WEBSTER

WEbster Based Signal Timing Evaluation Routine

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

2009 CMP Data

Mill Street @ Tippecanoe Avenue **City of SBD** **AM Peak Hour**

Input

	Eastbound			Westbound			Northbound			Southbound		
Movement Times	L	T	*R*	*L*	T	R	*L*	T	R	L	*T*	R
Movement 1: **12** secs	X	X	**X**									X
Movement 2: **4** secs				**X**	X	X						
Movement 3: **22** secs							**X**			X		
Movement 4: **52** secs								X	X		**X**	X
Movement 5: **0** secs												
Movement 6: **0** secs												
# of Lanes (#, S, P)	2	1	**1**	**1**	2	1	**1**	2	S	1	**2**	1
Unadjusted Volume	109	14	**71**	**14**	22	5	**138**	486	3	7	**745**	174
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			
Min. Time or Ped. Time	10	20	**20**	**10**	10	10	**10**	20	20	10	**20**	20
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

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)	109	14	**71**	**14**	22	10	**138**	486	10	10	**745**	174
Saturation Flow (vph)	3200	1800	**1800**	**1700**	3600	1800	**1700**	3600	Shrd	1700	**3600**	1800
X or V/C	0.31	0.07	**0.36**	**0.37**	0.28	0.25	**0.37**	0.25	-	0.03	**0.37**	0.14
Effective green (sec)	10	10	**10**	**2**	2	2	**20**	50	-	20	**50**	62
Split Time (sec)	12	12	**12**	**4**	4	4	**22**	52	-	22	**52**	64
Min. Time or Ped. Time (sec)	10	20	**20**	**10**	10	10	**10**	20	-	10	**20**	20
Delay - 15 min pk (sec/veh)	39	37	**42**	**69**	52	58	**32**	11	-	28	**12**	5
Level of Service (LOS)	D+	D+	**D**	**E**	D-	E+	**C-**	B	-	C	**B**	A
Average 'Q' (veh/ln)	1	1	**2**	**1**	1	1	**3**	3	-	1	**4**	1
Design 'Q'- ft/ln	40	40	**60**	**40**	40	40	**100**	100	-	40	**120**	40
Do Vehicles Clear?	YES	YES	**YES**	**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) = 18
Level of Service - LOS = B
Intersection Capacity Utilization - ICU = 0.37

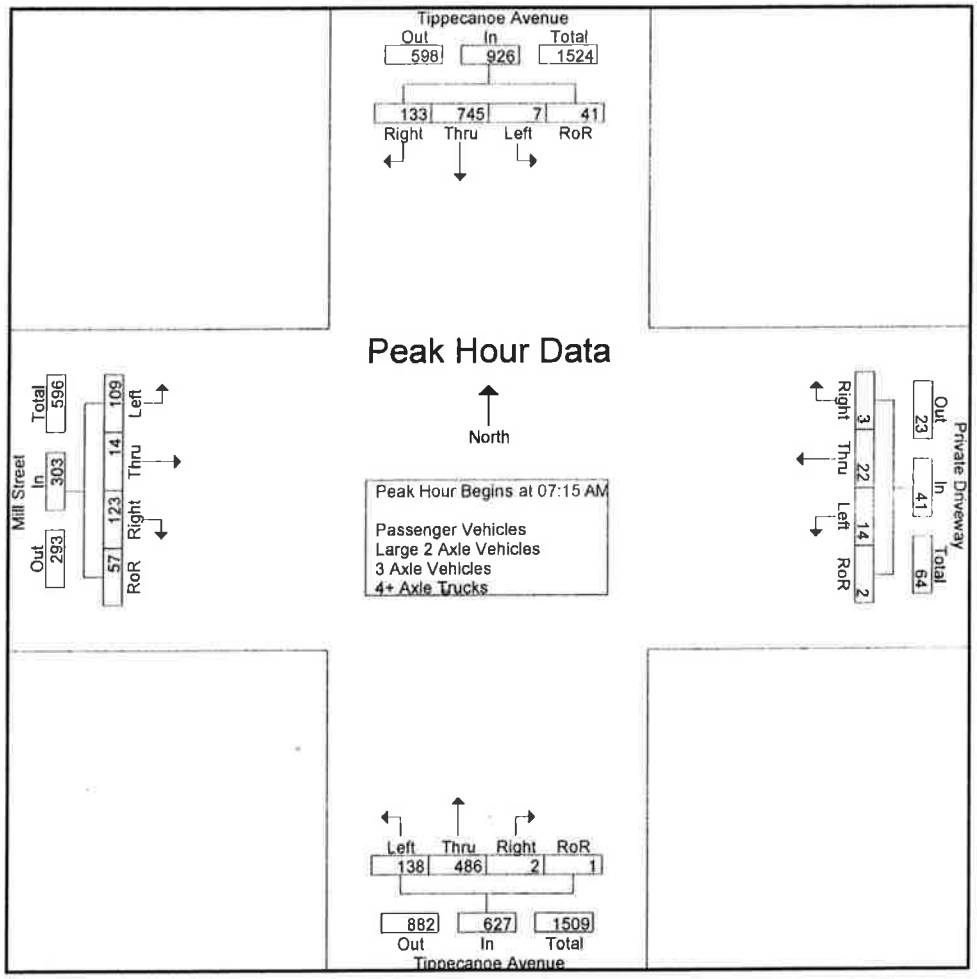
Predetermined Cycle Length is 90 sec

Min./Ped. Times May Not Be Satisfied

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

City of San Bernardino
N/S: Tippecanoe Avenue
E/W: Mill Street
Weather: Sunny

File Name : SBCTIMIAM
Site Code : 9153050
Start Date : 6/9/2009
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:15 AM					07:00 AM					07:45 AM					07:45 AM				
+0 mins.	0	189	32	**15**	236	5	**8**	1	0	14	**48**	**138**	**0**	0	**186**	24	**8**	35	17	84
+15 mins.	2	183	28	9	222	7	7	**2**	**1**	**17**	34	126	**2**	**1**	163	**35**	3	24	12	74
+30 mins.	2	**216**	**44**	9	**271**	2	6	0	0	8	28	137	1	0	166	24	1	30	14	69
+45 mins.	**3**	157	29	8	197	2	4	0	0	6	31	130	0	0	161	27	3	**37**	**20**	**87**
Total Volume	7	745	133	41	926	16	25	3	1	45	141	531	3	1	676	110	15	126	63	314
% App. Total	0.8	80.5	14.4	4.4		35.6	55.6	6.7	2.2		20.9	78.6	0.4	0.1		35	4.8	40.1	20.1	
PHF	.583	.862	.756	.683	.854	.571	.781	.375	.250	.662	.734	.962	.375	.250	.909	.786	.469	.851	.788	.902

WEBSTER

WEbster Based Signal Timing Evaluation Routine

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

2009 CMP Data

Mill Street @ Tippecanoe Avenue **City of SBD** **PM Peak Hour**

Input

	Eastbound			Westbound			Northbound			Southbound		
Movement Times	L	T	*R*	*L*	T	R	*L*	*T*	R	L	T	R
Movement 1: **31** secs	X	X	**X**									X
Movement 2: **9** secs				**X**	X	X						
Movement 3: **8** secs							**X**			X		
Movement 4: **42** secs								**X**	X		X	X
Movement 5: **0** secs												
Movement 6: **0** secs												
# of Lanes (#, S, P)	2	1	**1**	**1**	2	1	**1**	**2**	S	1	2	1
Unadjusted Volume	215	5	**324**	**71**	9	1	**67**	**904**	1	5	619	184
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			
Min. Time or Ped. Time	10	20	**20**	**10**	10	10	**10**	**20**	20	10	20	20
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

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)	215	10	**324**	**71**	10	10	**67**	**904**	10	10	619	184
Saturation Flow (vph)	3200	1800	**1800**	**1700**	3600	1800	**1700**	**3600**	Shrd	1700	3600	1800
X or V/C	0.21	0.02	**0.56**	**0.54**	0.04	0.07	**0.59**	**0.57**	-	0.09	0.39	0.13
Effective green (sec)	29	29	**29**	**7**	7	7	**6**	**40**	-	6	40	71
Split Time (sec)	31	31	**31**	**9**	9	9	**8**	**42**	-	8	42	73
Min. Time or Ped. Time (sec)	10	20	**20**	**10**	10	10	**10**	**20**	-	10	20	20
Delay - 15 min pk (sec/veh)	23	21	**29**	**55**	39	39	**61**	**20**	-	41	17	2
Level of Service (LOS)	C+	C+	**C**	**D-**	D+	D+	**E**	**C+**	-	D	B	A
Average 'Q' (veh/ln)	2	1	**5**	**2**	1	1	**2**	**6**	-	1	4	1
Design 'Q'- ft/ln	60	40	**160**	**60**	40	40	**60**	**180**	-	40	120	40
Do Vehicles Clear?	YES	YES	**YES**	**YES**	YES	YES	**YES**	**YES**	-	YES	YES	YES

Summary

Whole Intersection

Weighted Avg Delay (sec) = 22
Level of Service - LOS = C+

Critical Movements

Weighted Avg Delay (sec) = 26
Level of Service - LOS = C
Intersection Capacity Utilization - ICU = 0.57

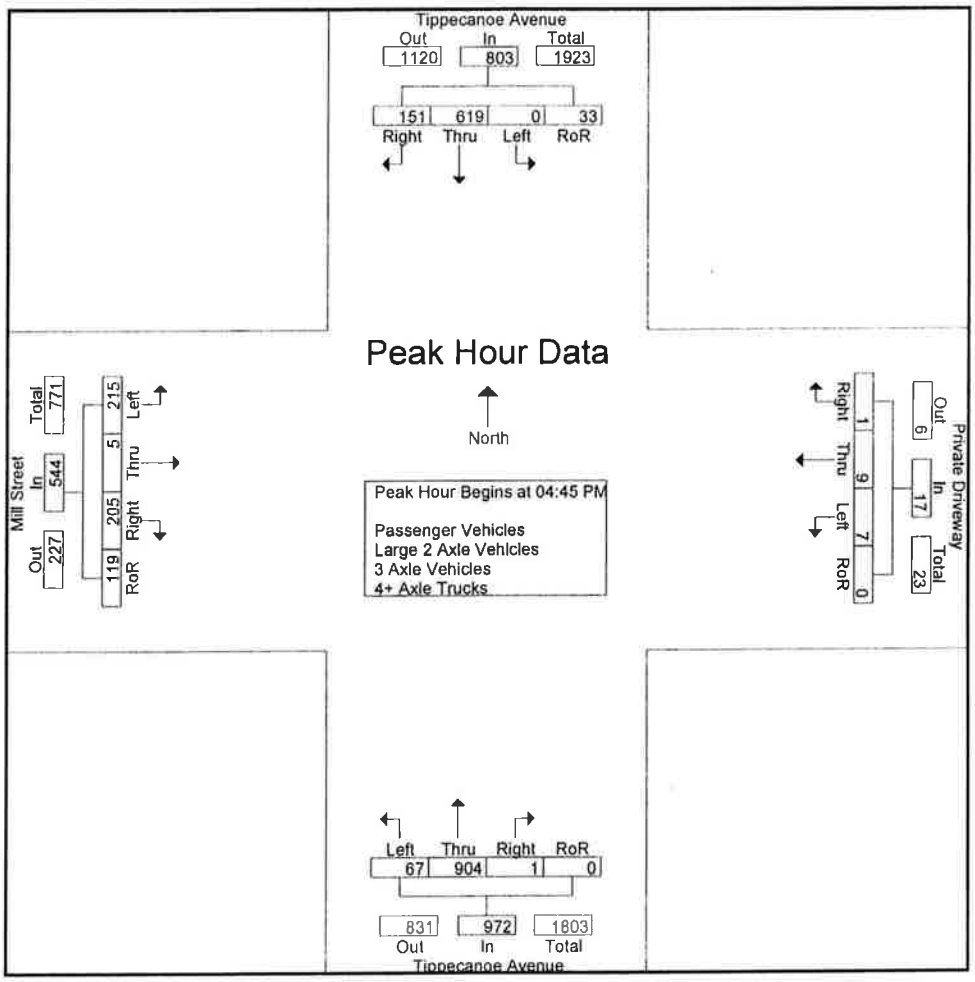
Predetermined Cycle Length is 90 sec

Min./Ped. Times May Not Be Satisfied

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

City of San Bernardino
N/S: Tippecanoe Avenue
E/W: Mill Street
Weather: Sunny

File Name : SBCTIMIPM
Site Code : 9153050
Start Date : 6/9/2009
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	05:00 PM					04:00 PM					04:45 PM					04:15 PM				
+0 mins.	0	170	40	**16**	**226**	4	1	**3**	**3**	**11**	17	193	0	0	210	52	**2**	50	30	134
+15 mins.	0	153	36	1	190	0	3	0	0	3	**20**	**261**	0	0	**281**	54	0	56	23	133
+30 mins.	0	**175**	**41**	6	222	2	2	0	0	4	15	234	**1**	0	250	42	1	37	19	99
+45 mins.	**1**	139	23	3	166	3	**5**	0	0	8	15	216	0	0	231	**69**	0	**83**	**50**	**202**
Total Volume	1	637	140	26	804	9	11	3	3	26	67	904	1	0	972	217	3	226	122	568
% App. Total	0.1	79.2	17.4	3.2		34.6	42.3	11.5	11.5		6.9	93	0.1	0		38.2	0.5	39.8	21.5	
PHF	.250	.910	.854	.406	.889	.563	.550	.250	.250	.591	.838	.866	.250	.000	.865	.786	.375	.681	.610	.703