

TRAFFIC IMPACT STUDY

ROUND POND WINERY EXPANSION

September 4, 2008

Prepared for: Round Pond Winery

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I. INTRODUCTION

This report has been prepared at the request of Round Pond Winery along State Route 128 in the Napa Valley to detail the circulation-related impacts due to proposed expansion of winery production and visitor traffic. Proposed expansion would increase production from 20,000 up to 100,000 gallons of finished wine per year, while visitor traffic (by appointment only) would be expected to increase from 15 up to 60 persons on the busiest day (a fall harvest Saturday).

Evaluation has been conducted of Winery traffic impacts at the S.R.128/project driveway intersection as well as at the S.R.128/Honig Winery-Round Pond Olive Oil Sales driveway intersection about 230 feet to the east. Early August 2008 traffic counts have been conducted at both locations during a summer Friday PM commute period and during a Saturday afternoon. Summer counts have then been seasonally adjusted to reflect peak harvest conditions. Napa County Transportation Planning Agency (NCTPA) traffic model projections have been utilized to estimate year 2010 Base Case (without Winery expansion) traffic volumes on S.R.128. This is the year of projected project completion and full operation. The net change in traffic due to proposed expansion of Round Pond Winery has then been determined and Base Case (without project) as well as Base Case + Project operating conditions determined on the local circulation network. Round Pond Winery is proposing construction of a left turn lane on the westbound S.R.128 approach to their driveway as part of the proposed project. The impact of this turn lane on operation of the Honig Winery-Round Pond Olive Oil Sales driveway intersection has been evaluated, with recommendations made regarding left turn lane striping for this second driveway.

II. SUMMARY OF FINDINGS

- I. Round Pond Winery is currently generating low to moderate levels of traffic during the hours of peak traffic along State Route 128.

EXISTING ROUND POND WINERY TRIP GENERATION DURING HOURS OF PEAK TRAFFIC ALONG STATE ROUTE 128

SEASON	FRIDAY PM PEAK HOUR TRIPS		SATURDAY AFTERNOON PEAK HOUR TRIPS	
	INBOUND	OUTBOUND	INBOUND	OUTBOUND
Summer	2	9	8	7
Harvest	2	10	9	8

Source: Round Pond Winery/Crane Transportation Group

2. The proposed Round Pond Winery expansion would be expected to result in the following volume increases during the hours of peak traffic along State Route 128.

**ROUND POND WINERY PROPOSED EXPANSION
NET NEW TRIP GENERATION DURING
HOURS OF PEAK TRAFFIC ALONG STATE ROUTE 128**

SEASON	FRIDAY PM PEAK HOUR TRIPS		SATURDAY AFTERNOON PEAK HOUR TRIPS	
	INBOUND	OUTBOUND	INBOUND	OUTBOUND
Summer	0	3	2	2
Harvest	0	4	3	3

Source: Round Pond Winery/Crane Transportation Group

3. The S.R.128/Round Pond Winery intersection currently operates at acceptable levels of service during harvest Friday and Saturday peak traffic hours along S.R.128, and should continue to operate acceptably through the year 2010 (without the proposed project).
4. The S.R.128/Round Pond Winery intersection would continue to operate acceptably in the year 2010 with the addition of project traffic during all Friday and Saturday peak traffic hours on S.R.128.
5. Sight lines for drivers exiting the Round Pond Winery driveway to S.R.128 are excellent in both directions (exceeding 1,000 feet to the east and west). S.R.128 is level and straight in the project vicinity.
6. The proposed project is providing a left turn lane on the westbound S.R.128 approach to the Winery entrance. This would eliminate any potentially significant circulation impacts at this location.
7. Average size special events with up to 75 persons for private promotional tasting with meals would virtually all occur during evenings, starting at 7:00 PM. Traffic associated with these events would occur well after peak volumes on this local circulation network.
8. Recommendations:
- Widening along S.R.128 for the left turn lane on the westbound S.R.128 approach to the Round Pond Winery entrance should be continued easterly to the Honig Winery-Round Pond Olive Oil Sales driveway. Back-to-back left turn lanes, at least 75 feet long each, should be striped on the approaches to both driveways. Honig Winery should provide a fair share contribution for the additional widening if they agree to extend the widening of S.R.128 to their driveway.
 - Should widening along S.R.128 not be extended easterly (beyond what is needed to provide a left turn lane on the westbound approach to the Round Pond Winery driveway),

then there should be a break in the taper/transition striping at the Honig Winery driveway.

- There are no other circulation system recommendations.

III. PROJECT DESCRIPTION

Round Pond Winery is located on the south side of the Rutherford Road (S.R.128) about 1.15 miles east of State Route 29 (S.R.29) (see **Figure 1**).

Round Pond Winery currently produces 20,000 gallons of finished wine per year and averages about 15 visitors per day by appointment only. Private promotional tasting with meals for up to 20 persons are held 24 times per year (virtually all during evenings) and release events for up to 50 people are held four times per year.

The proposed Winery expansion would be expected to increase production, employees and visitor totals by the following levels.

- Winery production would increase from a permitted 20,000 up to 100,000 gallons of finished wine per year.
- Employee totals would increase as follows:
 - Winemaking Staff = 1 new full-time employee
 - Cellar Staff = 1 new full-time employee
 - Wine Tasting Staff = 2 new full-time positions and 1 new part-time position
- Trucks: No grape deliveries would occur during peak weekday or weekend traffic hours. Ninety-five percent of grape delivery trucks would arrive between 10:00 AM and 2:00 PM on weekdays.
- Visitor totals would be expected to increase as follows:
 - Maximum daily visitor totals would increase from 15 up to 60 per day, by appointment only.
 - Private promotional tasting with meals for up to 75 persons would increase from 24 per year up to three times per week. Virtually all private promotional tasting with meal events would be held during the evening.
 - Maximum size special events (product releases) would continue to be held four times per year, with attendance increasing from 50 up to 150 persons.
 - A wine auction would continue to be held once per year, with attendance increasing from 50 up to 100 persons.

- Tasting room hours would remain 10:00 AM to 4:00 PM.
- All Friday, Saturday or Sunday evening special events would begin at 7:00 PM, well after peak traffic conditions.
- Special events on weekend afternoons would be scheduled to start at 11:00 AM and finish by no later than 2:00 PM.

Tables 1 and 2 present details of existing Round Pond Winery trip generation for peak summer and harvest conditions during the Friday PM peak traffic hour on S.R.128 as well as during the Saturday afternoon peak traffic hour along S.R.128. Employee, truck and visitor traffic projections are provided. As shown, the existing Round Pond Winery is generating the following levels of traffic.

EXISTING ROUND POND WINERY TRIP GENERATION DURING HOURS OF PEAK TRAFFIC ALONG STATE ROUTE 128

SEASON	FRIDAY PM PEAK HOUR TRIPS		SATURDAY AFTERNOON PEAK HOUR TRIPS	
	INBOUND	OUTBOUND	INBOUND	OUTBOUND
Summer	2	9	8	7
Harvest	2	10	9	8

Source: Round Pond Winery/Crane Transportation Group

IV. EXISTING CONDITIONS

A. ROADWAYS

Direct access to the project site is provided by the State Route 128 highway (Rutherford Road), which is briefly described below, while a schematic presentation of driveway intersection approach lanes and control is presented in **Figure 2**.

State Route 128 (S.R.128) is a two-lane regional arterial roadway with 10.5-foot-wide lanes and wide gravel shoulders in most locations. In the project vicinity, it is named Rutherford Road. The posted speed limit is 45 miles per hour. It is level and straight in the project vicinity and a 10-foot-wide paved shoulder is provided on the north side of the highway extending easterly from about 150 feet west of the Round Pond Winery driveway to the Honig Winery driveway. In addition, wide paved flares are provided on both sides of the Round Pond Winery driveway connection, each about 30 feet deep and 75 feet long, to facilitate turns to/from the Round Pond Winery driveway. No left turn lane is provided on the westbound S.R.128 approach to the Round Pond Winery driveway on the south side of the road nor on the eastbound S.R.128 approach to the Honig Winery-Round Pond Olive Oil Sales driveway on the north side of the road, about 230 feet to the east.

B. VOLUMES

Friday PM peak period (3:00-6:00) and Saturday afternoon (noon to 4:00) traffic counts were conducted for Crane Transportation Group at the S.R.128/Round Pond Winery driveway and S.R.128/Honig Winery-Round Pond Olive Oil Sales driveway intersections on August 1 and 2, 2008. The weather was clear and hot on both days. The Friday peak hour was determined to be 4:00-5:00 PM, while the Saturday afternoon peak hour was determined to be 3:00-4:00 PM. Resultant August 2008 Friday PM peak hour and Saturday afternoon peak hour counts are presented in Figure 3.

August counts were seasonally adjusted to reflect harvest (October) conditions based upon seasonal traffic count data for S.R.128 from Caltrans as well as the original Wine Train EIR, which specifically surveyed summer versus harvest traffic volumes along the entire length of S.R.29 adjacent to the train route. This study found that harvest weekday volumes were typically about three percent higher than summer weekday volumes, while harvest weekend volumes were typically about five percent higher than summer weekend volumes. Resultant harvest 2008 Friday PM peak hour and Saturday afternoon peak hour volumes are presented in Figure 4.

C. INTERSECTION LEVEL OF SERVICE

1. Analysis Methodology

Transportation engineers and planners commonly use a grading system called level of service (LOS) to measure and describe the operational status of the local roadway network. LOS is a description of the quality of a roadway facility's operation, ranging from LOS A (indicating free-flow traffic conditions with little or no delay) to LOS F (representing oversaturated conditions where traffic flows exceed design capacity, resulting in long queues and delays). Intersections, rather than roadway segments between intersections, are almost always the capacity controlling locations for any circulation system.

Signalized Intersections. For signalized intersections, the 2000 *Highway Capacity Manual* (Transportation Research Board, National Research Council) methodology was utilized. With this methodology, operations are defined by the level of service and average control delay per vehicle (measured in seconds) for the entire intersection. For a signalized intersection, control delay is the portion of the total delay attributed to traffic signal operation. This includes delay associated with deceleration, acceleration, stopping, and moving up in the queue. Table 3 summarizes the relationship between delay and LOS for signalized intersections.

Unsignalized Intersections. For unsignalized (all-way stop-controlled and side-street stop-controlled) intersections, the 2000 *Highway Capacity Manual* (Transportation Research Board, National Research Council) methodology for unsignalized intersections was utilized. For side-street stop-controlled intersections, operations are defined by the level of service and average control delay per vehicle (measured in seconds), with delay typically represented for the stop sign controlled approaches or turn movements. For all-way stop-controlled intersections, operations are defined by the average control delay for the entire intersection (measured in seconds per vehicle). The delay at an unsignalized intersection incorporates delay associated

with deceleration, acceleration, stopping, and moving up in the queue. **Table 4** summarizes the relationship between delay and LOS for unsignalized intersections.

2. Minimum Acceptable Operation

a. Napa County

Napa County has no published minimum level of service standards for unsignalized public road intersections nor for intersections with private side street driveway approaches to public roads. Typically, LOS D has been used as the poorest acceptable operation on a County roadway stop sign controlled intersection approach, while there have been no assigned criteria for private driveway approaches.

b. Caltrans

Caltrans' Guide for the Preparation of Traffic Impacts Studies (December 2002) is intended to provide a consistent basis for evaluating traffic impacts to state facilities. Caltrans endeavors to maintain a target LOS at the transition between LOS C and LOS D. On state highway facilities; however, Caltrans acknowledges that this may not always be feasible and recommends that the lead agency consult with Caltrans to determine the appropriate target LOS.¹

3. Existing Operation

Table 5 shows that the stop sign controlled Round Pond Winery driveway approach to S.R.128 is operating acceptably at LOS B conditions during harvest peak traffic hours on a Friday or Saturday.

V. NEAR TERM HORIZON BASE CASE (WITHOUT PROJECT) CONDITIONS

Evaluation has been conducted of Base Case operating conditions for a year 2010 horizon. Year 2010 reflects the likely year of project completion and full operation.

A. YEAR 2010 (NEAR TERM HORIZON)

1. Base Case (Without Project) Volumes

Year 2010 harvest, Friday and Saturday Base Case peak hour volumes were determined projecting straight line growth between existing traffic volumes and those projected for 2020 by the NCTPA.² Resultant year 2010 harvest Friday PM peak hour and Saturday afternoon peak hour Base Case (without project) projections are presented in **Figure 5**.

¹ California Department of Transportation, December 2002, *Caltrans Guide for the Preparation of Traffic Impact Studies*.

² NCTPA = Napa County Transportation Planning Agency.

2. Base Case 2010 Intersection Level of Service

a. Harvest

Table 5 shows that in 2010 the Round Pond Winery driveway stop sign controlled approach to S.R.128 would operate acceptably at LOS B conditions during Friday PM peak hour and Saturday afternoon peak hour conditions.

VI. PROJECT IMPACTS

A. SIGNIFICANCE CRITERIA

The following criteria were developed for recent traffic impact analyses in the County. These same criteria have been utilized in this study to determine the significance of impacts due to the Round Pond Winery project. An impact is considered to be significant if any of the following conditions are met.

- If an unsignalized intersection with Base Case (without project) volumes in the County has stop sign controlled movements operating at LOS A, B, C or D and deteriorates to LOS E or F operation with the addition of project traffic, the impact is considered significant and would require mitigation.
- If, in the opinion of the registered traffic engineer conducting this study, certain project-related traffic changes would substantially increase safety or operational concerns, the impact is considered significant and would require mitigation.

B. PROJECT TRIP GENERATION

The added traffic that would be expected due to the Round Pond Winery expansion is detailed in **Table 6** for Friday PM peak hour conditions and in **Table 7** for Saturday afternoon peak hour conditions. Projections have been developed by Round Pond Winery and Crane Transportation Group. Projected increases are summarized below.

HARVEST

- **Friday PM Peak Hour**
There would be four new outbound trips, two due to new employees and two due to increased visitor vehicles. There would be no new inbound trips.
- **Saturday Afternoon Peak Hour**
There would be three new inbound and three new outbound trips, all due to increased visitor vehicles.

C. PROJECT TRIP DISTRIBUTION

The increment of project traffic is shown distributed to the local roadway network in **Figure 6** during the Friday and Saturday peak traffic hours along S.R.128. Distribution of net new project traffic is projected to be the same as existing distribution.

Resultant year 2010 Harvest Base Case + Project peak hour traffic is presented in **Figure 7**.

D. YEAR 2010 PROJECT IMPACTS TO S.R.128/ROUND POND WINERY INTERSECTION DURING HARVEST CONDITIONS

1. Intersection Level of Service

Table 5 shows that at the S.R.128/Round Pond Winery intersection, the stop sign controlled Round Pond Winery intersection approach would maintain acceptable LOS B operation with the addition of project traffic during all Friday and Saturday peak traffic hours along S.R.128.

This would be a less than significant impact.

2. Vehicle Queuing on Westbound S.R.128 Approach to Round Pond Winery

The project will be providing a left turn lane on the westbound S.R.128 approach to the Round Pond Winery entrance. The specific design has not been finalized. Analysis has been conducted of the projected 95th percentile vehicle queuing that would be expected in this lane. Evaluation has utilized formula contained in *Estimation of Maximum Queue Lengths at Unsignalized Intersections*, by John T. Gard, *ITE Journal*, November 2001 (see **Appendix**).

Table 8 shows that the 95th percentile vehicle queue in the westbound S.R.128 left lane approaching the Round Pond Winery driveway would be one vehicle during the Friday PM peak hour and one vehicle during the Saturday afternoon peak hour. At most, a 75-foot left turn lane would be required for storage purposes (to accommodate a truck). Provision of a normal taper into the turn lane and then transition back to a two-lane section would extend through the driveway on the north side of the road serving the Honig Winery and the Round Pond Olive Oil Sales. However, should widening extend easterly, a left turn lane could also be provided on the eastbound S.R.128 approach to the Honig Winery-Round Pond Olive Oil Sales driveway. **Table 8** shows that should a left turn lane also be provided on the eastbound S.R.128 approach to the Honig Winery-Round Pond Olive Oil Sales driveway, the 95th percentile vehicle queue would be one vehicle during both the Friday and Saturday afternoon peak traffic hours. The 230-foot distance between driveway intersections would allow provision of 75-foot-long left turn lanes on the approaches to both intersections as well as an 80-foot taper separating the back-to-back left turn pockets.

This would be a less than significant impact.

E. SPECIAL EVENT TRAFFIC IMPACTS

There would be four maximum size special events during the year with up to 150 persons. Two of the four events would be scheduled midday on a Saturday or Sunday, starting at 11:00 AM, with the remaining two scheduled for a Friday, Saturday or Sunday evening, starting at 7:00 PM. Events would last two to three hours. Therefore, maximum size event traffic would not impact peak traffic flow hours on S.R.128. Average size events for private promotional tasting with meals with up to 75 people (and 30 to 37 vehicles) would virtually all occur during evenings starting at 7:00 PM, and would likewise not impact traffic flow along S.R.128 during peak traffic hours.

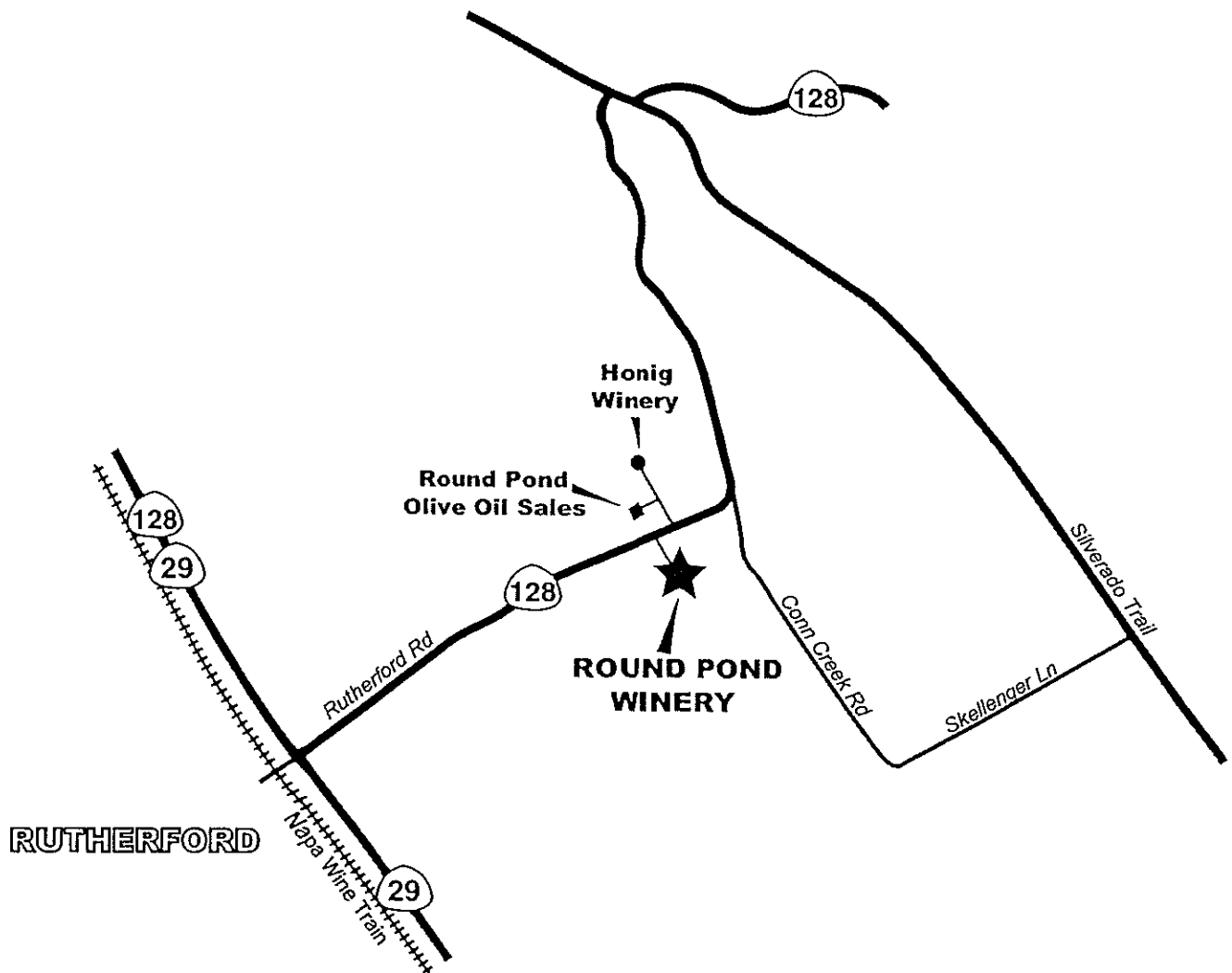
This would be a less than significant impact.

VII. RECOMMENDATIONS

- Widening along S.R.128 for the left turn lane on the westbound S.R.128 approach to the Round Pond Winery entrance should be continued easterly to the Honig Winery-Round Pond Olive Oil Sales driveway. Back-to-back left turn lanes, at least 75 feet long each, should be striped on the approaches to both driveways. Honig Winery should provide a fair share contribution for the additional widening if they agree to extend the widening of S.R.128 to their driveway.
- Should widening along S.R.128 not be extended easterly (beyond what is needed to provide a left turn lane on the westbound approach to the Round Pond Winery driveway), then the taper/transition striping should be discontinued just at the Honig Winery driveway.

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Not To Scale



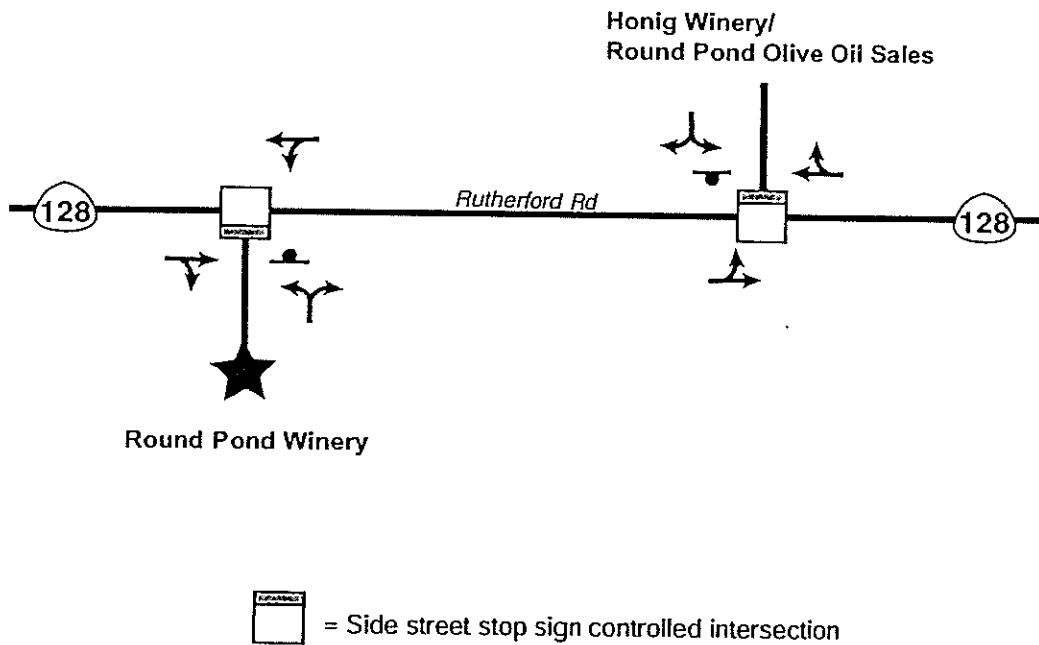
Round Pond Winery Expansion Traffic Study



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Figure 1
Area Map

Not To Scale



Round Pond Winery Expansion Traffic Study

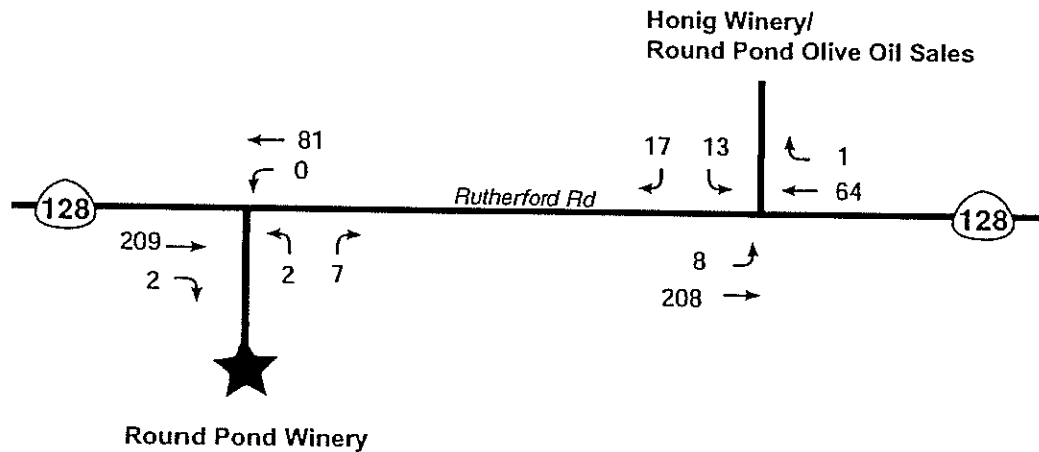


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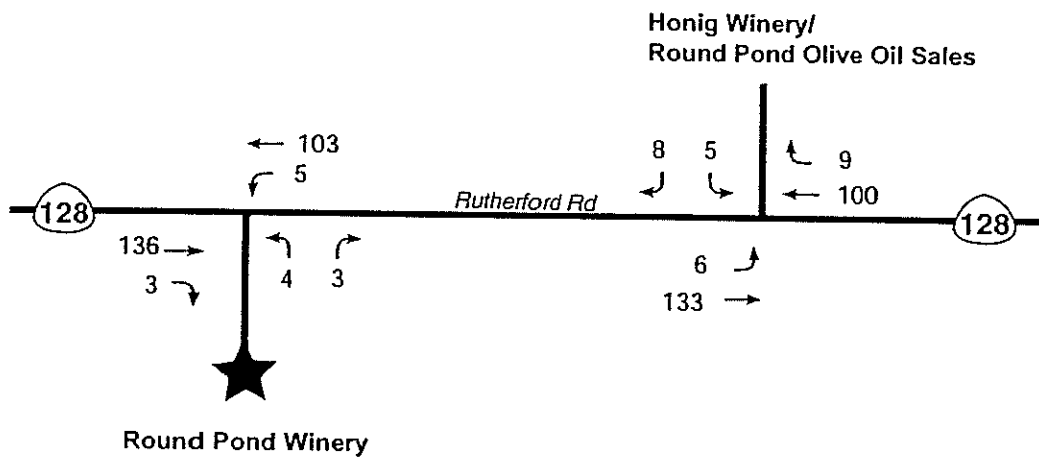
Figure 2

Lane Geometrics and Intersection Control

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**FRIDAY VOLUMES
(4:00-5:00 PM)**



**SATURDAY VOLUMES
(3:00-4:00 PM)**

Round Pond Winery Expansion Traffic Study

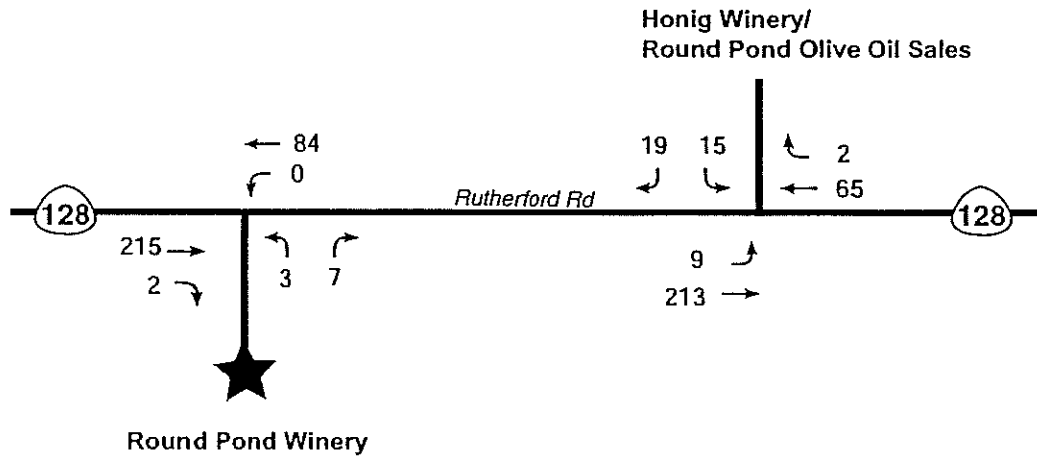


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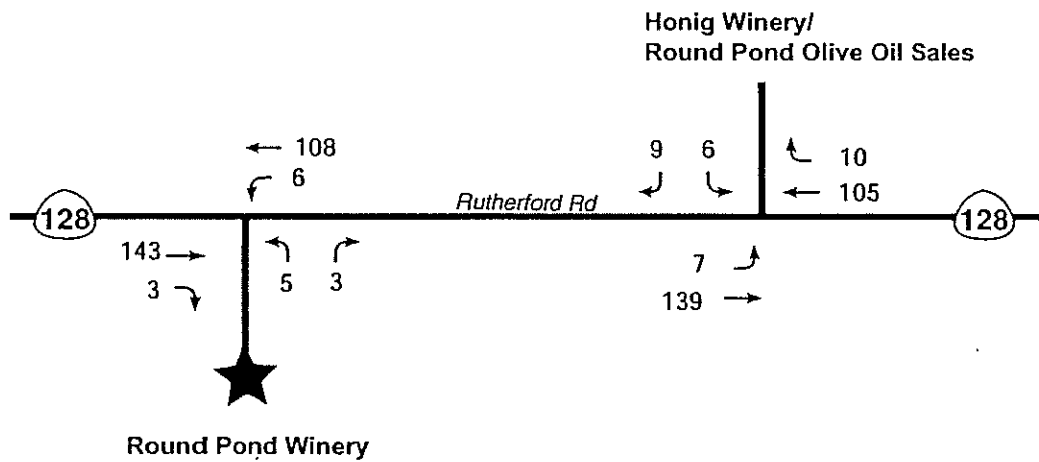
Figure 3

**Existing Summer Friday & Saturday
Peak Hour Volumes (August 2008)**

Not To Scale



FRIDAY VOLUMES (4:00-5:00 PM)



SATURDAY VOLUMES (3:00-4:00 PM)

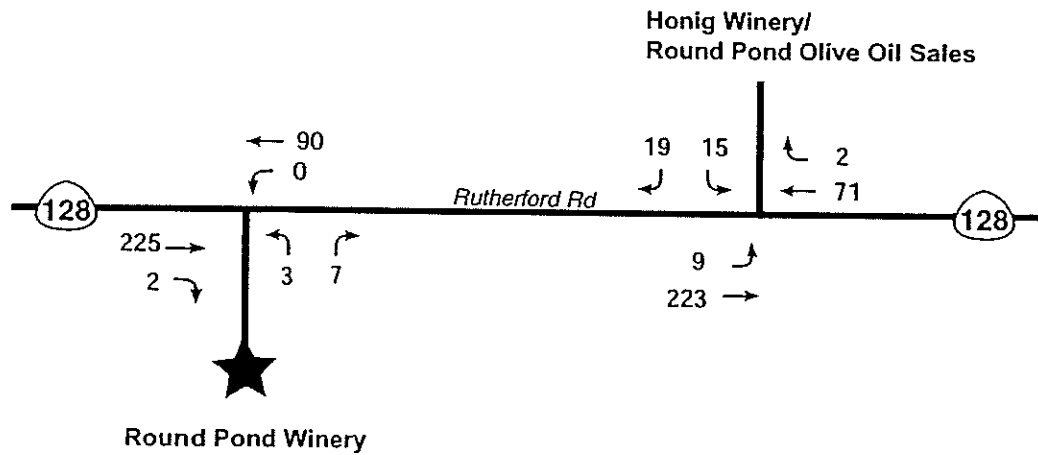
Round Pond Winery Expansion Traffic Study



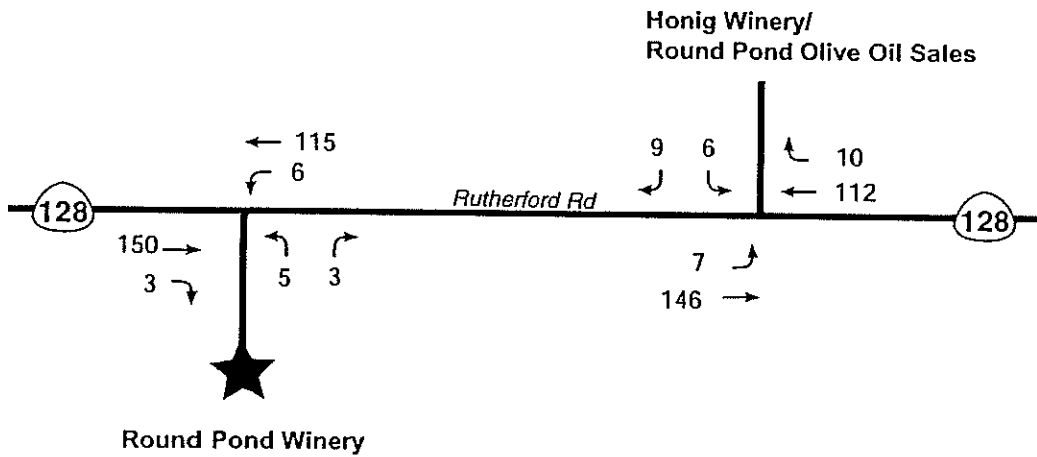
CRANE TRANSPORTATION GROUP

Figure 4
Existing Harvest Friday & Saturday
Peak Hour Volumes

Not To Scale



FRIDAY VOLUMES (4:00-5:00 PM)



SATURDAY VOLUMES (3:00-4:00 PM)

Round Pond Winery Expansion Traffic Study



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Figure 5
Year 2010 Harvest
Friday & Saturday Base Case (Without Project)
Peak Hour Volumes



NORTH

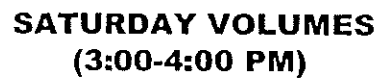
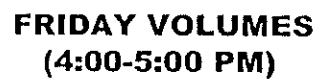
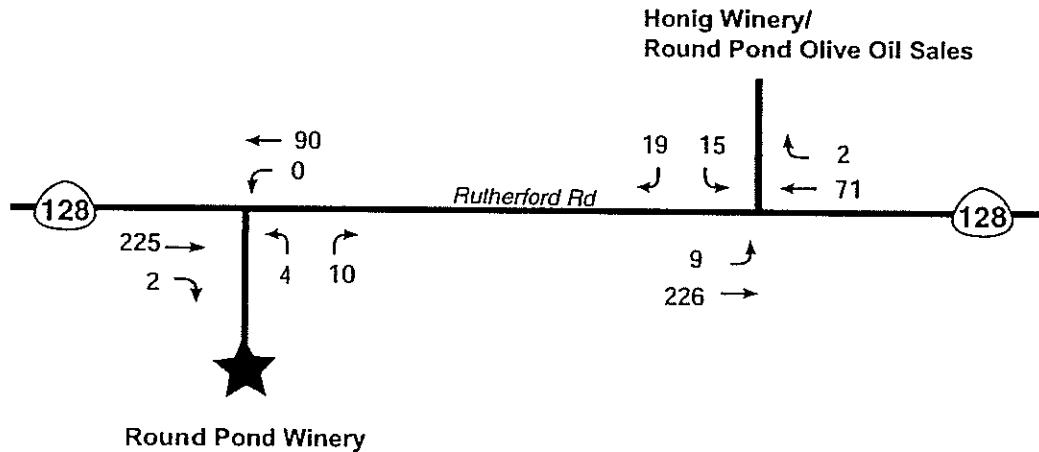
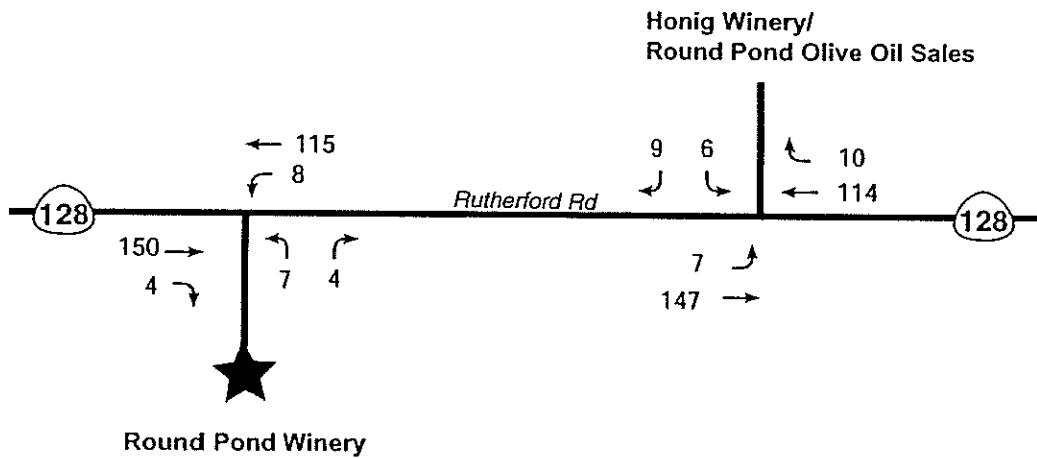


Figure 6
Round Pond Winery Expansion
Friday & Saturday Peak Hour
Project Volume Increment

Not To Scale



FRIDAY VOLUMES (4:00-5:00 PM)



SATURDAY VOLUMES (3:00-4:00 PM)

Round Pond Winery Expansion Traffic Study



CRANE TRANSPORTATION GROUP

Figure 7
Year 2010 Harvest
Friday & Saturday Base Case + Project
Peak Hour Volumes

Table 1

**ROUND POND WINERY
EXISTING TRIP GENERATION DURING FRIDAY AMBIENT
PM COMMUTE PEAK TRAFFIC HOURS ON S.R.128***

STAFF/VISITOR CATEGORIES	PM PEAK HOUR VEHICLE TRIPS			
	4:00-5:00		5:00-6:00	
	IN	OUT	IN	OUT
SUMMER				
Winery				
Management				
Admin		1		
Cellar		1		
Winemaking		1		
Tasting Room (Full Time)				1
Tasting Room (Part Time)				2
Visitor Vehicles	2	2	1	1
Trucks				
Office		4		4
Gardeners				
Field Workers				
SUMMER INCREMENT TOTAL	2	9	1	8
HARVEST INCREMENT**				
Winery				
Staff Vehicles				
Visitor Vehicles		1		
Grape Haul Trucks				
Office				
Gardeners				
Field Workers				
HARVEST INCREMENT TOTAL**	0	1	0	0

* Peak Hour = 4:00-5:00 PM

** Volumes in addition to the summer increment.

Source: Round Pond Winery

Compiled by: Crane Transportation Group

Table 2

ROUND POND WINERY
EXISTING TRIP GENERATION DURING A SATURDAY AFTERNOON
HOUR OF PEAK AMBIENT TRAFFIC ON S.R.128
(3:00 – 4:00 PM)

STAFF/VISITOR CATEGORIES	VEHICLE TRIPS	
	IN	OUT
SUMMER		
Winery		
Management		
Admin		
Cellar		
Winemaking		
Tasting Room (Full Time)		
Tasting Room (Part Time)		
Visitor Vehicles	8*	7*
Trucks		
Office		
Gardeners		
Field Workers		
SUMMER INCREMENT TOTAL	8	7
HARVEST INCREMENT**		
Winery		
Staff Vehicles		
Visitor Vehicles	1	1
Grape Haul Trucks		
Office		
Gardeners		
Field Workers		
HARVEST INCREMENT TOTAL**	1	1

* Most visitor vehicles did not have an appointment and left the property soon after entry.

** Volumes in addition to the summer increment.

Source: Round Pond Winery

Compiled by: Crane Transportation Group

Table 3

SIGNALIZED INTERSECTION LOS CRITERIA

Level of Service	Description	Average Control Delay (Seconds Per Vehicle)
A	Operations with very low delay occurring with favorable progression and/or short cycle lengths.	< 10.0
B	Operations with low delay occurring with good progression and/or short cycle lengths.	10.1 to 20.0
C	Operations with average delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures begin to appear.	20.1 to 35.0
D	Operations with longer delays due to a combination of unfavorable progression, long cycle lengths, and/or high volume-to-capacity (V/C) ratios. Many vehicles stop and individual cycle failures are noticeable.	35.1 to 55.0
E	Operations with high delay values indicating poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences. This is considered to be the limit of acceptable delay.	55.1 to 80.0
F	Operation with delays unacceptable to most drivers occurring due to oversaturation, poor progression, or very long cycle lengths.	> 80.0

Source: 2000 Highway Capacity Manual (Transportation Research Board, 2000).

Table 4

UNSIGNALIZED INTERSECTION LOS CRITERIA

Level of Service	Description	Average Control Delay (Seconds Per Vehicle)
A	Little or no delays	< 10.0
B	Short traffic delays	10.1 to 15.0
C	Average traffic delays	15.1 to 25.0
D	Long traffic delays	25.1 to 35.0
E	Very long traffic delays	35.1 to 50.0
F	Extreme traffic delays with intersection capacity exceeded (for an all-way stop), or with approach/turn movement capacity exceeded (for a side street stop controlled intersection)	> 50.0

Source: 2000 Highway Capacity Manual (Transportation Research Board, 2000).

Table 5

INTERSECTION LEVEL OF SERVICE S.R.128/ROUND POND WINERY DRIVEWAY

FRIDAY PM PEAK HOUR

EXISTING (2008)		YEAR 2010 HARVEST	
SUMMER	HARVEST	BASE CASE	BASE CASE + PROJECT
B-10.6/A-9.7/A-9.9 ⁽¹⁾	B-10.7/A-9.7/B-10.0	B-10.8/A-9.8/B-10.1	B-10.9/A-9.8/B-10.1

SATURDAY AFTERNOON PEAK HOUR

EXISTING (2008)		YEAR 2010 HARVEST	
SUMMER	HARVEST	BASE CASE	BASE CASE + PROJECT
B-10.4/A-9.1/A-9.8 ⁽¹⁾	B-10.5/A-9.2/B-10.0	B-10.7/A-9.2/B-10.1	B-10.8/A-9.3/A-10.2

⁽¹⁾ Unsignalized level of service – vehicle control delay in seconds. Round Pond Winery driveway stop sign controlled approach.

Year 2000 Highway Capacity Manual Analysis Methodology
Source: Crane Transportation Group

Table 6

**ROUND POND WINERY
TRAFFIC INCREMENT DUE TO
PROPOSED PROJECT DURING FRIDAY AMBIENT
PM COMMUTE PEAK TRAFFIC HOURS ON S.R.128**

STAFF/VISITOR CATEGORIES	PM PEAK HOUR VEHICLE TRIPS			
	4:00-5:00		5:00-6:00	
	IN	OUT	IN	OUT
SUMMER INCREMENT				
Winery				
Management				
Admin				
Cellar		1		
Winemaking		1		
Tasting Room (Full Time)				2
Tasting Room (Part Time)				1
Visitor Vehicles		1		
Trucks				
Office				
Gardeners				
Field Workers				
SUMMER INCREMENT TOTAL	0	3	0	3
HARVEST INCREMENT*				
Winery				
Staff Vehicles				
Visitor Vehicles		1		
Grape Haul Trucks				
Office				
Gardeners				
Field Workers				
HARVEST INCREMENT TOTAL*	0	1	0	0

* Volumes in addition to the summer increment.

Source: Round Pond Winery

Compiled by: Crane Transportation Group

Table 7

ROUND POND WINERY
TRAFFIC INCREMENT DUE TO PROPOSED PROJECT TRIP
GENERATION DURING A SATURDAY AFTERNOON
HOUR OF PEAK AMBIENT TRAFFIC ON S.R.128
(3:00 – 4:00 PM)

STAFF/VISITOR CATEGORIES	VEHICLE TRIPS	
	IN	OUT
SUMMER INCREMENT		
Winery		
Management		
Admin		
Cellar		
Winemaking		
Tasting Room (Full Time)		
Tasting Room (Part Time)		
Visitor Vehicles	2	2
Trucks		
Office		
Gardeners		
Field Workers		
SUMMER INCREMENT TOTAL	2	2
HARVEST INCREMENT*		
Winery		
Staff Vehicles		
Visitor Vehicles	1	1
Grape Haul Trucks		
Office		
Gardeners		
Field Workers		
HARVEST INCREMENT TOTAL*	1	1

* Volumes in addition to the summer increment.

Source: Round Pond Winery

Compiled by: Crane Transportation Group

Table 8

**95TH PERCENTILE VEHICLE QUEUING
YEAR 2010**

**LEFT TURN LANES ON THE S.R.128 APPROACHES TO
ROUND POND WINERY DRIVEWAY AND
HONIG WINERY-ROUND POND OLIVE OIL SALES DRIVEWAY**

TIME PERIOD	WESTBOUND S.R.128 APPROACH TO ROUND POND WINERY DRIVEWAY	EASTBOUND S.R.128 APPROACH TO HONIG-ROUND POND OLIVE OIL SALES DRIVEWAY
Friday PM Peak Hour	1 vehicle	1 vehicle
Saturday PM Peak Hour	1 vehicle	1 vehicle

Source: Crane Transportation Group

Appendix

EQUATIONS TO DETERMINE 95TH PERCENTILE QUEUES AT UNSIGNALIZED INTERSECTIONS

MOVEMENT	CONDITION	EQUATION
Major street left turn	Approach volume ≤ 100 VPH/PHF**	Max. Queue = $-2.042 + 1.167 \ln(\text{AppVol}) + 0.975 \cdot \text{TS}$
	Approach > 100 VPH/PHF	Max. Queue = $4.252 - 1.23 \cdot \text{Lanes} + 0.07996 \cdot \text{Speed} + 1.412 \cdot \text{TS} - 374.028/\text{AppVol} + 0.00001144 \cdot \text{AppVol} \cdot \text{ConflVol}$
Minor street left turn	Approach volume ≤ 60 VPH/PHF	Max. Queue = $+0.958 + 0.00111 \cdot (\text{AppVol})^{0.25} + 0.000333 \cdot (\text{ConflVol})$
	Approach volume > 60 VPH/PHF	Max. Queue = $+6.174 - 2.313 \cdot \text{TS} + 0.03307 \cdot \text{Speed} - 1201.644/\text{ConflVol} + 0.00006549 (\text{AppVol})^{0.25}$
Minor street right turn	Approach volume ≤ 100 VPH/PHF	Max. Queue = $-19.822 + 0.688 \ln(\text{AppVol}) + 1.886 \cdot \text{TS} + 0.369 \cdot (\text{Lane})^{0.25} + 0.000000288 \cdot (\text{ConflVol})^{0.25} + 0.401 \cdot \text{Speed}$
	Approach volume > 100 VPH/PHF	Max. Queue = $-26.23 + 0.132 \cdot \text{Speed} + 0.000000603 \cdot (\text{ConflVol})^{0.25} + 4.909 \ln(\text{AppVol})$
Minor street shared left/through/right	All conditions	Max. Queue = $-12.916 + 3.225 \ln(\text{AppVol}) + 0.00569 \cdot (\text{ConflVol for LTs \& THs}) - 0.000177 \cdot (\text{ConflVol for RTs}) - 2.109 \cdot (\text{RT}\%) - 3.157 \cdot \text{TS}$

* VPH = vehicles per hour

** PHF = peak-hour factor

The independent variables included in the regression equations are defined as follows:

- AppVol = hourly traffic volume divided by peak-hour factor (PHF) for subject movement.
- ConflVol = hourly traffic volume divided by PHF that conflicts with subject movement (refer to the *Highway Capacity Manual* to identify movements that conflict with subject approach).
- TS = a dummy variable with a value of 1% if a traffic signal is located on the major street within one-quarter mile of the subject intersection and 0 otherwise.
- Lanes = number of through lanes occupied by conflicting traffic.
- Speed = posted speed limit on major street (in miles per hour).
- RT % = percentage of vehicles on shared left/through/right minor street approach that turn right.

Estimation of Maximum Queue Lengths at Unsignalized Intersections by John T. Gard, ITE Journal, November 2001.