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 & THIRD AVENUE **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: 7 secs	X			X					X			
Movement 2: 5 secs				X	X	X			X			
Movement 3: 68 secs		X	X		X	X						
Movement 4: 7 secs							X	X	X			
Movement 5: 13 secs										X	X	X
Movement 6: 0 secs												
# of Lanes (#, S, P)	2	2	S	2	2	S	1	1	1	1	1	1
Unadjusted Volume	90	975	10	130	1255	40	45	15	150	85	85	50
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						
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

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)	90	975	10	130	1255	40	45	15	150	85	85	50
Saturation Flow (vph)	3500	3800	Shrd	3500	3800	Shrd	1800	1900	1800	1800	1900	1800
X or V/C	0.51	0.39	-	0.37	0.48	-	0.50	0.16	0.49	0.43	0.41	0.25
Effective green (sec)	5	66	-	10	71	-	5	5	17	11	11	11
Split Time (sec)	7	68	-	12	73	-	7	7	19	13	13	13
Min. Time or Ped. Time (sec)	10	20	-	10	20	-	10	20	20	10	20	20
Delay - 15 min pk (sec/veh)	57	8	-	45	7	-	65	49	43	48	47	44
Level of Service (LOS)	E+	A	-	D	A	-	E	D	D	D	D	D
Average 'Q' (veh/ln)	1	5	-	2	5	-	1	1	3	2	2	1
Design 'Q'- ft/ln	40	160	-	60	160	-	40	40	100	60	60	40
Do Vehicles Clear?	YES	YES	-	YES	YES	-	YES	YES	YES	YES	YES	YES

Summary

Whole Intersection

Weighted Avg Delay (sec) = 17
Level of Service - LOS = B

Critical Movements

Weighted Avg Delay (sec) = 14
Level of Service - LOS = B
Intersection Capacity Utilization - ICU = 0.48

Predetermined Cycle Length is 100 sec

Min./Ped. Times May Not Be Satisfied

INTERSECTION TURN COUNT

PEAK HOUR

NORTH-SOUTH STREET: 3RD
EAST-WEST STREET: MAIN
JURISDICTION: HESPERIA

DATE: 06-04-09

PEAK HOUR: 08:00AM

NORTH LEG

TOTAL: 182

Rt	Thru	Lt		
54	27	101	Total	
21	12	20	1st	596
10	4	25	2nd	528
11	6	21	3rd	576
12	5	35	4th	681

$V_{15} \times 4$

Autos

48 20 128

76 832 8

36 1,112 108

36 12 136

Total in PCE's

50 20 150

90 975 10

40 1,25 130

45 15 150

EAST LEG TOTAL: 1,175

	1st	2nd	3rd	4th	Total
Rt	8	12	8	9	37
Thru	248	236	255	295	1034
Lt	28	19	27	30	104

WEST LEG TOTAL: 823

Total	1st	2nd	3rd	4th	
90	22	19	29	20	Lt
718	166	164	163	225	Thru
15	3	4	6	2	Rt

Geometrics

TS

Trucks in PCE's

0 0 20

12 140 0

0 140 20

8 0 12

SOUTH LEG

	Lt	Thru	Rt
1st	21	4	43
2nd	10	5	20
3rd	12	9	29
4th	10	3	35
Total	53	21	127

TOTAL: 201

PEAK HOUR FACTORS

NORTH LEG = 0.86
SOUTH LEG = 0.74
EAST LEG = 0.88
WEST LEG = 0.83

ALL LEGS = 0.87

HOUR TOTAL: 2,381

Prepared by NEWPORT TRAFFIC STUDIES

SANBAG CLASSIFICATION SUMMARY

NORTH-SOUTH STREET : 3RD 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						
8	5	8	0	0	0	0	0	0	0	0	0	21
4	5	15	1	0	0	1	0	1	0	0	0	27
7	0	19	0	0	0	0	0	1	0	0	0	27
21	7	17	1	0	3	0	0	0	0	0	0	49
19	12	20	2	0	0	0	0	0	0	0	0	53
10	4	23	0	0	1	0	0	0	0	0	1	39
10	6	18	1	0	3	0	0	0	0	0	0	38
12	5	32	0	0	(5) 3	0	0	0	0	0	0	52
91	44	152	5	0	10	1	0	2	0	0	1	306
						SOUTH LEG						
18	1	3	0	0	0	0	2	0	1	0	0	25
21	8	4	0	1	0	0	0	0	0	0	0	34
31	8	10	0	1	0	0	0	0	1	1	0	52
35	10	9	1	0	0	0	0	0	2	0	0	57
41	4	19	0	0	0	0	0	1	2	0	1	68
18	5	8	1	0	1	0	0	0	1	0	1	35
27	9	12	0	0	0	1	0	0	1	0	0	50
34	3	9	0	0	(2) 1	0	0	0	(3) 1	0	0	48
225	48	74	2	2	2	1	2	1	9	1	2	369
						EAST LEG						
3	188	16	1	8	0	0	4	0	0	4	0	224
3	226	22	0	7	0	0	4	0	0	6	0	268
6	202	40	1	7	0	0	7	0	0	5	0	268
8	247	33	0	6	2	0	5	0	0	4	0	305
7	230	28	1	12	0	0	4	0	0	2	0	284
11	214	19	1	13	0	0	3	0	0	6	0	267
7	243	27	0	3	0	0	5	0	1	4	0	290
9	278	27	0	(11) 7	(3) 2	0	(12) 6	(2) 1	0	(12) 4	0	334
54	1828	212	4	63	4	0	38	1	1	35	0	2240
						WEST LEG						
4	121	7	0	3	0	0	3	0	0	6	0	144
4	153	15	0	3	2	0	8	0	0	0	3	188
3	160	20	0	5	0	0	6	0	0	2	1	197
6	187	16	0	6	0	0	8	0	0	13	0	236
3	164	22	0	1	0	0	0	0	0	1	0	191
3	150	18	1	6	1	0	2	0	0	6	0	187
5	151	29	1	7	0	0	4	0	0	1	0	198
2	208	19	0	(12) 8	0	0	(8) 4	0	0	(15) 6	(3) 1	247
30	1294	146	2	39	3	0	35	0	0	34	5	1588

Prepared by Newport Traffic Studies

INTERSECTION TURNING COUNT

NORTH-SOUTH STREET: 3RD

EAST-WEST STREET: MAIN

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

NORTH LEG

Rt	Thru	Lt	
43	17	64	Total
8	5	8	1st
6	5	16	2nd
7	0	20	3rd
22	7	20	4th

	1st	2nd	3rd	4th	Total
Rt	4	3	7	8	22
Thru	204	243	221	262	930
Lt	16	22	40	35	113

Total	1st	2nd	3rd	4th	
64	7	20	21	16	Lt
684	133	164	173	214	Thru
17	4	4	3	6	Rt

	Lt	Thru	Rt
1st	3	3	19
2nd	4	9	21
3rd	10	10	32
4th	9	10	38
Total	26	32	110

Prepared by NEWPORT TRAFFIC STUDIES

INTERSECTION TURNING COUNT

NORTH-SOUTH STREET: 3RD

EAST-WEST STREET: MAIN

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

NORTH LEG

Rt	Thru	Lt	
54	27	101	Total
21	12	20	1st
10	4	25	2nd
11	6	21	3rd
12	5	35	4th

	1st	2nd	3rd	4th	Total
Rt	8	12	8	9	37
Thru	248	236	255	295	1034
Lt	28	19	27	30	104

Total	1st	2nd	3rd	4th	
90	22	19	29	20	Lt
718	166	164	163	225	Thru
15	3	4	6	2	Rt

	Lt	Thru	Rt
1st	21	4	43
2nd	10	5	20
3rd	12	9	29
4th	10	3	35
Total	53	21	127

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WEBSTER

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Existing Traffic with Existing Geometrics

MAIN STREET & THIRD AVENUE | **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: 8 secs	X			X					X			
Movement 2: 2 secs				X	X	X			X			
Movement 3: 56 secs		X	X		X	X						
Movement 4: 7 secs							X	X	X			
Movement 5: 27 secs										X	X	X
Movement 6: 0 secs												
# of Lanes (#, S, P)	2	2	S	2	2	S	1	1	1	1	1	1
Unadjusted Volume	150	1440	25	160	1430	50	60	45	155	305	55	125
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						
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

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)	150	1440	25	160	1430	50	60	45	155	305	55	125
Saturation Flow (vph)	3500	3800	Shrd	3500	3800	Shrd	1800	1900	1800	1800	1900	1800
X or V/C	0.71	0.71	-	0.57	0.70	-	0.67	0.47	0.57	0.68	0.12	0.28
Effective green (sec)	6	54	-	8	56	-	5	5	15	25	25	25
Split Time (sec)	8	56	-	10	58	-	7	7	17	27	27	27
Min. Time or Ped. Time (sec)	10	20	-	10	20	-	10	20	20	10	20	20
Delay - 15 min pk (sec/veh)	65	19	-	53	18	-	80	62	48	42	29	32
Level of Service (LOS)	E	B	-	D-	B	-	E-	E	D	D	C	C-
Average 'Q' (veh/ln)	2	9	-	2	9	-	2	1	4	6	1	3
Design 'Q'- ft/ln	60	280	-	60	280	-	60	40	120	180	40	100
Do Vehicles Clear?	YES	YES	-	YES	YES	-	YES	YES	YES	YES	YES	YES

Summary

Whole Intersection

Weighted Avg Delay (sec) = 27
Level of Service - LOS = C

Critical Movements

Weighted Avg Delay (sec) = 27
Level of Service - LOS = C
Intersection Capacity Utilization - ICU = 0.69

Predetermined Cycle Length is 100 sec

Min./Ped. Times May Not Be Satisfied

INTERSECTION TURN COUNT

PEAK HOUR

NORTH-SOUTH STREET: 3RD
EAST-WEST STREET: MAIN
JURISDICTION: HESPERIA

DATE: 06-04-09

PEAK HOUR: 04:45PM

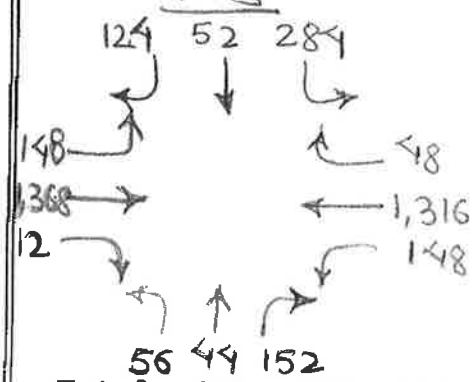
NORTH LEG

TOTAL: 394

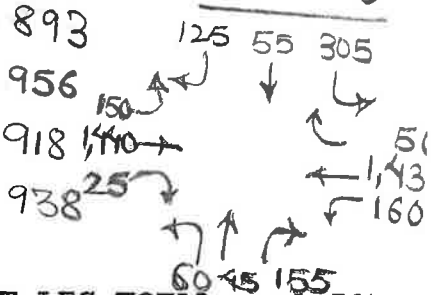
	Rt	Thru	Lt
Total	95	52	247
1st	23	18	66
2nd	31	13	73
3rd	23	13	54
4th	18	8	54

$V = V_{15} \times 4$

Autos



Total in PCE's



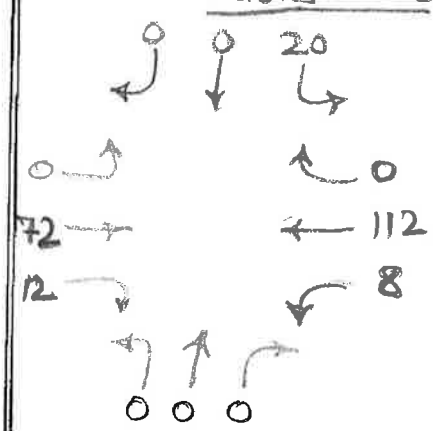
EAST LEG TOTAL: 1,507

	1st	2nd	3rd	4th	Total
Rt	6	12	11	8	37
Thru	309	343	323	310	1285
Lt	56	38	52	39	185

	Total	1st	2nd	3rd	4th
Lt	119	31	27	20	41
Thru	1362	306	352	321	383
Rt	20	4	4	5	7

WEST LEG TOTAL: 1,501

Trucks in PCE's



	Lt	Thru	Rt
1st	10	20	44
2nd	14	11	38
3rd	16	12	68
4th	17	8	45
Total	57	51	195

TOTAL: 303

SOUTH LEG

PEAK HOUR FACTORS

NORTH LEG = 0.84
SOUTH LEG = 0.79
EAST LEG = 0.96
WEST LEG = 0.87

ALL LEGS = 0.97

HOUR TOTAL: 3,705

Prepared by NEWPORT TRAFFIC STUDIES

SANBAG CLASSIFICATION SUMMARY

NORTH-SOUTH STREET : 3RD HESPERIA

EAST-WEST STREET : MAIN 06-04-09

BEGINNING TIME : 04:00PM

AUTOS			LARGE 2 AXLE			3 AXLE			4(+) AXLE			TOTALS
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	
						NORTH LEG						
29	14	61	0	1	2	0	0	0	0	0	0	107
19	8	57	0	0	1	1	0	0	0	0	0	86
21	8	41	0	0	3	0	0	0	0	1	0	74
22	18	65	1	0	1	0	0	0	0	0	0	107
31	13	71	0	0	(2) 1	0	0	0	0	0	(3) 1	117
20	12	51	1	0	1	0	0	0	2	1	2	90
18	7	52	0	0	1	0	0	0	0	1	1	80
23	8	38	0	0	2	0	0	0	0	0	0	71
183	88	436	2	1	12	1	0	0	2	3	4	732
						SOUTH LEG						
48	12	12	1	0	0	0	0	0	1	0	0	74
34	10	16	3	0	0	0	0	0	1	0	0	64
40	9	10	0	0	0	1	0	0	1	0	0	61
43	20	10	1	0	0	0	0	0	0	0	0	74
38	11	14	0	0	0	0	0	0	0	0	0	63
68	12	15	0	0	1	0	0	0	0	0	0	96
44	8	17	1	0	0	0	0	0	0	0	0	70
33	11	6	2	0	0	0	0	0	0	0	0	52
348	93	100	8	0	1	1	0	0	3	0	0	554
						EAST LEG						
5	288	54	2	12	0	0	3	0	0	2	0	366
9	316	48	1	5	1	0	0	0	0	4	0	384
10	340	60	0	3	0	0	2	1	0	2	1	419
4	299	53	2	6	1	0	2	1	0	2	1	371
12	329	37	0	(9) 6	(2) 1	0	(10) 5	0	0	(9) 3	0	393
11	313	51	0	5	1	0	1	0	0	4	0	386
8	303	39	0	3	0	0	3	0	0	1	0	357
5	200	36	0	2	3	0	3	0	0	2	0	251
64	2388	378	5	42	7	0	19	2	0	20	2	2927
						WEST LEG						
5	295	28	0	5	0	0	0	0	0	2	0	335
0	251	31	0	4	0	0	1	0	0	8	0	295
5	323	41	0	5	1	0	1	0	0	3	0	379
4	292	30	0	9	0	0	5	0	0	0	1	341
3	342	27	0	(11) 7	0	0	(4) 2	0	(3) 1	(3) 1	0	383
5	309	20	0	6	0	0	1	0	0	5	0	346
5	377	38	1	2	3	0	0	0	1	4	0	431
2	252	29	0	3	0	0	3	0	0	1	0	290
29	2441	244	1	41	4	0	13	0	2	24	1	2800

Prepared by Newport Traffic Studies

INTERSECTION TURNING COUNT

NORTH-SOUTH STREET: 3RD

EAST-WEST STREET: MAIN

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

NORTH LEG

Rt	Thru	Lt	
93	50	231	Total
29	15	63	1st
20	8	58	2nd
21	9	44	3rd
23	18	66	4th

	1st	2nd	3rd	4th	Total
Rt	7	10	10	6	33
Thru	305	325	347	309	1286
Lt	54	49	62	56	221

Total	1st	2nd	3rd	4th	
132	28	31	42	31	Lt
1204	302	264	332	306	Thru
14	5	0	5	4	Rt

	Lt	Thru	Rt
1st	12	12	50
2nd	16	10	38
3rd	10	9	42
4th	10	20	44
Total	48	51	174

Prepared by NEWPORT TRAFFIC STUDIES

INTERSECTION TURNING COUNT

NORTH-SOUTH STREET: 3RD

EAST-WEST STREET: MAIN

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

NORTH LEG

Rt	Thru	Lt	
95	42	221	Total
31	13	73	1st
23	13	54	2nd
18	8	54	3rd
23	8	40	4th

	1st	2nd	3rd	4th	Total
Rt	12	11	8	5	36
Thru	343	323	310	207	1183
Lt	38	52	39	39	168

Total	1st	2nd	3rd	4th	
117	27	20	41	29	Lt
1315	352	321	383	259	Thru
18	4	5	7	2	Rt

	Lt	Thru	Rt
1st	14	11	38
2nd	16	12	68
3rd	17	8	45
4th	6	11	35
Total	53	42	186

Prepared by NEWPORT TRAFFIC STUDIES