WEBSTER

WEbster Based Signal Timing Evaluation Routine

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

2009 CMP Data

2nd Street @ 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: 10 secs	X		X									
Movement 2: 10 secs							X	X				
Movement 3: 26 secs								X			X	X
Movement 4: 0 secs												
Movement 5: 0 secs												
Movement 6: 0 secs												
# of Lanes (#, S, P)	2		1				1	3			3	S
Unadjusted Volume	131		47				42	510			604	92
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)												Shrd
Min. Time or Ped. Time	10		20				10	20			20	20
Permissive Veh/Cycle												
Progression Adj. Factor (PAF)	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)	1700	1800
Vehicle Length (feet)		20

Output

	***						***				***	
Pk. Hr. Vol. (vph)	131		47				42	510			604	92
Saturation Flow (vph)	3400		1700				1700	5700			5700	Shrd
X or V/C	0.22		0.16				0.14	0.12			0.23	-
Effective green (sec)	8		8				8	34			24	-
Split Time (sec)	10		10				10	36			26	-
Min. Time or Ped. Time (sec)	10		20				10	20			20	-
Delay - 15 min pk (sec/veh)	17		17				17	2			6	-
Level of Service (LOS)	B		B				B	A			A	-
Average 'Q' (veh/ln)	1		1				1	1			1	-
Design 'Q'- ft/ln	40		40				40	40			40	-
Do Vehicles Clear?	YES		YES				YES	YES			YES	-

Summary

Whole Intersection

Weighted Avg Delay (sec) = 6
Level of Service - LOS = A

Critical Movements

Weighted Avg Delay (sec) = 8
Level of Service - LOS = A
Intersection Capacity Utilization - ICU = 0.21

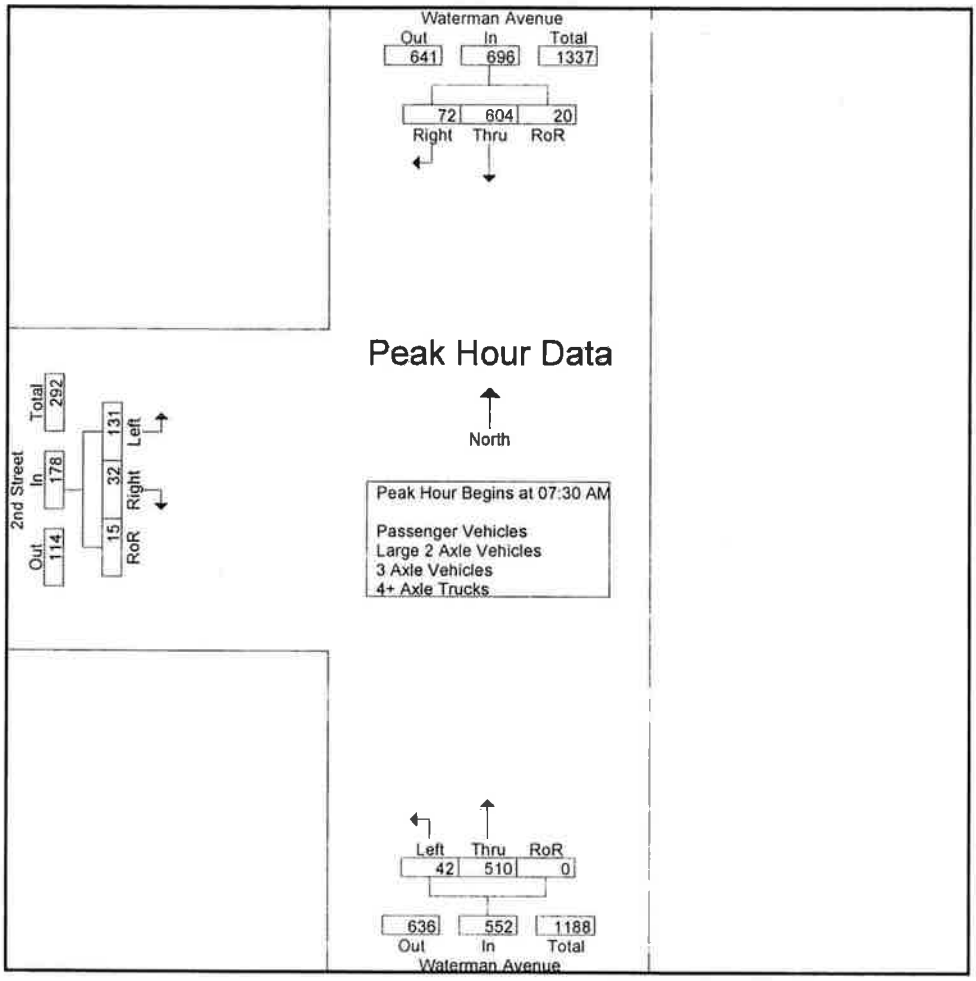
Required Cycle Length is 46 sec

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: Waterman Avenue
E/W: 2nd Street
Weather: Sunny

File Name : SBCWA2AM
Site Code : 9153079
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				08:00 AM				07:00 AM			
+0 mins.	139	17	5	161	**9**	124	0	133	38	7	4	49
+15 mins.	**169**	19	6	194	7	136	0	143	30	2	3	35
+30 mins.	168	**24**	**7**	**199**	7	126	0	133	23	9	**5**	37
+45 mins.	138	15	6	159	9	**141**	0	**150**	**46**	**11**	3	**60**
Total Volume	614	75	24	713	32	527	0	559	137	29	15	181
% App. Total	86.1	10.5	3.4		5.7	94.3	0		75.7	16	8.3	
PHF	.908	.781	.857	.896	.889	.934	.000	.932	.745	.659	.750	.754

WEBSTER

WEbster Based Signal Timing Evaluation Routine

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

2009 CMP

2nd Street @ 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: 10 secs							X	X				
Movement 3: 22 secs								X			X	X
Movement 4: 0 secs												
Movement 5: 0 secs												
Movement 6: 0 secs												
# of Lanes (#, S, P)	2		1				1	3			3	S
Unadjusted Volume	173		55				71	917			667	110
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)												Shrd
Min. Time or Ped. Time	10		20				10	20			20	20
Permissive Veh/Cycle												
Progression Adj. Factor (PAF)	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)	173		55				71	917			667	110
Saturation Flow (vph)	3400		1800				1700	5400			5400	Shrd
X or V/C	0.27		0.16				0.22	0.24			0.30	-
Effective green (sec)	8		8				8	30			20	-
Split Time (sec)	10		10				10	32			22	-
Min. Time or Ped. Time (sec)	10		20				10	20			20	-
Delay - 15 min pk (sec/veh)	16		15				16	2			7	-
Level of Service (LOS)	B		B				B	A			A	-
Average 'Q' (veh/ln)	1		1				1	1			2	-
Design 'Q'- ft/ln	40		40				40	40			60	-
Do Vehicles Clear?	YES		YES				YES	YES			YES	-

Summary

Whole Intersection

Weighted Avg Delay (sec) = 6
Level of Service - LOS = A

Critical Movements

Weighted Avg Delay (sec) = 9
Level of Service - LOS = A
Intersection Capacity Utilization - ICU = 0.28

Required Cycle Length is 42 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: Waterman Avenue
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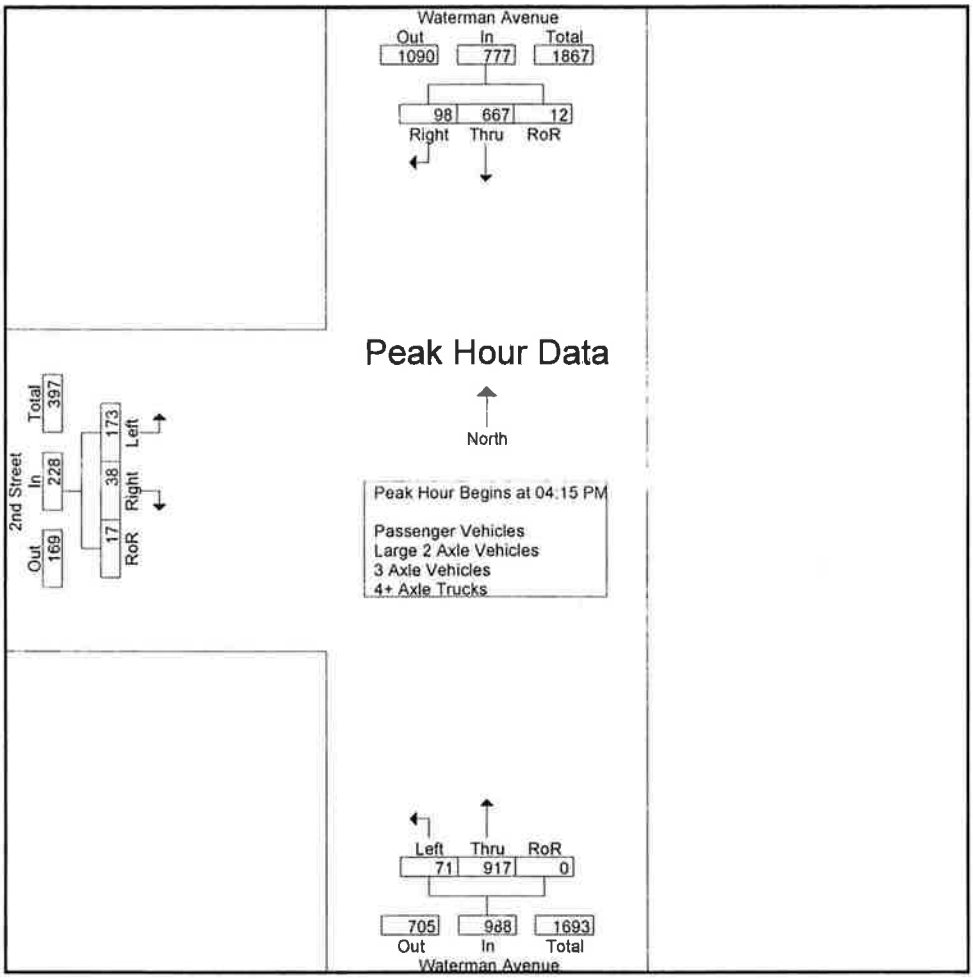

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:15 PM				04:30 PM				04:00 PM			
+0 mins.	151	15	**5**	171	24	224	0	248	36	9	6	51
+15 mins.	178	**35**	2	215	10	203	0	213	43	5	**10**	58
+30 mins.	152	16	4	172	**32**	**261**	0	**293**	43	**17**	2	**62**
+45 mins.	**186**	32	1	**219**	11	232	0	243	**49**	6	2	57
Total Volume	667	98	12	777	77	920	0	997	171	37	20	228
% App. Total	85.8	12.6	1.5		7.7	92.3	0		75	16.2	8.8	
PHF	.897	.700	.600	.887	.602	.881	.000	.851	.872	.544	.500	.919