WEBSTER

WEbster Based Signal Timing Evaluation Routine

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

2009 CMP Data

Rialto 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: 20 secs	X	X	X	X	X	X						
Movement 2: 20 secs							X	X	X	X	X	X
Movement 3: 0 secs												
Movement 4: 0 secs												
Movement 5: 0 secs												
Movement 6: 0 secs												
# of Lanes (#, S, P)	1	2	S	1	2	S	1	2	S	1	2	S
Unadjusted Volume	63	392	30	41	175	24	25	218	52	42	247	46
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			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	-

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)	63	392	30	41	175	24	25	218	52	42	247	46
Saturation Flow (vph)	1200	3800	Shrd	900	3800	Shrd	1000	3800	Shrd	1100	3800	Shrd
X or V/C	0.12	0.26	-	0.10	0.12	-	0.06	0.16	-	0.08	0.17	-
Effective green (sec)	18	18	-	18	18	-	18	18	-	18	18	-
Split Time (sec)	20	20	-	20	20	-	20	20	-	20	20	-
Min. Time or Ped. Time (sec)	10	20	-	10	20	-	10	20	-	10	20	-
Delay - 15 min pk (sec/veh)	7	7	-	7	7	-	6	7	-	7	7	-
Level of Service (LOS)	A	A	-	A	A	-	A	A	-	A	A	-
Average 'Q' (veh/ln)	1	1	-	1	1	-	1	1	-	1	1	-
Design 'Q'- ft/ln	40	40	-	40	40	-	40	40	-	40	40	-
Do Vehicles Clear?	YES	YES	-	YES	YES	-	YES	YES	-	YES	YES	-

Summary

Whole Intersection

Weighted Avg Delay (sec) = 7
Level of Service - LOS = A

Critical Movements

Weighted Avg Delay (sec) = 7
Level of Service - LOS = A
Intersection Capacity Utilization - ICU = 0.21

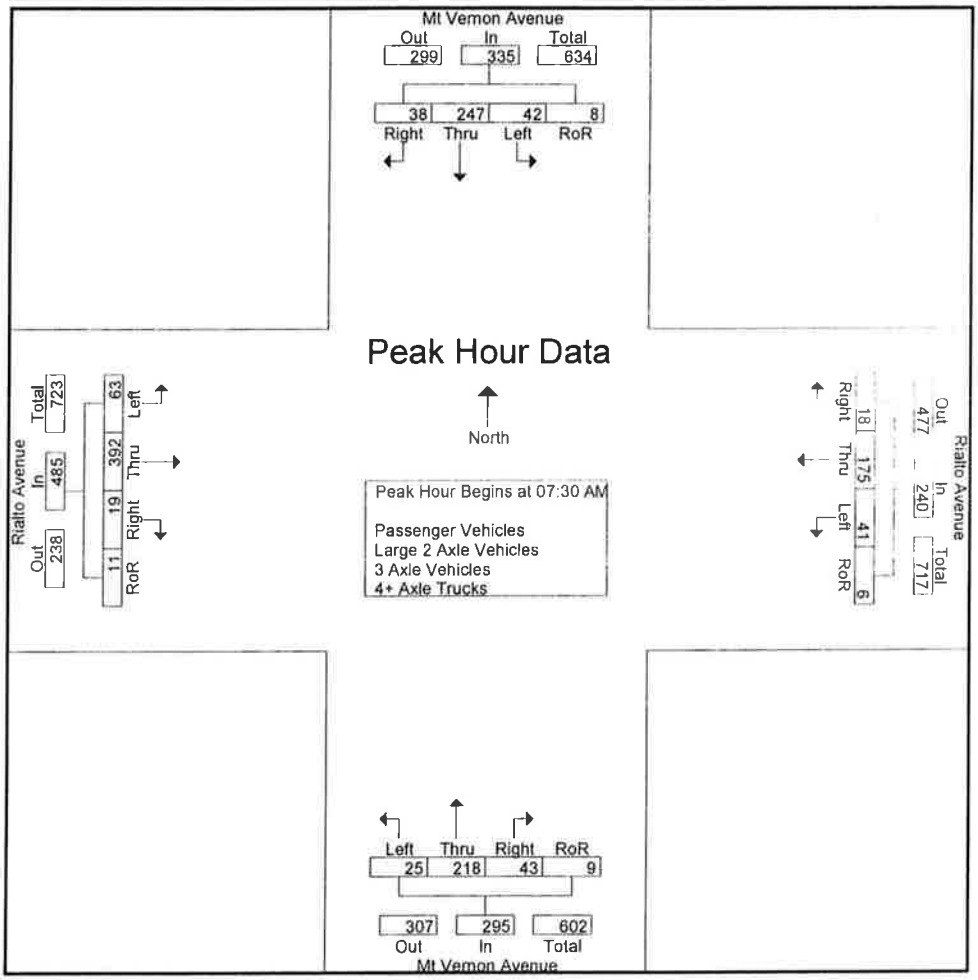
Required Cycle Length is 40 sec

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: Rialto Avenue
Weather: Sunny

File Name : SBCMVRIAM
Site Code : 9153092
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					07:30 AM					07:45 AM					08:00 AM				
+0 mins.	10	54	3	3	70	9	**46**	2	**3**	60	6	**73**	13	**4**	**96**	18	105	**6**	0	129
+15 mins.	10	**76**	**10**	1	**97**	**16**	46	**8**	0	**70**	5	49	8	1	63	**21**	**118**	6	1	**146**
+30 mins.	9	61	10	1	81	9	42	5	1	57	5	43	**15**	2	65	16	75	4	4	99
+45 mins.	**16**	61	9	**4**	90	7	41	3	2	53	**7**	**68**	**8**	**3**	**86**	**8**	**94**	**3**	**6**	111
Total Volume	45	252	32	9	338	41	175	18	6	240	23	233	44	10	310	63	392	19	11	485
% App. Total	13.3	74.6	9.5	2.7		17.1	72.9	7.5	2.5		7.4	75.2	14.2	3.2		13	80.8	3.9	2.3	
PHF	.703	.829	.800	.563	.871	.641	.951	.563	.500	.857	.821	.798	.733	.625	.807	.750	.831	.792	.458	.830

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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

Rialto 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: 20 secs	X	X	X	X	X	X						
Movement 2: 20 secs							X	X	X	X	X	X
Movement 3: 0 secs												
Movement 4: 0 secs												
Movement 5: 0 secs												
Movement 6: 0 secs												
# of Lanes (#, S, P)	1	2	S	1	2	S	1	2	S	1	2	S
Unadjusted Volume	71	318	37	87	439	56	46	489	72	30	391	82
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			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	-

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)	71	318	37	87	439	56	46	489	72	30	391	82
Saturation Flow (vph)	800	3800	Shrd	1000	3800	Shrd	900	3800	Shrd	800	3800	Shrd
X or V/C	0.20	0.21	-	0.19	0.29	-	0.11	0.33	-	0.08	0.28	-
Effective green (sec)	18	18	-	18	18	-	18	18	-	18	18	-
Split Time (sec)	20	20	-	20	20	-	20	20	-	20	20	-
Min. Time or Ped. Time (sec)	10	20	-	10	20	-	10	20	-	10	20	-
Delay - 15 min pk (sec/veh)	8	7	-	8	7	-	7	8	-	7	7	-
Level of Service (LOS)	A	A	-	A	A	-	A	A	-	A	A	-
Average 'Q' (veh/ln)	1	1	-	1	2	-	1	2	-	1	1	-
Design 'Q'- ft/ln	40	40	-	40	60	-	40	60	-	40	40	-
Do Vehicles Clear?	YES	YES	-	YES	YES	-	YES	YES	-	YES	YES	-

Summary

Whole Intersection

Weighted Avg Delay (sec) = 7
Level of Service - LOS = A

Critical Movements

Weighted Avg Delay (sec) = 8
Level of Service - LOS = A
Intersection Capacity Utilization - ICU = 0.31

Required Cycle Length is 40 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: Rialto Avenue
Weather: Sunny

File Name : SBCMVRIPM
Site Code : 9153092
Start Date : 6/10/2009
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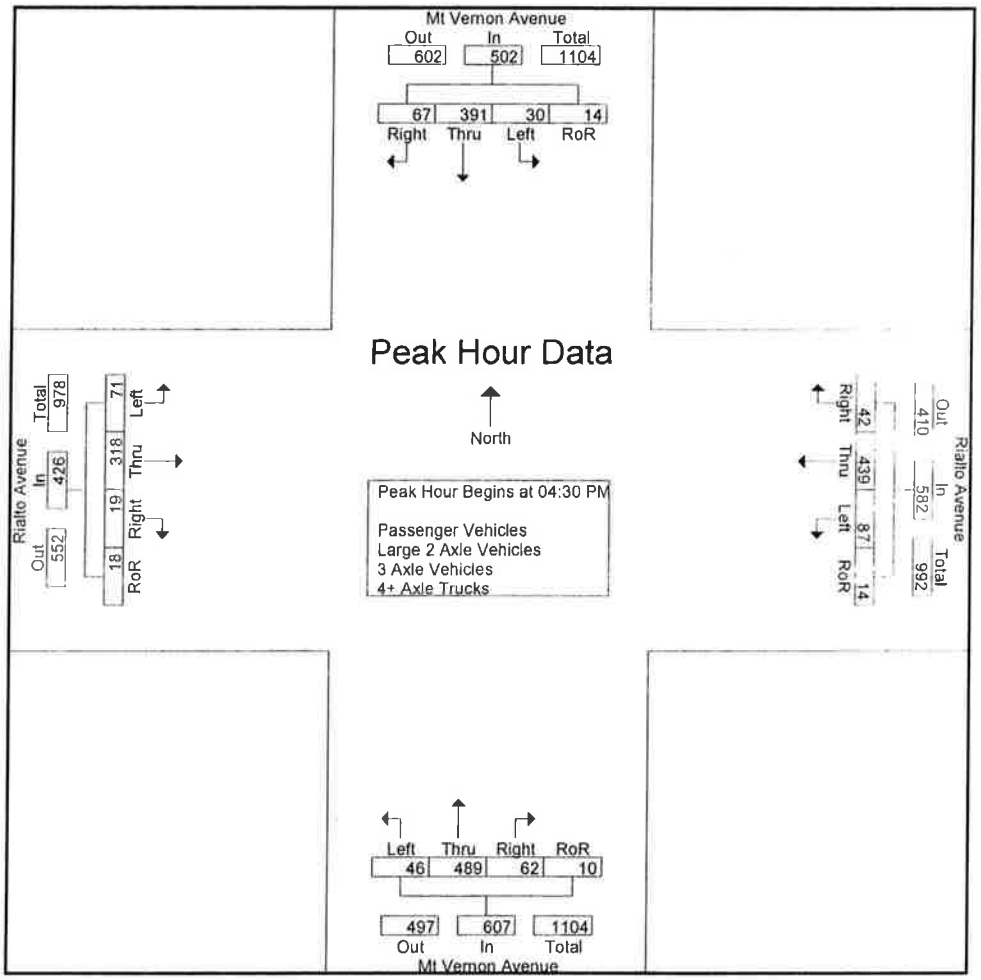

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	05:00 PM					04:30 PM					04:30 PM					04:30 PM				
+0 mins.	8	93	**15**	3	119	21	118	4	3	146	12	**133**	17	**4**	**166**	17	78	3	**6**	104
+15 mins.	10	**109**	13	3	**135**	22	88	14	0	124	9	117	**18**	0	144	18	81	5	4	108
+30 mins.	3	106	14	5	128	**24**	**140**	**16**	3	**183**	**15**	117	14	3	149	15	**85**	**8**	5	**113**
+45 mins.	**12**	101	15	**7**	135	20	93	8	**8**	129	10	122	13	3	148	**21**	**74**	3	3	101
Total Volume	33	409	57	18	517	87	439	42	14	582	46	489	62	10	607	71	318	19	18	426
% App. Total	6.4	79.1	11	3.5		14.9	75.4	7.2	2.4		7.6	80.6	10.2	1.6		16.7	74.6	4.5	4.2	
PHF	.688	.938	.950	.643	.957	.906	.784	.656	.438	.795	.767	.919	.861	.625	.914	.845	.935	.594	.750	.942