



## TECHNICAL MEMORANDUM

*Date:* October 10, 2018

*To:* Roger A. Montes  
NV5  
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San Jose, CA 95110  
P: 408.392.7222

*Project No.:* Amendment 1-Newell  
Bridge Supplemental  
Traffic Evaluation Report

*From:* Ruta Jariwala  
Project Manager

*Jurisdiction:* City of Palo Alto

Shruti Shrivastava  
Project Engineer

*Subject:* **Evaluation of Woodland Avenue/University Avenue & Woodland Avenue/E. Crescent Drive Intersections under Existing Bridge Closure Conditions**

The purpose of this memorandum is to perform operational analysis to evaluate the level of service (LOS) and delay at the subject intersections under existing (2018) bridge closure conditions.

Under this task, TJKM will reroute 50% of the trips using the Newell Road Bridge on to the study intersections at University Avenue to evaluate level of service (LOS) and delay under bridge closure conditions. The assumption of rerouting 50% of the trips was made in concurrence with the City Staff based on project meetings and email correspondence. The analysis will be conducted for existing (2018) conditions using the projected 2018 traffic demands from the *Final Supplemental Traffic Evaluation Report, September 2016* for the Newell Road Bridge Replacement Project.

Using the projected 2018 traffic demands from the *Final Supplemental Traffic Evaluation Report, September 2016* for the Newell Road Bridge Replacement Project Traffix models were developed for the weekday a.m. and p.m. peak periods for the bridge closure conditions scenario. *Highway Capacity Manual (HCM), 2000 Edition* was adopted in assessing LOS and delay.

**Table 1** summarizes the peak hour a.m. and p.m. volumes at the study intersections and **Table 2** summarizes the results of the analysis. **Appendix A** contains Traffix analysis reports.

**Table 1: Existing (2018) and Existing Plus Bridge Closure Traffic Volumes**

Scenario	Intersection	Peak Period	SBL	SBT	SBR	NBL	NBT	NBR	EBL	EBT	EBR	WBL	WBT	WBR
Existing (2018) Conditions	Woodland Ave & University Ave	AM	58	588	13	233	955	509	15	121	315	343	93	50
		PM	39	705	23	135	516	327	11	67	444	449	153	41
	E. Crescent Dr & University Ave	AM	2	649	4	22	1016	5	0	0	46	4	0	2
		PM	1	566	1	49	562	5	4	0	154	3	2	1
Existing Bridge Closure Conditions	Woodland Ave & University Ave	AM	58	<b>620</b>	13	233	955	509	<b>134</b>	121	315	343	93	50
		PM	39	<b>870</b>	23	135	516	327	<b>65</b>	67	444	449	153	41
	E. Crescent Dr & University Ave	AM	2	<b>681</b>	4	22	<b>1135</b>	5	0	0	46	4	0	2
		PM	1	<b>731</b>	1	49	<b>616</b>	5	4	0	154	3	2	1

**Table 2: LOS and Delay Analysis**

#	Intersection	Peak Period	Existing (2018) Conditions		Existing Conditions + Bridge Closure Conditions	
			Delay (sec)	LOS	Delay (sec)	LOS
1	Woodland Ave & University Ave	AM	37.4	D	40.0	D
		PM	41.3	D	46.2	D
2	E. Crescent Dr & University Ave	AM	51.7	F	65.7	F
		PM	33.6	D	49.1	E

Based on the LOS and delay analysis conducted, it was observed that rerouting 50% of the traffic from Newell Bridge onto University Avenue would result in the following:

1. Woodland Avenue/University Drive: This intersection would continue to operate at LOS D during the a.m. and p.m. peak periods.
2. E. Crescent Drive/University Avenue: This intersection would operate at unacceptable LOS F and E during the a.m. and p.m. peak periods respectively.

Rerouting of 50% of the traffic currently using Newell Bridge on to University Avenue would result in E. Crescent Drive/University Avenue operating unacceptably with significant impact under bridge closure conditions.



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## APPENDIX A – TRAFFIX REPORTS



# Existing (2018) Conditions



DelAdjPctr: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

Level Of Service Detailed Computation Report (HCM2000 Queue Method)

2000 HCM Operations Method
Future Volume Alternative

Table with columns: Approach, Movement, North Bound, South Bound, East Bound, West Bound. Rows include: Green/Cycle, ArrivalType, ProgFactor, Q1, UpstreamVC, UpstreamAdj, EarlyArrAdj, Q2, HCM2kQueue, 70thFactor, HCM2k70thQ, 85thFactor, HCM2k85thQ, 90thFactor, HCM2k90thQ, 95thFactor, HCM2k95thQ, 98thFactor, HCM2k98thQ.

Fuel Consumption and Emissions

2000 HCM Operations Method
Future Volume Alternative

Table with columns: Approach, Movement, North Bound, South Bound, East Bound, West Bound. Rows include: Run Speed, NumOfStops.

Name: year 1995 composite fleet

Fuel Consumption: 127.433 pounds
20.644 gallons
Carbon Dioxide: 397.592 pounds
Carbon Monoxide: 32.313 pounds
Hydrocarbons: 6.244 pounds
Nitrogen Oxides: 1.054 pounds

Name: year 2000 composite fleet

Fuel Consumption: 127.433 pounds
20.644 gallons
Carbon Dioxide: 397.592 pounds
Carbon Monoxide: 32.313 pounds
Hydrocarbons: 6.244 pounds
Nitrogen Oxides: 1.054 pounds

DISCLAIMER

The fuel consumption and emissions measures should be used with caution and only for comparisons of different signal timings, geometric design Future Volume Alternatives or for general planning applications, as these calculations are applied to the analysis of a single intersection within the CCG and TRAFFIX. Network models are more appropriate since they can account for the influence of the adjacent control measures and other system elements.



DelAdjPctr: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00  
 Level Of Service Detailed Computation Report (HCM2000 Queue Method)

2000 HCM Operations Method  
 Future Volume Alternative

\*\*\*\*\*  
 Intersection #4 Woodland Ave/University Ave  
 \*\*\*\*\*

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Green/Cycle:	0.37	0.37	0.37	0.17	0.17	0.17	0.03	0.24	0.24	0.09	0.30	0.30
ArrivalType:	3			3			3			3		
ProgFactor:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Q1:	13.2	13.2	13.2	6.9	5.0	5.0	1.0	10.1	10.1	3.7	6.1	7.9
UpstreamVC:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UpstreamAdj:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EarlyArrAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Q2:	3.8	3.8	3.8	3.3	1.5	1.5	1.3	3.6	3.6	2.7	0.9	1.9
HCM2kQueue:	17.0	17.0	17.0	10.2	6.4	6.4	2.3	13.7	13.7	6.4	7.0	9.8
70thFactor:	1.17	1.17	1.17	1.18	1.19	1.19	1.19	1.17	1.17	1.19	1.18	1.18
HCM2k70thQ:	19.8	19.8	19.8	12.0	7.6	7.6	2.8	16.0	16.0	7.6	8.3	11.5
85thFactor:	1.47	1.47	1.47	1.51	1.54	1.54	1.58	1.49	1.49	1.54	1.54	1.52
HCM2k85thQ:	25.0	25.0	25.0	15.4	9.9	9.9	3.7	20.4	20.4	9.9	10.8	14.9
90thFactor:	1.57	1.57	1.57	1.64	1.69	1.69	1.76	1.60	1.60	1.69	1.68	1.65
HCM2k90thQ:	26.7	26.7	26.7	16.7	10.9	10.9	4.1	21.9	21.9	10.8	11.8	16.1
95thFactor:	1.73	1.73	1.73	1.84	1.92	1.92	2.03	1.78	1.78	1.92	1.91	1.85
HCM2k95thQ:	29.4	29.4	29.4	18.7	12.4	12.4	4.8	24.3	24.3	12.3	13.4	18.1
98thFactor:	1.97	1.97	1.97	2.16	2.31	2.31	2.53	2.05	2.05	2.31	2.28	2.17
HCM2k98thQ:	33.5	33.5	33.5	21.9	14.9	14.9	5.9	28.0	28.0	14.8	16.0	21.3

Fuel Consumption and Emissions  
 2000 HCM Operations Method  
 Future Volume Alternative

\*\*\*\*\*  
 Intersection #4 Woodland Ave/University Ave  
 \*\*\*\*\*

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Run Speed:	30 MPH			30 MPH			30 MPH			30 MPH		
NumOfStops:	2.5	15.2	100.8	120.5	35.4	9.5	9.4	167	5.5	33.2	105	71.5

Name: year 1995 composite fleet  
 Fuel Consumption: 122.490 pounds  
 19.843 gallons  
 Carbon Dioxide: 382.170 pounds  
 Carbon Monoxide: 31.299 pounds  
 Hydrocarbons: 6.126 pounds  
 Nitrogen Oxides: 0.991 pounds

Name: year 2000 composite fleet  
 Fuel Consumption: 122.490 pounds  
 19.843 gallons  
 Carbon Dioxide: 382.170 pounds  
 Carbon Monoxide: 31.299 pounds  
 Hydrocarbons: 6.126 pounds  
 Nitrogen Oxides: 0.991 pounds

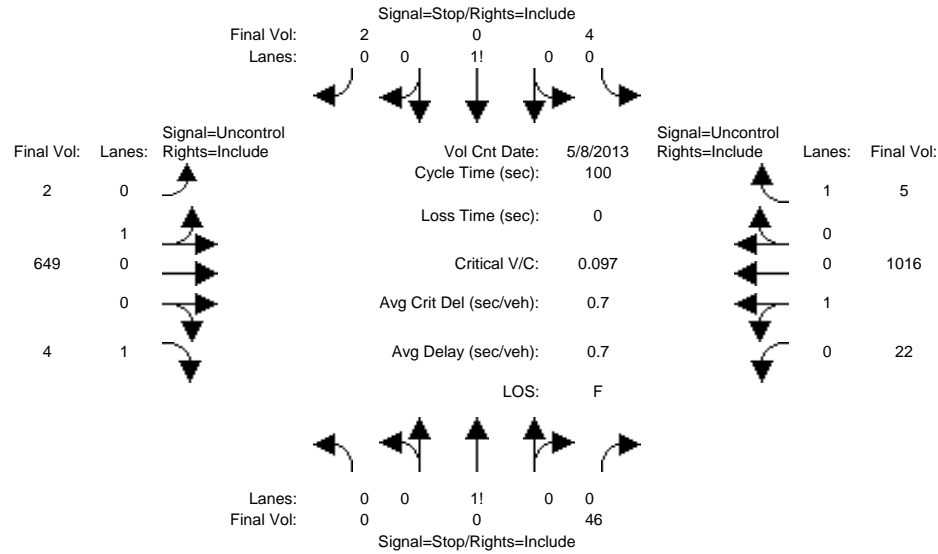
DISCLAIMER  
 The fuel consumption and emissions measures should be used with caution and only for comparisons of different signal timings, geometric design Future Volume Alternatives or for general planning applications, as these calculations are applied to the analysis of a single intersection within the CCG and TRAFFIX. Network models are more appropriate since they can account for the influence of the adjacent control measures and other system elements.



TJKM -- Palo Alto Newell Road Bridge -- P042-051  
Alternative 1 - No Project

Level Of Service Computation Report  
2000 HCM Unsignalized (Future Volume Alternative)  
2018 AM

Intersection #5: E. Crescent Dr / University Ave



Street Name:	E. Crescent Dr				University Ave				
Approach:	North Bound		South Bound		East Bound		West Bound		
Movement:	L	T	R	L	T	R	L	T	R
Volume Module: >> Count Date: 8 May 2013 << 7:30 AM - 8:30 AM	0	0	46	4	0	2	2	649	4
Base Vol:	0	0	46	4	0	2	2	649	4
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	46	4	0	2	2	649	4
Added Vol:	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	46	4	0	2	2	649	4
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	0	46	4	0	2	2	649	4
Reduct Vol:	0	0	0	0	0	0	0	0	0
Final Volume:	0	0	46	4	0	2	2	649	4

Critical Gap Module:	North Bound		South Bound		East Bound		West Bound	
Critical Gap:	6.2	7.1	6.5	6.2	4.1	xxxx	xxxx	4.1
FollowUpTim:	3.3	3.5	4.0	3.3	2.2	xxxx	xxxx	2.2

Capacity Module:	North Bound		South Bound		East Bound		West Bound	
Cnflct Vol:	xxxx	xxxx	649	1738	1717	1016	1021	xxxx
Potent Cap.:	xxxx	xxxx	473	69	91	291	688	xxxx
Move Cap.:	xxxx	xxxx	473	61	88	291	688	xxxx
Volume/Cap:	xxxx	xxxx	0.10	0.07	0.00	0.01	0.00	xxxx

Level Of Service Module:	North Bound		South Bound		East Bound		West Bound	
2Way95thQ:	xxxx	xxxx	8.0	xxxx	xxxx	xxxx	0.2	xxxx
Control Del:	xxxx	xxxx	13.4	xxxx	xxxx	xxxx	10.3	xxxx
LOS by Move:	*	*	B	*	*	*	B	*
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR
Shared Cap.:	xxxx	xxxx	xxxx	83	xxxx	xxxx	xxxx	xxxx
Shared Queue:	xxxx	xxxx	xxxx	0.2	xxxx	0.0	xxxx	xxxx
Shrd ConDel:	xxxx	xxxx	xxxx	51.7	xxxx	10.3	xxxx	xxxx
Shared LOS:	*	*	F	*	*	*	A	*
ApproachDel:	13.4		51.7		xxxx		xxxx	
ApproachLOS:	B		F		*		*	

Note: Queue reported is the distance per lane in feet.

HevVeh:	North Bound	South Bound	East Bound	West Bound
Grade:	0%	0%	0%	0%
Peds/Hour:	0	0	0	0
Pedestrian Walk Speed:	4.00 feet/sec			
LaneWidth:	12 feet	12 feet	12 feet	12 feet
Time Period:	0.25 hour			

Peak Hour Delay Signal Warrant Report

Intersection #5 E. Crescent Dr / University Ave

Future Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound		South Bound		East Bound		West Bound		
Movement:	L	T	R	L	T	R	L	T	R
Control:	Stop Sign	Stop Sign	Uncontrolled	Uncontrolled					
Lanes:	0	0	0	1	0	0	1	0	0
Initial Vol:	0	0	46	4	0	2	2	649	4
ApproachDel:	13.4		51.7		xxxx		xxxx		

Approach[northbound][lanes=1][control=Stop Sign]

Signal Warrant Rule #1: [vehicle-hours=0.2]  
 FAIL - Vehicle-hours less than 4 for one lane approach.  
 Signal Warrant Rule #2: [approach volume=46]  
 FAIL - Approach volume less than 100 for one lane approach.  
 Signal Warrant Rule #3: [approach count=4][total volume=1750]  
 SUCCEED - Total volume greater than or equal to 800 for intersection with four or more approaches.

Approach[southbound][lanes=1][control=Stop Sign]

Signal Warrant Rule #1: [vehicle-hours=0.1]  
 FAIL - Vehicle-hours less than 4 for one lane approach.  
 Signal Warrant Rule #2: [approach volume=6]  
 FAIL - Approach volume less than 100 for one lane approach.  
 Signal Warrant Rule #3: [approach count=4][total volume=1750]  
 SUCCEED - Total volume greater than or equal to 800 for intersection with four or more approaches.

SIGNAL WARRANT DISCLAIMER

This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.

Peak Hour Volume Signal Warrant Report [Urban]

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*****
Intersection #5 E. Crescent Dr / University Ave
*****
Future Volume Alternative: Peak Hour Warrant NOT Met
-----|-----|-----|-----|-----|-----|
Approach:  North Bound      South Bound      East Bound      West Bound
Movement:  L   T   R       L   T   R       L   T   R       L   T   R
-----|-----|-----|-----|-----|-----|
Control:   Stop Sign      Stop Sign      Uncontrolled    Uncontrolled
Lanes:     0 0 0 0 1       0 0 1 0 0       0 1 0 0 1       0 1 0 0 1
Initial Vol: 0 0 46       4 0 2         2 649 4         22 1016 5
-----|-----|-----|-----|-----|
Major Street Volume:      1698
Minor Approach Volume:    46
Minor Approach Volume Threshold: 102
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SIGNAL WARRANT DISCLAIMER

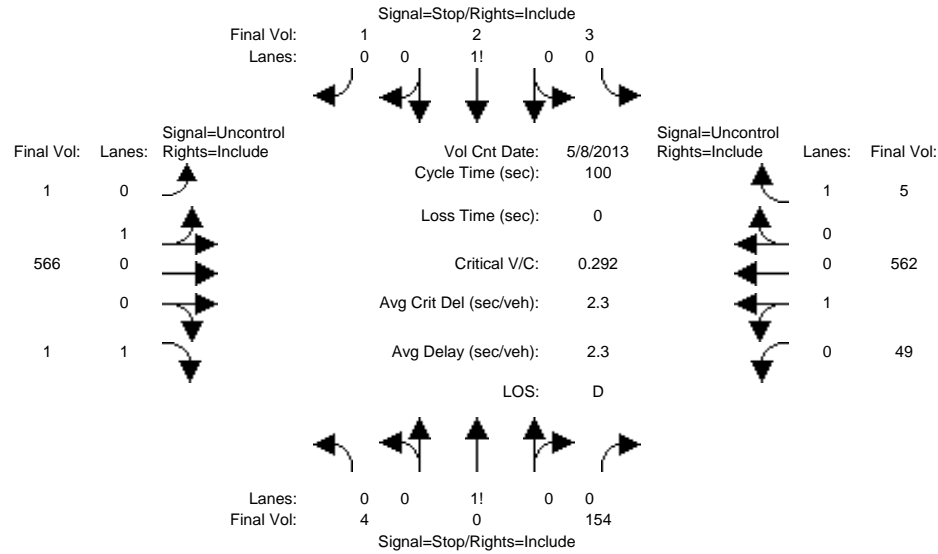
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TJKM -- Palo Alto Newell Road Bridge -- P042-051  
Alternative 1 - No Project

Level Of Service Computation Report  
2000 HCM Unsignalized (Future Volume Alternative)  
2018 PM

Intersection #5: E. Crescent Dr / University Ave



Street Name:	E. Crescent Dr				University Ave				
Approach:	North Bound		South Bound		East Bound		West Bound		
Movement:	L	T	R	L	T	R	L	T	R
Volume Module: >> Count Date: 8 May 2013 << 5:00 PM - 6:00 PM	4	0	154	3	2	1	1	566	1
Base Vol:	4	0	154	3	2	1	1	566	1
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	4	0	154	3	2	1	1	566	1
Added Vol:	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0
Initial Fut:	4	0	154	3	2	1	1	566	1
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	4	0	154	3	2	1	1	566	1
Reduct Vol:	0	0	0	0	0	0	0	0	0
Final Volume:	4	0	154	3	2	1	1	566	1

Critical Gap Module:	North Bound		South Bound		East Bound		West Bound	
Critical Gap:	7.1	6.5	6.2	7.1	6.5	6.2	4.1	xxxx
FollowUpTim:	3.5	4.0	3.3	3.5	4.0	3.3	2.2	xxxx

Capacity Module:	North Bound		South Bound		East Bound		West Bound	
Cnflct Vol:	1232	1233	566	1306	1229	562	567	xxxx
Potent Cap.:	155	178	528	138	179	530	1015	xxxx
Move Cap.:	148	169	528	94	170	530	1015	xxxx
Volume/Cap.:	0.03	0.00	0.29	0.03	0.01	0.00	0.00	xxxx

Level Of Service Module:	North Bound		South Bound		East Bound		West Bound	
2Way95thQ:	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	0.1	xxxx
Control Del:	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	8.5	xxxx
LOS by Move:	A	A	A	A	A	A	A	A
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR
Shared Cap.:	xxxx	495	xxxx	xxxx	132	xxxx	xxxx	xxxx
Shared Queue:	xxxx	1.4	xxxx	xxxx	0.1	xxxx	0.0	xxxx
Shrd ConDel:	xxxx	15.6	xxxx	33.6	xxxx	8.5	xxxx	
Shared LOS:	C	C	D	D	A	A	A	A
ApproachDel:	15.6		33.6		xxxx	xxxx	xxxx	
ApproachLOS:	C		D		D	A	A	

Note: Queue reported is the distance per lane in feet.

HevVeh:	North Bound	South Bound	East Bound	West Bound	
HevVeh:	0%	0%	0%	0%	0%
Grade:	0%	0%	0%	0%	0%
Peds/Hour:	0	0	0	0	0

Pedestrian Walk Speed: 4.00 feet/sec  
LaneWidth: 12 feet  
Time Period: 0.25 hour

Peak Hour Delay Signal Warrant Report

Intersection #5 E. Crescent Dr / University Ave

Future Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound		South Bound		East Bound		West Bound		
Movement:	L	T	R	L	T	R	L	T	R
Control:	Stop Sign	Stop Sign	Uncontrolled	Uncontrolled	Uncontrolled	Uncontrolled	Uncontrolled	Uncontrolled	Uncontrolled
Lanes:	0	0	1	0	0	1	0	1	0
Initial Vol:	4	0	154	3	2	1	1	566	1
ApproachDel:	15.6		33.6		xxxx	xxxx	xxxx	xxxx	xxxx

Approach[northbound][lanes=1][control=Stop Sign]

Signal Warrant Rule #1: [vehicle-hours=0.7]  
FAIL - Vehicle-hours less than 4 for one lane approach.  
Signal Warrant Rule #2: [approach volume=158]  
SUCCEED - Approach volume greater than or equal to 100 for one lane approach.  
Signal Warrant Rule #3: [approach count=4][total volume=1348]  
SUCCEED - Total volume greater than or equal to 800 for intersection with four or more approaches.

Approach[southbound][lanes=1][control=Stop Sign]

Signal Warrant Rule #1: [vehicle-hours=0.1]  
FAIL - Vehicle-hours less than 4 for one lane approach.  
Signal Warrant Rule #2: [approach volume=6]  
FAIL - Approach volume less than 100 for one lane approach.  
Signal Warrant Rule #3: [approach count=4][total volume=1348]  
SUCCEED - Total volume greater than or equal to 800 for intersection with four or more approaches.

SIGNAL WARRANT DISCLAIMER

This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.

Peak Hour Volume Signal Warrant Report [Urban]

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*****
Intersection #5 E. Crescent Dr / University Ave
*****
Future Volume Alternative: Peak Hour Warrant NOT Met
-----|-----|-----|-----|-----|-----|
Approach:  North Bound      South Bound      East Bound      West Bound
Movement:  L - T - R      L - T - R      L - T - R      L - T - R
-----|-----|-----|-----|-----|-----|
Control:   Stop Sign      Stop Sign      Uncontrolled    Uncontrolled
Lanes:     0 0 1 0 0      0 0 1 0 0      0 1 0 0 1      0 1 0 0 1
Initial Vol: 4 0 154      3 2 1          1 566 1          49 562 5
-----|-----|-----|-----|-----|-----|
Major Street Volume:      1184
Minor Approach Volume:    158
Minor Approach Volume Threshold: 227
-----|-----|-----|-----|-----|-----|

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SIGNAL WARRANT DISCLAIMER

This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

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# **Existing Plus Bridge Closure Conditions**

TJKM -- Palo Alto Newell Road Bridge -- P042-051  
 Alternative 1 - No Project

Level of Service Computation Report  
 2000 HCM Operations Method (Base Volume Alternative)

\*\*\*\*\*  
 Intersection #4 Woodland Ave/University Ave  
 \*\*\*\*\*  
 Cycle (sec): 70 Critical Vol./Cap.(X): 0.934  
 Loss Time (sec): 12 Average Delay (sec/veh): 40.0  
 Optimal Cycle: 101 Level of Service: D  
 \*\*\*\*\*

Street Name:	Woodland Ave						University Ave					
	North Bound			South Bound			East Bound			West Bound		
Approach:	L	T	R	L	T	R	L	T	R	L	T	R
Movement:												
Control:	Split Phase			Split Phase			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	0	0	1 0	0	0	1 0	1	0	1 1	0	1	0 1

Volume Module: >> Count Date: 8 May 2013 << 7:30 AM - 8:30 AM

Base Vol:	134	121	315	343	93	50	58	620	13	233	955	509
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	134	121	315	343	93	50	58	620	13	233	955	509
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	134	121	315	343	93	50	58	620	13	233	955	509
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	134	121	315	343	93	50	58	620	13	233	955	509
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Volume:	134	121	315	343	93	50	58	620	13	233	955	509

Saturation Flow Module:

Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.91	0.91	0.91	0.92	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.85
Lanes:	0.24	0.21	0.55	2.00	0.65	0.35	1.00	1.96	0.04	1.00	2.00	1.00
Final Sat.:	408	369	960	3502	1171	630	1805	3525	74	1805	3610	1615

Capacity Analysis Module:

Vol/Sat:	0.33	0.33	0.33	0.10	0.08	0.08	0.03	0.18	0.18	0.13	0.26	0.32
Crit Moves:	****			****			****			****		
Green/Cycle:	0.35	0.35	0.35	0.10	0.10	0.10	0.03	0.21	0.21	0.16	0.34	0.34
Volume/Cap:	0.93	0.93	0.93	0.93	0.76	0.76	0.93	0.82	0.82	0.82	0.78	0.93
Delay/Veh:	43.4	43.4	43.4	61.6	46.5	46.5	124.1	33.1	33.1	45.5	24.3	45.7
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	43.4	43.4	43.4	61.6	46.5	46.5	124.1	33.1	33.1	45.5	24.3	45.7
LOS by Move:	D	D	D	E	D	D	F	C	C	D	C	D
HCM2k95thQ:	736	736	736	351	242	242	178	441	441	354	538	683

Note: Queue reported is the distance per lane in feet.  
 \*\*\*\*\*

TJKM -- Palo Alto Newell Road Bridge -- P042-051
Alternative 1 - No Project

Level of Service Computation Report
2000 HCM Unsignalized Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #5 E. Crescent Dr / University Ave
\*\*\*\*\*

Average Delay (sec/veh): 0.7 Worst Case Level of Service: F[ 65.7]
\*\*\*\*\*

Table with columns for Street Name (E. Crescent Dr, University Ave), Approach (North Bound, South Bound, East Bound, West Bound), Movement (L, T, R), Control (Stop Sign, Uncontrolled), Rights (Include), and Lanes (0, 1).

Table with columns for Volume Module: >> Count Date: 8 May 2013 << 7:30 AM - 8:30 AM, Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Final Volume.

Table with columns for Critical Gap Module: Critical Gp, FollowUpTim.

Table with columns for Capacity Module: Cnflct Vol, Potent Cap., Move Cap., Volume/Cap.

Table with columns for Level of Service Module: 2Way95thQ, Control Del, LOS by Move, Movement, Shared Cap., SharedQueue, Shrd ConDel, Shared LOS, ApproachDel, ApproachLOS.

\*\*\*\*\*
Note: Queue reported is the distance per lane in feet.
\*\*\*\*\*

TJKM -- Palo Alto Newell Road Bridge -- P042-051
Alternative 1 - No Project

Level of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #4 Woodland Ave/University Ave
\*\*\*\*\*
Cycle (sec): 70 Critical Vol./Cap.(X): 0.973
Loss Time (sec): 12 Average Delay (sec/veh): 46.2
Optimal Cycle: 118 Level of Service: D
\*\*\*\*\*

Table with columns for Street Name (Woodland Ave, University Ave), Approach (North Bound, South Bound, East Bound, West Bound), Movement (L, T, R), Control (Split Phase, Protected), Rights (Include), and various timing parameters like Min. Green, Y+R, and Lanes.

Volume Module: >> Count Date: 8 May 2013 << 5:00 PM - 6:00 PM
Table with columns for Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, PCE Adj, MLF Adj, and Final Volume for each approach.

Saturation Flow Module:
Table with columns for Sat/Lane, Adjustment, Lanes, and Final Sat. for each approach.

Capacity Analysis Module:
Table with columns for Vol/Sat, Crit Moves, Green/Cycle, Volume/Cap, Delay/Veh, User DelAdj, AdjDel/Veh, LOS by Move, and HCM2k95thQ for each approach.

Note: Queue reported is the distance per lane in feet.
\*\*\*\*\*



TJKM -- Palo Alto Newell Road Bridge -- P042-051
Alternative 1 - No Project

Level of Service Computation Report
2000 HCM Unsignalized Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #5 E. Crescent Dr / University Ave
\*\*\*\*\*

Average Delay (sec/veh): 2.5 Worst Case Level of Service: E[ 49.1]
\*\*\*\*\*

Table with columns for Street Name (E. Crescent Dr, University Ave), Approach (North Bound, South Bound, East Bound, West Bound), Movement (L, T, R), Control (Stop Sign, Uncontrolled), Rights (Include), and Lanes (0, 1, 0, 0, 1).

Table with columns for Volume Module: >> Count Date: 8 May 2013 << 5:00 PM - 6:00 PM. Rows include Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, and Final Volume.

Table for Critical Gap Module: Critical Gp, FollowUpTim. Values include 7.1, 6.5, 6.2, 4.1, 3.5, 4.0, 3.3, 2.2, and xxxxx.

Table for Capacity Module: Cnflct Vol, Potent Cap., Move Cap., Volume/Cap. Values include 1451, 1452, 731, 1525, 1448, 616, 621, 732, 110, 132, 425, 98, 133, 494, 969, 882, 103, 124, 425, 59, 125, 494, 969, 882, 0.04, 0.00, 0.36, 0.05, 0.02, 0.00, 0.00, 0.06.

Table for Level of Service Module: 2Way95thQ, Control Del, LOS by Move, Movement, Shared Cap., SharedQueue, Shrd ConDel, Shared LOS, ApproachDel, ApproachLOS. Values include xxxxx, 0.1, 4.4, 8.7, 9.3, A, \*.

Note: Queue reported is the distance per lane in feet.
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