WEBSTER

WEbster Based Signal Timing Evaluation Routine

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

2009 CMP east and west P/P LT's

3rd @ Waterman | **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								
Movement 2: 20 secs		X	X		X	X						
Movement 3: 10 secs							X			X		
Movement 4: 20 secs								X	X		X	X
Movement 5: 0 secs												
Movement 6: 0 secs												
# of Lanes (#, S, P)	1	2	S	1	2	1	1	3	1	1	3	S
Unadjusted Volume	19	142	16	183	314	62	40	434	115	133	609	41
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	20	20	10	20	20	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	-

Parameter Values

	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)	3400	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)	19	142	16	183	314	62	40	434	115	133	609	41
Saturation Flow (vph)	1700	3600	Shrd	1700	3600	1800	1700	5400	1800	1700	5400	Shrd
X or V/C	0.07	0.15	-	0.67	0.30	0.12	0.18	0.28	0.22	0.61	0.41	-
Effective green (sec)	10	18	-	10	18	18	8	18	18	8	18	-
Split Time (sec)	12	20	-	12	20	20	10	20	20	10	20	-
Min. Time or Ped. Time (sec)	10	20	-	10	20	20	10	20	20	10	20	-
Delay - 15 min pk (sec/veh)	23	17	-	37	18	17	26	17	18	37	19	-
Level of Service (LOS)	C+	B	-	D+	B	B	C	B	B	D+	B	-
Average 'Q' (veh/ln)	1	1	-	3	2	1	1	2	1	2	3	-
Design 'Q'- ft/ln	40	40	-	100	60	40	40	60	40	60	100	-
Do Vehicles Clear?	YES	YES	-	YES	YES	YES	YES	YES	YES	YES	YES	-

Summary

Whole Intersection

Weighted Avg Delay (sec) = 21
Level of Service - LOS = C+

Critical Movements

Weighted Avg Delay (sec) = 23
Level of Service - LOS = C+
Intersection Capacity Utilization - ICU = 0.45

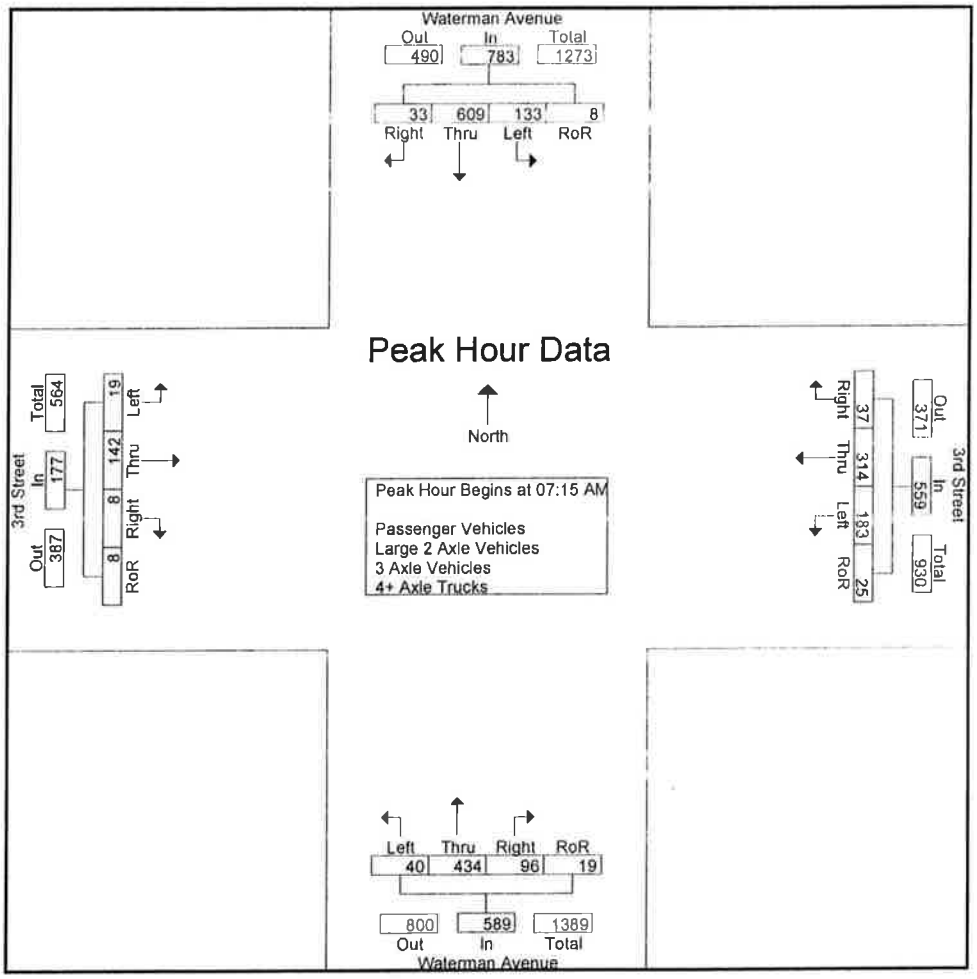
Required Cycle Length is 62 sec

Min./Ped. Times Satisfied

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

City of San Bernardino
N/S: Waterman Avenue
E/W: 3th Street
Weather: Sunny

File Name : SBCWA3AM
Site Code : 9153078
Start Date : 6/10/2009
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					07:15 AM					08:00 AM					07:00 AM				
+0 mins.	27	151	**10**	**5**	193	37	78	8	3	126	**13**	108	29	7	157	5	38	**6**	0	**49**
+15 mins.	31	152	7	0	190	47	77	8	6	138	13	98	**31**	**10**	152	2	**41**	0	2	45
+30 mins.	**44**	**187**	7	2	**240**	**53**	**89**	**12**	6	**160**	9	107	18	9	143	4	33	1	**3**	41
+45 mins.	31	119	9	1	160	46	70	9	**10**	135	9	**136**	18	8	**171**	**6**	**32**	**4**	0	**42**
Total Volume	133	609	33	8	783	183	314	37	25	559	44	449	96	34	623	17	144	11	5	177
% App. Total	17	77.8	4.2	1		32.7	56.2	6.6	4.5		7.1	72.1	15.4	5.5		9.6	81.4	6.2	2.8	
PHF	.756	.814	.825	.400	.816	.863	.882	.771	.625	.873	.846	.825	.774	.850	.911	.708	.878	.458	.417	.903

WEBSTER

WEbster Based Signal Timing Evaluation Routine

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

CMP 2009 P/P LT's east west

3rd @ Waterman **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: 10 secs	X			X								
Movement 2: 20 secs		X	X		X	X						
Movement 3: 10 secs							X			X		
Movement 4: 20 secs								X	X		X	X
Movement 5: 0 secs												
Movement 6: 0 secs												
# of Lanes (#, S, P)	1	2	S	1	2	1	1	3	1	1	3	S
Unadjusted Volume	30	269	42	140	213	107	41	883	163	110	732	17
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	20	20	10	20	20	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	-

Parameter Values

	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)		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)	30	269	42	140	213	107	41	883	163	110	732	17
Saturation Flow (vph)	1700	3600	Shrd	1700	3600	1800	1700	5400	1800	1700	5400	Shrd
X or V/C	0.13	0.29	-	0.62	0.20	0.20	0.18	0.55	0.30	0.49	0.46	-
Effective green (sec)	8	18	-	8	18	18	8	18	18	8	18	-
Split Time (sec)	10	20	-	10	20	20	10	20	20	10	20	-
Min. Time or Ped. Time (sec)	10	20	-	10	20	20	10	20	20	10	20	-
Delay - 15 min pk (sec/veh)	24	17	-	37	16	16	25	19	18	31	18	-
Level of Service (LOS)	C+	B	-	D+	B	B	C+	B	B	C-	B	-
Average 'Q' (veh/ln)	1	2	-	2	1	1	1	3	2	2	3	-
Design 'Q'- ft/ln	40	60	-	60	40	40	40	100	60	60	100	-
Do Vehicles Clear?	YES	YES	-	YES	YES	YES	YES	YES	YES	YES	YES	-

Summary

Whole Intersection

Weighted Avg Delay (sec) = 20
Level of Service - LOS = B

Critical Movements

Weighted Avg Delay (sec) = 21
Level of Service - LOS = C+
Intersection Capacity Utilization - ICU = 0.46

Required Cycle Length is 60 sec

Min./Ped. Times Satisfied

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

City of San Bernardino
N/S: Waterman Avenue
E/W: 3th Street
Weather: Sunny

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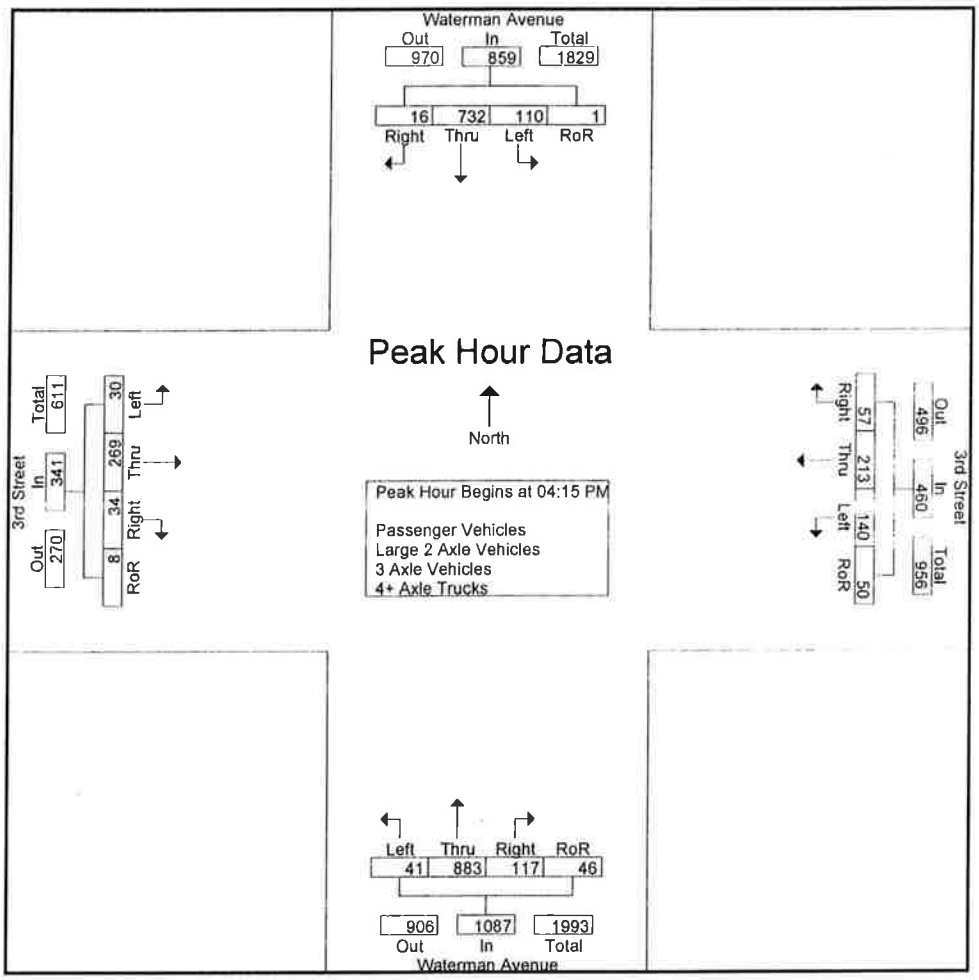

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:00 PM					04:15 PM					05:00 PM					04:30 PM				
+0 mins.	27	**204**	**9**	**1**	**241**	**40**	38	15	14	107	**10**	**253**	**39**	3	**305**	8	68	6	2	84
+15 mins.	27	181	6	0	214	35	**66**	13	**15**	**129**	10	220	25	6	261	6	55	**12**	**3**	76
+30 mins.	**33**	190	5	1	229	39	48	9	11	107	6	245	38	**7**	296	**10**	**102**	11	1	**124**
+45 mins.	23	152	2	0	177	26	61	**20**	10	117	0	202	26	6	234	6	53	2	1	62
Total Volume	110	727	22	2	861	140	213	57	50	460	26	920	128	22	1096	30	278	31	7	346
% App. Total	12.8	84.4	2.6	0.2		30.4	46.3	12.4	10.9		2.4	83.9	11.7	2		8.7	80.3	9	2	
PHF	.833	.891	.611	.500	.893	.875	.807	.713	.833	.891	.650	.909	.821	.786	.898	.750	.681	.646	.583	.698