May 11, 2016

Mr. Guy Byrne
Leslie Rudd Investment Company, Inc.
P.O. Box 105
Oakville, CA 94562-0105

Revised Traffic Study for Rudd Wines Winery & Tasting Room

Dear Mr. Byrne;

W-Trans has completed a focused traffic analysis addressing potential traffic impacts and circulation needs for the proposed new Rudd Wines Winery & Tasting Room (PLP14-0031) to be located at 4603 Westside Road southwest of the City of Healdsburg in unincorporated County of Sonoma. The scope for the traffic study was established based on the information requested by Mr. Greg Desmond of the County's Permit and Resource Management Department in a letter dated June 26, 2014.

Project Description

The site is a 26.2-acre parcel that is currently occupied by some vineyards and a small equipment shed/office building. Ultimately, the proposed project would add a new 8,145 square foot production building and 2,520 square foot tasting room to achieve a production capacity of 10,000 cases.

Study Area

The project site is on Westside Road, a rural major collector, approximately four and a quarter miles southwest of the nearest US 101 interchange. Westside Road is a two-lane road, with about a ten- to twelve-foot travel lane in each direction and a double yellow centerline. The posted speed limit on Westside Road near the project site is 45 miles per hour (mph). Traffic counts were collected north of Felta Road on Thursday August 23, 2012. Based on this data, Westside Road has an average daily traffic (ADT) volume of approximately 3,070 vehicles on weekdays. It is important to note that there is an elementary school located on Felta Road that contributed many of the vehicles counted at that location. Most trips associated with the elementary school arrived from and returned to US 101 at Westside Road, so were not present at the project driveway.

Collision History

The collision history for the segment of Westside Road within one-half mile of the project driveway was reviewed to determine any trends that may indicate a safety issue. Collision rates were calculated based on collision data available from the California Highway Patrol as published in their Statewide Integrated Traffic Records System (SWITRS) reports. The most current five-year period available is from March 1, 2010 to February 28, 2015. The calculated collision rate for the study segment was compared to the average collision rate for similar facilities statewide, as indicated in *2012 Collision Data on California State Highways*, Caltrans.

The statewide average collision rate for a rural two-lane road with a speed limit of less than 55 mph is 0.93 collision/million vehicles miles (c/mvm). Two collisions occurred just north and south of the project driveway, but the vehicles were traveling northbound and it was due to unsafe speed. The calculated collision rate for the two reported collisions during a five-year study period is 0.35 c/mvm, which is lower than the statewide average of 0.93 c/mvm for similar facilities. Similarly, the fatality rate of 0.0 was below the statewide average. Though the injury rate was higher than the statewide average, with only two collisions reported for the study segment, one of which resulted in an injury, the above-average rate is not seen as significant. A copy of the collision rate spreadsheet is enclosed for reference.

Trip Generation

The anticipated trip generation for a proposed project is typically estimated using standard rates published by the Institute of Transportation Engineers (ITE) in *Trip Generation Manual*, 9th Edition, 2012. However, this publication does not contain information for wineries. Therefore, Sonoma County's Winery Trip Generation form was used to determine the potential trip generation for existing and proposed conditions.

The project as proposed is expected to have 24 employees total. Each of the 24 employees is assumed to generate three trip ends daily, or 72 daily trips for all employees. Based on year-long counts taken at a wine tasting facility, visitation was found to range from 47 percent of the maximum number of tasting visitors during the winter months to 100 percent during the summer and up to 99 percent during harvest. The tasting room is expected to serve a peak of 200 and an average of 140 guests on a daily basis. Per County policy, assuming an average of 2.5 persons per vehicle, the tasting room operation will generate an average of 112 visitor trip ends daily. The sum of these typical daily trips is 186 trips per day, which includes employees and tasting visitors, as well as deliveries of materials and supplies. The estimated truck traffic is approximately two trips per day on average. Special event traffic is not shown in the tables below. It is discussed in the next section and included in a separate enclosure, which shows the number of vehicles on the event days.

Data collected by W-Trans at a local Sonoma County winery was used to develop factors for winery tasting room trips made during both the p.m. and weekend midday peak hours. Based on this information it was assumed that the p.m. peak accounted for ten percent of the weekday daily trips, and the weekend midday peak captures thirteen percent of traffic on a weekend day. Details of the trip generation derivation for an average day are shown in Table 1 and provided on the enclosed spreadsheet.

Table 1 – Trip Generation Summary – Average (non-Harvest)

Trip Type	Unit	Daily		PM Peak Hour			Weekend MD Peak		
		Rate	Trips	Trips	In	Out	Trips	In	Out
Winery Employees	11	3	33	11	3	8	11	5	6
Vineyard Employees	3	3	9	3	1	2	3	1	2
Tasting Employees	10	3	30	10	3	7	10	5	5
Tasting Visitors	140	0.8	112	11	4	7	15	8	7
Truck Traffic	2	n/a	2	0	0	0	0	0	0
Total New Trips			**186**	**35**	**11**	**24**	**39**	**19**	**20**

Note: Trip generation does not include special event traffic

The employee count is expected to increase to 38 employees with extra staff hired during harvest. The 38 employees for the winery and tasting room operations during the harvest season are expected to generate 114 daily trips. Peak visitation during harvest is expected to be 198 visitors or 158 daily trips. Truck traffic is expected to be 1.67 daily trips, so was rounded to two trips, as shown in Table 2, which presents the anticipated peak harvest-period trip count.

Table 2 – Trip Generation Summary – Harvest

Trip Type	Unit	Daily		PM Peak Hour			Weekend MD Peak		
		Rate	Trips	Trips	In	Out	Trips	In	Out
Winery Employees	17	3	51	17	4	13	17	8	9
Vineyard Employees	11	3	33	11	3	8	11	6	5
Tasting Employees	10	3	30	10	3	7	10	5	5
Tasting Visitors	198	0.8	158	16	5	11	21	11	10
Truck Traffic	n/a	n/a	2	0	0	0	0	0	0
Total New Trips			**274**	**54**	**15**	**39**	**59**	**30**	**29**

Note: Trip generation does not include special event traffic

As indicated by the difference between the trip generation for typical daily conditions and during harvest, the traffic at a winery varies substantially over the course of the year, depending on the season. The variation by month, including the increase in employees needed for bottling in July and additional employees needed for harvest from August through October, is shown for each category of trip generator in Table 3.

Table 3 – Trip Generation Summary – ADT Variation by Month

	Jan	Feb	Mar	Apr	May	Jun	Jul	**Aug**	**Sept**	**Oct**	Nov	Dec
Employees	72	72	72	72	72	72	87	**114**	**114**	**114**	72	72
Truck Trips	0.95	0.95	0.95	0.92	0.95	0.98	2.15	**1.67**	**1.65**	**0.95**	0.95	0.95
Visitors	77	83	94	106	120	126	160	**158**	**120**	**125**	101	75
Total	150	156	167	179	193	199	249	**274**	**236**	**240**	174	148

Notes: Months in bold represent harvest season conditions; total values rounded to nearest whole number

Agricultural Promotional Events

The project proposal includes 37 events per year, including 12 agricultural promotional events, 13 industry-wide events, and 12 wine maker lunches or dinners. Of the 12 agricultural promotional events proposed per year, six events would have as many as 80 guests, three events would have 100 guests, and three events would have as many as 150 guests. Six winemaker lunches and six winemaker dinners are proposed per year with as many as 36 guests per event. The winery would also participate in as many as 13 days of industry-wide events, such as Winter Wineland and Barrel Tasting. It was assumed that a staff of eight employees would be needed for the maximum-sized site-specific 150-person event. The 150-person events are proposed to occur on Saturday afternoons, at which time employees that work weekdays would not be on the site. Using occupancy of 2.5 persons per vehicle for guests, and solo occupancy for staff, a 150-person event would be expected to generate 136 trip ends at the facility. This would include 68 inbound trips prior to the start of the event and 68 outbound trips upon its conclusion.

Since events occur so infrequently, trips from events are not included in the trip generation estimates shown above or as presented on the enclosed Winery Trip Generation form. The trips that would be generated on an event day are shown on the Event Matrix, which is enclosed.

Event Parking

The project site should provide adequate parking to accommodate daily operations at the winery as well as agricultural promotional events. For the largest 150-person event, 60 guest vehicles would be expected to arrive at the site in addition to eight employee vehicles, resulting in a total parking demand of 68 spaces. The enclosed

site plan indicates a total parking supply of approximately 75 spaces, including 27 designated parking spaces and room for approximately 48 vehicles between the vineyard rows. The parking supply as proposed is more than adequate for typical daily operations as well as the winery's largest special event.

Harvest Conditions Parking

Assuming the total number of employees during harvest season is 38 and the peak number of visitor vehicles during the day is 21, the parking supply (assuming 1 vehicle per employee) would need to be at least 59 spaces. The proposed parking supply is adequate for harvest season conditions.

Site Access

The project site is accessed via a proposed driveway approximately 20 feet south of the existing driveway on Westside Road. It is expected that most traffic will arrive from the north as this is the shortest path to US 101 and there are numerous other wineries as well as hotels to the north.

Prevailing Speed

A radar speed study was conducted on Thursday, October 8, 2015 between 1 and 2 p.m. to determine the prevailing speed of vehicles traveling on Westside Road as they approach the existing driveway. Conducting a speed survey outside peak periods results in ideal conditions for capturing free-flow speeds of motorists. Due to the low volume of the roadway, it took an hour to obtain speeds of 25 vehicles in each direction for a total sample size of 50 vehicles. The 85th percentile of vehicle speeds sampled was 40 mph, which is lower than the posted speed limit. It is further noted that nearly 70 percent of vehicles were traveling between 28 and 38 mph and only two vehicles were sampled at speeds exceeding 45 mph.

An additional speed survey was conducted on Tuesday, December 1, 2015 between 1 and 2 p.m. to determine the speed at which southbound traveling drivers exit the curve just north of the project driveway. It is noted that the *California Manual on Uniform Traffic Control Devices* (CA-MUTCD) indicates that a minimum of 50 vehicles should be sampled for speed surveys that are to be used for Engineering and Traffic Surveys to establish a posted speed limit on a road segment. However, given that the speed survey was performed to obtain prevailing speeds for the sight distance analysis, and not for a use such as a speed limit that is legally binding, the smaller sample is adequate to provide guidance. The 85th percentile of southbound vehicle speeds was found to be 35 mph, which is higher than the posted advisory speed sign of 30 mph, but lower than the posted speed limit of 45 mph. Output data from the speed surveys are enclosed.

Sight Distance

At driveways a substantially clear line of sight should be maintained between the driver of a vehicle waiting on the driveway and the driver of an approaching vehicle. Adequate time must be provided for the waiting vehicle to either cross, turn left, or turn right, without requiring the through traffic to radically alter their speed. Sight distance along Westside Road from the proposed driveway location was evaluated based on sight distance criteria contained in *A Policy on Geometric Design on Highways and Streets* published by American Association of State Highway and Transportation Officials (AASHTO). Because this is a private driveway and not a public road, stopping sight distance was used to evaluate sight distance at the project driveway. Measurements of available sight distance at the project driveway were taken in the field using a measuring wheel and an object representing the height of a driver sitting in a car at the project driveway. Measuring from the project driveway the distance at which the object representing the height of a driver goes out of view is determined for both directions.

Looking South

Looking to the south of the driveway, there is a more gradual curve with a posted advisory speed of 25 mph for northbound traffic. A speed survey was conducted at the location of the existing driveway to capture 85th percentile speeds of northbound and southbound vehicles. The **northbound** 85th percentile speed was found to

be 36 mph. At speeds of 35 mph, 250 feet of stopping sight distance is recommended for motorists on Westside Road. Sight lines at the location of the proposed driveway are approximately 350 feet, which is an adequate distance for speeds of 40 mph. The speed profiles with 85th percentile speeds are enclosed. Sight distance measurements are shown graphically in another enclosure.

Looking North

To the north of the driveway there is a sharp curve with a posted advisory speed of 30 mph for southbound traffic. Speeds taken at the existing driveway indicate an 85th percentile southbound speed of 44 mph. For speeds of 45 mph, 360 feet of stopping sight distance is required. At the location of the proposed driveway, sight lines are limited to approximately 310. Because this speed was recorded at the project driveway and not at the location where a southbound vehicle would see a vehicle at the project driveway and react, a second speed survey was conducted at the location of the curve. The 85th percentile speed of **southbound** vehicles at the point at which they exit the curve north of the project driveway was found to be 35 mph. For an approach speed of 35 mph, 250 feet of stopping sight distance on Westside Road is recommended and for a 40-mph approach speed, 305 feet is recommended. The 310 feet available is more than adequate for the 35-mph critical speed sampled at the point where drivers would first be able to see and react to a vehicle exiting the driveway. It is recommended that vegetation along the project frontage be planted and maintained such that it does not exceed three feet in height to maximize clear sight lines.

Turn Lane Warrants

The need for a left-turn lane on Westside Road at the proposed driveway was evaluated using volumes from a count obtained on Westside Road north of Felta Road in August of 2012. Because much of the traffic on this segment is associated with the elementary school on Felta Road, this results in a conservative analysis. To capture "typical" conditions, the 50-person event at the winery was used for this analysis rather than the infrequent larger events. This size of event is expected to generate 24 inbound trips in a single hour, which exceeds the inbound volumes under typical operation without an event. It is assumed employees would arrive in the hour before the guests arrive, so they were not included in the project volumes for the turn warrant analysis. The turn warrant analyses were conservatively performed assuming peak hour volumes on Westside Road. The left-turn warrant analysis was first run with all traffic arriving from the south and making a left turn into the project site even though such an arrival pattern is not expected. A left-turn lane is not warranted on Westside Road at the project site even under these highly unlikely conditions. The right-turn warrant analysis was then run with all the traffic arriving from the north. A right-turn lane or taper is also not warranted on Westside Road at the project site.

Copies of the warrant analysis spreadsheets are enclosed for reference.

Alternative Modes Access

There are currently no pedestrian or bicycle facilities on Westside Road, but there are plans to include Class III bicycle facilities, based on the *2014 SCTA Countywide Bicycle and Pedestrian Plan*. It is typical for pedestrians and bicyclists to share the travel way with vehicles on rural roads such as Westside, and this will continue upon signing the road as a Class III facility. The project includes no changes that would impede any existing use or future improvements.

Conclusions and Recommendations

- The proposed project would generate an average of 186 new trips on a daily basis, including 35 p.m. peak hour trips and 39 weekend midday peak hour trips.

- During harvest, the proposed project would generate 274 new daily trips, including 54 p.m. peak hour trips and 59 weekend midday peak hour trips.

- Westside Road has experienced collisions at a rate below the statewide average, so exhibits an acceptable safety condition.

- The site plan indicates a parking supply of 75 parking spaces, which is more than adequate for the largest special event as well as for harvest conditions.

- The speed sampled on northbound Westside Road approaching the project driveway was 36 mph; sight distance to the south of the proposed driveway exceeds the minimum requirement for an approach speed of 40 mph so is more than adequate for the prevailing speed.

- Sight distance to the north of the proposed driveway location along Westside Road is more than adequate for southbound vehicles traveling at 35 mph, which is the speed at which drivers were recorded exiting the curve to the north of the driveway. It is recommended that the landscaping along the project frontage be planted and maintained to be less than three feet in height to maximize the availability of clear sight lines, such that a driver traveling southbound would have a clear view of the driveway prior to accelerating out of the curve to the north of the driveway.

- Neither a left-turn or right-turn lane nor a right-turn taper are warranted on Westside Road at the proposed driveway for peak hour traffic or special event traffic.

We appreciate the opportunity to provide these services. Please call us if you have any questions.

Sincerely,

Lauren Davini, EIT
Assistant Transportation Engineer

Dalene J. Whitlock, PE, PTOE
Principal

DJW/lgd/SOX508.L1

References

2012 Collision Data on California State Highways, California Department of Transportation, 2012
A Policy on Geometric Design of Highways and Streets, 6th Edition, American Association of State Highway and Transportation Officials, 2011
California Manual on Uniform Traffic Control Devices for Streets and Highways, California Department of Transportation, 2012
Intersection Channelization Design Guide, National Cooperative Highway Research Program (NCHRP) Report No. 279, Transportation Research Board, 1985
SCTA Countywide Bicycle & Pedestrian Master Plan, Sonoma County Transportation Authority, 2014
Statewide Integrated Traffic Records System (SWITRS), California Highway Patrol, 2010-2015

Enclosures

Collision Rate Spreadsheet
Winery Trip Generation Worksheet
Sonoma County Winery Events Matrix
Event Parking Exhibit
Speed Survey
Sight Distance Exhibit
Left-turn Lane Warrant Spreadsheet

SEGMENT COLLISION RATE CALCULATIONS

SOX508 Rudd Wines Winery & Tasting Room

Location: 4603 Westside Road and Project Driveway

Date of Count: Thursday, August 23, 2012
ADT: 3,100

Number of Collisions: 2
Number of Injuries: 1
Number of Fatalities: 0
Start Date: March 1, 2010
End Date: February 28, 2015
Number of Years: 5

Highway Type: Conventional 2 lanes or less
Area: Rural
Design Speed: ≤55
Terrain: Flat

Segment Length: 1.0 miles
Direction: North/South

$$\frac{\text{Number of Collisions x 1 Million}}{\text{ADT x 365 Days per Year x Segment Length x Number of Years}}$$

$$\frac{2 \times 1{,}000{,}000}{3{,}100 \times 365 \times 1 \times 5}$$

	Collision Rate	Fatality Rate	Injury Rate
Study Segment	**0.35 c/mvm**	**0.0%**	**50.0%**
Statewide Average*	**0.93 c/mvm**	**2.4%**	**40.1%**

ADT = average daily traffic volume
c/mvm = collisions per million vehicle miles
* 2012 Collision Data on California State Highways, Caltrans

Winery Trip Generation

Winery: Rudd Wines Winery & Tasting Room
Location: 4603 Westside Road
Annual Full Production: 10000 cases

WINERY OPERATIONS

Employee traffic using passenger vehicles, in average ADT

Item Description	Employees				Trips			
	Existing	Proposed (year round)	Proposed (harvest period)	Proposed (bottling period)	Existing	Proposed (year round)	Proposed (harvest period)	Proposed (bottling period)
Winery Production	0	3	5	--	0	9	15	--
Cellar / Storage	0	2	6	--	0	6	18	--
Administrative	0	3	3	--	0	9	9	--
Sales	0	3	3	--	0	9	9	--
Bottling	0	0	--	5	0	0	--	15
Other staff (describe):					0	0	0	0
Totals	**0**	**11**	**17**	**5**	**0**	**33**	**51**	**15**

Truck traffic associated with winery operations (average ADT during period of activity)

Item Description		Existing	Average	Harvest
Grape Importation				
Truck loads per year:	20.2; 17.96 truck(s) at 6 tons/truck; and 2.24 truck(s) at 12 tons/truck	0.00	0.00	0.70
Dates of Activity:	August through September			
Juice Importation				
Truck loads per year:	None	0.00	0.00	0.00
Dates of Activity:	through			
Juice/Fruit Exportation				
Truck loads per year:	None	0.00	0.00	0.00
Dates of Activity:	August through September			
Pomace Disposal				
Truck loads per year:	0	0.00	0.00	0.00
Dates of Activity:	August through September			
Disposed:				
Bottle Delivery				
Truck loads per year:	4.2 truck(s) at 2380 cases/truck	0.00	0.40	0.00
Dates of Activity:	July through July			
Barrel Delivery				
Truck loads per year:	0.88 truck(s) at 150 barrels/truck	0.00	0.03	0.03
Dates of Activity:	June through August			
Finished Wine Transportation to storage/sales				
Truck loads per year:	8.12 truck(s) at 1232 cases/truck	0.00	0.77	0.00
Dates of Activity:	July through July			
Less Backhauls				
Truck loads per year:	0	0.00	0.00	0.00
Dates of Activity:				
Miscellaneous trips				
Truck loads per year:	119.52 trucks	0.00	0.95	0.95
Dates of Activity:	January through December			
Totals		**0.00**	**2.15**	**1.67**

VINEYARD OPERATIONS

Employee trips associated with vineyard operations (in average ADT)

Item Description	Employees		Trips		
	Existing	Proposed	Existing	Average	Harvest
Vineyard Maintenance: Year Round	0	3	0	9	
Vineyard Maintenance: Peak Season	0	11			33
Totals	**0**	**14**	**0**	**9**	**33**

Winery Trip Generation

TASTING ROOM OPERATIONS

Item Description	Persons			Trips		
	Existing	Average	Harvest	Existing	Average	Harvest
Tasting Room Visitors	0	140	198	0	112	158
Tasting Room Employees	0	10	10	0	30	30
Totals	**0**	**150**	**208**	**0**	**142**	**188**

	Tasting Room			Production		
	Existing	Average	Harvest	Existing	Average	Harvest
Months of Operation	-	Year Round	Year Round	-	Year Round	0
Days of Operation	-	Daily	Daily	-	Monday - Friday	Daily
Hours of Operation	-	10:00 am - 5:00 pm	10:00 am - 10:00 pm	-	7:00 am - 6:00 pm	6:00 am - 10:00 pm

MISCELLANEOUS OTHER TRAFFIC GENERATORS

Item Description	Existing	Average	Harvest
Event Traffic Enter Event Information on Schedule Tab	0	13	9
Other Trips (If Applicable) None			
Totals	**0**	**13**	**9**

SUMMARY

Item Description	Existing	Average	Harvest
Winery Operations (employees)	0	33	51
Winery Operations (truck traffic)	0	2	2
Vineyard Operations (employees)	0	9	33
Tasting Room Traffic (employees and visitors)	0	142	188
Miscellaneous other traffic generators	0	0	0
Totals	**0**	**186**	**274**

Variation in ADT during the course of a typical full production year (Proposed Project Trips)

Generator	January	February	March	April	May	June
Employees	72	72	72	72	72	72
Visitors	77	83	94	106	120	126
Trucks	0.95	0.95	0.95	0.95	0.95	0.98
Total Trips	150	156	167	179	193	199

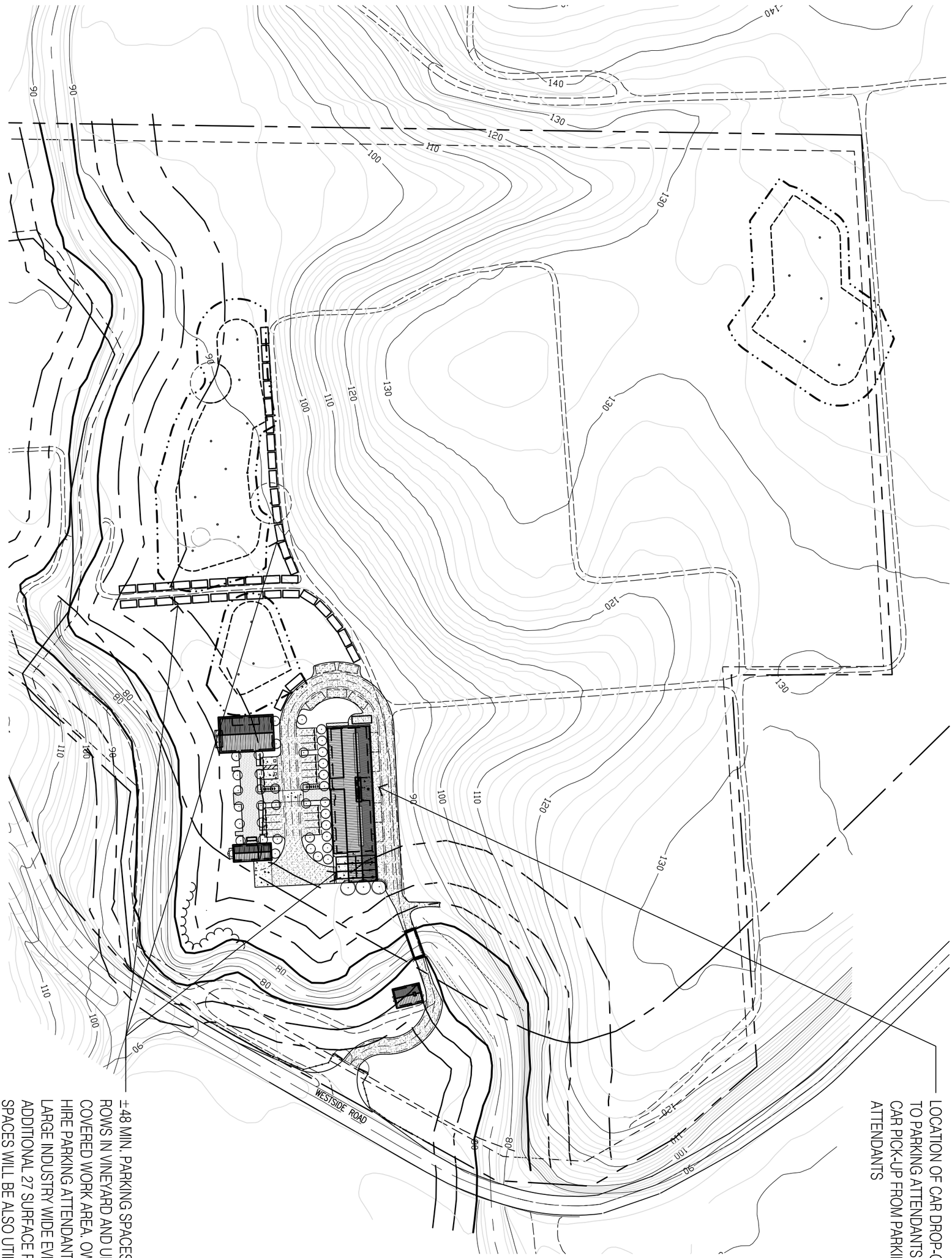
Month	July	August	September	October	November	December
Employees	87	**114**	**114**	**114**	72	72
Visitors	160	**158**	**120**	**125**	101	75
Trucks	2.15	**1.67**	**1.65**	**0.95**	0.95	0.95
Total Trips	249	**274**	**236**	**240**	174	148

Notes:
Total may not equal sum of trips for individual generators due to rounding.
Employees - Assume 3 ADT per employee
Visitors - Assume 2.5 person per vehicle occupancy
Months indicated in **bold** represent harvest season.

Winery Event Matrix

Winery: Rudd Wines
Location: 4603 Westside Road
Condition: Proposed

Event	Number of Guests	Number of events this size annually	Estimated Month(s) during which events will occur	Day of Week when Events will occur	Time of Day (start and end)	No. of Employees	No. of Guest Vehicles	No. of Employee Vehicles	Total Vehicles
Special-Agricultural Promotional	80	6	January - December	Monday - Sunday	10:00 AM - 9:00 PM	5	32	5	37
Special-Agricultural Promotional	100	3	January - December	Monday - Sunday	10:00 AM - 9:00 PM	6	40	6	46
Special-Agricultural Promotional	150	3	January - December	Monday - Sunday	10:00 AM - 9:00 PM	8	60	8	68
Annual Barrel Tasting	150	6	March	Friday - Sunday	11:00 AM - 4:00 PM	8	60	8	68
Annual Winter WINEland	100	2	January	Saturday - Sunday	11:00 AM - 4:00 PM	6	40	6	46
Annual A Wine & Food Affair	100	2	November	Saturday - Sunday	11:00 AM - 4:00 PM	6	40	6	46
Wine Tourism Day	100	1	May	Saturday	10:00 AM - 5:00 PM	6	40	6	46
Russian River Valley Pinot Classic	150	2	May	Saturday - Sunday	10:00 AM - 5:00 PM	8	60	8	68
Wine Maker Lunches/Dinners	36	12	January - December	Monday - Sunday	11:00 AM - 9:00 PM	2	14.4	2	16.4



ASK-1

Project: WESTSIDE ROAD WINERY

Title: PARKING FOR INDUSTRY WIDE EVENTS

Scale:	Date:	Project #:
N.T.S.	11/17/2015	201154

BACKEN GILLAM KROEGER
architects

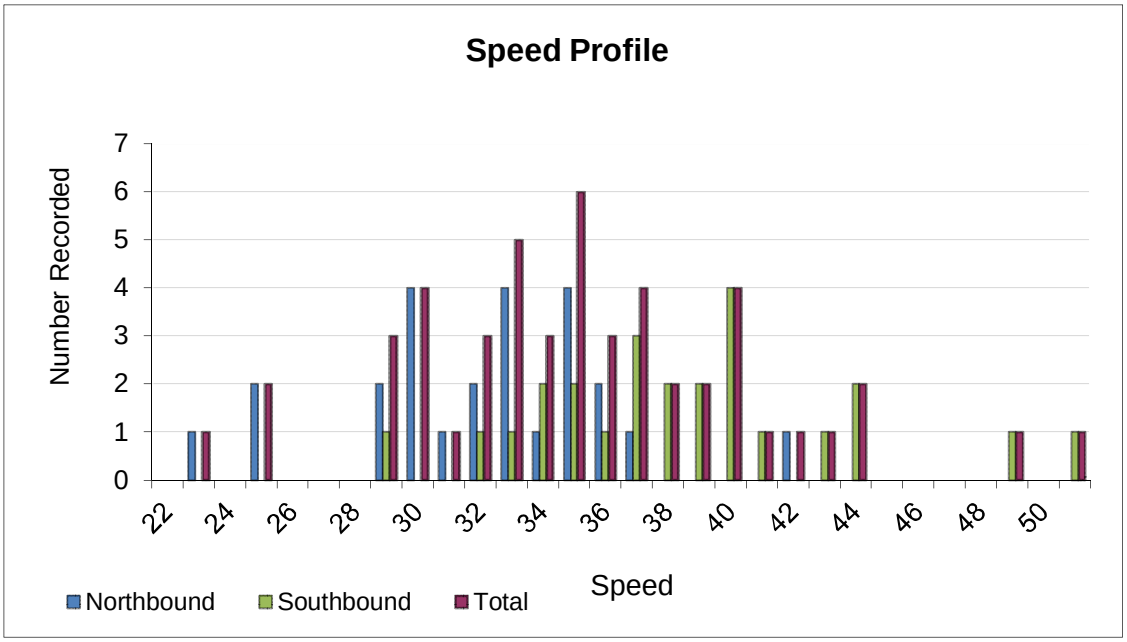
2352 MARINSHIP WAY
SAUSALITO CALIF 94965
TELEPHONE 415 289 3860
FACSIMILE 415 289 3866

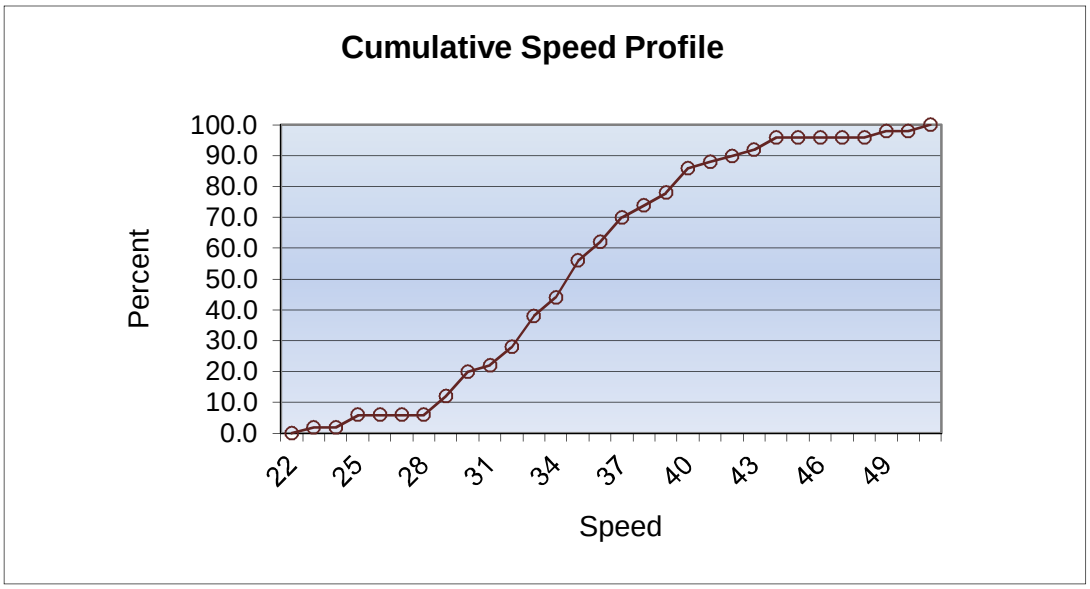
1421 MAIN STREET
ST. HELENA CALIF 94574
TELEPHONE 707 967 1920
FACSIMILE 707 967 1924

Speed Survey

4603 Westside Road (Existing Driveway)

85th Percentile Speed Northbound: 36 *85th Percentile Speed Southbound:* 44
85th Percentile Speed (Both Directions): 40 (Speeds in mph)



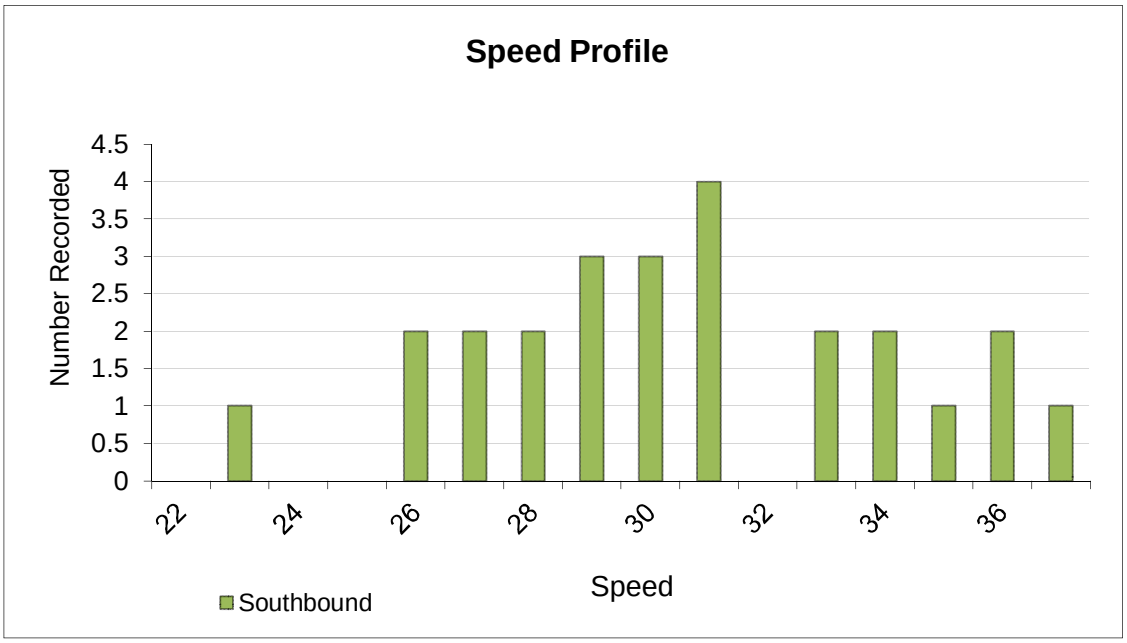


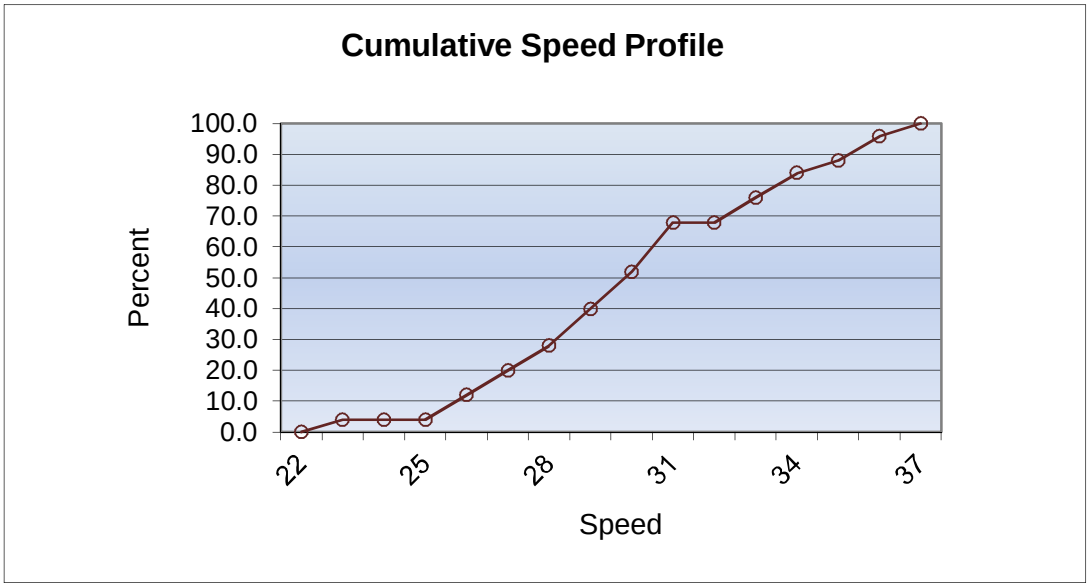
Date Data Collected:	10/08/15	*Start Time:*	1:00 PM	*Weather:*	Clear
Day of the Week:	Thursday	*End Time:*	2:00 PM	*Recorder:*	DT

Speed Survey

Westside Road (Curve to North of Project Driveway)

85th Percentile Speed Southbound (mph): 35





Date Data Collected:	12/01/15	*Start Time:*	1:00 PM	*Weather:*	Clear
Day of the Week:	Tuesday	*End Time:*	2:00 PM	*Recorder:*	DT

Whitlock & Weinberger Transportation, Inc
490 Mendocino Ave, Suite 201
Santa Rosa, CA
(707)542-9500 Fax (707)542-9590

Sight Distance at Rudd Wines Driveway

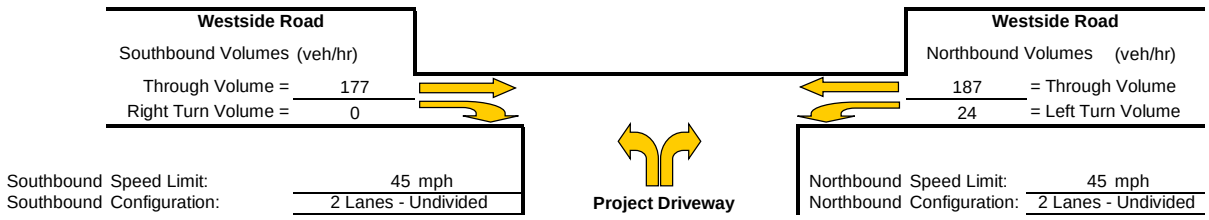
4603 Westside Road

DRAWN: LD	SCALE: NTS
DESIGN:	DATE: 10/28/15
SHEET 1 of 1 SHEETS	JOB NO. SOX508

Turn Lane Warrant Analysis - Tee Intersections

Study Intersection: Westside Road & Project Driveway
Study Scenario: Existing Plus Project Conditions (50-person event)

Direction of Analysis Street: North/South
Cross Street Intersects: From the West



Southbound Speed Limit: 45 mph
Southbound Configuration: 2 Lanes - Undivided

Northbound Speed Limit: 45 mph
Northbound Configuration: 2 Lanes - Undivided

Southbound Right Turn Lane Warrants

1. Check for right turn volume criteria

NOT WARRANTED Less than 40 vehicles

2. Check advance volume threshold criteria for turn lane

Advancing Volume Threshold	AV =	-
Advancing Volume	Va =	177
If AV<Va then warrant is met		-

Right Turn Lane Warranted: **NO**

Southbound Right Turn Taper Warrants
(evaluate if right turn lane is unwarranted)

1. Check taper volume criteria

NOT WARRANTED - Less than 20 vehicles

2. Check advance volume threshold criteria for taper

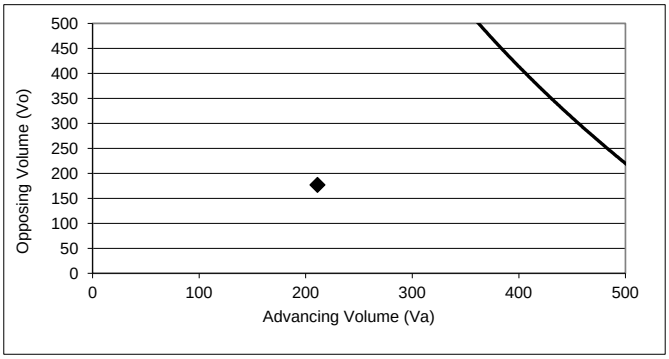
Advancing Volume Threshold	AV =	-
Advancing Volume	Va =	177
If AV<Va then warrant is met		-

Right Turn Taper Warranted: **NO**

Northbound Left Turn Lane Warrants

Percentage Left Turns	%lt	11.4 %
Advancing Volume Threshold	AV	525 veh/hr

If AV<Va then warrant is met



◆ Study Intersection
Two lane roadway warrant threshold for: 45 mph
Turn lane warranted if point falls to right of warrant threshold line

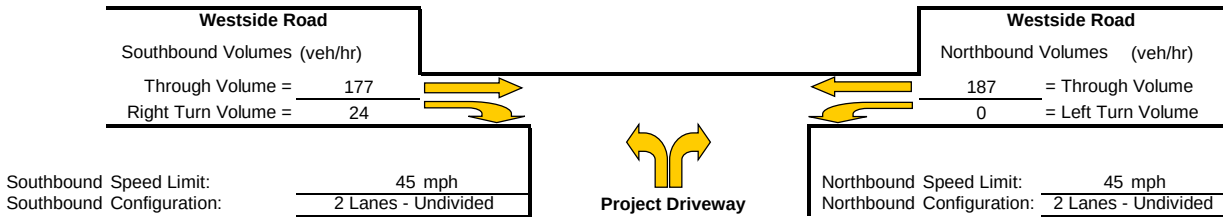
Left Turn Lane Warranted: **NO**

Methodology based on Washington State Transportation Center Research Report *Method For Prioritizing Intersection Improvements* , January 1997.
The right turn lane and taper analysis is based on work conducted by Cottrell in 1981.
The left turn lane analysis is based on work conducted by M.D. Harmelink in 1967, and modified by Kikuchi and Chakroborty in 1991.

Turn Lane Warrant Analysis - Tee Intersections

Study Intersection: Westside Road & Project Driveway
Study Scenario: Existing Plus Project Conditions (150-person event)

Direction of Analysis Street: North/South
Cross Street Intersects: From the West



Southbound Speed Limit: 45 mph
Southbound Configuration: 2 Lanes - Undivided

Northbound Speed Limit: 45 mph
Northbound Configuration: 2 Lanes - Undivided

Southbound Right Turn Lane Warrants

1. Check for right turn volume criteria

NOT WARRANTED Less than 40 vehicles

2. Check advance volume threshold criteria for turn lane

Advancing Volume Threshold	AV =	-
Advancing Volume	Va =	201
If AV<Va then warrant is met		-

Right Turn Lane Warranted: **NO**

Southbound Right Turn Taper Warrants
(evaluate if right turn lane is unwarranted)

1. Check taper volume criteria

Thresholds not met, continue to next step

2. Check advance volume threshold criteria for taper

Advancing Volume Threshold	AV =	460
Advancing Volume	Va =	201
If AV<Va then warrant is met		No

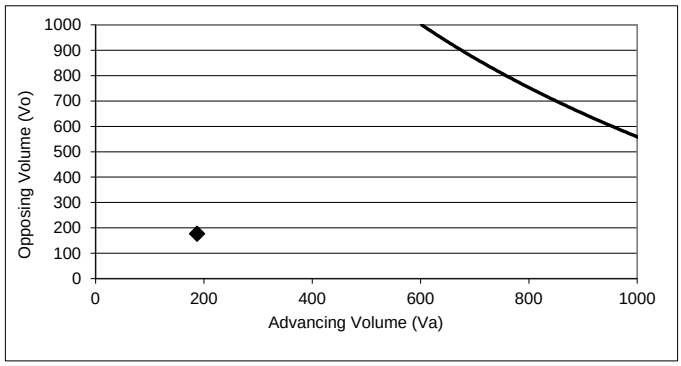
Right Turn Taper Warranted: **NO**

Northbound Left Turn Lane Warrants

Percentage Left Turns %lt 0.0 %

Advancing Volume Threshold AV 1552 veh/hr

If AV<Va then warrant is met



◆ Study Intersection

Two lane roadway warrant threshold for: 45 mph

Turn lane warranted if point falls to right of warrant threshold line

Left Turn Lane Warranted: **NO**

Methodology based on Washington State Transportation Center Research Report *Method For Prioritizing Intersection Improvements* , January 1997.
The right turn lane and taper analysis is based on work conducted by Cottrell in 1981.
The left turn lane analysis is based on work conducted by M.D. Harmelink in 1967, and modified by Kikuchi and Chakroborty in 1991.