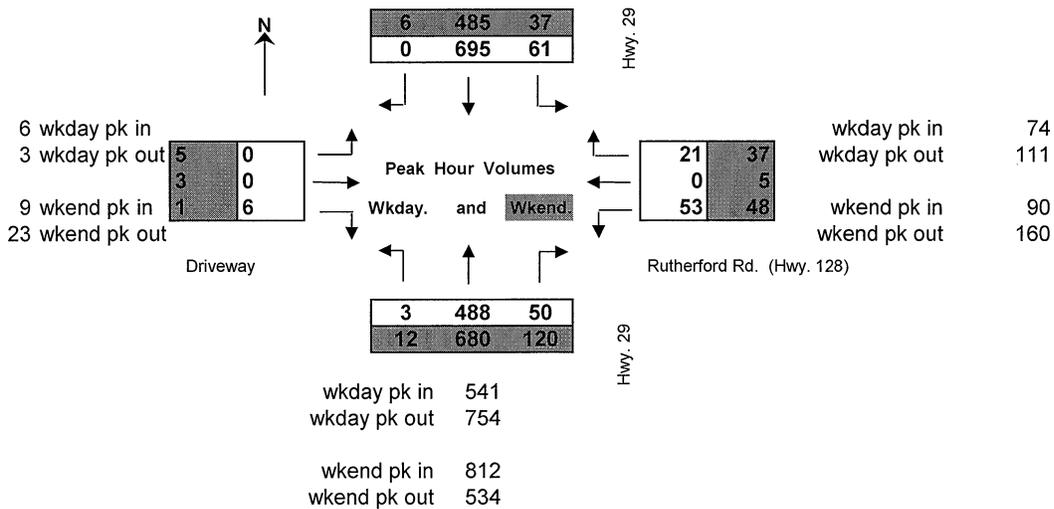
	1	2	3	4	5	6	7	8	9	10	11	12	15 MIN.	60 MIN.	a - b / c - d
4:00-4:15	0	186	14	4	0	10	14	122	1	2	0	0	353		0
4:15-4:30	0	175	15	5	0	13	11	133	1	2	0	0	355		0
4:30-4:45	0	190	17	7	0	16	12	140	1	2	0	0	385		0
4:45-5:00	0	144	15	5	0	14	13	93	0	0	0	0	284	1377	0-0/0-AB
5:00-5:15	0	124	21	2	0	10	19	115	0	4	0	0	295	1319	0-0/0-A
5:15-5:30	0	159	20	4	0	13	10	104	2	1	0	1	314	1278	0-0/0-A
5:30-5:45	0	178	13	6	0	12	6	100	1	1	1	0	318	1211	0
5:45-6:00	0	118	5	3	0	7	5	95	0	1	0	1	235	1162	0
PeakHour:															
4:00-5:00	0	695	61	21	0	53	50	488	3	6	0	0	1377	1377	0-0/0-2A,1AB 0-0/0-3

Weekend Afternoon

	1	2	3	4	5	6	7	8	9	10	11	12	15 MIN.	60 MIN.	Pds&Bicy a - b / c - d
1:00-1:15	1	82	12	6	0	8	22	124	0	0	0	0	255		0
1:15-1:30	1	80	10	8	0	12	22	149	0	0	0	1	283		0-0/AB-0
1:30-1:45	0	98	7	7	0	6	17	168	0	1	1	3	308		0
1:45-2:00	5	108	6	14	0	11	24	187	3	0	2	2	362	1208	0
2:00-2:15	0	135	11	5	4	10	31	174	2	1	0	1	374	1327	0-0/AB-4A
2:15-2:30	0	124	11	8	0	12	29	167	4	0	1	2	358	1402	0-0/0-AB
2:30-2:45	1	118	9	10	1	15	36	152	3	0	0	0	345	1439	0-0/0-4AB
2:45-3:00	1	116	11	13	2	17	25	148	2	0	0	1	336	1413	0
PeakHour:															
1:45-2:45	6	485	37	37	5	48	120	680	12	1	3	5	1439	1439	0-0/AB-4A,5AB 0-0/1-9

wkday pk in 756
wkday pk out 509

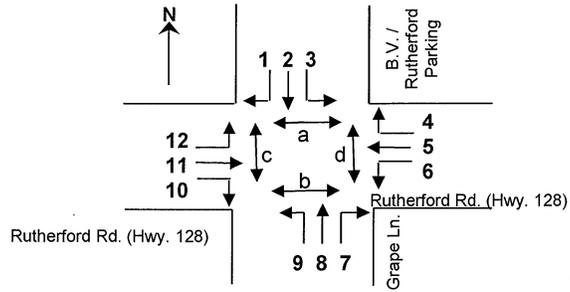
wkend pk in 528
wkend pk out 722



Intersection Volume Worksheet

Rutherford Rd. (Hwy. 128) / Grape Ln.

Counts: Feb. 8 & 10, 2018
Weather: Clear



A = Adult
T = Teen
C = Child
B = Bike

Weekday PM

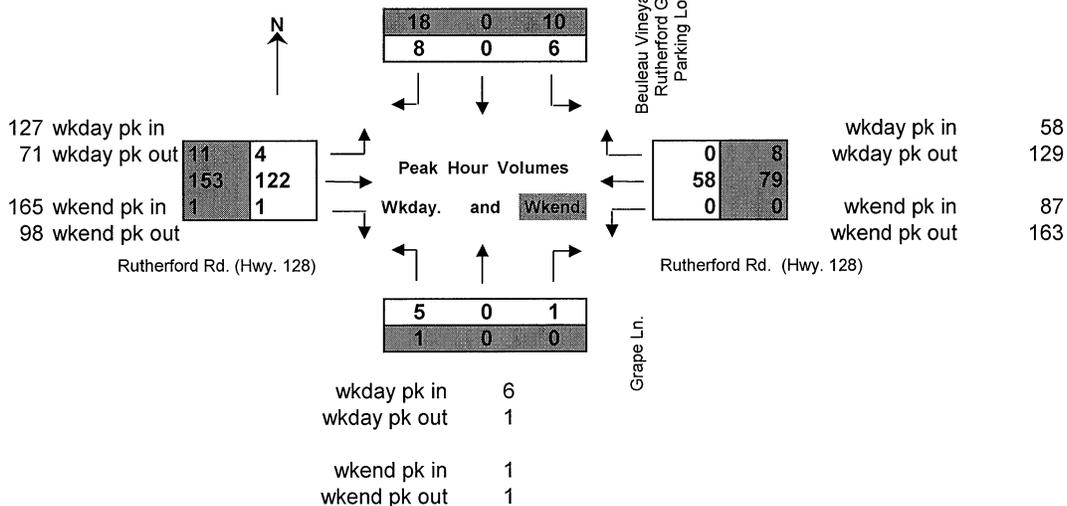
	1	2	3	4	5	6	7	8	9	10	11	12	15 MIN.	60 MIN.	Pds&Bicy a - b / c - d
4:00-4:15	0	0	3	1	14	0	0	0	0	0	28	0	46		0
4:15-4:30	1	0	2	1	17	0	0	0	0	0	24	2	47		0
4:30-4:45	1	0	2	0	22	0	0	0	0	0	28	1	54		0
4:45-5:00	2	0	1	0	13	0	0	0	4	0	27	1	48	195	0 - 0 / 0 - AB
5:00-5:15	2	0	2	0	9	0	0	0	1	0	39	1	54	203	0 - 0 / 0 - A
5:15-5:30	3	0	1	0	14	0	1	0	0	1	28	1	49	205	0 - 0 / 0 - A
5:30-5:45	2	0	2	1	14	0	1	0	2	2	18	0	42	193	0
5:45-6:00	0	0	2	1	10	0	0	0	0	0	10	0	23	168	0
PeakHour:															
4:30-5:30	8	0	6	0	58	0	1	0	5	1	122	4	205	205	0 - 0 / 0 - 2A,1AB 0 - 0 / 0 - 3

Weekend Afternoon

	1	2	3	4	5	6	7	8	9	10	11	12	15 MIN.	60 MIN.	Pds&Bicy a - b / c - d
1:00-1:15	2	0	2	0	12	0	0	0	0	0	32	2	50		0
1:15-1:30	5	0	2	0	15	0	0	0	0	0	31	1	54		0 - 0 / AB - 0
1:30-1:45	4	0	0	0	8	0	0	0	0	0	24	1	37		0
1:45-2:00	7	0	4	0	18	0	0	0	0	0	27	4	60	201	0
2:00-2:15	8	0	2	2	11	0	0	0	1	0	38	4	66	217	0 - 0 / AB - 4A
2:15-2:30	4	0	5	2	16	0	0	0	0	1	40	1	69	232	0 - 0 / 0 - AB
2:30-2:45	3	0	2	2	23	0	0	0	0	0	42	3	75	270	0 - 0 / 0 - 4AB
2:45-3:00	3	0	1	2	29	0	0	0	0	0	33	3	71	281	0
PeakHour:															
2:00-3:00	18	0	10	8	79	0	0	0	1	1	153	11	281	281	0 - 0 / AB - 4A,5AB 0 - 0 / 1 - 9

wkday pk in 14
wkday pk out 4

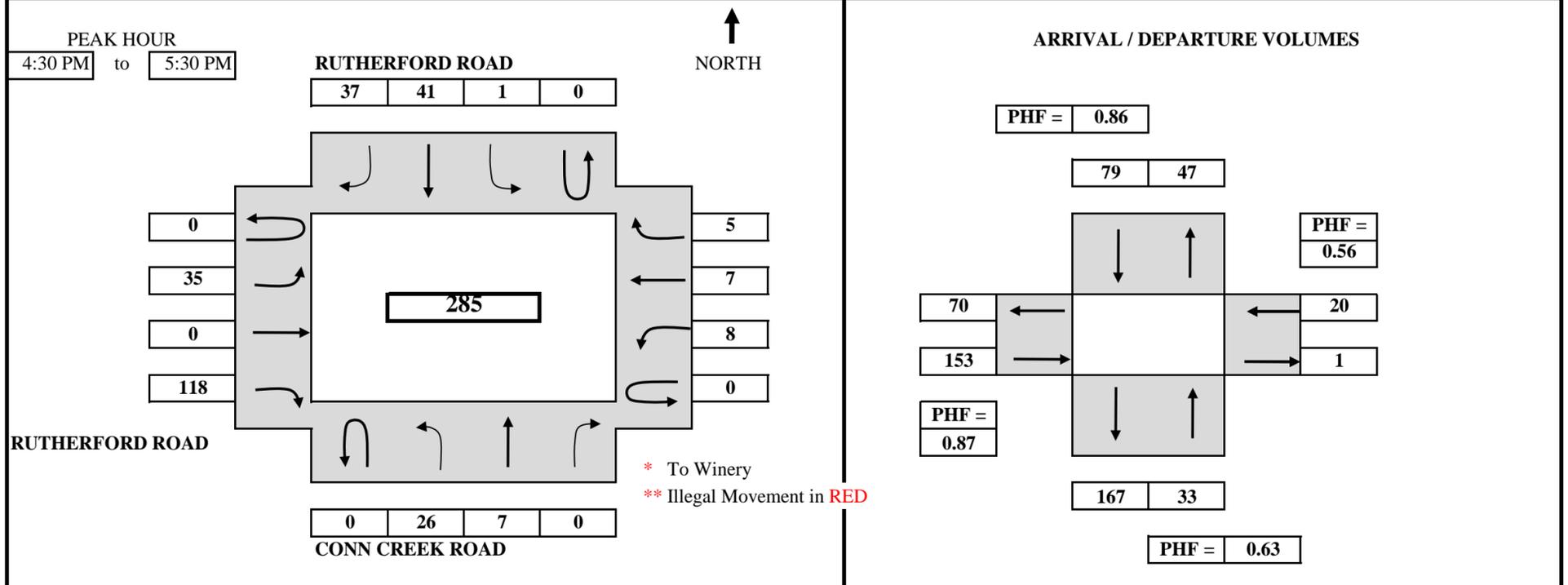
wkend pk in 28
wkend pk out 19



B.A.Y.M.E.T.R.I.C.S.

INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT:	TMC COUNTS IN RUTHERFORD	SURVEY DATE:	2/13/2018	DAY:	TUESDAY
N-S APPROACH:	CONN CREEK ROAD	SURVEY TIME:	4:00 PM	TO	6:00 PM
E-W APPROACH:	RUTHERFORD ROAD	JURISDICTION:	NAPA VALLEY	FILE:	3802011-PM



TIME PERIOD	NB (CONN CREEK ROAD)				SB (RUTHERFORD ROAD)				EB (RUTHERFORD ROAD)				WB (WINERY DRIVEWAY)				TOTAL
	U-TURN	LEFT	THRU	RIGHT*	U-TURN	LEFT*	THRU	RIGHT	U-TURN	LEFT	THRU*	RIGHT	U-TURN	LEFT	THRU**	RIGHT	

SURVEY DATA																
4:00 PM to 4:15 PM	3	2	1	2	0	11	10	2	16	1	0	1	49			
4:15 PM to 4:30 PM	6	4	1	2	1	15	27	3	25	4	0	5	93			
4:30 PM to 4:45 PM	14	9	1	3	4	29	41	3	54	6	0	7	171			
4:45 PM to 5:00 PM	20	10	1	3	15	37	54	3	85	9	4	7	248			
5:00 PM to 5:15 PM	26	11	1	3	33	42	55	3	123	12	7	10	326			
5:15 PM to 5:30 PM	32	11	1	3	42	52	62	3	143	12	7	10	378			
5:30 PM to 5:45 PM	34	11	1	3	51	60	70	3	159	14	7	11	424			
5:45 PM to 6:00 PM	34	13	1	3	53	64	75	3	166	14	7	11	444			

TOTAL BY PERIOD																	
4:00 PM to 4:15 PM	0	3	2	1	0	2	0	11	0	10	2	16	0	1	0	1	49
4:15 PM to 4:30 PM	0	3	2	0	0	0	1	4	0	17	1	9	0	3	0	4	44
4:30 PM to 4:45 PM	0	8	5	0	0	1	3	14	0	14	0	29	0	2	0	2	78
4:45 PM to 5:00 PM	0	6	1	0	0	0	11	8	0	13	0	31	0	3	4	0	77
5:00 PM to 5:15 PM	0	6	1	0	0	0	18	5	0	1	0	38	0	3	3	3	78
5:15 PM to 5:30 PM	0	6	0	0	0	0	9	10	0	7	0	20	0	0	0	0	52
5:30 PM to 5:45 PM	0	2	0	0	0	0	9	8	0	8	0	16	0	2	0	1	46
5:45 PM to 6:00 PM	0	0	2	0	0	0	2	4	0	5	0	7	0	0	0	0	20

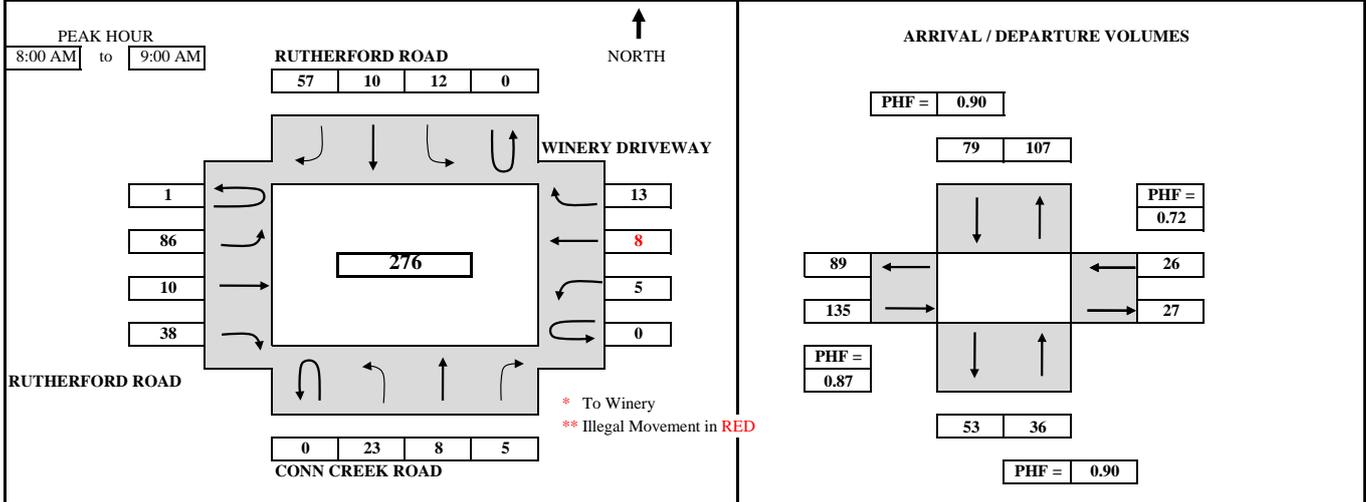
HOURLY TOTALS																	
4:00 PM to 5:00 PM	0	20	10	1	0	3	15	37	0	54	3	85	0	9	4	7	248
4:15 PM to 5:15 PM	0	23	9	0	0	1	33	31	0	45	1	107	0	11	7	9	277
4:30 PM to 5:30 PM	0	26	7	0	0	1	41	37	0	35	0	118	0	8	7	5	285
4:45 PM to 5:45 PM	0	20	2	0	0	0	47	31	0	29	0	105	0	8	7	4	253
5:00 PM to 6:00 PM	0	14	3	0	0	0	38	27	0	21	0	81	0	5	3	4	196

PEAK HOUR SUMMARY																	
4:30 PM to 5:30 PM	NB (CONN CREEK ROAD)				SB (RUTHERFORD ROAD)				EB (RUTHERFORD ROAD)				WB (WINERY DRIVEWAY)				TOTAL
	U-TURN	LEFT	THRU	RIGHT*	U-TURN	LEFT*	THRU	RIGHT	U-TURN	LEFT	THRU*	RIGHT	U-TURN	LEFT	THRU**	RIGHT	
VOLUME	0	26	7	0	0	1	41	37	0	35	0	118	0	8	7	5	285
PHF BY MOVEMENT	0.00	0.81	0.35	0.00	0.00	0.25	0.57	0.66	0.00	0.63	0.00	0.78	0.00	0.67	0.44	0.42	OVERALL
PHF BY APPROACH	0.63				0.86				0.87				0.56				0.91
BICYCLE	0				0				1				0				1
PEDESTRIAN	0				0				0				0				0
	N-LEG				S-LEG				E-LEG				W-LEG				
PEDESTRIAN BY LEG:	0				0				0				0				0

B.A.Y.M.E.T.R.I.C.S.

INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT:	TMC COUNTS IN RUTHERFORD	SURVEY DATE:	2/10/2018	DAY:	SATURDAY
N-S APPROACH:	CONN CREEK ROAD	SURVEY TIME:	1:00 PM	TO	3:00 PM
E-W APPROACH:	RUTHERFORD ROAD	JURISDICTION:	NAPA VALLEY	FILE:	3802011-SAT



TIME	PERIOD	NB (CONN CREEK ROAD)				SB (RUTHERFORD ROAD)				EB (RUTHERFORD ROAD)				WB (WINERY DRIVEWAY)				TOTAL
		U-TURN	LEFT	THRU	RIGHT*	U-TURN	LEFT*	THRU	RIGHT	U-TURN	LEFT	THRU*	RIGHT	U-TURN	LEFT	THRU**	RIGHT	

SURVEY DATA																	
7:00 AM	to	7:15 AM	0	9	2	1	0	3	15	0	17	0	8	1	1	1	58
7:15 AM	to	7:30 AM	1	14	4	6	3	5	27	0	34	2	15	3	6	1	121
7:30 AM	to	7:45 AM	1	18	5	8	4	5	39	0	57	6	18	6	9	4	180
7:45 AM	to	8:00 AM	1	21	5	8	5	6	56	0	78	13	25	8	12	6	244
8:00 AM	to	8:15 AM	1	26	7	8	8	6	70	0	95	19	32	10	15	8	305
8:15 AM	to	8:30 AM	1	32	9	9	11	9	86	0	124	20	41	11	18	13	384
8:30 AM	to	8:45 AM	1	39	11	10	14	13	98	0	142	21	51	13	19	16	448
8:45 AM	to	9:00 AM	1	44	13	13	17	16	113	1	164	23	63	13	20	19	520

TOTAL BY PERIOD																			
7:00 AM	to	7:15 AM	0	9	2	1	0	0	3	15	0	17	0	8	0	1	1	1	58
7:15 AM	to	7:30 AM	1	5	2	5	0	3	2	12	0	17	2	7	0	2	5	0	63
7:30 AM	to	7:45 AM	0	4	1	2	0	1	0	12	0	23	4	3	0	3	3	3	59
7:45 AM	to	8:00 AM	0	3	0	0	0	1	1	17	0	21	7	7	0	2	3	2	64
8:00 AM	to	8:15 AM	0	5	2	0	0	3	0	14	0	17	6	7	0	2	3	2	61
8:15 AM	to	8:30 AM	0	6	2	1	0	3	3	16	0	29	1	9	0	1	3	5	79
8:30 AM	to	8:45 AM	0	7	2	1	0	3	4	12	0	18	1	10	0	2	1	3	64
8:45 AM	to	9:00 AM	0	5	2	3	0	3	3	15	1	22	2	12	0	0	1	3	72

HOURLY TOTALS																			
7:00 AM	to	8:00 AM	1	21	5	8	0	5	6	56	0	78	13	25	0	8	12	6	244
7:15 AM	to	8:15 AM	1	17	5	7	0	8	3	55	0	78	19	24	0	9	14	7	247
7:30 AM	to	8:30 AM	0	18	5	3	0	8	4	59	0	90	18	26	0	8	12	12	263
7:45 AM	to	8:45 AM	0	21	6	2	0	10	8	59	0	85	15	33	0	7	10	12	268
8:00 AM	to	9:00 AM	0	23	8	5	0	12	10	57	1	86	10	38	0	5	8	13	276

PEAK HOUR SUMMARY																				
8:00 AM	to	9:00 AM	NB (CONN CREEK ROAD)				SB (RUTHERFORD ROAD)				EB (RUTHERFORD ROAD)				WB (WINERY DRIVEWAY)				TOTAL	
			U-TURN	LEFT	THRU	RIGHT*	U-TURN	LEFT*	THRU	RIGHT	U-TURN	LEFT	THRU*	RIGHT	U-TURN	LEFT	THRU**	RIGHT		
			0	23	8	5	0	12	10	57	1	86	10	38	0	5	8	13	276	
			PHF BY MOVEMENT	0.00	0.82	1.00	0.42	0.00	1.00	0.63	0.89	0.25	0.74	0.42	0.79	0.00	0.63	0.67	0.65	OVERALL
			PHF BY APPROACH	0.90				0.90				0.87				0.72				0.87
			BICYCLE	0				0				8				0				8
			PEDESTRIAN	0				0				4				6				10
				N-LEG				S-LEG				E-LEG				W-LEG				
			PEDESTRIAN BY LEG:	10				0				0				0				10

TEL: (510) 232 - 1271

FAX: (510) 232 - 1272

HCM 6th TWSC
1: SR-29 & Rutherford Rd.

PM Weekday Existing Conditions

Intersection												
Int Delay, s/veh	235.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↕		↕	↕	↕	↕		↕	↕	
Traffic Vol, veh/h	0	0	6	69	0	40	3	1058	85	105	1508	0
Future Vol, veh/h	0	0	6	69	0	40	3	1058	85	105	1508	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	100	-	-	50	175	-	-	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	75	75	75	80	80	80	88	88	88	91	91	91
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	0	0	8	86	0	50	3	1202	97	115	1657	0

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	3169	3192	1657	3148	3144	1251	1657	0	0	1299	0	0
Stage 1	1887	1887	-	1257	1257	-	-	-	-	-	-	-
Stage 2	1282	1305	-	1891	1887	-	-	-	-	-	-	-
Critical Hdwy	7.15	6.55	6.25	7.15	6.55	6.25	4.15	-	-	4.15	-	-
Critical Hdwy Stg 1	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4.045	3.345	3.545	4.045	3.345	2.245	-	-	2.245	-	-
Pot Cap-1 Maneuver	6	10	119	~6	11	207	381	-	-	523	-	-
Stage 1	89	117	-	207	239	-	-	-	-	-	-	-
Stage 2	200	227	-	89	117	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	4	8	119	~5	9	207	381	-	-	523	-	-
Mov Cap-2 Maneuver	4	8	-	~5	9	-	-	-	-	-	-	-
Stage 1	88	91	-	205	237	-	-	-	-	-	-	-
Stage 2	150	225	-	~65	91	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	37.4	\$ 5539.8	0	0.9
HCM LOS	E	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	381	-	-	-	119	5	207	523	-	-
HCM Lane V/C Ratio	0.009	-	-	-	0.067	17.25	0.242	0.221	-	-
HCM Control Delay (s)	14.5	-	-	0	37.4	8735.2	27.8	13.8	-	-
HCM Lane LOS	B	-	-	A	E	F	D	B	-	-
HCM 95th %tile Q(veh)	0	-	-	-	0.2	12.7	0.9	0.8	-	-

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

HCM 6th TWSC
2: Grape Ln./BV Drive & Rutherford Rd.

PM Weekday Existing Conditions

Intersection												
Int Delay, s/veh	0.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	4	200	4	1	100	0	7	0	2	6	0	8
Future Vol, veh/h	4	200	4	1	100	0	7	0	2	6	0	8
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	5	2	2	5	2	2	2	2	2	2	2
Mvmt Flow	4	217	4	1	109	0	8	0	2	7	0	9

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	109	0	0	221	0	0	343	338	219	339	340	109
Stage 1	-	-	-	-	-	-	227	227	-	111	111	-
Stage 2	-	-	-	-	-	-	116	111	-	228	229	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1481	-	-	1348	-	-	611	583	821	615	582	945
Stage 1	-	-	-	-	-	-	776	716	-	894	804	-
Stage 2	-	-	-	-	-	-	889	804	-	775	715	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1481	-	-	1348	-	-	604	581	821	611	580	945
Mov Cap-2 Maneuver	-	-	-	-	-	-	604	581	-	611	580	-
Stage 1	-	-	-	-	-	-	774	714	-	891	803	-
Stage 2	-	-	-	-	-	-	880	803	-	771	713	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.1			0.1			10.7			9.8		
HCM LOS							B			A		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	642	1481	-	-	1348	-	-	766
HCM Lane V/C Ratio	0.015	0.003	-	-	0.001	-	-	0.02
HCM Control Delay (s)	10.7	7.4	0	-	7.7	0	-	9.8
HCM Lane LOS	B	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0.1

Intersection						
Int Delay, s/veh	2.9					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	44	148	63	55	33	12
Future Vol, veh/h	44	148	63	55	33	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	100	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	87	87	86	86	75	75
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	51	170	73	64	44	16

Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	221	0	346	136
Stage 1	-	-	-	-	136	-
Stage 2	-	-	-	-	210	-
Critical Hdwy	-	-	4.15	-	6.45	6.25
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	-	-	2.245	-	3.545	3.345
Pot Cap-1 Maneuver	-	-	1331	-	645	905
Stage 1	-	-	-	-	883	-
Stage 2	-	-	-	-	818	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1331	-	608	905
Mov Cap-2 Maneuver	-	-	-	-	608	-
Stage 1	-	-	-	-	833	-
Stage 2	-	-	-	-	818	-

Approach	EB	WB	NB
HCM Control Delay, s	0	4.2	10.8
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	608	905	-	-	1331	-
HCM Lane V/C Ratio	0.072	0.018	-	-	0.055	-
HCM Control Delay (s)	11.4	9	-	-	7.9	0
HCM Lane LOS	B	A	-	-	A	A
HCM 95th %tile Q(veh)	0.2	0.1	-	-	0.2	-

HCM 6th TWSC
1: SR-29 & Rutherford Rd.

MD Weekend Existing Conditions

Intersection												
Int Delay, s/veh	221.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↕		↕	↕	↕	↕		↕	↕	
Traffic Vol, veh/h	5	3	1	59	5	46	12	1421	158	45	1014	6
Future Vol, veh/h	5	3	1	59	5	46	12	1421	158	45	1014	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	100	-	-	50	175	-	-	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	75	75	75	80	80	80	88	88	88	91	91	91
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	7	4	1	74	6	58	14	1615	180	49	1114	7

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	2981	3039	1118	2951	2952	1705	1121	0	0	1795	0	0
Stage 1	1216	1216	-	1733	1733	-	-	-	-	-	-	-
Stage 2	1765	1823	-	1218	1219	-	-	-	-	-	-	-
Critical Hdwy	7.15	6.55	6.25	7.15	6.55	6.25	4.15	-	-	4.15	-	-
Critical Hdwy Stg 1	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4.045	3.345	3.545	4.045	3.345	2.245	-	-	2.245	-	-
Pot Cap-1 Maneuver	8	12	248	~9	14	111	612	-	-	337	-	-
Stage 1	218	250	-	110	140	-	-	-	-	-	-	-
Stage 2	105	126	-	218	250	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	~2	10	248	~5	12	111	612	-	-	337	-	-
Mov Cap-2 Maneuver	~2	10	-	~5	12	-	-	-	-	-	-	-
Stage 1	213	214	-	107	137	-	-	-	-	-	-	-
Stage 2	47	123	-	182	214	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, \$	2917.9		4782.6		0.1		0.7	
HCM LOS	F		F					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	612	-	-	3	248	5	111	337	-	-
HCM Lane V/C Ratio	0.022	-	-	3.556	0.005	16	0.518	0.147	-	-
HCM Control Delay (s)	11	-	-	\$3280.2	19.5	\$8171.2	68	17.5	-	-
HCM Lane LOS	B	-	-	F	C	F	F	C	-	-
HCM 95th %tile Q(veh)	0.1	-	-	2.5	0	11.9	2.4	0.5	-	-

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

HCM 6th TWSC
2: Grape Ln./BV Drive & Rutherford Rd.

MD Weekend Existing Conditions

Intersection												
Int Delay, s/veh	1.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	11	203	4	1	105	8	3	0	1	10	0	18
Future Vol, veh/h	11	203	4	1	105	8	3	0	1	10	0	18
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	5	2	2	5	2	2	2	2	2	2	2
Mvmt Flow	12	221	4	1	114	9	3	0	1	11	0	20

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	123	0	0	225	0	0	378	372	223	369	370	119
Stage 1	-	-	-	-	-	-	247	247	-	121	121	-
Stage 2	-	-	-	-	-	-	131	125	-	248	249	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1464	-	-	1344	-	-	580	558	817	588	560	933
Stage 1	-	-	-	-	-	-	757	702	-	883	796	-
Stage 2	-	-	-	-	-	-	873	792	-	756	701	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1464	-	-	1344	-	-	564	552	817	583	554	933
Mov Cap-2 Maneuver	-	-	-	-	-	-	564	552	-	583	554	-
Stage 1	-	-	-	-	-	-	750	696	-	875	795	-
Stage 2	-	-	-	-	-	-	854	791	-	748	695	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.4			0.1			10.9			9.9		
HCM LOS							B			A		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	611	1464	-	-	1344	-	-	768
HCM Lane V/C Ratio	0.007	0.008	-	-	0.001	-	-	0.04
HCM Control Delay (s)	10.9	7.5	0	-	7.7	0	-	9.9
HCM Lane LOS	B	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0.1

HCM 6th TWSC
3: Conn Creek Rd. & Rutherford Rd.

MD Weekend Existing Conditions

Intersection						
Int Delay, s/veh	2.5					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	131	52	37	89	31	21
Future Vol, veh/h	131	52	37	89	31	21
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	100	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	87	87	86	86	75	75
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	151	60	43	103	41	28

Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	211	0	370	181
Stage 1	-	-	-	-	181	-
Stage 2	-	-	-	-	189	-
Critical Hdwy	-	-	4.15	-	6.45	6.25
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	-	-	2.245	-	3.545	3.345
Pot Cap-1 Maneuver	-	-	1342	-	624	854
Stage 1	-	-	-	-	843	-
Stage 2	-	-	-	-	836	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1342	-	603	854
Mov Cap-2 Maneuver	-	-	-	-	603	-
Stage 1	-	-	-	-	814	-
Stage 2	-	-	-	-	836	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.3	10.6
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	603	854	-	-	1342	-
HCM Lane V/C Ratio	0.069	0.033	-	-	0.032	-
HCM Control Delay (s)	11.4	9.4	-	-	7.8	0
HCM Lane LOS	B	A	-	-	A	A
HCM 95th %tile Q(veh)	0.2	0.1	-	-	0.1	-

Intersection												
Int Delay, s/veh	461.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↕		↕	↕	↕	↕		↕	↕	
Traffic Vol, veh/h	0	0	6	90	0	45	3	1101	95	108	1598	0
Future Vol, veh/h	0	0	6	90	0	45	3	1101	95	108	1598	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	100	-	-	50	175	-	-	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	75	75	75	80	80	80	88	88	88	91	91	91
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	8	113	0	56	3	1251	108	119	1756	0

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	3333	3359	1756	3309	3305	1305	1756	0	0	1359	0	0
Stage 1	1994	1994	-	1311	1311	-	-	-	-	-	-	-
Stage 2	1339	1365	-	1998	1994	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	5	8	105	~ 5	9	196	356	-	-	506	-	-
Stage 1	78	105	-	195	229	-	-	-	-	-	-	-
Stage 2	188	215	-	~ 78	105	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	3	6	105	~ 4	7	196	356	-	-	506	-	-
Mov Cap-2 Maneuver	3	6	-	~ 4	7	-	-	-	-	-	-	-
Stage 1	77	80	-	193	227	-	-	-	-	-	-	-
Stage 2	133	213	-	~ 55	80	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	42.1	\$ 9331.7	0	0.9
HCM LOS	E	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	356	-	-	-	105	4	196	506	-	-
HCM Lane V/C Ratio	0.01	-	-	-	0.076	28.125	0.287	0.235	-	-
HCM Control Delay (s)	15.2	-	-	0	4	113982.3	30.6	14.3	-	-
HCM Lane LOS	C	-	-	A	E	F	D	B	-	-
HCM 95th %tile Q(veh)	0	-	-	-	0.2	16.2	1.1	0.9	-	-

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

HCM 6th TWSC
2: Grape Ln./BV Drive & Rutherford Rd.

PM Weekday Year 2020 (NP)

Intersection												
Int Delay, s/veh	0.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	6	211	4	1	120	0	7	0	2	6	0	14
Future Vol, veh/h	6	211	4	1	120	0	7	0	2	6	0	14
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	7	229	4	1	130	0	8	0	2	7	0	15

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	130	0	0	233	0	0	385	377	231	378	379	130
Stage 1	-	-	-	-	-	-	245	245	-	132	132	-
Stage 2	-	-	-	-	-	-	140	132	-	246	247	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1455	-	-	1335	-	-	573	555	808	580	553	920
Stage 1	-	-	-	-	-	-	759	703	-	871	787	-
Stage 2	-	-	-	-	-	-	863	787	-	758	702	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1455	-	-	1335	-	-	560	551	808	575	549	920
Mov Cap-2 Maneuver	-	-	-	-	-	-	560	551	-	575	549	-
Stage 1	-	-	-	-	-	-	754	699	-	866	786	-
Stage 2	-	-	-	-	-	-	848	786	-	751	698	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.2			0.1			11.1			9.7		
HCM LOS							B			A		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	601	1455	-	-	1335	-	-	780
HCM Lane V/C Ratio	0.016	0.004	-	-	0.001	-	-	0.028
HCM Control Delay (s)	11.1	7.5	0	-	7.7	0	-	9.7
HCM Lane LOS	B	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.1

Intersection						
Int Delay, s/veh	2.8					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	51	152	65	73	34	12
Future Vol, veh/h	51	152	65	73	34	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	100	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	87	87	86	86	75	75
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	59	175	76	85	45	16

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	234	0	384 147
Stage 1	-	-	-	-	147 -
Stage 2	-	-	-	-	237 -
Critical Hdwy	-	-	4.12	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	-	-	2.218	-	3.518 3.318
Pot Cap-1 Maneuver	-	-	1333	-	619 900
Stage 1	-	-	-	-	880 -
Stage 2	-	-	-	-	802 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1333	-	582 900
Mov Cap-2 Maneuver	-	-	-	-	582 -
Stage 1	-	-	-	-	827 -
Stage 2	-	-	-	-	802 -

Approach	EB	WB	NB
HCM Control Delay, s	0	3.7	11
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	582	900	-	-	1333	-
HCM Lane V/C Ratio	0.078	0.018	-	-	0.057	-
HCM Control Delay (s)	11.7	9.1	-	-	7.9	0
HCM Lane LOS	B	A	-	-	A	A
HCM 95th %tile Q(veh)	0.3	0.1	-	-	0.2	-

HCM 6th TWSC
1: SR-29 & Rutherford Rd.

MD Weekend Year 2020 (NP)

Intersection												
Int Delay, s/veh	549.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↕		↕	↕	↕	↕		↕	↕	
Traffic Vol, veh/h	5	3	1	76	5	51	12	1507	178	50	1090	6
Future Vol, veh/h	5	3	1	76	5	51	12	1507	178	50	1090	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	100	-	-	50	175	-	-	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	75	75	75	80	80	80	88	88	88	91	91	91
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	7	4	1	95	6	64	14	1713	202	55	1198	7

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	3189	3255	1202	3156	3157	1814	1205	0	0	1915	0	0
Stage 1	1312	1312	-	1842	1842	-	-	-	-	-	-	-
Stage 2	1877	1943	-	1314	1315	-	-	-	-	-	-	-
Critical Hdwy	7.15	6.55	6.25	7.15	6.55	6.25	4.15	-	-	4.15	-	-
Critical Hdwy Stg 1	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4.045	3.345	3.545	4.045	3.345	2.245	-	-	2.245	-	-
Pot Cap-1 Maneuver	~ 6	9	222	~ 6	10	95	569	-	-	302	-	-
Stage 1	192	225	-	95	123	-	-	-	-	-	-	-
Stage 2	90	110	-	192	224	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	~ 1	7	222	~ 3	8	95	569	-	-	302	-	-
Mov Cap-2 Maneuver	~ 1	7	-	~ 3	8	-	-	-	-	-	-	-
Stage 1	187	184	-	~ 93	120	-	-	-	-	-	-	-
Stage 2	27	107	-	153	183	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, \$	9310.4		10525.2		0.1		0.9	
HCM LOS	F		F					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	569	-	-	1	222	3	95	302	-	-
HCM Lane V/C Ratio	0.024	-	-	10.667	0.006	33.75	0.671	0.182	-	-
HCM Control Delay (s)	11.5	-	-	10471.5	2.1	17089.8	99	19.6	-	-
HCM Lane LOS	B	-	-	F	C	F	F	C	-	-
HCM 95th %tile Q(veh)	0.1	-	-	2.7	0	14.8	3.3	0.7	-	-

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

HCM 6th TWSC
2: Grape Ln./BV Drive & Rutherford Rd.

MD Weekend Year 2020 (NP)

Intersection												
Int Delay, s/veh	1.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	15	224	4	1	124	8	3	0	1	10	0	22
Future Vol, veh/h	15	224	4	1	124	8	3	0	1	10	0	22
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	5	2	2	5	2	2	2	2	2	2	2
Mvmt Flow	16	243	4	1	135	9	3	0	1	11	0	24

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	144	0	0	247	0	0	431	423	245	420	421	140
Stage 1	-	-	-	-	-	-	277	277	-	142	142	-
Stage 2	-	-	-	-	-	-	154	146	-	278	279	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1438	-	-	1319	-	-	535	522	794	544	524	908
Stage 1	-	-	-	-	-	-	729	681	-	861	779	-
Stage 2	-	-	-	-	-	-	848	776	-	728	680	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1438	-	-	1319	-	-	515	515	794	537	517	908
Mov Cap-2 Maneuver	-	-	-	-	-	-	515	515	-	537	517	-
Stage 1	-	-	-	-	-	-	720	672	-	850	778	-
Stage 2	-	-	-	-	-	-	825	775	-	718	671	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.5			0.1			11.4			10.1		
HCM LOS							B			B		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	565	1438	-	-	1319	-	-	747
HCM Lane V/C Ratio	0.008	0.011	-	-	0.001	-	-	0.047
HCM Control Delay (s)	11.4	7.5	0	-	7.7	0	-	10.1
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0.1

Intersection						
Int Delay, s/veh	2.4					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	150	53	38	107	32	22
Future Vol, veh/h	150	53	38	107	32	22
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	100	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	87	87	86	86	75	75
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	172	61	44	124	43	29

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	233	0	415 203
Stage 1	-	-	-	-	203 -
Stage 2	-	-	-	-	212 -
Critical Hdwy	-	-	4.15	-	6.45 6.25
Critical Hdwy Stg 1	-	-	-	-	5.45 -
Critical Hdwy Stg 2	-	-	-	-	5.45 -
Follow-up Hdwy	-	-	2.245	-	3.545 3.345
Pot Cap-1 Maneuver	-	-	1317	-	588 830
Stage 1	-	-	-	-	824 -
Stage 2	-	-	-	-	816 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1317	-	567 830
Mov Cap-2 Maneuver	-	-	-	-	567 -
Stage 1	-	-	-	-	794 -
Stage 2	-	-	-	-	816 -

Approach	EB	WB	NB
HCM Control Delay, s	0	2.1	10.9
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	567	830	-	-	1317	-
HCM Lane V/C Ratio	0.075	0.035	-	-	0.034	-
HCM Control Delay (s)	11.9	9.5	-	-	7.8	0
HCM Lane LOS	B	A	-	-	A	A
HCM 95th %tile Q(veh)	0.2	0.1	-	-	0.1	-

Intersection												
Int Delay, s/veh	247.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↕		↕	↕	↕	↕		↕	↕	
Traffic Vol, veh/h	0	0	6	71	0	41	3	1058	87	106	1508	0
Future Vol, veh/h	0	0	6	71	0	41	3	1058	87	106	1508	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	100	-	-	50	175	-	-	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	75	75	75	80	80	80	88	88	88	91	91	91
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	0	0	8	89	0	51	3	1202	99	116	1657	0

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	3172	3196	1657	3151	3147	1252	1657	0	0	1301	0	0
Stage 1	1889	1889	-	1258	1258	-	-	-	-	-	-	-
Stage 2	1283	1307	-	1893	1889	-	-	-	-	-	-	-
Critical Hdwy	7.15	6.55	6.25	7.15	6.55	6.25	4.15	-	-	4.15	-	-
Critical Hdwy Stg 1	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4.045	3.345	3.545	4.045	3.345	2.245	-	-	2.245	-	-
Pot Cap-1 Maneuver	6	10	119	~6	11	207	381	-	-	522	-	-
Stage 1	89	117	-	207	239	-	-	-	-	-	-	-
Stage 2	200	226	-	~88	117	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	4	8	119	~5	8	207	381	-	-	522	-	-
Mov Cap-2 Maneuver	4	8	-	~5	8	-	-	-	-	-	-	-
Stage 1	88	91	-	205	237	-	-	-	-	-	-	-
Stage 2	149	224	-	~64	91	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	37.4	\$ 5690.8	0	0.9
HCM LOS	E	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	381	-	-	-	119	5	207	522	-	-
HCM Lane V/C Ratio	0.009	-	-	-	0.067	17.75	0.248	0.223	-	-
HCM Control Delay (s)	14.5	-	-	0	37.4	8960.8	28	13.9	-	-
HCM Lane LOS	B	-	-	A	E	F	D	B	-	-
HCM 95th %tile Q(veh)	0	-	-	-	0.2	13	0.9	0.8	-	-

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

Intersection												
Int Delay, s/veh	1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	4	200	7	2	100	0	10	0	4	6	0	8
Future Vol, veh/h	4	200	7	2	100	0	10	0	4	6	0	8
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	5	2	2	5	2	2	2	2	2	2	2
Mvmt Flow	4	217	8	2	109	0	11	0	4	7	0	9

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	109	0	0	225	0	0	347	342	221	344	346	109
Stage 1	-	-	-	-	-	-	229	229	-	113	113	-
Stage 2	-	-	-	-	-	-	118	113	-	231	233	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1481	-	-	1344	-	-	607	580	819	610	577	945
Stage 1	-	-	-	-	-	-	774	715	-	892	802	-
Stage 2	-	-	-	-	-	-	887	802	-	772	712	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1481	-	-	1344	-	-	599	577	819	605	574	945
Mov Cap-2 Maneuver	-	-	-	-	-	-	599	577	-	605	574	-
Stage 1	-	-	-	-	-	-	772	713	-	889	800	-
Stage 2	-	-	-	-	-	-	877	800	-	766	710	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.1			0.2			10.7			9.8		
HCM LOS							B			A		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	649	1481	-	-	1344	-	-	762
HCM Lane V/C Ratio	0.023	0.003	-	-	0.002	-	-	0.02
HCM Control Delay (s)	10.7	7.4	0	-	7.7	0	-	9.8
HCM Lane LOS	B	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.1

Intersection						
Int Delay, s/veh	2.9					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	46	148	63	56	33	12
Future Vol, veh/h	46	148	63	56	33	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	100	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	87	87	86	86	75	75
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	53	170	73	65	44	16

Major/Minor	Major1	Major2	Minor1	Minor2	Minor3
Conflicting Flow All	0	0	223	0	349
Stage 1	-	-	-	-	138
Stage 2	-	-	-	-	211
Critical Hdwy	-	-	4.15	-	6.45
Critical Hdwy Stg 1	-	-	-	-	5.45
Critical Hdwy Stg 2	-	-	-	-	5.45
Follow-up Hdwy	-	-	2.245	-	3.545
Pot Cap-1 Maneuver	-	-	1328	-	642
Stage 1	-	-	-	-	881
Stage 2	-	-	-	-	817
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1328	-	605
Mov Cap-2 Maneuver	-	-	-	-	605
Stage 1	-	-	-	-	831
Stage 2	-	-	-	-	817

Approach	EB	WB	NB
HCM Control Delay, s	0	4.2	10.8
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	605	902	-	-	1328	-
HCM Lane V/C Ratio	0.073	0.018	-	-	0.055	-
HCM Control Delay (s)	11.4	9.1	-	-	7.9	0
HCM Lane LOS	B	A	-	-	A	A
HCM 95th %tile Q(veh)	0.2	0.1	-	-	0.2	-

HCM 6th TWSC
1: SR-29 & Rutherford Rd.

MD Weekend Exist+Prj. Conditions

Intersection												
Int Delay, s/veh	246.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↕		↕	↕	↕	↕		↕	↕	
Traffic Vol, veh/h	5	3	1	63	5	48	12	1421	162	46	1014	6
Future Vol, veh/h	5	3	1	63	5	48	12	1421	162	46	1014	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	100	-	-	50	175	-	-	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	75	75	75	80	80	80	88	88	88	91	91	91
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	7	4	1	79	6	60	14	1615	184	51	1114	7

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	2988	3047	1118	2957	2958	1707	1121	0	0	1799	0	0
Stage 1	1220	1220	-	1735	1735	-	-	-	-	-	-	-
Stage 2	1768	1827	-	1222	1223	-	-	-	-	-	-	-
Critical Hdwy	7.15	6.55	6.25	7.15	6.55	6.25	4.15	-	-	4.15	-	-
Critical Hdwy Stg 1	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4.045	3.345	3.545	4.045	3.345	2.245	-	-	2.245	-	-
Pot Cap-1 Maneuver	8	12	248	~ 9	14	111	612	-	-	335	-	-
Stage 1	217	249	-	109	139	-	-	-	-	-	-	-
Stage 2	105	125	-	217	248	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	~ 2	10	248	~ 5	12	111	612	-	-	335	-	-
Mov Cap-2 Maneuver	~ 2	10	-	~ 5	12	-	-	-	-	-	-	-
Stage 1	212	211	-	106	136	-	-	-	-	-	-	-
Stage 2	45	122	-	180	210	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, \$	2917.9		5083.6		0.1		0.8	
HCM LOS	F		F					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	612	-	-	3	248	5	111	335	-	-
HCM Lane V/C Ratio	0.022	-	-	3.556	0.005	17	0.541	0.151	-	-
HCM Control Delay (s)	11	-	-	\$ 3280.2	19	\$ 8622.4	70.3	17.6	-	-
HCM Lane LOS	B	-	-	F	C	F	F	C	-	-
HCM 95th %tile Q(veh)	0.1	-	-	2.5	0	12.5	2.5	0.5	-	-

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

HCM 6th TWSC
2: Grape Ln./BV Drive & Rutherford Rd.

MD Weekend Exist+Prj. Conditions

Intersection												
Int Delay, s/veh	1.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	11	203	9	3	105	8	9	0	4	10	0	18
Future Vol, veh/h	11	203	9	3	105	8	9	0	4	10	0	18
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	5	2	2	5	2	2	2	2	2	2	2
Mvmt Flow	12	221	10	3	114	9	10	0	4	11	0	20

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	123	0	0	231	0	0	385	379	226	377	380	119
Stage 1	-	-	-	-	-	-	250	250	-	125	125	-
Stage 2	-	-	-	-	-	-	135	129	-	252	255	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1464	-	-	1337	-	-	573	553	813	580	552	933
Stage 1	-	-	-	-	-	-	754	700	-	879	792	-
Stage 2	-	-	-	-	-	-	868	789	-	752	696	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1464	-	-	1337	-	-	556	547	813	572	546	933
Mov Cap-2 Maneuver	-	-	-	-	-	-	556	547	-	572	546	-
Stage 1	-	-	-	-	-	-	747	694	-	871	790	-
Stage 2	-	-	-	-	-	-	848	787	-	741	690	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.4			0.2			11			9.9		
HCM LOS							B			A		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	616	1464	-	-	1337	-	-	761
HCM Lane V/C Ratio	0.023	0.008	-	-	0.002	-	-	0.04
HCM Control Delay (s)	11	7.5	0	-	7.7	0	-	9.9
HCM Lane LOS	B	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.1

Intersection						
Int Delay, s/veh	2.5					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	134	52	37	91	31	21
Future Vol, veh/h	134	52	37	91	31	21
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	100	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	87	87	86	86	75	75
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	154	60	43	106	41	28

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	214	0	376 184
Stage 1	-	-	-	-	184 -
Stage 2	-	-	-	-	192 -
Critical Hdwy	-	-	4.15	-	6.45 6.25
Critical Hdwy Stg 1	-	-	-	-	5.45 -
Critical Hdwy Stg 2	-	-	-	-	5.45 -
Follow-up Hdwy	-	-	2.245	-	3.545 3.345
Pot Cap-1 Maneuver	-	-	1338	-	619 851
Stage 1	-	-	-	-	840 -
Stage 2	-	-	-	-	833 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1338	-	598 851
Mov Cap-2 Maneuver	-	-	-	-	598 -
Stage 1	-	-	-	-	811 -
Stage 2	-	-	-	-	833 -

Approach	EB	WB	NB
HCM Control Delay, s	0	2.2	10.7
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	598	851	-	-	1338	-
HCM Lane V/C Ratio	0.069	0.033	-	-	0.032	-
HCM Control Delay (s)	11.5	9.4	-	-	7.8	0
HCM Lane LOS	B	A	-	-	A	A
HCM 95th %tile Q(veh)	0.2	0.1	-	-	0.1	-

Intersection												
Int Delay, s/veh	480.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↕		↕	↕	↕	↕		↕	↕	
Traffic Vol, veh/h	0	0	6	92	0	46	3	1101	97	109	1598	0
Future Vol, veh/h	0	0	6	92	0	46	3	1101	97	109	1598	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	100	-	-	50	175	-	-	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	75	75	75	80	80	80	88	88	88	91	91	91
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	0	0	8	115	0	58	3	1251	110	120	1756	0

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	3337	3363	1756	3312	3308	1306	1756	0	0	1361	0	0
Stage 1	1996	1996	-	1312	1312	-	-	-	-	-	-	-
Stage 2	1341	1367	-	2000	1996	-	-	-	-	-	-	-
Critical Hdwy	7.15	6.55	6.25	7.15	6.55	6.25	4.15	-	-	4.15	-	-
Critical Hdwy Stg 1	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4.045	3.345	3.545	4.045	3.345	2.245	-	-	2.245	-	-
Pot Cap-1 Maneuver	5	8	104	~ 5	8	192	349	-	-	496	-	-
Stage 1	77	103	-	192	225	-	-	-	-	-	-	-
Stage 2	185	212	-	~ 76	103	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	3	6	104	~ 4	6	192	349	-	-	496	-	-
Mov Cap-2 Maneuver	3	6	-	~ 4	6	-	-	-	-	-	-	-
Stage 1	76	78	-	190	223	-	-	-	-	-	-	-
Stage 2	128	210	-	~ 53	78	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	42.5	\$ 9519.9	0	0.9
HCM LOS	E	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	349	-	-	-	104	4	192	496	-	-
HCM Lane V/C Ratio	0.01	-	-	-	0.077	28.75	0.299	0.241	-	-
HCM Control Delay (s)	15.4	-	-	0	4.5	426.1	31.6	14.6	-	-
HCM Lane LOS	C	-	-	A	E	F	D	B	-	-
HCM 95th %tile Q(veh)	0	-	-	-	0.2	16.5	1.2	0.9	-	-

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

Intersection												
Int Delay, s/veh	1.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	6	211	7	2	120	0	10	0	4	6	0	14
Future Vol, veh/h	6	211	7	2	120	0	10	0	4	6	0	14
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	5	2	2	5	2	2	2	2	2	2	2
Mvmt Flow	7	229	8	2	130	0	11	0	4	7	0	15

Major/Minor	Major1		Major2		Minor1			Minor2				
Conflicting Flow All	130	0	0	237	0	0	389	381	233	383	385	130
Stage 1	-	-	-	-	-	-	247	247	-	134	134	-
Stage 2	-	-	-	-	-	-	142	134	-	249	251	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1455	-	-	1330	-	-	570	552	806	575	549	920
Stage 1	-	-	-	-	-	-	757	702	-	869	785	-
Stage 2	-	-	-	-	-	-	861	785	-	755	699	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1455	-	-	1330	-	-	557	548	806	569	545	920
Mov Cap-2 Maneuver	-	-	-	-	-	-	557	548	-	569	545	-
Stage 1	-	-	-	-	-	-	752	698	-	864	783	-
Stage 2	-	-	-	-	-	-	845	783	-	746	695	-

Approach	EB		WB		NB			SB		
HCM Control Delay, s	0.2		0.1		11			9.8		
HCM LOS					B			A		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	611	1455	-	-	1330	-	-	776
HCM Lane V/C Ratio	0.025	0.004	-	-	0.002	-	-	0.028
HCM Control Delay (s)	11	7.5	0	-	7.7	0	-	9.8
HCM Lane LOS	B	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.1

Intersection						
Int Delay, s/veh	2.8					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	53	152	65	74	34	12
Future Vol, veh/h	53	152	65	74	34	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	100	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	87	87	86	86	75	75
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	61	175	76	86	45	16

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	236	0	387 149
Stage 1	-	-	-	-	149 -
Stage 2	-	-	-	-	238 -
Critical Hdwy	-	-	4.15	-	6.45 6.25
Critical Hdwy Stg 1	-	-	-	-	5.45 -
Critical Hdwy Stg 2	-	-	-	-	5.45 -
Follow-up Hdwy	-	-	2.245	-	3.545 3.345
Pot Cap-1 Maneuver	-	-	1314	-	610 890
Stage 1	-	-	-	-	871 -
Stage 2	-	-	-	-	795 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1314	-	573 890
Mov Cap-2 Maneuver	-	-	-	-	573 -
Stage 1	-	-	-	-	818 -
Stage 2	-	-	-	-	795 -

Approach	EB	WB	NB
HCM Control Delay, s	0	3.7	11.1
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	573	890	-	-	1314	-
HCM Lane V/C Ratio	0.079	0.018	-	-	0.058	-
HCM Control Delay (s)	11.8	9.1	-	-	7.9	0
HCM Lane LOS	B	A	-	-	A	A
HCM 95th %tile Q(veh)	0.3	0.1	-	-	0.2	-

Intersection												
Int Delay, s/veh	596.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↕		↕	↕	↕	↕		↕	↕	
Traffic Vol, veh/h	5	3	1	80	5	53	12	1507	182	51	1090	6
Future Vol, veh/h	5	3	1	80	5	53	12	1507	182	51	1090	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	100	-	-	50	175	-	-	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	75	75	75	80	80	80	88	88	88	91	91	91
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	7	4	1	100	6	66	14	1713	207	56	1198	7

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	3195	3262	1202	3161	3162	1817	1205	0	0	1920	0	0
Stage 1	1314	1314	-	1845	1845	-	-	-	-	-	-	-
Stage 2	1881	1948	-	1316	1317	-	-	-	-	-	-	-
Critical Hdwy	7.15	6.55	6.25	7.15	6.55	6.25	4.15	-	-	4.15	-	-
Critical Hdwy Stg 1	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4.045	3.345	3.545	4.045	3.345	2.245	-	-	2.245	-	-
Pot Cap-1 Maneuver	~ 6	9	222	~ 6	10	95	569	-	-	301	-	-
Stage 1	192	225	-	~ 94	123	-	-	-	-	-	-	-
Stage 2	90	109	-	191	224	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	~ 1	7	222	~ 3	8	95	569	-	-	301	-	-
Mov Cap-2 Maneuver	~ 1	7	-	~ 3	8	-	-	-	-	-	-	-
Stage 1	187	183	-	~ 92	120	-	-	-	-	-	-	-
Stage 2	25	106	-	151	182	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, \$	9310.4		11029.3		0.1		0.9	
HCM LOS	F		F					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	569	-	-	1	222	3	95	301	-	-
HCM Lane V/C Ratio	0.024	-	-	10.667	0.006	35.417	0.697	0.186	-	-
HCM Control Delay (s)	11.5	-	-	\$ 10471.5	21.	\$ 17842	103.4	19.7	-	-
HCM Lane LOS	B	-	-	F	C	F	F	C	-	-
HCM 95th %tile Q(veh)	0.1	-	-	2.7	0	15.5	3.5	0.7	-	-

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

Intersection												
Int Delay, s/veh	1.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	15	224	9	3	124	8	9	0	4	10	0	22
Future Vol, veh/h	15	224	9	3	124	8	9	0	4	10	0	22
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	5	2	2	5	2	2	2	2	2	2	2
Mvmt Flow	16	243	10	3	135	9	10	0	4	11	0	24

Major/Minor	Major1		Major2		Minor1		Minor2					
Conflicting Flow All	144	0	0	253	0	0	438	430	248	428	431	140
Stage 1	-	-	-	-	-	-	280	280	-	146	146	-
Stage 2	-	-	-	-	-	-	158	150	-	282	285	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1438	-	-	1312	-	-	529	518	791	537	517	908
Stage 1	-	-	-	-	-	-	727	679	-	857	776	-
Stage 2	-	-	-	-	-	-	844	773	-	725	676	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1438	-	-	1312	-	-	509	510	791	528	509	908
Mov Cap-2 Maneuver	-	-	-	-	-	-	509	510	-	528	509	-
Stage 1	-	-	-	-	-	-	718	670	-	846	774	-
Stage 2	-	-	-	-	-	-	820	771	-	712	667	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	0.5		0.2		11.5		10.1	
HCM LOS					B		B	

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	572	1438	-	-	1312	-	-	741
HCM Lane V/C Ratio	0.025	0.011	-	-	0.002	-	-	0.047
HCM Control Delay (s)	11.5	7.5	0	-	7.8	0	-	10.1
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.1

Intersection						
Int Delay, s/veh	2.4					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	150	53	38	107	32	22
Future Vol, veh/h	150	53	38	107	32	22
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	100	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	87	87	86	86	75	75
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	172	61	44	124	43	29

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	233	0	415 203
Stage 1	-	-	-	-	203 -
Stage 2	-	-	-	-	212 -
Critical Hdwy	-	-	4.15	-	6.45 6.25
Critical Hdwy Stg 1	-	-	-	-	5.45 -
Critical Hdwy Stg 2	-	-	-	-	5.45 -
Follow-up Hdwy	-	-	2.245	-	3.545 3.345
Pot Cap-1 Maneuver	-	-	1317	-	588 830
Stage 1	-	-	-	-	824 -
Stage 2	-	-	-	-	816 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1317	-	567 830
Mov Cap-2 Maneuver	-	-	-	-	567 -
Stage 1	-	-	-	-	794 -
Stage 2	-	-	-	-	816 -

Approach	EB	WB	NB
HCM Control Delay, s	0	2.1	10.9
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	567	830	-	-	1317	-
HCM Lane V/C Ratio	0.075	0.035	-	-	0.034	-
HCM Control Delay (s)	11.9	9.5	-	-	7.8	0
HCM Lane LOS	B	A	-	-	A	A
HCM 95th %tile Q(veh)	0.2	0.1	-	-	0.1	-

Intersection												
Int Delay, s/veh	677.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↕	↗	↗	↗		↗	↗	
Traffic Vol, veh/h	0	0	7	79	0	46	3	1214	98	120	1730	0
Future Vol, veh/h	0	0	7	79	0	46	3	1214	98	120	1730	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	100	-	-	50	175	-	-	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	75	75	75	80	80	80	88	88	88	91	91	91
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	0	0	9	99	0	58	3	1380	111	132	1901	0

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	3636	3662	1901	3612	3607	1436	1901	0	0	1491	0	0
Stage 1	2165	2165	-	1442	1442	-	-	-	-	-	-	-
Stage 2	1471	1497	-	2170	2165	-	-	-	-	-	-	-
Critical Hdwy	7.15	6.55	6.25	7.15	6.55	6.25	4.15	-	-	4.15	-	-
Critical Hdwy Stg 1	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4.045	3.345	3.545	4.045	3.345	2.245	-	-	2.245	-	-
Pot Cap-1 Maneuver	3	5	85	~3	5	161	306	-	-	442	-	-
Stage 1	61	84	-	162	195	-	-	-	-	-	-	-
Stage 2	156	183	-	~60	84	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	1	3	85	~2	3	161	306	-	-	442	-	-
Mov Cap-2 Maneuver	1	3	-	~2	3	-	-	-	-	-	-	-
Stage 1	60	59	-	160	193	-	-	-	-	-	-	-
Stage 2	99	181	-	~37	59	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	52.5	\$ 15989.9	0	1.1
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	306	-	-	-	85	2	161	442	-	-
HCM Lane V/C Ratio	0.011	-	-	-	0.11	49.375	0.357	0.298	-	-
HCM Control Delay (s)	16.9	-	-	0	\$ 25277.6	39.3	16.6	-	-	-
HCM Lane LOS	C	-	-	A	F	F	E	C	-	-
HCM 95th %tile Q(veh)	0	-	-	-	0.4	14.6	1.5	1.2	-	-

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

Intersection												
Int Delay, s/veh	0.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	5	230	4	1	115	0	7	0	2	7	0	9
Future Vol, veh/h	5	230	4	1	115	0	7	0	2	7	0	9
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	5	2	2	5	2	2	2	2	2	2	2
Mvmt Flow	5	250	4	1	125	0	8	0	2	8	0	10

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	125	0	0	254	0	0	394	389	252	390	391	125
Stage 1	-	-	-	-	-	-	262	262	-	127	127	-
Stage 2	-	-	-	-	-	-	132	127	-	263	264	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1462	-	-	1311	-	-	566	546	787	569	545	926
Stage 1	-	-	-	-	-	-	743	691	-	877	791	-
Stage 2	-	-	-	-	-	-	871	791	-	742	690	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1462	-	-	1311	-	-	558	543	787	565	542	926
Mov Cap-2 Maneuver	-	-	-	-	-	-	558	543	-	565	542	-
Stage 1	-	-	-	-	-	-	740	688	-	873	790	-
Stage 2	-	-	-	-	-	-	861	790	-	737	687	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.2			0.1			11.1			10.1		
HCM LOS							B			B		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	597	1462	-	-	1311	-	-	724
HCM Lane V/C Ratio	0.016	0.004	-	-	0.001	-	-	0.024
HCM Control Delay (s)	11.1	7.5	0	-	7.7	0	-	10.1
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.1

Intersection						
Int Delay, s/veh	3					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	↔
Traffic Vol, veh/h	50	170	72	63	38	14
Future Vol, veh/h	50	170	72	63	38	14
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	100	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	87	87	86	86	75	75
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	57	195	84	73	51	19

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	252	0	396 155
Stage 1	-	-	-	-	155 -
Stage 2	-	-	-	-	241 -
Critical Hdwy	-	-	4.15	-	6.45 6.25
Critical Hdwy Stg 1	-	-	-	-	5.45 -
Critical Hdwy Stg 2	-	-	-	-	5.45 -
Follow-up Hdwy	-	-	2.245	-	3.545 3.345
Pot Cap-1 Maneuver	-	-	1296	-	603 883
Stage 1	-	-	-	-	866 -
Stage 2	-	-	-	-	792 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1296	-	562 883
Mov Cap-2 Maneuver	-	-	-	-	562 -
Stage 1	-	-	-	-	807 -
Stage 2	-	-	-	-	792 -

Approach	EB	WB	NB
HCM Control Delay, s	0	4.3	11.2
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	562	883	-	-	1296	-
HCM Lane V/C Ratio	0.09	0.021	-	-	0.065	-
HCM Control Delay (s)	12	9.2	-	-	8	0
HCM Lane LOS	B	A	-	-	A	A
HCM 95th %tile Q(veh)	0.3	0.1	-	-	0.2	-

Intersection												
Int Delay, s/veh	0.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗		↖	↗	↖	↗		↖	↗	
Traffic Vol, veh/h	6	4	2	68	6	53	14	1631	181	52	1164	7
Future Vol, veh/h	6	4	2	68	6	53	14	1631	181	52	1164	7
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	100	-	-	50	175	-	-	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	75	75	75	80	80	80	88	88	88	91	91	91
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	8	5	3	85	8	66	16	1853	206	57	1279	8

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	3422	3488	1283	3389	3389	1956	1287	0	0	2059	0	0
Stage 1	1397	1397	-	1988	1988	-	-	-	-	-	-	-
Stage 2	2025	2091	-	1401	1401	-	-	-	-	-	-	-
Critical Hdwy	7.15	6.55	6.25	7.15	6.55	6.25	4.15	-	-	4.15	-	-
Critical Hdwy Stg 1	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4.045	3.345	3.545	4.045	3.345	2.245	-	-	2.245	-	-
Pot Cap-1 Maneuver	~ 4	6	199	~ 4	~ 7	78	529	-	-	265	-	-
Stage 1	172	205	-	~ 78	104	-	-	-	-	-	-	-
Stage 2	74	92	-	171	204	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	~ 5	199	-	~ 5	78	529	-	-	265	-	-
Mov Cap-2 Maneuver	-	~ 5	-	-	~ 5	-	-	-	-	-	-	-
Stage 1	167	161	-	~ 76	101	-	-	-	-	-	-	-
Stage 2	10	89	-	128	160	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s					0.1		0.9	
HCM LOS	-		-					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	529	-	-	-	199	-	78	265	-	-
HCM Lane V/C Ratio	0.03	-	-	-	0.013	-	0.849	0.216	-	-
HCM Control Delay (s)	12	-	-	-	23.3	-	154.3	22.3	-	-
HCM Lane LOS	B	-	-	-	C	-	F	C	-	-
HCM 95th %tile Q(veh)	0.1	-	-	-	0	-	4.3	0.8	-	-

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

Intersection												
Int Delay, s/veh	1.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	13	233	4	1	120	9	3	0	1	11	0	21
Future Vol, veh/h	13	233	4	1	120	9	3	0	1	11	0	21
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	5	2	2	5	2	2	2	2	2	2	2
Mvmt Flow	14	253	4	1	130	10	3	0	1	12	0	23

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	140	0	0	257	0	0	432	425	255	421	422	135
Stage 1	-	-	-	-	-	-	283	283	-	137	137	-
Stage 2	-	-	-	-	-	-	149	142	-	284	285	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1443	-	-	1308	-	-	534	521	784	543	523	914
Stage 1	-	-	-	-	-	-	724	677	-	866	783	-
Stage 2	-	-	-	-	-	-	854	779	-	723	676	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1443	-	-	1308	-	-	516	515	784	537	517	914
Mov Cap-2 Maneuver	-	-	-	-	-	-	516	515	-	537	517	-
Stage 1	-	-	-	-	-	-	716	670	-	856	782	-
Stage 2	-	-	-	-	-	-	832	778	-	714	669	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.4			0.1			11.4			10.1		
HCM LOS							B			B		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	564	1443	-	-	1308	-	-	736
HCM Lane V/C Ratio	0.008	0.01	-	-	0.001	-	-	0.047
HCM Control Delay (s)	11.4	7.5	0	-	7.8	0	-	10.1
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0.1

Intersection						
Int Delay, s/veh	2.6					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	150	60	42	102	36	24
Future Vol, veh/h	150	60	42	102	36	24
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	100	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	87	87	86	86	75	75
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	172	69	49	119	48	32

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	241	0	424 207
Stage 1	-	-	-	-	207 -
Stage 2	-	-	-	-	217 -
Critical Hdwy	-	-	4.15	-	6.45 6.25
Critical Hdwy Stg 1	-	-	-	-	5.45 -
Critical Hdwy Stg 2	-	-	-	-	5.45 -
Follow-up Hdwy	-	-	2.245	-	3.545 3.345
Pot Cap-1 Maneuver	-	-	1308	-	581 826
Stage 1	-	-	-	-	821 -
Stage 2	-	-	-	-	812 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1308	-	558 826
Mov Cap-2 Maneuver	-	-	-	-	558 -
Stage 1	-	-	-	-	788 -
Stage 2	-	-	-	-	812 -

Approach	EB	WB	NB
HCM Control Delay, s	0	2.3	11.1
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	558	826	-	-	1308	-
HCM Lane V/C Ratio	0.086	0.039	-	-	0.037	-
HCM Control Delay (s)	12.1	9.5	-	-	7.9	0
HCM Lane LOS	B	A	-	-	A	A
HCM 95th %tile Q(veh)	0.3	0.1	-	-	0.1	-

Intersection												
Int Delay, s/veh	708.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↕	↗	↕	↗		↕	↗	
Traffic Vol, veh/h	0	0	7	81	0	47	3	1214	100	121	1730	0
Future Vol, veh/h	0	0	7	81	0	47	3	1214	100	121	1730	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	100	-	-	50	175	-	-	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	75	75	75	80	80	80	88	88	88	91	91	91
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	0	0	9	101	0	59	3	1380	114	133	1901	0

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	3640	3667	1901	3615	3610	1437	1901	0	0	1494	0	0
Stage 1	2167	2167	-	1443	1443	-	-	-	-	-	-	-
Stage 2	1473	1500	-	2172	2167	-	-	-	-	-	-	-
Critical Hdwy	7.15	6.55	6.25	7.15	6.55	6.25	4.15	-	-	4.15	-	-
Critical Hdwy Stg 1	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4.045	3.345	3.545	4.045	3.345	2.245	-	-	2.245	-	-
Pot Cap-1 Maneuver	3	5	85	~3	5	161	306	-	-	440	-	-
Stage 1	61	84	-	162	194	-	-	-	-	-	-	-
Stage 2	155	182	-	~60	84	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	1	3	85	~2	3	161	306	-	-	440	-	-
Mov Cap-2 Maneuver	1	3	-	~2	3	-	-	-	-	-	-	-
Stage 1	60	59	-	160	192	-	-	-	-	-	-	-
Stage 2	97	180	-	~37	59	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	52.5	\$ 16367.8	0	1.1
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	306	-	-	-	85	2	161	440	-	-
HCM Lane V/C Ratio	0.011	-	-	-	0.1150	0.625	0.365	0.302	-	-
HCM Control Delay (s)	16.9	-	-	0	5.25	584.2	39.7	16.7	-	-
HCM Lane LOS	C	-	-	A	F	F	E	C	-	-
HCM 95th %tile Q(veh)	0	-	-	-	0.4	14.9	1.5	1.3	-	-

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

Intersection												
Int Delay, s/veh	1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	5	230	7	2	115	0	10	0	4	7	0	9
Future Vol, veh/h	5	230	7	2	115	0	10	0	4	7	0	9
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	5	2	2	5	2	2	2	2	2	2	2
Mvmt Flow	5	250	8	2	125	0	11	0	4	8	0	10

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	125	0	0	258	0	0	398	393	254	395	397	125
Stage 1	-	-	-	-	-	-	264	264	-	129	129	-
Stage 2	-	-	-	-	-	-	134	129	-	266	268	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1462	-	-	1307	-	-	562	543	785	565	540	926
Stage 1	-	-	-	-	-	-	741	690	-	875	789	-
Stage 2	-	-	-	-	-	-	869	789	-	739	687	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1462	-	-	1307	-	-	554	540	785	559	537	926
Mov Cap-2 Maneuver	-	-	-	-	-	-	554	540	-	559	537	-
Stage 1	-	-	-	-	-	-	738	687	-	872	787	-
Stage 2	-	-	-	-	-	-	858	787	-	732	684	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.2			0.1			11.1			10.1		
HCM LOS							B			B		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	605	1462	-	-	1307	-	-	719
HCM Lane V/C Ratio	0.025	0.004	-	-	0.002	-	-	0.024
HCM Control Delay (s)	11.1	7.5	0	-	7.8	0	-	10.1
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.1

Intersection						
Int Delay, s/veh	3					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	52	170	72	64	38	14
Future Vol, veh/h	52	170	72	64	38	14
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	100	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	87	87	86	86	75	75
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	60	195	84	74	51	19

Major/Minor	Major1	Major2	Minor1	Minor2	Minor3
Conflicting Flow All	0	0	255	0	400
Stage 1	-	-	-	-	158
Stage 2	-	-	-	-	242
Critical Hdwy	-	-	4.15	-	6.45
Critical Hdwy Stg 1	-	-	-	-	5.45
Critical Hdwy Stg 2	-	-	-	-	5.45
Follow-up Hdwy	-	-	2.245	-	3.545
Pot Cap-1 Maneuver	-	-	1293	-	600
Stage 1	-	-	-	-	863
Stage 2	-	-	-	-	791
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1293	-	559
Mov Cap-2 Maneuver	-	-	-	-	559
Stage 1	-	-	-	-	804
Stage 2	-	-	-	-	791

Approach	EB	WB	NB
HCM Control Delay, s	0	4.2	11.3
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	559	880	-	-	1293	-
HCM Lane V/C Ratio	0.091	0.021	-	-	0.065	-
HCM Control Delay (s)	12.1	9.2	-	-	8	0
HCM Lane LOS	B	A	-	-	A	A
HCM 95th %tile Q(veh)	0.3	0.1	-	-	0.2	-

Intersection												
Int Delay, s/veh	0.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗		↖	↗	↖	↗		↖	↗	
Traffic Vol, veh/h	6	4	2	72	6	55	14	1631	185	53	1164	7
Future Vol, veh/h	6	4	2	72	6	55	14	1631	185	53	1164	7
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	100	-	-	50	175	-	-	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	75	75	75	80	80	80	88	88	88	91	91	91
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	8	5	3	90	8	69	16	1853	210	58	1279	8

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	3428	3494	1283	3393	3393	1958	1287	0	0	2063	0	0
Stage 1	1399	1399	-	1990	1990	-	-	-	-	-	-	-
Stage 2	2029	2095	-	1403	1403	-	-	-	-	-	-	-
Critical Hdwy	7.15	6.55	6.25	7.15	6.55	6.25	4.15	-	-	4.15	-	-
Critical Hdwy Stg 1	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4.045	3.345	3.545	4.045	3.345	2.245	-	-	2.245	-	-
Pot Cap-1 Maneuver	~ 4	6	199	~ 4	~ 7	78	529	-	-	264	-	-
Stage 1	171	204	-	~ 77	104	-	-	-	-	-	-	-
Stage 2	73	92	-	171	203	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	~ 5	199	-	~ 5	78	529	-	-	264	-	-
Mov Cap-2 Maneuver	-	~ 5	-	-	~ 5	-	-	-	-	-	-	-
Stage 1	166	159	-	~ 75	101	-	-	-	-	-	-	-
Stage 2	8	89	-	127	158	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s			0.1	1
HCM LOS	-	-		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	529	-	-	-	199	-	78	264	-	-
HCM Lane V/C Ratio	0.03	-	-	-	0.013	-	0.881	0.221	-	-
HCM Control Delay (s)	12	-	-	-	23.3	-	162.4	22.5	-	-
HCM Lane LOS	B	-	-	-	C	-	F	C	-	-
HCM 95th %tile Q(veh)	0.1	-	-	-	0	-	4.5	0.8	-	-

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

Intersection												
Int Delay, s/veh	1.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	13	233	9	3	120	9	9	0	4	11	0	21
Future Vol, veh/h	13	233	9	3	120	9	9	0	4	11	0	21
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	5	2	2	5	2	2	2	2	2	2	2
Mvmt Flow	14	253	10	3	130	10	10	0	4	12	0	23

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	140	0	0	263	0	0	439	432	258	429	432	135
Stage 1	-	-	-	-	-	-	286	286	-	141	141	-
Stage 2	-	-	-	-	-	-	153	146	-	288	291	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1443	-	-	1301	-	-	528	516	781	536	516	914
Stage 1	-	-	-	-	-	-	721	675	-	862	780	-
Stage 2	-	-	-	-	-	-	849	776	-	720	672	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1443	-	-	1301	-	-	510	509	781	527	509	914
Mov Cap-2 Maneuver	-	-	-	-	-	-	510	509	-	527	509	-
Stage 1	-	-	-	-	-	-	713	668	-	853	778	-
Stage 2	-	-	-	-	-	-	825	774	-	708	665	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.4			0.2			11.5			10.2		
HCM LOS							B			B		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	571	1443	-	-	1301	-	-	730
HCM Lane V/C Ratio	0.025	0.01	-	-	0.003	-	-	0.048
HCM Control Delay (s)	11.5	7.5	0	-	7.8	0	-	10.2
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.1

Intersection						
Int Delay, s/veh	2.6					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	153	60	42	104	36	24
Future Vol, veh/h	153	60	42	104	36	24
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	100	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	87	87	86	86	75	75
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	176	69	49	121	48	32

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	245	0	430 211
Stage 1	-	-	-	-	211 -
Stage 2	-	-	-	-	219 -
Critical Hdwy	-	-	4.15	-	6.45 6.25
Critical Hdwy Stg 1	-	-	-	-	5.45 -
Critical Hdwy Stg 2	-	-	-	-	5.45 -
Follow-up Hdwy	-	-	2.245	-	3.545 3.345
Pot Cap-1 Maneuver	-	-	1304	-	577 822
Stage 1	-	-	-	-	817 -
Stage 2	-	-	-	-	810 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1304	-	554 822
Mov Cap-2 Maneuver	-	-	-	-	554 -
Stage 1	-	-	-	-	784 -
Stage 2	-	-	-	-	810 -

Approach	EB	WB	NB
HCM Control Delay, s	0	2.3	11.1
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	554	822	-	-	1304	-
HCM Lane V/C Ratio	0.087	0.039	-	-	0.037	-
HCM Control Delay (s)	12.1	9.6	-	-	7.9	0
HCM Lane LOS	B	A	-	-	A	A
HCM 95th %tile Q(veh)	0.3	0.1	-	-	0.1	-

**Generalized Peak Hour Directional Volumes for Florida's
Transitioning and
Areas Over 5,000 Not In Urbanized Areas¹**

12/18/12

INTERRUPTED FLOW FACILITIES						UNINTERRUPTED FLOW FACILITIES					
STATE SIGNALIZED ARTERIALS						FREEWAYS					
Class I (40 mph or higher posted speed limit)											
Lanes	Median	B	C	D	E	Lanes	B	C	D	E	
1	Undivided	*	710	800	**	2	2,200	2,880	3,440	3,580	
2	Divided	*	1,740	1,820	**	3	3,260	4,280	5,100	5,540	
3	Divided	*	2,670	2,740	**	4	4,260	5,680	6,760	7,500	
						5	5,300	7,080	8,440	9,440	
Class II (35 mph or slower posted speed limit)						Freeway Adjustments					
Lanes	Median	B	C	D	E	Auxiliary Lane		Ramp Metering			
1	Undivided	*	330	680	720	+ 1,000		+ 5%			
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						UNINTERRUPTED FLOW HIGHWAYS					
Lanes	Median	Exclusive Left Lanes	Exclusive Right Lanes	Adjustment Factors		Lanes	Median	B	C	D	E
1	Divided	Yes	No	+5%		1	Undivided	450	850	1,200	1,640
2	Undivided	No	No	-20%		2	Divided	1,740	2,450	3,110	3,440
Multi	Undivided	Yes	No	-5%		3	Divided	2,610	3,680	4,660	5,170
Multi	Undivided	No	No	-25%		Uninterrupted Flow Highway Adjustments					
-	-	-	Yes	+ 5%		Lanes	Median	Exclusive left lanes	Adjustment factors		
One-Way Facility Adjustment Multiply the corresponding directional volumes in this table by 1.2						1	Divided	Yes	+5%		
						Multi	Undivided	Yes	-5%		
						Multi	Undivided	No	-25%		
BICYCLE MODE² (Multiply motorized vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)						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.					
Paved Shoulder/Bicycle Lane Coverage						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.					
		B	C	D	E	³ Buses per hour shown are only for the peak hour in the single direction of the higher traffic flow.					
	0-49%	*	140	320	1,000	* Cannot be achieved using table input value defaults.					
	50-84%	100	280	940	>1,000	** 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.					
	85-100%	380	1,000	>1,000	**						
PEDESTRIAN MODE² (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						

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

Existing Conditions Winery Traffic Information / Trip Generation Sheet

Maximum Daily Weekday Traffic (non-harvest season)

Total number of FT employees: 7 x 3.05 one-way trips per employee = 21 daily trips.
 Total number of PT employees: 4 x 1.90 one-way trips per employee = 8 daily trips.
 Anticipated weekday visitors: 0 / 2.6 visitors per vehicle x 2 one-way trips = — daily trips.
 Gallons of production: 0 / 1,000 x .009 truck trips daily³ x 2 one-way trips = — daily trips.
 Total = 29 daily trips.
 (No of FT employees) + (No of PT employees/2) + (sum of visitor and truck trips x .38) = 9(0,9) PM peak trips.

Maximum Daily Weekend Traffic (non-harvest Saturday)

Number of FT employees (on Saturdays): 7 x 3.05 one-way trips per employee = 21 daily trips.
 Number of PT employees (on Saturdays): 4 x 1.90 one-way trips per employee = 8 daily trips.
 Anticipated Saturday visitors: 0 / 2.8 visitors per vehicle x 2 one-way trips = 0 daily trips.
 Total = 29 daily trips.
 (No of FT employees) + (No of PT employees/2) + (visitor trips x .57) = 9(5,4) PM peak trips.

Maximum Daily Weekend Traffic – Saturday Harvest Season

Number of FT employees (during crush): 7 x 3.05 one-way trips per employee = 21 daily trips.
 Number of PT employees (during crush): 4 x 1.90 one-way trips per employee = 8 daily trips.
 Anticipated Saturday visitors: 0 / 2.8 visitors per vehicle x 2 one-way trips = — daily trips.
 Gallons of production: 0 / 1,000 x .009 truck trips daily x 2 one-way trips = — daily trips.
 Avg. annual tons of grape on-haul: 0 / 144 truck trips daily⁴ x 2 one-way trips = — daily trips.
 Total = 29 daily trips.

Largest Marketing Event- Additional Traffic

Number of event staff (largest event): _____ x 2 one-way trips per staff person = _____ trips.
 Number of visitors (largest event): _____ / 2.8 visitors per vehicle x 2 one-way trips = _____ trips.
 Number of special event truck trips (largest event): _____ x 2 one-way trips = _____ 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).

MATHEW BRUNO PROPOSED

Proposed Project Winery Traffic Information / Trip Generation Sheet

Maximum Daily Weekday Traffic (non-harvest season)

Total number of FT employees:	<u>2</u>	x 3.05 one-way trips per employee	=	<u>6</u>	daily trips.
Total number of PT employees:	<u>0</u>	x 1.90 one-way trips per employee	=	<u>0</u>	daily trips.
Anticipated weekday visitors:	<u>56</u>	/ 2.6 visitors per vehicle x 2 one-way trips	=	<u>43</u>	daily trips.
Gallons of production:	<u>0</u>	/ 1,000 x .009 truck trips daily ³ x 2 one-way trips	=	<u>0</u>	daily trips.
	<u>2</u>			<u>49</u>	daily trips.
	<u>0</u>				
		<u>43 x .38</u>			
Total				=	<u>49</u> daily trips.
(No of FT employees) + (No of PT employees/2) + (sum of visitor and truck trips x .38)				=	<u>18 (4, 14)</u> PM peak trips.

Maximum Daily Weekend Traffic (non-harvest Saturday)

Number of FT employees (on Saturdays):	<u>2</u>	x 3.05 one-way trips per employee	=	<u>6</u>	daily trips.
Number of PT employees (on Saturdays):	<u>0</u>	x 1.90 one-way trips per employee	=	<u>0</u>	daily trips.
Anticipated Saturday visitors:	<u>56</u>	/ 2.8 visitors per vehicle x 2 one-way trips	=	<u>40</u>	daily trips.
	<u>2</u>			<u>46</u>	daily trips.
	<u>0</u>				
		<u>40 x .57</u>			
Total				=	<u>46</u> daily trips.
(No of FT employees) + (No of PT employees/2) + (visitor trips x .57)				=	<u>25 (12, 13)</u> PM peak trips.

Maximum Daily Weekend Traffic – Saturday Harvest Season

Number of FT employees (during crush):	<u>2</u>	x 3.05 one-way trips per employee	=	<u>6</u>	daily trips.
Number of PT employees (during crush):	<u>0</u>	x 1.90 one-way trips per employee	=	<u>0</u>	daily trips.
Anticipated Saturday visitors:	<u>56</u>	/ 2.8 visitors per vehicle x 2 one-way trips	=	<u>40</u>	daily trips.
Gallons of production:	<u>0</u>	/ 1,000 x .009 truck trips daily x 2 one-way trips	=	<u>0</u>	daily trips.
Avg. annual tons of grape on-haul:	<u>0</u>	/ 144 truck trips daily ⁴ x 2 one-way trips	=	<u>0</u>	daily trips.
				<u>46</u>	daily trips.
Total				=	<u>46</u> daily trips.

Largest Marketing Event- Additional Traffic

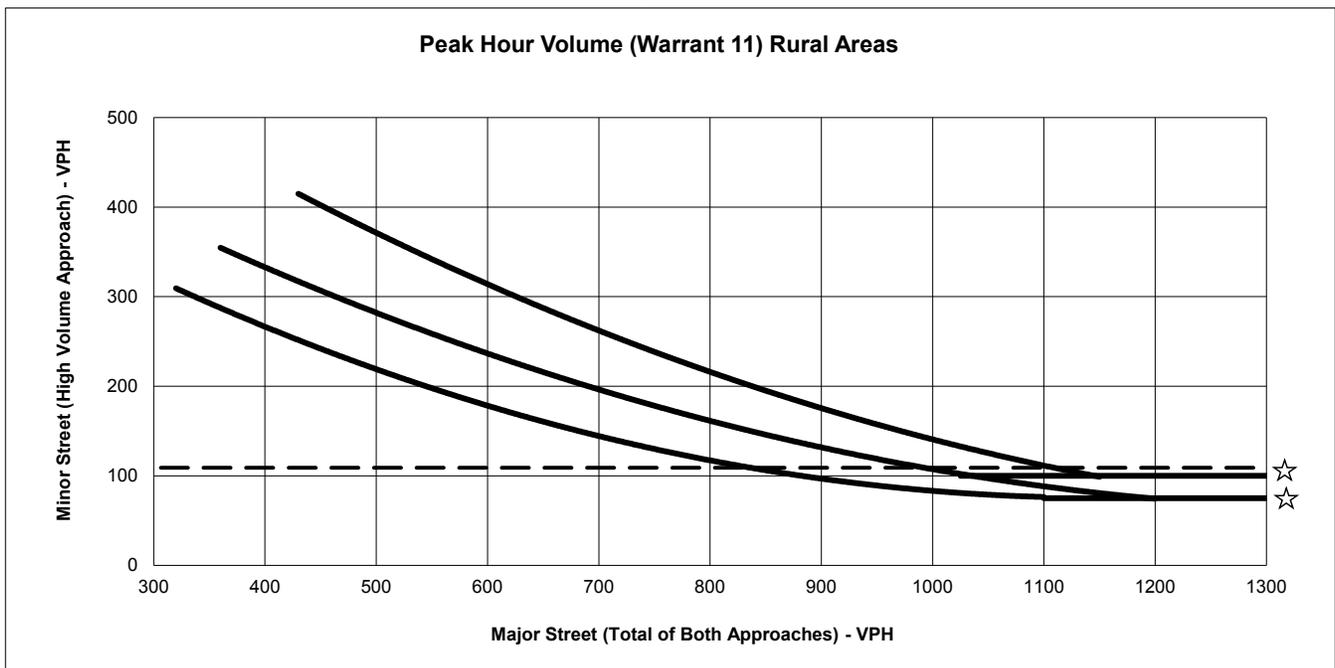
Number of event staff (largest event):	<u>6</u>	x 2 one-way trips per staff person	=	<u>12</u>	trips.
Number of visitors (largest event):	<u>250</u>	/ 2.8 visitors per vehicle x 2 one-way trips	=	<u>179</u>	trips.
Number of special event truck trips (largest event):	<u>3</u>	x 2 one-way trips	=	<u>6</u>	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)

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

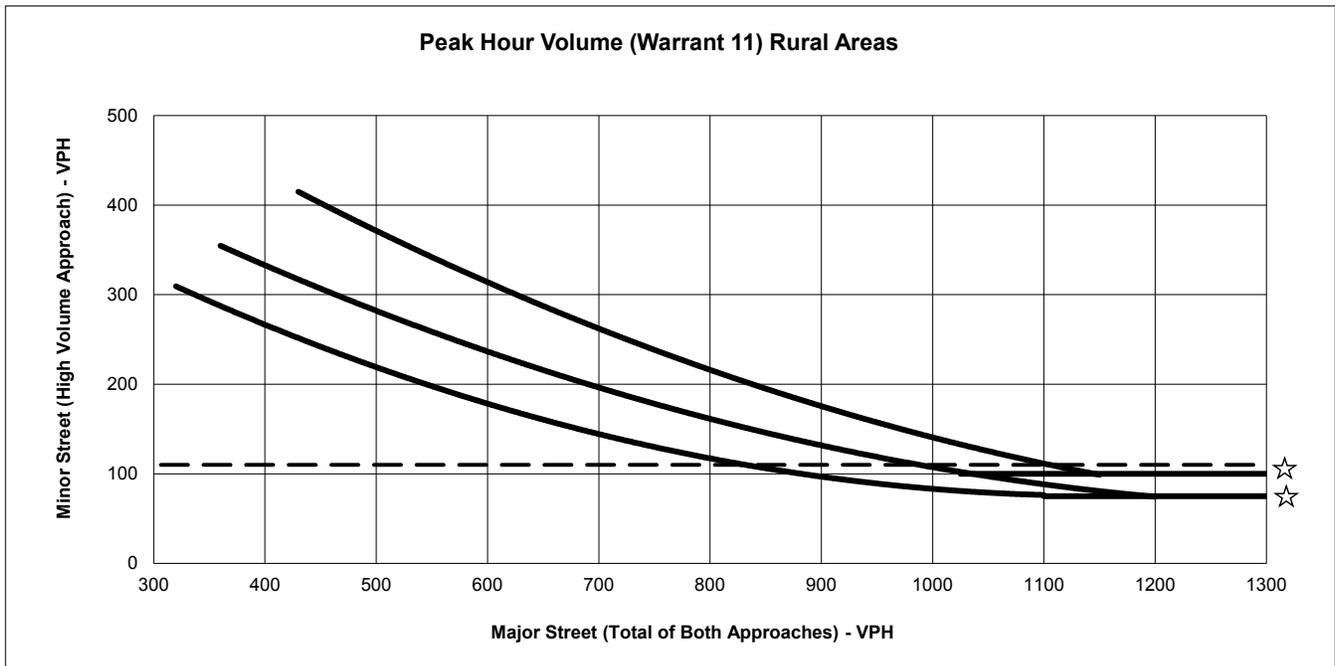


☆ NOTE:
 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 75 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Intersection: Rutherford Road / State Route 29
 Scenario: Existing Weekday PM Peak Hour Conditions
 Minor St. Volume: 109
 Major St. Volume: 2759
 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

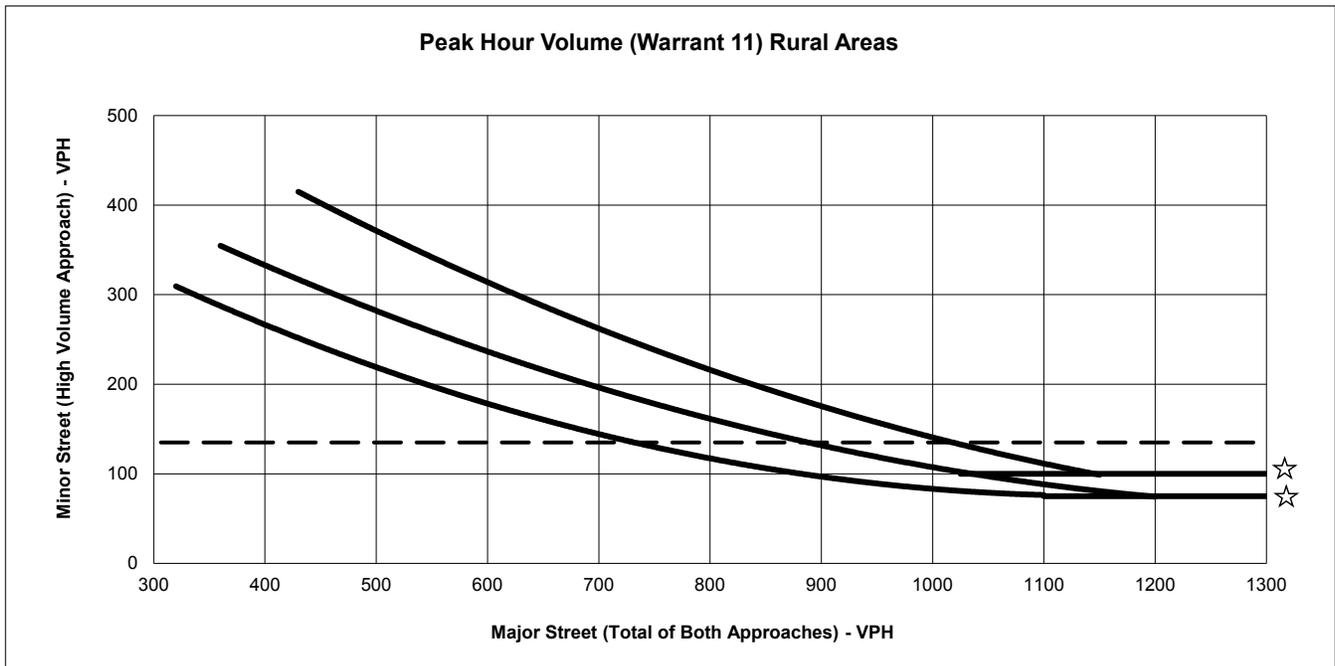


☆ NOTE:
 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 75 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Intersection: Rutherford Road / State Route 29
 Scenario: Existing Weekend Saturday MD Peak Hour Conditions
 Minor St. Volume: 110
 Major St. Volume: 2656
 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

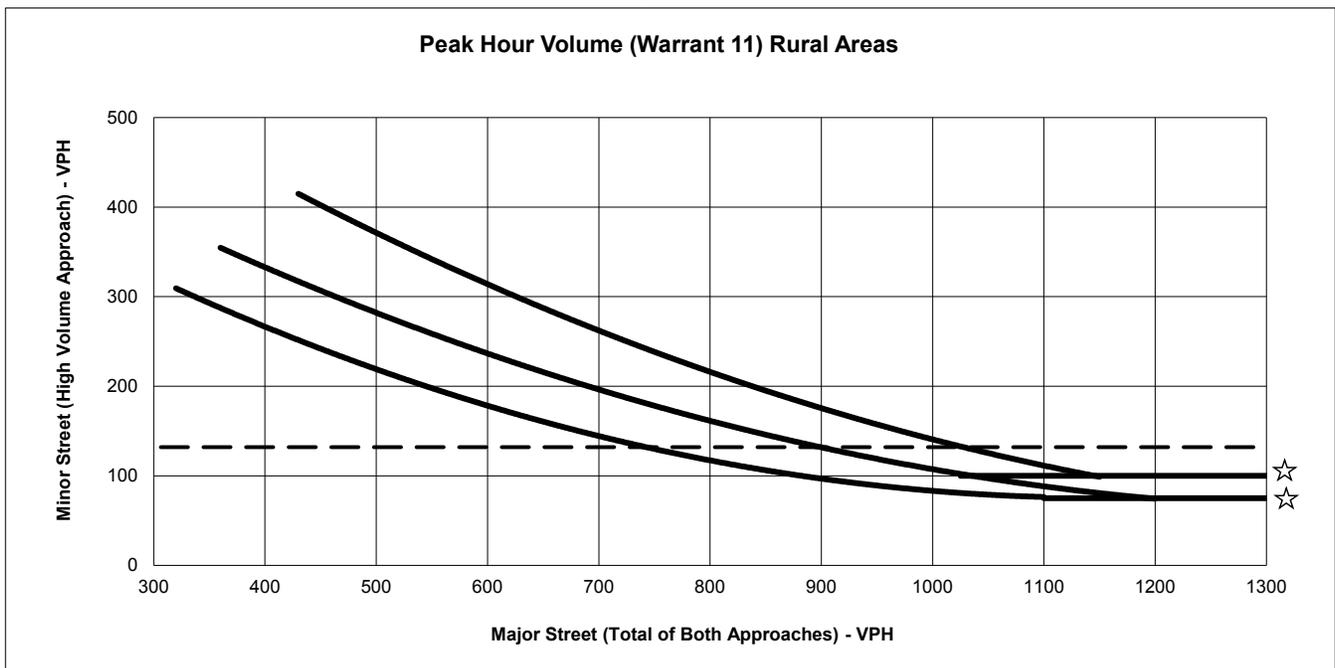


☆ NOTE:
 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 75 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Intersection: Rutherford Road / State Route 29
 Scenario: Near-Term (NP) Weekday PM Peak Hour Conditions
 Minor St. Volume: 135
 Major St. Volume: 2905
 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

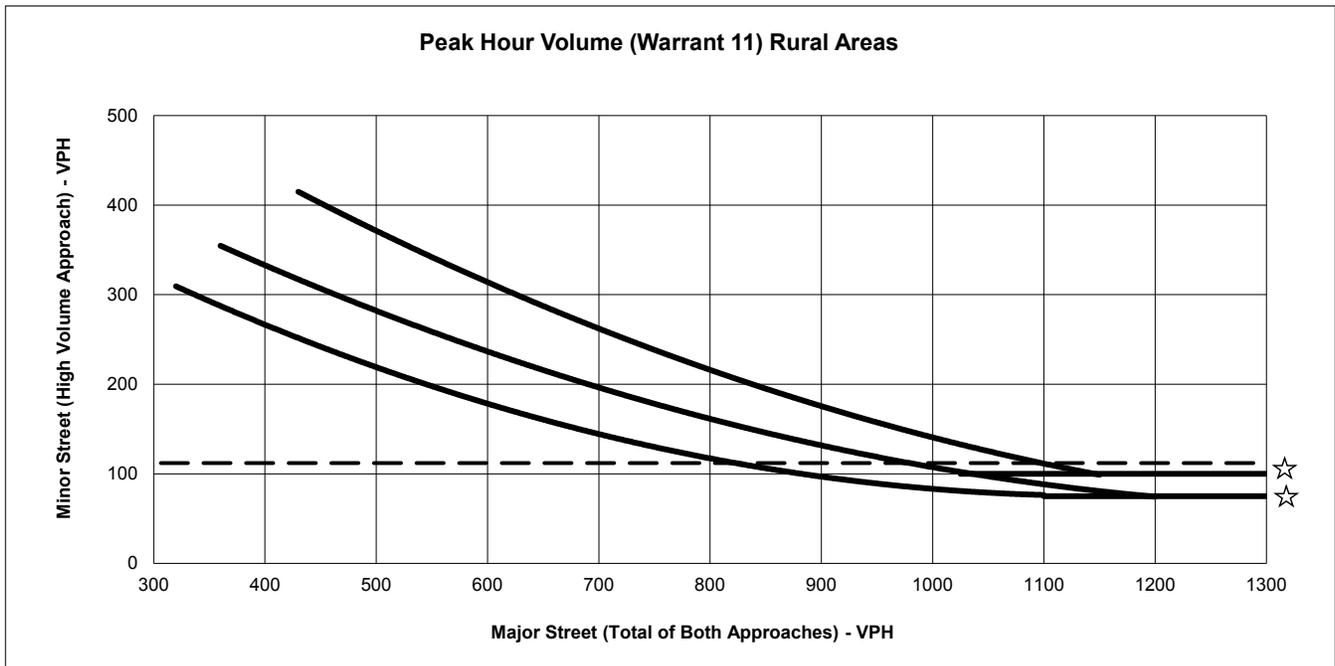


☆ NOTE:
 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 75 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Intersection: Rutherford Road / State Route 29
 Scenario: Near-Term Weekend Saturday MD Peak Hour Conditions
 Minor St. Volume: 132
 Major St. Volume: 2843
 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

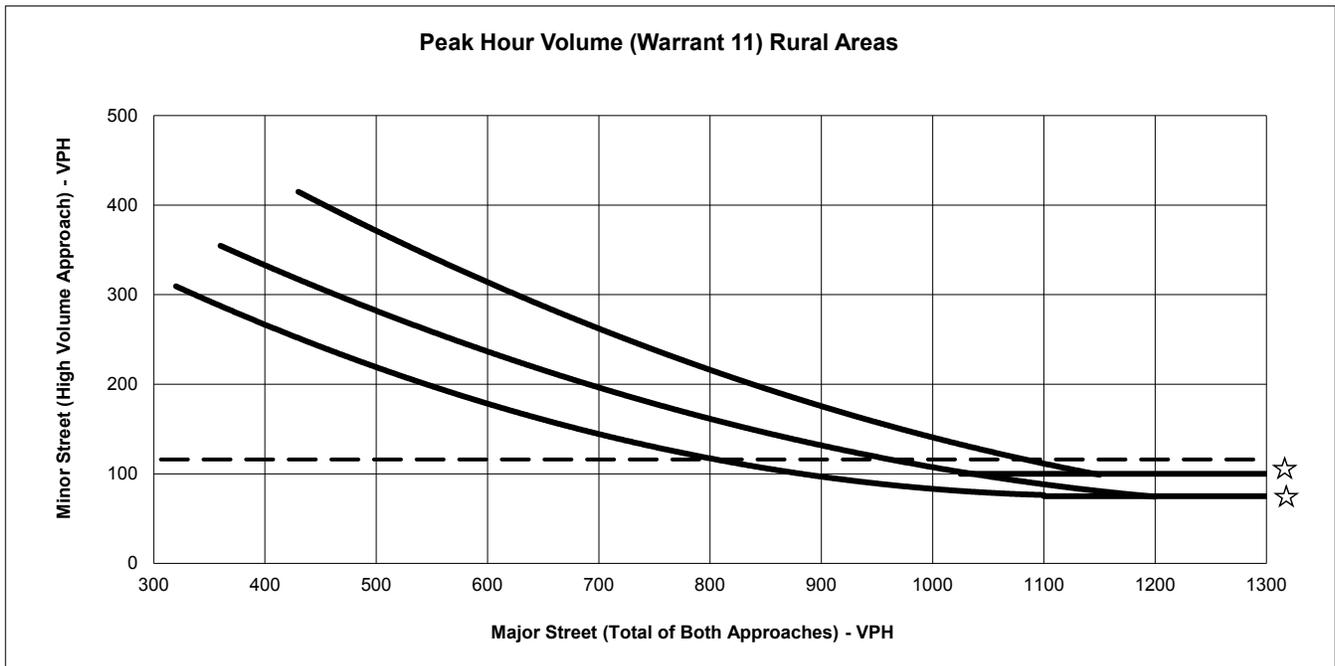


☆ NOTE:
 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 75 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Intersection: Rutherford Road / State Route 29
 Scenario: Existing plus Project Weekday PM Peak Hour Conditions
 Minor St. Volume: 112
 Major St. Volume: 2762
 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

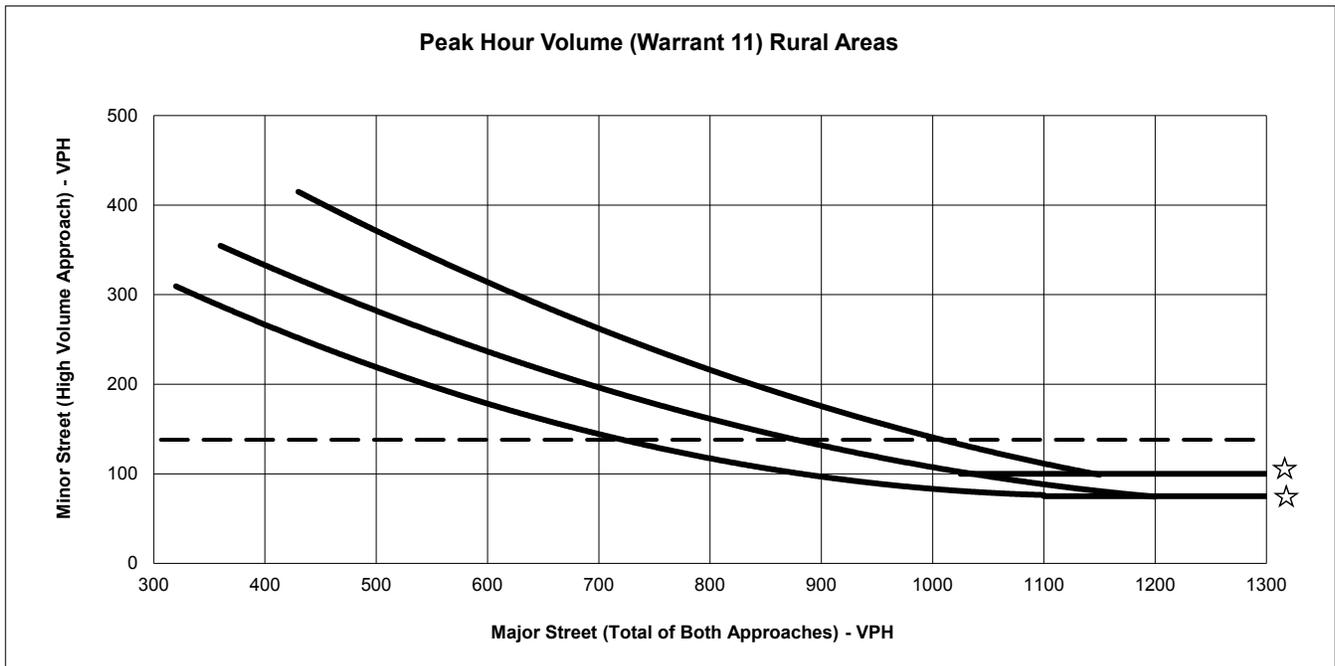


☆ NOTE:
 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 75 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Intersection: Rutherford Road / State Route 29
 Scenario: Existing plus Project Weekend Saturday MD Peak Hour Conditions
 Minor St. Volume: 116
 Major St. Volume: 2661
 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

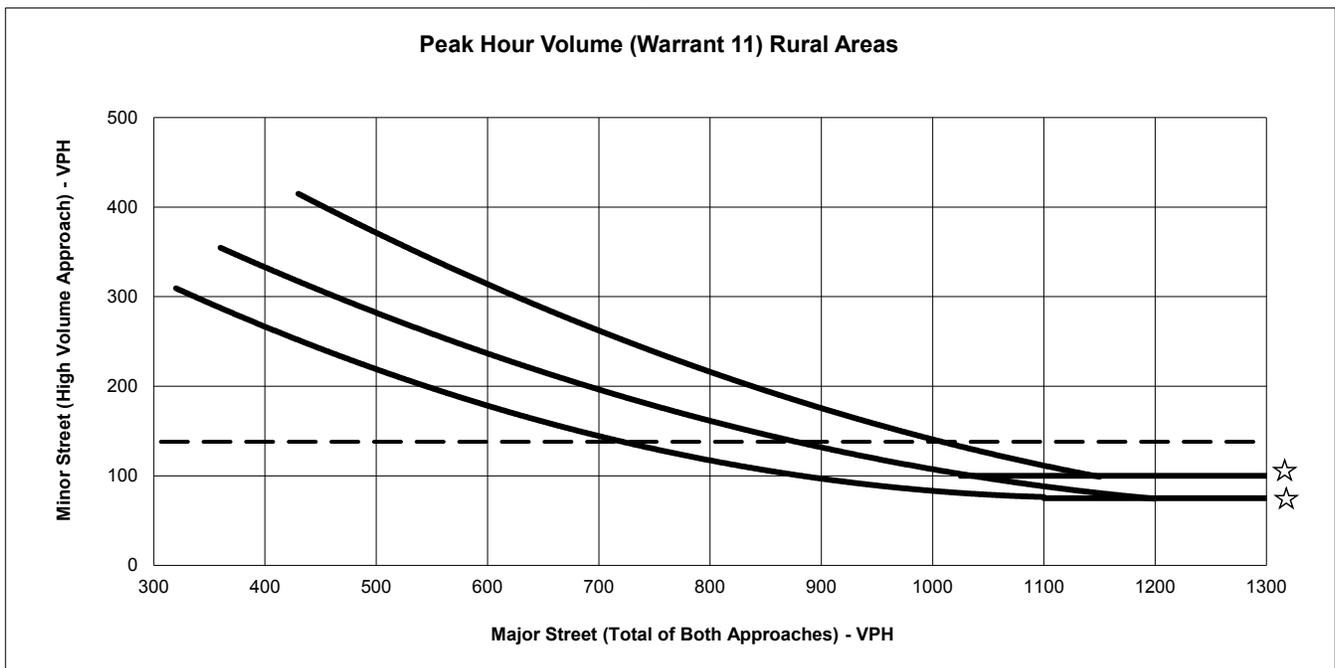


☆ NOTE:
 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 75 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Intersection: Rutherford Road / State Route 29
 Scenario: Near-Term plus Project Weekday PM Peak Hour Conditions
 Minor St. Volume: 138
 Major St. Volume: 2908
 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

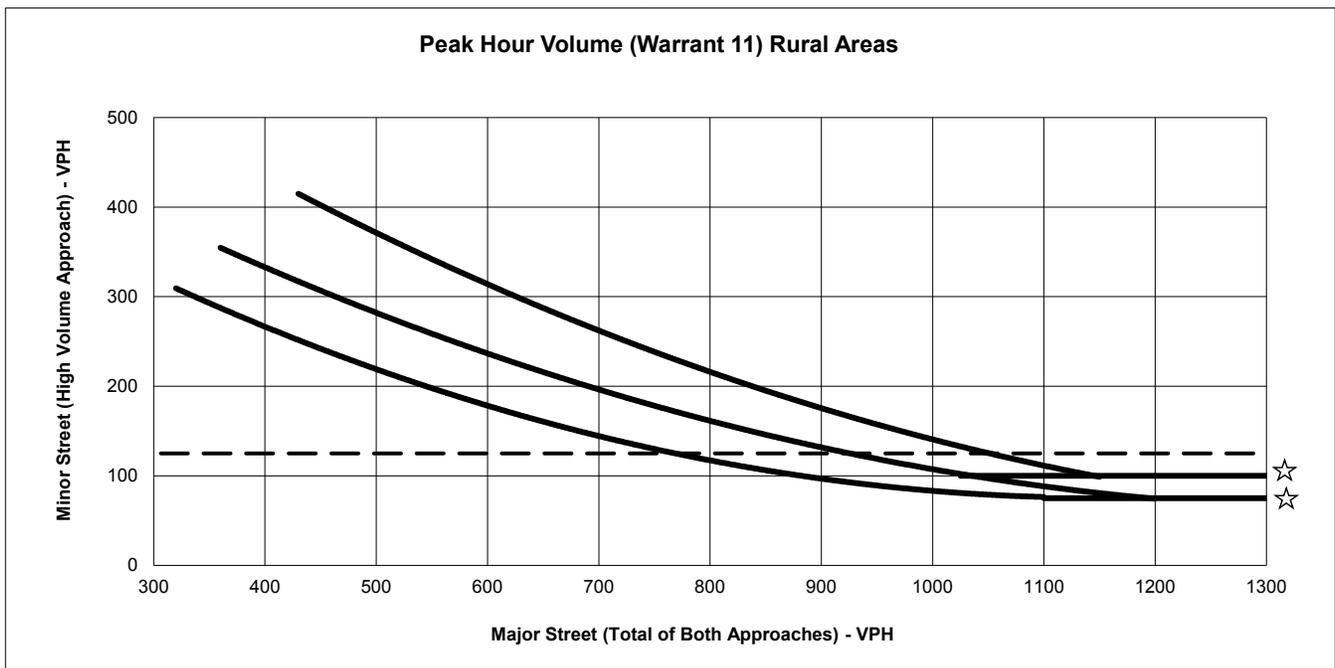


☆ NOTE:
 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 75 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Intersection: Rutherford Road / State Route 29
 Scenario: Near-Term plus Project Weekend Saturday MD Peak Hour Conditions
 Minor St. Volume: 138
 Major St. Volume: 2848
 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

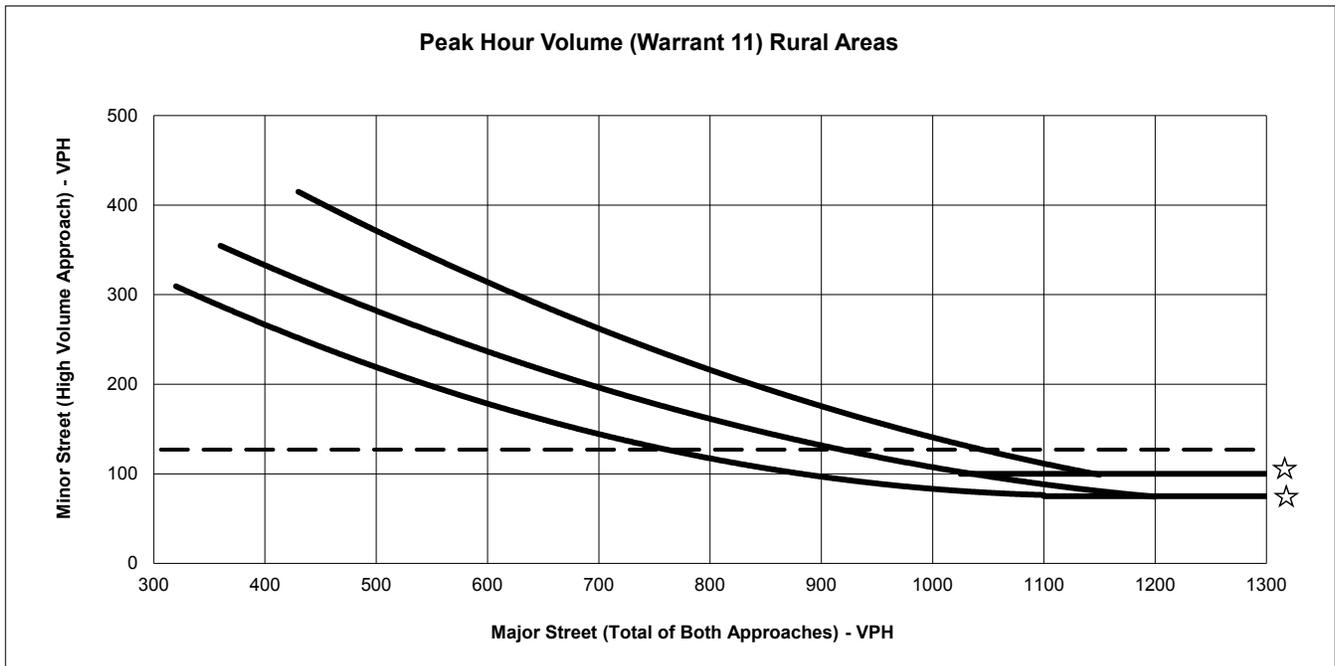


☆ NOTE:
 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 75 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Intersection: Rutherford Road / State Route 29
 Scenario: Cumulative Yr. 2030 (NP) Weekday PM Peak Hour Conditions
 Minor St. Volume: 125
 Major St. Volume: 3165
 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

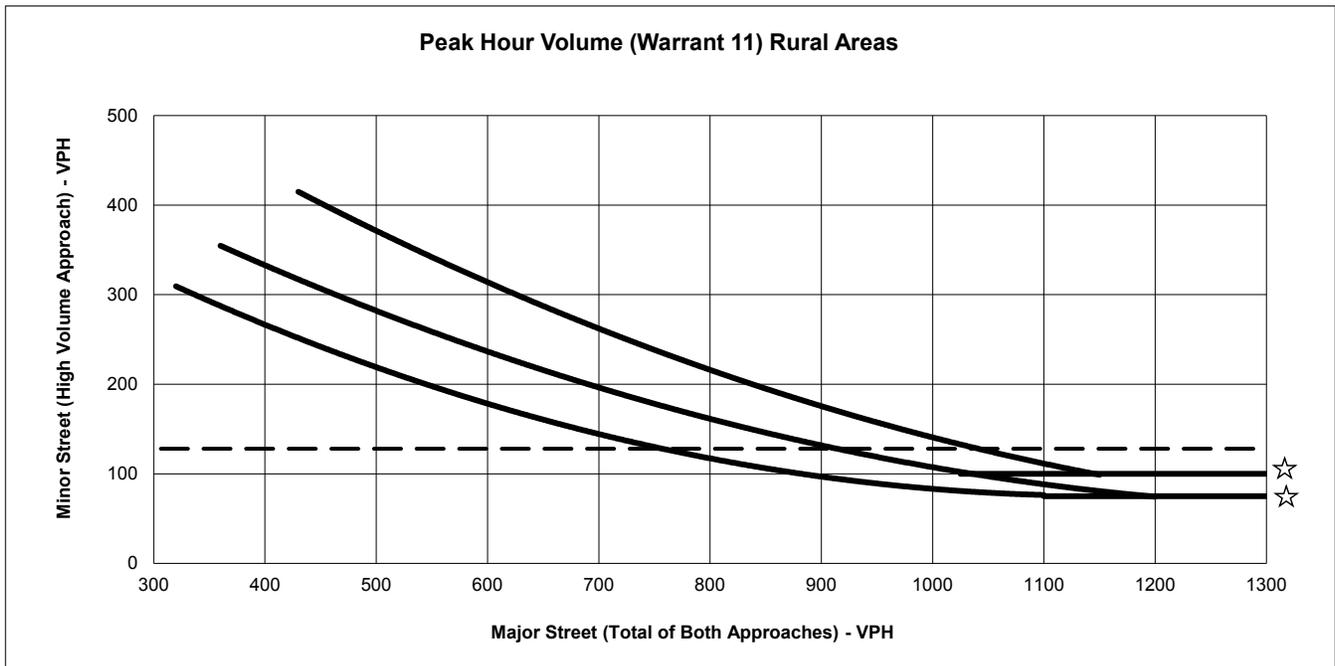


☆ NOTE:
 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 75 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Intersection: Rutherford Road / State Route 29
 Scenario: Cumulative Yr. 2030 (NP) Weekend Saturday MD Peak Hour Conditions
 Minor St. Volume: 127
 Major St. Volume: 3049
 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

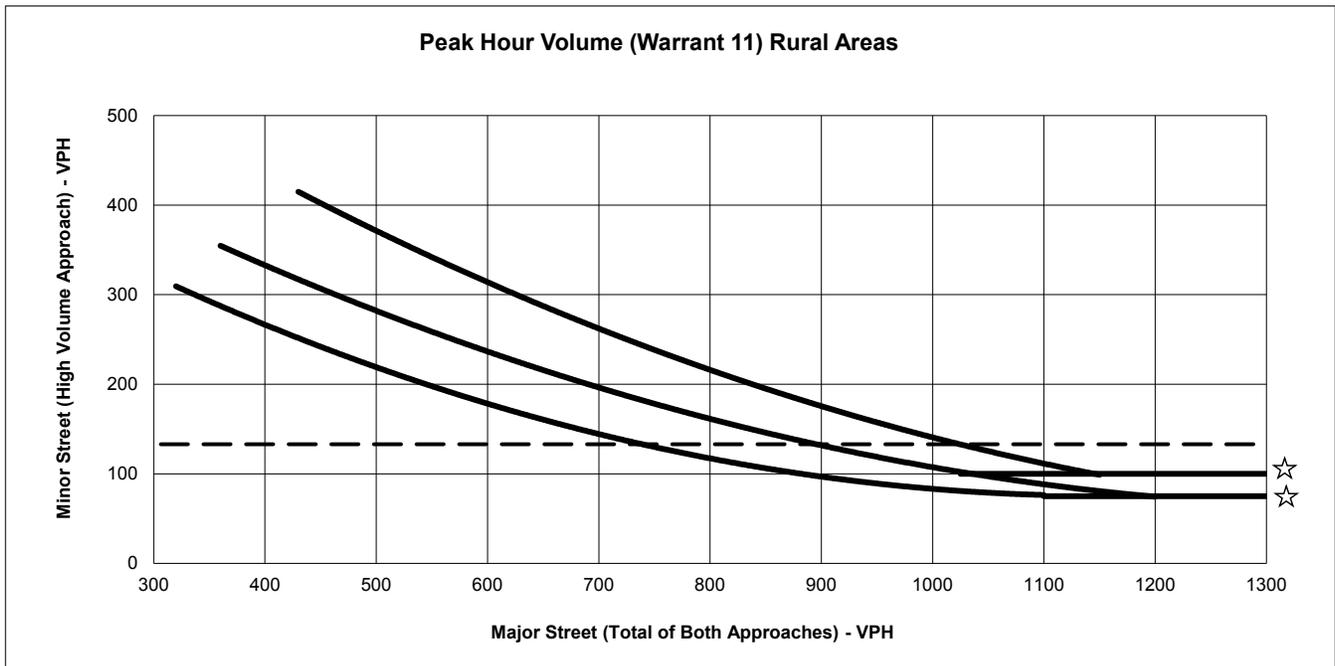


☆ NOTE:
 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 75 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Intersection: Rutherford Road / State Route 29
 Scenario: Cumulative Yr. 2030 plus Project Weekday PM Peak Hour Conditions
 Minor St. Volume: 128
 Major St. Volume: 3168
 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

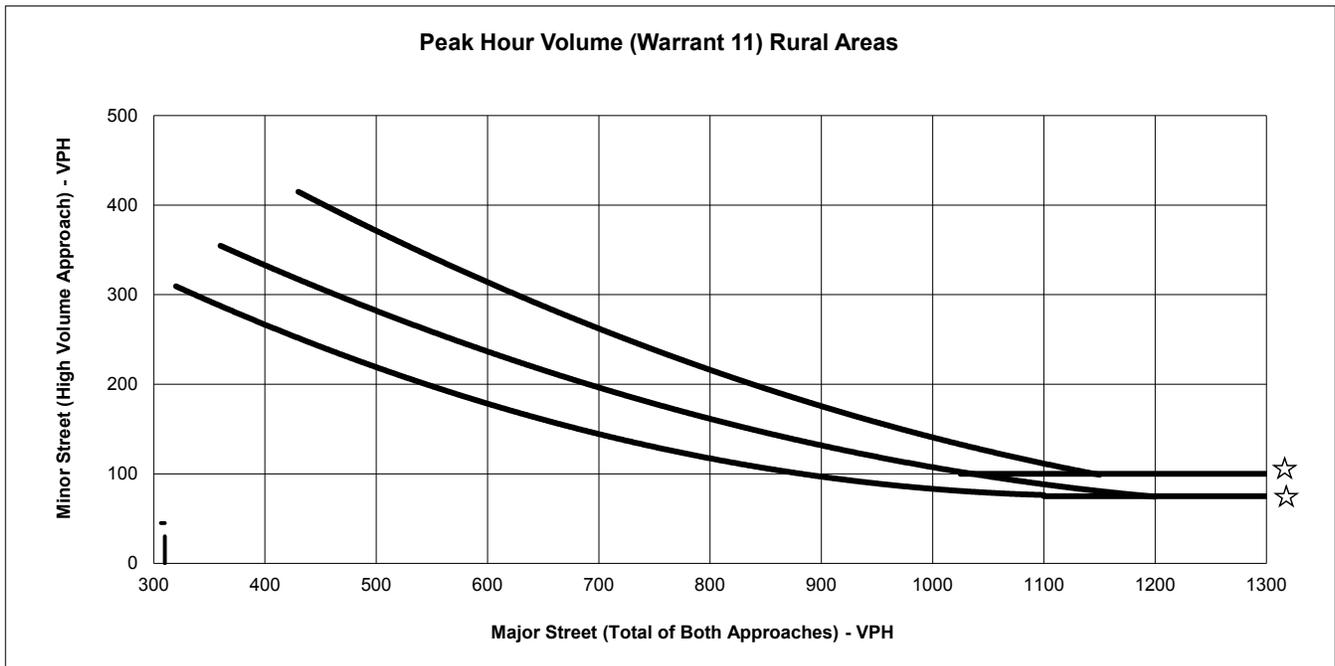


☆ NOTE:
 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 75 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Intersection: Rutherford Road / State Route 29
 Scenario: Cumulative Yr. 2030 (NP) Weekend Saturday MD Peak Hour Conditions
 Minor St. Volume: 133
 Major St. Volume: 3054
 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

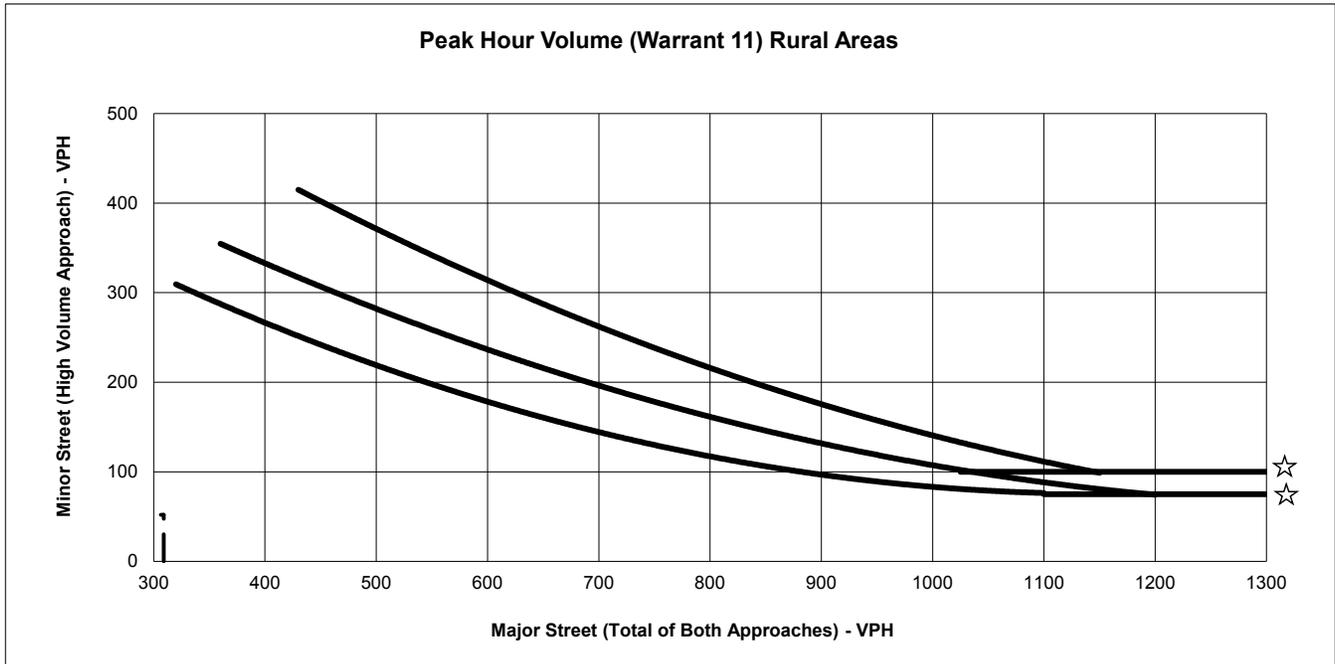


☆ NOTE:
 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 75 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Intersection: Rutherford Road / Conn Creek Road
 Scenario: Existing Weekday PM Peak Hour Conditions
 Minor St. Volume: 45
 Major St. Volume: 310
 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

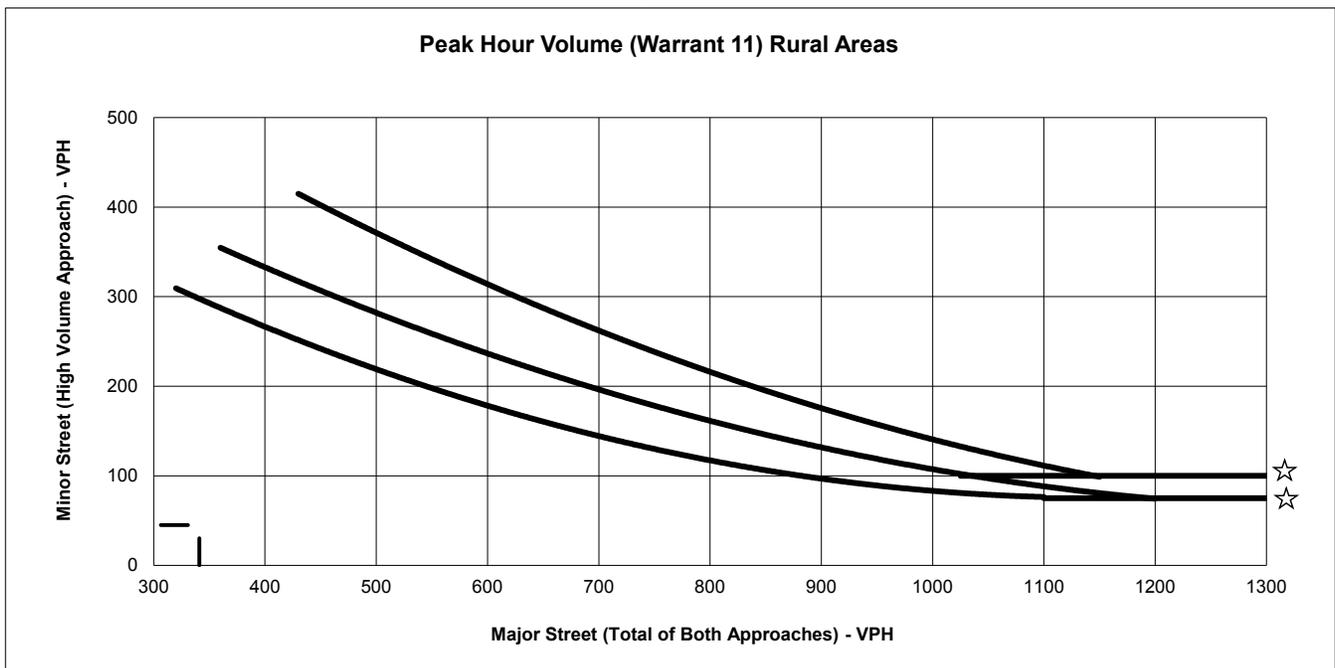


☆ NOTE:
 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 75 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Intersection: Rutherford Road / State Route 29
 Scenario: Existing Weekend Saturday MD Peak Hour Conditions
 Minor St. Volume: 52
 Major St. Volume: 309
 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

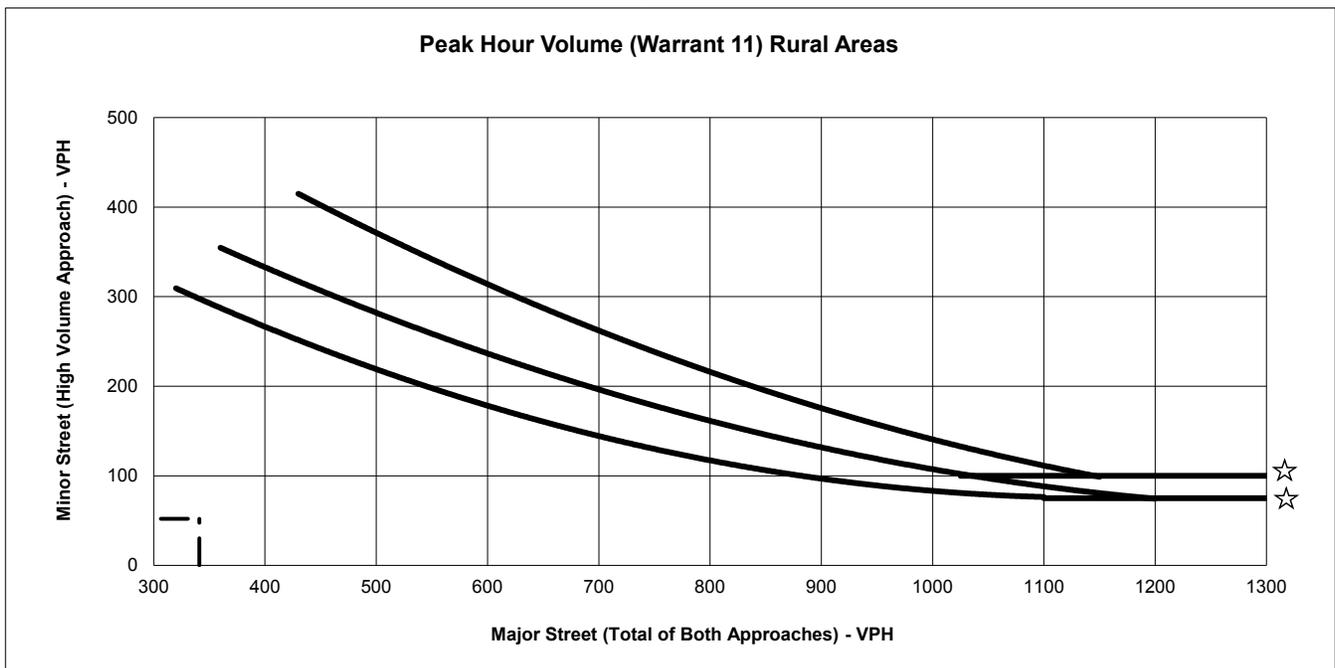


☆ NOTE:
 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 75 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Intersection: Rutherford Road / Conn Creek Road
 Scenario: Near-Term (NP) Weekday PM Peak Hour Conditions
 Minor St. Volume: 45
 Major St. Volume: 341
 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

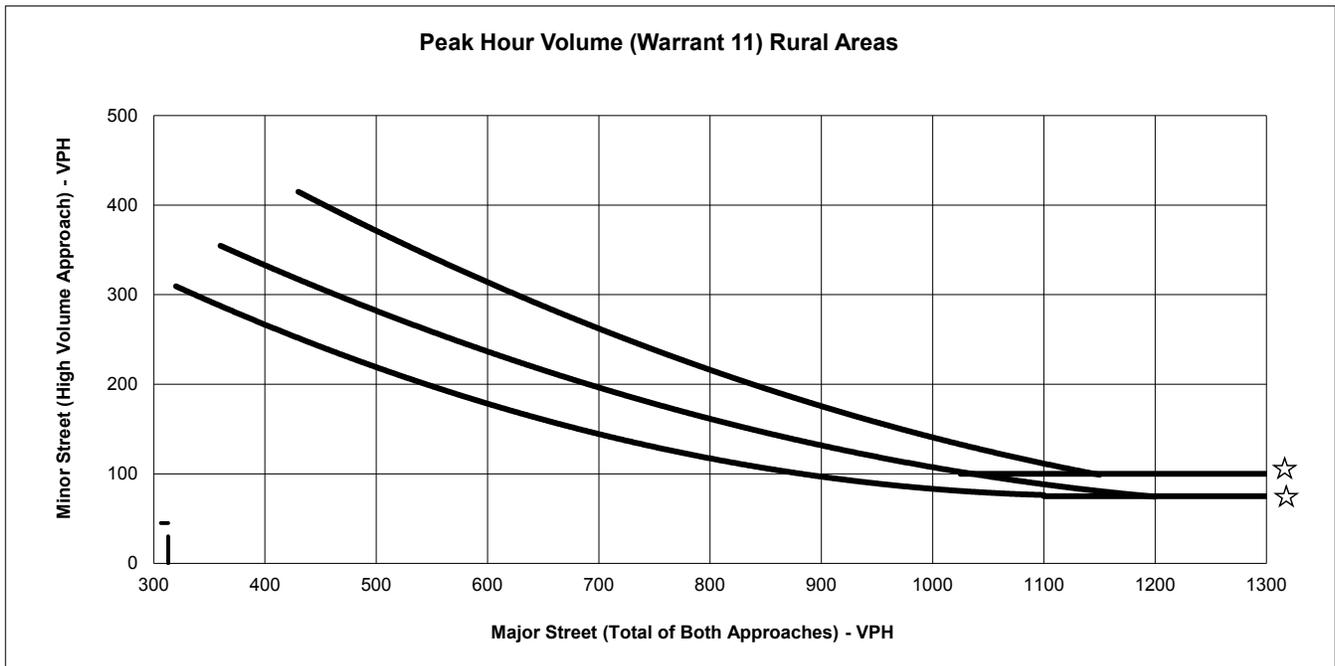


☆ NOTE:
 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 75 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Intersection: Rutherford Road / State Route 29
 Scenario: Near-Term (NP) Weekend Saturday MD Peak Hour Conditions
 Minor St. Volume: 52
 Major St. Volume: 341
 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

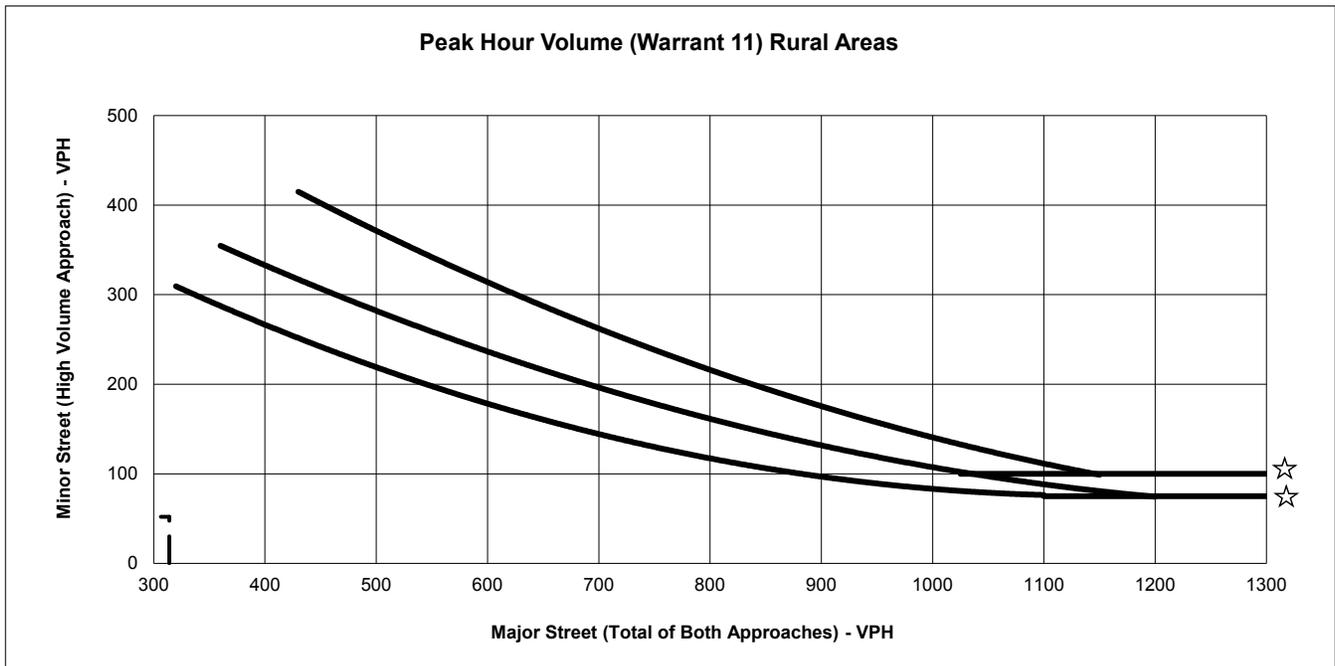


☆ NOTE:
 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 75 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Intersection: Rutherford Road / Conn Creek Road
 Scenario: Existing plus Project Weekday PM Peak Hour Conditions
 Minor St. Volume: 45
 Major St. Volume: 313
 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

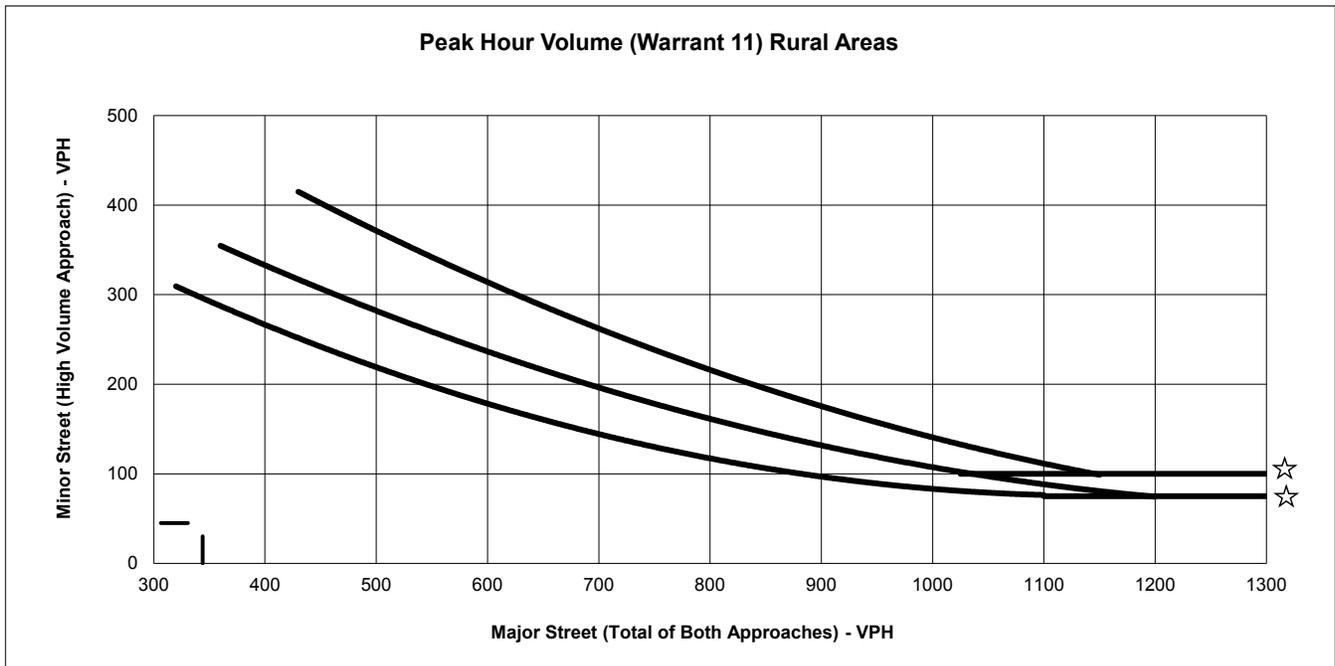


☆ NOTE:
 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 75 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Intersection: Rutherford Road / State Route 29
 Scenario: Existing plus Project Weekend Saturday MD Peak Hour Conditions
 Minor St. Volume: 52
 Major St. Volume: 314
 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

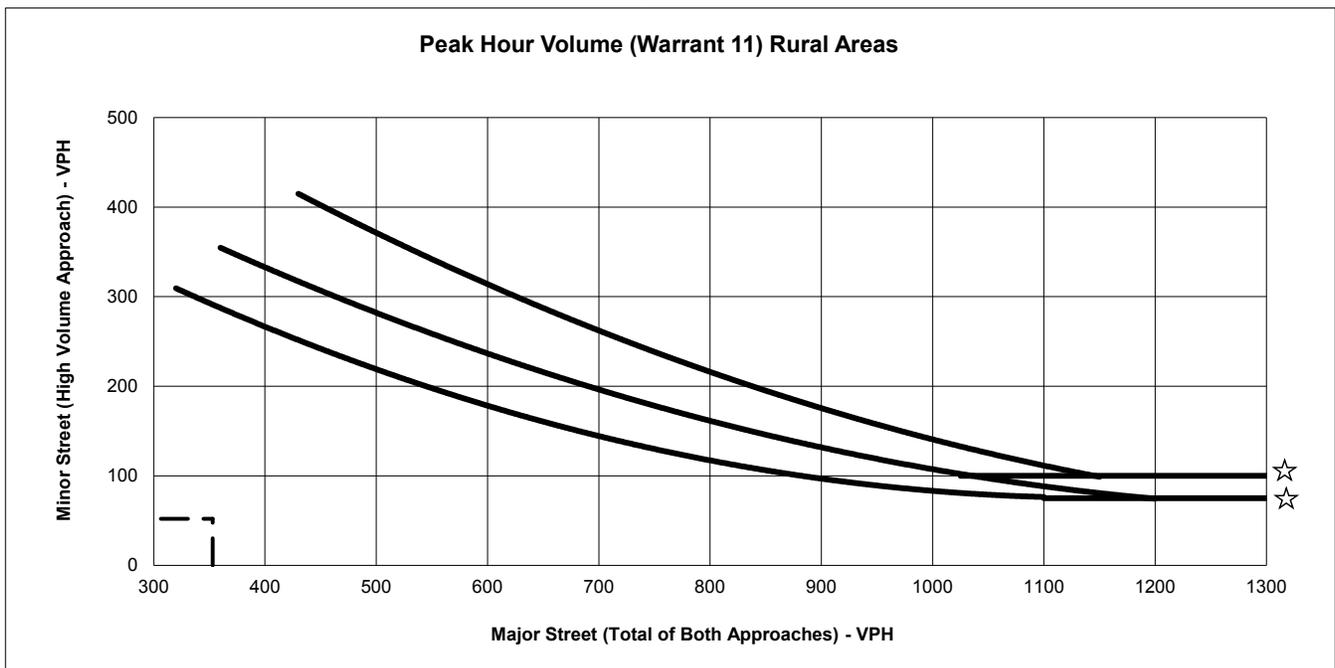


☆ NOTE:
 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 75 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Intersection: Rutherford Road / Conn Creek Road
 Scenario: Near-Term plus Project PM Weekday Conditions
 Minor St. Volume: 45
 Major St. Volume: 344
 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

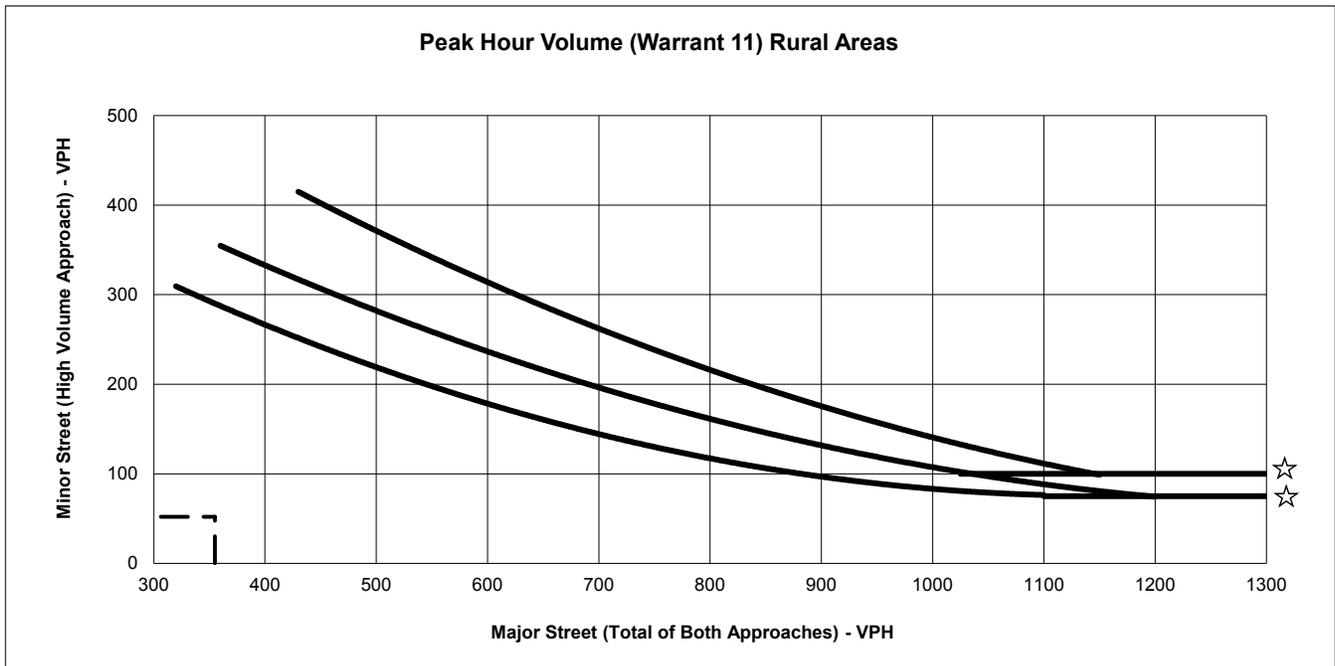


☆ NOTE:
 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 75 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Intersection: Rutherford Road / State Route 29
 Scenario: Near-Term plus Project Weekend Saturday MD Peak Hour Conditions
 Minor St. Volume: 52
 Major St. Volume: 353
 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

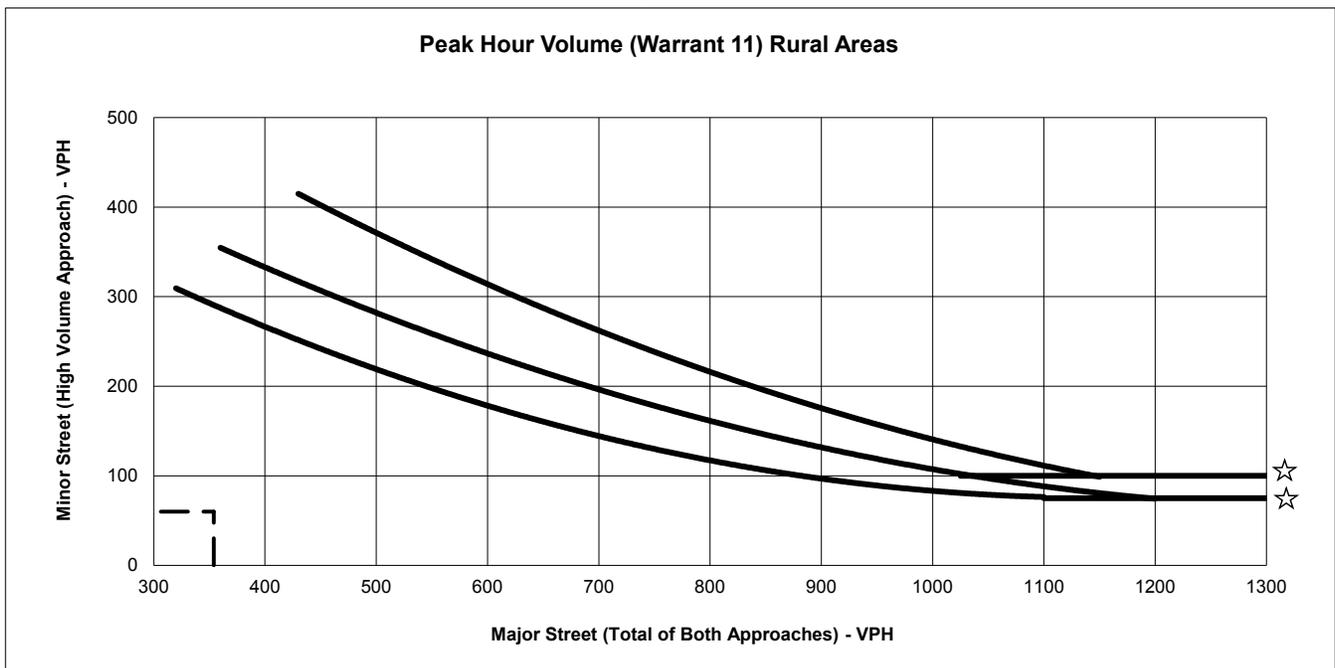


☆ NOTE:
 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 75 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Intersection: Rutherford Road / Conn Creek Road
 Scenario: Cumulative (NP) Weekday PM Peak Hour
 Minor St. Volume: 52
 Major St. Volume: 355
 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

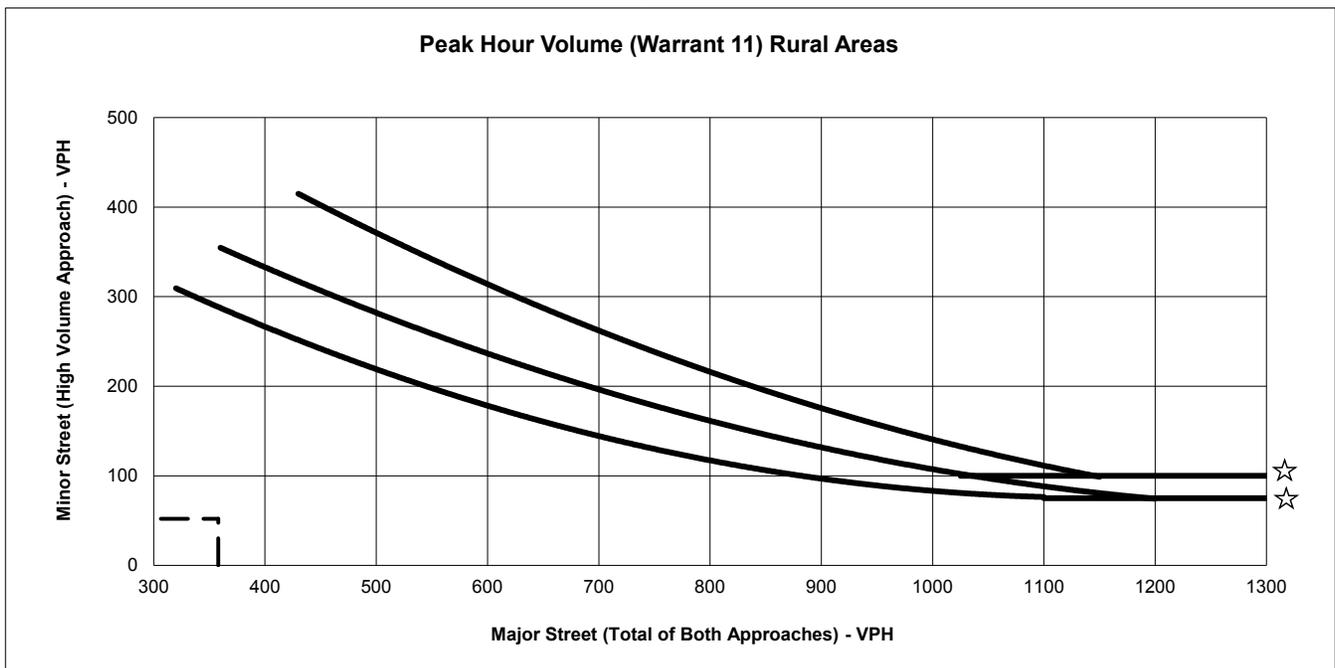


☆ NOTE:
 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 75 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Intersection: Rutherford Road / Conn Creek Road
 Scenario: Cumulative (NP) Weekend MiddayPeak Hour
 Minor St. Volume: 60
 Major St. Volume: 354
 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

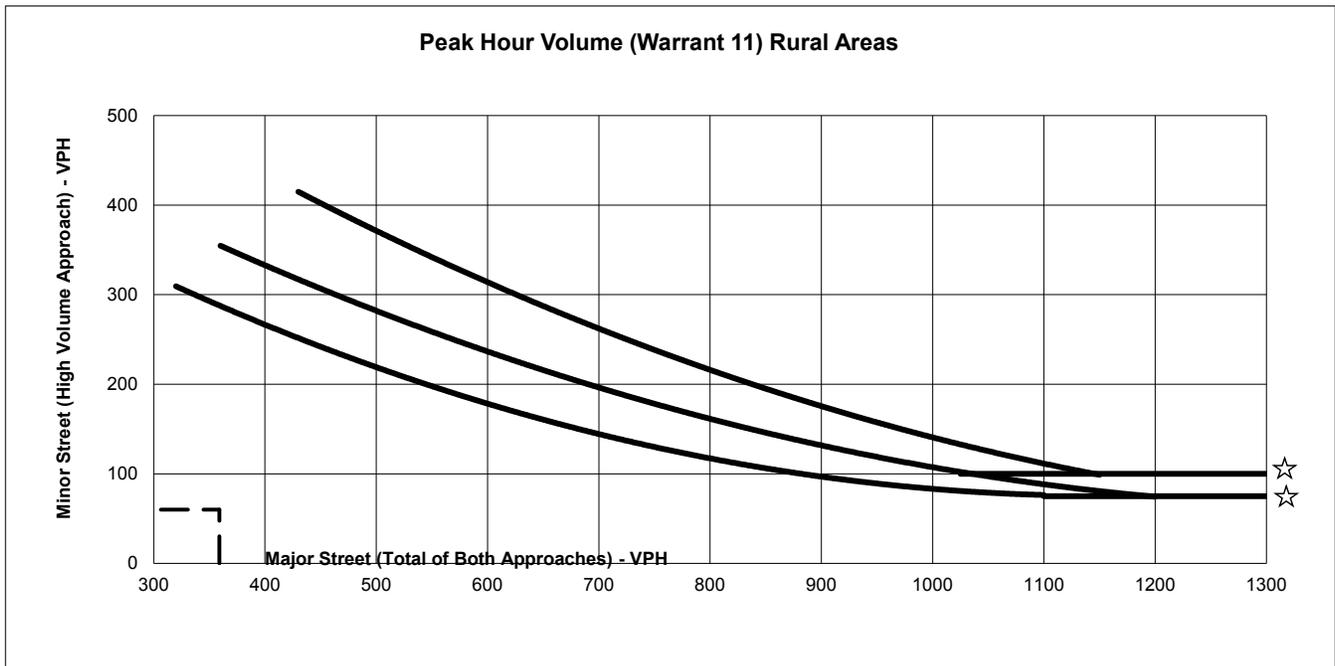


☆ NOTE:
 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 75 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Intersection: Rutherford Road / Conn Creek Road
 Scenario: Cumulative plus Project Weekday PM Peak Hour
 Minor St. Volume: 52
 Major St. Volume: 358
 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



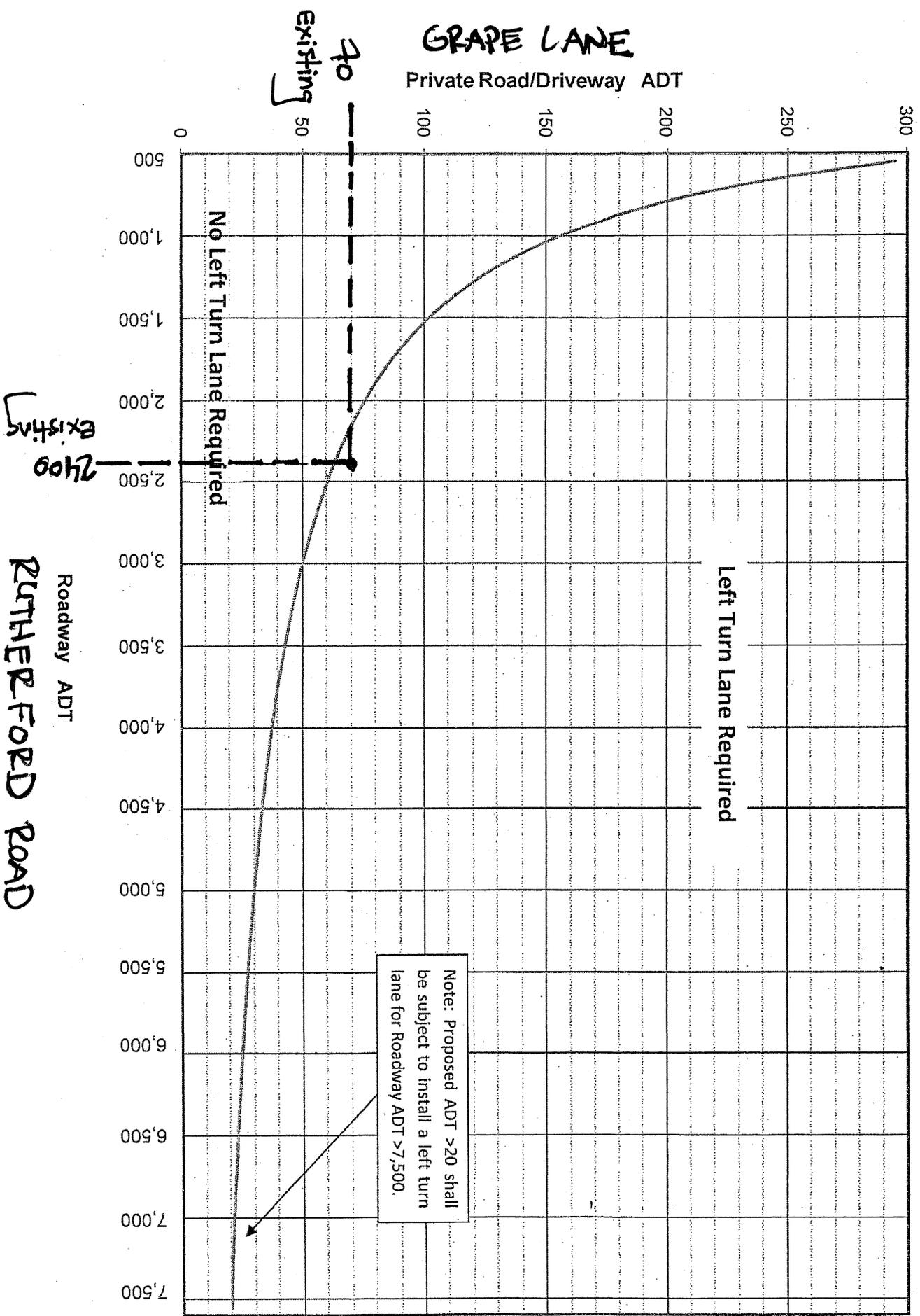
☆ NOTE:
 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 75 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Intersection: Rutherford Road / Conn Creek Road
 Scenario: Cumulative plus Project Weekend Midday Peak Hour
 Minor St. Volume: 60
 Major St. Volume: 359
 Warrant Met?: **NO**

LEFT TURN LANE WARRANT GRAPH

GRAPE LANE

Private Road/Driveway ADT



Roadway ADT
RUTHERFORD ROAD