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MEMORANDUM

To:	Mr. Tom Blackwood Director of Retail Operations Boisset Family Estates	**Date:**	January 22, 2014
From:	Omni-Means Engineers & Planners Walnut Creek, CA	**Re:**	Vehicle Trip Reduction For Permit Application Without Production Increase
Project:	Raymond Vineyards Winery Use Permit Modification P11-00156	**Job No.:**	35-5629-01
		File No.:	C1557MEM001.docx

Dear Mr. Blackwood,

The traffic study we prepared for the Raymond Vineyards Winery Use Permit Modification #P11-00156 (dated April 5, 2013) was based on proposed increases in visitation, employees, and winery production from the existing use permit. At your request, we have reevaluated the project without a winery production increase from the existing use permit. With the winery production component excluded, fewer vehicle trips would be generated and, therefore, all of the findings in the traffic study would also address conditions associated with the reduced project description.

The traffic study calculated trips for a proposed production increase from the current use permit of 750,000 gallons per year over any consecutive three year period (or not to exceed 900,000 gallons in any given year) to a proposed 1.5 million gallons per year. In the traffic study, the net change in only production-related trips from 900,000 gallons to 1.5 million gallons consisted of a minimum of one daily trip for a typical weekday and up to thirteen daily trips during the crush season. As a result, the net decrease in vehicle trips would be a minimum of one less typical daily trip and thirteen fewer daily trips during the crush with the production increase excluded.

The original traffic study included installation of a left turn lane on Zinfandel Lane at Wheeler Lane to access the project site which mitigated impacts at the project access. With a left turn lane installed and the lower number of vehicle trips resulting from removal of the production increase component, the Zinfandel Lane/Wheeler Lane (project access) intersection would correspondingly continue to operate satisfactorily with slightly better operating conditions.

In summary, the number of vehicle trips generated by the proposed project without a winery production increase component would be less than identified in the traffic study report. As a result, all of the findings in the traffic report would also address conditions with the production increase excluded. The traffic report included installation of a left turn lane on Zinfandel Lane at the project access. With a left turn lane, the project access intersection would operate satisfactorily, experiencing fewer trips and slightly better operating conditions with the production increase excluded.

We trust this provides you with the requested information. Please feel free to contact us if you have any questions or need additional information.

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MEMORANDUM

To:	Mr. John McDowell Deputy Planning Director Planning Division Zoning & Land Use Permits County of Napa, CA	**Date:**	January 27, 2014
		Re:	Traffic Analysis With Approved Developments Update
From:	Omni-Means Engineers & Planners Walnut Creek, CA		
		Job No.:	35-5629-01
Project:	Raymond Vineyards Winery Use Permit Modification P11-00156	**File No.:**	C1557MEM002.docx

Dear Mr. McDowell,

At the County's request, we have reevaluated traffic operating conditions for the proposed Raymond Vineyards Winery Use Permit Modification request (P11-00156) with vehicle trips from two additional approved developments included. The vehicle trips from the Castellucci Winery and Zinfandel Lane Winery were added to the other approved development trips in the report and the corresponding levels of service, turn lane warrants, queuing, and signal warrants were recalculated.

The two developments, located on Zinfandel Lane east of the Raymond Winery, would add approximately 42-46 daily trips and 5-9 peak hour trips to the Raymond study intersections. Levels of service would remain unchanged and delays would remain unchanged or increase slightly (under one second) for some approaches. With the additional volumes, the left turn lane warrant for the Zinfandel Lane/Wheeler Lane (project access) intersection would, necessarily, also continue to be met for no-project and plus-project conditions.

The revised text of the report and technical worksheets are attached for your reference. A revised traffic report which includes these changes is also available.

We trust this provides you with the required information. If you have any additional questions please feel free to contact us.

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8. NEAR TERM CONDITIONS (APPROVED DEVELOPMENTS)

Approved Developments

Near term conditions reflect existing volumes plus any additional volumes expected to be generated by approved developments within the project study area. Approved developments include structures that are built but not fully occupied or are not yet built but are expected to be within the near term future.

The County of Napa planning department provided information regarding approved developments.[13] The vehicle trips for these developments were generated based on the type of development and distributed onto the street network. The County identified eight developments (all wineries). A list of the developments that have calculated trips on Zinfandel Lane is provided in Table A-3 the Appendix.

Near Term Without Project Operating Conditions

The approved developments were calculated to generate 385 weekday daily trips on Zinfandel Lane adjacent to the site. Added to the existing volumes on Zinfandel Lane results in 3,264 weekday daily trips for near term conditions. The approved developments would add approximately 319 Saturday daily trips on Zinfandel Lane, resulting in a total of 1,768 daily trips for near term conditions. It is noted that the approved development volumes are likely conservatively high since they assume all trips are new trips when it is reasonable to assume a portion of the trips are shared trips with other wineries in the area. The arterial level of service on Zinfandel Lane would remain unchanged from existing conditions, continuing to function at LOS 'B' on weekdays and LOS 'A' on weekends.

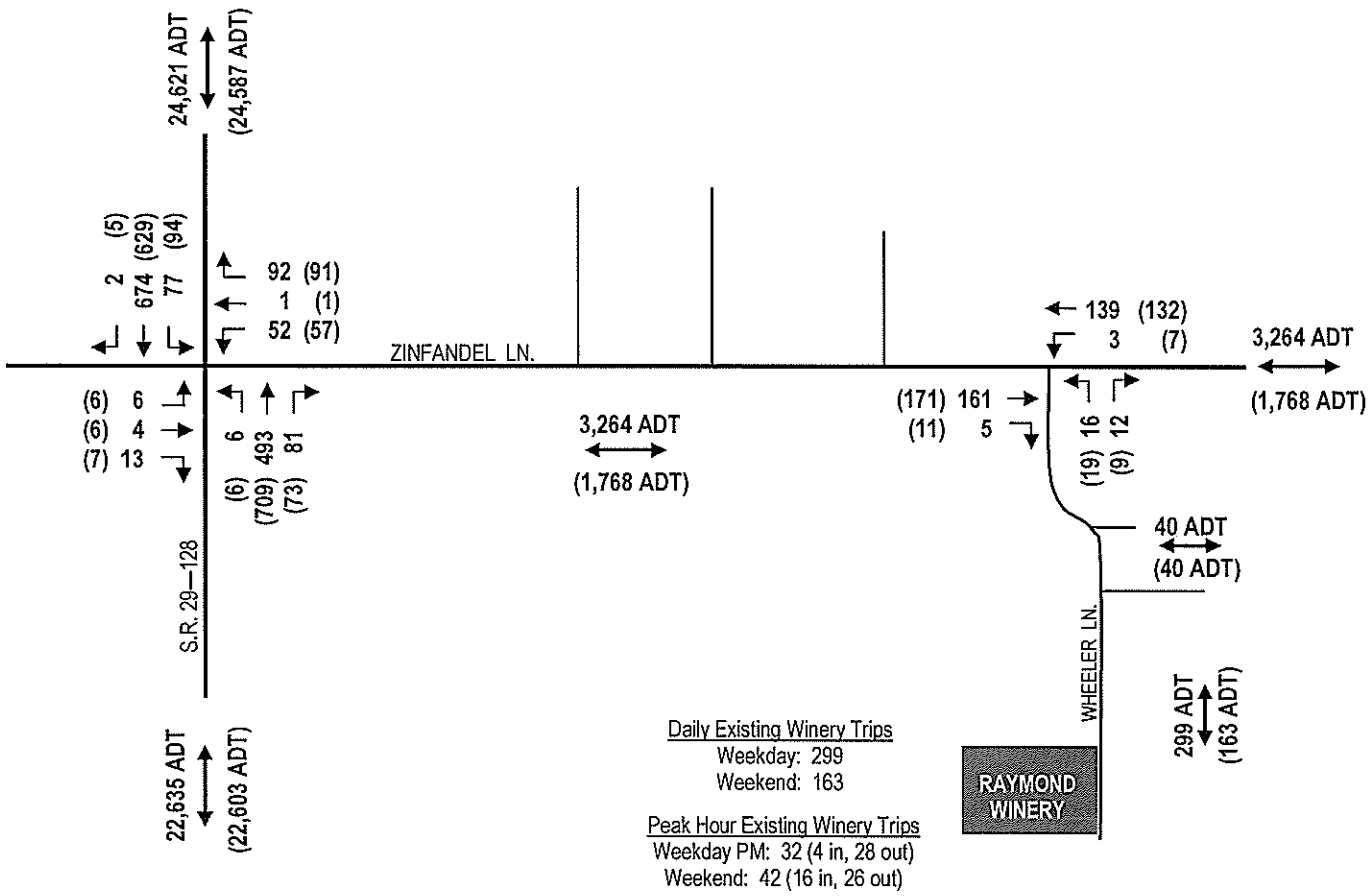
Daily volumes on SR 29 near Zinfandel Lane were calculated to increase approximately 340 trips from existing conditions, resulting in 22,600-24,600 daily trips on weekdays and weekends. LOS on SR 29 would be categorized as LOS 'F' based on the County standard for a rural two lane arterial.

The peak hour approved development trips were generated using a conservative rate of twenty five percent of the daily volumes or from traffic studies when available. The approved developments would add approximately 90 weekday and 77 weekend peak hour trips to Zinfandel Lane. The near term volumes without the project are shown in Figure 6.

Near term levels of service are shown in Table 9. Under near term conditions the Zinfandel Lane/Wheeler Lane intersection would operate at LOS 'B' (11 seconds of delay or less) for the northbound approach during weekday and weekend peak hours. The westbound approach would operate at LOS 'A' (less than one second of delay). Operation would remain efficient and no vehicle queuing would be expected at the intersection.

At the Zinfandel Lane/State Route 29 intersection, delays for the Zinfandel Lane approaches (LOS 'E'-'F') would increase compared to existing conditions. The northbound and southbound left-turn lane movements would operate at LOS 'B' (10 seconds of delay) or better during the weekday and weekend peak hours.

The Zinfandel Lane/SR 29 intersection would qualify for signalization under the peak hour warrants based on the near term (existing plus approved development) volumes. With signalization the intersection would operate at LOS 'B' (15 seconds of delay or less).



NOT TO SCALE

Existing + Approved Developments Without Project
Weekday PM and (Weekend) Peak Hour Volumes

North

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figure 6

Near Term Plus Project Operating Conditions

New trips associated with the project would add 78 weekday and 166 Saturday daily trips on the highest volume segment of Zinfandel Lane, resulting in 3,342 weekday and 1,934 Saturday daily trips. Zinfandel Lane would continue to function at LOS 'B' on weekdays and LOS 'A' on weekends.

The project would add up to 47 weekday and 100 Saturday trips to SR 29, resulting in approximately 24,670 ADT north of Zinfandel Lane and 22,670 south of Zinfandel Lane. The near term plus project volumes are shown in Figure 7.

The peak hour intersection operating conditions were evaluated for near term plus project conditions and are shown in Table 9. LOS would remain unchanged from near term without project conditions. The Zinfandel Lane/Wheeler Lane intersection would operate at LOS 'B' (11-12 seconds of delay). Based on the volumes there would not be any expected vehicle queuing issues at the project access intersection.

The Zinfandel Lane/SR 29 intersection would continue to operate at LOS 'F' for the stop controlled approaches and the SR 29 left turn movements would continue to operate at LOS 'B' or better.

The Zinfandel Lane/SR 29 intersection would qualify for signalization under the peak hour warrants and would operate at LOS 'B' (17 seconds of delay or better).

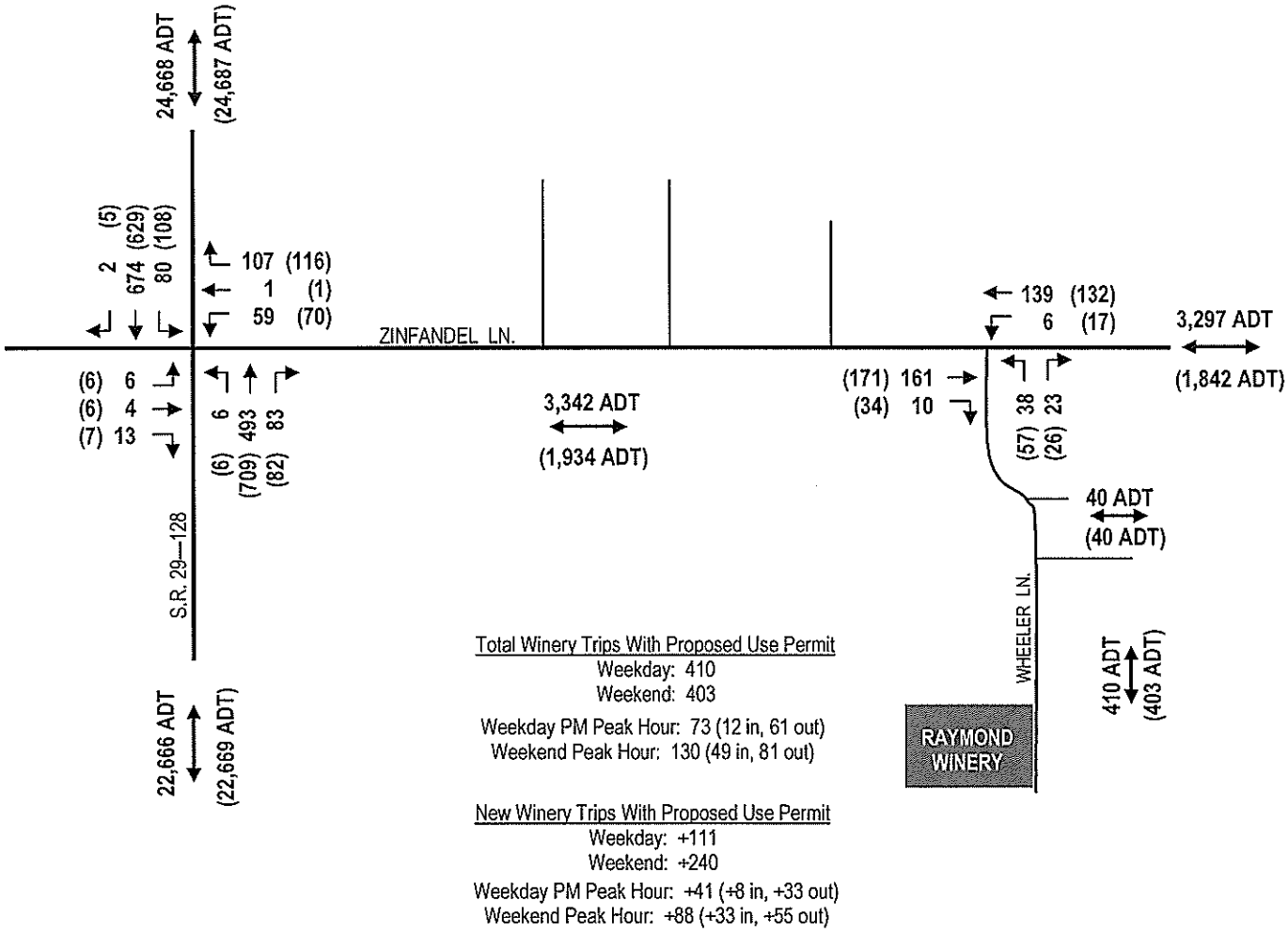
Turn Lane Warrants (Near Term and Near Term Plus Project Conditions)

The near term and near term plus project volumes were compared with the Napa County guidelines for installing a left turn lane on Zinfandel Lane. A left turn lane would be warranted under near term no project and near term plus project conditions. The near term and near term plus project right turn volumes at Wheeler Lane would not warrant right turn lanes.

TABLE 9
NEAR TERM AND NEAR TERM + PROJECT PEAK HOUR INTERSECTION OPERATIONS
LEVEL OF SERVICE (LOS) AND SECONDS OF DELAY

Intersection	Weekday PM Peak Hour		Saturday Afternoon Peak Hour	
	Near Term LOS Delay	Near Term + Project LOS Delay	Near Term LOS Delay	Near Term + Project LOS Delay
Zinfandel Lane / Wheeler Lane				
Unsignalized (minor street stop)				
Wheeler Lane northbound approach	B 10.4"	B 10.9"	B 10.8"	B 11.8"
Zinfandel Lane westbound approach	A < 1"	A < 1"	A < 1"	A 1.0"
Zinfandel Lane / SR 29				
Unsignalized (minor street stops)				
Zinfandel Lane westbound approach	F > 50"	F > 50"	F > 50"	F > 50"
Zinfandel Lane eastbound approach	E 36.6"	E 38.7"	F > 50"	F > 50"
SR 29 southbound approach	A 9.2"	A 9.2"	B 10.4"	B 10.5"
SR 29 northbound approach	A 9.2"	A 9.2"	A 9.1"	A 9.1"

Based on Highway Capacity Manual (HCM) 2000, Operations methodology for stop-sign controlled (unsignalized) intersections using Synchro-Simtraffic software. Intersection calculation yields an LOS and vehicle delay in seconds.



NOT TO SCALE

Existing + Approved Developments + Project Weekday PM and (Weekend) Peak Hour Volumes

North

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figure 7

TABLE A-3
Approved Developments Trip Generation

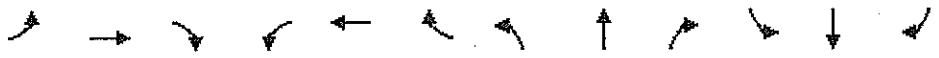
Napa County: Approved Developments In The Vicinity of Raymond Winery

Napa County:	Facility Size (sq. ft.)	Production (gals./yr)	Daily Truck Trips	Visitors (per week)	Daily Visitor Trips	Employees	Daily Employee Trips	TOTAL TRIPS		Weekday Daily Trips on Zinfandel at Raymond Access		Weekend
Kelham Winery	33,000	75,000	1	140	15	5.5	17	33	0.7	23		23
The Ranch Winery	443,000	12,500,000	98	15	2	85	259	359	0.7	251		183
Del Dotto Family Winery	15,000	48,000	1	15	2	4.5	14	16	0.1	2		2
Whitehall Lane Winery	25,000	50,000	1	500	55	4.5	14	70	0.1	7		7
Sullivan Family Estate	5,000	22,500	1	7	1	3.5	11	12	0.1	1		1
Franciscan Winery	119,000	1,200,000	1	3500	385	64.5	197	582	0.1	58		58
										343		273
Castellucci Winery[1]		30,000		350		4		55	0.5	28		28
Zinfandel Lane Winery[2]		50,000		125		3		26	0.7	14		18
										385	Total	319

Source: Napa County, Planning Department, Ms. Kirsty Shelton, March 15, 2013.

[1] *Crane Transportation Group, Traffic Impact Report for Proposed Castellucci Family Winery, November 2013.*

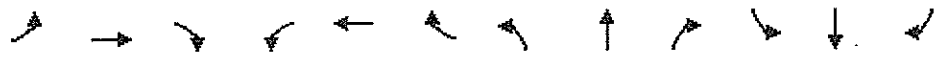
[2] *George Nickelson Transportation, Focused Traffic Study for a Proposed Winery at #588 Zinfandel Lane in Napa County, January 22, 2009.*



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	161	5	3	139	0	16	0	12	0	0	0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	0	181	6	3	156	0	18	0	13	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	156			187			347	347	184	360	349	156
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	156			187			347	347	184	360	349	156
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			97	100	98	100	100	100
cM capacity (veh/h)	1424			1388			607	575	859	585	573	889

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	187	160	31	0
Volume Left	0	3	18	0
Volume Right	6	0	13	0
cSH	1424	1388	694	1700
Volume to Capacity	0.00	0.00	0.05	0.00
Queue Length 95th (ft)	0	0	4	0
Control Delay (s)	0.0	0.2	10.4	0.0
Lane LOS		A	B	A
Approach Delay (s)	0.0	0.2	10.4	0.0
Approach LOS			B	A

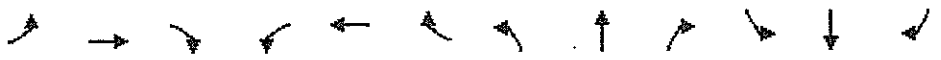
Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	19.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	6	4	13	52	1	92	6	493	81	77	674	2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	7	4	14	58	1	102	7	548	90	86	749	2
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1585	1572	750	1543	1528	593	751			638		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1585	1572	750	1543	1528	593	751			638		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	90	96	96	29	99	80	99			91		
cM capacity (veh/h)	64	99	411	81	106	506	858			946		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	26	161	7	638	86	751
Volume Left	7	58	7	0	86	0
Volume Right	14	102	0	90	0	2
cSH	139	174	858	1700	946	1700
Volume to Capacity	0.18	0.93	0.01	0.38	0.09	0.44
Queue Length 95th (ft)	16	176	1	0	7	0
Control Delay (s)	36.6	103.7	9.2	0.0	9.2	0.0
Lane LOS	E	F	A		A	
Approach Delay (s)	36.6	103.7	0.1		0.9	
Approach LOS	E	F				

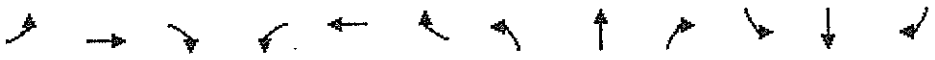
Intersection Summary			
Average Delay	11.1		
Intersection Capacity Utilization	62.0%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	171	11	7	132	0	19	0	9	0	0	0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	0	192	12	8	148	0	21	0	10	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	148			204			362	362	198	372	369	148
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	148			204			362	362	198	372	369	148
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			96	100	99	100	100	100
cM capacity (veh/h)	1433			1367			591	562	843	575	557	898

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	204	156	31	0
Volume Left	0	8	21	0
Volume Right	12	0	10	0
cSH	1433	1367	654	1700
Volume to Capacity	0.00	0.01	0.05	0.00
Queue Length 95th (ft)	0	0	4	0
Control Delay (s)	0.0	0.4	10.8	0.0
Lane LOS		A	B	A
Approach Delay (s)	0.0	0.4	10.8	0.0
Approach LOS			B	A

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	22.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↑			↑	
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	6	6	7	57	1	91	6	709	73	94	629	5
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	7	7	8	63	1	101	7	788	81	104	699	6
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1813	1793	702	1761	1755	828	704			869		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1813	1793	702	1761	1755	828	704			869		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	83	90	98	0	98	73	99			87		
cM capacity (veh/h)	39	69	438	54	73	371	893			775		

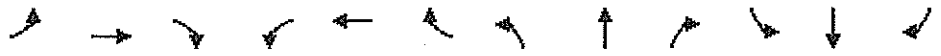
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	21	166	7	869	104	704
Volume Left	7	63	7	0	104	0
Volume Right	8	101	0	81	0	6
cSH	74	113	893	1700	775	1700
Volume to Capacity	0.29	1.47	0.01	0.51	0.13	0.41
Queue Length 95th (ft)	26	296	1	0	12	0
Control Delay (s)	72.2	322.3	9.1	0.0	10.4	0.0
Lane LOS	F	F	A		B	
Approach Delay (s)	72.2	322.3	0.1		1.3	
Approach LOS	F	F				

Intersection Summary			
Average Delay	29.9		
Intersection Capacity Utilization	69.5%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	161	10	6	139	0	38	0	23	0	0	0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	0	181	11	7	156	0	43	0	26	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	156			192			356	356	187	382	362	156
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	156			192			356	356	187	382	362	156
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			93	100	97	100	100	100
cM capacity (veh/h)	1424			1381			597	567	856	557	563	889

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	192	163	69	0
Volume Left	0	7	43	0
Volume Right	11	0	26	0
cSH	1424	1381	674	1700
Volume to Capacity	0.00	0.00	0.10	0.00
Queue Length 95th (ft)	0	0	8	0
Control Delay (s)	0.0	0.4	10.9	0.0
Lane LOS		A	B	A
Approach Delay (s)	0.0	0.4	10.9	0.0
Approach LOS			B	A

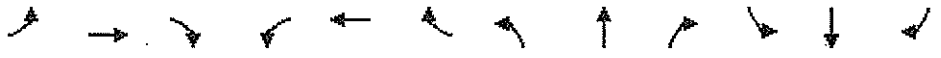
Intersection Summary			
Average Delay	1.9		
Intersection Capacity Utilization	22.4%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	6	4	13	59	1	107	6	493	83	80	674	2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	7	4	14	66	1	119	7	548	92	89	749	2
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1608	1581	750	1551	1536	594	751			640		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1608	1581	750	1551	1536	594	751			640		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	89	95	96	18	99	76	99			91		
cM capacity (veh/h)	59	98	411	80	104	505	858			944		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	26	186	7	640	89	751
Volume Left	7	66	7	0	89	0
Volume Right	14	119	0	92	0	2
cSH	132	173	858	1700	944	1700
Volume to Capacity	0.19	1.07	0.01	0.38	0.09	0.44
Queue Length 95th (ft)	17	228	1	0	8	0
Control Delay (s)	38.7	142.7	9.2	0.0	9.2	0.0
Lane LOS	E	F	A		A	
Approach Delay (s)	38.7	142.7	0.1		1.0	
Approach LOS	E	F				

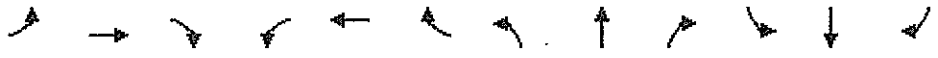
Intersection Summary			
Average Delay	16.7		
Intersection Capacity Utilization	63.8%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	171	34	17	132	0	57	0	26	0	0	0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	0	192	38	19	148	0	64	0	29	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	148			230			398	398	211	427	417	148
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	148			230			398	398	211	427	417	148
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			88	100	96	100	100	100
cM capacity (veh/h)	1433			1338			556	532	829	513	519	898

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	230	167	93	0
Volume Left	0	19	64	0
Volume Right	38	0	29	0
cSH	1433	1338	620	1700
Volume to Capacity	0.00	0.01	0.15	0.00
Queue Length 95th (ft)	0	1	13	0
Control Delay (s)	0.0	1.0	11.8	0.0
Lane LOS		A	B	A
Approach Delay (s)	0.0	1.0	11.8	0.0
Approach LOS			B	A

Intersection Summary			
Average Delay	2.6		
Intersection Capacity Utilization	32.6%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	6	6	7	70	1	116	6	709	82	108	629	5
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	7	7	8	78	1	129	7	788	91	120	699	6
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1872	1834	702	1797	1791	833	704			879		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1872	1834	702	1797	1791	833	704			879		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	78	90	98	0	98	65	99			84		
cM capacity (veh/h)	31	64	438	49	68	368	893			769		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	21	208	7	879	120	704
Volume Left	7	78	7	0	120	0
Volume Right	8	129	0	91	0	6
cSH	62	107	893	1700	769	1700
Volume to Capacity	0.34	1.94	0.01	0.52	0.16	0.41
Queue Length 95th (ft)	31	429	1	0	14	0
Control Delay (s)	89.7	524.3	9.1	0.0	10.5	0.0
Lane LOS	F	F	A		B	
Approach Delay (s)	89.7	524.3	0.1		1.5	
Approach LOS	F	F				

Intersection Summary			
Average Delay	57.8		
Intersection Capacity Utilization	73.9%	ICU Level of Service	D
Analysis Period (min)	15		

Intersection: 1: Zinfandel Lane & Wheeler Lane

Movement	WB	NB
Directions Served	LTR	LR
Maximum Queue (ft)	10	45
Average Queue (ft)	0	18
95th Queue (ft)	5	45
Link Distance (ft)	1406	1145
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 2: Zinfandel Lane & Hwy. 29

Movement	EB	WB	NB	NB	SB
Directions Served	LTR	LTR	L	TR	L
Maximum Queue (ft)	52	163	23	13	61
Average Queue (ft)	16	58	3	0	24
95th Queue (ft)	42	117	17	5	54
Link Distance (ft)	1414	1638		2063	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)			90		120
Storage Blk Time (%)					
Queuing Penalty (veh)					

Nework Summary

Network wide Queuing Penalty: 0

Intersection: 1: Zinfandel Lane & Wheeler Lane

Movement	WB	NB
Directions Served	LTR	LR
Maximum Queue (ft)	21	46
Average Queue (ft)	1	19
95th Queue (ft)	10	46
Link Distance (ft)	1406	1145
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 2: Zinfandel Lane & Hwy. 29

Movement	EB	WB	NB	NB	SB
Directions Served	LTR	LTR	L	TR	L
Maximum Queue (ft)	61	180	30	19	71
Average Queue (ft)	17	65	3	1	33
95th Queue (ft)	45	128	16	9	61
Link Distance (ft)	1414	1638		2063	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)			90		120
Storage Blk Time (%)					
Queuing Penalty (veh)					

Nework Summary

Network wide Queuing Penalty: 0

Intersection: 1: Zinfandel Lane & Wheeler Lane

Movement	WB	NB
Directions Served	LTR	LR
Maximum Queue (ft)	27	64
Average Queue (ft)	1	30
95th Queue (ft)	10	55
Link Distance (ft)	1406	1145
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 2: Zinfandel Lane & Hwy. 29

Movement	EB	WB	NB	NB	SB
Directions Served	LTR	LTR	L	TR	L
Maximum Queue (ft)	44	142	34	19	60
Average Queue (ft)	14	61	4	1	22
95th Queue (ft)	38	113	22	9	50
Link Distance (ft)	1414	1638		2063	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)			90		120
Storage Blk Time (%)					
Queuing Penalty (veh)					

Nework Summary

Network wide Queuing Penalty: 0

Intersection: 1: Zinfandel Lane & Wheeler Lane

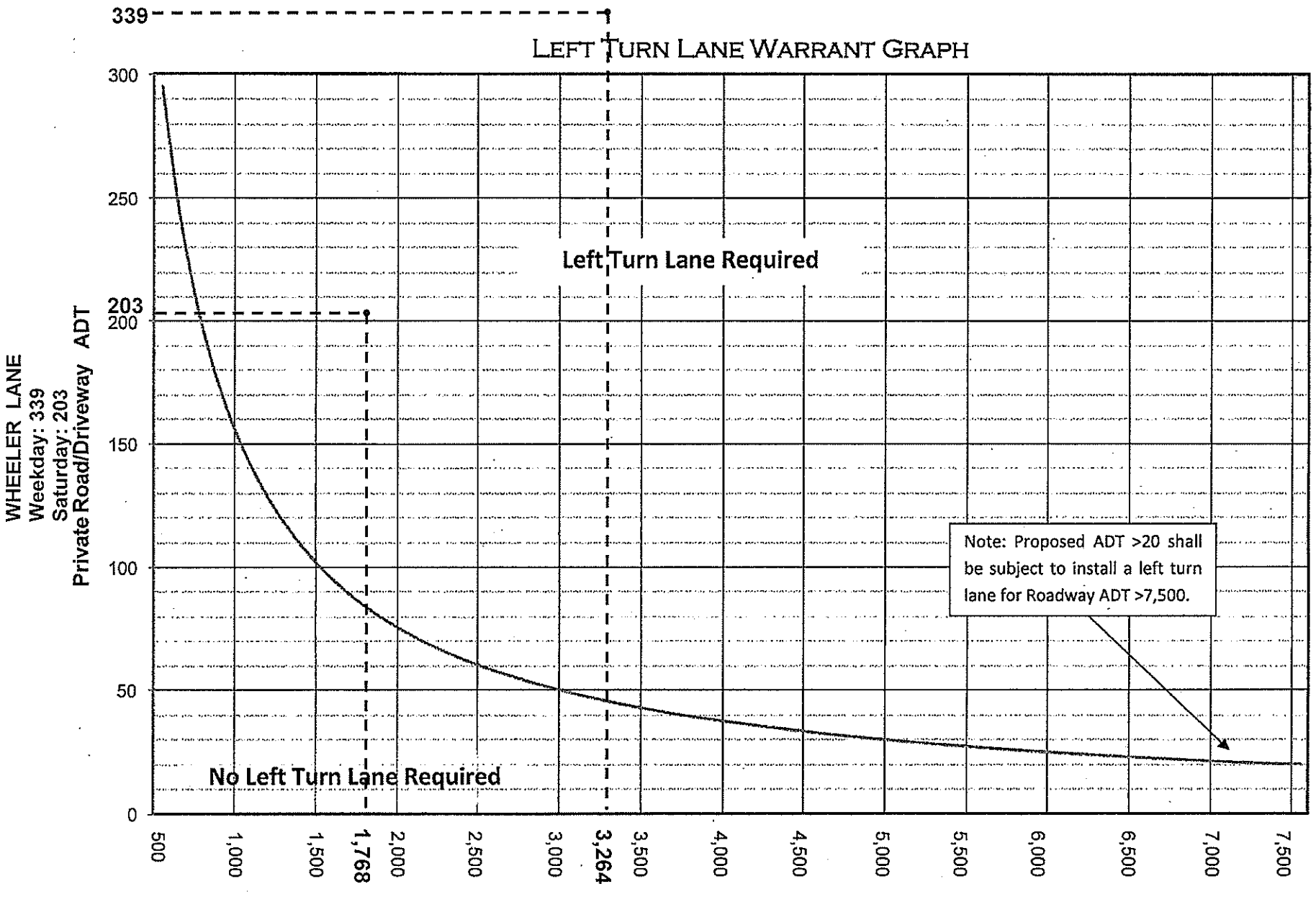
Movement	WB	NB
Directions Served	LTR	LR
Maximum Queue (ft)	32	59
Average Queue (ft)	3	36
95th Queue (ft)	19	60
Link Distance (ft)	1406	1145
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 2: Zinfandel Lane & Hwy. 29

Movement	EB	WB	NB	NB	SB
Directions Served	LTR	LTR	L	TR	L
Maximum Queue (ft)	48	289	30	18	69
Average Queue (ft)	13	116	2	1	33
95th Queue (ft)	37	249	15	9	61
Link Distance (ft)	1414	1638		2063	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)			90		120
Storage Blk Time (%)					
Queuing Penalty (veh)					

Nework Summary

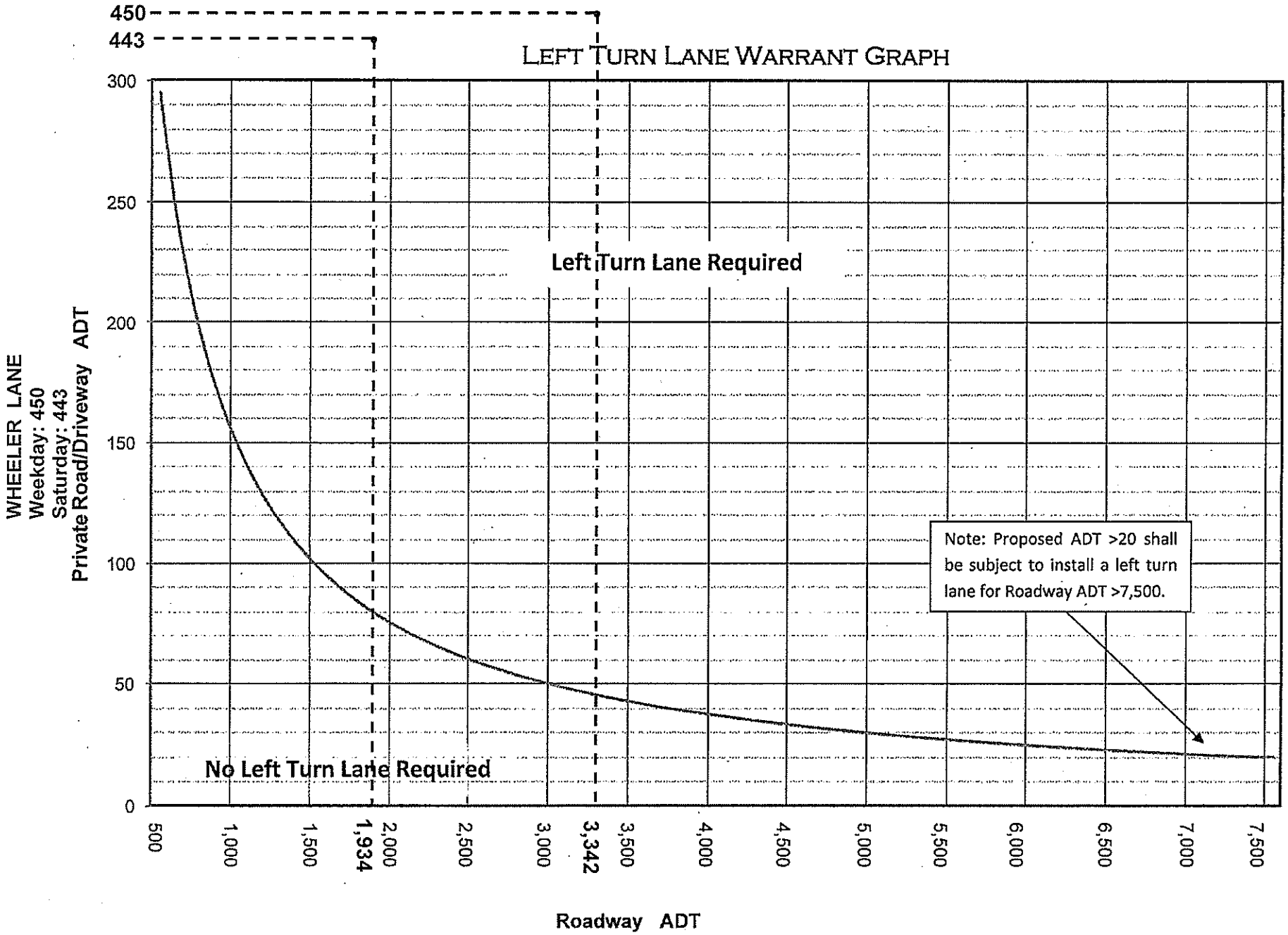
Network wide Queuing Penalty: 0



ZINFANDEL LANE
Weekday: 3,264 ADT
Saturday: 1,768 ADT

EXISTING + APPROVED DEVELOPMENTS
Left Turn Lane Warranted

Napa County, *Adopted Road and Street Standards*, revised August 31, 2004.

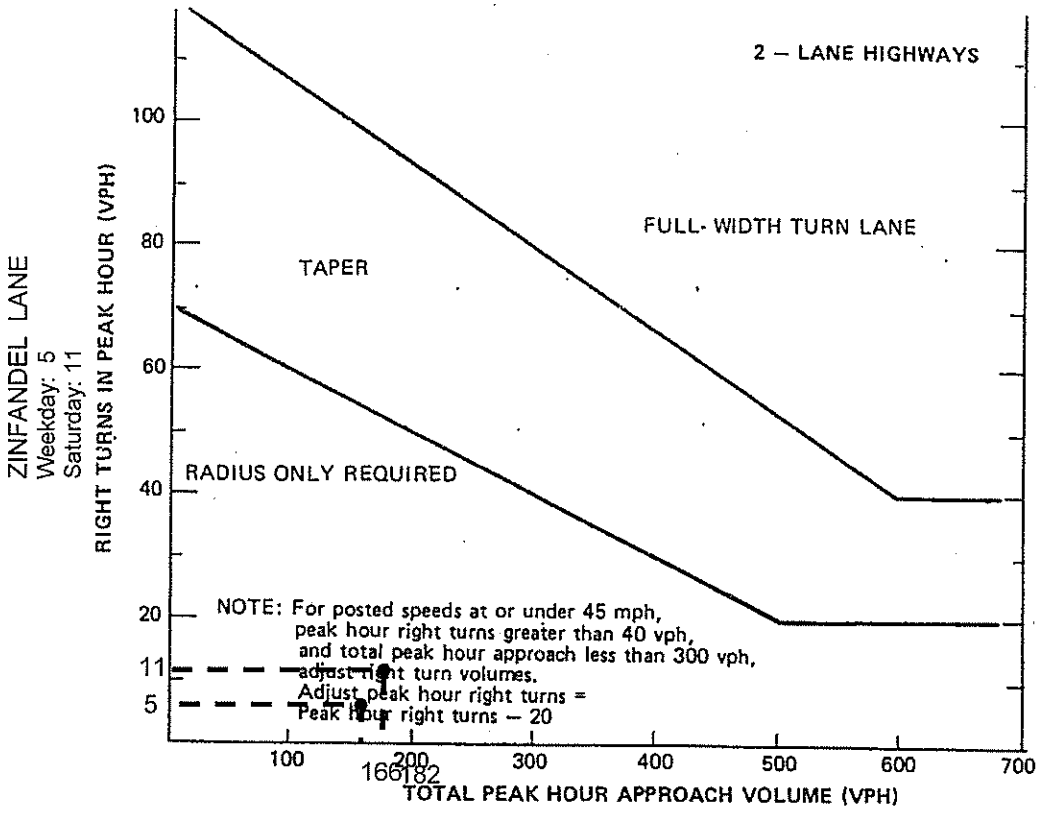


EXISTING + APPROVED DVLPMNTS. + PROJECT
Left Turn Lane Warranted

ZINFANDEL LANE
Weekday: 3,342 ADT
Saturday: 1,934 ADT

Napa County, *Adopted Road and Street Standards*, revised August 31, 2004.

CALTRANS RIGHT TURN LANE WARRANTS



ZINFANDEL LANE
Weekday: 166
Saturday: 182

Raymond Winery Project

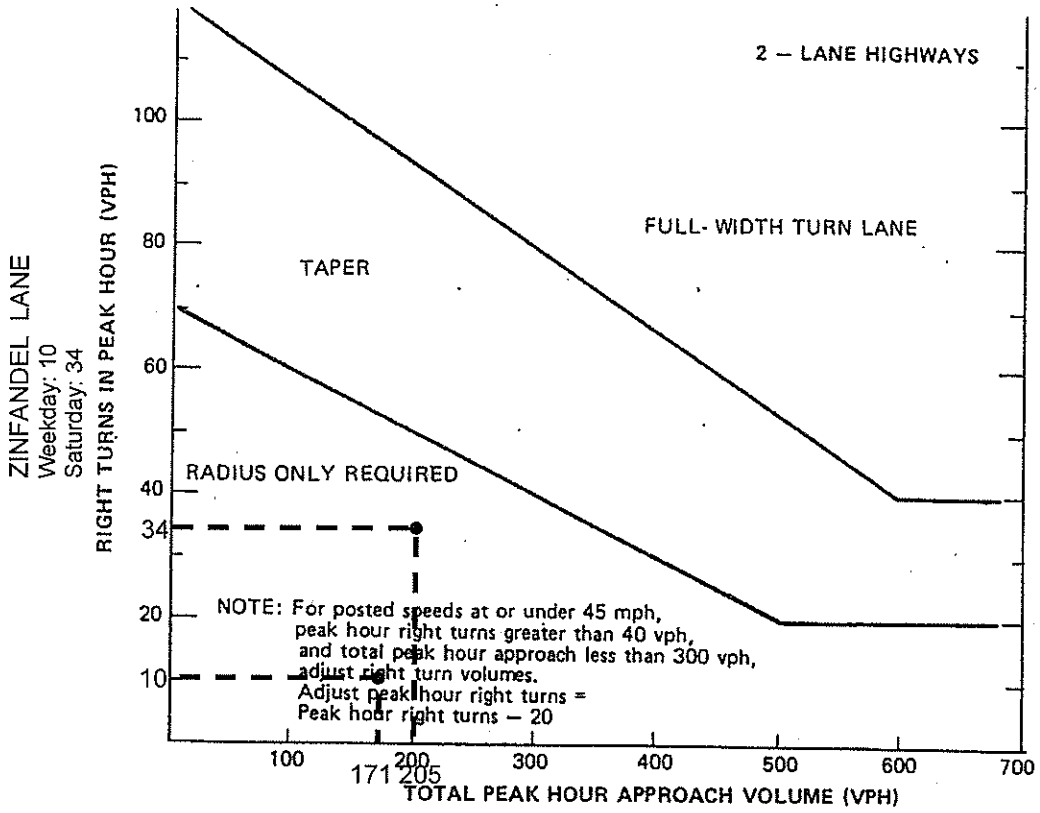
Zinfandel Ln. / Wheeler Ln. (Winery Access) Intersection

EXISTING + APPROVED DEVELOPMENTS
WEEKDAY & WEEKEND PEAK HOURS

RIGHT TURN LANE NOT WARRANTED

Transportation Research Board, National Cooperative Highway Research Program Report 279, "Intersection Channelization Design Guide", November, 1985.

CALTRANS RIGHT TURN LANE WARRANTS



ZINFANDEL LANE
Weekday: 171
Saturday: 205

Raymond Winery Project

Zinfandel Ln. / Wheeler Ln. (Winery Access) Intersection

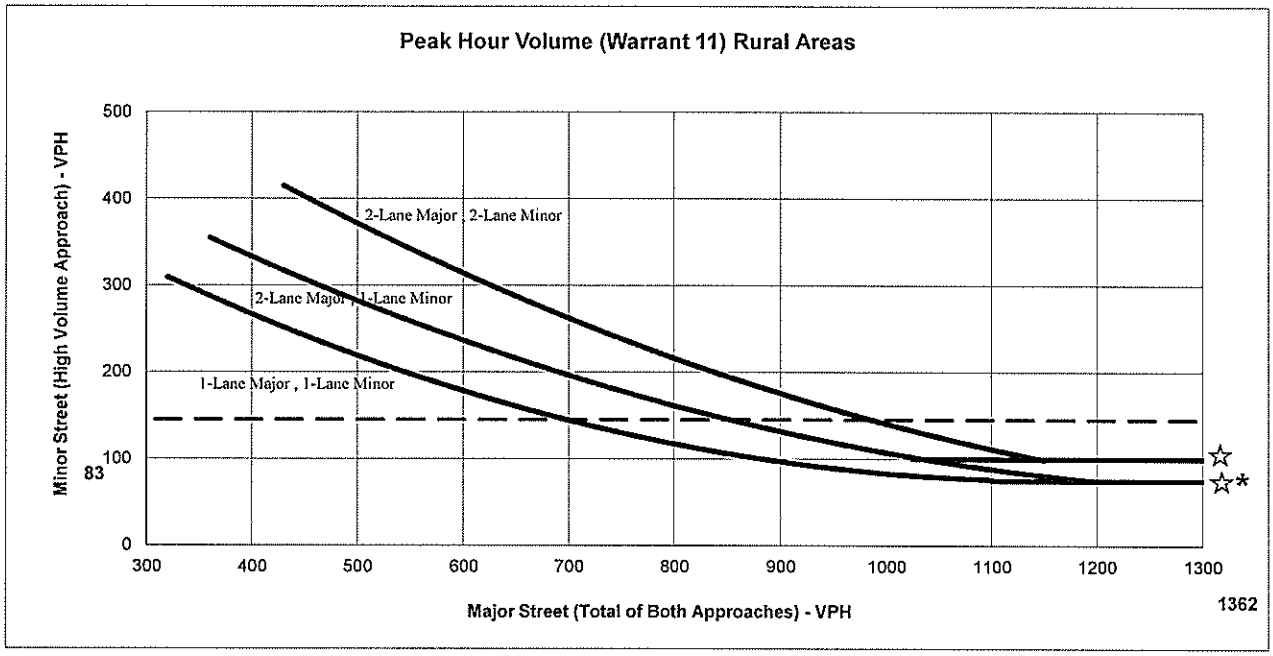
EXISTING + APPROVED DEVELOPMENTS + PROJECT
WEEKDAY & WEEKEND PEAK HOURS

RIGHT TURN LANE NOT WARRANTED

Transportation Research Board, National Cooperative Highway Research Program Report 279, "Intersection Channelization Design Guide", November, 1985.

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*

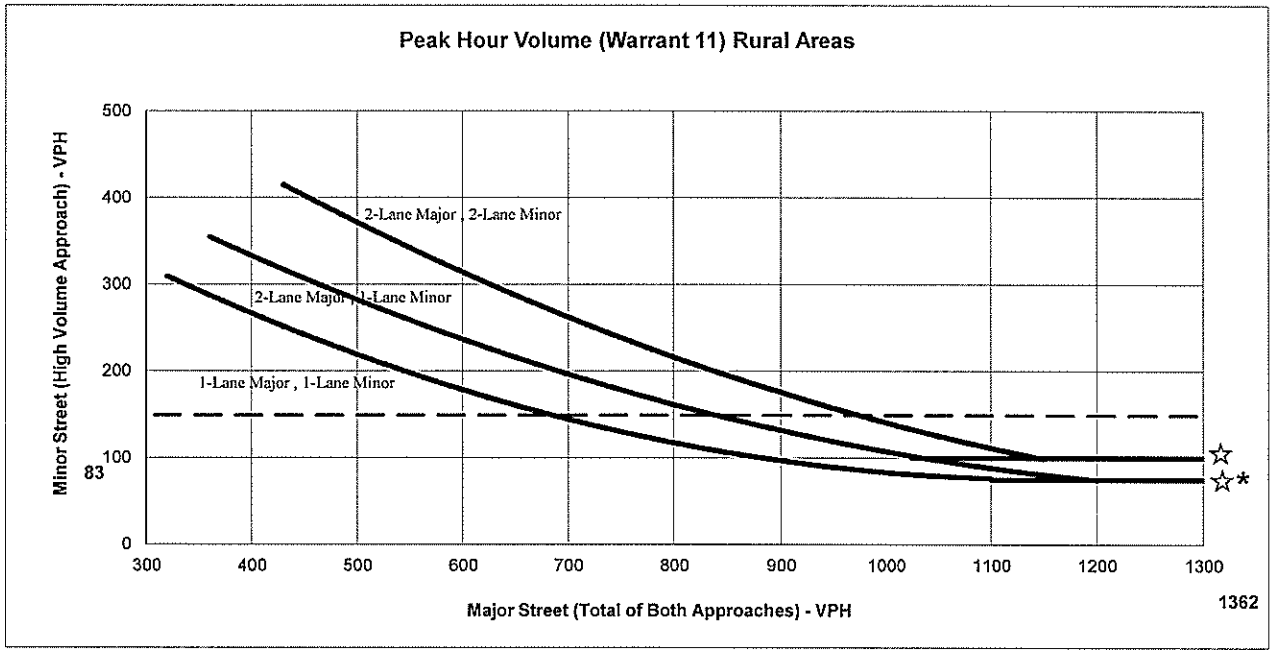


☆ NOTE:
100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 75 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Intersection:	Hwy. 29 / Zinfandel Lane
Scenario:	Near Term (Existing + Approved Developments) Weekday Peak Hour Conditions
Minor St. Volume:	145
Major St. Volume:	1333
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*

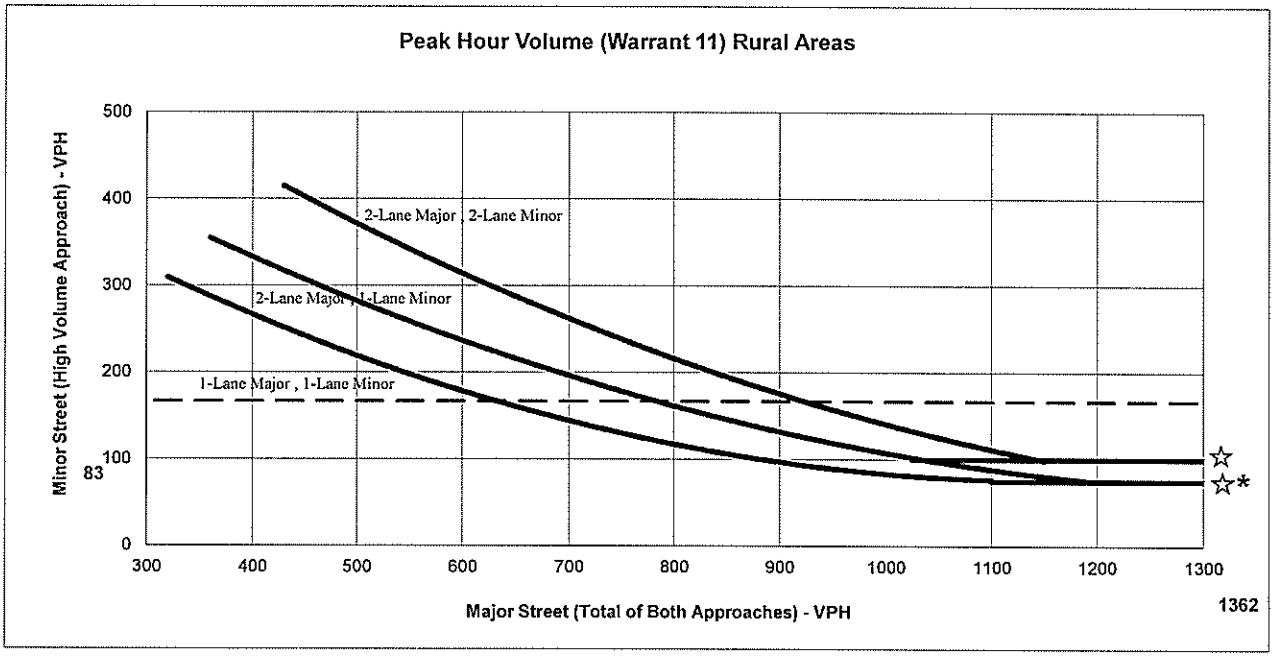


☆ NOTE:
100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 75 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Intersection:	Hwy. 29 / Zinfandel Lane
Scenario:	Near Term (Existing + Approved Developments) Saturday Peak Hour Conditions
Minor St. Volume:	149
Major St. Volume:	1516
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*

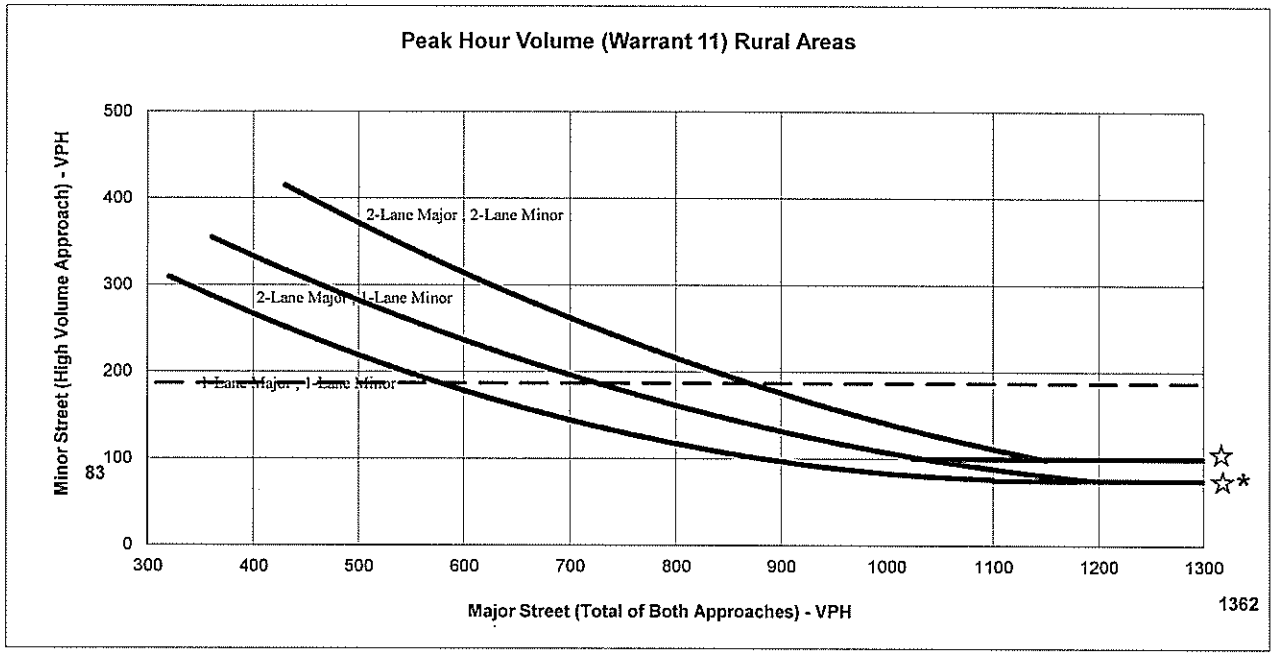


☆ NOTE:
100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 75 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Intersection:	Hwy. 29 / Zinfandel Lane
Scenario:	Near Term (Existing + Approved Developments) Plus Project Weekday Peak Hour Conditions
Minor St. Volume:	167
Major St. Volume:	1338
Warrant Met?:	Yes

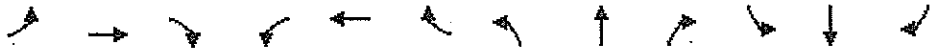
Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume 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.

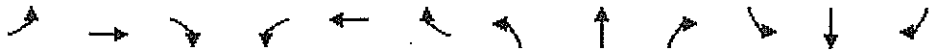
Intersection:	Hwy. 29 / Zinfandel Lane
Scenario:	Near Term (Existing + Approved Developments) Plus Project Saturday Peak Hour Conditions
Minor St. Volume:	187
Major St. Volume:	1539
Warrant Met?:	Yes



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	161	5	3	139	0	16	0	12	0	0	0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	0	181	6	3	156	0	18	0	13	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	156			187			347	347	184	360	349	156
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	156			187			347	347	184	360	349	156
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			97	100	98	100	100	100
cM capacity (veh/h)	1424			1388			607	575	859	585	573	889

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	187	160	31	0
Volume Left	0	3	18	0
Volume Right	6	0	13	0
cSH	1424	1388	694	1700
Volume to Capacity	0.00	0.00	0.05	0.00
Queue Length 95th (ft)	0	0	4	0
Control Delay (s)	0.0	0.2	10.4	0.0
Lane LOS		A	B	A
Approach Delay (s)	0.0	0.2	10.4	0.0
Approach LOS			B	A

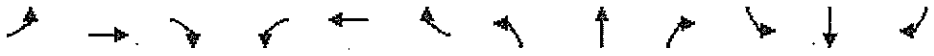
Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	19.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes		0.97			0.97		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.92			0.91		1.00	0.98		1.00	1.00	
Flt Protected		0.99			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1653			1623		1770	1817		1770	1862	
Flt Permitted		0.92			0.87		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1550			1438		1770	1817		1770	1862	
Volume (vph)	6	4	13	52	1	92	6	493	81	77	674	2
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	7	4	14	58	1	102	7	548	90	86	749	2
RTOR Reduction (vph)	0	12	0	0	88	0	0	7	0	0	0	0
Lane Group Flow (vph)	0	13	0	0	73	0	7	631	0	86	751	0
Confl. Bikes (#/hr)			10			10			10			10
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)		8.0			8.0		0.8	36.6		3.3	39.1	
Effective Green, g (s)		8.0			8.0		0.8	36.6		3.3	39.1	
Actuated g/C Ratio		0.13			0.13		0.01	0.61		0.06	0.65	
Clearance Time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		207			192		24	1110		98	1215	
v/s Ratio Prot							0.00	0.35		c0.05	c0.40	
v/s Ratio Perm		0.01			c0.05							
v/c Ratio		0.06			0.38		0.29	0.57		0.88	0.62	
Uniform Delay, d1		22.7			23.7		29.3	6.9		28.1	6.1	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.1			1.2		6.7	0.7		53.1	0.9	
Delay (s)		22.8			24.9		35.9	7.6		81.2	7.0	
Level of Service		C			C		D	A		F	A	
Approach Delay (s)		22.8			24.9			7.9			14.6	
Approach LOS		C			C			A			B	

Intersection Summary			
HCM Average Control Delay	13.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	59.9	Sum of lost time (s)	8.0
Intersection Capacity Utilization	62.0%	ICU Level of Service	B
Analysis Period (min)	15		

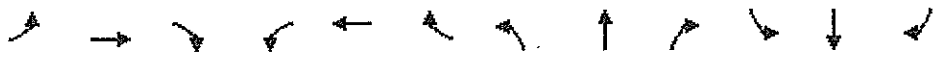
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	171	11	7	132	0	19	0	9	0	0	0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	0	192	12	8	148	0	21	0	10	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	148			204			362	362	198	372	369	148
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	148			204			362	362	198	372	369	148
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			96	100	99	100	100	100
cM capacity (veh/h)	1433			1367			591	562	843	575	557	898

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	204	156	31	0
Volume Left	0	8	21	0
Volume Right	12	0	10	0
cSH	1433	1367	654	1700
Volume to Capacity	0.00	0.01	0.05	0.00
Queue Length 95th (ft)	0	0	4	0
Control Delay (s)	0.0	0.4	10.8	0.0
Lane LOS		A	B	A
Approach Delay (s)	0.0	0.4	10.8	0.0
Approach LOS			B	A

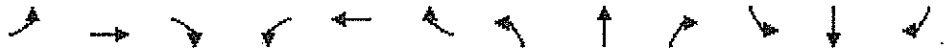
Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	22.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↑			↑	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes		0.98			0.97		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.95			0.92		1.00	0.99		1.00	1.00	
Flt Protected		0.98			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1713			1628		1770	1832		1770	1860	
Flt Permitted		0.91			0.87		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1587			1435		1770	1832		1770	1860	
Volume (vph)	6	6	7	57	1	91	6	709	73	94	629	5
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	7	7	8	63	1	101	7	788	81	104	699	6
RTOR Reduction (vph)	0	7	0	0	83	0	0	4	0	0	0	0
Lane Group Flow (vph)	0	15	0	0	82	0	7	865	0	104	705	0
Confl. Bikes (#/hr)			10			10			10			10
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)		9.1			9.1		0.7	42.5		5.0	46.8	
Effective Green, g (s)		9.1			9.1		0.7	42.5		5.0	46.8	
Actuated g/C Ratio		0.13			0.13		0.01	0.62		0.07	0.68	
Clearance Time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		211			190		18	1135		129	1269	
v/s Ratio Prot							0.00	c0.47		c0.06	0.38	
v/s Ratio Perm		0.01			c0.06							
v/c Ratio		0.07			0.43		0.39	0.76		0.81	0.56	
Uniform Delay, d1		26.1			27.4		33.7	9.4		31.3	5.6	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.1			1.6		13.4	3.1		29.5	0.5	
Delay (s)		26.2			28.9		47.1	12.5		60.8	6.1	
Level of Service		C			C		D	B		E	A	
Approach Delay (s)		26.2			28.9			12.8			13.1	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM Average Control Delay	14.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	68.6	Sum of lost time (s)	12.0
Intersection Capacity Utilization	69.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	161	10	6	139	0	38	0	23	0	0	0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	0	181	11	7	156	0	43	0	26	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	156			192			356	356	187	382	362	156
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	156			192			356	356	187	382	362	156
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			93	100	97	100	100	100
cM capacity (veh/h)	1424			1381			597	567	856	557	563	889

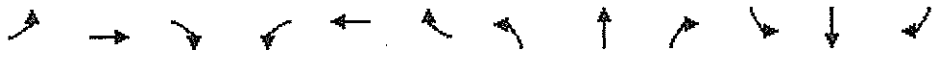
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	192	163	69	0
Volume Left	0	7	43	0
Volume Right	11	0	26	0
cSH	1424	1381	674	1700
Volume to Capacity	0.00	0.00	0.10	0.00
Queue Length 95th (ft)	0	0	8	0
Control Delay (s)	0.0	0.4	10.9	0.0
Lane LOS		A	B	A
Approach Delay (s)	0.0	0.4	10.9	0.0
Approach LOS			B	A

Intersection Summary			
Average Delay	1.9		
Intersection Capacity Utilization	22.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes		0.97			0.97		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.92			0.91		1.00	0.98		1.00	1.00	
Flt Protected		0.99			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1654			1622		1770	1816		1770	1862	
Flt Permitted		0.91			0.87		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1523			1440		1770	1816		1770	1862	
Volume (vph)	6	4	13	59	1	107	6	493	83	80	674	2
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	7	4	14	66	1	119	7	548	92	89	749	2
RTOR Reduction (vph)	0	12	0	0	103	0	0	7	0	0	0	0
Lane Group Flow (vph)	0	13	0	0	83	0	7	633	0	89	751	0
Confl. Bikes (#/hr)			10			10			10			10
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)		7.7			7.7		0.7	33.1		3.0	35.4	
Effective Green, g (s)		7.7			7.7		0.7	33.1		3.0	35.4	
Actuated g/C Ratio		0.14			0.14		0.01	0.59		0.05	0.63	
Clearance Time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		210			199		22	1077		95	1181	
v/s Ratio Prot							0.00	0.35		c0.05	c0.40	
v/s Ratio Perm		0.01			c0.06							
v/c Ratio		0.06			0.42		0.32	0.59		0.94	0.64	
Uniform Delay, d1		20.9			22.0		27.3	7.1		26.3	6.3	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.1			1.4		8.2	0.8		71.2	1.1	
Delay (s)		21.0			23.4		35.5	7.9		97.5	7.4	
Level of Service		C			C		D	A		F	A	
Approach Delay (s)		21.0			23.4			8.2			16.9	
Approach LOS		C			C			A			B	

Intersection Summary			
HCM Average Control Delay	14.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	55.8	Sum of lost time (s)	8.0
Intersection Capacity Utilization	63.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	171	34	17	132	0	57	0	26	0	0	0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	0	192	38	19	148	0	64	0	29	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	148			230			398	398	211	427	417	148
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	148			230			398	398	211	427	417	148
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			88	100	96	100	100	100
cM capacity (veh/h)	1433			1338			556	532	829	513	519	898

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	230	167	93	0
Volume Left	0	19	64	0
Volume Right	38	0	29	0
cSH	1433	1338	620	1700
Volume to Capacity	0.00	0.01	0.15	0.00
Queue Length 95th (ft)	0	1	13	0
Control Delay (s)	0.0	1.0	11.8	0.0
Lane LOS		A	B	A
Approach Delay (s)	0.0	1.0	11.8	0.0
Approach LOS			B	A

Intersection Summary			
Average Delay	2.6		
Intersection Capacity Utilization	32.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↰	↑		↰	↑	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes		0.98			0.97		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.95			0.92		1.00	0.98		1.00	1.00	
Flt Protected		0.98			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1715			1629		1770	1829		1770	1860	
Flt Permitted		0.90			0.87		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1565			1439		1770	1829		1770	1860	
Volume (vph)	6	6	7	70	1	116	6	709	82	108	629	5
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	7	7	8	78	1	129	7	788	91	120	699	6
RTOR Reduction (vph)	0	7	0	0	85	0	0	5	0	0	0	0
Lane Group Flow (vph)	0	15	0	0	123	0	7	874	0	120	705	0
Confl. Bikes (#/hr)			10			10			10			10
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)		10.3			10.3		0.7	40.6		6.1	46.0	
Effective Green, g (s)		10.3			10.3		0.7	40.6		6.1	46.0	
Actuated g/C Ratio		0.15			0.15		0.01	0.59		0.09	0.67	
Clearance Time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		234			215		18	1076		156	1240	
v/s Ratio Prot							0.00	c0.48		c0.07	0.38	
v/s Ratio Perm		0.01			c0.09							
v/c Ratio		0.06			0.57		0.39	0.81		0.77	0.57	
Uniform Delay, d1		25.2			27.3		33.9	11.2		30.8	6.2	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.1			3.6		13.4	4.8		20.1	0.6	
Delay (s)		25.3			30.9		47.3	16.0		50.9	6.8	
Level of Service		C			C		D	B		D	A	
Approach Delay (s)		25.3			30.9			16.2			13.2	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM Average Control Delay	16.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	69.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	73.9%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group