WEBSTER

WEbster Based Signal Timing Evaluation Routine

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

Existing Traffic with Existing Geometrics

MAIN STREET AND MARIPOSA ROAD **HFI, inc.** **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: 4 secs	X	X	X									
Movement 3: 59 secs		X	X		X	X						
Movement 4: 25 secs							X	X	X	X	X	X
Movement 5: 0 secs												
Movement 6: 0 secs												
# of Lanes (#, S, P)	1	4	S	1	4	S	1	1	S	1	1	S
Unadjusted Volume	80	940	30	30	1400	50	100	20	45	50	10	90
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)	80	940	30	30	1400	50	100	20	45	50	10	90
Saturation Flow (vph)	1800	7600	Shrd	1800	7600	Shrd	1300	1900	Shrd	1300	1900	Shrd
X or V/C	0.32	0.21	-	0.17	0.33	-	0.33	0.15	-	0.17	0.23	-
Effective green (sec)	14	61	-	10	57	-	23	23	-	23	23	-
Split Time (sec)	16	63	-	12	59	-	25	25	-	25	25	-
Min. Time or Ped. Time (sec)	10	20	-	10	20	-	10	20	-	10	20	-
Delay - 15 min pk (sec/veh)	42	9	-	43	12	-	35	31	-	32	33	-
Level of Service (LOS)	D	A	-	D	B	-	D+	C-	-	C-	C-	-
Average 'Q' (veh/ln)	2	3	-	1	4	-	2	1	-	1	2	-
Design 'Q'- ft/ln	60	100	-	40	120	-	60	40	-	40	60	-
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 = 0.33

Predetermined Cycle Length is 100 sec

Min./Ped. Times Satisfied

INTERSECTION TURN COUNT

PEAK HOUR

NORTH-SOUTH STREET: MARIPOSA
EAST-WEST STREET: MAIN
JURISDICTION: HESPERIA

DATE: 06-04-09

PEAK HOUR: 07:15AM

NORTH LEG

TOTAL: 169

Rt	Thru	Lt	
124	24	21	Total
32	4	6	1st 599
30	7	3	2nd 613
26	4	9	3rd 616
36	9	3	4th 604

$\vartheta = V_{15} \times 4$

Autos

104 16 36

80 36

772 1,172

44 36

48 24 8

Total in PCE's

105 20 40

80 40

895 1,24

45 50

60 25 10

EAST LEG TOTAL: 1,328

	1st	2nd	3rd	4th	Total
Rt	4	9	9	5	27
Thru	348	316	300	301	1265
Lt	6	8	11	11	36

Total	1st	2nd	3rd	4th	
77	23	18	20	16	Lt
728	146	190	205	187	Thru
27	3	2	11	11	Rt

WEST LEG TOTAL: 832

Geometrics

TS

Trucks in PCE's

0 0 0

0 0

120 72

0 12

12 0 0

	Lt	Thru	Rt
1st	14	4	9
2nd	19	6	5
3rd	13	6	2
4th	16	5	4
Total	62	21	20

TOTAL: 103

SOUTH LEG

PEAK HOUR FACTORS

NORTH LEG = 0.88
SOUTH LEG = 0.86
EAST LEG = 0.93
WEST LEG = 0.88

ALL LEGS = 0.99

HOUR TOTAL: 2,432

Prepared by NEWPORT TRAFFIC STUDIES

SANBAG CLASSIFICATION SUMMARY

NORTH-SOUTH STREET : MARIPOSA HESPERIA

EAST-WEST STREET : MAIN 06-04-09

BEGINNING TIME : 07:00AM

AUTOS			LARGE 2 AXLE			3 AXLE			4 (+) AXLE			TOTALS
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	
						NORTH LEG						
26	2	8	0	0	0	0	0	0	0	0	0	36
32	4	6	0	0	0	0	0	0	0	0	0	42
30	7	3	0	0	0	0	0	0	0	0	0	40
26	4	9	0	0	0	0	0	0	0	0	0	39
36	9	3	0	0	0	0	0	0	0	0	0	48
28	5	5	2	1	0	0	0	0	1	0	0	42
20	5	7	0	0	0	0	0	0	0	0	0	32
31	8	9	1	0	0	0	0	0	0	0	0	49
229	44	50	3	1	0	0	0	0	1	0	0	328
						SOUTH LEG						
4	4	18	0	0	0	0	0	0	0	0	0	26
9	4	14	0	0	0	0	0	0	0	0	0	27
5	6	17	0	0	2	0	0	0	0	0	0	30
2	6	12	0	0	0	0	0	0	0	0	(3) 1	21
4	4	14	0	1	1	0	0	0	0	0	1	25
11	6	16	0	0	0	0	0	0	0	0	0	33
8	7	15	0	0	1	0	0	0	0	0	0	31
13	4	17	0	0	0	0	0	0	0	0	0	34
56	41	123	0	1	4	0	0	0	0	0	2	227
						EAST LEG						
1	318	5	0	2	0	0	0	0	0	6	0	332
4	339	6	0	3	0	0	0	0	0	6	0	358
9	304	8	0	1	0	0	2	0	0	9	0	333
9	293	9	0	(3) 2	(3) 2	0	0	0	0	(15) 5	0	320
4	290	10	1	4	1	0	1	0	0	6	0	317
5	261	7	0	2	0	0	0	0	0	9	0	284
8	267	4	0	3	0	0	3	0	0	7	0	292
7	219	9	0	1	1	0	1	0	0	11	0	249
47	2291	58	1	18	4	0	7	0	0	59	0	2485
						WEST LEG						
9	122	18	0	3	1	0	0	0	0	8	0	161
3	133	23	0	2	0	0	2	0	0	9	0	172
2	175	16	0	2	2	0	1	0	0	12	0	210
11	193	20	0	(6) 4	0	0	0	0	0	(21) 8	0	236
11	175	16	0	1	0	0	2	0	0	9	0	214
10	154	20	0	3	1	0	3	0	0	7	1	199
14	208	20	1	2	2	0	1	0	0	9	0	257
12	201	19	0	1	1	0	2	0	0	4	0	240
72	1361	152	1	18	7	0	11	0	0	66	1	1689

Prepared by Newport Traffic Studies

INTERSECTION TURNING COUNT

NORTH-SOUTH STREET: MARIPOSA

EAST-WEST STREET: MAIN

TIME: 07:00AM-08:00AM DATE: 06-04-09

NORTH LEG

Rt	Thru	Lt	
114	17	26	Total
26	2	8	1st
32	4	6	2nd
30	7	3	3rd
26	4	9	4th

	1st	2nd	3rd	4th	Total
Rt	1	4	9	9	23
Thru	326	348	316	300	1290
Lt	5	6	8	11	30

Total	1st	2nd	3rd	4th	
80	19	23	18	20	Lt
674	133	146	190	205	Thru
25	9	3	2	11	Rt

	Lt	Thru	Rt
1st	18	4	4
2nd	14	4	9
3rd	19	6	5
4th	13	6	2
Total	64	20	20

Prepared by NEWPORT TRAFFIC STUDIES

INTERSECTION TURNING COUNT

NORTH-SOUTH STREET: MARIPOSA

EAST-WEST STREET: MAIN

TIME: 08:00AM-09:00AM DATE: 06-04-09

NORTH LEG

Rt	Thru	Lt	
119	28	24	Total
36	9	3	1st
31	6	5	2nd
20	5	7	3rd
32	8	9	4th

	1st	2nd	3rd	4th	Total
Rt	5	5	8	7	25
Thru	301	272	280	232	1085
Lt	11	7	4	10	32

Total	1st	2nd	3rd	4th	
80	16	22	22	20	Lt
782	187	167	220	208	Thru
48	11	10	15	12	Rt

	Lt	Thru	Rt
1st	16	5	4
2nd	16	6	11
3rd	16	7	8
4th	17	4	13
Total	65	22	36

Prepared by NEWPORT TRAFFIC STUDIES

WEBSTER

WEbster Based Signal Timing Evaluation Routine

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

Existing Traffic with Existing Geometrics

MAIN STREET AND MARIPOSA ROAD **HFI, inc.** **PM Peak Hour**

Input

	Eastbound			Westbound			Northbound			Southbound		
Movement Times	*L*	T	R	L	*T*	R	L	T	R	L	*T*	R
Movement 1: 17 secs	X			X								
Movement 2: 0 secs	X	X	X									
Movement 3: 59 secs		X	X		X	X						
Movement 4: 24 secs							X	X	X	X	X	X
Movement 5: 0 secs												
Movement 6: 0 secs												
# of Lanes (#, S, P)	1	4	S	1	4	S	1	1	S	1	1	S
Unadjusted Volume	80	895	45	50	1245	40	60	25	10	40	20	105
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)	80	895	45	50	1245	40	60	25	10	40	20	105
Saturation Flow (vph)	1800	7600	Shrd	1800	7600	Shrd	1300	1900	Shrd	1400	1900	Shrd
X or V/C	0.30	0.22	-	0.19	0.30	-	0.21	0.08	-	0.13	0.30	-
Effective green (sec)	15	57	-	15	57	-	22	22	-	22	22	-
Split Time (sec)	17	59	-	17	59	-	24	24	-	24	24	-
Min. Time or Ped. Time (sec)	10	20	-	10	20	-	10	20	-	10	20	-
Delay - 15 min pk (sec/veh)	41	11	-	39	11	-	34	31	-	32	34	-
Level of Service (LOS)	D	B	-	D+	B	-	C-	C-	-	C-	C-	-
Average 'Q' (veh/ln)	2	3	-	1	4	-	1	1	-	1	3	-
Design 'Q'- ft/ln	60	100	-	40	120	-	40	40	-	40	100	-
Do Vehicles Clear?	YES	YES	-	YES	YES	-	YES	YES	-	YES	YES	-

Summary

Whole Intersection

Weighted Avg Delay (sec) = 15
Level of Service - LOS = B

Critical Movements

Weighted Avg Delay (sec) = 15
Level of Service - LOS = B
Intersection Capacity Utilization - ICU = 0.30

Predetermined Cycle Length is 100 sec

Min./Ped. Times Satisfied

INTERSECTION TURN COUNT

PEAK HOUR

NORTH-SOUTH STREET: MARIPOSA
EAST-WEST STREET: MAIN
JURISDICTION: HESPERIA

DATE: 06-04-09

PEAK HOUR: 04:15PM

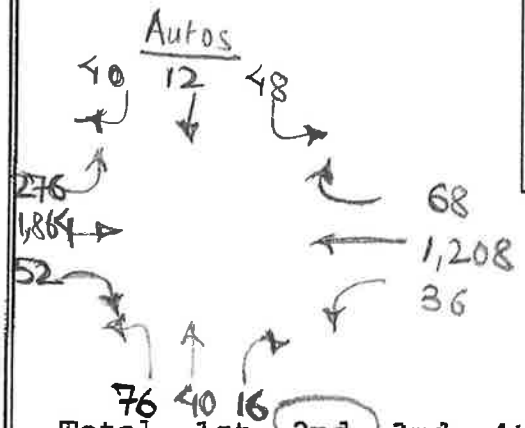
NORTH LEG

TOTAL: 116

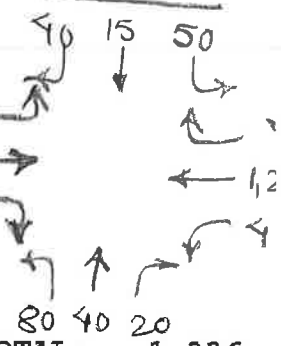
Rt	Thru	Lt		
47	23	46	Total	
6	6	7	1st	911
10	3	12	2nd	952
14	6	14	3rd	901
17	8	13	4th	947

$V = V_{15} \times 4$

Autos



Total in PCE's



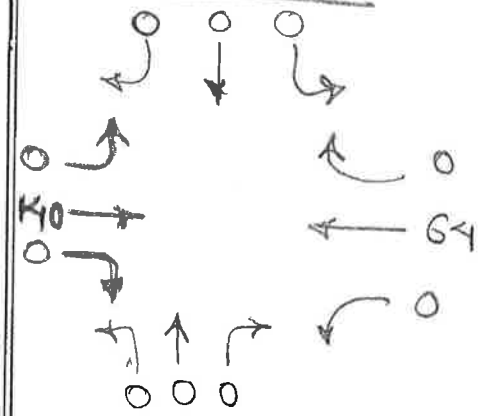
EAST LEG TOTAL: 1,336

	1st	2nd	3rd	4th	Total
Rt	17	17	9	11	54
Thru	316	308	332	293	1249
Lt	9	9	6	9	33

Total	1st	2nd	3rd	4th	
247	64	69	55	59	Lt
1803	442	478	406	477	Thru
57	17	13	14	13	Rt

WEST LEG TOTAL: 2,107

Trucks in PCE's



	Lt	Thru	Rt
1st	19	3	5
2nd	19	10	4
3rd	16	14	15
4th	28	12	7
Total	82	39	31

SOUTH LEG

TOTAL: 152

PEAK HOUR FACTORS

NORTH LEG = 0.76
SOUTH LEG = 0.81
EAST LEG = 0.96
WEST LEG = 0.94

ALL LEGS = 0.97

HOUR TOTAL: 3,711

Prepared by NEWPORT TRAFFIC STUDIES

SANBAG CLASSIFICATION SUMMARY

NORTH-SOUTH STREET : MARIPOSA HESPERIA

EAST-WEST STREET : MAIN 06-04-09

BEGINNING TIME : 04:00PM

AUTOS RT	AUTOS THRU	AUTOS LT	LARGE 2 AXLE RT	LARGE 2 AXLE THRU	LARGE 2 AXLE LT	3 AXLE RT	3 AXLE THRU	3 AXLE LT	4(+) AXLE RT	4(+) AXLE THRU	4(+) AXLE LT	TOTALS
						NORTH LEG						
12	5	12	0	0	0	0	0	0	0	0	0	29
6	6	7	0	0	0	0	0	0	0	0	0	19
10	3	12	0	0	0	0	0	0	0	0	0	25
14	5	12	0	1	2	0	0	0	0	0	0	34
17	8	13	0	0	0	0	0	0	0	0	0	38
23	3	9	0	0	0	0	0	0	0	0	0	35
15	9	11	2	0	0	0	0	0	0	0	0	37
6	3	7	1	0	0	0	0	0	0	0	0	17
103	42	83	3	1	2	0	0	0	0	0	0	234
						SOUTH LEG						
7	12	13	0	0	0	0	0	0	0	0	0	32
5	3	19	0	0	0	0	0	0	0	0	0	27
4	10	19	0	0	0	0	0	0	0	0	0	33
15	14	16	0	0	0	0	0	0	0	0	0	45
7	12	28	0	0	0	0	0	0	0	0	0	47
6	8	25	0	0	2	0	0	0	0	0	0	41
3	9	20	0	1	0	0	0	0	0	0	0	33
4	3	13	0	0	0	0	0	0	0	0	0	20
51	71	153	0	1	2	0	0	0	0	0	0	278
						EAST LEG						
6	235	7	0	0	0	0	0	0	0	3	0	251
17	308	9	0	2	0	0	0	0	0	6	0	342
17	302	9	0	0	0	0	(4)2	0	0	(12)4	0	334
9	323	6	0	3	0	0	0	0	0	6	0	347
11	283	9	0	1	0	0	1	0	0	8	0	313
14	287	8	0	0	0	0	0	0	0	9	0	318
14	268	6	0	4	0	0	0	0	0	6	0	298
10	196	4	0	1	1	0	0	0	0	8	0	220
98	2202	58	0	11	1	0	3	0	0	50	0	2423
						WEST LEG						
10	432	53	0	2	0	0	0	0	0	5	0	502
17	427	64	0	3	0	0	3	0	0	9	0	523
13	466	69	0	(2)1	0	0	0	0	0	(33)11	0	560
14	401	53	0	1	2	0	0	0	0	4	0	475
13	466	59	0	3	0	0	1	0	0	7	0	549
6	433	42	0	1	1	0	1	0	0	6	0	490
9	383	47	0	3	0	0	0	0	0	2	0	444
7	331	38	0	2	0	0	0	0	0	6	0	384
89	3339	425	0	16	3	0	5	0	0	50	0	3927

Prepared by Newport Traffic Studies

INTERSECTION TURNING COUNT

NORTH-SOUTH STREET: MARIPOSA

EAST-WEST STREET: MAIN

TIME: 04:00PM-05:00PM DATE: 06-04-09

NORTH LEG

Rt	Thru	Lt	
42	20	45	Total
12	5	12	1st
6	6	7	2nd
10	3	12	3rd
14	6	14	4th

	1st	2nd	3rd	4th	Total
Rt	6	17	17	9	49
Thru	238	316	308	332	1194
Lt	7	9	9	6	31

Total	1st	2nd	3rd	4th	
241	53	64	69	55	Lt
1765	439	442	478	406	Thru
54	10	17	13	14	Rt

	Lt	Thru	Rt
1st	13	12	7
2nd	19	3	5
3rd	19	10	4
4th	16	14	15
Total	67	39	31

Prepared by NEWPORT TRAFFIC STUDIES

INTERSECTION TURNING COUNT

NORTH-SOUTH STREET: MARIPOSA

EAST-WEST STREET: MAIN

TIME: 05:00PM-06:00PM DATE: 06-04-09

NORTH LEG

	Rt	Thru	Lt
Total	64	23	40
1st	17	8	13
2nd	23	3	9
3rd	17	9	11
4th	7	3	7

	1st	2nd	3rd	4th	Total
Rt	11	14	14	10	49
Thru	293	296	278	205	1072
Lt	9	8	6	5	28

	Total	1st	2nd	3rd	4th
Lt	187	59	43	47	38
Thru	1645	477	441	388	339
Rt	35	13	6	9	7

	Lt	Thru	Rt
1st	28	12	7
2nd	27	8	6
3rd	20	10	3
4th	13	3	4
Total	88	33	20

Prepared by NEWPORT TRAFFIC STUDIES