WEBSTER

WEbster Based Signal Timing Evaluation Routine

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

2009 CMP Data

Highland Ave @ Mt. Vernon Ave | **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: 26 secs	X			X								
Movement 2: 23 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	2	1	1	2	1
Unadjusted Volume	411	417	50	56	689	65	40	115	64	67	170	235
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	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	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)	411	417	50	56	689	65	40	115	64	67	170	235
Saturation Flow (vph)	1700	3600	Shrd	1700	3600	1800	1700	3600	1800	1700	3600	1800
X or V/C	0.80	0.49	-	0.11	0.72	0.14	0.23	0.14	0.16	0.39	0.21	0.57
Effective green (sec)	24	21	-	24	21	21	8	18	18	8	18	18
Split Time (sec)	26	23	-	26	23	23	10	20	20	10	20	20
Min. Time or Ped. Time (sec)	10	20	-	10	20	20	10	20	20	10	20	20
Delay - 15 min pk (sec/veh)	37	26	-	20	31	23	36	25	25	40	25	33
Level of Service (LOS)	D+	C	-	C+	C-	C+	D+	C+	C	D+	C	C-
Average 'Q' (veh/ln)	7	4	-	1	6	1	1	1	1	1	1	4
Design 'Q'- ft/ln	220	120	-	40	180	40	40	40	40	40	40	120
Do Vehicles Clear?	YES	YES	-	YES	YES	YES	YES	YES	YES	YES	YES	YES

Summary

Whole Intersection

Weighted Avg Delay (sec) = 30
Level of Service - LOS = C-

Critical Movements

Weighted Avg Delay (sec) = 34
Level of Service - LOS = C-
Intersection Capacity Utilization - ICU = 0.67

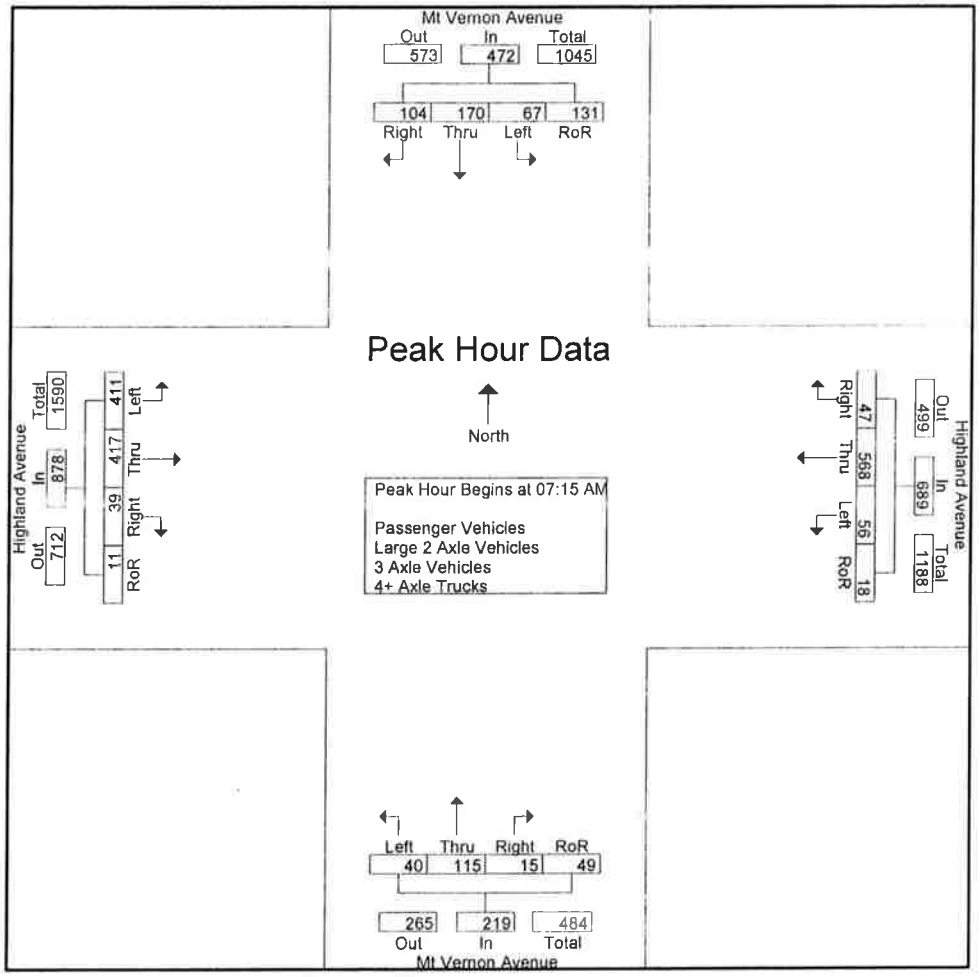
Required Cycle Length is 79 sec

Min./Ped. Times Satisfied

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

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

File Name : SBCMVHIAM
Site Code : 9153033
Start Date : 6/10/2009
Page No : 2



Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:15 AM					07:15 AM					07:15 AM					07:15 AM				
+0 mins.	**22**	**56**	28	28	**134**	**24**	131	3	5	163	**13**	**41**	**6**	9	**69**	114	105	6	1	226
+15 mins.	14	51	**34**	29	128	10	139	13	**6**	168	6	32	3	11	52	**116**	**129**	12	0	**257**
+30 mins.	16	38	31	**38**	123	8	**163**	**16**	4	**191**	9	22	2	14	47	91	76	7	**8**	182
+45 mins.	15	25	11	36	87	14	135	15	3	167	12	20	4	**15**	51	**90**	**107**	**14**	2	213
Total Volume	67	170	104	131	472	56	568	47	18	689	40	115	15	49	219	411	417	39	11	878
% App. Total	14.2	36	22	27.8		8.1	82.4	6.8	2.6		18.3	52.5	6.8	22.4		46.8	47.5	4.4	1.3	
PHF	.761	.759	.765	.862	.881	.583	.871	.734	.750	.902	.769	.701	.625	.817	.793	.886	.808	.696	.344	.854

WEBSTER

WEbster Based Signal Timing Evaluation Routine

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

2009 CMP Data

Highland Ave @ Mt. Vernon Ave | **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: 32 secs	X			X								
Movement 2: 39 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	2	1	1	2	1
Unadjusted Volume	438	998	74	99	902	137	79	159	80	67	92	189
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	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	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)	438	998	74	99	902	137	79	159	80	67	92	189
Saturation Flow (vph)	1700	3600	Shrd	1700	3600	1800	1700	3600	1800	1700	3600	1800
X or V/C	0.87	0.81	-	0.20	0.68	0.21	0.59	0.25	0.25	0.50	0.14	0.59
Effective green (sec)	30	37	-	30	37	37	8	18	18	8	18	18
Split Time (sec)	32	39	-	32	39	39	10	20	20	10	20	20
Min. Time or Ped. Time (sec)	10	20	-	10	20	20	10	20	20	10	20	20
Delay - 15 min pk (sec/veh)	52	34	-	27	30	23	62	37	38	57	35	46
Level of Service (LOS)	D-	C-	-	C	C	C+	E	D+	D+	E+	D+	D
Average 'Q' (veh/ln)	9	10	-	2	8	2	2	2	2	2	1	4
Design 'Q'- ft/ln	280	300	-	60	240	60	60	60	60	60	40	120
Do Vehicles Clear?	YES	YES	-	YES	YES	YES	YES	YES	YES	YES	YES	YES

Summary

Whole Intersection

Weighted Avg Delay (sec) = 37
Level of Service - LOS = D+

Critical Movements

Weighted Avg Delay (sec) = 41
Level of Service - LOS = D
Intersection Capacity Utilization - ICU = 0.77

Required Cycle Length is 101 sec

Min./Ped. Times Satisfied

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

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

File Name : SBCMVHIPM
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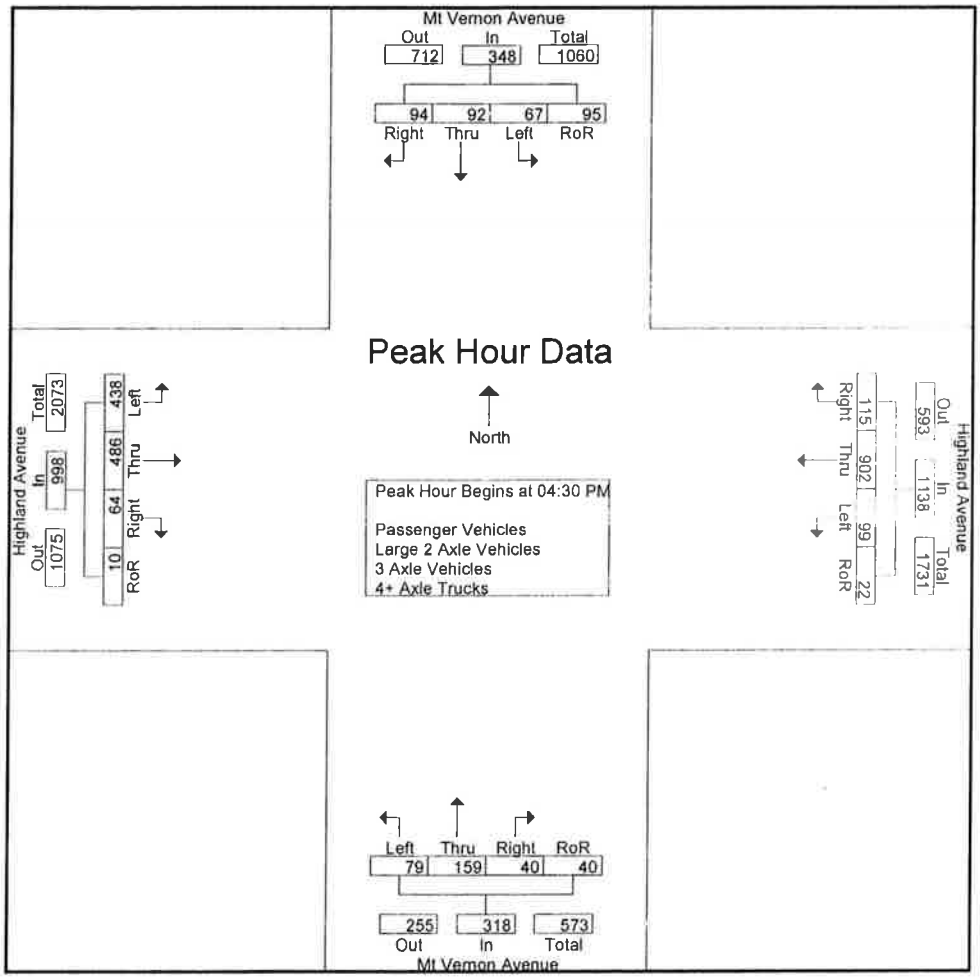

Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:30 PM					04:30 PM					04:30 PM					04:30 PM				
+0 mins.	15	**35**	19	24	**93**	25	**243**	**32**	7	**307**	18	35	5	**16**	74	107	113	**21**	2	243
+15 mins.	16	16	**28**	**28**	88	23	210	24	**8**	265	18	**44**	10	14	**86**	110	121	9	**3**	243
+30 mins.	17	21	27	27	92	**32**	234	31	4	301	20	41	**15**	8	84	**121**	**132**	18	2	**273**
+45 mins.	**19**	20	20	16	75	19	215	28	3	265	**23**	39	10	2	74	**100**	120	16	3	239
Total Volume	67	92	94	95	348	99	902	115	22	1138	79	159	40	40	318	438	486	64	10	998
% App. Total	19.3	26.4	27	27.3		8.7	79.3	10.1	1.9		24.8	50	12.6	12.6		43.9	48.7	6.4	1	
PHF	.882	.657	.839	.848	.935	.773	.928	.898	.688	.927	.859	.903	.667	.625	.924	.905	.920	.762	.833	.914