WEBSTER

WEbster Based Signal Timing Evaluation Routine

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

2009 CMP data

Pepper Ave. at 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: 12 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	S	1	2	S	1	2	S
Unadjusted Volume	39	224	61	166	195	38	54	357	64	65	395	25
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)	39	224	61	166	195	38	54	357	64	65	395	25
Saturation Flow (vph)	1800	3800	Shrd	1800	3800	Shrd	1800	3800	Shrd	1800	3800	Shrd
X or V/C	0.13	0.26	-	0.57	0.21	-	0.23	0.38	-	0.28	0.38	-
Effective green (sec)	10	18	-	10	18	-	8	18	-	8	18	-
Split Time (sec)	12	20	-	12	20	-	10	20	-	10	20	-
Min. Time or Ped. Time (sec)	10	20	-	10	20	-	10	20	-	10	20	-
Delay - 15 min pk (sec/veh)	23	17	-	32	17	-	27	19	-	27	19	-
Level of Service (LOS)	C+	B	-	C-	B	-	C	B	-	C	B	-
Average 'Q' (veh/ln)	1	2	-	2	1	-	1	3	-	1	3	-
Design 'Q'- ft/ln	40	60	-	60	40	-	40	100	-	40	100	-
Do Vehicles Clear?	YES	YES	-	YES	YES	-	YES	YES	-	YES	YES	-

Summary

Whole Intersection

Weighted Avg Delay (sec) = 20
Level of Service - LOS = C+

Critical Movements

Weighted Avg Delay (sec) = 21
Level of Service - LOS = C+
Intersection Capacity Utilization - ICU = 0.36

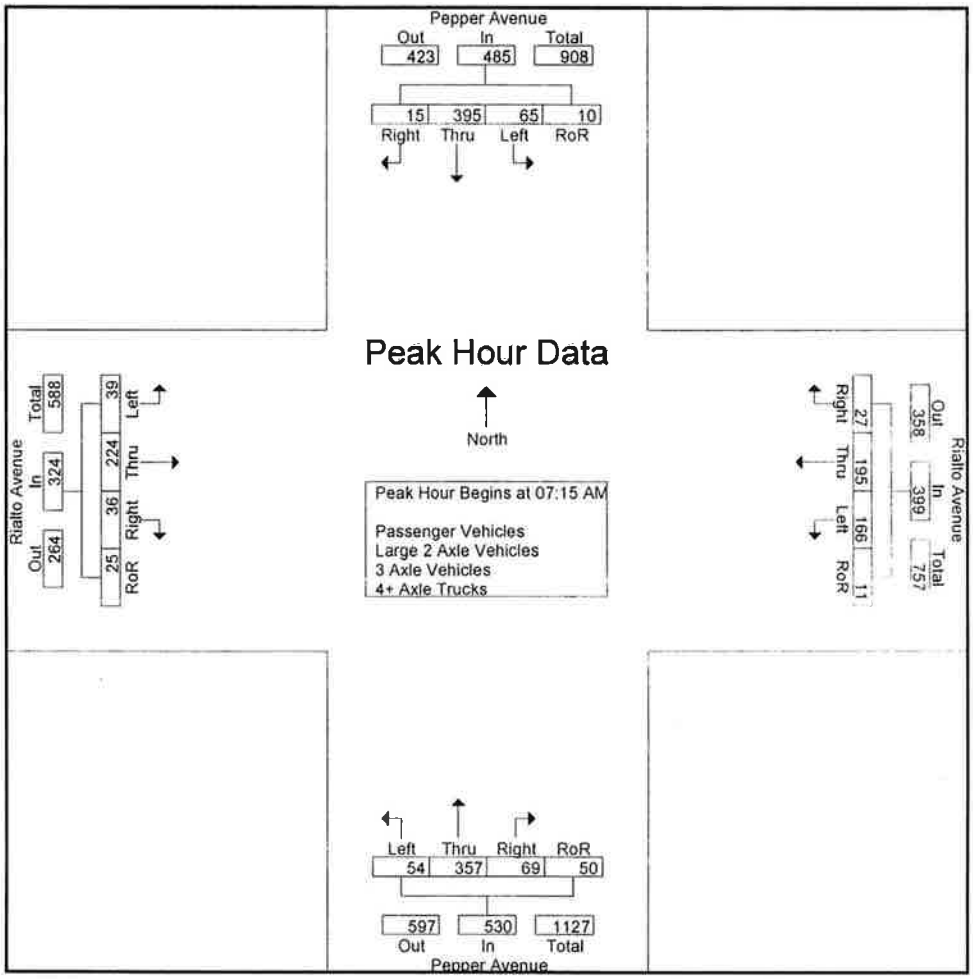
Required Cycle Length is 62 sec

Min./Ped. Times Satisfied

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

City of San Bernardino
N/S: Pepper Avenue
E/W: Rialto Avenue
Weather: Sunny

File Name : SBCPERIAM
Site Code : 9153097
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					07:00 AM					07:15 AM					07:15 AM				
+0 mins.	13	**114**	5	2	**134**	33	41	9	3	86	**17**	97	23	13	150	11	54	**13**	6	84
+15 mins.	**19**	95	**7**	**3**	124	**65**	**68**	3	2	**138**	17	**105**	**25**	**16**	**163**	9	59	5	**11**	84
+30 mins.	19	97	0	2	118	44	49	**10**	3	106	12	77	12	7	108	**15**	**62**	12	5	**94**
+45 mins.	14	89	3	3	109	24	43	4	4	75	8	78	9	14	109	4	49	6	3	62
Total Volume	65	395	15	10	485	166	201	26	12	405	54	357	69	50	530	39	224	36	25	324
% App. Total	13.4	81.4	3.1	2.1		41	49.6	6.4	3		10.2	67.4	13	9.4		12	69.1	11.1	7.7	
PHF	.855	.866	.536	.833	.905	.638	.739	.650	.750	.734	.794	.850	.690	.781	.813	.650	.903	.692	.568	.862

WEBSTER

WEbster Based Signal Timing Evaluation Routine

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

2009 CMP Data

Pepper Ave. at 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: 11 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	S	1	2	S	1	2	S
Unadjusted Volume	37	207	45	159	260	76	95	448	178	78	381	30
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)	37	207	45	159	260	76	95	448	178	78	381	30
Saturation Flow (vph)	1800	3800	Shrd	1800	3800	Shrd	1800	3800	Shrd	1800	3800	Shrd
X or V/C	0.14	0.22	-	0.60	0.30	-	0.40	0.56	-	0.33	0.37	-
Effective green (sec)	9	18	-	9	18	-	8	18	-	8	18	-
Split Time (sec)	11	20	-	11	20	-	10	20	-	10	20	-
Min. Time or Ped. Time (sec)	10	20	-	10	20	-	10	20	-	10	20	-
Delay - 15 min pk (sec/veh)	24	17	-	34	17	-	29	20	-	28	18	-
Level of Service (LOS)	C+	B	-	C-	B	-	C	C+	-	C	B	-
Average 'Q' (veh/ln)	1	2	-	2	2	-	1	4	-	1	2	-
Design 'Q'- ft/ln	40	60	-	60	60	-	40	120	-	40	60	-
Do Vehicles Clear?	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 = 0.45

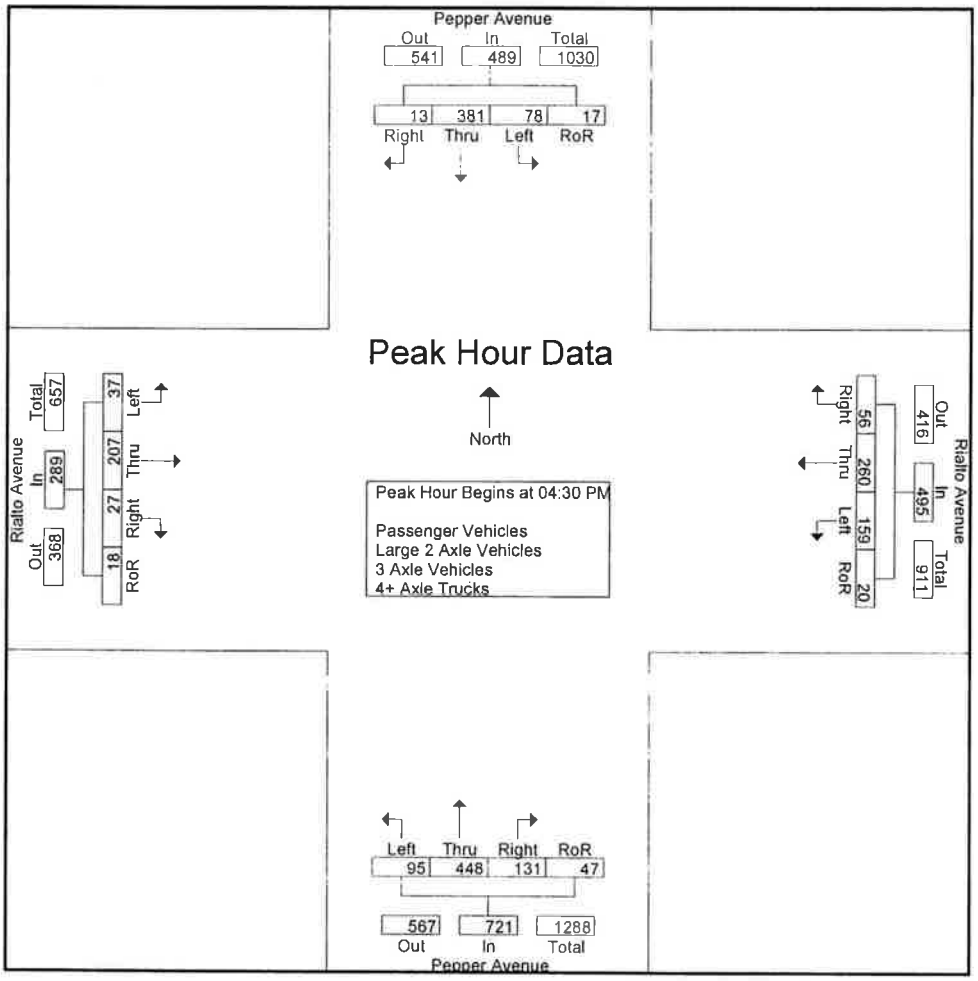
Required Cycle Length is 61 sec

Min./Ped. Times Satisfied

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

City of San Bernardino
N/S: Pepper Avenue
E/W: Rialto Avenue
Weather: Sunny

File Name : SBCPERIPM
Site Code : 9153097
Start Date : 6/10/2009
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:

	04:30 PM					04:30 PM					04:00 PM					04:45 PM				
+0 mins.	12	104	1	3	120	33	66	15	6	120	21	116	26	18	181	7	50	7	2	66
+15 mins.	16	84	**5**	4	109	36	66	11	**8**	121	16	119	29	**19**	183	**13**	**59**	4	**5**	**81**
+30 mins.	**27**	**107**	4	3	**141**	44	**69**	**16**	2	**131**	24	**125**	**34**	12	**195**	11	53	**10**	4	78
+45 mins.	23	86	3	**7**	119	**46**	59	14	4	123	**26**	105	32	12	175	12	57	8	3	80
Total Volume	78	381	13	17	489	159	260	56	20	495	87	465	121	61	734	43	219	29	14	305
% App. Total	16	77.9	2.7	3.5		32.1	52.5	11.3	4		11.9	63.4	16.5	8.3		14.1	71.8	9.5	4.6	
PHF	.722	.890	.650	.607	.867	.864	.942	.875	.625	.945	.837	.930	.890	.803	.941	.827	.928	.725	.700	.941