

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

Future Buildout 2030

40

Euclid St at Commonwealth Ave

Fullerton

AM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

	Eastbound			Westbound			Northbound			Southbound		
Movement Times	L	T	R	L	T	R	L	T	R	L	T	R
Movement 1: 13 secs	X			X								
Movement 2: 25 secs		X	X		X	X						
Movement 3: 8 secs							X			X		
Movement 4: 9 secs										X	X	X
Movement 5: 45 secs								X	X		X	X
Movement 6: 0 secs												
# of Lanes (#, S, P)	P	2	S	P	2	S	P	2	1	P	2	S
Unadjusted Volume	140	735	152	266	619	99	145	1635	192	160	1898	145
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
Min/Ped Time Override (sec)	8	24	24	8	24	24	8	22	22	8	22	22
Permissive Veh/Cycle	2			2			2			2		
Progression Adj. Factor (PAF)	P/P	1.00	-	P/P	1.00	-	P/P	1.00	1.00	P/P	1.00	-

Output

Peak Hour Volume (vph)	140	735	152	266	619	99	145	1635	192	160	1898	145
Saturation Flow (vph)	P/P	3800	Shrd	P/P	3800	Shrd	P/P	3800	1800	P/P	3800	Shrd
X or Volume/Capacity	0.34	1.01	-	0.99	0.82	-	0.67	1.00	0.25	0.33	1.03	-
Effective Green (sec)	11	23	-	11	23	-	6	43	43	15	52	-
Split Time (sec)	13	25	-	13	25	-	8	45	45	17	54	-
Min. Time or Ped. Time (sec)	8	24	-	8	24	-	8	22	22	8	22	-
Delay - 15 min pk (sec/veh)	22	73	-	84	45	-	39	51	19	23	54	-
Level of Service (LOS)	C+	E	-	F	D	-	D+	D-	B	C+	D-	-
Average 'Q' (veh/ln)	2	11	-	6	8	-	2	14	3	2	16	-
Design 'Q'-ft/ln (1.5*Qavg)	60	340	-	180	240	-	60	420	100	60	480	-
Available Storage (ft)	2			2			2			2		
Do Vehicles Clear?	YES	NO	-	YES	YES	-	YES	NO	YES	YES	NO	-

Summary of Results

Intersection Unstable-Consider Mitigation			
Whole Intersection		Critical Movements	
Weighted Average Delay (seconds) =	54	Weighted Average Delay (seconds) =	62
Level of Service - LOS =	D-	Level of Service - LOS =	F
		Intersection Capacity Utilization - ICU =	1.00
Predetermined Cycle Length is 100 sec			
Min./Ped. Times Satisfied			
Analysis Based on User Selected Splits			

WEBSTER
Webster Based Signal Timing Evaluation Routine
For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

Future Buildout 2030

40

Euclid St at Commonwealth Ave

Fullerton

PM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

	Eastbound			Westbound			Northbound			Southbound		
Movement Times	L	T	R	L	T	R	L	T	R	L	T	R
Movement 1: 13 secs	X			X								
Movement 2: 3 secs				X	X	X						
Movement 3: 25 secs		X	X		X	X						
Movement 4: 8 secs							X			X		
Movement 5: 0 secs							X	X	X			
Movement 6: 51 secs								X	X		X	X
# of Lanes (#, S, P)	P	2	S	P	2	S	P	1	P	2	S	
Unadjusted Volume	197	756	178	323	797	181	173	1962	261	125	1722	130
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
Min/Ped Time Override (sec)	13	24	24	8	24	24	8	22	22	8	22	22
Permissive Veh/Cycle	2			2			2			2		
Progression Adj. Factor (PAF)	P/P	1.00	-	P/P	1.00	-	P/P	1.00	1.00	P/P	1.00	-

Output

Peak Hour Volume (vph)	197	756	178	323	797	181	173	1962	261	125	1722	130
Saturation Flow (vph)	P/P	3800	Shrd	P/P	3800	Shrd	P/P	3800	1800	P/P	3800	Shrd
X or Volume/Capacity	0.63	1.07	-	1.00	0.99	-	0.93	1.05	0.30	0.49	0.99	-
Effective Green (sec)	11	23	-	14	26	-	6	49	49	6	49	-
Split Time (sec)	13	25	-	16	28	-	8	51	51	8	51	-
Min. Time or Ped. Time (sec)	13	24	-	8	24	-	8	22	22	8	22	-
Delay - 15 min pk (sec/veh)	36	90	-	64	63	-	77	64	16	26	45	-
Level of Service (LOS)	D+	F	-	F	E	-	E-	E	B	C	D	-
Average 'Q' (veh/ln)	3	12	-	7	11	-	3	16	4	1	14	-
Design 'Q'-ft/ln (1.5*Qavg)	100	360	-	220	340	-	100	480	120	40	420	-
Available Storage (ft)	2			2			2			2		
Do Vehicles Clear?	YES	NO	-	YES	NO	-	YES	NO	YES	YES	NO	-

Summary of Results

Oversaturated - Mitigation Required			
Whole Intersection		Critical Movements	
Weighted Average Delay (seconds) =	61	Weighted Average Delay (seconds) =	72
Level of Service - LOS =	E	Level of Service - LOS =	F
		Intersection Capacity Utilization - ICU =	1.01
Predetermined Cycle Length is 100 sec			
Min/Ped. Times Satisfied			
Analysis Based on User Selected Splits			

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control-Delay

Future Buildout 2030

41

Commonwealth Ave at Highland Ave

Fullerton

AM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Movement Times												
Movement 1: 59 secs	X	X	X	X	X	X						
Movement 2: 41 secs							X	X	X	X	X	X
Movement 3: 0 secs												
Movement 4: 0 secs												
Movement 5: 0 secs												
Movement 6: 0 secs												
# of Lanes (#, S, P)	1	2	1	1	2	1	1	1	S	1	1	S
Unadjusted Volume	41	1209	78	94	732	35	89	230	161	74	256	29
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
Min/Ped Time Override (sec)	15	15	15	15	15	15	22	22	22	22	22	22
Progression Adj. Factor (PAF)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-	1.00	1.00	-

Output

	***						***					
Peak Hour Volume (vph)	41	1209	78	94	732	35	89	230	161	74	256	29
Saturation Flow (vph)	600	3800	1800	300	3800	1800	1350	1900	Shrd	1050	1900	Shrd
X or Volume/Capacity	0.12	0.56	0.08	0.55	0.34	0.03	0.17	0.53	-	0.18	0.38	-
Effective Green (sec)	57	57	57	57	57	57	39	39	-	39	39	-
Split Time (sec)	59	59	59	59	59	59	41	41	-	41	41	-
Min. Time or Ped. Time (sec)	15	15	15	15	15	15	22	22	-	22	22	-
Delay - 15 min pk (sec/veh)	11	15	10	26	12	9	21	26	-	21	23	-
Level of Service (LOS)	B	B	A	C	B	A	C+	C	-	C+	C+	-
Average 'Q' (veh/in)	1	7	1	1	4	1	2	7	-	1	5	-
Design 'Q'-ft/in (1.5*Qavg)	40	220	40	40	120	40	60	220	-	40	160	-
Do Vehicles Clear?	YES	YES	YES	YES	YES	YES	YES	YES	-	YES	YES	-

Summary of Results

Whole Intersection		Critical Movements	
Weighted Average Delay (seconds) =	17	Weighted Average Delay (seconds) =	18
Level of Service - LOS =	B	Level of Service - LOS =	B
Predetermined Cycle Length is 100 sec			
Min./Ped. Times Satisfied			
Notes: Commonwealth Ave EB Approach is 1 left-turn, 1 through, and 1 wide shared through/right-turn			

WEBSTER
Webster Based Signal Timing Evaluation Routine
For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

Future Buildout 2030

41

Commonwealth Ave at Highland Ave

Fullerton

PM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

Movement Times	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Movement 1: 71 secs	X	X	X	X	X	X						
Movement 2: 29 secs							X	X	X	X	X	X
Movement 3: 0 secs												
Movement 4: 0 secs												
Movement 5: 0 secs												
Movement 6: 0 secs												
# of Lanes (#, S, P)	1	2	1	1	2	1	1	1	S	1	1	S
Unadjusted Volume	83	1140	120	189	1700	120	153	336	125	69	307	53
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
Min/Ped Time Override (sec)	15	15	15	15	15	15	22	22	22	22	22	22
Progression Adj. Factor (PAF)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-	1.00	1.00	-

Output

Peak Hour Volume (vph)	83	1140	120	189	1700	120	153	336	125	69	307	53
Saturation Flow (vph)	300	3800	1800	300	3800	1800	1300	1900	Shrd	1150	1900	Shrd
X or Volume/Capacity	0.40	0.43	0.10	0.91	0.65	0.10	0.44	0.90	-	0.22	0.70	-
Effective Green (sec)	69	69	69	69	69	69	27	27	-	27	27	-
Split Time (sec)	71	71	71	71	71	71	29	29	-	29	29	-
Min. Time or Ped. Time (sec)	15	15	15	15	15	15	22	22	-	22	22	-
Delay - 15 min pk (sec/veh)	12	7	5	56	10	5	34	56	-	30	41	-
Level of Service (LOS)	B	A	A	E+	A	A	C-	E+	-	C	D	-
Average 'Q' (veh/in)	1	5	1	2	7	1	3	10	-	1	7	-
Design 'Q'-ft/in (1.5*Qavg)	40	160	40	60	220	40	100	300	-	40	220	-
Do Vehicles Clear?	YES	YES	YES	NO	YES	YES	YES	YES	-	YES	YES	-

Summary of Results

Whole Intersection Weighted Average Delay (seconds) = 20 Level of Service - LOS = B	Critical Movements Weighted Average Delay (seconds) = 57 Level of Service - LOS = E+ Intersection Capacity Utilization - ICU = 0.91
Predetermined Cycle Length Is 100 sec Min/Ped. Times Satisfied Analysis Based on User Selected Splits	
Notes: Commonwealth Ave EB Approach is 1 left-turn, 1 through, and 1 wide shared though/right-turn	

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

Future Buildout 2030

42

Harbor Blvd at Commonwealth Ave

Fullerton

AM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Movement 1: 9 secs	X			X								
Movement 2: 11 secs	X	X	X									
Movement 3: 22 secs		X	X		X	X						
Movement 4: 9 secs							X			X		
Movement 5: 49 secs								X	X		X	X
Movement 6: 0 secs												
# of Lanes (#, S, P)	P	2	1	P	2	1	P	2	1	P	2	S
Unadjusted Volume	242	1213	231	180	752	86	187	1576	174	177	1708	138
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
Min/Ped Time Override (sec)	8	25	25	8	19	19	8	27	27	8	26	26
Permissive Veh/Cycle	2			2			2			2		
Progression Adj. Factor (PAF)	P/P	1.00	1.00	P/P	1.00	1.00	P/P	1.00	1.00	P/P	1.00	-

Output

	***			***			***			***		
Peak Hour Volume (vph)	242	1213	231	180	752	86	187	1576	174	177	1708	138
Saturation Flow (vph)	P/P	3800	1800	P/P	3800	1800	P/P	3800	1800	P/P	3800	Shrd
X or Volume/Capacity	0.53	1.03	0.41	0.86	0.99	0.24	0.91	0.88	0.21	0.83	1.03	-
Effective Green (sec)	18	31	31	7	20	20	7	47	47	7	47	-
Split Time (sec)	20	33	33	9	22	22	9	49	49	9	49	-
Min. Time or Ped. Time (sec)	8	25	25	8	19	19	8	27	27	8	26	-
Delay - 15 min pk (sec/veh)	30	69	30	61	70	35	70	31	16	57	58	-
Level of Service (LOS)	C-	E	C	E	E	D+	E	C-	B	E+	E+	-
Average 'Q' (veh/ln)	4	13	4	3	9	2	4	12	3	3	16	-
Design 'Q'-ft/ln (1.5*Qavg)	120	400	120	100	280	60	120	360	100	100	480	-
Available Storage (ft)	2			2			2			2		-
Do Vehicles Clear?	YES	NO	YES	YES	NO	YES	YES	YES	YES	YES	NO	-

Summary of Results

Oversaturated - Mitigation Required	
Whole Intersection	Critical Movements
Weighted Average Delay (seconds) = 52	Weighted Average Delay (seconds) = 63
Level of Service - LOS = D-	Level of Service - LOS = F
Intersection Capacity Utilization - ICU = 1.01	
Predetermined Cycle Length is 100 sec	
Min/Ped. Times Satisfied	
Analysis Based on User Selected Splits	

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

Future Buildout 2030

42

Harbor Blvd at Commonwealth Ave

Fullerton

PM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

	Eastbound			Westbound			Northbound			Southbound		
Movement Times	L*	T	R	L	T*	R	L*	T	R	L	T*	R
Movement 1: 9 secs	X			X								
Movement 2: 2 secs				X	X	X						
Movement 3: 25 secs		X	X		X	X						
Movement 4: 8 secs							X			X		
Movement 5: 7 secs							X	X	X			
Movement 6: 49 secs								X	X		X	X
# of Lanes (#, S, P)	P	2	1	P	2	1	P	2	1	P	2	S
Unadjusted Volume	227	1159	357	261	1257	143	365	1835	300	193	2071	155
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
Min/Ped Time Override (sec)	8	25	25	8	19	19	8	27	27	8	26	26
Permissive Veh/Cycle	2			2			2			2		
Progression Adj. Factor (PAF)	P/P	1.00	1.00	P/P	1.00	1.00	P/P	1.00	1.00	P/P	1.00	-

Output

	***	***	***	***	***	***	***	***	***	***	***	***
Peak Hour Volume (vph)	227	1159	357	261	1257	143	365	1835	300	193	2071	155
Saturation Flow (vph)	P/P	3800	1800	P/P	3800	1800	P/P	3800	1800	P/P	3800	Shrd
X or Volume/Capacity	1.22	1.33	0.86	1.16	1.32	0.32	1.25	0.89	0.31	1.13	1.25	-
Effective Green (sec)	7	23	23	9	25	25	13	54	54	6	47	-
Split Time (sec)	9	25	25	11	27	27	15	56	56	8	49	-
Min. Time or Ped. Time (sec)	8	25	25	8	19	19	8	27	27	8	26	-
Delay - 15 min pk (sec/veh)	171	197	57	143	195	32	173	27	14	137	150	-
Level of Service (LOS)	F	F	E+	F	F	C-	F	C	B	F	F	-
Average 'Q' (veh/ln)	6	19	8	7	20	3	11	12	4	5	26	-
Design 'Q'-ft/ln (1.5*Qavg)	180	580	240	220	600	100	340	360	120	160	780	-
Available Storage (ft)	2			2			2			2		-
Do Vehicles Clear?	NO	NO	YES	NO	NO	YES	NO	YES	YES	NO	NO	-

Summary of Results

Oversaturated - Mitigation Required	
Whole Intersection	Critical Movements
Weighted Average Delay (seconds) = 127	Weighted Average Delay (seconds) = 167
Level of Service - LOS = F	Level of Service - LOS = F
Intersection Capacity Utilization - ICU = 1.27	
Predetermined Cycle Length is 100 sec	
Min./Ped. Times Satisfied	
Analysis Based on User Selected Splits	

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

43

Future Buildout 2030

Commonwealth Ave at Lemon St

Fullerton

AM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Movement Times												
Movement 1: 12 secs	X			X								
Movement 2: 3 secs				X	X	X						
Movement 3: 37 secs		X	X		X	X						
Movement 4: 9 secs							X			X		
Movement 5: 39 secs								X	X		X	X
Movement 6: 0 secs											X	
# of Lanes (#, S, P)	1	2	1	2	2	1	P	2	1	P	2	S
Unadjusted Volume	128	1146	273	394	880	52	176	963	254	58	1135	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
Min/Ped Time Override (sec)	12	24	24	12	24	24	8	28	28	8	28	28
Permissive Veh/Cycle							2			2		
Progression Adj. Factor (PAF)	1.00	1.00	1.00	1.00	1.00	1.00	P/P	1.00	1.00	P/P	1.00	-

Output

	***			***			***			***		
Peak Hour Volume (vph)	128	1146	273	394	880	52	176	963	254	58	1135	105
Saturation Flow (vph)	1800	3800	1800	3500	3800	1800	P/P	3800	1800	P/P	3800	Shrd
X or Volume/Capacity	0.71	0.86	0.43	0.87	0.61	0.08	0.82	0.68	0.38	0.14	0.88	-
Effective Green (sec)	10	35	35	13	38	38	7	37	37	7	37	-
Split Time (sec)	12	37	37	15	40	40	9	39	39	9	39	-
Min. Time or Ped. Time (sec)	12	24	24	12	24	24	8	28	28	8	28	-
Delay - 15 min pk (sec/veh)	65	38	27	62	27	20	56	29	25	5	38	-
Level of Service (LOS)	E	D+	C	E	C	C+	E+	C	C+	A	D+	-
Average 'Q' (veh/ln)	3	11	5	5	8	1	3	8	4	1	11	-
Design 'Q'-ft/ln (1.5*Qavg)	100	340	160	160	240	40	100	240	120	40	340	-
Available Storage (ft)							2			2		
Do Vehicles Clear?	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	-

Summary of Results

Whole Intersection		Critical Movements	
Weighted Average Delay (seconds) =	36	Weighted Average Delay (seconds) =	43
Level of Service - LOS =	D+	Level of Service - LOS =	D
		Intersection Capacity Utilization - ICU =	0.87
Predetermined Cycle Length is 100 sec			
Min/Ped. Times Satisfied			
Analysis Based on User Selected Splits			

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

Future Buildout 2030

43

Commonwealth Ave at Lemon St

Fullerton

PM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

	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: 5 secs				X	X	X						
Movement 3: 38 secs		X	X		X	X						
Movement 4: 8 secs							X			X		
Movement 5: 2 secs							X	X	X			
Movement 6: 30 secs								X	X	X	X	X
# of Lanes (#, S, P)	1	2	1	2	2	1	P	2	1	P	2	S
Unadjusted Volume	222	1219	212	445	1425	82	193	990	261	46	858	117
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
Min/Ped Time Override (sec)	12	24	24	12	24	24	8	28	28	8	28	28
Permissive Veh/Cycle							2			2		
Progression Adj. Factor (PAF)	1.00	1.00	1.00	1.00	1.00	1.00	P/P	1.00	1.00	P/P	1.00	-

Output

	***			***			***			***		
Peak Hour Volume (vph)	222	1219	212	445	1425	82	193	990	261	46	858	117
Saturation Flow (vph)	1800	3800	1800	3500	3800	1800	P/P	3800	1800	P/P	3800	Shrd
X or Volume/Capacity	0.82	0.89	0.33	0.64	0.91	0.11	0.85	0.87	0.48	0.13	0.92	-
Effective Green (sec)	15	36	36	20	41	41	8	30	30	6	28	-
Split Time (sec)	17	38	38	22	43	43	10	32	32	8	30	-
Min. Time or Ped. Time (sec)	12	24	24	12	24	24	8	28	28	8	28	-
Delay - 15 min pk (sec/veh)	65	39	25	41	38	19	59	42	32	5	48	-
Level of Service (LOS)	E	D+	C+	D	D+	B	E+	D	C-	A	D	-
Average 'Q' (veh/ln)	6	11	4	5	12	1	3	10	5	1	10	-
Design 'Q'-ft/ln (1.5*Qavg)	180	340	120	160	360	40	100	300	160	40	300	-
Available Storage (ft)							2			2		-
Do Vehicles Clear?	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	-

Summary of Results

Whole Intersection Weighted Average Delay (seconds) = 42 Level of Service - LOS = D	Critical Movements Weighted Average Delay (seconds) = 46 Level of Service - LOS = D Intersection Capacity Utilization - ICU = 0.89
Predetermined Cycle Length is 100 sec Min/Ped. Times Satisfied Analysis Based on User Selected Splits	

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

44

Future Buildout 2030

Commonwealth Ave at Raymond Ave

Fullerton

AM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Movement Times												
Movement 1: 8 secs	X			X								
Movement 2: 9 secs	X	X	X									
Movement 3: 39 secs		X	X		X	X						
Movement 4: 8 secs							X			X		
Movement 5: 7 secs							X	X	X			
Movement 6: 29 secs								X	X	X	X	X
# of Lanes (#, S, P)	P	2	S	P	2	S	P	2	S	P	2	S
Unadjusted Volume	252	1079	355	155	1027	112	251	457	60	59	677	150
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
Min/Ped Time Override (sec)	8	23	23	8	23	23	8	23	23	8	23	23
Permissive Veh/Cycle	2			2			2			2		
Progression Adj. Factor (PAF)	P/P	1.00	-	P/P	1.00	-	P/P	1.00	-	P/P	1.00	-

Output

Peak Hour Volume (vph)	252	1079	355	155	1027	112	251	457	60	59	677	150
Saturation Flow (vph)	P/P	3800	Shrd	P/P	3800	Shrd	P/P	3800	Shrd	P/P	3800	Shrd
X or Volume/Capacity	0.67	0.82	-	0.77	0.81	-	0.77	0.40	-	0.16	0.81	-
Effective Green (sec)	15	46	-	6	37	-	13	34	-	6	27	-
Split Time (sec)	17	48	-	8	39	-	15	36	-	8	29	-
Min. Time or Ped. Time (sec)	8	23	-	8	23	-	8	23	-	8	23	-
Delay - 15 min pk (sec/veh)	38	28	-	49	33	-	46	26	-	5	41	-
Level of Service (LOS)	D+	C	-	D	C-	-	D	C	-	A	D	-
Average 'Q' (veh/in)	4	11	-	2	10	-	5	5	-	1	9	-
Design 'Q'-ft/in (1.5*Qavg)	120	340	-	60	300	-	160	160	-	40	280	-
Available Storage (ft)	2			2			2			2		
Do Vehicles Clear?	YES	YES	-	YES	YES	-	YES	YES	-	YES	YES	-

Summary of Results

Whole Intersection	Critical Movements
Weighted Average Delay (seconds) = 34	Weighted Average Delay (seconds) = 35
Level of Service - LOS = C-	Level of Service - LOS = C-
	Intersection Capacity Utilization - ICU = 0.81
Predetermined Cycle Length is 100 sec Min/Ped. Times Satisfied Analysis Based on User Selected Splits	

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

Future Buildout 2030

44

Commonwealth Ave at Raymond Ave

Fullerton

PM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

Movement Times	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Movement 1: 8 secs	X			X								
Movement 2: 5 secs	X	X	X									
Movement 3: 42 secs		X	X		X	X						
Movement 4: 8 secs							X			X		
Movement 5: 14 secs							X	X	X			
Movement 6: 23 secs								X	X	X	X	X
# of Lanes (#, S, P)	P	2	S	P	2	S	P	2	S	P	2	S
Unadjusted Volume	264	1188	211	92	1426	49	418	1021	149	43	493	187
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
Min/Ped Time Override (sec)	8	23	23	8	23	23	8	23	23	8	23	23
Permissive Veh/Cycle	2			2			2			2		
Progression Adj. Factor (PAF)	P/P	1.00	-	P/P	1.00	-	P/P	1.00	-	P/P	1.00	-

Output

	***	***	***	***	***	***	***	***	***	***	***	***
Peak Hour Volume (vph)	264	1188	211	92	1426	49	418	1021	149	43	493	187
Saturation Flow (vph)	P/P	3800	Shrd	P/P	3800	Shrd	P/P	3800	Shrd	P/P	3800	Shrd
X or Volume/Capacity	0.98	0.82	-	0.26	0.97	-	0.97	0.88	-	0.12	0.85	-
Effective Green (sec)	11	45	-	6	40	-	20	35	-	6	21	-
Split Time (sec)	13	47	-	8	42	-	22	37	-	8	23	-
Min. Time or Ped. Time (sec)	8	23	-	8	23	-	8	23	-	8	23	-
Delay - 15 min pk (sec/veh)	77	28	-	11	46	-	70	39	-	5	49	-
Level of Service (LOS)	E	C	-	B	D	-	E	D+	-	A	D	-
Average 'Q' (veh/ln)	8	11	-	1	13	-	9	11	-	1	8	-
Design 'Q'-ft/ln (1.5*Qavg)	180	340	-	40	400	-	280	340	-	40	240	-
Available Storage (ft)	2			2			2			2		
Do Vehicles Clear?	YES	YES	-	YES	NO	-	YES	YES	-	YES	YES	-

Summary of Results

Whole Intersection		Critical Movements	
Weighted Average Delay (seconds) =	43	Weighted Average Delay (seconds) =	54
Level of Service - LOS =	D	Level of Service - LOS =	D-
		Intersection Capacity Utilization - ICU =	0.94
Predetermined Cycle Length is 100 sec			
Min./Ped. Times Satisfied			
Analysis Based on User Selected Splits			

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

45

Future Buildout 2030

Commonwealth Ave at Acacia Ave

Fullerton

AM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Movement Times												
Movement 1: 62 secs	X	X	X	X	X	X						
Movement 2: 38 secs							X	X	X	X	X	X
Movement 3: 0 secs												
Movement 4: 0 secs												
Movement 5: 0 secs												
Movement 6: 0 secs												
# of Lanes (#, S, P)	1	2	S	1	2	S	1	1	1	1	1	1
Unadjusted Volume	136	686	168	47	516	20	51	105	27	10	249	128
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
Min/Ped Time Override (sec)	25	25	25	25	25	25	25	25	25	25	25	25
Progression Adj. Factor (PAF)	1.00	1.00	-	1.00	1.00	-	1.00	1.00	1.00	1.00	1.00	1.00

Output

	***						***					
Peak Hour Volume (vph)	136	686	168	47	516	20	51	105	27	10	249	128
Saturation Flow (vph)	800	3800	Shrd	500	3800	Shrd	1100	1900	1800	1350	1900	1800
X or Volume/Capacity	0.28	0.37	-	0.16	0.24	-	0.13	0.15	0.04	0.02	0.36	0.20
Effective Green (sec)	60	60	-	60	60	-	36	36	36	36	36	36
Split Time (sec)	62	62	-	62	62	-	38	38	38	38	38	38
Min. Time or Ped. Time (sec)	25	25	-	25	25	-	25	25	25	25	25	25
Delay - 15 min pk (sec/veh)	11	11	-	10	10	-	22	22	21	21	25	23
Level of Service (LOS)	B	B	-	A	A	-	C+	C+	C+	C+	C	C+
Average 'Q' (veh/ln)	2	5	-	1	3	-	1	2	1	1	4	2
Design 'Q'-ft/ln (1.5*Qavg)	60	160	-	40	100	-	40	60	40	40	120	60
Do Vehicles Clear?	YES	YES	-	YES	YES	-	YES	YES	YES	YES	YES	YES

Summary of Results

Whole Intersection Weighted Average Delay (seconds) = 14 Level of Service - LOS = B	Critical Movements Weighted Average Delay (seconds) = 15 Level of Service - LOS = B Intersection Capacity Utilization - ICU = 0.37
Predetermined Cycle Length is 100 sec Min./Ped. Times Satisfied Analysis Based on User Selected Splits	

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

45

Future Buildout 2030

Commonwealth Ave at Acacia Ave

Fullerton

PM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

Movement Times	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Movement 1: 67 secs	X			X	X	X						
Movement 2: 33 secs							X	X	X	X	X	X
Movement 3: 0 secs												
Movement 4: 0 secs												
Movement 5: 0 secs												
Movement 6: 0 secs												
# of Lanes (#, S, P)	1	2	S	1	2	S	1	1	1	1	1	1
Unadjusted Volume	143	842	63	31	935	36	167	252	98	21	129	155
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
Min/Ped Time Override (sec)	25	25	25	25	25	25	25	25	25	25	25	25
Progression Adj. Factor (PAF)	1.00	1.00	-	1.00	1.00	-	1.00	1.00	1.00	1.00	1.00	1.00

Output

Peak Hour Volume (vph)	143	842	63	31	935	36	167	252	98	21	129	155
Saturation Flow (vph)	400	3800	Shrd	450	3800	Shrd	1000	1900	1800	1150	1900	1800
X or Volume/Capacity	0.55	0.37	-	0.11	0.39	-	0.54	0.43	0.18	0.06	0.22	0.28
Effective Green (sec)	65	65	-	65	65	-	31	31	31	31	31	31
Split Time (sec)	67	67	-	67	67	-	33	33	33	33	33	33
Min. Time or Ped. Time (sec)	25	25	-	25	25	-	25	25	25	25	25	25
Delay - 15 min pk (sec/veh)	18	8	-	7	9	-	35	30	26	25	26	27
Level of Service (LOS)	B	A	-	A	A	-	D+	C	C	C+	C	C
Average 'Q' (veh/ln)	1	4	-	1	5	-	3	5	2	1	2	3
Design 'Q'-ft/ln (1.5*Qavg)	40	120	-	40	160	-	100	160	60	40	60	100
Do Vehicles Clear?	YES	YES	-	YES	YES	-	YES	YES	YES	YES	YES	YES

Summary of Results

Whole Intersection	Critical Movements
Weighted Average Delay (seconds) = 15	Weighted Average Delay (seconds) = 28
Level of Service - LOS = B	Level of Service - LOS = C
Intersection Capacity Utilization - ICU = 0.55	
Predetermined Cycle Length is 100 sec	
Min./Ped. Times Satisfied	
Analysis Based on User Selected Splits	

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

46

Future Buildout 2030

State College Blvd at Commonwealth Ave Fullerton

AM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Movement Times												
Movement 1: 5 secs	X			X								
Movement 2: 8 secs	X		X									
Movement 3: 15 secs		X	X		X	X						
Movement 4: 8 secs							X			X		
Movement 5: 64 secs								X	X		X	X
Movement 6: 0 secs												
# of Lanes (#, S, P)	P	2	S	P	2	S	P	2	S	P	2	S
Unadjusted Volume	239	436	239	121	394	28	165	1213	107	53	1675	311
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
Min/Ped Time Override (sec)	8	25	25	8	25	25	8	26	26	8	26	26
Permissive Veh/Cycle	2			2			2			2		
Progression Adj. Factor (PAF)	P/P	1.00	-	P/P	1.00	-	P/P	1.00	-	P/P	1.00	-

Output

	***			***			***			***		
Peak Hour Volume (vph)	239	436	239	121	394	28	165	1213	107	53	1675	311
Saturation Flow (vph)	P/P	3800	Shrd	P/P	3800	Shrd	P/P	3800	Shrd	P/P	3800	Shrd
X or Volume/Capacity	0.84	0.85	-	0.91	0.85	-	0.86	0.56	-	0.15	0.84	-
Effective Green (sec)	11	21	-	3	13	-	6	62	-	6	62	-
Split Time (sec)	13	23	-	5	15	-	8	64	-	8	64	-
Min. Time or Ped. Time (sec)	8	25	-	8	25	-	8	26	-	8	26	-
Delay - 15 min pk (sec/veh)	55	49	-	76	60	-	63	12	-	5	19	-
Level of Service (LOS)	D-	D	-	E	E+	-	E	B	-	A	B	-
Average 'Q' (veh/ln)	5	8	-	2	5	-	3	7	-	1	10	-
Design 'Q'-ft/ln (1.5*Qavg)	160	240	-	60	160	-	100	220	-	40	300	-
Available Storage (ft)	2			2			2			2		
Do Vehicles Clear?	YES	YES	-	YES	YES	-	YES	YES	-	YES	YES	-

Summary of Results

Whole Intersection		Critical Movements	
Weighted Average Delay (seconds) =	29	Weighted Average Delay (seconds) =	31
Level of Service - LOS =	C	Level of Service - LOS =	C-
		Intersection Capacity Utilization - ICU =	0.85
Predetermined Cycle Length is 100 sec			
Min./Ped. Times May Not Be Satisfied			

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

46

Future Buildout 2030

State College Blvd at Commonwealth Ave Fullerton

PM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

	Eastbound			Westbound			Northbound			Southbound		
Movement Times	L*	T	R	L	T*	R	L*	T	R	L	T*	R
Movement 1: 13 secs	X			X								
Movement 2: 6 secs	X	X	X									
Movement 3: 25 secs		X	X		X	X						
Movement 4: 8 secs							X			X		
Movement 5: 8 secs							X	X	X			
Movement 6: 40 secs								X	X		X	X
# of Lanes (#, S, P)	P	2	S	P	2	S	P	2	S	P	2	S
Unadjusted Volume	382	607	107	227	513	41	327	1637	162	62	1234	303
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
Min/Ped Time Override (sec)	8	25	25	8	25	25	8	26	26	8	26	26
Permissive Veh/Cycle	2			2			2			2		
Progression Adj. Factor (PAF)	P/P	1.00	-	P/P	1.00	-	P/P	1.00	-	P/P	1.00	-

Output

	***			***			***			***		
Peak Hour Volume (vph)	382	607	107	227	513	41	327	1637	162	62	1234	303
Saturation Flow (vph)	P/P	3800	Shrd	P/P	3800	Shrd	P/P	3800	Shrd	P/P	3800	Shrd
X or Volume/Capacity	1.02	0.65	-	0.78	0.63	-	1.02	1.03	-	0.17	1.06	-
Effective Green (sec)	17	29	-	11	23	-	14	46	-	6	38	-
Split Time (sec)	19	31	-	13	25	-	16	48	-	8	40	-
Min. Time or Ped. Time (sec)	8	25	-	8	25	-	8	26	-	8	26	-
Delay - 15 min pk (sec/veh)	86	34	-	48	38	-	88	57	-	6	75	-
Level of Service (LOS)	F	C-	-	D	D+	-	F	E+	-	A	E	-
Average 'Q' (veh/ln)	9	7	-	4	6	-	7	15	-	1	16	-
Design 'Q'-ft/ln (1.5*Qavg)	280	220	-	120	180	-	220	460	-	40	480	-
Available Storage (ft)	2			2			2			2		
Do Vehicles Clear?	YES	YES	-	YES	YES	-	YES	NO	-	YES	NO	-

Summary of Results

Whole Intersection	Critical Movements
Weighted Average Delay (seconds) = 61	Weighted Average Delay (seconds) = 71
Level of Service - LOS = E	Level of Service - LOS = E
Intersection Capacity Utilization - ICU = 0.94	
Predetermined Cycle Length is 100 sec	
Min/Ped. Times Satisfied	
Analysis Based on User Selected Splits	

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

47

Future Buildout 2030

Magnolia Ave at Valencia Dr

Fullerton

AM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

Movement Times	Eastbound			Westbound			Northbound			Southbound		
	L	T	*R*	L	T	R	*L*	T	R	L	T	R
Movement 1: 24 secs	X	X	X	X	X	X						
Movement 2: 76 secs							X	X	X	X	X	X
Movement 3: 0 secs												
Movement 4: 0 secs												
Movement 5: 0 secs												
Movement 6: 0 secs												
# of Lanes (#, S, P)	S	2	1	S	2	1	1	2	S	1	2	S
Unadjusted Volume	26	286	253	93	189	36	193	1068	150	39	1040	26
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
Min/Ped Time Override (sec)	24	24	24	24	24	24	24	24	24	24	24	24
Progression Adj. Factor (PAF)	-	1.00	1.00	-	1.00	1.00	1.00	1.00	-	1.00	1.00	-

Output

	***			***								
Peak Hour Volume (vph)	26	286	253	93	189	36	193	1068	150	39	1040	26
Saturation Flow (vph)	Shrd	3700	1800	Shrd	3200	1800	350	3800	Shrd	300	3800	Shrd
X or Volume/Capacity	-	0.38	0.64	-	0.40	0.09	0.75	0.43	-	0.18	0.38	-
Effective Green (sec)	-	22	22	-	22	22	74	74	-	74	74	-
Split Time (sec)	-	24	24	-	24	24	76	76	-	76	76	-
Min. Time or Ped. Time (sec)	-	24	24	-	24	24	24	24	-	24	24	-
Delay - 15 min pk (sec/veh)	-	35	43	-	35	31	25	5	-	6	5	-
Level of Service (LOS)	-	C-	D	-	D+	C-	C	A	-	A	A	-
Average 'Q' (veh/in)	-	3	6	-	3	1	2	4	-	1	4	-
Design 'Q'-ft/in (1.5*Qavg)	-	100	180	-	100	40	60	120	-	40	120	-
Do Vehicles Clear?	-	YES	YES	-	YES	YES	YES	YES	-	YES	YES	-

Summary of Results

Whole Intersection		Critical Movements	
Weighted Average Delay (seconds) =	15	Weighted Average Delay (seconds) =	36
Level of Service - LOS =	B	Level of Service - LOS =	D+
		Intersection Capacity Utilization - ICU =	0.72
Predetermined Cycle Length Is 100 sec			
Min./Ped. Times Satisfied			
Analysis Based on User Selected Splits			

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

47

Future Buildout 2030 (E/W Ped Ovr)

Magnolia Ave at Valencia Dr

Fullerton

PM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

Movement Times	Eastbound			Westbound			Northbound			Southbound		
	L	T	*R*	L	T	R	*L*	T	R	L	T	R
Movement 1: 18 secs	X	X	X	X	X	X						
Movement 2: 82 secs							X	X	X	X	X	X
Movement 3: 0 secs												
Movement 4: 0 secs												
Movement 5: 0 secs												
Movement 6: 0 secs												
# of Lanes (#, S, P)	S	2		S	2	1	1	2	S	1	2	S
Unadjusted Volume	13	231	281	96	268	43	232	1008	111	37	1212	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
Min/Ped Time Override (sec)	24	24	24	24	24	24	24	24	24	24	24	24
Progression Adj. Factor (PAF)	-	1.00	1.00	-	1.00	1.00	1.00	1.00	-	1.00	1.00	-

Output

	***			***								
Peak Hour Volume (vph)	13	231	281	96	268	43	232	1008	111	37	1212	30
Saturation Flow (vph)	Shrd	3700	1800	Shrd	3300	1800	300	3800	Shrd	300	3800	Shrd
X or Volume/Capacity	-	0.41	0.98	-	0.69	0.15	0.97	0.37	-	0.15	0.41	-
Effective Green (sec)	-	16	16	-	16	16	80	80	-	80	80	-
Split Time (sec)	-	18	18	-	18	18	82	82	-	82	82	-
Min. Time or Ped. Time (sec)	-	24	24	-	24	24	24	24	-	24	24	-
Delay - 15 min pk (sec/veh)	-	40	89	-	47	37	59	3	-	4	3	-
Level of Service (LOS)	-	D+	F	-	D	D+	E+	A	-	A	A	-
Average 'Q' (veh/ln)	-	3	7	-	4	1	2	3	-	1	3	-
Design 'Q'-ft/ln (1.5*Qavg)	-	100	220	-	120	40	60	100	-	40	100	-
Do Vehicles Clear?	-	YES	NO	-	YES	YES	NO	YES	-	YES	YES	-

Summary of Results

Intersection Unstable-Consider Mitigation			
Whole Intersection		Critical Movements	
Weighted Average Delay (seconds) =	22	Weighted Average Delay (seconds) =	76
Level of Service - LOS =	C+	Level of Service - LOS =	E-
		Intersection Capacity Utilization - ICU =	0.97
Predetermined Cycle Length is 100 sec			
Min/Ped. Times May Not Be Satisfied			

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

48

Future Buildout 2030

Brookhurst Rd at Valencia Dr

Fullerton

AM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Movement Times												
Movement 1: 11 secs	X			X								
Movement 2: 34 secs		X	X		X	X						
Movement 3: 8 secs							X			X		
Movement 4: 47 secs								X	X		X	X
Movement 5: 0 secs												
Movement 6: 0 secs												
# of Lanes (#, S, P)	P	2	S	P	2	S	P	2	S	P	2	S
Unadjusted Volume	167	564	196	171	295	109	118	882	158	109	987	61
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
Min/Ped Time Override (sec)	8	26	26	8	26	26	8	26	26	8	26	26
Permissive Veh/Cycle	2			2			2			2		
Progression Adj. Factor (PAF)	P/P	1.00	-	P/P	1.00	-	P/P	1.00	-	P/P	1.00	-

Output

Peak Hour Volume (vph)	167	564	196	171	295	109	118	882	158	109	987	61
Saturation Flow (vph)	P/P	3800	Shrd	P/P	3800	Shrd	P/P	3800	Shrd	P/P	3800	Shrd
X or Volume/Capacity	0.59	0.63	-	0.61	0.33	-	0.43	0.61	-	0.34	0.61	-
Effective Green (sec)	9	32	-	9	32	-	6	45	-	6	45	-
Split Time (sec)	11	34	-	11	34	-	8	47	-	8	47	-
Min. Time or Ped. Time (sec)	8	26	-	8	26	-	8	26	-	8	26	-
Delay - 15 min pk (sec/veh)	34	31	-	35	27	-	22	22	-	18	23	-
Level of Service (LOS)	C-	C	-	D+	C	-	C+	C+	-	B	C+	-
Average 'Q' (veh/in)	2	7	-	3	4	-	1	8	-	1	8	-
Design 'Q'-ft/in (1.5*Qavg)	60	220	-	100	120	-	40	240	-	40	240	-
Available Storage (ft)	2			2			2			2		
Do Vehicles Clear?	YES	YES	-	YES	YES	-	YES	YES	-	YES	YES	-

Summary of Results

Whole Intersection	Critical Movements
Weighted Average Delay (seconds) = 26	Weighted Average Delay (seconds) = 27
Level of Service - LOS = C	Level of Service - LOS = C
Intersection Capacity Utilization - ICU = 0.61	
Predetermined Cycle Length is 100 sec	
Min./Ped. Times Satisfied	
Analysis Based on User Selected Splits	

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

48

Future Buildout 2030

Brookhurst Rd at Valencia Dr

Fullerton

PM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

	Eastbound			Westbound			Northbound			Southbound		
Movement Times	L	T	R	L	T	R	L	T	R	L	T	R
Movement 1: 8 secs	X			X								
Movement 2: 5 secs	X	X	X									
Movement 3: 26 secs		X	X	X	X							
Movement 4: 8 secs							X			X		
Movement 5: 5 secs										X	X	X
Movement 6: 48 secs								X	X		X	X
# of Lanes (#, S, P)	P	2	S	P	2	S	P	2	S	P	2	S
Unadjusted Volume	291	317	90	122	308	97	70	1655	162	120	2014	211
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
Min/Ped Time Override (sec)	8	26	26	8	26	26	8	26	26	8	52	52
Permissive Veh/Cycle	2			2			2			2		
Progression Adj. Factor (PAF)	P/P	1.00	-	P/P	1.00	-	P/P	1.00	-	P/P	1.00	-

Output

Peak Hour Volume (vph)	291	317	90	122	308	97	70	1655	162	120	2014	211
Saturation Flow (vph)	P/P	3800	Shrd	P/P	3800	Shrd	P/P	3800	Shrd	P/P	3800	Shrd
X or Volume/Capacity	1.10	0.37	-	0.46	0.44	-	0.19	1.04	-	0.24	1.15	-
Effective Green (sec)	11	29	-	6	24	-	6	46	-	11	51	-
Split Time (sec)	13	31	-	8	26	-	8	48	-	13	53	-
Min. Time or Ped. Time (sec)	8	26	-	8	26	-	8	26	-	8	52	-
Delay - 15 min pk (sec/veh)	119	29	-	24	34	-	6	60	-	17	102	-
Level of Service (LOS)	F	C	-	C+	C-	-	A	E	-	B	F	-
Average 'Q' (veh/ln)	7	4	-	1	4	-	1	16	-	1	21	-
Design 'Q'-ft/ln (1.5*Qavg)	220	120	-	40	120	-	40	480	-	40	640	-
Available Storage (ft)	2			2			2			2		
Do Vehicles Clear?	NO	YES	-	YES	YES	-	YES	NO	-	YES	NO	-

Summary of Results

Whole Intersection	Critical Movements
Weighted Average Delay (seconds) = 74	Weighted Average Delay (seconds) = 93
Level of Service - LOS = E	Level of Service - LOS = F
	Intersection Capacity Utilization - ICU = 0.90
Predetermined Cycle Length Is 100 sec Min/Ped. Times Satisfied Analysis Based on User Selected Splits	

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

49

Future Buildout 2030

Euclid St at Valencia Dr

Fullerton

AM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

	Eastbound			Westbound			Northbound			Southbound		
Movement Times	L*	T	R	L	T*	R	L*	T	R	L	T*	R
Movement 1: 8 secs	X			X								
Movement 2: 5 secs	X	X	X									
Movement 3: 25 secs		X	X		X	X						
Movement 4: 8 secs							X			X		
Movement 5: 6 secs								X	X	X	X	X
Movement 6: 48 secs											X	X
# of Lanes (#, S, P)	P	1	1	P	1	1	P	2	S	P	2	S
Unadjusted Volume	291	317	90	122	308	97	70	1655	162	120	2014	211
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
Min/Ped Time Override (sec)	8	25	25	8	25	25	8	28	28	8	28	28
Permissive Veh/Cycle	2			2			2			2		
Progression Adj. Factor (PAF)	P/P	1.00	1.00	P/P	1.00	1.00	P/P	1.00	-	P/P	1.00	-

Output

Peak Hour Volume (vph)	291	317	90	122	308	97	70	1655	162	120	2014	211
Saturation Flow (vph)	P/P	1900	1800	P/P	1900	1800	P/P	3800	Shrd	P/P	3800	Shrd
X or Volume/Capacity	1.10	0.60	0.18	0.46	0.70	0.23	0.19	1.04	-	0.22	1.13	-
Effective Green (sec)	11	28	28	6	23	23	6	46	-	12	52	-
Split Time (sec)	13	30	30	8	25	25	8	48	-	14	54	-
Min. Time or Ped. Time (sec)	8	25	25	8	25	25	8	28	-	8	28	-
Delay - 15 min pk (sec/veh)	119	36	28	24	45	33	6	60	-	17	92	-
Level of Service (LOS)	F	D+	C	C+	D	C-	A	E	-	B	F	-
Average 'Q' (veh/in)	7	6	2	1	7	2	1	16	-	1	20	-
Design 'Q'-ft/in (1.5*Qavg)	220	180	60	40	220	60	40	480	-	40	600	-
Available Storage (ft)	2			2			2			2		
Do Vehicles Clear?	NO	YES	YES	YES	YES	YES	YES	NO	-	YES	NO	-

Summary of Results

Intersection Unstable-Consider Mitigation			
Whole Intersection		Critical Movements	
Weighted Average Delay (seconds) =	71	Weighted Average Delay (seconds) =	88
Level of Service - LOS =	E	Level of Service - LOS =	F
		Intersection Capacity Utilization - ICU =	0.96
Predetermined Cycle Length is 100 sec			
Min./Ped. Times Satisfied			
Analysis Based on User Selected Splits			

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

49

Future Buildout 2030

Euclid St at Valencia Dr

Fullerton

PM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

	Eastbound			Westbound			Northbound			Southbound		
	L*	T	R	L	T*	R	L*	T	R	L	T*	R
Movement Times												
Movement 1: 8 secs	X			X								
Movement 2: 2 secs	X	X	X									
Movement 3: 25 secs		X	X		X	X						
Movement 4: 8 secs							X			X		
Movement 5: 0 secs							X	X	X			
Movement 6: 57 secs								X	X	X	X	X
# of Lanes (#, S, P)	P	1	1	P	1	1	P	2	S	P	2	S
Unadjusted Volume	225	280	86	159	361	181	121	1951	102	101	1965	222
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
Min/Ped Time Override (sec)	8	25	25	8	25	25	8	28	28	8	28	28
Permissive Veh/Cycle	2			2			2			2		
Progression Adj. Factor (PAF)	P/P	1.00	1.00	P/P	1.00	1.00	P/P	1.00	-	P/P	1.00	-

Output

	***			***			***			***		
Peak Hour Volume (vph)	225	280	86	159	361	181	121	1951	102	101	1965	222
Saturation Flow (vph)	P/P	1900	1800	P/P	1900	1800	P/P	3800	Shrd	P/P	3800	Shrd
X or Volume/Capacity	1.06	0.59	0.19	0.80	0.83	0.44	0.45	0.98	-	0.28	1.05	-
Effective Green (sec)	8	25	25	6	23	23	6	55	-	6	55	-
Split Time (sec)	10	27	27	8	25	25	8	57	-	8	57	-
Min. Time or Ped. Time (sec)	8	25	25	8	25	25	8	28	-	8	28	-
Delay - 15 min pk (sec/veh)	110	38	30	54	53	36	24	38	-	15	57	-
Level of Service (LOS)	F	D+	C-	D-	D-	D+	C+	D+	-	B	E+	-
Average 'Q' (veh/ln)	5	6	2	3	8	4	1	14	-	1	16	-
Design 'Q'-ft/ln (1.5*Qavg)	160	180	60	100	240	120	40	420	-	40	480	-
Available Storage (ft)	2			2			2			2		
Do Vehicles Clear?	YES	YES	YES	YES	YES	YES	YES	NO	-	YES	NO	-

Summary of Results

Intersection Unstable-Consider Mitigation			
Whole Intersection		Critical Movements	
Weighted Average Delay (seconds) =	49	Weighted Average Delay (seconds) =	60
Level of Service - LOS =	D	Level of Service - LOS =	E+
		Intersection Capacity Utilization - ICU =	0.95
Predetermined Cycle Length Is 100 sec			
Min./Ped. Times Satisfied			
Analysis Based on User Selected Splits			

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

50

Future Buildout 2030

Valencia Dr at Highland Ave

Fullerton

AM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Movement Times												
Movement 1: 43 secs	X	X	X	X	X	X						
Movement 2: 57 secs							X	X	X	X	X	X
Movement 3: 0 secs												
Movement 4: 0 secs												
Movement 5: 0 secs												
Movement 6: 0 secs												
# of Lanes (#, S, P)	1	1	1	1	1	S	1	1	1	1	1	S
Unadjusted Volume	113	246	89	18	301	55	32	310	19	36	382	107
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
Min/Ped Time Override (sec)		22	22		22	22		22	22		22	22
Progression Adj. Factor (PAF)	1.00	1.00	1.00	1.00	1.00	-	1.00	1.00	1.00	1.00	1.00	-

Output

Peak Hour Volume (vph)	113	246	89	18	301	55	32	310	19	36	382	107
Saturation Flow (vph)	1300	1900	1800	1200	1900	Shrd	1150	1900	1800	1350	1900	Shrd
X or Volume/Capacity	0.21	0.32	0.12	0.04	0.46	-	0.05	0.30	0.02	0.05	0.47	-
Effective Green (sec)	41	41	41	41	41	-	55	55	55	55	55	-
Split Time (sec)	43	43	43	43	43	-	57	57	57	57	57	-
Min. Time or Ped. Time (sec)	10	22	22	10	22	-	10	22	22	10	22	-
Delay - 15 min pk (sec/veh)	20	21	19	18	23	-	11	13	10	11	15	-
Level of Service (LOS)	B	C+	B	B	C+	-	B	B	B	B	B	-
Average 'Q' (veh/in)	2	4	1	1	6	-	1	4	1	1	6	-
Design 'Q'-ft/in (1.5*Qavg)	60	120	40	40	180	-	40	120	40	40	180	-
Do Vehicles Clear?	YES	YES	YES	YES	YES	-	YES	YES	YES	YES	YES	-

Summary of Results

Whole Intersection		Critical Movements	
Weighted Average Delay (seconds) =	18	Weighted Average Delay (seconds) =	19
Level of Service - LOS =	B	Level of Service - LOS =	B
		Intersection Capacity Utilization - ICU =	0.46
Predetermined Cycle Length is 100 sec			
Min./Ped. Times Satisfied			
Analysis Based on User Selected Splits			

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

Future Buildout 2030

50

Valencia Dr at Highland Ave

Fullerton

PM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

Movement Times	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Movement 1: 44 secs	X	X	X	X	X	X						
Movement 2: 56 secs							X	X	X	X	X	X
Movement 3: 0 secs												
Movement 4: 0 secs												
Movement 5: 0 secs												
Movement 6: 0 secs												
# of Lanes (#, S, P)	1	1	1	1	1	S	1	1	1	1	1	S
Unadjusted Volume	133	418	86	35	374	64	76	418	72	122	449	109
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
Min/Ped Time Override (sec)		22	22		22	22		22	22		22	22
Progression Adj. Factor (PAF)	1.00	1.00	1.00	1.00	1.00	-	1.00	1.00	1.00	1.00	1.00	-

Output

Peak Hour Volume (vph)	133	418	86	35	374	64	76	418	72	122	449	109
Saturation Flow (vph)	1250	1900	1800	1200	1900	Shrd	1150	1900	1800	1200	1900	Shrd
X or Volume/Capacity	0.25	0.52	0.11	0.07	0.55	-	0.12	0.41	0.07	0.19	0.54	-
Effective Green (sec)	42	42	42	42	42	-	54	54	54	54	54	-
Split Time (sec)	44	44	44	44	44	-	56	56	56	56	56	-
Min. Time or Ped. Time (sec)	10	22	22	10	22	-	10	22	22	10	22	-
Delay - 15 min pk (sec/veh)	20	24	18	18	25	-	12	15	11	12	17	-
Level of Service (LOS)	B	C+	B	B	C+	-	B	B	B	B	B	-
Average 'Q' (veh/in)	2	7	1	1	7	-	1	5	1	2	7	-
Design 'Q'-ft/in (1.5*Qavg)	60	220	40	40	220	-	40	160	40	60	220	-
Do Vehicles Clear?	YES	YES	YES	YES	YES	-	YES	YES	YES	YES	YES	-

Summary of Results

Whole Intersection	Critical Movements
Weighted Average Delay (seconds) = 19	Weighted Average Delay (seconds) = 21
Level of Service - LOS = B	Level of Service - LOS = C+
	Intersection Capacity Utilization - ICU = 0.55
Predetermined Cycle Length is 100 sec	
Min./Ped. Times Satisfied	
Analysis Based on User Selected Splits	

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

51

Future Buildout 2030

Magnolia Ave at Orangethorpe Ave

Fullerton

AM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

Movement Times	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Movement 1: 12 secs	X			X						X		
Movement 2: 6 secs				X	X	X				X		
Movement 3: 33 secs		X	X		X	X						
Movement 4: 12 secs			X				X				X	
Movement 5: 2 secs			X				X	X	X			
Movement 6: 35 secs								X	X		X	X
# of Lanes (#, S, P)	2	2	1	2	3	S	2	2	1	2	2	S
Unadjusted Volume	188	1005	389	513	874	145	387	840	274	147	1075	80
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
Min/Ped Time Override (sec)	12	30	30	12	27	27	12	30	30	12	30	30
Progression Adj. Factor (PAF)	1.00	1.00	1.00	1.00	1.00	-	1.00	1.00	1.00	1.00	1.00	-

Output

	***			***			***			***		
Peak Hour Volume (vph)	188	1005	389	513	874	145	387	840	274	147	1075	80
Saturation Flow (vph)	3500	3800	1800	3500	5700	Shrd	3500	3800	1800	3500	3800	Shrd
X or Volume/Capacity	0.54	0.85	0.48	0.92	0.48	-	0.92	0.63	0.29	0.42	0.92	-
Effective Green (sec)	10	31	45	16	37	-	12	35	53	10	33	-
Split Time (sec)	12	33	47	18	39	-	14	37	55	12	35	-
Min. Time or Ped. Time (sec)	12	30	30	12	27	-	12	30	30	12	30	-
Delay - 15 min pk (sec/veh)	49	40	21	63	25	-	72	29	14	46	45	-
Level of Service (LOS)	D	D	C+	E	C+	-	E	C	B	D	D	-
Average 'Q' (veh/ln)	2	10	6	6	6	-	5	8	4	2	11	-
Design 'Q'-fl/ln (1.5*Qavg)	60	300	180	180	180	-	160	240	120	60	340	-
Do Vehicles Clear?	YES	YES	YES	YES	YES	-	YES	YES	YES	YES	YES	-

Summary of Results

Whole Intersection	Critical Movements
Weighted Average Delay (seconds) = 39	Weighted Average Delay (seconds) = 50
Level of Service - LOS = D+	Level of Service - LOS = D
	Intersection Capacity Utilization - ICU = 0.90
Predetermined Cycle Length is 100 sec	
Min./Ped. Times Satisfied	

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

51

Future Buildout 2030

Magnolia Ave at Orangethorpe Ave

Fullerton

PM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

Movement Times	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Movement 1: 12 secs	X			X					X			
Movement 2: 0 secs				X	X	X			X			
Movement 3: 30 secs		X	X		X	X						
Movement 4: 12 secs			X				X			X		
Movement 5: 2 secs			X				X	X	X			
Movement 6: 44 secs							X	X	X	X	X	X
# of Lanes (#, S, P)	2	2	1	2	3	S	2	2	1	2	2	S
Unadjusted Volume	136	816	382	356	1026	130	408	1197	532	157	1521	99
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
Min/Ped Time Override (sec)	12	30	30	12	27	27	12	30	30	12	30	30
Progression Adj. Factor (PAF)	1.00	1.00	1.00	1.00	1.00	-	1.00	1.00	1.00	1.00	1.00	-

Output

	***			***			***			***		
Peak Hour Volume (vph)	136	816	382	356	1026	130	408	1197	532	157	1521	99
Saturation Flow (vph)	3500	3800	1800	3500	5700	Shrd	3500	3800	1800	3500	3800	Shrd
X or Volume/Capacity	0.39	0.77	0.51	1.02	0.72	-	0.97	0.72	0.53	0.45	1.02	-
Effective Green (sec)	10	28	42	10	28	-	12	44	56	10	42	-
Split Time (sec)	12	30	44	12	30	-	14	46	58	12	44	-
Min. Time or Ped. Time (sec)	12	30	30	12	27	-	12	30	30	12	30	-
Delay - 15 min pk (sec/veh)	45	38	24	98	35	-	81	26	16	47	56	-
Level of Service (LOS)	D	D+	C+	F	D+	-	F	C	B	D	E+	-
Average 'Q' (veh/ln)	2	8	6	5	8	-	6	9	7	2	15	-
Design 'Q'-ft/ln (1.5*Qavg)	60	240	180	160	240	-	180	280	220	60	460	-
Do Vehicles Clear?	YES	YES	YES	NO	YES	-	NO	YES	YES	YES	NO	-

Summary of Results

Whole Intersection		Critical Movements	
Weighted Average Delay (seconds) =	44	Weighted Average Delay (seconds) =	60
Level of Service - LOS =	D	Level of Service - LOS =	E+
		Intersection Capacity Utilization - ICU =	0.93
Predetermined Cycle Length is 100 sec Min./Ped. Times Satisfied Analysis Based on User Selected Splits			

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

52

Future Buildout 2030

Brookhurst Rd at Orangethorpe Ave

Fullerton

AM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

Movement Times	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Movement 1: 12 secs	X			X								
Movement 2: 0 secs				X	X	X						
Movement 3: 34 secs		X	X		X	X						
Movement 4: 8 secs							X			X		
Movement 5: 2 secs							X	X	X			
Movement 6: 44 secs								X	X		X	X
# of Lanes (#, S, P)	1	3	S	2	3	S	P	2	1	P	2	S
Unadjusted Volume	113	1268	191	275	865	108	178	955	221	85	1209	49
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
Min/Ped Time Override (sec)	12	26	26	12	26	26	8	30	30	8	32	32
Permissive Veh/Cycle							2			2		
Progression Adj. Factor (PAF)	1.00	1.00	-	1.00	1.00	-	P/P	1.00	1.00	P/P	1.00	-

Output

Peak Hour Volume (vph)	113	1268	191	275	865	108	178	955	221	85	1209	49
Saturation Flow (vph)	1800	5700	Shrd	3500	5700	Shrd	P/P	3800	1800	P/P	3800	Shrd
X or Volume/Capacity	0.63	0.80	-	0.79	0.53	-	0.74	0.57	0.28	0.24	0.79	-
Effective Green (sec)	10	32	-	10	32	-	8	44	44	6	42	-
Split Time (sec)	12	34	-	12	34	-	10	46	46	8	44	-
Min. Time or Ped. Time (sec)	12	26	-	12	26	-	8	30	30	8	32	-
Delay - 15 min pk (sec/veh)	59	35	-	60	29	-	45	22	19	8	29	-
Level of Service (LOS)	E+	C-	-	E	C	-	D	C+	B	A	C	-
Average 'Q' (veh/in)	3	9	-	4	6	-	3	7	3	1	10	-
Design 'Q'-ft/in (1.5*Qavg)	100	280	-	120	180	-	100	220	100	40	300	-
Do Vehicles Clear?	YES	YES	-	YES	YES	-	YES	YES	YES	YES	YES	-

Summary of Results

Whole Intersection		Critical Movements	
Weighted Average Delay (seconds) =	32	Weighted Average Delay (seconds) =	36
Level of Service - LOS =	C-	Level of Service - LOS =	D+
		Intersection Capacity Utilization - ICU =	0.79
Predetermined Cycle Length is 100 sec			
Min/Ped. Times Satisfied			
Analysis Based on User Selected Splits			

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

52

Future Buildout 2030

Brookhurst Rd at Orangethorpe Ave

Fullerton

PM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

Movement Times	Eastbound			Westbound		Northbound			Southbound			
	L*	T	R	L	R	L*	T	R	L	T*	R	
Movement 1: 12 secs	X			X								
Movement 2: 3 secs				X	X							
Movement 3: 28 secs		X	X		X							
Movement 4: 8 secs						X			X			
Movement 5: 7 secs						X	X	X				
Movement 6: 42 secs							X	X		X	X	
# of Lanes (#, S, P)	1	3	S	2	3	S	P	2	1	P	2	S
Unadjusted Volume	107	900	149	271	1140	109	240	1134	216	112	1033	85
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
Min/Ped Time Override (sec)	12	26	26	12	26	26	8	30	30	8	32	32
Permissive Veh/Cycle							2			2		
Progression Adj. Factor (PAF)	1.00	1.00	-	1.00	1.00	-	P/P	1.00	1.00	P/P	1.00	-

Output

Peak Hour Volume (vph)	107	900	149	271	1140	109	240	1134	216	112	1033	85
Saturation Flow (vph)	1800	5700	Shrd	3500	5700	Shrd	P/P	3800	1800	P/P	3800	Shrd
X or Volume/Capacity	0.59	0.71	-	0.60	0.76	-	0.72	0.63	0.26	0.37	0.74	-
Effective Green (sec)	10	26	-	13	29	-	13	47	47	6	40	-
Split Time (sec)	12	28	-	15	31	-	15	49	49	8	42	-
Min. Time or Ped. Time (sec)	12	26	-	12	26	-	8	30	30	8	32	-
Delay - 15 min pk (sec/veh)	57	36	-	47	36	-	42	22	17	20	29	-
Level of Service (LOS)	E+	D+	-	D	D+	-	D	C+	B	B	C	-
Average 'Q' (veh/in)	3	7	-	3	8	-	4	8	3	1	9	-
Design 'Q'-ft/in (1.5*Qavg)	100	220	-	100	240	-	120	240	100	40	280	-
Available Storage (ft)							2			2		
Do Vehicles Clear?	YES	YES	-	YES	YES	-	YES	YES	YES	YES	YES	-

Summary of Results

Whole Intersection		Critical Movements	
Weighted Average Delay (seconds) =	32	Weighted Average Delay (seconds) =	35
Level of Service - LOS =	C-	Level of Service - LOS =	C-
		Intersection Capacity Utilization - ICU =	0.72
Predetermined Cycle Length is 100 sec			
Min./Ped. Times Satisfied			
Analysis Based on User Selected Splits			

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

53

Future Buildout 2030

Euclid St at Orangethorpe Ave

Fullerton

AM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

Movement Times	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Movement 1: 12 secs	X			X						X		X
Movement 2: 0 secs				X						X		
Movement 3: 27 secs		X	X		X	X						
Movement 4: 8 secs							X			X		
Movement 5: 12 secs										X	X	X
Movement 6: 41 secs								X	X		X	X
# of Lanes (#, S, P)	2	3	S	2	3	S	P	2	1	P	2	1
Unadjusted Volume	259	1051	200	293	785	184	171	1402	205	212	1815	123
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
Min/Ped Time Override (sec)	12	27	27	12	27	27	8	30	30	8	30	30
Permissive Veh/Cycle							2			2		
Progression Adj. Factor (PAF)	1.00	1.00	-	1.00	1.00	-	P/P	1.00	1.00	P/P	1.00	1.00

Output

Peak Hour Volume (vph)	259	1051	200	293	785	184	171	1402	205	212	1815	123
Saturation Flow (vph)	3500	5700	Shrd	3500	5700	Shrd	P/P	3800	1800	P/P	3800	1800
X or Volume/Capacity	0.74	0.88	-	0.84	0.68	-	0.92	0.95	0.22	0.43	0.94	0.11
Effective Green (sec)	10	25	-	10	25	-	6	39	51	18	51	63
Split Time (sec)	12	27	-	12	27	-	8	41	53	20	53	65
Min. Time or Ped. Time (sec)	12	27	-	12	27	-	8	30	30	8	30	30
Delay - 15 min pk (sec/veh)	57	44	-	65	37	-	75	43	14	27	33	8
Level of Service (LOS)	E+	D	-	E	D+	-	E	D	B	C	C	A
Average 'Q' (veh/in)	3	9	-	4	7	-	3	12	3	3	13	1
Design 'Q'-R/in (1.5*Qavg)	100	280	-	120	220	-	100	360	100	100	400	40
Do Vehicles Clear?	YES	YES	-	YES	YES	-	YES	YES	YES	YES	YES	YES

Summary of Results

Whole Intersection	Critical Movements
Weighted Average Delay (seconds) = 40	Weighted Average Delay (seconds) = 42
Level of Service - LOS = D+	Level of Service - LOS = D
	Intersection Capacity Utilization - ICU = 0.91
Predetermined Cycle Length Is 100 sec	
Min./Ped. Times Satisfied	

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

53

Future Buildout 2030

Euclid St at Orangethorpe Ave

Fullerton

PM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

Movement Times	Eastbound			Westbound			Northbound			Southbound		
	L*	T	R	L	T*	R	L	T*	R	L*	T	R
Movement 1: 12 secs	X			X					X			X
Movement 2: 1 secs				X	X	X			X			
Movement 3: 27 secs		X	X		X	X						
Movement 4: 12 secs							X			X		
Movement 5: 2 secs							X	X	X			
Movement 6: 46 secs							X	X		X	X	X
# of Lanes (#, S, P)	2	3	S	2	3	S	P	2	1	P	2	1
Unadjusted Volume	188	936	215	387	1215	282	279	1748	325	233	1631	223
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
Min/Ped Time Override (sec)	12	27	27	12	27	27	8	30	30	8	30	30
Permissive Veh/Cycle							2			2		
Progression Adj. Factor (PAF)	1.00	1.00	-	1.00	1.00	-	P/P	1.00	1.00	P/P	1.00	1.00

Output

	***			***			***			***		
Peak Hour Volume (vph)	188	936	215	387	1215	282	279	1748	325	233	1631	223
Saturation Flow (vph)	3500	5700	Shrd	3500	5700	Shrd	P/P	3800	1800	P/P	3800	1800
X or Volume/Capacity	0.54	0.81	-	1.01	1.01	-	0.95	1.00	0.31	0.90	0.98	0.22
Effective Green (sec)	10	25	-	11	26	-	12	46	59	10	44	56
Split Time (sec)	12	27	-	13	28	-	14	48	61	12	46	58
Min. Time or Ped. Time (sec)	12	27	-	12	27	-	8	30	30	8	30	30
Delay - 15 min pk (sec/veh)	49	40	-	92	63	-	73	49	11	65	44	12
Level of Service (LOS)	D	D	-	F	E	-	E	D	B	E	D	B
Average 'Q' (veh/ln)	2	8	-	5	11	-	6	14	4	5	14	3
Design 'Q'-ft/ln (1.5*Qavg)	60	240	-	160	340	-	180	420	120	160	420	100
Do Vehicles Clear?	YES	YES	-	NO	NO	-	YES	NO	YES	YES	NO	YES

Summary of Results

Whole Intersection		Critical Movements	
Weighted Average Delay (seconds) =	51	Weighted Average Delay (seconds) =	56
Level of Service - LOS =	D-	Level of Service - LOS =	E+
		Intersection Capacity Utilization - ICU =	0.94
Predetermined Cycle Length is 100 sec			
Min./Ped. Times Satisfied			
Analysis Based on User Selected Splits			

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

54

Future Buildout 2030

Orangethorpe Ave at Highland Ave

Fullerton

AM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

Movement Times	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Movement 1: 8 secs	X			X								
Movement 2: 33 secs	X	X	X									
Movement 3: 25 secs		X	X		X	X						
Movement 4: 34 secs							X	X	X	X	X	X
Movement 5: 0 secs												
Movement 6: 0 secs												
# of Lanes (#, S, P)	P	3	S	P	3	S	1	1	1	1	1	1
Unadjusted Volume	86	1948	21	20	674	70	32	54	167	195	24	79
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
Min/Ped Time Override (sec)	8	24	24	8	24	24	27	27	27	27	27	27
Permissive Veh/Cycle	2			2								
Progression Adj. Factor (PAF)	P/P	1.00	-	P/P	1.00	-	1.00	1.00	1.00	1.00	1.00	1.00

Output

Peak Hour Volume (vph)	86	1948	21	20	674	70	32	54	167	195	24	79
Saturation Flow (vph)	P/P	5700	Shrd	P/P	5700	Shrd	1200	1900	1800	1000	1900	1800
X or Volume/Capacity	0.04	0.62	-	0.06	0.57	-	0.08	0.09	0.29	0.61	0.04	0.14
Effective Green (sec)	39	56	-	6	23	-	32	32	32	32	32	32
Split Time (sec)	41	58	-	8	25	-	34	34	34	34	34	34
Min. Time or Ped. Time (sec)	8	24	-	8	24	-	27	27	27	27	27	27
Delay - 15 min pk (sec/veh)	3	16	-	5	36	-	24	24	27	37	24	25
Level of Service (LOS)	A	B	-	A	D+	-	C+	C+	C	D+	C+	C+
Average 'Q' (veh/ln)	1	8	-	1	5	-	1	1	3	4	1	1
Design 'Q' ft/ln (1.5*Qavg)	40	240	-	40	160	-	40	40	100	120	40	40
Do Vehicles Clear?	YES	YES	-	YES	YES	-	YES	YES	YES	YES	YES	YES

Summary of Results

Whole Intersection		Critical Movements	
Weighted Average Delay (seconds) =	23	Weighted Average Delay (seconds) =	18
Level of Service - LOS =	C+	Level of Service - LOS =	B
		Intersection Capacity Utilization - ICU =	0.58
Predetermined Cycle Length is 100 sec Min./Ped. Times Satisfied Analysis Based on User Selected Splits			

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

54

Future Buildout 2030

Orangethorpe Ave at Highland Ave

Fullerton

PM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

	Eastbound			Westbound			Northbound			Southbound		
Movement Times	L	T	R	L	T	R	L	T	R	L	T	R
Movement 1: 8 secs	X			X								
Movement 2: 0 secs	X	X	X									
Movement 3: 64 secs		X	X	X	X							
Movement 4: 28 secs							X	X	X	X	X	X
Movement 5: 0 secs												
Movement 6: 0 secs												
# of Lanes (#, S, P)	P	3	S	P	3	S	1	1	1	1	1	1
Unadjusted Volume	116	1389	64	102	1781	188	119	126	121	161	101	170
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
Min/Ped Time Override (sec)	8	24	24	8	24	24	27	27	27	27	27	27
Permissive Veh/Cycle	2			2								
Progression Adj. Factor (PAF)	P/P	1.00	-	P/P	1.00	-	1.00	1.00	1.00	1.00	1.00	1.00

Output

Peak Hour Volume (vph)	116	1389	64	102	1781	188	119	126	121	161	101	170
Saturation Flow (vph)	P/P	5700	Shrd	P/P	5700	Shrd	1000	1900	1800	1100	1900	1800
X or Volume/Capacity	0.41	0.41	-	0.28	0.56	-	0.46	0.26	0.26	0.56	0.20	0.36
Effective Green (sec)	6	62	-	6	62	-	26	26	26	26	26	26
Split Time (sec)	8	64	-	8	64	-	28	28	28	28	28	28
Min. Time or Ped. Time (sec)	8	24	-	8	24	-	27	27	27	27	27	27
Delay - 15 min pk (sec/veh)	21	10	-	15	12	-	37	31	31	40	30	32
Level of Service (LOS)	C+	B	-	B	B	-	D+	C-	C-	D+	C	C-
Average 'Q' (veh/ln)	1	5	-	1	7	-	2	3	2	3	2	3
Design 'Q'-ft/ln (1.5*Qavg)	40	160	-	40	220	-	60	100	60	100	60	100
Do Vehicles Clear?	YES	YES	-	YES	YES	-	YES	YES	YES	YES	YES	YES

Summary of Results

Whole Intersection		Critical Movements	
Weighted Average Delay (seconds) =	16	Weighted Average Delay (seconds) =	15
Level of Service - LOS =	B	Level of Service - LOS =	B
Intersection Capacity Utilization - ICU = 0.55			
Predetermined Cycle Length is 100 sec			
Min./Ped. Times Satisfied			
Analysis Based on User Selected Splits			

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

55

Future Buildout 2030

Harbor Blvd at Orangethorpe Ave

Fullerton

AM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

	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: 0 secs	X	X	X									
Movement 3: 31 secs		X	X		X	X						
Movement 4: 12 secs							X			X		
Movement 5: 0 secs										X	X	X
Movement 6: 45 secs								X	X			X
# of Lanes (#, S, P)	2	3	1	2	2	1	2	2	1	2	2	1
Unadjusted Volume	236	1119	192	169	723	274	257	1703	204	288	1796	207
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
Min/Ped Time Override (sec)	12	31	31	12	31	31	12	30	30	12	30	30
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	1.00

Output

Peak Hour Volume (vph)	236	1119	192	169	723	274	257	1703	204	288	1796	207
Saturation Flow (vph)	3500	5700	1800	3500	3800	1800	3500	3800	1800	3500	3800	1800
X or Volume/Capacity	0.67	0.68	0.37	0.48	0.66	0.52	0.73	1.04	0.26	0.82	1.10	0.27
Effective Green (sec)	10	29	29	10	29	29	10	43	43	10	43	43
Split Time (sec)	12	31	31	12	31	31	12	45	45	12	45	45
Min. Time or Ped. Time (sec)	12	31	31	12	31	31	12	30	30	12	30	30
Delay - 15 min pk (sec/veh)	53	34	30	47	34	33	57	64	19	63	85	19
Level of Service (LOS)	D	C-	C-	D	C-	C-	E+	E	B	E	F	B
Average 'Q' (veh/in)	3	7	4	2	7	5	3	16	3	4	18	3
Design 'Q'-ft/in (1.5*Qavg)	100	220	120	60	220	160	100	480	100	120	540	100
Do Vehicles Clear?	YES	YES	YES	YES	YES	YES	YES	NO	YES	YES	NO	YES

Summary of Results

Whole Intersection	Critical Movements
Weighted Average Delay (seconds) = 56	Weighted Average Delay (seconds) = 69
Level of Service - LOS = E+	Level of Service - LOS = E
	Intersection Capacity Utilization - ICU = 0.87
Predetermined Cycle Length is 100 sec	
Min/Ped. Times Satisfied	
Analysis Based on User Selected Splits	

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

55

Future Buildout 2030

Harbor Blvd at Orangethorpe Ave

Fullerton

PM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

	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: 31 secs		X	X		X	X						
Movement 3: 12 secs							X			X		
Movement 4: 45 secs								X	X		X	X
Movement 5: 0 secs												
Movement 6: 0 secs												
# of Lanes (#, S, P)	2	3	1	2	2	1	2	2	1	2	2	1
Unadjusted Volume	392	975	234	350	1219	332	397	1819	284	393	2000	288
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
Min/Ped Time Override (sec)	12	31	31	12	31	31	12	30	30	12	30	30
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	1.00

Output

Peak Hour Volume (vph)	392	975	234	350	1219	332	397	1819	284	393	2000	288
Saturation Flow (vph)	3500	5700	1800	3500	3800	1800	3500	3800	1800	3500	3800	1800
X or Volume/Capacity	1.12	0.59	0.45	1.00	1.11	0.64	1.13	1.11	0.37	1.12	1.22	0.37
Effective Green (sec)	10	29	29	10	29	29	10	43	43	10	43	43
Split Time (sec)	12	31	31	12	31	31	12	45	45	12	45	45
Min. Time or Ped. Time (sec)	12	31	31	12	31	31	12	30	30	12	30	30
Delay - 15 min pk (sec/veh)	130	32	32	93	98	37	135	91	21	131	141	21
Level of Service (LOS)	F	C-	C-	F	F	D+	F	F	C+	F	F	C+
Average 'Q' (veh/in)	6	6	5	5	15	7	6	18	4	6	24	5
Design 'Q'-ft/in (1.5'Qavg)	180	180	160	160	460	220	180	540	120	180	720	160
Do Vehicles Clear?	NO	YES	YES	NO	NO	YES	NO	NO	YES	NO	NO	YES

Summary of Results

Oversaturated - Mitigation Required			
Whole Intersection		Critical Movements	
Weighted Average Delay (seconds) =	95	Weighted Average Delay (seconds) =	127
Level of Service - LOS =	F	Level of Service - LOS =	F
		Intersection Capacity Utilization - ICU =	1.17
Predetermined Cycle Length is 100 sec			
Min/Ped. Times Satisfied			
Analysis Based on User Selected Splits			

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

56

Future Buildout 2030

Orangethorpe Ave at Lemon St

Fullerton

AM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

Movement Times	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Movement 1: 12 secs	X			X								
Movement 2: 1 secs	X	X	X									
Movement 3: 28 secs		X	X		X	X						
Movement 4: 12 secs							X			X		
Movement 5: 8 secs							X	X	X			
Movement 6: 39 secs								X	X		X	X
# of Lanes (#, S, P)	1	3	S	2	2	S	P	2	1	P	2	1
Unadjusted Volume	148	1095	380	195	727	118	380	1141	378	249	1331	114
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
Min/Ped Time Override (sec)	12	25	25	12	28	28	8	31	31	8	29	29
Permissive Veh/Cycle							2			2		
Progression Adj. Factor (PAF)	1.00	1.00	-	1.00	1.00	-	P/P	0.76	0.76	P/P	0.76	0.76

Output

	***			***			***			***		
Peak Hour Volume (vph)	148	1095	380	195	727	118	380	1141	378	249	1331	114
Saturation Flow (vph)	1800	5700	Shrd	3500	3800	Shrd	P/P	3800	1800	P/P	3800	1800
X or Volume/Capacity	0.75	0.96	-	0.56	0.86	-	0.96	0.67	0.47	0.98	0.95	0.17
Effective Green (sec)	11	27	-	10	26	-	18	45	45	10	37	37
Split Time (sec)	13	29	-	12	28	-	20	47	47	12	39	39
Min. Time or Ped. Time (sec)	12	25	-	12	28	-	8	31	31	8	29	29
Delay - 15 min pk (sec/veh)	66	51	-	49	45	-	69	19	16	83	37	17
Level of Service (LOS)	E	D	-	D	D	-	E	B	B	F	D+	B
Average 'Q' (veh/ln)	4	10	-	2	9	-	8	7	4	5	9	2
Design 'Q'-ft/ln (1.5*Qavg)	120	300	-	60	280	-	240	220	120	160	280	60
Do Vehicles Clear?	YES	YES	-	YES	YES	-	YES	YES	YES	YES	YES	YES

Summary of Results

Whole Intersection		Critical Movements	
Weighted Average Delay (seconds) =	42	Weighted Average Delay (seconds) =	48
Level of Service - LOS =	D	Level of Service - LOS =	D
		Intersection Capacity Utilization - ICU =	0.91
Predetermined Cycle Length is 100 sec Min/Ped. Times Satisfied Analysis Based on User Selected Splits			

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

56

Future Buildout 2030

Orangethorpe Ave at Lemon St

Fullerton

PM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

	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: 11 secs				X	X	X						
Movement 3: 25 secs		X	X		X	X						
Movement 4: 8 secs							X			X		
Movement 5: 12 secs							X	X	X			
Movement 6: 32 secs								X	X		X	X
# of Lanes (#, S, P)	1	3	S	2	2	S	P	2	1	P	2	1
Unadjusted Volume	225	1016	616	503	1371	242	463	1422	188	185	1432	126
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
Min/Ped Time Override (sec)	12	25	25	12	28	28	8	31	31	8	29	29
Permissive Veh/Cycle							2			2		
Progression Adj. Factor (PAF)	1.00	1.00	-	1.00	1.00	-	P/P	0.76	0.76	P/P	0.76	0.76

Output

Peak Hour Volume (vph)	225	1016	616	503	1371	242	463	1422	188	185	1432	126
Saturation Flow (vph)	1800	5700	Shrd	3500	3800	Shrd	P/P	3800	1800	P/P	3800	1800
X or Volume/Capacity	1.25	1.24	-	0.68	1.25	-	1.20	0.89	0.25	1.05	1.26	0.23
Effective Green (sec)	10	23	-	21	34	-	18	42	42	6	30	30
Split Time (sec)	12	25	-	23	36	-	20	44	44	8	32	32
Min. Time or Ped. Time (sec)	12	25	-	12	28	-	8	31	31	8	29	29
Delay - 15 min pk (sec/veh)	196	158	-	42	156	-	147	28	15	109	152	21
Level of Service (LOS)	F	F	-	D	F	-	F	C	B	F	F	C+
Average 'Q' (veh/ln)	8	16	-	6	22	-	13	9	2	4	17	2
Design 'Q'-ft/ln (1.5*Qavg)	240	480	-	180	660	-	400	280	60	120	520	60
Available Storage (ft)							2			2		
Do Vehicles Clear?	NO	NO	-	YES	NO	-	NO	YES	YES	YES	NO	YES

Summary of Results

Oversaturated - Mitigation Required	
Whole Intersection	Critical Movements
Weighted Average Delay (seconds) = 120	Weighted Average Delay (seconds) = 157
Level of Service - LOS = F	Level of Service - LOS = F
	Intersection Capacity Utilization - ICU = 1.24
Predetermined Cycle Length is 100 sec	
Min/Ped. Times Satisfied	
Analysis Based on User Selected Splits	

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

51

Future Buildout 2030

Orangethorpe Ave at Raymond Ave

Fullerton

AM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

Movement Times	Eastbound			Westbound			Northbound			Southbound		
	L	T*	R	*L*	T	R	L	*T*	R	*L*	T	R
Movement 1: 12 secs	X			X								
Movement 2: 12 secs	X	X	X									
Movement 3: 25 secs		X	X		X	X						
Movement 4: 9 secs							X			X		
Movement 5: 10 secs							X	X	X			
Movement 6: 32 secs								X	X		X	X
# of Lanes (#, S, P)	1	3	S	2	3	S	P	2	S	P	2	1
Unadjusted Volume	186	1244	234	245	868	77	258	867	265	121	796	84
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
Min/Ped Time Override (sec)	12	23	23	12	23	23	8	28	28	8	28	28
Permissive Veh/Cycle							2			2		
Progression Adj. Factor (PAF)	1.00	1.00	-	1.00	1.00	-	P/P	1.00	-	P/P	1.00	1.00

Output

Peak Hour Volume (vph)	186	1244	234	245	868	77	258	867	265	121	796	84
Saturation Flow (vph)	1800	5700	Shrd	3500	5700	Shrd	P/P	3800	Shrd	P/P	3800	1800
X or Volume/Capacity	0.47	0.74	-	0.70	0.72	-	0.61	0.74	-	0.39	0.70	0.16
Effective Green (sec)	22	35	-	10	23	-	17	40	-	7	30	30
Split Time (sec)	24	37	-	12	25	-	19	42	-	9	32	32
Min. Time or Ped. Time (sec)	12	23	-	12	23	-	8	28	-	8	28	28
Delay - 15 min pk (sec/veh)	38	31	-	55	39	-	34	29	-	22	35	26
Level of Service (LOS)	D+	C-	-	D-	D+	-	C-	C	-	C+	C-	C
Average 'Q' (veh/in)	4	9	-	3	7	-	4	9	-	1	8	2
Design 'Q'-ft/in (1.5*Qavg)	120	280	-	100	220	-	120	280	-	40	240	60
Available Storage (ft)							2			2		
Do Vehicles Clear?	YES	YES	-	YES	YES	-	YES	YES	-	YES	YES	YES

Summary of Results

Whole Intersection	Critical Movements
Weighted Average Delay (seconds) = 34	Weighted Average Delay (seconds) = 32
Level of Service - LOS = C-	Level of Service - LOS = C-
	Intersection Capacity Utilization - ICU = 0.71
Predetermined Cycle Length is 100 sec	
Min/Ped. Times Satisfied	
Analysis Based on User Selected Splits	

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

57

Future Buildout 2030

Orangethorpe Ave at Raymond Ave

Fullerton

PM Peak Hour

Parameter Values (using default set Webster)

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min. Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

Movement Times	Eastbound			Westbound			Northbound			Southbound		
	L*	T	R	L	T	R	L*	T	R	L	T	R
Movement 1: 16 secs	X			X								
Movement 2: 10 secs				X	X	X						
Movement 3: 28 secs		X	X		X	X						
Movement 4: 8 secs							X			X		
Movement 5: 9 secs							X	X	X			
Movement 6: 29 secs								X	X		X	X
# of Lanes (#, S, P)	1	3	S	2	3	S	P	2	S	P	2	1
Unadjusted Volume	176	958	272	468	1690	148	316	1006	184	111	927	245
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
Min/Ped Time Override (sec)	12	23	23	12	23	23	8	28	28	8	28	28
Permissive Veh/Cycle							2			2		
Progression Adj. Factor (PAF)	1.00	1.00	-	1.00	1.00	-	P/P	1.00	-	P/P	1.00	1.00

Output

Peak Hour Volume (vph)	176	958	272	468	1690	148	316	1006	184	111	927	245
Saturation Flow (vph)	1800	5700	Shrd	3500	5700	Shrd	P/P	3800	Shrd	P/P	3800	1800
X or Volume/Capacity	0.70	0.83	-	0.56	0.90	-	0.90	0.87	-	0.36	0.90	0.50
Effective Green (sec)	14	26	-	24	36	-	15	36	-	6	27	27
Split Time (sec)	16	28	-	26	38	-	17	38	-	8	29	29
Min. Time or Ped. Time (sec)	12	23	-	12	23	-	8	28	-	8	28	28
Delay - 15 min pk (sec/Veh)	56	40	-	36	37	-	60	38	-	19	48	35
Level of Service (LOS)	E+	D	-	D+	D+	-	E+	D+	-	B	D	C-
Average 'Q' (veh/in)	4	9	-	5	11	-	6	11	-	1	10	5
Design 'Q'-ft/in (1.5*Qavg)	120	280	-	160	340	-	180	340	-	40	300	160
Available Storage (ft)							2			2		
Do Vehicles Clear?	YES	YES	-	YES	YES	-	YES	YES	-	YES	YES	YES

Summary of Results

Whole Intersection		Critical Movements	
Weighted Average Delay (seconds) =	41	Weighted Average Delay (seconds) =	44
Level of Service - LOS =	D	Level of Service - LOS =	D
		Intersection Capacity Utilization - ICU =	0.87
Predetermined Cycle Length is 100 sec			
Min/Ped. Times Satisfied			
Analysis Based on User Selected Splits			

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

58

Future Buildout 2030

Orangethorpe Ave at Acacia Ave

Fullerton

AM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

Movement Times	Eastbound			Westbound			Northbound			Southbound		
	L*	T	R	L	T	R	L	T	R	L*	T	R
Movement 1: 72 secs	X	X	X	X	X	X						
Movement 2: 28 secs							X	X	X	X	X	X
Movement 3: 0 secs												
Movement 4: 0 secs												
Movement 5: 0 secs												
Movement 6: 0 secs												
# of Lanes (#, S, P)	1	3	S	1	3	S	1	2	S	1	1	1
Unadjusted Volume	166	1166	69	102	1188	180	61	107	89	83	94	107
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
Min/Ped Time Override (sec)	23	23	23	23	23	23	28	28	28	28	28	28
Progression Adj. Factor (PAF)	1.00	1.00	-	1.00	1.00	-	1.00	1.00	-	1.00	1.00	1.00

Output

Peak Hour Volume (vph)	166	1166	69	102	1188	180	61	107	89	83	94	107
Saturation Flow (vph)	300	5700	Shrd	300	5700	Shrd	1150	3800	Shrd	1150	1900	1800
X or Volume/Capacity	0.79	0.31	-	0.49	0.34	-	0.20	0.20	-	0.28	0.19	0.23
Effective Green (sec)	70	70	-	70	70	-	26	26	-	26	26	26
Split Time (sec)	72	72	-	72	72	-	28	28	-	28	28	28
Min. Time or Ped. Time (sec)	23	23	-	23	23	-	28	28	-	28	28	28
Delay - 15 min pk (sec/veh)	36	6	-	15	6	-	30	29	-	32	30	30
Level of Service (LOS)	D+	A	-	B	A	-	C-	C	-	C	C	C-
Average 'Q' (veh/in)	2	3	-	1	4	-	1	2	-	2	2	2
Design 'Q'-ft/in (1.5*Qavg)	60	100	-	40	120	-	40	60	-	60	60	60
Do Vehicles Clear?	YES	YES	-	YES	YES	-	YES	YES	-	YES	YES	YES

Summary of Results

Whole Intersection		Critical Movements	
Weighted Average Delay (seconds) =	12	Weighted Average Delay (seconds) =	35
Level of Service - LOS =	B	Level of Service - LOS =	C-
		Intersection Capacity Utilization - ICU =	0.65
Predetermined Cycle Length Is 100 sec			
Min./Ped. Times Satisfied			
Analysis Based on User Selected Splits			

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

58

Future Buildout 2030

Orangethorpe Ave at Acacia Ave

Fullerton

PM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

Movement Times	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	*L*	T	R	L	T	R	*L*	T	R
Movement 1: 65 secs	X	X	X	X	X	X				X	X	X
Movement 2: 35 secs							X	X	X			
Movement 3: 0 secs												
Movement 4: 0 secs												
Movement 5: 0 secs												
Movement 6: 0 secs												
# of Lanes (#, S, P)	1	3	S	1	3	S	1	2	S	1	1	1
Unadjusted Volume	92	1375	115	107	1635	118	115	107	115	211	159	222
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
Min/Ped Time Override (sec)	23	23	23	23	23	23	28	28	28	28	28	28
Progression Adj. Factor (PAF)	1.00	1.00	-	1.00	1.00	-	1.00	1.00	-	1.00	1.00	1.00

Output

	***						***					
Peak Hour Volume (vph)	92	1375	115	107	1635	118	115	107	115	211	159	222
Saturation Flow (vph)	300	5700	Shrd	300	5700	Shrd	900	3800	Shrd	1100	1900	1800
X or Volume/Capacity	0.49	0.41	-	0.57	0.49	-	0.39	0.18	-	0.58	0.25	0.37
Effective Green (sec)	63	63	-	63	63	-	33	33	-	33	33	33
Split Time (sec)	65	65	-	65	65	-	35	35	-	35	35	35
Min. Time or Ped. Time (sec)	23	23	-	23	23	-	28	28	-	28	28	28
Delay - 15 min pk (sec/veh)	19	10	-	22	10	-	30	24	-	34	25	27
Level of Service (LOS)	B	A	-	C+	B	-	C	C+	-	C-	C	C
Average 'Q' (veh/ln)	1	5	-	1	6	-	2	2	-	4	3	4
Design 'Q'-ft/ln (1.5*Qavg)	40	160	-	40	180	-	60	60	-	120	100	120
Do Vehicles Clear?	YES	YES	-	YES	YES	-	YES	YES	-	YES	YES	YES

Summary of Results

Whole Intersection	Critical Movements
Weighted Average Delay (seconds) = 15	Weighted Average Delay (seconds) = 31
Level of Service - LOS = B	Level of Service - LOS = C-
Predetermined Cycle Length is 100 sec	
Min./Ped. Times Satisfied	
Analysis Based on User Selected Splits	
Intersection Capacity Utilization - ICU = 0.57	

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

59

Future Buildout 2030

State College Blvd at Orangethorpe Ave

Fullerton

AM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

	Eastbound			Westbound			Northbound			Southbound		
Movement Times	L	T	R	L	T	R	L	T	R	L	T	R
Movement 1: 10 secs	X			X								
Movement 2: 5 secs	X	X	X									
Movement 3: 28 secs		X	X		X	X						
Movement 4: 9 secs							X			X		
Movement 5: 19 secs							X	X	X			
Movement 6: 29 secs								X	X		X	X
# of Lanes (#, S, P)	P	3	S	P	3	S	P	2	1	P	3	S
Unadjusted Volume	387	1269	298	248	1662	322	436	2340	110	235	1689	193
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
Min/Ped Time Override (sec)	8	28	28	10	28	28	8	29	29	8	29	29
Permissive Veh/Cycle	2			2			2			2		
Progression Adj. Factor (PAF)	P/P	1.00	-	P/P	1.00	-	P/P	1.00	1.00	P/P	1.00	-

Output

Peak Hour Volume (vph)	387	1269	298	248	1662	322	436	2340	110	235	1689	193
Saturation Flow (vph)	P/P	5700	Shrd	P/P	5700	Shrd	P/P	3800	1800	P/P	5700	Shrd
X or Volume/Capacity	1.35	0.89	-	1.22	1.34	-	0.78	1.34	0.13	1.29	1.22	-
Effective Green (sec)	13	31	-	8	26	-	26	46	46	7	27	-
Split Time (sec)	15	33	-	10	28	-	28	48	48	9	29	-
Min. Time or Ped. Time (sec)	8	28	-	10	28	-	8	29	29	8	29	-
Delay - 15 min pk (sec/veh)	218	40	-	167	199	-	39	194	16	199	146	-
Level of Service (LOS)	F	D+	-	F	F	-	D+	F	B	F	F	-
Average 'Q' (veh/in)	13	10	-	7	21	-	8	31	2	7	17	-
Design 'Q'-ft/in (1.5*Qavg)	400	300	-	220	640	-	240	940	60	220	520	-
Available Storage (ft)	2			2			2			2		
Do Vehicles Clear?	NO	YES	-	NO	NO	-	YES	NO	YES	NO	NO	-

Summary of Results

Oversaturated - Mitigation Required	
Whole Intersection Weighted Average Delay (seconds) = 150 Level of Service - LOS = F	Critical Movements Weighted Average Delay (seconds) = 199 Level of Service - LOS = F Intersection Capacity Utilization - ICU = 1.34
Predetermined Cycle Length is 100 sec Min/Ped. Times Satisfied Analysis Based on User Selected Splits	

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

59

Future Buildout 2030

State College Blvd at Orangethorpe Ave

Fullerton

PM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

Movement Times	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Movement 1: 12 secs	X			X								
Movement 2: 3 secs				X	X	X						
Movement 3: 33 secs		X	X		X	X						
Movement 4: 15 secs							X			X		
Movement 5: 2 secs										X	X	X
Movement 6: 35 secs								X	X		X	X
# of Lanes (#, S, P)	P	3	S	P	3	S	P	2	1	P	3	S
Unadjusted Volume	223	1329	361	286	1317	256	301	1179	123	339	1447	322
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
Min/Ped Time Override (sec)	12	28	28	8	28	28	8	29	29	8	29	29
Permissive Veh/Cycle	2			2			2			2		
Progression Adj. Factor (PAF)	P/P	1.00	-	P/P	1.00	-	P/P	1.00	1.00	P/P	1.00	-

Output

Peak Hour Volume (vph)	223	1329	361	286	1317	256	301	1179	123	339	1447	322
Saturation Flow (vph)	P/P	5700	Shrd	P/P	5700	Shrd	P/P	3800	1800	P/P	5700	Shrd
X or Volume/Capacity	0.84	0.96	-	0.92	0.81	-	0.99	0.94	0.21	0.98	0.89	-
Effective Green (sec)	10	31	-	13	34	-	13	33	33	15	35	-
Split Time (sec)	12	33	-	15	36	-	15	35	35	17	37	-
Min. Time or Ped. Time (sec)	12	28	-	8	28	-	8	29	29	8	29	-
Delay - 15 min pk (sec/veh)	56	47	-	66	34	-	81	47	25	78	37	-
Level of Service (LOS)	E+	D	-	E	C-	-	F	D	C+	E	D+	-
Average 'Q' (veh/in)	4	11	-	6	10	-	7	12	2	7	11	-
Design 'Q'-ft/in (1.5*Qavg)	120	340	-	180	300	-	220	360	60	220	340	-
Available Storage (ft)	2			2			2			2		
Do Vehicles Clear?	YES	YES	-	YES	YES	-	YES	YES	YES	YES	YES	-

Summary of Results

Whole Intersection	Critical Movements
Weighted Average Delay (seconds) = 46	Weighted Average Delay (seconds) = 52
Level of Service - LOS = D	Level of Service - LOS = D-
	Intersection Capacity Utilization - ICU = 0.95
Predetermined Cycle Length is 100 sec	
Min/Ped. Times Satisfied	
Analysis Based on User Selected Splits	

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

Future Buildout 2030

60

Orangethorpe Ave at Placentia Ave

Placentia

AM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

Movement Times	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	*T*	R	*L*	T	R	L	*T*	R
Movement 1: 15 secs	X			X								
Movement 2: 10 secs				X	X	X						
Movement 3: 31 secs		X	X		X	X						
Movement 4: 12 secs							X			X		
Movement 5: 3 secs										X	X	X
Movement 6: 29 secs								X	X		X	X
# of Lanes (#, S, P)	1	3	S	1	3	1	1	2	1	2	2	S
Unadjusted Volume	187	1202	26	255	1852	318	62	329	187	410	544	368
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
Min/Ped Time Override (sec)	12	31	31	12	26	26	12	29	29	12	31	31
Progression Adj. Factor (PAF)	1.00	1.00	-	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-

Output

	***			***			***			***		
Peak Hour Volume (vph)	187	1202	26	255	1852	318	62	329	187	410	544	368
Saturation Flow (vph)	1800	5700	Shrd	1800	5700	1800	1800	3800	1800	3500	3800	Shrd
X or Volume/Capacity	0.80	0.74	-	0.62	0.83	0.45	0.34	0.32	0.38	0.90	0.80	-
Effective Green (sec)	13	29	-	23	39	39	10	27	27	13	30	-
Split Time (sec)	15	31	-	25	41	41	12	29	29	15	32	-
Min. Time or Ped. Time (sec)	12	31	-	12	26	26	12	29	29	12	31	-
Delay - 15 min pk (sec/veh)	66	35	-	41	31	25	47	30	32	66	38	-
Level of Service (LOS)	E	D+	-	D	C-	C+	D	C	C-	E	D+	-
Average 'Q' (veh/ln)	5	8	-	6	10	5	2	3	4	5	9	-
Design 'Q'-ft/ln (1.5*Qavg)	160	240	-	180	300	160	60	100	120	160	280	-
Do Vehicles Clear?	YES	YES	-	YES	YES	YES	YES	YES	YES	YES	YES	-

Summary of Results

Whole Intersection		Critical Movements	
Weighted Average Delay (seconds) =	38	Weighted Average Delay (seconds) =	36
Level of Service - LOS =	D+	Level of Service - LOS =	D+
		Intersection Capacity Utilization - ICU =	0.76
Predetermined Cycle Length is 100 sec Min./Ped. Times Satisfied Analysis Based on User Selected Splits			

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

Future Buildout 2030

60

Orangethorpe Ave at Placentia Ave

Placentia

PM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

Movement Times	Eastbound		Westbound		Northbound		Southbound					
	T	R	L	T	R	L	T	R				
Movement 1: 16 secs	X		X									
Movement 2: 9 secs	X	X										
Movement 3: 30 secs		X		X								
Movement 4: 12 secs					X			X				
Movement 5: 4 secs							X	X				
Movement 6: 29 secs						X	X	X				
# of Lanes (#, S, P)	3	S	1	3	1	1	2	1	2	2	S	
Unadjusted Volume	354	1433	56	214	1410	338	98	411	191	427	436	286
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
Min/Ped Time Override (sec)	12	31	31	12	26	26	12	29	29	12	31	31
Progression Adj. Factor (PAF)	1.00	1.00	-	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-

Output

	***	***	***	***	***	***	***	***	***	***	***	
Peak Hour Volume (vph)	354	1433	56	214	1410	338	98	411	191	427	436	286
Saturation Flow (vph)	1800	5700	Shrd	1800	5700	1800	1800	3800	1800	3500	3800	Shrd
X or Volume/Capacity	0.86	0.71	-	0.85	0.88	0.67	0.54	0.40	0.39	0.87	0.61	-
Effective Green (sec)	23	37	-	14	28	28	10	27	27	14	31	-
Split Time (sec)	25	39	-	16	30	30	12	29	29	16	33	-
Min. Time or Ped. Time (sec)	12	31	-	12	26	26	12	29	29	12	31	-
Delay - 15 min pk (sec/veh)	57	29	-	70	42	39	54	31	32	61	32	-
Level of Service (LOS)	E+	C	-	E	D	D+	D-	C-	C-	E	C-	-
Average 'Q' (veh/ln)	8	9	-	6	10	7	3	4	4	5	7	-
Design 'Q'-ft/ln (1.5*Qavg)	240	280	-	180	300	220	100	120	120	160	220	-
Do Vehicles Clear?	YES	YES	-	YES	YES	YES	YES	YES	YES	YES	YES	-

Summary of Results

Whole Intersection	Critical Movements
Weighted Average Delay (seconds) = 40	Weighted Average Delay (seconds) = 42
Level of Service - LOS = D+	Level of Service - LOS = D
	Intersection Capacity Utilization - ICU = 0.75
Predetermined Cycle Length is 100 sec	
Min./Ped. Times Satisfied	
Analysis Based on User Selected Splits	

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

Future Buildout 2030

61

Euclid St at Imperial Hwy

Caltrans

AM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

	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: 2 secs				X	X	X						
Movement 3: 53 secs		X	X		X	X						
Movement 4: 14 secs							X			X		
Movement 5: 39 secs								X	X		X	X
Movement 6: 0 secs												
# of Lanes (#, S, P)	2	3	S	2	3	S	2	2	1	2	2	S
Unadjusted Volume	85	1948	249	283	2031	74	219	498	282	216	1022	61
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
Min/Ped Time Override (sec)	12	28	28	12	28	28	12	28	28	12	28	28
Progression Adj. Factor (PAF)	1.00	1.00	-	1.00	1.00	-	1.00	1.00	1.00	1.00	1.00	-

Output

	***			***			***			***		
Peak Hour Volume (vph)	85	1948	249	283	2031	74	219	498	282	216	1022	61
Saturation Flow (vph)	3500	5700	Shrd	3500	5700	Shrd	3500	3800	1800	3500	3800	Shrd
X or Volume/Capacity	0.29	0.91	-	0.81	0.84	-	0.63	0.43	0.51	0.62	0.92	-
Effective Green (sec)	10	51	-	12	53	-	12	37	37	12	37	-
Split Time (sec)	12	53	-	14	55	-	14	39	39	14	39	-
Min. Time or Ped. Time (sec)	12	28	-	12	28	-	12	28	28	12	28	-
Delay - 15 min pk (sec/veh)	54	39	-	71	33	-	60	34	37	60	54	-
Level of Service (LOS)	D-	D+	-	E	C-	-	E	C-	D+	E+	D-	-
Average 'Q' (veh/in)	1	14	-	4	13	-	3	6	7	3	13	-
Design 'Q'-f/in (1.5*Qavg)	40	420	-	120	400	-	100	180	220	100	400	-
Do Vehicles Clear?	YES	YES	-	YES	YES	-	YES	YES	YES	YES	YES	-

Summary of Results

Whole Intersection		Critical Movements	
Weighted Average Delay (seconds) =	42	Weighted Average Delay (seconds) =	47
Level of Service - LOS =	D	Level of Service - LOS =	D
		Intersection Capacity Utilization - ICU =	0.87
Predetermined Cycle Length is 120 sec			
Min./Ped. Times Satisfied			
Analysis Based on User Selected Splits			

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

61

Future Buildout 2030

Euclid St at Imperial Hwy

Caltrans

PM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

Movement Times	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	*T*	R	L	*T*	R	*L*	T	R
Movement 1: 14 secs	X			X								
Movement 2: 4 secs				X	X	X						
Movement 3: 53 secs		X	X		X	X						
Movement 4: 14 secs							X			X		
Movement 5: 5 secs							X	X	X			
Movement 6: 30 secs							X	X		X	X	X
# of Lanes (#, S, P)	2	3	S	2	3	S	2	2	1	2	2	S
Unadjusted Volume	166	1774	194	361	2180	131	322	908	261	158	564	115
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
Min/Ped Time Override (sec)	12	28	28	12	28	28	12	28	28	12	28	28
Progression Adj. Factor (PAF)	1.00	1.00	-	1.00	1.00	-	1.00	1.00	1.00	1.00	1.00	-

Output

	***	***	***	***	***	***	***	***	***	***	***	***
Peak Hour Volume (vph)	166	1774	194	361	2180	131	322	908	261	158	564	115
Saturation Flow (vph)	3500	5700	Shrd	3500	5700	Shrd	3500	3800	1800	3500	3800	Shrd
X or Volume/Capacity	0.47	0.81	-	0.77	0.88	-	0.65	0.87	0.53	0.45	0.77	-
Effective Green (sec)	12	51	-	16	55	-	17	33	33	12	28	-
Split Time (sec)	14	53	-	18	57	-	19	35	35	14	30	-
Min. Time or Ped. Time (sec)	12	28	-	12	28	-	12	28	28	12	28	-
Delay - 15 min pk (sec/veh)	56	33	-	62	34	-	55	51	41	55	49	-
Level of Service (LOS)	E+	C-	-	E	C-	-	E+	D-	D	E+	D	-
Average 'Q' (veh/ln)	2	13	-	5	14	-	5	11	6	2	9	-
Design 'Q'-ft/ln (1.5*Qavg)	60	400	-	160	420	-	160	340	180	60	280	-
Do Vehicles Clear?	YES	YES	-	YES	YES	-	YES	YES	YES	YES	YES	-

Summary of Results

Whole Intersection		Critical Movements	
Weighted Average Delay (seconds) =	42	Weighted Average Delay (seconds) =	41
Level of Service - LOS =	D	Level of Service - LOS =	D
		Intersection Capacity Utilization - ICU =	0.79
Predetermined Cycle Length is 120 sec			
Min/Ped. Times Satisfied			
Analysis Based on User Selected Splits			

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

Future Buildout 2030

62

Imperial Hwy at Brea Blvd

Caltrans

AM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

	Eastbound		Westbound		Northbound		Southbound	
Movement Times	T	R	L	T	R	L	T	R
Movement 1: 14 secs			X					
Movement 2: 8 secs			X	X	X			
Movement 3: 43 secs	X	X		X	X			
Movement 4: 14 secs						X		X
Movement 5: 6 secs							X	X
Movement 6: 35 secs						X	X	X
# of Lanes (#, S, P)	3	1	2	3	1	2	3	1
Unadjusted Volume	1511	597	239	2561	94	224	1065	289
Peak Hour Factor (PHF)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Min/Ped Time Override (sec)	35	35	12	35	35	12	35	35
Progression Adj. Factor (PAF)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Output

	Eastbound		Westbound		Northbound		Southbound	
Peak Hour Volume (vph)	1511	597	239	94	224	1065	289	577
Saturation Flow (vph)	5700	1800	3500	5700	1800	3500	5700	1800
X or Volume/Capacity	0.78	0.97	0.41	1.10	0.13	0.64	0.68	0.58
Effective Green (sec)	41	41	20	49	49	12	33	33
Split Time (sec)	43	43	22	51	51	14	35	35
Min. Time or Ped. Time (sec)	35	35	12	35	35	12	35	35
Delay - 15 min pk (sec/veh)	38	69	47	91	23	61	41	43
Level of Service (LOS)	D+	E	D	F	C+	E	D	D
Average 'Q' (veh/ln)	11	14	3	20	2	3	9	7
Design 'Q'-ft/ln (1.5*Qavg)	340	420	100	600	60	100	280	220
Do Vehicles Clear?	YES	NO	YES	NO	YES	YES	YES	NO

Summary of Results

Whole Intersection	Critical Movements
Weighted Average Delay (seconds) = 64	Weighted Average Delay (seconds) = 77
Level of Service - LOS = E	Level of Service - LOS = E-
Intersection Capacity Utilization - ICU = 0.91	
Predetermined Cycle Length is 120 sec	
Min./Ped. Times Satisfied	
Analysis Based on User Selected Splits	

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

62

Future Buildout 2030

Imperial Hwy at Brea Blvd

Caltrans

PM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

Movement Times	Eastbound			Westbound			Northbound			Southbound		
	L*	T	R	L	T*	R	L	T*	R	L*	T	R
Movement 1: 17 secs	X			X								
Movement 2: 48 secs		X	X		X	X						
Movement 3: 14 secs							X			X		
Movement 4: 6 secs										X	X	X
Movement 5: 35 secs								X	X		X	X
Movement 6: 0 secs												
# of Lanes (#, S, P)	2	3	1	2	3	1	2	3	1	2	2	1
Unadjusted Volume	406	2169	448	337	2275	116	236	1212	113	524	1085	139
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
Min/Ped Time Override (sec)	12	35	35	12	35	35	14	35	35	12	35	35
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	1.00

Output

Peak Hour Volume (vph)	406	2169	448	337	2275	116	236	1212	113	524	1085	139
Saturation Flow (vph)	3500	5700	1800	3500	5700	1800	3500	5700	1800	3500	3800	1800
X or Volume/Capacity	0.93	0.99	0.65	0.77	1.04	0.17	0.67	0.77	0.23	1.00	0.88	0.24
Effective Green (sec)	15	46	46	15	46	46	12	33	33	18	39	39
Split Time (sec)	17	48	48	17	48	48	14	35	35	20	41	41
Min. Time or Ped. Time (sec)	12	35	35	12	35	35	14	35	35	12	35	35
Delay - 15 min pk (sec/veh)	80	54	35	63	69	25	62	44	35	90	47	31
Level of Service (LOS)	F	D-	D+	E	E	C+	E	D	C-	F	D	C-
Average 'Q' (veh/ln)	6	16	9	5	17	2	4	10	3	8	12	3
Design 'Q'-f _l /n (1.5*Q _{avg})	180	480	280	160	520	60	120	300	100	240	360	100
Do Vehicles Clear?	YES	NO	YES	YES	NO	YES	YES	YES	YES	NO	YES	YES

Summary of Results

Whole Intersection		Critical Movements	
Weighted Average Delay (seconds) =	58	Weighted Average Delay (seconds) =	66
Level of Service - LOS =	E+	Level of Service - LOS =	E
		Intersection Capacity Utilization - ICU =	0.94
Predetermined Cycle Length is 120 sec			
Min/Ped. Times Satisfied			
Analysis Based on User Selected Splits			

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

63

Future Buildout 2030

Imperial Hwy at Kraemer Blvd

Caltrans

AM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

	Eastbound			Westbound			Northbound			Southbound		
Movement Times	*L*	T	R	L	*T*	R	*L*	T	R	L	*T*	R
Movement 1: 14 secs	X			X								
Movement 2: 9 secs	X	X	X									
Movement 3: 49 secs		X	X		X	X						
Movement 4: 17 secs							X			X		
Movement 5: 31 secs								X	X		X	X
Movement 6: 0 secs												
# of Lanes (#, S, P)	2	3	S	2	3	S	2	2	1	2	2	1
Unadjusted Volume	374	2101	239	88	1787	120	386	568	172	334	805	120
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
Min/Ped Time Override (sec)	12	31	31	14	31	31	12	29	29	12	29	29
Progression Adj. Factor (PAF)	1.00	1.00	-	1.00	1.00	-	1.00	1.00	1.00	1.00	1.00	1.00

Output

	***			***			***			***		
Peak Hour Volume (vph)	374	2101	239	88	1787	120	386	568	172	334	805	120
Saturation Flow (vph)	3500	5700	Shrd	3500	5700	Shrd	3500	3800	1800	3500	3800	1800
X or Volume/Capacity	0.61	0.88	-	0.25	0.85	-	0.88	0.62	0.40	0.76	0.88	0.28
Effective Green (sec)	21	56	-	12	47	-	15	29	29	15	29	29
Split Time (sec)	23	58	-	14	49	-	17	31	31	17	31	31
Min. Time or Ped. Time (sec)	12	31	-	14	31	-	12	29	29	12	29	29
Delay - 15 min pk (sec/veh)	50	34	-	52	38	-	73	44	41	63	55	39
Level of Service (LOS)	D-	C-	-	D-	D+	-	E	D	D	E	E+	D+
Average 'Q' (veh/in)	5	14	-	1	13	-	6	7	4	5	10	3
Design 'Q'-ft/in (1.5*Qavg)	160	420	-	40	400	-	180	220	120	160	300	100
Do Vehicles Clear?	YES	YES	-	YES	YES	-	YES	YES	YES	YES	YES	YES

Summary of Results

Whole Intersection		Critical Movements	
Weighted Average Delay (seconds) =	43	Weighted Average Delay (seconds) =	48
Level of Service - LOS =	D	Level of Service - LOS =	D
		Intersection Capacity Utilization - ICU =	0.82
Predetermined Cycle Length is 120 sec			
Min/Ped. Times Satisfied			
Analysis Based on User Selected Splits			

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

63

Future Buildout 2030

Imperial Hwy at Kraemer Blvd

Caltrans

PM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

	Eastbound			Westbound			Northbound			Southbound		
Movement Times	T	R	L	T	R	L	T	R	L	T	R	
Movement 1: 14 secs			X									
Movement 2: 0 secs			X	X	X							
Movement 3: 56 secs	X	X		X	X							
Movement 4: 16 secs							X		X			
Movement 5: 5 secs							X	X	X			
Movement 6: 29 secs							X	X		X	X	
# of Lanes (#, S, P)	2	3	S	2	3	S	2	1	2	2	1	
Unadjusted Volume	180	1974	247	238	2105	211	502	735	99	364	777	
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	
Min/Ped Time Override (sec)	14	31	31	14	31	31	12	29	29	12	29	
Progression Adj. Factor (PAF)	1.00	1.00	-	1.00	1.00	-	1.00	1.00	1.00	1.00	1.00	

Output

	***			***			***			***		
Peak Hour Volume (vph)	180	1974	247	238	2105	211	502	735	99	364	777	
Saturation Flow (vph)	3500	5700	Shrd	3500	5700	Shrd	3500	3800	1800	3500	3800	
X or Volume/Capacity	0.51	0.87	-	0.68	0.90	-	0.91	0.73	0.21	0.89	0.91	
Effective Green (sec)	12	54	-	12	54	-	19	32	32	14	27	
Split Time (sec)	14	56	-	14	56	-	21	34	34	16	29	
Min. Time or Ped. Time (sec)	14	31	-	14	31	-	12	29	29	12	29	
Delay - 15 min pk (sec/veh)	57	34	-	62	36	-	71	45	35	76	61	
Level of Service (LOS)	E+	C-	-	E	D+	-	E	D	D+	E-	E	
Average 'Q' (veh/ln)	3	14	-	4	14	-	7	9	2	6	10	
Design 'Q'-ft/ln (1.5*Qavg)	100	420	-	120	420	-	220	280	60	180	300	
Do Vehicles Clear?	YES	YES	-	YES	YES	-	YES	YES	YES	YES	YES	

Summary of Results

Whole Intersection		Critical Movements	
Weighted Average Delay (seconds) =	45	Weighted Average Delay (seconds) =	47
Level of Service - LOS =	D	Level of Service - LOS =	D
		Intersection Capacity Utilization - ICU =	0.86
Predetermined Cycle Length is 120 sec			
Min./Ped. Times Satisfied			
Analysis Based on User Selected Splits			

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

64

Future Buildout 2030

Beach Blvd at Rosecrans Ave

Caltrans

AM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

Movement Times	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Movement 1: 19 secs	X			X								
Movement 2: 6 secs				X	X	X						
Movement 3: 31 secs		X	X		X	X						
Movement 4: 14 secs							X			X		
Movement 5: 18 secs										X	X	X
Movement 6: 32 secs								X	X		X	X
# of Lanes (#, S, P)	1	2	1	1	2	1	1	3	1	1	3	1
Unadjusted Volume	200	766	284	203	932	124	146	1224	140	149	1968	296
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
Min/Ped Time Override (sec)	12	30	30	12	30	30	12	30	30	12	30	30
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	1.00

Output

Peak Hour Volume (vph)	200	766	284	203	932	124	146	1224	140	149	1968	296
Saturation Flow (vph)	1800	3800	1800	1800	3800	1800	1800	5700	1800	1800	5700	1800
X or Volume/Capacity	0.78	0.83	0.65	0.59	0.84	0.24	0.81	0.86	0.31	0.33	0.86	0.41
Effective Green (sec)	17	29	29	23	35	35	12	30	30	30	48	48
Split Time (sec)	19	31	31	25	37	37	14	32	32	32	50	50
Min. Time or Ped. Time (sec)	12	30	30	12	30	30	12	30	30	12	30	30
Delay - 15 min pk (sec/veh)	71	52	48	51	48	33	84	50	38	39	38	28
Level of Service (LOS)	E	D-	D	D-	D	C-	F	D	D+	D+	D+	C
Average 'Q' (veh/in)	6	10	7	6	11	3	5	10	4	4	13	6
Design 'Q'-ft/in (1.5*Qavg)	180	300	220	180	340	100	160	300	120	120	400	180
Do Vehicles Clear?	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

Summary of Results

Whole Intersection	Critical Movements
Weighted Average Delay (seconds) = 46	Weighted Average Delay (seconds) = 45
Level of Service - LOS = D	Level of Service - LOS = D
	Intersection Capacity Utilization - ICU = 0.84
Predetermined Cycle Length is 120 sec	
Min/Ped. Times Satisfied	

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

64

Future Buildout 2030

Beach Blvd at Rosecrans Ave

Caltrans

PM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

Movement Times	Eastbound			Westbound			Northbound			Southbound		
	L*	T	R	L	T*	R	L	T*	R	L*	T	R
Movement 1: 18 secs	X			X								
Movement 2: 10 secs	X	X	X									
Movement 3: 30 secs		X	X		X	X						
Movement 4: 14 secs							X			X		
Movement 5: 48 secs								X	X		X	X
Movement 6: 0 secs												
# of Lanes (#, S, P)	1	2	1	1	2	1	1	3	1	1	3	1
Unadjusted Volume	348	951	167	216	836	269	155	2019	238	168	1218	271
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
Min/Ped Time Override (sec)	12	30	30	12	30	30	12	30	30	12	30	30
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	1.00

Output

	***			***			***			***		
Peak Hour Volume (vph)	348	951	167	216	836	269	155	2019	238	168	1218	271
Saturation Flow (vph)	1800	3800	1800	1800	3800	1800	1800	5700	1800	1800	5700	1800
X or Volume/Capacity	0.89	0.79	0.29	0.90	0.94	0.64	0.86	0.92	0.34	0.93	0.56	0.39
Effective Green (sec)	26	38	38	16	28	28	12	46	46	12	46	46
Split Time (sec)	28	40	40	18	30	30	14	48	48	14	48	48
Min. Time or Ped. Time (sec)	12	30	30	12	30	30	12	30	30	12	30	30
Delay - 15 min pk (sec/veh)	71	43	32	88	64	49	92	43	28	105	30	29
Level of Service (LOS)	E	D	C-	F	E	D	F	D	C	F	C-	C
Average 'Q' (veh/ln)	10	11	4	7	11	7	5	14	5	6	8	6
Design 'Q'-ft/ln (1.5*Qavg)	300	340	120	220	340	220	160	420	160	180	240	180
Do Vehicles Clear?	YES	YES	YES	YES	YES	YES	YES	YES	YES	NO	YES	YES

Summary of Results

Whole Intersection Weighted Average Delay (seconds) = 48 Level of Service - LOS = D	Critical Movements Weighted Average Delay (seconds) = 55 Level of Service - LOS = D- Intersection Capacity Utilization - ICU = 0.92
Predetermined Cycle Length is 120 sec Min/Ped. Times Satisfied Analysis Based on User Selected Splits	

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

65

Future Buildout 2030

Yorba Linda Blvd at Kraemer Blvd

Placentia

AM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

Movement Times	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Movement 1: 14 secs	X			X								
Movement 2: 8 secs				X	X	X						
Movement 3: 30 secs		X	X		X	X						
Movement 4: 18 secs							X			X		
Movement 5: 30 secs								X	X		X	X
Movement 6: 0 secs												
# of Lanes (#, S, P)	2	3	S	1	3	S	2	2	1	1	3	1
Unadjusted Volume	207	1042	214	261	1452	168	393	690	247	226	912	135
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
Min/Ped Time Override (sec)	14	24	24	12	24	24	12	30	30	12	30	30
Progression Adj. Factor (PAF)	1.00	1.00	-	1.00	1.00	-	1.00	1.00	1.00	1.00	1.00	1.00

Output

	***			***			***			***		
Peak Hour Volume (vph)	207	1042	214	261	1452	168	393	690	247	226	912	135
Saturation Flow (vph)	3500	5700	Shrd	1800	5700	Shrd	3500	3800	1800	1800	5700	1800
X or Volume/Capacity	0.49	0.79	-	0.73	0.79	-	0.70	0.65	0.49	0.78	0.57	0.27
Effective Green (sec)	12	28	-	20	36	-	16	28	28	16	28	28
Split Time (sec)	14	30	-	22	38	-	18	30	30	18	30	30
Min. Time or Ped. Time (sec)	14	24	-	12	24	-	12	30	30	12	30	30
Delay - 15 min pk (sec/veh)	45	37	-	49	32	-	47	35	33	59	32	29
Level of Service (LOS)	D	D+	-	D	C-	-	D	C-	C-	E+	C-	C
Average 'Q' (veh/ln)	3	8	-	6	10	-	5	7	5	6	6	3
Design 'Q'-ft/ln (1.5*Qavg)	100	240	-	180	300	-	160	220	160	180	180	100
Do Vehicles Clear?	YES	YES	-	YES	YES	-	YES	YES	YES	YES	YES	YES

Summary of Results

Whole Intersection	Critical Movements
Weighted Average Delay (seconds) = 37	Weighted Average Delay (seconds) = 40
Level of Service - LOS = D+	Level of Service - LOS = D+
Predetermined Cycle Length is 100 sec	
Min/Ped. Times Satisfied	
Analysis Based on User Selected Splits	
Intersection Capacity Utilization - ICU = 0.73	

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

65

Future Buildout 2030

Yorba Linda Blvd at Kraemer Blvd

Placentia

PM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Movement Times												
Movement 1: 14 secs	X			X								
Movement 2: 0 secs				X	X	X						
Movement 3: 34 secs		X	X		X	X						
Movement 4: 14 secs							X			X		
Movement 5: 4 secs										X	X	X
Movement 6: 34 secs								X	X		X	X
# of Lanes (#, S, P)	2	3	S	1	3	S	2	2	1	1	3	1
Unadjusted Volume	277	1609	184	203	1309	141	337	1180	246	280	904	202
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
Min/Ped Time Override (sec)	14	24	24	12	24	24	14	30	30	12	30	30
Progression Adj. Factor (PAF)	1.00	1.00	-	1.00	1.00	-	1.00	1.00	1.00	1.00	1.00	1.00

Output

Peak Hour Volume (vph)	277	1609	184	203	1309	141	337	1180	246	280	904	202
Saturation Flow (vph)	3500	5700	Shrd	1800	5700	Shrd	3500	3800	1800	1800	5700	1800
X or Volume/Capacity	0.66	0.98	-	0.94	0.79	-	0.80	0.97	0.43	0.97	0.44	0.31
Effective Green (sec)	12	32	-	12	32	-	12	32	32	16	36	36
Split Time (sec)	14	34	-	14	34	-	14	34	34	18	38	38
Min. Time or Ped. Time (sec)	14	24	-	12	24	-	14	30	30	12	30	30
Delay - 15 min pk (sec/veh)	50	51	-	91	35	-	58	53	29	88	25	24
Level of Service (LOS)	D	D-	-	F	C-	-	E+	D-	C	F	C	C+
Average 'Q' (veh/ln)	3	12	-	6	9	-	4	12	5	7	5	4
Design 'Q'-ft/ln (1.5*Qavg)	100	360	-	180	280	-	120	360	160	220	160	120
Do Vehicles Clear?	YES	NO	-	NO	YES	-	YES	NO	YES	NO	YES	YES

Summary of Results

Intersection Unstable-Consider Mitigation			
Whole Intersection		Critical Movements	
Weighted Average Delay (seconds) =	46	Weighted Average Delay (seconds) =	58
Level of Service - LOS =	D	Level of Service - LOS =	E+
		Intersection Capacity Utilization - ICU =	0.97
Predetermined Cycle Length is 100 sec			
Min/Ped. Times Satisfied			
Analysis Based on User Selected Splits			

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

66

Future Buildout 2030

Brookhurst St at La Palma Ave

Anaheim

AM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

	Eastbound			Westbound			Northbound			Southbound		
Movement Times	L*	T	R	L	T*	R	L*	T	R	L	T*	R
Movement 1: 15 secs	X			X								X
Movement 2: 6 secs	X	X	X									X
Movement 3: 37 secs		X	X		X	X						
Movement 4: 14 secs			X				X			X		
Movement 5: 48 secs							X	X			X	X
Movement 6: 0 secs												
# of Lanes (#, S, P)	2	3	1	2	3	1	2	3	1	2	3	1
Unadjusted Volume	405	878	84	233	890	57	231	1593	194	135	1609	177
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
Min/Ped Time Override (sec)	12	33	33	12	35	35	12	35	35	12	35	35
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	1.00

Output

	***			***			***			***		
Peak Hour Volume (vph)	405	878	84	233	890	57	231	1593	194	135	1609	177
Saturation Flow (vph)	3500	5700	1800	3500	5700	1800	3500	5700	1800	3500	5700	1800
X or Volume/Capacity	0.73	0.45	0.10	0.61	0.54	0.11	0.66	0.73	0.28	0.39	0.74	0.18
Effective Green (sec)	19	41	55	13	35	35	12	46	46	12	46	67
Split Time (sec)	21	43	57	15	37	37	14	48	48	14	48	69
Min. Time or Ped. Time (sec)	12	33	33	12	35	35	12	35	35	12	35	35
Delay - 15 min pk (sec/veh)	56	31	19	58	37	32	61	34	27	54	34	13
Level of Service (LOS)	E+	C-	B	E+	D+	C-	E	C-	C	D-	C-	B
Average 'Q' (veh/ln)	6	6	2	4	7	1	4	11	4	2	11	3
Design 'Q'-ft/ln (1.5*Qavg)	180	180	60	120	220	40	120	340	120	60	340	100
Do Vehicles Clear?	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

Summary of Results

Whole Intersection		Critical Movements	
Weighted Average Delay (seconds) =	37	Weighted Average Delay (seconds) =	40
Level of Service - LOS =	D+	Level of Service - LOS =	D+
		Intersection Capacity Utilization - ICU =	0.66
Predetermined Cycle Length is 120 sec			
Min./Ped. Times Satisfied			
Analysis Based on User Selected Splits			

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

66

Future Buildout 2030

Brookhurst St at La Palma Ave

Anaheim

PM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

	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
Movement 2: 38 secs		X	X		X	X						
Movement 3: 14 secs			X				X			X		
Movement 4: 5 secs			X				X	X	X			
Movement 5: 43 secs							X	X			X	X
Movement 6: 0 secs												
# of Lanes (#, S, P)	2	3	1	2	3	1	2	3	1	2	3	1
Unadjusted Volume	443	1146	118	423	1307	140	338	1851	319	145	1459	129
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
Min/Ped Time Override (sec)	12	33	33	12	35	35	12	35	35	12	35	35
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	1.00

Output

Peak Hour Volume (vph)	443	1146	118	423	1307	140	338	1851	319	145	1459	129
Saturation Flow (vph)	3500	5700	1800	3500	5700	1800	3500	5700	1800	3500	5700	1800
X or Volume/Capacity	0.84	0.67	0.14	0.81	0.76	0.26	0.68	0.85	0.46	0.41	0.75	0.14
Effective Green (sec)	18	36	55	18	36	36	17	46	46	12	41	61
Split Time (sec)	20	38	57	20	38	38	19	48	48	14	43	63
Min. Time or Ped. Time (sec)	12	33	33	12	35	35	12	35	35	12	35	35
Delay - 15 min pk (sec/veh)	65	39	19	62	41	33	56	38	30	54	38	16
Level of Service (LOS)	E	D+	B	E	D	C-	E+	D+	C	D	D+	B
Average 'Q' (veh/in)	6	9	2	6	10	3	5	13	7	2	11	2
Design 'Q'-f/In (1.5*Qavg)	180	280	60	180	300	100	160	400	220	60	340	60
Do Vehicles Clear?	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

Summary of Results

Whole Intersection		Critical Movements	
Weighted Average Delay (seconds) =	42	Weighted Average Delay (seconds) =	44
Level of Service - LOS =	D	Level of Service - LOS =	D
		Intersection Capacity Utilization - ICU =	0.77
Predetermined Cycle Length is 120 sec			
Min./Ped. Times Satisfied			
Analysis Based on User Selected Splits			

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

67

Future Buildout 2030

Euclid St at La Palma Ave

Anaheim

AM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

Movement Times	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L*	T	R	L*	T	R	L	T	R
Movement 1: 16 secs	X			X								
Movement 2: 6 secs	X	X	X									
Movement 3: 31 secs		X	X		X	X						
Movement 4: 13 secs							X			X		
Movement 5: 3 secs							X	X	X			
Movement 6: 51 secs								X	X		X	X
# of Lanes (#, S, P)	1	2	1	1	2	1	1	3	S	1	3	S
Unadjusted Volume	264	989	179	193	677	210	182	1725	165	150	1863	201
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
Min/Ped Time Override (sec)	12	31	31	12	31	31	12	33	33	12	33	33
Progression Adj. Factor (PAF)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-	1.00	1.00	-

Output

Peak Hour Volume (vph)	264	989	179	193	677	210	182	1725	165	150	1863	201
Saturation Flow (vph)	1800	3800	1800	1800	3800	1800	1800	5700	Shrd	1800	5700	Shrd
X or Volume/Capacity	0.88	0.89	0.34	0.92	0.74	0.48	0.87	0.77	-	0.91	0.89	-
Effective Green (sec)	20	35	35	14	29	29	14	52	-	11	49	-
Split Time (sec)	22	37	37	16	31	31	16	54	-	13	51	-
Min. Time or Ped. Time (sec)	12	31	31	12	31	31	12	33	-	12	33	-
Delay - 15 min pk (sec/veh)	78	52	35	96	47	43	87	31	-	103	38	-
Level of Service (LOS)	E-	D-	D+	F-	D	D	F-	C-	-	F	D+	-
Average 'Q' (veh/in)	8	12	4	6	9	5	6	12	-	5	14	-
Design 'Q'-ft/in (1.5*Qavg)	240	360	120	180	280	160	180	360	-	160	420	-
Do Vehicles Clear?	YES	YES	YES	NO	YES	YES	YES	YES	-	NO	YES	-

Summary of Results

Whole Intersection		Critical Movements	
Weighted Average Delay (seconds) =	46	Weighted Average Delay (seconds) =	49
Level of Service - LOS =	D	Level of Service - LOS =	D
		Intersection Capacity Utilization - ICU =	0.89
Predetermined Cycle Length is 120 sec Min./Ped. Times Satisfied Analysis Based on User Selected Splits			

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

67

Future Buildout 2030

Euclid St at La Palma Ave

Anaheim

PM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

	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: 5 secs				X	X	X						
Movement 3: 31 secs		X	X		X	X						
Movement 4: 17 secs							X			X		
Movement 5: 4 secs							X	X	X			
Movement 6: 46 secs								X	X		X	X
# of Lanes (#, S, P)	1	2	1	1	2	1	1	3	S	1	3	S
Unadjusted Volume	223	747	132	289	915	309	269	1803	159	211	1759	226
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
Min/Ped Time Override (sec)	12	31	31	12	31	31	12	33	33	12	33	33
Progression Adj. Factor (PAF)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-	1.00	1.00	-

Output

Peak Hour Volume (vph)	223	747	132	289	915	309	269	1803	159	211	1759	226
Saturation Flow (vph)	1800	3800	1800	1800	3800	1800	1800	5700	Shrd	1800	5700	Shrd
X or Volume/Capacity	0.99	0.81	0.30	0.96	0.85	0.61	0.94	0.86	-	0.94	0.95	-
Effective Green (sec)	15	29	29	20	34	34	19	48	-	15	44	-
Split Time (sec)	17	31	31	22	36	36	21	50	-	17	46	-
Min. Time or Ped. Time (sec)	12	31	31	12	31	31	12	33	-	12	33	-
Delay - 15 min pk (sec/veh)	110	51	39	93	49	42	91	37	-	98	48	-
Level of Service (LOS)	F	D-	D+	F	D	D	F	D+	-	F	D	-
Average 'Q' (veh/in)	7	10	3	9	11	7	8	13	-	7	14	-
Design 'Q'-ft/in (1.5*Qavg)	220	300	100	280	340	220	240	400	-	220	420	-
Do Vehicles Clear?	NO	YES	YES	NO	YES	YES	NO	YES	-	NO	YES	-

Summary of Results

Whole Intersection		Critical Movements	
Weighted Average Delay (seconds) =	52	Weighted Average Delay (seconds) =	56
Level of Service - LOS =	D-	Level of Service - LOS =	E+
		Intersection Capacity Utilization - ICU =	0.92
Predetermined Cycle Length is 120 sec			
Min/Ped. Times Satisfied			
Analysis Based on User Selected Splits			

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

68

Future Buildout 2030

Harbor Blvd at La Palma Ave

Anaheim

AM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	*T*	R	*L*	T	R	L	*T*	R
Movement Times												
Movement 1: 14 secs	X			X								
Movement 2: 3 secs	X	X	X									
Movement 3: 41 secs		X	X		X	X						
Movement 4: 10 secs							X			X		
Movement 5: 52 secs								X	X		X	X
Movement 6: 0 secs												
# of Lanes (#, S, P)	P	2	1	P	2	1	P	2	S	P	2	1
Unadjusted Volume	218	778	161	162	663	58	122	1008	68	116	1090	182
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
Min/Ped Time Override (sec)	8	28	28	8	41	41	8	38	38	8	38	38
Permissive Veh/Cycle	2			2			2			2		
Progression Adj. Factor (PAF)	P/P	1.00	1.00	P/P	1.00	1.00	P/P	1.00	-	P/P	1.00	1.00

Output

	***			***			***			***		
Peak Hour Volume (vph)	218	778	161	162	663	58	122	1008	68	116	1090	182
Saturation Flow (vph)	P/P	3800	1800	P/P	3800	1800	P/P	3800	Shrd	P/P	3800	1800
X or Volume/Capacity	0.70	0.58	0.26	0.57	0.54	0.10	0.52	0.68	-	0.46	0.69	0.24
Effective Green (sec)	15	42	42	12	39	39	8	50	-	8	50	50
Split Time (sec)	17	44	44	14	41	41	10	52	-	10	52	52
Min. Time or Ped. Time (sec)	8	28	28	8	41	41	8	38	-	8	38	38
Delay - 15 min pk (sec/veh)	49	34	29	40	35	29	35	31	-	32	31	23
Level of Service (LOS)	D	C-	C	D	C-	C	D+	C-	-	C-	C-	C+
Average 'Q' (veh/ln)	5	8	3	3	7	1	2	10	-	2	11	4
Design 'Q'-ft/ln (1.5*Qavg)	160	240	100	100	220	40	60	300	-	60	340	120
Available Storage (ft)	2			2			2			2		
Do Vehicles Clear?	YES	YES	YES	YES	YES	YES	YES	YES	-	YES	YES	YES

Summary of Results

Whole Intersection Weighted Average Delay (seconds) = 33 Level of Service - LOS = C-	Critical Movements Weighted Average Delay (seconds) = 35 Level of Service - LOS = C- Intersection Capacity Utilization - ICU = 0.62
Predetermined Cycle Length Is 120 sec Min/Ped. Times Satisfied Analysis Based on User Selected Splits	

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

68

Future Buildout 2030

Harbor Blvd at La Palma Ave

Anaheim

PM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

Movement Times	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	*T*	R	L	*T*	R	*L*	T	R
Movement 1: 12 secs	X			X								
Movement 2: 13 secs				X	X	X						
Movement 3: 28 secs		X	X		X	X						
Movement 4: 12 secs							X			X		
Movement 5: 55 secs								X	X		X	X
Movement 6: 0 secs												
# of Lanes (#, S, P)	P	2	1	P	2	1	P	2	S	P	2	1
Unadjusted Volume	218	662	204	248	1093	124	167	1648	78	200	1234	322
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
Min/Ped Time Override (sec)	8	28	28	8	41	41	8	38	38	8	38	38
Permissive Veh/Cycle	2			2			2			2		
Progression Adj. Factor (PAF)	P/P	1.00	1.00	P/P	1.00	1.00	P/P	1.00	-	P/P	1.00	1.00

Output

	***	***	***	***	***	***	***	***	***	***	***	***
Peak Hour Volume (vph)	218	662	204	248	1093	124	167	1648	78	200	1234	322
Saturation Flow (vph)	P/P	3800	1800	P/P	3800	1800	P/P	3800	Shrd	P/P	3800	1800
X or Volume/Capacity	1.05	0.80	0.52	0.55	0.89	0.21	0.72	1.03	-	0.94	0.74	0.41
Effective Green (sec)	10	26	26	23	39	39	10	53	-	10	53	53
Split Time (sec)	12	28	28	25	41	41	12	55	-	12	55	55
Min. Time or Ped. Time (sec)	8	28	28	8	41	41	8	38	-	8	38	38
Delay - 15 min pk (sec/veh)	115	53	46	38	48	30	51	64	-	86	31	24
Level of Service (LOS)	F	D-	D	D+	D	C-	D-	E	-	F	C-	C+
Average 'Q' (veh/in)	6	9	5	5	13	3	3	18	-	5	11	6
Design 'Q'-ft/in (1.5*Qavg)	180	280	160	160	400	100	100	540	-	160	340	180
Available Storage (ft)	2			2			2			2		
Do Vehicles Clear?	YES	YES	YES	YES	YES	YES	YES	NO	-	YES	YES	YES

Summary of Results

Intersection Unstable-Consider Mitigation			
Whole Intersection		Critical Movements	
Weighted Average Delay (seconds) =	52	Weighted Average Delay (seconds) =	64
Level of Service - LOS =	D-	Level of Service - LOS =	E
		Intersection Capacity Utilization - ICU =	0.97
Predetermined Cycle Length is 120 sec			
Min./Ped. Times Satisfied			
Analysis Based on User Selected Splits			

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

69

Lemon Street
La Palma Ave at Anaheim Blvd (West) Anaheim AM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

	Eastbound			Westbound			Northbound			Southbound		
Movement Times	L*	T	R	L	T*	R	L	T*	R	L*	T	R
Movement 1: 21 secs	X	X				X						
Movement 2: 28 secs		X			X	X						
Movement 3: 34 secs					X	X	X	X				
Movement 4: 37 secs					X					X		X
Movement 5: 0 secs												
Movement 6: 0 secs												
# of Lanes (#, S, P)	P	2		2	1	S	1	S	2			1
Unadjusted Volume	299	568		701	531	28	394	15	838			205
Peak Hour Factor (PHF)	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00			1.00
Min/Ped Time Override (sec)	8	20		20	20	32	32	32	12			12
Permissive Veh/Cycle	2											
Progression Adj. Factor (PAF)	P/P	1.00		1.00	1.00	-	1.00	-	1.00			1.00

Output

	***			***			***			***		
Peak Hour Volume (vph)	299	568		701	531	28	394	15	838			205
Saturation Flow (vph)	P/P	3800		3800	1800	Shrd	1900	Shrd	3500			1800
X or Volume/Capacity	0.84	0.38		0.85	0.30	-	0.86	-	0.82			0.39
Effective Green (sec)	19	47		26	120	-	32	-	35			35
Split Time (sec)	21	49		28	120	-	34	-	37			37
Min. Time or Ped. Time (sec)	8	20		20	20	-	32	-	12			12
Delay - 15 min pk (sec/veh)	60	27		56	0	-	59	-	47			36
Level of Service (LOS)	E+	C		E+	A	-	E+	-	D			D+
Average 'Q' (veh/in)	7	6		9	0	-	11	-	10			5
Design 'Q'-ft/in (1.5*Qavg)	220	180		280	0	-	340	-	300			160
Available Storage (ft)	2											
Do Vehicles Clear?	YES	YES		YES	YES	-	YES	-	YES			YES

Summary of Results

Whole Intersection		Critical Movements	
Weighted Average Delay (seconds) =	41	Weighted Average Delay (seconds) =	54
Level of Service - LOS =	D	Level of Service - LOS =	D-
		Intersection Capacity Utilization - ICU =	0.84
Predetermined Cycle Length is 120 sec Min./Ped. Times Satisfied Analysis Based on User Selected Splits			

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

69

Lemon Street Future Buildout 2030
La Palma Ave at Anaheim Blvd (West) Anaheim **PM Peak Hour**

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

Movement Times	Eastbound			Westbound			Northbound			Southbound		
	L*	T	R	L	T*	R	L	T*	R	L*	T	R
Movement 1: 21 secs	X	X				X						
Movement 2: 30 secs		X			X	X						
Movement 3: 32 secs						X	X	X	X			
Movement 4: 37 secs						X				X		X
Movement 5: 0 secs												
Movement 6: 0 secs												
# of Lanes (#, S, P)	P	2		2	1	S	1	S	2			1
Unadjusted Volume	354	667		949	816	59	417	12	1096			358
Peak Hour Factor (PHF)	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00			1.00
Min/Ped Time Override (sec)	8	20		20	20	32	32	32	12			12
Permissive Veh/Cycle	2											
Progression Adj. Factor (PAF)	P/P	1.00		1.00	1.00	-	1.00	-	1.00			1.00

Output

Peak Hour Volume (vph)	354	667		949	816	59	417	12	1096			358
Saturation Flow (vph)	P/P	3800		3800	1800	Shrd	1900	Shrd	3500			1800
X or Volume/Capacity	1.04	0.43		1.07	0.45	-	1.03	-	1.07			0.68
Effective Green (sec)	19	49		28	120	-	30	-	35			35
Split Time (sec)	21	51		30	120	-	32	-	37			37
Min. Time or Ped. Time (sec)	8	20		20	20	-	32	-	12			12
Delay - 15 min pk (sec/veh)	102	26		98	0	-	94	-	94			45
Level of Service (LOS)	F	C		F	A	-	F	-	F			D
Average 'Q' (veh/ln)	10	7		14	0	-	14	-	15			9
Design 'Q'-ft/ln (1.5*Qavg)	300	220		420	0	-	420	-	460			280
Available Storage (ft)	2											
Do Vehicles Clear?	NO	YES		NO	YES	-	NO	-	NO			YES

Summary of Results

Whole Intersection		Critical Movements	
Weighted Average Delay (seconds) =	66	Weighted Average Delay (seconds) =	97
Level of Service - LOS =	E	Level of Service - LOS =	F
		Intersection Capacity Utilization - ICU =	1.05
Predetermined Cycle Length is 120 sec Min/Ped. Times Satisfied Analysis Based on User Selected Splits			

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

70

Future Buildout 2030

La Palma Ave at East St

Anaheim

AM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

	Eastbound			Westbound			Northbound			Southbound		
Movement Times	L	T	R	L	T	R	L	T	R	L	T	R
Movement 1: 16 secs	X			X								
Movement 2: 18 secs	X	X	X									
Movement 3: 32 secs		X	X		X	X						
Movement 4: 13 secs							X			X		
Movement 5: 0 secs							X	X	X			
Movement 6: 41 secs								X	X		X	X
# of Lanes (#, S, P)	1	2	1	1	2	S	1	2	1	1	2	S
Unadjusted Volume	243	1287	126	167	811	126	89	1049	294	61	706	158
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
Min/Ped Time Override (sec)	12	27	27	12	27	27	12	30	30	12	30	30
Progression Adj. Factor (PAF)	1.00	1.00	1.00	1.00	1.00	-	1.00	1.00	1.00	1.00	1.00	-

Output

Peak Hour Volume (vph)	243	1287	126	167	811	126	89	1049	294	61	706	158
Saturation Flow (vph)	1800	3800	1800	1800	3800	Shrd	1800	3800	1800	1800	3800	Shrd
X or Volume/Capacity	0.51	0.85	0.18	0.80	0.99	-	0.54	0.85	0.50	0.37	0.70	-
Effective Green (sec)	32	48	48	14	30	-	11	39	39	11	39	-
Split Time (sec)	34	50	50	16	32	-	13	41	41	13	41	-
Min. Time or Ped. Time (sec)	12	27	27	12	27	-	12	30	30	12	30	-
Delay - 15 min pk (sec/veh)	41	39	24	78	71	-	64	45	36	58	39	-
Level of Service (LOS)	D	D+	C+	E-	E	-	E	D	D+	E+	D+	-
Average 'Q' (veh/ln)	6	13	3	5	13	-	3	12	7	2	10	-
Design 'Q'-ft/ln (1.5*Qavg)	180	400	100	160	400	-	100	360	220	60	300	-
Do Vehicles Clear?	YES	YES	YES	YES	NO	-	YES	YES	YES	YES	YES	-

Summary of Results

Whole Intersection		Critical Movements	
Weighted Average Delay (seconds) =	48	Weighted Average Delay (seconds) =	45
Level of Service - LOS =	D	Level of Service - LOS =	D
		Intersection Capacity Utilization - ICU =	0.79
Predetermined Cycle Length is 120 sec			
Min./Ped. Times Satisfied			

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

70

Future Buildout 2030

La Palma Ave at East St

Anaheim

PM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

	Eastbound			Westbound			Northbound			Southbound		
Movement Times	L*	T	R	L	T*	R	L*	T	R	L	T*	R
Movement 1: 18 secs	X			X								
Movement 2: 7 secs	X	X	X									
Movement 3: 42 secs		X	X		X	X						
Movement 4: 14 secs							X			X		
Movement 5: 0 secs										X	X	X
Movement 6: 39 secs								X	X		X	X
# of Lanes (#, S, P)	1	2	1	1	2	S	1	2	1	1	2	S
Unadjusted Volume	339	887	138	245	1123	149	63	1073	303	64	922	237
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
Min/Ped Time Override (sec)	12	27	27	12	27	27	12	30	30	12	30	30
Progression Adj. Factor (PAF)	1.00	1.00	1.00	1.00	1.00	-	1.00	1.00	1.00	1.00	1.00	-

Output

Peak Hour Volume (vph)	339	887	138	245	1123	149	63	1073	303	64	922	237
Saturation Flow (vph)	1800	3800	1800	1800	3800	Shrd	1800	3800	1800	1800	3800	Shrd
X or Volume/Capacity	0.98	0.60	0.20	1.02	1.00	-	0.35	0.92	0.55	0.36	0.99	-
Effective Green (sec)	23	47	47	16	40	-	12	37	37	12	37	-
Split Time (sec)	25	49	49	18	42	-	14	39	39	14	39	-
Min. Time or Ped. Time (sec)	12	27	27	12	27	-	12	30	30	12	30	-
Delay - 15 min pk (sec/veh)	93	31	25	116	66	-	56	53	38	56	65	-
Level of Service (LOS)	F	C-	C+	F	E	-	E+	D-	D+	E+	E	-
Average 'Q' (veh/ln)	10	9	3	8	15	-	2	13	7	2	14	-
Design 'Q'-ft/ln (1.5*Qavg)	300	280	100	240	460	-	60	400	220	60	420	-
Do Vehicles Clear?	NO	YES	YES	NO	NO	-	YES	YES	YES	YES	NO	-

Summary of Results

Whole Intersection		Critical Movements	
Weighted Average Delay (seconds) =	59	Weighted Average Delay (seconds) =	69
Level of Service - LOS =	E+	Level of Service - LOS =	E
		Intersection Capacity Utilization - ICU =	0.92
Predetermined Cycle Length is 120 sec Min/Ped. Times Satisfied Analysis Based on User Selected Splits			

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

Future Buildout 2030

71

State College Blvd at La Palma Ave

Anaheim

AM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Movement 1: 18 secs	X			X								
Movement 2: 34 secs		X	X		X	X						
Movement 3: 16 secs							X			X		
Movement 4: 20 secs										X	X	X
Movement 5: 32 secs							X	X		X	X	X
Movement 6: 0 secs												
# of Lanes (#, S, P)	1	2	1	1	2	1	1	3	S	1	3	S
Unadjusted Volume	180	949	124	206	669	302	174	947	96	474	1055	92
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
Min/Ped Time Override (sec)	12	31	31	12	31	31	12	32	32	12	32	32
Progression Adj. Factor (PAF)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-	1.00	1.00	-

Output

Peak Hour Volume (vph)	180	949	124	206	669	302	174	947	96	474	1055	92
Saturation Flow (vph)	1800	3800	1800	1800	3800	1800	1800	5700	Shrd	1800	5700	Shrd
X or Volume/Capacity	0.75	0.94	0.26	0.86	0.66	0.63	0.83	0.73	-	0.93	0.48	-
Effective Green (sec)	16	32	32	16	32	32	14	30	-	34	50	-
Split Time (sec)	18	34	34	18	34	34	16	32	-	36	52	-
Min. Time or Ped. Time (sec)	12	31	31	12	31	31	12	32	-	12	32	-
Delay - 15 min pk (sec/veh)	69	60	36	82	43	45	82	45	-	68	26	-
Level of Service (LOS)	E	E+	D+	F	D	D	F	D	-	E	C	-
Average 'Q' (veh/in)	5	12	3	6	8	7	5	9	-	12	7	-
Design 'Q'-ft/in (1.5*Qavg)	160	360	100	180	240	220	160	280	-	360	220	-
Do Vehicles Clear?	YES	YES	YES	YES	YES	YES	YES	YES	-	YES	YES	-

Summary of Results

Whole Intersection		Critical Movements	
Weighted Average Delay (seconds) =	49	Weighted Average Delay (seconds) =	57
Level of Service - LOS =	D	Level of Service - LOS =	E+
		Intersection Capacity Utilization - ICU =	0.87
Predetermined Cycle Length is 120 sec			
Min/Ped. Times Satisfied			
Analysis Based on User Selected Splits			

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

71

Future Buildout 2030

State College Blvd at La Palma Ave

Anaheim

PM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

	Eastbound			Westbound			Northbound			Southbound		
Movement Times	L*	T	R	L	T*	R	L*	T	R	L	T*	R
Movement 1: 24 secs	X			X								
Movement 2: 7 secs	X	X	X									
Movement 3: 31 secs		X	X		X	X						
Movement 4: 26 secs							X			X		
Movement 5: 0 secs							X	X	X			
Movement 6: 32 secs								X	X		X	X
# of Lanes (#, S, P)	1	2	1	1	2	1	1	3	S	1	3	S
Unadjusted Volume	561	640	80	368	836	275	455	1405	72	404	1362	117
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
Min/Ped Time Override (sec)	12	31	31	12	31	31	12	32	32	12	32	32
Progression Adj. Factor (PAF)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-	1.00	1.00	-

Output

Peak Hour Volume (vph)	561	640	80	368	836	275	455	1405	72	404	1362	117
Saturation Flow (vph)	1800	3800	1800	1800	3800	1800	1800	5700	Shrd	1800	5700	Shrd
X or Volume/Capacity	1.29	0.56	0.15	1.12	0.91	0.63	1.26	1.04	-	1.12	1.04	-
Effective Green (sec)	29	36	36	22	29	29	24	30	-	24	30	-
Split Time (sec)	31	38	38	24	31	31	26	32	-	26	32	-
Min. Time or Ped. Time (sec)	12	31	31	12	31	31	12	32	-	12	32	-
Delay - 15 min pk (sec/veh)	197	37	31	135	59	48	191	79	-	134	80	-
Level of Service (LOS)	F	D+	C-	F	E+	D	F	E-	-	F	E	-
Average 'Q' (veh/ln)	20	7	2	12	11	7	17	13	-	13	14	-
Design 'Q'-ft/ln (1.5*Qavg)	600	220	60	360	340	220	520	400	-	400	420	-
Do Vehicles Clear?	NO	YES	YES	NO	YES	YES	NO	NO	-	NO	NO	-

Summary of Results

Oversaturated - Mitigation Required	
Whole Intersection Weighted Average Delay (seconds) = 96 Level of Service - LOS = F	Critical Movements Weighted Average Delay (seconds) = 110 Level of Service - LOS = F Intersection Capacity Utilization - ICU = 1.12
Predetermined Cycle Length is 120 sec Min/Ped. Times Satisfied Analysis Based on User Selected Splits	

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

72

Future Buildout 2030

Imperial Hwy at SR-57 SB Off-Ramp

Caltrans

AM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Movement Times												
Movement 1: 72 secs		X			X							
Movement 2: 48 secs										X		X
Movement 3: 0 secs												
Movement 4: 0 secs												
Movement 5: 0 secs												
Movement 6: 0 secs												
# of Lanes (#, S, P)		3			3					2		1
Unadjusted Volume		1612			2439					998		429
Peak Hour Factor (PHF)		1.00			1.00					1.00		1.00
Min/Ped Time Override (sec)		24			24					15		15
Progression Adj. Factor (PAF)		1.00			1.00					1.00		1.00

Output

Peak Hour Volume (vph)	1612			2439					998		429
Saturation Flow (vph)		5700		5700					3500		1800
X or Volume/Capacity		0.48		0.73					0.74		0.62
Effective Green (sec)		70		70					46		46
Split Time (sec)		72		72					48		48
Min. Time or Ped. Time (sec)		24		24					15		15
Delay - 15 min pk (sec/veh)		15		20					36		34
Level of Service (LOS)		B		B					D+		C-
Average 'Q' (veh/ln)		7		11					10		9
Design 'Q'-ft/ln (1.5*Qavg)		220		340					300		280
Do Vehicles Clear?		YES		YES					YES		YES

Summary of Results

Whole Intersection		Critical Movements	
Weighted Average Delay (seconds) =	23	Weighted Average Delay (seconds) =	25
Level of Service - LOS =	C+	Level of Service - LOS =	C+
		Intersection Capacity Utilization - ICU =	0.74
Predetermined Cycle Length is 120 sec			
Min/Ped. Times Satisfied			

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

72

Future Buildout 2030

Imperial Hwy at SR-57 SB Off-Ramp

Caltrans

PM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Movement Times												
Movement 1: 73 secs		X			X							
Movement 2: 47 secs										X		
Movement 3: 0 secs												
Movement 4: 0 secs												
Movement 5: 0 secs												
Movement 6: 0 secs												
# of Lanes (#, S, P)		3			3					2		
Unadjusted Volume		1929			2419					794		
Peak Hour Factor (PHF)		1.00			1.00					1.00		
Min/Ped Time Override (sec)		24			24					15		
Progression Adj. Factor (PAF)		1.00			1.00					1.00		

Output

Peak Hour Volume (vph)	1929			2419					794			497
Saturation Flow (vph)	5700			5700					3500			1800
X or Volume/Capacity	0.57			0.72					0.60			0.74
Effective Green (sec)	71			71					45			45
Split Time (sec)	73			73					47			47
Min. Time or Ped. Time (sec)	24			24					15			15
Delay - 15 min pk (sec/veh)	16			19					32			39
Level of Service (LOS)	B			B					C-			D+
Average 'Q' (veh/ln)	9			11					8			10
Design 'Q'-ft/ln (1.5*Qavg)	280			340					240			300
Do Vehicles Clear?	YES			YES					YES			YES

Summary of Results

Whole Intersection		Critical Movements	
Weighted Average Delay (seconds) =	22	Weighted Average Delay (seconds) =	23
Level of Service - LOS =	C+	Level of Service - LOS =	C+
		Intersection Capacity Utilization - ICU =	0.72
Predetermined Cycle Length is 120 sec			
Min./Ped. Times Satisfied			

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

73

Future Buildout 2030

Imperial Hwy at SR-57 NB Off-Ramp

Caltrans

AM Peak Hour

Parameter Values (using default set 'Other Values')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)	12	10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

Movement Times	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	*R*	L	*T*	R	L	T	R
Movement 1: 15 secs	X	X										X
Movement 2: 52 secs		X			X	X						
Movement 3: 53 secs							X	X	X			
Movement 4: 0 secs												
Movement 5: 0 secs												
Movement 6: 0 secs												
# of Lanes (#, S, P)	1	3		3	1	S	2	2				2
Unadjusted Volume	64	2043		1665	652	1210	64	589				34
Peak Hour Factor (PHF)	1.00	1.00		1.00	1.00	1.00	1.00	1.00				1.00
Sat. Flow Override (vph)						Shrd	3500					
Min/Ped Time Override (sec)	12	28		28	28	24	24	24				15
Progression Adj. Factor (PAF)	1.00	1.00		1.00	1.00	-	1.00	1.00				1.00

Output

Peak Hour Volume (vph)	64	2043		1665	652	1210	64	589				34
Saturation Flow (vph)	1800	5700		5700	1800	Shrd	3500	3400				3400
X or Volume/Capacity	0.33	0.66		0.70	0.87	-	0.86	0.41				0.09
Effective Green (sec)	13	65		50	50	-	51	51				13
Split Time (sec)	15	67		52	52	-	53	53				15
Min. Time or Ped. Time (sec)	12	28		28	28	-	24	24				15
Delay - 15 min pk (sec/veh)	54	21		31	45	-	38	25				49
Level of Service (LOS)	D	C+		C-	D	-	D+	C+				D
Average 'Q' (veh/in)	2	10		11	13	-	12	6				1
Design 'Q'-ft/in (1.5*Qavg)	60	300		340	400	-	360	180				40
Do Vehicles Clear?	YES	YES		YES	YES	-	YES	YES				YES

Summary of Results

Whole Intersection		Critical Movements	
Weighted Average Delay (seconds) =	31	Weighted Average Delay (seconds) =	41
Level of Service - LOS =	C-	Level of Service - LOS =	D
		Intersection Capacity Utilization - ICU =	0.80
Predetermined Cycle Length is 120 sec Min/Ped. Times Satisfied Analysis Based on User Selected Splits			

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

73

Future Buildout 2030

Imperial Hwy at SR-57 NB Off-Ramp

Caltrans

PM Peak Hour

Parameter Values (using default set 'Other Values')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)	12	10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	*R*	L	T	*R*	L	T	*R*
Movement 1: 15 secs	X	X										X
Movement 2: 73 secs		X			X	X						
Movement 3: 32 secs							X	X	X			
Movement 4: 0 secs												
Movement 5: 0 secs												
Movement 6: 0 secs												
# of Lanes (#, S, P)	1	3		3	1	1	S	3	1			2
Unadjusted Volume	169	2356		2108	1035	1035	949	33	431			353
Peak Hour Factor (PHF)	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00			1.00
Sat. Flow Override (vph)							Shrd	4800				
Min/Ped Time Override (sec)	12	28		28	28	28	24	24	24			15
Progression Adj. Factor (PAF)	1.00	1.00		1.00	1.00	1.00	-	1.00	1.00			1.00

Output

Peak Hour Volume (vph)	169	2356		2108	1035	1035	949	33	431			353
Saturation Flow (vph)	1800	5700		5700	1800	1800	Shrd	4800	1800			3400
X or Volume/Capacity	0.87	0.58		0.63	0.97	0.97	-	0.82	0.96			0.96
Effective Green (sec)	13	86		71	71	71	-	30	30			13
Split Time (sec)	15	88		73	73	73	-	32	32			15
Min. Time or Ped. Time (sec)	12	28		28	28	28	-	24	24			15
Delay - 15 min pk (sec/veh)	90	9		17	45	45	-	49	77			91
Level of Service (LOS)	F	A		B	D	D	-	D	E			F
Average 'Q' (veh/ln)	5	7		10	16	16	-	8	12			6
Design 'Q'-ft/ln (1.5*Qavg)	160	220		300	480	480	-	240	360			180
Do Vehicles Clear?	YES	YES		YES	NO	NO	-	YES	NO			NO

Summary of Results

Intersection Unstable-Consider Mitigation			
Whole Intersection		Critical Movements	
Weighted Average Delay (seconds) =	32	Weighted Average Delay (seconds) =	62
Level of Service - LOS =	C-	Level of Service - LOS =	E
		Intersection Capacity Utilization - ICU =	0.97
Predetermined Cycle Length Is 120 sec			
Min/Ped. Times Satisfied			
Analysis Based on User Selected Splits			

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

Future Buildout 2030

74

Yorba Linda Blvd at SR-57 SB Off-Ramp

Caltrans

AM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	*T*	R	L	T	R	L	T	*R*
Movement Times												
Movement 1: 47 secs		X			X							
Movement 2: 53 secs										X		X
Movement 3: 0 secs												
Movement 4: 0 secs												
Movement 5: 0 secs												
Movement 6: 0 secs												
# of Lanes (#, S, P)		3			3					1		1
Unadjusted Volume		928			1488					338		549
Peak Hour Factor (PHF)		1.00			1.00					1.00		1.00
Min/Ped Time Override (sec)		20			20					22		22
Progression Adj. Factor (PAF)		1.00			1.00					1.00		1.00

Output

Peak Hour Volume (vph)	928		1488			338	549
Saturation Flow (vph)	5700		5700			1800	1800
X or Volume/Capacity	0.36		0.58			0.37	0.60
Effective Green (sec)	45		45			51	51
Split Time (sec)	47		47			53	53
Min. Time or Ped. Time (sec)	20		20			22	22
Delay - 15 min pk (sec/veh)	18		21			16	20
Level of Service (LOS)	B		C+			B	C+
Average 'Q' (veh/ln)	5		8			5	7
Design 'Q'-ft/ln (1.5*Qavg)	160		240			160	220
Do Vehicles Clear?	YES		YES			YES	YES

Summary of Results

Whole Intersection	Critical Movements
Weighted Average Delay (seconds) = 20	Weighted Average Delay (seconds) = 22
Level of Service - LOS = B	Level of Service - LOS = C+
	Intersection Capacity Utilization - ICU = 0.59
Predetermined Cycle Length is 100 sec	
Min./Ped. Times Satisfied	

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

Future Buildout 2030

74

Yorba Linda Blvd at SR-57 SB Off-Ramp

Caltrans

PM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Movement Times												
Movement 1: 37 secs		X			X							
Movement 2: 63 secs										X		X
Movement 3: 0 secs												
Movement 4: 0 secs												
Movement 5: 0 secs												
Movement 6: 0 secs												
# of Lanes (#, S, P)		3			3					1		1
Unadjusted Volume		1609			1771					982		182
Peak Hour Factor (PHF)		1.00			1.00					1.00		1.00
Min/Ped Time Override (sec)		20			20					22		22
Progression Adj. Factor (PAF)		1.00			1.00					1.00		1.00

Output

Peak Hour Volume (vph)	1609			1771					982			182
Saturation Flow (vph)	5700			5700					1800			1800
X or Volume/Capacity	0.81			0.89					0.89			0.17
Effective Green (sec)	35			35					61			61
Split Time (sec)	37			37					63			63
Min. Time or Ped. Time (sec)	20			20					22			22
Delay - 15 min pk (sec/veh)	33			37					28			9
Level of Service (LOS)	C-			D+					C			A
Average 'Q' (veh/in)	10			11					11			2
Design 'Q'-ft/in (1.5*Qavg)	300			340					340			60
Do Vehicles Clear?	YES			YES					YES			YES

Summary of Results

Whole Intersection		Critical Movements	
Weighted Average Delay (seconds) =	33	Weighted Average Delay (seconds) =	34
Level of Service - LOS =	C-	Level of Service - LOS =	C-
		Intersection Capacity Utilization - ICU =	0.89
Predetermined Cycle Length is 100 sec			
Min./Ped. Times Satisfied			
Analysis Based on User Selected Splits			

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

75

Future Buildout 2030

Yorba Linda Blvd at SR-57 NB Off-Ramp

Calltrans

AM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Movement Times												
Movement 1: 45 secs		X			X							
Movement 2: 55 secs							X	X	X			
Movement 3: 0 secs												
Movement 4: 0 secs												
Movement 5: 0 secs												
Movement 6: 0 secs												
# of Lanes (#, S, P)		3			3		S	2	S			
Unadjusted Volume		1184			1696		501	10	773			
Peak Hour Factor (PHF)		1.00			1.00		1.00	1.00	1.00			
Sat. Flow Override (vph)							Shrd	3600	Shrd			
Min/Ped Time Override (sec)		24			24		24	24	24			
Progression Adj. Factor (PAF)		1.00			1.00		-	1.00	-			

Output

Peak Hour Volume (vph)	1184	1696	501	10	773
Saturation Flow (vph)	5700	5700	Shrd	3600	Shrd
X or Volume/Capacity	0.48	0.69	-	0.67	-
Effective Green (sec)	43	43	-	53	-
Split Time (sec)	45	45	-	55	-
Min. Time or Ped. Time (sec)	24	24	-	24	-
Delay - 15 min pk (sec/veh)	21	25	-	19	-
Level of Service (LOS)	C+	C+	-	B	-
Average 'Q' (veh/ln)	6	9	-	8	-
Design 'Q'-ft/ln (1.5*Qavg)	180	280	-	240	-
Do Vehicles Clear?	YES	YES	-	YES	-

Summary of Results

Whole Intersection		Critical Movements	
Weighted Average Delay (seconds) =	22	Weighted Average Delay (seconds) =	23
Level of Service - LOS =	C+	Level of Service - LOS =	C+
		Intersection Capacity Utilization - ICU =	0.68
Predetermined Cycle Length is 100 sec			
Min./Ped. Times Satisfied			
Analysis Based on User Selected Splits			

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

Future Buildout 2030

75

Yorba Linda Blvd at SR-57 NB Off-Ramp

Caltrans

PM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus. sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Movement Times												
Movement 1: 43 secs		X			X							
Movement 2: 57 secs							X	X	X			
Movement 3: 0 secs												
Movement 4: 0 secs												
Movement 5: 0 secs												
Movement 6: 0 secs												
# of Lanes (#, S, P)		3			3		S	2	S			
Unadjusted Volume		1778			1542		416	10	1086			
Peak Hour Factor (PHF)		1.00			1.00		1.00	1.00	1.00			
Sat. Flow Override (vph)							Shrd	3600	Shrd			
Min/Ped Time Override (sec)		24			24		24	24	24			
Progression Adj. Factor (PAF)		1.00			1.00		-	1.00	-			

Output

Peak Hour Volume (vph)	1778	1542	416	10	1086			
Saturation Flow (vph)	5700	5700	Shrd	3600	Shrd			
X or Volume/Capacity	0.76	0.66	-	0.76	-			
Effective Green (sec)	41	41	-	55	-			
Split Time (sec)	43	43	-	57	-			
Min. Time or Ped. Time (sec)	24	24	-	24	-			
Delay - 15 min pk (sec/veh)	28	25	-	20	-			
Level of Service (LOS)	C	C	-	C+	-			
Average 'Q' (veh/in)	10	8	-	9	-			
Design 'Q' (veh/in (1.5*Qavg))	300	240	-	280	-			
Do Vehicles Clear?	YES	YES	-	YES	-			

Summary of Results

Whole Intersection	Critical Movements
Weighted Average Delay (seconds) = 25	Weighted Average Delay (seconds) = 25
Level of Service - LOS = C+	Level of Service - LOS = C+
	Intersection Capacity Utilization - ICU = 0.76
Predetermined Cycle Length is 100 sec	
Min./Ped. Times Satisfied	
Analysis Based on User Selected Splits	

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

76

Future Buildout 2030

Nutwood Ave at SR-57 SB Ramps

Caltrans

AM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Movement Times												
Movement 1: 38 secs		X		X	X							
Movement 2: 24 secs	X		X		X							
Movement 3: 38 secs										X	X	X
Movement 4: 0 secs												
Movement 5: 0 secs												
Movement 6: 0 secs												
# of Lanes (#, S, P)	3		S	2	2					1	1	1
Unadjusted Volume	365		344	311	1866					143	436	538
Peak Hour Factor (PHF)	1.00		1.00	1.00	1.00					1.00	1.00	1.00
Min/Ped Time Override (sec)	22		22	12	22					12	12	12
Progression Adj. Factor (PAF)	1.00		-	1.00	1.00					1.00	1.00	1.00

Output

Peak Hour Volume (vph)	365	344	311	1866					143	436	538
Saturation Flow (vph)	5700	Shrd	3500	3800					1800	1900	1800
X or Volume/Capacity	0.57	-	0.25	0.82					0.22	0.64	0.83
Effective Green (sec)	22	-	36	60					36	36	36
Split Time (sec)	24	-	38	62					38	38	38
Min. Time or Ped. Time (sec)	22	-	12	22					12	12	12
Delay - 15 min pk (sec/veh)	37	-	23	19					23	31	41
Level of Service (LOS)	D+	-	C+	B					C+	C-	D
Average 'Q' (veh/ln)	5	-	3	10					3	8	10
Design 'Q'-ft/ln (1.5*Qavg)	160	-	100	300					100	240	300
Do Vehicles Clear?	YES	-	YES	YES					YES	YES	YES

Summary of Results

Whole Intersection Weighted Average Delay (seconds) = 27 Level of Service - LOS = C	Critical Movements Weighted Average Delay (seconds) = 36 Level of Service - LOS = D+ Intersection Capacity Utilization - ICU = 0.54
Predetermined Cycle Length is 100 sec Min/Ped. Times Satisfied Analysis Based on User Selected Splits	

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

76

Future Buildout 2030

Nutwood Ave at SR-57 SB Ramps

Caltrans

PM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Movement Times												
Movement 1: 28 secs				X		X						
Movement 2: 38 secs		X	X		X							
Movement 3: 34 secs										X	X	X
Movement 4: 0 secs												
Movement 5: 0 secs												
Movement 6: 0 secs												
# of Lanes (#, S, P)		3	S	2		2				1	1	1
Unadjusted Volume		838	591	674		660				179	448	357
Peak Hour Factor (PHF)		1.00	1.00	1.00		1.00				1.00	1.00	1.00
Min/Ped Time Override (sec)		22	22	12		22				12	12	12
Progression Adj. Factor (PAF)		1.00	-	1.00		1.00				1.00	1.00	1.00

Output

Peak Hour Volume (vph)	838	591	674	660					179	448	357
Saturation Flow (vph)	5700	Shrd	3500	3800					1800	1900	1800
X or Volume/Capacity	0.70	-	0.74	0.27					0.31	0.74	0.62
Effective Green (sec)	36	-	26	64					32	32	32
Split Time (sec)	38	-	28	66					34	34	34
Min. Time or Ped. Time (sec)	22	-	12	22					12	12	12
Delay - 15 min pk (sec/veh)	29	-	39	8					27	38	34
Level of Service (LOS)	C	-	D+	A					C	D+	C-
Average 'Q' (veh/ln)	8	-	7	3					3	9	7
Design 'Q'-ft/ln (1.5*Qavg)	240	-	220	100					100	280	220
Do Vehicles Clear?	YES	-	YES	YES					YES	YES	YES

Summary of Results

Whole Intersection		Critical Movements	
Weighted Average Delay (seconds) =	29	Weighted Average Delay (seconds) =	34
Level of Service - LOS =	C	Level of Service - LOS =	C-
Intersection Capacity Utilization - ICU = 0.72			
Predetermined Cycle Length is 100 sec			
Min./Ped. Times Satisfied			
Analysis Based on User Selected Splits			

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

77

Future Buildout 2030

Nutwood Ave at SR-57 NB Ramps

Caltrans

AM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

Movement Times	Eastbound			Westbound			Northbound			Southbound		
	L*	T	R	L	T*	R	L*	T	R	L	T	R
Movement 1: 14 secs	X	X										
Movement 2: 43 secs		X			X	X						
Movement 3: 43 secs							X	X	X			
Movement 4: 0 secs												
Movement 5: 0 secs												
Movement 6: 0 secs												
# of Lanes (#, S, P)	2	2		2	S		2	1	1			
Unadjusted Volume	196	329		1219	147		1229	505	213			
Peak Hour Factor (PHF)	1.00	1.00		1.00	1.00		1.00	1.00	1.00			
Min/Ped Time Override (sec)	12	21		21	21		20	20	20			
Progression Adj. Factor (PAF)	1.00	1.00		1.00	-		1.00	1.00	1.00			

Output

	***			***			***		
Peak Hour Volume (vph)	196	329		1219	147		1229	505	213
Saturation Flow (vph)	3500	3800		3800	Shrd		3500	1900	1800
X or Volume/Capacity	0.47	0.16		0.88	-		0.86	0.65	0.29
Effective Green (sec)	12	55		41	-		41	41	41
Split Time (sec)	14	57		43	-		43	43	43
Min. Time or Ped. Time (sec)	12	21		21	-		20	20	20
Delay - 15 min pk (sec/veh)	45	11		34	-		34	28	21
Level of Service (LOS)	D	B		C-	-		C-	C	C+
Average 'Q' (veh/ln)	2	2		11	-		10	8	3
Design 'Q'-ft/ln (1.5*Qavg)	60	60		340	-		300	240	100
Do Vehicles Clear?	YES	YES		YES	-		YES	YES	YES

Summary of Results

Whole Intersection		Critical Movements	
Weighted Average Delay (seconds) =	32	Weighted Average Delay (seconds) =	35
Level of Service - LOS =	C-	Level of Service - LOS =	C-
		Intersection Capacity Utilization - ICU =	0.82
Predetermined Cycle Length is 100 sec			
Min/Ped. Times Satisfied			
Analysis Based on User Selected Splits			

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

11

Future Buildout 2030

Nutwood Ave at SR-57 NB Ramps

Caltrans

PM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

	Eastbound			Westbound			Northbound			Southbound		
Movement Times	L	T	R	L	T	R	L	T	R	L	T	R
Movement 1: 18 secs	X	X										
Movement 2: 31 secs		X		X	X							
Movement 3: 51 secs							X	X	X			
Movement 4: 0 secs												
Movement 5: 0 secs												
Movement 6: 0 secs												
# of Lanes (#, S, P)	2	2		2	S		2	1	1			
Unadjusted Volume	387	693		633	108	711	643	204				
Peak Hour Factor (PHF)	1.00	1.00		1.00	1.00	1.00	1.00	1.00				
Min/Ped Time Override (sec)	12	21		21	21	20	20	20				
Progression Adj. Factor (PAF)	1.00	1.00		1.00	-	1.00	1.00	1.00				

Output

	***			***			***				
Peak Hour Volume (vph)	387	693		633	108	711	643	204			
Saturation Flow (vph)	3500	3800		3800	Shrd	3500	1900	1800			
X or Volume/Capacity	0.69	0.39		0.67	-	0.41	0.69	0.23			
Effective Green (sec)	16	47		29	-	49	49	49			
Split Time (sec)	18	49		31	-	51	51	51			
Min. Time or Ped. Time (sec)	12	21		21	-	20	20	20			
Delay - 15 min pk (sec/veh)	47	18		35	-	17	24	15			
Level of Service (LOS)	D	B		C	-	B	C+	B			
Average 'Q' (veh/ln)	5	5		7	-	5	9	3			
Design 'Q'-ft/ln (1.5*Qavg)	160	160		220	-	160	280	100			
Do Vehicles Clear?	YES	YES		YES	-	YES	YES	YES			

Summary of Results

Whole Intersection		Critical Movements	
Weighted Average Delay (seconds) =	26	Weighted Average Delay (seconds) =	34
Level of Service - LOS =	C	Level of Service - LOS =	C-
Intersection Capacity Utilization - ICU = 0.69			
Predetermined Cycle Length is 100 sec			
Min./Ped. Times Satisfied			
Analysis Based on User Selected Splits			

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

78

Future Buildout 2030

Chapman Ave at SR-57 SB Ramps

Caltrans

AM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

	Eastbound			Westbound			Northbound			Southbound		
	L	T*	R	*L*	T	R	L	T	R	L	T	*R*
Movement 1: 25 secs		X		X	X							
Movement 2: 51 secs		X	X		X							
Movement 3: 24 secs										X	X	X
Movement 4: 0 secs												
Movement 5: 0 secs												
Movement 6: 0 secs												
# of Lanes (#, S, P)	2		S	1	2					S	1	1
Unadjusted Volume	1086		626	391	2092					114	19	376
Peak Hour Factor (PHF)	1.00		1.00	1.00	1.00					1.00	1.00	1.00
Min/Ped Time Override (sec)	23		23	12	23					23	23	23
Progression Adj. Factor (PAF)	1.00		-	1.00	1.00					-	1.00	1.00

Output

Peak Hour Volume (vph)	1086	626	391	2092					114	19	376
Saturation Flow (vph)	3800	Shrd	1800	3800					Shrd	1900	1800
X or Volume/Capacity	0.92	-	0.94	0.74					-	0.32	0.95
Effective Green (sec)	49	-	23	74					-	22	22
Split Time (sec)	51	-	25	76					-	24	24
Min. Time or Ped. Time (sec)	23	-	12	23					-	23	23
Delay - 15 min pk (sec/veh)	33	-	70	9					-	35	73
Level of Service (LOS)	C-	-	E	A					-	C-	E
Average 'Q' (veh/in)	13	-	9	8					-	3	9
Design 'Q'-ft/in (1.5*Qavg)	400	-	280	240					-	100	280
Do Vehicles Clear?	YES	-	NO	YES					-	YES	NO

Summary of Results

Whole Intersection		Critical Movements	
Weighted Average Delay (seconds) =	29	Weighted Average Delay (seconds) =	45
Level of Service - LOS =	C	Level of Service - LOS =	D
		Intersection Capacity Utilization - ICU =	0.93
Predetermined Cycle Length is 100 sec			
Min./Ped. Times Satisfied			
Analysis Based on User Selected Splits			

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

78

Future Buildout 2030

Chapman Ave at SR-57 SB Ramps

Caltrans

PM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

	Eastbound			Westbound			Northbound			Southbound		
	L	T*	R	*L*	T	R	L	T	R	L	T	*R*
Movement Times												
Movement 1: 22 secs				X	X							
Movement 2: 55 secs		X	X		X							
Movement 3: 23 secs										X	X	X
Movement 4: 0 secs												
Movement 5: 0 secs												
Movement 6: 0 secs												
# of Lanes (#, S, P)	2		S	1	2					S	1	1
Unadjusted Volume	1852		751	470	2216					136	54	414
Peak Hour Factor (PHF)	1.00		1.00	1.00	1.00					1.00	1.00	1.00
Min/Ped Time Override (sec)	23		23	12	23					23	23	23
Progression Adj. Factor (PAF)	1.00		-	1.00	1.00					-	1.00	1.00

Output

Peak Hour Volume (vph)	1852	751	470	2216					136	54	414
Saturation Flow (vph)	3800	Shrd	1800	3800					Shrd	1900	1800
X or Volume/Capacity	1.29	-	1.31	0.78					-	0.48	1.10
Effective Green (sec)	53	-	20	75					-	21	21
Split Time (sec)	55	-	22	77					-	23	23
Min. Time or Ped. Time (sec)	23	-	12	23					-	23	23
Delay - 15 min pk (sec/veh)	171	-	200	10					-	39	115
Level of Service (LOS)	F	-	F	A					-	D+	F
Average 'Q' (veh/ln)	30	-	16	8					-	4	11
Design 'Q'-ft/ln (1.5*Qavg)	900	-	480	240					-	120	340
Do Vehicles Clear?	NO	-	NO	YES					-	YES	NO

Summary of Results

Oversaturated - Mitigation Required	
Whole Intersection	Critical Movements
Weighted Average Delay (seconds) = 105	Weighted Average Delay (seconds) = 168
Level of Service - LOS = F	Level of Service - LOS = F
Intersection Capacity Utilization - ICU = 1.25	
Predetermined Cycle Length is 100 sec	
Min./Ped. Times Satisfied	
Analysis Based on User Selected Splits	

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

79

Future Buildout 2030

Chapman Ave at SR-57 NB Ramps

Caltrans

AM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

	Eastbound			Westbound			Northbound			Southbound		
Movement Times	L*	T	R	L	T*	R	L	T*	R	L	T	R
Movement 1: 20 secs	X	X										
Movement 2: 49 secs		X		X	X							
Movement 3: 31 secs							X	X	X			
Movement 4: 0 secs												
Movement 5: 0 secs												
Movement 6: 0 secs												
# of Lanes (#, S, P)	1	2		2	S		S	3	S			
Unadjusted Volume	320	898		1594	234		967	39	570			
Peak Hour Factor (PHF)	1.00	1.00		1.00	1.00		1.00	1.00	1.00			
Sat. Flow Override (vph)					Shrd		Shrd	5400	Shrd			
Min/Ped Time Override (sec)	12	23		23	23		12	12	12			
Progression Adj. Factor (PAF)	1.00	1.00		1.00	-		-	1.00	-			

Output

	***			***			***					
Peak Hour Volume (vph)	320	898		1594	234		967	39	570			
Saturation Flow (vph)	1800	3800		3800	Shrd		Shrd	5400	Shrd			
X or Volume/Capacity	0.99	0.35		1.02	-		-	1.01	-			
Effective Green (sec)	18	67		47	-		-	29	-			
Split Time (sec)	20	69		49	-		-	31	-			
Min. Time or Ped. Time (sec)	12	23		23	-		-	12	-			
Delay - 15 min pk (sec/veh)	88	8		55	-		-	60	-			
Level of Service (LOS)	F	A		D	-		-	E+	-			
Average 'Q' (veh/ln)	8	4		15	-		-	11	-			
Design 'Q'-ft/ln (1.5*Qavg)	240	120		460	-		-	340	-			
Do Vehicles Clear?	NO	YES		NO	-		-	NO	-			

Summary of Results

Oversaturated - Mitigation Required			
Whole Intersection		Critical Movements	
Weighted Average Delay (seconds) =	50	Weighted Average Delay (seconds) =	60
Level of Service - LOS =	D	Level of Service - LOS =	F
		Intersection Capacity Utilization - ICU =	1.01
Predetermined Cycle Length is 100 sec			
Min./Ped. Times Satisfied			

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

Future Buildout 2030

19

Chapman Ave at SR-57 NB Ramps

Caltrans

PM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

	Eastbound			Westbound			Northbound			Southbound		
	L*	T	R	L	T*	R	L	T*	R	L	T	R
Movement 1: 23 secs	X	X										
Movement 2: 54 secs		X		X	X							
Movement 3: 23 secs							X	X	X			
Movement 4: 0 secs												
Movement 5: 0 secs												
Movement 6: 0 secs												
# of Lanes (#, S, P)	1	2		2	S	S	3	S				
Unadjusted Volume	460	1768		2087	391	964	22	435				
Peak Hour Factor (PHF)	1.00	1.00		1.00	1.00	1.00	1.00	1.00				
Sat. Flow Override (vph)					Shrd	Shrd	5400	Shrd				
Min/Ped Time Override (sec)	12	23		23	23	12	12	12				
Progression Adj. Factor (PAF)	1.00	1.00		1.00	-	-	1.00	-				

Output

	***			***			***					
Peak Hour Volume (vph)	460	1768		2087	391	964	22	435				
Saturation Flow (vph)	1800	3800		3800	Shrd	Shrd	5400	Shrd				
X or Volume/Capacity	1.22	0.62		1.25	-	-	1.25	-				
Effective Green (sec)	21	75		52	-	-	21	-				
Split Time (sec)	23	77		54	-	-	23	-				
Min. Time or Ped. Time (sec)	12	23		23	-	-	12	-				
Delay - 15 min pk (sec/veh)	161	7		152	-	-	164	-				
Level of Service (LOS)	F	A		F	-	-	F	-				
Average 'Q' (veh/ln)	14	6		28	-	-	14	-				
Design 'Q'-ft/ln (1.5*Qavg)	420	180		840	-	-	420	-				
Do Vehicles Clear?	NO	YES		NO	-	-	NO	-				

Summary of Results

Oversaturated - Mitigation Required			
Whole Intersection		Critical Movements	
Weighted Average Delay (seconds) =	114	Weighted Average Delay (seconds) =	157
Level of Service - LOS =	F	Level of Service - LOS =	F
		Intersection Capacity Utilization - ICU =	1.25
Predetermined Cycle Length is 100 sec			
Min./Ped. Times Satisfied			

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

Future Buildout 2030

80

Orangethorpe Ave at SR-57 SB Ramps

Caltrans

AM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

Movement Times	Eastbound			Westbound			Northbound			Southbound		
	L*	T	R	L	T*	R	L	T*	R	L	T*	R
Movement 1: 13 secs	X			X								
Movement 2: 41 secs		X	X		X	X						
Movement 3: 13 secs							X	X	X			
Movement 4: 33 secs										X	X	X
Movement 5: 0 secs												
Movement 6: 0 secs												
# of Lanes (#, S, P)	2	3	S	1	3	1	S	1	S	S	2	S
Unadjusted Volume	153	961	10	19	1613	409	13	10	40	424	10	353
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
Sat. Flow Override (vph)			Shrd				Shrd		Shrd	Shrd	3500	Shrd
Min/Ped Time Override (sec)	12	22	22	12	22	22	12	12	12	30	30	30
Progression Adj. Factor (PAF)	1.00	1.00	-	1.00	1.00	1.00	-	1.00	-	-	1.00	-

Output

	***			***			***			***		
Peak Hour Volume (vph)	153	961	10	19	1613	409	13	10	40	424	10	353
Saturation Flow (vph)	3500	5700	Shrd	1800	5700	1800	Shrd	1900	Shrd	Shrd	3500	Shrd
X or Volume/Capacity	0.40	0.44	-	0.10	0.73	0.58	-	0.30	-	-	0.73	-
Effective Green (sec)	11	39	-	11	39	39	-	11	-	-	31	-
Split Time (sec)	13	41	-	13	41	41	-	13	-	-	33	-
Min. Time or Ped. Time (sec)	12	22	-	12	22	22	-	12	-	-	30	-
Delay - 15 min pk (sec/veh)	44	23	-	41	28	28	-	45	-	-	35	-
Level of Service (LOS)	D	C+	-	D	C	C	-	D	-	-	C-	-
Average 'Q' (veh/ln)	2	5	-	1	9	7	-	2	-	-	8	-
Design 'Q'-ft/ln (1.5*Qavg)	60	160	-	40	280	220	-	60	-	-	240	-
Do Vehicles Clear?	YES	YES	-	YES	YES	YES	-	YES	-	-	YES	-

Summary of Results

Whole Intersection		Critical Movements	
Weighted Average Delay (seconds) =	30	Weighted Average Delay (seconds) =	32
Level of Service - LOS =	C	Level of Service - LOS =	C-
		Intersection Capacity Utilization - ICU =	0.64
Predetermined Cycle Length is 100 sec Min./Ped. Times Satisfied Analysis Based on User Selected Splits			

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

80

Future Buildout 2030

Orangethorpe Ave at SR-57 SB Ramps

Fullerton

PM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

	Eastbound			Westbound			Northbound			Southbound		
Movement Times	L	T	R	L	T	R	L	T	R	L	T	R
Movement 1: 19 secs	X			X								
Movement 2: 39 secs		X	X		X	X						
Movement 3: 12 secs							X	X	X			
Movement 4: 30 secs										X	X	X
Movement 5: 0 secs												
Movement 6: 0 secs												
# of Lanes (#, S, P)	2	3	S	1	3	1	S	1	S	S	2	S
Unadjusted Volume	460	1510	10	21	1633	370	15	10	15	213	10	375
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
Sat. Flow Override (vph)			Shrd				Shrd		Shrd	Shrd	3500	Shrd
Min/Ped Time Override (sec)	12	22	22	12	22	22	12	12	12	30	30	30
Progression Adj. Factor (PAF)	1.00	1.00	-	1.00	1.00	1.00	-	1.00	-	-	1.00	-

Output

	***			***			***			***		
Peak Hour Volume (vph)	460	1510	10	21	1633	370	13	10	15	213	10	375
Saturation Flow (vph)	3500	5700	Shrd	1800	5700	1800	Shrd	1900	Shrd	Shrd	3500	Shrd
X or Volume/Capacity	0.77	0.72	-	0.07	0.77	0.56	-	0.22	-	-	0.61	-
Effective Green (sec)	17	37	-	17	37	37	-	10	-	-	28	-
Split Time (sec)	19	39	-	19	39	39	-	12	-	-	30	-
Min. Time or Ped. Time (sec)	12	22	-	12	22	22	-	12	-	-	30	-
Delay - 15 min pk (sec/veh)	49	29	-	35	31	28	-	44	-	-	34	-
Level of Service (LOS)	D	C	-	D+	C	C	-	D	-	-	C-	-
Average 'Q' (veh/ln)	5	9	-	1	10	6	-	1	-	-	6	-
Design 'Q' (1.5*Qavg)	160	280	-	40	300	180	-	40	-	-	180	-
Do Vehicles Clear?	YES	YES	-	YES	YES	YES	-	YES	-	-	YES	-

Summary of Results

Whole Intersection		Critical Movements	
Weighted Average Delay (seconds) =	33	Weighted Average Delay (seconds) =	35
Level of Service - LOS =	C-	Level of Service - LOS =	C-
		Intersection Capacity Utilization - ICU =	0.66
Predetermined Cycle Length is 100 sec			
Min./Ped. Times Satisfied			
Analysis Based on User Selected Splits			

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay
Future Buildout 2030

81

Orangethorpe Ave at SR-57 NB Ramps

Caltrans

AM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

	Eastbound			Westbound			Northbound			Southbound		
Movement Times	L*	T	R	L	T*	R	L	T	R*	L	T	R
Movement 1: 14 secs	X	X										
Movement 2: 45 secs		X			X	X						
Movement 3: 41 secs							X	X	X			
Movement 4: 0 secs												
Movement 5: 0 secs												
Movement 6: 0 secs												
# of Lanes (#, S, P)	2	3		3	S	S	2	1				
Unadjusted Volume	205	1186		1411	284	673	10	495				
Peak Hour Factor (PHF)	1.00	1.00		1.00	1.00	1.00	1.00	1.00				
Sat. Flow Override (vph)					Shrd	Shrd	3500					
Min/Ped Time Override (sec)	12	21		21	21	31	31	31				
Progression Adj. Factor (PAF)	1.00	1.00		1.00	-	-	1.00	1.00				

Output

Peak Hour Volume (vph)	205	1186		1411	284	673	10	495				
Saturation Flow (vph)	3500	5700		5700	Shrd	Shrd	3500	1800				
X or Volume/Capacity	0.49	0.37		0.69	-	-	0.50	0.71				
Effective Green (sec)	12	57		43	-	-	39	39				
Split Time (sec)	14	59		45	-	-	41	41				
Min. Time or Ped. Time (sec)	12	21		21	-	-	31	31				
Delay - 15 min pk (sec/veh)	45	12		25	-	-	24	32				
Level of Service (LOS)	D	B		C+	-	-	C+	C				
Average 'Q' (veh/in)	3	5		9	-	-	6	8				
Design 'Q'-R/n (1.5*Qavg)	100	160		280	-	-	180	240				
Do Vehicles Clear?	YES	YES		YES	-	-	YES	YES				

Summary of Results

Whole Intersection		Critical Movements	
Weighted Average Delay (seconds) =	23	Weighted Average Delay (seconds) =	28
Level of Service - LOS =	C+	Level of Service - LOS =	C
		Intersection Capacity Utilization - ICU =	0.67
Predetermined Cycle Length is 100 sec			
Min./Ped. Times Satisfied			

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

81

Future Buildout 2030

Orangethorpe Ave at SR-57 NB Ramps

Caltrans

PM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	*T*	R	L	T	*R*	L	T	R
Movement 1: 15 secs	X	X										
Movement 2: 46 secs		X			X	X						
Movement 3: 39 secs							X	X	X			
Movement 4: 0 secs												
Movement 5: 0 secs												
Movement 6: 0 secs												
# of Lanes (#, S, P)	2	3		3	S	S	2	1				
Unadjusted Volume	393	1302		1560	712	421	10	602				
Peak Hour Factor (PHF)	1.00	1.00		1.00	1.00	1.00	1.00	1.00				
Sat. Flow Override (vph)					Shrd	Shrd	3500					
Min/Ped Time Override (sec)	12	21		21	21	31	31	31				
Progression Adj. Factor (PAF)	1.00	1.00		1.00	-	-	1.00	1.00				

Output

	***			***			***				
Peak Hour Volume (vph)	393	1302		1560	712	421	10	602			
Saturation Flow (vph)	3500	5700		5700	Shrd	Shrd	3500	1800			
X or Volume/Capacity	0.86	0.39		0.91	-	-	0.33	0.90			
Effective Green (sec)	13	59		44	-	-	37	37			
Split Time (sec)	15	61		46	-	-	39	39			
Min. Time or Ped. Time (sec)	12	21		21	-	-	31	31			
Delay - 15 min pk (sec/veh)	62	11		32	-	-	23	48			
Level of Service (LOS)	E	B		C-	-	-	C+	D			
Average 'Q' (veh/ln)	5	5		12	-	-	4	11			
Design 'Q'-ft/ln (1.5*Qavg)	160	160		360	-	-	120	340			
Do Vehicles Clear?	YES	YES		YES	-	-	YES	YES			

Summary of Results

Whole Intersection		Critical Movements	
Weighted Average Delay (seconds) =	31	Weighted Average Delay (seconds) =	39
Level of Service - LOS =	C-	Level of Service - LOS =	D+
		Intersection Capacity Utilization - ICU =	0.90
Predetermined Cycle Length is 100 sec			
Min./Ped. Times Satisfied			

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

82

Future Buildout 2030

Magnolia Ave at SR-91 WB Ramps

Caltrans

AM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Movement Times												
Movement 1: 23 secs				X	X	X						
Movement 2: 16 secs							X	X				
Movement 3: 61 secs								X		X	X	X
Movement 4: 0 secs												
Movement 5: 0 secs												
Movement 6: 0 secs												
# of Lanes (#, S, P)				2	1	S	2	3		2		1
Unadjusted Volume				482	13	265	351	1336		1655		439
Peak Hour Factor (PHF)				1.00	1.00	1.00	1.00	1.00		1.00		1.00
Sat. Flow Override (vph)					1800	Shrd						
Min/Ped Time Override (sec)				13	13	13	12	24		24		24
Progression Adj. Factor (PAF)				1.00	1.00	-	1.00	1.00		1.00		1.00

Output

Peak Hour Volume (vph)				482	13	265	351	1336		1655		439
Saturation Flow (vph)				3500	1800	Shrd	3500	5700		3800		1800
X or Volume/Capacity				0.66	0.74	-	0.72	0.31		0.74		0.41
Effective Green (sec)				21	21	-	14	75		59		59
Split Time (sec)				23	23	-	16	77		61		61
Min. Time or Ped. Time (sec)				13	13	-	12	24		24		24
Delay - 15 min pk (sec/veh)				41	49	-	50	4		17		12
Level of Service (LOS)				D	D	-	D	A		B		B
Average 'Q' (veh/ln)				5	6	-	4	3		9		5
Design 'Q'-ft/ln (1.5*Qavg)				160	180	-	120	100		280		160
Do Vehicles Clear?				YES	YES	-	YES	YES		YES		YES

Summary of Results

Whole Intersection		Critical Movements	
Weighted Average Delay (seconds) =	20	Weighted Average Delay (seconds) =	27
Level of Service - LOS =	B	Level of Service - LOS =	C
		Intersection Capacity Utilization - ICU =	0.73
Predetermined Cycle Length is 100 sec			
Min./Ped. Times Satisfied			
Analysis Based on User Selected Splits			

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

82

Future Buildout 2030

Magnolia Ave at SR-91 WB Ramps

Caltrans

PM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	*L*	T	R	*L*	T	R	L	T*	R
Movement Times												
Movement 1: 23 secs				X	X	X						
Movement 2: 15 secs							X	X				
Movement 3: 62 secs								X		X		X
Movement 4: 0 secs												
Movement 5: 0 secs												
Movement 6: 0 secs												
# of Lanes (#, S, P)				2	1	S	2	3		2		1
Unadjusted Volume				492	24	202	264	1972		1540		324
Peak Hour Factor (PHF)				1.00	1.00	1.00	1.00	1.00		1.00		1.00
Sat. Flow Override (vph)					1800	Shrd						
Min/Ped Time Override (sec)				13	13	13	12	24		24		24
Progression Adj. Factor (PAF)				1.00	1.00	-	1.00	1.00		1.00		1.00

Output

	***			***			***					
Peak Hour Volume (vph)				492	24	202	264	1972		1540		324
Saturation Flow (vph)				3500	1800	Shrd	3500	5700		3800		1800
X or Volume/Capacity				0.67	0.60	-	0.58	0.46		0.68		0.30
Effective Green (sec)				21	21	-	13	75		60		60
Split Time (sec)				23	23	-	15	77		62		62
Min. Time or Ped. Time (sec)				13	13	-	12	24		24		24
Delay - 15 min pk (sec/veh)				41	43	-	46	5		15		10
Level of Service (LOS)				D	D	-	D	A		B		B
Average 'Q' (veh/ln)				5	5	-	3	5		9		4
Design 'Q'-ft/ln (1.5*Qavg)				160	160	-	100	160		280		120
Do Vehicles Clear?				YES	YES	-	YES	YES		YES		YES

Summary of Results

Whole Intersection		Critical Movements	
Weighted Average Delay (seconds) =	17	Weighted Average Delay (seconds) =	25
Level of Service - LOS =	B	Level of Service - LOS =	C+
		Intersection Capacity Utilization - ICU =	0.66
Predetermined Cycle Length is 100 sec			
Min./Ped. Times Satisfied			
Analysis Based on User Selected Splits			

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

83

Future Buildout 2030 (EB Ped Ovr)

Magnolia Ave at I-5 NB Off-Ramp

Caltrans

AM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Movement 1: 24 secs	X	X	X									
Movement 2: 15 secs				X	X	X						
Movement 3: 13 secs										X	X	
Movement 4: 48 secs							X	X			X	
Movement 5: 0 secs												
Movement 6: 0 secs												
# of Lanes (#, S, P)	S	2	S	S	1	S	3	1	2	2		
Unadjusted Volume	349	51	300	122	10	80	1225	827	367	1714		
Peak Hour Factor (PHF)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Min/Ped Time Override (sec)	31	31	31	12	12	12	26	26	12	26		
Progression Adj. Factor (PAF)	-	1.00	-	-	1.00	-	1.00	1.00	1.00	1.00		

Output

Peak Hour Volume (vph)	349	51	300	122	10	80	1225	827	367	1714
Saturation Flow (vph)	Shrd	3800	Shrd	Shrd	1900	Shrd	5700	1800	3500	3800
X or Volume/Capacity	-	0.84	-	-	0.86	-	0.47	1.00	0.95	0.76
Effective Green (sec)	-	22	-	-	13	-	46	46	11	59
Split Time (sec)	-	24	-	-	15	-	48	48	13	61
Min. Time or Ped. Time (sec)	-	31	-	-	12	-	26	26	12	26
Delay - 15 min pk (sec/veh)	-	47	-	-	73	-	19	58	80	18
Level of Service (LOS)	-	D	-	-	E	-	B	E+	E	B
Average 'Q' (veh/ln)	-	8	-	-	6	-	6	14	5	10
Design 'Q'-ft/ln (1.5*Qavg)	-	240	-	-	180	-	180	420	160	300
Do Vehicles Clear?	-	YES	-	-	YES	-	YES	NO	NO	YES

Summary of Results

Whole Intersection	Critical Movements
Weighted Average Delay (seconds) = 36	Weighted Average Delay (seconds) = 60
Level of Service - LOS = D+	Level of Service - LOS = E+
	Intersection Capacity Utilization - ICU = 0.93
Predetermined Cycle Length is 100 sec Min./Ped. Times May Not Be Satisfied Analysis Based on User Selected Splits	

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

Future Buildout 2030 (EB Ped Ovr)

83

Magnolia Ave at I-5 NB Off-Ramp

Caltrans

PM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

Movement Times	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Movement 1: 29 secs	X	X	X									
Movement 2: 12 secs				X	X	X						
Movement 3: 12 secs										X	X	X
Movement 4: 47 secs							X	X	X			
Movement 5: 0 secs												
Movement 6: 0 secs												
# of Lanes (#, S, P)	S	2	S	S	1	S	3	1	2	2		
Unadjusted Volume	620	48	404	68	10	37	1606	854	301	1708		
Peak Hour Factor (PHF)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Min/Ped Time Override (sec)	31	31	31	12	12	12	26	26	12	26		
Progression Adj. Factor (PAF)	-	1.00	-	-	1.00	-	1.00	1.00	1.00	1.00		

Output

	***			***			***			***		
Peak Hour Volume (vph)	620	48	404	68	10	37	1606	854	301	1708		
Saturation Flow (vph)	Shrd	3800	Shrd	Shrd	1900	Shrd	5700	1800	3500	3800		
X or Volume/Capacity	-	1.04	-	-	0.61	-	0.63	1.05	0.86	0.79		
Effective Green (sec)	-	27	-	-	10	-	45	45	10	57		
Split Time (sec)	-	29	-	-	12	-	47	47	12	59		
Min. Time or Ped. Time (sec)	-	31	-	-	12	-	26	26	12	26		
Delay - 15 min pk (sec/veh)	-	78	-	-	57	-	22	76	67	20		
Level of Service (LOS)	-	E-	-	-	E+	-	C+	E-	E	B		
Average 'Q' (veh/ln)	-	12	-	-	3	-	8	16	4	10		
Design 'Q'-ft/ln (1.5*Qavg)	-	360	-	-	100	-	240	480	120	300		
Do Vehicles Clear?	-	NO	-	-	YES	-	YES	NO	YES	YES		

Summary of Results

Intersection Unstable-Consider Mitigation			
Whole Intersection		Critical Movements	
Weighted Average Delay (seconds) =	44	Weighted Average Delay (seconds) =	75
Level of Service - LOS =	D	Level of Service - LOS =	E
		Intersection Capacity Utilization - ICU = 0.98	
Predetermined Cycle Length is 100 sec Min JPed. Times May Not Be Satisfied Analysis Based on User Selected Splits			

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

Future Buildout 2030

84

Magnolia Ave at SR-91 EB Off/I-5 SB On

Caltrans

AM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Movement Times												
Movement 1: 21 secs	X	X	X									
Movement 2: 30 secs										X	X	
Movement 3: 49 secs							X	X				X
Movement 4: 0 secs												
Movement 5: 0 secs												
Movement 6: 0 secs												
# of Lanes (#, S, P)	1	2	S				3	1		2	3	
Unadjusted Volume	226	10	388				1801	271		655	1193	
Peak Hour Factor (PHF)	1.00	1.00	1.00				1.00	1.00		1.00	1.00	
Sat. Flow Override (vph)	2000	3400	Shrd									
Min/Ped Time Override (sec)	10	10	10				20	20		10	20	
Progression Adj. Factor (PAF)	1.00	1.00	-				1.00	1.00		1.00	1.00	

Output

	***			***			***			
Peak Hour Volume (vph)	226	10	388				1801	271	655	1193
Saturation Flow (vph)	2000	3400	Shrd				5700	1800	3500	5700
X or Volume/Capacity	0.59	0.62	-				0.67	0.32	0.67	0.27
Effective Green (sec)	19	19	-				47	47	28	77
Split Time (sec)	21	21	-				49	49	30	79
Min. Time or Ped. Time (sec)	10	10	-				20	20	10	20
Delay - 15 min pk (sec/veh)	44	42	-				22	18	36	3
Level of Service (LOS)	D	D	-				C+	B	D+	A
Average 'Q' (veh/ln)	5	4	-				9	4	7	3
Design 'Q'-ft/ln (1.5*Qavg)	160	120	-				280	120	220	100
Do Vehicles Clear?	YES	YES	-				YES	YES	YES	YES

Summary of Results

Whole Intersection		Critical Movements	
Weighted Average Delay (seconds) =	22	Weighted Average Delay (seconds) =	28
Level of Service - LOS =	C+	Level of Service - LOS =	C
		Intersection Capacity Utilization - ICU =	0.66
Predetermined Cycle Length is 100 sec			
Min./Ped. Times Satisfied			
Notes: SR-91 EB Off Ramp/I-5 SB On Ramp			

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

84

Future Buildout 2030

Magnolia Ave at SR-91 EB Off/I-5 SB On

Caltrans

PM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

Movement Times	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	*T*	R	*L*	T	R
Movement 1: 44 secs	X	X	X									
Movement 2: 21 secs										X	X	
Movement 3: 35 secs								X	X		X	
Movement 4: 0 secs												
Movement 5: 0 secs												
Movement 6: 0 secs												
# of Lanes (#, S, P)	1	2	S				3	1		2	3	
Unadjusted Volume	726	10	444				1769	377		641	1521	
Peak Hour Factor (PHF)	1.00	1.00	1.00				1.00	1.00		1.00	1.00	
Min/Ped Time Override (sec)	10	10	10				20	20		10	20	
Progression Adj. Factor (PAF)	1.00	1.00	-				1.00	1.00		1.00	1.00	

Output

Peak Hour Volume (vph)	726	10	444				1769	377		641	1521	
Saturation Flow (vph)	1800	3800	Shrd				5700	1800		3500	5700	
X or Volume/Capacity	0.96	0.28	-				0.94	0.63		0.96	0.49	
Effective Green (sec)	42	42	-				33	33		19	54	
Split Time (sec)	44	44	-				35	35		21	56	
Min. Time or Ped. Time (sec)	10	10	-				20	20		10	20	
Delay - 15 min pk (sec/veh)	53	20	-				43	33		67	15	
Level of Service (LOS)	D-	B	-				D	C-		E	B	
Average 'Q' (veh/ln)	13	4	-				11	7		8	6	
Design 'Q'-ft/ln (1.5*Qavg)	400	120	-				340	220		240	180	
Do Vehicles Clear?	NO	YES	-				YES	YES		NO	YES	

Summary of Results

Intersection Unstable-Consider Mitigation			
Whole Intersection		Critical Movements	
Weighted Average Delay (seconds) =	37	Weighted Average Delay (seconds) =	51
Level of Service - LOS =	D+	Level of Service - LOS =	D-
		Intersection Capacity Utilization - ICU = 0.95	
Predetermined Cycle Length is 100 sec			
Min./Ped. Times Satisfied			
Notes: SR-91 EB Off Ramp/I-5 SB On Ramp			

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

85

Future Buildout 2030

Brookhurst at SR-91 WB Ramps

Caltrans

AM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	*R*	*L*	T	R	L	T	R
Movement Times												
Movement 1: 39 secs				X		X						
Movement 2: 15 secs							X	X				
Movement 3: 46 secs								X			X	X
Movement 4: 0 secs												
Movement 5: 0 secs												
Movement 6: 0 secs												
# of Lanes (#, S, P)				2		1	1	2			3	S
Unadjusted Volume				415		353	83	1059			1012	326
Peak Hour Factor (PHF)				1.00		1.00	1.00	1.00			1.00	1.00
Min/Ped Time Override (sec)				24		24	12	18			18	18
Progression Adj. Factor (PAF)				1.00		1.00	1.00	1.00			1.00	-

Output

	***			***			***				
Peak Hour Volume (vph)				415	353	83	1059			1012	326
Saturation Flow (vph)				3500	1800	1800	3800			5700	Shrd
X or Volume/Capacity				0.32	0.53	0.35	0.47			0.53	-
Effective Green (sec)				37	37	13	59			44	-
Split Time (sec)				39	39	15	61			46	-
Min. Time or Ped. Time (sec)				24	24	12	18			18	-
Delay - 15 min pk (sec/veh)				23	28	44	12			21	-
Level of Service (LOS)				C+	C	D	B			C+	-
Average 'Q' (veh/ln)				4	6	2	6			7	-
Design 'Q'-ft/ln (1.5*Qavg)				120	180	60	180			220	-
Do Vehicles Clear?				YES	YES	YES	YES			YES	-

Summary of Results

Whole Intersection		Critical Movements	
Weighted Average Delay (seconds) =	20	Weighted Average Delay (seconds) =	24
Level of Service - LOS =	B	Level of Service - LOS =	C+
		Intersection Capacity Utilization - ICU =	0.51
Predetermined Cycle Length is 100 sec			
Min./Ped. Times Satisfied			
Analysis Based on User Selected Splits			

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

Future Buildout 2030

85

Brookhurst at SR-91 WB Ramps

Caltrans

PM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

Movement Times	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	*R*	*L*	T	R	L	*T*	R
Movement 1: 37 secs				X		X						
Movement 2: 15 secs							X	X				
Movement 3: 48 secs								X			X	X
Movement 4: 0 secs												
Movement 5: 0 secs												
Movement 6: 0 secs												
# of Lanes (#, S, P)				2		1	-1	2		3		S
Unadjusted Volume				591		432	102	1507		1224		387
Peak Hour Factor (PHF)				1.00		1.00	1.00	1.00		1.00		1.00
Sat. Flow Override (vph)										5100		Shrd
Min/Ped Time Override (sec)				24		24	12	18		18		18
Progression Adj. Factor (PAF)				1.00		1.00	1.00	1.00		1.00		-

Output

Peak Hour Volume (vph)			591	432	102	1507			1224	387
Saturation Flow (vph)			3500	1800	1800	3800			5100	Shrd
X or Volume/Capacity			0.48	0.69	0.44	0.65			0.69	-
Effective Green (sec)			35	35	13	61			46	-
Split Time (sec)			37	37	15	63			48	-
Min. Time or Ped. Time (sec)			24	24	12	18			18	-
Delay - 15 min pk (sec/veh)			27	34	46	14			23	-
Level of Service (LOS)			C	C	D	B			C+	-
Average 'Q' (veh/ln)			5	8	2	8			8	-
Design 'Q'-ft/ln (1.5*Qavg)			160	240	60	240			240	-
Do Vehicles Clear?			YES	YES	YES	YES			YES	-

Summary of Results

Whole Intersection	Critical Movements
Weighted Average Delay (seconds) = 22	Weighted Average Delay (seconds) = 27
Level of Service - LOS = C+	Level of Service - LOS = C
	Intersection Capacity Utilization - ICU = 0.65
Predetermined Cycle Length is 100 sec	
Min./Ped. Times Satisfied	
Analysis Based on User Selected Splits	

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

Future Buildout 2030

86

Brookhurst at SR-91 EB Ramps

Caltrans

AM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

Movement Times	Eastbound			Westbound			Northbound			Southbound		
	L*	T	R	L	T	R	L	T*	R	L*	T	R
Movement 1: 24 secs	X		X									
Movement 2: 31 secs										X	X	
Movement 3: 45 secs							X	X			X	
Movement 4: 0 secs												
Movement 5: 0 secs												
Movement 6: 0 secs												
# of Lanes (#, S, P)	2		1				3	S		1		2
Unadjusted Volume	305		135				695	679		447		1297
Peak Hour Factor (PHF)	1.00		1.00				1.00	1.00		1.00		1.00
Sat. Flow Override (vph)							3600	Shrd				
Min/Ped Time Override (sec)	24		24				17	17		12		17
Progression Adj. Factor (PAF)	1.00		1.00				1.00	-		1.00		1.00

Output

	***			***			***		
Peak Hour Volume (vph)	305	135		695	679	447	1297		
Saturation Flow (vph)	3500	1800		3600	Shrd	1800	3800		
X or Volume/Capacity	0.40	0.34		0.89	-	0.86	0.46		
Effective Green (sec)	22	22		43	-	29	74		
Split Time (sec)	24	24		45	-	31	76		
Min. Time or Ped. Time (sec)	24	24		17	-	12	17		
Delay - 15 min pk (sec/veh)	35	35		34	-	50	6		
Level of Service (LOS)	C	D+		C	-	D	A		
Average 'Q' (veh/ln)	3	3		7	-	9	5		
Design 'Q'-ft/ln (1.5*Qavg)	100	100		220	-	280	160		
Do Vehicles Clear?	YES	YES		YES	-	YES	YES		

Summary of Results

Whole Intersection		Critical Movements	
Weighted Average Delay (seconds) =	26	Weighted Average Delay (seconds) =	38
Level of Service - LOS =	C	Level of Service - LOS =	D+
		Intersection Capacity Utilization - ICU =	0.76
Predetermined Cycle Length is 100 sec			
Min./Ped. Times Satisfied			
Analysis Based on User Selected Splits			

WEBSTER
Webster Based Signal Timing Evaluation Routine
 - For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

86

Future Buildout 2030

Brookhurst at SR-91 EB Ramps

Caltrans

PM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

Movement Times	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Movement 1: 24 secs	X		X									
Movement 2: 25 secs										X	X	
Movement 3: 41 secs							X	X			X	
Movement 4: 0 secs												
Movement 5: 0 secs												
Movement 6: 0 secs												
# of Lanes (#, S, P)	2		1				3	S		1	2	
Unadjusted Volume	405		111				1146	633		475	1457	
Peak Hour Factor (PHF)	1.00		1.00				1.00	1.00		1.00	1.00	
Sat. Flow Override (vph)							4000	Shrd				
Min/Ped Time Override (sec)	24		24				17	17		12	17	
Progression Adj. Factor (PAF)	1.00		1.00				1.00	-		1.00	1.00	

Output

Peak Hour Volume (vph)	405	111				1146	633	475	1457
Saturation Flow (vph)	3500	1800				4000	Shrd	1800	3800
X or Volume/Capacity	0.47	0.25				1.03	-	1.03	0.54
Effective Green (sec)	22	22				39	-	23	64
Split Time (sec)	24	24				41	-	25	66
Min. Time or Ped. Time (sec)	24	24				17	-	12	17
Delay - 15 min pk (sec/veh)	31	29				55	-	84	7
Level of Service (LOS)	C	C				D	-	F	A
Average 'Q' (veh/ln)	4	2				10	-	11	5
Design 'Q'-fl/ln (1.5*Qavg)	120	60				300	-	340	160
Do Vehicles Clear?	YES	YES				NO	-	NO	YES

Summary of Results

Whole Intersection		Critical Movements	
Weighted Average Delay (seconds) =	39	Weighted Average Delay (seconds) =	57
Level of Service - LOS =	D+	Level of Service - LOS =	E+
		Intersection Capacity Utilization - ICU =	0.88
Predetermined Cycle Length is 90 sec			
Min/Ped. Times Satisfied			
Analysis Based on User Selected Splits			

WEBSTER
Webster Based Signal Timing Evaluation Routine
For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

87

Future Buildout 2030

Euclid St at SR-91 WB Ramps

Caltrans

AM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	*R*	*L*	T	R	L	T*	R
Movement Times												
Movement 1: 32 secs				X		X						
Movement 2: 12 secs							X	X				
Movement 3: 56 secs								X			X	X
Movement 4: 0 secs												
Movement 5: 0 secs												
Movement 6: 0 secs												
# of Lanes (#, S, P)				2		1	2	2		3		S
Unadjusted Volume				498		450	207	1363		1823		456
Peak Hour Factor (PHF)				1.00		1.00	1.00	1.00		1.00		1.00
Sat. Flow Override (vph)										5000		Shrd
Min/Ped Time Override (sec)				12		12	12	22		23		23
Progression Adj. Factor (PAF)				1.00		1.00	1.00	1.00		1.00		-

Output

Peak Hour Volume (vph)				498	450	207	1363			1823	456
Saturation Flow (vph)				3500	1800	3500	3800			5000	Shrd
X or Volume/Capacity				0.47	0.83	0.59	0.54			0.84	-
Effective Green (sec)				30	30	10	66			54	-
Split Time (sec)				32	32	12	68			56	-
Min. Time or Ped. Time (sec)				12	12	12	22			23	-
Delay - 15 min pk (sec/veh)				30	47	50	10			23	-
Level of Service (LOS)				C-	D	D	A			C+	-
Average 'Q' (veh/ln)				5	9	3	6			10	-
Design 'Q'-ft/ln (1.5*Qavg)				160	280	100	180			300	-
Do Vehicles Clear?				YES	YES	YES	YES			YES	-

Summary of Results

Whole Intersection	Critical Movements
Weighted Average Delay (seconds) = 24	Weighted Average Delay (seconds) = 29
Level of Service - LOS = C+	Level of Service - LOS = C
	Intersection Capacity Utilization - ICU = 0.81
Predetermined Cycle Length is 100 sec	
Min./Ped. Times Satisfied	
Analysis Based on User Selected Splits	

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

81

Future Buildout 2030

Euclid St at SR-91 WB Ramps

Caltrans

PM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

	Eastbound			Westbound			Northbound		Southbound			
	L	T	R	L	T	*R*	*L*	T	R	L	*T*	R
Movement Times				X		X						
Movement 1: 38 secs							X	X				
Movement 2: 12 secs								X				
Movement 3: 50 secs									X		X	X
Movement 4: 0 secs												
Movement 5: 0 secs												
Movement 6: 0 secs												
# of Lanes (#, S, P)				2		1	2	2			3	S
Unadjusted Volume				537		656	314	1734			1843	451
Peak Hour Factor (PHF)				1.00		1.00	1.00	1.00			1.00	1.00
Sat. Flow Override (vph)											4700	Shrd
Min/Ped Time Override (sec)				12		12	12	22			23	23
Progression Adj. Factor (PAF)				1.00		1.00	1.00	1.00			1.00	-

Output

Peak Hour Volume (vph)			537	656	314	1734		1843	451
Saturation Flow (vph)			3500	1800	3500	3800		4700	Shrd
X or Volume/Capacity			0.43	1.01	0.90	0.76		1.02	-
Effective Green (sec)			36	36	10	60		48	-
Split Time (sec)			38	38	12	62		50	-
Min. Time or Ped. Time (sec)			12	12	12	22		23	-
Delay - 15 min pk (sec/veh)			25	71	72	17		50	-
Level of Service (LOS)			C	E	E	B		D	-
Average 'Q' (veh/ln)			5	13	4	10		12	-
Design 'Q'-f/ln (1.5*Qavg)			160	400	120	300		360	-
Do Vehicles Clear?			YES	NO	YES	YES		NO	-

Summary of Results

Oversaturated - Mitigation Required			
Whole Intersection		Critical Movements	
Weighted Average Delay (seconds) =	41	Weighted Average Delay (seconds) =	57
Level of Service - LOS =	D	Level of Service - LOS =	F
		Intersection Capacity Utilization - ICU =	1.00
Predetermined Cycle Length is 100 sec			
Min./Ped. Times Satisfied			
Analysis Based on User Selected Splits			

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

89

Future Buildout 2030

Euclid St at SR-91 EB Ramps

Caltrans

AM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Movement Times			X									
Movement 1: 17 secs	X											
Movement 2: 31 secs										X	X	
Movement 3: 52 secs							X	X			X	
Movement 4: 0 secs												
Movement 5: 0 secs												
Movement 6: 0 secs												
# of Lanes (#, S, P)	2		1				3	1		2	2	
Unadjusted Volume	268		160				1378	446		598	1740	
Peak Hour Factor (PHF)	1.00		1.00				1.00	1.00		1.00	1.00	
Sat. Flow Override (vph)							4600					
Min/Ped Time Override (sec)	12		12				23	23		12	23	
Progression Adj. Factor (PAF)	1.00		1.00				1.00	1.00		1.00	1.00	

Output

Peak Hour Volume (vph)	268	160				1378	446	598	1740
Saturation Flow (vph)	3500	1800				4600	1800	3500	3800
X or Volume/Capacity	0.51	0.59				0.60	0.50	0.59	0.57
Effective Green (sec)	15	15				50	50	29	81
Split Time (sec)	17	17				52	52	31	83
Min. Time or Ped. Time (sec)	12	12				23	23	12	23
Delay - 15 min pk (sec/veh)	43	49				19	19	33	4
Level of Service (LOS)	D	D				B	B	C	A
Average 'Q' (veh/ln)	3	4				6	6	6	5
Design 'Q'-ft/ln (1.5*Qavg)	100	120				180	180	180	160
Do Vehicles Clear?	YES	YES				YES	YES	YES	YES

Summary of Results

Whole Intersection	Critical Movements
Weighted Average Delay (seconds) = 18	Weighted Average Delay (seconds) = 26
Level of Service - LOS = B	Level of Service - LOS = C
	Intersection Capacity Utilization - ICU = 0.60
Predetermined Cycle Length is 100 sec	
Min./Ped. Times Satisfied	

WEBSTER
Webster Based Signal Timing Evaluation Routine
For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

89

Future Buildout 2030

Euclid St at SR-91 EB Ramps

Caltrans

PM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

Movement Times	Eastbound			Westbound			Northbound			Southbound		
	L	T	*R*	L	T	R	L	*T*	R	*L*	T	R
Movement 1: 25 secs	X		X									
Movement 2: 25 secs										X	X	
Movement 3: 50 secs							X	X			X	
Movement 4: 0 secs												
Movement 5: 0 secs												
Movement 6: 0 secs												
# of Lanes (#, S, P)	2		1				3	1		2	2	
Unadjusted Volume	480		268				1552	421		535	1765	
Peak Hour Factor (PHF)	1.00		1.00				1.00	1.00		1.00	1.00	
Sat. Flow Override (vph)							5000					
Min/Ped Time Override (sec)	12		12				23	23		12	23	
Progression Adj. Factor (PAF)	1.00		1.00				1.00	1.00		1.00	1.00	

Output

Peak Hour Volume (vph)	480	268	1552	421	535	1765
Saturation Flow (vph)	3500	1800	5000	1800	3500	3800
X or Volume/Capacity	0.60	0.65	0.65	0.49	0.66	0.64
Effective Green (sec)	23	23	48	48	23	73
Split Time (sec)	25	25	50	50	25	75
Min. Time or Ped. Time (sec)	12	12	23	23	12	23
Delay - 15 min pk (sec/veh)	38	42	21	20	39	8
Level of Service (LOS)	D+	D	C+	B	D+	A
Average 'Q' (veh/in)	5	6	7	6	6	7
Design 'Q'-ft/in (1.5*Qavg)	160	180	220	180	180	220
Do Vehicles Clear?	YES	YES	YES	YES	YES	YES

Summary of Results

Whole Intersection		Critical Movements	
Weighted Average Delay (seconds) =	21	Weighted Average Delay (seconds) =	28
Level of Service - LOS =	C+	Level of Service - LOS =	C
		Intersection Capacity Utilization - ICU =	0.65
Predetermined Cycle Length is 100 sec			
Min/Ped. Times Satisfied			

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

89

Future Buildout 2030

Harbor Blvd at SR-91 WB Ramps

Caltrans

AM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

Movement Times	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	*R*	*L*	T	R	L	T	R
Movement 1: 30 secs				X	X	X						
Movement 2: 12 secs							X	X				
Movement 3: 58 secs								X			X	X
Movement 4: 0 secs												
Movement 5: 0 secs												
Movement 6: 0 secs												
# of Lanes (#, S, P)				1	2	1	2	3			3	S
Unadjusted Volume				250	340	358	108	1657			1645	684
Peak Hour Factor (PHF)				1.00	1.00	1.00	1.00	1.00			1.00	1.00
Min/Ped Time Override (sec)				20	20	20	12	23			23	23
Progression Adj. Factor (PAF)				1.00	1.00	1.00	1.00	1.00			1.00	-

Output

Peak Hour Volume (vph)				250	340	358	108	1657			1645	684
Saturation Flow (vph)				1800	3800	1800	3500	5700			5700	Shrd
X or Volume/Capacity				0.50	0.32	0.71	0.31	0.43			0.73	-
Effective Green (sec)				28	28	28	10	68			56	-
Split Time (sec)				30	30	30	12	70			58	-
Min. Time or Ped. Time (sec)				20	20	20	12	23			23	-
Delay - 15 min pk (sec/veh)				34	29	41	44	8			18	-
Level of Service (LOS)				C-	C	D	D	A			B	-
Average 'Q' (veh/ln)				5	3	7	1	5			9	-
Design 'Q'-fln (1.5*Qavg)				160	100	220	40	160			280	-
Do Vehicles Clear?				YES	YES	YES	YES	YES			YES	-

Summary of Results

Whole Intersection		Critical Movements	
Weighted Average Delay (seconds) =	19	Weighted Average Delay (seconds) =	22
Level of Service - LOS =	B	Level of Service - LOS =	C+
		Intersection Capacity Utilization - ICU =	0.68
Predetermined Cycle Length is 100 sec			
Min./Ped. Times Satisfied			
Analysis Based on User Selected Splits			

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

Future Buildout 2030

90

Harbor Blvd at SR-91 WB Ramps

Fullerton

PM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	*R*	*L*	T	R	L	T	*R*
Movement Times												
Movement 1: 30 secs				X	X	X						
Movement 2: 12 secs							X	X				
Movement 3: 58 secs								X			X	X
Movement 4: 0 secs												
Movement 5: 0 secs												
Movement 6: 0 secs												
# of Lanes (#, S, P)				1	2	1	2	3		2		1
Unadjusted Volume				234	503	403	137	2497		1492		788
Peak Hour Factor (PHF)				1.00	1.00	1.00	1.00	1.00		1.00		1.00
Min/Ped Time Override (sec)				20	20	20	12	23		23		23
Progression Adj. Factor (PAF)				1.00	1.00	1.00	1.00	1.00		1.00		1.00

Output

Peak Hour Volume (vph)				234	503	403	137	2497		1492		788
Saturation Flow (vph)				1800	3800	1800	3500	5700		3800		1800
X or Volume/Capacity				0.46	0.47	0.80	0.39	0.64		0.70		0.78
Effective Green (sec)				28	28	28	10	68		56		56
Split Time (sec)				30	30	30	12	70		58		58
Min. Time or Ped. Time (sec)				20	20	20	12	23		23		23
Delay - 15 min pk (sec/veh)				33	31	46	45	10		18		23
Level of Service (LOS)				C-	C-	D	D	A		B		C+
Average 'Q' (veh/ln)				5	5	8	2	7		9		10
Design 'Q'-ft/ln (1.5*Qavg)				160	160	240	60	220		280		300
Do Vehicles Clear?				YES	YES	YES	YES	YES		YES		YES

Summary of Results

Whole Intersection		Critical Movements	
Weighted Average Delay (seconds) =	20	Weighted Average Delay (seconds) =	33
Level of Service - LOS =	B	Level of Service - LOS =	C-
		Intersection Capacity Utilization - ICU =	0.75
Predetermined Cycle Length is 100 sec			
Min./Ped. Times Satisfied			
Analysis Based on User Selected Splits			

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

90

Future Buildout 2030

Harbor Blvd at SR-91 EB Ramps

Caltrans

AM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

Movement Times	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	*R*	*L*	T	R
Movement 1: 36 secs	X	X	X									
Movement 2: 26 secs										X	X	
Movement 3: 38 secs								X	X		X	
Movement 4: 0 secs												
Movement 5: 0 secs												
Movement 6: 0 secs												
# of Lanes (#, S, P)	2	1	1					3	1	2	3	
Unadjusted Volume	805	393	226					1134	396	570	1405	
Peak Hour Factor (PHF)	1.00	1.00	1.00					1.00	1.00	1.00	1.00	
Min/Ped Time Override (sec)	20	20	20					23	23	12	23	
Progression Adj. Factor (PAF)	1.00	1.00	1.00					1.00	1.00	1.00	1.00	

Output

	***			***			***			
Peak Hour Volume (vph)	805	393	226				1134	396	570	1405
Saturation Flow (vph)	3500	1900	1800				5700	1800	3500	5700
X or Volume/Capacity	0.68	0.61	0.37				0.55	0.61	0.68	0.40
Effective Green (sec)	34	34	34				36	36	24	62
Split Time (sec)	36	36	36				38	38	26	64
Min. Time or Ped. Time (sec)	20	20	20				23	23	12	23
Delay - 15 min pk (sec/veh)	31	32	27				27	31	39	10
Level of Service (LOS)	C-	C-	C				C	C-	D+	A
Average 'Q' (veh/ln)	7	7	4				7	7	6	5
Design 'Q'-ft/ln (1.5*Qavg)	220	220	120				220	220	180	160
Do Vehicles Clear?	YES	YES	YES				YES	YES	YES	YES

Summary of Results

Whole Intersection		Critical Movements	
Weighted Average Delay (seconds) =	25	Weighted Average Delay (seconds) =	34
Level of Service - LOS =	C+	Level of Service - LOS =	C-
		Intersection Capacity Utilization - ICU =	0.65
Predetermined Cycle Length is 100 sec			
Min./Ped. Times Satisfied			

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

90

Future Buildout 2030

Harbor Blvd at SR-91 EB Ramps

Caltrans

PM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

Movement Times	Eastbound			Westbound			Northbound			Southbound		
	L*	T	R	L	T	R	L	T*	R	L*	T	R
Movement 1: 38 secs	X	X	X									
Movement 2: 21 secs										X	X	
Movement 3: 41 secs							X	X			X	
Movement 4: 0 secs												
Movement 5: 0 secs												
Movement 6: 0 secs												
# of Lanes (#, S, P)	2	1	1				3	1	2	3		
Unadjusted Volume	925	318	184				1580	317	477	1469		
Peak Hour Factor (PHF)	1.00	1.00	1.00				1.00	1.00	1.00	1.00		
Min/Ped Time Override (sec)	20	20	20				23	23	12	23		
Progression Adj. Factor (PAF)	1.00	1.00	1.00				1.00	1.00	1.00	1.00		

Output

	***			***			***			
Peak Hour Volume (vph)	925	318	184				1580	317	477	1469
Saturation Flow (vph)	3500	1900	1800				5700	1800	3500	5700
X or Volume/Capacity	0.73	0.46	0.28				0.71	0.45	0.72	0.43
Effective Green (sec)	36	36	36				39	39	19	60
Split Time (sec)	38	38	38				41	41	21	62
Min. Time or Ped. Time (sec)	20	20	20				23	23	12	23
Delay - 15 min pk (sec/veh)	32	27	24				28	25	45	11
Level of Service (LOS)	C-	C	C+				C-	C+	D	B
Average 'Q' (veh/ln)	8	6	3				9	5	5	5
Design 'Q'-ft/ln (1.5*Qavg)	240	180	100				280	160	160	160
Do Vehicles Clear?	YES	YES	YES				YES	YES	YES	YES

Summary of Results

Whole Intersection		Critical Movements	
Weighted Average Delay (seconds) =	25	Weighted Average Delay (seconds) =	32
Level of Service - LOS =	C+	Level of Service - LOS =	C-
		Intersection Capacity Utilization - ICU =	0.72
Predetermined Cycle Length is 100 sec			
Min./Ped. Times Satisfied			

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

Future Buildout 2030

91

Lemon St at SR-91 WB Ramps

Caltrans

AM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

Movement Times	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Movement 1: 42 secs				X	X	X						
Movement 2: 12 secs							X	X				
Movement 3: 46 secs									X			X
Movement 4: 0 secs												
Movement 5: 0 secs												
Movement 6: 0 secs												
# of Lanes (#, S, P)				S	2	1	1	3		3		S
Unadjusted Volume				245	581	674	99	1102		1871		288
Peak Hour Factor (PHF)				1.00	1.00	1.00	1.00	1.00		1.00		1.00
Sat. Flow Override (vph)				Shrd						5200		Shrd
Min/Ped Time Override (sec)				12	12	12	12	21		21		21
Progression Adj. Factor (PAF)				-	1.00	1.00	1.00	1.00		1.00		-

Output

Peak Hour Volume (vph)				245	581	674	99	1102		1871		288
Saturation Flow (vph)				Shrd	3800	1800	1800	5700		5200		Shrd
X or Volume/Capacity				-	0.54	0.94	0.55	0.35		0.94		-
Effective Green (sec)				-	40	40	10	56		44		-
Split Time (sec)				-	42	42	12	58		46		-
Min. Time or Ped. Time (sec)				-	12	12	12	21		21		-
Delay - 15 min pk (sec/veh)				-	24	50	54	12		36		-
Level of Service (LOS)				-	C+	D	D	B		D+		-
Average 'Q' (veh/in)				-	7	12	3	4		12		-
Design 'Q'-ft/in (1.5*Qavg)				-	220	360	100	120		360		-
Do Vehicles Clear?				-	YES	YES	YES	YES		YES		-

Summary of Results

Whole Intersection Weighted Average Delay (seconds) = 32 Level of Service - LOS = C-	Critical Movements Weighted Average Delay (seconds) = 41 Level of Service - LOS = D Intersection Capacity Utilization - ICU = 0.90
Predetermined Cycle Length is 100 sec Min./Ped. Times Satisfied Analysis Based on User Selected Splits	

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

91

Future Buildout 2030

Lemon St at SR-91 WB Ramps

Caltrans

PM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

Movement Times	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R*	L*	T	R	L	T*	R
Movement 1: 42 secs				X	X	X						
Movement 2: 12 secs							X	X				
Movement 3: 46 secs									X		X	X
Movement 4: 0 secs												
Movement 5: 0 secs												
Movement 6: 0 secs												
# of Lanes (#, S, P)				S	2	1	1	3			3	S
Unadjusted Volume				158	667	858	124	1507			1865	373
Peak Hour Factor (PHF)				1.00	1.00	1.00	1.00	1.00			1.00	1.00
Sat. Flow Override (vph)				Shrd							4200	Shrd
Min/Ped Time Override (sec)				12	12	12	12	21			21	21
Progression Adj. Factor (PAF)				-	1.00	1.00	1.00	1.00			1.00	-

Output

Peak Hour Volume (vph)			158	667	858	124	1507			1865	373
Saturation Flow (vph)			Shrd	3800	1800	1800	5700			4200	Shrd
X or Volume/Capacity			-	0.54	1.19	0.69	0.47			1.21	-
Effective Green (sec)			-	40	40	10	56			44	-
Split Time (sec)			-	42	42	12	58			46	-
Min. Time or Ped. Time (sec)			-	12	12	12	21			21	-
Delay - 15 min pk (sec/veh)			-	24	134	63	14			134	-
Level of Service (LOS)			-	C+	F	E	B			F	-
Average 'Q' (veh/in)			-	7	21	3	6			17	-
Design 'Q'-ft/in (1.5*Qavg)			-	220	640	100	180			520	-
Do Vehicles Clear?			-	YES	NO	YES	YES			NO	-

Summary of Results

Oversaturated - Mitigation Required			
Whole Intersection		Critical Movements	
Weighted Average Delay (seconds) =	84	Weighted Average Delay (seconds) =	132
Level of Service - LOS =	F	Level of Service - LOS =	F
		Intersection Capacity Utilization - ICU =	1.15
Predetermined Cycle Length is 100 sec			
Min/Ped. Times Satisfied			
Analysis Based on User Selected Splits			

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

92

Future Buildout 2030

Lemon St at SR-91 EB Ramps

Caltrans

AM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

Movement Times	Eastbound			Westbound			Northbound			Southbound		
	L	T*	R	L	T	R	L	T*	R	L*	T	R
Movement 1: 41 secs	X	X	X									
Movement 2: 25 secs										X	X	
Movement 3: 34 secs							X	X			X	
Movement 4: 0 secs												
Movement 5: 0 secs												
Movement 6: 0 secs												
# of Lanes (#, S, P)	S	2	1				2	1	2	2		
Unadjusted Volume	263	897	126				965	297	625	1065		
Peak Hour Factor (PHF)	1.00	1.00	1.00				1.00	1.00	1.00	1.00		
Min/Ped Time Override (sec)	12	12	12				17	17	12	17		
Progression Adj. Factor (PAF)	-	1.00	1.00				1.00	1.00	1.00	1.00		

Output

		***				***		***		
Peak Hour Volume (vph)	263	897	126			965	297	625	1065	
Saturation Flow (vph)	Shrd	3800	1800			3800	1800	3500	3800	
X or Volume/Capacity	-	0.78	0.18			0.79	0.52	0.78	0.49	
Effective Green (sec)	-	39	39			32	32	23	57	
Split Time (sec)	-	41	41			34	34	25	59	
Min. Time or Ped. Time (sec)	-	12	12			17	17	12	17	
Delay - 15 min pk (sec/veh)	-	31	21			36	31	43	14	
Level of Service (LOS)	-	C-	C+			D+	C-	D	B	
Average 'Q' (veh/ln)	-	10	2			9	6	7	6	
Design 'Q'-ft/ln (1.5*Qavg)	-	300	60			280	180	220	180	
Do Vehicles Clear?	-	YES	YES			YES	YES	YES	YES	

Summary of Results

Whole Intersection		Critical Movements	
Weighted Average Delay (seconds) =	30	Weighted Average Delay (seconds) =	36
Level of Service - LOS =	C	Level of Service - LOS =	D+
		Intersection Capacity Utilization - ICU =	0.78
Predetermined Cycle Length is 100 sec			
Min./Ped. Times Satisfied			

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

92

Future Buildout 2030

Lemon St at SR-91 EB Ramps

Caltrans

PM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

Movement Times	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Movement 1: 33 secs	X	X	X									
Movement 2: 32 secs										X	X	
Movement 3: 35 secs							X	X			X	
Movement 4: 0 secs												
Movement 5: 0 secs												
Movement 6: 0 secs												
# of Lanes (#, S, P)	S	2	1				3	S	2	2		
Unadjusted Volume	343	744	54				1476	264	943	1419		
Peak Hour Factor (PHF)	1.00	1.00	1.00				1.00	1.00	1.00	1.00		
Min/Ped Time Override (sec)	12	12	12				17	17	12	17		
Progression Adj. Factor (PAF)	-	1.00	1.00				1.00	-	1.00	1.00		

Output

Peak Hour Volume (vph)	343	744	54				1476	264	943	1419		
Saturation Flow (vph)	Shrd	3800	1800				5700	Shrd	3500	3800		
X or Volume/Capacity	-	0.92	0.10				0.93	-	0.90	0.57		
Effective Green (sec)	-	31	31				33	-	30	65		
Split Time (sec)	-	33	33				35	-	32	67		
Min. Time or Ped. Time (sec)	-	12	12				17	-	12	17		
Delay - 15 min pk (sec/veh)	-	47	25				42	-	46	11		
Level of Service (LOS)	-	D	C+				D	-	D	B		
Average 'Q' (veh/ln)	-	11	1				11	-	10	7		
Design 'Q'-ft/ln (1.5*Qavg)	-	340	40				340	-	300	220		
Do Vehicles Clear?	-	YES	YES				YES	-	YES	YES		

Summary of Results

Whole Intersection	Critical Movements
Weighted Average Delay (seconds) = 35	Weighted Average Delay (seconds) = 44
Level of Service - LOS = C-	Level of Service - LOS = D
	Intersection Capacity Utilization - ICU = 0.92
Predetermined Cycle Length is 100 sec	
Min./Ped. Times Satisfied	

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

93

Future Buildout 2030

Raymond Ave-East St at SR-91 WB Ramps Caltrans

AM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	*R*	*L*	T	R	L	T	*R*
Movement Times												
Movement 1: 34 secs				X		X						
Movement 2: 30 secs							X	X				
Movement 3: 36 secs								X			X	X
Movement 4: 0 secs												
Movement 5: 0 secs												
Movement 6: 0 secs												
# of Lanes (#, S, P)				1		1	1	2			3	1
Unadjusted Volume				137		419	365	1430			723	459
Peak Hour Factor (PHF)				1.00		1.00	1.00	1.00			1.00	1.00
Sat. Flow Override (vph)											2900	
Min/Ped Time Override (sec)				20		20	12	19			21	21
Progression Adj. Factor (PAF)				1.00		1.00	1.00	1.00			1.00	1.00

Output

Peak Hour Volume (vph)				137		419	365	1430			723	459
Saturation Flow (vph)				1800		1800	1800	3800			2900	1800
X or Volume/Capacity				0.24		0.73	0.72	0.59			0.73	0.75
Effective Green (sec)				32		32	28	64			34	34
Split Time (sec)				34		34	30	66			36	36
Min. Time or Ped. Time (sec)				20		20	12	19			21	21
Delay - 15 min pk (sec/veh)				26		38	41	11			34	37
Level of Service (LOS)				C		D+	D	B			C-	D+
Average 'Q' (veh/ln)				3		8	7	7			4	9
Design 'Q'-ft/ln (1.5*Qavg)				100		240	220	220			120	280
Do Vehicles Clear?				YES		YES	YES	YES			YES	YES

Summary of Results

Whole Intersection		Critical Movements	
Weighted Average Delay (seconds) =	27	Weighted Average Delay (seconds) =	39
Level of Service - LOS =	C	Level of Service - LOS =	O+
		Intersection Capacity Utilization - ICU =	0.73
Predetermined Cycle Length is 100 sec			
Min./Ped. Times Satisfied			

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

Future Buildout 2030

93

Raymond Ave-East St at SR-91 WB Ramps Caltrans

PM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

Movement Times	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	*R*	*L*	T	R	L	T	*R*
Movement 1: 20 secs				X		X						
Movement 2: 21 secs							X	X				
Movement 3: 59 secs								X			X	X
Movement 4: 0 secs												
Movement 5: 0 secs												
Movement 6: 0 secs												
# of Lanes (#, S, P)				1		1	1	2			3	1
Unadjusted Volume				148		295	355	1198			1426	1053
Peak Hour Factor (PHF)				1.00		1.00	1.00	1.00			1.00	1.00
Sat. Flow Override (vph)											4600	
Min/Ped Time Override (sec)				20		20	12	19			21	21
Progression Adj. Factor (PAF)				1.00		1.00	1.00	1.00			1.00	1.00

Output

Peak Hour Volume (vph)				148		295	355	1198			1426	1053
Saturation Flow (vph)				1800		1800	1800	3800			4600	1800
X or Volume/Capacity				0.46		0.91	1.04	0.40			0.54	1.03
Effective Green (sec)				18		18	19	78			57	57
Split Time (sec)				20		20	21	80			59	59
Min. Time or Ped. Time (sec)				20		20	12	19			21	21
Delay - 15 min pk (sec/veh)				41		72	100	4			14	57
Level of Service (LOS)				D		E	F	A			B	E
Average 'Q' (veh/ln)				3		7	9	4			6	15
Design 'Q'-ft/ln (1.5*Qavg)				100		220	280	120			180	460
Do Vehicles Clear?				YES		YES	NO	YES			YES	NO

Summary of Results

Oversaturated - Mitigation Required			
Whole Intersection		Critical Movements	
Weighted Average Delay (seconds) =	34	Weighted Average Delay (seconds) =	69
Level of Service - LOS =	C-	Level of Service - LOS =	F
		Intersection Capacity Utilization - ICU =	1.01
Predetermined Cycle Length is 100 sec			
Min/Ped. Times Satisfied			
Analysis Based on User Selected Splits			

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

Future Buildout 2030

94

Raymond Ave-East St at SR-91 EB Ramps Caltrans

AM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

Movement Times	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	*R*	*L*	T	R
Movement 1: 38 secs	X	X	X									
Movement 2: 30 secs										X	X	
Movement 3: 32 secs							X	X			X	
Movement 4: 0 secs												
Movement 5: 0 secs												
Movement 6: 0 secs												
# of Lanes (#, S, P)	S	2	S				3	1	1	1	2	
Unadjusted Volume	838	10	281				1250	486	436	638		
Peak Hour Factor (PHF)	1.00	1.00	1.00				1.00	1.00	1.00	1.00		
Sat. Flow Override (vph)	Shrd	3500	Shrd				5500					
Min/Ped Time Override (sec)	20	20	20				16	16	10	19		
Progression Adj. Factor (PAF)	-	1.00	-				1.00	1.00	1.00	1.00		

Output

Peak Hour Volume (vph)	838	10	281				1250	486	436	638		
Saturation Flow (vph)	Shrd	3500	Shrd				5500	1800	1800	3800		
X or Volume/Capacity	-	0.90	-				0.76	0.90	0.87	0.28		
Effective Green (sec)	-	36	-				30	30	28	60		
Split Time (sec)	-	38	-				32	32	30	62		
Min. Time or Ped. Time (sec)	-	20	-				16	16	10	19		
Delay - 15 min pk (sec/veh)	-	40	-				35	54	52	10		
Level of Service (LOS)	-	D	-				D+	D-	D-	A		
Average 'Q' (veh/ln)	-	10	-				8	10	9	4		
Design 'Q'-ft/ln (1.5*Qavg)	-	300	-				240	300	280	120		
Do Vehicles Clear?	-	YES	-				YES	YES	YES	YES		

Summary of Results

Whole Intersection		Critical Movements	
Weighted Average Delay (seconds) =	37	Weighted Average Delay (seconds) =	47
Level of Service - LOS =	D+	Level of Service - LOS =	D
		Intersection Capacity Utilization - ICU =	0.89
Predetermined Cycle Length is 100 sec			
Min./Ped. Times Satisfied			

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

Future Buildout 2030

94

Raymond Ave-East St at SR-91 EB Ramps Caltrans

PM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

Movement Times	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Movement 1: 34 secs	X	X	X									
Movement 2: 39 secs										X	X	
Movement 3: 27 secs							X	X			X	
Movement 4: 0 secs												
Movement 5: 0 secs												
Movement 6: 0 secs												
# of Lanes (#, S, P)	S	2	S				3	1	1	2		
Unadjusted Volume	450	10	355				1101	320	550	883		
Peak Hour Factor (PHF)	1.00	1.00	1.00				1.00	1.00	1.00	1.00		
Sat. Flow Override (vph)	Shrd	3500	Shrd				5300					
Min/Ped Time Override (sec)	10	34	34				16	16	10	19		
Progression Adj. Factor (PAF)	-	1.00	-				1.00	1.00	1.00	1.00		

Output

Peak Hour Volume (vph)	450	10	355				1101	320	550	883		
Saturation Flow (vph)	Shrd	3500	Shrd				5300	1800	1800	3800		
X or Volume/Capacity	-	0.73	-				0.83	0.71	0.83	0.36		
Effective Green (sec)	-	32	-				25	25	37	64		
Split Time (sec)	-	34	-				27	27	39	66		
Min. Time or Ped. Time (sec)	-	34	-				16	16	10	19		
Delay - 15 min pk (sec/veh)	-	34	-				42	43	40	9		
Level of Service (LOS)	-	C-	-				D	D	D+	A		
Average 'Q' (veh/in)	-	8	-				8	7	10	4		
Design 'Q'-ft/in (1.5*Qavg)	-	240	-				240	220	300	120		
Do Vehicles Clear?	-	YES	-				YES	YES	YES	YES		

Summary of Results

Whole Intersection	Critical Movements
Weighted Average Delay (seconds) = 33	Weighted Average Delay (seconds) = 39
Level of Service - LOS = C-	Level of Service - LOS = D+
	Intersection Capacity Utilization - ICU = 0.79
Predetermined Cycle Length is 100 sec	
Min/Ped. Times Satisfied	
Analysis Based on User Selected Splits	

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

Future Buildout 2030

95

State College Blvd at SR-91 WB Ramps

Caltrans

AM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

Movement Times	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Movement 1: 29 secs				X	X	X						
Movement 2: 21 secs							X	X				
Movement 3: 50 secs								X			X	X
Movement 4: 0 secs												
Movement 5: 0 secs												
Movement 6: 0 secs												
# of Lanes (#, S, P)				1	2	S	2	3			2	1
Unadjusted Volume				198	10	660	327	1179			938	640
Peak Hour Factor (PHF)				1.00	1.00	1.00	1.00	1.00			1.00	1.00
Sat. Flow Override (vph)					3400	Shrd						
Min/Ped Time Override (sec)				12	12	12	21	27			24	24
Progression Adj. Factor (PAF)				1.00	1.00	-	1.00	1.00			1.00	1.00

Output

Peak Hour Volume (vph)				198	10	660	327	1179			938	640
Saturation Flow (vph)				1800	3400	Shrd	3500	5700			3800	1800
X or Volume/Capacity				0.41	0.73	-	0.49	0.30			0.51	0.74
Effective Green (sec)				27	27	-	19	69			48	48
Split Time (sec)				29	29	-	21	71			50	50
Min. Time or Ped. Time (sec)				12	12	-	21	27			24	24
Delay - 15 min pk (sec/veh)				32	38	-	39	6			19	27
Level of Service (LOS)				C-	D+	-	D+	A			B	C
Average 'Q' (veh/in)				4	7	-	4	3			7	9
Design 'Q'-ft/in (1.5*Qavg)				120	220	-	120	100			220	280
Do Vehicles Clear?				YES	YES	-	YES	YES			YES	YES

Summary of Results

Whole Intersection Weighted Average Delay (seconds) = 23 Level of Service - LOS = C+	Critical Movements Weighted Average Delay (seconds) = 34 Level of Service - LOS = C- Intersection Capacity Utilization - ICU = 0.69
Predetermined Cycle Length is 100 sec Min./Ped. Times Satisfied Analysis Based on User Selected Splits	

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

95

Future Buildout 2030

State College Blvd at SR-91 WB Ramps

Caltrans

PM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

Movement Times	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	*T*	R	*L*	T	R	L	T	*R*
Movement 1: 14 secs				X	X	X						
Movement 2: 16 secs							X	X				
Movement 3: 70 secs								X			X	X
Movement 4: 0 secs												
Movement 5: 0 secs												
Movement 6: 0 secs												
# of Lanes (#, S, P)				S	3	S	2	3			2	1
Unadjusted Volume				249	10	395	469	1415			1577	1149
Peak Hour Factor (PHF)				1.00	1.00	1.00	1.00	1.00			1.00	1.00
Min/Ped Time Override (sec)				12	12	12	12	27			24	24
Progression Adj. Factor (PAF)				-	1.00	-	1.00	1.00			1.00	1.00

Output

	***			***			***					
Peak Hour Volume (vph)				249	10	395	469	1415			1577	1149
Saturation Flow (vph)				Shrd	5700	Shrd	3500	5700			3800	1800
X or Volume/Capacity				-	0.96	-	0.98	0.30			0.61	0.94
Effective Green (sec)				-	12	-	14	84			68	68
Split Time (sec)				-	14	-	16	86			70	70
Min. Time or Ped. Time (sec)				-	12	-	12	27			24	24
Delay - 15 min pk (sec/veh)				-	69	-	74	2			10	29
Level of Service (LOS)				-	E	-	E	A			A	C
Average 'Q' (veh/ln)				-	6	-	6	2			7	11
Design 'Q'-ft/ln (1.5*Qavg)				-	180	-	180	60			220	340
Do Vehicles Clear?				-	NO	-	NO	YES			YES	YES

Summary of Results

Whole Intersection		Critical Movements	
Weighted Average Delay (seconds) =	25	Weighted Average Delay (seconds) =	50
Level of Service - LOS =	C+	Level of Service - LOS =	D
		Intersection Capacity Utilization - ICU =	0.94
Predetermined Cycle Length is 100 sec			
Min./Ped. Times Satisfied			

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

96

Future Buildout 2030

State College Blvd at SR-91 EB Ramps

Caltrans

AM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Movement 1: 35 secs	X	X	X									
Movement 2: 21 secs										X	X	
Movement 3: 44 secs							X	X			X	
Movement 4: 0 secs												
Movement 5: 0 secs												
Movement 6: 0 secs												
# of Lanes (#, S, P)	S	3	S				2	1	2	3		
Unadjusted Volume	761	10	441				917	509	378	800		
Peak Hour Factor (PHF)	1.00	1.00	1.00				1.00	1.00	1.00	1.00		
Sat. Flow Override (vph)	Shrd	5400	Shrd									
Min/Ped Time Override (sec)	12	12	12				23	23	21	23		
Progression Adj. Factor (PAF)	-	1.00	-				1.00	1.00	1.00	1.00		

Output

Peak Hour Volume (vph)	761	10	441				917	509	378	800		
Saturation Flow (vph)	Shrd	5400	Shrd				3800	1800	3500	5700		
X or Volume/Capacity	-	0.68	-				0.57	0.67	0.57	0.22		
Effective Green (sec)	-	33	-				42	42	19	63		
Split Time (sec)	-	35	-				44	44	21	65		
Min. Time or Ped. Time (sec)	-	12	-				23	23	21	23		
Delay - 15 min pk (sec/veh)	-	31	-				24	28	40	8		
Level of Service (LOS)	-	C	-				C+	C	D	A		
Average 'Q' (veh/ln)	-	8	-				7	8	4	3		
Design 'Q'-ft/ln (1.5*Qavg)	-	240	-				220	240	120	100		
Do Vehicles Clear?	-	YES	-				YES	YES	YES	YES		

Summary of Results

Whole Intersection Weighted Average Delay (seconds) = 26 Level of Service - LOS = C	Critical Movements Weighted Average Delay (seconds) = 33 Level of Service - LOS = C- Intersection Capacity Utilization - ICU = 0.65
Predetermined Cycle Length is 100 sec Min./Ped. Times Satisfied Analysis Based on User Selected Spills	

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

96

Future Buildout 2030

State College Blvd at SR-91 EB Ramps

Caltrans

PM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Movement Times												
Movement 1: 21 secs	X	X	X									
Movement 2: 35 secs										X	X	
Movement 3: 44 secs							X	X			X	
Movement 4: 0 secs												
Movement 5: 0 secs												
Movement 6: 0 secs												
# of Lanes (#, S, P)	S	3	S				3	S	2	3		
Unadjusted Volume	378	10	308				1335	297	802	1074		
Peak Hour Factor (PHF)	1.00	1.00	1.00				1.00	1.00	1.00	1.00		
Sat. Flow Override (vph)	Shrd	5400	Shrd				Shrd	Shrd	Shrd	Shrd		
Min/Ped Time Override (sec)	12	12	12				23	23	21	23		
Progression Adj. Factor (PAF)	-	1.00	-				1.00	-	1.00	1.00		

Output

Peak Hour Volume (vph)	378	10	308				1335	297	802	1074		
Saturation Flow (vph)	Shrd	5400	Shrd				5700	Shrd	3500	5700		
X or Volume/Capacity	-	0.68	-				0.68	-	0.69	0.24		
Effective Green (sec)	-	19	-				42	-	33	77		
Split Time (sec)	-	21	-				44	-	35	79		
Min. Time or Ped. Time (sec)	-	12	-				23	-	21	23		
Delay - 15 min pk (sec/veh)	-	41	-				25	-	33	3		
Level of Service (LOS)	-	D	-				C	-	C	A		
Average 'Q' (veh/ln)	-	5	-				9	-	7	2		
Design 'Q'-ft/ln (1.5*Qavg)	-	160	-				280	-	220	60		
Do Vehicles Clear?	-	YES	-				YES	-	YES	YES		

Summary of Results

Whole Intersection	Critical Movements
Weighted Average Delay (seconds) = 24	Weighted Average Delay (seconds) = 31
Level of Service - LOS = C+	Level of Service - LOS = C-
Intersection Capacity Utilization - ICU = 0.69	
Predetermined Cycle Length is 100 sec	
Min./Ped. Times Satisfied	

APPENDIX D

SUPPLEMENTAL ANALYSIS



Kimley-Horn
and Associates, Inc.

September 8, 2011

Ms. Michelle Kou
RBF Consulting, Inc.
14725 Alton Parkway
Irvine, CA 92618

■
Suite 400
765 The City Drive
Orange, California
92868

Subject: Supplemental Traffic Analysis for the Fullerton General Plan Update
Traffic Analysis

Dear Ms. Kou;

This supplemental analysis for the Fullerton General Plan Update Traffic Analysis has been prepared to address comments received from the City of La Habra in a letter dated May 31, 2011. The comments were based on a review of the Notice of Preparation of Draft Environmental Report prepared for the project.

The City of La Habra requested the analysis of the intersection of Imperial Highway and Beach Boulevard, as indicated below.

La Habra Comment: "Imperial Highway and Harbor Boulevard (south of Imperial Highway) in the City of La Habra are on the Orange County Congestion Management Program (CMP) Highway System. Furthermore, the intersections of Imperial Highway/Beach Boulevard and Imperial Highway/Harbor Boulevard are monitored intersections on the Orange County CMP system. Any CMP impacts need to be addressed by the Project EIR."

Response to La Habra Comment

The City of La Habra has requested an evaluation of Existing Conditions and Future Build-out Conditions at two CMP intersections in the City of La Habra – the intersections of Imperial Highway at Harbor Boulevard and Imperial Highway at Beach Boulevard.

The intersection of Imperial Highway and Harbor Boulevard has been analyzed in the Existing and Buildout Conditions Report prepared by Kimley-Horn and Associates dated July, 2011. Traffic-related impacts were identified and mitigation measures were recommended to bring the intersection's peak hour operations to the acceptable Level of Service D under the Buildout conditions.

■
TEL 714 939 1030
FAX 714 938 9488



The intersection of Imperial Highway and Beach Boulevard was not included in the original traffic analysis. Based on the City of La Habra’s request, the intersection of Imperial Highway and Beach Boulevard has subsequently been analyzed and the results are presented below.

Existing peak hour turning movement traffic data for this intersection was collected in March 2011. The existing conditions morning and evening peak hour operations at this intersection are shown on Table 1. The intersection of Imperial Highway and Beach Boulevard is currently operating at LOS D in both the morning and evening peak hours. Traffic count sheets and level of service worksheets are provided as an attachment to this letter.

TABLE 1 SUMMARY OF PEAK HOUR INTERSECTION OPERATIONS EXISTING CONDITIONS IMPERIAL HIGHWAY AT BEACH BOULEVARD						
Control	AM Peak Hour			PM Peak Hour		
	ICU	Delay	LOS	ICU	Delay	LOS
Signalized	0.63	42.0	D	0.75	47.0	D

Baseline General Plan forecasts were derived from the City’s traffic model, which is maintained by Albert Grover and Associates (AGA). At most arterial intersections, future Build-out Year traffic volumes include an ambient growth factor of 10% for through movements and 5% for turning movements from the base year 2009 traffic volumes.

Estimates of project traffic generation by Focus Area for the Fullerton General Plan Update vision are provided on Table 4 of the Existing and Buildout Conditions Report. The General Plan Update vision is estimated to generate 16,493 trips in the morning peak hour and 20,530 trips in the evening peak hour. Project-related traffic for the Fullerton General Plan Update vision was distributed through the intersection of Imperial Highway and Beach Boulevard.

Project-related traffic was added to the forecasted baseline build-out year volumes and the intersection analysis was re-run for the Future Build-out Conditions. The resulting intersection operation is summarized on Table 2. The project traffic would cause slight increases in overall peak hour delay and ICU at this intersection, but would not result in a noticeable change in operations or cause a significant impact. The intersection of Imperial Highway and Beach Boulevard would continue to operate at LOS D during both the morning and evening peak hours.



TABLE 2 SUMMARY OF PEAK HOUR INTERSECTION OPERATIONS FUTURE BUILD-OUT CONDITIONS IMPERIAL HIGHWAY AT BEACH BOULEVARD						
Control	AM Peak Hour			PM Peak Hour		
	ICU	Delay	LOS	ICU	Delay	LOS
Signalized	0.71	43.0	D	0.84	50.0	D

The analysis shows that the Fullerton General Plan Update would not significantly impact traffic operations at the intersection of Imperial Highway and Beach Boulevard. Therefore, no mitigation measures are necessary.

Please contact me if you have any questions, or if you need additional information.

Sincerely,

KIMLEY-HORN AND ASSOCIATES, INC.

Serine Ciandella, AICP
Senior Vice President

Attachments

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

N-S STREET: Beach Blvd

DATE: 3/16/2011

LOCATION: City of La Habra

E-W STREET: Imperial Highway

DAY: WEDNESDAY

PROJECT# 2011 Historical

LANES:	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			TOTAL
	NL 1	NT 3	NR 2	SL 2	ST 3	SR 0	EL 2	ET 3	ER 0	WL 2	WT 2	WR 1	
6:00 AM	13	49	32	9	112	9	3	75	15	31	123	3	474
6:15 AM	14	83	24	23	176	13	14	65	14	40	172	8	646
6:30 AM	12	100	27	25	269	18	5	88	14	64	164	9	795
6:45 AM	16	93	31	21	177	5	16	74	16	62	219	16	746
7:00 AM	36	145	62	48	301	47	16	151	42	71	240	25	1184
7:15 AM	51	163	85	49	318	50	24	186	26	83	301	37	1373
7:30 AM	64	193	89	50	338	51	21	237	41	74	305	37	1500
7:45 AM	52	218	81	56	332	48	40	209	46	104	300	42	1528
8:00 AM	54	165	80	48	302	60	30	195	58	57	206	50	1305
8:15 AM	61	193	81	48	273	37	28	204	46	84	233	32	1320
8:30 AM	29	193	79	57	303	45	28	170	54	78	206	28	1270
8:45 AM	40	209	73	28	249	46	25	147	43	74	169	42	1145

TOTAL VOLUMES =	NL 442	NT 1804	NR 744	SL 462	ST 3150	SR 429	EL 250	ET 1801	ER 415	WL 822	WT 2638	WR 329	TOTAL 13286
-----------------	-----------	------------	-----------	-----------	------------	-----------	-----------	------------	-----------	-----------	------------	-----------	----------------

AM Peak Hr Begins at: 715 AM

PEAK VOLUMES =	221	739	335	203	1290	209	115	827	171	318	1112	166	5706
PEAK HR. FACTOR:	0.922			0.969			0.931			0.895			0.934

CONTROL: Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

N-S STREET: Beach Blvd

DATE: 3/16/2011

LOCATION: City of La Habra

E-W STREET: Imperial Highway

DAY: WEDNESDAY

PROJECT# 2011 Historical

LANES:	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			TOTAL
	NL 1	NT 3	NR 2	SL 2	ST 3	SR 0	EL 2	ET 3	ER 0	WL 2	WT 2	WR 1	
3:00 PM	72	266	106	69	221	50	45	195	56	116	223	41	1460
3:15 PM	98	269	113	64	207	28	44	272	58	84	204	61	1502
3:30 PM	69	289	103	84	242	44	46	236	61	105	170	31	1480
3:45 PM	99	348	109	65	220	29	33	251	54	106	202	42	1558
4:00 PM	82	307	102	75	245	43	37	245	49	116	193	56	1550
4:15 PM	70	302	97	71	243	46	50	254	41	119	206	52	1551
4:30 PM	72	319	98	68	223	39	48	242	48	117	233	49	1556
4:45 PM	90	323	124	76	267	36	53	252	50	113	225	45	1654
5:00 PM	91	333	114	84	231	40	53	254	43	136	230	42	1651
5:15 PM	82	352	121	52	270	42	56	265	53	133	243	42	1711
5:30 PM	75	348	110	68	238	43	39	295	52	106	231	63	1668
5:45 PM	82	365	108	82	244	28	64	248	50	77	195	60	1603
6:00 PM	71	319	95	80	212	53	57	239	49	96	176	50	1497
6:15 PM	92	317	121	86	238	24	37	229	66	103	178	54	1545
6:30 PM	92	314	92	60	198	31	42	241	53	89	173	44	1429
6:45 PM	66	260	103	74	200	33	40	199	49	101	168	50	1343
TOTAL VOLUMES =	1303	5031	1716	1158	3699	609	744	3917	832	1717	3250	782	24758

PM Peak Hr Begins at: 4:45 PM

PEAK VOLUMES =	338	1356	469	280	1006	161	201	1066	198	488	929	192	6684
PEAK HR. FACTOR:		0.974			0.954			0.949			0.962		0.977

CONTROL: Signalized

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

Existing Traffic with Existing Lane Geometrics

Imperial Highway at Beach Boulevard

Caltrans

AM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

	Eastbound			Westbound			Northbound			Southbound		
Movement Times	L		R	T	R	L	T	R	L		R	
Movement 1: 14 secs	X			X								
Movement 2: 7 secs				X	X							
Movement 3: 51 secs			X		X							
Movement 4: 18 secs						X			X			
Movement 5: 50 secs							X	X		X	X	
Movement 6: 0 secs												
# of Lanes (#, S, P)	2	3	S	2	3	1	2	3	2	2	3	1
Unadjusted Volume	124	989	184	355	1243	186	240	801	363	209	1331	216
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
Min/Ped Time Override (sec)	14	40	40	14	40	40	14	36	36	14	36	36
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

Output

	***			***			***			***		
Peak Hour Volume (vph)	124	989	184	355	1243	186	240	801	363	209	1331	216
Saturation Flow (vph)	3500	5700	Shrd	3500	5700	1800	3500	5700	3400	3500	5700	1800
X or Volume/Capacity	0.41	0.54	-	0.75	0.55	0.26	0.60	0.41	0.31	0.52	0.68	0.35
Effective Green (sec)	12	45	-	19	56	56	16	48	48	16	48	48
Split Time (sec)	14	51	-	24	58	58	18	50	50	18	50	50
Min. Time or Ped. Time (sec)	14	40	-	14	40	40	14	36	36	14	36	36
Delay - 15 min pk (sec/veh)	65	37	-	58	33	29	65	36	35	63	41	36
Level of Service (LOS)	E	D-	-	E	C-	C	E	D+	C-	E	D	D+
Average 'Q' (veh/in)	2	3	-	4	10	4	4	7	5	4	7	6
Design 'Q'-ft/in (1.5*Qavg)	60	280	-	180	300	120	120	220	160	120	340	180
Do Vehicles Clear?	YES	YES	-	YES	YES	YES	YES	YES	YES	YES	YES	YES

Summary of Results

Whole Intersection		Critical Movements	
Weighted Average Delay (seconds) =	42	Weighted Average Delay (seconds) =	48
Level of Service - LOS =	D	Level of Service - LOS =	D
		Intersection Capacity Utilization - ICU =	0.63
Predetermined Cycle Length is 140 sec			
Min./Ped. Times Satisfied			
Analysis Based on User Selected Splits			

WEBSTER
Webster Based Signal Timing Evaluation Routine
For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

Existing Traffic with Existing Lane Geometrics

Imperial Highway at Beach Boulevard

Caltrans

PM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

	Eastbound			Westbound			Northbound			Southbound		
Movement Times	L		R	T	R		L		R	T	R	
Movement 1: 14 secs	X											
Movement 2: 13 secs					X	X						
Movement 3: 49 secs			X		X	X						
Movement 4: 17 secs							X					
Movement 5: 11 secs							X	X	X			
Movement 6: 36 secs								X	X		X	
# of Lanes (#, S, P)	2		S		3	1	2		2		3	1
Unadjusted Volume	212	123	209	507	965	200	347	1007	481	293	1054	169
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
Min/Ped Time Override (sec)	14	40	40	14	40	40	14	36	36	14	36	36
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

Output

Peak Hour Volume (vph)	212	123	209	507	965	200	347	1007	481	293	1054	169
Saturation Flow (vph)	3500	3500	Shrd	3500	5700	1800	3500	3700	3400	3500	5700	1800
X or Volume/Capacity	0.71	0.70	-	0.53	0.40	0.26	0.53	0.51	0.44	0.72	0.76	0.39
Effective Green (sec)	12	17	-	25	60	60	26	45	45	15	34	34
Split Time (sec)	14	49	-	27	62	62	28	47	47	17	36	36
Min. Time or Ped. Time (sec)	14	40	-	14	40	40	14	36	36	14	36	36
Delay - 15 min pk (sec/veh)	75	42	-	66	28	27	55	46	39	76	53	47
Level of Service (LOS)	E-	D	-	B	C	C	D-	D	D+	F	D-	D
Average 'Q' (veh/ln)	4	11	-	11	7	4	5	12	6	13	10	5
Design 'Q'-ft/ln (1.5*Qavg)	120	340	-	240	220	120	160	180	180	190	300	160
Do Vehicles Clear?	YES	YES	-	YES	YES	YES	YES	YES	YES	YES	YES	YES

Summary of Results

Whole Intersection	Critical Movements
Weighted Average Delay (seconds) = 47	Weighted Average Delay (seconds) = 50
Level of Service - LOS = D	Level of Service - LOS = D
Intersection Capacity Utilization - ICU = 0.75	
Predetermined Cycle Length is 140 sec	
Min./Ped. Times Satisfied	
Analysis Based on User Selected Splits	

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

Future Buildout 2030

Imperial Highway at Beach Boulevard

Caltrans

AM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

	Eastbound			Westbound			Northbound			Southbound		
Movement Times	L	T	R	L	T	R	L	T	R	L	T	R
Movement 1: 14 secs	X											
Movement 2: 7 secs					X	X						
Movement 3: 51 secs			X		X	X						
Movement 4: 18 secs										X		
Movement 5: 50 secs								X	X		X	X
Movement 6: 0 secs												
# of Lanes (#, S, P)	2	1	S	3	1	1	3	2	2	2	1	1
Unadjusted Volume	130	107	204	373	1462	204	255	885	381	222	1462	227
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
Min/Ped Time Override (sec)	14	40	40	14	40	40	14	36	36	14	36	36
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

Output

	***			***			***			***		
Peak Hour Volume (vph)	130	107	204	373	1462	204	255	885	381	222	1462	227
Saturation Flow (vph)	3500	3500	Shrd	3500	5700	1800	3500	5700	3400	3500	5700	1800
X or Volume/Capacity	0.43	0.60	-	0.73	0.64	0.28	0.34	0.45	0.33	0.56	0.75	0.37
Effective Green (sec)	12	48	-	49	56	56	16	48	48	16	48	48
Split Time (sec)	14	50	-	21	58	58	18	50	50	18	50	50
Min. Time or Ped. Time (sec)	14	40	-	14	40	40	14	36	36	14	36	36
Delay - 15 min pk (sec/veh)	65	40	-	71	35	29	67	37	35	64	41	36
Level of Service (LOS)	E	D	-	E	D+	C	E	D+	C-	E	D	D+
Average 'Q' (veh/in)	2	11	-	6	11	5	7	8	5	4	19	6
Design 'Q'-ft/in (1.5*Qavg)	60	240	-	150	340	160	120	240	160	120	360	180
Do Vehicles Clear?	YES	YES	-	YES	YES	YES	YES	YES	YES	YES	YES	YES

Summary of Results

Whole Intersection		Critical Movements	
Weighted Average Delay (seconds) =	43	Weighted Average Delay (seconds) =	47
Level of Service - LOS =	D	Level of Service - LOS =	D
Predetermined Cycle Length is 140 sec			
Min./Ped. Times Satisfied			
Analysis Based on User Selected Splits			

WEBSTER
Webster Based Signal Timing Evaluation Routine
 For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

Future Buildout 2030

Imperial Highway at Beach Boulevard

Caltrans

PM Peak Hour

Parameter Values (using default set 'Webster')

Parameter	Other	Default	Min. Time Parameter	Other	Default	Sat. Flow Parameter	Other	Default
Duration of Peak Period (min)		15	Min. Time (Left Turns, sec)		10	Sat Flow (1 Left lane, vphg)		1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)		3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)		1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

	Eastbound		Westbound		Northbound		Southbound	
Movement Times	L	R	T	R	L	R	T	R
Movement 1: 14 secs	X							
Movement 2: 13 secs			X	X				
Movement 3: 49 secs		X	X	X				
Movement 4: 17 secs					X			
Movement 5: 11 secs					X	X		
Movement 6: 36 secs						X	X	X
# of Lanes (#, S, P)	2	S	3	1	2	2	3	1
Unadjusted Volume	223	221	1210	216	374	505	1164	177
Peak Hour Factor (PHF)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Min/Ped Time Override (sec)	14	40	40	40	14	36	36	36
Progression Adj. Factor (PAF)	1.00	-	1.00	1.00	1.00	1.00	1.00	1.00

Output

	***		***		***		***	
Peak Hour Volume (vph)	223	221	1210	216	374	505	1164	177
Saturation Flow (vph)	3500	Shrd	5700	1800	3500	3400	5700	1800
X or Volume/Capacity	0.74	-	0.21	0.28	0.58	0.46	0.84	0.40
Effective Green (sec)	12	-	25	60	26	45	34	34
Split Time (sec)	14	-	20	62	28	47	36	36
Min. Time or Ped. Time (sec)	14	-	40	40	14	36	36	36
Delay - 15 min pk (sec/veh)	78	-	69	30	27	39	57	47
Level of Service (LOS)	E-	-	C	C	E+	D+	E+	D
Average 'Q' (veh/ln)	4	-	9	5	6	7	12	5
Design 'Q'-ft/ln (1.5*Qavg)	120	-	280	160	180	220	360	160
Do Vehicles Clear?	YES	-	YES	YES	YES	YES	YES	YES

Summary of Results

Whole Intersection		Critical Movements	
Weighted Average Delay (seconds) =	50	Weighted Average Delay (seconds) =	54
Level of Service - LOS =	D	Level of Service - LOS =	D-
Intersection Capacity Utilization - ICU = 0.84			
Predetermined Cycle Length is 140 sec			
Min/Ped. Times Satisfied			
Analysis Based on User Selected Splits			