WEBSTER

WEbster Based Signal Timing Evaluation Routine

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

2009 CMP Data

Mill at 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: 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	2	S	1	2	S
Unadjusted Volume	67	268	116	75	197	43	61	202	55	39	254	57
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 'Webster')

	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)		1800
Sat Flow (2 Left lanes, vphg)		3500
Sat Flow (1 Thru lane, vphg)		1900
Sat Flow (1 Right lane, vphg)		1800
Vehicle Length (feet)		20

Output

		***		***			***				***	
Pk. Hr. Vol. (vph)	67	268	116	75	197	43	61	202	55	39	254	57
Saturation Flow (vph)	1800	3800	Shrd	1800	3800	1800	1800	3800	Shrd	1800	3800	Shrd
X or V/C	0.28	0.34	-	0.31	0.17	0.08	0.25	0.23	-	0.16	0.27	-
Effective green (sec)	8	18	-	8	18	18	8	18	-	8	18	-
Split Time (sec)	10	20	-	10	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)	26	17	-	27	16	15	26	16	-	24	17	-
Level of Service (LOS)	C	B	-	C	B	B	C	B	-	C+	B	-
Average 'Q' (veh/ln)	1	2	-	1	1	1	1	1	-	1	2	-
Design 'Q'- ft/ln	40	60	-	40	40	40	40	40	-	40	60	-
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 = 0.30

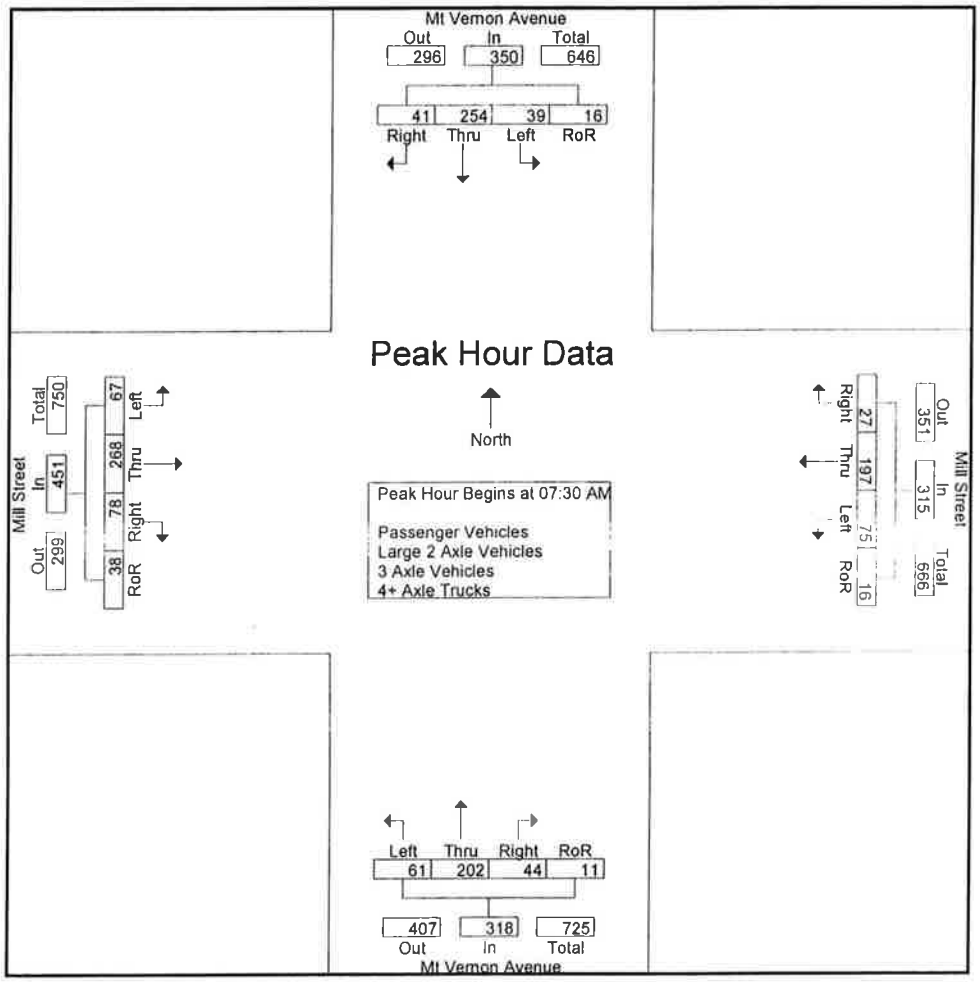
Required Cycle Length is 60 sec

Min./Ped. Times Satisfied

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

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

File Name : SBCMVMIAM
Site Code : 9153139
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:

	07:00 AM					07:15 AM					08:00 AM					07:15 AM				
+0 mins.	9	54	11	4	78	17	35	**10**	3	65	**19**	**59**	13	4	**95**	10	59	10	6	85
+15 mins.	**14**	63	**12**	2	91	14	**69**	4	**4**	**91**	16	52	**15**	2	85	16	60	19	7	102
+30 mins.	8	**74**	9	3	**94**	21	45	9	3	78	12	38	4	5	59	**21**	**89**	**26**	7	**143**
+45 mins.	8	63	9	**7**	87	**25**	48	7	4	84	10	56	11	7	84	19	71	23	**12**	125
Total Volume	39	254	41	16	350	77	197	30	14	318	57	205	43	18	323	66	279	78	32	455
% App. Total	11.1	72.6	11.7	4.6		24.2	61.9	9.4	4.4		17.6	63.5	13.3	5.6		14.5	61.3	17.1	7	
PHF	.696	.858	.854	.571	.931	.770	.714	.750	.875	.874	.750	.869	.717	.643	.850	.786	.784	.750	.667	.795

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WEbster Based Signal Timing Evaluation Routine

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

2009 CMP Data

Mill at 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: 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	2	S	1	2	S
Unadjusted Volume	147	327	88	119	339	58	104	477	112	51	513	95
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)		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)	147	327	88	119	339	58	104	477	112	51	513	95
Saturation Flow (vph)	1700	3600	Shrd	1700	3600	1800	1700	3600	Shrd	1700	3600	Shrd
X or V/C	0.65	0.38	-	0.53	0.31	0.11	0.46	0.55	-	0.23	0.56	-
Effective green (sec)	8	18	-	8	18	18	8	18	-	8	18	-
Split Time (sec)	10	20	-	10	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)	38	18	-	33	17	16	31	20	-	26	20	-
Level of Service (LOS)	D+	B	-	C-	B	B	C-	B	-	C	B	-
Average 'Q' (veh/ln)	2	2	-	2	2	1	2	3	-	1	4	-
Design 'Q'- ft/ln	60	60	-	60	60	40	60	100	-	40	120	-
Do Vehicles Clear?	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) = 22
Level of Service - LOS = C+
Intersection Capacity Utilization - ICU = 0.50

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: Mt Vernon Avenue
E/W: Mill Street
Weather: Sunny

File Name : SBCMVMIPM
Site Code : 9153139
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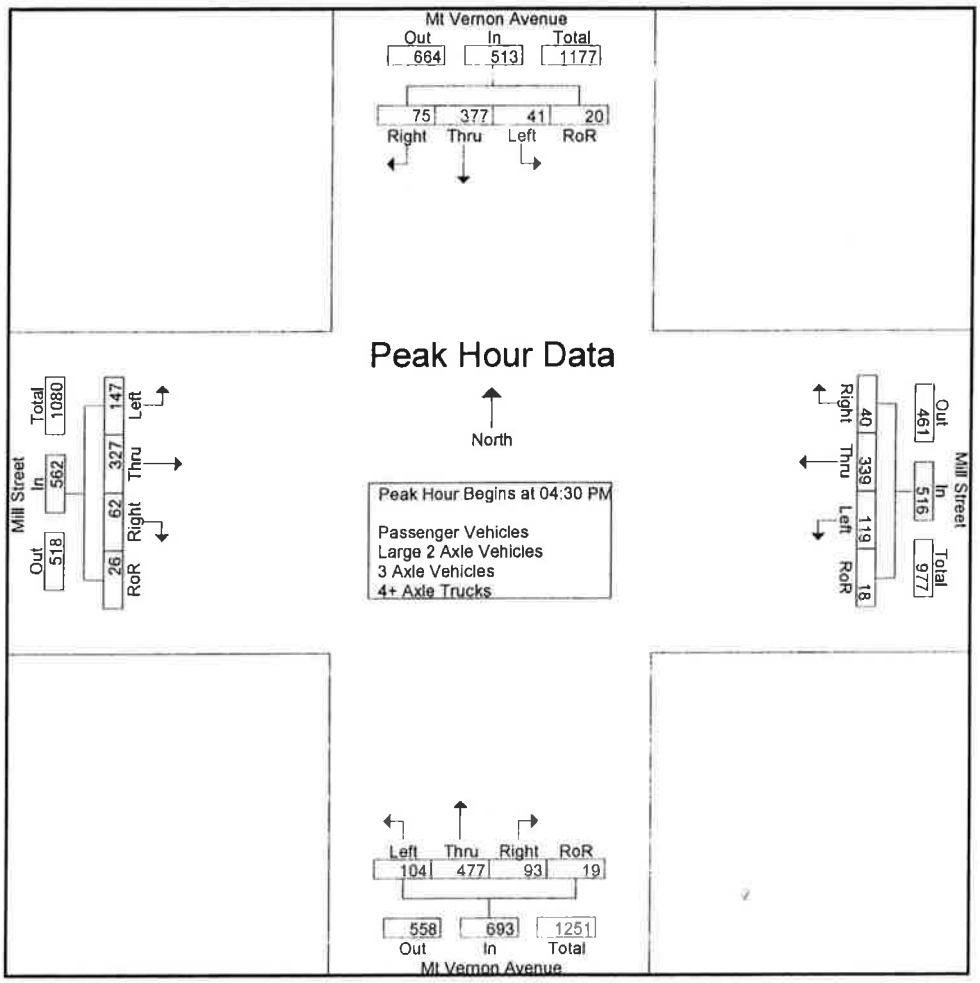

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:45 PM					04:30 PM					04:30 PM					04:45 PM				
+0 mins.	**14**	**106**	18	5	**143**	29	80	10	4	123	22	119	19	**6**	166	34	**88**	13	5	140
+15 mins.	8	83	**23**	6	120	**35**	86	**12**	4	**137**	**29**	**127**	**32**	3	**191**	34	72	15	5	126
+30 mins.	11	97	17	3	128	33	81	6	4	124	26	109	21	5	161	**43**	86	**22**	11	**162**
+45 mins.	**6**	**87**	18	**14**	**125**	22	**92**	12	**6**	132	27	122	**21**	5	175	**36**	75	**20**	**17**	**148**
Total Volume	39	373	76	28	516	119	339	40	18	516	104	477	93	19	693	147	321	70	38	576
% App. Total	7.6	72.3	14.7	5.4		23.1	65.7	7.8	3.5		15	68.8	13.4	2.7		25.5	55.7	12.2	6.6	
PHF	.696	.880	.826	.500	.902	.850	.921	.833	.750	.942	.897	.939	.727	.792	.907	.855	.912	.795	.559	.889