WEBSTER

WEbster Based Signal Timing Evaluation Routine

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

2009 CMP Data

"E" St @ Rialto 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: 25 secs	X	X	X	X	X	X						
Movement 2: 10 secs							X			X		
Movement 3: 20 secs								X	X		X	X
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	27	374	67	28	203	25	28	142	31	26	147	16
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 '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)	27	374	67	28	203	25	28	142	31	26	147	16
Saturation Flow (vph)	1100	3600	Shrd	900	3600	Shrd	1700	3600	Shrd	1700	3600	Shrd
X or V/C	0.06	0.29	-	0.07	0.15	-	0.11	0.15	-	0.11	0.14	-
Effective green (sec)	23	23	-	23	23	-	8	18	-	8	18	-
Split Time (sec)	25	25	-	25	25	-	10	20	-	10	20	-
Min. Time or Ped. Time (sec)	10	20	-	10	20	-	10	20	-	10	20	-
Delay - 15 min pk (sec/veh)	10	11	-	10	10	-	21	13	-	21	13	-
Level of Service (LOS)	A	B	-	A	B	-	C+	B	-	C+	B	-
Average 'Q' (veh/ln)	1	2	-	1	1	-	1	1	-	1	1	-
Design 'Q'- ft/ln	40	60	-	40	40	-	40	40	-	40	40	-
Do Vehicles Clear?	YES	YES	-	YES	YES	-	YES	YES	-	YES	YES	-

Summary

Whole Intersection

Weighted Avg Delay (sec) = 12
Level of Service - LOS = B

Critical Movements

Weighted Avg Delay (sec) = 12
Level of Service - LOS = B
Intersection Capacity Utilization - ICU = 0.21

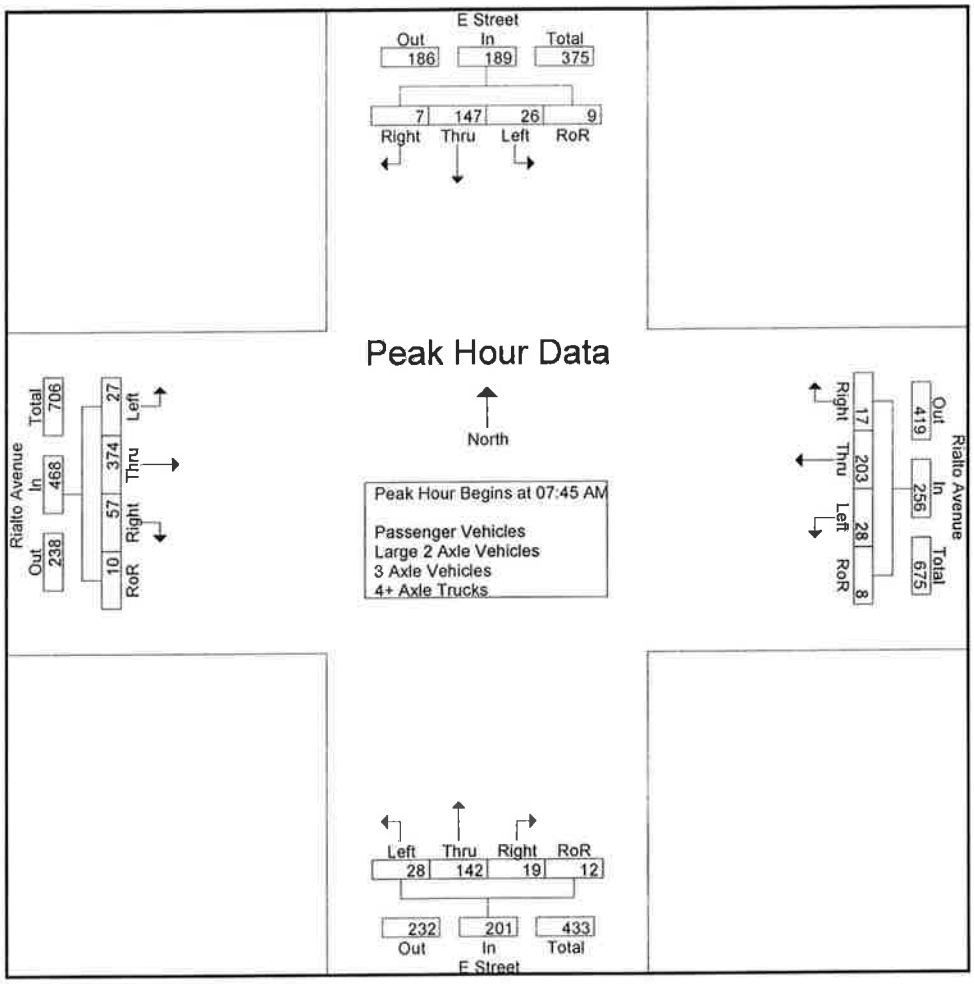
Required Cycle Length is 55 sec

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: Rialto Avenue
Weather: Sunny

File Name : SBCERIAM
Site Code : 91531963
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:

	08:00 AM					08:00 AM					08:00 AM					07:00 AM				
+0 mins.	4	31	0	2	37	4	50	4	2	60	2	33	**6**	**5**	46	4	95	4	1	104
+15 mins.	4	40	1	3	48	6	49	4	**4**	63	9	**38**	4	4	55	10	105	10	**6**	131
+30 mins.	**9**	**45**	**3**	1	**58**	**12**	57	**7**	1	**77**	**11**	34	1	2	48	**11**	110	12	2	135
+45 mins.	8	36	2	**4**	50	5	**67**	1	2	75	10	38	3	5	**56**	6	**139**	**14**	4	**163**
Total Volume	25	152	6	10	193	27	223	16	9	275	32	143	14	16	205	31	449	40	13	533
% App. Total	13	78.8	3.1	5.2		9.8	81.1	5.8	3.3		15.6	69.8	6.8	7.8		5.8	84.2	7.5	2.4	
PHF	.694	.844	.500	.625	.832	.563	.832	.571	.563	.893	.727	.941	.583	.800	.915	.705	.808	.714	.542	.817

WEBSTER

WEbster Based Signal Timing Evaluation Routine

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

2009 CMP Data

"E" St @ Rialto 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: **11** secs							**X**			X		
Movement 3: **20** secs								**X**	X		X	X
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	33	312	66	51	**482**	31	**138**	**487**	47	24	288	35
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 '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)	33	312	66	51	**482**	31	**138**	**487**	47	24	288	35
Saturation Flow (vph)	800	3600	Shrd	900	**3600**	Shrd	**1700**	**3600**	Shrd	1700	3600	Shrd
X or V/C	0.12	0.30	-	0.16	**0.40**	-	**0.46**	**0.42**	-	0.08	0.25	-
Effective green (sec)	18	18	-	18	**18**	-	**9**	**18**	-	9	18	-
Split Time (sec)	20	20	-	20	**20**	-	**11**	**20**	-	11	20	-
Min. Time or Ped. Time (sec)	10	20	-	10	**20**	-	**10**	**20**	-	10	20	-
Delay - 15 min pk (sec/veh)	12	13	-	12	**13**	-	**24**	**14**	-	18	12	-
Level of Service (LOS)	B	B	-	B	**B**	-	**C+**	**B**	-	B	B	-
Average 'Q' (veh/ln)	1	2	-	1	**2**	-	**2**	**2**	-	1	1	-
Design 'Q'- ft/ln	40	60	-	40	**60**	-	**60**	**60**	-	40	40	-
Do Vehicles Clear?	YES	YES	-	YES	**YES**	-	**YES**	**YES**	-	YES	YES	-

Summary

Whole Intersection

Weighted Avg Delay (sec) = 14
Level of Service - LOS = B

Critical Movements

Weighted Avg Delay (sec) = 15
Level of Service - LOS = B
Intersection Capacity Utilization - ICU = 0.42

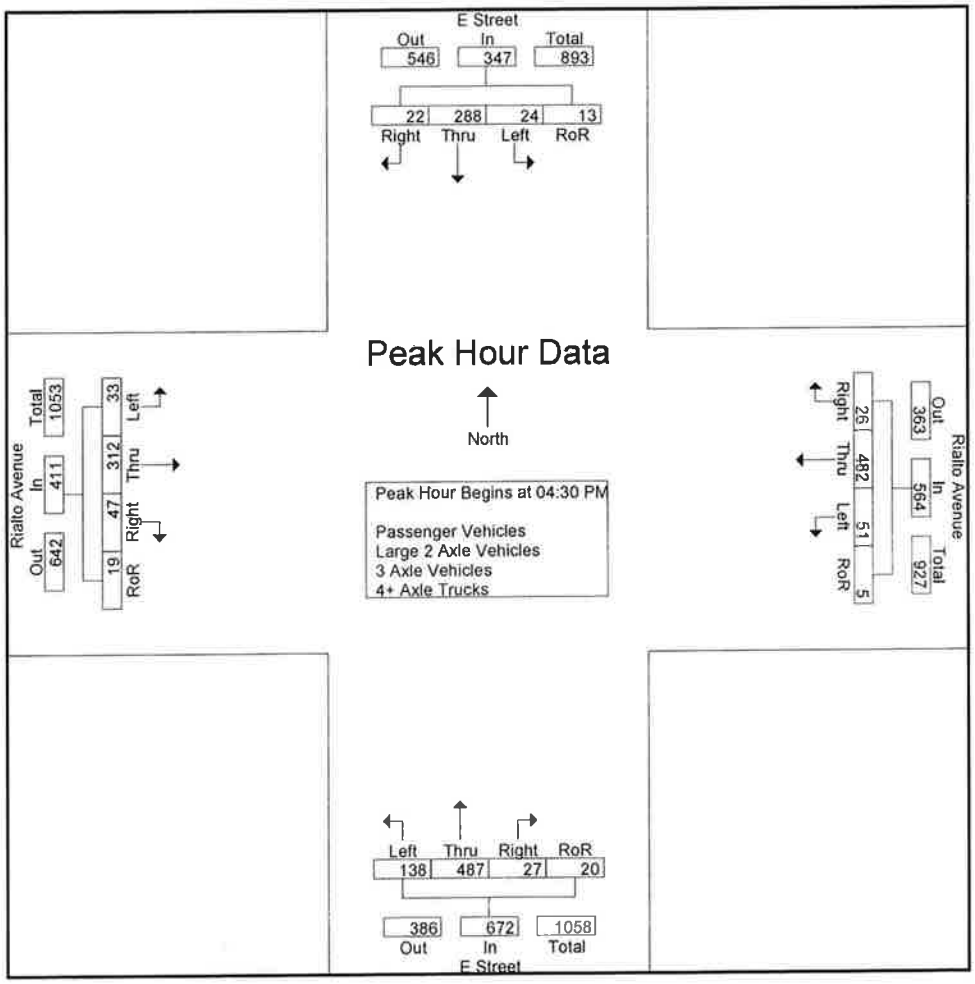
Required Cycle Length is 51 sec

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: Rialto Avenue
Weather: Sunny

File Name : SBCERIPM
Site Code : 91531963
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					04:30 PM					05:00 PM					04:00 PM				
+0 mins.	4	81	**6**	**6**	**97**	**23**	125	6	1	155	34	117	5	2	158	5	74	11	5	95
+15 mins.	**10**	72	1	4	87	11	99	5	**2**	117	**37**	123	**8**	**4**	172	1	**90**	**16**	6	113
+30 mins.	4	**82**	5	4	95	11	**142**	7	2	**162**	34	**139**	5	3	**181**	**12**	82	13	**10**	**117**
+45 mins.	5	59	5	3	72	6	116	**8**	0	130	29	130	7	2	168	2	77	12	3	94
Total Volume	23	294	17	17	351	51	482	26	5	564	134	509	25	11	679	20	323	52	24	419
% App. Total	6.6	83.8	4.8	4.8		9	85.5	4.6	0.9		19.7	75	3.7	1.6		4.8	77.1	12.4	5.7	
PHF	.575	.896	.708	.708	.905	.554	.849	.813	.625	.870	.905	.915	.781	.688	.938	.417	.897	.813	.600	.895