













HCM Signalized Intersection Capacity Analysis

1: SR 509 SB Ramps & S 128th St

SAMP Surface Transportation Analysis



















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗	↖	↑↑						↖	↗
Traffic Volume (vph)	0	385	495	185	985	0	0	0	0	130	5	300
Future Volume (vph)	0	385	495	185	985	0	0	0	0	130	5	300
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		5.0	5.0	4.6	5.0						5.0	5.0
Lane Util. Factor		0.95	1.00	1.00	0.95						1.00	1.00
Frbp, ped/bikes		1.00	0.97	1.00	1.00						1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00						1.00	1.00
Frt		1.00	0.85	1.00	1.00						1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (prot)		3260	1416	1646	3292						1637	1458
Flt Permitted		1.00	1.00	0.45	1.00						0.95	1.00
Satd. Flow (perm)		3260	1416	781	3292						1637	1458
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
Adj. Flow (vph)	0	385	495	185	985	0	0	0	0	130	5	300
RTOR Reduction (vph)	0	0	301	0	0	0	0	0	0	0	0	101
Lane Group Flow (vph)	0	385	194	185	985	0	0	0	0	0	135	199
Confl. Peds. (#/hr)			6									
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	0%	0%	0%	2%	2%	2%
Turn Type		NA	Perm	pm+pt	NA					Perm	NA	Perm
Protected Phases		2		1	6						4	
Permitted Phases			2	6						4		4
Actuated Green, G (s)		24.7	24.7	32.6	27.0						30.9	30.9
Effective Green, g (s)		24.7	24.7	32.6	27.0						30.9	30.9
Actuated g/C Ratio		0.33	0.33	0.43	0.36						0.41	0.41
Clearance Time (s)		5.0	5.0	4.6	5.0						5.0	5.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0						3.0	3.0
Lane Grp Cap (vph)		1062	461	399	1172						667	594
v/s Ratio Prot		0.12		c0.03	c0.30							
v/s Ratio Perm			0.14	0.16							0.08	c0.14
v/c Ratio		0.36	0.42	0.46	0.84						0.20	0.33
Uniform Delay, d1		19.5	20.0	14.0	22.4						14.5	15.4
Progression Factor		1.00	1.00	0.98	1.00						1.00	1.00
Incremental Delay, d2		0.2	0.6	0.7	4.9						0.2	0.3
Delay (s)		19.7	20.6	14.4	27.3						14.6	15.7
Level of Service		B	C	B	C						B	B
Approach Delay (s)		20.2			25.2			0.0			15.4	
Approach LOS		C			C			A			B	
Intersection Summary												
HCM 2000 Control Delay			21.7			HCM 2000 Level of Service					C	
HCM 2000 Volume to Capacity ratio			0.58									
Actuated Cycle Length (s)			75.8			Sum of lost time (s)					14.6	
Intersection Capacity Utilization			105.3%			ICU Level of Service					G	
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

2: NB SR 509 Ramps & S 128th St

SAMP Surface Transportation Analysis























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	125	390	0	0	470	95	700	5	255	0	0	0
Future Volume (vph)	125	390	0	0	470	95	700	5	255	0	0	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.6	5.0			5.0	5.0	5.0	5.0				
Lane Util. Factor	1.00	0.95			0.95	1.00	0.95	0.95				
Frbp, ped/bikes	1.00	1.00			1.00	0.97	1.00	0.99				
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00				
Frt	1.00	1.00			1.00	0.85	1.00	0.92				
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.98				
Satd. Flow (prot)	1646	3292			3292	1436	1564	1466				
Flt Permitted	0.47	1.00			1.00	1.00	0.95	0.98				
Satd. Flow (perm)	820	3292			3292	1436	1564	1466				
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
Adj. Flow (vph)	125	390	0	0	470	95	700	5	255	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	55	0	57	0	0	0	0
Lane Group Flow (vph)	125	390	0	0	470	40	497	406	0	0	0	0
Confl. Peds. (#/hr)						3			3			
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	0%	0%	0%
Turn Type	pm+pt	NA			NA	Perm	Perm	NA				
Protected Phases	5	2			6			8				
Permitted Phases	2					6	8					
Actuated Green, G (s)	28.0	24.7			27.0	27.0	30.9	30.9				
Effective Green, g (s)	28.0	24.7			27.0	27.0	30.9	30.9				
Actuated g/C Ratio	0.37	0.33			0.36	0.36	0.41	0.41				
Clearance Time (s)	4.6	5.0			5.0	5.0	5.0	5.0				
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0				
Lane Grp Cap (vph)	338	1072			1172	511	637	597				
v/s Ratio Prot	c0.02	0.12			c0.14							
v/s Ratio Perm	0.12					0.03	c0.32	0.28				
v/c Ratio	0.37	0.36			0.40	0.08	0.78	0.68				
Uniform Delay, d1	16.4	19.5			18.3	16.2	19.5	18.4				
Progression Factor	0.61	0.57			1.00	1.00	1.00	1.00				
Incremental Delay, d2	0.7	0.2			0.2	0.1	6.2	3.2				
Delay (s)	10.6	11.3			18.6	16.2	25.7	21.6				
Level of Service	B	B			B	B	C	C				
Approach Delay (s)		11.1			18.2			23.7			0.0	
Approach LOS		B			B			C			A	
Intersection Summary												
HCM 2000 Control Delay			19.0				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.59									
Actuated Cycle Length (s)			75.8				Sum of lost time (s)		14.6			
Intersection Capacity Utilization			105.3%				ICU Level of Service			G		
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

3: Des Moines Way S & S 128th St

















SAMP Surface Transportation Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	70	250	55	140	260	35	65	220	145	50	395	110
Future Volume (vph)	70	250	55	140	260	35	65	220	145	50	395	110
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00	1.00	1.00	1.00	1.00
Frbp, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.99	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	1.00
Frt	1.00	0.97		1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1614	3125		1630	3193		1614	1699	1424	1630	1716	1435
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1614	3125		1630	3193		1614	1699	1424	1630	1716	1435
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
Adj. Flow (vph)	70	250	55	140	260	35	65	220	145	50	395	110
RTOR Reduction (vph)	0	25	0	0	13	0	0	0	101	0	0	77
Lane Group Flow (vph)	70	280	0	140	282	0	65	220	44	50	395	33
Confl. Peds. (#/hr)	2		6	6		2	5		3	3		5
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	3%	3%	3%	2%	2%	2%	3%	3%	3%	2%	2%	2%
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases									8			4
Actuated Green, G (s)	3.8	14.7		6.3	17.2		3.8	19.4	19.4	3.2	18.8	18.8
Effective Green, g (s)	3.8	14.7		6.3	17.2		3.8	19.4	19.4	3.2	18.8	18.8
Actuated g/C Ratio	0.06	0.23		0.10	0.27		0.06	0.31	0.31	0.05	0.30	0.30
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	96	722		161	863		96	518	434	82	507	424
v/s Ratio Prot	0.04	c0.09		c0.09	0.09		c0.04	0.13		0.03	c0.23	
v/s Ratio Perm									0.03			0.02
v/c Ratio	0.73	0.39		0.87	0.33		0.68	0.42	0.10	0.61	0.78	0.08
Uniform Delay, d1	29.4	20.7		28.2	18.6		29.3	17.6	15.9	29.6	20.5	16.1
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	20.7	0.1		34.9	0.1		13.9	0.2	0.0	8.5	6.8	0.0
Delay (s)	50.1	20.8		63.2	18.6		43.2	17.8	15.9	38.1	27.3	16.2
Level of Service	D	C		E	B		D	B	B	D	C	B
Approach Delay (s)		26.3			33.0			21.0			26.1	
Approach LOS		C			C			C			C	
Intersection Summary												
HCM 2000 Control Delay			26.6				HCM 2000 Level of Service			C		
HCM 2000 Volume to Capacity ratio			0.65									
Actuated Cycle Length (s)			63.6				Sum of lost time (s)		20.0			
Intersection Capacity Utilization			63.6%				ICU Level of Service		B			
Analysis Period (min)			15									
c	Critical Lane Group											

HCM Signalized Intersection Capacity Analysis

















4: 24th Ave S & S 128th St

SAMP Surface Transportation Analysis

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	65	140	70	15	175	25	75	90	10	25	165	55	
Future Volume (vph)	65	140	70	15	175	25	75	90	10	25	165	55	
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	
Total Lost time (s)		5.0			5.0			5.0			5.0		
Lane Util. Factor		1.00			1.00			1.00			1.00		
Frbp, ped/bikes		0.99			1.00			1.00			1.00		
Flpb, ped/bikes		1.00			1.00			1.00			1.00		
Frt		0.97			0.98			0.99			0.97		
Flt Protected		0.99			1.00			0.98			0.99		
Satd. Flow (prot)		1612			1650			1698			1632		
Flt Permitted		0.88			0.97			0.82			0.94		
Satd. Flow (perm)		1431			1601			1421			1546		
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	
Adj. Flow (vph)	65	140	70	15	175	25	75	90	10	25	165	55	
RTOR Reduction (vph)	0	20	0	0	8	0	0	3	0	0	16	0	
Lane Group Flow (vph)	0	255	0	0	207	0	0	172	0	0	229	0	
Confl. Peds. (#/hr)			4	4			1					1	
Confl. Bikes (#/hr)									1				
Heavy Vehicles (%)	3%	3%	3%	4%	4%	4%	0%	0%	0%	3%	3%	3%	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA		
Protected Phases		2			6			4			8		
Permitted Phases	2			6			4			8			
Actuated Green, G (s)		12.8			12.8			7.8			7.8		
Effective Green, g (s)		12.8			12.8			7.8			7.8		
Actuated g/C Ratio		0.42			0.42			0.25			0.25		
Clearance Time (s)		5.0			5.0			5.0			5.0		
Vehicle Extension (s)		2.0			2.0			2.0			2.0		
Lane Grp Cap (vph)		598			669			362			394		
v/s Ratio Prot													
v/s Ratio Perm		c0.18			0.13			0.12			c0.15		
v/c Ratio		0.43			0.31			0.48			0.58		
Uniform Delay, d1		6.3			5.9			9.7			10.0		
Progression Factor		1.00			1.00			1.00			1.00		
Incremental Delay, d2		0.2			0.1			0.4			1.4		
Delay (s)		6.5			6.0			10.0			11.4		
Level of Service		A			A			B			B		
Approach Delay (s)		6.5			6.0			10.0			11.4		
Approach LOS		A			A			B			B		
Intersection Summary													
HCM 2000 Control Delay			8.4									HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.48										
Actuated Cycle Length (s)			30.6									Sum of lost time (s)	10.0
Intersection Capacity Utilization			70.8%									ICU Level of Service	C
Analysis Period (min)			15										
c	Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis
 5: Military Rd S & S 128th St

















SAMP Surface Transportation Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	5	130	10	10	5	170	260	10	10	300	45
Future Volume (Veh/h)	40	5	130	10	10	5	170	260	10	10	300	45
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	40	5	130	10	10	5	170	260	10	10	300	45
Pedestrians		4			2			1				
Lane Width (ft)		12.0			12.0			12.0				
Walking Speed (ft/s)		4.0			4.0			4.0				
Percent Blockage		0			0			0				
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	962	958	328	1083	976	267	349			272		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	962	958	328	1083	976	267	349			272		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	80	98	82	93	95	99	86			99		
cM capacity (veh/h)	199	218	711	139	215	775	1200			1283		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	175	25	440	355								
Volume Left	40	10	170	10								
Volume Right	130	5	10	45								
cSH	430	200	1200	1283								
Volume to Capacity	0.41	0.13	0.14	0.01								
Queue Length 95th (ft)	49	11	12	1								
Control Delay (s)	19.0	25.6	4.2	0.3								
Lane LOS	C	D	A	A								
Approach Delay (s)	19.0	25.6	4.2	0.3								
Approach LOS	C	D										
Intersection Summary												
Average Delay			5.9									
Intersection Capacity Utilization			69.3%		ICU Level of Service				C			
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

6: 8th Ave S & S 136th St



















SAMP Surface Transportation Analysis

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	40	275	55	35	275	25	35	75	35	50	200	70	
Future Volume (vph)	40	275	55	35	275	25	35	75	35	50	200	70	
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	
Total Lost time (s)		5.0			5.0			5.0			5.0		
Lane Util. Factor		1.00			1.00			1.00			1.00		
Frbp, ped/bikes		1.00			1.00			1.00			1.00		
Flpb, ped/bikes		1.00			1.00			1.00			1.00		
Frt		0.98			0.99			0.97			0.97		
Flt Protected		0.99			0.99			0.99			0.99		
Satd. Flow (prot)		1682			1703			1673			1645		
Flt Permitted		0.93			0.93			0.86			0.93		
Satd. Flow (perm)		1578			1597			1462			1540		
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	
Adj. Flow (vph)	40	275	55	35	275	25	35	75	35	50	200	70	
RTOR Reduction (vph)	0	11	0	0	5	0	0	14	0	0	12	0	
Lane Group Flow (vph)	0	359	0	0	330	0	0	131	0	0	308	0	
Confl. Peds. (#/hr)	5		3	3		5	1					1	
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	0%	0%	0%	2%	2%	2%	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA		
Protected Phases		2			6			4			8		
Permitted Phases	2			6			4			8			
Actuated Green, G (s)		15.4			15.4			13.2			13.2		
Effective Green, g (s)		15.4			15.4			13.2			13.2		
Actuated g/C Ratio		0.40			0.40			0.34			0.34		
Clearance Time (s)		5.0			5.0			5.0			5.0		
Vehicle Extension (s)		3.0			3.0			3.0			3.0		
Lane Grp Cap (vph)		629			637			499			526		
v/s Ratio Prot													
v/s Ratio Perm		c0.23			0.21			0.09			c0.20		
v/c Ratio		0.57			0.52			0.26			0.59		
Uniform Delay, d1		9.0			8.8			9.2			10.5		
Progression Factor		1.00			1.00			1.00			1.00		
Incremental Delay, d2		1.3			0.7			0.3			1.7		
Delay (s)		10.3			9.5			9.5			12.1		
Level of Service		B			A			A			B		
Approach Delay (s)		10.3			9.5			9.5			12.1		
Approach LOS		B			A			A			B		
Intersection Summary													
HCM 2000 Control Delay			10.5									HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.58										
Actuated Cycle Length (s)			38.6									Sum of lost time (s)	10.0
Intersection Capacity Utilization			60.1%									ICU Level of Service	B
Analysis Period (min)			15										
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis

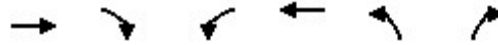
7: Des Moines Way S & S 136th St

SAMP Surface Transportation Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	50	150	60	70	125	35	105	390	130	45	450	75
Future Volume (vph)	50	150	60	70	125	35	105	390	130	45	450	75
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Width	16	16	16	16	16	16	12	12	12	12	12	12
Total Lost time (s)		8.3			8.3		8.0	8.0		8.0	8.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frbp, ped/bikes		0.99			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	
Frt		0.97			0.98		1.00	0.96		1.00	0.98	
Flt Protected		0.99			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1873			1886		1630	1651		1614	1663	
Flt Permitted		0.89			0.83		0.38	1.00		0.39	1.00	
Satd. Flow (perm)		1683			1592		659	1651		661	1663	
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
Adj. Flow (vph)	50	150	60	70	125	35	105	390	130	45	450	75
RTOR Reduction (vph)	0	14	0	0	8	0	0	18	0	0	9	0
Lane Group Flow (vph)	0	246	0	0	222	0	105	502	0	45	516	0
Confl. Peds. (#/hr)	2		3	3		2						
Confl. Bikes (#/hr)						1						
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	2%	2%	2%	3%	3%	3%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4			2			2		
Actuated Green, G (s)		13.8			13.8		24.2	24.2		24.2	24.2	
Effective Green, g (s)		13.8			13.8		24.2	24.2		24.2	24.2	
Actuated g/C Ratio		0.25			0.25		0.45	0.45		0.45	0.45	
Clearance Time (s)		8.3			8.3		8.0	8.0		8.0	8.0	
Vehicle Extension (s)		3.0			3.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)		427			404		293	735		294	741	
v/s Ratio Prot								0.30			c0.31	
v/s Ratio Perm		c0.15			0.14		0.16			0.07		
v/c Ratio		0.58			0.55		0.36	0.68		0.15	0.70	
Uniform Delay, d1		17.7			17.6		9.9	12.0		9.0	12.1	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		1.9			1.5		0.3	2.1		0.1	2.3	
Delay (s)		19.6			19.1		10.2	14.1		9.0	14.4	
Level of Service		B			B		B	B		A	B	
Approach Delay (s)		19.6			19.1			13.4			14.0	
Approach LOS		B			B			B			B	
Intersection Summary												
HCM 2000 Control Delay			15.3				HCM 2000 Level of Service				B	
HCM 2000 Volume to Capacity ratio			0.65									
Actuated Cycle Length (s)			54.3				Sum of lost time (s)			16.3		
Intersection Capacity Utilization			79.4%				ICU Level of Service			D		
Analysis Period (min)			15									

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
 8: 18th Ave S & S 136th St



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	305	20	10	220	10	15
Future Volume (Veh/h)	305	20	10	220	10	15
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	305	20	10	220	10	15
Pedestrians						8
Lane Width (ft)						12.0
Walking Speed (ft/s)						4.0
Percent Blockage						1
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (ft)	956					
pX, platoon unblocked						
vC, conflicting volume			333			563 323
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			333			563 323
tC, single (s)			4.1			6.4 6.2
tC, 2 stage (s)						
tF (s)			2.2			3.5 3.3
p0 queue free %			99			98 98
cM capacity (veh/h)			1229			484 718
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	325	230	25			
Volume Left	0	10	10			
Volume Right	20	0	15			
cSH	1700	1229	601			
Volume to Capacity	0.19	0.01	0.04			
Queue Length 95th (ft)	0	1	3			
Control Delay (s)	0.0	0.4	11.2			
Lane LOS			A			B
Approach Delay (s)	0.0	0.4	11.2			
Approach LOS			B			
Intersection Summary						
Average Delay			0.7			
Intersection Capacity Utilization			31.4%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

9: 24th Ave S & S 136th St

SAMP Surface Transportation Analysis



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	60	155	110	200	280	75
Future Volume (vph)	60	155	110	200	280	75
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	60	155	110	200	280	75

















Direction, Lane #	EB 1	NB 1	SB 1
Volume Total (vph)	215	310	355
Volume Left (vph)	60	110	0
Volume Right (vph)	155	0	75
Hadj (s)	-0.34	0.10	-0.08
Departure Headway (s)	5.1	5.0	4.8
Degree Utilization, x	0.31	0.43	0.48
Capacity (veh/h)	634	682	713
Control Delay (s)	10.4	11.9	12.1
Approach Delay (s)	10.4	11.9	12.1
Approach LOS	B	B	B

Intersection Summary			
Delay		11.6	
Level of Service		B	
Intersection Capacity Utilization	63.1%	ICU Level of Service	B
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis

10: 24th Ave S & S 138th St

SAMP Surface Transportation Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	5	10	10	10	15	10	290	15	30	400	5
Future Volume (Veh/h)	5	5	10	10	10	15	10	290	15	30	400	5
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	5	5	10	10	10	15	10	290	15	30	400	5
Pedestrians		2									5	
Lane Width (ft)		12.0									12.0	
Walking Speed (ft/s)		4.0									4.0	
Percent Blockage		0									0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	807	790	404	792	784	302	407			305		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	807	790	404	792	784	302	407			305		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	98	98	97	97	98	99			98		
cM capacity (veh/h)	280	314	649	293	316	739	1150			1250		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	20	35	315	435								
Volume Left	5	10	10	30								
Volume Right	10	15	15	5								
cSH	407	406	1150	1250								
Volume to Capacity	0.05	0.09	0.01	0.02								
Queue Length 95th (ft)	4	7	1	2								
Control Delay (s)	14.3	14.7	0.3	0.8								
Lane LOS	B	B	A	A								
Approach Delay (s)	14.3	14.7	0.3	0.8								
Approach LOS	B	B										
Intersection Summary												
Average Delay			1.6									
Intersection Capacity Utilization			49.0%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

11: Military Rd S & S 138th St

SAMP Surface Transportation Analysis



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	10	40	25	450	535	10
Future Volume (Veh/h)	10	40	25	450	535	10
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	10	40	25	450	535	10
Pedestrians	5				1	
Lane Width (ft)	12.0				12.0	
Walking Speed (ft/s)	4.0				4.0	
Percent Blockage	0				0	
Right turn flare (veh)						
Median type				None	None	
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1046	545	550			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1046	545	550			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	96	93	98			
cM capacity (veh/h)	248	540	1015			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	50	475	545			
Volume Left	10	25	0			
Volume Right	40	0	10			
cSH	437	1015	1700			
Volume to Capacity	0.11	0.02	0.32			
Queue Length 95th (ft)	10	2	0			
Control Delay (s)	14.3	0.7	0.0			
Lane LOS	B	A				
Approach Delay (s)	14.3	0.7	0.0			
Approach LOS	B					
Intersection Summary						
Average Delay			1.0			
Intersection Capacity Utilization			57.9%	ICU Level of Service	B	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

12: S 146th St & SR 509 SB Off-Ramp

SAMP Surface Transportation Analysis



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		↘	↗
Traffic Volume (veh/h)	0	440	235	0	105	435
Future Volume (Veh/h)	0	440	235	0	105	435
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	440	235	0	105	435
Pedestrians					1	
Lane Width (ft)					11.0	
Walking Speed (ft/s)					4.0	
Percent Blockage					0	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	236				676	236
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	236				676	236
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				75	46
cM capacity (veh/h)	1324				419	802
Direction, Lane #	EB 1	WB 1	SB 1	SB 2		
Volume Total	440	235	105	435		
Volume Left	0	0	105	0		
Volume Right	0	0	0	435		
cSH	1700	1700	419	802		
Volume to Capacity	0.26	0.14	0.25	0.54		
Queue Length 95th (ft)	0	0	25	83		
Control Delay (s)	0.0	0.0	16.5	14.7		
Lane LOS			C	B		
Approach Delay (s)	0.0	0.0	15.0			
Approach LOS			C			
Intersection Summary						
Average Delay			6.7			
Intersection Capacity Utilization			49.3%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
 13: S 146th St & SR 509 NB On-Ramp






















Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔			
Traffic Volume (veh/h)	240	305	235	60	0	0
Future Volume (Veh/h)	240	305	235	60	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	240	305	235	60	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	235				1050	265
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	235				1050	265
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	82				100	100
cM capacity (veh/h)	1326				208	779
Direction, Lane #	EB 1	WB 1				
Volume Total	545	295				
Volume Left	240	0				
Volume Right	0	60				
cSH	1326	1700				
Volume to Capacity	0.18	0.17				
Queue Length 95th (ft)	16	0				
Control Delay (s)	4.7	0.0				
Lane LOS	A					
Approach Delay (s)	4.7	0.0				
Approach LOS						
Intersection Summary						
Average Delay			3.0			
Intersection Capacity Utilization			55.9%	ICU Level of Service		B
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

















14: Des Moines Way S/Des Moines Memorial Dr S & S 144th St

SAMP Surface Transportation Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	160	65	245	215	50	40	440	380	50	400	65
Future Volume (vph)	45	160	65	245	215	50	40	440	380	50	400	65
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	10.0	10.0			10.0		5.0	10.0		5.0	10.0	
Lane Util. Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Frbp, ped/bikes	1.00	0.99			1.00		1.00	0.98		1.00	1.00	
Flpb, ped/bikes	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.96			0.99		1.00	0.93		1.00	0.98	
Flt Protected	0.95	1.00			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1568	1569			1617		1614	1555		1599	1647	
Flt Permitted	0.48	1.00			0.74		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	799	1569			1221		1614	1555		1599	1647	
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
Adj. Flow (vph)	45	160	65	245	215	50	40	440	380	50	400	65
RTOR Reduction (vph)	0	11	0	0	3	0	0	25	0	0	5	0
Lane Group Flow (vph)	45	214	0	0	507	0	40	795	0	50	460	0
Confl. Peds. (#/hr)							1		4			
Confl. Bikes (#/hr)			1			1						
Heavy Vehicles (%)	6%	6%	6%	4%	4%	4%	3%	3%	3%	4%	4%	4%
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		3			4		1	6		5	2	
Permitted Phases	3			4								
Actuated Green, G (s)	15.0	15.0			25.1		6.3	40.1		6.8	40.6	
Effective Green, g (s)	15.0	15.0			25.1		6.3	40.1		6.8	40.6	
Actuated g/C Ratio	0.12	0.12			0.21		0.05	0.33		0.06	0.33	
Clearance Time (s)	10.0	10.0			10.0		5.0	10.0		5.0	10.0	
Vehicle Extension (s)	2.0	2.0			2.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	98	192			251		83	511		89	548	
v/s Ratio Prot		c0.14					0.02	c0.51		c0.03	0.28	
v/s Ratio Perm	0.06				c0.42							
v/c Ratio	0.46	1.11			2.02		0.48	1.56		0.56	0.84	
Uniform Delay, d1	49.7	53.5			48.5		56.3	41.0		56.1	37.7	
Progression Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.2	98.3			472.4		1.6	259.7		4.8	10.7	
Delay (s)	51.0	151.8			520.9		57.9	300.7		60.9	48.4	
Level of Service	D	F			F		E	F		E	D	
Approach Delay (s)		135.0			520.9			289.4			49.6	
Approach LOS		F			F			F			D	
Intersection Summary												
HCM 2000 Control Delay			267.5				HCM 2000 Level of Service			F		
HCM 2000 Volume to Capacity ratio			1.53									
Actuated Cycle Length (s)			122.0				Sum of lost time (s)		35.0			
Intersection Capacity Utilization			119.3%				ICU Level of Service		H			
Analysis Period (min)			15									
c	Critical Lane Group											










HCM Unsignalized Intersection Capacity Analysis
 15: 24th Avenue S/24th Ave S & S 142nd St

SAMP Surface Transportation Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	35	45	65	30	15	30	85	250	45	60	310	50
Future Volume (vph)	35	45	65	30	15	30	85	250	45	60	310	50
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	35	45	65	30	15	30	85	250	45	60	310	50
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	145	75	380	420								
Volume Left (vph)	35	30	85	60								
Volume Right (vph)	65	30	45	50								
Hadj (s)	-0.07	-0.13	0.02	-0.01								
Departure Headway (s)	6.0	6.2	5.2	5.1								
Degree Utilization, x	0.24	0.13	0.55	0.60								
Capacity (veh/h)	513	477	653	674								
Control Delay (s)	11.0	10.1	14.5	15.6								
Approach Delay (s)	11.0	10.1	14.5	15.6								
Approach LOS	B	B	B	C								
Intersection Summary												
Delay			14.1									
Level of Service			B									
Intersection Capacity Utilization			52.5%	ICU Level of Service	A							
Analysis Period (min)			15									





















HCM Unsignalized Intersection Capacity Analysis
 16: 24th Avenue S/24th Ave S & S 144th St

SAMP Surface Transportation Analysis

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	75	95	285	60	95	310
Future Volume (Veh/h)	75	95	285	60	95	310
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	75	95	285	60	95	310
Pedestrians	1				2	
Lane Width (ft)	12.0				12.0	
Walking Speed (ft/s)	4.0				4.0	
Percent Blockage	0				0	
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	816	318			346	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	816	318			346	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	77	87			92	
cM capacity (veh/h)	320	723			1201	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	170	345	405			
Volume Left	75	0	95			
Volume Right	95	60	0			
cSH	465	1700	1201			
Volume to Capacity	0.37	0.20	0.08			
Queue Length 95th (ft)	41	0	6			
Control Delay (s)	17.1	0.0	2.5			
Lane LOS	C		A			
Approach Delay (s)	17.1	0.0	2.5			
Approach LOS	C					
Intersection Summary						
Average Delay			4.3			
Intersection Capacity Utilization			64.8%		ICU Level of Service	C
Analysis Period (min)			15			




















HCM Unsignalized Intersection Capacity Analysis
 17: 24th Avenue S/24th Ave S & S 146th St

SAMP Surface Transportation Analysis

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (veh/h)	25	20	335	10	15	15	180	305	25	30	315	40	
Future Volume (Veh/h)	25	20	335	10	15	15	180	305	25	30	315	40	
Sign Control	Stop			Stop			Free			Free			
Grade	0%			0%			0%			0%			
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Hourly flow rate (vph)	25	20	335	10	15	15	180	305	25	30	315	40	
Pedestrians	2			1			1						
Lane Width (ft)	12.0			12.0			12.0						
Walking Speed (ft/s)	4.0			4.0			4.0						
Percent Blockage	0			0			0						
Right turn flare (veh)													
Median type							None			None			
Median storage veh													
Upstream signal (ft)													
pX, platoon unblocked													
vC, conflicting volume	1084	1088	338	1400	1096	318	357			331			
vC1, stage 1 conf vol													
vC2, stage 2 conf vol													
vCu, unblocked vol	1084	1088	338	1400	1096	318	357			331			
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1			
tC, 2 stage (s)													
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2			
p0 queue free %	84	89	52	79	91	98	85			98			
cM capacity (veh/h)	154	178	702	49	176	719	1194			1216			
Direction, Lane #	EB 1	EB 2	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	25	355	40	180	330	30	355						
Volume Left	25	0	10	180	0	30	0						
Volume Right	0	335	15	0	25	0	40						
cSH	154	603	128	1194	1700	1216	1700						
Volume to Capacity	0.16	0.59	0.31	0.15	0.19	0.02	0.21						
Queue Length 95th (ft)	14	96	31	13	0	2	0						
Control Delay (s)	32.8	19.2	45.3	8.5	0.0	8.0	0.0						
Lane LOS	D	C	E	A		A							
Approach Delay (s)	20.1		45.3	3.0		0.6							
Approach LOS	C		E										
Intersection Summary													
Average Delay			8.5										
Intersection Capacity Utilization			65.2%		ICU Level of Service				C				
Analysis Period (min)			15										

HCM Unsignalized Intersection Capacity Analysis
 18: Military Road/Military Rd S & S 144th St























SAMP Surface Transportation Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	5	180	40	70	270	90	60	165	55	180	330	15
Future Volume (vph)	5	180	40	70	270	90	60	165	55	180	330	15
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	5	180	40	70	270	90	60	165	55	180	330	15
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total (vph)	225	430	60	220	180	345						
Volume Left (vph)	5	70	60	0	180	0						
Volume Right (vph)	40	90	0	55	0	15						
Hadj (s)	-0.10	-0.08	0.52	-0.16	0.53	0.00						
Departure Headway (s)	7.7	7.0	8.7	8.0	8.3	7.7						
Degree Utilization, x	0.48	0.84	0.15	0.49	0.41	0.74						
Capacity (veh/h)	422	430	371	407	419	450						
Control Delay (s)	17.5	36.6	12.0	17.4	15.8	28.4						
Approach Delay (s)	17.5	36.6	16.2		24.1							
Approach LOS	C	E	C		C							
Intersection Summary												
Delay			25.2									
Level of Service			D									
Intersection Capacity Utilization			76.1%		ICU Level of Service		D					
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

19: SR 99 & S 144th St

SAMP Surface Transportation Analysis
























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	95	300	95	120	415	55	105	520	70	65	875	65
Future Volume (vph)	95	300	95	120	415	55	105	520	70	65	875	65
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frbp, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00	0.94	1.00	1.00	0.93
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.96		1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1630	1637		1662	1710		1614	3228	1361	1630	3260	1358
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1630	1637		1662	1710		1614	3228	1361	1630	3260	1358
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
Adj. Flow (vph)	95	300	95	120	415	55	105	520	70	65	875	65
RTOR Reduction (vph)	0	12	0	0	5	0	0	0	48	0	0	46
Lane Group Flow (vph)	95	383	0	120	465	0	105	520	22	65	875	19
Confl. Peds. (#/hr)	34		30	30		34	22		17	17		22
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	3%	3%	3%	2%	2%	2%
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases									2			6
Actuated Green, G (s)	7.7	32.0		9.4	33.7		9.1	31.6	31.6	7.0	29.5	29.5
Effective Green, g (s)	7.7	32.0		9.4	33.7		9.1	31.6	31.6	7.0	29.5	29.5
Actuated g/C Ratio	0.08	0.32		0.09	0.34		0.09	0.32	0.32	0.07	0.29	0.29
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	4.0	4.0	2.0	4.0	4.0
Lane Grp Cap (vph)	125	523		156	576		146	1020	430	114	961	400
v/s Ratio Prot	0.06	0.23		c0.07	c0.27		c0.07	0.16		0.04	c0.27	
v/s Ratio Perm									0.02			0.01
v/c Ratio	0.76	0.73		0.77	0.81		0.72	0.51	0.05	0.57	0.91	0.05
Uniform Delay, d1	45.2	30.2		44.2	30.2		44.2	27.9	23.8	45.0	34.0	25.2
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	21.3	8.8		18.3	11.6		13.2	1.8	0.2	4.2	14.1	0.2
Delay (s)	66.6	39.0		62.6	41.8		57.4	29.7	24.0	49.3	48.1	25.4
Level of Service	E	D		E	D		E	C	C	D	D	C
Approach Delay (s)		44.4			46.0			33.3			46.7	
Approach LOS		D			D			C			D	
Intersection Summary												
HCM 2000 Control Delay			42.8				HCM 2000 Level of Service			D		
HCM 2000 Volume to Capacity ratio			0.85									
Actuated Cycle Length (s)			100.0				Sum of lost time (s)			20.0		
Intersection Capacity Utilization			82.6%				ICU Level of Service			E		
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

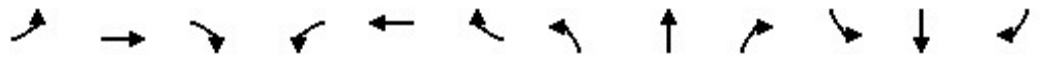
20: 1st Ave S & SW 148th St/SR 518

SAMP Surface Transportation Analysis

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	90	580	85	380	815	415	155	435	330	445	640	140	
Future Volume (vph)	90	580	85	380	815	415	155	435	330	445	640	140	
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	
Lane Width	12	11	12	12	11	11	12	11	11	12	11	11	
Total Lost time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Lane Util. Factor	1.00	0.95		0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00	
Frbp, ped/bikes	1.00	1.00		1.00	1.00	0.99	1.00	1.00	0.99	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	1.00	1.00	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1614	3061		3162	3151	1389	1646	3182	1407	3193	3182	1394	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	
Satd. Flow (perm)	1614	3061		3162	3151	1389	1646	3182	1407	3193	3182	1394	
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	
Adj. Flow (vph)	90	580	85	380	815	415	155	435	330	445	640	140	
RTOR Reduction (vph)	0	9	0	0	0	114	0	0	57	0	0	58	
Lane Group Flow (vph)	90	656	0	380	815	301	155	435	273	445	640	82	
Confl. Peds. (#/hr)						8			5			12	
Heavy Vehicles (%)	3%	3%	3%	2%	2%	2%	1%	1%	1%	1%	1%	1%	
Turn Type	Prot	NA		Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov	
Protected Phases	3	8		7	4	5	1	6	7	5	2	3	
Permitted Phases						4			6			2	
Actuated Green, G (s)	13.6	31.7		20.0	38.1	59.7	16.0	36.7	56.7	21.6	42.3	55.9	
Effective Green, g (s)	13.6	31.7		20.0	38.1	59.7	16.0	36.7	56.7	21.6	42.3	55.9	
Actuated g/C Ratio	0.10	0.24		0.15	0.29	0.46	0.12	0.28	0.44	0.17	0.33	0.43	
Clearance Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	168	746		486	923	637	202	898	667	530	1035	653	
v/s Ratio Prot	0.06	c0.21		0.12	c0.26	0.08	c0.09	0.14	0.06	c0.14	c0.20	0.01	
v/s Ratio Perm						0.14			0.13			0.05	
v/c Ratio	0.54	0.88		0.78	0.88	0.47	0.77	0.48	0.41	0.84	0.62	0.13	
Uniform Delay, d1	55.2	47.3		52.9	43.8	24.3	55.2	38.8	25.2	52.5	37.0	22.3	
Progression Factor	1.00	1.00		1.10	0.72	0.58	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.6	11.2		4.5	6.2	0.1	14.5	1.9	0.1	10.7	2.8	0.0	
Delay (s)	56.8	58.5		62.9	37.9	14.3	69.7	40.7	25.3	63.3	39.8	22.4	
Level of Service	E	E		E	D	B	E	D	C	E	D	C	
Approach Delay (s)		58.3			37.7			40.0			46.3		
Approach LOS		E			D			D			D		
Intersection Summary													
HCM 2000 Control Delay			44.0									HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio			0.81										
Actuated Cycle Length (s)			130.0									Sum of lost time (s)	20.0
Intersection Capacity Utilization			88.4%									ICU Level of Service	E
Analysis Period (min)			15										
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis
 21: SR509 SB On-Ramp/SR 509 SB Off-Ramp & SR 518













SAMP Surface Transportation Analysis



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑		↑↑	↑↑					↑	↑	↑
Traffic Volume (vph)	0	1100	255	585	1460	0	0	0	0	925	5	150
Future Volume (vph)	0	1100	255	585	1460	0	0	0	0	925	5	150
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Width	12	12	12	11	11	12	12	12	12	12	12	11
Total Lost time (s)		6.0		6.0	7.5					7.9	7.9	7.9
Lane Util. Factor		0.91		0.97	0.95					0.95	0.91	0.95
Frbp, ped/bikes		1.00		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
Frt		0.97		1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00		0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		4552		3027	3121					1548	1483	1339
Flt Permitted		1.00		0.95	1.00					0.95	0.95	1.00
Satd. Flow (perm)		4552		3027	3121					1548	1483	1339
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
Adj. Flow (vph)	0	1100	255	585	1460	0	0	0	0	925	5	150
RTOR Reduction (vph)	0	29	0	0	0	0	0	0	0	0	1	60
Lane Group Flow (vph)	0	1326	0	585	1460	0	0	0	0	472	472	75
Confl. Peds. (#/hr)						4						
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	0%	0%	0%	2%	2%	2%
Turn Type		NA		Prot	NA					Split	NA	Perm
Protected Phases		2		1	6					4	4	
Permitted Phases												4
Actuated Green, G (s)		44.0		24.0	72.5					42.1	42.1	42.1
Effective Green, g (s)		44.0		24.0	72.5					42.1	42.1	42.1
Actuated g/C Ratio		0.34		0.18	0.56					0.32	0.32	0.32
Clearance Time (s)		6.0		6.0	7.5					7.9	7.9	7.9
Vehicle Extension (s)		2.0		2.5	2.5					4.0	4.0	4.0
Lane Grp Cap (vph)		1540		558	1740					501	480	433
v/s Ratio Prot		c0.29		c0.19	0.47					0.30	c0.32	
v/s Ratio Perm												0.06
v/c Ratio		0.86		1.05	0.84					0.94	0.98	0.17
Uniform Delay, d1		40.1		53.0	23.9					42.8	43.6	31.5
Progression Factor		0.99		1.02	0.82					1.00	1.00	1.00
Incremental Delay, d2		4.4		44.7	3.5					26.5	36.7	0.3
Delay (s)		43.9		98.8	23.1					69.3	80.4	31.8
Level of Service		D		F	C					E	F	C
Approach Delay (s)		43.9			44.7			0.0			69.4	
Approach LOS		D			D			A			E	
Intersection Summary												
HCM 2000 Control Delay			50.4			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.95									
Actuated Cycle Length (s)			130.0			Sum of lost time (s)			19.9			
Intersection Capacity Utilization			93.6%			ICU Level of Service			F			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
 22: SR 509 NB Off-Ramp/SR 509 NB On-Ramp & SR 518


















SAMP Surface Transportation Analysis

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↑↑	↗		↑↑	↗		↑	↗				
Traffic Volume (vph)	0	1765	260	0	1890	1125	155	0	790	0	0	0	
Future Volume (vph)	0	1765	260	0	1890	1125	155	0	790	0	0	0	
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	
Lane Width	12	12	12	12	12	12	12	15	16	12	12	12	
Total Lost time (s)		5.9	5.9		5.9	4.0		5.9	4.0				
Lane Util. Factor		0.95	1.00		0.95	1.00		1.00	1.00				
Frt		1.00	0.85		1.00	0.85		1.00	0.85				
Flt Protected		1.00	1.00		1.00	1.00		0.95	1.00				
Satd. Flow (prot)		3260	1458		3260	1458		1775	1637				
Flt Permitted		1.00	1.00		1.00	1.00		0.95	1.00				
Satd. Flow (perm)		3260	1458		3260	1458		1775	1637				
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	
Adj. Flow (vph)	0	1765	260	0	1890	1125	155	0	790	0	0	0	
RTOR Reduction (vph)	0	0	58	0	0	0	0	0	0	0	0	0	
Lane Group Flow (vph)	0	1765	202	0	1890	1125	0	155	790	0	0	0	
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	3%	3%	3%	0%	0%	0%	
Turn Type		NA	Perm		NA	Free	Split	NA	Free				
Protected Phases		2			6		8	8					
Permitted Phases			2			Free			Free				
Actuated Green, G (s)		101.2	101.2		101.2	130.0		17.0	130.0				
Effective Green, g (s)		101.2	101.2		101.2	130.0		17.0	130.0				
Actuated g/C Ratio		0.78	0.78		0.78	1.00		0.13	1.00				
Clearance Time (s)		5.9	5.9		5.9			5.9					
Vehicle Extension (s)		4.0	4.0		4.0			3.5					
Lane Grp Cap (vph)		2537	1134		2537	1458		232	1637				
v/s Ratio Prot		0.54			0.58			0.09					
v/s Ratio Perm			0.14			c0.77			0.48				
v/c Ratio		0.70	0.18		0.74	0.77		0.67	0.48				
Uniform Delay, d1		7.0	3.7		7.6	0.0		53.8	0.0				
Progression Factor		1.31	3.63		1.00	1.00		1.00	1.00				
Incremental Delay, d2		0.6	0.1		2.0	4.0		7.4	1.0				
Delay (s)		9.8	13.6		9.6	4.0		61.2	1.0				
Level of Service		A	B		A	A		E	A				
Approach Delay (s)		10.3			7.5			10.9			0.0		
Approach LOS		B			A			B			A		
Intersection Summary													
HCM 2000 Control Delay			9.0									HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.85										
Actuated Cycle Length (s)			130.0									Sum of lost time (s)	11.8
Intersection Capacity Utilization			75.9%									ICU Level of Service	D
Analysis Period (min)			15										

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
 23: Des Moines Way S & SR 518 EB Ramps











SAMP Surface Transportation Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	115	0	45	0	0	0	0	160	390	300	665	0
Future Volume (Veh/h)	115	0	45	0	0	0	0	160	390	300	665	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	115	0	45	0	0	0	0	160	390	300	665	0
Pedestrians		4			7			1				
Lane Width (ft)		12.0			0.0			12.0				
Walking Speed (ft/s)		4.0			4.0			4.0				
Percent Blockage		0			0			0				
Right turn flare (veh)												
Median type								None			None	
Median storage veh												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1624	1436	670	1628	1631	362	669			167		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1624	1436	670	1628	1631	362	669			167		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	100	90	100	100	100	100			79		
cM capacity (veh/h)	68	104	453	62	80	687	918			1405		
Direction, Lane #	EB 1	EB 2	NB 1	SB 1	SB 2							
Volume Total	115	45	550	300	665							
Volume Left	115	0	0	300	0							
Volume Right	0	45	390	0	0							
cSH	68	453	1700	1405	1700							
Volume to Capacity	1.69	0.10	0.32	0.21	0.39							
Queue Length 95th (ft)	253	8	0	20	0							
Control Delay (s)	468.1	13.8	0.0	8.3	0.0							
Lane LOS	F	B		A								
Approach Delay (s)	340.3		0.0	2.6								
Approach LOS	F											
Intersection Summary												
Average Delay			34.0									
Intersection Capacity Utilization			70.9%		ICU Level of Service					C		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

24: Des Moines Way S & SR 518 WB Off-Ramp



















SAMP Surface Transportation Analysis

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	265	580	275	0	0	700
Future Volume (Veh/h)	265	580	275	0	0	700
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	265	580	275	0	0	700
Pedestrians	7					3
Lane Width (ft)	13.0					11.0
Walking Speed (ft/s)	4.0					4.0
Percent Blockage	1					0
Right turn flare (veh)		16				
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	982	285			282	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	982	285			282	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	3	22			100	
cM capacity (veh/h)	273	745			1261	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	845	275	700			
Volume Left	265	0	0			
Volume Right	580	0	0			
cSH	872	1700	1700			
Volume to Capacity	0.97	0.16	0.41			
Queue Length 95th (ft)	405	0	0			
Control Delay (s)	44.3	0.0	0.0			
Lane LOS	E					
Approach Delay (s)	44.3	0.0	0.0			
Approach LOS	E					
Intersection Summary						
Average Delay			20.6			
Intersection Capacity Utilization			70.9%		ICU Level of Service	C
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis










25: 24th Ave S & SeaTac Airport Parking/S 150th St

SAMP Surface Transportation Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	15	20	0	45	20	475	20	95	550	0
Future Volume (Veh/h)	0	0	15	20	0	45	20	475	20	95	550	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	0	15	20	0	45	20	475	20	95	550	0
Pedestrians		2			1							
Lane Width (ft)		12.0			12.0							
Walking Speed (ft/s)		4.0			4.0							
Percent Blockage		0			0							
Right turn flare (veh)												
Median type								None			None	
Median storage veh												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1302	1278	552	1281	1268	486	552			496		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1302	1278	552	1281	1268	486	552			496		
tC, single (s)	8.1	7.5	7.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	4.4	4.9	4.2	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	96	84	100	92	98			91		
cM capacity (veh/h)	74	96	385	125	149	579	1001			1057		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	15	65	20	495	95	550						
Volume Left	0	20	20	0	95	0						
Volume Right	15	45	0	20	0	0						
cSH	385	273	1001	1700	1057	1700						
Volume to Capacity	0.04	0.24	0.02	0.29	0.09	0.32						
Queue Length 95th (ft)	3	23	2	0	7	0						
Control Delay (s)	14.7	22.3	8.7	0.0	8.7	0.0						
Lane LOS	B	C	A		A							
Approach Delay (s)	14.7	22.3	0.3		1.3							
Approach LOS	B	C										
Intersection Summary												
Average Delay			2.2									
Intersection Capacity Utilization			55.6%	ICU Level of Service		B						
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
 26: 24th Ave S & S 152nd St






















SAMP Surface Transportation Analysis

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	70	40	475	65	25	560
Future Volume (Veh/h)	70	40	475	65	25	560
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	70	40	475	65	25	560
Pedestrians						1
Lane Width (ft)						12.0
Walking Speed (ft/s)						4.0
Percent Blockage						0
Right turn flare (veh)						
Median type			None		None	
Median storage veh						
Upstream signal (ft)			751			
pX, platoon unblocked	0.92	0.92			0.92	
vC, conflicting volume	1118	508			540	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1084	423			457	
tC, single (s)	6.4	6.2			4.2	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.3	
p0 queue free %	67	93			97	
cM capacity (veh/h)	215	580			997	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	110	540	585			
Volume Left	70	0	25			
Volume Right	40	65	0			
cSH	279	1700	997			
Volume to Capacity	0.39	0.32	0.03			
Queue Length 95th (ft)	45	0	2			
Control Delay (s)	26.0	0.0	0.7			
Lane LOS	D		A			
Approach Delay (s)	26.0	0.0	0.7			
Approach LOS	D					
Intersection Summary						
Average Delay			2.6			
Intersection Capacity Utilization			67.8%		ICU Level of Service	C
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

27: Air Cargo Rd/24th Ave S & S 154th St

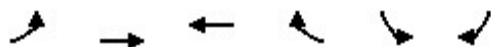
SAMP Surface Transportation Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	100	390	110	95	320	200	135	240	15	110	355	165
Future Volume (vph)	100	390	110	95	320	200	135	240	15	110	355	165
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	11.0	11.0		11.0	11.0		11.0	11.0	11.0		11.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00		0.95	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00	0.98		0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.99	1.00	1.00		1.00	
Frt	1.00	0.97		1.00	0.94		1.00	1.00	0.85		0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00		0.99	
Satd. Flow (prot)	1581	1612		1614	1586		1516	1606	1334		2959	
Flt Permitted	0.29	1.00		0.32	1.00		0.39	1.00	1.00		0.83	
Satd. Flow (perm)	489	1612		539	1586		625	1606	1334		2478	
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
Adj. Flow (vph)	100	390	110	95	320	200	135	240	15	110	355	165
RTOR Reduction (vph)	0	10	0	0	22	0	0	0	9	0	28	0
Lane Group Flow (vph)	100	490	0	95	498	0	135	240	6	0	602	0
Confl. Peds. (#/hr)	2					2	8		2	2		8
Confl. Bikes (#/hr)						1						
Heavy Vehicles (%)	5%	5%	5%	3%	3%	3%	9%	9%	9%	6%	6%	6%
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2		6		6
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)	35.2	35.2		35.2	35.2		37.7	37.7	37.7		37.7	
Effective Green, g (s)	35.2	35.2		35.2	35.2		37.7	37.7	37.7		37.7	
Actuated g/C Ratio	0.37	0.37		0.37	0.37		0.40	0.40	0.40		0.40	
Clearance Time (s)	11.0	11.0		11.0	11.0		11.0	11.0	11.0		11.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0		2.0	
Lane Grp Cap (vph)	181	597		199	588		248	638	529		984	
v/s Ratio Prot		0.30			c0.31			0.15				
v/s Ratio Perm	0.20			0.18			0.22		0.00		c0.24	
v/c Ratio	0.55	0.82		0.48	0.85		0.54	0.38	0.01		0.61	
Uniform Delay, d1	23.6	27.0		22.8	27.4		22.0	20.3	17.3		22.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00		1.00	
Incremental Delay, d2	2.1	8.4		0.7	10.5		1.3	0.1	0.0		0.8	
Delay (s)	25.7	35.4		23.5	37.8		23.3	20.4	17.3		23.6	
Level of Service	C	D		C	D		C	C	B		C	
Approach Delay (s)		33.8			35.6			21.3			23.6	
Approach LOS		C			D			C			C	
Intersection Summary												
HCM 2000 Control Delay			29.2				HCM 2000 Level of Service		C			
HCM 2000 Volume to Capacity ratio			0.73									
Actuated Cycle Length (s)			94.9				Sum of lost time (s)		22.0			
Intersection Capacity Utilization			125.1%				ICU Level of Service		H			
Analysis Period (min)			15									
c	Critical Lane Group											

HCM Unsignalized Intersection Capacity Analysis

28: S 154th St & EB SR518 Off Ramp

SAMP Surface Transportation Analysis



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		↘	↘
Traffic Volume (veh/h)	0	515	465	0	230	150
Future Volume (Veh/h)	0	515	465	0	230	150
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	515	465	0	230	150
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		273				
pX, platoon unblocked					0.74	
vC, conflicting volume	465				980	465
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	465				800	465
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				13	75
cM capacity (veh/h)	1091				263	597
Direction, Lane #	EB 1	WB 1	SB 1	SB 2		
Volume Total	515	465	230	150		
Volume Left	0	0	230	0		
Volume Right	0	0	0	150		
cSH	1700	1700	263	597		
Volume to Capacity	0.30	0.27	0.87	0.25		
Queue Length 95th (ft)	0	0	186	25		
Control Delay (s)	0.0	0.0	69.0	13.0		
Lane LOS			F	B		
Approach Delay (s)	0.0	0.0	46.9			
Approach LOS			E			
Intersection Summary						
Average Delay			13.1			
Intersection Capacity Utilization			61.5%		ICU Level of Service	B
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

29: S 154th St & WB SR 518 On Ramp

SAMP Surface Transportation Analysis

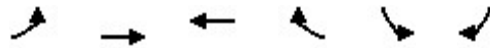


Movement	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations		↑	↑			
Traffic Volume (veh/h)	0	745	465	475	0	0
Future Volume (Veh/h)	0	745	465	475	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	745	465	475	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		TWLTL			
Median storage (veh)	2					
Upstream signal (ft)	1187					
pX, platoon unblocked					0.81	
vC, conflicting volume	940				1448	702
vC1, stage 1 conf vol					702	
vC2, stage 2 conf vol					745	
vCu, unblocked vol	940				1435	702
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	729				350	441
Direction, Lane #	EB 1	WB 1				
Volume Total	745	940				
Volume Left	0	0				
Volume Right	0	475				
cSH	1700	1700				
Volume to Capacity	0.44	0.55				
Queue Length 95th (ft)	0	0				
Control Delay (s)	0.0	0.0				
Lane LOS						
Approach Delay (s)	0.0	0.0				
Approach LOS						
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			61.5%	ICU Level of Service	B	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

30: S 154th St & 29th Ave S

SAMP Surface Transportation Analysis






















Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (veh/h)	20	725	935	5	5	5
Future Volume (Veh/h)	20	725	935	5	5	5
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	20	725	935	5	5	5
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL		TWLTL			
Median storage (veh)	2		2			
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	940				1702	938
vC1, stage 1 conf vol					938	
vC2, stage 2 conf vol					765	
vCu, unblocked vol	940				1702	938
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)	2.2				3.5	3.3
p0 queue free %	97				98	98
cM capacity (veh/h)	721				301	324
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	745	940	10			
Volume Left	20	0	5			
Volume Right	0	5	5			
cSH	721	1700	312			
Volume to Capacity	0.03	0.55	0.03			
Queue Length 95th (ft)	2	0	2			
Control Delay (s)	0.7	0.0	16.9			
Lane LOS	A		C			
Approach Delay (s)	0.7	0.0	16.9			
Approach LOS			C			
Intersection Summary						
Average Delay			0.4			
Intersection Capacity Utilization		68.9%		ICU Level of Service		C
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis




















31: 30th Ave S & S 154th St

SAMP Surface Transportation Analysis












													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (veh/h)	15	710	5	10	855	65	10	0	5	20	0	75	
Future Volume (Veh/h)	15	710	5	10	855	65	10	0	5	20	0	75	
Sign Control	Free			Free			Stop			Stop			
Grade	0%			0%			0%			0%			
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Hourly flow rate (vph)	15	710	5	10	855	65	10	0	5	20	0	75	
Pedestrians													
Lane Width (ft)													
Walking Speed (ft/s)													
Percent Blockage													
Right turn flare (veh)													
Median type	TWLTL			TWLTL									
Median storage veh	2			2									
Upstream signal (ft)				1209									
pX, platoon unblocked	0.85						0.85	0.85			0.85	0.85	0.85
vC, conflicting volume	920				715			1692	1682	712	1652	1652	888
vC1, stage 1 conf vol							742	742			908	908	
vC2, stage 2 conf vol							950	940			745	745	
vCu, unblocked vol	818				715			1726	1715	712	1679	1679	780
tC, single (s)	4.1				4.1			7.2	6.6	6.3	7.1	6.5	6.2
tC, 2 stage (s)							6.2	5.6			6.1	5.5	
tF (s)	2.2				2.2			3.6	4.1	3.4	3.5	4.0	3.3
p0 queue free %	98				99			94	100	99	92	100	78
cM capacity (veh/h)	685				881			179	238	413	246	263	339
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1							
Volume Total	15	715	10	920	15	95							
Volume Left	15	0	10	0	10	20							
Volume Right	0	5	0	65	5	75							
cSH	685	1700	881	1700	221	314							
Volume to Capacity	0.02	0.42	0.01	0.54	0.07	0.30							
Queue Length 95th (ft)	2	0	1	0	5	31							
Control Delay (s)	10.4	0.0	9.1	0.0	22.5	21.4							
Lane LOS	B			A			C						
Approach Delay (s)	0.2			0.1			22.5	21.4					
Approach LOS					C		C						
Intersection Summary													
Average Delay			1.5										
Intersection Capacity Utilization			65.9%		ICU Level of Service		C						
Analysis Period (min)			15										

HCM Unsignalized Intersection Capacity Analysis
 32: Driveway/32nd Ave S & S 154th St

SAMP Surface Transportation Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	695	10	10	855	95	15	10	25	75	5	60
Future Volume (Veh/h)	30	695	10	10	855	95	15	10	25	75	5	60
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	30	695	10	10	855	95	15	10	25	75	5	60
Pedestrians	2			3			3			3		
Lane Width (ft)	12.0			12.0			12.0			12.0		
Walking Speed (ft/s)	4.0			4.0			4.0			4.0		
Percent Blockage	0			0			0			0		
Right turn flare (veh)												
Median type	TWLTL				None							
Median storage (veh)	2											
Upstream signal (ft)					705							
pX, platoon unblocked	0.85						0.85			0.85		
vC, conflicting volume	953			708			1702			1736		
vC1, stage 1 conf vol							763			763		
vC2, stage 2 conf vol							940			973		
vCu, unblocked vol	854			708			1739			1779		
tC, single (s)	4.1			4.1			7.1			6.5		
tC, 2 stage (s)							6.1			5.5		
tF (s)	2.2			2.2			3.5			4.0		
p0 queue free %	95			99			92			96		
cM capacity (veh/h)	656			884			188			230		
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	30	705	865	95	50	140						
Volume Left	30	0	10	0	15	75						
Volume Right	0	10	0	95	25	60						
cSH	656	1700	884	1700	277	273						
Volume to Capacity	0.05	0.41	0.01	0.06	0.18	0.51						
Queue Length 95th (ft)	4	0	1	0	16	68						
Control Delay (s)	10.7	0.0	0.3	0.0	20.8	31.3						
Lane LOS	B		A		C		D					
Approach Delay (s)	0.4		0.3		20.8		31.3					
Approach LOS					C		D					
Intersection Summary												
Average Delay			3.2									
Intersection Capacity Utilization			79.6%		ICU Level of Service				D			
Analysis Period (min)			15									

















HCM Unsignalized Intersection Capacity Analysis
 33: SR 518 WB Off-Ramp & S 154th St

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations				 		
Traffic Volume (veh/h)	795	0	0	755	205	200
Future Volume (Veh/h)	795	0	0	755	205	200
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	795	0	0	755	205	200
Pedestrians				1	2	
Lane Width (ft)				11.0	13.5	
Walking Speed (ft/s)				4.0	4.0	
Percent Blockage				0	0	
Right turn flare (veh)						1
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)				469		
pX, platoon unblocked					0.92	
vC, conflicting volume				797	1174	798
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol				797	1007	798
tC, single (s)				4.2	6.9	7.0
tC, 2 stage (s)						
tF (s)				2.2	3.6	3.4
p0 queue free %				100	2	37
cM capacity (veh/h)				813	209	318
Direction, Lane #	EB 1	WB 1	WB 2	NB 1		
Volume Total	795	378	378	405		
Volume Left	0	0	0	205		
Volume Right	0	0	0	200		
cSH	1700	1700	1700	275		
Volume to Capacity	0.47	0.22	0.22	1.47		
Queue Length 95th (ft)	0	0	0	573		
Control Delay (s)	0.0	0.0	0.0	266.4		
Lane LOS				F		
Approach Delay (s)	0.0	0.0		266.4		
Approach LOS				F		
Intersection Summary						
Average Delay				55.2		
Intersection Capacity Utilization				65.7%	ICU Level of Service	C
Analysis Period (min)				15		

HCM Signalized Intersection Capacity Analysis

34: S 152nd St & Military Rd S

SAMP Surface Transportation Analysis






















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	60	120	10	60	90	165	0	0	0	455	45	40
Future Volume (vph)	60	120	10	60	90	165	0	0	0	455	45	40
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.0			4.0	4.0					4.0	
Lane Util. Factor		1.00			1.00	1.00					1.00	
Frbp, ped/bikes		1.00			1.00	0.99					1.00	
Flpb, ped/bikes		1.00			1.00	1.00					1.00	
Frt		0.99			1.00	0.85					0.99	
Flt Protected		0.98			0.98	1.00					0.96	
Satd. Flow (prot)		1687			1708	1475					1639	
Flt Permitted		0.86			0.83	1.00					0.96	
Satd. Flow (perm)		1472			1443	1475					1639	
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
Adj. Flow (vph)	60	120	10	60	90	165	0	0	0	455	45	40
RTOR Reduction (vph)	0	0	0	0	0	41	0	0	0	0	0	0
Lane Group Flow (vph)	0	190	0	0	150	124	0	0	0	0	540	0
Confl. Peds. (#/hr)	5		9	9		5	22		7	7		22
Heavy Vehicles (%)	1%	1%	1%	0%	0%	0%	0%	0%	0%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA	pm+ov				Split	NA	
Protected Phases		4			8	6				6	6	
Permitted Phases	4			8		8						
Actuated Green, G (s)		13.5			13.5	44.7					31.2	
Effective Green, g (s)		13.5			13.5	44.7					31.2	
Actuated g/C Ratio		0.23			0.23	0.75					0.53	
Clearance Time (s)		4.0			4.0	4.0					4.0	
Vehicle Extension (s)		3.0			3.0	3.0					3.0	
Lane Grp Cap (vph)		334			327	1209					860	
v/s Ratio Prot						0.05					c0.33	
v/s Ratio Perm		c0.13			0.10	0.03						
v/c Ratio		0.57			0.46	0.10					0.63	
Uniform Delay, d1		20.4			19.8	2.0					10.0	
Progression Factor		1.00			1.00	1.00					1.00	
Incremental Delay, d2		2.2			1.0	0.0					1.4	
Delay (s)		22.6			20.8	2.0					11.4	
Level of Service		C			C	A					B	
Approach Delay (s)		22.6			11.0			0.0			11.4	
Approach LOS		C			B			A			B	
Intersection Summary												
HCM 2000 Control Delay			13.3				HCM 2000 Level of Service				B	
HCM 2000 Volume to Capacity ratio			0.57									
Actuated Cycle Length (s)			59.4				Sum of lost time (s)				12.0	
Intersection Capacity Utilization			63.9%				ICU Level of Service				B	
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

35: SR 99 & S 152nd St

SAMP Surface Transportation Analysis

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT	
Lane Configurations													
Traffic Volume (vph)	115	125	335	115	80	45	5	215	810	90	120	1015	
Future Volume (vph)	115	125	335	115	80	45	5	215	810	90	120	1015	
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	
Total Lost time (s)		8.0	8.0		8.0	8.0		5.5	8.5	8.5	5.5	8.5	
Lane Util. Factor		1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	
Frbp, ped/bikes		1.00	0.97		1.00	0.98		1.00	1.00	0.82	1.00	1.00	
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	0.85		1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.98	1.00		0.97	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1692	1432		1700	1457		1630	3260	1195	1630	3249	
Flt Permitted		0.98	1.00		0.97	1.00		0.09	1.00	1.00	0.27	1.00	
Satd. Flow (perm)		1692	1432		1700	1457		149	3260	1195	463	3249	
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	
Adj. Flow (vph)	115	125	335	115	80	45	5	215	810	90	120	1015	
RTOR Reduction (vph)	0	0	281	0	0	38	0	0	0	54	0	1	
Lane Group Flow (vph)	0	240	54	0	195	7	0	220	810	36	120	1034	
Confl. Peds. (#/hr)			9			5				35			
Heavy Vehicles (%)	1%	1%	1%	0%	0%	0%	2%	2%	2%	2%	2%	2%	
Turn Type	Split	NA	Perm	Split	NA	Perm	pm+pt	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	3	3		4	4		5	5	2		1	6	
Permitted Phases			3			4	2	2		2	6		
Actuated Green, G (s)		22.6	22.6		21.5	21.5		72.0	55.6	55.6	59.3	48.4	
Effective Green, g (s)		22.6	22.6		21.5	21.5		72.0	55.6	55.6	59.3	48.4	
Actuated g/C Ratio		0.16	0.16		0.15	0.15		0.51	0.40	0.40	0.42	0.34	
Clearance Time (s)		8.0	8.0		8.0	8.0		5.5	8.5	8.5	5.5	8.5	
Vehicle Extension (s)		3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		271	230		259	222		266	1289	472	285	1118	
v/s Ratio Prot		c0.14			c0.11			c0.11	0.25		0.03	c0.32	
v/s Ratio Perm			0.04			0.00		0.32		0.03	0.14		
v/c Ratio		0.89	0.23		0.75	0.03		0.83	0.63	0.08	0.42	0.93	
Uniform Delay, d1		57.7	51.5		57.0	50.7		37.5	34.2	26.5	25.9	44.4	
Progression Factor		1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		27.2	0.5		11.7	0.1		18.6	1.0	0.1	1.0	12.6	
Delay (s)		84.9	52.0		68.7	50.7		56.1	35.2	26.6	26.9	57.0	
Level of Service		F	D		E	D		E	D	C	C	E	
Approach Delay (s)		65.7			65.3			38.6				53.9	
Approach LOS		E			E			D				D	
Intersection Summary													
HCM 2000 Control Delay			51.4		HCM 2000 Level of Service					D			
HCM 2000 Volume to Capacity ratio			0.87										
Actuated Cycle Length (s)			140.6	Sum of lost time (s)					30.0				
Intersection Capacity Utilization			105.6%	ICU Level of Service					G				
Analysis Period (min)			15										
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis

35: SR 99 & S 152nd St























SAMP Surface Transportation Analysis

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	20
Future Volume (vph)	20
Ideal Flow (vphpl)	1750
Total Lost time (s)	
Lane Util. Factor	
Frbp, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	20
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	3
Heavy Vehicles (%)	2%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
Intersection Summary	

HCM Signalized Intersection Capacity Analysis

37: SR 99 & S 154th St

SAMP Surface Transportation Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	215	425	355	240	325	150	290	750	55	5	155	1170
Future Volume (vph)	215	425	355	240	325	150	290	750	55	5	155	1170
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Width	11	11	12	11	12	12	12	12	12	12	12	12
Total Lost time (s)	5.5	8.9	5.5	5.5	8.9		5.5	9.3	5.5		5.5	9.3
Lane Util. Factor	0.97	1.00	1.00	0.97	0.95		1.00	0.95	1.00		1.00	0.95
Frpb, ped/bikes	1.00	1.00	0.99	1.00	0.99		1.00	1.00	0.95		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.95		1.00	1.00	0.85		1.00	1.00
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	3027	1642	1427	2941	2968		1630	3260	1391		1614	3228
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	3027	1642	1427	2941	2968		1630	3260	1391		1614	3228
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
Adj. Flow (vph)	215	425	355	240	325	150	290	750	55	5	155	1170
RTOR Reduction (vph)	0	0	43	0	31	0	0	0	29	0	0	0
Lane Group Flow (vph)	215	425	312	240	444	0	290	750	26	0	160	1170
Confl. Peds. (#/hr)			6			6			33			
Confl. Bikes (#/hr)						2						
Heavy Vehicles (%)	3%	3%	3%	6%	6%	6%	2%	2%	2%	3%	3%	3%
Turn Type	Prot	NA	pm+ov	Prot	NA		Prot	NA	pm+ov	Prot	Prot	NA
Protected Phases	7	4	5!	3	8		5	2	3	1	1	6
Permitted Phases			4						2			
Actuated Green, G (s)	24.8	38.8	63.8	18.5	32.5		25.0	61.3	79.8		20.7	57.0
Effective Green, g (s)	24.8	38.8	63.8	18.5	32.5		25.0	61.3	79.8		20.7	57.0
Actuated g/C Ratio	0.15	0.23	0.38	0.11	0.19		0.15	0.36	0.47		0.12	0.34
Clearance Time (s)	5.5	8.9	5.5	5.5	8.9		5.5	9.3	5.5		5.5	9.3
Vehicle Extension (s)	2.5	3.0	2.5	2.5	3.0		2.5	4.0	2.5		2.5	4.0
Lane Grp Cap (vph)	445	378	540	322	572		241	1185	658		198	1091
v/s Ratio Prot	0.07	c0.26	0.09	0.08	c0.15		c0.18	c0.23	0.00		0.10	c0.36
v/s Ratio Perm			0.13						0.01			
v/c Ratio	0.48	1.12	0.58	0.75	0.78		1.20	0.63	0.04		0.81	1.07
Uniform Delay, d1	66.0	64.8	41.6	72.7	64.6		71.8	44.3	23.8		72.0	55.8
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.6	84.5	1.2	8.6	6.6		124.1	1.3	0.0		20.4	48.9
Delay (s)	66.6	149.3	42.8	81.3	71.1		195.8	45.6	23.8		92.4	104.6
Level of Service	E	F	D	F	E		F	D	C		F	F
Approach Delay (s)		93.5			74.5			84.3				95.6
Approach LOS		F			E			F				F
Intersection Summary												
HCM 2000 Control Delay			88.7				HCM 2000 Level of Service		F			
HCM 2000 Volume to Capacity ratio			1.08									
Actuated Cycle Length (s)			168.5				Sum of lost time (s)		29.2			
Intersection Capacity Utilization			109.9%				ICU Level of Service		H			
Analysis Period (min)			15									
! Phase conflict between lane groups.												
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
 37: SR 99 & S 154th St

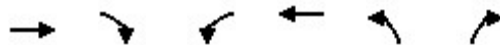
SAMP Surface Transportation Analysis

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	140
Future Volume (vph)	140
Ideal Flow (vphpl)	1750
Lane Width	11
Total Lost time (s)	5.5
Lane Util. Factor	1.00
Frbp, ped/bikes	0.99
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1383
Flt Permitted	1.00
Satd. Flow (perm)	1383
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	140
RTOR Reduction (vph)	52
Lane Group Flow (vph)	88
Confl. Peds. (#/hr)	1
Confl. Bikes (#/hr)	
Heavy Vehicles (%)	3%
Turn Type	pm+ov
Protected Phases	7
Permitted Phases	6
Actuated Green, G (s)	81.8
Effective Green, g (s)	81.8
Actuated g/C Ratio	0.49
Clearance Time (s)	5.5
Vehicle Extension (s)	2.5
Lane Grp Cap (vph)	671
v/s Ratio Prot	0.02
v/s Ratio Perm	0.04
v/c Ratio	0.13
Uniform Delay, d1	23.8
Progression Factor	1.00
Incremental Delay, d2	0.1
Delay (s)	23.9
Level of Service	C
Approach Delay (s)	
Approach LOS	
Intersection Summary	

HCM Unsignalized Intersection Capacity Analysis

38: S 156th St & Air Cargo Rd














SAMP Surface Transportation Analysis



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↑↑	
Traffic Volume (veh/h)	505	55	35	350	40	45
Future Volume (Veh/h)	505	55	35	350	40	45
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	505	55	35	350	40	45
Pedestrians				1	2	
Lane Width (ft)				12.0	12.0	
Walking Speed (ft/s)				4.0	4.0	
Percent Blockage				0	0	
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (ft)	1052					
pX, platoon unblocked						
vC, conflicting volume			562		780	283
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			562		780	283
tC, single (s)			4.4		7.3	7.4
tC, 2 stage (s)						
tF (s)			2.3		3.8	3.6
p0 queue free %			96		85	93
cM capacity (veh/h)			932		276	645
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	
Volume Total	337	223	152	233	85	
Volume Left	0	0	35	0	40	
Volume Right	0	55	0	0	45	
cSH	1700	1700	932	1700	396	
Volume to Capacity	0.20	0.13	0.04	0.14	0.21	
Queue Length 95th (ft)	0	0	3	0	20	
Control Delay (s)	0.0	0.0	2.4	0.0	16.6	
Lane LOS	A			C		
Approach Delay (s)	0.0		0.9		16.6	
Approach LOS						C
Intersection Summary						
Average Delay			1.7			
Intersection Capacity Utilization			44.4%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis
 39: SR 99 & SR 518 EB On-Ramp






















SAMP Surface Transportation Analysis

								
Movement	WBL	WBR	NBU	NBT	NBR	SBU	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	0	0	30	1090	280	5	460	1745
Future Volume (vph)	0	0	30	1090	280	5	460	1745
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750
Lane Width	12	12	12	11	13	12	11	12
Total Lost time (s)			5.5	6.3	6.3		5.5	6.3
Lane Util. Factor			1.00	0.95	1.00		1.00	0.91
Frbp, ped/bikes			1.00	1.00	0.93		1.00	1.00
Flpb, ped/bikes			1.00	1.00	1.00		1.00	1.00
Frt			1.00	1.00	0.85		1.00	1.00
Flt Protected			0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)			1614	3121	1390		1576	4684
Flt Permitted			0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)			1614	3121	1390		1576	4684
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	30	1090	280	5	460	1745
RTOR Reduction (vph)	0	0	0	0	125	0	0	0
Lane Group Flow (vph)	0	0	30	1090	155	0	465	1745
Confl. Peds. (#/hr)					17			
Heavy Vehicles (%)	0%	0%	3%	3%	3%	2%	2%	2%
Turn Type			Prot	NA	Perm	Prot	Prot	NA
Protected Phases			5	2		18	18	6
Permitted Phases					2			
Actuated Green, G (s)			2.8	41.5	41.5		34.7	63.9
Effective Green, g (s)			2.8	41.5	41.5		29.7	63.9
Actuated g/C Ratio			0.03	0.47	0.47		0.34	0.73
Clearance Time (s)			5.5	6.3	6.3			6.3
Vehicle Extension (s)			2.5	4.0	4.0			4.0
Lane Grp Cap (vph)			51	1471	655		531	3401
v/s Ratio Prot			0.02	c0.35			c0.30	0.37
v/s Ratio Perm					0.11			
v/c Ratio			0.59	0.74	0.24		0.88	0.51
Uniform Delay, d1			42.0	18.9	13.8		27.4	5.3
Progression Factor			1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2			13.5	2.2	0.3		14.9	0.2
Delay (s)			55.6	21.1	14.1		42.3	5.4
Level of Service			E	C	B		D	A
Approach Delay (s)	0.0			20.4				13.2
Approach LOS	A			C				B
Intersection Summary								
HCM 2000 Control Delay			16.0			HCM 2000 Level of Service		B
HCM 2000 Volume to Capacity ratio			0.80					
Actuated Cycle Length (s)			88.0			Sum of lost time (s)		16.8
Intersection Capacity Utilization			70.5%			ICU Level of Service		C
Analysis Period (min)			15					
c Critical Lane Group								

HCM Signalized Intersection Capacity Analysis

40: 42nd Ave S & Southcenter Blvd

SAMP Surface Transportation Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	370	70	215	505	200	50	135	140	145	230	65
Future Volume (vph)	40	370	70	215	505	200	50	135	140	145	230	65
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frbp, ped/bikes	1.00	1.00		1.00	0.99		1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.96		1.00	0.92		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1599	1635		1646	1648		1642	1581		1646	1664	
Flt Permitted	0.22	1.00		0.32	1.00		0.42	1.00		0.23	1.00	
Satd. Flow (perm)	368	1635		557	1648		719	1581		394	1664	
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
Adj. Flow (vph)	40	370	70	215	505	200	50	135	140	145	230	65
RTOR Reduction (vph)	0	4	0	0	7	0	0	30	0	0	7	0
Lane Group Flow (vph)	40	436	0	215	698	0	50	245	0	145	288	0
Confl. Peds. (#/hr)	1		2	2		1	3		1	1		3
Heavy Vehicles (%)	4%	4%	4%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	68.2	63.0		83.1	72.9		34.3	27.9		46.9	35.5	
Effective Green, g (s)	68.2	63.0		83.1	72.9		34.3	27.9		46.9	35.5	
Actuated g/C Ratio	0.49	0.45		0.59	0.52		0.24	0.20		0.33	0.25	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	2.0	3.0		2.0	3.0		2.0	3.0		2.0	2.0	
Lane Grp Cap (vph)	224	735		448	858		218	315		257	421	
v/s Ratio Prot	0.01	0.27		c0.05	c0.42		0.01	c0.16		c0.06	c0.17	
v/s Ratio Perm	0.08			0.23			0.05			0.13		
v/c Ratio	0.18	0.59		0.48	0.81		0.23	0.78		0.56	0.68	
Uniform Delay, d1	21.9	28.9		16.2	27.9		41.4	53.1		35.6	47.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	3.5		0.3	8.3		0.2	11.5		1.7	3.6	
Delay (s)	22.1	32.4		16.5	36.2		41.6	64.6		37.3	50.8	
Level of Service	C	C		B	D		D	E		D	D	
Approach Delay (s)		31.5			31.6			61.1			46.4	
Approach LOS		C			C			E			D	
Intersection Summary												
HCM 2000 Control Delay			39.0				HCM 2000 Level of Service				D	
HCM 2000 Volume to Capacity ratio			0.78									
Actuated Cycle Length (s)			140.0				Sum of lost time (s)			20.0		
Intersection Capacity Utilization			88.7%				ICU Level of Service			E		
Analysis Period (min)			15									

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis

41: 51st Ave S & SR 518 WB On-Ramp

SAMP Surface Transportation Analysis



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations				↕	↕	
Traffic Volume (veh/h)	0	0	640	305	220	80
Future Volume (Veh/h)	0	0	640	305	220	80
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	0	640	305	220	80
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1845	260	300			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1845	260	300			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	49			
cM capacity (veh/h)	41	784	1267			
Direction, Lane #	NB 1	SB 1				
Volume Total	945	300				
Volume Left	640	0				
Volume Right	0	80				
cSH	1267	1700				
Volume to Capacity	0.51	0.18				
Queue Length 95th (ft)	74	0				
Control Delay (s)	9.4	0.0				
Lane LOS	A					
Approach Delay (s)	9.4	0.0				
Approach LOS						
Intersection Summary						
Average Delay			7.1			
Intersection Capacity Utilization			80.4%	ICU Level of Service	D	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
 42: Klickitat Dr/51st Ave S & SR-518 EB Off-Ramp

SAMP Surface Transportation Analysis



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	60	715	0	885	220	0
Future Volume (Veh/h)	60	715	0	885	220	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	60	715	0	885	220	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)	5					
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1105	220	220			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1105	220	220			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	74	13	100			
cM capacity (veh/h)	234	822	1355			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	775	885	220			
Volume Left	60	0	0			
Volume Right	715	0	0			
cSH	891	1700	1700			
Volume to Capacity	0.87	0.52	0.13			
Queue Length 95th (ft)	282	0	0			
Control Delay (s)	30.4	0.0	0.0			
Lane LOS	D					
Approach Delay (s)	30.4	0.0	0.0			
Approach LOS	D					
Intersection Summary						
Average Delay			12.5			
Intersection Capacity Utilization			67.3%	ICU Level of Service	C	
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

43: Southcenter Blvd & Macadam Rd

SAMP Surface Transportation Analysis













Movement	EBL2	EBL	EBT	WBT	WBR	WBR2	SBL	SBR	SBR2	SEL	SER	
Lane Configurations		↔	↑↑↑	↑	↗	↗	↖	↖				
Traffic Volume (vph)	25	60	1640	720	850	250	155	25	20	0	0	
Future Volume (vph)	25	60	1640	720	850	250	155	25	20	0	0	
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	
Total Lost time (s)		5.0	5.0	5.0	5.0	5.0	5.0	5.0				
Lane Util. Factor		1.00	0.91	0.95	0.95	1.00	1.00	1.00				
Frbp, ped/bikes		1.00	1.00	1.00	1.00	0.97	1.00	1.00				
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00	1.00	1.00				
Frt		1.00	1.00	0.98	0.85	0.85	1.00	0.85				
Flt Protected		0.95	1.00	1.00	1.00	1.00	0.95	1.00				
Satd. Flow (prot)		1630	4684	1595	1385	1414	1630	1458				
Flt Permitted		0.95	1.00	1.00	1.00	1.00	0.95	1.00				
Satd. Flow (perm)		1630	4684	1595	1385	1414	1630	1458				
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	
Adj. Flow (vph)	25	60	1640	720	850	250	155	25	20	0	0	
RTOR Reduction (vph)	0	0	0	0	0	34	0	39	0	0	0	
Lane Group Flow (vph)	0	85	1640	839	731	216	155	6	0	0	0	
Confl. Peds. (#/hr)		5				5						
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	0%	0%	
Turn Type	Prot	Prot	NA	NA	Perm	Perm	Prot	Perm				
Protected Phases	7	7	4	8			1					
Permitted Phases					8	8		1				
Actuated Green, G (s)		9.3	76.2	61.9	61.9	61.9	13.8	13.8				
Effective Green, g (s)		9.3	76.2	61.9	61.9	61.9	13.8	13.8				
Actuated g/C Ratio		0.09	0.76	0.62	0.62	0.62	0.14	0.14				
Clearance Time (s)		5.0	5.0	5.0	5.0	5.0	5.0	5.0				
Vehicle Extension (s)		3.0	4.0	4.0	4.0	4.0	2.0	2.0				
Lane Grp Cap (vph)		151	3569	987	857	875	224	201				
v/s Ratio Prot		0.05	c0.35	0.53			c0.10					
v/s Ratio Perm					c0.53	0.15		0.00				
v/c Ratio		0.56	0.46	0.85	0.85	0.25	0.69	0.03				
Uniform Delay, d1		43.4	4.4	15.3	15.4	8.6	41.1	37.3				
Progression Factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00				
Incremental Delay, d2		4.7	0.4	9.1	10.5	0.7	7.2	0.0				
Delay (s)		48.1	4.8	24.4	25.9	9.2	48.3	37.3				
Level of Service		D	A	C	C	A	D	D				
Approach Delay (s)			6.9	22.9			45.8			0.0		
Approach LOS			A	C			D			A		
Intersection Summary												
HCM 2000 Control Delay			16.8		HCM 2000 Level of Service						B	
HCM 2000 Volume to Capacity ratio			0.80									
Actuated Cycle Length (s)			100.0		Sum of lost time (s)						15.0	
Intersection Capacity Utilization			87.0%		ICU Level of Service						E	
Analysis Period (min)			15									

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis

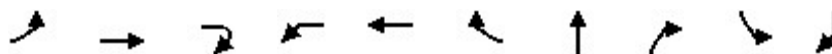
44: Klickitat Dr & I-5 SB On-Ramp

SAMP Surface Transportation Analysis

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	885	755	40	775
Future Volume (Veh/h)	0	0	885	755	40	775
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	0	885	755	40	775
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	1052					
pX, platoon unblocked						
vC, conflicting volume	1740	885			885	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1740	885			885	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			95	
cM capacity (veh/h)	92	347			769	
Direction, Lane #	NB 1	NB 2	SB 1	SB 2		
Volume Total	885	755	40	775		
Volume Left	0	0	40	0		
Volume Right	0	755	0	0		
cSH	1700	1700	769	1700		
Volume to Capacity	0.52	0.44	0.05	0.46		
Queue Length 95th (ft)	0	0	4	0		
Control Delay (s)	0.0	0.0	9.9	0.0		
Lane LOS	A					
Approach Delay (s)	0.0	0.5				
Approach LOS						
Intersection Summary						
Average Delay			0.2			
Intersection Capacity Utilization			60.8%	ICU Level of Service	B	
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

45: Southcenter Pkwy & I-5 NB Off-Ramp/Southcenter Mall Access SAMP Surface Transportation Analysis



Movement	EBL	EBT	EBR2	WBL	WBT	WBR	NBT	NBR	SBL	SBR
Lane Configurations		↖	↗	↖	↔		↑↑↑		↖	↗
Traffic Volume (vph)	130	105	150	175	0	110	605	160	50	800
Future Volume (vph)	130	105	150	175	0	110	605	160	50	800
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Width	14	12	16	11	12	12	11	12	11	12
Total Lost time (s)		5.0	4.0	5.0	5.0		5.0		5.0	4.0
Lane Util. Factor		1.00	1.00	0.95	0.95		0.91		1.00	0.88
Frbp, ped/bikes		1.00	0.99	1.00	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	0.85	1.00	0.88		0.97		1.00	1.00
Flt Protected		0.97	1.00	0.95	0.99		1.00		0.95	1.00
Satd. Flow (prot)		1686	1649	1527	1447		4429		1591	3011
Flt Permitted		0.97	1.00	0.95	0.95		1.00		0.95	1.00
Satd. Flow (perm)		1686	1649	1527	1395		4429		1591	3011
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	130	105	150	175	0	110	605	160	50	800
RTOR Reduction (vph)	0	0	0	0	77	0	40	0	0	0
Lane Group Flow (vph)	0	235	150	149	59	0	725	0	50	800
Confl. Peds. (#/hr)			1							1
Heavy Vehicles (%)	1%	1%	1%	0%	0%	0%	1%	1%	1%	1%
Turn Type	Split	NA	Free	Prot	NA		NA		Prot	Perm
Protected Phases	4!	4		3	8!		2		1	
Permitted Phases			Free							6
Actuated Green, G (s)		19.2	100.0	17.3	41.5		36.0		7.5	48.5
Effective Green, g (s)		19.2	100.0	17.3	41.5		36.0		7.5	49.5
Actuated g/C Ratio		0.19	1.00	0.17	0.42		0.36		0.08	0.50
Clearance Time (s)		5.0		5.0	5.0		5.0		5.0	5.0
Vehicle Extension (s)		3.0		3.0	3.0		3.0		3.0	3.0
Lane Grp Cap (vph)		323	1649	264	587		1594		119	1490
v/s Ratio Prot		c0.14		c0.10	0.02		0.16		0.03	
v/s Ratio Perm			0.09		0.02					c0.27
v/c Ratio		0.73	0.09	0.56	0.10		0.46		0.42	0.54
Uniform Delay, d1		37.9	0.0	37.9	17.9		24.5		44.2	17.4
Progression Factor		1.00	1.00	1.00	1.00		0.97		1.00	1.00
Incremental Delay, d2		7.9	0.1	2.8	0.1		0.7		2.4	1.4
Delay (s)		45.9	0.1	40.6	17.9		24.5		46.6	18.8
Level of Service		D	A	D	B		C		D	B
Approach Delay (s)		28.0			29.8		24.5			
Approach LOS		C			C		C			

Intersection Summary

HCM 2000 Control Delay	24.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	60.5%	ICU Level of Service	B
Analysis Period (min)	15		

! Phase conflict between lane groups.

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

46: Southcenter Pkwy & Klickitat Dr

SAMP Surface Transportation Analysis



Movement	EBL	EBR	EBR2	NBL	NBT	SBT	SBR	NEL	NER
Lane Configurations									
Traffic Volume (vph)	245	105	425	1220	515	0	0	0	0
Future Volume (vph)	245	105	425	1220	515	0	0	0	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Width	10	12	12	11	11	12	12	12	12
Total Lost time (s)	5.0		5.0	5.0	5.0				
Lane Util. Factor	1.00		0.95	0.86	0.86				
Frt	0.94		0.85	1.00	1.00				
Flt Protected	0.97		1.00	0.95	0.97				
Satd. Flow (prot)	1463		1385	1368	4207				
Flt Permitted	0.97		1.00	0.95	0.97				
Satd. Flow (perm)	1463		1385	1368	4207				
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	245	105	425	1220	515	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	401	0	374	610	1125	0	0	0	0
Heavy Vehicles (%)	2%	2%	2%	1%	1%	0%	0%	0%	0%
Turn Type	Prot		custom	Split	NA				
Protected Phases	4		2 4	2	2				
Permitted Phases									
Actuated Green, G (s)	25.0		86.4	56.4	56.4				
Effective Green, g (s)	25.0		86.4	56.4	56.4				
Actuated g/C Ratio	0.25		0.86	0.56	0.56				
Clearance Time (s)	5.0			5.0	5.0				
Vehicle Extension (s)	3.0			3.0	3.0				
Lane Grp Cap (vph)	365		1196	771	2372				
v/s Ratio Prot	c0.27		0.27	c0.45	0.27				
v/s Ratio Perm									
v/c Ratio	1.10		0.31	0.79	0.47				
Uniform Delay, d1	37.5		1.3	17.2	13.0				
Progression Factor	1.00		1.00	1.00	1.00				
Incremental Delay, d2	76.3		0.2	8.1	0.7				
Delay (s)	113.8		1.4	25.3	13.7				
Level of Service	F		A	C	B				
Approach Delay (s)	59.6				17.8	0.0		0.0	
Approach LOS	E				B	A		A	
Intersection Summary									
HCM 2000 Control Delay			30.7		HCM 2000 Level of Service				C
HCM 2000 Volume to Capacity ratio			0.83						
Actuated Cycle Length (s)			100.0		Sum of lost time (s)				13.0
Intersection Capacity Utilization			76.2%		ICU Level of Service				D
Analysis Period (min)			15						

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis

47: I 5 NB Off-Ramp

SAMP Surface Transportation Analysis



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↑			↑	
Traffic Volume (veh/h)	0	355	0	0	425	0
Future Volume (Veh/h)	0	355	0	0	425	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	355	0	0	425	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)				411	273	
pX, platoon unblocked						
vC, conflicting volume	425	425	425			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	425	425	425			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	44	100			
cM capacity (veh/h)	586	629	1145			
Direction, Lane #	EB 1	SB 1				
Volume Total	355	425				
Volume Left	0	0				
Volume Right	355	0				
cSH	629	1700				
Volume to Capacity	0.56	0.25				
Queue Length 95th (ft)	88	0				
Control Delay (s)	17.9	0.0				
Lane LOS	C					
Approach Delay (s)	17.9	0.0				
Approach LOS	C					
Intersection Summary						
Average Delay			8.1			
Intersection Capacity Utilization			54.8%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis
 48: Des Moines Way S & S 156th St/S 156th Way

SAMP Surface Transportation Analysis























Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	170	180	65	170	290	45	70	340	150	35	600	235
Future Volume (vph)	170	180	65	170	290	45	70	340	150	35	600	235
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	5.0	5.0		5.0	5.0			5.0			5.0	5.0
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Frbp, ped/bikes	1.00	0.99		1.00	1.00			0.99			1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Frt	1.00	0.96		1.00	0.98			0.96			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.99			1.00	1.00
Satd. Flow (prot)	1582	1590		1566	1612			1628			1711	1419
Flt Permitted	0.29	1.00		0.48	1.00			0.56			0.95	1.00
Satd. Flow (perm)	480	1590		798	1612			923			1635	1419
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
Adj. Flow (vph)	170	180	65	170	290	45	70	340	150	35	600	235
RTOR Reduction (vph)	0	13	0	0	5	0	0	10	0	0	0	128
Lane Group Flow (vph)	170	232	0	170	330	0	0	550	0	0	635	107
Confl. Peds. (#/hr)	3		3	3		3	4		8	8		4
Heavy Vehicles (%)	5%	5%	5%	6%	6%	6%	2%	2%	2%	2%	2%	2%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	Perm
Protected Phases	5	2		1	6			4			8	
Permitted Phases	2			6			4			8		8
Actuated Green, G (s)	34.5	23.1		32.7	22.2			40.5			40.5	40.5
Effective Green, g (s)	34.5	23.1		32.7	22.2			40.5			40.5	40.5
Actuated g/C Ratio	0.39	0.26		0.37	0.25			0.45			0.45	0.45
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0			5.0	5.0
Vehicle Extension (s)	2.0	2.0		2.0	2.0			2.0			2.0	2.0
Lane Grp Cap (vph)	326	412		383	401			419			743	645
v/s Ratio Prot	c0.07	0.15		0.05	c0.20							
v/s Ratio Perm	0.13			0.11				c0.60			0.39	0.08
v/c Ratio	0.52	0.56		0.44	0.82			1.31			0.85	0.17
Uniform Delay, d1	19.6	28.6		20.2	31.6			24.3			21.7	14.3
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	0.7	1.1		0.3	12.2			156.5			9.1	0.0
Delay (s)	20.3	29.7		20.5	43.8			180.8			30.8	14.4
Level of Service	C	C		C	D			F			C	B
Approach Delay (s)		25.8			35.9			180.8			26.4	
Approach LOS		C			D			F			C	

Intersection Summary		
HCM 2000 Control Delay	65.1	HCM 2000 Level of Service E
HCM 2000 Volume to Capacity ratio	1.04	
Actuated Cycle Length (s)	89.1	Sum of lost time (s) 15.0
Intersection Capacity Utilization	116.9%	ICU Level of Service H
Analysis Period (min)	15	

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 49: 1st Avenue S & Ambaum St SW & S 160th St

SAMP Surface Transportation Analysis

												
Movement	EBL2	EBL	EBT	EBR	EBR2	WBL	WBT	WBR	WBR2	NBL2	NBL	NBT
Lane Configurations												
Traffic Volume (vph)	5	125	330	30	175	235	505	50	145	170	100	515
Future Volume (vph)	5	125	330	30	175	235	505	50	145	170	100	515
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		5.0	5.0			5.0	5.0		5.0	5.0	5.0	5.0
Lane Util. Factor		1.00	0.95			1.00	0.91		0.91	0.91	0.95	0.95
Frbp, ped/bikes		1.00	0.99			1.00	1.00		0.97	1.00	1.00	0.99
Flpb, ped/bikes		1.00	1.00			1.00	1.00		1.00	1.00	1.00	1.00
Frt		1.00	0.94			1.00	0.98		0.85	1.00	1.00	0.96
Flt Protected		0.95	1.00			0.95	1.00		1.00	0.95	0.95	1.00
Satd. Flow (prot)		1646	3076			1630	3055		1287	1498	1564	3124
Flt Permitted		0.95	1.00			0.95	1.00		1.00	0.95	0.95	1.00
Satd. Flow (perm)		1646	3076			1630	3055		1287	1498	1564	3124
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
Adj. Flow (vph)	5	125	330	30	175	235	505	50	145	170	100	515
RTOR Reduction (vph)	0	0	48	0	0	0	2	0	100	0	0	0
Lane Group Flow (vph)	0	130	487	0	0	235	568	0	31	134	136	710
Confl. Peds. (#/hr)				6	1			7	12			
Confl. Bikes (#/hr)				1	1							
Heavy Vehicles (%)	1%	1%	1%	1%	1%	2%	2%	2%	2%	1%	1%	1%
Turn Type	Prot	Prot	NA			Prot	NA		Perm	Prot	Prot	NA
Protected Phases	3	3	8			7	4			1	1	6
Permitted Phases									4			
Actuated Green, G (s)		14.8	25.5			19.8	30.5		30.5	17.7	17.7	44.6
Effective Green, g (s)		14.8	25.5			19.8	30.5		30.5	17.7	17.7	44.6
Actuated g/C Ratio		0.11	0.20			0.15	0.23		0.23	0.14	0.14	0.34
Clearance Time (s)		5.0	5.0			5.0	5.0		5.0	5.0	5.0	5.0
Vehicle Extension (s)		3.0	2.0			2.0	2.0		2.0	2.0	2.0	2.0
Lane Grp Cap (vph)		187	603			248	716		301	203	212	1071
v/s Ratio Prot		0.08	0.16			c0.14	c0.19			0.09	0.09	c0.23
v/s Ratio Perm									0.02			
v/c Ratio		0.70	0.81			0.95	0.79		0.10	0.66	0.64	0.66
Uniform Delay, d1		55.4	49.9			54.6	46.8		39.0	53.3	53.1	36.3
Progression Factor		1.00	1.00			0.85	0.99		2.97	1.00	1.00	1.00
Incremental Delay, d2		10.7	7.4			39.8	5.2		0.0	6.1	4.9	3.2
Delay (s)		66.1	57.3			86.2	51.5		115.7	59.4	58.0	39.5
Level of Service		E	E			F	D		F	E	E	D
Approach Delay (s)			59.0				69.1					44.8
Approach LOS			E				E					D
Intersection Summary												
HCM 2000 Control Delay			56.6			HCM 2000 Level of Service				E		
HCM 2000 Volume to Capacity ratio			0.81									
Actuated Cycle Length (s)			130.0			Sum of lost time (s)			20.0			
Intersection Capacity Utilization			93.4%			ICU Level of Service			F			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
 49: 1st Avenue S & Ambaum St SW & S 160th St

SAMP Surface Transportation Analysis



Movement	NBR	NBR2	SBL2	SBL	SBT	SBR	SBR2	SER2	NWR2
Lane Configurations									
Traffic Volume (vph)	185	10	365	60	700	80	10	0	0
Future Volume (vph)	185	10	365	60	700	80	10	0	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)			5.0	5.0	5.0				
Lane Util. Factor			0.91	0.95	0.95				
Frbp, ped/bikes			1.00	1.00	0.99				
Flpb, ped/bikes			1.00	1.00	1.00				
Frt			1.00	1.00	0.98				
Flt Protected			0.95	0.95	1.00				
Satd. Flow (prot)			1498	1564	3218				
Flt Permitted			0.95	0.95	1.00				
Satd. Flow (perm)			1498	1564	3218				
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	185	10	365	60	700	80	10	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	212	213	790	0	0	0	0
Confl. Peds. (#/hr)	4	6				7	7	7	6
Confl. Bikes (#/hr)									
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	10%	0%
Turn Type			Prot	Prot	NA			Perm	Perm
Protected Phases			5	5	2				
Permitted Phases								4	8
Actuated Green, G (s)			20.1	20.1	47.0				
Effective Green, g (s)			20.1	20.1	47.0				
Actuated g/C Ratio			0.15	0.15	0.36				
Clearance Time (s)			5.0	5.0	5.0				
Vehicle Extension (s)			2.0	2.0	2.0				
Lane Grp Cap (vph)			231	241	1163				
v/s Ratio Prot			c0.14	0.14	c0.25				
v/s Ratio Perm									
v/c Ratio			0.92	0.88	0.68				
Uniform Delay, d1			54.1	53.8	35.1				
Progression Factor			1.00	1.00	1.00				
Incremental Delay, d2			36.6	28.7	3.2				
Delay (s)			90.8	82.5	38.3				
Level of Service			F	F	D				
Approach Delay (s)					55.2				
Approach LOS					E				
Intersection Summary									

LANE SUMMARY

Site: 50 [50-SW 160th St @ SR 509 SB Ramps (Site Folder: 2032 PA)]

SW 160th St @ SR 509 SB Ramps 2032 Proposed Action
 Site Category: 2032 Proposed Action
 Roundabout

Lane Use and Performance													
	DEMAND FLOWS		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE		Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
	[Total veh/h	[HV] %						[Veh	[Dist] ft				
East: SW 160th Street (WB)													
Lane 1 ^d	620	1.0	1416	0.438	100	5.2	LOS A	0.0	0.0	Full	750	0.0	0.0
Approach	620	1.0		0.438		5.2	LOS A	0.0	0.0				
North: SR 509 SB Off Ramp													
Lane 1 ^d	210	1.0	1164	0.180	100	12.1	LOS B	1.0	26.3	Full	1600	0.0	0.0
Lane 2	600	1.0	1658	0.362	100	3.9	LOS A	0.0	0.0	Full	1600	0.0	0.0
Approach	810	1.0		0.362		6.0	LOS A	1.0	26.3				
West: SW 160th Street (EB)													
Lane 1 ^d	655	1.0	1335	0.491	100	5.8	LOS A	3.7	94.1	Full	350	0.0	0.0
Lane 2	375	1.0	1658	0.226	100	3.8	LOS A	0.0	0.0	Full	350	0.0	0.0
Approach	1030	1.0		0.491		5.1	LOS A	3.7	94.1				
Intersection	2460	1.0		0.491		5.4	LOS A	3.7	94.1				

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Signalised Intersections.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used).

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

^d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)										
East: SW 160th Street (WB)										
Mov.	L2	T1	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
From E To Exit:	S	W								
Lane 1	120	500	620	1.0	1416	0.438	100	NA	NA	
Approach	120	500	620	1.0		0.438				
North: SR 509 SB Off Ramp										
Mov.	L2	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
From N To Exit:	E	W								
Lane 1	210	-	210	1.0	1164	0.180	100	NA	NA	
Lane 2	-	600	600	1.0	1658	0.362	100	NA	NA	
Approach	210	600	810	1.0		0.362				

LANE SUMMARY

 Site: 51 [51-S 160th Street @ 5th Pl S (Site Folder: 2032 PA)]

51-S 160th St @ 5th Pl S, 2032 Proposed Action
 Site Category: 2032 Proposed Action
 Roundabout

Lane Use and Performance													
	DEMAND FLOWS		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE		Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
	[Total veh/h	HV %]						[Veh	Dist] ft				
South: SR 509 NB Ramps													
Lane 1 ^d	385	1.0	1090	0.353	100	10.5	LOS B	2.1	52.4	Full	1600	0.0	0.0
Approach	385	1.0		0.353		10.5	LOS B	2.1	52.4				
East: SW 160th Street (WB)													
Lane 1 ^d	335	1.0	1081	0.310	100	6.3	LOS A	1.9	47.2	Full	710	0.0	0.0
Approach	335	1.0		0.310		6.3	LOS A	1.9	47.2				
North: 5th Place S (SB)													
Lane 1 ^d	21	0.0	914	0.023	100	8.0	LOS A	0.1	3.0	Full	1600	0.0	0.0
Approach	21	0.0		0.023		8.0	LOS A	0.1	3.0				
West: SW 160th Street (EB)													
Lane 1 ^d	865	1.0	1378	0.628	100	4.5	LOS A	6.4	160.8	Full	750	0.0	0.0
Approach	865	1.0		0.628		4.5	LOS A	6.4	160.8				
Intersection	1606	1.0		0.628		6.4	LOS A	6.4	160.8				

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Signalised Intersections.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used).

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

^d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)											
South: SR 509 NB Ramps											
Mov.	L2	T1	R2	Total	%HV		Deg. Satn	Lane Util.	Prob. SL	Ov. Lane	
From S						Cap. veh/h	v/c	%	%	No.	
To Exit:	W	N	E								
Lane 1	325	10	50	385	1.0	1090	0.353	100	NA	NA	
Approach	325	10	50	385	1.0		0.353				
East: SW 160th Street (WB)											
Mov.	L2	T1	R2	Total	%HV		Deg. Satn	Lane Util.	Prob. SL	Ov. Lane	
From E						Cap. veh/h	v/c	%	%	No.	
To Exit:	S	W	N								
Lane 1	25	280	30	335	1.0	1081	0.310	100	NA	NA	
Approach	25	280	30	335	1.0		0.310				
North: 5th Place S (SB)											

HCM Signalized Intersection Capacity Analysis

52: Des Moines Memorial Dr/Des Moines Way S & S 160th St












SAMP Surface Transportation Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	225	20	160	5	5	5	50	315	5	5	545	280
Future Volume (vph)	225	20	160	5	5	5	50	315	5	5	545	280
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frbp, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		0.99	1.00	
Frt	1.00	0.87		1.00	0.93		1.00	1.00		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1599	1458		1330	1295		1613	1694		1601	1600	
Flt Permitted	0.75	1.00		0.62	1.00		0.20	1.00		0.56	1.00	
Satd. Flow (perm)	1264	1458		873	1295		342	1694		939	1600	
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
Adj. Flow (vph)	225	20	160	5	5	5	50	315	5	5	545	280
RTOR Reduction (vph)	0	121	0	0	4	0	0	0	0	0	18	0
Lane Group Flow (vph)	225	59	0	5	6	0	50	320	0	5	807	0
Confl. Peds. (#/hr)							2		7	7		2
Heavy Vehicles (%)	4%	4%	4%	25%	25%	25%	3%	3%	3%	3%	3%	3%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		8			4			2			6	
Permitted Phases	8			4			2			6		
Actuated Green, G (s)	16.1	16.1		16.1	16.1		39.5	39.5		39.5	39.5	
Effective Green, g (s)	16.1	16.1		16.1	16.1		39.5	39.5		39.5	39.5	
Actuated g/C Ratio	0.25	0.25		0.25	0.25		0.60	0.60		0.60	0.60	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	310	357		214	317		205	1020		565	963	
v/s Ratio Prot		0.04			0.00			0.19			c0.50	
v/s Ratio Perm	c0.18			0.01			0.15			0.01		
v/c Ratio	0.73	0.17		0.02	0.02		0.24	0.31		0.01	0.84	
Uniform Delay, d1	22.7	19.5		18.8	18.8		6.1	6.4		5.2	10.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	7.0	0.1		0.0	0.0		0.2	0.1		0.0	6.2	
Delay (s)	29.7	19.5		18.8	18.8		6.3	6.5		5.2	16.6	
Level of Service	C	B		B	B		A	A		A	B	
Approach Delay (s)		25.2			18.8			6.4			16.6	
Approach LOS		C			B			A			B	
Intersection Summary												
HCM 2000 Control Delay			16.4				HCM 2000 Level of Service				B	
HCM 2000 Volume to Capacity ratio			0.80									
Actuated Cycle Length (s)			65.6				Sum of lost time (s)			10.0		
Intersection Capacity Utilization			78.3%				ICU Level of Service				D	
Analysis Period (min)			15									

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
 53: Air Cargo Rd & S 160th St




















SAMP Surface Transportation Analysis

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	55	465	180	110	300	165
Future Volume (vph)	55	465	180	110	300	165
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	55	465	180	110	300	165
Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2	
Volume Total (vph)	55	465	290	300	165	
Volume Left (vph)	55	0	0	300	0	
Volume Right (vph)	0	465	110	0	0	
Hadj (s)	0.46	-0.34	0.10	0.69	0.19	
Departure Headway (s)	6.0	3.2	4.8	5.6	5.1	
Degree Utilization, x	0.09	0.41	0.38	0.47	0.23	
Capacity (veh/h)	539	1115	738	632	693	
Control Delay (s)	9.7	8.4	10.7	12.2	8.4	
Approach Delay (s)	8.6		10.7	10.9		
Approach LOS	A		B	B		
Intersection Summary						
Delay			9.9			
Level of Service			A			
Intersection Capacity Utilization			55.5%	ICU Level of Service		B
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

54: Host Rd/SR 518 EB On Ramp & S 160th St























SAMP Surface Transportation Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	80	320	10	35	405	230	115	20	40	0	0	0
Future Volume (Veh/h)	80	320	10	35	405	230	115	20	40	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	80	320	10	35	405	230	115	20	40	0	0	0
Pedestrians								2				
Lane Width (ft)								12.0				
Walking Speed (ft/s)								4.0				
Percent Blockage								0				
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)					408							
pX, platoon unblocked	0.89						0.89	0.89		0.89	0.89	0.89
vC, conflicting volume	405			332			962	962	167	845	967	405
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	270			332			896	896	167	764	901	270
tC, single (s)	4.3			4.3			7.6	6.6	7.0	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.3			2.3			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	93			97			39	91	95	100	100	100
cM capacity (veh/h)	1099			1173			189	218	837	216	224	653
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2				
Volume Total	80	213	117	35	405	230	115	60				
Volume Left	80	0	0	35	0	0	115	0				
Volume Right	0	0	10	0	0	230	0	40				
cSH	1099	1700	1700	1173	1700	1700	189	430				
Volume to Capacity	0.07	0.13	0.07	0.03	0.24	0.14	0.61	0.14				
Queue Length 95th (ft)	6	0	0	2	0	0	85	12				
Control Delay (s)	8.5	0.0	0.0	8.2	0.0	0.0	49.9	14.7				
Lane LOS	A			A			E	B				
Approach Delay (s)	1.7			0.4			37.9					
Approach LOS							E					
Intersection Summary												
Average Delay			6.1									
Intersection Capacity Utilization			44.9%			ICU Level of Service			A			
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

55: Cell Phone Lot/Rental Car Pickup & S 160th St























SAMP Surface Transportation Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 						 	
Traffic Volume (vph)	30	330	0	0	630	60	0	0	0	75	5	40
Future Volume (vph)	30	330	0	0	630	60	0	0	0	75	5	40
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	5.0	5.0			5.0						5.0	
Lane Util. Factor	1.00	0.95			0.95						1.00	
Frbp, ped/bikes	1.00	1.00			1.00						1.00	
Flpb, ped/bikes	1.00	1.00			1.00						1.00	
Frt	1.00	1.00			0.99						0.95	
Flt Protected	0.95	1.00			1.00						0.97	
Satd. Flow (prot)	1539	3079			3119						1367	
Flt Permitted	0.33	1.00			1.00						0.95	
Satd. Flow (perm)	528	3079			3119						1339	
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
Adj. Flow (vph)	30	330	0	0	630	60	0	0	0	75	5	40
RTOR Reduction (vph)	0	0	0	0	5	0	0	0	0	0	25	0
Lane Group Flow (vph)	30	330	0	0	685	0	0	0	0	0	95	0
Confl. Peds. (#/hr)			7			2	3					3
Heavy Vehicles (%)	8%	8%	8%	5%	5%	5%	0%	0%	0%	18%	18%	18%
Bus Blockages (#/hr)	0	0	44	0	0	0	0	0	0	0	0	0
Turn Type	pm+pt	NA		pm+pt	NA		Perm			Perm		NA
Protected Phases	3	8		7	4			6				2
Permitted Phases	8			4			6			2		
Actuated Green, G (s)	48.2	48.2			40.1							11.1
Effective Green, g (s)	48.2	48.2			40.1							11.1
Actuated g/C Ratio	0.70	0.70			0.58							0.16
Clearance Time (s)	5.0	5.0			5.0							5.0
Vehicle Extension (s)	5.0	5.0			5.0							5.0
Lane Grp Cap (vph)	412	2141			1804							214
v/s Ratio Prot	0.00	c0.11			c0.22							
v/s Ratio Perm	0.05											c0.07
v/c Ratio	0.07	0.15			0.38							0.44
Uniform Delay, d1	3.7	3.6			7.9							26.3
Progression Factor	1.00	1.00			1.00							1.00
Incremental Delay, d2	0.2	0.2			0.6							3.0
Delay (s)	3.8	3.8			8.5							29.3
Level of Service	A	A			A							C
Approach Delay (s)		3.8			8.5			0.0				29.3
Approach LOS		A			A			A				C
Intersection Summary												
HCM 2000 Control Delay			9.2		HCM 2000 Level of Service			A				
HCM 2000 Volume to Capacity ratio			0.39									
Actuated Cycle Length (s)			69.3		Sum of lost time (s)			15.0				
Intersection Capacity Utilization			44.0%		ICU Level of Service			A				
Analysis Period (min)			15									
c	Critical Lane Group											

HCM Unsignalized Intersection Capacity Analysis

56: S 160th St & Rental Car Return























SAMP Surface Transportation Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 						 				
Traffic Volume (veh/h)	55	340	10	25	480	90	20	0	15	115	0	190
Future Volume (Veh/h)	55	340	10	25	480	90	20	0	15	115	0	190
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	55	340	10	25	480	90	20	0	15	115	0	190
Pedestrians	1			2			6					
Lane Width (ft)	12.0			12.0			12.0					
Walking Speed (ft/s)	4.0			4.0			4.0					
Percent Blockage	0			0			1					
Right turn flare (veh)												
Median type	TWLTL			TWLTL								
Median storage (veh)	2			2								
Upstream signal (ft)	502			393								
pX, platoon unblocked	0.88						0.88	0.88		0.88	0.88	0.88
vC, conflicting volume	486			350			986	991	177	833	996	487
vC1, stage 1 conf vol							455	455		536	536	
vC2, stage 2 conf vol							531	536		297	460	
vCu, unblocked vol	345			350			915	920	177	740	926	346
tC, single (s)	4.2			4.2			7.7	6.7	7.1	7.5	6.5	6.9
tC, 2 stage (s)							6.7	5.7		6.5	5.5	
tF (s)	2.2			2.3			3.6	4.1	3.4	3.5	4.0	3.3
p0 queue free %	95			98			92	100	98	74	100	67
cM capacity (veh/h)	1051			1170			253	373	807	442	407	572
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1	SB 2			
Volume Total	55	227	123	25	480	90	35	115	190			
Volume Left	55	0	0	25	0	0	20	115	0			
Volume Right	0	0	10	0	0	90	15	0	190			
cSH	1051	1700	1700	1170	1700	1700	358	442	572			
Volume to Capacity	0.05	0.13	0.07	0.02	0.28	0.05	0.10	0.26	0.33			
Queue Length 95th (ft)	4	0	0	2	0	0	8	26	36			
Control Delay (s)	8.6	0.0	0.0	8.1	0.0	0.0	16.1	16.0	14.4			
Lane LOS	A			A			C	C	B			
Approach Delay (s)	1.2			0.3			16.1	15.0				
Approach LOS							C	B				
Intersection Summary												
Average Delay	4.3											
Intersection Capacity Utilization	53.7%			ICU Level of Service			A					
Analysis Period (min)	15											

HCM Signalized Intersection Capacity Analysis

57: SR 99 & S 160th St

SAMP Surface Transportation Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	45	305	120	100	270	280	25	140	925	100	50	345
Future Volume (vph)	45	305	120	100	270	280	25	140	925	100	50	345
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	7.0	12.0	12.0	7.0	12.0	12.0		5.0	10.0			5.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00		0.97	0.91			0.97
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.99		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			1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.99			1.00
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.95	1.00			0.95
Satd. Flow (prot)	1614	1699	1414	1599	1683	1411		3072	4469			3131
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.95	1.00			0.95
Satd. Flow (perm)	1614	1699	1414	1599	1683	1411		3072	4469			3131
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
Adj. Flow (vph)	45	305	120	100	270	280	25	140	925	100	50	345
RTOR Reduction (vph)	0	0	92	0	0	211	0	0	9	0	0	0
Lane Group Flow (vph)	45	305	28	100	270	69	0	165	1016	0	0	395
Confl. Peds. (#/hr)			8			1				11		
Heavy Vehicles (%)	3%	3%	3%	4%	4%	4%	5%	5%	5%	5%	3%	3%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	Prot	NA		Prot	Prot
Protected Phases	7	4		3	8		5	5	2		1	1
Permitted Phases			4			8						
Actuated Green, G (s)	8.7	32.1	32.1	10.9	34.3	34.3		12.4	42.2			20.8
Effective Green, g (s)	8.7	32.1	32.1	10.9	34.3	34.3		12.4	42.2			20.8
Actuated g/C Ratio	0.06	0.23	0.23	0.08	0.24	0.24		0.09	0.30			0.15
Clearance Time (s)	7.0	12.0	12.0	7.0	12.0	12.0		5.0	10.0			5.0
Vehicle Extension (s)	4.0	4.0	4.0	3.0	2.0	2.0		2.5	3.0			3.0
Lane Grp Cap (vph)	100	389	324	124	412	345		272	1347			465
v/s Ratio Prot	0.03	c0.18		c0.06	0.16			0.05	c0.23			c0.13
v/s Ratio Perm			0.02			0.05						
v/c Ratio	0.45	0.78	0.08	0.81	0.66	0.20		0.61	0.75			0.85
Uniform Delay, d1	63.3	50.7	42.4	63.5	47.5	41.9		61.5	44.2			58.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00			1.00
Incremental Delay, d2	4.3	10.5	0.2	30.5	2.9	0.1		3.2	4.0			13.5
Delay (s)	67.7	61.2	42.6	94.0	50.4	42.0		64.7	48.2			71.6
Level of Service	E	E	D	F	D	D		E	D			E
Approach Delay (s)		57.1			53.5				50.5			
Approach LOS		E			D				D			
Intersection Summary												
HCM 2000 Control Delay			50.7				HCM 2000 Level of Service		D			
HCM 2000 Volume to Capacity ratio			0.79									
Actuated Cycle Length (s)			140.0				Sum of lost time (s)		34.0			
Intersection Capacity Utilization			88.9%				ICU Level of Service		E			
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

57: SR 99 & S 160th St










SAMP Surface Transportation Analysis



Movement	SBT	SBR
Lane Configurations	↑↑↑	↔
Traffic Volume (vph)	790	185
Future Volume (vph)	790	185
Ideal Flow (vphpl)	1750	1750
Total Lost time (s)	10.0	
Lane Util. Factor	0.91	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	0.97	
Flt Protected	1.00	
Satd. Flow (prot)	4491	
Flt Permitted	1.00	
Satd. Flow (perm)	4491	
Peak-hour factor, PHF	1.00	1.00
Adj. Flow (vph)	790	185
RTOR Reduction (vph)	26	0
Lane Group Flow (vph)	949	0
Confl. Peds. (#/hr)		3
Heavy Vehicles (%)	3%	3%
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	50.6	
Effective Green, g (s)	50.6	
Actuated g/C Ratio	0.36	
Clearance Time (s)	10.0	
Vehicle Extension (s)	3.0	
Lane Grp Cap (vph)	1623	
v/s Ratio Prot	0.21	
v/s Ratio Perm		
v/c Ratio	0.59	
Uniform Delay, d1	36.2	
Progression Factor	1.00	
Incremental Delay, d2	1.6	
Delay (s)	37.7	
Level of Service	D	
Approach Delay (s)	47.5	
Approach LOS	D	
Intersection Summary		

HCM Unsignalized Intersection Capacity Analysis
 63: NB NAE Off-Ramp & S 170th St





















SAMP Surface Transportation Analysis

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	85	0	0	390	0	200
Future Volume (Veh/h)	85	0	0	390	0	200
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	85	0	0	390	0	200
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			None		
Median storage veh	2					
Upstream signal (ft)	424					
pX, platoon unblocked					0.96	
vC, conflicting volume			85	475	85	
vC1, stage 1 conf vol					85	
vC2, stage 2 conf vol					390	
vCu, unblocked vol			85	437	85	
tC, single (s)			4.3	6.6	6.4	
tC, 2 stage (s)					5.6	
tF (s)			2.4	3.7	3.5	
p0 queue free %			100	100	79	
cM capacity (veh/h)			1389	632	934	
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	85	390	200			
Volume Left	0	0	0			
Volume Right	0	0	200			
cSH	1700	1700	934			
Volume to Capacity	0.05	0.23	0.21			
Queue Length 95th (ft)	0	0	20			
Control Delay (s)	0.0	0.0	9.9			
Lane LOS			A			
Approach Delay (s)	0.0	0.0	9.9			
Approach LOS			A			
Intersection Summary						
Average Delay			2.9			
Intersection Capacity Utilization			25.6%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

64: Pacific Hwy #1 & S 170th St

SAMP Surface Transportation Analysis

												
Movement	EBL	EBT	EBR	EBR2	WBL2	WBT	WBR	NBU	NBL	NBT	NBR	SBU
Lane Configurations												
Traffic Volume (vph)	160	120	0	5	15	85	275	15	225	600	25	25
Future Volume (vph)	160	120	0	5	15	85	275	15	225	600	25	25
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Width	11	12	11	12	8	12	12	12	13	12	12	12
Total Lost time (s)	11.5	11.5	11.5			12.0	12.0		5.0	10.0		
Lane Util. Factor	1.00	1.00	1.00			1.00	1.00		1.00	0.95		
Frbp, ped/bikes	1.00	1.00	0.94			1.00	0.98		1.00	1.00		
Flpb, ped/bikes	1.00	1.00	1.00			1.00	1.00		1.00	1.00		
Frt	1.00	1.00	0.85			1.00	0.85		1.00	0.99		
Flt Protected	0.95	1.00	1.00			0.99	1.00		0.95	1.00		
Satd. Flow (prot)	1502	1636	1269			1639	1381		1576	3022		
Flt Permitted	0.95	1.00	1.00			0.99	1.00		0.95	1.00		
Satd. Flow (perm)	1502	1636	1269			1639	1381		1576	3022		
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
Adj. Flow (vph)	160	120	0	5	15	85	275	15	225	600	25	25
RTOR Reduction (vph)	0	0	4	0	0	0	244	0	0	2	0	0
Lane Group Flow (vph)	160	120	1	0	0	100	31	0	240	623	0	0
Confl. Peds. (#/hr)			7	7			3				22	
Heavy Vehicles (%)	7%	7%	7%	7%	6%	6%	6%	9%	9%	9%	9%	4%
Turn Type	Split	NA	Perm		Split	NA	Perm	Prot	Prot	NA		Prot
Protected Phases	4	4			3	3		5	5	2		1
Permitted Phases			4				3					
Actuated Green, G (s)	20.9	20.9	20.9			16.2	16.2		34.0	43.0		
Effective Green, g (s)	20.9	20.9	20.9			16.2	16.2		34.0	43.0		
Actuated g/C Ratio	0.14	0.14	0.14			0.11	0.11		0.23	0.30		
Clearance Time (s)	11.5	11.5	11.5			12.0	12.0		5.0	10.0		
Vehicle Extension (s)	2.0	2.0	2.0			2.5	2.5		3.0	3.0		
Lane Grp Cap (vph)	216	235	182			183	154		369	896		
v/s Ratio Prot	c0.11	0.07				c0.06			0.15	c0.21		
v/s Ratio Perm			0.00				0.02					
v/c Ratio	0.74	0.51	0.00			0.55	0.20		0.65	0.70		
Uniform Delay, d1	59.5	57.3	53.1			60.9	58.5		50.1	45.2		
Progression Factor	1.00	1.00	1.00			1.00	1.00		1.26	0.54		
Incremental Delay, d2	11.3	0.8	0.0			2.6	0.5		3.8	4.1		
Delay (s)	70.7	58.1	53.1			63.5	59.0		66.9	28.3		
Level of Service	E	E	D			E	E		E	C		
Approach Delay (s)		65.1				60.2				39.0		
Approach LOS		E				E				D		
Intersection Summary												
HCM 2000 Control Delay			53.3			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.72									
Actuated Cycle Length (s)			145.0			Sum of lost time (s)				38.5		
Intersection Capacity Utilization			97.0%			ICU Level of Service				F		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
 64: Pacific Hwy #1 & S 170th St

SAMP Surface Transportation Analysis






















Movement	SBL	SBT	SBR	SBR2
Lane Configurations				
Traffic Volume (vph)	175	635	110	80
Future Volume (vph)	175	635	110	80
Ideal Flow (vphpl)	1750	1750	1750	1750
Lane Width	11	11	12	14
Total Lost time (s)	5.0	10.0	10.0	
Lane Util. Factor	1.00	0.95	1.00	
Frpb, ped/bikes	1.00	1.00	0.96	
Flpb, ped/bikes	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	
Flt Protected	0.95	1.00	1.00	
Satd. Flow (prot)	1545	3091	1379	
Flt Permitted	0.95	1.00	1.00	
Satd. Flow (perm)	1545	3091	1379	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00
Adj. Flow (vph)	175	635	110	80
RTOR Reduction (vph)	0	0	144	0
Lane Group Flow (vph)	200	635	46	0
Confl. Peds. (#/hr)				5
Heavy Vehicles (%)	4%	4%	4%	4%
Turn Type	Prot	NA	Perm	
Protected Phases	1	6		
Permitted Phases			6	
Actuated Green, G (s)	26.4	35.4	35.4	
Effective Green, g (s)	26.4	35.4	35.4	
Actuated g/C Ratio	0.18	0.24	0.24	
Clearance Time (s)	5.0	10.0	10.0	
Vehicle Extension (s)	2.0	3.0	3.0	
Lane Grp Cap (vph)	281	754	336	
v/s Ratio Prot	c0.13	c0.21		
v/s Ratio Perm			0.03	
v/c Ratio	0.71	0.84	0.14	
Uniform Delay, d1	55.7	52.1	42.9	
Progression Factor	1.00	1.00	1.00	
Incremental Delay, d2	6.9	11.0	0.9	
Delay (s)	62.6	63.2	43.7	
Level of Service	E	E	D	
Approach Delay (s)		59.5		
Approach LOS		E		
Intersection Summary				

HCM Signalized Intersection Capacity Analysis

65: International Blvd & S 176th St

SAMP Surface Transportation Analysis

												
Movement	WBL2	WBL	WBR	NBL	NBT	NBR	SBU	SBL	SBT	SBR	NEL	NER
Lane Configurations												
Traffic Volume (vph)	200	0	235	0	600	245	10	245	955	170	0	0
Future Volume (vph)	200	0	235	0	600	245	10	245	955	170	0	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	10.5		5.0		5.0	5.0		10.0	5.0	5.0		
Lane Util. Factor	0.97		1.00		0.95	1.00		1.00	0.95	1.00		
Frpb, ped/bikes	1.00		0.82		1.00	0.78		1.00	1.00	1.00		
Flpb, ped/bikes	1.00		1.00		1.00	1.00		0.99	1.00	1.00		
Frt	1.00		0.85		1.00	0.85		1.00	1.00	0.85		
Flt Protected	0.95		1.00		1.00	1.00		0.95	1.00	1.00		
Satd. Flow (prot)	3072		1156		2995	1044		1590	3228	1444		
Flt Permitted	0.95		1.00		1.00	1.00		0.31	1.00	1.00		
Satd. Flow (perm)	3072		1156		2995	1044		523	3228	1444		
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
Adj. Flow (vph)	200	0	235	0	600	245	10	245	955	170	0	0
RTOR Reduction (vph)	0	0	223	0	0	127	0	0	0	59	0	0
Lane Group Flow (vph)	200	0	12	0	600	118	0	255	955	111	0	0
Confl. Peds. (#/hr)			29			76		76				
Confl. Bikes (#/hr)						1						
Heavy Vehicles (%)	5%	5%	5%	11%	11%	11%	3%	3%	3%	3%	0%	0%
Turn Type	Prot		Perm		NA	Perm	pm+pt	pm+pt	NA	Perm		
Protected Phases	8				2		1	1	6			
Permitted Phases			4			2	6	6		6		
Actuated Green, G (s)	34.7		7.2		69.5	69.5		94.8	94.8	94.8		
Effective Green, g (s)	34.7		7.2		69.5	69.5		94.8	94.8	94.8		
Actuated g/C Ratio	0.24		0.05		0.48	0.48		0.65	0.65	0.65		
Clearance Time (s)	10.5		5.0		5.0	5.0		10.0	5.0	5.0		
Vehicle Extension (s)	3.0		3.0		3.0	3.0		2.0	3.0	3.0		
Lane Grp Cap (vph)	735		57		1435	500		454	2110	944		
v/s Ratio Prot	c0.07				0.20			0.06	c0.30			
v/s Ratio Perm			c0.01			0.11		c0.31		0.08		
v/c Ratio	0.27		0.20		0.42	0.24		0.56	0.45	0.12		
Uniform Delay, d1	44.9		66.2		24.6	22.2		12.7	12.3	9.4		
Progression Factor	1.00		1.00		0.39	0.56		1.16	1.39	3.00		
Incremental Delay, d2	0.2		1.8		0.8	1.0		0.9	0.7	0.2		
Delay (s)	45.1		67.9		10.5	13.5		15.6	17.9	28.5		
Level of Service	D		E		B	B		B	B	C		
Approach Delay (s)		57.4			11.4				18.8		0.0	
Approach LOS		E			B				B		A	
Intersection Summary												
HCM 2000 Control Delay			22.7		HCM 2000 Level of Service				C			
HCM 2000 Volume to Capacity ratio			0.51									
Actuated Cycle Length (s)			145.0		Sum of lost time (s)				25.5			
Intersection Capacity Utilization			72.9%		ICU Level of Service				C			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
66: International Blvd & S 182nd St (Arrival Dr)

SAMP Surface Transportation Analysis

Movement	EBL	EBT	EBR	EBR2	WBL2	WBT	WBR	NBU	NBL	NBT	NBR	SBU
Lane Configurations												
Traffic Volume (vph)	190	5	0	645	25	0	15	20	245	675	15	5
Future Volume (vph)	190	5	0	645	25	0	15	20	245	675	15	5
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	12.0	12.0	12.0		12.0	12.0			5.0	10.0	10.0	
Lane Util. Factor	0.95	0.95	1.00		1.00	1.00			0.97	0.95	1.00	
Frpb, ped/bikes	1.00	1.00	0.93		1.00	0.97			1.00	1.00	0.84	
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		1.00	0.85			1.00	1.00	0.85	
Flt Protected	0.95	0.95	1.00		0.95	1.00			0.95	1.00	1.00	
Satd. Flow (prot)	1316	1323	1149		1662	1445			2906	2995	1127	
Flt Permitted	0.95	0.95	1.00		0.95	1.00			0.95	1.00	1.00	
Satd. Flow (perm)	1316	1323	1149		1662	1445			2906	2995	1127	
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
Adj. Flow (vph)	190	5	0	645	25	0	15	20	245	675	15	5
RTOR Reduction (vph)	0	0	467	0	0	15	0	0	0	0	9	0
Lane Group Flow (vph)	97	98	178	0	25	0	0	0	265	675	6	0
Confl. Peds. (#/hr)	17		57		57		17		21		51	
Heavy Vehicles (%)	20%	20%	20%	20%	0%	0%	0%	11%	11%	11%	11%	4%
Turn Type	Split	NA	Perm		Split	NA		Prot	Prot	NA	Perm	Prot
Protected Phases	3	3			4	4		5	5	2		1
Permitted Phases			3								2	
Actuated Green, G (s)	40.0	40.0	40.0		4.7	4.7			12.0	58.7	58.7	
Effective Green, g (s)	40.0	40.0	40.0		4.7	4.7			12.0	58.7	58.7	
Actuated g/C Ratio	0.28	0.28	0.28		0.03	0.03			0.08	0.40	0.40	
Clearance Time (s)	12.0	12.0	12.0		12.0	12.0			5.0	10.0	10.0	
Vehicle Extension (s)	2.5	2.5	2.5		2.0	2.0			3.0	3.0	3.0	
Lane Grp Cap (vph)	363	364	316		53	46			240	1212	456	
v/s Ratio Prot	0.07	0.07			c0.02	0.00			c0.09	0.23		
v/s Ratio Perm			c0.15								0.01	
v/c Ratio	0.27	0.27	0.56		0.47	0.01			1.10	0.56	0.01	
Uniform Delay, d1	41.0	41.1	45.0		68.9	67.9			66.5	33.2	25.8	
Progression Factor	1.00	1.00	1.00		1.00	1.00			0.83	1.31	1.00	
Incremental Delay, d2	0.3	0.3	1.9		2.4	0.0			87.9	1.8	0.1	
Delay (s)	41.3	41.4	46.9		71.3	67.9			143.1	45.1	25.9	
Level of Service	D	D	D		E	E			F	D	C	
Approach Delay (s)		45.6				70.1				72.0		
Approach LOS		D				E				E		
Intersection Summary												
HCM 2000 Control Delay			56.0		HCM 2000 Level of Service					E		
HCM 2000 Volume to Capacity ratio			0.78									
Actuated Cycle Length (s)			145.0		Sum of lost time (s)					39.0		
Intersection Capacity Utilization			123.8%		ICU Level of Service					H		
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
66: International Blvd & S 182nd St (Arrival Dr)

SAMP Surface Transportation Analysis

























Movement	SBL	SBT	SBR
Lane Configurations			
Traffic Volume (vph)	5	995	175
Future Volume (vph)	5	995	175
Ideal Flow (vphpl)	1750	1750	1750
Total Lost time (s)	5.0	10.0	10.0
Lane Util. Factor	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00
Frt	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00
Satd. Flow (prot)	1599	3197	1430
Flt Permitted	0.95	1.00	1.00
Satd. Flow (perm)	1599	3197	1430
Peak-hour factor, PHF	1.00	1.00	1.00
Adj. Flow (vph)	5	995	175
RTOR Reduction (vph)	0	0	0
Lane Group Flow (vph)	10	995	175
Confl. Peds. (#/hr)	51		
Heavy Vehicles (%)	4%	4%	4%
Turn Type	Prot	NA	Perm
Protected Phases	1	6	
Permitted Phases			6
Actuated Green, G (s)	2.6	49.3	49.3
Effective Green, g (s)	2.6	49.3	49.3
Actuated g/C Ratio	0.02	0.34	0.34
Clearance Time (s)	5.0	10.0	10.0
Vehicle Extension (s)	2.0	3.0	3.0
Lane Grp Cap (vph)	28	1086	486
v/s Ratio Prot	0.01	c0.31	
v/s Ratio Perm			0.12
v/c Ratio	0.36	0.92	0.36
Uniform Delay, d1	70.4	45.9	36.0
Progression Factor	1.06	0.86	1.02
Incremental Delay, d2	2.6	12.6	1.9
Delay (s)	76.9	51.9	38.5
Level of Service	E	D	D
Approach Delay (s)		50.1	
Approach LOS		D	
Intersection Summary			

HCM Signalized Intersection Capacity Analysis

67: International Blvd & S 188th St

SAMP Surface Transportation Analysis

													
Movement	EBL	EBT	EBR	EBR2	WBL2	WBT	WBR	NBU	NBL	NBT	NBR	SBU	
Lane Configurations													
Traffic Volume (vph)	135	660	0	315	215	785	205	15	160	260	150	20	
Future Volume (vph)	135	660	0	315	215	785	205	15	160	260	150	20	
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	
Total Lost time (s)	7.0	12.0	12.0		7.0	12.0	12.0		6.0	11.0	11.0		
Lane Util. Factor	1.00	0.95	1.00		1.00	0.95	1.00		0.97	0.95	1.00		
Frpb, ped/bikes	1.00	1.00	0.95		1.00	1.00	0.96		1.00	1.00	0.93		
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		
Frt	1.00	1.00	0.85		1.00	1.00	0.85		1.00	1.00	0.85		
Flt Protected	0.95	1.00	1.00		0.95	1.00	1.00		0.95	1.00	1.00		
Satd. Flow (prot)	1568	3137	1337		1583	3167	1359		3072	3167	1322		
Flt Permitted	0.95	1.00	1.00		0.95	1.00	1.00		0.95	1.00	1.00		
Satd. Flow (perm)	1568	3137	1337		1583	3167	1359		3072	3167	1322		
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	
Adj. Flow (vph)	135	660	0	315	215	785	205	15	160	260	150	20	
RTOR Reduction (vph)	0	0	240	0	0	0	150	0	0	0	107	0	
Lane Group Flow (vph)	135	660	75	0	215	785	55	0	175	260	43	0	
Confl. Peds. (#/hr)	25		29		29		25		32		36		
Heavy Vehicles (%)	6%	6%	6%	6%	5%	5%	5%	5%	5%	5%	5%	7%	
Turn Type	Prot	NA	Perm		Prot	NA	Perm	Prot	Prot	NA	Perm	Prot	
Protected Phases	7	4			3	8		5	5	2		1	
Permitted Phases			4				8					2	
Actuated Green, G (s)	13.6	34.7	34.7		18.0	39.1	39.1		8.3	41.3	41.3		
Effective Green, g (s)	13.6	34.7	34.7		18.0	39.1	39.1		8.3	41.3	41.3		
Actuated g/C Ratio	0.09	0.24	0.24		0.12	0.27	0.27		0.06	0.28	0.28		
Clearance Time (s)	7.0	12.0	12.0		7.0	12.0	12.0		6.0	11.0	11.0		
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0	3.0		4.0	3.0	3.0		
Lane Grp Cap (vph)	147	750	319		196	853	366		175	902	376		
v/s Ratio Prot	c0.09	c0.21			0.14	c0.25			0.06	0.08			
v/s Ratio Perm			0.06				0.04				0.03		
v/c Ratio	0.92	0.88	0.24		1.10	0.92	0.15		1.00	0.29	0.11		
Uniform Delay, d1	65.1	53.1	44.5		63.5	51.4	40.3		68.3	40.4	38.3		
Progression Factor	0.58	0.41	1.00		1.00	1.00	1.00		0.81	0.93	1.00		
Incremental Delay, d2	32.0	6.4	0.2		92.6	15.0	0.2		67.5	0.8	0.6		
Delay (s)	69.6	28.1	44.7		156.1	66.4	40.5		123.1	38.3	38.9		
Level of Service	E	C	D		F	E	D		F	D	D		
Approach Delay (s)		37.9				78.0				63.8			
Approach LOS		D				E				E			
Intersection Summary													
HCM 2000 Control Delay			55.0									HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio			1.01										
Actuated Cycle Length (s)			145.0									Sum of lost time (s)	36.0
Intersection Capacity Utilization			104.4%									ICU Level of Service	G
Analysis Period (min)			15										

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

67: International Blvd & S 188th St

SAMP Surface Transportation Analysis

























Movement	SBL	SBT	SBR	SBR2
Lane Configurations				
Traffic Volume (vph)	220	1000	180	215
Future Volume (vph)	220	1000	180	215
Ideal Flow (vphpl)	1750	1750	1750	1750
Total Lost time (s)	6.0	11.0	11.0	
Lane Util. Factor	0.97	0.95	1.00	
Frpb, ped/bikes	1.00	1.00	0.94	
Flpb, ped/bikes	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	
Flt Protected	0.95	1.00	1.00	
Satd. Flow (prot)	3014	3107	1312	
Flt Permitted	0.95	1.00	1.00	
Satd. Flow (perm)	3014	3107	1312	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00
Adj. Flow (vph)	220	1000	180	215
RTOR Reduction (vph)	0	0	171	0
Lane Group Flow (vph)	240	1000	224	0
Confl. Peds. (#/hr)	36			32
Heavy Vehicles (%)	7%	7%	7%	7%
Turn Type	Prot	NA	Perm	
Protected Phases	1	6		
Permitted Phases			6	
Actuated Green, G (s)	15.0	48.0	48.0	
Effective Green, g (s)	15.0	48.0	48.0	
Actuated g/C Ratio	0.10	0.33	0.33	
Clearance Time (s)	6.0	11.0	11.0	
Vehicle Extension (s)	4.0	3.0	3.0	
Lane Grp Cap (vph)	311	1028	434	
v/s Ratio Prot	c0.08	c0.32		
v/s Ratio Perm			0.17	
v/c Ratio	0.77	0.97	0.52	
Uniform Delay, d1	63.3	47.9	39.1	
Progression Factor	1.35	0.58	0.24	
Incremental Delay, d2	10.2	20.0	3.7	
Delay (s)	95.9	47.9	12.9	
Level of Service	F	D	B	
Approach Delay (s)		46.5		
Approach LOS		D		
Intersection Summary				

HCM Signalized Intersection Capacity Analysis

68: 28th Ave S & S 188th St

SAMP Surface Transportation Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	880	365	285	845	50	100	15	130	55	55	15
Future Volume (vph)	20	880	365	285	845	50	100	15	130	55	55	15
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	6.0	11.0		6.0	11.0		6.5	11.5	11.5	6.5	11.5	
Lane Util. Factor	1.00	0.91		1.00	0.95		1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.97	1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.96		1.00	0.99		1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1583	4333		1554	3075		1498	1577	1300	1471	1487	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1583	4333		1554	3075		1498	1577	1300	1471	1487	
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
Adj. Flow (vph)	20	880	365	285	845	50	100	15	130	55	55	15
RTOR Reduction (vph)	0	51	0	0	3	0	0	0	105	0	7	0
Lane Group Flow (vph)	20	1194	0	285	892	0	100	15	25	55	63	0
Confl. Peds. (#/hr)	5		1	1		5	15		10	10		15
Heavy Vehicles (%)	5%	5%	5%	7%	7%	7%	11%	11%	11%	13%	13%	13%
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases									4			
Actuated Green, G (s)	5.3	40.0		31.9	66.6		11.8	28.1	28.1	10.0	26.3	
Effective Green, g (s)	5.3	40.0		31.9	66.6		11.8	28.1	28.1	10.0	26.3	
Actuated g/C Ratio	0.04	0.28		0.22	0.46		0.08	0.19	0.19	0.07	0.18	
Clearance Time (s)	6.0	11.0		6.0	11.0		6.5	11.5	11.5	6.5	11.5	
Vehicle Extension (s)	2.0	2.0		3.0	2.0		2.0	2.0	2.0	3.0	2.0	
Lane Grp Cap (vph)	57	1195		341	1412		121	305	251	101	269	
v/s Ratio Prot	0.01	c0.28		c0.18	0.29		c0.07	0.01		c0.04	c0.04	
v/s Ratio Perm									0.02			
v/c Ratio	0.35	1.00		0.84	0.63		0.83	0.05	0.10	0.54	0.24	
Uniform Delay, d1	68.2	52.5		54.0	29.9		65.6	47.6	48.1	65.3	50.8	
Progression Factor	1.00	1.00		0.84	0.44		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.4	25.5		8.7	0.3		33.5	0.3	0.8	5.9	2.1	
Delay (s)	69.5	78.0		54.0	13.5		99.1	47.9	48.9	71.2	52.8	
Level of Service	E	E		D	B		F	D	D	E	D	
Approach Delay (s)		77.9			23.3			69.3			60.9	
Approach LOS		E			C			E			E	
Intersection Summary												
HCM 2000 Control Delay			53.5				HCM 2000 Level of Service			D		
HCM 2000 Volume to Capacity ratio			0.78									
Actuated Cycle Length (s)			145.0			Sum of lost time (s)				35.0		
Intersection Capacity Utilization			89.9%			ICU Level of Service			E			
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

69: 28th Ave S/26th Ave S & S 192nd St

SAMP Surface Transportation Analysis



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	
Lane Configurations													
Traffic Volume (vph)	5	15	5	115	15	15	10	5	130	105	5	65	
Future Volume (vph)	5	15	5	115	15	15	10	5	130	105	5	65	
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	
Total Lost time (s)	10.0	10.0		10.0	10.0			10.0	10.0			5.0	
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	0.97			1.00	0.99			1.00	
Flpb, ped/bikes	0.96	1.00		1.00	1.00			1.00	1.00			0.99	
Frt	1.00	0.96		1.00	0.93			1.00	0.93			1.00	
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00			0.95	
Satd. Flow (prot)	1358	1435		1582	1498			1583	2913			1616	
Flt Permitted	0.74	1.00		0.74	1.00			0.33	1.00			0.61	
Satd. Flow (perm)	1055	1435		1240	1498			550	2913			1030	
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	
Adj. Flow (vph)	5	15	5	115	15	15	10	5	130	105	5	65	
RTOR Reduction (vph)	0	4	0	0	12	0	0	0	66	0	0	0	
Lane Group Flow (vph)	5	16	0	115	18	0	0	15	169	0	0	70	
Confl. Peds. (#/hr)	77		1	1			77			9		9	
Heavy Vehicles (%)	17%	17%	17%	5%	5%	5%	5%	5%	5%	5%	2%	2%	
Turn Type	Perm	NA		Perm	NA		Perm	Perm	NA		Perm	Perm	
Protected Phases		8			4				6				
Permitted Phases	8			4			6	6			2	2	
Actuated Green, G (s)	7.3	7.3		7.3	7.3			16.4	16.4			21.4	
Effective Green, g (s)	7.3	7.3		7.3	7.3			16.4	16.4			21.4	
Actuated g/C Ratio	0.17	0.17		0.17	0.17			0.38	0.38			0.49	
Clearance Time (s)	10.0	10.0		10.0	10.0			10.0	10.0			5.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0			2.0	2.0			2.0	
Lane Grp Cap (vph)	176	239		207	250			206	1093			504	
v/s Ratio Prot		0.01			0.01				0.06				
v/s Ratio Perm	0.00			0.09				0.03				0.07	
v/c Ratio	0.03	0.07		0.56	0.07			0.07	0.15			0.14	
Uniform Delay, d1	15.2	15.3		16.7	15.3			8.8	9.1			6.1	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00			1.00	
Incremental Delay, d2	0.0	0.0		1.8	0.0			0.1	0.0			0.0	
Delay (s)	15.3	15.4		18.5	15.4			8.8	9.1			6.2	
Level of Service	B	B		B	B			A	A			A	
Approach Delay (s)		15.3			17.9				9.1				
Approach LOS		B			B				A				
Intersection Summary													
HCM 2000 Control Delay			9.1									HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.60										
Actuated Cycle Length (s)			43.7									Sum of lost time (s)	20.0
Intersection Capacity Utilization			66.0%									ICU Level of Service	C
Analysis Period (min)			15										

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 69: 28th Ave S/26th Ave S & S 192nd St

SAMP Surface Transportation Analysis






















Movement	SBT	SBR
Lane Configurations	↑↑	
Traffic Volume (vph)	750	15
Future Volume (vph)	750	15
Ideal Flow (vphpl)	1750	1750
Total Lost time (s)	5.0	
Lane Util. Factor	0.95	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	1.00	
Flt Protected	1.00	
Satd. Flow (prot)	3250	
Flt Permitted	1.00	
Satd. Flow (perm)	3250	
Peak-hour factor, PHF	1.00	1.00
Adj. Flow (vph)	750	15
RTOR Reduction (vph)	2	0
Lane Group Flow (vph)	763	0
Confl. Peds. (#/hr)		
Heavy Vehicles (%)	2%	2%
Turn Type	NA	
Protected Phases	2	
Permitted Phases		
Actuated Green, G (s)	21.4	
Effective Green, g (s)	21.4	
Actuated g/C Ratio	0.49	
Clearance Time (s)	5.0	
Vehicle Extension (s)	2.0	
Lane Grp Cap (vph)	1591	
v/s Ratio Prot	c0.23	
v/s Ratio Perm		
v/c Ratio	0.48	
Uniform Delay, d1	7.4	
Progression Factor	1.00	
Incremental Delay, d2	0.1	
Delay (s)	7.5	
Level of Service	A	
Approach Delay (s)	7.4	
Approach LOS	A	
Intersection Summary		

HCM Signalized Intersection Capacity Analysis

70: International Blvd & S 192nd St

SAMP Surface Transportation Analysis

													
Movement	EBL	EBT	EBR2	WBL2	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	
Lane Configurations													
Traffic Volume (vph)	95	35	70	35	10	40	25	25	440	25	20	50	
Future Volume (vph)	95	35	70	35	10	40	25	25	440	25	20	50	
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	
Total Lost time (s)	11.0	11.0			11.0	11.0		5.0	10.0			5.0	
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	0.99		1.00	0.99			1.00	
Flpb, ped/bikes	1.00	1.00			0.99	1.00		1.00	1.00			0.98	
Frt	1.00	0.90			1.00	0.85		1.00	0.99			1.00	
Flt Protected	0.95	1.00			0.96	1.00		0.95	1.00			0.95	
Satd. Flow (prot)	1566	1486			1594	1398		1608	3184			1587	
Flt Permitted	0.73	1.00			0.71	1.00		0.22	1.00			0.46	
Satd. Flow (perm)	1200	1486			1167	1398		377	3184			762	
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	
Adj. Flow (vph)	95	35	70	35	10	40	25	25	440	25	20	50	
RTOR Reduction (vph)	0	88	0	0	0	34	0	0	2	0	0	0	
Lane Group Flow (vph)	95	17	0	0	45	6	0	50	463	0	0	70	
Confl. Peds. (#/hr)	1			8		1		31		24		24	
Heavy Vehicles (%)	6%	6%	6%	5%	5%	5%	3%	3%	3%	3%	3%	3%	
Turn Type	Perm	NA		Perm	NA	Perm	pm+pt	pm+pt	NA		pm+pt	pm+pt	
Protected Phases		8			4		1	1	6		5	5	
Permitted Phases	8			4		4	6	6			2	2	
Actuated Green, G (s)	22.9	22.9			22.9	22.9		95.5	90.5			90.5	
Effective Green, g (s)	22.9	22.9			22.9	22.9		95.5	90.5			90.5	
Actuated g/C Ratio	0.16	0.16			0.16	0.16		0.66	0.62			0.62	
Clearance Time (s)	11.0	11.0			11.0	11.0		5.0	10.0			5.0	
Vehicle Extension (s)	4.0	4.0			4.0	4.0		2.0	4.0			2.0	
Lane Grp Cap (vph)	189	234			184	220		295	1987			507	
v/s Ratio Prot		0.01						c0.01	0.15			0.01	
v/s Ratio Perm	c0.08				0.04	0.00		0.10				0.08	
v/c Ratio	0.50	0.07			0.24	0.03		0.17	0.23			0.14	
Uniform Delay, d1	55.8	52.0			53.5	51.6		12.8	12.0			10.8	
Progression Factor	1.00	1.00			1.00	1.00		0.54	0.55			0.34	
Incremental Delay, d2	2.9	0.2			0.9	0.1		0.1	0.2			0.0	
Delay (s)	58.7	52.2			54.4	51.7		7.0	6.8			3.7	
Level of Service	E	D			D	D		A	A			A	
Approach Delay (s)		55.3			53.1				6.8				
Approach LOS		E			D				A				
Intersection Summary													
HCM 2000 Control Delay			12.9									HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.55										
Actuated Cycle Length (s)			145.0									Sum of lost time (s)	26.0
Intersection Capacity Utilization			78.8%									ICU Level of Service	D
Analysis Period (min)			15										

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 70: International Blvd & S 192nd St
























SAMP Surface Transportation Analysis



Movement	SBT	SBR	SBR2
Lane Configurations	↑↑	↘	
Traffic Volume (vph)	1165	190	100
Future Volume (vph)	1165	190	100
Ideal Flow (vphpl)	1750	1750	1750
Total Lost time (s)	10.0	10.0	
Lane Util. Factor	0.95	1.00	
Frbp, ped/bikes	1.00	0.84	
Flpb, ped/bikes	1.00	1.00	
Frt	1.00	0.85	
Flt Protected	1.00	1.00	
Satd. Flow (prot)	3228	1216	
Flt Permitted	1.00	1.00	
Satd. Flow (perm)	3228	1216	
Peak-hour factor, PHF	1.00	1.00	1.00
Adj. Flow (vph)	1165	190	100
RTOR Reduction (vph)	0	51	0
Lane Group Flow (vph)	1165	239	0
Confl. Peds. (#/hr)			31
Heavy Vehicles (%)	3%	3%	3%
Turn Type	NA	Perm	
Protected Phases	2		
Permitted Phases		2	
Actuated Green, G (s)	90.5	90.5	
Effective Green, g (s)	90.5	90.5	
Actuated g/C Ratio	0.62	0.62	
Clearance Time (s)	10.0	10.0	
Vehicle Extension (s)	4.0	4.0	
Lane Grp Cap (vph)	2014	758	
v/s Ratio Prot	c0.36		
v/s Ratio Perm		0.20	
v/c Ratio	0.58	0.32	
Uniform Delay, d1	16.0	12.8	
Progression Factor	0.48	0.20	
Incremental Delay, d2	0.7	0.6	
Delay (s)	8.4	3.2	
Level of Service	A	A	
Approach Delay (s)	7.2		
Approach LOS	A		
Intersection Summary			

HCM Signalized Intersection Capacity Analysis

71: Des Moines Memorial Dr & S Normandy Rd & Ambaum Blvd S SAMP Surface Transportation Analysis

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	10	75	205	400	215	60	245	180	170	65	300	55	
Future Volume (vph)	10	75	205	400	215	60	245	180	170	65	300	55	
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	
Total Lost time (s)		5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0		
Lane Util. Factor		1.00	1.00	0.95	0.95	1.00	1.00	0.95		1.00	0.95		
Frbp, ped/bikes		1.00	1.00	1.00	1.00	0.99	1.00	0.99		1.00	1.00		
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	0.93		1.00	0.98		
Flt Protected		0.99	1.00	0.95	0.98	1.00	0.95	1.00		0.95	1.00		
Satd. Flow (prot)		1706	1458	1519	1574	1409	1630	2991		1645	3216		
Flt Permitted		0.99	1.00	0.95	0.98	1.00	0.34	1.00		0.54	1.00		
Satd. Flow (perm)		1706	1458	1519	1574	1409	582	2991		939	3216		
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	
Adj. Flow (vph)	10	75	205	400	215	60	245	180	170	65	300	55	
RTOR Reduction (vph)	0	0	181	0	0	43	0	121	0	0	12	0	
Lane Group Flow (vph)	0	85	24	304	311	17	245	229	0	65	343	0	
Confl. Peds. (#/hr)	3					3			1	1			
Heavy Vehicles (%)	2%	2%	2%	4%	4%	4%	2%	2%	2%	1%	1%	1%	
Turn Type	Split	NA	Perm	Split	NA	Perm	pm+pt	NA		pm+pt	NA		
Protected Phases	3	3		4	4		1	6		5	2		
Permitted Phases			3			4	6			2			
Actuated Green, G (s)		10.4	10.4	25.3	25.3	25.3	37.2	25.4		23.9	17.1		
Effective Green, g (s)		10.4	10.4	25.3	25.3	25.3	37.2	25.4		23.9	17.1		
Actuated g/C Ratio		0.12	0.12	0.29	0.29	0.29	0.42	0.29		0.27	0.19		
Clearance Time (s)		5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0		
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0	3.0	3.5		3.5	3.5		
Lane Grp Cap (vph)		201	172	437	453	405	426	864		309	625		
v/s Ratio Prot		c0.05		c0.20	0.20		c0.10	0.08		0.02	0.11		
v/s Ratio Perm			0.02			0.01	c0.14			0.04			
v/c Ratio		0.42	0.14	0.70	0.69	0.04	0.58	0.27		0.21	0.55		
Uniform Delay, d1		36.0	34.7	27.9	27.8	22.6	17.7	24.1		24.3	31.9		
Progression Factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		
Incremental Delay, d2		1.4	0.4	4.8	4.3	0.0	1.9	0.2		0.4	1.1		
Delay (s)		37.4	35.1	32.6	32.1	22.6	19.6	24.3		24.7	33.0		
Level of Service		D	D	C	C	C	B	C		C	C		
Approach Delay (s)		35.8			31.5			22.3			31.7		
Approach LOS		D			C			C			C		
Intersection Summary													
HCM 2000 Control Delay			29.4		HCM 2000 Level of Service						C		
HCM 2000 Volume to Capacity ratio			0.62										
Actuated Cycle Length (s)			87.9		Sum of lost time (s)					20.0			
Intersection Capacity Utilization			63.0%		ICU Level of Service					B			
Analysis Period (min)			15										

c Critical Lane Group

LANE SUMMARY

Site: 72 [72-Des Moines Memorial Dr @ SR 509 SB Ramps (Site Folder: 2032 PA)]

72-Des Moines Memorial Dr @ SR 509 SB Ramps, 2032 Proposed Action
 Site Category: 2032 Proposed Action
 Roundabout

Lane Use and Performance													
	DEMAND FLOWS		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE		Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
	[Total veh/h	[HV] %						[Veh	[Dist] ft				
East: Des Moines Memorial Dr (WB)													
Lane 1 ^d	595	9.0	1252	0.475	100	4.6	LOS A	3.9	104.1	Full	1000	0.0	0.0
Approach	595	9.0		0.475		4.6	LOS A	3.9	104.1				
North: SR 509 Ramps													
Lane 1	440	3.0	968	0.454	100	12.5	LOS B	3.1	78.8	Full	1600	0.0	0.0
Lane 2 ^d	540	3.0	1189	0.454	100	11.9	LOS B	3.3	84.0	Full	1600	0.0	0.0
Lane 3	780	3.0	1189	0.656	100	8.8	LOS A	7.1	180.8	Short	500	0.0	NA
Approach	1760	3.0		0.656		10.7	LOS B	7.1	180.8				
West: Des Moines Memorial Dr (EB)													
Lane 1	397	4.0	674	0.589	100	10.7	LOS B	3.7	95.0	Full	1600	0.0	0.0
Lane 2 ^d	483	4.0	819	0.589	100	8.9	LOS A	3.9	101.2	Full	1600	0.0	0.0
Approach	880	4.0		0.589		9.7	LOS A	3.9	101.2				
Intersection	3235	4.4		0.656		9.3	LOS A	7.1	180.8				

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Signalised Intersections.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used).

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

^d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)										
East: Des Moines Memorial Dr (WB)										
Mov.	T1	R2	Total	%HV	Cap.	Deg.	Lane	Prob.	Ov.	
From E					veh/h	Satn	Util.	SL	Ov.	Lane
To Exit:	W	N				v/c	%	%	%	No.
Lane 1	435	160	595	9.0	1252	0.475	100	NA	NA	
Approach	435	160	595	9.0		0.475				
North: SR 509 Ramps										
Mov.	L2	R2	Total	%HV	Cap.	Deg.	Lane	Prob.	Ov.	
From N					veh/h	Satn	Util.	SL	Ov.	Lane
To Exit:	E	W				v/c	%	%	%	No.
Lane 1	440	-	440	3.0	968	0.454	100	NA	NA	
Lane 2	540	-	540	3.0	1189	0.454	100	NA	NA	
Lane 3	-	780	780	3.0	1189	0.656	100	0.0	2	

HCM Signalized Intersection Capacity Analysis

73: Des Moines Memorial Dr & S 188th St

SAMP Surface Transportation Analysis























Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	905	615	40	785	5	340	0	35	10	5	15
Future Volume (vph)	10	905	615	40	785	5	340	0	35	10	5	15
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	5.3	5.3	5.3	5.3	5.3		5.5	5.5			5.5	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		0.97	1.00			1.00	
Frpb, 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	1.00	1.00		1.00	0.85			0.93	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00			0.98	
Satd. Flow (prot)	1599	3197	1398	1599	3194		3072	1417			1605	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00			0.30	
Satd. Flow (perm)	1599	3197	1398	1599	3194		3072	1417			490	
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
Adj. Flow (vph)	10	905	615	40	785	5	340	0	35	10	5	15
RTOR Reduction (vph)	0	0	193	0	0	0	0	29	0	0	13	0
Lane Group Flow (vph)	10	905	422	40	790	0	340	6	0	0	17	0
Confl. Peds. (#/hr)			1									
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	5%	5%	5%	0%	0%	0%
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA		Perm	NA	
Protected Phases	5	2		1	6		4	4			3	
Permitted Phases			2							3		
Actuated Green, G (s)	1.2	50.5	50.5	6.2	55.5		18.5	18.5			15.2	
Effective Green, g (s)	1.2	50.5	50.5	6.2	55.5		18.5	18.5			15.2	
Actuated g/C Ratio	0.01	0.45	0.45	0.06	0.50		0.17	0.17			0.14	
Clearance Time (s)	5.3	5.3	5.3	5.3	5.3		5.5	5.5			5.5	
Vehicle Extension (s)	3.0	3.0	3.0	2.0	3.0		2.0	2.0			3.0	
Lane Grp Cap (vph)	17	1441	630	88	1582		507	234			66	
v/s Ratio Prot	0.01	0.28		c0.03	c0.25		c0.11	0.00				
v/s Ratio Perm			c0.30								c0.03	
v/c Ratio	0.59	0.63	0.67	0.45	0.50		0.67	0.02			0.26	
Uniform Delay, d1	55.2	23.6	24.2	51.3	18.9		43.9	39.2			43.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	42.8	0.9	2.7	1.4	0.2		2.7	0.0			2.1	
Delay (s)	97.9	24.4	26.9	52.6	19.2		46.6	39.2			45.4	
Level of Service	F	C	C	D	B		D	D			D	
Approach Delay (s)		25.9			20.8			45.9			45.4	
Approach LOS		C			C			D			D	
Intersection Summary												
HCM 2000 Control Delay			27.3				HCM 2000 Level of Service				C	
HCM 2000 Volume to Capacity ratio			0.59									
Actuated Cycle Length (s)			112.0				Sum of lost time (s)			21.6		
Intersection Capacity Utilization			63.2%				ICU Level of Service			B		
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

74: Military Rd & S 176th St

SAMP Surface Transportation Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	85	305	100	135	145	215	70	330	85	75	375	50
Future Volume (vph)	85	305	100	135	145	215	70	330	85	75	375	50
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	6.0	6.0		5.0	5.0		5.2	5.2	5.2	5.2	5.2	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frbp, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.96		1.00	0.91		1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1614	1627		1646	1557		1614	1699	1413	1629	1681	
Flt Permitted	0.40	1.00		0.26	1.00		0.24	1.00	1.00	0.38	1.00	
Satd. Flow (perm)	686	1627		451	1557		403	1699	1413	645	1681	
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
Adj. Flow (vph)	85	305	100	135	145	215	70	330	85	75	375	50
RTOR Reduction (vph)	0	8	0	0	41	0	0	0	59	0	3	0
Lane Group Flow (vph)	85	397	0	135	319	0	70	330	26	75	422	0
Confl. Peds. (#/hr)	1		1	1		1	2		1	1		2
Heavy Vehicles (%)	3%	3%	3%	1%	1%	1%	3%	3%	3%	2%	2%	2%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases	8			4			2		2	6		
Actuated Green, G (s)	34.2	28.1		42.4	32.2		34.4	28.4	28.4	34.0	28.2	
Effective Green, g (s)	34.2	28.1		42.4	32.2		34.4	28.4	28.4	34.0	28.2	
Actuated g/C Ratio	0.36	0.30		0.45	0.34		0.37	0.30	0.30	0.36	0.30	
Clearance Time (s)	6.0	6.0		5.0	5.0		5.2	5.2	5.2	5.2	5.2	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	310	486		333	533		225	513	427	294	504	
v/s Ratio Prot	0.02	c0.24		c0.04	c0.20		c0.02	0.19		0.02	c0.25	
v/s Ratio Perm	0.08			0.14			0.09		0.02	0.08		
v/c Ratio	0.27	0.82		0.41	0.60		0.31	0.64	0.06	0.26	0.84	
Uniform Delay, d1	20.3	30.5		17.0	25.5		21.1	28.4	23.3	20.5	30.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.2	9.7		0.3	1.2		0.3	2.1	0.0	0.2	11.0	
Delay (s)	20.5	40.2		17.3	26.7		21.4	30.4	23.3	20.7	41.7	
Level of Service	C	D		B	C		C	C	C	C	D	
Approach Delay (s)		36.8			24.1			27.9			38.6	
Approach LOS		D			C			C			D	
Intersection Summary												
HCM 2000 Control Delay			31.9			HCM 2000 Level of Service			C			
HCM 2000 Volume to Capacity ratio			0.72									
Actuated Cycle Length (s)			93.9			Sum of lost time (s)			21.4			
Intersection Capacity Utilization			79.0%			ICU Level of Service			D			
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

75: 46th Ave S & S 188th St

SAMP Surface Transportation Analysis



Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	60	850	45	15	150	1165	120	35	25	20	35	15
Future Volume (vph)	60	850	45	15	150	1165	120	35	25	20	35	15
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.6	9.9			5.0	9.7			10.0			10.0
Lane Util. Factor	1.00	0.95			1.00	0.95			1.00			1.00
Frb, ped/bikes	1.00	1.00			1.00	1.00			1.00			0.99
Flpb, ped/bikes	1.00	1.00			1.00	1.00			1.00			1.00
Frt	1.00	0.99			1.00	0.99			0.97			0.94
Flt Protected	0.95	1.00			0.95	1.00			0.98			0.98
Satd. Flow (prot)	1599	3169			1599	3146			1614			1595
Flt Permitted	0.95	1.00			0.95	1.00			0.81			0.85
Satd. Flow (perm)	1599	3169			1599	3146			1343			1372
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
Adj. Flow (vph)	60	850	45	15	150	1165	120	35	25	20	35	15
RTOR Reduction (vph)	0	4	0	0	0	6	0	0	18	0	0	40
Lane Group Flow (vph)	60	891	0	0	165	1279	0	0	62	0	0	55
Confl. Peds. (#/hr)			1				1	3		4	4	
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	2%	2%	2%	0%	0%
Bus Blockages (#/hr)	0	0	48	0	0	0	0	0	0	0	0	0
Turn Type	Prot	NA		Prot	Prot	NA		Perm	NA		Perm	NA
Protected Phases	1	6		5	5	2			8			8
Permitted Phases								8			8	
Actuated Green, G (s)	5.3	35.7			9.7	40.7			9.7			9.7
Effective Green, g (s)	5.3	35.7			9.7	40.7			9.7			9.7
Actuated g/C Ratio	0.07	0.45			0.12	0.51			0.12			0.12
Clearance Time (s)	4.6	9.9			5.0	9.7			10.0			10.0
Vehicle Extension (s)	2.0	2.0			2.0	2.0			5.0			5.0
Lane Grp Cap (vph)	105	1414			193	1600			162			166
v/s Ratio Prot	0.04	0.28			c0.10	c0.41						
v/s Ratio Perm									c0.05			0.04
v/c Ratio	0.57	0.63			0.85	0.80			0.39			0.33
Uniform Delay, d1	36.2	17.1			34.5	16.3			32.4			32.2
Progression Factor	1.00	1.00			1.00	1.00			1.00			1.00
Incremental Delay, d2	4.6	2.1			28.1	4.3			3.2			2.5
Delay (s)	40.8	19.2			62.5	20.5			35.6			34.7
Level of Service	D	B			E	C			D			C
Approach Delay (s)		20.6				25.3			35.6			34.7
Approach LOS		C				C			D			C
Intersection Summary												
HCM 2000 Control Delay			24.2			HCM 2000 Level of Service			C			
HCM 2000 Volume to Capacity ratio			0.77									
Actuated Cycle Length (s)			80.0			Sum of lost time (s)			24.9			
Intersection Capacity Utilization			72.0%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
 75: 46th Ave S & S 188th St

SAMP Surface Transportation Analysis

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	45
Future Volume (vph)	45
Ideal Flow (vphpl)	1750
Total Lost time (s)	
Lane Util. Factor	
Frbp, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	45
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	3
Heavy Vehicles (%)	0%
Bus Blockages (#/hr)	0
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
Intersection Summary	

HCM Signalized Intersection Capacity Analysis

76: Military Rd & S 188th St













SAMP Surface Transportation Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		 			 					 			
Traffic Volume (vph)	65	810	45	135	695	265	30	115	50	380	395	110	
Future Volume (vph)	65	810	45	135	695	265	30	115	50	380	395	110	
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	
Total Lost time (s)	5.7	10.8		4.7	9.7	9.7	5.7	5.9		5.6	10.8		
Lane Util. Factor	1.00	0.91		1.00	0.95	1.00	1.00	1.00		0.97	1.00		
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.95		1.00	0.97		
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00		
Satd. Flow (prot)	1599	4557		1583	3167	1417	1646	1654		3162	1660		
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00		
Satd. Flow (perm)	1599	4557		1583	3167	1417	1646	1654		3162	1660		
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	
Adj. Flow (vph)	65	810	45	135	695	265	30	115	50	380	395	110	
RTOR Reduction (vph)	0	5	0	0	0	161	0	16	0	0	9	0	
Lane Group Flow (vph)	65	850	0	135	695	104	30	149	0	380	496	0	
Heavy Vehicles (%)	4%	4%	4%	5%	5%	5%	1%	1%	1%	2%	2%	2%	
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		Prot	NA		
Protected Phases	1	6		5	2		7	4		3	8		
Permitted Phases						2							
Actuated Green, G (s)	6.5	29.1		14.3	37.0	37.0	3.2	15.6		29.0	36.4		
Effective Green, g (s)	6.5	29.1		14.3	37.0	37.0	3.2	15.6		29.0	36.4		
Actuated g/C Ratio	0.06	0.25		0.12	0.32	0.32	0.03	0.14		0.25	0.32		
Clearance Time (s)	5.7	10.8		4.7	9.7	9.7	5.7	5.9		5.6	10.8		
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	3.0	3.0		2.0	2.0		
Lane Grp Cap (vph)	90	1153		196	1018	455	45	224		797	525		
v/s Ratio Prot	0.04	c0.19		c0.09	c0.22		0.02	c0.09		0.12	c0.30		
v/s Ratio Perm						0.07							
v/c Ratio	0.72	0.74		0.69	0.68	0.23	0.67	0.67		0.48	0.94		
Uniform Delay, d1	53.4	39.4		48.2	33.9	28.5	55.4	47.2		36.6	38.3		
Progression Factor	1.00	1.00		0.88	0.75	1.77	1.00	1.00		1.00	1.00		
Incremental Delay, d2	21.3	4.2		6.7	3.2	1.0	31.5	7.3		0.2	25.7		
Delay (s)	74.7	43.7		49.1	28.7	51.5	86.8	54.5		36.7	64.1		
Level of Service	E	D		D	C	D	F	D		D	E		
Approach Delay (s)		45.9			36.7			59.5			52.3		
Approach LOS		D			D			E			D		
Intersection Summary													
HCM 2000 Control Delay			45.3									HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio			0.88										
Actuated Cycle Length (s)			115.0									Sum of lost time (s)	32.0
Intersection Capacity Utilization			86.9%									ICU Level of Service	E
Analysis Period (min)			15										
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis

77: I-5 SB Ramp & S 188th St

SAMP Surface Transportation Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗	↖	↑↑					↖	↕	
Traffic Volume (vph)	0	865	375	400	1020	0	0	0	0	540	10	75
Future Volume (vph)	0	865	375	400	1020	0	0	0	0	540	10	75
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		6.6	6.6	5.5	6.6					5.9	5.9	
Lane Util. Factor		0.95	1.00	1.00	0.95					0.95	0.95	
Frt		1.00	0.85	1.00	1.00					1.00	0.96	
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.97	
Satd. Flow (prot)		3197	1430	1599	3197					1398	1368	
Flt Permitted		1.00	1.00	0.13	1.00					0.95	0.97	
Satd. Flow (perm)		3197	1430	224	3197					1398	1368	
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
Adj. Flow (vph)	0	865	375	400	1020	0	0	0	0	540	10	75
RTOR Reduction (vph)	0	0	241	0	0	0	0	0	0	0	11	0
Lane Group Flow (vph)	0	865	134	400	1020	0	0	0	0	319	295	0
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	0%	0%	0%	13%	13%	13%
Turn Type		NA	Perm	pm+pt	NA						Perm	NA
Protected Phases		2		1	6							8
Permitted Phases			2	6							8	
Actuated Green, G (s)		37.1	37.1	69.0	69.0					33.5	33.5	
Effective Green, g (s)		37.1	37.1	69.0	69.0					33.5	33.5	
Actuated g/C Ratio		0.32	0.32	0.60	0.60					0.29	0.29	
Clearance Time (s)		6.6	6.6	5.5	6.6					5.9	5.9	
Vehicle Extension (s)		4.0	4.0	3.0	5.0					3.5	3.5	
Lane Grp Cap (vph)		1031	461	450	1918					407	398	
v/s Ratio Prot		0.27		c0.20	0.32							
v/s Ratio Perm			0.09	c0.33						c0.23	0.22	
v/c Ratio		0.84	0.29	0.89	0.53					0.78	0.74	
Uniform Delay, d1		36.2	29.1	28.9	13.5					37.4	36.8	
Progression Factor		0.53	1.33	1.29	1.62					1.00	1.00	
Incremental Delay, d2		6.6	1.3	13.7	0.7					9.8	7.5	
Delay (s)		25.9	40.1	50.9	22.5					47.2	44.3	
Level of Service		C	D	D	C					D	D	
Approach Delay (s)		30.2			30.5			0.0			45.8	
Approach LOS		C			C			A			D	
Intersection Summary												
HCM 2000 Control Delay			33.3			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.88									
Actuated Cycle Length (s)			115.0			Sum of lost time (s)			18.0			
Intersection Capacity Utilization			124.3%			ICU Level of Service				H		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

78: I-5 NB Ramp & S 188th St























SAMP Surface Transportation Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	400	1005	0	0	955	975	465	0	175	0	0	0
Future Volume (vph)	400	1005	0	0	955	975	465	0	175	0	0	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	5.5	6.4			6.4	6.4	6.0	6.0				
Lane Util. Factor	1.00	0.95			0.95	1.00	0.95	0.95				
Frt	1.00	1.00			1.00	0.85	1.00	0.92				
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.98				
Satd. Flow (prot)	1554	3107			3197	1430	1449	1366				
Flt Permitted	0.18	1.00			1.00	1.00	0.95	0.98				
Satd. Flow (perm)	294	3107			3197	1430	1449	1366				
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
Adj. Flow (vph)	400	1005	0	0	955	975	465	0	175	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	182	0	63	0	0	0	0
Lane Group Flow (vph)	400	1005	0	0	955	793	330	247	0	0	0	0
Heavy Vehicles (%)	7%	7%	7%	4%	4%	4%	9%	9%	9%	0%	0%	0%
Turn Type	pm+pt	NA			NA	Perm	Split	NA				
Protected Phases	5	2			6		4	4				
Permitted Phases	2					6						
Actuated Green, G (s)	74.5	74.5			52.6	52.6	28.1	28.1				
Effective Green, g (s)	74.5	74.5			52.6	52.6	28.1	28.1				
Actuated g/C Ratio	0.65	0.65			0.46	0.46	0.24	0.24				
Clearance Time (s)	5.5	6.4			6.4	6.4	6.0	6.0				
Vehicle Extension (s)	3.0	4.0			5.0	5.0	3.5	3.5				
Lane Grp Cap (vph)	370	2012			1462	654	354	333				
v/s Ratio Prot	c0.15	0.32			0.30		c0.23	0.18				
v/s Ratio Perm	0.55					c0.55						
v/c Ratio	1.08	0.50			0.65	1.21	0.93	0.74				
Uniform Delay, d1	22.8	10.5			24.1	31.2	42.5	40.1				
Progression Factor	2.52	0.88			1.00	1.00	1.00	1.00				
Incremental Delay, d2	61.5	0.6			2.3	109.5	31.2	8.8				
Delay (s)	119.0	9.8			26.4	140.7	73.7	48.9				
Level of Service	F	A			C	F	E	D				
Approach Delay (s)		40.9			84.2			61.7			0.0	
Approach LOS		D			F			E			A	
Intersection Summary												
HCM 2000 Control Delay			65.3				HCM 2000 Level of Service		E			
HCM 2000 Volume to Capacity ratio			1.12									
Actuated Cycle Length (s)			115.0				Sum of lost time (s)		17.9			
Intersection Capacity Utilization			124.3%				ICU Level of Service		H			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

79: Des Moines Memorial Dr & S 200th St

SAMP Surface Transportation Analysis






















													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	25	270	160	60	145	110	40	310	30	235	515	10	
Future Volume (vph)	25	270	160	60	145	110	40	310	30	235	515	10	
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	
Total Lost time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0		
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00		
Frbp, ped/bikes	1.00	0.99		1.00	1.00	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	1.00		
Frt	1.00	0.94		1.00	1.00	0.85	1.00	0.99		1.00	1.00		
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00		
Satd. Flow (prot)	1630	1603		1598	1683	1430	1614	1677		1630	1711		
Flt Permitted	0.65	1.00		0.23	1.00	1.00	0.23	1.00		0.37	1.00		
Satd. Flow (perm)	1116	1603		391	1683	1430	382	1677		635	1711		
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	
Adj. Flow (vph)	25	270	160	60	145	110	40	310	30	235	515	10	
RTOR Reduction (vph)	0	18	0	0	0	62	0	3	0	0	1	0	
Lane Group Flow (vph)	25	412	0	60	145	48	40	337	0	235	524	0	
Confl. Peds. (#/hr)			4	4									
Heavy Vehicles (%)	2%	2%	2%	4%	4%	4%	3%	3%	3%	2%	2%	2%	
Turn Type	D.P+P	NA		D.P+P	NA	pm+ov	D.P+P	NA		D.P+P	NA		
Protected Phases	7	4		3	8	1	5	2		1	6		
Permitted Phases	8			4		8	6			2			
Actuated Green, G (s)	35.5	29.5		35.5	31.9	42.3	41.3	30.9		41.3	37.4		
Effective Green, g (s)	35.5	29.5		35.5	31.9	42.3	41.3	30.9		41.3	37.4		
Actuated g/C Ratio	0.37	0.30		0.37	0.33	0.44	0.43	0.32		0.43	0.39		
Clearance Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0		
Vehicle Extension (s)	3.0	2.0		3.0	2.0	3.0	3.0	2.0		3.0	2.0		
Lane Grp Cap (vph)	428	488		218	554	698	212	535		377	661		
v/s Ratio Prot	0.00	c0.26		c0.02	0.09	0.01	0.01	0.20		c0.07	c0.31		
v/s Ratio Perm	0.02			0.08		0.03	0.07			0.20			
v/c Ratio	0.06	0.84		0.28	0.26	0.07	0.19	0.63		0.62	0.79		
Uniform Delay, d1	19.7	31.5		21.6	23.8	15.8	18.4	28.1		19.3	26.3		
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00		
Incremental Delay, d2	0.1	12.1		0.7	0.1	0.0	0.4	1.7		3.2	6.1		
Delay (s)	19.8	43.6		22.3	23.9	15.9	18.8	29.7		22.5	32.4		
Level of Service	B	D		C	C	B	B	C		C	C		
Approach Delay (s)		42.3			20.8			28.6			29.3		
Approach LOS		D			C			C			C		
Intersection Summary													
HCM 2000 Control Delay			30.9									HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.78										
Actuated Cycle Length (s)			96.8									Sum of lost time (s)	20.0
Intersection Capacity Utilization			80.3%									ICU Level of Service	D
Analysis Period (min)			15										

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

80: 26th Ave S & S 200th St

SAMP Surface Transportation Analysis

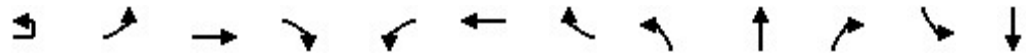
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	455	130	85	375	85	40	270	175	90	570	30
Future Volume (vph)	20	455	130	85	375	85	40	270	175	90	570	30
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	5.0	10.0		5.0	10.0	10.0	5.0	10.0		5.0	10.0	
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frbp, ped/bikes	1.00	1.00		1.00	1.00	0.98	1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	0.94		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1646	3172		1599	1683	1408	1646	3079		1568	3109	
Flt Permitted	0.47	1.00		0.30	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	816	3172		512	1683	1408	1646	3079		1568	3109	
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
Adj. Flow (vph)	20	455	130	85	375	85	40	270	175	90	570	30
RTOR Reduction (vph)	0	20	0	0	0	56	0	85	0	0	3	0
Lane Group Flow (vph)	20	565	0	85	375	29	40	360	0	90	597	0
Confl. Peds. (#/hr)			3			4	2		3	3		2
Heavy Vehicles (%)	1%	1%	1%	4%	4%	4%	1%	1%	1%	6%	6%	6%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases	8			4		4						
Actuated Green, G (s)	36.6	34.3		47.0	39.7	39.7	5.2	33.0		9.6	37.4	
Effective Green, g (s)	36.6	34.3		47.0	39.7	39.7	5.2	33.0		9.6	37.4	
Actuated g/C Ratio	0.32	0.30		0.41	0.35	0.35	0.05	0.29		0.08	0.33	
Clearance Time (s)	5.0	10.0		5.0	10.0	10.0	5.0	10.0		5.0	10.0	
Vehicle Extension (s)	2.0	2.0		3.0	2.0	2.0	3.0	2.0		3.0	2.0	
Lane Grp Cap (vph)	277	949		283	583	487	74	886		131	1014	
v/s Ratio Prot	0.00	0.18		c0.02	c0.22		0.02	0.12		c0.06	c0.19	
v/s Ratio Perm	0.02			0.10		0.02						
v/c Ratio	0.07	0.60		0.30	0.64	0.06	0.54	0.41		0.69	0.59	
Uniform Delay, d1	27.0	34.2		21.7	31.5	25.0	53.5	32.9		51.0	32.2	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	0.7		0.6	1.8	0.0	7.8	0.1		13.9	0.6	
Delay (s)	27.0	34.9		22.3	33.3	25.0	61.4	33.0		65.0	32.8	
Level of Service	C	C		C	C	C	E	C		E	C	
Approach Delay (s)		34.7			30.3			35.4			37.0	
Approach LOS		C			C			D			D	
Intersection Summary												
HCM 2000 Control Delay			34.5				HCM 2000 Level of Service				C	
HCM 2000 Volume to Capacity ratio			0.64									
Actuated Cycle Length (s)			114.6				Sum of lost time (s)			30.0		
Intersection Capacity Utilization			88.7%				ICU Level of Service			E		
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

81: 28th Ave S & S 200th St

SAMP Surface Transportation Analysis



Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	
Lane Configurations		↔	↕		↔	↕		↔	↕		↔	↕	
Traffic Volume (vph)	5	45	605	50	30	410	180	25	10	35	195	40	
Future Volume (vph)	5	45	605	50	30	410	180	25	10	35	195	40	
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	
Total Lost time (s)		5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor		1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frbp, ped/bikes		1.00	0.98		1.00	0.94		1.00	0.98		1.00	0.96	
Flpb, ped/bikes		1.00	1.00		1.00	1.00		0.95	1.00		0.98	1.00	
Frt		1.00	0.99		1.00	0.95		1.00	0.88		1.00	0.91	
Flt Protected		0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1614	3139		1568	2806		1516	1452		1619	1516	
Flt Permitted		0.40	1.00		0.38	1.00		0.66	1.00		0.73	1.00	
Satd. Flow (perm)		683	3139		634	2806		1048	1452		1240	1516	
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	
Adj. Flow (vph)	5	45	605	50	30	410	180	25	10	35	195	40	
RTOR Reduction (vph)	0	0	3	0	0	22	0	0	28	0	0	41	
Lane Group Flow (vph)	0	50	652	0	30	568	0	25	17	0	195	54	
Confl. Peds. (#/hr)				38			39	31		9	9		
Heavy Vehicles (%)	3%	3%	3%	3%	6%	6%	6%	4%	4%	4%	1%	1%	
Turn Type	pm+pt	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	7	7	4		3	8			2			6	
Permitted Phases	4	4			8			2				6	
Actuated Green, G (s)		103.8	98.9		101.0	97.5		27.6	27.6		27.6	27.6	
Effective Green, g (s)		103.8	98.9		101.0	97.5		27.6	27.6		27.6	27.6	
Actuated g/C Ratio		0.72	0.68		0.70	0.67		0.19	0.19		0.19	0.19	
Clearance Time (s)		5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)		2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)		520	2141		464	1886		199	276		236	288	
v/s Ratio Prot		c0.00	c0.21		0.00	0.20			0.01			0.04	
v/s Ratio Perm		0.07			0.04			0.02			c0.16		
v/c Ratio		0.10	0.30		0.06	0.30		0.13	0.06		0.83	0.19	
Uniform Delay, d1		6.2	9.3		6.9	9.8		48.7	48.1		56.4	49.3	
Progression Factor		1.00	1.00		0.39	0.36		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.0	0.4		0.0	0.3		0.1	0.0		19.6	0.1	
Delay (s)		6.2	9.6		2.7	3.8		48.8	48.1		76.0	49.4	
Level of Service		A	A		A	A		D	D		E	D	
Approach Delay (s)			9.4			3.7			48.4			67.3	
Approach LOS			A			A			D			E	
Intersection Summary													
HCM 2000 Control Delay			18.9									HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.41										
Actuated Cycle Length (s)			145.0									Sum of lost time (s)	15.0
Intersection Capacity Utilization			55.2%									ICU Level of Service	B
Analysis Period (min)			15										

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 81: 28th Ave S & S 200th St

SAMP Surface Transportation Analysis

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	55
Future Volume (vph)	55
Ideal Flow (vphpl)	1750
Total Lost time (s)	
Lane Util. Factor	
Frbp, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	55
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	31
Heavy Vehicles (%)	1%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
Intersection Summary	

HCM Signalized Intersection Capacity Analysis

82: International Blvd & S 200th St

SAMP Surface Transportation Analysis

Movement	EBL	EBT	EBR2	WBL2	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	
Lane Configurations													
Traffic Volume (vph)	85	590	145	45	335	115	5	180	470	185	10	315	
Future Volume (vph)	85	590	145	45	335	115	5	180	470	185	10	315	
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	
Total Lost time (s)	6.0	11.0		5.0	11.0			5.0	10.0	10.0		5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	0.95	1.00		1.00	
Frbp, ped/bikes	1.00	1.00		1.00	0.99			1.00	1.00	0.95		1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00	1.00		1.00	
Frt	1.00	0.97		1.00	0.96			1.00	1.00	0.85		1.00	
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00	1.00		0.95	
Satd. Flow (prot)	1646	3195		1599	3034			1614	3228	1376		1614	
Flt Permitted	0.95	1.00		0.95	1.00			0.95	1.00	1.00		0.95	
Satd. Flow (perm)	1646	3195		1599	3034			1614	3228	1376		1614	
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	
Adj. Flow (vph)	85	590	145	45	335	115	5	180	470	185	10	315	
RTOR Reduction (vph)	0	156	0	0	23	0	0	0	0	109	0	0	
Lane Group Flow (vph)	85	579	0	45	427	0	0	185	470	76	0	325	
Confl. Peds. (#/hr)						31				20			
Heavy Vehicles (%)	1%	1%	1%	4%	4%	4%	3%	3%	3%	3%	3%	3%	
Turn Type	Prot	NA		Prot	NA		Prot	Prot	NA	Perm	Prot	Prot	
Protected Phases	7	4		3	8		5	5	2		1	1	
Permitted Phases										2			
Actuated Green, G (s)	8.8	37.5		7.4	35.1			18.3	36.8	36.8		32.3	
Effective Green, g (s)	8.8	37.5		7.4	35.1			18.3	36.8	36.8		32.3	
Actuated g/C Ratio	0.06	0.26		0.05	0.24			0.13	0.25	0.25		0.22	
Clearance Time (s)	6.0	11.0		5.0	11.0			5.0	10.0	10.0		5.0	
Vehicle Extension (s)	2.0	2.0		3.0	2.0			2.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	99	826		81	734			203	819	349		359	
v/s Ratio Prot	c0.05	c0.18		0.03	0.14			c0.11	0.15			0.20	
v/s Ratio Perm										0.06			
v/c Ratio	0.86	0.70		0.56	0.58			0.91	0.57	0.22		0.91	
Uniform Delay, d1	67.5	48.7		67.2	48.5			62.5	47.3	42.7		54.9	
Progression Factor	0.96	0.92		1.00	1.00			0.91	0.88	1.23		0.84	
Incremental Delay, d2	45.2	2.1		8.0	0.8			38.3	2.9	1.4		23.9	
Delay (s)	110.1	47.1		75.2	49.2			95.1	44.3	53.9		69.9	
Level of Service	F	D		E	D			F	D	D		E	
Approach Delay (s)		53.6			51.6				57.6				
Approach LOS		D			D				E				
Intersection Summary													
HCM 2000 Control Delay			48.8									HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio			0.85										
Actuated Cycle Length (s)			145.0									Sum of lost time (s)	32.0
Intersection Capacity Utilization			101.0%									ICU Level of Service	G
Analysis Period (min)			15										

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

82: International Blvd & S 200th St

SAMP Surface Transportation Analysis


























Movement	SBT	SBR	SBR2
Lane Configurations	↑↑	↘	
Traffic Volume (vph)	1020	170	105
Future Volume (vph)	1020	170	105
Ideal Flow (vphpl)	1750	1750	1750
Total Lost time (s)	10.0	10.0	
Lane Util. Factor	0.95	1.00	
Frbp, ped/bikes	1.00	0.95	
Flpb, ped/bikes	1.00	1.00	
Frt	1.00	0.85	
Flt Protected	1.00	1.00	
Satd. Flow (prot)	3228	1368	
Flt Permitted	1.00	1.00	
Satd. Flow (perm)	3228	1368	
Peak-hour factor, PHF	1.00	1.00	1.00
Adj. Flow (vph)	1020	170	105
RTOR Reduction (vph)	0	118	0
Lane Group Flow (vph)	1020	157	0
Confl. Peds. (#/hr)			23
Heavy Vehicles (%)	3%	3%	3%
Turn Type	NA	Perm	
Protected Phases	6		
Permitted Phases		6	
Actuated Green, G (s)	50.8	50.8	
Effective Green, g (s)	50.8	50.8	
Actuated g/C Ratio	0.35	0.35	
Clearance Time (s)	10.0	10.0	
Vehicle Extension (s)	3.0	3.0	
Lane Grp Cap (vph)	1130	479	
v/s Ratio Prot	c0.32		
v/s Ratio Perm		0.12	
v/c Ratio	0.90	0.33	
Uniform Delay, d1	44.8	34.6	
Progression Factor	0.63	0.34	
Incremental Delay, d2	10.9	1.7	
Delay (s)	39.3	13.3	
Level of Service	D	B	
Approach Delay (s)	41.0		
Approach LOS	D		
Intersection Summary			

HCM Signalized Intersection Capacity Analysis

83: Military Rd & S 200th St/I-5 SB Ramp

SAMP Surface Transportation Analysis





















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	125	295	765	270	165	25	215	140	35	195	110	95
Future Volume (vph)	125	295	765	270	165	25	215	140	35	195	110	95
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	5.5	5.9	5.5	5.5	5.9		5.5	5.9	5.5	5.5	5.9	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		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	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85	1.00	0.93	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1630	1716	1458	1599	1645		1630	1716	1458	1646	1612	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1630	1716	1458	1599	1645		1630	1716	1458	1646	1612	
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
Adj. Flow (vph)	125	295	765	270	165	25	215	140	35	195	110	95
RTOR Reduction (vph)	0	0	224	0	4	0	0	0	22	0	25	0
Lane Group Flow (vph)	125	295	541	270	186	0	215	140	13	195	180	0
Confl. Peds. (#/hr)						1						
Heavy Vehicles (%)	2%	2%	2%	4%	4%	4%	2%	2%	2%	1%	1%	1%
Turn Type	Prot	NA	pm+ov	Prot	NA		Prot	NA	pm+ov	Prot	NA	
Protected Phases	7	4	5	3	8		5	2	3	1	6	
Permitted Phases			4						2			
Actuated Green, G (s)	13.5	38.2	57.5	23.8	48.5		19.3	23.6	47.4	15.1	19.4	
Effective Green, g (s)	13.5	38.2	57.5	23.8	48.5		19.3	23.6	47.4	15.1	19.4	
Actuated g/C Ratio	0.11	0.31	0.47	0.19	0.39		0.16	0.19	0.38	0.12	0.16	
Clearance Time (s)	5.5	5.9	5.5	5.5	5.9		5.5	5.9	5.5	5.5	5.9	
Vehicle Extension (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5	3.5	3.5	3.5	
Lane Grp Cap (vph)	178	530	678	308	646		254	327	559	201	253	
v/s Ratio Prot	0.08	0.17	c0.12	c0.17	0.11		c0.13	c0.08	0.00	0.12	c0.11	
v/s Ratio Perm			0.25						0.00			
v/c Ratio	0.70	0.56	0.80	0.88	0.29		0.85	0.43	0.02	0.97	0.71	
Uniform Delay, d1	53.1	35.6	28.1	48.4	25.7		50.7	44.0	23.7	54.0	49.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	12.2	1.4	6.7	23.6	0.3		22.5	1.1	0.0	54.9	9.3	
Delay (s)	65.3	37.0	34.8	72.1	26.0		73.2	45.1	23.7	108.8	58.7	
Level of Service	E	D	C	E	C		E	D	C	F	E	
Approach Delay (s)		38.5			53.0			58.6			83.2	
Approach LOS		D			D			E			F	
Intersection Summary												
HCM 2000 Control Delay			51.8				HCM 2000 Level of Service				D	
HCM 2000 Volume to Capacity ratio			0.81									
Actuated Cycle Length (s)			123.5				Sum of lost time (s)				22.8	
Intersection Capacity Utilization			94.3%				ICU Level of Service				F	
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

84: International Blvd & S 204th St

SAMP Surface Transportation Analysis

													
Movement	EBL	EBT	EBR	EBR2	WBL2	WBT	WBR	NBL	NBT	NBR	SBU	SBL	
Lane Configurations													
Traffic Volume (vph)	20	5	0	25	70	0	40	10	630	50	10	55	
Future Volume (vph)	20	5	0	25	70	0	40	10	630	50	10	55	
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	
Grade (%)		3%				0%			0%				
Total Lost time (s)		11.0	11.0		11.0	11.0		5.0	10.0			5.0	
Lane Util. Factor		1.00	1.00		1.00	1.00		1.00	0.95			1.00	
Frbp, ped/bikes		1.00	0.98		1.00	0.98		1.00	1.00			1.00	
Flpb, ped/bikes		0.99	1.00		1.00	1.00		1.00	1.00			1.00	
Frt		1.00	0.85		1.00	0.85		1.00	0.99			1.00	
Flt Protected		0.96	1.00		0.95	1.00		0.95	1.00			0.95	
Satd. Flow (prot)		1512	1322		1607	1417		1614	3182			1646	
Flt Permitted		0.74	1.00		0.74	1.00		0.95	1.00			0.95	
Satd. Flow (perm)		1166	1322		1253	1417		1614	3182			1646	
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	
Adj. Flow (vph)	20	5	0	25	70	0	40	10	630	50	10	55	
RTOR Reduction (vph)	0	0	23	0	0	36	0	0	3	0	0	0	
Lane Group Flow (vph)	0	25	2	0	70	4	0	10	677	0	0	65	
Confl. Peds. (#/hr)	5		3		3		5	6		6		6	
Heavy Vehicles (%)	9%	9%	9%	9%	3%	3%	3%	3%	3%	3%	1%	1%	
Turn Type	Perm	NA	Perm		Perm	NA		Prot	NA		Prot	Prot	
Protected Phases		4				8		5	2		1	1	
Permitted Phases	4		4		8								
Actuated Green, G (s)		14.1	14.1		14.1	14.1		3.0	95.4			9.5	
Effective Green, g (s)		14.1	14.1		14.1	14.1		3.0	95.4			9.5	
Actuated g/C Ratio		0.10	0.10		0.10	0.10		0.02	0.66			0.07	
Clearance Time (s)		11.0	11.0		11.0	11.0		5.0	10.0			5.0	
Vehicle Extension (s)		4.0	4.0		3.0	3.0		3.0	4.0			3.0	
Lane Grp Cap (vph)		113	128		121	137		33	2093			107	
v/s Ratio Prot						0.00		0.01	0.21			c0.04	
v/s Ratio Perm		0.02	0.00		c0.06								
v/c Ratio		0.22	0.02		0.58	0.03		0.30	0.32			0.61	
Uniform Delay, d1		60.4	59.2		62.6	59.2		70.0	10.8			65.9	
Progression Factor		1.00	1.00		1.00	1.00		0.80	1.71			1.15	
Incremental Delay, d2		1.4	0.1		6.6	0.1		5.1	0.4			7.0	
Delay (s)		61.7	59.3		69.2	59.3		60.7	18.9			83.0	
Level of Service		E	E		E	E		E	B			F	
Approach Delay (s)		60.5				65.6			19.5				
Approach LOS		E				E			B				
Intersection Summary													
HCM 2000 Control Delay			17.8									HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.51										
Actuated Cycle Length (s)			145.0									Sum of lost time (s)	26.0
Intersection Capacity Utilization			76.8%									ICU Level of Service	D
Analysis Period (min)			15										
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis

84: International Blvd & S 204th St

SAMP Surface Transportation Analysis



Movement	SBT	SBR	SBR2
Lane Configurations	↑↑	←	→
Traffic Volume (vph)	1110	180	15
Future Volume (vph)	1110	180	15
Ideal Flow (vphpl)	1750	1750	1750
Grade (%)	0%		
Total Lost time (s)	10.0	10.0	
Lane Util. Factor	0.95	1.00	
Frbp, ped/bikes	1.00	0.96	
Flpb, ped/bikes	1.00	1.00	
Frt	1.00	0.85	
Flt Protected	1.00	1.00	
Satd. Flow (prot)	3292	1410	
Flt Permitted	1.00	1.00	
Satd. Flow (perm)	3292	1410	
Peak-hour factor, PHF	1.00	1.00	1.00
Adj. Flow (vph)	1110	180	15
RTOR Reduction (vph)	0	29	0
Lane Group Flow (vph)	1110	166	0
Confl. Peds. (#/hr)			6
Heavy Vehicles (%)	1%	1%	1%
Turn Type	NA	Perm	
Protected Phases	6		
Permitted Phases		6	
Actuated Green, G (s)	101.9	101.9	
Effective Green, g (s)	101.9	101.9	
Actuated g/C Ratio	0.70	0.70	
Clearance Time (s)	10.0	10.0	
Vehicle Extension (s)	4.0	4.0	
Lane Grp Cap (vph)	2313	990	
v/s Ratio Prot	c0.34		
v/s Ratio Perm		0.12	
v/c Ratio	0.48	0.17	
Uniform Delay, d1	9.7	7.3	
Progression Factor	0.81	0.70	
Incremental Delay, d2	0.5	0.3	
Delay (s)	8.4	5.4	
Level of Service	A	A	
Approach Delay (s)	11.5		
Approach LOS	B		
Intersection Summary			

HCM Signalized Intersection Capacity Analysis

85: International Blvd & S 208th St

SAMP Surface Transportation Analysis



Movement	EBL	EBT	EBR2	WBL2	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	
Lane Configurations													
Traffic Volume (vph)	75	5	30	10	10	35	30	10	520	5	65	20	
Future Volume (vph)	75	5	30	10	10	35	30	10	520	5	65	20	
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	
Total Lost time (s)	11.0	11.0		11.0	11.0			5.0	10.0			5.0	
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	0.99			1.00	1.00			1.00	
Flpb, ped/bikes	0.99	1.00		0.97	1.00			1.00	1.00			1.00	
Frt	1.00	0.87		1.00	0.88			1.00	1.00			1.00	
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00			0.95	
Satd. Flow (prot)	1589	1466		1586	1494			1599	3191			1630	
Flt Permitted	0.73	1.00		0.73	1.00			0.95	1.00			0.95	
Satd. Flow (perm)	1217	1466		1226	1494			1599	3191			1630	
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	
Adj. Flow (vph)	75	5	30	10	10	35	30	10	520	5	65	20	
RTOR Reduction (vph)	0	31	0	0	31	0	0	0	0	0	0	0	
Lane Group Flow (vph)	75	4	0	10	14	0	0	40	525	0	0	85	
Confl. Peds. (#/hr)	4			18		4		8		4		4	
Confl. Bikes (#/hr)													
Heavy Vehicles (%)	4%	4%	4%	2%	2%	2%	4%	4%	4%	4%	2%	2%	
Turn Type	Perm	NA		Perm	NA		Prot	Prot	NA		Prot	Prot	
Protected Phases		4			8		5	5	2		1	1	
Permitted Phases	4			8									
Actuated Green, G (s)	17.9	17.9		17.9	17.9			7.9	87.9			13.2	
Effective Green, g (s)	17.9	17.9		17.9	17.9			7.9	87.9			13.2	
Actuated g/C Ratio	0.12	0.12		0.12	0.12			0.05	0.61			0.09	
Clearance Time (s)	11.0	11.0		11.0	11.0			5.0	10.0			5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	4.0			4.0	
Lane Grp Cap (vph)	150	180		151	184			87	1934			148	
v/s Ratio Prot		0.00			0.01			0.03	0.16			c0.05	
v/s Ratio Perm	c0.06			0.01									
v/c Ratio	0.50	0.02		0.07	0.08			0.46	0.27			0.57	
Uniform Delay, d1	59.4	55.9		56.2	56.2			66.5	13.5			63.2	
Progression Factor	1.00	1.00		1.00	1.00			1.38	0.25			1.15	
Incremental Delay, d2	2.6	0.1		0.2	0.2			3.5	0.3			6.0	
Delay (s)	62.0	55.9		56.3	56.4			95.4	3.7			79.0	
Level of Service	E	E		E	E			F	A			E	
Approach Delay (s)		60.1			56.4				10.2				
Approach LOS		E			E				B				
Intersection Summary													
HCM 2000 Control Delay			18.3									HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.52										
Actuated Cycle Length (s)			145.0									Sum of lost time (s)	26.0
Intersection Capacity Utilization			73.9%									ICU Level of Service	D
Analysis Period (min)			15										
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis

85: International Blvd & S 208th St

SAMP Surface Transportation Analysis



Movement	SBT	SBR	SBR2
Lane Configurations	↑↑	←	→
Traffic Volume (vph)	1045	170	60
Future Volume (vph)	1045	170	60
Ideal Flow (vphpl)	1750	1750	1750
Total Lost time (s)	10.0	10.0	
Lane Util. Factor	0.95	1.00	
Frbp, ped/bikes	1.00	0.95	
Flpb, ped/bikes	1.00	1.00	
Frt	1.00	0.85	
Flt Protected	1.00	1.00	
Satd. Flow (prot)	3260	1385	
Flt Permitted	1.00	1.00	
Satd. Flow (perm)	3260	1385	
Peak-hour factor, PHF	1.00	1.00	1.00
Adj. Flow (vph)	1045	170	60
RTOR Reduction (vph)	0	35	0
Lane Group Flow (vph)	1045	195	0
Confl. Peds. (#/hr)			8
Confl. Bikes (#/hr)			1
Heavy Vehicles (%)	2%	2%	2%
Turn Type	NA	Perm	
Protected Phases	6		
Permitted Phases		6	
Actuated Green, G (s)	93.2	93.2	
Effective Green, g (s)	93.2	93.2	
Actuated g/C Ratio	0.64	0.64	
Clearance Time (s)	10.0	10.0	
Vehicle Extension (s)	4.0	4.0	
Lane Grp Cap (vph)	2095	890	
v/s Ratio Prot	c0.32		
v/s Ratio Perm		0.14	
v/c Ratio	0.50	0.22	
Uniform Delay, d1	13.6	10.8	
Progression Factor	0.93	0.77	
Incremental Delay, d2	0.8	0.5	
Delay (s)	13.5	8.8	
Level of Service	B	A	
Approach Delay (s)	16.8		
Approach LOS	B		
Intersection Summary			

HCM Signalized Intersection Capacity Analysis

86: Military Rd & I-5 NB Ramp

SAMP Surface Transportation Analysis



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	255	60	335	135	775	370
Future Volume (vph)	255	60	335	135	775	370
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	5.5		5.0	5.0	5.0	5.5
Lane Util. Factor	1.00		1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00		1.00	1.00	1.00	0.99
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	0.97		1.00	1.00	1.00	0.85
Flt Protected	0.96		0.95	1.00	1.00	1.00
Satd. Flow (prot)	1584		1630	1716	1733	1453
Flt Permitted	0.96		0.09	1.00	1.00	1.00
Satd. Flow (perm)	1584		151	1716	1733	1453
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	255	60	335	135	775	370
RTOR Reduction (vph)	8	0	0	0	0	65
Lane Group Flow (vph)	307	0	335	135	775	305
Confl. Peds. (#/hr)		2				1
Heavy Vehicles (%)	3%	3%	2%	2%	1%	1%
Turn Type	Prot		pm+pt	NA	NA	pm+ov
Protected Phases	4		5	2	6	4
Permitted Phases			2			6
Actuated Green, G (s)	27.3		69.1	69.1	40.4	67.7
Effective Green, g (s)	27.3		69.1	69.1	40.4	67.7
Actuated g/C Ratio	0.26		0.65	0.65	0.38	0.63
Clearance Time (s)	5.5		5.0	5.0	5.0	5.5
Vehicle Extension (s)	4.0		3.5	4.0	4.0	4.0
Lane Grp Cap (vph)	404		425	1109	654	920
v/s Ratio Prot	c0.19		c0.17	0.08	c0.45	0.08
v/s Ratio Perm			0.33			0.13
v/c Ratio	0.76		0.79	0.12	1.19	0.33
Uniform Delay, d1	36.8		29.5	7.3	33.2	9.1
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	8.5		9.6	0.1	98.2	0.3
Delay (s)	45.2		39.1	7.3	131.5	9.4
Level of Service	D		D	A	F	A
Approach Delay (s)	45.2			30.0	92.0	
Approach LOS	D			C	F	
Intersection Summary						
HCM 2000 Control Delay			69.3		HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio			0.96			
Actuated Cycle Length (s)			106.9		Sum of lost time (s)	15.5
Intersection Capacity Utilization			96.7%		ICU Level of Service	F
Analysis Period (min)			15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 87: S 216th St/Marine View Dr S & Des Moines Memorial Dr

SAMP Surface Transportation Analysis
























Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	30	830	410	390	705	20
Future Volume (vph)	30	830	410	390	705	20
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	6.2	6.2	6.2	6.2	6.2	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.97	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	0.99	
Frt	1.00	1.00	1.00	0.85	1.00	
Flt Protected	0.95	1.00	1.00	1.00	0.95	
Satd. Flow (prot)	1646	3292	1699	1444	3139	
Flt Permitted	0.47	1.00	1.00	1.00	0.95	
Satd. Flow (perm)	817	3292	1699	1444	3139	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	30	830	410	390	705	20
RTOR Reduction (vph)	0	0	0	224	3	0
Lane Group Flow (vph)	30	830	410	166	722	0
Confl. Peds. (#/hr)					4	4
Heavy Vehicles (%)	1%	1%	3%	3%	2%	2%
Turn Type	Perm	NA	NA	Perm	Perm	
Protected Phases		6	2			
Permitted Phases	6			2	4	
Actuated Green, G (s)	20.7	20.7	20.7	20.7	15.4	
Effective Green, g (s)	20.7	20.7	20.7	20.7	15.4	
Actuated g/C Ratio	0.43	0.43	0.43	0.43	0.32	
Clearance Time (s)	6.2	6.2	6.2	6.2	6.2	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	0.2	
Lane Grp Cap (vph)	348	1405	725	616	996	
v/s Ratio Prot		c0.25	0.24			
v/s Ratio Perm	0.04			0.12	c0.23	
v/c Ratio	0.09	0.59	0.57	0.27	0.73	
Uniform Delay, d1	8.3	10.7	10.5	9.0	14.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.1	0.7	1.0	0.2	2.2	
Delay (s)	8.4	11.3	11.5	9.2	16.9	
Level of Service	A	B	B	A	B	
Approach Delay (s)		11.2	10.4		16.9	
Approach LOS		B	B		B	
Intersection Summary						
HCM 2000 Control Delay			12.7		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.65			
Actuated Cycle Length (s)			48.5		Sum of lost time (s)	12.4
Intersection Capacity Utilization			59.9%		ICU Level of Service	B
Analysis Period (min)			15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

88: 24th Ave S & S 216th St

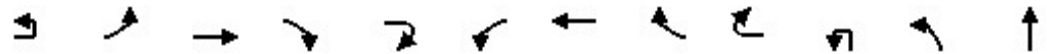
SAMP Surface Transportation Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	320	70	125	295	80	60	90	95	390	470	205
Future Volume (vph)	45	320	70	125	295	80	60	90	95	390	470	205
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	5.5	6.1		5.5	6.1		5.5	5.9		5.5	5.9	5.9
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frbp, ped/bikes	1.00	0.99		1.00	1.00		1.00	0.99		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.97		1.00	0.97		1.00	0.92		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1627	3153		1627	3141		1610	1552		1625	1716	1421
Flt Permitted	0.42	1.00		0.30	1.00		0.43	1.00		0.57	1.00	1.00
Satd. Flow (perm)	713	3153		518	3141		730	1552		978	1716	1421
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
Adj. Flow (vph)	45	320	70	125	295	80	60	90	95	390	470	205
RTOR Reduction (vph)	0	18	0	0	23	0	0	19	0	0	0	77
Lane Group Flow (vph)	45	372	0	125	352	0	60	166	0	390	470	128
Confl. Peds. (#/hr)	7		5	5		7	9		6	6		9
Confl. Bikes (#/hr)									1			2
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	3%	3%	3%	2%	2%	2%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	31.8	24.5		37.0	27.1		74.4	67.6		88.1	75.8	75.8
Effective Green, g (s)	31.8	24.5		37.0	27.1		74.4	67.6		88.1	75.8	75.8
Actuated g/C Ratio	0.23	0.18		0.26	0.19		0.53	0.48		0.63	0.54	0.54
Clearance Time (s)	5.5	6.1		5.5	6.1		5.5	5.9		5.5	5.9	5.9
Vehicle Extension (s)	3.5	4.0		3.5	4.0		3.5	4.0		3.5	4.0	4.0
Lane Grp Cap (vph)	209	551		215	608		430	749		684	929	769
v/s Ratio Prot	0.01	c0.12		c0.04	0.11		0.01	0.11		c0.06	0.27	
v/s Ratio Perm	0.04			c0.11			0.07			c0.30		0.09
v/c Ratio	0.22	0.67		0.58	0.58		0.14	0.22		0.57	0.51	0.17
Uniform Delay, d1	43.1	54.0		41.6	51.3		16.2	21.0		13.4	20.3	16.2
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.6	3.6		4.2	1.6		0.2	0.7		1.2	2.0	0.5
Delay (s)	43.7	57.6		45.8	52.9		16.4	21.6		14.6	22.2	16.6
Level of Service	D	E		D	D		B	C		B	C	B
Approach Delay (s)		56.2			51.1			20.4			18.4	
Approach LOS		E			D			C			B	
Intersection Summary												
HCM 2000 Control Delay			33.2				HCM 2000 Level of Service			C		
HCM 2000 Volume to Capacity ratio			0.61									
Actuated Cycle Length (s)			140.0				Sum of lost time (s)			23.0		
Intersection Capacity Utilization			88.5%				ICU Level of Service			E		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

89: Pacific Hwy #1 & S 216th St

SAMP Surface Transportation Analysis















Movement	EBU	EBL2	EBT	EBR	EBR2	WBL2	WBT	WBR	WBR2	NBU	NBL	NBT
Lane Configurations												
Traffic Volume (vph)	70	100	340	0	340	130	255	0	120	15	110	375
Future Volume (vph)	70	100	340	0	340	130	255	0	120	15	110	375
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Width	12	12	11	14	12	13	11	14	12	12	13	11
Total Lost time (s)		6.0	10.0	10.0		6.0	10.0	10.0			6.0	10.7
Lane Util. Factor		1.00	1.00	1.00		1.00	1.00	1.00			1.00	0.95
Frbp, ped/bikes		1.00	1.00	0.96		1.00	1.00	0.91			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		1.00	1.00	0.85			1.00	1.00
Flt Protected		0.95	1.00	1.00		0.95	1.00	1.00			0.95	1.00
Satd. Flow (prot)		1646	1675	1508		1684	1658	1416			1668	3121
Flt Permitted		0.95	1.00	1.00		0.95	1.00	1.00			0.95	1.00
Satd. Flow (perm)		1646	1675	1508		1684	1658	1416			1668	3121
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
Adj. Flow (vph)	70	100	340	0	340	130	255	0	120	15	110	375
RTOR Reduction (vph)	0	0	0	254	0	0	0	91	0	0	0	0
Lane Group Flow (vph)	0	170	340	86	0	130	255	29	0	0	125	375
Confl. Peds. (#/hr)		33		23		23		33			28	
Confl. Bikes (#/hr)								1	1			
Heavy Vehicles (%)	1%	1%	1%	1%	1%	2%	2%	2%	2%	3%	3%	3%
Turn Type	Prot	Prot	NA	Perm		Prot	NA	Perm		Prot	Prot	NA
Protected Phases	7	7	4			3	8			5	5	2
Permitted Phases				4				8				
Actuated Green, G (s)		16.0	36.7	36.7		14.3	35.0	35.0			12.0	25.6
Effective Green, g (s)		16.0	36.7	36.7		14.3	35.0	35.0			12.0	25.6
Actuated g/C Ratio		0.11	0.25	0.25		0.10	0.24	0.24			0.08	0.18
Clearance Time (s)		6.0	10.0	10.0		6.0	10.0	10.0			6.0	10.7
Vehicle Extension (s)		3.5	4.0	4.0		3.5	4.0	4.0			3.5	4.0
Lane Grp Cap (vph)		181	423	381		166	400	341			138	551
v/s Ratio Prot		c0.10	c0.20			0.08	c0.15				c0.07	0.12
v/s Ratio Perm				0.06				0.02				
v/c Ratio		0.94	0.80	0.23		0.78	0.64	0.08			0.91	0.68
Uniform Delay, d1		64.0	50.8	42.9		63.8	49.3	42.6			65.9	55.9
Progression Factor		1.00	1.00	1.00		1.00	1.00	1.00			0.85	0.74
Incremental Delay, d2		49.4	11.1	0.4		21.6	3.7	0.1			48.5	6.4
Delay (s)		113.4	61.9	43.3		85.4	53.0	42.7			104.8	47.7
Level of Service		F	E	D		F	D	D			F	D
Approach Delay (s)			64.8				58.9					59.6
Approach LOS			E				E					E
Intersection Summary												
HCM 2000 Control Delay			66.8			HCM 2000 Level of Service					E	
HCM 2000 Volume to Capacity ratio			0.88									
Actuated Cycle Length (s)			145.0			Sum of lost time (s)			32.7			
Intersection Capacity Utilization			104.0%			ICU Level of Service			G			
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

89: Pacific Hwy #1 & S 216th St


















SAMP Surface Transportation Analysis

							
Movement	NBR	NBR2	SBU	SBL	SBT	SBR	SBR2
Lane Configurations							
Traffic Volume (vph)	25	110	30	160	995	165	55
Future Volume (vph)	25	110	30	160	995	165	55
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750
Lane Width	12	13	12	12	12	12	14
Total Lost time (s)	10.7			6.0	10.7	10.7	
Lane Util. Factor	1.00			1.00	0.95	1.00	
Frbp, ped/bikes	0.91			1.00	1.00	0.95	
Flpb, ped/bikes	1.00			1.00	1.00	1.00	
Frt	0.85			1.00	1.00	0.85	
Flt Protected	1.00			0.95	1.00	1.00	
Satd. Flow (prot)	1320			1646	3292	1397	
Flt Permitted	1.00			0.95	1.00	1.00	
Satd. Flow (perm)	1320			1646	3292	1397	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	25	110	30	160	995	165	55
RTOR Reduction (vph)	111	0	0	0	0	144	0
Lane Group Flow (vph)	24	0	0	190	995	76	0
Confl. Peds. (#/hr)		28		28			28
Confl. Bikes (#/hr)							
Heavy Vehicles (%)	3%	3%	1%	1%	1%	1%	1%
Turn Type	Perm		Prot	Prot	NA	Perm	
Protected Phases			1	1	6		
Permitted Phases	2					6	
Actuated Green, G (s)	25.6			35.7	49.3	49.3	
Effective Green, g (s)	25.6			35.7	49.3	49.3	
Actuated g/C Ratio	0.18			0.25	0.34	0.34	
Clearance Time (s)	10.7			6.0	10.7	10.7	
Vehicle Extension (s)	4.0			3.5	4.0	4.0	
Lane Grp Cap (vph)	233			405	1119	474	
v/s Ratio Prot				0.12	c0.30		
v/s Ratio Perm	0.02					0.05	
v/c Ratio	0.10			0.47	0.89	0.16	
Uniform Delay, d1	50.1			46.6	45.3	33.4	
Progression Factor	1.00			1.20	1.19	4.00	
Incremental Delay, d2	0.8			1.0	10.1	0.7	
Delay (s)	50.9			56.8	64.1	134.2	
Level of Service	D			E	E	F	
Approach Delay (s)					74.1		
Approach LOS					E		
Intersection Summary							

HCM Signalized Intersection Capacity Analysis

90: Pacific Hwy #1 & S 220th St

SAMP Surface Transportation Analysis

												
Movement	EBL2	EBL	EBT	EBR2	WBL2	WBT	WBR2	NBU	NBL	NBT	NBR	NBR2
Lane Configurations												
Traffic Volume (vph)	30	5	30	35	80	10	50	15	15	575	40	45
Future Volume (vph)	30	5	30	35	80	10	50	15	15	575	40	45
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Width	12	12	14	12	12	14	12	12	13	11	12	14
Total Lost time (s)			5.9			5.9			5.5	6.7	6.7	
Lane Util. Factor			1.00			1.00			1.00	0.95	1.00	
Frbp, ped/bikes			1.00			1.00			1.00	1.00	0.94	
Flpb, ped/bikes			1.00			1.00			1.00	1.00	1.00	
Frt			0.95			0.95			1.00	1.00	0.85	
Flt Protected			0.98			0.97			0.95	1.00	1.00	
Satd. Flow (prot)			1728			1677			1652	3091	1343	
Flt Permitted			0.83			0.52			0.95	1.00	1.00	
Satd. Flow (perm)			1455			899			1652	3091	1343	
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
Adj. Flow (vph)	30	5	30	35	80	10	50	15	15	575	40	45
RTOR Reduction (vph)	0	0	88	0	0	129	0	0	0	0	35	0
Lane Group Flow (vph)	0	0	12	0	0	11	0	0	30	575	50	0
Confl. Peds. (#/hr)		2							4		11	
Heavy Vehicles (%)	1%	1%	1%	1%	3%	3%	3%	4%	4%	4%	4%	4%
Turn Type	Perm	Perm	NA		Perm	NA		Prot	Prot	NA	Perm	
Protected Phases			4			3		5	5	2		
Permitted Phases	4	4			3							2
Actuated Green, G (s)			16.9			11.3			5.1	85.3	85.3	
Effective Green, g (s)			16.9			11.3			5.1	85.3	85.3	
Actuated g/C Ratio			0.12			0.08			0.04	0.59	0.59	
Clearance Time (s)			5.9			5.9			5.5	6.7	6.7	
Vehicle Extension (s)			3.0			3.0			2.5	4.0	4.0	
Lane Grp Cap (vph)			169			70			58	1818	790	
v/s Ratio Prot									c0.02	0.19		
v/s Ratio Perm			c0.01			c0.01					0.04	
v/c Ratio			0.07			0.16			0.52	0.32	0.06	
Uniform Delay, d1			57.0			62.4			68.7	15.1	12.8	
Progression Factor			1.00			1.00			1.41	1.73	6.74	
Incremental Delay, d2			0.2			1.0			5.6	0.4	0.2	
Delay (s)			57.2			63.4			102.4	26.6	86.2	
Level of Service			E			E			F	C	F	
Approach Delay (s)			57.2			63.4				37.2		
Approach LOS			E			E				D		
Intersection Summary												
HCM 2000 Control Delay			30.5			HCM 2000 Level of Service			C			
HCM 2000 Volume to Capacity ratio			0.57									
Actuated Cycle Length (s)			145.0			Sum of lost time (s)			24.0			
Intersection Capacity Utilization			76.1%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

90: Pacific Hwy #1 & S 220th St

SAMP Surface Transportation Analysis






















Movement	SBU	SBL	SBT	SBR	SBR2
Lane Configurations		↔	↑↑	↔	
Traffic Volume (vph)	30	35	1385	225	10
Future Volume (vph)	30	35	1385	225	10
Ideal Flow (vphpl)	1750	1750	1750	1750	1750
Lane Width	12	12	11	12	14
Total Lost time (s)		5.5	6.7	6.7	
Lane Util. Factor		1.00	0.95	1.00	
Frbp, ped/bikes		1.00	1.00	0.97	
Flpb, ped/bikes		1.00	1.00	1.00	
Frt		1.00	1.00	0.85	
Flt Protected		0.95	1.00	1.00	
Satd. Flow (prot)		1630	3151	1409	
Flt Permitted		0.95	1.00	1.00	
Satd. Flow (perm)		1630	3151	1409	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	30	35	1385	225	10
RTOR Reduction (vph)	0	0	0	46	0
Lane Group Flow (vph)	0	65	1385	189	0
Confl. Peds. (#/hr)		11		4	
Heavy Vehicles (%)	2%	2%	2%	2%	2%
Turn Type	Prot	Prot	NA	Perm	
Protected Phases	1	1	6		
Permitted Phases				6	
Actuated Green, G (s)		7.5	87.7	87.7	
Effective Green, g (s)		7.5	87.7	87.7	
Actuated g/C Ratio		0.05	0.60	0.60	
Clearance Time (s)		5.5	6.7	6.7	
Vehicle Extension (s)		2.5	4.0	4.0	
Lane Grp Cap (vph)		84	1905	852	
v/s Ratio Prot		0.04	c0.44		
v/s Ratio Perm				0.13	
v/c Ratio		0.77	0.73	0.22	
Uniform Delay, d1		67.9	20.2	13.1	
Progression Factor		0.94	0.98	0.97	
Incremental Delay, d2		28.6	2.0	0.5	
Delay (s)		92.3	21.9	13.2	
Level of Service		F	C	B	
Approach Delay (s)			23.4		
Approach LOS			C		
Intersection Summary					

HCM Signalized Intersection Capacity Analysis

91: Pacific Hwy #1 & S 224th St

SAMP Surface Transportation Analysis

													
Movement	EBL2	EBT	EBR2	WBL2	WBT	WBR2	NBU	NBL	NBT	NBR	NBR2	SBU	
Lane Configurations													
Traffic Volume (vph)	35	25	70	55	20	50	45	60	530	35	50	10	
Future Volume (vph)	35	25	70	55	20	50	45	60	530	35	50	10	
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	
Lane Width	11	11	12	11	11	12	12	12	11	12	14	12	
Total Lost time (s)	6.8	6.8		6.8	6.8			5.5	6.7	6.7			
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	0.95			
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00	1.00			
Frt	1.00	0.89		1.00	0.89			1.00	1.00	0.85			
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00	1.00			
Satd. Flow (prot)	1576	1475		1591	1495			1614	3121	1368			
Flt Permitted	0.95	1.00		0.95	1.00			0.95	1.00	1.00			
Satd. Flow (perm)	1576	1475		1591	1495			1614	3121	1368			
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	
Adj. Flow (vph)	35	25	70	55	20	50	45	60	530	35	50	10	
RTOR Reduction (vph)	0	87	0	0	64	0	0	0	0	47	0	0	
Lane Group Flow (vph)	35	8	0	55	6	0	0	105	530	38	0	0	
Confl. Peds. (#/hr)								3		12			
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	3%	3%	3%	3%	3%	1%	
Turn Type	Prot	NA		Prot	NA		Prot	Prot	NA	Perm		Prot	
Protected Phases	7	4		3	8		5	5	2			1	
Permitted Phases											2		
Actuated Green, G (s)	7.4	11.8		8.0	12.4			12.0	64.9	64.9			
Effective Green, g (s)	7.4	11.8		8.0	12.4			12.0	64.9	64.9			
Actuated g/C Ratio	0.05	0.08		0.06	0.09			0.08	0.45	0.45			
Clearance Time (s)	6.8	6.8		6.8	6.8			5.5	6.7	6.7			
Vehicle Extension (s)	3.5	3.5		3.5	3.5			3.5	4.0	4.0			
Lane Grp Cap (vph)	80	120		87	127			133	1396	612			
v/s Ratio Prot	0.02	c0.01		c0.03	0.00			c0.07	0.17				
v/s Ratio Perm										0.03			
v/c Ratio	0.44	0.06		0.63	0.05			0.79	0.38	0.06			
Uniform Delay, d1	66.8	61.5		67.1	60.9			65.3	26.7	22.8			
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00			
Incremental Delay, d2	4.5	0.3		14.6	0.2			26.6	0.8	0.2			
Delay (s)	71.3	61.8		81.7	61.1			91.9	27.4	23.0			
Level of Service	E	E		F	E			F	C	C			
Approach Delay (s)		64.3			70.1				36.3				
Approach LOS		E			E				D				
Intersection Summary													
HCM 2000 Control Delay			35.6									HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio			0.69										
Actuated Cycle Length (s)			145.0									Sum of lost time (s)	25.8
Intersection Capacity Utilization			80.7%									ICU Level of Service	D
Analysis Period (min)			15										
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis

91: Pacific Hwy #1 & S 224th St




















SAMP Surface Transportation Analysis



Movement	SBL	SBT	SBR	SBR2
Lane Configurations				
Traffic Volume (vph)	55	1470	240	50
Future Volume (vph)	55	1470	240	50
Ideal Flow (vphpl)	1750	1750	1750	1750
Lane Width	12	11	12	14
Total Lost time (s)	5.5	6.7	6.7	
Lane Util. Factor	1.00	0.95	1.00	
Frbp, ped/bikes	1.00	1.00	0.97	
Flpb, ped/bikes	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	
Flt Protected	0.95	1.00	1.00	
Satd. Flow (prot)	1646	3182	1431	
Flt Permitted	0.95	1.00	1.00	
Satd. Flow (perm)	1646	3182	1431	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00
Adj. Flow (vph)	55	1470	240	50
RTOR Reduction (vph)	0	0	48	0
Lane Group Flow (vph)	65	1470	242	0
Confl. Peds. (#/hr)	12		3	
Heavy Vehicles (%)	1%	1%	1%	1%
Turn Type	Prot	NA	Perm	
Protected Phases	1	6		
Permitted Phases			6	
Actuated Green, G (s)	34.5	87.4	87.4	
Effective Green, g (s)	34.5	87.4	87.4	
Actuated g/C Ratio	0.24	0.60	0.60	
Clearance Time (s)	5.5	6.7	6.7	
Vehicle Extension (s)	3.5	4.0	4.0	
Lane Grp Cap (vph)	391	1917	862	
v/s Ratio Prot	0.04	c0.46		
v/s Ratio Perm			0.17	
v/c Ratio	0.17	0.77	0.28	
Uniform Delay, d1	43.8	21.3	13.8	
Progression Factor	1.30	1.31	1.94	
Incremental Delay, d2	0.2	2.5	0.7	
Delay (s)	57.4	30.4	27.4	
Level of Service	E	C	C	
Approach Delay (s)		30.9		
Approach LOS		C		
Intersection Summary				

HCM Signalized Intersection Capacity Analysis
 92: 25th Ave S/24th Ave S & S Kent Des Moines Rd

SAMP Surface Transportation Analysis

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	45	375	5	55	425	90	20	20	35	230	75	265	
Future Volume (vph)	45	375	5	55	425	90	20	20	35	230	75	265	
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	
Total Lost time (s)	5.9	5.9		5.9	5.9			5.9		5.9	5.9		
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00		
Frbp, ped/bikes	1.00	1.00		1.00	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		
Frt	1.00	1.00		1.00	0.97			0.94		1.00	0.88		
Flt Protected	0.95	1.00		0.95	1.00			0.99		0.95	1.00		
Satd. Flow (prot)	1643	1729		1630	1664			1585		1646	1499		
Flt Permitted	0.36	1.00		0.49	1.00			0.86		0.71	1.00		
Satd. Flow (perm)	623	1729		845	1664			1388		1227	1499		
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	
Adj. Flow (vph)	45	375	5	55	425	90	20	20	35	230	75	265	
RTOR Reduction (vph)	0	1	0	0	9	0	0	24	0	0	119	0	
Lane Group Flow (vph)	45	379	0	55	506	0	0	51	0	230	221	0	
Confl. Peds. (#/hr)	4					4	7					7	
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	2%	2%	2%	1%	1%	1%	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA		
Protected Phases		2			6			8			4		
Permitted Phases	2			6			8			4			
Actuated Green, G (s)	24.9	24.9		24.9	24.9			17.8		17.8	17.8		
Effective Green, g (s)	24.9	24.9		24.9	24.9			17.8		17.8	17.8		
Actuated g/C Ratio	0.46	0.46		0.46	0.46			0.33		0.33	0.33		
Clearance Time (s)	5.9	5.9		5.9	5.9			5.9		5.9	5.9		
Vehicle Extension (s)	3.5	3.5		3.5	3.5			3.0		3.5	3.5		
Lane Grp Cap (vph)	284	789		386	760			453		400	489		
v/s Ratio Prot		0.22			c0.30						0.15		
v/s Ratio Perm	0.07			0.07				0.04		c0.19			
v/c Ratio	0.16	0.48		0.14	0.67			0.11		0.57	0.45		
Uniform Delay, d1	8.7	10.3		8.6	11.6			12.8		15.2	14.5		
Progression Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00		
Incremental Delay, d2	0.3	0.5		0.2	2.3			0.1		2.2	0.8		
Delay (s)	9.0	10.9		8.8	13.9			12.9		17.4	15.3		
Level of Service	A	B		A	B			B		B	B		
Approach Delay (s)		10.7			13.4			12.9			16.1		
Approach LOS		B			B			B			B		
Intersection Summary													
HCM 2000 Control Delay			13.6									HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.63										
Actuated Cycle Length (s)			54.5									Sum of lost time (s)	11.8
Intersection Capacity Utilization			77.2%									ICU Level of Service	D
Analysis Period (min)			15										

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

93: Pacific Hwy #1 & S Kent Des Moines Rd

SAMP Surface Transportation Analysis



Movement	EBU	EBL2	EBT	EBR	EBR2	WBU	WBL2	WBT	WBR	WBR2	NBU	NBL
Lane Configurations		↔	↕	↔			↔	↕	↔			↔
Traffic Volume (vph)	5	45	545	0	155	5	795	460	0	135	55	100
Future Volume (vph)	5	45	545	0	155	5	795	460	0	135	55	100
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Width	12	12	11	14	12	12	12	12	13	12	12	12
Total Lost time (s)		6.0	6.0	6.0			6.0	6.0	6.0			6.5
Lane Util. Factor		1.00	0.95	1.00			0.97	0.95	1.00			0.97
Frbp, ped/bikes		1.00	1.00	0.97			1.00	1.00	0.98			1.00
Flpb, ped/bikes		1.00	1.00	1.00			1.00	1.00	1.00			1.00
Frt		1.00	1.00	0.85			1.00	1.00	0.85			1.00
Flt Protected		0.95	1.00	1.00			0.95	1.00	1.00			0.95
Satd. Flow (prot)		1646	3182	1531			3162	3260	1470			3162
Flt Permitted		0.95	1.00	1.00			0.95	1.00	1.00			0.95
Satd. Flow (perm)		1646	3182	1531			3162	3260	1470			3162
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
Adj. Flow (vph)	5	45	545	0	155	5	795	460	0	135	55	100
RTOR Reduction (vph)	0	0	0	118	0	0	0	0	76	0	0	0
Lane Group Flow (vph)	0	50	545	37	0	0	800	460	59	0	0	155
Confl. Peds. (#/hr)				13					10			
Heavy Vehicles (%)	1%	1%	1%	1%	1%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	Prot	NA	Perm		Prot	Prot	NA	Perm		Prot	Prot
Protected Phases	7	7	4			3	3	8			5	5
Permitted Phases				4					8			
Actuated Green, G (s)		9.4	44.3	44.3			45.2	80.1	80.1			12.4
Effective Green, g (s)		9.4	44.3	44.3			45.2	80.1	80.1			12.4
Actuated g/C Ratio		0.05	0.24	0.24			0.24	0.43	0.43			0.07
Clearance Time (s)		6.0	6.0	6.0			6.0	6.0	6.0			6.5
Vehicle Extension (s)		3.0	3.5	3.5			3.5	3.5	3.5			3.0
Lane Grp Cap (vph)		83	764	367			774	1415	638			212
v/s Ratio Prot		0.03	c0.17				c0.25	0.14				0.05
v/s Ratio Perm				0.02					0.04			
v/c Ratio		0.60	0.71	0.10			1.03	0.33	0.09			0.73
Uniform Delay, d1		85.7	64.3	54.6			69.7	34.4	30.8			84.4
Progression Factor		1.00	1.00	1.00			1.00	1.00	1.00			1.00
Incremental Delay, d2		11.7	3.3	0.1			41.3	0.2	0.1			12.2
Delay (s)		97.4	67.6	54.7			111.0	34.6	30.8			96.6
Level of Service		F	E	D			F	C	C			F
Approach Delay (s)			66.9					78.0				
Approach LOS			E					E				
Intersection Summary												
HCM 2000 Control Delay			98.2				HCM 2000 Level of Service		F			
HCM 2000 Volume to Capacity ratio			1.03									
Actuated Cycle Length (s)			184.5				Sum of lost time (s)		25.3			
Intersection Capacity Utilization			127.7%				ICU Level of Service		H			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

93: Pacific Hwy #1 & S Kent Des Moines Rd













SAMP Surface Transportation Analysis

	↑	↖	↗	↙	↘	↓	↖	↗
Movement	NBT	NBR	NBR2	SBU	SBL	SBT	SBR	SBR2
Lane Configurations	↑↑	↖	↗		↙	↑↑	↖	↗
Traffic Volume (vph)	310	20	810	20	550	1170	190	45
Future Volume (vph)	310	20	810	20	550	1170	190	45
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750
Lane Width	11	12	13	12	11	11	12	14
Total Lost time (s)	6.8	6.8	6.8		6.5	6.8	6.8	
Lane Util. Factor	0.95	0.88	0.91		0.97	0.95	1.00	
Frpb, ped/bikes	1.00	0.96	0.96		1.00	1.00	0.97	
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00	1.00	
Frt	1.00	0.85	0.85		1.00	1.00	0.85	
Flt Protected	1.00	1.00	1.00		0.95	1.00	1.00	
Satd. Flow (prot)	3151	1232	1317		3087	3182	1427	
Flt Permitted	1.00	1.00	1.00		0.95	1.00	1.00	
Satd. Flow (perm)	3151	1232	1317		3087	3182	1427	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	310	20	810	20	550	1170	190	45
RTOR Reduction (vph)	0	312	324	0	0	0	92	0
Lane Group Flow (vph)	310	105	89	0	570	1170	143	0
Confl. Peds. (#/hr)			21					15
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	1%	1%
Turn Type	NA	Perm	Perm	Prot	Prot	NA	Perm	
Protected Phases	2			1	1	6		
Permitted Phases		2	2				6	
Actuated Green, G (s)	39.6	39.6	39.6		30.1	57.3	57.3	
Effective Green, g (s)	39.6	39.6	39.6		30.1	57.3	57.3	
Actuated g/C Ratio	0.21	0.21	0.21		0.16	0.31	0.31	
Clearance Time (s)	6.8	6.8	6.8		6.5	6.8	6.8	
Vehicle Extension (s)	4.0	4.0	4.0		3.5	4.0	4.0	
Lane Grp Cap (vph)	676	264	282		503	988	443	
v/s Ratio Prot	0.10				c0.18	c0.37		
v/s Ratio Perm		0.09	0.07				0.10	
v/c Ratio	0.46	0.40	0.31		1.13	1.18	0.32	
Uniform Delay, d1	63.1	62.2	61.0		77.2	63.6	48.7	
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00	
Incremental Delay, d2	0.7	1.3	0.9		82.2	93.3	0.6	
Delay (s)	63.8	63.6	61.9		159.4	156.9	49.3	
Level of Service	E	E	E		F	F	D	
Approach Delay (s)	67.0					144.8		
Approach LOS	E					F		
Intersection Summary								

HCM Signalized Intersection Capacity Analysis













94: SB I-5 Ramps & S Kent Des Moines Rd

SAMP Surface Transportation Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗	↘↗	↑↑					↘	↖↑	↗↗
Traffic Volume (vph)	0	1305	585	370	820	0	0	0	0	1085	275	590
Future Volume (vph)	0	1305	585	370	820	0	0	0	0	1085	275	590
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		5.9	5.9	5.5	5.9					5.9	5.9	5.9
Lane Util. Factor		0.95	1.00	0.97	0.95					0.91	0.91	0.88
Frbp, ped/bikes		1.00	0.98	1.00	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
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.97	1.00
Satd. Flow (prot)		3260	1432	3131	3228					1455	2964	2411
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.97	1.00
Satd. Flow (perm)		3260	1432	3131	3228					1455	2964	2411
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
Adj. Flow (vph)	0	1305	585	370	820	0	0	0	0	1085	275	590
RTOR Reduction (vph)	0	0	160	0	0	0	0	0	0	0	0	182
Lane Group Flow (vph)	0	1305	425	370	820	0	0	0	0	542	818	408
Confl. Peds. (#/hr)	11		3			11	10					10
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	0%	0%	0%	4%	4%	4%
Turn Type		NA	Perm	Prot	NA					Split	NA	Perm
Protected Phases		2		1	6					4	4	
Permitted Phases			2									4
Actuated Green, G (s)		61.9	61.9	18.7	86.1					52.1	52.1	52.1
Effective Green, g (s)		61.9	61.9	18.7	86.1					52.1	52.1	52.1
Actuated g/C Ratio		0.41	0.41	0.12	0.57					0.35	0.35	0.35
Clearance Time (s)		5.9	5.9	5.5	5.9					5.9	5.9	5.9
Vehicle Extension (s)		4.0	4.0	3.5	4.0					4.0	4.0	4.0
Lane Grp Cap (vph)		1345	590	390	1852					505	1029	837
v/s Ratio Prot		c0.40		c0.12	0.25					c0.37	0.28	
v/s Ratio Perm			0.30									0.17
v/c Ratio		0.97	0.72	0.95	0.44					1.07	1.03dl	0.49
Uniform Delay, d1		43.1	36.8	65.2	18.2					49.0	44.1	38.5
Progression Factor		1.00	1.00	0.86	1.18					0.71	0.71	0.51
Incremental Delay, d2		18.4	7.4	29.1	0.6					58.8	4.0	0.5
Delay (s)		61.5	44.3	85.4	22.1					93.5	35.4	20.1
Level of Service		E	D	F	C					F	D	C
Approach Delay (s)		56.2			41.8			0.0			46.9	
Approach LOS		E			D			A			D	
Intersection Summary												
HCM 2000 Control Delay			49.2			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			1.01									
Actuated Cycle Length (s)			150.0			Sum of lost time (s)				17.3		
Intersection Capacity Utilization			98.2%			ICU Level of Service				F		
Analysis Period (min)			15									
dl Defacto Left Lane. Recode with 1 though lane as a left lane.												
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
 95: NB I-5 Off Ramp/Bus Layover & S Kent Des Moines Rd

SAMP Surface Transportation Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↗		↑↑	↗		↖↑	↗			
Traffic Volume (vph)	10	1940	440	0	1040	550	150	330	95	0	0	0
Future Volume (vph)	10	1940	440	0	1040	550	150	330	95	0	0	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		6.2	6.2		6.2	6.2		5.9	5.5			
Lane Util. Factor		0.91	1.00		0.95	1.00		0.95	1.00			
Frbp, ped/bikes		1.00	0.97		1.00	0.99		1.00	1.00			
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00	1.00			
Frt		1.00	0.85		1.00	0.85		1.00	0.85			
Flt Protected		1.00	1.00		1.00	1.00		0.98	1.00			
Satd. Flow (prot)		4683	1415		3228	1426		3089	1403			
Flt Permitted		0.93	1.00		1.00	1.00		0.98	1.00			
Satd. Flow (perm)		4363	1415		3228	1426		3089	1403			
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
Adj. Flow (vph)	10	1940	440	0	1040	550	150	330	95	0	0	0
RTOR Reduction (vph)	0	0	125	0	0	191	0	0	74	0	0	0
Lane Group Flow (vph)	0	1950	315	0	1040	359	0	480	21	0	0	0
Confl. Peds. (#/hr)	1		3	3		1						7
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	6%	6%	6%	0%	0%	0%
Turn Type	Perm	NA	Perm		NA	Perm	Split	NA	custom			
Protected Phases		2			6		3	3	1			
Permitted Phases	2		2			6			3			
Actuated Green, G (s)		80.3	80.3		95.8	95.8		23.1	33.1			
Effective Green, g (s)		80.3	80.3		95.8	95.8		23.1	33.1			
Actuated g/C Ratio		0.54	0.54		0.64	0.64		0.15	0.22			
Clearance Time (s)		6.2	6.2		6.2	6.2		5.9	5.5			
Vehicle Extension (s)		4.0	4.0		4.0	4.0		4.0	4.5			
Lane Grp Cap (vph)		2335	757		2061	910		475	309			
v/s Ratio Prot					c0.32			c0.16	0.00			
v/s Ratio Perm		c0.45	0.22			0.25			0.01			
v/c Ratio		0.84	0.42		0.50	0.39		1.01	0.07			
Uniform Delay, d1		29.3	20.8		14.4	13.1		63.5	46.2			
Progression Factor		0.62	0.55		1.00	1.00		1.00	1.00			
Incremental Delay, d2		1.2	0.5		0.9	1.3		43.9	0.2			
Delay (s)		19.3	12.0		15.3	14.4		107.4	46.4			
Level of Service		B	B		B	B		F	D			
Approach Delay (s)		17.9			15.0			97.3			0.0	
Approach LOS		B			B			F			A	
Intersection Summary												
HCM 2000 Control Delay			26.9		HCM 2000 Level of Service				C			
HCM 2000 Volume to Capacity ratio			0.76									
Actuated Cycle Length (s)			150.0		Sum of lost time (s)				22.6			
Intersection Capacity Utilization			107.9%		ICU Level of Service				G			
Analysis Period (min)			15									

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
 96: 16th Ave S & S 144th St

SAMP Surface Transportation Analysis













Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	→			←	←	↘
Traffic Volume (veh/h)	200	415	5	185	295	5
Future Volume (Veh/h)	200	415	5	185	295	5
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	200	415	5	185	295	5
Pedestrians	2				1	
Lane Width (ft)	12.0				12.0	
Walking Speed (ft/s)	4.0				4.0	
Percent Blockage	0				0	
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	790					
pX, platoon unblocked			0.93		0.93	0.93
vC, conflicting volume			616		606	408
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			546		535	323
tC, single (s)			4.1		6.5	6.3
tC, 2 stage (s)						
tF (s)			2.2		3.6	3.4
p0 queue free %			99		36	99
cM capacity (veh/h)			934		459	657
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	615	190	300			
Volume Left	0	5	295			
Volume Right	415	0	5			
cSH	1700	934	461			
Volume to Capacity	0.36	0.01	0.65			
Queue Length 95th (ft)	0	0	114			
Control Delay (s)	0.0	0.3	26.2			
Lane LOS		A	D			
Approach Delay (s)	0.0	0.3	26.2			
Approach LOS			D			
Intersection Summary						
Average Delay			7.2			
Intersection Capacity Utilization			63.9%	ICU Level of Service	B	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

















97: 24th Ave S & S 148th St

SAMP Surface Transportation Analysis

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	15	20	490	30	30	630
Future Volume (Veh/h)	15	20	490	30	30	630
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	15	20	490	30	30	630
Pedestrians	3		1		3	
Lane Width (ft)	12.0		12.0		12.0	
Walking Speed (ft/s)	4.0		4.0		4.0	
Percent Blockage	0		0		0	
Right turn flare (veh)						
Median type			None		None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1199	511			523	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1199	511			523	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	93	96			97	
cM capacity (veh/h)	200	564			1036	
Direction, Lane #	WB 1	NB 1	SB 1	SB 2		
Volume Total	35	520	30	630		
Volume Left	15	0	30	0		
Volume Right	20	30	0	0		
cSH	317	1700	1036	1700		
Volume to Capacity	0.11	0.31	0.03	0.37		
Queue Length 95th (ft)	9	0	2	0		
Control Delay (s)	17.8	0.0	8.6	0.0		
Lane LOS	C		A			
Approach Delay (s)	17.8	0.0	0.4			
Approach LOS	C					
Intersection Summary						
Average Delay			0.7			
Intersection Capacity Utilization			47.0%		ICU Level of Service	A
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis
 98: Des Moines Memorial Dr & S 168th St /S 168th St























SAMP Surface Transportation Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	0	10	55	0	75	5	255	10	25	650	15
Future Volume (Veh/h)	25	0	10	55	0	75	5	255	10	25	650	15
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	25	0	10	55	0	75	5	255	10	25	650	15
Pedestrians					7							
Lane Width (ft)					12.0							
Walking Speed (ft/s)					4.0							
Percent Blockage					1							
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1052	990	658	994	992	267	665			272		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1052	990	658	994	992	267	665			272		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	86	100	98	74	100	90	99			98		
cM capacity (veh/h)	179	237	461	214	240	772	924			1272		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	35	130	270	690								
Volume Left	25	55	5	25								
Volume Right	10	75	10	15								
cSH	216	368	924	1272								
Volume to Capacity	0.16	0.35	0.01	0.02								
Queue Length 95th (ft)	14	39	0	2								
Control Delay (s)	24.8	20.1	0.2	0.5								
Lane LOS	C	C	A	A								
Approach Delay (s)	24.8	20.1	0.2	0.5								
Approach LOS	C	C										
Intersection Summary												
Average Delay			3.5									
Intersection Capacity Utilization			67.6%		ICU Level of Service					C		
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

99: Marine View Dr S & 7th Ave S/S 216th St

SAMP Surface Transportation Analysis

















													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	105	80	5	80	140	130	0	565	75	160	745	630	
Future Volume (vph)	105	80	5	80	140	130	0	565	75	160	745	630	
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0		6.0	6.0	6.0	6.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frbp, ped/bikes	1.00	1.00		1.00	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	1.00	1.00	1.00	
Frt	1.00	0.99		1.00	1.00	0.85		1.00	0.85	1.00	1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00	1.00		1.00	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1662	1731		1630	1716	1458		1699	1444	1630	1716	1414	
Flt Permitted	0.95	1.00		0.95	1.00	1.00		1.00	1.00	0.21	1.00	1.00	
Satd. Flow (perm)	1662	1731		1630	1716	1458		1699	1444	364	1716	1414	
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	
Adj. Flow (vph)	105	80	5	80	140	130	0	565	75	160	745	630	
RTOR Reduction (vph)	0	1	0	0	0	111	0	0	42	0	0	167	
Lane Group Flow (vph)	105	84	0	80	140	19	0	565	33	160	745	463	
Confl. Peds. (#/hr)			7									5	
Heavy Vehicles (%)	0%	0%	0%	2%	2%	2%	3%	3%	3%	2%	2%	2%	
Turn Type	Prot	NA		Prot	NA	Perm		NA	Perm	pm+pt	NA	Perm	
Protected Phases	7	4		3	8			2		1	6		
Permitted Phases						8			2	6		6	
Actuated Green, G (s)	15.7	20.5		13.8	18.6	18.6		55.1	55.1	73.7	73.7	73.7	
Effective Green, g (s)	15.7	20.5		13.8	18.6	18.6		55.1	55.1	73.7	73.7	73.7	
Actuated g/C Ratio	0.12	0.16		0.11	0.15	0.15		0.44	0.44	0.58	0.58	0.58	
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0		6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	4.0	4.0		4.0	4.0	4.0		5.0	5.0	3.5	5.0	5.0	
Lane Grp Cap (vph)	207	281		178	253	215		742	631	339	1003	827	
v/s Ratio Prot	c0.06	0.05		0.05	c0.08			0.33		0.05	c0.43		
v/s Ratio Perm						0.01			0.02	0.23		0.33	
v/c Ratio	0.51	0.30		0.45	0.55	0.09		0.76	0.05	0.47	0.74	0.56	
Uniform Delay, d1	51.5	46.4		52.5	49.8	46.4		29.9	20.4	17.3	19.2	16.1	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	2.7	0.8		2.5	3.2	0.2		5.5	0.1	1.2	3.6	1.4	
Delay (s)	54.2	47.2		55.0	53.1	46.6		35.4	20.5	18.5	22.8	17.5	
Level of Service	D	D		D	D	D		D	C	B	C	B	
Approach Delay (s)		51.1			51.1			33.6			20.2		
Approach LOS		D			D			C			C		
Intersection Summary													
HCM 2000 Control Delay			29.5		HCM 2000 Level of Service					C			
HCM 2000 Volume to Capacity ratio			0.72										
Actuated Cycle Length (s)			126.0		Sum of lost time (s)					24.0			
Intersection Capacity Utilization			76.7%		ICU Level of Service					D			
Analysis Period (min)			15										

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis










100: 8th Ave S & S 152nd St

SAMP Surface Transportation Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	5	95	50	30	120	20	170	40	10	35	335	55
Future Volume (vph)	5	95	50	30	120	20	170	40	10	35	335	55
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	5	95	50	30	120	20	170	40	10	35	335	55
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	150	170	220	425								
Volume Left (vph)	5	30	170	35								
Volume Right (vph)	50	20	10	55								
Hadj (s)	-0.14	0.00	0.18	-0.01								
Departure Headway (s)	5.9	6.0	5.7	5.2								
Degree Utilization, x	0.25	0.28	0.35	0.62								
Capacity (veh/h)	526	533	574	657								
Control Delay (s)	10.8	11.3	11.8	16.4								
Approach Delay (s)	10.8	11.3	11.8	16.4								
Approach LOS	B	B	B	C								
Intersection Summary												
Delay			13.6									
Level of Service			B									
Intersection Capacity Utilization			71.7%	ICU Level of Service	C							
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
 101: Des Moines Way S & 8th Ave S

SAMP Surface Transportation Analysis

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	540	10	210	415	0	415
Future Volume (Veh/h)	540	10	210	415	0	415
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	540	10	210	415	0	415
Pedestrians	1		1			1
Lane Width (ft)	12.0		12.0			12.0
Walking Speed (ft/s)	4.0		4.0			4.0
Percent Blockage	0		0			0
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)			971			
pX, platoon unblocked	0.98	0.98			0.98	
vC, conflicting volume	834	420			211	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	820	397			184	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	98			100	
cM capacity (veh/h)	337	638			1361	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	550	625	415			
Volume Left	540	0	0			
Volume Right	10	415	0			
cSH	340	1700	1700			
Volume to Capacity	1.62	0.37	0.24			
Queue Length 95th (ft)	815	0	0			
Control Delay (s)	319.7	0.0	0.0			
Lane LOS	F					
Approach Delay (s)	319.7	0.0	0.0			
Approach LOS	F					
Intersection Summary						
Average Delay			110.6			
Intersection Capacity Utilization			79.5%	ICU Level of Service		D
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
 102: Des Moines Way S & S 152nd St

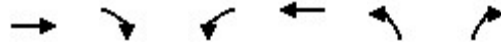
SAMP Surface Transportation Analysis



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	135	5	0	415	545	170
Future Volume (Veh/h)	135	5	0	415	545	170
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	135	5	0	415	545	170
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1045	630	715			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1045	630	715			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	46	99	100			
cM capacity (veh/h)	252	480	890			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	140	415	715			
Volume Left	135	0	0			
Volume Right	5	0	170			
cSH	257	890	1700			
Volume to Capacity	0.55	0.00	0.42			
Queue Length 95th (ft)	75	0	0			
Control Delay (s)	34.7	0.0	0.0			
Lane LOS	D					
Approach Delay (s)	34.7	0.0	0.0			
Approach LOS	D					
Intersection Summary						
Average Delay			3.8			
Intersection Capacity Utilization			57.5%	ICU Level of Service	B	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
 103: 30th Ave S & S 152nd St

SAMP Surface Transportation Analysis



















Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	115	65	25	100	65	10
Future Volume (Veh/h)	115	65	25	100	65	10
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	115	65	25	100	65	10
Pedestrians	5			5	5	
Lane Width (ft)	12.0			12.0	12.0	
Walking Speed (ft/s)	4.0			4.0	4.0	
Percent Blockage	0			0	0	
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	1236					
pX, platoon unblocked						
vC, conflicting volume			185		308	158
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			185		308	158
tC, single (s)			4.2		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.3		3.5	3.3
p0 queue free %			98		90	99
cM capacity (veh/h)			1354		662	875
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	180	125	75			
Volume Left	0	25	65			
Volume Right	65	0	10			
cSH	1700	1354	685			
Volume to Capacity	0.11	0.02	0.11			
Queue Length 95th (ft)	0	1	9			
Control Delay (s)	0.0	1.7	10.9			
Lane LOS		A	B			
Approach Delay (s)	0.0	1.7	10.9			
Approach LOS			B			
Intersection Summary						
Average Delay			2.7			
Intersection Capacity Utilization			34.6%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

104: 32nd Ln S & S 152nd St

















SAMP Surface Transportation Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	110	20	75	105	5	25	5	75	5	5	5
Future Volume (Veh/h)	5	110	20	75	105	5	25	5	75	5	5	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	5	110	20	75	105	5	25	5	75	5	5	5
Pedestrians		2			5			3			4	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)					726							
pX, platoon unblocked												
vC, conflicting volume	114			133			400	397	128	474	404	114
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	114			133			400	397	128	474	404	114
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			95			95	99	92	99	99	99
cM capacity (veh/h)	1470			1448			522	505	911	435	506	940
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	135	185	105	15								
Volume Left	5	75	25	5								
Volume Right	20	5	75	5								
cSH	1470	1448	749	562								
Volume to Capacity	0.00	0.05	0.14	0.03								
Queue Length 95th (ft)	0	4	12	2								
Control Delay (s)	0.3	3.3	10.6	11.6								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.3	3.3	10.6	11.6								
Approach LOS			B	B								
Intersection Summary												
Average Delay			4.4									
Intersection Capacity Utilization			38.8%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

105: 34th Ave S & S 160th St

SAMP Surface Transportation Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	450	200	55	340	5	200	50	80	10	10	10
Future Volume (Veh/h)	25	450	200	55	340	5	200	50	80	10	10	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	25	450	200	55	340	5	200	50	80	10	10	10
Pedestrians					5			6			5	
Lane Width (ft)					12.0			12.0			12.0	
Walking Speed (ft/s)					4.0			4.0			4.0	
Percent Blockage					0			1			0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		703										
pX, platoon unblocked												
vC, conflicting volume	350			656			901	1066	336	842	1164	178
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	350			656			901	1066	336	842	1164	178
tC, single (s)	4.2			4.2			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			94			4	76	88	94	94	99
cM capacity (veh/h)	1193			916			208	204	660	172	179	838
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	250	425	225	175	330	30						
Volume Left	25	0	55	0	200	10						
Volume Right	0	200	0	5	80	10						
cSH	1193	1700	916	1700	248	238						
Volume to Capacity	0.02	0.25	0.06	0.10	1.33	0.13						
Queue Length 95th (ft)	2	0	5	0	434	11						
Control Delay (s)	1.0	0.0	2.7	0.0	212.8	22.3						
Lane LOS	A		A		F	C						
Approach Delay (s)	0.4		1.5		212.8	22.3						
Approach LOS					F	C						
Intersection Summary												
Average Delay			50.0									
Intersection Capacity Utilization			70.7%	ICU Level of Service	C							
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis
 106: 42nd Ave S & S 164th St & Military Rd S

SAMP Surface Transportation Analysis



Movement	EBL2	EBL	EBT	EBR	WBL	WBT	WBR	WBR2	NBL	NBT	NBR	NBR2
Lane Configurations			↔			↔			↖	↗	↖	↗
Traffic Volume (vph)	35	55	15	20	50	75	20	30	20	170	180	40
Future Volume (vph)	35	55	15	20	50	75	20	30	20	170	180	40
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)			5.0			5.0			5.0	5.0	5.0	
Lane Util. Factor			1.00			1.00			1.00	1.00	1.00	
Frbp, ped/bikes			0.99			0.99			1.00	1.00	0.96	
Flpb, ped/bikes			0.99			1.00			1.00	1.00	1.00	
Frt			0.98			0.96			1.00	1.00	0.85	
Flt Protected			0.97			0.99			0.95	1.00	1.00	
Satd. Flow (prot)			1624			1600			1612	1699	1382	
Flt Permitted			0.54			0.88			0.25	1.00	1.00	
Satd. Flow (perm)			901			1431			426	1699	1382	
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
Adj. Flow (vph)	35	55	15	20	50	75	20	30	20	170	180	40
RTOR Reduction (vph)	0	0	5	0	0	5	0	0	0	0	67	0
Lane Group Flow (vph)	0	0	120	0	0	170	0	0	20	170	153	0
Confl. Peds. (#/hr)	7	5		5	5		7	5	6		5	2
Heavy Vehicles (%)	0%	0%	0%	0%	2%	2%	2%	2%	3%	3%	3%	3%
Turn Type	Perm	Perm	NA		Perm	NA			pm+pt	NA	Perm	
Protected Phases			4			4			1	6		
Permitted Phases	4	4			4				6		6	
Actuated Green, G (s)			20.8			20.8			33.1	29.3	29.3	
Effective Green, g (s)			20.8			20.8			33.1	29.3	29.3	
Actuated g/C Ratio			0.16			0.16			0.26	0.23	0.23	
Clearance Time (s)			5.0			5.0			5.0	5.0	5.0	
Vehicle Extension (s)			3.0			3.0			3.0	3.0	3.0	
Lane Grp Cap (vph)			148			236			147	394	321	
v/s Ratio Prot									0.00	0.10		
v/s Ratio Perm			0.13			0.12			0.03		0.11	
v/c Ratio			0.81			0.72			0.14	0.43	0.48	
Uniform Delay, d1			50.8			49.9			35.7	41.3	41.8	
Progression Factor			1.00			1.00			1.00	1.00	1.00	
Incremental Delay, d2			27.4			10.3			0.4	0.8	1.1	
Delay (s)			78.2			60.2			36.1	42.1	42.9	
Level of Service			E			E			D	D	D	
Approach Delay (s)			78.2			60.2				42.2		
Approach LOS			E			E				D		
Intersection Summary												
HCM 2000 Control Delay			70.6			HCM 2000 Level of Service			E			
HCM 2000 Volume to Capacity ratio			0.94									
Actuated Cycle Length (s)			126.1			Sum of lost time (s)			20.0			
Intersection Capacity Utilization			102.1%			ICU Level of Service			G			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
 106: 42nd Ave S & S 164th St & Military Rd S

















SAMP Surface Transportation Analysis



Movement	SBL2	SBL	SBT	SBR	SWL2	SWL	SWR	SWR2
Lane Configurations								
Traffic Volume (vph)	25	75	340	60	115	550	25	20
Future Volume (vph)	25	75	340	60	115	550	25	20
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		5.0	5.0			5.0	5.0	
Lane Util. Factor		1.00	1.00			1.00	1.00	
Frbp, ped/bikes		1.00	0.99			1.00	1.00	
Flpb, ped/bikes		0.99	1.00			1.00	1.00	
Frt		1.00	0.98			1.00	0.85	
Flt Protected		0.95	1.00			0.95	1.00	
Satd. Flow (prot)		1605	1651			1646	1473	
Flt Permitted		0.46	1.00			0.95	1.00	
Satd. Flow (perm)		774	1651			1646	1473	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	25	75	340	60	115	550	25	20
RTOR Reduction (vph)	0	0	4	0	0	0	28	0
Lane Group Flow (vph)	0	100	396	0	0	665	17	0
Confl. Peds. (#/hr)	5	2		6				
Heavy Vehicles (%)	3%	3%	3%	3%	1%	1%	1%	1%
Turn Type	pm+pt	pm+pt	NA		Prot	Prot	Perm	
Protected Phases	5	5	2		8	8		
Permitted Phases	2	2					8	
Actuated Green, G (s)		43.8	35.0			46.5	46.5	
Effective Green, g (s)		43.8	35.0			46.5	46.5	
Actuated g/C Ratio		0.35	0.28			0.37	0.37	
Clearance Time (s)		5.0	5.0			5.0	5.0	
Vehicle Extension (s)		3.0	3.0			3.0	3.0	
Lane Grp Cap (vph)		331	458			606	543	
v/s Ratio Prot		c0.02	c0.24			c0.40		
v/s Ratio Perm		0.08					0.01	
v/c Ratio		0.30	0.86			1.10	0.03	
Uniform Delay, d1		29.1	43.3			39.8	25.4	
Progression Factor		1.00	1.00			1.00	1.00	
Incremental Delay, d2		0.5	15.5			66.0	0.0	
Delay (s)		29.6	58.7			105.8	25.4	
Level of Service		C	E			F	C	
Approach Delay (s)			52.9			100.7		
Approach LOS			D			F		
Intersection Summary								

HCM Unsignalized Intersection Capacity Analysis
 107: 34th Ave S & S 170th St

















SAMP Surface Transportation Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	40	195	60	50	210	20	105	330	60	15	190	50
Future Volume (vph)	40	195	60	50	210	20	105	330	60	15	190	50
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	40	195	60	50	210	20	105	330	60	15	190	50
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	295	280	495	255								
Volume Left (vph)	40	50	105	15								
Volume Right (vph)	60	20	60	50								
Hadj (s)	-0.06	0.04	-0.01	-0.05								
Departure Headway (s)	7.5	7.6	6.9	7.5								
Degree Utilization, x	0.61	0.59	0.94	0.53								
Capacity (veh/h)	458	440	517	445								
Control Delay (s)	21.7	21.2	52.8	18.8								
Approach Delay (s)	21.7	21.2	52.8	18.8								
Approach LOS	C	C	F	C								
Intersection Summary												
Delay			32.6									
Level of Service			D									
Intersection Capacity Utilization			78.2%	ICU Level of Service	D							
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

108: 32nd Ave S & S 200th St




















SAMP Surface Transportation Analysis

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	25	1035	40	65	315	15	5	20	85	15	15	10	
Future Volume (vph)	25	1035	40	65	315	15	5	20	85	15	15	10	
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	
Total Lost time (s)		5.0			5.0			5.0			5.0		
Lane Util. Factor		0.95			0.95			1.00			1.00		
Frb, ped/bikes		1.00			1.00			1.00			1.00		
Flpb, ped/bikes		1.00			1.00			1.00			1.00		
Frt		0.99			0.99			0.90			0.97		
Flt Protected		1.00			0.99			1.00			0.98		
Satd. Flow (prot)		3204			3119			1533			1590		
Flt Permitted		0.94			0.74			0.98			0.84		
Satd. Flow (perm)		3022			2337			1512			1365		
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	
Adj. Flow (vph)	25	1035	40	65	315	15	5	20	85	15	15	10	
RTOR Reduction (vph)	0	2	0	0	2	0	0	56	0	0	8	0	
Lane Group Flow (vph)	0	1098	0	0	393	0	0	54	0	0	32	0	
Confl. Peds. (#/hr)	6		4	4		6	5					5	
Heavy Vehicles (%)	3%	3%	3%	5%	5%	5%	2%	2%	2%	4%	4%	4%	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA		
Protected Phases		2			6			4			8		
Permitted Phases	2			6			4			8			
Actuated Green, G (s)		28.1			28.1			7.5			7.5		
Effective Green, g (s)		28.1			28.1			7.5			7.5		
Actuated g/C Ratio		0.62			0.62			0.16			0.16		
Clearance Time (s)		5.0			5.0			5.0			5.0		
Vehicle Extension (s)		2.0			2.0			2.0			2.0		
Lane Grp Cap (vph)		1862			1440			248			224		
v/s Ratio Prot													
v/s Ratio Perm		c0.36			0.17			c0.04			0.02		
v/c Ratio		0.59			0.27			0.22			0.14		
Uniform Delay, d1		5.3			4.0			16.5			16.3		
Progression Factor		1.00			1.00			1.00			1.00		
Incremental Delay, d2		0.3			0.0			0.2			0.1		
Delay (s)		5.6			4.1			16.7			16.4		
Level of Service		A			A			B			B		
Approach Delay (s)		5.6			4.1			16.7			16.4		
Approach LOS		A			A			B			B		
Intersection Summary													
HCM 2000 Control Delay			6.2									HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.51										
Actuated Cycle Length (s)			45.6									Sum of lost time (s)	10.0
Intersection Capacity Utilization			70.0%									ICU Level of Service	C
Analysis Period (min)			15										
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis












109: Military Rd S & S 216th St

SAMP Surface Transportation Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	200	275	295	70	230	25	95	200	30	25	600	140
Future Volume (vph)	200	275	295	70	230	25	95	200	30	25	600	140
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.0	4.0		4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Frt		1.00	0.85		0.99		1.00	0.98		1.00	0.97	
Flt Protected		0.98	1.00		0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1680	1458		1696		1614	1666		1630	1667	
Flt Permitted		0.98	1.00		0.99		0.07	1.00		0.53	1.00	
Satd. Flow (perm)		1680	1458		1696		114	1666		915	1667	
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
Adj. Flow (vph)	200	275	295	70	230	25	95	200	30	25	600	140
RTOR Reduction (vph)	0	0	170	0	2	0	0	3	0	0	6	0
Lane Group Flow (vph)	0	475	125	0	323	0	95	227	0	25	734	0
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	3%	3%	3%	2%	2%	2%
Turn Type	Split	NA	pm+ov	Split	NA		D.P+P	NA		D.P+P	NA	
Protected Phases	8	8	1	4	4		1	6		5	2	
Permitted Phases			8				2			6		
Actuated Green, G (s)		39.0	45.0		26.0		65.6	62.6		65.6	59.6	
Effective Green, g (s)		39.0	45.0		26.0		65.6	62.6		65.6	59.6	
Actuated g/C Ratio		0.27	0.31		0.18		0.45	0.43		0.45	0.41	
Clearance Time (s)		4.0	4.0		4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)		4.0	5.0		4.0		5.0	5.0		5.0	5.0	
Lane Grp Cap (vph)		446	447		300		112	711		424	677	
v/s Ratio Prot		c0.28	0.01		c0.19		c0.03	c0.14		0.00	c0.44	
v/s Ratio Perm			0.07				0.34			0.03		
v/c Ratio		1.07	0.28		1.08		0.85	0.32		0.06	1.08	
Uniform Delay, d1		53.8	38.5		60.3		34.9	27.9		23.0	43.5	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		61.0	0.7		73.4		44.9	0.5		0.1	59.7	
Delay (s)		114.8	39.2		133.7		79.8	28.4		23.1	103.2	
Level of Service		F	D		F		E	C		C	F	
Approach Delay (s)		85.8			133.7			43.4			100.6	
Approach LOS		F			F			D			F	
Intersection Summary												
HCM 2000 Control Delay			91.8				HCM 2000 Level of Service			F		
HCM 2000 Volume to Capacity ratio			1.06									
Actuated Cycle Length (s)			146.6				Sum of lost time (s)			16.0		
Intersection Capacity Utilization			109.3%				ICU Level of Service			H		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis
 110: International Blvd & S 206th St

SAMP Surface Transportation Analysis

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations			 			 
Traffic Volume (veh/h)	0	120	570	125	0	1360
Future Volume (Veh/h)	0	120	570	125	0	1360
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	120	570	125	0	1360
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	587			739		
pX, platoon unblocked	0.88	0.93			0.93	
vC, conflicting volume	1312	348			695	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	747	154			527	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	85			100	
cM capacity (veh/h)	308	805			966	
Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	
Volume Total	120	380	315	680	680	
Volume Left	0	0	0	0	0	
Volume Right	120	0	125	0	0	
cSH	805	1700	1700	1700	1700	
Volume to Capacity	0.15	0.22	0.19	0.40	0.40	
Queue Length 95th (ft)	13	0	0	0	0	
Control Delay (s)	10.3	0.0	0.0	0.0	0.0	
Lane LOS	B					
Approach Delay (s)	10.3	0.0		0.0		
Approach LOS	B					
Intersection Summary						
Average Delay			0.6			
Intersection Capacity Utilization			44.1%	ICU Level of Service	A	
Analysis Period (min)			15			

LANE SUMMARY

Site: 112 [112-S 170th St @ Terminal RAB (Site Folder: 2032 PA)]

New Site
 Site Category: 2032 Proposed Action
 Roundabout

Lane Use and Performance													
	DEMAND FLOWS		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE		Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
	[Total veh/h	[HV] %						[Veh	[Dist] ft				
East: S 170th St (WB)													
Lane 1 ^d	371	3.0	1679	0.221	100	7.8	LOS A	1.4	35.9	Full	600	0.0	0.0
Lane 2	53	3.0	1193	0.044	20 ⁶	4.1	LOS A	0.2	5.8	Full	600	0.0	0.0
Approach	424	3.0		0.221		7.4	LOS A	1.4	35.9				
West: S 170th St (EB)													
Lane 1 ^d	103	3.0	1180	0.088	100	5.3	LOS A	0.4	11.1	Full	1600	0.0	0.0
Approach	103	3.0		0.088		5.3	LOS A	0.4	11.1				
Intersection	527	3.0		0.221		6.9	LOS A	1.4	35.9				

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Signalised Intersections.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used).

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

⁶ Lane under-utilisation due to downstream effects

^d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)												
East: S 170th St (WB)												
Mov.	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.		
From E To Exit:	S	W	N									
Lane 1	245	16	110	371	3.0	1679	0.221	100	NA	NA		
Lane 2	-	-	53	53	3.0	1193	0.044	20 ⁶	NA	NA		
Approach	245	16	163	424	3.0		0.221					
West: S 170th St (EB)												
Mov.	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.		
From W To Exit:	N	E	S									
Lane 1	5	92	5	103	3.0	1180	0.088	100	NA	NA		
Approach	5	92	5	103	3.0		0.088					
Total %HV Deg.Satn (v/c)												
Intersection	527	3.0					0.221					

LANE SUMMARY

**Site: 113 [113-Des Moines Memorial Dr @ SR 509 NB Ramps
(Site Folder: 2032 PA)]**

113-Des Moines Memorial Dr @ SR 509 NB Ramps, 2032 Proposed Action
Site Category: 2032 Proposed Action
Roundabout

Lane Use and Performance													
	DEMAND FLOWS		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE		Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
	[Total veh/h	[HV] %						[Veh	Dist] ft				
South: SR 509 NB Off Ramp													
Lane 1 ^d	256	4.0	636	0.402	100	13.5	LOS B	1.9	48.2	Full	1600	0.0	0.0
Approach	256	4.0		0.402		13.5	LOS B	1.9	48.2				
East: Des Moines Memorial Dr (WB)													
Lane 1 ^d	505	5.0	1137	0.444	100	7.2	LOS A	3.1	80.0	Full	1600	0.0	0.0
Lane 2	635	5.0	1595	0.398	100	4.0	LOS A	0.0	0.0	Full	1600	0.0	0.0
Approach	1140	5.0		0.444		5.4	LOS A	3.1	80.0				
West: Des Moines Memorial Dr (EB)													
Lane 1	851	6.0	1415	0.602	100	7.0	LOS A	0.0	0.0	Full	1000	0.0	0.0
Lane 2 ^d	949	6.0	1577	0.602	100	4.5	LOS A	0.0	0.0	Full	1000	0.0	0.0
Approach	1800	6.0		0.602		5.7	LOS A	0.0	0.0				
Intersection	3196	5.5		0.602		6.2	LOS A	3.1	80.0				

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Signalised Intersections.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used).

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).










HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

^d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)											
South: SR 509 NB Off Ramp											
Mov.	L2	T1	R2	Total	%HV	Cap.	Deg.	Lane	Prob.	Ov.	
From S						veh/h	Satn	Util.	SL	Ov.	Lane
To Exit:	W	N	E				v/c	%	%		No.
Lane 1	90	1	165	256	4.0	636	0.402	100	NA	NA	
Approach	90	1	165	256	4.0		0.402				
East: Des Moines Memorial Dr (WB)											
Mov.	T1	R2	Total	%HV	Cap.	Deg.	Lane	Prob.	Ov.	Ov.	
From E					veh/h	Satn	Util.	SL	Ov.	Lane	
To Exit:	W	N				v/c	%	%		No.	
Lane 1	505	-	505	5.0	1137	0.444	100	NA	NA	NA	
Lane 2	-	635	635	5.0	1595	0.398	100	NA	NA	NA	
Approach	505	635	1140	5.0		0.444					













HCM Signalized Intersection Capacity Analysis
 114: 24th Ave S & SR 509 On Ramp

SAMP Surface Transportation Analysis

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	200	10	215	595
Future Volume (vph)	0	0	200	10	215	595
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)			5.0		5.0	5.0
Lane Util. Factor			0.95		1.00	0.95
Frt			0.99		1.00	1.00
Flt Protected			1.00		0.95	1.00
Satd. Flow (prot)			3237		1630	3260
Flt Permitted			1.00		0.62	1.00
Satd. Flow (perm)			3237		1064	3260
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	200	10	215	595
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	210	0	215	595
Turn Type			NA		Perm	NA
Protected Phases			2			6
Permitted Phases					6	
Actuated Green, G (s)			21.0		21.0	21.0
Effective Green, g (s)			21.0		21.0	21.0
Actuated g/C Ratio			1.00		1.00	1.00
Clearance Time (s)			5.0		5.0	5.0
Lane Grp Cap (vph)			3237		1064	3260
v/s Ratio Prot			0.06			0.18
v/s Ratio Perm					c0.20	
v/c Ratio			0.06		0.20	0.18
Uniform Delay, d1			0.0		0.0	0.0
Progression Factor			1.00		1.00	1.00
Incremental Delay, d2			0.0		0.3	0.1
Delay (s)			0.0		0.3	0.1
Level of Service			A		A	A
Approach Delay (s)	0.0		0.0			0.2
Approach LOS	A		A			A
Intersection Summary						
HCM 2000 Control Delay			0.1		HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.27			
Actuated Cycle Length (s)			21.0		Sum of lost time (s)	5.0
Intersection Capacity Utilization			35.7%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						













HCM Signalized Intersection Capacity Analysis
 115: 24th Ave S & SR 509 Off Ramp

SAMP Surface Transportation Analysis

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations			 			 
Traffic Volume (vph)	10	140	200	0	0	800
Future Volume (vph)	10	140	200	0	0	800
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	5.0	5.0	5.0			5.0
Lane Util. Factor	1.00	1.00	0.95			0.95
Frt	1.00	0.85	1.00			1.00
Flt Protected	0.95	1.00	1.00			1.00
Satd. Flow (prot)	1630	1458	3260			3260
Flt Permitted	0.95	1.00	1.00			1.00
Satd. Flow (perm)	1630	1458	3260			3260
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	10	140	200	0	0	800
RTOR Reduction (vph)	0	87	0	0	0	0
Lane Group Flow (vph)	10	53	200	0	0	800
Turn Type	Prot	Perm	NA			NA
Protected Phases	8		2			6
Permitted Phases		8				
Actuated Green, G (s)	16.0	16.0	16.0			16.0
Effective Green, g (s)	16.0	16.0	16.0			16.0
Actuated g/C Ratio	0.38	0.38	0.38			0.38
Clearance Time (s)	5.0	5.0	5.0			5.0
Lane Grp Cap (vph)	620	555	1241			1241
v/s Ratio Prot	0.01		0.06			c0.25
v/s Ratio Perm		c0.04				
v/c Ratio	0.02	0.10	0.16			0.64
Uniform Delay, d1	8.1	8.4	8.6			10.7
Progression Factor	1.00	1.00	1.00			1.00
Incremental Delay, d2	0.0	0.3	0.3			2.6
Delay (s)	8.1	8.7	8.9			13.3
Level of Service	A	A	A			B
Approach Delay (s)	8.7		8.9			13.3
Approach LOS	A		A			B
Intersection Summary						
HCM 2000 Control Delay			11.9		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.37			
Actuated Cycle Length (s)			42.0		Sum of lost time (s)	10.0
Intersection Capacity Utilization			35.7%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						













HCM Signalized Intersection Capacity Analysis
 116: NB I-5 On Ramp & Veterans Dr

SAMP Surface Transportation Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑	↑		↑↑				
Traffic Volume (vph)	0	690	0	0	490	495	0	560	330	0	0	0
Future Volume (vph)	0	690	0	0	490	495	0	560	330	0	0	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		5.0			5.0	5.0		5.0				
Lane Util. Factor		0.95			0.95	1.00		0.95				
Frt		1.00			1.00	0.85		0.94				
Flt Protected		1.00			1.00	1.00		1.00				
Satd. Flow (prot)		3260			3260	1458		3079				
Flt Permitted		1.00			1.00	1.00		1.00				
Satd. Flow (perm)		3260			3260	1458		3079				
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
Adj. Flow (vph)	0	690	0	0	490	495	0	560	330	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	92	0	57	0	0	0	0
Lane Group Flow (vph)	0	690	0	0	490	403	0	833	0	0	0	0
Turn Type		NA			NA	Perm		NA				
Protected Phases		4			8			2				
Permitted Phases						8						
Actuated Green, G (s)		77.0			77.0	77.0		63.0				
Effective Green, g (s)		77.0			77.0	77.0		63.0				
Actuated g/C Ratio		0.51			0.51	0.51		0.42				
Clearance Time (s)		5.0			5.0	5.0		5.0				
Lane Grp Cap (vph)		1673			1673	748		1293				
v/s Ratio Prot		0.21			0.15			c0.27				
v/s Ratio Perm						c0.28						
v/c Ratio		0.41			0.29	0.54		0.64				
Uniform Delay, d1		22.5			20.9	24.5		34.6				
Progression Factor		1.04			1.00	1.00		0.51				
Incremental Delay, d2		0.6			0.4	2.8		1.8				
Delay (s)		24.0			21.4	27.3		19.3				
Level of Service		C			C	C		B				
Approach Delay (s)		24.0			24.3			19.3			0.0	
Approach LOS		C			C			B			A	
Intersection Summary												
HCM 2000 Control Delay			22.5				HCM 2000 Level of Service				C	
HCM 2000 Volume to Capacity ratio			0.59									
Actuated Cycle Length (s)			150.0				Sum of lost time (s)			10.0		
Intersection Capacity Utilization			101.2%				ICU Level of Service				G	
Analysis Period (min)			15									
c	Critical Lane Group											

HCM Signalized Intersection Capacity Analysis
 117: SB I-5 Ramps & Veterans Dr

SAMP Surface Transportation Analysis

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	 					  
Traffic Volume (vph)	490	0	0	0	690	1460
Future Volume (vph)	490	0	0	0	690	1460
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	5.0				5.0	5.0
Lane Util. Factor	0.97				1.00	0.91
Frt	1.00				1.00	1.00
Flt Protected	0.95				0.95	1.00
Satd. Flow (prot)	3162				1630	4684
Flt Permitted	0.95				0.95	1.00
Satd. Flow (perm)	3162				1630	4684
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	490	0	0	0	690	1460
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	490	0	0	0	690	1460
Turn Type	Prot				Prot	NA
Protected Phases	3				1	6
Permitted Phases						
Actuated Green, G (s)	38.0				102.0	102.0
Effective Green, g (s)	38.0				102.0	102.0
Actuated g/C Ratio	0.25				0.68	0.68
Clearance Time (s)	5.0				5.0	5.0
Lane Grp Cap (vph)	801				1108	3185
v/s Ratio Prot	c0.15				c0.42	0.31
v/s Ratio Perm						
v/c Ratio	0.61				0.62	0.46
Uniform Delay, d1	49.5				13.3	11.2
Progression Factor	0.69				1.00	1.00
Incremental Delay, d2	3.4				2.6	0.5
Delay (s)	37.5				16.0	11.6
Level of Service	D				B	B
Approach Delay (s)	37.5		0.0			13.0
Approach LOS	D		A			B
Intersection Summary						
HCM 2000 Control Delay			17.6		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.62			
Actuated Cycle Length (s)			150.0		Sum of lost time (s)	10.0
Intersection Capacity Utilization			115.6%		ICU Level of Service	H
Analysis Period (min)			15			
c	Critical Lane Group					