

Appendix A

Intersection Level of Service Calculations

HCM Signalized Intersection Capacity Analysis

Existing PM

1: SB US 101 Ramps & Tennant Avenue

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑	↑↑						↑	↑
Volume (vph)	0	679	389	44	454	0	0	0	0	66	1	662
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1800	1750
Total Lost time (s)		4.7	4.0	3.0	4.7						3.5	3.0
Lane Util. Factor		0.95	1.00	1.00	0.95						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)		3539	1458	1630	3539						1682	1458
Flt Permitted		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (perm)		3539	1458	1630	3539						1682	1458
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	0	730	418	47	488	0	0	0	0	71	1	712
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	33
Lane Group Flow (vph)	0	730	418	47	488	0	0	0	0	0	72	679
Turn Type		NA	Free	Prot	NA					Split	NA	custom
Protected Phases		2 10		1	6					4	4	10
Permitted Phases			Free									4
Actuated Green, G (s)		80.7	110.0	5.9	34.1						9.2	64.7
Effective Green, g (s)		80.7	110.0	5.9	34.1						9.2	64.7
Actuated g/C Ratio		0.73	1.00	0.05	0.31						0.08	0.59
Clearance Time (s)				3.0	4.7						3.5	3.0
Vehicle Extension (s)				3.0	2.2						2.5	3.0
Lane Grp Cap (vph)		2596	1458	87	1097						140	857
v/s Ratio Prot		0.21		c0.03	c0.14						0.04	c0.40
v/s Ratio Perm			0.29									0.07
v/c Ratio		0.28	0.29	0.54	0.44						0.51	0.79
Uniform Delay, d1		4.9	0.0	50.7	30.4						48.3	17.5
Progression Factor		1.00	1.00	1.34	0.76						1.00	1.00
Incremental Delay, d2		0.1	0.5	6.6	1.3						2.4	5.1
Delay (s)		5.0	0.5	74.4	24.4						50.6	22.5
Level of Service		A	A	E	C						D	C
Approach Delay (s)		3.3			28.8			0.0			25.1	
Approach LOS		A			C			A			C	
Intersection Summary												
HCM 2000 Control Delay			15.8			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.70									
Actuated Cycle Length (s)			110.0			Sum of lost time (s)			14.2			
Intersection Capacity Utilization			64.3%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

2: NB US 101 Ramps & Tennant Avenue

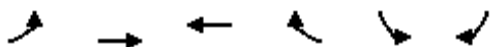
Existing PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑	↑	↑	↑				
Volume (vph)	0	363	0	0	239	77	259	0	91	0	0	0
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1800	1750	1750	1900	1750
Total Lost time (s)		4.0			4.0	4.0	3.8	3.8				
Lane Util. Factor		0.95			0.95	1.00	1.00	1.00				
Frt		1.00			1.00	0.85	1.00	0.85				
Flt Protected		1.00			1.00	1.00	0.95	1.00				
Satd. Flow (prot)		3539			3539	1458	1630	1500				
Flt Permitted		1.00			1.00	1.00	0.95	1.00				
Satd. Flow (perm)		3539			3539	1458	1630	1500				
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	0	399	0	0	263	85	285	0	100	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	26	0	76	0	0	0	0
Lane Group Flow (vph)	0	399	0	0	263	59	285	24	0	0	0	0
Turn Type		NA			NA	Perm	Perm	NA				
Protected Phases		2			6			8				
Permitted Phases						6	8					
Actuated Green, G (s)		76.2			76.2	76.2	26.0	26.0				
Effective Green, g (s)		76.2			76.2	76.2	26.0	26.0				
Actuated g/C Ratio		0.69			0.69	0.69	0.24	0.24				
Clearance Time (s)		4.0			4.0	4.0	3.8	3.8				
Vehicle Extension (s)		5.0			5.0	5.0	3.0	3.0				
Lane Grp Cap (vph)		2451			2451	1009	385	354				
v/s Ratio Prot		c0.11			0.07			0.02				
v/s Ratio Perm						0.04	c0.17					
v/c Ratio		0.16			0.11	0.06	0.74	0.07				
Uniform Delay, d1		5.9			5.6	5.4	38.9	32.6				
Progression Factor		0.90			1.00	1.00	1.00	1.00				
Incremental Delay, d2		0.1			0.1	0.1	7.5	0.1				
Delay (s)		5.4			5.7	5.5	46.3	32.7				
Level of Service		A			A	A	D	C				
Approach Delay (s)		5.4			5.7			42.8			0.0	
Approach LOS		A			A			D			A	
Intersection Summary												
HCM 2000 Control Delay		18.2			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.31										
Actuated Cycle Length (s)		110.0			Sum of lost time (s)			7.8				
Intersection Capacity Utilization		32.3%			ICU Level of Service			A				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

3: Tennant Avenue & Condit Road

Existing PM



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	108	346	239	15	10	77
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	110	353	244	15	10	79
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		360				
pX, platoon unblocked					0.95	
vC, conflicting volume	259				825	252
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	259				791	252
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	92				97	90
cM capacity (veh/h)	1305				312	787
Direction, Lane #	EB 1	EB 2	WB 1	SB 1		
Volume Total	110	353	259	89		
Volume Left	110	0	0	10		
Volume Right	0	0	15	79		
cSH	1305	1700	1700	670		
Volume to Capacity	0.08	0.21	0.15	0.13		
Queue Length 95th (ft)	7	0	0	11		
Control Delay (s)	8.0	0.0	0.0	11.2		
Lane LOS	A			B		
Approach Delay (s)	1.9		0.0	11.2		
Approach LOS				B		
Intersection Summary						
Average Delay			2.3			
Intersection Capacity Utilization			34.8%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

Existing PM

4: Murphy Avenue & Tennant Avenue

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	70	179	107	2	150	5	67	24	5	2	29	37
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	83	213	127	2	179	6	80	29	6	2	35	44
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	424	187	114	81								
Volume Left (vph)	83	2	80	2								
Volume Right (vph)	127	6	6	44								
Hadj (s)	-0.11	0.02	0.14	-0.29								
Departure Headway (s)	4.6	5.0	5.7	5.3								
Degree Utilization, x	0.54	0.26	0.18	0.12								
Capacity (veh/h)	750	675	563	591								
Control Delay (s)	12.9	9.8	9.9	9.0								
Approach Delay (s)	12.9	9.8	9.9	9.0								
Approach LOS	B	A	A	A								
Intersection Summary												
Delay				11.4								
Level of Service				B								
Intersection Capacity Utilization				50.1%	ICU Level of Service	A						
Analysis Period (min)				15								

HCM Signalized Intersection Capacity Analysis

1: SB US 101 Ramps & Tennant Avenue

Existing plus Alternative #1 PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑	↑↑						↑	↑
Volume (vph)	0	694	389	53	461	0	0	0	0	171	1	662
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1800	1750
Total Lost time (s)		4.7	4.0	3.0	4.7						3.5	3.0
Lane Util. Factor		0.95	1.00	1.00	0.95						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)		3539	1458	1630	3539						1681	1458
Flt Permitted		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (perm)		3539	1458	1630	3539						1681	1458
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	0	746	418	57	496	0	0	0	0	184	1	712
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	28
Lane Group Flow (vph)	0	746	418	57	496	0	0	0	0	0	185	684
Turn Type		NA	Free	Prot	NA					Split	NA	custom
Protected Phases		2 10		1	6					4	4	10
Permitted Phases			Free									4
Actuated Green, G (s)		72.1	110.0	7.0	34.5						16.7	64.3
Effective Green, g (s)		72.1	110.0	7.0	34.5						16.7	64.3
Actuated g/C Ratio		0.66	1.00	0.06	0.31						0.15	0.58
Clearance Time (s)				3.0	4.7						3.5	3.0
Vehicle Extension (s)				3.0	2.2						2.5	3.0
Lane Grp Cap (vph)		2319	1458	103	1109						255	852
v/s Ratio Prot		0.21		c0.03	c0.14						0.11	c0.35
v/s Ratio Perm			0.29									0.12
v/c Ratio		0.32	0.29	0.55	0.45						0.73	0.80
Uniform Delay, d1		8.3	0.0	50.0	30.1						44.5	17.9
Progression Factor		1.00	1.00	1.33	0.97						1.00	1.00
Incremental Delay, d2		0.1	0.5	6.2	1.3						9.2	5.5
Delay (s)		8.4	0.5	72.7	30.5						53.7	23.4
Level of Service		A	A	E	C						D	C
Approach Delay (s)		5.5			34.9			0.0			29.6	
Approach LOS		A			C			A			C	
Intersection Summary												
HCM 2000 Control Delay			20.0			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.70									
Actuated Cycle Length (s)			110.0			Sum of lost time (s)			14.2			
Intersection Capacity Utilization			64.5%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

2: NB US 101 Ramps & Tennant Avenue

Existing plus Alternative #1 PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑	↑	↑	↑				
Volume (vph)	0	483	0	0	255	127	259	0	109	0	0	0
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1800	1750	1750	1900	1750
Total Lost time (s)		4.0			4.0	4.0	3.8	3.8				
Lane Util. Factor		0.95			0.95	1.00	1.00	1.00				
Frt		1.00			1.00	0.85	1.00	0.85				
Flt Protected		1.00			1.00	1.00	0.95	1.00				
Satd. Flow (prot)		3539			3539	1458	1630	1500				
Flt Permitted		1.00			1.00	1.00	0.95	1.00				
Satd. Flow (perm)		3539			3539	1458	1630	1500				
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	0	531	0	0	280	140	285	0	120	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	43	0	92	0	0	0	0
Lane Group Flow (vph)	0	531	0	0	280	97	285	28	0	0	0	0
Turn Type		NA			NA	Perm	Perm	NA				
Protected Phases		2			6			8				
Permitted Phases						6	8					
Actuated Green, G (s)		76.5			76.5	76.5	25.7	25.7				
Effective Green, g (s)		76.5			76.5	76.5	25.7	25.7				
Actuated g/C Ratio		0.70			0.70	0.70	0.23	0.23				
Clearance Time (s)		4.0			4.0	4.0	3.8	3.8				
Vehicle Extension (s)		5.0			5.0	5.0	3.0	3.0				
Lane Grp Cap (vph)		2461			2461	1013	380	350				
v/s Ratio Prot		c0.15			0.08			0.02				
v/s Ratio Perm						0.07	c0.17					
v/c Ratio		0.22			0.11	0.10	0.75	0.08				
Uniform Delay, d1		6.0			5.5	5.5	39.2	32.9				
Progression Factor		0.75			1.00	1.00	1.00	1.00				
Incremental Delay, d2		0.2			0.1	0.2	8.1	0.1				
Delay (s)		4.7			5.6	5.7	47.3	33.0				
Level of Service		A			A	A	D	C				
Approach Delay (s)		4.7			5.6			43.0			0.0	
Approach LOS		A			A			D			A	
Intersection Summary												
HCM 2000 Control Delay		16.4			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.35										
Actuated Cycle Length (s)		110.0			Sum of lost time (s)			7.8				
Intersection Capacity Utilization		35.6%			ICU Level of Service			A				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

3: Tennant Avenue & Condit Road

Existing plus Alternative #1 PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	108	346	138	13	239	15	66	4	6	10	8	77
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.98	0.98	0.99	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	110	353	139	13	244	15	67	4	6	10	8	79
Pedestrians					20							
Lane Width (ft)					12.0							
Walking Speed (ft/s)					4.0							
Percent Blockage					2							
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		360										
pX, platoon unblocked				0.93			0.93	0.93	0.93	0.93	0.93	
vC, conflicting volume	259			492			1004	929	443	880	991	252
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	259			414			965	884	360	831	951	252
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 %	92			99			62	98	99	96	96	90
cM capacity (veh/h)	1305			1062			176	238	624	239	218	787
Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1							
Volume Total	110	492	272	78	97							
Volume Left	110	0	13	67	10							
Volume Right	0	139	15	6	79							
cSH	1305	1700	1062	190	538							
Volume to Capacity	0.08	0.29	0.01	0.41	0.18							
Queue Length 95th (ft)	7	0	1	46	16							
Control Delay (s)	8.0	0.0	0.5	36.6	13.2							
Lane LOS	A		A	E	B							
Approach Delay (s)	1.5		0.5	36.6	13.2							
Approach LOS				E	B							
Intersection Summary												
Average Delay			4.9									
Intersection Capacity Utilization			63.0%		ICU Level of Service				B			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis 4: Murphy Avenue & Tennant Avenue

Existing plus Alternative #1 PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	73	181	108	2	155	5	69	25	5	2	31	43
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	87	215	129	2	185	6	82	30	6	2	37	51
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	431	193	118	90								
Volume Left (vph)	87	2	82	2								
Volume Right (vph)	129	6	6	51								
Hadj (s)	-0.10	0.02	0.14	-0.30								
Departure Headway (s)	4.7	5.1	5.7	5.4								
Degree Utilization, x	0.56	0.27	0.19	0.13								
Capacity (veh/h)	741	665	555	585								
Control Delay (s)	13.4	10.0	10.0	9.2								
Approach Delay (s)	13.4	10.0	10.0	9.2								
Approach LOS	B	A	B	A								
Intersection Summary												
Delay				11.7								
Level of Service				B								
Intersection Capacity Utilization				50.8%	ICU Level of Service	A						
Analysis Period (min)				15								

HCM Signalized Intersection Capacity Analysis

1: SB US 101 Ramps & Tennant Avenue

Existing plus Alternative #2 PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑	↑↑						↑	↑
Volume (vph)	0	694	389	53	461	0	0	0	0	171	1	662
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1800	1750
Total Lost time (s)		4.7	4.0	3.0	4.7						3.5	3.0
Lane Util. Factor		0.95	1.00	1.00	0.95						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)		3539	1458	1630	3539						1681	1458
Flt Permitted		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (perm)		3539	1458	1630	3539						1681	1458
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	0	746	418	57	496	0	0	0	0	184	1	712
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	28
Lane Group Flow (vph)	0	746	418	57	496	0	0	0	0	0	185	684
Turn Type		NA	Free	Prot	NA					Split	NA	custom
Protected Phases		2 10		1	6					4	4	10
Permitted Phases			Free									4
Actuated Green, G (s)		72.1	110.0	7.0	34.5						16.7	64.3
Effective Green, g (s)		72.1	110.0	7.0	34.5						16.7	64.3
Actuated g/C Ratio		0.66	1.00	0.06	0.31						0.15	0.58
Clearance Time (s)				3.0	4.7						3.5	3.0
Vehicle Extension (s)				3.0	2.2						2.5	3.0
Lane Grp Cap (vph)		2319	1458	103	1109						255	852
v/s Ratio Prot		0.21		c0.03	c0.14						0.11	c0.35
v/s Ratio Perm			0.29									0.12
v/c Ratio		0.32	0.29	0.55	0.45						0.73	0.80
Uniform Delay, d1		8.3	0.0	50.0	30.1						44.5	17.9
Progression Factor		1.00	1.00	1.33	0.97						1.00	1.00
Incremental Delay, d2		0.1	0.5	6.2	1.3						9.2	5.5
Delay (s)		8.4	0.5	72.7	30.5						53.7	23.4
Level of Service		A	A	E	C						D	C
Approach Delay (s)		5.5			34.9			0.0			29.6	
Approach LOS		A			C			A			C	
Intersection Summary												
HCM 2000 Control Delay			20.0			HCM 2000 Level of Service					C	
HCM 2000 Volume to Capacity ratio			0.70									
Actuated Cycle Length (s)			110.0			Sum of lost time (s)			14.2			
Intersection Capacity Utilization			64.5%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis 2: NB US 101 Ramps & Tennant Avenue

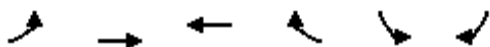
Existing plus Alternative #2 PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑	↑	↑	↑				
Volume (vph)	0	483	0	0	255	127	259	0	109	0	0	0
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1800	1750	1750	1900	1750
Total Lost time (s)		4.0			4.0	4.0	3.8	3.8				
Lane Util. Factor		0.95			0.95	1.00	1.00	1.00				
Frt		1.00			1.00	0.85	1.00	0.85				
Flt Protected		1.00			1.00	1.00	0.95	1.00				
Satd. Flow (prot)		3539			3539	1458	1630	1500				
Flt Permitted		1.00			1.00	1.00	0.95	1.00				
Satd. Flow (perm)		3539			3539	1458	1630	1500				
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	0	531	0	0	280	140	285	0	120	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	43	0	92	0	0	0	0
Lane Group Flow (vph)	0	531	0	0	280	97	285	28	0	0	0	0
Turn Type		NA			NA	Perm	Perm	NA				
Protected Phases		2			6			8				
Permitted Phases						6	8					
Actuated Green, G (s)		76.5			76.5	76.5	25.7	25.7				
Effective Green, g (s)		76.5			76.5	76.5	25.7	25.7				
Actuated g/C Ratio		0.70			0.70	0.70	0.23	0.23				
Clearance Time (s)		4.0			4.0	4.0	3.8	3.8				
Vehicle Extension (s)		5.0			5.0	5.0	3.0	3.0				
Lane Grp Cap (vph)		2461			2461	1013	380	350				
v/s Ratio Prot		c0.15			0.08			0.02				
v/s Ratio Perm						0.07	c0.17					
v/c Ratio		0.22			0.11	0.10	0.75	0.08				
Uniform Delay, d1		6.0			5.5	5.5	39.2	32.9				
Progression Factor		0.75			1.00	1.00	1.00	1.00				
Incremental Delay, d2		0.2			0.1	0.2	8.1	0.1				
Delay (s)		4.7			5.6	5.7	47.3	33.0				
Level of Service		A			A	A	D	C				
Approach Delay (s)		4.7			5.6			43.0			0.0	
Approach LOS		A			A			D			A	
Intersection Summary												
HCM 2000 Control Delay		16.4			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.35										
Actuated Cycle Length (s)		110.0			Sum of lost time (s)			7.8				
Intersection Capacity Utilization		35.6%			ICU Level of Service			A				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

3: Tennant Avenue & Condit Road

Existing plus Alternative #2 PM



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	108	484	305	19	18	77
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	110	494	311	19	18	79
Pedestrians			20			
Lane Width (ft)			12.0			
Walking Speed (ft/s)			4.0			
Percent Blockage			2			
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		360				
pX, platoon unblocked					0.93	
vC, conflicting volume	331				1055	321
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	331				1020	321
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	91				92	89
cM capacity (veh/h)	1229				218	720
Direction, Lane #	EB 1	EB 2	WB 1	SB 1		
Volume Total	110	494	331	97		
Volume Left	110	0	0	18		
Volume Right	0	0	19	79		
cSH	1229	1700	1700	501		
Volume to Capacity	0.09	0.29	0.19	0.19		
Queue Length 95th (ft)	7	0	0	18		
Control Delay (s)	8.2	0.0	0.0	13.9		
Lane LOS	A			B		
Approach Delay (s)	1.5		0.0	13.9		
Approach LOS				B		
Intersection Summary						
Average Delay			2.2			
Intersection Capacity Utilization			38.9%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis 4: Murphy Avenue & Tennant Avenue

Existing plus Alternative #2 PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	70	179	253	7	150	5	137	28	7	2	37	37
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	83	213	301	8	179	6	163	33	8	2	44	44
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	598	193	205	90								
Volume Left (vph)	83	8	163	2								
Volume Right (vph)	301	6	8	44								
Hadj (s)	-0.24	0.02	0.17	-0.25								
Departure Headway (s)	4.9	5.8	6.3	6.2								
Degree Utilization, x	0.82	0.31	0.36	0.16								
Capacity (veh/h)	709	559	519	516								
Control Delay (s)	26.4	11.3	12.8	10.3								
Approach Delay (s)	26.4	11.3	12.8	10.3								
Approach LOS	D	B	B	B								
Intersection Summary												
Delay				19.8								
Level of Service				C								
Intersection Capacity Utilization				63.5%	ICU Level of Service	B						
Analysis Period (min)				15								

HCM Signalized Intersection Capacity Analysis

1: SB US 101 Ramps & Tennant Avenue

Existing plus Alternative #3 PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 						 	
Volume (vph)	0	694	389	53	461	0	0	0	0	171	1	662
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1800	1750
Total Lost time (s)		4.7	4.0	3.0	4.7						3.5	3.0
Lane Util. Factor		0.95	1.00	1.00	0.95						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)		3539	1458	1630	3539						1681	1458
Flt Permitted		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (perm)		3539	1458	1630	3539						1681	1458
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	0	746	418	57	496	0	0	0	0	184	1	712
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	28
Lane Group Flow (vph)	0	746	418	57	496	0	0	0	0	0	185	684
Turn Type		NA	Free	Prot	NA					Split	NA	custom
Protected Phases		2 10		1	6					4	4	10
Permitted Phases			Free									4
Actuated Green, G (s)		72.1	110.0	7.0	34.5						16.7	64.3
Effective Green, g (s)		72.1	110.0	7.0	34.5						16.7	64.3
Actuated g/C Ratio		0.66	1.00	0.06	0.31						0.15	0.58
Clearance Time (s)				3.0	4.7						3.5	3.0
Vehicle Extension (s)				3.0	2.2						2.5	3.0
Lane Grp Cap (vph)		2319	1458	103	1109						255	852
v/s Ratio Prot		0.21		c0.03	c0.14						0.11	c0.35
v/s Ratio Perm			0.29									0.12
v/c Ratio		0.32	0.29	0.55	0.45						0.73	0.80
Uniform Delay, d1		8.3	0.0	50.0	30.1						44.5	17.9
Progression Factor		1.00	1.00	1.33	0.97						1.00	1.00
Incremental Delay, d2		0.1	0.5	6.2	1.3						9.2	5.5
Delay (s)		8.4	0.5	72.7	30.5						53.7	23.4
Level of Service		A	A	E	C						D	C
Approach Delay (s)		5.5			34.9			0.0			29.6	
Approach LOS		A			C			A			C	
Intersection Summary												
HCM 2000 Control Delay			20.0			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.70									
Actuated Cycle Length (s)			110.0			Sum of lost time (s)			14.2			
Intersection Capacity Utilization			64.5%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis 2: NB US 101 Ramps & Tennant Avenue

Existing plus Alternative #3 PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑	↑	↑	↑				
Volume (vph)	0	483	0	0	255	127	259	0	109	0	0	0
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1800	1750	1750	1900	1750
Total Lost time (s)		4.0			4.0	4.0	3.8	3.8				
Lane Util. Factor		0.95			0.95	1.00	1.00	1.00				
Frt		1.00			1.00	0.85	1.00	0.85				
Flt Protected		1.00			1.00	1.00	0.95	1.00				
Satd. Flow (prot)		3539			3539	1458	1630	1500				
Flt Permitted		1.00			1.00	1.00	0.95	1.00				
Satd. Flow (perm)		3539			3539	1458	1630	1500				
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	0	531	0	0	280	140	285	0	120	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	43	0	92	0	0	0	0
Lane Group Flow (vph)	0	531	0	0	280	97	285	28	0	0	0	0
Turn Type		NA			NA	Perm	Perm	NA				
Protected Phases		2			6			8				
Permitted Phases						6	8					
Actuated Green, G (s)		76.5			76.5	76.5	25.7	25.7				
Effective Green, g (s)		76.5			76.5	76.5	25.7	25.7				
Actuated g/C Ratio		0.70			0.70	0.70	0.23	0.23				
Clearance Time (s)		4.0			4.0	4.0	3.8	3.8				
Vehicle Extension (s)		5.0			5.0	5.0	3.0	3.0				
Lane Grp Cap (vph)		2461			2461	1013	380	350				
v/s Ratio Prot		c0.15			0.08			0.02				
v/s Ratio Perm						0.07	c0.17					
v/c Ratio		0.22			0.11	0.10	0.75	0.08				
Uniform Delay, d1		6.0			5.5	5.5	39.2	32.9				
Progression Factor		0.75			1.00	1.00	1.00	1.00				
Incremental Delay, d2		0.2			0.1	0.2	8.1	0.1				
Delay (s)		4.7			5.6	5.7	47.3	33.0				
Level of Service		A			A	A	D	C				
Approach Delay (s)		4.7			5.6			43.0			0.0	
Approach LOS		A			A			D			A	
Intersection Summary												
HCM 2000 Control Delay		16.4			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.35										
Actuated Cycle Length (s)		110.0			Sum of lost time (s)			7.8				
Intersection Capacity Utilization		35.6%			ICU Level of Service			A				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

3: Tennant Avenue & Condit Road

Existing plus Alternative #3 PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	108	346	138	0	305	19	0	0	0	18	0	77
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	110	353	141	0	311	19	0	0	0	18	0	79
Pedestrians					20							
Lane Width (ft)					12.0							
Walking Speed (ft/s)					4.0							
Percent Blockage					2							
Right turn flare (veh)												
Median type		None			None							
Median storage veh												
Upstream signal (ft)		360										
pX, platoon unblocked				0.93			0.93	0.93	0.93	0.93	0.93	
vC, conflicting volume	331			494			1043	974	443	914	1035	321
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	331			415			1007	933	360	868	999	321
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 %	91			100			100	100	100	92	100	89
cM capacity (veh/h)	1229			1061			169	225	624	231	206	720
Direction, Lane #	EB 1	EB 2	WB 1	SB 1								
Volume Total	110	494	331	97								
Volume Left	110	0	0	18								
Volume Right	0	141	19	79								
cSH	1229	1700	1061	514								
Volume to Capacity	0.09	0.29	0.00	0.19								
Queue Length 95th (ft)	7	0	0	17								
Control Delay (s)	8.2	0.0	0.0	13.6								
Lane LOS	A			B								
Approach Delay (s)	1.5		0.0	13.6								
Approach LOS				B								
Intersection Summary												
Average Delay			2.2									
Intersection Capacity Utilization			59.6%		ICU Level of Service				B			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis 4: Murphy Avenue & Tennant Avenue

Existing plus Alternative #3 PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	70	179	115	7	150	5	137	28	7	2	37	37
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	83	213	137	8	179	6	163	33	8	2	44	44
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	433	193	205	90								
Volume Left (vph)	83	8	163	2								
Volume Right (vph)	137	6	8	44								
Hadj (s)	-0.12	0.02	0.17	-0.25								
Departure Headway (s)	5.0	5.5	5.9	5.7								
Degree Utilization, x	0.60	0.29	0.33	0.14								
Capacity (veh/h)	690	609	554	540								
Control Delay (s)	15.2	10.7	11.8	9.7								
Approach Delay (s)	15.2	10.7	11.8	9.7								
Approach LOS	C	B	B	A								
Intersection Summary												
Delay				12.9								
Level of Service				B								
Intersection Capacity Utilization				55.0%	ICU Level of Service	B						
Analysis Period (min)				15								

HCM Signalized Intersection Capacity Analysis

Existing plus Alternative #4 PM

1: SB US 101 Ramps & Tennant Avenue

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑	↑↑						↑	↑
Volume (vph)	0	694	389	53	461	0	0	0	0	171	1	662
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1800	1750
Total Lost time (s)		4.7	4.0	3.0	4.7						3.5	3.0
Lane Util. Factor		0.95	1.00	1.00	0.95						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)		3539	1458	1630	3539						1681	1458
Flt Permitted		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (perm)		3539	1458	1630	3539						1681	1458
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	0	746	418	57	496	0	0	0	0	184	1	712
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	28
Lane Group Flow (vph)	0	746	418	57	496	0	0	0	0	0	185	684
Turn Type		NA	Free	Prot	NA					Split	NA	custom
Protected Phases		2 10		1	6					4	4	10
Permitted Phases			Free									4
Actuated Green, G (s)		72.1	110.0	7.0	34.5						16.7	64.3
Effective Green, g (s)		72.1	110.0	7.0	34.5						16.7	64.3
Actuated g/C Ratio		0.66	1.00	0.06	0.31						0.15	0.58
Clearance Time (s)				3.0	4.7						3.5	3.0
Vehicle Extension (s)				3.0	2.2						2.5	3.0
Lane Grp Cap (vph)		2319	1458	103	1109						255	852
v/s Ratio Prot		0.21		c0.03	c0.14						0.11	c0.35
v/s Ratio Perm			0.29									0.12
v/c Ratio		0.32	0.29	0.55	0.45						0.73	0.80
Uniform Delay, d1		8.3	0.0	50.0	30.1						44.5	17.9
Progression Factor		1.00	1.00	1.33	0.97						1.00	1.00
Incremental Delay, d2		0.1	0.5	6.2	1.3						9.2	5.5
Delay (s)		8.4	0.5	72.7	30.5						53.7	23.4
Level of Service		A	A	E	C						D	C
Approach Delay (s)		5.5			34.9			0.0			29.6	
Approach LOS		A			C			A			C	
Intersection Summary												
HCM 2000 Control Delay			20.0			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.70									
Actuated Cycle Length (s)			110.0			Sum of lost time (s)			14.2			
Intersection Capacity Utilization			64.5%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

2: NB US 101 Ramps & Tennant Avenue

Existing plus Alternative #4 PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑	↑	↑	↑				
Volume (vph)	0	483	0	0	255	127	259	0	109	0	0	0
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1800	1750	1750	1900	1750
Total Lost time (s)		4.0			4.0	4.0	3.8	3.8				
Lane Util. Factor		0.95			0.95	1.00	1.00	1.00				
Frt		1.00			1.00	0.85	1.00	0.85				
Flt Protected		1.00			1.00	1.00	0.95	1.00				
Satd. Flow (prot)		3539			3539	1458	1630	1500				
Flt Permitted		1.00			1.00	1.00	0.95	1.00				
Satd. Flow (perm)		3539			3539	1458	1630	1500				
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	0	531	0	0	280	140	285	0	120	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	43	0	92	0	0	0	0
Lane Group Flow (vph)	0	531	0	0	280	97	285	28	0	0	0	0
Turn Type		NA			NA	Perm	Perm	NA				
Protected Phases		2			6			8				
Permitted Phases						6	8					
Actuated Green, G (s)		76.5			76.5	76.5	25.7	25.7				
Effective Green, g (s)		76.5			76.5	76.5	25.7	25.7				
Actuated g/C Ratio		0.70			0.70	0.70	0.23	0.23				
Clearance Time (s)		4.0			4.0	4.0	3.8	3.8				
Vehicle Extension (s)		5.0			5.0	5.0	3.0	3.0				
Lane Grp Cap (vph)		2461			2461	1013	380	350				
v/s Ratio Prot		c0.15			0.08			0.02				
v/s Ratio Perm						0.07	c0.17					
v/c Ratio		0.22			0.11	0.10	0.75	0.08				
Uniform Delay, d1		6.0			5.5	5.5	39.2	32.9				
Progression Factor		0.75			1.00	1.00	1.00	1.00				
Incremental Delay, d2		0.2			0.1	0.2	8.1	0.1				
Delay (s)		4.7			5.6	5.7	47.3	33.0				
Level of Service		A			A	A	D	C				
Approach Delay (s)		4.7			5.6			43.0			0.0	
Approach LOS		A			A			D			A	
Intersection Summary												
HCM 2000 Control Delay		16.4			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.35										
Actuated Cycle Length (s)		110.0			Sum of lost time (s)			7.8				
Intersection Capacity Utilization		35.6%			ICU Level of Service			A				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis 3: Tennant Avenue & Condit Road

Existing plus Alternative #4 PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	108	346	138	0	255	16	54	3	5	18	0	77
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	110	353	141	0	260	16	55	3	5	18	0	79
Pedestrians					20							
Lane Width (ft)					12.0							
Walking Speed (ft/s)					4.0							
Percent Blockage					2							
Right turn flare (veh)												
Median type		None			None							
Median storage veh												
Upstream signal (ft)		360										
pX, platoon unblocked				0.93			0.93	0.93	0.93	0.93	0.93	
vC, conflicting volume	277			494			991	920	443	868	983	268
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	277			415			951	875	360	819	942	268
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 %	91			100			70	99	99	93	100	90
cM capacity (veh/h)	1286			1061			186	244	624	246	223	770
Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1							
Volume Total	110	494	277	63	97							
Volume Left	110	0	0	55	18							
Volume Right	0	141	16	5	79							
cSH	1286	1700	1700	200	549							
Volume to Capacity	0.09	0.29	0.16	0.32	0.18							
Queue Length 95th (ft)	7	0	0	32	16							
Control Delay (s)	8.1	0.0	0.0	31.1	13.0							
Lane LOS	A			D	B							
Approach Delay (s)	1.5		0.0	31.1	13.0							
Approach LOS				D	B							
Intersection Summary												
Average Delay			4.0									
Intersection Capacity Utilization			45.0%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis 4: Murphy Avenue & Tennant Avenue

Existing plus Alternative #4 PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	73	181	115	7	150	5	80	25	5	2	37	37
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	87	215	137	8	179	6	95	30	6	2	44	44
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	439	193	131	90								
Volume Left (vph)	87	8	95	2								
Volume Right (vph)	137	6	6	44								
Hadj (s)	-0.11	0.02	0.15	-0.25								
Departure Headway (s)	4.7	5.2	5.8	5.5								
Degree Utilization, x	0.58	0.28	0.21	0.14								
Capacity (veh/h)	734	653	552	572								
Control Delay (s)	13.9	10.1	10.3	9.3								
Approach Delay (s)	13.9	10.1	10.3	9.3								
Approach LOS	B	B	B	A								
Intersection Summary												
Delay				12.0								
Level of Service				B								
Intersection Capacity Utilization				51.9%	ICU Level of Service	A						
Analysis Period (min)				15								

HCM Signalized Intersection Capacity Analysis

1: SB US 101 Ramps & Tennant Avenue

Cumulative + Alternative #1 PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑	↑↑						↑	↑
Volume (vph)	0	1704	767	400	1258	0	0	0	0	580	0	1093
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1800	1750
Total Lost time (s)		4.7	4.0	3.0	4.7						3.5	3.0
Lane Util. Factor		0.95	1.00	1.00	0.95						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)		3539	1458	1630	3539						1676	1458
Flt Permitted		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (perm)		3539	1458	1630	3539						1676	1458
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1794	807	421	1324	0	0	0	0	611	0	1151
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	16
Lane Group Flow (vph)	0	1794	807	421	1324	0	0	0	0	0	611	1135
Turn Type		NA	Free	Prot	NA					Split	NA	custom
Protected Phases		2 10		1	6					4	4	10
Permitted Phases			Free									4
Actuated Green, G (s)		64.3	110.0	9.0	26.3						22.5	72.5
Effective Green, g (s)		64.3	110.0	9.0	26.3						22.5	72.5
Actuated g/C Ratio		0.58	1.00	0.08	0.24						0.20	0.66
Clearance Time (s)				3.0	4.7						3.5	3.0
Vehicle Extension (s)				3.0	2.2						2.5	3.0
Lane Grp Cap (vph)		2068	1458	133	846						342	960
v/s Ratio Prot		0.51		c0.26	c0.37						c0.36	c0.54
v/s Ratio Perm			0.55									0.24
v/c Ratio		0.87	0.55	3.17	1.57						1.79	1.18
Uniform Delay, d1		19.3	0.0	50.5	41.9						43.8	18.8
Progression Factor		1.00	1.00	0.96	1.02						1.00	1.00
Incremental Delay, d2		4.1	1.5	987.7	258.2						365.5	92.8
Delay (s)		23.4	1.5	1036.0	301.0						409.3	111.5
Level of Service		C	A	F	F						F	F
Approach Delay (s)		16.6			478.3			0.0			214.8	
Approach LOS		B			F			A			F	
Intersection Summary												
HCM 2000 Control Delay			205.7			HCM 2000 Level of Service				F		
HCM 2000 Volume to Capacity ratio			1.61									
Actuated Cycle Length (s)			110.0			Sum of lost time (s)			14.2			
Intersection Capacity Utilization			116.6%			ICU Level of Service			H			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis 2: NB US 101 Ramps & Tennant Avenue

Cumulative + Alternative #1 PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑	↑	↑	↑				
Volume (vph)	0	1445	0	0	1015	469	643	0	567	0	0	0
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1800	1750	1750	1900	1750
Total Lost time (s)		4.0			4.0	4.0	3.8	3.8				
Lane Util. Factor		0.95			0.95	1.00	1.00	1.00				
Frt		1.00			1.00	0.85	1.00	0.85				
Flt Protected		1.00			1.00	1.00	0.95	1.00				
Satd. Flow (prot)		3539			3539	1458	1630	1500				
Flt Permitted		1.00			1.00	1.00	0.95	1.00				
Satd. Flow (perm)		3539			3539	1458	1630	1500				
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1521	0	0	1068	494	677	0	597	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	267	0	5	0	0	0	0
Lane Group Flow (vph)	0	1521	0	0	1068	227	677	592	0	0	0	0
Turn Type		NA			NA	Perm	Perm	NA				
Protected Phases		2			6			8				
Permitted Phases						6	8					
Actuated Green, G (s)		50.6			50.6	50.6	51.6	51.6				
Effective Green, g (s)		50.6			50.6	50.6	51.6	51.6				
Actuated g/C Ratio		0.46			0.46	0.46	0.47	0.47				
Clearance Time (s)		4.0			4.0	4.0	3.8	3.8				
Vehicle Extension (s)		5.0			5.0	5.0	3.0	3.0				
Lane Grp Cap (vph)		1627			1627	670	764	703				
v/s Ratio Prot		c0.43			0.30			0.39				
v/s Ratio Perm						0.16	c0.42					
v/c Ratio		0.93			0.66	0.34	0.89	0.84				
Uniform Delay, d1		28.1			23.0	19.0	26.5	25.6				
Progression Factor		1.00			1.00	1.00	1.00	1.00				
Incremental Delay, d2		1.4			2.1	1.4	12.0	9.0				
Delay (s)		29.6			25.1	20.4	38.5	34.6				
Level of Service		C			C	C	D	C				
Approach Delay (s)		29.6			23.6			36.7			0.0	
Approach LOS		C			C			D			A	
Intersection Summary												
HCM 2000 Control Delay		29.5			HCM 2000 Level of Service			C				
HCM 2000 Volume to Capacity ratio		0.91										
Actuated Cycle Length (s)		110.0			Sum of lost time (s)			7.8				
Intersection Capacity Utilization		132.2%			ICU Level of Service			H				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

3: Tennant Avenue & Condit Road

Cumulative + Alternative #1 PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	213	1661	138	13	1209	26	66	4	6	20	8	209
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.98	0.98	0.99	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	217	1695	139	13	1234	27	67	4	6	20	8	213
Pedestrians					20							
Lane Width (ft)					12.0							
Walking Speed (ft/s)					4.0							
Percent Blockage					2							
Right turn flare (veh)												
Median type		None			None							
Median storage veh												
Upstream signal (ft)		360										
pX, platoon unblocked				0.54			0.54	0.54	0.54	0.54	0.54	
vC, conflicting volume	1260			1834			3690	3486	1785	3431	3542	1247
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1260			2121			5568	5189	2029	5087	5293	1247
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 %	61			90			0	0	84	0	0	0
cM capacity (veh/h)	552			138			0	0	38	0	0	212
Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1							
Volume Total	217	1834	1273	78	242							
Volume Left	217	0	13	67	20							
Volume Right	0	139	27	6	213							
cSH	552	1700	138	0	0							
Volume to Capacity	0.39	1.08	0.10	Err	Err							
Queue Length 95th (ft)	47	0	8	Err	Err							
Control Delay (s)	15.7	0.0	12.8	Err	Err							
Lane LOS	C		B	F	F							
Approach Delay (s)	1.7		12.8	Err	Err							
Approach LOS				F	F							
Intersection Summary												
Average Delay			Err									
Intersection Capacity Utilization			184.7%	ICU Level of Service					H			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis 4: Murphy Avenue & Tennant Avenue

Cumulative + Alternative #1 PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	229	594	864	10	456	13	612	46	10	32	70	180
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	241	625	909	11	480	14	644	48	11	34	74	189
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	1776	504	703	297								
Volume Left (vph)	241	11	644	34								
Volume Right (vph)	909	14	11	189								
Hadj (s)	-0.25	0.02	0.21	-0.33								
Departure Headway (s)	8.7	9.0	9.2	9.2								
Degree Utilization, x	4.29	1.26	1.79	0.76								
Capacity (veh/h)	419	408	398	384								
Control Delay (s)	1505.6	161.5	386.9	36.4								
Approach Delay (s)	1505.6	161.5	386.9	36.4								
Approach LOS	F	F	F	E								
Intersection Summary												
Delay				926.2								
Level of Service				F								
Intersection Capacity Utilization				188.9%	ICU Level of Service	H						
Analysis Period (min)				15								

HCM Signalized Intersection Capacity Analysis

1: SB US 101 Ramps & Tennant Avenue

Cumulative + Alternative #2 PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑	↑↑						↑	↑
Volume (vph)	0	1704	767	400	1258	0	0	0	0	580	0	1093
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1800	1750
Total Lost time (s)		4.7	4.0	3.0	4.7						3.5	3.0
Lane Util. Factor		0.95	1.00	1.00	0.95						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)		3539	1458	1630	3539						1676	1458
Flt Permitted		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (perm)		3539	1458	1630	3539						1676	1458
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1794	807	421	1324	0	0	0	0	611	0	1151
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	16
Lane Group Flow (vph)	0	1794	807	421	1324	0	0	0	0	0	611	1135
Turn Type		NA	Free	Prot	NA					Split	NA	custom
Protected Phases		2 10		1	6					4	4	10
Permitted Phases			Free									4
Actuated Green, G (s)		64.3	110.0	9.0	26.3						22.5	72.5
Effective Green, g (s)		64.3	110.0	9.0	26.3						22.5	72.5
Actuated g/C Ratio		0.58	1.00	0.08	0.24						0.20	0.66
Clearance Time (s)				3.0	4.7						3.5	3.0
Vehicle Extension (s)				3.0	2.2						2.5	3.0
Lane Grp Cap (vph)		2068	1458	133	846						342	960
v/s Ratio Prot		0.51		c0.26	c0.37						c0.36	c0.54
v/s Ratio Perm			0.55									0.24
v/c Ratio		0.87	0.55	3.17	1.57						1.79	1.18
Uniform Delay, d1		19.3	0.0	50.5	41.9						43.8	18.8
Progression Factor		1.00	1.00	0.96	1.02						1.00	1.00
Incremental Delay, d2		4.1	1.5	987.7	258.2						365.5	92.8
Delay (s)		23.4	1.5	1036.0	301.0						409.3	111.5
Level of Service		C	A	F	F						F	F
Approach Delay (s)		16.6			478.3			0.0			214.8	
Approach LOS		B			F			A			F	
Intersection Summary												
HCM 2000 Control Delay			205.7			HCM 2000 Level of Service				F		
HCM 2000 Volume to Capacity ratio			1.61									
Actuated Cycle Length (s)			110.0			Sum of lost time (s)			14.2			
Intersection Capacity Utilization			116.6%			ICU Level of Service			H			
Analysis Period (min)			15									
c Critical Lane Group												

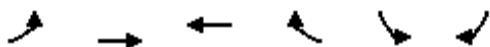
HCM Signalized Intersection Capacity Analysis 2: NB US 101 Ramps & Tennant Avenue

Cumulative + Alternative #2 PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑	↑	↑	↑				
Volume (vph)	0	1445	0	0	1015	469	643	0	567	0	0	0
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1800	1750	1750	1900	1750
Total Lost time (s)		4.0			4.0	4.0	3.8	3.8				
Lane Util. Factor		0.95			0.95	1.00	1.00	1.00				
Frt		1.00			1.00	0.85	1.00	0.85				
Flt Protected		1.00			1.00	1.00	0.95	1.00				
Satd. Flow (prot)		3539			3539	1458	1630	1500				
Flt Permitted		1.00			1.00	1.00	0.95	1.00				
Satd. Flow (perm)		3539			3539	1458	1630	1500				
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1521	0	0	1068	494	677	0	597	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	267	0	5	0	0	0	0
Lane Group Flow (vph)	0	1521	0	0	1068	227	677	592	0	0	0	0
Turn Type		NA			NA	Perm	Perm	NA				
Protected Phases		2			6			8				
Permitted Phases						6	8					
Actuated Green, G (s)		50.6			50.6	50.6	51.6	51.6				
Effective Green, g (s)		50.6			50.6	50.6	51.6	51.6				
Actuated g/C Ratio		0.46			0.46	0.46	0.47	0.47				
Clearance Time (s)		4.0			4.0	4.0	3.8	3.8				
Vehicle Extension (s)		5.0			5.0	5.0	3.0	3.0				
Lane Grp Cap (vph)		1627			1627	670	764	703				
v/s Ratio Prot		c0.43			0.30			0.39				
v/s Ratio Perm						0.16	c0.42					
v/c Ratio		0.93			0.66	0.34	0.89	0.84				
Uniform Delay, d1		28.1			23.0	19.0	26.5	25.6				
Progression Factor		1.00			1.00	1.00	1.00	1.00				
Incremental Delay, d2		1.4			2.1	1.4	12.0	9.0				
Delay (s)		29.6			25.1	20.4	38.5	34.6				
Level of Service		C			C	C	D	C				
Approach Delay (s)		29.6			23.6			36.7			0.0	
Approach LOS		C			C			D			A	
Intersection Summary												
HCM 2000 Control Delay		29.5			HCM 2000 Level of Service			C				
HCM 2000 Volume to Capacity ratio		0.91										
Actuated Cycle Length (s)		110.0			Sum of lost time (s)			7.8				
Intersection Capacity Utilization		132.2%			ICU Level of Service			H				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis 3: Tennant Avenue & Condit Road

Cumulative + Alternative #2 PM



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	213	1799	1275	30	28	209
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	217	1836	1301	31	29	213
Pedestrians			20			
Lane Width (ft)			12.0			
Walking Speed (ft/s)			4.0			
Percent Blockage			2			
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		360				
pX, platoon unblocked					0.54	
vC, conflicting volume	1332				3607	1316
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1332				5413	1316
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	58				0	0
cM capacity (veh/h)	518				0	193
Direction, Lane #	EB 1	EB 2	WB 1	SB 1		
Volume Total	217	1836	1332	242		
Volume Left	217	0	0	29		
Volume Right	0	0	31	213		
cSH	518	1700	1700	1		
Volume to Capacity	0.42	1.08	0.78	267.19		
Queue Length 95th (ft)	51	0	0	Err		
Control Delay (s)	16.9	0.0	0.0	Err		
Lane LOS	C			F		
Approach Delay (s)	1.8		0.0	Err		
Approach LOS				F		
Intersection Summary						
Average Delay			667.8			
Intersection Capacity Utilization			115.8%		ICU Level of Service	H
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis 4: Murphy Avenue & Tennant Avenue

Cumulative + Alternative #2 PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	226	592	1009	15	451	13	680	49	12	32	76	174
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	238	623	1062	16	475	14	716	52	13	34	80	183
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	1923	504	780	297								
Volume Left (vph)	238	16	716	34								
Volume Right (vph)	1062	14	13	183								
Hadj (s)	-0.27	0.02	0.21	-0.31								
Departure Headway (s)	8.7	9.0	9.2	9.3								
Degree Utilization, x	4.64	1.26	1.99	0.76								
Capacity (veh/h)	420	407	399	383								
Control Delay (s)	1660.0	161.8	473.2	36.5								
Approach Delay (s)	1660.0	161.8	473.2	36.5								
Approach LOS	F	F	F	E								
Intersection Summary												
Delay			1042.7									
Level of Service			F									
Intersection Capacity Utilization			201.6%	ICU Level of Service		H						
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

Cumulative + Alternative #3 PM

1: SB US 101 Ramps & Tennant Avenue

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑	↑↑						↑	↑
Volume (vph)	0	1704	767	400	1258	0	0	0	0	580	0	1093
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1800	1750
Total Lost time (s)		4.7	4.0	3.0	4.7						3.5	3.0
Lane Util. Factor		0.95	1.00	1.00	0.95						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)		3539	1458	1630	3539						1676	1458
Flt Permitted		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (perm)		3539	1458	1630	3539						1676	1458
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1794	807	421	1324	0	0	0	0	611	0	1151
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	16
Lane Group Flow (vph)	0	1794	807	421	1324	0	0	0	0	0	611	1135
Turn Type		NA	Free	Prot	NA					Split	NA	custom
Protected Phases		2 10		1	6					4	4	10
Permitted Phases			Free									4
Actuated Green, G (s)		64.3	110.0	9.0	26.3						22.5	72.5
Effective Green, g (s)		64.3	110.0	9.0	26.3						22.5	72.5
Actuated g/C Ratio		0.58	1.00	0.08	0.24						0.20	0.66
Clearance Time (s)				3.0	4.7						3.5	3.0
Vehicle Extension (s)				3.0	2.2						2.5	3.0
Lane Grp Cap (vph)		2068	1458	133	846						342	960
v/s Ratio Prot		0.51		c0.26	c0.37						c0.36	c0.54
v/s Ratio Perm			0.55									0.24
v/c Ratio		0.87	0.55	3.17	1.57						1.79	1.18
Uniform Delay, d1		19.3	0.0	50.5	41.9						43.8	18.8
Progression Factor		1.00	1.00	0.96	1.02						1.00	1.00
Incremental Delay, d2		4.1	1.5	987.7	258.2						365.5	92.8
Delay (s)		23.4	1.5	1036.0	301.0						409.3	111.5
Level of Service		C	A	F	F						F	F
Approach Delay (s)		16.6			478.3			0.0			214.8	
Approach LOS		B			F			A			F	
Intersection Summary												
HCM 2000 Control Delay			205.7			HCM 2000 Level of Service					F	
HCM 2000 Volume to Capacity ratio			1.61									
Actuated Cycle Length (s)			110.0			Sum of lost time (s)				14.2		
Intersection Capacity Utilization			116.6%			ICU Level of Service				H		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis 2: NB US 101 Ramps & Tennant Avenue

Cumulative + Alternative #3 PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑	↑	↑	↑				
Volume (vph)	0	1445	0	0	1015	469	643	0	567	0	0	0
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1800	1750	1750	1900	1750
Total Lost time (s)		4.0			4.0	4.0	3.8	3.8				
Lane Util. Factor		0.95			0.95	1.00	1.00	1.00				
Frt		1.00			1.00	0.85	1.00	0.85				
Flt Protected		1.00			1.00	1.00	0.95	1.00				
Satd. Flow (prot)		3539			3539	1458	1630	1500				
Flt Permitted		1.00			1.00	1.00	0.95	1.00				
Satd. Flow (perm)		3539			3539	1458	1630	1500				
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1521	0	0	1068	494	677	0	597	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	267	0	5	0	0	0	0
Lane Group Flow (vph)	0	1521	0	0	1068	227	677	592	0	0	0	0
Turn Type		NA			NA	Perm	Perm	NA				
Protected Phases		2			6			8				
Permitted Phases						6	8					
Actuated Green, G (s)		50.6			50.6	50.6	51.6	51.6				
Effective Green, g (s)		50.6			50.6	50.6	51.6	51.6				
Actuated g/C Ratio		0.46			0.46	0.46	0.47	0.47				
Clearance Time (s)		4.0			4.0	4.0	3.8	3.8				
Vehicle Extension (s)		5.0			5.0	5.0	3.0	3.0				
Lane Grp Cap (vph)		1627			1627	670	764	703				
v/s Ratio Prot		c0.43			0.30			0.39				
v/s Ratio Perm						0.16	c0.42					
v/c Ratio		0.93			0.66	0.34	0.89	0.84				
Uniform Delay, d1		28.1			23.0	19.0	26.5	25.6				
Progression Factor		1.00			1.00	1.00	1.00	1.00				
Incremental Delay, d2		1.4			2.1	1.4	12.0	9.0				
Delay (s)		29.6			25.1	20.4	38.5	34.6				
Level of Service		C			C	C	D	C				
Approach Delay (s)		29.6			23.6			36.7			0.0	
Approach LOS		C			C			D			A	
Intersection Summary												
HCM 2000 Control Delay		29.5			HCM 2000 Level of Service			C				
HCM 2000 Volume to Capacity ratio		0.91										
Actuated Cycle Length (s)		110.0			Sum of lost time (s)			7.8				
Intersection Capacity Utilization		132.2%			ICU Level of Service			H				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

3: Tennant Avenue & Condit Road

Cumulative + Alternative #3 PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	213	1661	138	0	1275	30	0	0	0	28	0	209
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	217	1695	141	0	1301	31	0	0	0	29	0	213
Pedestrians					20							
Lane Width (ft)					12.0							
Walking Speed (ft/s)					4.0							
Percent Blockage					2							
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		360										
pX, platoon unblocked				0.54			0.54	0.54	0.54	0.54	0.54	
vC, conflicting volume	1332			1836			3730	3532	1785	3466	3587	1316
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1332			2124			5641	5274	2030	5152	5376	1316
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 %	58			100			0	100	100	0	100	0
cM capacity (veh/h)	518			138			0	0	38	0	0	193
Direction, Lane #	EB 1	EB 2	WB 1	SB 1								
Volume Total	217	1836	1332	242								
Volume Left	217	0	0	29								
Volume Right	0	141	31	213								
cSH	518	1700	138	1								
Volume to Capacity	0.42	1.08	0.00	412.80								
Queue Length 95th (ft)	51	0	0	Err								
Control Delay (s)	16.9	0.0	0.0	Err								
Lane LOS	C			F								
Approach Delay (s)	1.8		0.0	Err								
Approach LOS				F								
Intersection Summary												
Average Delay			667.8									
Intersection Capacity Utilization			189.2%		ICU Level of Service				H			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis 4: Murphy Avenue & Tennant Avenue

Cumulative + Alternative #3 PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	226	592	871	15	451	13	680	49	12	28	70	174
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	238	623	917	16	475	14	716	52	13	29	74	183
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	1778	504	780	286								
Volume Left (vph)	238	16	716	29								
Volume Right (vph)	917	14	13	183								
Hadj (s)	-0.25	0.02	0.21	-0.33								
Departure Headway (s)	8.6	8.9	9.1	9.2								
Degree Utilization, x	4.26	1.25	1.97	0.73								
Capacity (veh/h)	422	411	402	383								
Control Delay (s)	1491.6	157.5	466.0	33.9								
Approach Delay (s)	1491.6	157.5	466.0	33.9								
Approach LOS	F	F	F	D								
Intersection Summary												
Delay			927.1									
Level of Service			F									
Intersection Capacity Utilization			192.6%	ICU Level of Service					H			
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

Cumulative + Alternative #4 PM

1: SB US 101 Ramps & Tennant Avenue

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑	↑↑						↑	↑
Volume (vph)	0	1704	767	400	1258	0	0	0	0	580	0	1093
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1800	1750
Total Lost time (s)		4.7	4.0	3.0	4.7						3.5	3.0
Lane Util. Factor		0.95	1.00	1.00	0.95						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)		3539	1458	1630	3539						1676	1458
Flt Permitted		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (perm)		3539	1458	1630	3539						1676	1458
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1794	807	421	1324	0	0	0	0	611	0	1151
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	16
Lane Group Flow (vph)	0	1794	807	421	1324	0	0	0	0	0	611	1135
Turn Type		NA	Free	Prot	NA					Split	NA	custom
Protected Phases		2 10		1	6					4	4	10
Permitted Phases			Free									4
Actuated Green, G (s)		64.3	110.0	9.0	26.3						22.5	72.5
Effective Green, g (s)		64.3	110.0	9.0	26.3						22.5	72.5
Actuated g/C Ratio		0.58	1.00	0.08	0.24						0.20	0.66
Clearance Time (s)				3.0	4.7						3.5	3.0
Vehicle Extension (s)				3.0	2.2						2.5	3.0
Lane Grp Cap (vph)		2068	1458	133	846						342	960
v/s Ratio Prot		0.51		c0.26	c0.37						c0.36	c0.54
v/s Ratio Perm			0.55									0.24
v/c Ratio		0.87	0.55	3.17	1.57						1.79	1.18
Uniform Delay, d1		19.3	0.0	50.5	41.9						43.8	18.8
Progression Factor		1.00	1.00	0.96	1.02						1.00	1.00
Incremental Delay, d2		4.1	1.5	987.7	258.2						365.5	92.8
Delay (s)		23.4	1.5	1036.0	301.0						409.3	111.5
Level of Service		C	A	F	F						F	F
Approach Delay (s)		16.6			478.3			0.0			214.8	
Approach LOS		B			F			A			F	
Intersection Summary												
HCM 2000 Control Delay			205.7			HCM 2000 Level of Service				F		
HCM 2000 Volume to Capacity ratio			1.61									
Actuated Cycle Length (s)			110.0			Sum of lost time (s)			14.2			
Intersection Capacity Utilization			116.6%			ICU Level of Service			H			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis 2: NB US 101 Ramps & Tennant Avenue

Cumulative + Alternative #4 PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑	↑	↑	↑				
Volume (vph)	0	1445	0	0	1015	469	643	0	567	0	0	0
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1800	1750	1750	1900	1750
Total Lost time (s)		4.0			4.0	4.0	3.8	3.8				
Lane Util. Factor		0.95			0.95	1.00	1.00	1.00				
Frt		1.00			1.00	0.85	1.00	0.85				
Flt Protected		1.00			1.00	1.00	0.95	1.00				
Satd. Flow (prot)		3539			3539	1458	1630	1500				
Flt Permitted		1.00			1.00	1.00	0.95	1.00				
Satd. Flow (perm)		3539			3539	1458	1630	1500				
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1521	0	0	1068	494	677	0	597	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	267	0	5	0	0	0	0
Lane Group Flow (vph)	0	1521	0	0	1068	227	677	592	0	0	0	0
Turn Type		NA			NA	Perm	Perm	NA				
Protected Phases		2			6			8				
Permitted Phases						6	8					
Actuated Green, G (s)		50.6			50.6	50.6	51.6	51.6				
Effective Green, g (s)		50.6			50.6	50.6	51.6	51.6				
Actuated g/C Ratio		0.46			0.46	0.46	0.47	0.47				
Clearance Time (s)		4.0			4.0	4.0	3.8	3.8				
Vehicle Extension (s)		5.0			5.0	5.0	3.0	3.0				
Lane Grp Cap (vph)		1627			1627	670	764	703				
v/s Ratio Prot		c0.43			0.30			0.39				
v/s Ratio Perm						0.16	c0.42					
v/c Ratio		0.93			0.66	0.34	0.89	0.84				
Uniform Delay, d1		28.1			23.0	19.0	26.5	25.6				
Progression Factor		1.00			1.00	1.00	1.00	1.00				
Incremental Delay, d2		1.4			2.1	1.4	12.0	9.0				
Delay (s)		29.6			25.1	20.4	38.5	34.6				
Level of Service		C			C	C	D	C				
Approach Delay (s)		29.6			23.6			36.7			0.0	
Approach LOS		C			C			D			A	
Intersection Summary												
HCM 2000 Control Delay		29.5			HCM 2000 Level of Service			C				
HCM 2000 Volume to Capacity ratio		0.91										
Actuated Cycle Length (s)		110.0			Sum of lost time (s)			7.8				
Intersection Capacity Utilization		132.2%			ICU Level of Service			H				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis 3: Tennant Avenue & Condit Road

Cumulative + Alternative #4 PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	213	1661	138	0	1221	27	54	3	5	28	0	209
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	217	1695	141	0	1246	28	55	3	5	29	0	213
Pedestrians					20							
Lane Width (ft)					12.0							
Walking Speed (ft/s)					4.0							
Percent Blockage					2							
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		360										
pX, platoon unblocked				0.54			0.54	0.54	0.54	0.54	0.54	
vC, conflicting volume	1273			1836			3673	3473	1785	3416	3530	1260
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1273			2124			5536	5166	2030	5059	5271	1260
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 %	60			100			0	0	87	0	100	0
cM capacity (veh/h)	545			138			0	0	38	0	0	208
Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1							
Volume Total	217	1836	1273	63	242							
Volume Left	217	0	0	55	29							
Volume Right	0	141	28	5	213							
cSH	545	1700	1700	0	0							
Volume to Capacity	0.40	1.08	0.75	Err	Err							
Queue Length 95th (ft)	47	0	0	Err	Err							
Control Delay (s)	15.9	0.0	0.0	Err	Err							
Lane LOS	C			F	F							
Approach Delay (s)	1.7		0.0	Err	Err							
Approach LOS				F	F							
Intersection Summary												
Average Delay			Err									
Intersection Capacity Utilization		119.2%		ICU Level of Service		H						
Analysis Period (min)		15										

HCM Unsignalized Intersection Capacity Analysis 4: Murphy Avenue & Tennant Avenue

Cumulative + Alternative #4 PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	229	594	871	15	449	13	625	46	10	32	76	174
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	241	625	917	16	473	14	658	48	11	34	80	183
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	1783	502	717	297								
Volume Left (vph)	241	16	658	34								
Volume Right (vph)	917	14	11	183								
Hadj (s)	-0.25	0.02	0.21	-0.31								
Departure Headway (s)	8.7	9.0	9.2	9.3								
Degree Utilization, x	4.31	1.25	1.82	0.76								
Capacity (veh/h)	418	407	398	383								
Control Delay (s)	1513.9	159.7	402.5	36.5								
Approach Delay (s)	1513.9	159.7	402.5	36.5								
Approach LOS	F	F	F	E								
Intersection Summary												
Delay				933.4								
Level of Service				F								
Intersection Capacity Utilization				189.9%	ICU Level of Service							H
Analysis Period (min)				15								

HCM Signalized Intersection Capacity Analysis

Existing Saturday MIDDAY

1: SB US 101 Ramps & Tennant Avenue

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑	↑↑						↑	↑
Volume (vph)	0	574	331	55	383	0	0	0	0	83	1	563
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1800	1750
Total Lost time (s)		4.7	4.0	3.0	4.7						3.5	3.0
Lane Util. Factor		0.95	1.00	1.00	0.95						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)		3539	1458	1630	3539						1682	1458
Flt Permitted		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (perm)		3539	1458	1630	3539						1682	1458
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	0	652	376	62	435	0	0	0	0	94	1	640
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	143
Lane Group Flow (vph)	0	652	376	62	435	0	0	0	0	0	95	497
Turn Type		NA	Free	Prot	NA					Split	NA	custom
Protected Phases		2 10		1	6					4	4	10
Permitted Phases			Free									4
Actuated Green, G (s)		22.9	44.5	2.2	15.5						5.2	17.8
Effective Green, g (s)		22.9	44.5	2.2	15.5						5.2	17.8
Actuated g/C Ratio		0.51	1.00	0.05	0.35						0.12	0.40
Clearance Time (s)				3.0	4.7						3.5	3.0
Vehicle Extension (s)				3.0	2.2						2.5	2.5
Lane Grp Cap (vph)		1821	1458	80	1232						196	583
v/s Ratio Prot		0.18		c0.04	c0.12						0.06	c0.24
v/s Ratio Perm			0.26									0.10
v/c Ratio		0.36	0.26	0.78	0.35						0.48	0.85
Uniform Delay, d1		6.4	0.0	20.9	10.8						18.4	12.1
Progression Factor		1.00	1.00	1.00	1.00						1.00	1.00
Incremental Delay, d2		0.1	0.4	36.4	0.1						1.4	11.4
Delay (s)		6.5	0.4	57.3	10.9						19.8	23.5
Level of Service		A	A	E	B						B	C
Approach Delay (s)		4.3			16.7			0.0			23.0	
Approach LOS		A			B			A			C	
Intersection Summary												
HCM 2000 Control Delay			13.1			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.71									
Actuated Cycle Length (s)			44.5			Sum of lost time (s)			14.2			
Intersection Capacity Utilization			55.7%			ICU Level of Service			B			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis 2: NB US 101 Ramps & Tennant Avenue

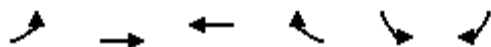
Existing Saturday MIDDAY

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑	↑	↑	↑				
Volume (vph)	0	332	0	0	218	96	220	0	114	0	0	0
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1800	1750	1750	1900	1750
Total Lost time (s)		4.0			4.0	4.0	3.8	3.8				
Lane Util. Factor		0.95			0.95	1.00	1.00	1.00				
Frt		1.00			1.00	0.85	1.00	0.85				
Flt Protected		1.00			1.00	1.00	0.95	1.00				
Satd. Flow (prot)		3539			3539	1458	1630	1500				
Flt Permitted		1.00			1.00	1.00	0.95	1.00				
Satd. Flow (perm)		3539			3539	1458	1630	1500				
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	0	377	0	0	248	109	250	0	130	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	66	0	86	0	0	0	0
Lane Group Flow (vph)	0	377	0	0	248	43	250	44	0	0	0	0
Turn Type		NA			NA	Perm	Perm	NA				
Protected Phases		2			6			8				
Permitted Phases						6	8					
Actuated Green, G (s)		11.8			11.8	11.8	10.2	10.2				
Effective Green, g (s)		11.8			11.8	11.8	10.2	10.2				
Actuated g/C Ratio		0.40			0.40	0.40	0.34	0.34				
Clearance Time (s)		4.0			4.0	4.0	3.8	3.8				
Vehicle Extension (s)		5.0			5.0	5.0	3.0	3.0				
Lane Grp Cap (vph)		1401			1401	577	557	513				
v/s Ratio Prot		c0.11			0.07			0.03				
v/s Ratio Perm						0.03	c0.15					
v/c Ratio		0.27			0.18	0.07	0.45	0.09				
Uniform Delay, d1		6.1			5.8	5.6	7.6	6.6				
Progression Factor		1.00			1.00	1.00	1.00	1.00				
Incremental Delay, d2		0.2			0.1	0.1	0.6	0.1				
Delay (s)		6.3			6.0	5.7	8.2	6.7				
Level of Service		A			A	A	A	A				
Approach Delay (s)		6.3			5.9			7.7			0.0	
Approach LOS		A			A			A			A	
Intersection Summary												
HCM 2000 Control Delay			6.6									
HCM 2000 Volume to Capacity ratio			0.35									
Actuated Cycle Length (s)			29.8									
Intersection Capacity Utilization			29.1%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

3: Tennant Avenue & Condit Road

Existing Saturday MIDDAY



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	147	299	213	13	9	101
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	167	340	242	15	10	115
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (ft)		360				
pX, platoon unblocked					0.96	
vC, conflicting volume	257				923	249
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	257				899	249
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	87				96	85
cM capacity (veh/h)	1308				259	789
Direction, Lane #	EB 1	EB 2	WB 1	SB 1		
Volume Total	167	340	257	125		
Volume Left	167	0	0	10		
Volume Right	0	0	15	115		
cSH	1308	1700	1700	676		
Volume to Capacity	0.13	0.20	0.15	0.18		
Queue Length 95th (ft)	11	0	0	17		
Control Delay (s)	8.2	0.0	0.0	11.5		
Lane LOS	A			B		
Approach Delay (s)	2.7		0.0	11.5		
Approach LOS				B		
Intersection Summary						
Average Delay			3.2			
Intersection Capacity Utilization			36.9%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis 4: Murphy Avenue & Tennant Avenue

Existing Saturday Midday

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	61	155	93	2	121	4	53	20	4	2	25	43
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	69	176	106	2	138	5	60	23	5	2	28	49
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	351	144	88	80								
Volume Left (vph)	69	2	60	2								
Volume Right (vph)	106	5	5	49								
Hadj (s)	-0.11	0.02	0.14	-0.33								
Departure Headway (s)	4.4	4.8	5.3	4.9								
Degree Utilization, x	0.43	0.19	0.13	0.11								
Capacity (veh/h)	780	711	613	659								
Control Delay (s)	10.7	8.9	9.1	8.4								
Approach Delay (s)	10.7	8.9	9.1	8.4								
Approach LOS	B	A	A	A								
Intersection Summary												
Delay				9.8								
Level of Service				A								
Intersection Capacity Utilization				44.8%	ICU Level of Service	A						
Analysis Period (min)				15								

HCM Signalized Intersection Capacity Analysis Existing plus Alternative #1 Saturday Middy 1: SB US 101 Ramps & Tennant Avenue

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑	↑↑						↑	↑
Volume (vph)	0	596	331	81	404	0	0	0	0	240	1	563
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1800	1750
Total Lost time (s)		4.7	4.0	3.0	4.7						3.5	3.0
Lane Util. Factor		0.95	1.00	1.00	0.95						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)		3539	1458	1630	3539						1681	1458
Flt Permitted		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (perm)		3539	1458	1630	3539						1681	1458
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	0	677	376	92	459	0	0	0	0	273	1	640
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	116
Lane Group Flow (vph)	0	677	376	92	459	0	0	0	0	0	274	524
Turn Type		NA	Free	Prot	NA					Split	NA	custom
Protected Phases		2 10		1	6					4	4	10
Permitted Phases			Free									4
Actuated Green, G (s)		19.1	47.4	3.8	16.3						10.3	19.9
Effective Green, g (s)		19.1	47.4	3.8	16.3						10.3	19.9
Actuated g/C Ratio		0.40	1.00	0.08	0.34						0.22	0.42
Clearance Time (s)				3.0	4.7						3.5	3.0
Vehicle Extension (s)				3.0	2.2						2.5	2.5
Lane Grp Cap (vph)		1426	1458	130	1216						365	612
v/s Ratio Prot		0.19		c0.06	c0.13						0.16	c0.17
v/s Ratio Perm			0.26									0.19
v/c Ratio		0.47	0.26	0.71	0.38						0.75	0.86
Uniform Delay, d1		10.4	0.0	21.3	11.7						17.3	12.5
Progression Factor		1.00	1.00	1.00	1.00						1.00	1.00
Incremental Delay, d2		0.1	0.4	16.1	0.1						8.0	11.2
Delay (s)		10.6	0.4	37.4	11.8						25.4	23.6
Level of Service		B	A	D	B						C	C
Approach Delay (s)		7.0			16.1			0.0			24.2	
Approach LOS		A			B			A			C	
Intersection Summary												
HCM 2000 Control Delay			15.2			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.73									
Actuated Cycle Length (s)			47.4			Sum of lost time (s)				14.2		
Intersection Capacity Utilization			56.3%			ICU Level of Service				B		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis Existing plus Alternative #1 Saturday MIDDAY 2: NB US 101 Ramps & Tennant Avenue

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑	↑	↑	↑				
Volume (vph)	0	511	0	0	265	248	220	0	141	0	0	0
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1800	1750	1750	1900	1750
Total Lost time (s)		4.0			4.0	4.0	3.8	3.8				
Lane Util. Factor		0.95			0.95	1.00	1.00	1.00				
Frt		1.00			1.00	0.85	1.00	0.85				
Flt Protected		1.00			1.00	1.00	0.95	1.00				
Satd. Flow (prot)		3539			3539	1458	1630	1500				
Flt Permitted		1.00			1.00	1.00	0.95	1.00				
Satd. Flow (perm)		3539			3539	1458	1630	1500				
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	0	581	0	0	301	282	250	0	160	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	161	0	107	0	0	0	0
Lane Group Flow (vph)	0	581	0	0	301	121	250	53	0	0	0	0
Turn Type		NA			NA	Perm	Perm	NA				
Protected Phases		2			6			8				
Permitted Phases						6	8					
Actuated Green, G (s)		13.9			13.9	13.9	10.6	10.6				
Effective Green, g (s)		13.9			13.9	13.9	10.6	10.6				
Actuated g/C Ratio		0.43			0.43	0.43	0.33	0.33				
Clearance Time (s)		4.0			4.0	4.0	3.8	3.8				
Vehicle Extension (s)		5.0			5.0	5.0	3.0	3.0				
Lane Grp Cap (vph)		1522			1522	627	534	492				
v/s Ratio Prot		c0.16			0.09			0.04				
v/s Ratio Perm						0.08	c0.15					
v/c Ratio		0.38			0.20	0.19	0.47	0.11				
Uniform Delay, d1		6.3			5.7	5.7	8.6	7.6				
Progression Factor		1.00			1.00	1.00	1.00	1.00				
Incremental Delay, d2		0.3			0.1	0.3	0.7	0.1				
Delay (s)		6.6			5.9	6.0	9.3	7.7				
Level of Service		A			A	A	A	A				
Approach Delay (s)		6.6			5.9			8.6			0.0	
Approach LOS		A			A			A			A	
Intersection Summary												
HCM 2000 Control Delay		6.9			HCM 2000 Level of Service			A				
HCM 2000 Volume to Capacity ratio		0.42										
Actuated Cycle Length (s)		32.3			Sum of lost time (s)			7.8				
Intersection Capacity Utilization		36.6%			ICU Level of Service			A				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis Existing plus Alternative #1 Saturday Midday 3: Tennant Avenue & Condit Road

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	147	299	206	19	213	13	199	12	19	9	12	101
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	167	340	234	22	242	15	226	14	22	10	14	115
Pedestrians					50							
Lane Width (ft)					12.0							
Walking Speed (ft/s)					4.0							
Percent Blockage					4							
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		360										
pX, platoon unblocked				0.84			0.84	0.84	0.84	0.84	0.84	
vC, conflicting volume	257			574			1205	1091	507	1045	1201	249
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	257			396			1149	1012	316	958	1143	249
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 %	87			98			0	92	96	93	90	85
cM capacity (veh/h)	1308			975			104	171	582	153	143	789
Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1							
Volume Total	167	574	278	261	139							
Volume Left	167	0	22	226	10							
Volume Right	0	234	15	22	115							
cSH	1308	1700	975	114	451							
Volume to Capacity	0.13	0.34	0.02	2.30	0.31							
Queue Length 95th (ft)	11	0	2	569	32							
Control Delay (s)	8.2	0.0	0.9	671.1	16.5							
Lane LOS	A		A	F	C							
Approach Delay (s)	1.8		0.9	671.1	16.5							
Approach LOS				F	C							
Intersection Summary												
Average Delay			126.3									
Intersection Capacity Utilization			71.2%		ICU Level of Service				C			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis Existing plus Alternative #1 Saturday Midday4: Murphy Avenue & Tennant Avenue

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	71	162	95	2	128	4	55	22	4	2	27	53
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	81	184	108	2	145	5	62	25	5	2	31	60
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	373	152	92	93								
Volume Left (vph)	81	2	63	2								
Volume Right (vph)	108	5	5	60								
Hadj (s)	-0.10	0.02	0.14	-0.35								
Departure Headway (s)	4.5	4.9	5.4	4.9								
Degree Utilization, x	0.47	0.21	0.14	0.13								
Capacity (veh/h)	765	695	597	646								
Control Delay (s)	11.3	9.1	9.3	8.7								
Approach Delay (s)	11.3	9.1	9.3	8.7								
Approach LOS	B	A	A	A								
Intersection Summary												
Delay				10.2								
Level of Service				B								
Intersection Capacity Utilization				46.4%	ICU Level of Service	A						
Analysis Period (min)				15								

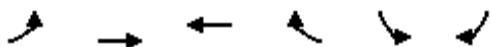
HCM Signalized Intersection Capacity Analysis Existing plus Alternative #2 Saturday Midday 1: SB US 101 Ramps & Tennant Avenue

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑	↑↑						↑	↑
Volume (vph)	0	596	331	81	404	0	0	0	0	240	1	563
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1800	1750
Total Lost time (s)		4.7	4.0	3.0	4.7						3.5	3.0
Lane Util. Factor		0.95	1.00	1.00	0.95						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)		3539	1458	1630	3539						1681	1458
Flt Permitted		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (perm)		3539	1458	1630	3539						1681	1458
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	0	677	376	92	459	0	0	0	0	273	1	640
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	116
Lane Group Flow (vph)	0	677	376	92	459	0	0	0	0	0	274	524
Turn Type		NA	Free	Prot	NA					Split	NA	custom
Protected Phases		2 10		1	6					4	4	10
Permitted Phases			Free									4
Actuated Green, G (s)		19.1	47.4	3.8	16.3						10.3	19.9
Effective Green, g (s)		19.1	47.4	3.8	16.3						10.3	19.9
Actuated g/C Ratio		0.40	1.00	0.08	0.34						0.22	0.42
Clearance Time (s)				3.0	4.7						3.5	3.0
Vehicle Extension (s)				3.0	2.2						2.5	2.5
Lane Grp Cap (vph)		1426	1458	130	1216						365	612
v/s Ratio Prot		0.19		c0.06	c0.13						0.16	c0.17
v/s Ratio Perm			0.26									0.19
v/c Ratio		0.47	0.26	0.71	0.38						0.75	0.86
Uniform Delay, d1		10.4	0.0	21.3	11.7						17.3	12.5
Progression Factor		1.00	1.00	1.00	1.00						1.00	1.00
Incremental Delay, d2		0.1	0.4	16.1	0.1						8.0	11.2
Delay (s)		10.6	0.4	37.4	11.8						25.4	23.6
Level of Service		B	A	D	B						C	C
Approach Delay (s)		7.0			16.1			0.0			24.2	
Approach LOS		A			B			A			C	
Intersection Summary												
HCM 2000 Control Delay			15.2			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.73									
Actuated Cycle Length (s)			47.4			Sum of lost time (s)				14.2		
Intersection Capacity Utilization			56.3%			ICU Level of Service				B		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis Existing plus Alternative #2 Saturday Middyay 2: NB US 101 Ramps & Tennant Avenue

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑	↑	↑	↑				
Volume (vph)	0	511	0	0	265	248	220	0	141	0	0	0
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1800	1750	1750	1900	1750
Total Lost time (s)		4.0			4.0	4.0	3.8	3.8				
Lane Util. Factor		0.95			0.95	1.00	1.00	1.00				
Frt		1.00			1.00	0.85	1.00	0.85				
Flt Protected		1.00			1.00	1.00	0.95	1.00				
Satd. Flow (prot)		3539			3539	1458	1630	1500				
Flt Permitted		1.00			1.00	1.00	0.95	1.00				
Satd. Flow (perm)		3539			3539	1458	1630	1500				
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	0	581	0	0	301	282	250	0	160	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	161	0	107	0	0	0	0
Lane Group Flow (vph)	0	581	0	0	301	121	250	53	0	0	0	0
Turn Type		NA			NA	Perm	Perm	NA				
Protected Phases		2			6			8				
Permitted Phases						6	8					
Actuated Green, G (s)		13.9			13.9	13.9	10.6	10.6				
Effective Green, g (s)		13.9			13.9	13.9	10.6	10.6				
Actuated g/C Ratio		0.43			0.43	0.43	0.33	0.33				
Clearance Time (s)		4.0			4.0	4.0	3.8	3.8				
Vehicle Extension (s)		5.0			5.0	5.0	3.0	3.0				
Lane Grp Cap (vph)		1522			1522	627	534	492				
v/s Ratio Prot		c0.16			0.09			0.04				
v/s Ratio Perm						0.08	c0.15					
v/c Ratio		0.38			0.20	0.19	0.47	0.11				
Uniform Delay, d1		6.3			5.7	5.7	8.6	7.6				
Progression Factor		1.00			1.00	1.00	1.00	1.00				
Incremental Delay, d2		0.3			0.1	0.3	0.7	0.1				
Delay (s)		6.6			5.9	6.0	9.3	7.7				
Level of Service		A			A	A	A	A				
Approach Delay (s)		6.6			5.9			8.6			0.0	
Approach LOS		A			A			A			A	
Intersection Summary												
HCM 2000 Control Delay		6.9			HCM 2000 Level of Service			A				
HCM 2000 Volume to Capacity ratio		0.42										
Actuated Cycle Length (s)		32.3			Sum of lost time (s)			7.8				
Intersection Capacity Utilization		36.6%			ICU Level of Service			A				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis Existing plus Alternative #2 Saturday MIDDAY 3: Tennant Avenue & Condit Road



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	147	505	412	25	21	101
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	167	574	468	28	24	115
Pedestrians			50			
Lane Width (ft)			12.0			
Walking Speed (ft/s)			4.0			
Percent Blockage			4			
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		360				
pX, platoon unblocked					0.84	
vC, conflicting volume	497				1440	482
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	497				1429	482
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	84				76	80
cM capacity (veh/h)	1067				101	584
Direction, Lane #	EB 1	EB 2	WB 1	SB 1		
Volume Total	167	574	497	139		
Volume Left	167	0	0	24		
Volume Right	0	0	28	115		
cSH	1067	1700	1700	320		
Volume to Capacity	0.16	0.34	0.29	0.43		
Queue Length 95th (ft)	14	0	0	53		
Control Delay (s)	9.0	0.0	0.0	24.6		
Lane LOS	A			C		
Approach Delay (s)	2.0		0.0	24.6		
Approach LOS				C		
Intersection Summary						
Average Delay			3.6			
Intersection Capacity Utilization			48.7%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis Existing plus Alternative #2 Saturday Midday4: Murphy Avenue & Tennant Avenue

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	61	155	311	9	121	4	264	32	11	2	37	43
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	69	176	353	10	138	5	300	36	12	2	42	49
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	599	152	349	93								
Volume Left (vph)	69	10	300	2								
Volume Right (vph)	353	5	13	49								
Hadj (s)	-0.30	0.03	0.18	-0.28								
Departure Headway (s)	5.4	6.6	6.5	6.7								
Degree Utilization, x	0.90	0.28	0.63	0.17								
Capacity (veh/h)	653	511	532	488								
Control Delay (s)	38.3	12.1	19.7	11.1								
Approach Delay (s)	38.3	12.1	19.7	11.1								
Approach LOS	E	B	C	B								
Intersection Summary												
Delay				27.4								
Level of Service				D								
Intersection Capacity Utilization				71.4%	ICU Level of Service	C						
Analysis Period (min)				15								

HCM Signalized Intersection Capacity Analysis Existing plus Alternative #3 Saturday Midday 1: SB US 101 Ramps & Tennant Avenue

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑	↑↑						↑	↑
Volume (vph)	0	596	331	81	404	0	0	0	0	240	1	563
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1800	1750
Total Lost time (s)		4.7	4.0	3.0	4.7						3.5	3.0
Lane Util. Factor		0.95	1.00	1.00	0.95						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)		3539	1458	1630	3539						1681	1458
Flt Permitted		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (perm)		3539	1458	1630	3539						1681	1458
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	0	677	376	92	459	0	0	0	0	273	1	640
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	116
Lane Group Flow (vph)	0	677	376	92	459	0	0	0	0	0	274	524
Turn Type		NA	Free	Prot	NA					Split	NA	custom
Protected Phases		2 10		1	6					4	4	10
Permitted Phases			Free									4
Actuated Green, G (s)		19.1	47.4	3.8	16.3						10.3	19.9
Effective Green, g (s)		19.1	47.4	3.8	16.3						10.3	19.9
Actuated g/C Ratio		0.40	1.00	0.08	0.34						0.22	0.42
Clearance Time (s)				3.0	4.7						3.5	3.0
Vehicle Extension (s)				3.0	2.2						2.5	2.5
Lane Grp Cap (vph)		1426	1458	130	1216						365	612
v/s Ratio Prot		0.19		c0.06	c0.13						0.16	c0.17
v/s Ratio Perm			0.26									0.19
v/c Ratio		0.47	0.26	0.71	0.38						0.75	0.86
Uniform Delay, d1		10.4	0.0	21.3	11.7						17.3	12.5
Progression Factor		1.00	1.00	1.00	1.00						1.00	1.00
Incremental Delay, d2		0.1	0.4	16.1	0.1						8.0	11.2
Delay (s)		10.6	0.4	37.4	11.8						25.4	23.6
Level of Service		B	A	D	B						C	C
Approach Delay (s)		7.0			16.1			0.0			24.2	
Approach LOS		A			B			A			C	
Intersection Summary												
HCM 2000 Control Delay			15.2			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.73									
Actuated Cycle Length (s)			47.4			Sum of lost time (s)				14.2		
Intersection Capacity Utilization			56.3%			ICU Level of Service				B		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis Existing plus Alternative #3 Saturday MIDDAY 2: NB US 101 Ramps & Tennant Avenue

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑	↑	↑	↑				
Volume (vph)	0	511	0	0	265	248	220	0	141	0	0	0
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1800	1750	1750	1900	1750
Total Lost time (s)		4.0			4.0	4.0	3.8	3.8				
Lane Util. Factor		0.95			0.95	1.00	1.00	1.00				
Frt		1.00			1.00	0.85	1.00	0.85				
Flt Protected		1.00			1.00	1.00	0.95	1.00				
Satd. Flow (prot)		3539			3539	1458	1630	1500				
Flt Permitted		1.00			1.00	1.00	0.95	1.00				
Satd. Flow (perm)		3539			3539	1458	1630	1500				
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	0	581	0	0	301	282	250	0	160	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	161	0	107	0	0	0	0
Lane Group Flow (vph)	0	581	0	0	301	121	250	53	0	0	0	0
Turn Type		NA			NA	Perm	Perm	NA				
Protected Phases		2			6			8				
Permitted Phases						6	8					
Actuated Green, G (s)		13.9			13.9	13.9	10.6	10.6				
Effective Green, g (s)		13.9			13.9	13.9	10.6	10.6				
Actuated g/C Ratio		0.43			0.43	0.43	0.33	0.33				
Clearance Time (s)		4.0			4.0	4.0	3.8	3.8				
Vehicle Extension (s)		5.0			5.0	5.0	3.0	3.0				
Lane Grp Cap (vph)		1522			1522	627	534	492				
v/s Ratio Prot		c0.16			0.09			0.04				
v/s Ratio Perm						0.08	c0.15					
v/c Ratio		0.38			0.20	0.19	0.47	0.11				
Uniform Delay, d1		6.3			5.7	5.7	8.6	7.6				
Progression Factor		1.00			1.00	1.00	1.00	1.00				
Incremental Delay, d2		0.3			0.1	0.3	0.7	0.1				
Delay (s)		6.6			5.9	6.0	9.3	7.7				
Level of Service		A			A	A	A	A				
Approach Delay (s)		6.6			5.9			8.6			0.0	
Approach LOS		A			A			A			A	
Intersection Summary												
HCM 2000 Control Delay		6.9			HCM 2000 Level of Service			A				
HCM 2000 Volume to Capacity ratio		0.42										
Actuated Cycle Length (s)		32.3			Sum of lost time (s)			7.8				
Intersection Capacity Utilization		36.6%			ICU Level of Service			A				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis Existing plus Alternative #3 Saturday Midday 3: Tennant Avenue & Condit Road

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	147	299	206	0	412	25	0	0	0	21	0	101
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.88	0.88	0.88	0.92	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	167	340	234	0	468	28	0	0	0	24	0	115
Pedestrians					50							
Lane Width (ft)					12.0							
Walking Speed (ft/s)					4.0							
Percent Blockage					4							
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		360										
pX, platoon unblocked				0.84			0.84	0.84	0.84	0.84	0.84	
vC, conflicting volume	497			574			1388	1288	507	1206	1390	482
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	497			396			1367	1247	316	1150	1369	482
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 %	84			100			100	100	100	81	100	80
cM capacity (veh/h)	1067			975			74	123	582	124	104	584
Direction, Lane #	EB 1	EB 2	WB 1	SB 1								
Volume Total	167	574	497	139								
Volume Left	167	0	0	24								
Volume Right	0	234	28	115								
cSH	1067	1700	1700	356								
Volume to Capacity	0.16	0.34	0.29	0.39								
Queue Length 95th (ft)	14	0	0	45								
Control Delay (s)	9.0	0.0	0.0	21.4								
Lane LOS	A			C								
Approach Delay (s)	2.0		0.0	21.4								
Approach LOS				C								
Intersection Summary												
Average Delay			3.2									
Intersection Capacity Utilization			48.7%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis Existing plus Alternative #3 Saturday Midday4: Murphy Avenue & Tennant Avenue

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	61	155	105	9	121	4	264	32	11	2	37	43
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	69	176	119	10	138	5	300	36	12	2	42	49
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	365	152	349	93								
Volume Left (vph)	69	10	300	2								
Volume Right (vph)	119	5	13	49								
Hadj (s)	-0.12	0.03	0.18	-0.28								
Departure Headway (s)	5.4	5.9	5.7	5.8								
Degree Utilization, x	0.54	0.25	0.55	0.15								
Capacity (veh/h)	632	548	592	525								
Control Delay (s)	14.6	10.8	15.6	9.8								
Approach Delay (s)	14.6	10.8	15.6	9.8								
Approach LOS	B	B	C	A								
Intersection Summary												
Delay				13.9								
Level of Service				B								
Intersection Capacity Utilization				58.7%	ICU Level of Service	B						
Analysis Period (min)				15								

HCM Signalized Intersection Capacity Analysis Existing plus Alternative #4 Saturday Midday 1: SB US 101 Ramps & Tennant Avenue

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	596	331	81	404	0	0	0	0	240	1	563
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1800	1750
Total Lost time (s)		4.7	4.0	3.0	4.7						3.5	3.0
Lane Util. Factor		0.95	1.00	1.00	0.95						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)		3539	1458	1630	3539						1681	1458
Flt Permitted		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (perm)		3539	1458	1630	3539						1681	1458
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	0	677	376	92	459	0	0	0	0	273	1	640
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	116
Lane Group Flow (vph)	0	677	376	92	459	0	0	0	0	0	274	524
Turn Type		NA	Free	Prot	NA					Split	NA	custom
Protected Phases		2 10		1	6					4	4	10
Permitted Phases			Free									4
Actuated Green, G (s)		19.1	47.4	3.8	16.3						10.3	19.9
Effective Green, g (s)		19.1	47.4	3.8	16.3						10.3	19.9
Actuated g/C Ratio		0.40	1.00	0.08	0.34						0.22	0.42
Clearance Time (s)				3.0	4.7						3.5	3.0
Vehicle Extension (s)				3.0	2.2						2.5	2.5
Lane Grp Cap (vph)		1426	1458	130	1216						365	612
v/s Ratio Prot		0.19		c0.06	c0.13						0.16	c0.17
v/s Ratio Perm			0.26									0.19
v/c Ratio		0.47	0.26	0.71	0.38						0.75	0.86
Uniform Delay, d1		10.4	0.0	21.3	11.7						17.3	12.5
Progression Factor		1.00	1.00	1.00	1.00						1.00	1.00
Incremental Delay, d2		0.1	0.4	16.1	0.1						8.0	11.2
Delay (s)		10.6	0.4	37.4	11.8						25.4	23.6
Level of Service		B	A	D	B						C	C
Approach Delay (s)		7.0			16.1			0.0			24.2	
Approach LOS		A			B			A			C	
Intersection Summary												
HCM 2000 Control Delay			15.2			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.73									
Actuated Cycle Length (s)			47.4			Sum of lost time (s)			14.2			
Intersection Capacity Utilization			56.3%			ICU Level of Service			B			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis Existing plus Alternative #4 Saturday Middyay 2: NB US 101 Ramps & Tennant Avenue

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑	↑	↑	↑				
Volume (vph)	0	511	0	0	265	248	220	0	141	0	0	0
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1800	1750	1750	1900	1750
Total Lost time (s)		4.0			4.0	4.0	3.8	3.8				
Lane Util. Factor		0.95			0.95	1.00	1.00	1.00				
Frt		1.00			1.00	0.85	1.00	0.85				
Flt Protected		1.00			1.00	1.00	0.95	1.00				
Satd. Flow (prot)		3539			3539	1458	1630	1500				
Flt Permitted		1.00			1.00	1.00	0.95	1.00				
Satd. Flow (perm)		3539			3539	1458	1630	1500				
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	0	581	0	0	301	282	250	0	160	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	161	0	107	0	0	0	0
Lane Group Flow (vph)	0	581	0	0	301	121	250	53	0	0	0	0
Turn Type		NA			NA	Perm	Perm	NA				
Protected Phases		2			6			8				
Permitted Phases						6	8					
Actuated Green, G (s)		13.9			13.9	13.9	10.6	10.6				
Effective Green, g (s)		13.9			13.9	13.9	10.6	10.6				
Actuated g/C Ratio		0.43			0.43	0.43	0.33	0.33				
Clearance Time (s)		4.0			4.0	4.0	3.8	3.8				
Vehicle Extension (s)		5.0			5.0	5.0	3.0	3.0				
Lane Grp Cap (vph)		1522			1522	627	534	492				
v/s Ratio Prot		c0.16			0.09			0.04				
v/s Ratio Perm						0.08	c0.15					
v/c Ratio		0.38			0.20	0.19	0.47	0.11				
Uniform Delay, d1		6.3			5.7	5.7	8.6	7.6				
Progression Factor		1.00			1.00	1.00	1.00	1.00				
Incremental Delay, d2		0.3			0.1	0.3	0.7	0.1				
Delay (s)		6.6			5.9	6.0	9.3	7.7				
Level of Service		A			A	A	A	A				
Approach Delay (s)		6.6			5.9			8.6			0.0	
Approach LOS		A			A			A			A	
Intersection Summary												
HCM 2000 Control Delay		6.9			HCM 2000 Level of Service			A				
HCM 2000 Volume to Capacity ratio		0.42										
Actuated Cycle Length (s)		32.3			Sum of lost time (s)			7.8				
Intersection Capacity Utilization		36.6%			ICU Level of Service			A				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis Existing plus Alternative #4 Saturday Midday 3: Tennant Avenue & Condit Road

																			
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR							
Lane Configurations																			
Volume (veh/h)	147	299	206	0	313	19	99	6	9	21	0	101							
Sign Control		Free			Free			Stop			Stop								
Grade		0%			0%			0%			0%								
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88							
Hourly flow rate (vph)	167	340	234	0	356	22	112	7	10	24	0	115							
Pedestrians					50														
Lane Width (ft)					12.0														
Walking Speed (ft/s)					4.0														
Percent Blockage					4														
Right turn flare (veh)																			
Median type		None			None														
Median storage (veh)																			
Upstream signal (ft)		360																	
pX, platoon unblocked				0.84			0.84	0.84	0.84	0.84	0.84								
vC, conflicting volume	377			574			1272	1168	507	1104	1274	366							
vC1, stage 1 conf vol																			
vC2, stage 2 conf vol																			
vCu, unblocked vol	377			396			1228	1105	316	1028	1231	366							
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 %	86			100			0	96	98	83	100	83							
cM capacity (veh/h)	1181			975			96	152	582	145	128	679							
Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1														
Volume Total	167	574	377	130	139														
Volume Left	167	0	0	112	24														
Volume Right	0	234	22	10	115														
cSH	1181	1700	1700	105	415														
Volume to Capacity	0.14	0.34	0.22	1.23	0.33														
Queue Length 95th (ft)	12	0	0	216	36														
Control Delay (s)	8.5	0.0	0.0	238.6	18.0														
Lane LOS	A			F	C														
Approach Delay (s)	1.9		0.0	238.6	18.0														
Approach LOS				F	C														
Intersection Summary																			
Average Delay			25.1																
Intersection Capacity Utilization			49.1%	ICU Level of Service					A										
Analysis Period (min)			15																

HCM Unsignalized Intersection Capacity Analysis Existing plus Alternative #4 Saturday Midday 4: Murphy Avenue & Tennant Avenue

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	67	158	105	9	121	4	159	26	8	2	37	43
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	76	180	119	10	138	5	181	30	9	2	42	49
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	375	152	219	93								
Volume Left (vph)	76	10	181	2								
Volume Right (vph)	119	5	9	49								
Hadj (s)	-0.12	0.03	0.17	-0.28								
Departure Headway (s)	4.9	5.4	5.6	5.4								
Degree Utilization, x	0.51	0.23	0.34	0.14								
Capacity (veh/h)	696	614	586	582								
Control Delay (s)	13.0	10.0	11.5	9.3								
Approach Delay (s)	13.0	10.0	11.5	9.3								
Approach LOS	B	A	B	A								
Intersection Summary												
Delay			11.6									
Level of Service			B									
Intersection Capacity Utilization			52.9%	ICU Level of Service					A			
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

1: SB US 101 Ramps & Tennant Avenue

Cumulative + Alternative #1 Sat. Midday

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑	↑↑						↑	↑
Volume (vph)	0	1455	652	500	977	0	0	0	0	646	0	929
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1800	1750
Total Lost time (s)		4.7	4.0	3.0	4.7						3.5	3.0
Lane Util. Factor		0.95	1.00	1.00	0.95						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)		3539	1458	1630	3539						1676	1458
Flt Permitted		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (perm)		3539	1458	1630	3539						1676	1458
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1582	709	543	1062	0	0	0	0	702	0	1010
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	60
Lane Group Flow (vph)	0	1582	709	543	1062	0	0	0	0	0	702	950
Turn Type		NA	Free	Prot	NA					Split	NA	custom
Protected Phases		2 10		1	6					4	4	10
Permitted Phases			Free									4
Actuated Green, G (s)		19.7	50.0	5.0	17.7						11.1	21.1
Effective Green, g (s)		19.7	50.0	5.0	17.7						11.1	21.1
Actuated g/C Ratio		0.39	1.00	0.10	0.35						0.22	0.42
Clearance Time (s)				3.0	4.7						3.5	3.0
Vehicle Extension (s)				3.0	2.2						2.5	2.5
Lane Grp Cap (vph)		1394	1458	163	1252						372	615
v/s Ratio Prot		c0.45		c0.33	0.30						c0.42	c0.31
v/s Ratio Perm			0.49									0.34
v/c Ratio		1.13	0.49	3.33	0.85						1.89	1.55
Uniform Delay, d1		15.2	0.0	22.5	14.9						19.4	14.4
Progression Factor		1.00	1.00	1.00	1.00						1.00	1.00
Incremental Delay, d2		70.1	1.2	1064.6	5.4						409.2	253.5
Delay (s)		85.2	1.2	1087.1	20.3						428.7	267.9
Level of Service		F	A	F	C						F	F
Approach Delay (s)		59.2			381.2			0.0			333.9	
Approach LOS		E			F			A			F	
Intersection Summary												
HCM 2000 Control Delay			235.2			HCM 2000 Level of Service				F		
HCM 2000 Volume to Capacity ratio			1.79									
Actuated Cycle Length (s)			50.0			Sum of lost time (s)				14.2		
Intersection Capacity Utilization			119.7%			ICU Level of Service				H		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis 2: NB US 101 Ramps & Tennant Avenue

Cumulative + Alternative #1 Sat. Midday

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑	↑	↑	↑				
Volume (vph)	0	1388	0	0	931	589	546	0	695	0	0	0
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1800	1750	1750	1900	1750
Total Lost time (s)		4.0			4.0	4.0	3.8	3.8				
Lane Util. Factor		0.95			0.95	1.00	1.00	1.00				
Frt		1.00			1.00	0.85	1.00	0.85				
Flt Protected		1.00			1.00	1.00	0.95	1.00				
Satd. Flow (prot)		3539			3539	1458	1630	1500				
Flt Permitted		1.00			1.00	1.00	0.95	1.00				
Satd. Flow (perm)		3539			3539	1458	1630	1500				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1509	0	0	1012	640	593	0	755	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	352	0	17	0	0	0	0
Lane Group Flow (vph)	0	1509	0	0	1012	288	593	738	0	0	0	0
Turn Type		NA			NA	Perm	Perm	NA				
Protected Phases		2			6			8				
Permitted Phases						6	8					
Actuated Green, G (s)		18.0			18.0	18.0	14.2	14.2				
Effective Green, g (s)		18.0			18.0	18.0	14.2	14.2				
Actuated g/C Ratio		0.45			0.45	0.45	0.35	0.35				
Clearance Time (s)		4.0			4.0	4.0	3.8	3.8				
Vehicle Extension (s)		5.0			5.0	5.0	3.0	3.0				
Lane Grp Cap (vph)		1592			1592	656	578	532				
v/s Ratio Prot		c0.43			0.29			c0.49				
v/s Ratio Perm						0.20	0.36					
v/c Ratio		0.95			0.64	0.44	1.03	1.39				
Uniform Delay, d1		10.5			8.5	7.5	12.9	12.9				
Progression Factor		1.00			1.00	1.00	1.00	1.00				
Incremental Delay, d2		12.6			1.2	1.0	44.2	185.3				
Delay (s)		23.1			9.6	8.5	57.1	198.2				
Level of Service		C			A	A	E	F				
Approach Delay (s)		23.1			9.2			136.1			0.0	
Approach LOS		C			A			F			A	
Intersection Summary												
HCM 2000 Control Delay			51.8		HCM 2000 Level of Service				D			
HCM 2000 Volume to Capacity ratio			1.14									
Actuated Cycle Length (s)			40.0		Sum of lost time (s)				7.8			
Intersection Capacity Utilization			139.2%		ICU Level of Service				H			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

3: Tennant Avenue & Condit Road

Cumulative + Alternative #1 Sat. Midday

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	278	1599	206	19	1055	22	199	12	19	18	12	266
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	302	1738	224	21	1147	24	216	13	21	20	13	289
Pedestrians					50							
Lane Width (ft)					12.0							
Walking Speed (ft/s)					4.0							
Percent Blockage					4							
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		360										
pX, platoon unblocked				0.52			0.52	0.52	0.52	0.52	0.52	
vC, conflicting volume	1171			1962			3950	3666	1900	3620	3766	1159
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1171			2395			6247	5697	2275	5607	5891	1159
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 %	49			80			0	0	18	0	0	0
cM capacity (veh/h)	597			103			0	0	25	0	0	238
Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1							
Volume Total	302	1962	1191	250	322							
Volume Left	302	0	21	216	20							
Volume Right	0	224	24	21	289							
cSH	597	1700	103	0	0							
Volume to Capacity	0.51	1.15	0.20	Err	Err							
Queue Length 95th (ft)	71	0	18	Err	Err							
Control Delay (s)	17.1	0.0	31.3	Err	Err							
Lane LOS	C		D	F	F							
Approach Delay (s)	2.3		31.3	Err	Err							
Approach LOS				F	F							
Intersection Summary												
Average Delay			Err									
Intersection Capacity Utilization			199.3%	ICU Level of Service					H			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis 4: Murphy Avenue & Tennant Avenue

Cumulative + Alternative #1 Sat. Midday

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	204	694	738	9	411	11	516	40	8	28	60	169
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	222	754	802	10	447	12	561	43	9	30	65	184
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	1778	468	613	279								
Volume Left (vph)	222	10	561	30								
Volume Right (vph)	802	12	9	184								
Hadj (s)	-0.21	0.02	0.21	-0.34								
Departure Headway (s)	8.6	8.9	9.0	9.2								
Degree Utilization, x	4.26	1.15	1.54	0.72								
Capacity (veh/h)	422	410	402	383								
Control Delay (s)	1489.4	122.1	278.4	32.3								
Approach Delay (s)	1489.4	122.1	278.4	32.3								
Approach LOS	F	F	F	D								
Intersection Summary												
Delay				919.2								
Level of Service				F								
Intersection Capacity Utilization				175.3%	ICU Level of Service				H			
Analysis Period (min)				15								

HCM Signalized Intersection Capacity Analysis

1: SB US 101 Ramps & Tennant Avenue

Cumulative + Alternative #2 Sat. Midday

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑	↑↑						↑	↑
Volume (vph)	0	1455	652	500	977	0	0	0	0	646	0	929
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1800	1750
Total Lost time (s)		4.7	4.0	3.0	4.7						3.5	3.0
Lane Util. Factor		0.95	1.00	1.00	0.95						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)		3539	1458	1630	3539						1676	1458
Flt Permitted		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (perm)		3539	1458	1630	3539						1676	1458
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1582	709	543	1062	0	0	0	0	702	0	1010
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	60
Lane Group Flow (vph)	0	1582	709	543	1062	0	0	0	0	0	702	950
Turn Type		NA	Free	Prot	NA					Split	NA	custom
Protected Phases		2 10		1	6					4	4	10
Permitted Phases			Free									4
Actuated Green, G (s)		19.7	50.0	5.0	17.7						11.1	21.1
Effective Green, g (s)		19.7	50.0	5.0	17.7						11.1	21.1
Actuated g/C Ratio		0.39	1.00	0.10	0.35						0.22	0.42
Clearance Time (s)				3.0	4.7						3.5	3.0
Vehicle Extension (s)				3.0	2.2						2.5	2.5
Lane Grp Cap (vph)		1394	1458	163	1252						372	615
v/s Ratio Prot		c0.45		c0.33	0.30						c0.42	c0.31
v/s Ratio Perm			0.49									0.34
v/c Ratio		1.13	0.49	3.33	0.85						1.89	1.55
Uniform Delay, d1		15.2	0.0	22.5	14.9						19.4	14.4
Progression Factor		1.00	1.00	1.00	1.00						1.00	1.00
Incremental Delay, d2		70.1	1.2	1064.6	5.4						409.2	253.5
Delay (s)		85.2	1.2	1087.1	20.3						428.7	267.9
Level of Service		F	A	F	C						F	F
Approach Delay (s)		59.2			381.2			0.0			333.9	
Approach LOS		E			F			A			F	
Intersection Summary												
HCM 2000 Control Delay			235.2			HCM 2000 Level of Service				F		
HCM 2000 Volume to Capacity ratio			1.79									
Actuated Cycle Length (s)			50.0			Sum of lost time (s)				14.2		
Intersection Capacity Utilization			119.7%			ICU Level of Service				H		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis 2: NB US 101 Ramps & Tennant Avenue

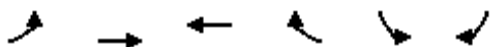
Cumulative + Alternative #2 Sat. Midday

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑	↑	↑	↑				
Volume (vph)	0	1388	0	0	931	589	546	0	695	0	0	0
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1800	1750	1750	1900	1750
Total Lost time (s)		4.0			4.0	4.0	3.8	3.8				
Lane Util. Factor		0.95			0.95	1.00	1.00	1.00				
Frt		1.00			1.00	0.85	1.00	0.85				
Flt Protected		1.00			1.00	1.00	0.95	1.00				
Satd. Flow (prot)		3539			3539	1458	1630	1500				
Flt Permitted		1.00			1.00	1.00	0.95	1.00				
Satd. Flow (perm)		3539			3539	1458	1630	1500				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1509	0	0	1012	640	593	0	755	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	352	0	17	0	0	0	0
Lane Group Flow (vph)	0	1509	0	0	1012	288	593	738	0	0	0	0
Turn Type		NA			NA	Perm	Perm	NA				
Protected Phases		2			6			8				
Permitted Phases						6	8					
Actuated Green, G (s)		18.0			18.0	18.0	14.2	14.2				
Effective Green, g (s)		18.0			18.0	18.0	14.2	14.2				
Actuated g/C Ratio		0.45			0.45	0.45	0.35	0.35				
Clearance Time (s)		4.0			4.0	4.0	3.8	3.8				
Vehicle Extension (s)		5.0			5.0	5.0	3.0	3.0				
Lane Grp Cap (vph)		1592			1592	656	578	532				
v/s Ratio Prot		c0.43			0.29			c0.49				
v/s Ratio Perm						0.20	0.36					
v/c Ratio		0.95			0.64	0.44	1.03	1.39				
Uniform Delay, d1		10.5			8.5	7.5	12.9	12.9				
Progression Factor		1.00			1.00	1.00	1.00	1.00				
Incremental Delay, d2		12.6			1.2	1.0	44.2	185.3				
Delay (s)		23.1			9.6	8.5	57.1	198.2				
Level of Service		C			A	A	E	F				
Approach Delay (s)		23.1			9.2			136.1			0.0	
Approach LOS		C			A			F			A	
Intersection Summary												
HCM 2000 Control Delay			51.8		HCM 2000 Level of Service				D			
HCM 2000 Volume to Capacity ratio			1.14									
Actuated Cycle Length (s)			40.0		Sum of lost time (s)				7.8			
Intersection Capacity Utilization			139.2%		ICU Level of Service				H			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

3: Tennant Avenue & Condit Road

Cumulative + Alternative #2 Sat. Midday



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	278	1805	1254	34	30	266
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	302	1962	1363	37	33	289
Pedestrians			50			
Lane Width (ft)			12.0			
Walking Speed (ft/s)			4.0			
Percent Blockage			4			
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		360				
pX, platoon unblocked					0.52	
vC, conflicting volume	1400				3998	1382
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1400				6339	1382
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	38				0	0
cM capacity (veh/h)	488				0	176
Direction, Lane #	EB 1	EB 2	WB 1	SB 1		
Volume Total	302	1962	1400	322		
Volume Left	302	0	0	33		
Volume Right	0	0	37	289		
cSH	488	1700	1700	0		
Volume to Capacity	0.62	1.15	0.82	2215.87		
Queue Length 95th (ft)	104	0	0	Err		
Control Delay (s)	23.6	0.0	0.0	Err		
Lane LOS	C			F		
Approach Delay (s)	3.2		0.0	Err		
Approach LOS				F		
Intersection Summary						
Average Delay			808.9			
Intersection Capacity Utilization			119.8%		ICU Level of Service	H
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis 4: Murphy Avenue & Tennant Avenue

Cumulative + Alternative #2 Sat. Midday

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	174	707	954	16	404	11	725	50	15	28	70	159
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	189	768	1037	17	439	12	788	54	16	30	76	173
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	1995	468	859	279								
Volume Left (vph)	189	17	788	30								
Volume Right (vph)	1037	12	16	173								
Hadj (s)	-0.26	0.03	0.21	-0.32								
Departure Headway (s)	8.6	8.9	9.0	9.3								
Degree Utilization, x	4.75	1.15	2.16	0.72								
Capacity (veh/h)	425	410	405	382								
Control Delay (s)	1711.5	122.5	549.1	32.5								
Approach Delay (s)	1711.5	122.5	549.1	32.5								
Approach LOS	F	F	F	D								
Intersection Summary												
Delay			1097.4									
Level of Service			F									
Intersection Capacity Utilization			200.1%	ICU Level of Service					H			
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

1: SB US 101 Ramps & Tennant Avenue

Cumulative + Alternative #3 Sat. Midday

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑	↑↑						↑	↑
Volume (vph)	0	1455	652	500	977	0	0	0	0	646	0	929
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1800	1750
Total Lost time (s)		4.7	4.0	3.0	4.7						3.5	3.0
Lane Util. Factor		0.95	1.00	1.00	0.95						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)		3539	1458	1630	3539						1676	1458
Flt Permitted		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (perm)		3539	1458	1630	3539						1676	1458
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1582	709	543	1062	0	0	0	0	702	0	1010
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	60
Lane Group Flow (vph)	0	1582	709	543	1062	0	0	0	0	0	702	950
Turn Type		NA	Free	Prot	NA					Split	NA	custom
Protected Phases		2 10		1	6					4	4	10
Permitted Phases			Free									4
Actuated Green, G (s)		19.7	50.0	5.0	17.7						11.1	21.1
Effective Green, g (s)		19.7	50.0	5.0	17.7						11.1	21.1
Actuated g/C Ratio		0.39	1.00	0.10	0.35						0.22	0.42
Clearance Time (s)				3.0	4.7						3.5	3.0
Vehicle Extension (s)				3.0	2.2						2.5	2.5
Lane Grp Cap (vph)		1394	1458	163	1252						372	615
v/s Ratio Prot		c0.45		c0.33	0.30						c0.42	c0.31
v/s Ratio Perm			0.49									0.34
v/c Ratio		1.13	0.49	3.33	0.85						1.89	1.55
Uniform Delay, d1		15.2	0.0	22.5	14.9						19.4	14.4
Progression Factor		1.00	1.00	1.00	1.00						1.00	1.00
Incremental Delay, d2		70.1	1.2	1064.6	5.4						409.2	253.5
Delay (s)		85.2	1.2	1087.1	20.3						428.7	267.9
Level of Service		F	A	F	C						F	F
Approach Delay (s)		59.2			381.2			0.0			333.9	
Approach LOS		E			F			A			F	
Intersection Summary												
HCM 2000 Control Delay			235.2			HCM 2000 Level of Service				F		
HCM 2000 Volume to Capacity ratio			1.79									
Actuated Cycle Length (s)			50.0			Sum of lost time (s)			14.2			
Intersection Capacity Utilization			119.7%			ICU Level of Service			H			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis 2: NB US 101 Ramps & Tennant Avenue

Cumulative + Alternative #3 Sat. Midday

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑	↑	↑	↑				
Volume (vph)	0	1388	0	0	931	589	546	0	695	0	0	0
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1800	1750	1750	1900	1750
Total Lost time (s)		4.0			4.0	4.0	3.8	3.8				
Lane Util. Factor		0.95			0.95	1.00	1.00	1.00				
Frt		1.00			1.00	0.85	1.00	0.85				
Flt Protected		1.00			1.00	1.00	0.95	1.00				
Satd. Flow (prot)		3539			3539	1458	1630	1500				
Flt Permitted		1.00			1.00	1.00	0.95	1.00				
Satd. Flow (perm)		3539			3539	1458	1630	1500				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1509	0	0	1012	640	593	0	755	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	352	0	17	0	0	0	0
Lane Group Flow (vph)	0	1509	0	0	1012	288	593	738	0	0	0	0
Turn Type		NA			NA	Perm	Perm	NA				
Protected Phases		2			6			8				
Permitted Phases						6	8					
Actuated Green, G (s)		18.0			18.0	18.0	14.2	14.2				
Effective Green, g (s)		18.0			18.0	18.0	14.2	14.2				
Actuated g/C Ratio		0.45			0.45	0.45	0.35	0.35				
Clearance Time (s)		4.0			4.0	4.0	3.8	3.8				
Vehicle Extension (s)		5.0			5.0	5.0	3.0	3.0				
Lane Grp Cap (vph)		1592			1592	656	578	532				
v/s Ratio Prot		c0.43			0.29			c0.49				
v/s Ratio Perm						0.20	0.36					
v/c Ratio		0.95			0.64	0.44	1.03	1.39				
Uniform Delay, d1		10.5			8.5	7.5	12.9	12.9				
Progression Factor		1.00			1.00	1.00	1.00	1.00				
Incremental Delay, d2		12.6			1.2	1.0	44.2	185.3				
Delay (s)		23.1			9.6	8.5	57.1	198.2				
Level of Service		C			A	A	E	F				
Approach Delay (s)		23.1			9.2			136.1			0.0	
Approach LOS		C			A			F			A	
Intersection Summary												
HCM 2000 Control Delay			51.8		HCM 2000 Level of Service				D			
HCM 2000 Volume to Capacity ratio			1.14									
Actuated Cycle Length (s)			40.0		Sum of lost time (s)				7.8			
Intersection Capacity Utilization			139.2%		ICU Level of Service				H			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

3: Tennant Avenue & Condit Road

Cumulative + Alternative #3 Sat. Midday

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	278	1599	206	0	1254	34	0	0	0	30	0	266
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	302	1738	224	0	1363	37	0	0	0	33	0	289
Pedestrians					50							
Lane Width (ft)					12.0							
Walking Speed (ft/s)					4.0							
Percent Blockage					4							
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		360										
pX, platoon unblocked				0.52			0.52	0.52	0.52	0.52	0.52	
vC, conflicting volume	1400			1962			4125	3854	1900	3774	3948	1382
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1400			2395			6586	6061	2275	5906	6243	1382
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 %	38			100			0	100	100	0	100	0
cM capacity (veh/h)	488			103			0	0	25	0	0	176
Direction, Lane #	EB 1	EB 2	WB 1	SB 1								
Volume Total	302	1962	1400	322								
Volume Left	302	0	0	33								
Volume Right	0	224	37	289								
cSH	488	1700	1700	0								
Volume to Capacity	0.62	1.15	0.82	2605.04								
Queue Length 95th (ft)	104	0	0	Err								
Control Delay (s)	23.6	0.0	0.0	Err								
Lane LOS	C			F								
Approach Delay (s)	3.2		0.0	Err								
Approach LOS				F								
Intersection Summary												
Average Delay			808.9									
Intersection Capacity Utilization			121.4%		ICU Level of Service				H			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis 4: Murphy Avenue & Tennant Avenue

Cumulative + Alternative #3 Sat. Midday

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	194	687	748	16	404	11	725	50	15	28	70	159
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	211	747	813	17	439	12	788	54	16	30	76	173
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	1771	468	859	279								
Volume Left (vph)	211	17	788	30								
Volume Right (vph)	813	12	16	173								
Hadj (s)	-0.22	0.03	0.21	-0.32								
Departure Headway (s)	8.6	8.9	9.0	9.3								
Degree Utilization, x	4.24	1.15	2.16	0.72								
Capacity (veh/h)	423	410	405	382								
Control Delay (s)	1481.0	122.5	549.1	32.5								
Approach Delay (s)	1481.0	122.5	549.1	32.5								
Approach LOS	F	F	F	D								
Intersection Summary												
Delay				935.8								
Level of Service				F								
Intersection Capacity Utilization				187.5%	ICU Level of Service							H
Analysis Period (min)				15								

HCM Signalized Intersection Capacity Analysis

1: SB US 101 Ramps & Tennant Avenue

Cumulative + Alternative #4 Sat. Midday

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑	↑↑						↑	↑
Volume (vph)	0	1455	652	500	977	0	0	0	0	646	0	929
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1800	1750
Total Lost time (s)		4.7	4.0	3.0	4.7						3.5	3.0
Lane Util. Factor		0.95	1.00	1.00	0.95						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)		3539	1458	1630	3539						1676	1458
Flt Permitted		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (perm)		3539	1458	1630	3539						1676	1458
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1582	709	543	1062	0	0	0	0	702	0	1010
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	60
Lane Group Flow (vph)	0	1582	709	543	1062	0	0	0	0	0	702	950
Turn Type		NA	Free	Prot	NA					Split	NA	custom
Protected Phases		2 10		1	6					4	4	10
Permitted Phases			Free									4
Actuated Green, G (s)		19.7	50.0	5.0	17.7						11.1	21.1
Effective Green, g (s)		19.7	50.0	5.0	17.7						11.1	21.1
Actuated g/C Ratio		0.39	1.00	0.10	0.35						0.22	0.42
Clearance Time (s)				3.0	4.7						3.5	3.0
Vehicle Extension (s)				3.0	2.2						2.5	2.5
Lane Grp Cap (vph)		1394	1458	163	1252						372	615
v/s Ratio Prot		c0.45		c0.33	0.30						c0.42	c0.31
v/s Ratio Perm			0.49									0.34
v/c Ratio		1.13	0.49	3.33	0.85						1.89	1.55
Uniform Delay, d1		15.2	0.0	22.5	14.9						19.4	14.4
Progression Factor		1.00	1.00	1.00	1.00						1.00	1.00
Incremental Delay, d2		70.1	1.2	1064.6	5.4						409.2	253.5
Delay (s)		85.2	1.2	1087.1	20.3						428.7	267.9
Level of Service		F	A	F	C						F	F
Approach Delay (s)		59.2			381.2			0.0			333.9	
Approach LOS		E			F			A			F	
Intersection Summary												
HCM 2000 Control Delay			235.2			HCM 2000 Level of Service				F		
HCM 2000 Volume to Capacity ratio			1.79									
Actuated Cycle Length (s)			50.0			Sum of lost time (s)			14.2			
Intersection Capacity Utilization			119.7%			ICU Level of Service			H			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis 2: NB US 101 Ramps & Tennant Avenue

Cumulative + Alternative #4 Sat. Midday

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑	↑	↑	↑				
Volume (vph)	0	1388	0	0	931	589	546	0	695	0	0	0
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1800	1750	1750	1900	1750
Total Lost time (s)		4.0			4.0	4.0	3.8	3.8				
Lane Util. Factor		0.95			0.95	1.00	1.00	1.00				
Frt		1.00			1.00	0.85	1.00	0.85				
Flt Protected		1.00			1.00	1.00	0.95	1.00				
Satd. Flow (prot)		3539			3539	1458	1630	1500				
Flt Permitted		1.00			1.00	1.00	0.95	1.00				
Satd. Flow (perm)		3539			3539	1458	1630	1500				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1509	0	0	1012	640	593	0	755	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	352	0	17	0	0	0	0
Lane Group Flow (vph)	0	1509	0	0	1012	288	593	738	0	0	0	0
Turn Type		NA			NA	Perm	Perm	NA				
Protected Phases		2			6			8				
Permitted Phases						6	8					
Actuated Green, G (s)		18.0			18.0	18.0	14.2	14.2				
Effective Green, g (s)		18.0			18.0	18.0	14.2	14.2				
Actuated g/C Ratio		0.45			0.45	0.45	0.35	0.35				
Clearance Time (s)		4.0			4.0	4.0	3.8	3.8				
Vehicle Extension (s)		5.0			5.0	5.0	3.0	3.0				
Lane Grp Cap (vph)		1592			1592	656	578	532				
v/s Ratio Prot		c0.43			0.29			c0.49				
v/s Ratio Perm						0.20	0.36					
v/c Ratio		0.95			0.64	0.44	1.03	1.39				
Uniform Delay, d1		10.5			8.5	7.5	12.9	12.9				
Progression Factor		1.00			1.00	1.00	1.00	1.00				
Incremental Delay, d2		12.6			1.2	1.0	44.2	185.3				
Delay (s)		23.1			9.6	8.5	57.1	198.2				
Level of Service		C			A	A	E	F				
Approach Delay (s)		23.1			9.2			136.1			0.0	
Approach LOS		C			A			F			A	
Intersection Summary												
HCM 2000 Control Delay			51.8		HCM 2000 Level of Service				D			
HCM 2000 Volume to Capacity ratio			1.14									
Actuated Cycle Length (s)			40.0		Sum of lost time (s)				7.8			
Intersection Capacity Utilization			139.2%		ICU Level of Service				H			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

3: Tennant Avenue & Condit Road

Cumulative + Alternative #4 Sat. Midday

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	278	1599	206	0	1155	34	99	6	9	30	0	266
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	302	1738	224	0	1255	37	108	7	10	33	0	289
Pedestrians					50							
Lane Width (ft)					12.0							
Walking Speed (ft/s)					4.0							
Percent Blockage					4							
Right turn flare (veh)												
Median type		None			None							
Median storage veh												
Upstream signal (ft)		360										
pX, platoon unblocked				0.52			0.52	0.52	0.52	0.52	0.52	
vC, conflicting volume	1292			1962			4017	3747	1900	3679	3840	1274
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1292			2395			6377	5853	2275	5722	6034	1274
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 %	44			100			0	0	61	0	100	0
cM capacity (veh/h)	536			103			0	0	25	0	0	204
Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1							
Volume Total	302	1962	1292	124	322							
Volume Left	302	0	0	108	33							
Volume Right	0	224	37	10	289							
cSH	536	1700	1700	0	0							
Volume to Capacity	0.56	1.15	0.76	Err	Err							
Queue Length 95th (ft)	87	0	0	Err	Err							
Control Delay (s)	20.0	0.0	0.0	Err	Err							
Lane LOS	C			F	F							
Approach Delay (s)	2.7		0.0	Err	Err							
Approach LOS				F	F							
Intersection Summary												
Average Delay			Err									
Intersection Capacity Utilization			136.8%	ICU Level of Service					H			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis 4: Murphy Avenue & Tennant Avenue

Cumulative + Alternative #4 Sat. Midday

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	200	690	748	16	410	11	620	44	12	28	70	159
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	217	750	813	17	446	12	674	48	13	30	76	173
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	1780	475	735	279								
Volume Left (vph)	217	17	674	30								
Volume Right (vph)	813	12	13	173								
Hadj (s)	-0.22	0.03	0.21	-0.32								
Departure Headway (s)	8.6	8.9	9.0	9.3								
Degree Utilization, x	4.26	1.17	1.85	0.72								
Capacity (veh/h)	422	411	403	382								
Control Delay (s)	1491.9	128.3	411.6	32.5								
Approach Delay (s)	1491.9	128.3	411.6	32.5								
Approach LOS	F	F	F	D								
Intersection Summary												
Delay				926.3								
Level of Service				F								
Intersection Capacity Utilization				182.0%	ICU Level of Service	H						
Analysis Period (min)				15								

Appendix B

Vehicle Queuing Calculations

Queuing and Blocking Report

Existing PM

3/20/2014

Intersection: 1: SB US 101 Ramps & Tennant Avenue

Movement	EB	EB	EB	WB	WB	WB	SB	SB
Directions Served	T	T	R	L	T	T	LT	R
Maximum Queue (ft)	69	107	17	93	126	94	141	362
Average Queue (ft)	28	32	5	68	88	76	46	179
95th Queue (ft)	72	95	17	104	122	111	126	341
Link Distance (ft)	556	556			1072	1072	366	366
Upstream Blk Time (%)								0
Queuing Penalty (veh)								0
Storage Bay Dist (ft)			260	295				
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 2: NB US 101 Ramps & Tennant Avenue

Movement	EB	WB	WB	WB	NB	NB
Directions Served	T	T	T	R	L	TR
Maximum Queue (ft)	88	95	98	25	221	51
Average Queue (ft)	33	44	25	10	189	31
95th Queue (ft)	81	96	87	30	237	48
Link Distance (ft)	287	112	112	112	415	415
Upstream Blk Time (%)		0	0			
Queuing Penalty (veh)		0	0			
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 3: Tennant Avenue & Condit Road

Movement	EB	SB
Directions Served	L	LR
Maximum Queue (ft)	55	31
Average Queue (ft)	23	27
95th Queue (ft)	58	31
Link Distance (ft)		139
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	140	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Queuing and Blocking Report

Existing PM

3/20/2014

Intersection: 4: Murphy Avenue & Tennant Avenue

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	105	101	55	53
Average Queue (ft)	67	45	34	39
95th Queue (ft)	99	91	51	57
Link Distance (ft)	500	754		399
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 1: SB US 101 Ramps & Tennant Avenue

Movement	EB	EB	EB	WB	WB	WB	SB	SB
Directions Served	T	T	R	L	T	T	LT	R
Maximum Queue (ft)	66	44	11	45	78	51	50	87
Average Queue (ft)	36	21	8	33	55	37	38	63
95th Queue (ft)	65	52	15	43	93	56	53	88
Link Distance (ft)	556	556			1072	1072	366	366
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			260	295				
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 2: NB US 101 Ramps & Tennant Avenue

Movement	EB	WB	WB	WB	NB	NB
Directions Served	T	T	T	R	L	TR
Maximum Queue (ft)	127	98	27	45	93	75
Average Queue (ft)	81	41	21	18	69	35
95th Queue (ft)	139	88	39	46	95	68
Link Distance (ft)	287	112	112	112	415	415
Upstream Blk Time (%)		0				
Queuing Penalty (veh)		0				
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 3: Tennant Avenue & Condit Road

Movement	EB	B13	SB
Directions Served	L	T	LR
Maximum Queue (ft)	54	34	49
Average Queue (ft)	35	7	31
95th Queue (ft)	50	29	60
Link Distance (ft)		112	139
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	140		
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 4: Murphy Avenue & Tennant Avenue

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	100	72	31	74
Average Queue (ft)	73	38	24	42
95th Queue (ft)	100	66	44	71
Link Distance (ft)	500	754		399
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 1: SB US 101 Ramps & Tennant Avenue

Movement	EB	EB	EB	WB	WB	WB	SB	SB
Directions Served	T	T	R	L	T	T	LT	R
Maximum Queue (ft)	92	81	11	52	148	138	160	121
Average Queue (ft)	50	38	2	40	129	120	133	111
95th Queue (ft)	100	82	9	56	147	146	174	129
Link Distance (ft)	556	556			1072	1072	366	366
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			260	295				
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 2: NB US 101 Ramps & Tennant Avenue

Movement	EB	WB	WB	WB	NB	NB
Directions Served	T	T	T	R	L	TR
Maximum Queue (ft)	163	48	27	27	222	50
Average Queue (ft)	95	20	11	15	159	33
95th Queue (ft)	177	51	33	36	241	55
Link Distance (ft)	287	112	112	112	415	415
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 3: Tennant Avenue & Condit Road

Movement	EB	NB	SB
Directions Served	L	LTR	LTR
Maximum Queue (ft)	31	54	50
Average Queue (ft)	18	41	38
95th Queue (ft)	43	57	53
Link Distance (ft)		262	138
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	140		
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 4: Murphy Avenue & Tennant Avenue

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	77	54	53	31
Average Queue (ft)	63	40	27	29
95th Queue (ft)	79	58	55	32
Link Distance (ft)	505	754		399
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 1: SB US 101 Ramps & Tennant Avenue

Movement	EB	EB	EB	WB	WB	WB	SB	SB
Directions Served	T	T	R	L	T	T	LT	R
Maximum Queue (ft)	148	66	10	74	119	99	93	162
Average Queue (ft)	96	41	2	41	65	69	68	125
95th Queue (ft)	153	66	9	72	115	113	95	174
Link Distance (ft)	556	556			1072	1072	366	366
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			260	295				
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 2: NB US 101 Ramps & Tennant Avenue

Movement	EB	WB	WB	WB	NB	NB
Directions Served	T	T	T	R	L	TR
Maximum Queue (ft)	158	48	51	51	100	50
Average Queue (ft)	105	31	25	36	83	39
95th Queue (ft)	172	45	52	55	111	57
Link Distance (ft)	287	112	112	112	415	415
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 3: Tennant Avenue & Condit Road

Movement	EB	B13	WB	NB	SB
Directions Served	L	T	LTR	LTR	LTR
Maximum Queue (ft)	52	33	52	135	68
Average Queue (ft)	35	7	22	75	36
95th Queue (ft)	49	28	55	127	62
Link Distance (ft)		112	505	262	138
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	140				
Storage Blk Time (%)					
Queuing Penalty (veh)					

Queuing and Blocking Report

Existing plus Alternative #1 Saturday Midday

Intersection: 4: Murphy Avenue & Tennant Avenue

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	57	53	31	31
Average Queue (ft)	56	35	29	25
95th Queue (ft)	57	50	32	45
Link Distance (ft)	505	754		399
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 1: SB US 101 Ramps & Tennant Avenue

Movement	EB	EB	EB	WB	WB	WB	SB	SB
Directions Served	T	T	R	L	T	T	LT	R
Maximum Queue (ft)	103	98	11	52	152	139	142	262
Average Queue (ft)	64	53	2	42	123	120	107	160
95th Queue (ft)	102	107	9	60	158	149	158	279
Link Distance (ft)	556	556			1072	1072	366	366
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			260	295				
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 2: NB US 101 Ramps & Tennant Avenue

Movement	EB	WB	WB	WB	NB	NB
Directions Served	T	T	T	R	L	TR
Maximum Queue (ft)	92	48	27	26	238	52
Average Queue (ft)	50	31	10	5	195	36
95th Queue (ft)	119	45	31	22	238	56
Link Distance (ft)	287	112	112	112	415	415
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 3: Tennant Avenue & Condit Road

Movement	EB	SB
Directions Served	L	LR
Maximum Queue (ft)	31	28
Average Queue (ft)	18	26
95th Queue (ft)	43	28
Link Distance (ft)		139
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	140	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Queuing and Blocking Report

Existing plus Alternative #2 PM

Intersection: 4: Murphy Avenue & Tennant Avenue

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	154	68	54	51
Average Queue (ft)	119	42	34	34
95th Queue (ft)	160	66	51	48
Link Distance (ft)	500	754		399
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Queuing and Blocking Report

Existing plus Alternative #2 Saturday MIDDAY

Intersection: 1: SB US 101 Ramps & Tennant Avenue

Movement	EB	EB	EB	WB	WB	WB	SB	SB
Directions Served	T	T	R	L	T	T	LT	R
Maximum Queue (ft)	107	109	10	93	96	71	114	202
Average Queue (ft)	66	69	4	55	59	51	91	120
95th Queue (ft)	119	116	12	97	107	78	143	205
Link Distance (ft)	556	556			1072	1072	366	366
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			260	295				
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 2: NB US 101 Ramps & Tennant Avenue

Movement	EB	WB	WB	WB	NB	NB
Directions Served	T	T	T	R	L	TR
Maximum Queue (ft)	89	69	28	67	70	49
Average Queue (ft)	47	35	16	43	50	30
95th Queue (ft)	85	74	39	69	72	46
Link Distance (ft)	287	112	112	112	415	415
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 3: Tennant Avenue & Condit Road

Movement	EB	EB	WB	SB
Directions Served	L	T	TR	LR
Maximum Queue (ft)	76	30	53	52
Average Queue (ft)	45	6	11	38
95th Queue (ft)	75	26	45	56
Link Distance (ft)		139	500	139
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	140			
Storage Blk Time (%)				
Queuing Penalty (veh)				

Queuing and Blocking Report

Existing plus Alternative #2 Saturday MIDDAY

Intersection: 4: Murphy Avenue & Tennant Avenue

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	121	56	98	54
Average Queue (ft)	85	41	68	34
95th Queue (ft)	121	60	97	51
Link Distance (ft)	500	754		399
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Queuing and Blocking Report

Existing plus Alternative #3 PM

Intersection: 1: SB US 101 Ramps & Tennant Avenue

Movement	EB	EB	EB	WB	WB	WB	SB	SB
Directions Served	T	T	R	L	T	T	LT	R
Maximum Queue (ft)	131	44	39	111	226	238	172	282
Average Queue (ft)	49	30	10	68	121	120	113	204
95th Queue (ft)	118	58	35	114	244	251	168	328
Link Distance (ft)	556	556			1072	1072	366	366
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			260	295				
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 2: NB US 101 Ramps & Tennant Avenue

Movement	EB	WB	WB	WB	NB	NB
Directions Served	T	T	T	R	L	TR
Maximum Queue (ft)	70	71	50	26	327	50
Average Queue (ft)	27	23	21	10	185	37
95th Queue (ft)	65	66	52	31	307	57
Link Distance (ft)	287	112	112	112	415	415
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 3: Tennant Avenue & Condit Road

Movement	EB	SB
Directions Served	L	LTR
Maximum Queue (ft)	31	118
Average Queue (ft)	28	65
95th Queue (ft)	33	138
Link Distance (ft)		138
Upstream Blk Time (%)		0
Queuing Penalty (veh)		0
Storage Bay Dist (ft)	140	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Queuing and Blocking Report

Existing plus Alternative #3 PM

Intersection: 4: Murphy Avenue & Tennant Avenue

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	56	54	55	51
Average Queue (ft)	49	40	40	34
95th Queue (ft)	64	57	59	48
Link Distance (ft)	505	754		399
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 1: SB US 101 Ramps & Tennant Avenue

Movement	EB	EB	EB	WB	WB	WB	SB	SB
Directions Served	T	T	R	L	T	T	LT	R
Maximum Queue (ft)	171	162	11	52	53	73	207	198
Average Queue (ft)	86	78	2	34	46	58	104	112
95th Queue (ft)	159	161	9	49	60	88	219	194
Link Distance (ft)	556	556			1072	1072	366	366
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			260	295				
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 2: NB US 101 Ramps & Tennant Avenue

Movement	EB	WB	WB	WB	NB	NB
Directions Served	T	T	T	R	L	TR
Maximum Queue (ft)	128	50	27	64	161	73
Average Queue (ft)	99	30	11	43	91	40
95th Queue (ft)	133	48	33	67	173	71
Link Distance (ft)	287	112	112	112	415	415
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 3: Tennant Avenue & Condit Road

Movement	EB	EB	WB	SB
Directions Served	L	TR	TR	LTR
Maximum Queue (ft)	54	52	55	52
Average Queue (ft)	38	10	11	43
95th Queue (ft)	72	45	48	60
Link Distance (ft)		134	505	138
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	140			
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 4: Murphy Avenue & Tennant Avenue

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	102	79	75	64
Average Queue (ft)	82	50	56	40
95th Queue (ft)	110	79	81	65
Link Distance (ft)	505	754		399
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Queuing and Blocking Report

Existing plus Alternative #4 PM

Intersection: 1: SB US 101 Ramps & Tennant Avenue

Movement	EB	EB	WB	WB	WB	SB	SB
Directions Served	T	T	L	T	T	LT	R
Maximum Queue (ft)	70	67	115	136	139	117	187
Average Queue (ft)	46	35	56	88	78	98	118
95th Queue (ft)	69	84	125	133	131	128	183
Link Distance (ft)	556	556		1072	1072	366	366
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)			295				
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 2: NB US 101 Ramps & Tennant Avenue

Movement	EB	WB	WB	WB	NB	NB
Directions Served	T	T	T	R	L	TR
Maximum Queue (ft)	158	50	28	24	181	98
Average Queue (ft)	56	36	6	5	158	48
95th Queue (ft)	148	55	24	20	187	98
Link Distance (ft)	287	112	112	112	415	415
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 3: Tennant Avenue & Condit Road

Movement	EB	WB	NB	SB
Directions Served	L	TR	LTR	LTR
Maximum Queue (ft)	55	21	48	31
Average Queue (ft)	22	4	34	28
95th Queue (ft)	56	18	45	31
Link Distance (ft)		505	313	138
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	140			
Storage Blk Time (%)				
Queuing Penalty (veh)				

Queuing and Blocking Report

Existing plus Alternative #4 PM

Intersection: 4: Murphy Avenue & Tennant Avenue

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	103	55	56	31
Average Queue (ft)	65	49	33	24
95th Queue (ft)	105	64	52	43
Link Distance (ft)	505	754		399
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Queuing and Blocking Report

Existing plus Alternative #4 Saturday Midday

Intersection: 1: SB US 101 Ramps & Tennant Avenue

Movement	EB	EB	EB	WB	WB	WB	SB	SB
Directions Served	T	T	R	L	T	T	LT	R
Maximum Queue (ft)	104	63	59	52	73	71	128	137
Average Queue (ft)	78	33	13	42	61	49	91	83
95th Queue (ft)	111	68	51	60	77	71	144	130
Link Distance (ft)	556	556			1072	1072	366	366
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			260	295				
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 2: NB US 101 Ramps & Tennant Avenue

Movement	EB	WB	WB	WB	NB	NB
Directions Served	T	T	T	R	L	TR
Maximum Queue (ft)	72	48	27	71	95	48
Average Queue (ft)	57	25	16	40	60	34
95th Queue (ft)	86	61	38	69	89	52
Link Distance (ft)	287	112	112	112	415	415
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 3: Tennant Avenue & Condit Road

Movement	EB	EB	WB	NB	SB
Directions Served	L	TR	TR	LTR	LTR
Maximum Queue (ft)	31	31	49	144	55
Average Queue (ft)	23	6	10	76	38
95th Queue (ft)	43	26	42	145	59
Link Distance (ft)		134	506	233	138
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	140				
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 4: Murphy Avenue & Tennant Avenue

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	118	54	55	89
Average Queue (ft)	76	35	44	40
95th Queue (ft)	113	51	61	81
Link Distance (ft)	506	754		399
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 1: SB US 101 Ramps & Tennant Avenue

Movement	EB	EB	EB	WB	WB	WB	SB	SB
Directions Served	T	T	R	L	T	T	LT	R
Maximum Queue (ft)	571	571	285	320	998	984	381	381
Average Queue (ft)	433	418	171	316	753	734	371	147
95th Queue (ft)	700	733	401	323	1117	1074	387	444
Link Distance (ft)	556	556			1072	1072	366	366
Upstream Blk Time (%)	30	57					85	1
Queuing Penalty (veh)	0	0					0	0
Storage Bay Dist (ft)			260	295				
Storage Blk Time (%)		57	1	94	12			
Queuing Penalty (veh)		440	6	589	48			

Intersection: 2: NB US 101 Ramps & Tennant Avenue

Movement	EB	WB	WB	WB	B13	NB	NB
Directions Served	T	T	T	R	T	L	TR
Maximum Queue (ft)	300	180	112	99	85	448	430
Average Queue (ft)	292	144	109	50	24	434	430
95th Queue (ft)	302	181	117	94	79	446	430
Link Distance (ft)	287	112	112	112	134	415	415
Upstream Blk Time (%)	73	13	3	0		45	59
Queuing Penalty (veh)	528	67	17	1		0	0
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 3: Tennant Avenue & Condit Road

Movement	EB	EB	B13	B13	WB	NB	SB	B17
Directions Served	L	TR	T		LTR	LTR	LTR	T
Maximum Queue (ft)	134	224	162	163	31	206	201	382
Average Queue (ft)	133	211	146	143	18	156	188	271
95th Queue (ft)	134	224	160	174	42	203	200	509
Link Distance (ft)		134	112	112	505	262	138	370
Upstream Blk Time (%)	1	89	51	11			84	49
Queuing Penalty (veh)	0	1784	512	107			0	0
Storage Bay Dist (ft)	140							
Storage Blk Time (%)	1	89						
Queuing Penalty (veh)	18	189						

Intersection: 4: Murphy Avenue & Tennant Avenue

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	512	516	830	144
Average Queue (ft)	508	411	808	90
95th Queue (ft)	513	556	853	143
Link Distance (ft)	505	754		399
Upstream Blk Time (%)	28			
Queuing Penalty (veh)	468			
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Queuing and Blocking Report

Cumulative + Alternative #1 Sat. Midday

Intersection: 1: SB US 101 Ramps & Tennant Avenue

Movement	EB	EB	EB	WB	WB	WB	SB	SB
Directions Served	T	T	R	L	T	T	LT	R
Maximum Queue (ft)	571	571	285	320	523	468	400	393
Average Queue (ft)	445	422	173	318	434	164	385	384
95th Queue (ft)	702	725	399	324	545	416	398	392
Link Distance (ft)	556	556			1072	1072	366	366
Upstream Blk Time (%)	19	53					83	47
Queuing Penalty (veh)	0	0					0	0
Storage Bay Dist (ft)			260	295				
Storage Blk Time (%)		53	0	90	1			
Queuing Penalty (veh)		345	1	438	3			

Intersection: 2: NB US 101 Ramps & Tennant Avenue

Movement	EB	WB	WB	WB	NB	NB
Directions Served	T	T	T	R	L	TR
Maximum Queue (ft)	322	75	56	66	430	449
Average Queue (ft)	301	68	37	47	430	434
95th Queue (ft)	319	82	58	69	430	447
Link Distance (ft)	287	112	112	112	415	415
Upstream Blk Time (%)	67				77	86
Queuing Penalty (veh)	468				0	0
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 3: Tennant Avenue & Condit Road

Movement	EB	EB	B13	B13	WB	NB	SB	B17
Directions Served	L	TR	T		LTR	LTR	LTR	T
Maximum Queue (ft)	134	229	181	132	182	277	201	368
Average Queue (ft)	133	222	159	96	54	275	190	339
95th Queue (ft)	134	235	191	176	161	278	199	401
Link Distance (ft)		134	112	112	505	262	138	370
Upstream Blk Time (%)	1	84	52	11		100	100	74
Queuing Penalty (veh)	0	1752	540	110		0	0	0
Storage Bay Dist (ft)	140							
Storage Blk Time (%)	1	84						
Queuing Penalty (veh)	25	234						

Queuing and Blocking Report

Cumulative + Alternative #1 Sat. MIDDAY

Intersection: 4: Murphy Avenue & Tennant Avenue

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	508	515	610	76
Average Queue (ft)	506	325	419	67
95th Queue (ft)	508	549	606	83
Link Distance (ft)	505	754		399
Upstream Blk Time (%)	24			
Queuing Penalty (veh)	396			
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Queuing and Blocking Report

Cumulative + Alternative #2 PM

Intersection: 1: SB US 101 Ramps & Tennant Avenue

Movement	EB	EB	EB	WB	WB	WB	SB	SB
Directions Served	T	T	R	L	T	T	LT	R
Maximum Queue (ft)	590	571	285	320	762	738	418	381
Average Queue (ft)	442	432	173	317	668	673	380	373
95th Queue (ft)	715	713	399	323	827	809	416	384
Link Distance (ft)	556	556			1072	1072	366	366
Upstream Blk Time (%)	31	50					86	67
Queuing Penalty (veh)	0	0					0	0
Storage Bay Dist (ft)			260	295				
Storage Blk Time (%)		50	0	68	41			
Queuing Penalty (veh)		384	3	427	166			

Intersection: 2: NB US 101 Ramps & Tennant Avenue

Movement	EB	WB	WB	WB	B13	NB	NB
Directions Served	T	T	T	R	T	L	TR
Maximum Queue (ft)	294	185	112	49	152	430	430
Average Queue (ft)	291	173	92	35	87	430	430
95th Queue (ft)	296	198	115	53	178	430	430
Link Distance (ft)	287	112	112	112	139	415	415
Upstream Blk Time (%)	70	21	4		3	54	79
Queuing Penalty (veh)	509	105	21		50	0	0
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 3: Tennant Avenue & Condit Road

Movement	EB	EB	B13	B13	WB	SB	B17
Directions Served	L	T	T		TR	LR	T
Maximum Queue (ft)	138	211	179	159	54	208	387
Average Queue (ft)	111	211	156	129	21	198	217
95th Queue (ft)	202	211	186	157	55	214	468
Link Distance (ft)		139	112	112	500	139	372
Upstream Blk Time (%)	1	90	59	11		84	32
Queuing Penalty (veh)	0	1817	594	113		0	0
Storage Bay Dist (ft)	140						
Storage Blk Time (%)	1	90					
Queuing Penalty (veh)	15	192					

Queuing and Blocking Report

Cumulative + Alternative #2 PM

Intersection: 4: Murphy Avenue & Tennant Avenue

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	506	510	811	97
Average Queue (ft)	505	385	792	86
95th Queue (ft)	507	562	856	103
Link Distance (ft)	500	754		399
Upstream Blk Time (%)	27			
Queuing Penalty (veh)	490			
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Queuing and Blocking Report

Cumulative + Alternative #2 Sat. Midday

Intersection: 1: SB US 101 Ramps & Tennant Avenue

Movement	EB	EB	EB	WB	WB	WB	SB	SB
Directions Served	T	T	R	L	T	T	LT	R
Maximum Queue (ft)	571	590	285	320	888	768	381	381
Average Queue (ft)	503	508	228	317	589	356	378	381
95th Queue (ft)	702	731	416	326	979	888	387	381
Link Distance (ft)	556	556			1072	1072	366	366
Upstream Blk Time (%)	57	64					91	75
Queuing Penalty (veh)	0	0					0	0
Storage Bay Dist (ft)			260	295				
Storage Blk Time (%)		67	1	86				
Queuing Penalty (veh)		437	6	418				

Intersection: 2: NB US 101 Ramps & Tennant Avenue

Movement	EB	WB	WB	WB	NB	NB
Directions Served	T	T	T	R	L	TR
Maximum Queue (ft)	300	87	100	87	449	430
Average Queue (ft)	295	56	51	57	434	430
95th Queue (ft)	303	82	94	82	447	430
Link Distance (ft)	287	112	112	112	415	415
Upstream Blk Time (%)	78		0		77	92
Queuing Penalty (veh)	543		0		0	0
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 3: Tennant Avenue & Condit Road

Movement	EB	EB	B13	B13	WB	SB	B17
Directions Served	L	T	T		TR	LR	T
Maximum Queue (ft)	138	248	146	162	67	208	387
Average Queue (ft)	138	230	136	137	33	207	267
95th Queue (ft)	139	257	147	163	72	209	479
Link Distance (ft)		139	112	112	500	139	372
Upstream Blk Time (%)	2	91	51	7		89	37
Queuing Penalty (veh)	0	1902	529	69		0	0
Storage Bay Dist (ft)	140						
Storage Blk Time (%)	2	91					
Queuing Penalty (veh)	29	254					

Intersection: 4: Murphy Avenue & Tennant Avenue

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	508	99	848	116
Average Queue (ft)	503	92	824	70
95th Queue (ft)	509	109	849	112
Link Distance (ft)	500	754		399
Upstream Blk Time (%)	23			
Queuing Penalty (veh)	419			
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Queuing and Blocking Report

Cumulative + Alternative #3 PM

Intersection: 1: SB US 101 Ramps & Tennant Avenue

Movement	EB	EB	EB	WB	WB	WB	SB	SB
Directions Served	T	T	R	L	T	T	LT	R
Maximum Queue (ft)	571	590	285	320	1084	1112	381	381
Average Queue (ft)	459	474	171	319	934	902	372	229
95th Queue (ft)	688	713	401	320	1272	1337	387	537
Link Distance (ft)	556	556			1072	1072	366	366
Upstream Blk Time (%)	31	57			31	10	75	26
Queuing Penalty (veh)	0	0			257	80	0	0
Storage Bay Dist (ft)			260	295				
Storage Blk Time (%)		57	1	98	5			
Queuing Penalty (veh)		438	5	614	19			

Intersection: 2: NB US 101 Ramps & Tennant Avenue

Movement	EB	WB	WB	WB	B13	NB	NB
Directions Served	T	T	T	R	T	L	TR
Maximum Queue (ft)	301	185	113	54	195	449	467
Average Queue (ft)	294	180	109	37	142	438	437
95th Queue (ft)	304	198	120	57	214	453	462
Link Distance (ft)	287	112	112	112	134	415	415
Upstream Blk Time (%)	74	26	11		8	41	60
Queuing Penalty (veh)	534	131	54		116	0	0
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 3: Tennant Avenue & Condit Road

Movement	EB	EB	B13	B13	WB	SB	B17
Directions Served	L	TR	T		LTR	LTR	T
Maximum Queue (ft)	133	224	181	163	95	208	404
Average Queue (ft)	114	209	149	90	23	192	237
95th Queue (ft)	178	222	190	213	84	236	505
Link Distance (ft)		134	112	112	505	138	370
Upstream Blk Time (%)	1	87	52	5		85	39
Queuing Penalty (veh)	0	1755	525	48		0	0
Storage Bay Dist (ft)	140						
Storage Blk Time (%)	1	87					
Queuing Penalty (veh)	13	186					

Queuing and Blocking Report

Cumulative + Alternative #3 PM

Intersection: 4: Murphy Avenue & Tennant Avenue

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	526	390	835	164
Average Queue (ft)	521	232	803	97
95th Queue (ft)	527	384	853	164
Link Distance (ft)	505	754		399
Upstream Blk Time (%)	51			
Queuing Penalty (veh)	857			
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 1: SB US 101 Ramps & Tennant Avenue

Movement	EB	EB	EB	WB	WB	WB	SB	SB
Directions Served	T	T	R	L	T	T	LT	R
Maximum Queue (ft)	571	571	285	320	1083	1107	381	400
Average Queue (ft)	441	444	171	313	946	552	380	385
95th Queue (ft)	637	706	401	335	1283	1290	384	398
Link Distance (ft)	556	556			1072	1072	366	366
Upstream Blk Time (%)	15	40			42	7	83	78
Queuing Penalty (veh)	0	0			309	52	0	0
Storage Bay Dist (ft)			260	295				
Storage Blk Time (%)		40	0	91	17			
Queuing Penalty (veh)		259	2	444	86			

Intersection: 2: NB US 101 Ramps & Tennant Avenue

Movement	EB	WB	WB	WB	NB	NB
Directions Served	T	T	T	R	L	TR
Maximum Queue (ft)	300	93	50	49	449	448
Average Queue (ft)	297	54	48	44	374	374
95th Queue (ft)	301	89	51	58	568	570
Link Distance (ft)	287	112	112	112	415	415
Upstream Blk Time (%)	55	0			68	71
Queuing Penalty (veh)	382	0			0	0
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 3: Tennant Avenue & Condit Road

Movement	EB	EB	B13	B13	WB	SB	B17
Directions Served	L	TR	T		TR	LTR	T
Maximum Queue (ft)	134	242	182	115	52	208	375
Average Queue (ft)	107	225	172	46	31	178	182
95th Queue (ft)	195	244	191	137	62	245	454
Link Distance (ft)		134	112	112	505	138	370
Upstream Blk Time (%)	1	82	50	5		73	24
Queuing Penalty (veh)	0	1717	519	55		0	0
Storage Bay Dist (ft)	140						
Storage Blk Time (%)	1	82					
Queuing Penalty (veh)	11	229					

Intersection: 4: Murphy Avenue & Tennant Avenue

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	524	292	811	119
Average Queue (ft)	520	249	805	90
95th Queue (ft)	524	289	826	124
Link Distance (ft)	505	754		399
Upstream Blk Time (%)	45			
Queuing Penalty (veh)	728			
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Queuing and Blocking Report

Cumulative + Alternative #4 PM

Intersection: 1: SB US 101 Ramps & Tennant Avenue

Movement	EB	EB	EB	WB	WB	WB	SB	SB
Directions Served	T	T	R	L	T	T	LT	R
Maximum Queue (ft)	571	571	285	320	1087	1063	381	381
Average Queue (ft)	465	442	59	319	889	740	372	275
95th Queue (ft)	676	697	246	321	1288	1131	389	519
Link Distance (ft)	556	556			1072	1072	366	366
Upstream Blk Time (%)	38	52			32	0	64	23
Queuing Penalty (veh)	0	0			263	2	0	0
Storage Bay Dist (ft)			260	295				
Storage Blk Time (%)		59	0	92	15			
Queuing Penalty (veh)		449	1	577	59			

Intersection: 2: NB US 101 Ramps & Tennant Avenue

Movement	EB	WB	WB	WB	B13	NB	NB
Directions Served	T	T	T	R	T	L	TR
Maximum Queue (ft)	300	185	112	54	133	430	430
Average Queue (ft)	291	149	112	36	62	383	408
95th Queue (ft)	299	187	112	55	152	459	481
Link Distance (ft)	287	112	112	112	134	415	415
Upstream Blk Time (%)	73	12	7		1	13	40
Queuing Penalty (veh)	525	60	32		11	0	0
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 3: Tennant Avenue & Condit Road

Movement	EB	EB	B13	B13	WB	NB	SB	B17
Directions Served	L	TR	T		TR	LTR	LTR	T
Maximum Queue (ft)	134	243	163	163	30	328	208	385
Average Queue (ft)	133	225	144	119	6	293	199	313
95th Queue (ft)	134	245	164	178	26	353	211	440
Link Distance (ft)		134	112	112	505	313	138	370
Upstream Blk Time (%)	1	84	46	5		59	98	52
Queuing Penalty (veh)	0	1682	466	49		0	0	0
Storage Bay Dist (ft)	140							
Storage Blk Time (%)	1	84						
Queuing Penalty (veh)	17	178						

Queuing and Blocking Report

Cumulative + Alternative #4 PM

Intersection: 4: Murphy Avenue & Tennant Avenue

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	510	332	848	76
Average Queue (ft)	509	295	779	54
95th Queue (ft)	511	374	919	77
Link Distance (ft)	505	754		399
Upstream Blk Time (%)	22			
Queuing Penalty (veh)	379			
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Queuing and Blocking Report

Cumulative + Alternative #4 Sat. Midday

Intersection: 1: SB US 101 Ramps & Tennant Avenue

Movement	EB	EB	EB	WB	WB	WB	SB	SB
Directions Served	T	T	R	L	T	T	LT	R
Maximum Queue (ft)	561	571	285	320	1100	998	400	400
Average Queue (ft)	396	402	118	319	955	274	384	384
95th Queue (ft)	649	728	343	321	1212	872	398	398
Link Distance (ft)	556	556			1072	1072	366	366
Upstream Blk Time (%)	1	53			24		92	81
Queuing Penalty (veh)	0	0			176		0	0
Storage Bay Dist (ft)			260	295				
Storage Blk Time (%)		53	0	97				
Queuing Penalty (veh)		347	1	473				

Intersection: 2: NB US 101 Ramps & Tennant Avenue

Movement	EB	WB	WB	WB	NB	NB
Directions Served	T	T	T	R	L	TR
Maximum Queue (ft)	301	91	72	72	478	467
Average Queue (ft)	296	53	40	62	440	442
95th Queue (ft)	305	96	71	78	472	466
Link Distance (ft)	287	112	112	112	415	415
Upstream Blk Time (%)	77				74	80
Queuing Penalty (veh)	533				0	0
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 3: Tennant Avenue & Condit Road

Movement	EB	EB	B13	B13	WB	NB	SB	B17
Directions Served	L	TR	T		TR	LTR	LTR	T
Maximum Queue (ft)	134	243	164	180	52	248	208	385
Average Queue (ft)	133	217	136	125	36	235	184	256
95th Queue (ft)	134	241	163	234	70	265	243	520
Link Distance (ft)		134	112	112	506	233	138	370
Upstream Blk Time (%)	1	87	50	16		78	72	43
Queuing Penalty (veh)	0	1802	524	166		0	0	0
Storage Bay Dist (ft)	140							
Storage Blk Time (%)	1	87						
Queuing Penalty (veh)	23	240						

Queuing and Blocking Report

Cumulative + Alternative #4 Sat. Midday

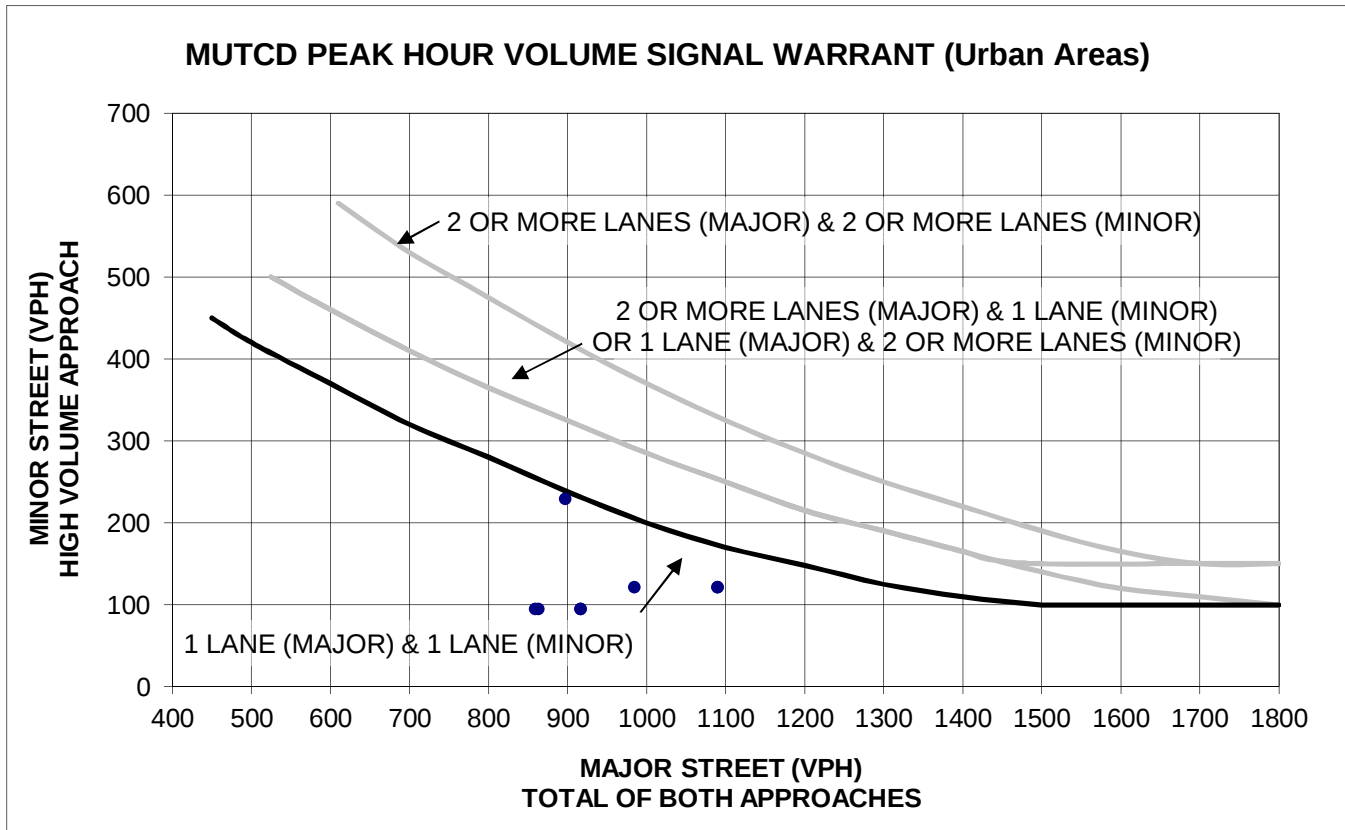
Intersection: 4: Murphy Avenue & Tennant Avenue

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	514	147	811	99
Average Queue (ft)	508	112	712	83
95th Queue (ft)	514	151	925	103
Link Distance (ft)	506	754		399
Upstream Blk Time (%)	21			
Queuing Penalty (veh)	347			
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Appendix C

Signal Warrant Worksheets

Intersection #3 - Condit Road / Tennant Avenue



Scenario	Tennant	Condit	Warrant
	East/West	North/South	Met?
A. Ex+Alt 1 PM	859	95	No
B. Ex+Alt 1 Sat	897	230	No
C. Ex+Alt 2 PM	916	95	No
D. Ex+Alt 2 Sat	1089	122	No
E. Ex+Alt 3 PM	916	95	No
F. Ex+Alt 3 Sat	1089	122	No
G. Ex+Alt 4 PM	863	95	No
H. Ex+Alt 4 Sat	984	122	No
I. Cum+Alt 1 PM	3260	237	Yes
J. Cum+Alt 1 Sat	3179	296	Yes
K. Cum+Alt 2 PM	3317	237	Yes
L. Cum+Alt 2 Sat	3371	296	Yes
M. Cum+Alt 3 PM	3317	237	Yes
N. Cum+Alt 3 Sat	3371	296	Yes
O. Cum+Alt 4 PM	3260	237	Yes
P. Cum+Alt 4 Sat	3272	296	Yes

Notes:

- 150 VPH applies as the lower threshold volume for a minor street approach with two or more lanes and 100 VPH applies as the lower threshold volume for a minor street approaching with one lane.
- Bold line applies to intersection geometry.

**Warrant 3 (Part B) - Peak Hour Delay
Condit Road / Tennant Avenue**

Number of Approaches to Intersection:

Total Entering Volumes:

Ex+Alt 1 PM:	4 approaches	Minimum Entering Vehicles:	800
Ex+Alt 1 Sat:	1030 vehicles	Cum+Alt 1 PM:	3573 vehicles
Ex+Alt 2 PM:	1249 vehicles	Cum+Alt 1 Sat:	3705 vehicles
Ex+Alt 2 Sat:	1011 vehicles	Cum+Alt 2 PM:	3554 vehicles
Ex+Alt 3 PM:	1211 vehicles	Cum+Alt 2 Sat:	3667 vehicles
Ex+Alt 3 Sat:	1011 vehicles	Cum+Alt 3 PM:	3554 vehicles
Ex+Alt 4 PM:	1211 vehicles	Cum+Alt 3 Sat:	3667 vehicles
Ex+Alt 4 Sat:	1022 vehicles	Cum+Alt 4 PM:	3559 vehicles
	1220 vehicles	Cum+Alt 4 Sat:	3682 vehicles

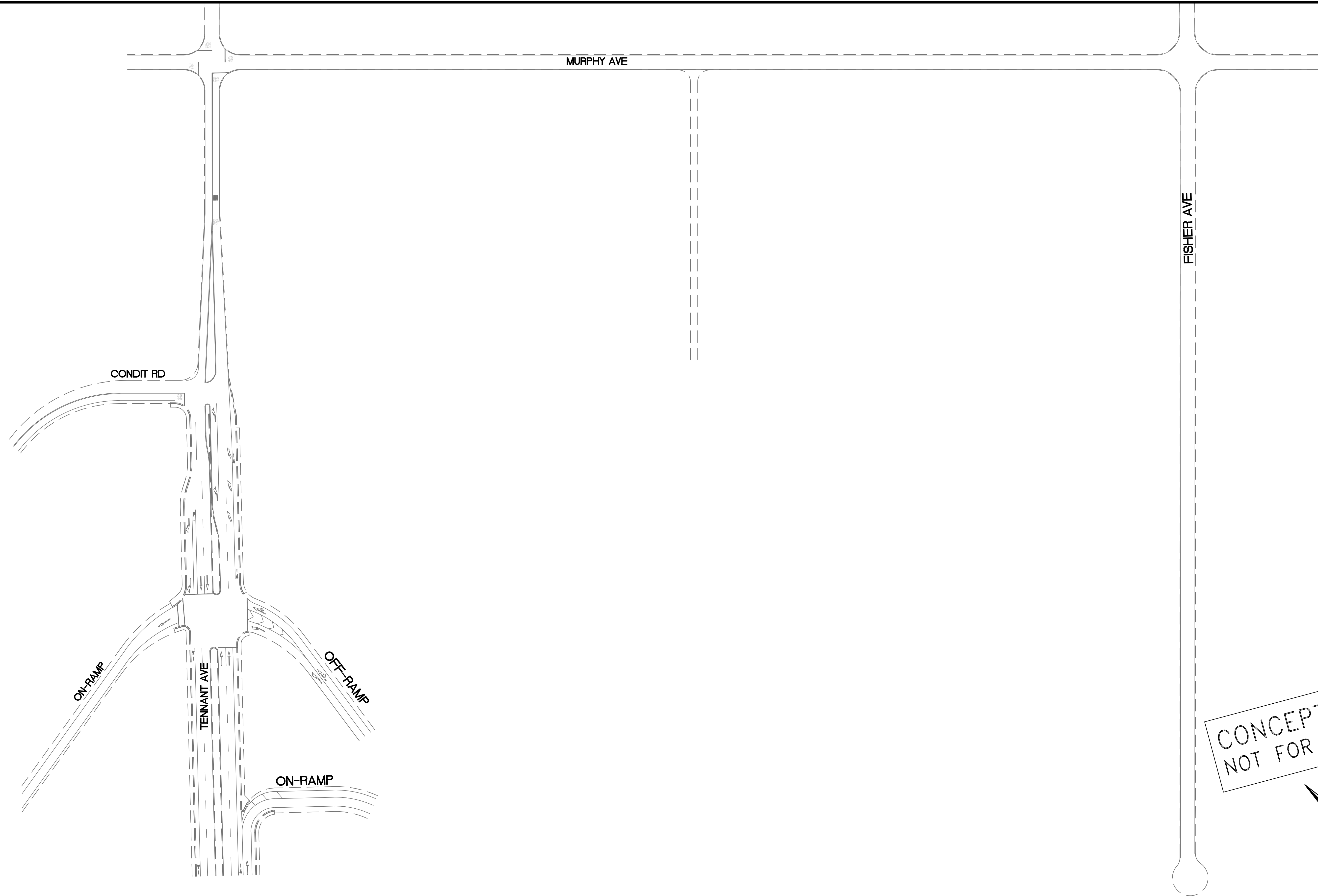
Street	Direction	Scenario	Peak Hour	No. of Stopped Vehicles	Average Vehicle Delay (sec)	Total Vehicle Delay (sec)	Total Delay (hours)	Min. 4 Veh-Hrs of Delay? (Approach)	At least 100 Veh? (Approach)	At least 800 Veh? (Intersection)	Warrant Met?
Proj. Dwy	NB	Ex+Alt 1	PM	76	36.6	2,782	0.77	NO	NO	Yes	NO
Condit	SB	Ex+Alt 1	PM	95	13.2	1,254	0.35	NO	NO	Yes	NO
Proj. Dwy	NB	Ex+Alt 1	Sat	230	671.1	154,353	42.88	Yes	Yes	Yes	Yes
Condit	SB	Ex+Alt 1	Sat	122	16.5	2,013	0.56	NO	Yes	Yes	NO
Condit	SB	Ex+Alt 2	PM	95	13.9	1,321	0.37	NO	NO	Yes	NO
Condit	SB	Ex+Alt 2	Sat	122	24.6	3,001	0.83	NO	Yes	Yes	NO
Condit	SB	Ex+Alt 3	PM	95	13.6	1,292	0.36	NO	NO	Yes	NO
Condit	SB	Ex+Alt 3	Sat	122	21.4	2,611	0.73	NO	Yes	Yes	NO
Proj. Dwy	NB	Ex+Alt 4	PM	62	31.1	1,928	0.54	NO	NO	Yes	NO
Condit	SB	Ex+Alt 4	PM	95	13.0	1,235	0.34	NO	NO	Yes	NO
Proj. Dwy	NB	Ex+Alt 4	Sat	114	238.6	27,200	7.56	Yes	Yes	Yes	Yes
Condit	SB	Ex+Alt 4	Sat	122	18	2,196	0.61	NO	Yes	Yes	NO
Proj. Dwy	NB	Cum+Alt 1	PM	76	1,101	83,676	23.24	Yes	NO	Yes	NO
Condit	SB	Cum+Alt 1	PM	237	1,101	260,937	72.48	Yes	Yes	Yes	Yes
Proj. Dwy	NB	Cum+Alt 1	Sat	230	1,101	253,230	70.34	Yes	Yes	Yes	Yes
Condit	SB	Cum+Alt 1	Sat	296	1,101	325,896	90.53	Yes	Yes	Yes	Yes
Condit	SB	Cum+Alt 2	PM	237	1,101	260,937	72.48	Yes	Yes	Yes	Yes
Condit	SB	Cum+Alt 2	Sat	296	1,101	325,896	90.53	Yes	Yes	Yes	Yes
Condit	SB	Cum+Alt 3	PM	770	1,101	847,770	235.49	Yes	Yes	Yes	Yes
Condit	SB	Cum+Alt 3	Sat	296	1,101	325,896	90.53	Yes	Yes	Yes	Yes
Proj. Dwy	NB	Cum+Alt 4	PM	62	1,101	68,262	18.96	Yes	NO	Yes	NO
Condit	SB	Cum+Alt 4	PM	237	1,101	260,937	72.48	Yes	Yes	Yes	Yes
Proj. Dwy	NB	Cum+Alt 4	Sat	114	1,101	125,514	34.87	Yes	Yes	Yes	Yes
Condit	SB	Cum+Alt 4	Sat	296	1,101	325,896	90.53	Yes	Yes	Yes	Yes

Notes:

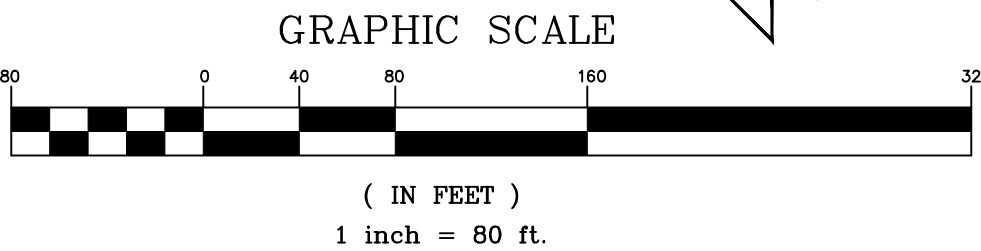
1. Warrant based on level of service calculations.
2. NB, SB, EB, WB = Northbound, Southbound, Eastbound, Westbound.

Appendix D

Conceptual Improvement Drawings



CONCEPTUAL PLANS
NOT FOR CONSTRUCTION



**BASE MAP & UTILITY
INFORMATION DISCLAIMER**

THIS PLAN WAS PREPARED FROM AVAILABLE AERIAL PHOTOS AND FIELD INSPECTIONS, NOT TOPOGRAPHIC SURVEY DATA. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO FIELD VERIFY ALL CONDITIONS ON THE JOB SITE PRIOR TO CONSTRUCTION.

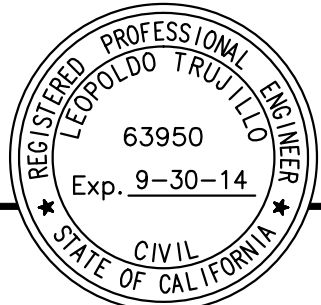
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				AS-BUILT CORRECTIONS		CHECKED: <i>LT</i>		VERT: <i>NONE</i>
NO.	DESCRIPTION	DATE	BY	BY:	DATE:	APPROVED:	DATE:	JOB NUMBER: <i>334046</i>
Revisions						KARL BLARKE, ACTING PUBLIC WORKS DIRECTOR R.C.E. #39419 EXP. 12-31-13		



City of Morgan Hill
Public Works Department

17575 Peak Avenue Morgan Hill, CA 95037 (408)778-6480, Fax (408)779-7236

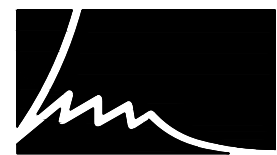
SUPERVISED BY:
LEOPOLDO TRUJILLO
REGISTERED CIVIL ENGINEER
REG. # 63950
EXP. DATE 9-30-14



SIGNATURE _____

DATE _____

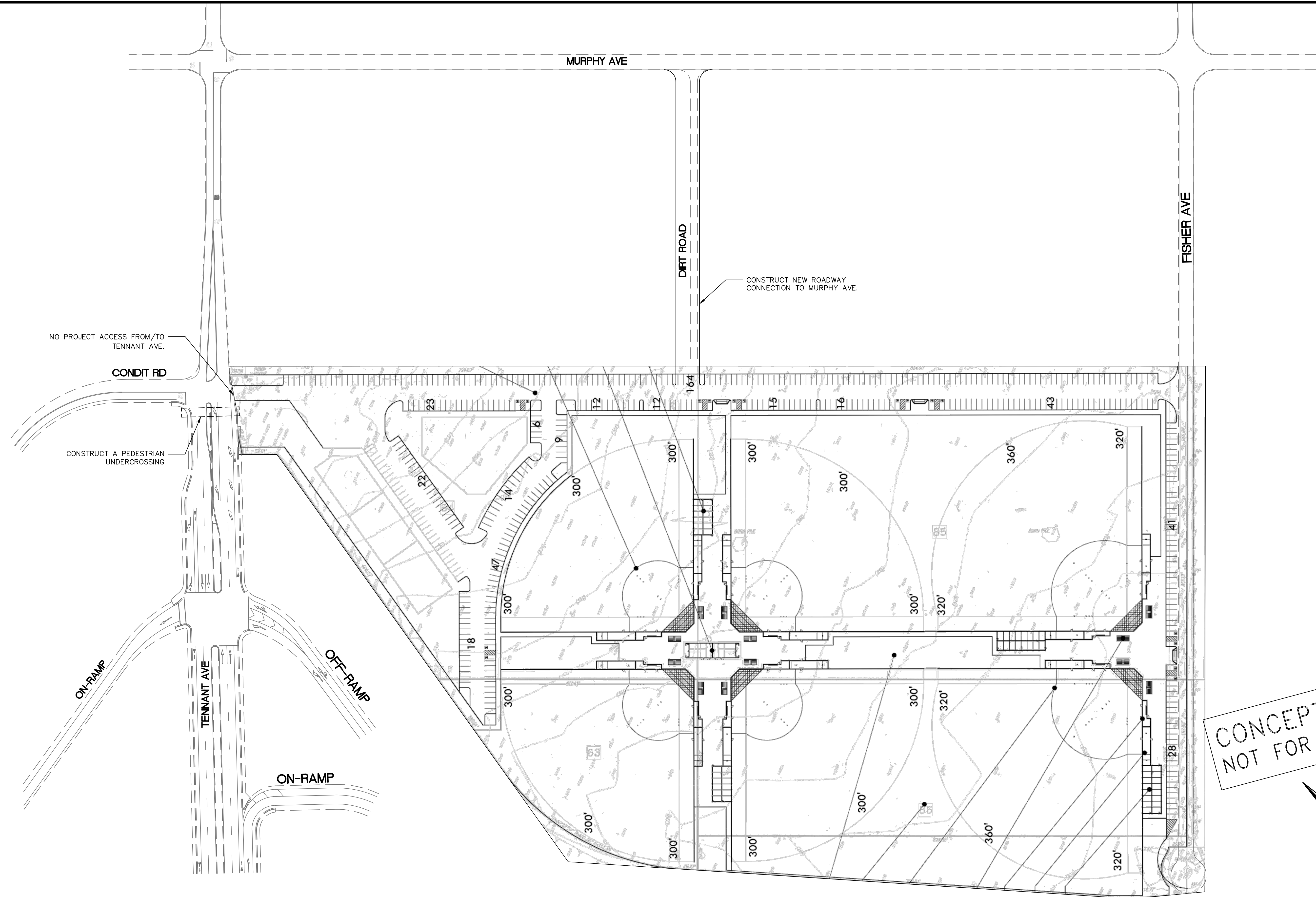
**MORGANHILL SPORTS PARK
EXISTING CONDITIONS**



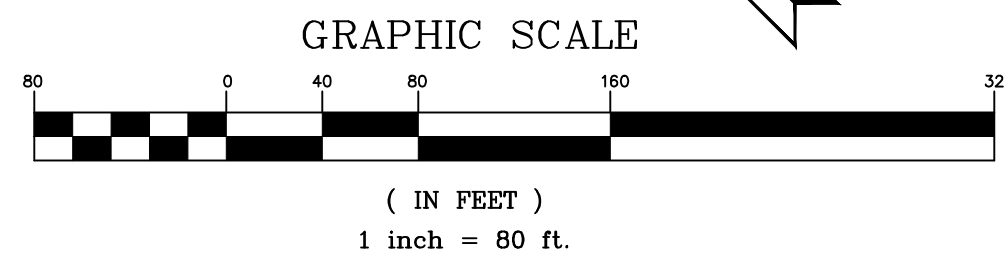
**Hatch Mott
MacDonald**

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(408)848-3122
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FILE NUMBER:
334046 C1
PRINT DATE:
2014-04-30
SHEET NUMBER:
1 OF 1



CONCEPTUAL PLANS
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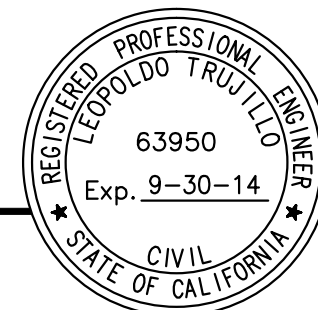
**BASE MAP & UTILITY
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AVAILABLE AERIAL PHOTOS AND FIELD
INSPECTIONS, NOT TOPOGRAPHIC
SURVEY DATA. IT SHALL BE THE
CONTRACTOR'S RESPONSIBILITY TO
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JOB SITE PRIOR TO CONSTRUCTION.

				WORK ACCEPTED:	INSPECTOR:	DRAWN: <i>FC</i>	DESIGN: <i>---</i>	HOR: <i>1"=80'</i>
				AS-BUILT CORRECTIONS		CHECKED: <i>LT</i>		VERT: <i>NONE</i>
NO.	DESCRIPTION	DATE	BY	BY:	DATE:	APPROVED:	DATE:	JOB NUMBER: <i>334046</i>
Revisions						KARL BLARKE, ACTING PUBLIC WORKS DIRECTOR R.C.E. #39419 EXP. 12-31-13		



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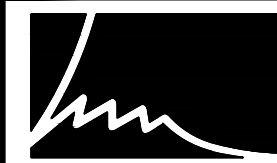


SUPERVISED BY:
LEOPOLDO TRUJILLO
REGISTERED CIVIL ENGINEER
RCE # 63950
EXP. DATE 9-30-14

SIGNATURE _____

DATE _____

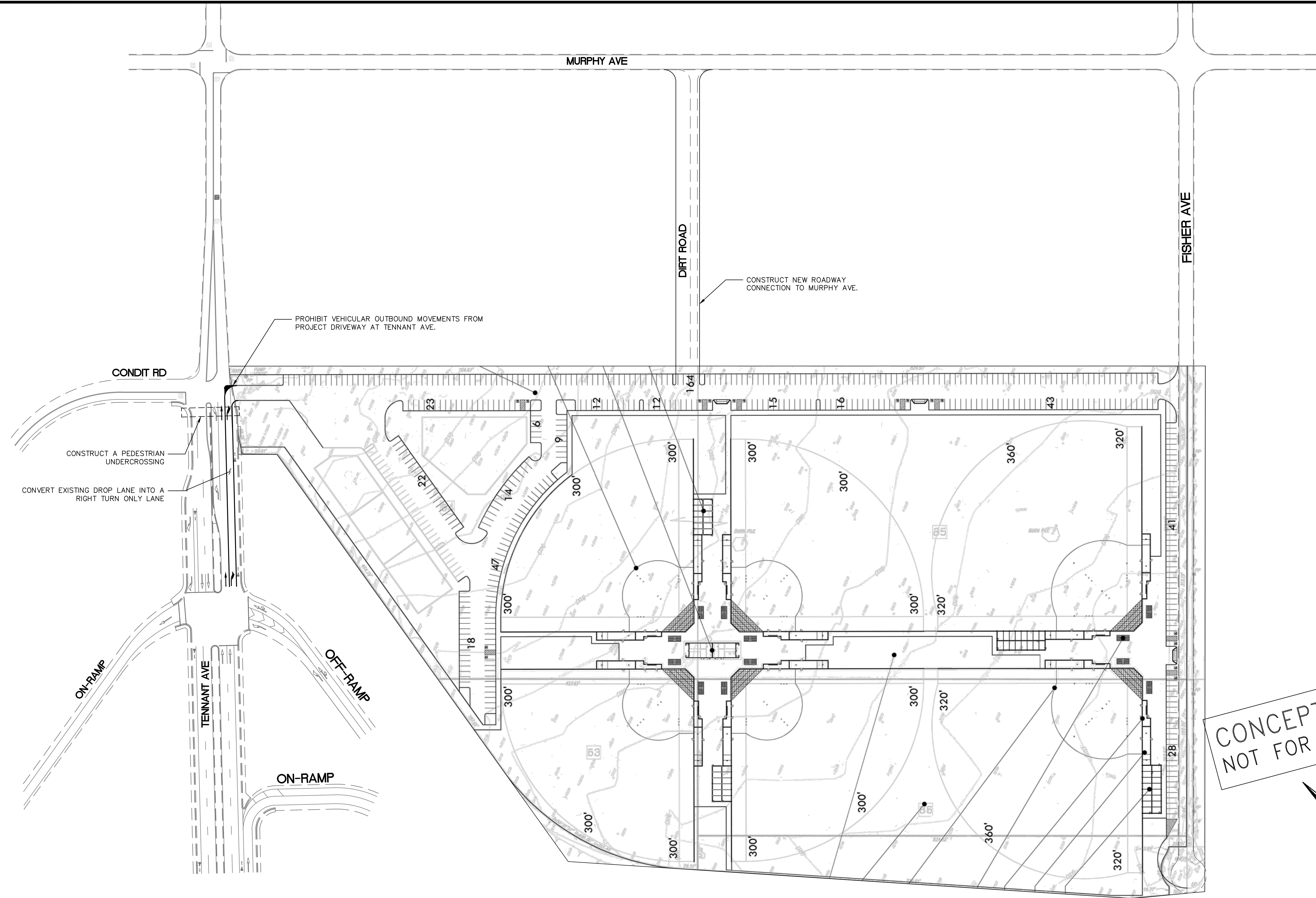
MORGANHILL SPORTS PARK
ALTERNATIVE - 2
NO ACCESS FROM TENNANT AVE



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1 OF 1

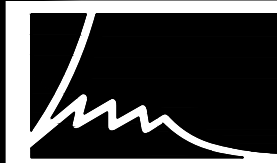


CONCEPTUAL PLANS
NOT FOR CONSTRUCTION

GRAPHIC SCALE



(IN FEET)
1 inch = 80 ft.



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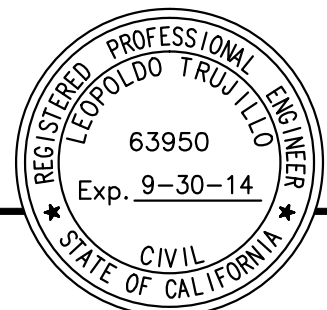
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				AS-BUILT CORRECTIONS		CHECKED: LT		VERT: NONE
NO.	DESCRIPTION	DATE	BY	BY:	DATE:	APPROVED:	DATE:	JOB NUMBER: 334046
Revisions						KARL BLARKE, ACTING PUBLIC WORKS DIRECTOR R.C.E. #39418 EXP. 12-31-13		



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SUPERVISED BY:
LEOPOLDO TRUJILLO
REGISTERED CIVIL ENGINEER
RCE # 63950
EXP. DATE 9-30-14



SIGNATURE _____ DATE _____

MORGANHILL SPORTS PARK
ALTERNATIVE - 3
EAST BOUND RIGHT TURN ACCESS ONLY INTO SPORTS PARK