Town of Apple Valley
14955 Dale Evans Parkway • Apple Valley, California 92307

August 1, 2012

Mr. James Mejia
Transportation Planning/Programming Specialist
San Bernardino Associated Governments
1170 West 3rd Street, 2nd Floor
San Bernardino, CA 92410

Re: 2012 CMP Monitoring Request, Town of Apple Valley, CA.

Dear Mr. Mejia,

Attached hereto are the results of the Town of Apple Valley's 2012 Congestion Management Program (CMP) analysis. The four intersections surveyed and analyzed are as follows:

1. Apple Valley Road / Bear Valley Road
2. Corwin Road / State Route 18
3. Kiowa Road / State Route 18
4. Navajo Road / State Route 18

Table 1 shows the intersection levels of service for existing 2012 conditions. These levels are based upon the existing intersection geometrics and the current AM and PM peak hour intersection volumes.

Table 1 – 2012 Levels of Service

Intersection	Traffic Control	AM Peak Hour		PM Peak Hour	
		Delay (sec)	LOS	Delay (sec)	LOS
1. Apple Valley Road at Bear Valley Road	Signal	28	C	35	C-
2. Corwin Road at State Route 18	Signal	9	A	7	A
3. Kiowa Road at State Route 18	Signal	14	B	18	B
4. Navajo Road at State Route 18	Signal	15	B	17	B

If you have any questions, please feel free to contact me.

Sincerely,

V. Brett Morgan
Engineering Department
Town of Apple Valley
760-240-7000 Extension 7534

cc: Brad Miller P.E.
Town Engineer

Attachments:

WEBSTER

WEbster Based Signal Timing Evaluation Routine

For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

Existing Traffic with Existing Lane Geometrics

Apple Valley Rd at Bear Valley Rd **Town of Apple Valley** **AM Peak Hour**

Input

	Eastbound			Westbound			Northbound			Southbound		
Movement Times	*L*	T	R	L	*T*	R	*L*	T	R	L	*T*	R
Movement 1: **21** secs	**X**			X								X
Movement 2: **17** secs	**X**	X	X									X
Movement 3: **54** secs		X	X		**X**	X						
Movement 4: **8** secs						X	**X**			X		
Movement 5: **2** secs						X				X	**X**	X
Movement 6: **18** secs								X	X		**X**	X
# of Lanes (#, S, P)	**2**	2	1	1	**3**	1	**2**	2	1	2	**1**	2
Unadjusted Volume	**456**	523	46	58	**1096**	116	**75**	149	32	126	**130**	712
Peak Hour Factor (PHF)	**1.00**	1.00	1.00	1.00	**1.00**	1.00	**1.00**	1.00	1.00	1.00	**1.00**	1.00
Growth Factor (%)												
Project Trip Volume (vph)												
Sat. Flow Override (vph)												
Min. Time or Ped. Time	**10**	33	33	10	**33**	33	**10**	35	35	10	**35**	35
Permissive Veh/Cycle												
Progression Adj. Factor (PAF)	**1.00**	1.00	1.00	1.00	**1.00**	1.00	**1.00**	1.00	1.00	1.00	**1.00**	1.00

Parameter Values (using default set 'SANBAG (Existing)')

	Other	Default
Duration of Peak Period (min)		15
Lost Time (sec)		2
Min. Time (Left Turns, sec)		10
Min/Ped Time (Thru Lanes, sec)		20
Sat Flow (1 Left lane, vphg)	1700	1800
Sat Flow (2 Left lanes, vphg)	3200	3500
Sat Flow (1 Thru lane, vphg)	1800	1900
Sat Flow (1 Right lane, vphg)		1800
Vehicle Length (feet)		20

Output

	***				***		***				***	
Pk. Hr. Vol. (vph)	**456**	523	46	58	**1096**	116	**75**	149	32	126	**130**	712
Saturation Flow (vph)	**3200**	3600	1800	1700	**5400**	1800	**3200**	3600	1800	3200	**1800**	3400
X or V/C	**0.48**	0.25	0.04	0.22	**0.47**	0.12	**0.47**	0.31	0.13	0.59	**0.48**	0.45
Effective green (sec)	**36**	69	69	19	**52**	62	**6**	16	16	8	**18**	56
Split Time (sec)	**38**	71	71	21	**54**	64	**8**	18	18	10	**20**	58
Min. Time or Ped. Time (sec)	**10**	33	33	10	**33**	33	**10**	35	35	10	**35**	35
Delay - 15 min pk (sec/veh)	**36**	13	11	46	**25**	15	**65**	49	47	66	**53**	23
Level of Service (LOS)	**D+**	B	B	D	**C+**	B	**E**	D	D	E	**D-**	C+
Average 'Q' (veh/ln)	**5**	4	1	2	**7**	2	**1**	2	1	2	**4**	6
Design 'Q'- ft/ln	**160**	120	40	60	**220**	60	**40**	60	40	60	**120**	180
Do Vehicles Clear?	**YES**	YES	YES	YES	**YES**	YES	**YES**	YES	YES	YES	**YES**	YES

Summary

Whole Intersection

Weighted Avg Delay (sec) = 28
Level of Service - LOS = C

Critical Movements

Weighted Avg Delay (sec) = 32
Level of Service - LOS = C-
Intersection Capacity Utilization - ICU = 0.47

Predetermined Cycle Length is 120 sec

Min./Ped. Times May Not Be Satisfied

WEBSTER

WEbster Based Signal Timing Evaluation Routine

For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

Existing Traffic with Existing Lane Geometrics

Apple Valley Rd at Bear Valley Rd **Town of Apple Valley** **PM Peak Hour**

Input

	Eastbound			Westbound			Northbound			Southbound		
Movement Times	*L*	T	R	L	*T*	R	*L*	T	R	L	*T*	R
Movement 1: **19** secs	**X**			X								X
Movement 2: **17** secs	**X**	X	X									X
Movement 3: **33** secs		X	X		**X**	X						
Movement 4: **10** secs						X	**X**			X		
Movement 5: **3** secs						X				X	**X**	X
Movement 6: **35** secs								X	X		**X**	X
# of Lanes (#, S, P)	**2**	2	1	1	**3**	1	**2**	2	1	2	**1**	2
Unadjusted Volume	**717**	1029	63	142	**866**	78	**83**	249	145	154	**240**	590
Peak Hour Factor (PHF)	**1.00**	1.00	1.00	1.00	**1.00**	1.00	**1.00**	1.00	1.00	1.00	**1.00**	1.00
Growth Factor (%)												
Project Trip Volume (vph)												
Sat. Flow Override (vph)												
Min. Time or Ped. Time	**10**	33	33	10	**33**	33	**10**	35	35	10	**35**	35
Permissive Veh/Cycle												
Progression Adj. Factor (PAF)	**1.00**	1.00	1.00	1.00	**1.00**	1.00	**1.00**	1.00	1.00	1.00	**1.00**	1.00

Parameter Values (using default set 'SANBAG (Existing)')

	Other	Default
Duration of Peak Period (min)		15
Lost Time (sec)		2
Min. Time (Left Turns, sec)		10
Min/Ped Time (Thru Lanes, sec)		20
Sat Flow (1 Left lane, vphg)	1700	1800
Sat Flow (2 Left lanes, vphg)	3200	3500
Sat Flow (1 Thru lane, vphg)	1800	1900
Sat Flow (1 Right lane, vphg)		1800
Vehicle Length (feet)		20

Output

	***				***		***				***	
Pk. Hr. Vol. (vph)	**717**	1029	63	142	**866**	78	**83**	249	145	154	**240**	590
Saturation Flow (vph)	**3200**	3600	1800	1700	**5400**	1800	**3200**	3600	1800	3200	**1800**	3400
X or V/C	**0.77**	0.70	0.09	0.57	**0.61**	0.12	**0.38**	0.25	0.29	0.51	**0.43**	0.28
Effective green (sec)	**34**	48	48	17	**31**	44	**8**	33	33	11	**36**	72
Split Time (sec)	**36**	50	50	19	**33**	46	**10**	35	35	13	**38**	74
Min. Time or Ped. Time (sec)	**10**	33	33	10	**33**	33	**10**	35	35	10	**35**	35
Delay - 15 min pk (sec/veh)	**44**	31	21	56	**40**	24	**57**	33	34	57	**35**	11
Level of Service (LOS)	**D**	C-	C+	E+	**D+**	C+	**E+**	C-	C-	E+	**C-**	B
Average 'Q' (veh/ln)	**8**	10	1	4	**7**	2	**1**	3	3	2	**5**	4
Design 'Q'- ft/ln	**240**	300	40	120	**220**	60	**40**	100	100	60	**160**	120
Do Vehicles Clear?	**YES**	YES	YES	YES	**YES**	YES	**YES**	YES	YES	YES	**YES**	YES

Summary

Whole Intersection

Weighted Avg Delay (sec) = 35
Level of Service - LOS = C-

Critical Movements

Weighted Avg Delay (sec) = 41
Level of Service - LOS = D
Intersection Capacity Utilization - ICU = 0.58

Required Cycle Length is 117 sec

Min./Ped. Times Satisfied

WEBSTER

WEbster Based Signal Timing Evaluation Routine

For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

Existing Traffic with Existing Lane Geometrics

Corwin Rd at State Route 18 **Town of Apple Valley** **AM Peak Hour**

Input

	Eastbound			Westbound			Northbound			Southbound		
Movement Times	*L*	T	R	L	*T*	R	L	T	R	*L*	T	R
Movement 1: 13 secs	X	X										X
Movement 2: 31 secs		X			X	X						
Movement 3: 10 secs										X		X
Movement 4: 0 secs												
Movement 5: 0 secs												
Movement 6: 0 secs												
# of Lanes (#, S, P)	1	2			2	1				1		2
Unadjusted Volume	197	462			807	27				30		197
Peak Hour Factor (PHF)	1.00	1.00			1.00	1.00				1.00		1.00
Growth Factor (%)												
Project Trip Volume (vph)												
Sat. Flow Override (vph)												
Min. Time or Ped. Time	10	26			31	31				10		10
Permissive Veh/Cycle												
Progression Adj. Factor (PAF)	1.00	1.00			1.00	1.00				1.00		1.00

Parameter Values (using default set 'SANBAG (Existing)')

	Other	Default
Duration of Peak Period (min)		15
Lost Time (sec)		2
Min. Time (Left Turns, sec)		10
Min/Ped Time (Thru Lanes, sec)		20
Sat Flow (1 Left lane, vphg)	1700	1800
Sat Flow (2 Left lanes, vphg)	3200	3500
Sat Flow (1 Thru lane, vphg)	1800	1900
Sat Flow (1 Right lane, vphg)		1800
Vehicle Length (feet)		20

Output

	***				***					***		
Pk. Hr. Vol. (vph)	197	462			807	27				30		197
Saturation Flow (vph)	1700	3600			3600	1800				1700		3400
X or V/C	0.57	0.17			0.42	0.03				0.12		0.15
Effective green (sec)	11	42			29	29				8		21
Split Time (sec)	13	44			31	31				10		23
Min. Time or Ped. Time (sec)	10	26			31	31				10		10
Delay - 15 min pk (sec/veh)	26	2			8	6				21		11
Level of Service (LOS)	C	A			A	A				C+		B
Average 'Q' (veh/ln)	2	1			3	1				1		1
Design 'Q'- ft/ln	60	40			100	40				40		40
Do Vehicles Clear?	YES	YES			YES	YES				YES		YES

Summary

Whole Intersection

Weighted Avg Delay (sec) = 9
Level of Service - LOS = A

Critical Movements

Weighted Avg Delay (sec) = 12
Level of Service - LOS = B
Intersection Capacity Utilization - ICU = 0.40

Required Cycle Length is 54 sec

Min./Ped. Times Satisfied

WEBSTER

WEbster Based Signal Timing Evaluation Routine

For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

Existing Traffic with Existing Lane Geometrics

Corwin Rd at State Route 18 **Town of Apple Valley** **PM Peak Hour**

Input

	Eastbound			Westbound			Northbound			Southbound		
Movement Times	*L*	T	R	L	*T*	R	L	T	R	*L*	T	R
Movement 1: **14** secs	**X**	X										X
Movement 2: **31** secs		X			**X**	X						
Movement 3: **10** secs										**X**		X
Movement 4: **0** secs												
Movement 5: **0** secs												
Movement 6: **0** secs												
# of Lanes (#, S, P)	**1**	2			**2**	1				**1**		2
Unadjusted Volume	**220**	1121			**740**	13				**28**		162
Peak Hour Factor (PHF)	**1.00**	1.00			**1.00**	1.00				**1.00**		1.00
Growth Factor (%)												
Project Trip Volume (vph)												
Sat. Flow Override (vph)												
Min. Time or Ped. Time	**10**	26			**31**	31				**10**		10
Permissive Veh/Cycle												
Progression Adj. Factor (PAF)	**1.00**	1.00			**1.00**	1.00				**1.00**		1.00

Parameter Values (using default set 'SANBAG (Existing)')

	Other	Default
Duration of Peak Period (min)		15
Lost Time (sec)		2
Min. Time (Left Turns, sec)		10
Min/Ped Time (Thru Lanes, sec)		20
Sat Flow (1 Left lane, vphg)	1700	1800
Sat Flow (2 Left lanes, vphg)	3200	3500
Sat Flow (1 Thru lane, vphg)	1800	1900
Sat Flow (1 Right lane, vphg)		1800
Vehicle Length (feet)		20

Output

	***				***					***		
Pk. Hr. Vol. (vph)	**220**	1121			**740**	13				**28**		162
Saturation Flow (vph)	**1700**	3600			**3600**	1800				**1700**		3400
X or V/C	**0.59**	0.40			**0.39**	0.01				**0.11**		0.12
Effective green (sec)	**12**	43			**29**	29				**8**		22
Split Time (sec)	**14**	45			**31**	31				**10**		24
Min. Time or Ped. Time (sec)	**10**	26			**31**	31				**10**		10
Delay - 15 min pk (sec/veh)	**26**	2			**8**	6				**21**		11
Level of Service (LOS)	**C**	A			**A**	A				**C+**		B
Average 'Q' (veh/ln)	**3**	2			**3**	1				**1**		1
Design 'Q'- ft/ln	**100**	60			**100**	40				**40**		40
Do Vehicles Clear?	**YES**	YES			**YES**	YES				**YES**		YES

Summary

Whole Intersection

Weighted Avg Delay (sec) = 7
Level of Service - LOS = A

Critical Movements

Weighted Avg Delay (sec) = 13
Level of Service - LOS = B
Intersection Capacity Utilization - ICU = 0.39

Required Cycle Length is 55 sec

Min./Ped. Times Satisfied

ITM Peak Hour Summary

Prepared by:

National Data & Surveying Services

Corwin Rd and SR-18 , City of Apple Valley

Date: 7/19/12

Day: Thursday

Project #: CA12_6101_001

AM Peak Hour	745 AM
NOON Peak Hour	
PM Peak Hour	500 PM

Peak Hour Summary

Southbound Approach (Corwin Rd)

Lanes	2	0	1		
AM	197	0	30	224	AM
NOON	0	0	0	0	NOON
PM	162	0	28	233	PM

Eastbound Approach (SR-18)

	AM	NOON	PM
	1004	0	902
1	197	0	220
2	462	0	1121
0	0	0	0
Lanes	AM	NOON	PM

Westbound Approach

AM	NOON	PM	Lanes
27	0	13	0.5
807	0	740	0.5
0	0	0	1
492	0	1149	
AM	NOON	PM	

Northbound Approach

AM	0	0	0	0	AM
NOON	0	0	0	0	NOON
PM	0	0	0	0	PM
		0	0	0	Lanes

CONTROL: Signalized

Count Periods	Start	End
AM	7:00 AM	9:00 AM
NOON		
PM	4:00 PM	6:00 PM

Total Ins & Outs

	North Leg		
AM	227	224	
NOON	0	0	
PM	190	233	

West Leg	AM	NOON	PM
	1004	0	902
	659	0	1341

East Leg	AM	NOON	PM
	834	0	753
	492	0	1149

South Leg		
AM	0	0
NOON	0	0
PM	0	0

Total Volume Per Leg

	North Leg
AM	451
NOON	0
PM	423

West Leg	AM	NOON	PM
	1663	0	2243

East Leg	AM	NOON	PM
	1326	0	1902

South Leg	
AM	0
NOON	0
PM	0

WEBSTER

WEbster Based Signal Timing Evaluation Routine

For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

Existing Traffic with Existing Lane Geometrics

Kiowa Rd at State Route 18 **Town of Apple Valley** **AM Peak Hour**

Input

	Eastbound			Westbound			Northbound			Southbound		
Movement Times	*L*	T	R	L	*T*	R	*L*	T	R	L	T	R
Movement 1: **10** secs	**X**			X								
Movement 2: **0** secs	**X**	X	X									
Movement 3: **36** secs		X	X		**X**	X						
Movement 4: **28** secs							**X**	X	X	X	X	X
Movement 5: **0** secs												
Movement 6: **0** secs												
# of Lanes (#, S, P)	**1**	2	S	1	**2**	S	**1**	1	1	1	1	1
Unadjusted Volume	**21**	291	67	10	**450**	10	**134**	37	18	10	40	32
Peak Hour Factor (PHF)	**1.00**	1.00	1.00	1.00	**1.00**	1.00	**1.00**	1.00	1.00	1.00	1.00	1.00
Growth Factor (%)												
Project Trip Volume (vph)												
Sat. Flow Override (vph)			Shrd			Shrd						
Min. Time or Ped. Time	**10**	10	10	10	**10**	10	**28**	28	28	28	28	28
Permissive Veh/Cycle												
Progression Adj. Factor (PAF)	**1.00**	1.00	-	1.00	**1.00**	-	**1.00**	1.00	1.00	1.00	1.00	1.00

Parameter Values (using default set 'SANBAG (Existing)')

	Other	Default
Duration of Peak Period (min)		15
Lost Time (sec)		2
Min. Time (Left Turns, sec)		10
Min/Ped Time (Thru Lanes, sec)		20
Sat Flow (1 Left lane, vphg)	1700	1800
Sat Flow (2 Left lanes, vphg)	3200	3500
Sat Flow (1 Thru lane, vphg)	1800	1900
Sat Flow (1 Right lane, vphg)		1800
Vehicle Length (feet)		20

Output

	***				***		***					
Pk. Hr. Vol. (vph)	**21**	291	67	10	**450**	10	**134**	37	18	10	40	32
Saturation Flow (vph)	**1700**	3600	Shrd	1700	**3600**	Shrd	**1300**	1800	1800	1300	1800	1800
X or V/C	**0.11**	0.22	-	0.05	**0.28**	-	**0.29**	0.06	0.03	0.02	0.06	0.05
Effective green (sec)	**8**	34	-	8	**34**	-	**26**	26	26	26	26	26
Split Time (sec)	**10**	36	-	10	**36**	-	**28**	28	28	28	28	28
Min. Time or Ped. Time (sec)	**10**	10	-	10	**10**	-	**28**	28	28	28	28	28
Delay - 15 min pk (sec/veh)	**31**	12	-	30	**13**	-	**19**	16	16	16	16	16
Level of Service (LOS)	**C-**	B	-	C-	**B**	-	**B**	B	B	B	B	B
Average 'Q' (veh/ln)	**1**	2	-	1	**3**	-	**2**	1	1	1	1	1
Design 'Q'- ft/ln	**40**	60	-	40	**100**	-	**60**	40	40	40	40	40
Do Vehicles Clear?	**YES**	YES	-	YES	**YES**	-	**YES**	YES	YES	YES	YES	YES

Summary

Whole Intersection

Weighted Avg Delay (sec) = 14
Level of Service - LOS = B

Critical Movements

Weighted Avg Delay (sec) = 15
Level of Service - LOS = B
Intersection Capacity Utilization - ICU = 0.26

Required Cycle Length is 74 sec

Min./Ped. Times Satisfied

WEBSTER

WEbster Based Signal Timing Evaluation Routine

For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

Existing Traffic with Existing Lane Geometrics

Kiowa Rd at State Route 18 **Town of Apple Valley** **PM Peak Hour**

Input

	Eastbound			Westbound			Northbound			Southbound		
Movement Times	L	*T*	R	*L*	T	R	*L*	T	R	L	T	R
Movement 1: **10** secs	X			**X**								
Movement 2: **16** secs	X	**X**	X									
Movement 3: **29** secs		**X**	X		X	X						
Movement 4: **28** secs							**X**	X	X	X	X	X
Movement 5: **0** secs												
Movement 6: **0** secs												
# of Lanes (#, S, P)	1	**2**	S	**1**	2	S	**1**	1	1	1	1	1
Unadjusted Volume	32	**602**	201	**20**	455	10	**190**	63	29	10	45	31
Peak Hour Factor (PHF)	1.00	**1.00**	1.00	**1.00**	1.00	1.00	**1.00**	1.00	1.00	1.00	1.00	1.00
Growth Factor (%)												
Project Trip Volume (vph)												
Sat. Flow Override (vph)			Shrd			Shrd						
Min. Time or Ped. Time	10	**10**	10	**10**	10	10	**28**	28	28	28	28	28
Permissive Veh/Cycle												
Progression Adj. Factor (PAF)	1.00	**1.00**	-	**1.00**	1.00	-	**1.00**	1.00	1.00	1.00	1.00	1.00

Parameter Values (using default set 'SANBAG (Existing)')

	Other	Default
Duration of Peak Period (min)		15
Lost Time (sec)		2
Min. Time (Left Turns, sec)		10
Min/Ped Time (Thru Lanes, sec)		20
Sat Flow (1 Left lane, vphg)	1700	1800
Sat Flow (2 Left lanes, vphg)	3200	3500
Sat Flow (1 Thru lane, vphg)	1800	1900
Sat Flow (1 Right lane, vphg)		1800
Vehicle Length (feet)		20

Output

		***		***			***					
Pk. Hr. Vol. (vph)	32	**602**	201	**20**	455	10	**190**	63	29	10	45	31
Saturation Flow (vph)	1700	**3600**	Shrd	**1700**	3600	Shrd	**1300**	1800	1800	1300	1800	1800
X or V/C	0.07	**0.43**	-	**0.12**	0.40	-	**0.47**	0.11	0.05	0.02	0.08	0.05
Effective green (sec)	24	**43**	-	**8**	27	-	**26**	26	26	26	26	26
Split Time (sec)	26	**45**	-	**10**	29	-	**28**	28	28	28	28	28
Min. Time or Ped. Time (sec)	10	**10**	-	**10**	10	-	**28**	28	28	28	28	28
Delay - 15 min pk (sec/veh)	22	**13**	-	**36**	23	-	**27**	21	20	20	20	20
Level of Service (LOS)	C+	**B**	-	**D+**	C+	-	**C**	C+	C+	B	C+	C+
Average 'Q' (veh/ln)	1	**4**	-	**1**	4	-	**3**	1	1	1	1	1
Design 'Q'- ft/ln	40	**120**	-	**40**	120	-	**100**	40	40	40	40	40
Do Vehicles Clear?	YES	**YES**	-	**YES**	YES	-	**YES**	YES	YES	YES	YES	YES

Summary

Whole Intersection

Weighted Avg Delay (sec) = 18
Level of Service - LOS = B

Critical Movements

Weighted Avg Delay (sec) = 16
Level of Service - LOS = B
Intersection Capacity Utilization - ICU = 0.41

Required Cycle Length is 83 sec

Min./Ped. Times Satisfied

ITM Peak Hour Summary

Prepared by:

National Data & Surveying Services

Kiowa Rd and SR-18 , City of Apple Valley

Date: 7/19/12

Day: Thursday

Project #: CA12 6101 003

AM Peak Hour	730 AM
NOON Peak Hour	
PM Peak Hour	500 PM

Peak Hour Summary

Southbound Approach (Kiowa Rd)

Lanes	0	1	0		
AM	32	40	6	60	AM
NOON	0	0	0	0	NOON
PM	31	45	2	95	PM

Eastbound Approach (SR-18)

Lanes	AM	NOON	PM
	616	0	676
1	21	0	32
2	291	0	602
0	67	0	201

Westbound Approach

Lanes	AM	NOON	PM
0	2	0	0
2	450	0	455
1	10	0	20
	315	0	633

Northbound Approach

				Lanes
AM	117	134	37	18
NOON	0	0	0	0
PM	266	190	63	29
Lanes		1	1	0

CONTROL: Signalized

Count Periods	Start	End
AM	7:00 AM	9:00 AM
NOON		
PM	4:00 PM	6:00 PM

Total Ins & Outs

	North Leg			East Leg			South Leg			West Leg		
										AM	NOON	PM
AM	78	60		462	0	475	117	189		616	0	676
NOON	0	0		315	0	633	0	0		379	0	835
PM	78	95		AM	NOON	PM	266	282				

Total Volume Per Leg

	North Leg	East Leg	South Leg	West Leg
AM	138	777	306	995
NOON	0	0	0	0
PM	173	1108	548	1511

WEBSTER

WEbster Based Signal Timing Evaluation Routine

For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

Existing Traffic with Existing Lane Geometrics

Navajo Rd at State Route 18 **Town of Apple Valley** **AM Peak Hour**

Input

	Eastbound			Westbound			Northbound			Southbound		
Movement Times	L	*T*	R	*L*	T	R	*L*	T	R	L	T	R
Movement 1: **10** secs	X			X								
Movement 2: **0** secs				X	X	X						
Movement 3: **14** secs		X	X		X	X						
Movement 4: **29** secs							X	X	X	X	X	X
Movement 5: **0** secs												
Movement 6: **0** secs												
# of Lanes (#, S, P)	1	**2**	S	**1**	2	S	**1**	2	S	1	2	S
Unadjusted Volume	25	**207**	89	**114**	301	16	**125**	109	55	14	104	34
Peak Hour Factor (PHF)	1.00	**1.00**	1.00	**1.00**	1.00	1.00	**1.00**	1.00	1.00	1.00	1.00	1.00
Growth Factor (%)												
Project Trip Volume (vph)												
Sat. Flow Override (vph)			Shrd			Shrd			Shrd			Shrd
Min. Time or Ped. Time	10	**10**	10	**10**	10	10	**29**	29	29	29	29	29
Permissive Veh/Cycle												
Progression Adj. Factor (PAF)	1.00	**1.00**	-	**1.00**	1.00	-	**1.00**	1.00	-	1.00	1.00	-

Parameter Values (using default set 'SANBAG (Existing)')

	Other	Default
Duration of Peak Period (min)		15
Lost Time (sec)		2
Min. Time (Left Turns, sec)		10
Min/Ped Time (Thru Lanes, sec)		20
Sat Flow (1 Left lane, vphg)	1700	1800
Sat Flow (2 Left lanes, vphg)	3200	3500
Sat Flow (1 Thru lane, vphg)	1800	1900
Sat Flow (1 Right lane, vphg)		1800
Vehicle Length (feet)		20

Output

		***		***			***					
Pk. Hr. Vol. (vph)	25	**207**	89	**114**	301	16	**125**	109	55	14	104	34
Saturation Flow (vph)	1700	**3600**	Shrd	**1700**	3600	Shrd	**1200**	3600	Shrd	1200	3600	Shrd
X or V/C	0.10	**0.36**	-	**0.44**	0.39	-	**0.20**	0.09	-	0.02	0.08	-
Effective green (sec)	8	**12**	-	**8**	12	-	**27**	27	-	27	27	-
Split Time (sec)	10	**14**	-	**10**	14	-	**29**	29	-	29	29	-
Min. Time or Ped. Time (sec)	10	**10**	-	**10**	10	-	**29**	29	-	29	29	-
Delay - 15 min pk (sec/veh)	20	**19**	-	**26**	19	-	**8**	7	-	7	7	-
Level of Service (LOS)	C+	**B**	-	**C**	B	-	**A**	A	-	A	A	-
Average 'Q' (veh/ln)	1	**2**	-	**1**	2	-	**1**	1	-	1	1	-
Design 'Q'- ft/ln	40	**60**	-	**40**	60	-	**40**	40	-	40	40	-
Do Vehicles Clear?	YES	**YES**	-	**YES**	YES	-	**YES**	YES	-	YES	YES	-

Summary

Whole Intersection

Weighted Avg Delay (sec) = 15
Level of Service - LOS = B

Critical Movements

Weighted Avg Delay (sec) = 18
Level of Service - LOS = B
Intersection Capacity Utilization - ICU = 0.29

Required Cycle Length is 53 sec

Min./Ped. Times Satisfied

WEBSTER

WEbster Based Signal Timing Evaluation Routine

For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

Existing Traffic with Existing Lane Geometrics

Navajo Rd at State Route 18 **Town of Apple Valley** **PM Peak Hour**

Input

	Eastbound			Westbound			Northbound			Southbound		
Movement Times	L	*T*	R	*L*	T	R	*L*	T	R	L	T	R
Movement 1: **10** secs	X			X								
Movement 2: **2** secs				X	X	X						
Movement 3: **25** secs		X	X		X	X						
Movement 4: **29** secs							X	X	X	X	X	X
Movement 5: **0** secs												
Movement 6: **0** secs												
# of Lanes (#, S, P)	1	**2**	S	**1**	2	S	**1**	2	S	1	2	S
Unadjusted Volume	45	**403**	188	**145**	316	27	**151**	146	79	40	166	32
Peak Hour Factor (PHF)	1.00	**1.00**	1.00	**1.00**	1.00	1.00	**1.00**	1.00	1.00	1.00	1.00	1.00
Growth Factor (%)												
Project Trip Volume (vph)												
Sat. Flow Override (vph)			Shrd			Shrd			Shrd			Shrd
Min. Time or Ped. Time	10	**10**	10	**10**	10	10	**29**	29	29	29	29	29
Permissive Veh/Cycle												
Progression Adj. Factor (PAF)	1.00	**1.00**	-	**1.00**	1.00	-	**1.00**	1.00	-	1.00	1.00	-

Parameter Values (using default set 'SANBAG (Existing)')

	Other	Default
Duration of Peak Period (min)		15
Lost Time (sec)		2
Min. Time (Left Turns, sec)		10
Min/Ped Time (Thru Lanes, sec)		20
Sat Flow (1 Left lane, vphg)	1700	1800
Sat Flow (2 Left lanes, vphg)	3200	3500
Sat Flow (1 Thru lane, vphg)	1800	1900
Sat Flow (1 Right lane, vphg)		1800
Vehicle Length (feet)		20

Output

		***		***			***					
Pk. Hr. Vol. (vph)	45	**403**	188	**145**	316	27	**151**	146	79	40	166	32
Saturation Flow (vph)	1700	**3600**	Shrd	**1700**	3600	Shrd	**1200**	3600	Shrd	1100	3600	Shrd
X or V/C	0.22	**0.47**	-	**0.56**	0.25	-	**0.31**	0.15	-	0.09	0.13	-
Effective green (sec)	8	**23**	-	**10**	25	-	**27**	27	-	27	27	-
Split Time (sec)	10	**25**	-	**12**	27	-	**29**	29	-	29	29	-
Min. Time or Ped. Time (sec)	10	**10**	-	**10**	10	-	**29**	29	-	29	29	-
Delay - 15 min pk (sec/veh)	29	**18**	-	**35**	15	-	**15**	13	-	12	12	-
Level of Service (LOS)	C	**B**	-	**C-**	B	-	**B**	B	-	B	B	-
Average 'Q' (veh/ln)	1	**4**	-	**2**	2	-	**2**	1	-	1	1	-
Design 'Q'- ft/ln	40	**120**	-	**60**	60	-	**60**	40	-	40	40	-
Do Vehicles Clear?	YES	**YES**	-	**YES**	YES	-	**YES**	YES	-	YES	YES	-

Summary

Whole Intersection

Weighted Avg Delay (sec) = 17
Level of Service - LOS = B

Critical Movements

Weighted Avg Delay (sec) = 20
Level of Service - LOS = C+
Intersection Capacity Utilization - ICU = 0.41

Required Cycle Length is 66 sec

Min./Ped. Times Satisfied

ITM Peak Hour Summary

Prepared by:

National Data & Surveying Services

Navajo Rd and SR-18 , City of Apple Valley

Date: 7/19/12

Day: Thursday

Project #: CA12 6101 002

AM Peak Hour	730 AM
NOON Peak Hour	
PM Peak Hour	430 PM

Peak Hour Summary

Southbound Approach

Navajo Rd

Lanes	0	2	1		
AM	34	104	14	150	AM
NOON	0	0	0	0	NOON
PM	32	166	40	218	PM

Eastbound Approach

SR-18

Lanes	AM	NOON	PM
	460	0	499
1	25	0	45
2	207	0	403
0	89	0	188

Westbound Approach

Lanes	AM	NOON	PM
0	16	0	27
2	301	0	316
1	114	0	145
	276	0	522

Northbound Approach

	1	2	0	Lanes
AM	307	125	109	55
NOON	0	0	0	0
PM	499	151	146	79

CONTROL

Signalized

Count Periods	Start	End
AM	7:00 AM	9:00 AM
NOON		
PM	4:00 PM	6:00 PM

Total Ins & Outs

	North Leg		
AM	152	150	
NOON	0	0	
PM	238	218	

West Leg	AM	NOON	PM
	460	0	499
	321	0	636

East Leg	AM	NOON	PM
	431	0	488
	276	0	522

South Leg		
AM	307	289
NOON	0	0
PM	499	376

Total Volume Per Leg

	North Leg
AM	302
NOON	0
PM	456

West Leg	AM	NOON	PM
	781	0	1135

East Leg	AM	NOON	PM
	707	0	1010

South Leg	
AM	596
NOON	0
PM	875