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SAN BERNARDINO
ASSOCIATED GOVTS

WEBSTER

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

Valley Blvd at Cedar Ave

Valley Blvd at Cedar Ave | **County of San Bernardino** | **AM Peak Hour**

Parameter Values (using default set 'SANBAG (Existing)')

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)	1700	1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)	3200	3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)	1800	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: **34** secs		X	X		X	X						
Movement 3: **21** secs							X			X		
Movement 4: **37** secs								X	X		X	X
Movement 5: **0** secs												
Movement 6: **0** secs												
# of Lanes (#, S, P)	2	1	2	2	2	1	2	2	1	2	3	S
Unadjusted Volume	40	144	664	382	294	54	451	930	212	40	1444	31
Peak Hour Factor (PHF)	0.95	0.95	0.95	0.86	0.86	0.86	0.91	0.91	0.91	0.98	0.98	0.98
Min/Ped Time Override (sec)	10	34	34	10	34	34	10	31	31	10	34	34
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)	42	152	699	444	342	63	496	1022	233	41	1473	32
Saturation Flow (vph)	3200	1800	3400	3200	3600	1800	3200	3600	1800	3200	5400	Shrd
X or Volume/Capacity	0.09	0.29	0.71	0.91	0.33	0.12	0.91	0.90	0.41	0.07	0.88	-
Effective Green (sec)	17	32	32	17	32	32	19	35	35	19	35	-
Split Time (sec)	19	34	34	19	34	34	21	37	37	21	37	-
Min. Time or Ped. Time (sec)	10	34	34	10	34	34	10	31	31	10	34	-
Delay - 15 min pk (sec/veh)	41	32	40	69	32	30	66	48	32	39	43	-
Level of Service (LOS)	D	C-	D+	E	C-	C	E	D	C-	D+	D	-
Average 'Q' (veh/ln)	1	3	8	6	4	1	7	11	5	1	11	-
Design 'Q'-ft/ln (1.5*Qavg)	40	100	240	180	120	40	220	340	160	40	340	-
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 Level of Service - LOS = D	Weighted Average Delay (seconds) = 53 Level of Service - LOS = D- Capacity Utilization - ICU/TCU = 0.84

Required Cycle Length is 111 sec
Min./Ped. Times Satisfied

WEBSTER

WEbster Based Signal Timing Evaluation Routine

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

Valley Blvd at Cedar Ave

Valley Blvd at Cedar Ave **County of San Bernardino** **PM Peak Hour**

Parameter Values (using default set 'SANBAG (Existing)')

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)	1700	1800
Lost Time (sec)		2	Min/Ped Time (Thrus, sec)	Varies	Varies	Sat Flow (2 Left lanes, vphg)	3200	3500
Vehicle Length (feet)		20				Sat Flow (1 Thru lane, vphg)	1800	1900
						Sat Flow (1 Right lane, vphg)		1800

Input Values

	Eastbound			Westbound			Northbound			Southbound		
Movement Times	L		R	*L*	T	R	*L*	*T*	R	L	T	R
Movement 1: **15** secs	X			X								
Movement 2: **34** secs			X		X	X						
Movement 3: **33** secs							X			X		
Movement 4: **76** secs								X	X		X	X
Movement 5: **0** secs												
Movement 6: **0** secs												
# of Lanes (#, S, P)	2		2	2	2	1	2	2	1	2	3	S
Unadjusted Volume	154		744	269	264	75	628	1623	225	73	1126	92
Peak Hour Factor (PHF)	1.00		1.00	0.92	0.92	0.92	0.93	0.93	0.93	0.89	0.89	0.89
Min/Ped Time Override (sec)	10		34	10	34	34	10	31	31	10	34	34
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)	154	400	744	292	287	82	675	1745	242	82	1265	103
Saturation Flow (vph)	3200	1800	3400	3200	3600	1800	3200	3600	1800	3200	5400	Shrd
X or Volume/Capacity	0.58	1.10	1.08	1.11	0.39	0.22	1.08	1.03	0.29	0.13	0.54	-
Effective Green (sec)	13	32	32	13	32	32	31	74	74	31	74	-
Split Time (sec)	15	34	34	15	34	34	33	76	76	33	76	-
Min. Time or Ped. Time (sec)	10	34	34	10	34	34	10	31	31	10	34	-
Delay - 15 min pk (sec/veh)	79	140	122	161	56	54	122	75	27	53	31	-
Level of Service (LOS)	E-	F	F	F	E+	D-	F	E	C	D-	C-	-
Average 'Q' (veh/ln)	3	16	15	7	5	3	13	22	6	1	11	-
Design 'Q'-ft/ln (1.5*Qavg)	100	480	460	220	160	100	400	660	180	40	340	-
Do Vehicles Clear?	YES	NO	NO	NO	YES	YES	NO	NO	YES	YES	YES	-

Summary of Results

Oversaturated - Mitigation Required

Whole Intersection	Critical Movements
Weighted Average Delay (seconds) = 82 Level of Service - LOS = F	Weighted Average Delay (seconds) = 102 Level of Service - LOS = F Capacity Utilization - ICU/TCU = 1.06

Required Cycle Length is 158 sec
Min./Ped. Times Satisfied

AM
Valley at Cedar

	EB			WB			NB			SB			Total
	Rt	Th	Lt	Rt	Th	Lt	Rt	Th	Lt	Rt	Th	Lt	
7:00	142	22	14	9	30	65	47	231	69	2	327	6	964
7:15	170	34	5	9	67	92	56	231	84	3	343	12	1106
7:30	151	42	10	9	100	77	37	230	126	12	337	4	1135
7:45	146	28	7	4	74	102	27	183	111	9	323	7	1021
Veh	609	126	36	31	271	336	167	875	390	26	1330	29	
Trucks		0.949507			0.857527			0.910941			0.980878		
2 axle	20	6	1	6	9	15	16	42	10	1	34	5	
PCI	30	9	1.5	9	13.5	22.5	24	0	15	1.5	51	7.5	
3 axle	2	0	1	1	3	4	6	8	2	0	6	0	
PCI	4	0	2	2	6	8	12	16	4	0	12	0	
4+ axle	7	3	0	4	1	5	3	13	14	1	17	1	
PCI	21	9	0	12	3	15	9	39	42	3	51	3	
Total (PCI)	664	144	40	54	294	382	212	930	451	31	1444	40	

PM
Valley at Cedar

	EB			WB			NB			SB			Total
	Rt	Th	Lt	Rt	Th	Lt	Rt	Th	Lt	Rt	Th	Lt	
4:45	211	97	36	18	59	52	58	373	153	20	275	15	1367
5:00	181	108	38	22	77	54	36	385	127	24	231	20	1303
5:15	168	88	43	13	54	64	54	389	141	13	233	16	1276
5:30	140	81	31	14	65	75	54	412	168	29	284	17	1370
Veh	700	374	148	67	255	245	202	1559	589	86	1023	68	
Trucks		1.212302			0.920455			0.926656			0.891667		
2 axle	18	14	4	3	4	8	7	21	13	4	21	2	
PCI	27	21	6	4.5	6	12	10.5	0	19.5	6	31.5	3	
3 axle	1	1	0	0	0	0	0	5	2	0	4	1	
PCI	2	2	0	0	0	0	0	10	4	0	8	2	
4+ axle	5	1	0	1	1	4	4	18	5	0	21	0	
PCI	15	3	0	3	3	12	12	54	15	0	63	0	
Total (PCI)	744	400	154	75	264	269	225	1623	628	92	1126	73	

CEDAR AVE. @ VALLEY BLVD.
SAN BERNARDINO COUNTY
PUBLIC WORKS
TRAFFIC DIVISION

File Name : CEDAR@VALLEY100406
Site Code : 00000000
Start Date : 04/06/2010
Page No : 1

Groups Printed- Unshifted

	VALLEY BLVD. Eastbound				VALLEY BLVD. Westbound				CEDAR AVE. Northbound				CEDAR AVE. Southbound				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
07:00 AM	142	22	14	0	9	30	65	0	47	231	69	0	2	327	6	0	964
07:15 AM	170	34	5	0	9	67	92	0	56	231	84	0	3	343	12	0	1106
07:30 AM	151	42	10	0	9	100	77	0	37	230	126	0	12	337	4	0	1135 ← PH
07:45 AM	146	28	7	0	4	74	102	0	27	183	111	0	9	323	7	0	1021
Total	609	126	36	0	31	271	336	0	167	875	390	0	26	1330	29	0	4226
08:00 AM	127	24	13	0	1	26	62	0	39	174	97	0	14	282	15	0	874
08:15 AM	81	26	11	0	5	22	59	0	32	139	63	0	17	267	13	0	735
08:30 AM	98	47	7	0	5	35	60	0	23	131	71	0	11	255	7	0	750
08:45 AM	76	24	6	0	4	33	56	0	20	156	84	0	14	178	10	0	661
Total	382	121	37	0	15	116	237	0	114	600	315	0	56	982	45	0	3020
09:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00 PM	134	88	40	0	12	75	53	0	49	364	134	0	22	242	18	2	1233
15 PM	116	72	37	0	5	79	50	0	39	347	143	0	17	268	24	1	1198
..30 PM	173	100	46	0	14	45	86	0	45	381	165	0	20	261	6	0	1342
04:45 PM	211	97	36	0	18	59	52	0	58	373	153	0	20	275	15	0	1367 PH
Total	634	357	159	0	49	258	241	0	191	1465	595	0	79	1046	63	3	5140

CEDAR AVE. @ VALLEY BLVD.
SAN BERNARDINO COUNTY
PUBLIC WORKS
TRAFFIC DIVISION

File Name : CEDAR@VALLEY100406
Site Code : 00000000
Start Date : 04/06/2010
Page No : 2

Groups Printed- Unshifted

	VALLEY BLVD. Eastbound				VALLEY BLVD. Westbound				CEDAR AVE. Northbound				CEDAR AVE. Southbound				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
05:00 PM	181	108	38	0	22	77	54	0	36	385	127	0	24	231	20	0	1303
05:15 PM	168	88	43	0	13	54	64	2	54	389	141	0	13	233	16	1	1279
05:30 PM	140	81	31	0	14	65	75	0	54	412	168	0	29	284	17	0	1370
05:45 PM	106	66	38	0	17	35	63	1	61	354	135	2	25	255	16	1	1175
Total	595	343	150	0	66	231	256	3	205	1540	571	2	91	1003	69	2	5127
Grand Total	2220	947	382	0	161	876	1070	3	677	4480	1871	2	252	4361	206	5	17513
Apprch %	62.6	26.7	10.8	0.0	7.6	41.5	50.7	0.1	9.6	63.7	26.6	0.0	5.2	90.4	4.3	0.1	
Total %	12.7	5.4	2.2	0.0	0.9	5.0	6.1	0.0	3.9	25.6	10.7	0.0	1.4	24.9	1.2	0.0	

SAN BERNARDINO COUNTY
Department Of Public works
Traffic Division

LOCATION: CEDAR AVE @ VALLEY AVE
DATE: 4/6/2010 COUNT BY: DAVID TRAN / JORGE VELA / IVAN

		NB LT	NB THRU	NB RT	SB LT	SB THRU	SB RT	EB LT	EB THRU	EB RT	WB LT	WB THRU	WB RT
7:00	CARS												
	2-AXLE	3	7	2	1	5			1	1		1	
	3-AXLE	3	2	1				1			2	1	
	4-AXLE	1		1						1			
	5-AXLE +		2	1		6			1	1	1	1	
7:15	CARS												
	2-AXLE	6	9		2	3		1	3	4	9	2	2
	3-AXLE	1	2	1		2				2	1		1
	4-AXLE		2										
	5-AXLE +		4	5		5			1	2	1		
7:30	CARS												
	2-AXLE	3	13	3	1	16			1	9	2	5	1
	3-AXLE	1	1			2						2	
	4-AXLE	1				1							
	5-AXLE +	1	5	4	1	2	1		1	2	2		3
7:45	CARS										2		3
	2-AXLE	4	13	5	1	10	1		1	6	4	1	
	3-AXLE	1	3			2					1		
	4-AXLE			1									
	5-AXLE +			2		3				1	1		1
MOVEMENT TOTALS:							4226						
8:00	CARS												
	2-AXLE	3	4	2	2	8	1		3	8	2		1
	3-AXLE		2	1		6	1			4			
	4-AXLE												
	5-AXLE +	1	3			9	1			1	3		

		NB LT	NB THRU	NB RT	SB LT	SB THRU	SB RT	EB LT	EB THRU	EB RT	WB LT	WB THRU	WB RT
8:15	CARS												
	2-AXLE	5	8	7	2	9				7	6	3	1
	3-AXLE		2			3			1		2	1	
	4-AXLE		1			1	1						
	5-AXLE +	2	2			6		1		1	1		
8:30	CARS												
	2-AXLE	4	8	2	1	12	1	1	4	6	6	2	
	3-AXLE	2		1		8		2		2	1		
	4-AXLE												
	5-AXLE +		5	2		1			1	2	1		
8:45	CARS												
	2-AXLE	7	8	2	1	5		1	1	11	6	2	1
	3-AXLE		1	1		1		1			3		1
	4-AXLE		1			1							
	5-AXLE +	3	3	1		2				5	1	2	1
MOVEMENT TOTALS:							3020						
16:00	CARS												
	2-AXLE	9	8	3	1	5	1	2	3	3	3	2	
	3-AXLE			1		2				2			2
	4-AXLE			1									
	5-AXLE +	1	8	3		5						1	
16:15	CARS												
	2-AXLE	8	6	1	2	9		4	1	2		3	
	3-AXLE					5		2		1			
	4-AXLE												
	5-AXLE +	1	3			6			1				
16:30	CARS												
	2-AXLE	5	10	5	1	6			3	4	5	2	
	3-AXLE		4	1		2				1			
	4-AXLE	1	1										
	5-AXLE +	1	2	2		2				1	1	1	

		NB LT	NB THRU	NB RT	SB LT	SB THRU	SB RT	EB LT	EB THRU	EB RT	WB LT	WB THRU	WB RT
16:45	CARS												
	2-AXLE	3	4	5	1	3	1		1	2	1	1	
	3-AXLE	1	1		1	1				1			
	4-AXLE		1										
	5-AXLE +		7			5					1		
				MOVEMENT TOTALS:			5140						
17:00	CARS												
	2-AXLE	2	6			6	3	2	7	5	1		2
	3-AXLE		3			2							
	4-AXLE					2							
	5-AXLE +	1	3	3		5			1	2			
17:15	CARS												
	2-AXLE	6	7	4	1	7		1	4	2	2	3	1
	3-AXLE	1				1			1				
	4-AXLE	1		1		2							
	5-AXLE +	2	3			2				1	2	1	
17:30	CARS												
	2-AXLE	2	4	3		5		1	3	9	4	3	
	3-AXLE		1										
	4-AXLE	1				1							
	5-AXLE +		4			4				2	1		1
17:45	CARS												
	2-AXLE	2	11	3		2	1		1	4	5	2	1
	3-AXLE		1			2				1		1	
	4-AXLE												
	5-AXLE +	2	2			3			1	1			1
				MOVEMENT TOTALS:			5127						