EXHIBIT (C) - TRAFFIC IMPACT ANALYSIS
PART 3 OF 4

HCM Signalized Intersection Capacity Analysis
1: Military Dr & IH-410 NB Frnt Rd

Scenario 1 AM-2023
2/5/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	157	1235	22	0	0	0	0	341	821	426	1418	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0						5.1		6.0	6.0	
Lane Util. Factor	0.91	0.91						0.91		0.91	0.91	
Frt	1.00	1.00						0.89		1.00	1.00	
Flt Protected	0.95	1.00						1.00		0.95	1.00	
Satd. Flow (prot)	1610	3376						4546		1610	3385	
Flt Permitted	0.95	1.00						1.00		0.16	0.74	
Satd. Flow (perm)	1610	3376						4546		272	2518	
Peak-hour factor, PHF	0.89	0.81	0.57	1.00	1.00	1.00	1.00	0.86	0.86	0.88	0.91	1.00
Adj. Flow (vph)	176	1525	39	0	0	0	0	397	955	484	1558	0
RTOR Reduction (vph)	0	1	0	0	0	0	0	111	0	0	0	0
Lane Group Flow (vph)	158	1581	0	0	0	0	0	1241	0	436	1606	0
Turn Type	Split	NA						NA		pm+pt	NA	
Protected Phases	8 16	8 16						6		5	5 6	
Permitted Phases										5 6		
Actuated Green, G (s)	32.9	32.9						24.9		68.9	68.9	
Effective Green, g (s)	32.9	32.9						24.9		68.9	68.9	
Actuated g/C Ratio	0.28	0.28						0.21		0.58	0.58	
Clearance Time (s)								5.1		6.0		
Vehicle Extension (s)								3.0		3.0		
Lane Grp Cap (vph)	448	941						959		657	1793	
v/s Ratio Prot	0.10	c0.47						c0.27		0.25	c0.33	
v/s Ratio Perm										0.14	0.19	
v/c Ratio	0.35	1.68						2.12dr		0.66	0.90	
Uniform Delay, d1	34.0	42.5						46.5		21.8	21.4	
Progression Factor	1.00	1.00						1.00		0.40	0.89	
Incremental Delay, d2	2.2	310.5						140.0		0.2	0.6	
Delay (s)	36.2	353.1						186.6		9.0	19.6	
Level of Service	D	F						F		A	B	
Approach Delay (s)		324.3			0.0			186.6			17.3	
Approach LOS		F			A			F			B	

Intersection Summary			
HCM 2000 Control Delay	165.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.32		
Actuated Cycle Length (s)	118.0	Sum of lost time (s)	22.2
Intersection Capacity Utilization	116.7%	ICU Level of Service	H
Analysis Period (min)	15		

dr Defacto Right Lane. Recode with 1 though lane as a right lane.
c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
2: Military Dr & IH-410 SB Frnt Rd

Scenario 1 AM-2023
2/5/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	1251	325	195	83	407	0	0	728	46
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				5.8	5.8		5.7	5.7			5.1	
Lane Util. Factor				0.91	0.91		0.91	0.91			0.95	
Frt				1.00	0.98		1.00	1.00			0.99	
Flt Protected				0.95	0.97		0.95	1.00			1.00	
Satd. Flow (prot)				1610	3222		1610	3387			3502	
Flt Permitted				0.95	0.97		0.16	0.95			1.00	
Satd. Flow (perm)				1610	3222		272	3238			3502	
Peak-hour factor, PHF	1.00	1.00	1.00	0.92	0.80	0.91	0.74	0.75	1.00	1.00	0.84	0.71
Adj. Flow (vph)	0	0	0	1360	406	214	112	543	0	0	867	65
RTOR Reduction (vph)	0	0	0	0	13	0	0	0	0	0	5	0
Lane Group Flow (vph)	0	0	0	680	1287	0	101	554	0	0	927	0
Turn Type				Split	NA		pm+pt	NA			NA	
Protected Phases				4 12	4 12		1	1 2			2	
Permitted Phases							1 2					
Actuated Green, G (s)				34.9	34.9		67.2	67.2			24.9	
Effective Green, g (s)				34.9	34.9		67.2	67.2			24.9	
Actuated g/C Ratio				0.30	0.30		0.57	0.57			0.21	
Clearance Time (s)							5.7				5.1	
Vehicle Extension (s)							3.0				3.0	
Lane Grp Cap (vph)				476	952		634	1897			738	
v/s Ratio Prot				c0.42	0.40		0.06	c0.10			c0.26	
v/s Ratio Perm							0.03	0.06				
v/c Ratio				1.43	1.35		0.16	0.29			1.26	
Uniform Delay, d1				41.5	41.5		13.6	13.1			46.5	
Progression Factor				1.00	1.00		0.34	0.23			1.00	
Incremental Delay, d2				204.7	165.5		0.1	0.1			126.3	
Delay (s)				246.3	207.0		4.7	3.1			172.9	
Level of Service				F	F		A	A			F	
Approach Delay (s)		0.0			220.5			3.3			172.9	
Approach LOS		A			F			A			F	

Intersection Summary			
HCM 2000 Control Delay	168.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	118.0	Sum of lost time (s)	22.2
Intersection Capacity Utilization	116.7%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

EXHIBIT (C) - TRAFFIC IMPACT ANALYSIS
PART 3 OF 4

HCM Unsignalized Intersection Capacity Analysis
3: IH-410 SB Frnt Rd & Richland Hills

Scenario 1 AM-2023
2/5/2014

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	0	0	2736	230	0	288
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	0.86	0.70	1.00	0.81
Hourly flow rate (vph)	0	0	3181	329	0	356
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	3510				3346	1225
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	3510				3346	1225
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	0
cM capacity (veh/h)	70				6	171

Direction, Lane #	WB 1	WB 2	WB 3	SB 1
Volume Total	1273	1273	965	356
Volume Left	0	0	0	0
Volume Right	0	0	329	356
cSH	1700	1700	1700	171
Volume to Capacity	0.75	0.75	0.57	2.08
Queue Length 95th (ft)	0	0	0	697
Control Delay (s)	0.0	0.0	0.0	551.1
Lane LOS				F
Approach Delay (s)	0.0			551.1
Approach LOS				F

Intersection Summary			
Average Delay	50.7		
Intersection Capacity Utilization	82.5%	ICU Level of Service	E
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
4: Military Dr & Walmart/Sony Pl

Scenario 1 AM-2023
2/5/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	48	0	40	0	0	0	19	540	0	0	702	62
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.7		5.2				5.0	5.9			5.9	
Lane Util. Factor	1.00		1.00				1.00	0.95			0.95	
Frt	1.00		0.85				1.00	1.00			0.99	
Flt Protected	0.95		1.00				0.95	1.00			1.00	
Satd. Flow (prot)	1770		1583				1770	3539			3490	
Flt Permitted	0.95		1.00				0.23	1.00			1.00	
Satd. Flow (perm)	1770		1583				434	3539			3490	
Peak-hour factor, PHF	1.00	1.00	0.83	1.00	1.00	1.00	0.70	0.82	1.00	1.00	0.88	0.77
Adj. Flow (vph)	48	0	48	0	0	0	27	659	0	0	798	81
RTOR Reduction (vph)	0	0	44	0	0	0	0	0	0	0	4	0
Lane Group Flow (vph)	48	0	4	0	0	0	27	659	0	0	875	0
Turn Type	custom		custom	Perm			pm+pt	NA			NA	
Protected Phases	7		4		8		5	2			6	
Permitted Phases	4			8			2					
Actuated Green, G (s)	3.4		2.9				23.5	23.5			17.1	
Effective Green, g (s)	3.4		2.9				23.5	23.5			17.1	
Actuated g/C Ratio	0.09		0.08				0.63	0.63			0.46	
Clearance Time (s)	4.7		5.2				5.0	5.9			5.9	
Vehicle Extension (s)	1.0		1.0				1.0	2.5			2.5	
Lane Grp Cap (vph)	160		122				321	2217			1591	
v/s Ratio Prot	c0.03		0.00				0.00	c0.19			c0.25	
v/s Ratio Perm							0.05					
v/c Ratio	0.30		0.03				0.08	0.30			0.55	
Uniform Delay, d1	15.9		16.0				3.2	3.2			7.4	
Progression Factor	1.00		1.00				1.00	1.00			1.00	
Incremental Delay, d2	0.4		0.0				0.0	0.1			0.3	
Delay (s)	16.3		16.0				3.2	3.3			7.7	
Level of Service	B		B				A	A			A	
Approach Delay (s)		16.2			0.0			3.3			7.7	
Approach LOS		B			A			A			A	

Intersection Summary				
HCM 2000 Control Delay	6.4	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.71			
Actuated Cycle Length (s)	37.5	Sum of lost time (s)	21.1	
Intersection Capacity Utilization	35.6%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

EXHIBIT (C) - TRAFFIC IMPACT ANALYSIS
PART 3 OF 4

HCM Signalized Intersection Capacity Analysis
5: SH 151 SB Frnt Rd & Ingram Rd

Scenario 1 AM-2023
2/5/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	886	770	434	291	0	0	0	0	119	1075	198
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0		5.5	5.5					6.4	6.4	6.4
Lane Util. Factor		0.95		0.91	0.91					0.91	0.91	1.00
Frt		0.93		1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00		0.95	0.98					0.95	1.00	1.00
Satd. Flow (prot)		3274		1610	3327					1610	3388	1583
Flt Permitted		1.00		0.16	0.60					0.95	1.00	1.00
Satd. Flow (perm)		3274		271	2031					1610	3388	1583
Peak-hour factor, PHF	1.00	0.85	0.74	0.95	0.77	1.00	1.00	1.00	1.00	0.72	0.91	0.61
Adj. Flow (vph)	0	1042	1041	457	378	0	0	0	0	165	1181	325
RTOR Reduction (vph)	0	117	0	0	0	0	0	0	0	0	0	102
Lane Group Flow (vph)	0	1966	0	228	607	0	0	0	0	148	1198	223
Turn Type		NA		pm+pt	NA					Split	NA	Perm
Protected Phases		2		1	1 2					4 12	4 12	
Permitted Phases				1 2								4 12
Actuated Green, G (s)		25.0		84.7	84.7					53.0	53.0	53.0
Effective Green, g (s)		25.0		84.7	84.7					53.0	53.0	53.0
Actuated g/C Ratio		0.16		0.55	0.55					0.35	0.35	0.35
Clearance Time (s)		5.0		5.5								
Vehicle Extension (s)		3.0		3.0								
Lane Grp Cap (vph)		534		671	1627					556	1172	547
v/s Ratio Prot		c0.60		0.13	c0.15					0.09	c0.35	
v/s Ratio Perm				0.06	0.06							0.14
v/c Ratio		3.68		0.34	0.37					0.27	1.02	0.41
Uniform Delay, d1		64.1		19.5	19.3					36.1	50.1	38.1
Progression Factor		1.00		0.10	0.14					1.00	1.00	1.00
Incremental Delay, d2		1211.2		0.2	0.1					1.2	32.0	2.2
Delay (s)		1275.3		2.2	2.8					37.3	82.1	40.4
Level of Service		F		A	A					D	F	D
Approach Delay (s)		1275.3			2.6			0.0			70.0	
Approach LOS		F			A			A			E	

Intersection Summary			
HCM 2000 Control Delay	604.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.29		
Actuated Cycle Length (s)	153.2	Sum of lost time (s)	22.8
Intersection Capacity Utilization	80.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
6: SH 151 NB Frnt Rd & Ingram Rd

Scenario 1 AM-2023
2/5/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	352	620	0	0	417	39	355	604	205	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.4	6.4			5.0		6.4	6.4	6.4			
Lane Util. Factor	0.91	0.91			0.95		0.91	0.91	1.00			
Frt	1.00	1.00			0.98		1.00	1.00	0.85			
Flt Protected	0.95	0.99			1.00		0.95	1.00	1.00			
Satd. Flow (prot)	1610	3365			3483		1610	3381	1583			
Flt Permitted	0.16	0.55			1.00		0.95	1.00	1.00			
Satd. Flow (perm)	274	1851			3483		1610	3381	1583			
Peak-hour factor, PHF	0.78	0.83	1.00	1.00	0.83	0.66	0.92	0.86	0.62	1.00	1.00	1.00
Adj. Flow (vph)	451	747	0	0	502	59	386	702	331	0	0	0
RTOR Reduction (vph)	0	0	0	0	6	0	0	0	130	0	0	0
Lane Group Flow (vph)	320	878	0	0	555	0	347	741	201	0	0	0
Turn Type	pm+pt	NA			NA		Split	NA	Perm			
Protected Phases	5	5 6			6		8 16	8 16				
Permitted Phases	5 6								8 16			
Actuated Green, G (s)	83.8	83.8			30.2		53.0	53.0	53.0			
Effective Green, g (s)	83.8	83.8			30.2		53.0	53.0	53.0			
Actuated g/C Ratio	0.55	0.55			0.20		0.35	0.35	0.35			
Clearance Time (s)	6.4				5.0							
Vehicle Extension (s)	3.0				3.0							
Lane Grp Cap (vph)	617	1542			686		556	1169	547			
v/s Ratio Prot	0.18	c0.20			c0.16		0.22	c0.22				
v/s Ratio Perm	0.10	0.11							0.13			
v/c Ratio	0.52	0.57			0.81		0.62	0.63	0.37			
Uniform Delay, d1	24.1	22.8			58.8		41.8	42.0	37.6			
Progression Factor	0.37	0.67			1.00		1.00	1.00	1.00			
Incremental Delay, d2	0.1	0.0			7.0		5.2	2.6	1.9			
Delay (s)	9.1	15.3			65.8		47.0	44.6	39.5			
Level of Service	A	B			E		D	D	D			
Approach Delay (s)		13.6			65.8			44.0			0.0	
Approach LOS		B			E			D			A	

Intersection Summary			
HCM 2000 Control Delay	36.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	153.2	Sum of lost time (s)	22.8
Intersection Capacity Utilization	80.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Intersection Delay, s/veh	35.7
Intersection LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	223	362	112	38	107	12	28	74	26	52	293	334
Peak Hour Factor	0.88	0.89	0.59	0.88	0.77	0.45	0.59	0.81	0.40	0.75	0.83	0.85
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	253	407	190	43	139	27	47	91	65	69	353	393
Number of Lanes	1	2	0	1	2	0	1	2	0	1	2	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	3	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	3	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	3	3
HCM Control Delay	28.5	16	15.9	53.2
HCM LOS	D	C	C	F

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2
Vol Left, %	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%
Vol Thru, %	0%	100%	49%	0%	100%	52%	0%	100%	75%	0%	100%
Vol Right, %	0%	0%	51%	0%	0%	48%	0%	0%	25%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	28	49	51	223	241	233	38	71	48	52	195
LT Vol	0	49	25	0	241	121	0	71	36	0	195
Through Vol	0	0	26	0	0	112	0	0	12	0	0
RT Vol	28	0	0	223	0	0	38	0	0	52	0
Lane Flow Rate	47	61	95	253	271	325	43	93	73	69	235
Geometry Grp	8	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.145	0.177	0.269	0.64	0.648	0.748	0.131	0.265	0.208	0.179	0.575
Departure Headway (Hd)	10.98	10.491	10.14	9.097	8.608	8.279	10.899	10.423	10.245	9.4	8.9
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	328	344	356	395	418	436	331	346	353	384	407
Service Time	8.683	8.195	7.844	6.873	6.385	6.056	8.607	8.123	7.952	7.1	6.6
HCM Lane V/C Ratio	0.143	0.177	0.267	0.641	0.648	0.745	0.13	0.269	0.207	0.18	0.577
HCM Control Delay	15.5	15.4	16.5	26.8	26	32	15.2	16.8	15.6	14.1	23
HCM Lane LOS	C	C	C	D	D	D	C	C	C	B	C
HCM 95th-tile Q	0.5	0.6	1.1	4.3	4.4	6.1	0.4	1	0.8	0.6	3.5

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

EXHIBIT (C) - TRAFFIC IMPACT ANALYSIS
PART 3 OF 4

HCM Unsignalized Intersection Capacity Analysis
7: Richland Hills & Ingram Rd

Scenario 1 AM-2023
2/5/2014

Intersection has too many lanes per leg.

HCM All-Way analysis is limited to two lanes per leg.
Channelized right turn lanes are not counted.

HCM Signalized Intersection Capacity Analysis
8: SH 151 SB Frnt Rd & Potranco Rd

Scenario 1 AM-2023
2/5/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1363	661	355	831	0	0	0	0	1050	509	231
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.3		5.7	5.3					6.3	6.3	6.3
Lane Util. Factor		0.91		0.91	0.91					0.91	0.91	1.00
Frt		0.95		1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00		0.95	0.99					0.95	0.98	1.00
Satd. Flow (prot)		4825		1610	3372					1610	3309	1583
Flt Permitted		1.00		0.08	0.50					0.95	0.98	1.00
Satd. Flow (perm)		4825		139	1683					1610	3309	1583
Peak-hour factor, PHF	1.00	0.96	0.90	0.80	0.86	1.00	1.00	1.00	1.00	0.91	0.86	0.81
Adj. Flow (vph)	0	1420	734	444	966	0	0	0	0	1154	592	285
RTOR Reduction (vph)	0	53	0	0	0	0	0	0	0	0	0	145
Lane Group Flow (vph)	0	2101	0	324	1086	0	0	0	0	577	1169	140
Turn Type		NA		pm+pt	NA					Perm	NA	Perm
Protected Phases		6		5	6 5						8 16	
Permitted Phases				6 5						8 16		8 16
Actuated Green, G (s)		48.7		75.7	75.7					27.0	27.0	27.0
Effective Green, g (s)		48.7		75.7	75.7					27.0	27.0	27.0
Actuated g/C Ratio		0.41		0.63	0.63					0.22	0.22	0.22
Clearance Time (s)		5.3		5.7								
Vehicle Extension (s)		2.5		1.0								
Lane Grp Cap (vph)		1958		418	1441					362	744	356
v/s Ratio Prot		c0.44		c0.17	0.17							
v/s Ratio Perm				0.31	0.31					c0.36	0.35	0.09
v/c Ratio		1.07		0.78	0.75					1.59	1.57	0.39
Uniform Delay, d1		35.6		33.4	15.6					46.5	46.5	39.5
Progression Factor		1.00		0.79	0.73					1.00	1.00	1.00
Incremental Delay, d2		43.2		0.8	0.2					280.0	263.5	0.5
Delay (s)		78.8		27.2	11.8					326.5	310.0	40.1
Level of Service		E		C	B					F	F	D
Approach Delay (s)		78.8			15.2			0.0			276.8	
Approach LOS		E			B			A			F	

Intersection Summary			
HCM 2000 Control Delay	134.7	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.21		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	117.7%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
9: SH 151 NB Frnt Rd & Potranco Rd

Scenario 1 AM-2023
2/5/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	296	2073	0	0	689	288	490	456	123	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.7	5.3			5.3		6.3	6.3	6.3			
Lane Util. Factor	0.91	0.91			0.91		0.91	0.91	1.00			
Frt	1.00	1.00			0.95		1.00	1.00	0.85			
Flt Protected	0.95	1.00			1.00		0.95	0.99	1.00			
Satd. Flow (prot)	1610	3387			4814		1610	3357	1583			
Flt Permitted	0.19	0.94			1.00		0.95	0.99	1.00			
Satd. Flow (perm)	328	3176			4814		1610	3357	1583			
Peak-hour factor, PHF	0.65	0.93	1.00	1.00	0.95	0.72	0.86	0.67	0.73	1.00	1.00	1.00
Adj. Flow (vph)	455	2229	0	0	725	400	570	681	168	0	0	0
RTOR Reduction (vph)	0	0	0	0	83	0	0	0	141	0	0	0
Lane Group Flow (vph)	409	2275	0	0	1042	0	405	846	27	0	0	0
Turn Type	pm+pt	NA			NA		Perm	NA	Perm			
Protected Phases	1	2 1			2			4 12				
Permitted Phases	2 1						4 12		4 12			
Actuated Green, G (s)	83.7	83.7			20.7		19.0	19.0	19.0			
Effective Green, g (s)	83.7	83.7			20.7		19.0	19.0	19.0			
Actuated g/C Ratio	0.70	0.70			0.17		0.16	0.16	0.16			
Clearance Time (s)	5.7				5.3							
Vehicle Extension (s)	1.0				2.5							
Lane Grp Cap (vph)	901	2326			830		254	531	250			
v/s Ratio Prot	0.24	c0.51			c0.22							
v/s Ratio Perm	0.08	0.17					0.25	0.25	0.02			
v/c Ratio	0.45	0.98			1.26		1.59	1.59	0.11			
Uniform Delay, d1	10.6	17.3			49.6		50.5	50.5	43.2			
Progression Factor	0.73	0.66			0.90		1.00	1.00	1.00			
Incremental Delay, d2	0.0	2.4			122.3		285.3	275.8	0.1			
Delay (s)	7.8	13.7			166.8		335.8	326.3	43.4			
Level of Service	A	B			F		F	F	D			
Approach Delay (s)		12.8			166.8			295.5			0.0	
Approach LOS		B			F			F			A	

Intersection Summary			
HCM 2000 Control Delay	122.7	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.23		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	117.7%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
10: Richland Hills & Potranco Rd

Scenario 1 AM-2023
2/5/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	212	2020	241	102	542	172	64	151	178	349	374	358
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.7	5.8		4.7	5.8		5.2	5.2	5.2		5.2	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00	1.00		0.95	
Frt	1.00	0.97		1.00	0.97		1.00	1.00	0.85		0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00		0.98	
Satd. Flow (prot)	1770	3439		1770	3423		1770	1863	1583		3299	
Flt Permitted	0.18	1.00		0.08	1.00		0.95	1.00	1.00		0.98	
Satd. Flow (perm)	336	3439		150	3423		1770	1863	1583		3299	
Peak-hour factor, PHF	0.65	0.86	0.44	0.55	0.75	0.85	0.45	0.69	0.65	0.87	0.96	0.84
Adj. Flow (vph)	326	2349	548	185	723	202	142	219	274	401	390	426
RTOR Reduction (vph)	0	17	0	0	21	0	0	0	148	0	59	0
Lane Group Flow (vph)	326	2880	0	185	904	0	142	219	126	0	1158	0
Turn Type	D.P+P	NA		D.P+P	NA		Split	NA	Perm	Split	NA	
Protected Phases	1	6		5	2		4	4		3	3	
Permitted Phases	2			6					4			
Actuated Green, G (s)	59.5	49.6		59.5	49.2		11.8	11.8	11.8		27.8	
Effective Green, g (s)	59.5	49.6		59.5	49.2		11.8	11.8	11.8		27.8	
Actuated g/C Ratio	0.50	0.41		0.50	0.41		0.10	0.10	0.10		0.23	
Clearance Time (s)	4.7	5.8		4.7	5.8		5.2	5.2	5.2		5.2	
Vehicle Extension (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0		1.0	
Lane Grp Cap (vph)	289	1421		208	1403		174	183	155		764	
v/s Ratio Prot	c0.10	c0.84		0.07	0.26		0.08	c0.12			c0.35	
v/s Ratio Perm	0.46			0.37					0.08			
v/c Ratio	1.13	2.03		0.89	0.64		0.82	1.20	0.81		1.52	
Uniform Delay, d1	24.6	35.2		31.9	28.4		53.0	54.1	53.0		46.1	
Progression Factor	1.46	0.92		0.80	1.13		1.00	1.00	1.00		1.00	
Incremental Delay, d2	84.9	463.9		32.2	2.2		23.5	129.4	25.6		238.7	
Delay (s)	120.9	496.1		57.6	34.2		76.6	183.5	78.6		284.8	
Level of Service	F	F		E	C		E	F	E		F	
Approach Delay (s)		458.1			38.1			114.3			284.8	
Approach LOS		F			D			F			F	

Intersection Summary			
HCM 2000 Control Delay	313.4	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.70		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.9
Intersection Capacity Utilization	126.5%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
11: Ingram Rd & Potranco Rd

Scenario 1 AM-2023
2/5/2014

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	2331	19	153	784	1	332
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.88	0.58	0.63	0.80	0.25	0.86
Hourly flow rate (vph)	2649	33	243	980	4	386
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			2682		3641	1341
vC1, stage 1 conf vol					2665	
vC2, stage 2 conf vol					976	
vCu, unblocked vol			2682		3641	1341
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			0		0	0
cM capacity (veh/h)			152		0	142

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	NB 2
Volume Total	1766	916	243	490	490	4	386
Volume Left	0	0	243	0	0	4	0
Volume Right	0	33	0	0	0	0	386
cSH	1700	1700	152	1700	1700	0	142
Volume to Capacity	1.04	0.54	1.60	0.29	0.29	Err	2.71
Queue Length 95th (ft)	0	0	420	0	0	Err	866
Control Delay (s)	0.0	0.0	351.4	0.0	0.0	Err	837.6
Lane LOS			F			F	F
Approach Delay (s)	0.0		69.8			Err	
Approach LOS						F	

Intersection Summary			
Average Delay	Err		
Intersection Capacity Utilization	92.3%	ICU Level of Service	F
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
12: Military Dr & Potranco Rd

Scenario 1 AM-2023
2/5/2014

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1905	910	317	591	181	372
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.8		4.7	5.8	5.2	5.2
Lane Util. Factor	0.95		1.00	0.95	1.00	1.00
Frt	0.94		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3335		1770	3539	1770	1583
Flt Permitted	1.00		0.06	1.00	0.95	1.00
Satd. Flow (perm)	3335		116	3539	1770	1583
Peak-hour factor, PHF	0.94	0.72	0.88	0.72	0.73	0.83
Adj. Flow (vph)	2027	1264	360	821	248	448
RTOR Reduction (vph)	77	0	0	0	0	257
Lane Group Flow (vph)	3214	0	360	821	248	191
Turn Type	NA		D.P+P	NA	NA	Perm
Protected Phases	6		5	2	4	
Permitted Phases			6			4
Actuated Green, G (s)	64.1		85.8	90.5	18.5	18.5
Effective Green, g (s)	64.1		85.8	90.5	18.5	18.5
Actuated g/C Ratio	0.53		0.71	0.75	0.15	0.15
Clearance Time (s)	5.8		4.7	5.8	5.2	5.2
Vehicle Extension (s)	1.0		1.0	1.0	1.0	1.0
Lane Grp Cap (vph)	1781		382	2668	272	244
v/s Ratio Prot	c0.96		c0.17	0.23	c0.14	
v/s Ratio Perm			0.50			0.12
v/c Ratio	1.80		0.94	0.31	0.91	0.78
Uniform Delay, d1	28.0		40.4	4.7	49.9	48.8
Progression Factor	0.64		0.75	1.26	1.00	1.00
Incremental Delay, d2	362.3		25.5	0.2	31.8	13.9
Delay (s)	380.1		55.8	6.2	81.8	62.7
Level of Service	F		E	A	F	E
Approach Delay (s)	380.1			21.3	69.5	
Approach LOS	F			C	E	

Intersection Summary			
HCM 2000 Control Delay	256.3	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.47		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.7
Intersection Capacity Utilization	122.5%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

EXHIBIT (C) - TRAFFIC IMPACT ANALYSIS
PART 3 OF 4

HCM Signalized Intersection Capacity Analysis
13: Micron & Potranco Rd

Scenario 1 AM-2023
2/5/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	42	1154	551	245	480	11	13	16	19	269	151	310
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.8	5.7	5.7	4.8	5.7		4.0	5.1		5.1	5.1	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.95		1.00	0.89	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	1770	3516		1770	1762		1770	1665	
Flt Permitted	0.37	1.00	1.00	0.08	1.00		0.14	1.00		0.71	1.00	
Satd. Flow (perm)	686	3539	1583	144	3516		257	1762		1319	1665	
Peak-hour factor, PHF	0.78	0.89	0.84	0.63	0.80	0.40	0.42	0.33	0.70	0.69	0.82	0.70
Adj. Flow (vph)	54	1297	656	389	600	28	31	48	27	390	184	443
RTOR Reduction (vph)	0	0	224	0	2	0	0	17	0	0	66	0
Lane Group Flow (vph)	54	1297	432	389	626	0	31	58	0	390	561	0
Turn Type	D.P+P	NA	Perm	D.P+P	NA		D.P+P	NA		Perm	NA	
Protected Phases	1	6		5	2		7	4			8	
Permitted Phases	2		6	6			8			8		
Actuated Green, G (s)	67.9	51.7	51.7	67.9	63.7		32.5	36.5		29.0	29.0	
Effective Green, g (s)	67.9	51.7	51.7	67.9	63.7		32.5	36.5		29.0	29.0	
Actuated g/C Ratio	0.57	0.43	0.43	0.57	0.53		0.27	0.30		0.24	0.24	
Clearance Time (s)	4.8	5.7	5.7	4.8	5.7		4.0	5.1		5.1	5.1	
Vehicle Extension (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lane Grp Cap (vph)	426	1524	682	300	1866		113	535		318	402	
v/s Ratio Prot	0.00	0.37		c0.17	0.18		c0.01	0.03			c0.34	
v/s Ratio Perm	0.07		0.27	c0.56			0.07			0.30		
v/c Ratio	0.13	0.85	0.63	1.30	0.34		0.27	0.11		1.23	1.40	
Uniform Delay, d1	11.9	30.7	26.7	43.5	16.1		35.1	30.0		45.5	45.5	
Progression Factor	0.42	0.56	0.41	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	0.6	0.4	155.9	0.5		0.5	0.0		126.6	192.6	
Delay (s)	5.0	17.7	11.5	199.4	16.6		35.6	30.1		172.1	238.1	
Level of Service	A	B	B	F	B		D	C		F	F	
Approach Delay (s)		15.3			86.5			31.7			212.8	
Approach LOS		B			F			C			F	

Intersection Summary			
HCM 2000 Control Delay	81.6	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.29		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	19.6
Intersection Capacity Utilization	87.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
14: Micron & Ingram Rd

Scenario 1 AM-2023
2/5/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	1	0	0	105	1	112	1	106	28	179	517	1
Peak Hour Factor	0.25	1.00	1.00	0.70	0.25	0.74	0.25	0.68	0.66	0.98	0.89	0.25
Hourly flow rate (vph)	4	0	0	150	4	151	4	156	42	183	581	4

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total (vph)	4	0	150	155	202	768
Volume Left (vph)	4	0	150	0	4	183
Volume Right (vph)	0	0	0	151	42	4
Hadj (s)	0.53	0.00	0.53	-0.65	-0.09	0.08
Departure Headway (s)	8.0	7.5	7.3	6.1	5.7	5.3
Degree Utilization, x	0.01	0.00	0.30	0.26	0.32	1.12
Capacity (veh/h)	424	464	479	574	611	675
Control Delay (s)	9.9	9.3	12.3	10.1	11.4	93.3
Approach Delay (s)	9.9		11.2		11.4	93.3
Approach LOS	A		B		B	F

Intersection Summary			
Delay	60.5		
Level of Service	F		
Intersection Capacity Utilization	67.0%	ICU Level of Service	C
Analysis Period (min)	15		

EXHIBIT (C) - TRAFFIC IMPACT ANALYSIS
PART 3 OF 4

HCM Unsignalized Intersection Capacity Analysis
16: Military Dr & Reed Rd

Scenario 1 AM-2023
2/5/2014

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	493	138	364	33	11	277
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.86	0.88	0.74	0.75	0.38	0.70
Hourly flow rate (vph)	573	157	492	44	29	396
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		751				
pX, platoon unblocked						
vC, conflicting volume	536				1817	514
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	536				1817	514
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	44				24	29
cM capacity (veh/h)	1032				38	561

Direction, Lane #	EB 1	WB 1	SB 1	SB 2
Volume Total	730	536	29	396
Volume Left	573	0	29	0
Volume Right	0	44	0	396
cSH	1032	1700	38	561
Volume to Capacity	0.56	0.32	0.76	0.71
Queue Length 95th (ft)	88	0	69	141
Control Delay (s)	11.7	0.0	233.5	25.4
Lane LOS	B		F	D
Approach Delay (s)	11.7	0.0	39.6	
Approach LOS			E	

Intersection Summary			
Average Delay	15.0		
Intersection Capacity Utilization	69.1%	ICU Level of Service	C
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
17: Richland Hills & Military Dr

Scenario 1 AM-2023
2/5/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	334	295	320	228	3	246	8	254	23	48	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.3			5.4		4.5	4.3		4.6	4.3	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.94			1.00		1.00	0.86		1.00	0.97	
Flt Protected		1.00			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1742			1807		1770	1599		1770	1816	
Flt Permitted		1.00			0.25		0.66	1.00		0.19	1.00	
Satd. Flow (perm)		1742			459		1223	1599		360	1816	
Peak-hour factor, PHF	1.00	0.83	0.79	0.77	0.82	0.50	0.73	0.38	0.70	0.61	0.60	0.50
Adj. Flow (vph)	0	402	373	416	278	6	337	21	363	38	80	16
RTOR Reduction (vph)	0	23	0	0	0	0	0	280	0	0	9	0
Lane Group Flow (vph)	0	752	0	0	700	0	337	104	0	38	87	0
Turn Type	Perm	NA		pm+pt	NA		D.P+P	NA		D.P+P	NA	
Protected Phases		6		5	2		7	4		3	8	
Permitted Phases	6			2			8			4		
Actuated Green, G (s)		51.7			51.6		24.2	20.7		24.1	6.9	
Effective Green, g (s)		51.7			51.6		24.2	20.7		24.1	6.9	
Actuated g/C Ratio		0.57			0.57		0.27	0.23		0.27	0.08	
Clearance Time (s)		5.3			5.4		4.5	4.3		4.6	4.3	
Vehicle Extension (s)		1.0			1.0		1.0	1.0		1.0	1.0	
Lane Grp Cap (vph)		1000			263		433	367		149	139	
v/s Ratio Prot		0.43					c0.15	c0.07		0.01	0.05	
v/s Ratio Perm					c1.52		c0.06			0.06		
v/c Ratio		0.75			2.66		0.78	0.28		0.26	0.62	
Uniform Delay, d1		14.3			19.2		29.7	28.6		25.9	40.3	
Progression Factor		1.09			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		3.5			757.8		7.8	0.2		0.3	6.1	
Delay (s)		19.2			777.0		37.6	28.7		26.2	46.4	
Level of Service		B			F		D	C		C	D	
Approach Delay (s)		19.2			777.0			32.9			40.7	
Approach LOS		B			F			C			D	

Intersection Summary			
HCM 2000 Control Delay	252.3	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	2.17		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.4
Intersection Capacity Utilization	98.3%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
18: Richland Hills & Jack Jordan MS

Scenario 1 AM-2023
2/5/2014

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	273	360	290	191	407	477
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.65	0.70	0.74	0.74	0.76	0.85
Hourly flow rate (vph)	420	514	392	258	536	561
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)					1086	
pX, platoon unblocked						
vC, conflicting volume	1858	816	1097			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1858	816	1097			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	0	38			
cM capacity (veh/h)	31	377	636			

Direction, Lane #	EB 1	EB 2	NB 1	SB 1
Volume Total	420	514	650	1097
Volume Left	420	0	392	0
Volume Right	0	514	0	561
cSH	31	377	636	1700
Volume to Capacity	13.54	1.36	0.62	0.65
Queue Length 95th (ft)	Err	623	106	0
Control Delay (s)	Err	208.8	17.2	0.0
Lane LOS	F	F	C	
Approach Delay (s)	4609.9		17.2	0.0
Approach LOS	F			

Intersection Summary			
Average Delay	1610.7		
Intersection Capacity Utilization	101.9%	ICU Level of Service	G
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
19: Richland Hills & Christian Evers ES

Scenario 1 AM-2023
2/5/2014

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	27	40	36	536	732	35
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.42	0.47	0.68	0.78	0.94	0.50
Hourly flow rate (vph)	64	85	53	687	779	70
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1607	814	849			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1607	814	849			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	40	77	93			
cM capacity (veh/h)	108	378	789			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	149	740	849
Volume Left	64	53	0
Volume Right	85	0	70
cSH	182	789	1700
Volume to Capacity	0.82	0.07	0.50
Queue Length 95th (ft)	143	5	0
Control Delay (s)	79.1	1.7	0.0
Lane LOS	F	A	
Approach Delay (s)	79.1	1.7	0.0
Approach LOS	F		

Intersection Summary			
Average Delay	7.5		
Intersection Capacity Utilization	68.4%	ICU Level of Service	C
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
20: Military Dr & Earl Warren High School

Scenario 1 AM-2023
2/5/2014

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	106	823	551	66	78	63
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.9	4.9	4.9	4.9	5.1	5.1
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	1863	1863	1583	1770	1583
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	1863	1863	1583	1770	1583
Peak-hour factor, PHF	0.53	0.72	0.89	0.88	0.91	0.62
Adj. Flow (vph)	200	1143	619	75	86	102
RTOR Reduction (vph)	0	0	0	30	0	93
Lane Group Flow (vph)	200	1143	619	45	86	9
Turn Type	Prot	NA	NA	Perm	NA	Perm
Protected Phases	1	6	2		8	
Permitted Phases				2		8
Actuated Green, G (s)	13.7	71.8	53.2	53.2	8.2	8.2
Effective Green, g (s)	13.7	71.8	53.2	53.2	8.2	8.2
Actuated g/C Ratio	0.15	0.80	0.59	0.59	0.09	0.09
Clearance Time (s)	4.9	4.9	4.9	4.9	5.1	5.1
Vehicle Extension (s)	1.0	2.0	2.0	2.0	1.0	1.0
Lane Grp Cap (vph)	269	1486	1101	935	161	144
v/s Ratio Prot	0.11	c0.61	0.33		c0.05	
v/s Ratio Perm				0.03		0.01
v/c Ratio	0.74	0.77	0.56	0.05	0.53	0.06
Uniform Delay, d1	36.5	4.8	11.3	7.7	39.1	37.4
Progression Factor	1.09	0.46	0.98	0.76	1.00	1.00
Incremental Delay, d2	0.9	0.4	0.2	0.0	1.7	0.1
Delay (s)	40.7	2.5	11.2	5.9	40.8	37.5
Level of Service	D	A	B	A	D	D
Approach Delay (s)		8.2	10.7		39.0	
Approach LOS		A	B		D	

Intersection Summary			
HCM 2000 Control Delay	11.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	14.9
Intersection Capacity Utilization	56.6%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
21: Hunt Ln & Military Dr

Scenario 1 AM-2023
2/5/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	103	516	82	203	203	294	21	334	188	478	915	59
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.7		5.0	5.8		5.2	5.6		5.2	5.6	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.98		1.00	0.91		1.00	0.95		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3451		1770	3214		1770	3361		1770	3510	
Flt Permitted	0.29	1.00		0.19	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	537	3451		358	3214		1770	3361		1770	3510	
Peak-hour factor, PHF	0.92	0.80	0.64	0.89	0.87	0.80	0.56	0.75	0.84	0.65	0.76	0.85
Adj. Flow (vph)	112	645	128	228	233	368	38	445	224	735	1204	69
RTOR Reduction (vph)	0	18	0	0	283	0	0	71	0	0	4	0
Lane Group Flow (vph)	112	755	0	228	318	0	38	598	0	735	1269	0
Turn Type	pm+pt	NA		pm+pt	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	24.0	17.6		30.5	20.8		3.9	11.4		29.8	37.3	
Effective Green, g (s)	24.0	17.6		30.5	20.8		3.9	11.4		29.8	37.3	
Actuated g/C Ratio	0.27	0.20		0.34	0.23		0.04	0.13		0.33	0.41	
Clearance Time (s)	5.0	5.7		5.0	5.8		5.2	5.6		5.2	5.6	
Vehicle Extension (s)	1.0	2.5		1.0	2.0		1.0	2.5		1.0	2.5	
Lane Grp Cap (vph)	230	674		273	742		76	425		586	1454	
v/s Ratio Prot	0.03	c0.22		c0.09	0.10		0.02	c0.18		c0.42	0.36	
v/s Ratio Perm	0.09			0.19								
v/c Ratio	0.49	1.12		0.84	0.43		0.50	1.41		1.25	0.87	
Uniform Delay, d1	26.0	36.2		24.4	29.5		42.1	39.3		30.1	24.2	
Progression Factor	1.00	1.00		0.87	0.61		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.6	72.8		17.5	0.1		1.9	197.1		128.0	7.5	
Delay (s)	26.6	109.0		38.7	18.2		44.0	236.4		158.1	31.7	
Level of Service	C	F		D	B		D	F		F	C	
Approach Delay (s)		98.6			23.8			226.0			77.9	
Approach LOS		F			C			F			E	

Intersection Summary			
HCM 2000 Control Delay	95.6	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.19		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	21.6
Intersection Capacity Utilization	87.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
22: SH 151 NB Frnt Rd & Hunt Ln

Scenario 1 AM-2023
2/5/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	22	25	0	0	1379	51	53	654	392	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.3			5.3	5.3	6.0	6.0				
Lane Util. Factor		0.95			0.95	1.00	0.91	0.91				
Frt		1.00			1.00	0.85	1.00	0.94				
Flt Protected		0.98			1.00	1.00	0.95	1.00				
Satd. Flow (prot)		3457			3539	1583	1610	3193				
Flt Permitted		0.55			1.00	1.00	0.95	1.00				
Satd. Flow (perm)		1951			3539	1583	1610	3193				
Peak-hour factor, PHF	0.57	0.58	1.00	1.00	0.80	0.75	0.56	0.73	0.69	1.00	1.00	1.00
Adj. Flow (vph)	39	43	0	0	1724	68	95	896	568	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	48	0	69	0	0	0	0
Lane Group Flow (vph)	0	82	0	0	1724	20	85	1405	0	0	0	0
Turn Type	Perm	NA			NA	Perm	Split	NA				
Protected Phases		6			6		8	16	8	16		
Permitted Phases	6					6						
Actuated Green, G (s)		34.7			34.7	34.7	74.6	74.6				
Effective Green, g (s)		34.7			34.7	34.7	74.6	74.6				
Actuated g/C Ratio		0.29			0.29	0.29	0.62	0.62				
Clearance Time (s)		5.3			5.3	5.3						
Vehicle Extension (s)		3.0			3.0	3.0						
Lane Grp Cap (vph)		565			1025	458	1002	1988				
v/s Ratio Prot					c0.49		0.05	c0.44				
v/s Ratio Perm		0.04				0.01						
v/c Ratio		0.15			1.68	0.04	0.08	0.71				
Uniform Delay, d1		31.6			42.5	30.6	9.0	15.2				
Progression Factor		0.87			1.00	1.00	1.00	1.00				
Incremental Delay, d2		0.5			311.1	0.2	0.0	1.2				
Delay (s)		28.0			353.7	30.8	9.0	16.4				
Level of Service		C			F	C	A	B				
Approach Delay (s)		28.0			341.4			16.0			0.0	
Approach LOS		C			F			B			A	

Intersection Summary			
HCM 2000 Control Delay	186.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.08		
Actuated Cycle Length (s)	119.8	Sum of lost time (s)	17.3
Intersection Capacity Utilization	69.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
23: SH 151 SB Frnt Rd & Hunt Ln

Scenario 1 AM-2023
2/5/2014

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	1454	0	0	0	48	1564
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2				6.0	6.0
Lane Util. Factor	0.97				0.91	0.91
Frt	1.00				1.00	1.00
Flt Protected	0.95				0.95	1.00
Satd. Flow (prot)	3433				1610	3390
Flt Permitted	0.95				0.95	1.00
Satd. Flow (perm)	3433				1610	3390
Peak-hour factor, PHF	0.83	1.00	1.00	1.00	0.67	0.85
Adj. Flow (vph)	1752	0	0	0	72	1840
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	1752	0	0	0	65	1847
Turn Type	NA				Split	NA
Protected Phases	1				4	12
Permitted Phases						
Actuated Green, G (s)	62.6				46.8	46.8
Effective Green, g (s)	62.6				46.8	46.8
Actuated g/C Ratio	0.52				0.39	0.39
Clearance Time (s)	5.2					
Vehicle Extension (s)	3.0					
Lane Grp Cap (vph)	1793				628	1324
v/s Ratio Prot	c0.51				0.04	c0.54
v/s Ratio Perm						
v/c Ratio	0.98				0.10	1.40
Uniform Delay, d1	27.9				23.2	36.5
Progression Factor	0.72				1.00	1.00
Incremental Delay, d2	2.9				0.1	182.4
Delay (s)	22.9				23.3	218.9
Level of Service	C				C	F
Approach Delay (s)	22.9		0.0			212.3
Approach LOS	C		A			F

Intersection Summary			
HCM 2000 Control Delay	121.7	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.23		
Actuated Cycle Length (s)	119.8	Sum of lost time (s)	17.3
Intersection Capacity Utilization	85.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1: Military Dr & IH-410 NB Frnt Rd

Scenario 1 PM-2023
2/5/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	152	246	58	0	0	0	0	902	895	433	1201	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0						5.1		6.0	6.0	
Lane Util. Factor	0.91	0.91						0.91		0.91	0.91	
Frt	1.00	0.97						0.93		1.00	1.00	
Flt Protected	0.95	1.00						1.00		0.95	1.00	
Satd. Flow (prot)	1610	3294						4707		1610	3377	
Flt Permitted	0.95	1.00						1.00		0.16	0.51	
Satd. Flow (perm)	1610	3294						4707		272	1732	
Peak-hour factor, PHF	0.91	0.86	0.90	1.00	1.00	1.00	1.00	0.93	0.94	0.86	0.96	1.00
Adj. Flow (vph)	167	286	64	0	0	0	0	970	952	503	1251	0
RTOR Reduction (vph)	0	14	0	0	0	0	0	150	0	0	0	0
Lane Group Flow (vph)	150	353	0	0	0	0	0	1772	0	397	1357	0
Turn Type	Split	NA						NA		pm+pt	NA	
Protected Phases	8 16	8 16						6		5	5 6	
Permitted Phases										5 6		
Actuated Green, G (s)	32.9	32.9						24.9		68.9	68.9	
Effective Green, g (s)	32.9	32.9						24.9		68.9	68.9	
Actuated g/C Ratio	0.28	0.28						0.21		0.58	0.58	
Clearance Time (s)								5.1		6.0		
Vehicle Extension (s)								3.0		3.0		
Lane Grp Cap (vph)	448	918						993		657	1624	
v/s Ratio Prot	0.09	c0.11						c0.38		0.23	c0.31	
v/s Ratio Perm										0.13	0.18	
v/c Ratio	0.33	0.38						1.95dr		0.60	0.84	
Uniform Delay, d1	33.8	34.4						46.5		20.3	19.9	
Progression Factor	1.00	1.00						1.00		0.37	0.60	
Incremental Delay, d2	2.0	1.2						357.1		0.1	0.4	
Delay (s)	35.9	35.6						403.7		7.6	12.3	
Level of Service	D	D						F		A	B	
Approach Delay (s)		35.7			0.0			403.7			11.2	
Approach LOS		D			A			F			B	

Intersection Summary			
HCM 2000 Control Delay	194.1	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	118.0	Sum of lost time (s)	22.2
Intersection Capacity Utilization	125.7%	ICU Level of Service	H
Analysis Period (min)	15		

dr Defacto Right Lane. Recode with 1 though lane as a right lane.
c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
2: Military Dr & IH-410 SB Frnt Rd

Scenario 1 PM-2023
2/5/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	829	1013	380	273	798	0	0	753	204
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				5.8	5.8		5.7	5.7			5.1	
Lane Util. Factor				0.91	0.91		0.91	0.91			0.95	
Frt				1.00	0.96		1.00	1.00			0.97	
Flt Protected				0.95	1.00		0.95	1.00			1.00	
Satd. Flow (prot)				1610	3257		1610	3374			3423	
Flt Permitted				0.95	1.00		0.16	0.54			1.00	
Satd. Flow (perm)				1610	3257		272	1838			3423	
Peak-hour factor, PHF	1.00	1.00	1.00	0.88	0.90	0.97	0.77	0.98	1.00	1.00	0.82	0.79
Adj. Flow (vph)	0	0	0	942	1126	392	355	814	0	0	918	258
RTOR Reduction (vph)	0	0	0	0	23	0	0	0	0	0	22	0
Lane Group Flow (vph)	0	0	0	820	1617	0	266	903	0	0	1154	0
Turn Type				Split	NA		pm+pt	NA			NA	
Protected Phases				4 12	4 12		1	1 2			2	
Permitted Phases							1 2					
Actuated Green, G (s)				34.9	34.9		67.2	67.2			24.9	
Effective Green, g (s)				34.9	34.9		67.2	67.2			24.9	
Actuated g/C Ratio				0.30	0.30		0.57	0.57			0.21	
Clearance Time (s)							5.7				5.1	
Vehicle Extension (s)							3.0				0.2	
Lane Grp Cap (vph)				476	963		634	1597			722	
v/s Ratio Prot				c0.51	0.50		0.15	c0.20			c0.34	
v/s Ratio Perm							0.09	0.12				
v/c Ratio				1.72	1.68		0.42	0.57			1.60	
Uniform Delay, d1				41.5	41.5		15.3	16.1			46.5	
Progression Factor				1.00	1.00		0.28	0.37			1.00	
Incremental Delay, d2				334.0	310.0		0.0	0.0			275.7	
Delay (s)				375.5	351.6		4.3	6.0			322.2	
Level of Service				F	F		A	A			F	
Approach Delay (s)		0.0			359.6			5.6			322.2	
Approach LOS		A			F			A			F	

Intersection Summary			
HCM 2000 Control Delay	264.3	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.29		
Actuated Cycle Length (s)	118.0	Sum of lost time (s)	22.2
Intersection Capacity Utilization	125.7%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

EXHIBIT (C) - TRAFFIC IMPACT ANALYSIS
PART 3 OF 4

EXHIBIT (C) - TRAFFIC IMPACT ANALYSIS
PART 3 OF 4

HCM Unsignalized Intersection Capacity Analysis
3: IH-410 SB Frnt Rd & Richland Hills

Scenario 1 PM-2023
2/5/2014

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations			↑↑↑			↱
Volume (veh/h)	0	0	3297	577	0	195
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	0.97	0.84	1.00	0.77
Hourly flow rate (vph)	0	0	3399	687	0	253
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	4086				3742	1476
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	4086				3742	1476
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	0
cM capacity (veh/h)	40				3	115

Direction, Lane #	WB 1	WB 2	WB 3	SB 1
Volume Total	1360	1360	1367	253
Volume Left	0	0	0	0
Volume Right	0	0	687	253
cSH	1700	1700	1700	115
Volume to Capacity	0.80	0.80	0.80	2.20
Queue Length 95th (ft)	0	0	0	541
Control Delay (s)	0.0	0.0	0.0	627.2
Lane LOS				F
Approach Delay (s)	0.0			627.2
Approach LOS				F

Intersection Summary			
Average Delay	36.6		
Intersection Capacity Utilization	95.3%	ICU Level of Service	F
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
4: Military Dr & Walmart/Sony Pl

Scenario 1 PM-2023
2/5/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			↱		↔		↰	↑↑			↑↑	
Volume (vph)	234	0	91	0	0	0	59	878	0	0	640	231
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.7		5.2				5.0	5.9			5.9	
Lane Util. Factor	1.00		1.00				1.00	0.95			0.95	
Frt	1.00		0.85				1.00	1.00			0.96	
Flt Protected	0.95		1.00				0.95	1.00			1.00	
Satd. Flow (prot)	1770		1583				1770	3539			3390	
Flt Permitted	0.95		1.00				0.15	1.00			1.00	
Satd. Flow (perm)	1770		1583				275	3539			3390	
Peak-hour factor, PHF	0.79	1.00	0.74	1.00	1.00	1.00	0.85	0.92	1.00	1.00	0.87	0.80
Adj. Flow (vph)	296	0	123	0	0	0	69	954	0	0	736	289
RTOR Reduction (vph)	0	0	92	0	0	0	0	0	0	0	25	0
Lane Group Flow (vph)	296	0	31	0	0	0	69	954	0	0	1000	0
Turn Type	custom		custom	Perm			pm+pt	NA			NA	
Protected Phases	7		4		8		5	2			6	
Permitted Phases	4			8			2					
Actuated Green, G (s)	16.4		15.9				36.3	36.3			26.5	
Effective Green, g (s)	16.4		15.9				36.3	36.3			26.5	
Actuated g/C Ratio	0.26		0.25				0.57	0.57			0.42	
Clearance Time (s)	4.7		5.2				5.0	5.9			5.9	
Vehicle Extension (s)	1.0		1.0				1.0	2.5			2.5	
Lane Grp Cap (vph)	458		397				271	2029			1419	
v/s Ratio Prot	c0.17		0.02				0.02	c0.27			c0.30	
v/s Ratio Perm							0.13					
v/c Ratio	0.65		0.08				0.25	0.47			0.70	
Uniform Delay, d1	20.9		18.1				8.0	7.9			15.2	
Progression Factor	1.00		1.00				1.00	1.00			1.00	
Incremental Delay, d2	2.3		0.0				0.2	0.1			1.5	
Delay (s)	23.2		18.1				8.2	8.0			16.7	
Level of Service	C		B				A	A			B	
Approach Delay (s)		21.7			0.0			8.0			16.7	
Approach LOS		C			A			A			B	

Intersection Summary			
HCM 2000 Control Delay	13.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	63.3	Sum of lost time (s)	21.1
Intersection Capacity Utilization	53.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
5: SH 151 SB Frnt Rd & Ingram Rd

Scenario 1 PM-2023
2/5/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	842	259	651	1142	0	0	0	0	204	945	301
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0		5.5	5.5					6.4	6.4	6.4
Lane Util. Factor		0.95		0.91	0.91					0.91	0.91	1.00
Frt		0.96		1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00		0.95	0.99					0.95	1.00	1.00
Satd. Flow (prot)		3411		1610	3361					1610	3386	1583
Flt Permitted		1.00		0.16	0.54					0.95	1.00	1.00
Satd. Flow (perm)		3411		271	1841					1610	3386	1583
Peak-hour factor, PHF	1.00	0.94	0.91	0.94	0.97	1.00	1.00	1.00	1.00	0.77	0.86	0.81
Adj. Flow (vph)	0	896	285	693	1177	0	0	0	0	265	1099	372
RTOR Reduction (vph)	0	20	0	0	0	0	0	0	0	0	0	85
Lane Group Flow (vph)	0	1161	0	444	1426	0	0	0	0	238	1126	287
Turn Type		NA		pm+pt	NA					Split	NA	Perm
Protected Phases		2		1	1 2					4 12	4 12	
Permitted Phases				1 2								4 12
Actuated Green, G (s)		25.0		85.5	85.5					53.0	53.0	53.0
Effective Green, g (s)		25.0		85.5	85.5					53.0	53.0	53.0
Actuated g/C Ratio		0.16		0.56	0.56					0.34	0.34	0.34
Clearance Time (s)		5.0		5.5								
Vehicle Extension (s)		2.5		3.0								
Lane Grp Cap (vph)		553		676	1619					554	1165	544
v/s Ratio Prot		c0.34		0.26	c0.35					0.15	c0.33	
v/s Ratio Perm				0.11	0.14							0.18
v/c Ratio		2.10		0.66	0.88					0.43	0.97	0.53
Uniform Delay, d1		64.5		29.0	29.8					38.9	49.6	40.5
Progression Factor		1.00		0.45	0.25					1.00	1.00	1.00
Incremental Delay, d2		500.8		0.2	0.6					2.4	19.5	3.6
Delay (s)		565.3		13.1	8.2					41.3	69.1	44.1
Level of Service		F		B	A					D	E	D
Approach Delay (s)		565.3			9.4			0.0			59.9	
Approach LOS		F			A			A			E	

Intersection Summary				
HCM 2000 Control Delay	164.9	HCM 2000 Level of Service	F	
HCM 2000 Volume to Capacity ratio	1.20			
Actuated Cycle Length (s)	154.0	Sum of lost time (s)	22.8	
Intersection Capacity Utilization	146.8%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
6: SH 151 NB Frnt Rd & Ingram Rd

Scenario 1 PM-2023
2/5/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	397	663	0	0	861	245	1006	1706	283	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.4	6.4			5.0		6.4	6.4	6.4			
Lane Util. Factor	0.91	0.91			0.95		0.91	0.91	1.00			
Frt	1.00	1.00			0.96		1.00	1.00	0.85			
Flt Protected	0.95	0.99			1.00		0.95	1.00	1.00			
Satd. Flow (prot)	1610	3354			3415		1610	3376	1583			
Flt Permitted	0.13	0.54			1.00		0.95	1.00	1.00			
Satd. Flow (perm)	219	1847			3415		1610	3376	1583			
Peak-hour factor, PHF	0.79	0.90	1.00	1.00	0.96	0.89	0.90	0.94	0.90	1.00	1.00	1.00
Adj. Flow (vph)	503	737	0	0	897	275	1118	1815	314	0	0	0
RTOR Reduction (vph)	0	0	0	0	19	0	0	0	85	0	0	0
Lane Group Flow (vph)	302	938	0	0	1153	0	950	1983	229	0	0	0
Turn Type	pm+pt	NA			NA		Split	NA	Perm			
Protected Phases	5	5 6			6		8 16	8 16				
Permitted Phases	5 6								8 16			
Actuated Green, G (s)	84.6	84.6			31.0		53.0	53.0	53.0			
Effective Green, g (s)	84.6	84.6			31.0		53.0	53.0	53.0			
Actuated g/C Ratio	0.55	0.55			0.20		0.34	0.34	0.34			
Clearance Time (s)	6.4				5.0							
Vehicle Extension (s)	3.0				2.5							
Lane Grp Cap (vph)	604	1539			687		554	1161	544			
v/s Ratio Prot	0.17	c0.21			c0.34		c0.59	0.59				
v/s Ratio Perm	0.10	0.12							0.14			
v/c Ratio	0.50	0.61			1.68		1.71	1.71	0.42			
Uniform Delay, d1	26.9	23.5			61.5		50.5	50.5	38.7			
Progression Factor	0.29	0.64			1.00		1.00	1.00	1.00			
Incremental Delay, d2	0.0	0.1			311.5		329.3	322.3	2.4			
Delay (s)	7.7	15.2			373.0		379.8	372.8	41.1			
Level of Service	A	B			F		F	F	D			
Approach Delay (s)		13.4			373.0			342.8			0.0	
Approach LOS		B			F			F			A	

Intersection Summary				
HCM 2000 Control Delay	276.8	HCM 2000 Level of Service	F	
HCM 2000 Volume to Capacity ratio	1.34			
Actuated Cycle Length (s)	154.0	Sum of lost time (s)	22.8	
Intersection Capacity Utilization	146.8%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				

Intersection	
Intersection Delay, s/veh	74.6
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	302	270	40	30	369	59	280	447	65	9	163	239
Peak Hour Factor	0.67	0.81	0.86	0.79	0.87	0.69	0.67	0.89	0.80	0.44	0.83	0.88
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	451	333	47	38	424	86	418	502	81	20	196	272
Number of Lanes	1	2	0	1	2	0	1	2	0	1	2	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	3	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	3	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	3	3
HCM Control Delay	70.5	70.7	82.1	70.5
HCM LOS	F	F	F	F

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2
Vol Left, %	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%
Vol Thru, %	0%	100%	70%	0%	100%	69%	0%	100%	68%	0%	100%
Vol Right, %	0%	0%	30%	0%	0%	31%	0%	0%	32%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	280	298	214	302	180	130	30	246	182	9	109
LT Vol	0	298	149	0	180	90	0	246	123	0	109
Through Vol	0	0	65	0	0	40	0	0	59	0	0
RT Vol	280	0	0	302	0	0	30	0	0	9	0
Lane Flow Rate	418	335	249	451	222	158	38	283	227	20	131
Geometry Grp	8	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	1	1	0.84	1	0.796	0.556	0.142	1	0.802	0.077	0.477
Departure Headway (Hd)	12.855	12.365	12.156	13.398	12.903	12.689	13.443	12.948	12.723	13.624	13.129
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	284	295	298	275	282	285	267	280	284	264	276
Service Time	10.577	10.087	9.878	11.119	10.623	10.41	11.241	10.746	10.521	11.335	10.839
HCM Lane V/C Ratio	1.472	1.136	0.836	1.64	0.787	0.554	0.142	1.011	0.799	0.076	0.475
HCM Control Delay	91.7	89.7	55.7	93.8	51.8	30.2	18.5	92.4	52.3	17.5	27.3
HCM Lane LOS	F	F	F	F	F	D	C	F	F	C	D
HCM 95th-tile Q	10.2	10.4	7.1	10	6.2	3.1	0.5	10.2	6.3	0.2	2.4

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

EXHIBIT (C) - TRAFFIC IMPACT ANALYSIS
PART 3 OF 4

HCM Unsignalized Intersection Capacity Analysis
7: Richland Hills & Ingram Rd

Scenario 1 PM-2023
2/5/2014

Intersection has too many lanes per leg.
HCM All-Way analysis is limited to two lanes per leg.
Channelized right turn lanes are not counted.

HCM Signalized Intersection Capacity Analysis
8: SH 151 SB Frnt Rd & Potranco Rd

Scenario 1 PM-2023
2/5/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1234	697	357	2341	0	0	0	0	451	363	296
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5		5.0	5.5					6.3	6.3	6.3
Lane Util. Factor		0.91		0.91	0.91					0.91	0.91	1.00
Frt		0.94		1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00		0.95	1.00					0.95	0.99	1.00
Satd. Flow (prot)		4798		1610	3387					1610	3341	1583
Flt Permitted		1.00		0.12	0.85					0.95	0.99	1.00
Satd. Flow (perm)		4798		197	2876					1610	3341	1583
Peak-hour factor, PHF	1.00	0.91	0.85	0.91	0.98	1.00	1.00	1.00	1.00	0.89	0.78	0.83
Adj. Flow (vph)	0	1356	820	392	2389	0	0	0	0	507	465	357
RTOR Reduction (vph)	0	78	0	0	0	0	0	0	0	0	0	143
Lane Group Flow (vph)	0	2098	0	353	2428	0	0	0	0	314	658	214
Turn Type		NA		pm+pt	NA					Perm	NA	Perm
Protected Phases		6		5	6 5						8 16	
Permitted Phases				6 5						8 16		8 16
Actuated Green, G (s)		34.5		107.2	107.2					16.0	16.0	16.0
Effective Green, g (s)		34.5		107.2	107.2					16.0	16.0	16.0
Actuated g/C Ratio		0.25		0.77	0.77					0.11	0.11	0.11
Clearance Time (s)		5.5		5.0								
Vehicle Extension (s)		2.5		1.0								
Lane Grp Cap (vph)		1182		884	2467					184	381	180
v/s Ratio Prot		c0.44		0.21	c0.51							
v/s Ratio Perm				0.10	0.24					0.19	0.20	0.14
v/c Ratio		1.78		0.40	0.98					1.71	1.73	1.19
Uniform Delay, d1		52.8		13.7	15.6					62.0	62.0	62.0
Progression Factor		1.00		0.35	0.90					1.00	1.00	1.00
Incremental Delay, d2		352.3		0.0	2.8					340.0	338.0	127.9
Delay (s)		405.1		4.9	16.9					402.0	400.0	189.9
Level of Service		F		A	B					F	F	F
Approach Delay (s)		405.1			15.4			0.0			344.1	
Approach LOS		F			B			A			F	

Intersection Summary			
HCM 2000 Control Delay	219.8	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.38		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	23.6
Intersection Capacity Utilization	143.5%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
9: SH 151 NB Frnt Rd & Potranco Rd

Scenario 1 PM-2023
2/5/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	352	1263	0	0	1378	468	1350	705	199	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.5			5.5		6.3	6.3	6.3			
Lane Util. Factor	0.91	0.91			0.91		0.91	0.91	1.00			
Frt	1.00	1.00			0.96		1.00	1.00	0.85			
Flt Protected	0.95	1.00			1.00		0.95	0.98	1.00			
Satd. Flow (prot)	1610	3386			4887		1610	3310	1583			
Flt Permitted	0.09	0.70			1.00		0.95	0.98	1.00			
Satd. Flow (perm)	160	2377			4887		1610	3310	1583			
Peak-hour factor, PHF	0.98	0.95	1.00	1.00	0.96	0.93	0.98	0.95	0.83	1.00	1.00	1.00
Adj. Flow (vph)	359	1329	0	0	1435	503	1378	742	240	0	0	0
RTOR Reduction (vph)	0	0	0	0	45	0	0	0	113	0	0	0
Lane Group Flow (vph)	323	1365	0	0	1893	0	689	1431	127	0	0	0
Turn Type	pm+pt	NA			NA		Perm	NA	Perm			
Protected Phases	1	2 1			2			4 12				
Permitted Phases	2 1						4 12		4 12			
Actuated Green, G (s)	81.2	81.2			42.5		42.0	42.0	42.0			
Effective Green, g (s)	81.2	81.2			42.5		42.0	42.0	42.0			
Actuated g/C Ratio	0.58	0.58			0.30		0.30	0.30	0.30			
Clearance Time (s)	5.0				5.5							
Vehicle Extension (s)	1.0				2.5							
Lane Grp Cap (vph)	493	1657			1483		483	993	474			
v/s Ratio Prot	0.18	c0.23			c0.39							
v/s Ratio Perm	0.20	0.25					0.43	0.43	0.08			
v/c Ratio	0.66	0.82			1.28		1.43	1.44	0.27			
Uniform Delay, d1	33.3	23.6			48.8		49.0	49.0	37.3			
Progression Factor	0.49	0.53			0.74		1.00	1.00	1.00			
Incremental Delay, d2	0.2	0.3			124.8		203.7	204.2	0.2			
Delay (s)	16.5	12.8			160.7		252.7	253.2	37.5			
Level of Service	B	B			F		F	F	D			
Approach Delay (s)		13.5			160.7			231.1			0.0	
Approach LOS		B			F			F			A	

Intersection Summary			
HCM 2000 Control Delay	147.0	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.26		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	23.6
Intersection Capacity Utilization	143.5%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
10: Richland Hills & Potranco Rd

Scenario 1 PM-2023
2/5/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	427	1002	186	141	1469	205	301	563	213	186	276	324
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.7	5.8		4.7	5.8		5.2	5.2	5.2		5.2	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00	1.00		0.95	
Frt	1.00	0.97		1.00	0.98		1.00	1.00	0.85		0.94	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00		0.99	
Satd. Flow (prot)	1770	3447		1770	3468		1770	1863	1583		3289	
Flt Permitted	0.08	1.00		0.07	1.00		0.95	1.00	1.00		0.99	
Satd. Flow (perm)	146	3447		133	3468		1770	1863	1583		3289	
Peak-hour factor, PHF	0.82	0.85	0.75	0.61	0.96	0.87	0.79	0.83	0.59	0.80	0.76	0.82
Adj. Flow (vph)	521	1179	248	231	1530	236	381	678	361	232	363	395
RTOR Reduction (vph)	0	13	0	0	9	0	0	0	151	0	81	0
Lane Group Flow (vph)	521	1414	0	231	1757	0	381	678	210	0	909	0
Turn Type	D.P+P	NA		D.P+P	NA		Split	NA	Perm	Split	NA	
Protected Phases	1	6		5	2		4	4		3	3	
Permitted Phases	2			6					4			
Actuated Green, G (s)	67.5	56.2		67.5	51.2		25.8	25.8	25.8		25.8	
Effective Green, g (s)	67.5	56.2		67.5	51.2		25.8	25.8	25.8		25.8	
Actuated g/C Ratio	0.48	0.40		0.48	0.37		0.18	0.18	0.18		0.18	
Clearance Time (s)	4.7	5.8		4.7	5.8		5.2	5.2	5.2		5.2	
Vehicle Extension (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0		1.0	
Lane Grp Cap (vph)	259	1383		196	1268		326	343	291		606	
v/s Ratio Prot	c0.23	0.41		0.10	0.51		0.22	c0.36			c0.28	
v/s Ratio Perm	c0.74			0.47					0.13			
v/c Ratio	2.01	1.02		1.18	1.39		1.17	1.98	0.72		1.50	
Uniform Delay, d1	44.9	41.9		42.6	44.4		57.1	57.1	53.7		57.1	
Progression Factor	1.49	0.75		1.14	0.86		1.00	1.00	1.00		1.00	
Incremental Delay, d2	466.4	28.0		112.2	177.2		103.9	449.9	7.3		233.8	
Delay (s)	533.1	59.6		160.8	215.2		161.0	507.0	61.0		290.9	
Level of Service	F	E		F	F		F	F	E		F	
Approach Delay (s)		186.2			208.9			300.8			290.9	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	235.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.89		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	20.9
Intersection Capacity Utilization	141.3%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
11: Ingram Rd & Potranco Rd

Scenario 1 PM-2023
2/5/2014

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1196	20	293	1733	11	536
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.94	0.70	0.89	0.67	0.80
Hourly flow rate (vph)	1259	21	419	1947	16	670
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			1280		3080	640
vC1, stage 1 conf vol					1270	
vC2, stage 2 conf vol					1811	
vCu, unblocked vol			1280		3080	640
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			22		34	0
cM capacity (veh/h)			538		25	418

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	NB 2
Volume Total	839	441	419	974	974	16	670
Volume Left	0	0	419	0	0	16	0
Volume Right	0	21	0	0	0	0	670
cSH	1700	1700	538	1700	1700	25	418
Volume to Capacity	0.49	0.26	0.78	0.57	0.57	0.66	1.60
Queue Length 95th (ft)	0	0	178	0	0	50	952
Control Delay (s)	0.0	0.0	31.3	0.0	0.0	294.9	306.2
Lane LOS			D			F	F
Approach Delay (s)	0.0		5.5			305.9	
Approach LOS						F	

Intersection Summary			
Average Delay	51.5		
Intersection Capacity Utilization	73.6%	ICU Level of Service	D
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
12: Military Dr & Potranco Rd

Scenario 1 PM-2023
2/5/2014

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1167	599	216	1455	474	560
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.8		4.7	5.8	5.2	4.7
Lane Util. Factor	0.95		1.00	0.95	1.00	1.00
Frt	0.95		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3353		1770	3539	1770	1583
Flt Permitted	1.00		0.07	1.00	0.95	1.00
Satd. Flow (perm)	3353		121	3539	1770	1583
Peak-hour factor, PHF	0.96	0.91	0.94	0.91	0.92	0.91
Adj. Flow (vph)	1216	658	230	1599	515	615
RTOR Reduction (vph)	50	0	0	0	0	12
Lane Group Flow (vph)	1824	0	230	1599	515	603
Turn Type	NA		D.P+P	NA	NA	pm+ov
Protected Phases	6		5	2	4	5
Permitted Phases			6			4
Actuated Green, G (s)	61.5		81.8	86.5	42.5	62.8
Effective Green, g (s)	61.5		81.8	86.5	42.5	62.8
Actuated g/C Ratio	0.44		0.58	0.62	0.30	0.45
Clearance Time (s)	5.8		4.7	5.8	5.2	4.7
Vehicle Extension (s)	1.0		1.0	1.0	1.0	1.0
Lane Grp Cap (vph)	1472		309	2186	537	763
v/s Ratio Prot	c0.54		0.11	0.45	c0.29	c0.11
v/s Ratio Perm			0.33			0.27
v/c Ratio	1.24		0.74	0.73	0.96	0.79
Uniform Delay, d1	39.2		53.5	18.7	47.9	33.0
Progression Factor	0.71		0.64	0.30	1.00	1.00
Incremental Delay, d2	112.1		4.5	1.2	28.2	5.2
Delay (s)	139.9		39.0	6.7	76.1	38.2
Level of Service	F		D	A	E	D
Approach Delay (s)	139.9			10.8	55.5	
Approach LOS	F			B	E	

Intersection Summary			
HCM 2000 Control Delay	71.3	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.08		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.7
Intersection Capacity Utilization	102.7%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
13: Micron & Potranco Rd

Scenario 1 PM-2023
2/5/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	409	1426	30	20	1347	23	173	13	120	34	1	261
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.8	5.7	5.7	4.8	5.7		5.0	5.1		5.1	5.1	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.87		1.00	0.85	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	1770	3530		1770	1620		1770	1587	
Flt Permitted	0.06	1.00	1.00	0.10	1.00		0.30	1.00		0.63	1.00	
Satd. Flow (perm)	112	3539	1583	190	3530		552	1620		1181	1587	
Peak-hour factor, PHF	0.95	0.92	0.69	0.54	0.90	0.85	0.73	0.50	0.70	0.42	0.25	0.81
Adj. Flow (vph)	431	1550	43	37	1497	27	237	26	171	81	4	322
RTOR Reduction (vph)	0	0	15	0	1	0	0	135	0	0	243	0
Lane Group Flow (vph)	431	1550	28	37	1523	0	237	62	0	81	83	0
Turn Type	D.P+P	NA	Perm	D.P+P	NA		D.P+P	NA		Perm	NA	
Protected Phases	1	6		5	2		7	4			8	
Permitted Phases	2		6	6			8			8		
Actuated Green, G (s)	94.9	91.2	91.2	94.9	73.8		24.5	29.5		13.5	13.5	
Effective Green, g (s)	94.9	91.2	91.2	94.9	73.8		24.5	29.5		13.5	13.5	
Actuated g/C Ratio	0.68	0.65	0.65	0.68	0.53		0.18	0.21		0.10	0.10	
Clearance Time (s)	4.8	5.7	5.7	4.8	5.7		5.0	5.1		5.1	5.1	
Vehicle Extension (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lane Grp Cap (vph)	325	2305	1031	170	1860		192	341		113	153	
v/s Ratio Prot	c0.20	0.44		0.01	0.43		c0.10	0.04			0.05	
v/s Ratio Perm	c0.70		0.02	0.14			c0.12			0.07		
v/c Ratio	1.33	0.67	0.03	0.22	0.82		1.23	0.18		0.72	0.54	
Uniform Delay, d1	46.4	15.1	8.7	12.3	27.5		55.7	45.3		61.4	60.3	
Progression Factor	0.80	0.70	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	152.5	0.4	0.0	0.2	4.2		142.1	0.1		16.4	2.1	
Delay (s)	189.6	11.0	8.7	12.6	31.7		197.8	45.4		77.8	62.4	
Level of Service	F	B	A	B	C		F	D		E	E	
Approach Delay (s)		49.0			31.2			128.6			65.5	
Approach LOS		D			C			F			E	

Intersection Summary			
HCM 2000 Control Delay	52.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.30		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	20.6
Intersection Capacity Utilization	103.6%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
14: Micron & Ingram Rd

Scenario 1 PM-2023
2/5/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	1	0	0	106	3	196	0	254	52	65	146	0
Peak Hour Factor	0.25	1.00	1.00	0.94	0.50	0.79	1.00	0.96	0.70	0.71	0.88	1.00
Hourly flow rate (vph)	4	0	0	113	6	248	0	265	74	92	166	0

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total (vph)	4	0	113	254	339	257
Volume Left (vph)	4	0	113	0	0	92
Volume Right (vph)	0	0	0	248	74	0
Hadj (s)	0.53	0.00	0.53	-0.65	-0.10	0.11
Departure Headway (s)	7.3	6.8	6.6	5.4	5.2	5.5
Degree Utilization, x	0.01	0.00	0.21	0.38	0.49	0.39
Capacity (veh/h)	422	467	511	624	655	621
Control Delay (s)	9.2	8.6	10.2	10.6	13.0	12.0
Approach Delay (s)	9.2		10.4		13.0	12.0
Approach LOS	A		B		B	B

Intersection Summary			
Delay	11.8		
Level of Service	B		
Intersection Capacity Utilization	50.3%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
16: Military Dr & Reed Rd

Scenario 1 PM-2023
2/5/2014

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	578	377	241	25	27	677
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.94	0.93	0.86	0.50	0.25	0.88
Hourly flow rate (vph)	615	405	280	50	108	769
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		751				
pX, platoon unblocked					0.77	
vC, conflicting volume	330				1940	305
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	330				2071	305
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	50				0	0
cM capacity (veh/h)	1229				23	735

Direction, Lane #	EB 1	WB 1	SB 1	SB 2
Volume Total	1020	330	108	769
Volume Left	615	0	108	0
Volume Right	0	50	0	769
cSH	1229	1700	23	735
Volume to Capacity	0.50	0.19	4.72	1.05
Queue Length 95th (ft)	72	0	Err	482
Control Delay (s)	9.3	0.0	Err	69.8
Lane LOS	A		F	F
Approach Delay (s)	9.3	0.0	1292.1	
Approach LOS			F	

Intersection Summary			
Average Delay	513.1		
Intersection Capacity Utilization	79.4%	ICU Level of Service	D
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
17: Richland Hills & Military Dr

Scenario 1 PM-2023
2/5/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	9	456	218	399	391	22	314	39	463	7	15	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.3			5.4		4.5	4.3		4.6	4.3	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.95			0.99		1.00	0.87		1.00	0.96	
Flt Protected		1.00			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1775			1804		1770	1614		1770	1787	
Flt Permitted		0.97			0.42		1.00	1.00		0.14	1.00	
Satd. Flow (perm)		1729			772		1863	1614		264	1787	
Peak-hour factor, PHF	0.58	0.91	0.81	0.77	0.87	0.44	0.84	0.60	0.89	0.63	0.55	0.50
Adj. Flow (vph)	16	501	269	518	449	50	374	65	520	11	27	10
RTOR Reduction (vph)	0	13	0	0	2	0	0	251	0	0	10	0
Lane Group Flow (vph)	0	773	0	0	1015	0	374	334	0	11	27	0
Turn Type	Perm	NA		pm+pt	NA		D.P+P	NA		D.P+P	NA	
Protected Phases		6		5	2		7	4		3	8	
Permitted Phases	6			2			8			4		
Actuated Green, G (s)		56.6			56.5		29.3	28.2		29.2	3.9	
Effective Green, g (s)		56.6			56.5		29.3	28.2		29.2	3.9	
Actuated g/C Ratio		0.57			0.56		0.29	0.28		0.29	0.04	
Clearance Time (s)		5.3			5.4		4.5	4.3		4.6	4.3	
Vehicle Extension (s)		1.0			1.0		1.0	1.0		1.0	1.0	
Lane Grp Cap (vph)		978			436		522	455		92	69	
v/s Ratio Prot							0.18	c0.21		0.00	0.02	
v/s Ratio Perm		0.45			c1.32		c0.03			0.03		
v/c Ratio		0.79			2.33		0.72	0.73		0.12	0.40	
Uniform Delay, d1		17.0			21.8		30.4	32.5		28.2	46.9	
Progression Factor		0.74			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		5.5			605.0		3.9	5.2		0.2	1.4	
Delay (s)		18.1			626.8		34.3	37.7		28.4	48.3	
Level of Service		B			F		C	D		C	D	
Approach Delay (s)		18.1			626.8			36.4			43.7	
Approach LOS		B			F			D			D	

Intersection Summary				
HCM 2000 Control Delay	245.1	HCM 2000 Level of Service	F	
HCM 2000 Volume to Capacity ratio	1.89			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	18.4	
Intersection Capacity Utilization	124.9%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
18: Richland Hills & Jack Jordan MS

Scenario 1 PM-2023
2/5/2014

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	74	39	51	642	562	74
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.86	0.91	0.63	0.86	0.80	0.81
Hourly flow rate (vph)	86	43	81	747	702	91
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)					1086	
pX, platoon unblocked						
vC, conflicting volume	1657	748	794			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1657	748	794			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	11	90	90			
cM capacity (veh/h)	97	412	827			

Direction, Lane #	EB 1	EB 2	NB 1	SB 1
Volume Total	86	43	827	794
Volume Left	86	0	81	0
Volume Right	0	43	0	91
cSH	97	412	827	1700
Volume to Capacity	0.89	0.10	0.10	0.47
Queue Length 95th (ft)	126	9	8	0
Control Delay (s)	140.6	14.7	2.5	0.0
Lane LOS	F	B	A	
Approach Delay (s)	98.8		2.5	0.0
Approach LOS	F			

Intersection Summary			
Average Delay	8.5		
Intersection Capacity Utilization	84.8%	ICU Level of Service	E
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
19: Richland Hills & Christian Evers ES

Scenario 1 PM-2023
2/5/2014

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	39	52	47	767	553	20
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.91	0.89	0.67	0.86	0.89	0.63
Hourly flow rate (vph)	43	58	70	892	621	32
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1669	637	653			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1669	637	653			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	56	88	92			
cM capacity (veh/h)	98	477	934			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	101	962	653
Volume Left	43	70	0
Volume Right	58	0	32
cSH	181	934	1700
Volume to Capacity	0.56	0.08	0.38
Queue Length 95th (ft)	74	6	0
Control Delay (s)	47.7	2.0	0.0
Lane LOS	E	A	
Approach Delay (s)	47.7	2.0	0.0
Approach LOS	E		

Intersection Summary			
Average Delay	3.9		
Intersection Capacity Utilization	88.6%	ICU Level of Service	E
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
20: Military Dr & Earl Warren High School

Scenario 1 PM-2023
2/5/2014

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	103	715	675	121	151	188
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.9	4.9	4.9	5.1	5.1	5.1
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	1863	1863	1583	1770	1583
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	1863	1863	1583	1770	1583
Peak-hour factor, PHF	0.64	0.91	0.87	0.58	0.78	0.88
Adj. Flow (vph)	161	786	776	209	194	214
RTOR Reduction (vph)	0	0	0	119	0	179
Lane Group Flow (vph)	161	786	776	90	194	35
Turn Type	Prot	NA	NA	custom	NA	Perm
Protected Phases	1	6	2		8	
Permitted Phases				8		8
Actuated Green, G (s)	13.9	73.5	54.7	16.5	16.5	16.5
Effective Green, g (s)	13.9	73.5	54.7	16.5	16.5	16.5
Actuated g/C Ratio	0.14	0.74	0.55	0.16	0.16	0.16
Clearance Time (s)	4.9	4.9	4.9	5.1	5.1	5.1
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	246	1369	1019	261	292	261
v/s Ratio Prot	0.09	c0.42	c0.42		c0.11	
v/s Ratio Perm				0.06		0.02
v/c Ratio	0.65	0.57	0.76	0.35	0.66	0.14
Uniform Delay, d1	40.8	6.1	17.6	37.0	39.2	35.7
Progression Factor	0.86	1.33	1.08	1.32	1.00	1.00
Incremental Delay, d2	2.7	0.8	0.5	0.1	5.6	0.2
Delay (s)	37.9	8.8	19.6	48.9	44.8	35.9
Level of Service	D	A	B	D	D	D
Approach Delay (s)		13.8	25.8		40.1	
Approach LOS		B	C		D	

Intersection Summary			
HCM 2000 Control Delay	23.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.9
Intersection Capacity Utilization	62.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
21: Hunt Ln & Military Dr

Scenario 1 PM-2023
2/5/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	121	328	28	165	402	415	29	850	191	392	403	114
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.7		5.0	5.8		5.2	5.6		5.2	5.6	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.99		1.00	0.92		1.00	0.97		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3501		1770	3260		1770	3445		1770	3402	
Flt Permitted	0.19	1.00		0.32	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	345	3501		593	3260		1770	3445		1770	3402	
Peak-hour factor, PHF	0.70	0.79	0.88	0.78	0.87	0.81	0.70	0.91	0.95	0.81	0.87	0.71
Adj. Flow (vph)	173	415	32	212	462	512	41	934	201	484	463	161
RTOR Reduction (vph)	0	5	0	0	199	0	0	18	0	0	32	0
Lane Group Flow (vph)	173	442	0	212	775	0	41	1117	0	484	592	0
Turn Type	pm+pt	NA		pm+pt	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	30.9	21.6		35.6	23.9		4.2	17.0		28.2	41.0	
Effective Green, g (s)	30.9	21.6		35.6	23.9		4.2	17.0		28.2	41.0	
Actuated g/C Ratio	0.31	0.22		0.36	0.24		0.04	0.17		0.28	0.41	
Clearance Time (s)	5.0	5.7		5.0	5.8		5.2	5.6		5.2	5.6	
Vehicle Extension (s)	1.0	2.5		1.0	2.0		1.0	2.5		1.0	2.5	
Lane Grp Cap (vph)	239	756		348	779		74	585		499	1394	
v/s Ratio Prot	0.07	0.13		c0.07	c0.24		0.02	c0.32		c0.27	0.17	
v/s Ratio Perm	0.16			0.15								
v/c Ratio	0.72	0.58		0.61	1.00		0.55	1.91		0.97	0.42	
Uniform Delay, d1	28.2	35.2		24.0	38.0		47.0	41.5		35.5	21.1	
Progression Factor	1.00	1.00		1.45	1.33		1.00	1.00		1.00	1.00	
Incremental Delay, d2	8.8	1.0		1.8	28.6		5.0	415.4		32.1	1.0	
Delay (s)	37.0	36.1		36.6	79.3		52.0	456.9		67.5	22.0	
Level of Service	D	D		D	E		D	F		E	C	
Approach Delay (s)		36.4			71.6			442.8			41.9	
Approach LOS		D			E			F			D	

Intersection Summary			
HCM 2000 Control Delay	165.0	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.16		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	21.6
Intersection Capacity Utilization	100.5%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
22: SH 151 NB Frnt Rd & Hunt Ln

Scenario 1 PM-2023
2/5/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	52	89	0	0	598	56	60	996	1002	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.3			5.3	5.3	6.0	6.0				
Lane Util. Factor		0.95			0.95	1.00	0.91	0.91				
Frt		1.00			1.00	0.85	1.00	0.93				
Flt Protected		0.98			1.00	1.00	0.95	1.00				
Satd. Flow (prot)		3469			3539	1583	1610	3145				
Flt Permitted		0.55			1.00	1.00	0.95	1.00				
Satd. Flow (perm)		1944			3539	1583	1610	3145				
Peak-hour factor, PHF	0.70	0.82	1.00	1.00	0.89	0.60	0.69	0.88	0.95	1.00	1.00	1.00
Adj. Flow (vph)	74	109	0	0	672	93	87	1132	1055	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	70	0	77	0	0	0	0
Lane Group Flow (vph)	0	183	0	0	672	23	78	2119	0	0	0	0
Turn Type	pm+pt	NA			NA	Perm	Split	NA				
Protected Phases	5	6			6		8 16	8 16				
Permitted Phases	6					6						
Actuated Green, G (s)		28.3			28.3	28.3	75.0	75.0				
Effective Green, g (s)		28.3			28.3	28.3	75.0	75.0				
Actuated g/C Ratio		0.25			0.25	0.25	0.66	0.66				
Clearance Time (s)		5.3			5.3	5.3						
Vehicle Extension (s)		3.0			3.0	3.0						
Lane Grp Cap (vph)		483			880	393	1061	2072				
v/s Ratio Prot					c0.19		0.05	c0.67				
v/s Ratio Perm		0.09				0.01						
v/c Ratio		0.90dl			0.76	0.06	0.07	1.02				
Uniform Delay, d1		35.5			39.6	32.6	7.0	19.4				
Progression Factor		0.82			1.00	1.00	1.00	1.00				
Incremental Delay, d2		0.5			4.0	0.1	0.1	25.8				
Delay (s)		29.5			43.6	32.7	7.1	45.2				
Level of Service		C			D	C	A	D				
Approach Delay (s)		29.5			42.3			43.9			0.0	
Approach LOS		C			D			D			A	

Intersection Summary			
HCM 2000 Control Delay	42.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.07		
Actuated Cycle Length (s)	113.8	Sum of lost time (s)	21.7
Intersection Capacity Utilization	77.2%	ICU Level of Service	D
Analysis Period (min)	15		

dl Defacto Left Lane. Recode with 1 though lane as a left lane.
c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
23: SH 151 SB Frnt Rd & Hunt Ln

Scenario 1 PM-2023
2/5/2014

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	643	0	0	0	142	786
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2				6.0	6.0
Lane Util. Factor	0.97				0.91	0.91
Frt	1.00				1.00	1.00
Flt Protected	0.95				0.95	1.00
Satd. Flow (prot)	3433				1610	3387
Flt Permitted	0.95				0.95	1.00
Satd. Flow (perm)	3433				1610	3387
Peak-hour factor, PHF	0.93	1.00	1.00	1.00	0.75	0.91
Adj. Flow (vph)	691	0	0	0	189	864
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	691	0	0	0	170	883
Turn Type	NA				Split	NA
Protected Phases	1				4 12	4 12
Permitted Phases						
Actuated Green, G (s)	56.5				46.9	46.9
Effective Green, g (s)	56.5				46.9	46.9
Actuated g/C Ratio	0.50				0.41	0.41
Clearance Time (s)	5.2					
Vehicle Extension (s)	3.0					
Lane Grp Cap (vph)	1704				663	1395
v/s Ratio Prot	c0.20				0.11	c0.26
v/s Ratio Perm						
v/c Ratio	0.41				0.26	0.63
Uniform Delay, d1	18.1				22.0	26.6
Progression Factor	0.46				1.00	1.00
Incremental Delay, d2	0.1				0.9	2.2
Delay (s)	8.4				22.9	28.8
Level of Service	A				C	C
Approach Delay (s)	8.4		0.0			27.9
Approach LOS	A		A			C

Intersection Summary			
HCM 2000 Control Delay	20.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	113.8	Sum of lost time (s)	21.7
Intersection Capacity Utilization	49.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

EXHIBIT (C) - TRAFFIC IMPACT ANALYSIS
PART 3 OF 4

HCM Signalized Intersection Capacity Analysis
1: Military Dr & IH-410 NB Frnt Rd

Scenario 1 AM-2023-Improvements
2/5/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	157	1235	22	0	0	0	0	341	821	426	1418	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0					5.1	5.1	6.0	6.0	
Lane Util. Factor	0.91	0.91	1.00					0.91	1.00	0.91	0.91	
Frt	1.00	1.00	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1610	3388	1583					5085	1583	1610	3385	
Flt Permitted	0.95	1.00	1.00					1.00	1.00	0.45	0.94	
Satd. Flow (perm)	1610	3388	1583					5085	1583	756	3190	
Peak-hour factor, PHF	0.89	0.81	0.57	1.00	1.00	1.00	1.00	0.86	0.86	0.88	0.91	1.00
Adj. Flow (vph)	176	1525	39	0	0	0	0	397	955	484	1558	0
RTOR Reduction (vph)	0	0	28	0	0	0	0	0	140	0	0	0
Lane Group Flow (vph)	158	1543	11	0	0	0	0	397	815	436	1606	0
Turn Type	Split	NA	Perm					NA	Perm	pm+pt	NA	
Protected Phases	8 16	8 16						6		5	5 6	
Permitted Phases			8 16						6	5 6		
Actuated Green, G (s)	32.9	32.9	32.9					24.9	24.9	68.9	68.9	
Effective Green, g (s)	32.9	32.9	32.9					24.9	24.9	68.9	68.9	
Actuated g/C Ratio	0.28	0.28	0.28					0.21	0.21	0.58	0.58	
Clearance Time (s)								5.1	5.1	6.0		
Vehicle Extension (s)								3.0	3.0	3.0		
Lane Grp Cap (vph)	448	944	441					1073	334	759	1935	
v/s Ratio Prot	0.10	c0.46						0.08		0.21	c0.31	
v/s Ratio Perm			0.01						c0.51	0.12	0.18	
v/c Ratio	0.35	1.63	0.02					0.37	2.44	0.57	0.83	
Uniform Delay, d1	34.0	42.5	30.9					39.8	46.5	14.1	19.8	
Progression Factor	1.00	1.00	1.00					1.00	1.00	0.76	0.65	
Incremental Delay, d2	2.2	290.4	0.1					0.2	656.5	0.1	0.3	
Delay (s)	36.2	332.9	31.0					40.1	703.0	10.8	13.1	
Level of Service	D	F	C					D	F	B	B	
Approach Delay (s)		299.2			0.0			508.3			12.6	
Approach LOS		F			A			F			B	

Intersection Summary			
HCM 2000 Control Delay	240.3	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.58		
Actuated Cycle Length (s)	118.0	Sum of lost time (s)	22.2
Intersection Capacity Utilization	136.3%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
2: Military Dr & IH-410 SB Frnt Rd

Scenario 1 AM-2023-Improvements
2/5/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	1251	325	195	83	407	0	0	728	46
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				5.8	5.8	5.8	5.7	5.7			5.1	5.1
Lane Util. Factor				0.91	0.91	1.00	0.91	0.91			0.95	1.00
Frt				1.00	1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	0.97	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1610	3287	1583	1610	3387			3539	1583
Flt Permitted				0.95	0.97	1.00	0.16	0.95			1.00	1.00
Satd. Flow (perm)				1610	3287	1583	272	3238			3539	1583
Peak-hour factor, PHF	1.00	1.00	1.00	0.92	0.80	0.91	0.74	0.75	1.00	1.00	0.84	0.71
Adj. Flow (vph)	0	0	0	1360	406	214	112	543	0	0	867	65
RTOR Reduction (vph)	0	0	0	0	0	119	0	0	0	0	0	51
Lane Group Flow (vph)	0	0	0	680	1086	95	101	554	0	0	867	14
Turn Type				Split	NA	Perm	pm+pt	NA			NA	Perm
Protected Phases				4 12	4 12		1	1 2			2	
Permitted Phases						4 12	1 2					2
Actuated Green, G (s)				34.9	34.9	34.9	67.2	67.2			24.9	24.9
Effective Green, g (s)				34.9	34.9	34.9	67.2	67.2			24.9	24.9
Actuated g/C Ratio				0.30	0.30	0.30	0.57	0.57			0.21	0.21
Clearance Time (s)							5.7				5.1	5.1
Vehicle Extension (s)							3.0				3.0	3.0
Lane Grp Cap (vph)				476	972	468	634	1897			746	334
v/s Ratio Prot				c0.42	0.33		0.06	c0.10			c0.24	
v/s Ratio Perm						0.06	0.03	0.06				0.01
v/c Ratio				1.43	1.40di	0.20	0.16	0.29			1.16	0.04
Uniform Delay, d1				41.5	41.5	31.1	13.6	13.1			46.5	37.0
Progression Factor				1.00	1.00	1.00	0.43	0.38			1.00	1.00
Incremental Delay, d2				204.7	66.7	1.0	0.1	0.1			87.4	0.1
Delay (s)				246.3	108.3	32.1	6.0	5.0			134.0	37.1
Level of Service				F	F	C	A	A			F	D
Approach Delay (s)		0.0			147.4			5.2			127.2	
Approach LOS		A			F			A			F	

Intersection Summary			
HCM 2000 Control Delay	116.0	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	118.0	Sum of lost time (s)	22.2
Intersection Capacity Utilization	136.3%	ICU Level of Service	H
Analysis Period (min)	15		
di Defacto Left Lane. Recode with 1 though lane as a left lane.			
c Critical Lane Group			

EXHIBIT (C) - TRAFFIC IMPACT ANALYSIS
PART 3 OF 4

HCM Unsignalized Intersection Capacity Analysis
3: IH-410 SB Frnt Rd & Richland Hills

Scenario 1 AM-2023-Improvements
2/5/2014

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	0	0	2736	230	0	288
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	0.86	0.70	1.00	0.81
Hourly flow rate (vph)	0	0	3181	329	0	356
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	3510				3346	1225
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	3510				3346	1225
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	0
cM capacity (veh/h)	70				6	171

Direction, Lane #	WB 1	WB 2	WB 3	SB 1
Volume Total	1273	1273	965	356
Volume Left	0	0	0	0
Volume Right	0	0	329	356
cSH	1700	1700	1700	171
Volume to Capacity	0.75	0.75	0.57	2.08
Queue Length 95th (ft)	0	0	0	697
Control Delay (s)	0.0	0.0	0.0	551.1
Lane LOS				F
Approach Delay (s)	0.0			551.1
Approach LOS				F

Intersection Summary			
Average Delay	50.7		
Intersection Capacity Utilization	82.5%	ICU Level of Service	E
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
4: Military Dr & Walmart/Sony Pl

Scenario 1 AM-2023-Improvements
2/5/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	48	0	40	0	0	0	19	540	0	0	702	62
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.7		5.2				5.0	5.9			5.9	
Lane Util. Factor	1.00		1.00				1.00	0.95			0.95	
Frt	1.00		0.85				1.00	1.00			0.99	
Flt Protected	0.95		1.00				0.95	1.00			1.00	
Satd. Flow (prot)	1770		1583				1770	3539			3490	
Flt Permitted	0.95		1.00				0.23	1.00			1.00	
Satd. Flow (perm)	1770		1583				434	3539			3490	
Peak-hour factor, PHF	1.00	1.00	0.83	1.00	1.00	1.00	0.70	0.82	1.00	1.00	0.88	0.77
Adj. Flow (vph)	48	0	48	0	0	0	27	659	0	0	798	81
RTOR Reduction (vph)	0	0	44	0	0	0	0	0	0	0	4	0
Lane Group Flow (vph)	48	0	4	0	0	0	27	659	0	0	875	0
Turn Type	custom		custom	Perm			pm+pt	NA			NA	
Protected Phases	7		4		8		5	2			6	
Permitted Phases	4			8			2					
Actuated Green, G (s)	3.4		2.9				23.5	23.5			17.1	
Effective Green, g (s)	3.4		2.9				23.5	23.5			17.1	
Actuated g/C Ratio	0.09		0.08				0.63	0.63			0.46	
Clearance Time (s)	4.7		5.2				5.0	5.9			5.9	
Vehicle Extension (s)	1.0		1.0				1.0	2.5			2.5	
Lane Grp Cap (vph)	160		122				321	2217			1591	
v/s Ratio Prot	c0.03		0.00				0.00	c0.19			c0.25	
v/s Ratio Perm							0.05					
v/c Ratio	0.30		0.03				0.08	0.30			0.55	
Uniform Delay, d1	15.9		16.0				3.2	3.2			7.4	
Progression Factor	1.00		1.00				1.00	1.00			1.00	
Incremental Delay, d2	0.4		0.0				0.0	0.1			0.3	
Delay (s)	16.3		16.0				3.2	3.3			7.7	
Level of Service	B		B				A	A			A	
Approach Delay (s)		16.2			0.0			3.3			7.7	
Approach LOS		B			A			A			A	

Intersection Summary					
HCM 2000 Control Delay	6.4	HCM 2000 Level of Service	A		
HCM 2000 Volume to Capacity ratio	0.71				
Actuated Cycle Length (s)	37.5	Sum of lost time (s)	21.1		
Intersection Capacity Utilization	35.6%	ICU Level of Service	A		
Analysis Period (min)	15				
c Critical Lane Group					

HCM Signalized Intersection Capacity Analysis
5: SH 151 SB Frnt Rd & Ingram Rd

Scenario 1 AM-2023-Improvements
2/5/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	886	770	434	291	0	0	0	0	119	1075	198
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0	5.5	5.5					6.4	6.4	6.4
Lane Util. Factor		0.95	1.00	0.91	0.91					0.91	0.91	1.00
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	0.98					0.95	1.00	1.00
Satd. Flow (prot)		3539	1583	1610	3327					1610	3388	1583
Flt Permitted		1.00	1.00	0.16	0.60					0.95	1.00	1.00
Satd. Flow (perm)		3539	1583	271	2031					1610	3388	1583
Peak-hour factor, PHF	1.00	0.85	0.74	0.95	0.77	1.00	1.00	1.00	1.00	0.72	0.91	0.61
Adj. Flow (vph)	0	1042	1041	457	378	0	0	0	0	165	1181	325
RTOR Reduction (vph)	0	0	135	0	0	0	0	0	0	0	0	102
Lane Group Flow (vph)	0	1042	906	228	607	0	0	0	0	148	1198	223
Turn Type		NA	Perm	pm+pt	NA					Split	NA	Perm
Protected Phases		2		1	1 2					4 12	4 12	
Permitted Phases			2	1 2								4 12
Actuated Green, G (s)		25.0	25.0	83.5	83.5					53.0	53.0	53.0
Effective Green, g (s)		25.0	25.0	83.5	83.5					53.0	53.0	53.0
Actuated g/C Ratio		0.16	0.16	0.55	0.55					0.35	0.35	0.35
Clearance Time (s)		5.0	5.0	5.5								
Vehicle Extension (s)		3.0	3.0	3.0								
Lane Grp Cap (vph)		582	260	664	1614					561	1181	551
v/s Ratio Prot		0.29		0.13	c0.14					0.09	c0.35	
v/s Ratio Perm			c0.57	0.06	0.06							0.14
v/c Ratio		1.79	3.48	0.34	0.38					0.26	1.01	0.41
Uniform Delay, d1		63.5	63.5	19.7	19.5					35.5	49.5	37.5
Progression Factor		1.00	1.00	0.16	0.22					1.00	1.00	1.00
Incremental Delay, d2		362.5	1127.1	0.2	0.1					1.1	29.8	2.2
Delay (s)		426.0	1190.6	3.3	4.4					36.7	79.3	39.8
Level of Service		F	F	A	A					D	E	D
Approach Delay (s)		808.1			4.1			0.0			67.8	
Approach LOS		F			A			A			E	

Intersection Summary				
HCM 2000 Control Delay	392.3	HCM 2000 Level of Service	F	
HCM 2000 Volume to Capacity ratio	1.26			
Actuated Cycle Length (s)	152.0	Sum of lost time (s)	22.8	
Intersection Capacity Utilization	79.3%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
6: SH 151 NB Frnt Rd & Ingram Rd

Scenario 1 AM-2023-Improvements
2/5/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	352	620	0	0	417	39	355	604	205	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.4	6.4			5.0	5.0	6.4	6.4	6.4			
Lane Util. Factor	0.91	0.91			0.95	1.00	0.91	0.91	1.00			
Frt	1.00	1.00			1.00	0.85	1.00	1.00	0.85			
Flt Protected	0.95	0.99			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	1610	3365			3539	1583	1610	3381	1583			
Flt Permitted	0.21	0.58			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	351	1956			3539	1583	1610	3381	1583			
Peak-hour factor, PHF	0.78	0.83	1.00	1.00	0.83	0.66	0.92	0.86	0.62	1.00	1.00	1.00
Adj. Flow (vph)	451	747	0	0	502	59	386	702	331	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	48	0	0	127	0	0	0
Lane Group Flow (vph)	320	878	0	0	502	11	347	741	204	0	0	0
Turn Type	pm+pt	NA			NA	Perm	Split	NA	Perm			
Protected Phases	5	5 6			6		8 16	8 16				
Permitted Phases	5 6					6			8 16			
Actuated Green, G (s)	82.6	82.6			29.0	29.0	53.0	53.0	53.0			
Effective Green, g (s)	82.6	82.6			29.0	29.0	53.0	53.0	53.0			
Actuated g/C Ratio	0.54	0.54			0.19	0.19	0.35	0.35	0.35			
Clearance Time (s)	5.4				5.0	5.0						
Vehicle Extension (s)	3.0				3.0	3.0						
Lane Grp Cap (vph)	634	1559			675	302	561	1178	551			
v/s Ratio Prot	0.18	c0.20			c0.14		0.22	c0.22				
v/s Ratio Perm	0.10	0.11				0.01			0.13			
v/c Ratio	0.50	0.56			0.74	0.04	0.62	0.63	0.37			
Uniform Delay, d1	21.2	22.8			58.0	50.1	41.1	41.3	37.0			
Progression Factor	0.45	0.72			1.00	1.00	1.00	1.00	1.00			
Incremental Delay, d2	0.1	0.0			4.4	0.1	5.1	2.6	1.9			
Delay (s)	9.6	16.5			62.4	50.2	46.2	43.9	38.9			
Level of Service	A	B			E	D	D	D	D			
Approach Delay (s)		14.7			61.1			43.3			0.0	
Approach LOS		B			E			D			A	

Intersection Summary				
HCM 2000 Control Delay	35.6	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.66			
Actuated Cycle Length (s)	152.0	Sum of lost time (s)	22.8	
Intersection Capacity Utilization	79.3%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

EXHIBIT (C) - TRAFFIC IMPACT ANALYSIS
PART 3 OF 4

HCM Signalized Intersection Capacity Analysis
7: Richland Hills & Ingram Rd

Scenario 1 AM-2023-Improvements
2/5/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	223	362	112	38	107	12	28	74	26	52	293	334
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.95		1.00	0.98		1.00	0.94		1.00	0.92	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3370		1770	3453		1770	3318		1770	3260	
Flt Permitted	0.65	1.00		0.43	1.00		0.37	1.00		0.65	1.00	
Satd. Flow (perm)	1205	3370		794	3453		690	3318		1217	3260	
Peak-hour factor, PHF	0.88	0.89	0.59	0.88	0.77	0.45	0.59	0.81	0.40	0.75	0.83	0.85
Adj. Flow (vph)	253	407	190	43	139	27	47	91	65	69	353	393
RTOR Reduction (vph)	0	102	0	0	15	0	0	45	0	0	272	0
Lane Group Flow (vph)	253	495	0	43	151	0	47	111	0	69	474	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	16.2	16.2		16.2	16.2		10.8	10.8		10.8	10.8	
Effective Green, g (s)	16.2	16.2		16.2	16.2		10.8	10.8		10.8	10.8	
Actuated g/C Ratio	0.46	0.46		0.46	0.46		0.31	0.31		0.31	0.31	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	557	1559		367	1598		212	1023		375	1005	
v/s Ratio Prot		0.15			0.04			0.03			c0.15	
v/s Ratio Perm	c0.21			0.05			0.07			0.06		
v/c Ratio	0.45	0.32		0.12	0.09		0.22	0.11		0.18	0.47	
Uniform Delay, d1	6.4	5.9		5.3	5.3		9.0	8.7		8.9	9.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.7	0.5		0.6	0.1		0.5	0.0		0.2	0.4	
Delay (s)	9.1	6.5		6.0	5.4		9.5	8.7		9.1	10.1	
Level of Service	A	A		A	A		A	A		A	B	
Approach Delay (s)		7.2			5.5			8.9			10.1	
Approach LOS		A			A			A			B	

Intersection Summary			
HCM 2000 Control Delay	8.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	35.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	50.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
8: SH 151 SB Frnt Rd & Potranco Rd

Scenario 1 AM-2023-Improvements
2/5/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1363	661	355	831	0	0	0	0	1050	509	231
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.3	5.3	5.7	5.3					6.3	6.3	6.3
Lane Util. Factor		0.91	1.00	0.91	0.91					0.91	0.91	1.00
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	0.99					0.95	0.98	1.00
Satd. Flow (prot)		5085	1583	1610	3372					1610	3309	1583
Flt Permitted		1.00	1.00	0.09	0.53					0.95	0.98	1.00
Satd. Flow (perm)		5085	1583	154	1794					1610	3309	1583
Peak-hour factor, PHF	1.00	0.96	0.90	0.80	0.86	1.00	1.00	1.00	1.00	0.91	0.86	0.81
Adj. Flow (vph)	0	1420	734	444	966	0	0	0	0	1154	592	285
RTOR Reduction (vph)	0	0	115	0	0	0	0	0	0	0	0	143
Lane Group Flow (vph)	0	1420	619	324	1086	0	0	0	0	577	1169	142
Turn Type		NA	Perm	pm+pt	NA					Perm	NA	Perm
Protected Phases		6		5	6 5						8 16	
Permitted Phases			6	6 5						8 16		8 16
Actuated Green, G (s)		48.7	48.7	75.7	75.7					27.0	27.0	27.0
Effective Green, g (s)		48.7	48.7	75.7	75.7					27.0	27.0	27.0
Actuated g/C Ratio		0.41	0.41	0.63	0.63					0.22	0.22	0.22
Clearance Time (s)		5.3	5.3	5.7								
Vehicle Extension (s)		2.5	2.5	1.0								
Lane Grp Cap (vph)		2063	642	424	1486					362	744	356
v/s Ratio Prot		0.28		c0.17	0.16							
v/s Ratio Perm			c0.39	0.31	0.30					c0.36	0.35	0.09
v/c Ratio		0.69	0.96	0.76	0.73					1.59	1.57	0.40
Uniform Delay, d1		29.4	34.8	30.2	15.2					46.5	46.5	39.6
Progression Factor		1.00	1.00	0.72	0.79					1.00	1.00	1.00
Incremental Delay, d2		0.9	26.7	0.7	0.2					280.0	263.5	0.5
Delay (s)		30.3	61.5	22.5	12.1					326.5	310.0	40.1
Level of Service		C	E	C	B					F	F	D
Approach Delay (s)		40.9			14.5			0.0			276.8	
Approach LOS		D			B			A			F	

Intersection Summary			
HCM 2000 Control Delay	119.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.15		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	115.6%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

EXHIBIT (C) - TRAFFIC IMPACT ANALYSIS
PART 3 OF 4

HCM Signalized Intersection Capacity Analysis
9: SH 151 NB Frnt Rd & Potranco Rd

Scenario 1 AM-2023-Improvements
2/5/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	296	2073	0	0	689	288	490	456	123	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.7	5.3			5.3	5.3	6.3	6.3	6.3			
Lane Util. Factor	0.91	0.91			0.91	1.00	0.91	0.91	1.00			
Frt	1.00	1.00			1.00	0.85	1.00	1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.99	1.00			
Satd. Flow (prot)	1610	3387			5085	1583	1610	3357	1583			
Flt Permitted	0.19	0.95			1.00	1.00	0.95	0.99	1.00			
Satd. Flow (perm)	328	3233			5085	1583	1610	3357	1583			
Peak-hour factor, PHF	0.65	0.93	1.00	1.00	0.95	0.72	0.86	0.67	0.73	1.00	1.00	1.00
Adj. Flow (vph)	455	2229	0	0	725	400	570	681	168	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	264	0	0	141	0	0	0
Lane Group Flow (vph)	409	2275	0	0	725	136	405	846	27	0	0	0
Turn Type	pm+pt	NA			NA	Perm	Perm	NA	Perm			
Protected Phases	1	2 1			2			4 12				
Permitted Phases	2 1					2	4 12		4 12			
Actuated Green, G (s)	83.7	83.7			20.7	20.7	19.0	19.0	19.0			
Effective Green, g (s)	83.7	83.7			20.7	20.7	19.0	19.0	19.0			
Actuated g/C Ratio	0.70	0.70			0.17	0.17	0.16	0.16	0.16			
Clearance Time (s)	5.7				5.3	5.3						
Vehicle Extension (s)	1.0				2.5	2.5						
Lane Grp Cap (vph)	901	2335			877	273	254	531	250			
v/s Ratio Prot	0.24	c0.51			0.14							
v/s Ratio Perm	0.08	c0.17				0.09	0.25	0.25	0.02			
v/c Ratio	0.45	0.97			0.83	0.50	1.59	1.59	0.11			
Uniform Delay, d1	10.2	17.1			47.9	44.9	50.5	50.5	43.2			
Progression Factor	0.73	0.83			0.82	0.63	1.00	1.00	1.00			
Incremental Delay, d2	0.0	2.1			8.0	5.8	285.3	275.8	0.1			
Delay (s)	7.5	16.3			47.3	34.2	335.8	326.3	43.4			
Level of Service	A	B			D	C	F	F	D			
Approach Delay (s)		14.9			42.7			295.5			0.0	
Approach LOS		B			D			F			A	

Intersection Summary			
HCM 2000 Control Delay	97.1	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.16		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	115.6%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
10: Richland Hills & Potranco Rd

Scenario 1 AM-2023-Improvements
2/5/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	212	2020	241	102	542	172	64	151	178	349	374	358
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.7	5.8	5.8	4.7	5.8	5.8	5.2	5.2	5.2	5.2	5.2	5.2
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1863	1583	1770	3539	1583
Flt Permitted	0.26	1.00	1.00	0.07	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	478	3539	1583	131	3539	1583	1770	1863	1583	1770	3539	1583
Peak-hour factor, PHF	0.65	0.86	0.44	0.55	0.75	0.85	0.45	0.69	0.65	0.87	0.96	0.84
Adj. Flow (vph)	326	2349	548	185	723	202	142	219	274	401	390	426
RTOR Reduction (vph)	0	0	93	0	0	103	0	0	144	0	0	265
Lane Group Flow (vph)	326	2349	455	185	723	99	142	219	130	401	390	161
Turn Type	D.P+P	NA	Perm	D.P+P	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	1	6		5	2		4	4		3	3	
Permitted Phases	2		6	6		2			4			3
Actuated Green, G (s)	61.3	57.0	57.0	61.3	44.9	44.9	10.8	10.8	10.8	27.0	27.0	27.0
Effective Green, g (s)	61.3	57.0	57.0	61.3	44.9	44.9	10.8	10.8	10.8	27.0	27.0	27.0
Actuated g/C Ratio	0.51	0.48	0.48	0.51	0.37	0.37	0.09	0.09	0.09	0.22	0.22	0.22
Clearance Time (s)	4.7	5.8	5.8	4.7	5.8	5.8	5.2	5.2	5.2	5.2	5.2	5.2
Vehicle Extension (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lane Grp Cap (vph)	420	1681	751	125	1324	592	159	167	142	398	796	356
v/s Ratio Prot	0.11	0.66		c0.05	0.20		0.08	c0.12		c0.23	0.11	
v/s Ratio Perm	0.29		0.29	c0.70		0.06			0.08			0.10
v/c Ratio	0.78	1.40	0.61	1.48	0.55	0.17	0.89	1.31	0.92	1.01	0.49	0.45
Uniform Delay, d1	19.2	31.5	23.2	29.0	29.5	25.1	54.0	54.6	54.2	46.5	40.5	40.1
Progression Factor	1.23	0.91	0.85	1.20	1.06	1.17	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	6.0	181.6	2.7	253.0	1.6	0.6	41.0	176.2	50.1	47.0	0.2	0.3
Delay (s)	29.6	210.3	22.4	287.9	32.9	30.0	95.0	230.8	104.3	93.5	40.7	40.5
Level of Service	C	F	C	F	C	C	F	F	F	F	D	D
Approach Delay (s)		160.1			74.9			145.8			58.0	
Approach LOS		F			E			F			E	

Intersection Summary			
HCM 2000 Control Delay	123.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.33		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.9
Intersection Capacity Utilization	106.2%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
11: Ingram Rd & Potranco Rd

Scenario 1 AM-2023-Improvements
2/5/2014

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	2331	19	153	784	1	332
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	4.0
Lane Util. Factor	0.95		1.00	0.95	1.00	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3533		1770	3539	1770	1583
Flt Permitted	1.00		0.05	1.00	0.95	1.00
Satd. Flow (perm)	3533		86	3539	1770	1583
Peak-hour factor, PHF	0.88	0.58	0.63	0.80	0.25	0.86
Adj. Flow (vph)	2649	33	243	980	4	386
RTOR Reduction (vph)	1	0	0	0	0	97
Lane Group Flow (vph)	2681	0	243	980	4	289
Turn Type	NA		pm+pt	NA	NA	custom
Protected Phases	4		3	8		
Permitted Phases			8		2	2
Actuated Green, G (s)	83.0		96.0	96.0	16.0	16.0
Effective Green, g (s)	83.0		96.0	96.0	16.0	16.0
Actuated g/C Ratio	0.69		0.80	0.80	0.13	0.13
Clearance Time (s)	4.0		4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	2443		195	2831	236	211
v/s Ratio Prot	0.76		c0.09	0.28		
v/s Ratio Perm			c0.91		0.00	c0.18
v/c Ratio	1.10		1.25	0.35	0.02	1.37
Uniform Delay, d1	18.5		45.8	3.3	45.2	52.0
Progression Factor	0.54		0.96	0.51	1.00	1.00
Incremental Delay, d2	44.6		144.5	0.3	0.1	193.4
Delay (s)	54.6		188.3	2.0	45.3	245.4
Level of Service	D		F	A	D	F
Approach Delay (s)	54.6			39.0	243.3	
Approach LOS	D			D	F	

Intersection Summary			
HCM 2000 Control Delay	67.3	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.29		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	92.3%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
12: Military Dr & Potranco Rd

Scenario 1 AM-2023-Improvements
2/5/2014

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1905	910	317	591	181	372
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.8	5.8	4.7	5.8	5.2	5.2
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	1583	1770	3539	1770	1583
Flt Permitted	1.00	1.00	0.06	1.00	0.95	1.00
Satd. Flow (perm)	3539	1583	116	3539	1770	1583
Peak-hour factor, PHF	0.94	0.72	0.88	0.72	0.73	0.83
Adj. Flow (vph)	2027	1264	360	821	248	448
RTOR Reduction (vph)	0	268	0	0	0	257
Lane Group Flow (vph)	2027	996	360	821	248	191
Turn Type	NA	Perm	D.P+P	NA	NA	Perm
Protected Phases	6		5	2	4	
Permitted Phases		6	6			4
Actuated Green, G (s)	64.1	64.1	85.8	90.5	18.5	18.5
Effective Green, g (s)	64.1	64.1	85.8	90.5	18.5	18.5
Actuated g/C Ratio	0.53	0.53	0.71	0.75	0.15	0.15
Clearance Time (s)	5.8	5.8	4.7	5.8	5.2	5.2
Vehicle Extension (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lane Grp Cap (vph)	1890	845	382	2668	272	244
v/s Ratio Prot	0.57		c0.17	0.23	c0.14	
v/s Ratio Perm		c0.63	0.50			0.12
v/c Ratio	1.07	1.18	0.94	0.31	0.91	0.78
Uniform Delay, d1	28.0	28.0	40.4	4.7	49.9	48.8
Progression Factor	0.59	0.58	0.68	0.97	1.00	1.00
Incremental Delay, d2	33.8	81.7	27.5	0.2	31.8	13.9
Delay (s)	50.4	98.0	54.8	4.8	81.8	62.7
Level of Service	D	F	D	A	F	E
Approach Delay (s)	68.7			20.1	69.5	
Approach LOS	E			C	E	

Intersection Summary			
HCM 2000 Control Delay	57.7	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.08		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.7
Intersection Capacity Utilization	93.3%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
13: Micron & Potranco Rd

Scenario 1 AM-2023-Improvements
2/5/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	42	1154	551	245	480	11	13	16	19	269	151	310
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.8	5.7	5.7	4.8	5.7		4.0	5.1		5.1	5.1	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.95		1.00	0.89	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	1770	3516		1770	1762		1770	1665	
Flt Permitted	0.35	1.00	1.00	0.10	1.00		0.10	1.00		0.71	1.00	
Satd. Flow (perm)	657	3539	1583	187	3516		193	1762		1319	1665	
Peak-hour factor, PHF	0.78	0.89	0.84	0.63	0.80	0.40	0.42	0.33	0.70	0.69	0.82	0.70
Adj. Flow (vph)	54	1297	656	389	600	28	31	48	27	390	184	443
RTOR Reduction (vph)	0	0	244	0	3	0	0	16	0	0	70	0
Lane Group Flow (vph)	54	1297	412	389	625	0	31	59	0	390	557	0
Turn Type	D.P+P	NA	Perm	D.P+P	NA		D.P+P	NA		Perm	NA	
Protected Phases	1	6		5	2		7	4			8	
Permitted Phases	2		6	6			8			8		
Actuated Green, G (s)	59.9	39.8	39.8	59.9	57.2		40.5	44.5		38.7	38.7	
Effective Green, g (s)	59.9	39.8	39.8	59.9	57.2		40.5	44.5		38.7	38.7	
Actuated g/C Ratio	0.50	0.33	0.33	0.50	0.48		0.34	0.37		0.32	0.32	
Clearance Time (s)	4.8	5.7	5.7	4.8	5.7		4.0	5.1		5.1	5.1	
Vehicle Extension (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lane Grp Cap (vph)	352	1173	525	358	1675		88	653		425	536	
v/s Ratio Prot	0.00	c0.37		c0.18	0.18		c0.01	0.03			c0.33	
v/s Ratio Perm	0.07		0.26	0.36			0.11			0.30		
v/c Ratio	0.15	1.11	0.78	1.09	0.37		0.35	0.09		0.92	1.04	
Uniform Delay, d1	15.8	40.1	36.2	46.5	20.0		31.9	24.6		39.1	40.6	
Progression Factor	0.50	0.61	0.68	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	49.0	1.1	72.8	0.6		0.9	0.0		24.0	49.5	
Delay (s)	7.9	73.2	25.6	119.3	20.6		32.8	24.6		63.1	90.2	
Level of Service	A	E	C	F	C		C	C		E	F	
Approach Delay (s)		55.9			58.4			27.0			79.8	
Approach LOS		E			E			C			E	

Intersection Summary			
HCM 2000 Control Delay	61.6	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.06		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	19.6
Intersection Capacity Utilization	87.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
14: Micron & Ingram Rd

Scenario 1 AM-2023-Improvements
2/5/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	1	0	0	105	1	112	1	106	28	179	517	1
Peak Hour Factor	0.25	1.00	1.00	0.70	0.25	0.74	0.25	0.68	0.66	0.98	0.89	0.25
Hourly flow rate (vph)	4	0	0	150	4	151	4	156	42	183	581	4

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total (vph)	4	0	150	155	202	768
Volume Left (vph)	4	0	150	0	4	183
Volume Right (vph)	0	0	0	151	42	4
Hadj (s)	0.53	0.00	0.53	-0.65	-0.09	0.08
Departure Headway (s)	8.0	7.5	7.3	6.1	5.7	5.3
Degree Utilization, x	0.01	0.00	0.30	0.26	0.32	1.12
Capacity (veh/h)	424	464	479	574	611	675
Control Delay (s)	9.9	9.3	12.3	10.1	11.4	93.3
Approach Delay (s)	9.9		11.2		11.4	93.3
Approach LOS	A		B		B	F

Intersection Summary			
Delay	60.5		
Level of Service	F		
Intersection Capacity Utilization	67.0%	ICU Level of Service	C
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
16: Military Dr & Reed Rd

Scenario 1 AM-2023-Improvements
2/5/2014

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	493	138	364	33	11	277
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.86	0.88	0.74	0.75	0.38	0.70
Hourly flow rate (vph)	573	157	492	44	29	396
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		751				
pX, platoon unblocked						
vC, conflicting volume	536				1817	514
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	536				1817	514
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	44				24	29
cM capacity (veh/h)	1032				38	561

Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2
Volume Total	573	157	536	29	396
Volume Left	573	0	0	29	0
Volume Right	0	0	44	0	396
cSH	1032	1700	1700	38	561
Volume to Capacity	0.56	0.09	0.32	0.76	0.71
Queue Length 95th (ft)	88	0	0	69	141
Control Delay (s)	12.8	0.0	0.0	233.5	25.4
Lane LOS	B			F	D
Approach Delay (s)	10.0		0.0	39.6	
Approach LOS				E	

Intersection Summary			
Average Delay	14.3		
Intersection Capacity Utilization	61.8%	ICU Level of Service	B
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
17: Richland Hills & Military Dr

Scenario 1 AM-2023-Improvements
2/5/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	334	295	320	228	3	246	8	254	23	48	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.3		4.2	5.4		4.5	4.3		4.6	4.3	
Lane Util. Factor		1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt		0.93		1.00	1.00		1.00	0.86		1.00	0.97	
Flt Protected		1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1728		1770	1857		1770	1599		1770	1816	
Flt Permitted		1.00		0.10	1.00		0.65	1.00		0.22	1.00	
Satd. Flow (perm)		1728		189	1857		1206	1599		409	1816	
Peak-hour factor, PHF	1.00	0.83	0.79	0.77	0.82	0.50	0.73	0.38	0.70	0.61	0.60	0.50
Adj. Flow (vph)	0	402	373	416	278	6	337	21	363	38	80	16
RTOR Reduction (vph)	0	38	0	0	1	0	0	290	0	0	8	0
Lane Group Flow (vph)	0	737	0	416	283	0	337	94	0	38	88	0
Turn Type	pm+pt	NA		pm+pt	NA		D.P+P	NA		D.P+P	NA	
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases	6			2			8			4		
Actuated Green, G (s)		35.4		55.7	55.7		20.1	18.2		20.0	6.2	
Effective Green, g (s)		35.4		55.7	55.7		20.1	18.2		20.0	6.2	
Actuated g/C Ratio		0.39		0.62	0.62		0.22	0.20		0.22	0.07	
Clearance Time (s)		5.3		4.2	5.4		4.5	4.3		4.6	4.3	
Vehicle Extension (s)		1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lane Grp Cap (vph)		679		401	1149		356	323		118	125	
v/s Ratio Prot		0.43		c0.19	0.15		c0.15	0.06		0.01	0.05	
v/s Ratio Perm				c0.46			c0.07			c0.06		
v/c Ratio		1.09		1.04	0.25		0.95	0.29		0.32	0.70	
Uniform Delay, d1		27.3		27.7	7.7		33.6	30.4		29.0	41.0	
Progression Factor		0.86		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		54.3		55.0	0.5		33.4	0.2		0.6	13.5	
Delay (s)		77.7		82.7	8.2		67.0	30.6		29.5	54.5	
Level of Service		E		F	A		E	C		C	D	
Approach Delay (s)		77.7			52.5			47.6			47.4	
Approach LOS		E			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	59.1	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.4
Intersection Capacity Utilization	85.1%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
18: Richland Hills & Jack Jordan MS

Scenario 1 AM-2023-Improvements
2/5/2014

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	273	360	290	191	407	477
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.65	0.70	0.74	0.74	0.76	0.85
Hourly flow rate (vph)	420	514	392	258	536	561
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)					1086	
pX, platoon unblocked	0.94	0.94	0.94			
vC, conflicting volume	1858	816	1097			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1882	771	1070			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	0	36			
cM capacity (veh/h)	26	375	611			

Direction, Lane #	EB 1	EB 2	NB 1	SB 1
Volume Total	420	514	650	1097
Volume Left	420	0	392	0
Volume Right	0	514	0	561
cSH	26	375	611	1700
Volume to Capacity	16.01	1.37	0.64	0.65
Queue Length 95th (ft)	Err	627	115	0
Control Delay (s)	Err	211.3	18.8	0.0
Lane LOS	F	F	C	
Approach Delay (s)	4611.3		18.8	0.0
Approach LOS	F			

Intersection Summary			
Average Delay	1611.5		
Intersection Capacity Utilization	101.9%	ICU Level of Service	G
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
19: Richland Hills & Christian Evers ES

Scenario 1 AM-2023-Improvements
2/5/2014

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	27	40	36	536	732	35
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.42	0.47	0.68	0.78	0.94	0.50
Hourly flow rate (vph)	64	85	53	687	779	70
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1607	814	849			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1607	814	849			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	40	77	93			
cM capacity (veh/h)	108	378	789			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	149	740	849
Volume Left	64	53	0
Volume Right	85	0	70
cSH	182	789	1700
Volume to Capacity	0.82	0.07	0.50
Queue Length 95th (ft)	143	5	0
Control Delay (s)	79.1	1.7	0.0
Lane LOS	F	A	
Approach Delay (s)	79.1	1.7	0.0
Approach LOS	F		

Intersection Summary			
Average Delay	7.5		
Intersection Capacity Utilization	68.4%	ICU Level of Service	C
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
20: Military Dr & Earl Warren High School

Scenario 1 AM-2023-Improvements
2/5/2014

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	106	823	551	66	78	63
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.9	4.9	4.9	4.9	5.1	5.1
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	1863	1863	1583	1770	1583
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	1863	1863	1583	1770	1583
Peak-hour factor, PHF	0.53	0.72	0.89	0.88	0.91	0.62
Adj. Flow (vph)	200	1143	619	75	86	102
RTOR Reduction (vph)	0	0	0	30	0	93
Lane Group Flow (vph)	200	1143	619	45	86	9
Turn Type	Prot	NA	NA	Perm	NA	Perm
Protected Phases	1	6	2		8	
Permitted Phases				2		8
Actuated Green, G (s)	13.7	71.8	53.2	53.2	8.2	8.2
Effective Green, g (s)	13.7	71.8	53.2	53.2	8.2	8.2
Actuated g/C Ratio	0.15	0.80	0.59	0.59	0.09	0.09
Clearance Time (s)	4.9	4.9	4.9	4.9	5.1	5.1
Vehicle Extension (s)	1.0	2.0	2.0	2.0	1.0	1.0
Lane Grp Cap (vph)	269	1486	1101	935	161	144
v/s Ratio Prot	0.11	c0.61	0.33		c0.05	
v/s Ratio Perm				0.03		0.01
v/c Ratio	0.74	0.77	0.56	0.05	0.53	0.06
Uniform Delay, d1	36.5	4.8	11.3	7.7	39.1	37.4
Progression Factor	1.11	0.57	0.60	0.11	1.00	1.00
Incremental Delay, d2	2.4	1.0	1.6	0.1	1.7	0.1
Delay (s)	42.8	3.7	8.3	0.9	40.8	37.5
Level of Service	D	A	A	A	D	D
Approach Delay (s)		9.5	7.5		39.0	
Approach LOS		A	A		D	

Intersection Summary			
HCM 2000 Control Delay	11.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	14.9
Intersection Capacity Utilization	56.6%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
21: Hunt Ln & Military Dr

Scenario 1 AM-2023-Improvements
2/5/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	103	516	82	203	203	294	21	334	188	478	915	59
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.7		5.0	5.8	5.8	5.2	5.6	5.6	5.2	5.6	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3451		1770	3539	1583	1770	3539	1583	1770	3510	
Flt Permitted	0.61	1.00		0.19	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1130	3451		358	3539	1583	1770	3539	1583	1770	3510	
Peak-hour factor, PHF	0.92	0.80	0.64	0.89	0.87	0.80	0.56	0.75	0.84	0.65	0.76	0.85
Adj. Flow (vph)	112	645	128	228	233	368	38	445	224	735	1204	69
RTOR Reduction (vph)	0	18	0	0	0	283	0	0	196	0	4	0
Lane Group Flow (vph)	112	755	0	228	233	85	38	445	28	735	1269	0
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8		8			2			
Actuated Green, G (s)	24.0	17.6		30.5	20.8	20.8	3.9	11.4	11.4	29.8	37.3	
Effective Green, g (s)	24.0	17.6		30.5	20.8	20.8	3.9	11.4	11.4	29.8	37.3	
Actuated g/C Ratio	0.27	0.20		0.34	0.23	0.23	0.04	0.13	0.13	0.33	0.41	
Clearance Time (s)	5.0	5.7		5.0	5.8	5.8	5.2	5.6	5.6	5.2	5.6	
Vehicle Extension (s)	1.0	2.5		1.0	2.0	2.0	1.0	2.5	2.5	1.0	2.5	
Lane Grp Cap (vph)	346	674		273	817	365	76	448	200	586	1454	
v/s Ratio Prot	0.02	c0.22		c0.09	0.07		0.02	0.13		c0.42	c0.36	
v/s Ratio Perm	0.06			0.19		0.05			0.02			
v/c Ratio	0.32	1.12		0.84	0.29	0.23	0.50	0.99	0.14	1.25	0.87	
Uniform Delay, d1	25.8	36.2		24.4	28.5	28.1	42.1	39.3	35.0	30.1	24.2	
Progression Factor	1.00	1.00		0.83	0.67	1.10	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.2	72.8		17.5	0.1	0.1	1.9	40.9	1.5	128.0	7.5	
Delay (s)	26.0	109.0		37.7	19.1	31.0	44.0	80.2	36.4	158.1	31.7	
Level of Service	C	F		D	B	C	D	F	D	F	C	
Approach Delay (s)		98.5			29.5			64.4			77.9	
Approach LOS		F			C			E			E	

Intersection Summary			
HCM 2000 Control Delay	70.8	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.13		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	21.6
Intersection Capacity Utilization	81.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
22: SH 151 NB Frnt Rd & Hunt Ln

Scenario 1 AM-2023-Improvements
2/5/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	22	25	0	0	1379	51	53	654	392	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.3			5.3	5.3	6.0	6.0	6.0			
Lane Util. Factor		0.95			0.95	1.00	0.91	0.91	1.00			
Frt		1.00			1.00	0.85	1.00	1.00	0.85			
Flt Protected		0.98			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)		3457			3539	1583	1610	3388	1583			
Flt Permitted		0.58			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)		2039			3539	1583	1610	3388	1583			
Peak-hour factor, PHF	0.57	0.58	1.00	1.00	0.80	0.75	0.56	0.73	0.69	1.00	1.00	1.00
Adj. Flow (vph)	39	43	0	0	1724	68	95	896	568	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	39	0	0	252	0	0	0
Lane Group Flow (vph)	0	82	0	0	1724	29	85	906	316	0	0	0
Turn Type	pm+pt	NA			NA	Perm	Split	NA	Perm			
Protected Phases	5	6			6		8 16	8 16				
Permitted Phases	6					6			8 16			
Actuated Green, G (s)		51.7			51.7	51.7	57.8	57.8	57.8			
Effective Green, g (s)		51.7			51.7	51.7	57.8	57.8	57.8			
Actuated g/C Ratio		0.43			0.43	0.43	0.48	0.48	0.48			
Clearance Time (s)		5.3			5.3	5.3						
Vehicle Extension (s)		3.0			3.0	3.0						
Lane Grp Cap (vph)		878			1524	682	775	1631	762			
v/s Ratio Prot					c0.49		0.05	c0.27				
v/s Ratio Perm		0.04				0.02			0.20			
v/c Ratio		0.09			1.13	0.04	0.11	0.56	0.41			
Uniform Delay, d1		20.3			34.1	19.8	17.0	22.0	20.1			
Progression Factor		1.30			1.00	1.00	1.00	1.00	1.00			
Incremental Delay, d2		0.0			67.9	0.1	0.1	0.4	0.4			
Delay (s)		26.3			102.1	19.9	17.1	22.4	20.5			
Level of Service		C			F	B	B	C	C			
Approach Delay (s)		26.3			98.9			21.4			0.0	
Approach LOS		C			F			C			A	

Intersection Summary			
HCM 2000 Control Delay	62.0	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	22.5
Intersection Capacity Utilization	65.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
23: SH 151 SB Frnt Rd & Hunt Ln

Scenario 1 AM-2023-Improvements
2/5/2014

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	1454	0	0	0	48	1564
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2				6.0	6.0
Lane Util. Factor	0.97				0.91	0.91
Frt	1.00				1.00	1.00
Flt Protected	0.95				0.95	1.00
Satd. Flow (prot)	3433				1610	3390
Flt Permitted	0.95				0.95	1.00
Satd. Flow (perm)	3433				1610	3390
Peak-hour factor, PHF	0.83	1.00	1.00	1.00	0.67	0.85
Adj. Flow (vph)	1752	0	0	0	72	1840
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	1752	0	0	0	65	1847
Turn Type	NA				Split	NA
Protected Phases	1				4 12	4 12
Permitted Phases						
Actuated Green, G (s)	57.8				51.8	51.8
Effective Green, g (s)	57.8				51.8	51.8
Actuated g/C Ratio	0.48				0.43	0.43
Clearance Time (s)	5.2					
Vehicle Extension (s)	3.0					
Lane Grp Cap (vph)	1653				694	1463
v/s Ratio Prot	c0.51				0.04	c0.54
v/s Ratio Perm						
v/c Ratio	1.06				0.09	1.26
Uniform Delay, d1	31.1				20.2	34.1
Progression Factor	0.43				1.00	1.00
Incremental Delay, d2	28.6				0.1	123.8
Delay (s)	41.8				20.3	157.9
Level of Service	D				C	F
Approach Delay (s)	41.8		0.0		153.2	
Approach LOS	D		A		F	

Intersection Summary			
HCM 2000 Control Delay	99.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.30		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	22.5
Intersection Capacity Utilization	85.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1: Military Dr & IH-410 NB Frnt Rd

Scenario 1 PM-2023-Improvements
2/5/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	152	246	58	0	0	0	0	902	895	433	1201	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0					5.1	5.1	6.0	6.0	
Lane Util. Factor	0.91	0.91	1.00					0.91	1.00	0.91	0.91	
Frt	1.00	1.00	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1610	3379	1583					5085	1583	1610	3377	
Flt Permitted	0.95	1.00	1.00					1.00	1.00	0.16	0.57	
Satd. Flow (perm)	1610	3379	1583					5085	1583	272	1926	
Peak-hour factor, PHF	0.91	0.86	0.90	1.00	1.00	1.00	1.00	0.93	0.94	0.86	0.96	1.00
Adj. Flow (vph)	167	286	64	0	0	0	0	970	952	503	1251	0
RTOR Reduction (vph)	0	0	46	0	0	0	0	0	196	0	0	0
Lane Group Flow (vph)	147	306	18	0	0	0	0	970	756	397	1357	0
Turn Type	Split	NA	Perm					NA	Perm	pm+pt	NA	
Protected Phases	8 16	8 16						6		5	5 6	
Permitted Phases			8 16						6	5 6		
Actuated Green, G (s)	32.9	32.9	32.9					24.9	24.9	68.9	68.9	
Effective Green, g (s)	32.9	32.9	32.9					24.9	24.9	68.9	68.9	
Actuated g/C Ratio	0.28	0.28	0.28					0.21	0.21	0.58	0.58	
Clearance Time (s)								5.1	5.1	6.0		
Vehicle Extension (s)								3.0	3.0	3.0		
Lane Grp Cap (vph)	448	942	441					1073	334	657	1665	
v/s Ratio Prot	c0.09	0.09						0.19		0.23	c0.30	
v/s Ratio Perm			0.01						c0.48	0.13	0.17	
v/c Ratio	0.33	0.32	0.04					0.90	2.26	0.60	0.82	
Uniform Delay, d1	33.8	33.7	31.0					45.4	46.5	20.1	19.5	
Progression Factor	1.00	1.00	1.00					1.00	1.00	0.37	0.50	
Incremental Delay, d2	1.9	0.9	0.2					10.6	577.4	0.1	0.3	
Delay (s)	35.7	34.7	31.2					56.0	624.0	7.5	10.1	
Level of Service	D	C	C					E	F	A	B	
Approach Delay (s)		34.5			0.0			337.4			9.5	
Approach LOS		C			A			F			A	

Intersection Summary			
HCM 2000 Control Delay	162.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.07		
Actuated Cycle Length (s)	118.0	Sum of lost time (s)	22.2
Intersection Capacity Utilization	127.8%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
2: Military Dr & IH-410 SB Frnt Rd

Scenario 1 PM-2023-Improvements
2/5/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	829	1013	380	273	798	0	0	753	204
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				5.8	5.8	5.8	5.7	5.7			5.1	5.1
Lane Util. Factor				0.91	0.91	1.00	0.91	0.91			0.95	1.00
Frt				1.00	1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	0.99	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1610	3357	1583	1610	3374			3539	1583
Flt Permitted				0.95	0.99	1.00	0.16	0.54			1.00	1.00
Satd. Flow (perm)				1610	3357	1583	272	1838			3539	1583
Peak-hour factor, PHF	1.00	1.00	1.00	0.88	0.90	0.97	0.77	0.98	1.00	1.00	0.82	0.79
Adj. Flow (vph)	0	0	0	942	1126	392	355	814	0	0	918	258
RTOR Reduction (vph)	0	0	0	0	0	130	0	0	0	0	0	159
Lane Group Flow (vph)	0	0	0	669	1399	262	266	903	0	0	918	99
Turn Type				Split	NA	Perm	pm+pt	NA			NA	Perm
Protected Phases				4 12	4 12		1	1 2			2	
Permitted Phases						4 12	1 2					2
Actuated Green, G (s)				34.9	34.9	34.9	67.2	67.2			24.9	24.9
Effective Green, g (s)				34.9	34.9	34.9	67.2	67.2			24.9	24.9
Actuated g/C Ratio				0.30	0.30	0.30	0.57	0.57			0.21	0.21
Clearance Time (s)							5.7				5.1	5.1
Vehicle Extension (s)							3.0				0.2	0.2
Lane Grp Cap (vph)				476	992	468	634	1597			746	334
v/s Ratio Prot				0.42	c0.42		0.15	c0.20			c0.26	
v/s Ratio Perm						0.17	0.09	0.12				0.06
v/c Ratio				1.41	1.41	0.56	0.42	0.57			1.23	0.30
Uniform Delay, d1				41.5	41.5	35.1	15.3	16.1			46.5	39.2
Progression Factor				1.00	1.00	1.00	0.24	0.39			1.00	1.00
Incremental Delay, d2				194.7	190.7	4.8	0.2	0.3			115.3	0.2
Delay (s)				236.3	232.2	39.9	3.9	6.6			161.9	39.3
Level of Service				F	F	D	A	A			F	D
Approach Delay (s)		0.0			202.7			6.0			135.0	
Approach LOS		A			F			A			F	

Intersection Summary			
HCM 2000 Control Delay	138.3	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.08		
Actuated Cycle Length (s)	118.0	Sum of lost time (s)	22.2
Intersection Capacity Utilization	127.8%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
3: IH-410 SB Frnt Rd & Richland Hills

Scenario 1 PM-2023-Improvements
2/5/2014

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	0	0	3297	577	0	195
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	0.97	0.84	1.00	0.77
Hourly flow rate (vph)	0	0	3399	687	0	253
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	4086				3742	1476
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	4086				3742	1476
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	0
cM capacity (veh/h)	40				3	115

Direction, Lane #	WB 1	WB 2	WB 3	SB 1
Volume Total	1360	1360	1367	253
Volume Left	0	0	0	0
Volume Right	0	0	687	253
cSH	1700	1700	1700	115
Volume to Capacity	0.80	0.80	0.80	2.20
Queue Length 95th (ft)	0	0	0	541
Control Delay (s)	0.0	0.0	0.0	627.2
Lane LOS				F
Approach Delay (s)	0.0			627.2
Approach LOS				F

Intersection Summary			
Average Delay	36.6		
Intersection Capacity Utilization	95.3%	ICU Level of Service	F
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
4: Military Dr & Walmart/Sony Pl

Scenario 1 PM-2023-Improvements
2/5/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	234	0	91	0	0	0	59	878	0	0	640	231
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.7		5.2				5.0	5.9			5.9	
Lane Util. Factor	1.00		1.00				1.00	0.95			0.95	
Frt	1.00		0.85				1.00	1.00			0.96	
Flt Protected	0.95		1.00				0.95	1.00			1.00	
Satd. Flow (prot)	1770		1583				1770	3539			3390	
Flt Permitted	0.95		1.00				0.15	1.00			1.00	
Satd. Flow (perm)	1770		1583				275	3539			3390	
Peak-hour factor, PHF	0.79	1.00	0.74	1.00	1.00	1.00	0.85	0.92	1.00	1.00	0.87	0.80
Adj. Flow (vph)	296	0	123	0	0	0	69	954	0	0	736	289
RTOR Reduction (vph)	0	0	92	0	0	0	0	0	0	0	25	0
Lane Group Flow (vph)	296	0	31	0	0	0	69	954	0	0	1000	0
Turn Type	custom		custom	Perm			pm+pt	NA			NA	
Protected Phases	7		4		8		5	2			6	
Permitted Phases	4			8			2					
Actuated Green, G (s)	16.4		15.9				36.3	36.3			26.5	
Effective Green, g (s)	16.4		15.9				36.3	36.3			26.5	
Actuated g/C Ratio	0.26		0.25				0.57	0.57			0.42	
Clearance Time (s)	4.7		5.2				5.0	5.9			5.9	
Vehicle Extension (s)	1.0		1.0				1.0	2.5			2.5	
Lane Grp Cap (vph)	458		397				271	2029			1419	
v/s Ratio Prot	c0.17		0.02				0.02	c0.27			c0.30	
v/s Ratio Perm							0.13					
v/c Ratio	0.65		0.08				0.25	0.47			0.70	
Uniform Delay, d1	20.9		18.1				8.0	7.9			15.2	
Progression Factor	1.00		1.00				1.00	1.00			1.00	
Incremental Delay, d2	2.3		0.0				0.2	0.1			1.5	
Delay (s)	23.2		18.1				8.2	8.0			16.7	
Level of Service	C		B				A	A			B	
Approach Delay (s)		21.7			0.0			8.0			16.7	
Approach LOS		C			A			A			B	

Intersection Summary					
HCM 2000 Control Delay	13.9	HCM 2000 Level of Service		B	
HCM 2000 Volume to Capacity ratio	0.77				
Actuated Cycle Length (s)	63.3	Sum of lost time (s)		21.1	
Intersection Capacity Utilization	53.8%	ICU Level of Service		A	
Analysis Period (min)	15				
c Critical Lane Group					

HCM Signalized Intersection Capacity Analysis
5: SH 151 SB Frnt Rd & Ingram Rd

Scenario 1 PM-2023-Improvements
2/5/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	842	259	651	1142	0	0	0	0	204	945	301
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0	5.5	5.5					6.4	6.4	6.4
Lane Util. Factor		0.95	1.00	0.91	0.91					0.91	0.91	1.00
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	0.99					0.95	1.00	1.00
Satd. Flow (prot)		3539	1583	1610	3361					1610	3386	1583
Flt Permitted		1.00	1.00	0.16	0.54					0.95	1.00	1.00
Satd. Flow (perm)		3539	1583	271	1841					1610	3386	1583
Peak-hour factor, PHF	1.00	0.94	0.91	0.94	0.97	1.00	1.00	1.00	1.00	0.77	0.86	0.81
Adj. Flow (vph)	0	896	285	693	1177	0	0	0	0	265	1099	372
RTOR Reduction (vph)	0	0	117	0	0	0	0	0	0	0	0	85
Lane Group Flow (vph)	0	896	168	444	1426	0	0	0	0	238	1126	287
Turn Type		NA	Perm	pm+pt	NA					Split	NA	Perm
Protected Phases		2		1	1 2					4 12	4 12	
Permitted Phases			2	1 2								4 12
Actuated Green, G (s)		25.0	25.0	85.5	85.5					53.0	53.0	53.0
Effective Green, g (s)		25.0	25.0	85.5	85.5					53.0	53.0	53.0
Actuated g/C Ratio		0.16	0.16	0.56	0.56					0.34	0.34	0.34
Clearance Time (s)		5.0	5.0	5.5								
Vehicle Extension (s)		2.5	2.5	3.0								
Lane Grp Cap (vph)		574	256	676	1619					554	1165	544
v/s Ratio Prot		c0.25		0.26	c0.35					0.15	c0.33	
v/s Ratio Perm			0.11	0.11	0.14							0.18
v/c Ratio		1.56	0.66	0.66	0.88					0.43	0.97	0.53
Uniform Delay, d1		64.5	60.5	29.0	29.8					38.9	49.6	40.5
Progression Factor		1.00	1.00	0.43	0.25					1.00	1.00	1.00
Incremental Delay, d2		260.9	5.3	0.2	0.6					2.4	19.5	3.6
Delay (s)		325.4	65.8	12.7	8.0					41.3	69.1	44.1
Level of Service		F	E	B	A					D	E	D
Approach Delay (s)		282.7			9.1			0.0			59.9	
Approach LOS		F			A			A			E	

Intersection Summary			
HCM 2000 Control Delay	90.1	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.09		
Actuated Cycle Length (s)	154.0	Sum of lost time (s)	22.8
Intersection Capacity Utilization	130.7%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
6: SH 151 NB Frnt Rd & Ingram Rd

Scenario 1 PM-2023-Improvements
2/5/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	397	663	0	0	861	245	1006	1706	283	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.4	6.4			5.0	5.0	6.4	6.4	6.4			
Lane Util. Factor	0.91	0.91			0.95	1.00	0.91	0.91	1.00			
Frt	1.00	1.00			1.00	0.85	1.00	1.00	0.85			
Flt Protected	0.95	0.99			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	1610	3354			3539	1583	1610	3376	1583			
Flt Permitted	0.13	0.54			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	219	1847			3539	1583	1610	3376	1583			
Peak-hour factor, PHF	0.79	0.90	1.00	1.00	0.96	0.89	0.90	0.94	0.90	1.00	1.00	1.00
Adj. Flow (vph)	503	737	0	0	897	275	1118	1815	314	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	112	0	0	85	0	0	0
Lane Group Flow (vph)	302	938	0	0	897	163	950	1983	229	0	0	0
Turn Type	pm+pt	NA			NA	Perm	Split	NA	Perm			
Protected Phases	5	5 6			6		8 16	8 16				
Permitted Phases	5 6					6			8 16			
Actuated Green, G (s)	84.6	84.6			31.0	31.0	53.0	53.0	53.0			
Effective Green, g (s)	84.6	84.6			31.0	31.0	53.0	53.0	53.0			
Actuated g/C Ratio	0.55	0.55			0.20	0.20	0.34	0.34	0.34			
Clearance Time (s)	6.4				5.0	5.0						
Vehicle Extension (s)	3.0				2.5	2.5						
Lane Grp Cap (vph)	604	1539			712	318	554	1161	544			
v/s Ratio Prot	0.17	c0.21			c0.25		c0.59	0.59				
v/s Ratio Perm	0.10	0.12				0.10			0.14			
v/c Ratio	0.50	0.61			1.26	0.51	1.71	1.71	0.42			
Uniform Delay, d1	26.9	23.5			61.5	54.8	50.5	50.5	38.7			
Progression Factor	0.28	0.65			1.00	1.00	1.00	1.00	1.00			
Incremental Delay, d2	0.0	0.1			128.1	1.0	329.3	322.3	2.4			
Delay (s)	7.6	15.3			189.6	55.8	379.8	372.8	41.1			
Level of Service	A	B			F	E	F	F	D			
Approach Delay (s)		13.4			158.2			342.8			0.0	
Approach LOS		B			F			F			A	

Intersection Summary			
HCM 2000 Control Delay	232.4	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.24		
Actuated Cycle Length (s)	154.0	Sum of lost time (s)	22.8
Intersection Capacity Utilization	130.7%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

EXHIBIT (C) - TRAFFIC IMPACT ANALYSIS
PART 3 OF 4

HCM Signalized Intersection Capacity Analysis
7: Richland Hills & Ingram Rd

Scenario 1 PM-2023-Improvements
2/5/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	302	270	40	30	369	59	280	447	65	9	163	239
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.98		1.00	0.97		1.00	0.98		1.00	0.91	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3474		1770	3450		1770	3465		1770	3231	
Flt Permitted	0.46	1.00		0.53	1.00		0.48	1.00		0.41	1.00	
Satd. Flow (perm)	853	3474		981	3450		901	3465		758	3231	
Peak-hour factor, PHF	0.67	0.81	0.86	0.79	0.87	0.69	0.67	0.89	0.80	0.44	0.83	0.88
Adj. Flow (vph)	451	333	47	38	424	86	418	502	81	20	196	272
RTOR Reduction (vph)	0	28	0	0	43	0	0	32	0	0	163	0
Lane Group Flow (vph)	451	352	0	38	467	0	418	551	0	20	305	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	16.0	16.0		16.0	16.0		16.0	16.0		16.0	16.0	
Effective Green, g (s)	16.0	16.0		16.0	16.0		16.0	16.0		16.0	16.0	
Actuated g/C Ratio	0.40	0.40		0.40	0.40		0.40	0.40		0.40	0.40	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	341	1389		392	1380		360	1386		303	1292	
v/s Ratio Prot		0.10			0.14			0.16			0.09	
v/s Ratio Perm	c0.53			0.04			c0.46			0.03		
v/c Ratio	1.32	0.25		0.10	0.34		1.16	0.40		0.07	0.24	
Uniform Delay, d1	12.0	8.0		7.5	8.3		12.0	8.6		7.4	8.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	164.3	0.4		0.5	0.7		98.9	0.2		0.1	0.1	
Delay (s)	176.3	8.5		8.0	9.0		110.9	8.7		7.5	8.0	
Level of Service	F	A		A	A		F	A		A	A	
Approach Delay (s)		99.5			8.9			51.4			8.0	
Approach LOS		F			A			D			A	

Intersection Summary			
HCM 2000 Control Delay	49.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.24		
Actuated Cycle Length (s)	40.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	89.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
8: SH 151 SB Frnt Rd & Potranco Rd

Scenario 1 PM-2023-Improvements
2/5/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1234	697	357	2341	0	0	0	0	451	363	296
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5	5.5	5.0	5.5					6.3	6.3	6.3
Lane Util. Factor		0.91	1.00	0.91	0.91					0.91	0.91	1.00
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.99	1.00
Satd. Flow (prot)		5085	1583	1610	3387					1610	3341	1583
Flt Permitted		1.00	1.00	0.12	0.85					0.95	0.99	1.00
Satd. Flow (perm)		5085	1583	197	2876					1610	3341	1583
Peak-hour factor, PHF	1.00	0.91	0.85	0.91	0.98	1.00	1.00	1.00	1.00	0.89	0.78	0.83
Adj. Flow (vph)	0	1356	820	392	2389	0	0	0	0	507	465	357
RTOR Reduction (vph)	0	0	292	0	0	0	0	0	0	0	0	143
Lane Group Flow (vph)	0	1356	528	353	2428	0	0	0	0	314	658	214
Turn Type		NA	Perm	pm+pt	NA					Perm	NA	Perm
Protected Phases		6		5	6 5						8 16	
Permitted Phases			6	6 5						8 16		8 16
Actuated Green, G (s)		34.5	34.5	107.2	107.2					16.0	16.0	16.0
Effective Green, g (s)		34.5	34.5	107.2	107.2					16.0	16.0	16.0
Actuated g/C Ratio		0.25	0.25	0.77	0.77					0.11	0.11	0.11
Clearance Time (s)		5.5	5.5	5.0								
Vehicle Extension (s)		2.5	2.5	1.0								
Lane Grp Cap (vph)		1253	390	884	2467					184	381	180
v/s Ratio Prot		0.27		0.21	c0.51							
v/s Ratio Perm			c0.33	0.10	0.24					0.19	0.20	0.14
v/c Ratio		1.08	1.35	0.40	0.98					1.71	1.73	1.19
Uniform Delay, d1		52.8	52.8	13.7	15.6					62.0	62.0	62.0
Progression Factor		1.00	1.00	0.33	1.02					1.00	1.00	1.00
Incremental Delay, d2		50.8	174.9	0.0	2.8					340.0	338.0	127.9
Delay (s)		103.5	227.6	4.5	18.7					402.0	400.0	189.9
Level of Service		F	F	A	B					F	F	F
Approach Delay (s)		150.3			16.9			0.0			344.1	
Approach LOS		F			B			A			F	

Intersection Summary			
HCM 2000 Control Delay	132.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.25		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	23.6
Intersection Capacity Utilization	139.1%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
9: SH 151 NB Frnt Rd & Potranco Rd

Scenario 1 PM-2023-Improvements
2/5/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	352	1263	0	0	1378	468	1350	705	199	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.5			5.5	5.5	6.3	6.3	6.3			
Lane Util. Factor	0.91	0.91			0.91	1.00	0.91	0.91	1.00			
Frt	1.00	1.00			1.00	0.85	1.00	1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.98	1.00			
Satd. Flow (prot)	1610	3386			5085	1583	1610	3310	1583			
Flt Permitted	0.09	0.77			1.00	1.00	0.95	0.98	1.00			
Satd. Flow (perm)	160	2603			5085	1583	1610	3310	1583			
Peak-hour factor, PHF	0.98	0.95	1.00	1.00	0.96	0.93	0.98	0.95	0.83	1.00	1.00	1.00
Adj. Flow (vph)	359	1329	0	0	1435	503	1378	742	240	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	116	0	0	113	0	0	0
Lane Group Flow (vph)	323	1365	0	0	1435	387	689	1431	127	0	0	0
Turn Type	pm+pt	NA			NA	Perm	Perm	NA	Perm			
Protected Phases	1	2 1			2			4 12				
Permitted Phases	2 1					2	4 12		4 12			
Actuated Green, G (s)	81.2	81.2			42.5	42.5	42.0	42.0	42.0			
Effective Green, g (s)	81.2	81.2			42.5	42.5	42.0	42.0	42.0			
Actuated g/C Ratio	0.58	0.58			0.30	0.30	0.30	0.30	0.30			
Clearance Time (s)	5.0				5.5	5.5						
Vehicle Extension (s)	1.0				2.5	2.5						
Lane Grp Cap (vph)	493	1726			1543	480	483	993	474			
v/s Ratio Prot	0.18	c0.22			c0.28							
v/s Ratio Perm	0.20	0.24				0.24	0.43	0.43	0.08			
v/c Ratio	0.66	0.79			0.93	0.81	1.43	1.44	0.27			
Uniform Delay, d1	33.0	22.8			47.3	44.9	49.0	49.0	37.3			
Progression Factor	0.41	0.52			0.69	0.53	1.00	1.00	1.00			
Incremental Delay, d2	0.2	0.2			1.3	1.4	203.7	204.2	0.2			
Delay (s)	13.7	12.1			33.9	25.4	252.7	253.2	37.5			
Level of Service	B	B			C	C	F	F	D			
Approach Delay (s)		12.4			31.7			231.1			0.0	
Approach LOS		B			C			F			A	

Intersection Summary			
HCM 2000 Control Delay	104.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.12		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	23.6
Intersection Capacity Utilization	139.1%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
10: Richland Hills & Potranco Rd

Scenario 1 PM-2023-Improvements
2/5/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	427	1002	186	141	1469	205	301	563	213	186	276	324
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.7	5.8	5.8	4.7	5.8	5.8	5.2	5.2	5.2	5.2	5.2	5.2
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1863	1583	1770	3539	1583
Flt Permitted	0.08	1.00	1.00	0.08	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	151	3539	1583	153	3539	1583	1770	1863	1583	1770	3539	1583
Peak-hour factor, PHF	0.82	0.85	0.75	0.61	0.96	0.87	0.79	0.83	0.59	0.80	0.76	0.82
Adj. Flow (vph)	521	1179	248	231	1530	236	381	678	361	232	363	395
RTOR Reduction (vph)	0	0	71	0	0	85	0	0	151	0	0	215
Lane Group Flow (vph)	521	1179	177	231	1530	151	381	678	210	232	363	180
Turn Type	D.P+P	NA	Perm	D.P+P	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	1	6		5	2		4	4		3	3	
Permitted Phases	2		6	6		2			4			3
Actuated Green, G (s)	71.5	57.3	57.3	71.5	49.2	49.2	33.8	33.8	33.8	13.8	13.8	13.8
Effective Green, g (s)	71.5	57.3	57.3	71.5	49.2	49.2	33.8	33.8	33.8	13.8	13.8	13.8
Actuated g/C Ratio	0.51	0.41	0.41	0.51	0.35	0.35	0.24	0.24	0.24	0.10	0.10	0.10
Clearance Time (s)	4.7	5.8	5.8	4.7	5.8	5.8	5.2	5.2	5.2	5.2	5.2	5.2
Vehicle Extension (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lane Grp Cap (vph)	335	1448	647	242	1243	556	427	449	382	174	348	156
v/s Ratio Prot	c0.25	0.33		0.10	0.43		0.22	c0.36		c0.13	0.10	
v/s Ratio Perm	c0.54		0.11	0.39		0.10			0.13			0.11
v/c Ratio	1.56	0.81	0.27	0.95	1.23	0.27	0.89	1.51	0.55	1.33	1.04	1.16
Uniform Delay, d1	45.9	36.6	27.5	39.5	45.4	32.6	51.3	53.1	46.4	63.1	63.1	63.1
Progression Factor	1.50	0.73	0.69	1.24	0.69	0.85	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	262.0	4.4	0.9	29.3	107.6	0.6	19.9	240.8	0.9	183.8	59.9	120.4
Delay (s)	331.0	31.3	19.8	78.2	139.0	28.3	71.2	293.9	47.3	246.9	123.0	183.5
Level of Service	F	C	B	E	F	C	E	F	D	F	F	F
Approach Delay (s)		110.0			118.9			171.5			176.2	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	136.8	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.52		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	20.9
Intersection Capacity Utilization	121.6%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
11: Ingram Rd & Potranco Rd

Scenario 1 PM-2023-Improvements
2/5/2014

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1196	20	293	1733	11	536
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	4.0
Lane Util. Factor	0.95		1.00	0.95	1.00	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3531		1770	3539	1770	1583
Flt Permitted	1.00		0.13	1.00	0.95	1.00
Satd. Flow (perm)	3531		240	3539	1770	1583
Peak-hour factor, PHF	0.95	0.94	0.70	0.89	0.67	0.80
Adj. Flow (vph)	1259	21	419	1947	16	670
RTOR Reduction (vph)	2	0	0	0	0	270
Lane Group Flow (vph)	1278	0	419	1947	16	400
Turn Type	NA		pm+pt	NA	NA	custom
Protected Phases	4		3	8		
Permitted Phases			8		2	2
Actuated Green, G (s)	27.0		44.0	44.0	18.0	18.0
Effective Green, g (s)	27.0		44.0	44.0	18.0	18.0
Actuated g/C Ratio	0.39		0.63	0.63	0.26	0.26
Clearance Time (s)	4.0		4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1361		435	2224	455	407
v/s Ratio Prot	0.36		0.18	c0.55		
v/s Ratio Perm			c0.43		0.01	c0.25
v/c Ratio	0.94		0.96	0.88	0.04	0.98
Uniform Delay, d1	20.7		22.9	10.7	19.5	25.9
Progression Factor	1.48		1.27	1.44	1.00	1.00
Incremental Delay, d2	7.9		27.2	3.8	0.1	40.7
Delay (s)	38.5		56.3	19.3	19.6	66.6
Level of Service	D		E	B	B	E
Approach Delay (s)	38.5			25.8	65.5	
Approach LOS	D			C	E	

Intersection Summary			
HCM 2000 Control Delay	35.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	73.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
12: Military Dr & Potranco Rd

Scenario 1 PM-2023-Improvements
2/5/2014

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1167	599	216	1455	474	560
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.8	5.8	4.7	5.8	5.2	4.7
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	1583	1770	3539	1770	1583
Flt Permitted	1.00	1.00	0.09	1.00	0.95	1.00
Satd. Flow (perm)	3539	1583	168	3539	1770	1583
Peak-hour factor, PHF	0.96	0.91	0.94	0.91	0.92	0.91
Adj. Flow (vph)	1216	658	230	1599	515	615
RTOR Reduction (vph)	0	231	0	0	0	12
Lane Group Flow (vph)	1216	427	230	1599	515	603
Turn Type	NA	Perm	D.P+P	NA	NA	pm+ov
Protected Phases	6		5	2	4	5
Permitted Phases		6	6			4
Actuated Green, G (s)	61.5	61.5	81.8	86.5	42.5	62.8
Effective Green, g (s)	61.5	61.5	81.8	86.5	42.5	62.8
Actuated g/C Ratio	0.44	0.44	0.58	0.62	0.30	0.45
Clearance Time (s)	5.8	5.8	4.7	5.8	5.2	4.7
Vehicle Extension (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lane Grp Cap (vph)	1554	695	330	2186	537	763
v/s Ratio Prot	c0.34		0.10	0.45	c0.29	c0.11
v/s Ratio Perm		0.27	0.31			0.27
v/c Ratio	0.78	0.61	0.70	0.73	0.96	0.79
Uniform Delay, d1	33.5	30.1	44.0	18.7	47.9	33.0
Progression Factor	0.64	0.68	0.55	0.19	1.00	1.00
Incremental Delay, d2	1.3	1.3	2.5	1.1	28.2	5.2
Delay (s)	22.9	21.7	26.9	4.6	76.1	38.2
Level of Service	C	C	C	A	E	D
Approach Delay (s)	22.5			7.4	55.5	
Approach LOS	C			A	E	

Intersection Summary			
HCM 2000 Control Delay	24.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.7
Intersection Capacity Utilization	83.6%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
13: Micron & Potranco Rd

Scenario 1 PM-2023-Improvements
2/5/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	409	1426	30	20	1347	23	173	13	120	34	1	261
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.8	5.7	5.7	4.8	5.7		5.0	5.1		5.1	5.1	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.87		1.00	0.85	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	1770	3530		1770	1620		1770	1587	
Flt Permitted	0.06	1.00	1.00	0.11	1.00		0.31	1.00		0.63	1.00	
Satd. Flow (perm)	106	3539	1583	196	3530		569	1620		1181	1587	
Peak-hour factor, PHF	0.95	0.92	0.69	0.54	0.90	0.85	0.73	0.50	0.70	0.42	0.25	0.81
Adj. Flow (vph)	431	1550	43	37	1497	27	237	26	171	81	4	322
RTOR Reduction (vph)	0	0	15	0	0	0	0	58	0	0	292	0
Lane Group Flow (vph)	431	1550	28	37	1524	0	237	139	0	81	34	0
Turn Type	D.P+P	NA	Perm	D.P+P	NA		D.P+P	NA		Perm	NA	
Protected Phases	1	6		5	2		7	4			8	
Permitted Phases	2		6	6			8			8		
Actuated Green, G (s)	96.3	92.6	92.6	96.3	70.1		23.1	28.1		13.1	13.1	
Effective Green, g (s)	96.3	92.6	92.6	96.3	70.1		23.1	28.1		13.1	13.1	
Actuated g/C Ratio	0.69	0.66	0.66	0.69	0.50		0.17	0.20		0.09	0.09	
Clearance Time (s)	4.8	5.7	5.7	4.8	5.7		5.0	5.1		5.1	5.1	
Vehicle Extension (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lane Grp Cap (vph)	384	2340	1047	176	1767		179	325		110	148	
v/s Ratio Prot	c0.21	0.44		0.01	0.43		c0.09	0.09			0.02	
v/s Ratio Perm	c0.56		0.02	0.14			c0.12			0.07		
v/c Ratio	1.12	0.66	0.03	0.21	0.86		1.32	0.43		0.74	0.23	
Uniform Delay, d1	47.2	14.3	8.2	11.5	30.7		56.6	48.9		61.8	58.8	
Progression Factor	0.79	0.66	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	76.5	1.0	0.0	0.2	5.8		179.2	0.3		19.6	0.3	
Delay (s)	113.8	10.4	8.2	11.8	36.5		235.9	49.2		81.4	59.1	
Level of Service	F	B	A	B	D		F	D		F	E	
Approach Delay (s)		32.4			35.9			151.1			63.5	
Approach LOS		C			D			F			E	

Intersection Summary				
HCM 2000 Control Delay	48.1	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	1.16			
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	20.6	
Intersection Capacity Utilization	103.6%	ICU Level of Service	G	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
14: Micron & Ingram Rd

Scenario 1 PM-2023-Improvements
2/5/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	1	0	0	106	3	196	0	254	52	65	146	0
Peak Hour Factor	0.25	1.00	1.00	0.94	0.50	0.79	1.00	0.96	0.70	0.71	0.88	1.00
Hourly flow rate (vph)	4	0	0	113	6	248	0	265	74	92	166	0

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total (vph)	4	0	113	254	339	257
Volume Left (vph)	4	0	113	0	0	92
Volume Right (vph)	0	0	0	248	74	0
Hadj (s)	0.53	0.00	0.53	-0.66	-0.10	0.11
Departure Headway (s)	7.3	6.8	6.6	5.4	5.2	5.5
Degree Utilization, x	0.01	0.00	0.21	0.38	0.49	0.39
Capacity (veh/h)	422	467	511	624	655	621
Control Delay (s)	9.2	8.6	10.2	10.6	13.0	12.0
Approach Delay (s)	9.2		10.4		13.0	12.0
Approach LOS	A		B		B	B

Intersection Summary			
Delay	11.8		
Level of Service	B		
Intersection Capacity Utilization	50.3%	ICU Level of Service	A
Analysis Period (min)	15		

EXHIBIT (C) - TRAFFIC IMPACT ANALYSIS
PART 3 OF 4

HCM Unsignalized Intersection Capacity Analysis — Scenario 1 PM-2023-Improvements
16: Military Dr & Reed Rd — 2/5/2014

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	578	377	241	25	27	677
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.94	0.93	0.86	0.50	0.25	0.88
Hourly flow rate (vph)	615	405	280	50	108	769
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		751				
pX, platoon unblocked						
vC, conflicting volume	330				1940	305
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	330				1940	305
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	50				0	0
cM capacity (veh/h)	1229				36	735

Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2
Volume Total	615	405	330	108	769
Volume Left	615	0	0	108	0
Volume Right	0	0	50	0	769
cSH	1229	1700	1700	36	735
Volume to Capacity	0.50	0.24	0.19	3.01	1.05
Queue Length 95th (ft)	72	0	0	Err	482
Control Delay (s)	10.8	0.0	0.0	Err	69.8
Lane LOS	B			F	F
Approach Delay (s)	6.5		0.0	1292.1	
Approach LOS				F	

Intersection Summary			
Average Delay	511.8		
Intersection Capacity Utilization	62.8%	ICU Level of Service	B
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis — Scenario 1 PM-2023-Improvements
17: Richland Hills & Military Dr — 2/5/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	9	456	218	399	391	22	314	39	463	7	15	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.3		4.2	5.4		4.5	4.3		4.6	4.3	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.95		1.00	0.98		1.00	0.87		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1765		1770	1835		1770	1614		1770	1787	
Flt Permitted	0.48	1.00		0.10	1.00		1.00	1.00		0.17	1.00	
Satd. Flow (perm)	895	1765		184	1835		1863	1614		313	1787	
Peak-hour factor, PHF	0.58	0.91	0.81	0.77	0.87	0.44	0.84	0.60	0.89	0.63	0.55	0.50
Adj. Flow (vph)	16	501	269	518	449	50	374	65	520	11	27	10
RTOR Reduction (vph)	0	20	0	0	4	0	0	267	0	0	10	0
Lane Group Flow (vph)	16	750	0	518	495	0	374	318	0	11	27	0
Turn Type	pm+pt	NA		pm+pt	NA		D.P+P	NA		D.P+P	NA	
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases	6			2			8			4		
Actuated Green, G (s)	38.0	36.4		61.3	55.7		24.5	23.8		24.4	3.9	
Effective Green, g (s)	38.0	36.4		61.3	55.7		24.5	23.8		24.4	3.9	
Actuated g/C Ratio	0.38	0.36		0.61	0.56		0.24	0.24		0.24	0.04	
Clearance Time (s)	4.0	5.3		4.2	5.4		4.5	4.3		4.6	4.3	
Vehicle Extension (s)	3.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lane Grp Cap (vph)	354	642		442	1022		437	384		85	69	
v/s Ratio Prot	0.00	0.42		c0.24	0.27		0.18	c0.20		0.00	0.02	
v/s Ratio Perm	0.02			c0.47			c0.03			0.03		
v/c Ratio	0.05	1.17		1.17	0.48		0.86	0.83		0.13	0.40	
Uniform Delay, d1	19.4	31.8		31.0	13.4		34.8	36.2		30.7	46.9	
Progression Factor	0.90	0.78		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	89.4		99.1	1.6		14.6	13.1		0.3	1.4	
Delay (s)	17.5	114.1		130.0	15.1		49.3	49.3		31.0	48.3	
Level of Service	B	F		F	B		D	D		C	D	
Approach Delay (s)		112.2			73.6			49.3			44.3	
Approach LOS		F			E			D			D	

Intersection Summary			
HCM 2000 Control Delay	75.6	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.13		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	18.4
Intersection Capacity Utilization	101.6%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
18: Richland Hills & Jack Jordan MS

Scenario 1 PM-2023-Improvements
2/5/2014

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	74	39	51	642	562	74
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.86	0.91	0.63	0.86	0.80	0.81
Hourly flow rate (vph)	86	43	81	747	702	91
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)					1086	
pX, platoon unblocked	0.83	0.83	0.83			
vC, conflicting volume	1657	748	794			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1688	598	653			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	90	90			
cM capacity (veh/h)	77	419	778			

Direction, Lane #	EB 1	EB 2	NB 1	SB 1
Volume Total	86	43	827	794
Volume Left	86	0	81	0
Volume Right	0	43	0	91
cSH	77	419	778	1700
Volume to Capacity	1.12	0.10	0.10	0.47
Queue Length 95th (ft)	157	8	9	0
Control Delay (s)	234.2	14.6	2.7	0.0
Lane LOS	F	B	A	
Approach Delay (s)	161.2		2.7	0.0
Approach LOS	F			

Intersection Summary			
Average Delay	13.1		
Intersection Capacity Utilization	84.8%	ICU Level of Service	E
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
19: Richland Hills & Christian Evers ES

Scenario 1 PM-2023-Improvements
2/5/2014

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	39	52	47	767	553	20
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.91	0.89	0.67	0.86	0.89	0.63
Hourly flow rate (vph)	43	58	70	892	621	32
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1669	637	653			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1669	637	653			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	56	88	92			
cM capacity (veh/h)	98	477	934			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	101	962	653
Volume Left	43	70	0
Volume Right	58	0	32
cSH	181	934	1700
Volume to Capacity	0.56	0.08	0.38
Queue Length 95th (ft)	74	6	0
Control Delay (s)	47.7	2.0	0.0
Lane LOS	E	A	
Approach Delay (s)	47.7	2.0	0.0
Approach LOS	E		

Intersection Summary			
Average Delay	3.9		
Intersection Capacity Utilization	88.6%	ICU Level of Service	E
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
20: Military Dr & Earl Warren High School

Scenario 1 PM-2023-Improvements
2/5/2014

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	103	715	675	121	151	188
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.9	4.9	4.9	5.1	5.1	5.1
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	1863	1863	1583	1770	1583
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	1863	1863	1583	1770	1583
Peak-hour factor, PHF	0.64	0.91	0.87	0.58	0.78	0.88
Adj. Flow (vph)	161	786	776	209	194	214
RTOR Reduction (vph)	0	0	0	119	0	179
Lane Group Flow (vph)	161	786	776	90	194	35
Turn Type	Prot	NA	NA	custom	NA	Perm
Protected Phases	1	6	2		8	
Permitted Phases				8		8
Actuated Green, G (s)	13.9	73.5	54.7	16.5	16.5	16.5
Effective Green, g (s)	13.9	73.5	54.7	16.5	16.5	16.5
Actuated g/C Ratio	0.14	0.74	0.55	0.16	0.16	0.16
Clearance Time (s)	4.9	4.9	4.9	5.1	5.1	5.1
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	246	1369	1019	261	292	261
v/s Ratio Prot	0.09	c0.42	c0.42		c0.11	
v/s Ratio Perm				0.06		0.02
v/c Ratio	0.65	0.57	0.76	0.35	0.66	0.14
Uniform Delay, d1	40.8	6.1	17.6	37.0	39.2	35.7
Progression Factor	0.76	1.73	1.02	1.65	1.00	1.00
Incremental Delay, d2	4.5	1.3	4.5	0.7	5.6	0.2
Delay (s)	35.5	11.8	22.5	61.6	44.8	35.9
Level of Service	D	B	C	E	D	D
Approach Delay (s)		15.8	30.8		40.1	
Approach LOS		B	C		D	

Intersection Summary			
HCM 2000 Control Delay	26.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.9
Intersection Capacity Utilization	62.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
21: Hunt Ln & Military Dr

Scenario 1 PM-2023-Improvements
2/5/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	121	328	28	165	402	415	29	850	191	392	403	114
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.7		5.0	5.8	5.8	5.2	5.6	5.6	5.2	5.6	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3501		1770	3539	1583	1770	3539	1583	1770	3402	
Flt Permitted	0.37	1.00		0.24	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	696	3501		449	3539	1583	1770	3539	1583	1770	3402	
Peak-hour factor, PHF	0.70	0.79	0.88	0.78	0.87	0.81	0.70	0.91	0.95	0.81	0.87	0.71
Adj. Flow (vph)	173	415	32	212	462	512	41	934	201	484	463	161
RTOR Reduction (vph)	0	6	0	0	0	413	0	0	160	0	29	0
Lane Group Flow (vph)	173	441	0	212	462	99	41	934	41	484	595	0
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8		8			2			
Actuated Green, G (s)	25.5	16.4		31.4	19.3	19.3	4.2	20.5	20.5	29.5	45.8	
Effective Green, g (s)	25.5	16.4		31.4	19.3	19.3	4.2	20.5	20.5	29.5	45.8	
Actuated g/C Ratio	0.26	0.16		0.31	0.19	0.19	0.04	0.20	0.20	0.29	0.46	
Clearance Time (s)	5.0	5.7		5.0	5.8	5.8	5.2	5.6	5.6	5.2	5.6	
Vehicle Extension (s)	1.0	2.5		1.0	2.0	2.0	1.0	2.5	2.5	1.0	2.5	
Lane Grp Cap (vph)	275	574		300	683	305	74	725	324	522	1558	
v/s Ratio Prot	0.06	0.13		c0.09	0.13		0.02	c0.26		c0.27	0.17	
v/s Ratio Perm	0.10			c0.14		0.06			0.03			
v/c Ratio	0.63	0.77		0.71	0.68	0.32	0.55	1.29	0.13	0.93	0.38	
Uniform Delay, d1	30.8	40.0		27.4	37.5	34.7	47.0	39.8	32.4	34.2	17.8	
Progression Factor	1.00	1.00		1.53	1.38	4.53	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	3.2	5.9		5.3	1.8	0.2	5.0	140.0	0.8	22.3	0.7	
Delay (s)	34.1	45.9		47.2	53.4	157.6	52.0	179.8	33.3	56.6	18.5	
Level of Service	C	D		D	D	F	D	F	C	E	B	
Approach Delay (s)		42.6			97.3			150.3			35.1	
Approach LOS		D			F			F			D	

Intersection Summary			
HCM 2000 Control Delay	87.4	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	21.6
Intersection Capacity Utilization	82.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
22: SH 151 NB Frnt Rd & Hunt Ln

Scenario 1 PM-2023-Improvements
2/5/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	52	89	0	0	598	56	60	996	1002	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.3			5.3	5.3	6.0	6.0	6.0			
Lane Util. Factor		0.95			0.95	1.00	0.91	0.91	1.00			
Frt		1.00			1.00	0.85	1.00	1.00	0.85			
Flt Protected		0.98			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)		3469			3539	1583	1610	3389	1583			
Flt Permitted		0.55			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)		1944			3539	1583	1610	3389	1583			
Peak-hour factor, PHF	0.70	0.82	1.00	1.00	0.89	0.60	0.69	0.88	0.95	1.00	1.00	1.00
Adj. Flow (vph)	74	109	0	0	672	93	87	1132	1055	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	70	0	0	278	0	0	0
Lane Group Flow (vph)	0	183	0	0	672	23	78	1141	777	0	0	0
Turn Type	pm+pt	NA			NA	Perm	Split	NA	Perm			
Protected Phases	5	6			6		8 16	8 16				
Permitted Phases	6					6			8 16			
Actuated Green, G (s)		28.3			28.3	28.3	75.0	75.0	75.0			
Effective Green, g (s)		28.3			28.3	28.3	75.0	75.0	75.0			
Actuated g/C Ratio		0.25			0.25	0.25	0.66	0.66	0.66			
Clearance Time (s)		5.3			5.3	5.3						
Vehicle Extension (s)		3.0			3.0	3.0						
Lane Grp Cap (vph)		483			880	393	1061	2233	1043			
v/s Ratio Prot					c0.19		0.05	0.34				
v/s Ratio Perm		0.09				0.01			c0.49			
v/c Ratio		0.90dl			0.76	0.06	0.07	0.51	0.75			
Uniform Delay, d1		35.5			39.6	32.6	7.0	10.0	13.0			
Progression Factor		0.82			1.00	1.00	1.00	1.00	1.00			
Incremental Delay, d2		0.5			4.0	0.1	0.1	0.8	4.8			
Delay (s)		29.5			43.6	32.7	7.1	10.8	17.8			
Level of Service		C			D	C	A	B	B			
Approach Delay (s)		29.5			42.3			13.9			0.0	
Approach LOS		C			D			B			A	

Intersection Summary			
HCM 2000 Control Delay	21.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	113.8	Sum of lost time (s)	21.7
Intersection Capacity Utilization	77.3%	ICU Level of Service	D
Analysis Period (min)	15		

dl Defacto Left Lane. Recode with 1 though lane as a left lane.
c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
23: SH 151 SB Frnt Rd & Hunt Ln

Scenario 1 PM-2023-Improvements
2/5/2014

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	643	0	0	0	142	786
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2				6.0	6.0
Lane Util. Factor	0.97				0.91	0.91
Frt	1.00				1.00	1.00
Flt Protected	0.95				0.95	1.00
Satd. Flow (prot)	3433				1610	3387
Flt Permitted	0.95				0.95	1.00
Satd. Flow (perm)	3433				1610	3387
Peak-hour factor, PHF	0.93	1.00	1.00	1.00	0.75	0.91
Adj. Flow (vph)	691	0	0	0	189	864
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	691	0	0	0	170	883
Turn Type	NA				Split	NA
Protected Phases	1				4 12	4 12
Permitted Phases						
Actuated Green, G (s)	56.5				46.9	46.9
Effective Green, g (s)	56.5				46.9	46.9
Actuated g/C Ratio	0.50				0.41	0.41
Clearance Time (s)	5.2					
Vehicle Extension (s)	3.0					
Lane Grp Cap (vph)	1704				663	1395
v/s Ratio Prot	c0.20				0.11	c0.26
v/s Ratio Perm						
v/c Ratio	0.41				0.26	0.63
Uniform Delay, d1	18.1				22.0	26.6
Progression Factor	0.45				1.00	1.00
Incremental Delay, d2	0.1				0.9	2.2
Delay (s)	8.3				22.9	28.8
Level of Service	A				C	C
Approach Delay (s)	8.3		0.0			27.9
Approach LOS	A		A			C

Intersection Summary			
HCM 2000 Control Delay	20.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	113.8	Sum of lost time (s)	21.7
Intersection Capacity Utilization	49.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
8: SH 151 SB Frnt Rd & Potranco Rd

Scenario 1 AM-3 Lanes on Potranco
2/7/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑↑	↱	↰	↲↑↑↑					↰	↲↑	↱
Volume (vph)	0	1363	661	355	831	0	0	0	0	1050	509	231
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.3	5.3	5.7	5.3					6.3	6.3	6.3
Lane Util. Factor		0.86	1.00	0.86	0.86					0.91	0.91	1.00
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	0.99					0.95	0.98	1.00
Satd. Flow (prot)		6408	1583	1522	4765					1610	3309	1583
Flt Permitted		1.00	1.00	0.11	0.66					0.95	0.98	1.00
Satd. Flow (perm)		6408	1583	170	3174					1610	3309	1583
Peak-hour factor, PHF	1.00	0.96	0.90	0.80	0.86	1.00	1.00	1.00	1.00	0.91	0.86	0.81
Adj. Flow (vph)	0	1420	734	444	966	0	0	0	0	1154	592	285
RTOR Reduction (vph)	0	0	132	0	0	0	0	0	0	0	0	133
Lane Group Flow (vph)	0	1420	602	244	1166	0	0	0	0	577	1169	152
Turn Type		NA	Perm	pm+pt	NA					Perm	NA	Perm
Protected Phases		6		5	6 5						8 16	
Permitted Phases			6	6 5						8 16		8 16
Actuated Green, G (s)		37.7	37.7	69.6	69.6					33.1	33.1	33.1
Effective Green, g (s)		37.7	37.7	69.6	69.6					33.1	33.1	33.1
Actuated g/C Ratio		0.31	0.31	0.58	0.58					0.28	0.28	0.28
Clearance Time (s)		5.3	5.3	5.7								
Vehicle Extension (s)		2.5	2.5	1.0								
Lane Grp Cap (vph)		2013	497	458	2263					444	912	436
v/s Ratio Prot		0.22		c0.14	0.14							
v/s Ratio Perm			c0.38	0.17	0.16					c0.36	0.35	0.10
v/c Ratio		0.71	1.21	0.53	0.52					1.30	1.28	0.35
Uniform Delay, d1		36.3	41.1	22.3	15.1					43.5	43.5	34.8
Progression Factor		1.00	1.00	0.65	0.55					1.00	1.00	1.00
Incremental Delay, d2		1.1	112.3	0.3	0.1					150.5	135.2	0.4
Delay (s)		37.3	153.5	14.9	8.4					194.0	178.7	35.2
Level of Service		D	F	B	A					F	F	D
Approach Delay (s)		76.9			9.5			0.0			162.9	
Approach LOS		E			A			A			F	

Intersection Summary				
HCM 2000 Control Delay	91.1	HCM 2000 Level of Service	F	
HCM 2000 Volume to Capacity ratio	1.10			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	24.0	
Intersection Capacity Utilization	115.6%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
9: SH 151 NB Frnt Rd & Potranco Rd

Scenario 1 AM-3 Lanes on Potranco
2/7/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↲↑↑↑			↑↑↑↑	↱	↰	↲↑↑	↱			
Volume (vph)	296	2073	0	0	689	288	490	456	123	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.7	5.3			5.3	5.3	6.3	6.3	6.3			
Lane Util. Factor	0.86	0.86			0.86	1.00	0.91	0.91	1.00			
Frt	1.00	1.00			1.00	0.85	1.00	1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.99	1.00			
Satd. Flow (prot)	1522	4801			6408	1583	1610	3357	1583			
Flt Permitted	0.25	0.93			1.00	1.00	0.95	0.99	1.00			
Satd. Flow (perm)	402	4466			6408	1583	1610	3357	1583			
Peak-hour factor, PHF	0.65	0.93	1.00	1.00	0.95	0.72	0.86	0.67	0.73	1.00	1.00	1.00
Adj. Flow (vph)	455	2229	0	0	725	400	570	681	168	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	205	0	0	136	0	0	0
Lane Group Flow (vph)	409	2275	0	0	725	195	405	846	32	0	0	0
Turn Type	pm+pt	NA			NA	Perm	Perm	NA	Perm			
Protected Phases	1	2 1			2			4 12				
Permitted Phases	2 1					2	4 12		4 12			
Actuated Green, G (s)	79.7	79.7			25.7	25.7	23.0	23.0	23.0			
Effective Green, g (s)	79.7	79.7			25.7	25.7	23.0	23.0	23.0			
Actuated g/C Ratio	0.66	0.66			0.21	0.21	0.19	0.19	0.19			
Clearance Time (s)	5.7				5.3	5.3						
Vehicle Extension (s)	1.0				2.5	2.5						
Lane Grp Cap (vph)	770	3116			1372	339	308	643	303			
v/s Ratio Prot	0.24	c0.33			0.11							
v/s Ratio Perm	0.11	c0.16				0.12	0.25	0.25	0.02			
v/c Ratio	0.53	0.73			0.53	0.57	1.31	1.32	0.11			
Uniform Delay, d1	10.2	13.1			41.8	42.3	48.5	48.5	40.0			
Progression Factor	0.54	0.40			0.79	0.58	1.00	1.00	1.00			
Incremental Delay, d2	0.1	0.3			1.4	6.5	162.9	152.9	0.1			
Delay (s)	5.6	5.6			34.5	31.2	211.4	201.4	40.1			
Level of Service	A	A			C	C	F	F	D			
Approach Delay (s)		5.6			33.3			185.2			0.0	
Approach LOS		A			C			F			A	

Intersection Summary				
HCM 2000 Control Delay	60.3	HCM 2000 Level of Service	E	
HCM 2000 Volume to Capacity ratio	0.92			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	24.0	
Intersection Capacity Utilization	115.6%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
10: Richland Hills & Potranco Rd

Scenario 1 AM-3 Lanes on Potranco
2/7/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	212	2020	241	102	542	172	64	151	178	349	374	358
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.7	5.8	5.8	4.7	5.8	5.8	5.2	5.2	5.2	5.2	5.2	5.2
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	1.00	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	1583	1770	5085	1583	1770	1863	1583	1770	3539	1583
Flt Permitted	0.30	1.00	1.00	0.08	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	562	5085	1583	143	5085	1583	1770	1863	1583	1770	3539	1583
Peak-hour factor, PHF	0.65	0.86	0.44	0.55	0.75	0.85	0.45	0.69	0.65	0.87	0.96	0.84
Adj. Flow (vph)	326	2349	548	185	723	202	142	219	274	401	390	426
RTOR Reduction (vph)	0	0	134	0	0	130	0	0	141	0	0	285
Lane Group Flow (vph)	326	2349	414	185	723	72	142	219	133	401	390	141
Turn Type	D.P+P	NA	Perm	D.P+P	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	1	6		5	2		4	4		3	3	
Permitted Phases	2		6	6		2			4			3
Actuated Green, G (s)	59.3	52.0	52.0	59.3	43.0	43.0	12.8	12.8	12.8	27.0	27.0	27.0
Effective Green, g (s)	59.3	52.0	52.0	59.3	43.0	43.0	12.8	12.8	12.8	27.0	27.0	27.0
Actuated g/C Ratio	0.49	0.43	0.43	0.49	0.36	0.36	0.11	0.11	0.11	0.22	0.22	0.22
Clearance Time (s)	4.7	5.8	5.8	4.7	5.8	5.8	5.2	5.2	5.2	5.2	5.2	5.2
Vehicle Extension (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lane Grp Cap (vph)	441	2203	685	169	1822	567	188	198	168	398	796	356
v/s Ratio Prot	0.10	0.46		c0.07	0.14		0.08	c0.12		c0.23	0.11	
v/s Ratio Perm	0.26		0.26	c0.47		0.05			0.08			0.09
v/c Ratio	0.74	1.07	0.60	1.09	0.40	0.13	0.76	1.11	0.79	1.01	0.49	0.40
Uniform Delay, d1	19.3	34.0	26.1	32.0	28.8	25.9	52.1	53.6	52.3	46.5	40.5	39.6
Progression Factor	1.15	0.84	0.70	0.83	1.08	1.62	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.9	38.7	3.5	96.5	0.6	0.5	14.1	95.2	20.6	47.0	0.2	0.3
Delay (s)	27.0	67.4	21.8	123.1	31.8	42.4	66.2	148.8	72.9	93.5	40.7	39.8
Level of Service	C	E	C	F	C	D	E	F	E	F	D	D
Approach Delay (s)		55.6			48.9			97.6			57.8	
Approach LOS		E			D			F			E	

Intersection Summary			
HCM 2000 Control Delay	59.1	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.07		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.9
Intersection Capacity Utilization	89.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
11: Ingram Rd & Potranco Rd

Scenario 1 AM-3 Lanes on Potranco
2/7/2014

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	2331	19	153	784	1	332
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	4.0
Lane Util. Factor	0.91		1.00	0.91	1.00	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	5076		1770	5085	1770	1583
Flt Permitted	1.00		0.05	1.00	0.95	1.00
Satd. Flow (perm)	5076		86	5085	1770	1583
Peak-hour factor, PHF	0.88	0.58	0.63	0.80	0.25	0.86
Adj. Flow (vph)	2649	33	243	980	4	386
RTOR Reduction (vph)	1	0	0	0	0	97
Lane Group Flow (vph)	2681	0	243	980	4	289
Turn Type	NA		pm+pt	NA	NA	Prot
Protected Phases	4		3	8	2	2
Permitted Phases			8			
Actuated Green, G (s)	83.0		96.0	96.0	16.0	16.0
Effective Green, g (s)	83.0		96.0	96.0	16.0	16.0
Actuated g/C Ratio	0.69		0.80	0.80	0.13	0.13
Clearance Time (s)	4.0		4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	3510		195	4068	236	211
v/s Ratio Prot	0.53		c0.09	0.19	0.00	c0.18
v/s Ratio Perm			c0.91			
v/c Ratio	0.76		1.25	0.24	0.02	1.37
Uniform Delay, d1	12.1		39.7	3.0	45.2	52.0
Progression Factor	0.33		0.98	0.52	1.00	1.00
Incremental Delay, d2	0.1		145.2	0.1	0.1	193.4
Delay (s)	4.1		184.0	1.7	45.3	245.4
Level of Service	A		F	A	D	F
Approach Delay (s)	4.1			37.9	243.3	
Approach LOS	A			D	F	

Intersection Summary			
HCM 2000 Control Delay	35.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.29		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	72.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
12: Military Dr & Potranco Rd

Scenario 1 AM-3 Lanes on Potranco
2/7/2014

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1905	910	317	591	181	372
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.8	5.8	4.7	5.8	5.2	5.2
Lane Util. Factor	0.91	1.00	1.00	0.91	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)	5085	1583	1770	5085	1770	1583
Flt Permitted	1.00	1.00	0.06	1.00	0.95	1.00
Satd. Flow (perm)	5085	1583	116	5085	1770	1583
Peak-hour factor, PHF	0.94	0.72	0.88	0.72	0.73	0.83
Adj. Flow (vph)	2027	1264	360	821	248	448
RTOR Reduction (vph)	0	268	0	0	0	257
Lane Group Flow (vph)	2027	996	360	821	248	191
Turn Type	NA	Perm	D.P+P	NA	NA	Perm
Protected Phases	6		5	2	4	
Permitted Phases		6	6			4
Actuated Green, G (s)	64.1	64.1	85.8	90.5	18.5	18.5
Effective Green, g (s)	64.1	64.1	85.8	90.5	18.5	18.5
Actuated g/C Ratio	0.53	0.53	0.71	0.75	0.15	0.15
Clearance Time (s)	5.8	5.8	4.7	5.8	5.2	5.2
Vehicle Extension (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lane Grp Cap (vph)	2716	845	382	3834	272	244
v/s Ratio Prot	0.40		c0.17	0.16	c0.14	
v/s Ratio Perm		c0.63	0.50			0.12
v/c Ratio	0.75	1.18	0.94	0.21	0.91	0.78
Uniform Delay, d1	21.7	28.0	38.1	4.3	49.9	48.8
Progression Factor	0.61	0.83	0.70	0.96	1.00	1.00
Incremental Delay, d2	1.2	88.5	28.4	0.1	31.8	13.9
Delay (s)	14.5	111.8	54.9	4.3	81.8	62.7
Level of Service	B	F	D	A	F	E
Approach Delay (s)	51.8			19.7	69.5	
Approach LOS	D			B	E	

Intersection Summary			
HCM 2000 Control Delay	46.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.08		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.7
Intersection Capacity Utilization	82.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
13: Micron & Potranco Rd

Scenario 1 AM-3 Lanes on Potranco
2/7/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	42	1154	551	245	480	11	13	16	19	269	151	310
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.8	5.7	5.7	4.8	5.7		4.0	5.1		5.1	5.1	
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.95		1.00	0.89	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	5085	1583	1770	5051		1770	1762		1770	1665	
Flt Permitted	0.38	1.00	1.00	0.10	1.00		0.10	1.00		0.71	1.00	
Satd. Flow (perm)	704	5085	1583	187	5051		193	1762		1319	1665	
Peak-hour factor, PHF	0.78	0.89	0.84	0.63	0.80	0.40	0.42	0.33	0.70	0.69	0.82	0.70
Adj. Flow (vph)	54	1297	656	389	600	28	31	48	27	390	184	443
RTOR Reduction (vph)	0	0	263	0	4	0	0	16	0	0	70	0
Lane Group Flow (vph)	54	1297	393	389	624	0	31	59	0	390	557	0
Turn Type	D.P+P	NA	Perm	D.P+P	NA		D.P+P	NA		Perm	NA	
Protected Phases	1	6		5	2		7	4			8	
Permitted Phases	2		6	6			8			8		
Actuated Green, G (s)	59.9	39.8	39.8	59.9	57.2		40.5	44.5		38.7	38.7	
Effective Green, g (s)	59.9	39.8	39.8	59.9	57.2		40.5	44.5		38.7	38.7	
Actuated g/C Ratio	0.50	0.33	0.33	0.50	0.48		0.34	0.37		0.32	0.32	
Clearance Time (s)	4.8	5.7	5.7	4.8	5.7		4.0	5.1		5.1	5.1	
Vehicle Extension (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lane Grp Cap (vph)	375	1686	525	358	2407		88	653		425	536	
v/s Ratio Prot	0.00	0.26		c0.18	0.12		c0.01	0.03			c0.33	
v/s Ratio Perm	0.07		0.25	c0.36			0.11			0.30		
v/c Ratio	0.14	0.77	0.75	1.09	0.26		0.35	0.09		0.92	1.04	
Uniform Delay, d1	15.6	36.0	35.7	41.3	18.7		31.9	24.6		39.1	40.6	
Progression Factor	0.59	0.67	1.05	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	2.2	6.0	72.8	0.3		0.9	0.0		24.0	49.5	
Delay (s)	9.2	26.4	43.4	114.1	19.0		32.8	24.6		63.1	90.2	
Level of Service	A	C	D	F	B		C	C		E	F	
Approach Delay (s)		31.5			55.4			27.0			79.8	
Approach LOS		C			E			C			E	

Intersection Summary			
HCM 2000 Control Delay	49.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.05		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	19.6
Intersection Capacity Utilization	87.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	1	0	0	105	1	112	1	106	28	179	517	1
Peak Hour Factor	0.25	1.00	1.00	0.70	0.25	0.74	0.25	0.68	0.66	0.98	0.89	0.25
Hourly flow rate (vph)	4	0	0	150	4	151	4	156	42	183	581	4

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total (vph)	4	0	150	155	202	768
Volume Left (vph)	4	0	150	0	4	183
Volume Right (vph)	0	0	0	151	42	4
Hadj (s)	0.53	0.00	0.53	-0.65	-0.09	0.08
Departure Headway (s)	8.0	7.5	7.3	6.1	5.7	5.3
Degree Utilization, x	0.01	0.00	0.30	0.26	0.32	1.12
Capacity (veh/h)	424	464	479	574	611	675
Control Delay (s)	9.9	9.3	12.3	10.1	11.4	93.3
Approach Delay (s)	9.9		11.2		11.4	93.3
Approach LOS	A		B		B	F

Intersection Summary			
Delay	60.5		
Level of Service	F		
Intersection Capacity Utilization	67.0%	ICU Level of Service	C
Analysis Period (min)	15		

EXHIBIT (C) - TRAFFIC IMPACT ANALYSIS
PART 3 OF 4

EXHIBIT (C) - TRAFFIC IMPACT ANALYSIS
PART 3 OF 4

HCM Signalized Intersection Capacity Analysis
7: Richland Hills & Ingram Rd

Scenario 2 PM-3 lanes on Potranco
2/7/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	302	270	40	30	369	59	280	447	65	9	163	239
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.98		1.00	0.97		1.00	0.98		1.00	0.91	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3474		1770	3450		1770	3465		1770	3231	
Flt Permitted	0.46	1.00		0.53	1.00		0.48	1.00		0.41	1.00	
Satd. Flow (perm)	853	3474		981	3450		901	3465		758	3231	
Peak-hour factor, PHF	0.67	0.81	0.86	0.79	0.87	0.69	0.67	0.89	0.80	0.44	0.83	0.88
Adj. Flow (vph)	451	333	47	38	424	86	418	502	81	20	196	272
RTOR Reduction (vph)	0	28	0	0	43	0	0	32	0	0	163	0
Lane Group Flow (vph)	451	352	0	38	467	0	418	551	0	20	305	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	16.0	16.0		16.0	16.0		16.0	16.0		16.0	16.0	
Effective Green, g (s)	16.0	16.0		16.0	16.0		16.0	16.0		16.0	16.0	
Actuated g/C Ratio	0.40	0.40		0.40	0.40		0.40	0.40		0.40	0.40	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	341	1389		392	1380		360	1386		303	1292	
v/s Ratio Prot		0.10			0.14			0.16			0.09	
v/s Ratio Perm	c0.53			0.04			c0.46			0.03		
v/c Ratio	1.32	0.25		0.10	0.34		1.16	0.40		0.07	0.24	
Uniform Delay, d1	12.0	8.0		7.5	8.3		12.0	8.6		7.4	8.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	164.3	0.4		0.5	0.7		98.9	0.2		0.1	0.1	
Delay (s)	176.3	8.5		8.0	9.0		110.9	8.7		7.5	8.0	
Level of Service	F	A		A	A		F	A		A	A	
Approach Delay (s)		99.5			8.9			51.4			8.0	
Approach LOS		F			A			D			A	

Intersection Summary			
HCM 2000 Control Delay	49.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.24		
Actuated Cycle Length (s)	40.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	69.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
8: SH 151 SB Frnt Rd & Potranco Rd

Scenario 2 PM-3 lanes on Potranco
2/7/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1234	697	357	2341	0	0	0	0	451	363	296
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5	5.5	5.0	5.5					6.3	6.3	6.3
Lane Util. Factor		0.86	1.00	0.86	0.86					0.91	0.91	1.00
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.99	1.00
Satd. Flow (prot)		6408	1583	1522	4802					1610	3341	1583
Flt Permitted		1.00	1.00	0.09	0.91					0.95	0.99	1.00
Satd. Flow (perm)		6408	1583	151	4372					1610	3341	1583
Peak-hour factor, PHF	1.00	0.91	0.85	0.91	0.98	1.00	1.00	1.00	1.00	0.89	0.78	0.83
Adj. Flow (vph)	0	1356	820	392	2389	0	0	0	0	507	465	357
RTOR Reduction (vph)	0	0	222	0	0	0	0	0	0	0	0	139
Lane Group Flow (vph)	0	1356	598	353	2428	0	0	0	0	314	658	218
Turn Type		NA	Perm	pm+pt	NA					Perm	NA	Perm
Protected Phases		6		5	6 5						8 16	
Permitted Phases			6	6 5						8 16		8 16
Actuated Green, G (s)		42.5	42.5	104.5	104.5					18.7	18.7	18.7
Effective Green, g (s)		42.5	42.5	104.5	104.5					18.7	18.7	18.7
Actuated g/C Ratio		0.30	0.30	0.75	0.75					0.13	0.13	0.13
Clearance Time (s)		5.5	5.5	5.0								
Vehicle Extension (s)		2.5	2.5	1.0								
Lane Grp Cap (vph)		1945	480	719	3453					215	446	211
v/s Ratio Prot		0.21		0.22	c0.31							
v/s Ratio Perm			c0.38	0.15	0.21					0.19	0.20	0.14
v/c Ratio		0.70	1.25	0.49	0.70					1.46	1.48	1.03
Uniform Delay, d1		43.1	48.8	19.6	9.5					60.6	60.6	60.6
Progression Factor		1.00	1.00	0.26	0.77					1.00	1.00	1.00
Incremental Delay, d2		1.0	127.0	0.0	0.1					231.0	225.8	70.2
Delay (s)		44.1	175.8	5.1	7.3					291.7	286.4	130.9
Level of Service		D	F	A	A					F	F	F
Approach Delay (s)		93.7			7.0			0.0			245.9	
Approach LOS		F			A			A			F	

Intersection Summary			
HCM 2000 Control Delay	87.5	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.07		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	23.6
Intersection Capacity Utilization	139.1%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
9: SH 151 NB Frnt Rd & Potranco Rd

Scenario 2 PM-3 lanes on Potranco
2/7/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	352	1263	0	0	1378	468	1350	705	199	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.5			5.5	5.5	6.3	6.3	6.3			
Lane Util. Factor	0.86	0.86			0.86	1.00	0.91	0.91	1.00			
Frt	1.00	1.00			1.00	0.85	1.00	1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.98	1.00			
Satd. Flow (prot)	1522	4791			6408	1583	1610	3310	1583			
Flt Permitted	0.14	0.66			1.00	1.00	0.95	0.98	1.00			
Satd. Flow (perm)	217	3171			6408	1583	1610	3310	1583			
Peak-hour factor, PHF	0.98	0.95	1.00	1.00	0.96	0.93	0.98	0.95	0.83	1.00	1.00	1.00
Adj. Flow (vph)	359	1329	0	0	1435	503	1378	742	240	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	164	0	0	111	0	0	0
Lane Group Flow (vph)	273	1415	0	0	1435	339	689	1431	129	0	0	0
Turn Type	pm+pt	NA			NA	Perm	Perm	NA	Perm			
Protected Phases	1	2 1			2			4 12				
Permitted Phases	2 1					2	4 12		4 12			
Actuated Green, G (s)	79.5	79.5			29.5	29.5	43.7	43.7	43.7			
Effective Green, g (s)	79.5	79.5			29.5	29.5	43.7	43.7	43.7			
Actuated g/C Ratio	0.57	0.57			0.21	0.21	0.31	0.31	0.31			
Clearance Time (s)	5.0				5.5	5.5						
Vehicle Extension (s)	1.0				2.5	2.5						
Lane Grp Cap (vph)	589	2379			1350	333	502	1033	494			
v/s Ratio Prot	0.17	c0.21			c0.22							
v/s Ratio Perm	0.10	0.13				0.21	0.43	0.43	0.08			
v/c Ratio	0.46	0.59			1.06	1.02	1.37	1.39	0.26			
Uniform Delay, d1	21.9	19.7			55.2	55.2	48.1	48.1	36.1			
Progression Factor	0.28	0.19			0.67	0.44	1.00	1.00	1.00			
Incremental Delay, d2	0.1	0.1			36.0	37.0	179.9	179.4	0.2			
Delay (s)	6.3	3.9			73.1	61.3	228.1	227.6	36.3			
Level of Service	A	A			E	E	F	F	D			
Approach Delay (s)		4.3			70.1			208.3			0.0	
Approach LOS		A			E			F			A	

Intersection Summary			
HCM 2000 Control Delay	106.0	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.04		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	23.6
Intersection Capacity Utilization	139.1%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
10: Richland Hills & Potranco Rd

Scenario 2 PM-3 lanes on Potranco
2/7/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	427	1002	186	141	1469	205	301	563	213	186	276	324
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.7	5.8	5.8	4.7	5.8	5.8	5.2	5.2	5.2	5.2	5.2	5.2
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	1.00	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	1583	1770	5085	1583	1770	1863	1583	1770	3539	1583
Flt Permitted	0.10	1.00	1.00	0.12	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	190	5085	1583	232	5085	1583	1770	1863	1583	1770	3539	1583
Peak-hour factor, PHF	0.82	0.85	0.75	0.61	0.96	0.87	0.79	0.83	0.59	0.80	0.76	0.82
Adj. Flow (vph)	521	1179	248	231	1530	236	381	678	361	232	363	395
RTOR Reduction (vph)	0	0	99	0	0	94	0	0	150	0	0	275
Lane Group Flow (vph)	521	1179	149	231	1530	142	381	678	211	232	363	120
Turn Type	D.P+P	NA	Perm	D.P+P	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	1	6		5	2		4	4		3	3	
Permitted Phases	2		6	6		2			4			3
Actuated Green, G (s)	65.5	49.9	49.9	65.5	39.2	39.2	38.8	38.8	38.8	14.8	14.8	14.8
Effective Green, g (s)	65.5	49.9	49.9	65.5	39.2	39.2	38.8	38.8	38.8	14.8	14.8	14.8
Actuated g/C Ratio	0.47	0.36	0.36	0.47	0.28	0.28	0.28	0.28	0.28	0.11	0.11	0.11
Clearance Time (s)	4.7	5.8	5.8	4.7	5.8	5.8	5.2	5.2	5.2	5.2	5.2	5.2
Vehicle Extension (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lane Grp Cap (vph)	385	1812	564	279	1423	443	490	516	438	187	374	167
v/s Ratio Prot	c0.25	0.23		0.09	0.30		0.22	c0.36		c0.13	0.10	
v/s Ratio Perm	c0.38		0.09	0.29		0.09			0.13			0.08
v/c Ratio	1.35	0.65	0.26	0.83	1.08	0.32	0.78	1.31	0.48	1.24	0.97	0.72
Uniform Delay, d1	44.4	37.7	32.0	26.8	50.4	39.9	46.6	50.6	42.2	62.6	62.4	60.6
Progression Factor	1.43	0.72	0.45	1.56	0.70	0.69	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	174.1	1.7	1.1	14.4	44.9	1.5	7.0	154.6	0.3	145.3	38.5	12.2
Delay (s)	237.6	28.8	15.4	56.2	80.3	28.9	53.6	205.2	42.5	207.9	100.8	72.8
Level of Service	F	C	B	E	F	C	D	F	D	F	F	E
Approach Delay (s)		82.9			71.5			123.2			114.7	
Approach LOS		F			E			F			F	

Intersection Summary			
HCM 2000 Control Delay	93.3	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.32		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	20.9
Intersection Capacity Utilization	109.4%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

EXHIBIT (C) - TRAFFIC IMPACT ANALYSIS
PART 3 OF 4

HCM Signalized Intersection Capacity Analysis
11: Ingram Rd & Potranco Rd

Scenario 2 PM-3 lanes on Potranco
2/7/2014

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1196	20	293	1733	11	536
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	4.0
Lane Util. Factor	0.91		1.00	0.91	1.00	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	5073		1770	5085	1770	1583
Flt Permitted	1.00		0.13	1.00	0.95	1.00
Satd. Flow (perm)	5073		244	5085	1770	1583
Peak-hour factor, PHF	0.95	0.94	0.70	0.89	0.67	0.80
Adj. Flow (vph)	1259	21	419	1947	16	670
RTOR Reduction (vph)	2	0	0	0	0	270
Lane Group Flow (vph)	1278	0	419	1947	16	400
Turn Type	NA		pm+pt	NA	NA	custom
Protected Phases	4		3	8		
Permitted Phases			8		2	2
Actuated Green, G (s)	27.0		44.0	44.0	18.0	18.0
Effective Green, g (s)	27.0		44.0	44.0	18.0	18.0
Actuated g/C Ratio	0.39		0.63	0.63	0.26	0.26
Clearance Time (s)	4.0		4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1956		436	3196	455	407
v/s Ratio Prot	0.25		c0.18	0.38		
v/s Ratio Perm			c0.42		0.01	c0.25
v/c Ratio	0.65		0.96	0.61	0.04	0.98
Uniform Delay, d1	17.7		18.6	7.8	19.5	25.9
Progression Factor	0.99		1.27	1.23	1.00	1.00
Incremental Delay, d2	1.2		29.9	0.7	0.1	40.7
Delay (s)	18.6		53.6	10.4	19.6	66.6
Level of Service	B		D	B	B	E
Approach Delay (s)	18.6			18.0	65.5	
Approach LOS	B			B	E	

Intersection Summary			
HCM 2000 Control Delay	25.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	63.4%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
12: Military Dr & Potranco Rd

Scenario 2 PM-3 lanes on Potranco
2/7/2014

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1167	599	216	1455	474	560
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.8	5.8	4.7	5.8	5.2	4.7
Lane Util. Factor	0.91	1.00	1.00	0.91	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)	5085	1583	1770	5085	1770	1583
Flt Permitted	1.00	1.00	0.15	1.00	0.95	1.00
Satd. Flow (perm)	5085	1583	275	5085	1770	1583
Peak-hour factor, PHF	0.96	0.91	0.94	0.91	0.92	0.91
Adj. Flow (vph)	1216	658	230	1599	515	615
RTOR Reduction (vph)	0	333	0	0	0	12
Lane Group Flow (vph)	1216	325	230	1599	515	603
Turn Type	NA	Perm	D.P+P	NA	NA	pm+ov
Protected Phases	6		5	2	4	5
Permitted Phases		6	6			4
Actuated Green, G (s)	61.5	61.5	81.8	86.5	42.5	62.8
Effective Green, g (s)	61.5	61.5	81.8	86.5	42.5	62.8
Actuated g/C Ratio	0.44	0.44	0.58	0.62	0.30	0.45
Clearance Time (s)	5.8	5.8	4.7	5.8	5.2	4.7
Vehicle Extension (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lane Grp Cap (vph)	2233	695	377	3141	537	763
v/s Ratio Prot	0.24		0.09	0.31	c0.29	c0.11
v/s Ratio Perm		0.21	c0.27			0.27
v/c Ratio	0.54	0.47	0.61	0.51	0.96	0.79
Uniform Delay, d1	28.9	27.7	34.7	14.9	47.9	33.0
Progression Factor	0.59	1.17	0.56	0.22	1.00	1.00
Incremental Delay, d2	0.6	1.4	1.5	0.4	28.2	5.2
Delay (s)	17.5	33.8	20.9	3.7	76.1	38.2
Level of Service	B	C	C	A	E	D
Approach Delay (s)	23.2			5.8	55.5	
Approach LOS	C			A	E	

Intersection Summary			
HCM 2000 Control Delay	24.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.7
Intersection Capacity Utilization	73.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			