WEBSTER

WEbster Based Signal Timing Evaluation Routine

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

2009 CMP Data

Highland Avenue @ "E" Street | **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: 31 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	S	1	2	1	1	2	S
Unadjusted Volume	36	522	44	23	531	33	25	106	18	37	151	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						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 (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)	36	522	44	23	531	33	25	106	18	37	151	41
Saturation Flow (vph)	1700	3600	Shrd	1700	3600	Shrd	1700	3600	1800	1700	3600	Shrd
X or V/C	0.19	0.38	-	0.12	0.38	-	0.13	0.12	0.04	0.19	0.21	-
Effective green (sec)	8	29	-	8	29	-	8	18	18	8	18	-
Split Time (sec)	10	31	-	10	31	-	10	20	20	10	20	-
Min. Time or Ped. Time (sec)	10	20	-	10	20	-	10	20	20	10	20	-
Delay - 15 min pk (sec/veh)	31	16	-	30	15	-	30	21	20	31	21	-
Level of Service (LOS)	C-	B	-	C	B	-	C	C+	C+	C-	C+	-
Average 'Q' (veh/ln)	1	3	-	1	3	-	1	1	1	1	1	-
Design 'Q'- ft/ln	40	100	-	40	100	-	40	40	40	40	40	-
Do Vehicles Clear?	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) = 18
Level of Service - LOS = B
Intersection Capacity Utilization - ICU = 0.29

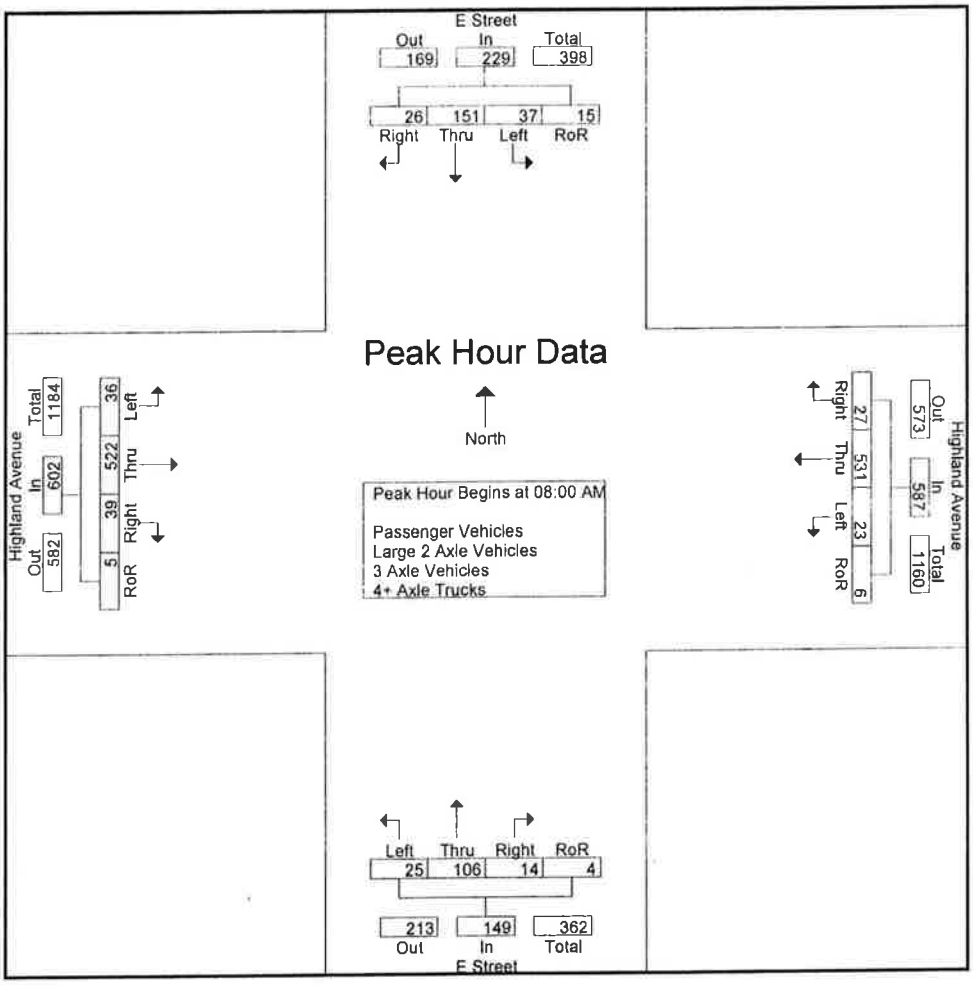
Required Cycle Length is 71 sec

Min./Ped. Times Satisfied

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

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

File Name : SBCEHIAM
Site Code : 9153051
Start Date : 6/11/2009
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:

	07:30 AM					08:00 AM					08:00 AM					08:00 AM				
+0 mins.	5	36	6	2	49	7	114	7	2	130	8	25	6	0	39	14	123	10	3	150
+15 mins.	14	68	6	4	92	4	127	7	1	139	8	26	3	0	37	6	122	7	1	136
+30 mins.	10	39	8	4	61	5	135	5	1	146	2	27	2	0	31	10	137	6	1	154
+45 mins.	8	40	8	8	64	7	155	8	2	172	7	28	3	4	42	6	140	16	0	162
Total Volume	37	183	28	18	266	23	531	27	6	587	25	106	14	4	149	36	522	39	5	602
% App. Total	13.9	68.8	10.5	6.8		3.9	90.5	4.6	1		16.8	71.1	9.4	2.7		6	86.7	6.5	0.8	
PHF	.661	.673	.875	.563	.723	.821	.856	.844	.750	.853	.781	.946	.583	.250	.887	.643	.932	.609	.417	.929

WEBSTER

WEbster Based Signal Timing Evaluation Routine

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

2009 CMP Data

Highland Avenue @ "E" Street | **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: 40 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	S	1	2	1	1	2	S
Unadjusted Volume	49	590	32	43	846	66	50	260	62	65	169	63
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 (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)	49	590	32	43	846	66	50	260	62	65	169	63
Saturation Flow (vph)	1700	3600	Shrd	1700	3600	Shrd	1700	3600	1800	1700	3600	Shrd
X or V/C	0.29	0.36	-	0.25	0.53	-	0.29	0.32	0.15	0.38	0.29	-
Effective green (sec)	8	38	-	8	38	-	8	18	18	8	18	-
Split Time (sec)	10	40	-	10	40	-	10	20	20	10	20	-
Min. Time or Ped. Time (sec)	10	20	-	10	20	-	10	20	20	10	20	-
Delay - 15 min pk (sec/veh)	38	14	-	37	16	-	38	27	26	40	27	-
Level of Service (LOS)	D+	B	-	D+	B	-	D+	C	C	D	C	-
Average 'Q' (veh/ln)	1	4	-	1	5	-	1	2	1	1	2	-
Design 'Q'- ft/ln	40	120	-	40	160	-	40	60	40	40	60	-
Do Vehicles Clear?	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) = 20
Level of Service - LOS = C+
Intersection Capacity Utilization - ICU = 0.44

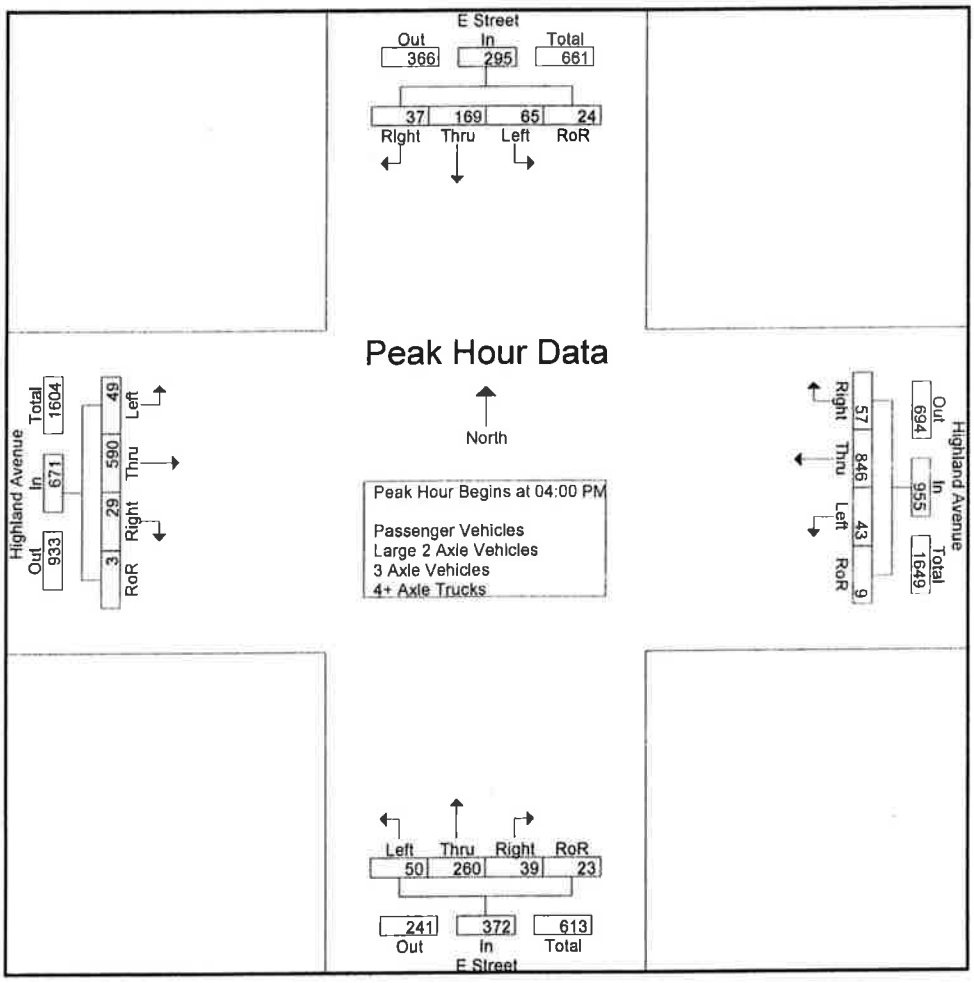
Required Cycle Length is 80 sec

Min./Ped. Times Satisfied

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

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

File Name : SBCEHIPM
Site Code : 9153051
Start Date : 6/11/2009
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:

	04:00 PM					04:00 PM					05:00 PM					04:00 PM				
+0 mins.	17	47	**12**	7	**83**	**12**	218	14	**4**	248	18	72	6	6	102	10	152	6	**2**	170
+15 mins.	13	34	8	4	59	10	179	6	0	195	14	73	9	**6**	102	8	145	5	1	159
+30 mins.	**19**	38	9	**8**	74	11	**235**	**19**	1	**266**	**22**	**77**	12	**10**	**121**	**19**	**157**	**11**	0	**187**
+45 mins.	16	**50**	8	5	79	10	214	18	4	246	14	69	**16**	4	103	12	136	7	0	155
Total Volume	65	169	37	24	295	43	846	57	9	955	68	291	43	26	428	49	590	29	3	671
% App. Total	22	57.3	12.5	8.1		4.5	88.6	6	0.9		15.9	68	10	6.1		7.3	87.9	4.3	0.4	
PHF	.855	.845	.771	.750	.889	.896	.900	.750	.563	.898	.773	.945	.672	.650	.884	.645	.939	.659	.375	.897