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

5th @ 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: 0 secs	X			X								
Movement 2: 20 secs	X	X	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	S	1	3	S
Unadjusted Volume	54	130	124	60	340	30	66	434	36	31	667	73
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
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	-

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)		1900
Sat Flow (1 Right lane, vphg)		1800
Vehicle Length (feet)		20

Output

					***		***				***	
Pk. Hr. Vol. (vph)	54	130	124	60	340	30	66	434	36	31	667	73
Saturation Flow (vph)	1000	3800	Shrd	1100	3800	1800	1700	5700	Shrd	1700	5700	Shrd
X or V/C	0.15	0.19	-	0.15	0.25	0.05	0.24	0.23	-	0.11	0.36	-
Effective green (sec)	18	18	-	18	18	18	8	18	-	8	18	-
Split Time (sec)	20	20	-	20	20	20	10	20	-	10	20	-
Min. Time or Ped. Time (sec)	10	20	-	10	20	20	10	20	-	10	20	-
Delay - 15 min pk (sec/veh)	12	11	-	12	12	11	20	11	-	19	12	-
Level of Service (LOS)	B	B	-	B	B	B	C+	B	-	B	B	-
Average 'Q' (veh/ln)	1	1	-	1	2	1	1	1	-	1	2	-
Design 'Q'- ft/ln	40	40	-	40	60	40	40	40	-	40	60	-
Do Vehicles Clear?	YES	YES	-	YES	YES	YES	YES	YES	-	YES	YES	-

Summary

Whole Intersection

Weighted Avg Delay (sec) = 12
Level of Service - LOS = B

Critical Movements

Weighted Avg Delay (sec) = 13
Level of Service - LOS = B
Intersection Capacity Utilization - ICU = 0.29

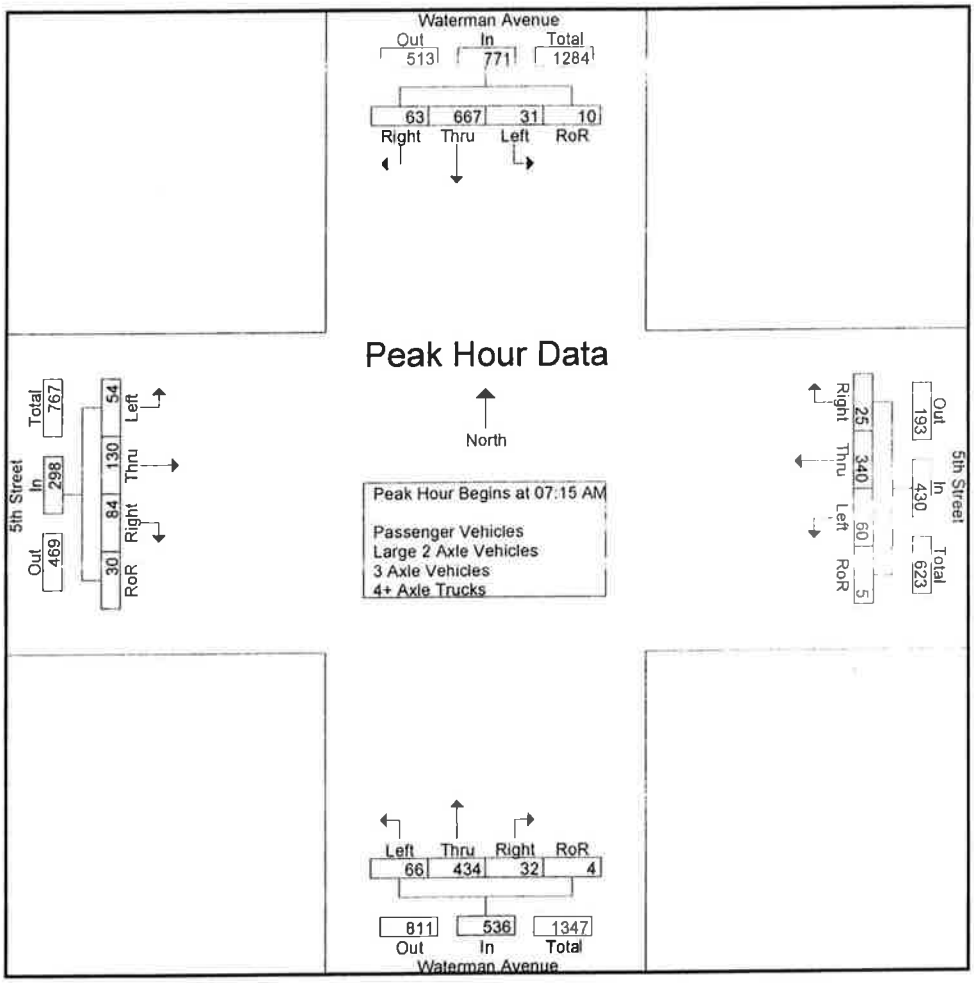
Required Cycle Length is 50 sec

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: 5th Street
Weather: Sunny

File Name : SBCWA5AM
Site Code : 9153044
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					07:45 AM					07:15 AM				
+0 mins.	9	160	15	2	186	16	82	5	2	105	**20**	**125**	**9**	0	**154**	13	31	22	9	75
+15 mins.	**10**	195	**16**	1	**222**	13	93	3	0	109	20	122	6	1	149	12	24	16	7	59
+30 mins.	6	**196**	16	**4**	222	**20**	**100**	**10**	1	**131**	7	118	8	0	133	14	35	21	**10**	80
+45 mins.	6	116	16	3	141	11	65	7	2	85	15	115	8	**6**	144	**15**	**40**	**25**	4	**84**
Total Volume	31	667	63	10	771	60	340	25	5	430	62	480	31	7	580	54	130	84	30	298
% App. Total	4	86.5	8.2	1.3		14	79.1	5.8	1.2		10.7	82.8	5.3	1.2		18.1	43.6	28.2	10.1	
PHF	.775	.851	.984	.625	.868	.750	.850	.625	.625	.821	.775	.960	.861	.292	.942	.900	.813	.840	.750	.887

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 and west

5th @ 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: 0 secs	X			X								
Movement 2: 20 secs	X	X	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	95	408	100	38	164	34	101	864	108	35	665	101
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)	95	408	100	38	164	34	101	864	108	35	665	101
Saturation Flow (vph)	1200	3600	Shrd	800	3600	1800	1700	5400	1800	1700	5400	Shrd
X or V/C	0.22	0.39	-	0.13	0.13	0.05	0.37	0.44	0.17	0.13	0.39	-
Effective green (sec)	18	18	-	18	18	18	8	18	18	8	18	-
Split Time (sec)	20	20	-	20	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)	12	13	-	12	11	11	23	13	11	19	13	-
Level of Service (LOS)	B	B	-	B	B	B	C+	B	B	B	B	-
Average 'Q' (veh/ln)	1	2	-	1	1	1	1	3	1	1	2	-
Design 'Q'- ft/ln	40	60	-	40	40	40	40	100	40	40	60	-
Do Vehicles Clear?	YES	YES	-	YES	YES	YES	YES	YES	YES	YES	YES	-

Summary

Whole Intersection

Weighted Avg Delay (sec) = 13
Level of Service - LOS = B

Critical Movements

Weighted Avg Delay (sec) = 14
Level of Service - LOS = B
Intersection Capacity Utilization - ICU = 0.41

Required Cycle Length is 50 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: 5th Street
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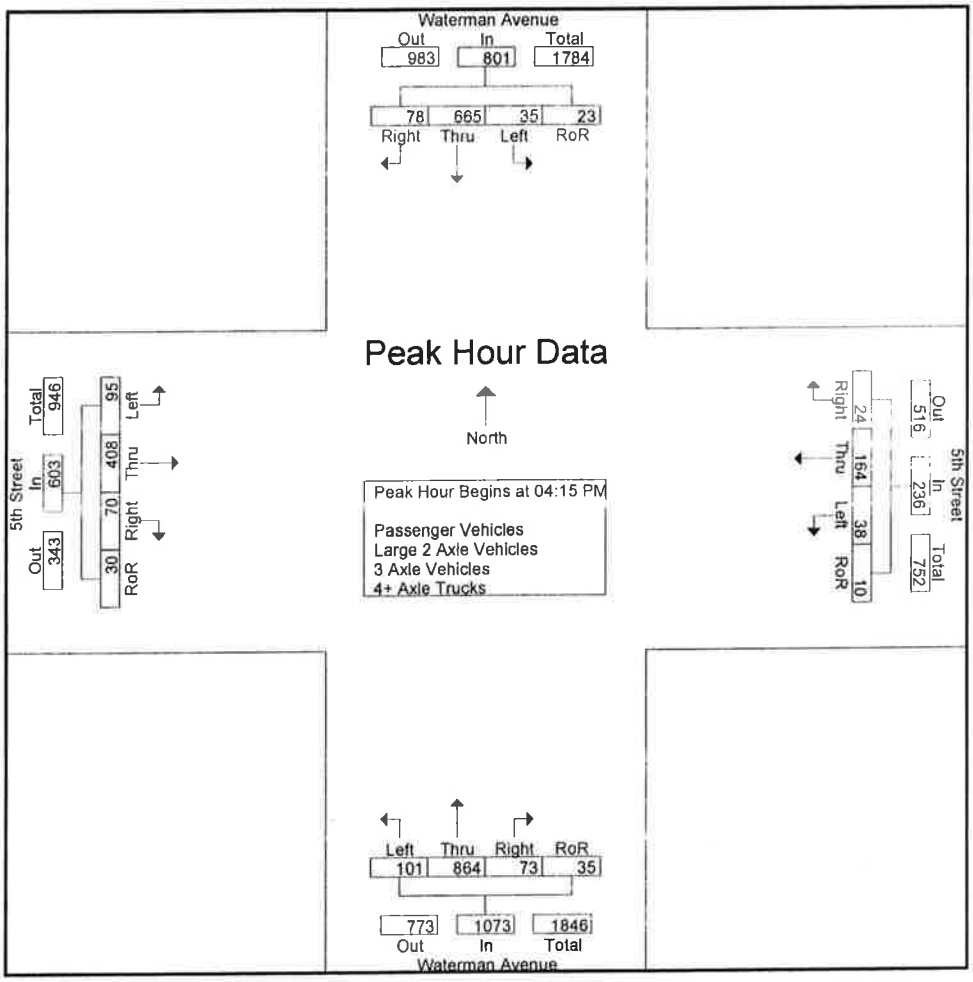

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:15 PM					04:15 PM					04:15 PM					04:00 PM				
+0 mins.	10	171	24	**10**	215	7	32	**8**	**5**	52	26	220	15	9	270	25	108	18	8	159
+15 mins.	**11**	174	16	3	204	4	**46**	6	3	59	**35**	205	13	**10**	263	16	93	9	7	125
+30 mins.	7	140	13	4	164	8	43	4	0	55	15	195	16	9	235	22	**131**	**21**	**9**	**183**
+45 mins.	7	**180**	**25**	6	**218**	**19**	43	6	2	**70**	**25**	**244**	**29**	7	**305**	25	98	20	1	144
Total Volume	35	665	78	23	801	38	164	24	10	236	101	864	73	35	1073	88	430	68	25	611
% App. Total	4.4	83	9.7	2.9		16.1	69.5	10.2	4.2		9.4	80.5	6.8	3.3		14.4	70.4	11.1	4.1	
PHF	.795	.924	.780	.575	.919	.500	.891	.750	.500	.843	.721	.885	.629	.875	.880	.880	.821	.810	.694	.835