WEBSTER

WEbster Based Signal Timing Evaluation Routine

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

2009 CMP Data

E Street @ Orange Show road | **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: 12 secs	X			X								X
Movement 2: 20 secs		X	X		X	X						
Movement 3: 10 secs						X	X			X		
Movement 4: 20 secs								X	X		X	X
Movement 5: 0 secs												
Movement 6: 0 secs												
# of Lanes (#, S, P)	2	2	1	2	2	1	2	2	S	2	2	1
Unadjusted Volume	281	540	187	63	293	43	70	122	50	40	103	104
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 (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)	281	540	187	63	293	43	70	122	50	40	103	104
Saturation Flow (vph)	3200	3600	1800	3200	3600	1800	3200	3600	Shrd	3200	3600	1800
X or V/C	0.54	0.52	0.36	0.12	0.28	0.05	0.17	0.16	-	0.10	0.10	0.12
Effective green (sec)	10	18	18	10	18	28	8	18	-	8	18	30
Split Time (sec)	12	20	20	12	20	30	10	20	-	10	20	32
Min. Time or Ped. Time (sec)	10	20	20	10	20	20	10	20	-	10	20	20
Delay - 15 min pk (sec/veh)	28	20	19	23	18	10	25	17	-	24	16	9
Level of Service (LOS)	C	C+	B	C+	B	A	C+	B	-	C+	B	A
Average 'Q' (veh/ln)	2	3	2	1	2	1	1	1	-	1	1	1
Design 'Q'- ft/ln	60	100	60	40	60	40	40	40	-	40	40	40
Do Vehicles Clear?	YES	YES	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) = 22
Level of Service - LOS = C+
Intersection Capacity Utilization - ICU = 0 35

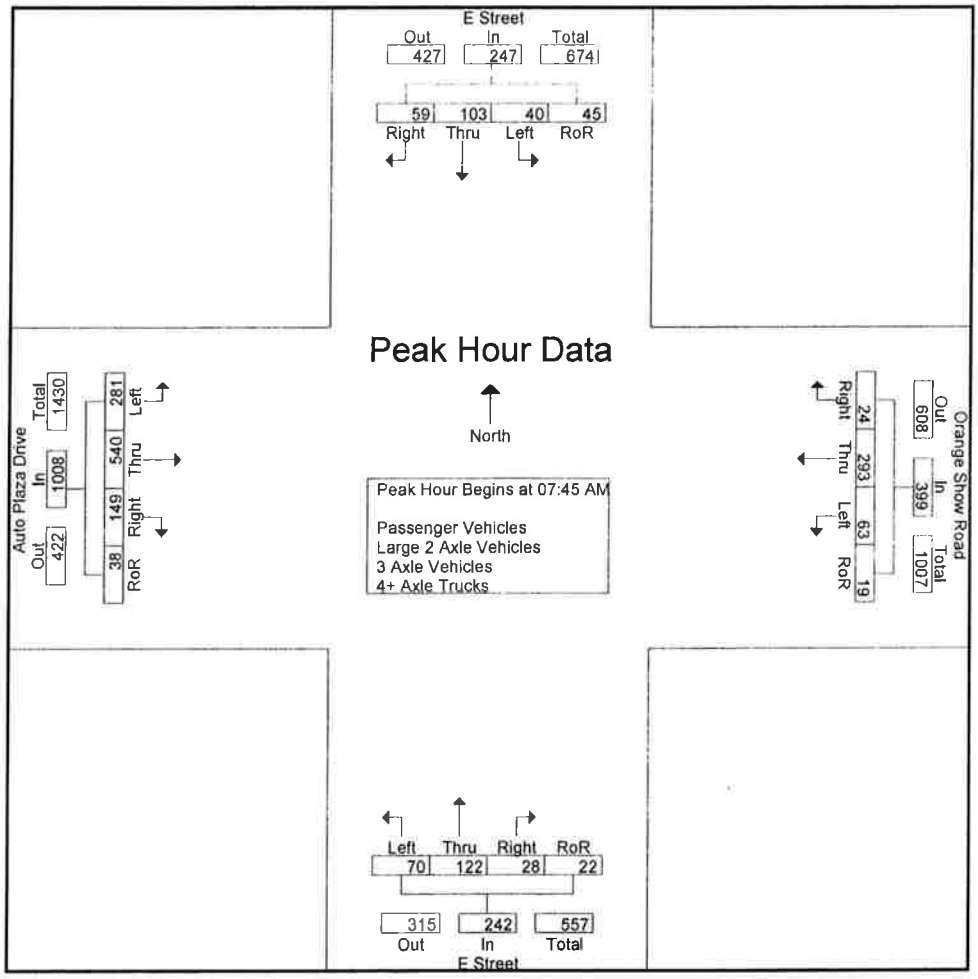
Required Cycle Length is 62 sec

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: Orange Show Road/Auto Plaza Drive
Weather: Sunny

File Name : SBCEORAM
Site Code : 9153037
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:

	08:00 AM					07:45 AM					08:00 AM					07:15 AM				
+0 mins.	6	21	**16**	11	54	16	75	**10**	4	105	**20**	**41**	**11**	6	**78**	69	142	3	**42**	256
+15 mins.	12	22	12	**20**	66	**19**	75	8	2	104	17	21	7	4	49	61	132	**49**	4	246
+30 mins.	10	**30**	12	10	62	12	47	2	**8**	69	16	**32**	6	5	59	**82**	**180**	49	5	**316**
+45 mins.	**16**	23	13	15	**67**	16	**96**	4	5	**121**	19	26	5	**7**	57	77	150	45	14	286
Total Volume	44	96	53	56	249	63	293	24	19	399	72	120	29	22	243	289	604	146	65	1104
% App. Total	17.7	38.6	21.3	22.5		15.8	73.4	6	4.8		29.6	49.4	11.9	9.1		26.2	54.7	13.2	5.9	
PHF	.688	.800	.828	.700	.929	.829	.763	.600	.594	.824	.900	.732	.659	.786	.779	.881	.839	.745	.387	.873

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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

E Street @ Orange Show road | **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: 18 secs	X			X								X
Movement 2: 20 secs		X	X		X	X						
Movement 3: 10 secs						X	X			X		
Movement 4: 20 secs								X	X		X	X
Movement 5: 0 secs												
Movement 6: 0 secs												
# of Lanes (#, S, P)	2	2	1	2	2	1	2	2	S	2	2	1
Unadjusted Volume	512	500	105	91	501	135	197	357	83	149	255	317
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 (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)	512	500	105	91	501	135	197	357	83	149	255	317
Saturation Flow (vph)	3200	3600	1800	3200	3600	1800	3200	3600	Shrd	3200	3600	1800
X or V/C	0.68	0.52	0.22	0.12	0.53	0.18	0.52	0.46	-	0.40	0.27	0.33
Effective green (sec)	16	18	18	16	18	28	8	18	-	8	18	36
Split Time (sec)	18	20	20	18	20	30	10	20	-	10	20	38
Min. Time or Ped. Time (sec)	10	20	20	10	20	20	10	20	-	10	20	20
Delay - 15 min pk (sec/veh)	29	23	21	21	23	13	33	23	-	31	20	10
Level of Service (LOS)	C	C+	C+	C+	C+	B	C-	C+	-	C-	C+	B
Average 'Q' (veh/ln)	4	3	1	1	3	2	2	3	-	1	2	3
Design 'Q'- ft/ln	120	100	40	40	100	60	60	100	-	40	60	100
Do Vehicles Clear?	YES	YES	YES	YES	YES	YES	YES	YES	-	YES	YES	YES

Summary

Whole Intersection

Weighted Avg Delay (sec) = 23
Level of Service - LOS = C+

Critical Movements

Weighted Avg Delay (sec) = 26
Level of Service - LOS = C
Intersection Capacity Utilization - ICU = 0.55

Required Cycle Length is 68 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: Orange Show Road/Auto Plaza Drive
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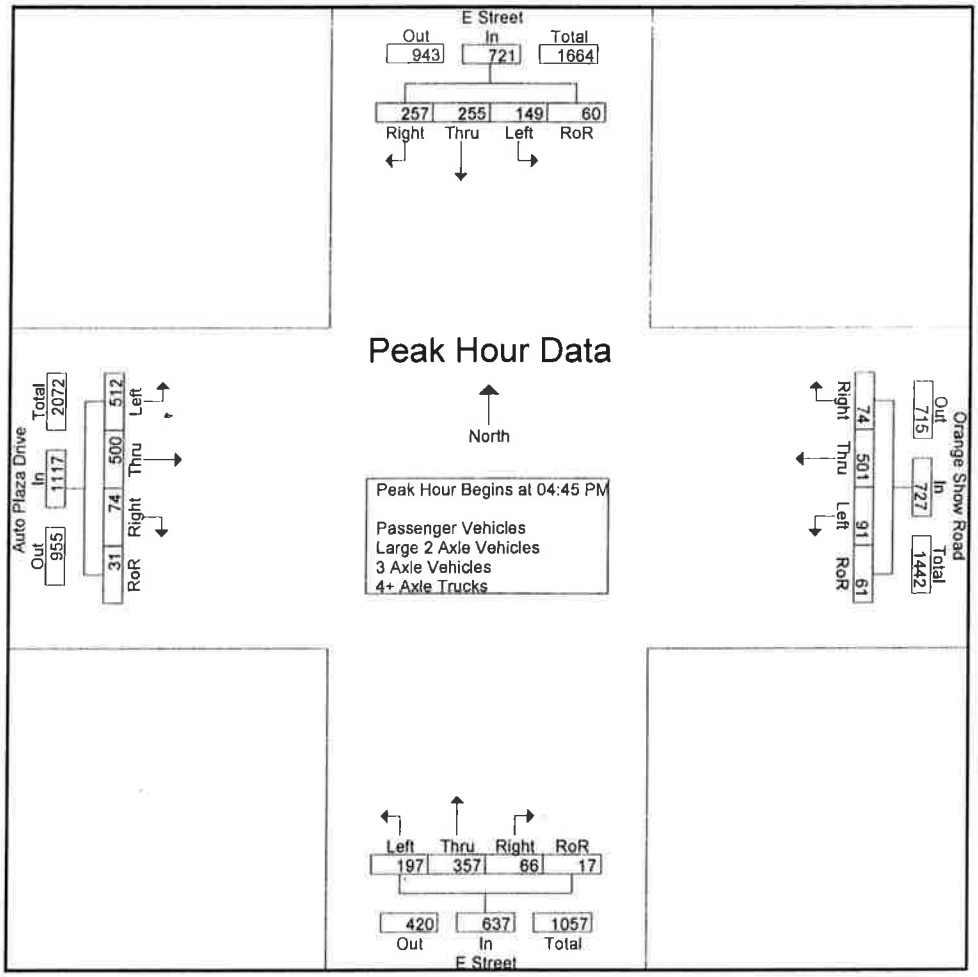

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:45 PM					04:30 PM					04:45 PM					05:00 PM				
+0 mins.	36	67	54	**24**	181	**35**	**148**	**26**	13	**222**	33	75	**19**	1	128	114	121	18	6	259
+15 mins.	**40**	49	62	11	162	25	103	16	**23**	167	**69**	**106**	19	**6**	**200**	**151**	**150**	7	9	**317**
+30 mins.	37	65	70	6	178	28	134	25	12	199	44	101	14	5	164	151	131	20	**11**	313
+45 mins.	36	**74**	**71**	19	**200**	19	137	18	14	188	51	75	14	5	145	117	106	**21**	10	254
Total Volume	149	255	257	60	721	107	522	85	62	776	197	357	66	17	637	533	508	66	36	1143
% App. Total	20.7	35.4	35.6	8.3		13.8	67.3	11	8		30.9	56	10.4	2.7		46.6	44.4	5.8	3.1	
PHF	.931	.861	.905	.625	.901	.764	.882	.817	.674	.874	.714	.842	.868	.708	.796	.882	.847	.786	.818	.901