

APPENDIX

INTERSECTION LEVEL OF SERVICE

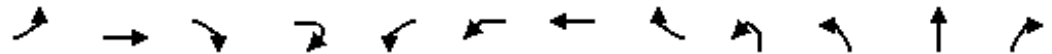
HCM Signalized Intersection Capacity Analysis
45: Cutting Blvd. & San Pablo Ave.

Existing Conditions AM Peak
8/3/2007

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	3.0		3.0	3.0	3.0	3.0	3.0	3.0			3.0	3.0
Lane Util. Factor	1.00		0.88	0.97	0.95	1.00	0.97	0.95			0.95	1.00
Frbp, ped/bikes	1.00		0.98	1.00	1.00	0.94	1.00	1.00			1.00	0.98
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00
Frt	1.00		0.85	1.00	1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected	0.95		1.00	0.95	1.00	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)	1676		2594	3072	3320	1156	3252	3320			3257	1475
Flt Permitted	0.95		1.00	0.95	1.00	1.00	0.95	1.00			1.00	1.00
Satd. Flow (perm)	1676		2594	3072	3320	1156	3252	3320			3257	1475
Volume (vph)	187	0	881	144	246	53	266	401	0	0	597	178
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	193	0	908	148	254	55	274	413	0	0	615	184
RTOR Reduction (vph)	0	0	363	0	0	39	0	0	0	0	0	76
Lane Group Flow (vph)	193	0	545	148	254	16	274	413	0	0	615	108
Confl. Peds. (#/hr)			7			53			7			13
Confl. Bikes (#/hr)						1			1			1
Heavy Vehicles (%)	2%	2%	2%	8%	3%	25%	2%	3%	2%	2%	5%	2%
Turn Type	custom		custom	Split		Perm	Prot					pm+ov
Protected Phases	4		5	3	3		5	2			6	4
Permitted Phases	4		4 5			3						6
Actuated Green, G (s)	18.6		33.0	29.0	29.0	29.0	14.4	42.7			25.3	43.9
Effective Green, g (s)	19.1		33.5	29.5	29.5	29.5	14.4	43.7			26.3	45.4
Actuated g/C Ratio	0.19		0.33	0.29	0.29	0.29	0.14	0.43			0.26	0.45
Clearance Time (s)	3.5		3.0	3.5	3.5	3.5	3.0	4.0			4.0	3.5
Vehicle Extension (s)	2.0		2.0	2.0	2.0	2.0	2.0	4.0			4.0	2.0
Lane Grp Cap (vph)	316		935	895	967	337	462	1432			846	661
v/s Ratio Prot	c0.12		c0.08	0.05	c0.08		0.08	0.12			c0.19	0.03
v/s Ratio Perm			0.13			0.01						0.04
v/c Ratio	0.61		0.58	0.17	0.26	0.05	0.59	0.29			0.73	0.16
Uniform Delay, d1	37.7		28.1	26.7	27.6	25.8	40.7	18.7			34.2	16.6
Progression Factor	1.00		1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2	2.5		0.6	0.0	0.1	0.0	1.4	0.2			3.4	0.0
Delay (s)	40.1		28.7	26.8	27.6	25.8	42.1	18.9			37.6	16.7
Level of Service	D		C	C	C	C	D	B			D	B
Approach Delay (s)		30.7			27.1			28.1			32.8	
Approach LOS		C			C			C			C	
Intersection Summary												
HCM Average Control Delay			30.1				HCM Level of Service				C	
HCM Volume to Capacity ratio			0.52									
Actuated Cycle Length (s)			101.3				Sum of lost time (s)				9.0	
Intersection Capacity Utilization			77.1%				ICU Level of Service				D	
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
44: Hill St. & San Pablo Ave.

Existing Conditions AM Peak
8/3/2007



Movement	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL2	NBL	NBT	NBR
Lane Configurations		↖	↗			↖	↗			↖	↗	↖
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		3.0	3.0			3.0	3.0			3.0	3.0	3.0
Lane Util. Factor		1.00	1.00			1.00	1.00			1.00	0.95	1.00
Frbp, ped/bikes		1.00	1.00			1.00	1.00			1.00	1.00	0.97
Flpb, ped/bikes		1.00	1.00			1.00	1.00			1.00	1.00	1.00
Frt		1.00	0.85			1.00	0.86			1.00	1.00	0.85
Flt Protected		0.98	1.00			0.95	1.00			0.95	1.00	1.00
Satd. Flow (prot)		1736	1500			1676	1514			1676	3353	1339
Flt Permitted		0.98	1.00			0.95	1.00			0.95	1.00	1.00
Satd. Flow (perm)		1736	1500			1676	1514			1676	3353	1339
Volume (vph)	14	29	21	2	44	42	4	69	29	7	439	75
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	15	30	22	2	46	44	4	72	30	7	457	78
RTOR Reduction (vph)	0	0	2	0	0	0	65	0	0	0	0	54
Lane Group Flow (vph)	0	45	22	0	0	90	11	0	0	37	457	24
Conf. Peds. (#/hr)												11
Conf. Bikes (#/hr)				1								
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	11%
Turn Type	Split		Prot		Split	Split			Prot	Prot		Perm
Protected Phases	3	3	3		7	7	7		5	5	2	
Permitted Phases												2
Actuated Green, G (s)		4.1	4.1			7.6	7.6			4.8	25.8	25.8
Effective Green, g (s)		5.1	5.1			8.1	8.1			4.8	26.8	26.8
Actuated g/C Ratio		0.06	0.06			0.09	0.09			0.06	0.31	0.31
Clearance Time (s)		4.0	4.0			3.5	3.5			3.0	4.0	4.0
Vehicle Extension (s)		2.0	2.0			2.0	2.0			2.0	2.0	2.0
Lane Grp Cap (vph)		102	88			156	141			92	1032	412
v/s Ratio Prot		c0.03	0.01			c0.05	0.01			0.02	0.14	
v/s Ratio Perm												0.02
v/c Ratio		0.44	0.25			0.58	0.08			0.40	0.44	0.06
Uniform Delay, d1		39.6	39.2			37.9	36.1			39.8	24.2	21.3
Progression Factor		1.00	1.00			1.00	1.00			1.00	1.00	1.00
Incremental Delay, d2		1.1	0.5			3.2	0.1			1.0	0.1	0.0
Delay (s)		40.7	39.7			41.0	36.2			40.8	24.3	21.3
Level of Service		D	D			D	D			D	C	C
Approach Delay (s)		40.4					38.8				24.9	
Approach LOS		D					D				C	
Intersection Summary												
HCM Average Control Delay			28.7									HCM Level of Service C
HCM Volume to Capacity ratio			0.71									
Actuated Cycle Length (s)			87.1							12.0		
Intersection Capacity Utilization			75.9%									ICU Level of Service D
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
44: Hill St. & San Pablo Ave.

Existing Conditions AM Peak
8/3/2007



Movement	SBL	SBT	SBR	SBR2	NEL2	NEL	NER	NER2
Lane Configurations								
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	3.0	3.0				3.0		3.0
Lane Util. Factor	0.97	0.95				0.97		1.00
Frbp, ped/bikes	1.00	0.97				1.00		1.00
Flpb, ped/bikes	1.00	1.00				1.00		1.00
Frt	1.00	0.95				0.94		0.85
Flt Protected	0.95	1.00				0.97		1.00
Satd. Flow (prot)	3159	3053				3092		1500
Flt Permitted	0.95	1.00				0.97		1.00
Satd. Flow (perm)	3159	3053				3092		1500
Volume (vph)	525	756	332	9	11	145	112	14
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	547	788	346	9	11	151	117	15
RTOR Reduction (vph)	0	1	0	0	0	0	0	0
Lane Group Flow (vph)	547	1142	0	0	0	279	0	15
Confl. Peds. (#/hr)			17	17				
Confl. Bikes (#/hr)			1	1				
Heavy Vehicles (%)	5%	4%	3%	2%	2%	2%	4%	2%
Turn Type	Prot		Split			Free		
Protected Phases	1	6			4	4		
Permitted Phases								Free
Actuated Green, G (s)	18.6	40.1				12.0		87.1
Effective Green, g (s)	19.1	41.1				13.0		87.1
Actuated g/C Ratio	0.22	0.47				0.15		1.00
Clearance Time (s)	3.5	4.0				4.0		
Vehicle Extension (s)	2.0	4.0				2.0		
Lane Grp Cap (vph)	693	1441				461		1500
v/s Ratio Prot	c0.17	c0.37				c0.09		
v/s Ratio Perm								0.01
v/c Ratio	0.79	0.79				0.61		0.01
Uniform Delay, d1	32.1	19.4				34.7		0.0
Progression Factor	1.00	1.00				1.00		1.00
Incremental Delay, d2	5.5	3.3				1.5		0.0
Delay (s)	37.6	22.7				36.2		0.0
Level of Service	D	C				D		A
Approach Delay (s)		27.5				34.3		
Approach LOS		C				C		
Intersection Summary								

HCM Signalized Intersection Capacity Analysis
38: Central Ave. & San Pablo Ave.

Existing Conditions AM Peak
8/3/2007

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	3.0	3.0	3.0		3.0		3.0	3.0		3.0	3.0	
Lane Util. Factor	0.95	0.95	1.00		0.95		1.00	0.95		1.00	0.95	
Frbp, ped/bikes	1.00	1.00	0.98		1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85		0.98		1.00	0.99		1.00	0.97	
Flt Protected	0.95	1.00	1.00		0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1593	1676	1383		3174		1676	3288		1402	3238	
Flt Permitted	0.95	1.00	1.00		0.99		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1593	1676	1383		3174		1676	3288		1402	3238	
Volume (vph)	161	293	69	60	299	42	97	350	38	45	785	167
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	164	299	70	61	305	43	99	357	39	46	801	170
RTOR Reduction (vph)	0	0	41	0	9	0	0	6	0	0	15	0
Lane Group Flow (vph)	164	299	29	0	400	0	99	390	0	46	956	0
Confl. Peds. (#/hr)			32			6			9			9
Confl. Bikes (#/hr)			1			2			1			1
Heavy Vehicles (%)	2%	2%	8%	2%	3%	23%	2%	2%	2%	22%	2%	4%
Turn Type	Split		pm+ov	Split			Prot			Prot		
Protected Phases	4	4	1	3	3		1	6		5	2	
Permitted Phases			4									
Actuated Green, G (s)	22.8	22.8	44.4		14.8		21.6	49.9		7.0	35.3	
Effective Green, g (s)	23.3	23.3	44.9		14.8		21.6	50.9		7.0	36.3	
Actuated g/C Ratio	0.22	0.22	0.42		0.14		0.20	0.47		0.06	0.34	
Clearance Time (s)	3.5	3.5	3.0		3.0		3.0	4.0		3.0	4.0	
Vehicle Extension (s)	2.0	2.0	2.0		2.0		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	344	362	575		435		335	1550		91	1088	
v/s Ratio Prot	0.10	c0.18	0.01		c0.13		c0.06	0.12		0.03	c0.30	
v/s Ratio Perm			0.01									
v/c Ratio	0.48	0.83	0.05		0.92		0.30	0.25		0.51	0.88	
Uniform Delay, d1	37.0	40.4	18.8		46.0		36.7	17.1		48.8	33.8	
Progression Factor	1.00	1.00	1.00		1.00		0.91	0.80		1.06	0.52	
Incremental Delay, d2	0.4	13.6	0.0		24.4		0.2	0.4		1.5	9.3	
Delay (s)	37.4	54.0	18.8		70.4		33.7	14.1		53.3	27.0	
Level of Service	D	D	B		E		C	B		D	C	
Approach Delay (s)		44.3			70.4			18.0			28.2	
Approach LOS		D			E			B			C	
Intersection Summary												
HCM Average Control Delay			36.7				HCM Level of Service				D	
HCM Volume to Capacity ratio			0.74									
Actuated Cycle Length (s)			108.0				Sum of lost time (s)			12.0		
Intersection Capacity Utilization			82.5%				ICU Level of Service			E		
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
45: Cutting Blvd. & San Pablo Ave.

Existing Conditions PM Peak
8/3/2007



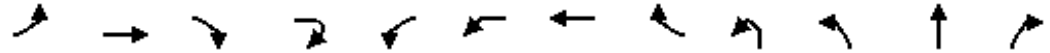
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖		↖↖	↖↖	↖↖	↖	↖↖	↖↖			↖↖	↖
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	3.0		3.0	3.0	3.0	3.0	3.0	3.0			3.0	3.0
Lane Util. Factor	1.00		0.88	0.97	0.95	1.00	0.97	0.95			0.95	1.00
Frbp, ped/bikes	1.00		1.00	1.00	1.00	0.95	1.00	1.00			1.00	0.96
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00
Frt	1.00		0.85	1.00	1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected	0.95		1.00	0.95	1.00	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)	1676		2640	2936	3320	1276	3252	3320			3288	1444
Flt Permitted	0.95		1.00	0.95	1.00	1.00	0.95	1.00			1.00	1.00
Satd. Flow (perm)	1676		2640	2936	3320	1276	3252	3320			3288	1444
Volume (vph)	233	0	597	81	398	102	503	946	0	0	580	195
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	243	0	622	84	415	106	524	985	0	0	604	203
RTOR Reduction (vph)	0	0	381	0	0	68	0	0	0	0	0	55
Lane Group Flow (vph)	243	0	241	84	415	38	524	985	0	0	604	148
Confl. Peds. (#/hr)			3			37			23			31
Confl. Bikes (#/hr)			5			3			3			4
Heavy Vehicles (%)	2%	2%	2%	13%	3%	14%	2%	3%	2%	2%	4%	2%
Turn Type	Prot		custom	Split		Perm	Prot					pm+ov
Protected Phases	4		4 5	3	3		5	2			6	4
Permitted Phases			4 5			3						6
Actuated Green, G (s)	20.0		46.0	32.2	32.2	32.2	23.0	56.8			30.8	50.8
Effective Green, g (s)	20.5		46.5	32.7	32.7	32.7	23.0	57.8			31.8	52.3
Actuated g/C Ratio	0.17		0.39	0.27	0.27	0.27	0.19	0.48			0.26	0.44
Clearance Time (s)	3.5			3.5	3.5	3.5	3.0	4.0			4.0	3.5
Vehicle Extension (s)	2.0			2.0	2.0	2.0	2.0	4.0			4.0	2.0
Lane Grp Cap (vph)	286		1023	800	905	348	623	1599			871	629
v/s Ratio Prot	c0.14		0.09	0.03	c0.12		c0.16	0.30			c0.18	0.04
v/s Ratio Perm						0.03						0.06
v/c Ratio	0.85		0.24	0.10	0.46	0.11	0.84	0.62			0.69	0.24
Uniform Delay, d1	48.3		24.8	32.7	36.3	32.7	46.7	22.9			39.7	21.3
Progression Factor	1.00		1.00	1.00	1.00	1.00	0.73	0.59			0.85	0.59
Incremental Delay, d2	19.6		0.0	0.0	0.1	0.1	6.3	1.1			4.3	0.1
Delay (s)	67.9		24.8	32.7	36.4	32.8	40.6	14.5			38.2	12.6
Level of Service	E		C	C	D	C	D	B			D	B
Approach Delay (s)		36.9			35.3			23.6			31.7	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM Average Control Delay	30.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	86.5%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
44: Hill St. & San Pablo Ave.

Existing Conditions PM Peak
8/3/2007



Movement	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL2	NBL	NBT	NBR
Lane Configurations		↖	↗			↖	↗			↖	↗	↖
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		3.0	3.0			3.0	3.0			3.0	3.0	3.0
Lane Util. Factor		1.00	1.00			1.00	1.00			1.00	0.95	1.00
Frbp, ped/bikes		1.00	0.97			1.00	1.00			1.00	1.00	0.97
Flpb, ped/bikes		1.00	1.00			1.00	1.00			1.00	1.00	1.00
Frt		1.00	0.85			1.00	0.86			1.00	1.00	0.85
Flt Protected		0.97	1.00			0.95	1.00			0.95	1.00	1.00
Satd. Flow (prot)		1720	1449			1676	1513			1676	3320	1381
Flt Permitted		0.97	1.00			0.95	1.00			0.95	1.00	1.00
Satd. Flow (perm)		1720	1449			1676	1513			1676	3320	1381
Volume (vph)	38	35	31	3	63	77	16	304	60	25	845	114
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	41	38	33	3	68	83	17	327	65	27	909	123
RTOR Reduction (vph)	0	0	3	0	0	0	286	0	0	0	0	83
Lane Group Flow (vph)	0	79	33	0	0	151	58	0	0	92	909	40
Confl. Peds. (#/hr)												6
Confl. Bikes (#/hr)			1	2								1
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	3%	8%
Turn Type	Split		Perm		Split	Split			Prot	Prot		Perm
Protected Phases	3	3			7	7	7		5	5	2	
Permitted Phases			3									2
Actuated Green, G (s)		8.6	8.6			14.6	14.6			11.5	38.0	38.0
Effective Green, g (s)		9.6	9.6			15.1	15.1			11.5	39.0	39.0
Actuated g/C Ratio		0.08	0.08			0.13	0.13			0.10	0.32	0.32
Clearance Time (s)		4.0	4.0			3.5	3.5			3.0	4.0	4.0
Vehicle Extension (s)		2.0	2.0			2.0	2.0			2.0	2.0	2.0
Lane Grp Cap (vph)		138	116			211	190			161	1079	449
v/s Ratio Prot		c0.05				c0.09	0.04			0.05	c0.27	
v/s Ratio Perm			0.02									0.03
v/c Ratio		0.57	0.29			0.72	0.31			0.57	0.84	0.09
Uniform Delay, d1		53.2	52.0			50.4	47.7			51.9	37.6	28.2
Progression Factor		1.00	1.00			1.00	1.00			1.00	1.00	1.00
Incremental Delay, d2		3.5	0.5			9.2	0.3			3.0	8.0	0.4
Delay (s)		56.8	52.5			59.6	48.0			54.9	45.7	28.5
Level of Service		E	D			E	D			D	D	C
Approach Delay (s)		55.4				51.6				44.5		
Approach LOS		E				D				D		
Intersection Summary												
HCM Average Control Delay			43.9			HCM Level of Service				D		
HCM Volume to Capacity ratio			0.79									
Actuated Cycle Length (s)			120.0			Sum of lost time (s)			15.0			
Intersection Capacity Utilization			90.9%			ICU Level of Service			E			
Analysis Period (min)			15									
c	Critical Lane Group											

HCM Signalized Intersection Capacity Analysis
44: Hill St. & San Pablo Ave.

Existing Conditions PM Peak
8/3/2007



Movement	SBL	SBT	SBR	SBR2	NEL2	NEL	NER	NER2
Lane Configurations	↩↩	↑↩				↩↩		↩
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	3.0	3.0				3.0		3.0
Lane Util. Factor	0.97	0.95				0.97		1.00
Frbp, ped/bikes	1.00	0.96				0.99		0.99
Flpb, ped/bikes	1.00	1.00				1.00		1.00
Frt	1.00	0.96				0.95		0.85
Flt Protected	0.95	1.00				0.97		1.00
Satd. Flow (prot)	3130	3078				3108		1482
Flt Permitted	0.95	1.00				0.97		1.00
Satd. Flow (perm)	3130	3078				3108		1482
Volume (vph)	397	649	207	5	13	262	133	38
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	427	698	223	5	14	282	143	41
RTOR Reduction (vph)	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	427	926	0	0	0	439	0	41
Conf. Peds. (#/hr)			22	22				
Conf. Bikes (#/hr)			2	2			1	1
Heavy Vehicles (%)	6%	3%	3%	2%	2%	2%	4%	2%
Turn Type	Prot					Split		Free
Protected Phases	1	6			4	4		
Permitted Phases								Free
Actuated Green, G (s)	18.8	45.8				21.0		120.0
Effective Green, g (s)	19.3	46.8				22.0		120.0
Actuated g/C Ratio	0.16	0.39				0.18		1.00
Clearance Time (s)	3.5	4.0				4.0		
Vehicle Extension (s)	2.0	4.0				2.0		
Lane Grp Cap (vph)	503	1200				570		1482
v/s Ratio Prot	c0.14	0.30				c0.14		
v/s Ratio Perm								0.03
v/c Ratio	0.85	0.77				0.77		0.03
Uniform Delay, d1	48.9	31.9				46.6		0.0
Progression Factor	1.31	0.53				1.00		1.00
Incremental Delay, d2	10.7	4.2				5.8		0.0
Delay (s)	75.0	21.1				52.4		0.0
Level of Service	E	C				D		A
Approach Delay (s)		38.1				47.9		
Approach LOS		D				D		
Intersection Summary								

HCM Signalized Intersection Capacity Analysis
 38: Central Ave. & San Pablo Ave.

Existing Conditions PM Peak
 8/3/2007



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗			↖↗		↖	↗		↖	↗	
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	3.0	3.0			3.0		3.0	3.0		3.0	3.0	
Lane Util. Factor	1.00	0.95			0.95		1.00	0.95		1.00	0.95	
Frbp, ped/bikes	1.00	0.97			0.99		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.94			0.97		1.00	0.99		1.00	0.96	
Flt Protected	0.95	1.00			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1598	3020			3117		1676	3331		1462	3194	
Flt Permitted	0.95	1.00			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1598	3020			3117		1676	3331		1462	3194	
Volume (vph)	215	202	122	64	238	74	183	1016	39	61	533	164
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	229	215	130	68	253	79	195	1081	41	65	567	174
RTOR Reduction (vph)	0	89	0	0	19	0	0	2	0	0	22	0
Lane Group Flow (vph)	229	256	0	0	381	0	195	1120	0	65	719	0
Confl. Peds. (#/hr)			48			9			7			23
Confl. Bikes (#/hr)			9			6			10			5
Heavy Vehicles (%)	7%	2%	7%	2%	4%	9%	2%	2%	2%	17%	2%	2%
Turn Type	Split			Split			Prot			Prot		
Protected Phases	4	4		3	3		1	6		5	2	
Permitted Phases												
Actuated Green, G (s)	20.5	20.5			14.0		21.6	58.2		7.8	44.4	
Effective Green, g (s)	21.0	21.0			14.0		21.6	59.2		7.8	45.4	
Actuated g/C Ratio	0.18	0.18			0.12		0.19	0.52		0.07	0.40	
Clearance Time (s)	3.5	3.5			3.0		3.0	4.0		3.0	4.0	
Vehicle Extension (s)	2.0	2.0			2.0		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	294	556			383		318	1730		100	1272	
v/s Ratio Prot	c0.14	0.08			c0.12		0.12	c0.34		c0.04	0.22	
v/s Ratio Perm												
v/c Ratio	0.78	0.46			0.99		0.61	0.65		0.65	0.57	
Uniform Delay, d1	44.3	41.5			50.0		42.4	19.8		51.8	26.6	
Progression Factor	1.00	1.00			1.00		0.62	0.38		0.78	0.92	
Incremental Delay, d2	11.2	0.2			44.1		1.6	1.2		10.5	1.7	
Delay (s)	55.5	41.7			94.1		27.8	8.7		51.0	26.3	
Level of Service	E	D			F		C	A		D	C	
Approach Delay (s)		47.2			94.1			11.5			28.3	
Approach LOS		D			F			B			C	
Intersection Summary												
HCM Average Control Delay			33.1				HCM Level of Service				C	
HCM Volume to Capacity ratio			0.72									
Actuated Cycle Length (s)			114.0				Sum of lost time (s)			12.0		
Intersection Capacity Utilization			83.1%				ICU Level of Service			E		
Analysis Period (min)			15									
c Critical Lane Group												