

EXHIBIT (C) - TRAFFIC IMPACT ANALYSIS

PART 4 OF 4

HCM Signalized Intersection Capacity Analysis
 13: Micron & 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)	408	1426	30	20	1947	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	5.7	5.0	5.1	5.1	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	1.00	1.00	0.85
Flt. Projected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Satd. Flow (P/H)	1770	5085	1583	1770	5072	1770	1620	1770	1587	1587	1587	1587
Flt. Permitted	0.10	1.00	1.00	0.13	1.00	0.31	1.00	0.63	1.00	0.63	1.00	0.63
Satd. Flow (Perm)	186	5085	1583	236	5072	560	1620	1181	1587	1587	1587	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	1487	21	237	25	171	81	4	322
RTOR Reduction (vph)	0	0	15	0	1	0	0	58	0	0	0	292
Lane Group Flow (vph)	431	1550	28	37	1523	0	237	139	0	81	34	0
Turn Type	D,P,P	NA	Perm	D,P,P	NA	D,P,P	NA	Perm	NA	NA	NA	NA
Prohibited Phases	1	6	6	5	2	7	4	8	8	8	8	8
Permitted Phases	2	6	6	6	6	6	6	6	6	6	6	6
Actuated Green, G (s)	96.3	92.6	92.6	96.3	70.1	23.1	28.1	13.1	13.1	13.1	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	13.1	13.1	13.1
Actuated p/C Ratio	0.68	0.66	0.66	0.68	0.50	0.17	0.20	0.09	0.09	0.09	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	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	1.0	1.0	1.0
Lane Grp Cap (vph)	424	3363	1047	202	2539	178	325	110	148	110	148	148
vs Ratio Prod.	0.019	0.30	0.00	0.30	0.09	0.09	0.09	0.02	0.02	0.02	0.02	0.02
vs Ratio Perm	0.51	0.02	0.02	0.12	0.12	0.12	0.12	0.07	0.07	0.07	0.07	0.07
v/c Ratio	1.02	0.46	0.03	0.18	0.69	0.12	0.12	0.07	0.07	0.07	0.07	0.07
Uniform Delay, d1	36.1	11.5	8.2	8.0	24.9	56.6	48.9	61.8	58.8	61.8	58.8	58.8
Progression Factor	0.74	0.69	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	44.0	0.4	0.0	0.2	1.1	179.2	0.3	19.6	0.3	19.6	0.3	0.3
Delay (s)	70.8	8.4	8.2	8.2	26.0	235.9	49.2	81.4	59.1	81.4	59.1	59.1
Level of Service	E	A	A	A	C	F	D	F	D	F	E	E
Approach Delay (s)	21.7	25.6	25.6	25.6	25.6	25.6	25.6	25.6	25.6	25.6	25.6	25.6
Approach LOS	C	C	C	C	C	C	C	C	C	C	C	C
Intersection Summary												
HCM 2000 Control Delay	39.6 HCM 2000 Level of Service D											
HCM 2000 Volume to Capacity ratio	1.07											
Actuated Cycle Length (s)	140.0											
Intersection Capacity Utilization	92.2%											
Analysis Period (min)	15											
Critical Lane Group	F											

EXHIBIT (C) - TRAFFIC IMPACT ANALYSIS
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EXHIBIT (C) - TRAFFIC IMPACT ANALYSIS

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HCM Signalized Intersection Capacity Analysis

1: Military Dr & IH-410 NB Frnt Rd

HCM Signalized Intersection Capacity Analysis

2: Military Dr & IH-410 SB Frnt Rd

Scenario 2 AM-2023
2/5/2014

Scenario 2 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	341	821	698	1418	0	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	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Flt. Protected	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt. Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00
Satd. Flow (vphpl)	1610	3376	1610	3376	1610	3376	1610	3376	1610	3376	1610	3376
Satd. Flow (norm)	1610	3376	1610	3376	1610	3376	1610	3376	1610	3376	1610	3376
Peak-hour factor, PHF	0.89	0.81	0.57	1.00	1.00	1.00	0.86	0.86	0.86	0.88	0.91	1.00
Adj. Flow (vph)	176	1525	39	0	0	0	397	955	793	1558	0	0
RTOR Reduction (vph)	0	1	0	0	0	0	41	0	0	0	0	0
Lane Group Flow (vph)	158	1583	0	0	0	0	1311	0	650	1701	0	0
Turn Type	Split	NA	NA	Split	NA	NA	Split	NA	NA	Split	NA	NA
Protected Phases	8-16	8-16	6	5	6	5	5	6	5	5	6	5
Permitted Phases												
Actuated Green, G (s)	32.9	32.9	24.9	66.9	68.9	68.9	68.9	68.9	68.9	68.9	68.9	68.9
Effective Green, g (s)	32.9	32.9	24.9	66.9	68.9	68.9	68.9	68.9	68.9	68.9	68.9	68.9
Actuated g/C Ratio	0.28	0.28	0.21	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58
Clearance Time (s)	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	448	941	959	657	1629	657	1629	657	1629	657	1629	657
v/s Ratio Prot.	0.10	0.47	0.29	0.37	0.38	0.38	0.37	0.38	0.38	0.37	0.38	0.38
v/s Ratio Perm.	0.35	1.66	2.51	0.99	1.04	1.04	0.99	1.04	1.04	0.99	1.04	1.04
Uniform Delay, d1	34.0	42.5	46.5	30.3	24.5	24.5	30.3	24.5	24.5	30.3	24.5	24.5
Progression Factor	1.00	1.00	1.00	1.00	1.07	1.07	1.00	1.07	1.07	1.00	1.07	1.07
Incremental Delay, d2	2.2	310.5	171.9	8.2	22.0	22.0	8.2	22.0	22.0	8.2	22.0	22.0
Delay (s)	D	F	F	F	C	C	F	C	C	F	D	D
Level of Service	D	F	F	F	C	C	F	C	C	F	D	D
Approach Delay (s)	324.3	0.0	0.0	218.4	41.7	41.7	218.4	41.7	41.7	218.4	41.7	41.7
Approach LOS	F	A	A	F	F	F	F	F	F	F	F	F
Intersection Summary												
HCM 2000 Control Delay												F
HCM 2000 Volume to Capacity ratio												1.41
Actuated Cycle Length (s)												118.0
Intersection Capacity Utilization												127.3%
Analysis Period (min)												15
of Dequeue Right Lane: Record with 1 though lane as a right lane.												15
c Critical Lane Group												15

EXHIBIT (C) - TRAFFIC IMPACT ANALYSIS

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HCM Unsignalized Intersection Capacity Analysis

3: IH-410 SB Frnt Rd & Richland Hills

HCM Signalized Intersection Capacity Analysis

4: Military Dr & Walmart/Sony Pl

Scenario 2 AM-2023
2/5/2014

Scenario 2 AM-2023
2/5/2014

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	0	0	2736	215	0	299
Volume (veh/h)	0	0	Free	Free	0	Stop
Sign Control			0%	0%		0%
Grade			1.00	1.00	0.70	1.00
Peak Hour Factor			0.81	0.81	0.81	0.81
Hourly flow rate (veh/h)			3181	307	0	369
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn lane (veh)						
Median Type			None	None		
Median storage (veh)						
Upstream signal (ft)						
PX platoon unblocked						
VC conflicting volume	3489				3335	1214
VC1, stage 1 cont vol						
VC2, stage 2 cont vol	3489				3335	1214
VCU, unblocked vol					6.8	6.9
IC, single (s)	4.1					
IC, 2 stage (s)						
pl queue free %	22		3.9		3.3	
pl queue free %	100		100		100	
pl capacity (veh/h)	71		6		174	
Direction Lane #	WB1	WB2	WB3	SB1	SB2	SB3
Volumes Total	1273	1273	943	369		
Volume Left	0	0	0	0		
Volume Right	0	0	307	369		
cSH	1700	1700	1700	174		
Volume to Capacity	0.75	0.75	0.55	2.13		
Queue Length 95th (ft)	0	0	0	730		
Control Delay (s)	0.0	0.0	0.0	569.4		
Lane LOS	F	F	F	F		
Approach Delay (s)	0.0		569.4			
Approach LOS			F			
Intersection Summary						
Average Delay	54.5					
Intersection Capacity Utilization	82.8%					
Analysis Period (min)	15					
Level of Service	E					

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	4	4	4	4	4	4
Volume (veh/h)	48	0	1900	1900	1900	1900
Ideal Flow (veh/h)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.7	5.2	5.0	5.9	5.9	5.9
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	0.95
Flt Protected	1.00	1.00	1.00	1.00	1.00	0.99
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	1770	3539	1770	3503
Satd. Flow (perm)	1770	1583	1770	3539	1770	3503
Peak-hour factor, PHF	1.00	1.00	0.82	0.82	1.00	0.88
Adj. Flow (veh/h)	48	0	2288	2288	1900	1672
RTOR Reduction (veh/h)	0	0	0	0	0	0
Lane Group Flow (veh/h)	48	0	2288	2288	1900	1672
Turn Type	custom	custom	perm	perm	NA	NA
Protected Phases	7	4	8	5	2	6
Permitted Phases	4	8	2	2	6	6
Actuated Green, G (s)	3.9	3.4	41.5	41.5	34.7	34.7
Effective Green, g (s)	3.9	3.4	41.5	41.5	34.7	34.7
Actuated g/C Ratio	0.07	0.08	0.74	0.74	0.62	0.62
Clearance Time (s)	4.7	5.2	5.0	5.9	5.9	5.9
Vehicle Extension (s)	1.0	1.0	1.0	2.5	2.5	2.5
Lane Grp Cap (veh/h)	123	96	288	2822	2170	2170
v/c Ratio Prot	0.03	0.00	0.00	0.07	0.03	0.03
v/c Ratio Perm	0.39	0.03	0.09	0.32	0.55	0.55
Uniform Delay, d1	24.9	24.7	2.9	2.5	6.1	6.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.7	0.0	0.1	0.1	0.2	0.2
Delay (s)	25.7	24.7	3.0	2.5	6.3	6.3
Level of Service	C	C	A	A	A	A
Approach Delay (s)	25.2		0.0	2.5	8.3	8.3
Approach LOS	C		A	A	A	A
Intersection Summary						
HCM 2000 Control Delay	5.6					
HCM 2000 Volume to Capacity ratio	0.83					
Actuated Cycle Length (s)	56.0					
Intersection Capacity Utilization	43.1%					
Analysis Period (min)	15					
Level of Service	B					

EXHIBIT (C) - TRAFFIC IMPACT ANALYSIS

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

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

Scenario 2 AM-2023
 2/5/2014

Scenario 2 AM-2023
 2/5/2014

Movement	EBL	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBL	SBR	SBR
Lane Configurations	4	4	4	4	4	4	4	4	4	4	4
Volume (vph)	352	620	0	460	39	1900	1900	1900	1900	1900	1900
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4
Lane Util. Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Flt	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt Protected	0.95	0.99	0.95	0.99	0.95	0.99	0.95	0.99	0.95	0.99	0.95
Satd. Flow (prot)	1610	3364	1610	3364	1610	3364	1610	3364	1610	3364	1610
Flt Permitted	0.13	0.52	0.13	0.52	0.13	0.52	0.13	0.52	0.13	0.52	0.13
Satd. Flow (perm)	220	1759	220	1759	220	1759	220	1759	220	1759	220
Peak-hour factor, PHF	0.78	0.83	0.78	0.83	0.78	0.83	0.78	0.83	0.78	0.83	0.78
Adj. Flow (vph)	451	747	0	554	59	388	686	353	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	316	862	0	607	0	347	725	221	0	0	0
Turn Type	pm+pl	NA	NA	NA	NA	Split	NA	Perm	NA	NA	Perm
Permitted Phases	5	5,6	6	6	6	8,16	8,16	8,16	8,16	8,16	8,16
Actuated Green, G (s)	84.4	84.4	30.8	30.8	53.0	53.0	53.0	53.0	53.0	53.0	53.0
Effective Green, g (s)	84.4	84.4	30.8	30.8	53.0	53.0	53.0	53.0	53.0	53.0	53.0
Actuated g/C Ratio	0.95	0.55	0.20	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34
Clearance Time (s)	6.4	6.4	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	605	1524	688	688	554	1165	545	545	545	545	545
v/s Ratio Prot	0.10	0.12	0.17	0.17	0.22	0.21	0.21	0.21	0.21	0.21	0.21
v/s Ratio Perm	0.10	0.12	0.17	0.17	0.22	0.21	0.21	0.21	0.21	0.21	0.21
v/c Ratio	0.52	0.58	0.87	0.87	0.63	0.62	0.40	0.40	0.40	0.40	0.40
Uniform Delay, d1	27.3	22.9	59.6	59.6	42.1	42.0	38.4	38.4	38.4	38.4	38.4
Progression Factor	0.33	0.67	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	0.0	11.4	11.4	5.3	2.5	2.2	2.2	2.2	2.2	2.2
Delay (s)	9.1	15.3	71.0	71.0	47.4	44.6	40.6	40.6	40.6	40.6	40.6
Level of Service	A	B	E	E	D	D	D	D	D	D	D
Approach Delay (s)	13.8	71.0	44.3	44.3	44.3	44.3	44.3	44.3	44.3	44.3	44.3
Approach LOS	B	E	D	D	D	D	D	D	D	D	D
Intersection Summary											
HCM 2000 Control Delay	38.1										
HCM 2000 Volume to Capacity ratio	0.69										
Actuated Cycle Length (s)	153.8										
Intersection Capacity Utilization	80.0%										
Analysis Period (min)	15										
c. Critical Lane Group											

Movement	EBL	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBL	SBR	SBR
Lane Configurations	4	4	4	4	4	4	4	4	4	4	4
Volume (vph)	886	770	477	291	0	0	119	1032	198	1900	1900
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lane Util. Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Flt	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt Protected	0.95	0.98	0.95	0.98	0.95	0.98	0.95	0.98	0.95	0.98	0.95
Satd. Flow (prot)	3274	1610	3324	1610	3388	1610	3388	1610	3388	1610	3388
Flt Permitted	1.00	0.16	0.61	0.61	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Satd. Flow (perm)	3274	271	2051	2051	1610	3388	1610	3388	1610	3388	1610
Peak-hour factor, PHF	0.85	0.74	0.95	0.77	1.00	1.00	1.00	0.72	0.91	0.61	0.61
Adj. Flow (vph)	1042	1041	502	378	0	0	0	165	1134	325	325
RTOR Reduction (vph)	0	117	0	0	0	0	0	0	0	0	107
Lane Group Flow (vph)	1966	0	251	620	0	0	0	148	1151	218	218
Turn Type	NA	NA	pm+pl	NA	NA	Split	NA	Perm	NA	NA	Perm
Permitted Phases	2	2	1,2	2	2	4,12	4,12	4,12	4,12	4,12	4,12
Actuated Green, G (s)	25.0	85.3	85.3	85.3	53.0	53.0	53.0	53.0	53.0	53.0	53.0
Effective Green, g (s)	25.0	85.3	85.3	85.3	53.0	53.0	53.0	53.0	53.0	53.0	53.0
Actuated g/C Ratio	0.16	0.55	0.55	0.55	0.34	0.34	0.34	0.34	0.34	0.34	0.34
Clearance Time (s)	5.0	5.5	5.5	5.5	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	532	675	1636	675	554	1167	545	545	545	545	545
v/s Ratio Prot	0.60	0.15	0.15	0.15	0.09	0.34	0.14	0.14	0.14	0.14	0.14
v/s Ratio Perm	0.60	0.15	0.15	0.15	0.09	0.34	0.14	0.14	0.14	0.14	0.14
v/c Ratio	0.37	0.38	0.38	0.38	0.27	0.99	0.40	0.40	0.40	0.40	0.40
Uniform Delay, d1	64.4	19.8	19.4	19.4	36.4	50.0	38.3	38.3	38.3	38.3	38.3
Progression Factor	1.00	0.10	0.14	0.14	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	121.4	0.2	0.1	0.1	1.2	23.3	2.2	2.2	2.2	2.2	2.2
Delay (s)	1281.8	2.2	2.7	2.7	37.6	73.3	40.5	40.5	40.5	40.5	40.5
Level of Service	F	A	A	A	D	E	D	D	D	D	D
Approach Delay (s)	1281.8	2.6	2.6	2.6	0.0	0.0	63.5	63.5	63.5	63.5	63.5
Approach LOS	F	A	A	A	A	A	E	E	E	E	E
Intersection Summary											
HCM 2000 Control Delay	605.0										
HCM 2000 Volume to Capacity ratio	1.28										
Actuated Cycle Length (s)	153.8										
Intersection Capacity Utilization	80.0%										
Analysis Period (min)	15										
c. Critical Lane Group											

Synchro 7 Report 5:00 pm Baseline
 Page Dawson Engineers, Inc.

Synchro 7 Report 5:00 pm Baseline
 Page Dawson Engineers, Inc.

EXHIBIT (C) - TRAFFIC IMPACT ANALYSIS

PART 4 OF 4

Intersection has too many lanes per leg.
HCM A1-Way analysis is limited to two lanes per leg.
Channelized right turn lanes are not counted.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBR
Lane Configurations	←	←	←	←	←	←	←	←	←	←	←
Volume (vph)	0	1363	661	312	831	0	0	0	0	1050	509
1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost Time (s)	5.3	5.7	5.3	5.7	5.3	5.7	5.3	5.7	5.3	5.7	5.3
Lane Util. Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Flt Protected	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Flt Permitted	0.00	0.05	0.00	0.05	0.00	0.05	0.00	0.05	0.00	0.05	0.00
Satd. Flow (Permi)	4825	4825	1610	3377	1610	3377	1610	3377	1610	3377	1610
Peak-hour factor, PHF	1.00	0.96	0.80	0.86	1.00	0.86	1.00	0.86	1.00	0.86	1.00
Adj. Flow (vph)	0	1420	734	390	966	0	0	0	0	1154	592
RTOR Reduction (vph)	0	64	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	2090	0	308	1048	0	0	0	0	577	169
Turn Type	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA
Protected Phases	6	5	6.5	5	6.5	6	5	6.5	5	6.5	6
Permitted Phases	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
Actuated Green, G (s)	48.7	75.7	75.7	75.7	75.7	48.7	75.7	75.7	75.7	75.7	48.7
Effective Green, g (s)	48.7	75.7	75.7	75.7	75.7	48.7	75.7	75.7	75.7	75.7	48.7
Actuated g/C Ratio	0.41	0.63	0.63	0.63	0.63	0.41	0.63	0.63	0.63	0.63	0.41
Clearance Time (s)	5.3	5.7	5.7	5.7	5.7	5.3	5.7	5.7	5.7	5.7	5.3
Vehicle Extension (s)	2.5	1.0	1.0	1.0	1.0	2.5	1.0	1.0	1.0	1.0	2.5
Lane Grp Cap (vph)	1968	418	1485	418	1485	1968	418	1485	418	1485	1968
v/s Ratio Pref	0.43	0.17	0.16	0.17	0.16	0.43	0.17	0.16	0.17	0.16	0.43
v/s Ratio Perm	0.30	0.29	0.29	0.29	0.29	0.30	0.29	0.29	0.29	0.29	0.30
v/c Ratio	1.07	0.74	0.71	0.74	0.71	1.07	0.74	0.71	0.74	0.71	1.07
Uniform Delay, d1	35.6	32.5	14.7	32.5	14.7	35.6	32.5	14.7	32.5	14.7	35.6
Progression Factor, p	1.00	0.82	0.66	0.82	0.66	1.00	0.82	0.66	0.82	0.66	1.00
Incremental Delay, d2	41.2	0.5	0.1	0.5	0.1	41.2	0.5	0.1	0.5	0.1	41.2
Delay (s)	76.8	27.3	9.8	27.3	9.8	76.8	27.3	9.8	27.3	9.8	76.8
Level of Service	E	C	A	C	A	E	C	A	C	A	E
Approach Delay (s)	76.8	13.8	13.8	13.8	13.8	76.8	13.8	13.8	13.8	13.8	76.8
Approach LOS	E	B	B	B	B	E	B	B	B	B	E
Intersection Summary											
HCM 2000 Control Delay	134.7										
HCM 2000 Volume to Capacity ratio	1.20										
Actuated Cycle Length (s)	120.0										
Intersection Capacity Utilization	116.8%										
Analysis Period (min)	15										
Critical Lane Group	E										

EXHIBIT (C) - TRAFFIC IMPACT ANALYSIS

PART 4 OF 4

Scenario 2 AM-2023
2/5/2014

HCM 2010 AWSC
7: Richland Hills & Ingram Rd

Intersection	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Intersection Delay, sveh	215	384	112	74	180	12	28	51	30	52	257	304
Intersection LOS	E	E	E	E	E	E	E	E	E	E	E	E
Management	215	384	112	74	180	12	28	51	30	52	257	304
Vol. Vch/ln	0.88	0.89	0.59	0.88	0.77	0.45	0.59	0.81	0.40	0.75	0.83	0.85
Peak Hour Factor	2	2	2	2	2	2	2	2	2	2	2	2
Heavy Vehicles, %	244	431	190	84	234	27	47	63	75	69	310	358
Mgmt Flow	1	2	0	1	2	0	1	2	0	1	2	0
Number of Lanes												

Approach	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Opposing Approach	WB	EB										
Opposing Lanes	3	3	3	3	3	3	3	3	3	3	3	3
Conflicting Approach Left	SB	NB										
Conflicting Lanes Left	3	3	3	3	3	3	3	3	3	3	3	3
Conflicting Approach Right	NB	SB										
Conflicting Lanes Right	3	3	3	3	3	3	3	3	3	3	3	3
HCM Control Delay	34.7	19.5	16.8	16.8	34.7	19.5	16.8	16.8	34.7	19.5	16.8	16.8
HCM LOS	D	C	C	C	D	C	C	C	D	C	C	C

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%
Vol Thru, %	0%	100%	36%	0%	100%	53%	0%	100%	83%	0%	100%	100%
Vol Right, %	0%	0%	64%	0%	0%	47%	0%	0%	17%	0%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	28	34	47	215	256	240	74	120	72	52	171	171
LT Vol	0	34	17	0	256	128	0	120	60	0	171	171
Through Vol	28	0	0	30	0	0	112	0	0	12	0	0
RT Vol	0	0	0	215	0	0	74	0	0	52	0	0
Lane Flow Rate	47	42	96	244	288	334	84	156	105	69	206	206
Geometry Grp	8	8	8	8	8	8	8	8	8	8	8	8
Degree of UI (X)	0.162	0.129	0.284	0.652	0.729	0.816	0.257	0.455	0.302	0.193	0.547	0.547
Departure Headway [ft/s]	11.56	11.075	10.641	9.612	9.125	8.808	11.002	10.518	10.406	10.035	9.535	9.535
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	311	324	338	376	397	414	327	343	346	358	378	378
Service Time	9.313	8.827	8.393	7.347	6.861	6.544	8.754	8.271	8.158	7.787	7.287	7.287
HCM Lane V/C Ratio	0.151	0.13	0.284	0.649	0.725	0.807	0.257	0.455	0.303	0.193	0.545	0.545
HCM Control Delay	16.4	15.5	17.6	28.7	32.9	40.6	17.5	21.8	17.6	15.2	23.3	23.3
HCM Lane LOS	C	C	C	D	D	E	C	C	C	C	C	C
HCM 98th-ile Q	0.5	0.4	1.1	4.4	5.7	7.4	1	2.3	1.2	0.7	3.2	3.2

Notes: - : Volume Exceeds Capacity; \$: Delay Exceeds 300 Seconds; Error: Computation Not Defined

EXHIBIT (C) - TRAFFIC IMPACT ANALYSIS

PART 4 OF 4

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

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	T T T T T T T T T T T T											
Volume (vph)	183	2035	241	102	583	77	64	120	178	266	308	268
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.7	5.3	4.7	5.8	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2
Lane Util. Factor	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00	1.00	1.00	0.95	0.95
Fit	1.00	0.97	1.00	0.98	1.00	0.98	1.00	1.00	1.00	0.95	0.95	0.95
Fit Protected	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00	0.95	0.95	0.95
Satd. Flow (vph)	1770	3439	1770	3484	1770	3484	1770	1863	1583	1583	3309	3309
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)	282	2366	548	185	785	91	142	174	274	340	321	319
RTOR Reduction (vph)	0	16	0	0	8	0	0	0	0	161	0	48
Lane Group Flow (vph)	282	2898	0	185	868	0	142	174	113	0	932	0
Turn Type	DP+P	NA	DP+P	NA	DP+P	NA	Split	NA	Perm	Split	NA	NA
Protected Phases	1	6	2	5	2	4	4	4	3	3	3	3
Permitted Phases	2	6	6	6	6	6	6	6	4	4	4	4
Actuated Green, G (s)	59.5	49.6	59.5	49.2	59.5	49.2	11.8	11.8	11.8	11.8	27.8	27.8
Effective Green, g (s)	59.5	49.6	59.5	49.2	59.5	49.2	11.8	11.8	11.8	11.8	27.8	27.8
Actuated g/C Ratio	0.50	0.41	0.50	0.41	0.50	0.41	0.10	0.10	0.10	0.10	0.23	0.23
Clearance Time (s)	4.7	5.8	4.7	5.8	4.7	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)	306	1421	208	1428	208	1428	174	183	155	155	766	766
v/s Ratio Prot	60.06	60.24	0.97	0.25	0.97	0.25	0.08	0.08	0.07	0.07	60.28	60.28
v/s Ratio Perm	0.38	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37
v/s Ratio	0.92	2.04	0.92	0.61	0.92	0.61	0.82	0.65	0.73	0.73	1.22	1.22
Uniform Delay, d1	22.7	35.2	31.9	27.8	31.9	27.8	53.0	53.8	52.5	46.1	46.1	46.1
Progression Factor	1.22	0.91	1.36	0.91	1.36	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	25.2	489.4	31.4	1.8	23.5	51.8	13.4	13.4	13.4	109.1	109.1	109.1
Delay (s)	53.0	501.6	74.8	27.0	76.6	105.6	66.9	66.9	66.9	155.2	155.2	155.2
Level of Service	D	F	F	E	C	E	F	F	E	F	F	F
Approach Delay (s)	462.0	35.4	80.2	35.4	80.2	35.4	80.2	35.4	80.2	35.4	80.2	35.4
Approach LOS	F	F	D	F	D	F	F	F	F	F	F	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	T T T T T T T T T T T T											
Volume (vph)	296	2073	0	646	288	490	458	109	0	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	0	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3
Lane Util. Factor	0.91	0.91	0	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Fit	1.00	1.00	0	0.94	1.00	1.00	0.85	1.00	1.00	1.00	1.00	1.00
Fit Protected	0.95	1.00	0	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00
Satd. Flow (vph)	1610	3387	0	4803	1610	3357	1583	1583	1583	1583	3309	3309
Peak-hour factor, PHF	0.85	0.93	1.00	0.95	0.72	0.88	0.67	0.73	1.00	1.00	1.00	1.00
Adj. Flow (vph)	455	2229	0	680	400	570	691	149	0	0	0	0
RTOR Reduction (vph)	0	0	0	89	0	0	0	125	0	0	0	0
Lane Group Flow (vph)	409	2225	0	991	0	405	846	24	0	0	0	0
Turn Type	pm-pt	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Protected Phases	1	2.1	2	2	2	2	4.12	4.12	4.12	4.12	4.12	4.12
Permitted Phases	2.1	4.12	4.12	4.12	4.12	4.12	4.12	4.12	4.12	4.12	4.12	4.12
Actuated Green, G (s)	83.7	83.7	20.7	20.7	20.7	19.0	19.0	19.0	19.0	19.0	19.0	19.0
Effective Green, g (s)	83.7	83.7	20.7	20.7	20.7	19.0	19.0	19.0	19.0	19.0	19.0	19.0
Actuated g/C Ratio	0.70	0.70	0.17	0.17	0.17	0.16	0.16	0.16	0.16	0.16	0.16	0.16
Clearance Time (s)	5.7	5.3	0	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3
Vehicle Extension (s)	1.0	1.0	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Lane Grp Cap (vph)	901	2326	828	254	531	250	250	250	250	250	250	250
v/s Ratio Prot	0.24	60.51	60.21	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
v/s Ratio Perm	0.08	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17
v/s Ratio	0.35	0.98	1.20	1.59	1.59	0.69	0.69	0.69	0.69	0.69	0.69	0.69
Uniform Delay, d1	10.6	17.3	49.6	50.5	50.5	43.1	43.1	43.1	43.1	43.1	43.1	43.1
Progression Factor	0.74	0.67	0.85	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.0	2.4	98.7	285.3	275.8	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Delay (s)	7.8	13.9	141.0	335.8	326.3	43.3	43.3	43.3	43.3	43.3	43.3	43.3
Level of Service	A	B	F	F	F	D	D	D	D	D	D	D
Approach Delay (s)	13.0	141.0	298.9	141.0	298.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Approach LOS	B	B	F	F	F	A	A	A	A	A	A	A

Intersection Summary

HCM 2000 Control Delay	294.1	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.57		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.9
Intersection Capacity Utilization	119.0%	ICU Level of Service	H
Analysis Period (min)	15		
Critical Lane Group			

Intersection Summary

HCM 2000 Control Delay	117.3	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	116.8%	ICU Level of Service	H
Analysis Period (min)	15		
Critical Lane Group			

EXHIBIT (C) - TRAFFIC IMPACT ANALYSIS

PART 4 OF 4

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

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

Scenario 2 AM-2023
 2/5/2014

Scenario 2 AM-2023
 2/5/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	1	1	1	1	1	1	1	1	1	1	1	1
Volume (veh/h)	5	2286	19	191	722	0	26	332	0	70	14	14
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Peak Hour Factor	1.00	0.88	0.58	0.63	0.80	1.00	0.25	1.00	0.66	1.00	1.00	1.00
Hourly flow rate (vph)	5	2000	33	303	902	0	4	26	386	0	70	14
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (feet)												
Median type												
Median storage (veh)												
Upstream Signal (ft)												
pK platoon unblocked												
vC, conflicting volume	902			2633			3733	4136	1316	3218	4152	451
vC1, stage 1 conf vol				2626			2626	2626		1509	1509	
vC2, stage 2 conf vol				1187			1187	1509		1709	2643	
vCu, unblocked vol	902			2633			3733	4136	1316	3218	4152	451
IC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
IC, 2-stage (s)							6.5	5.5		6.5	5.5	
IC (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			0			0	0	0	0	0	97
cM capacity (veh/h)	748			159			0	0	148	0	0	555
Direction Lane #	EB1	EB2	EB3	WB1	WB2	WB3	NB1	NB2	NB3	SB1	SB2	SB3
Volume Total	5	1733	899	303	602	301	4	17	395	0	47	37
Volume Left	5	0	0	303	0	0	4	0	0	0	0	0
Volume Right	0	0	0	0	0	0	0	0	0	0	0	0
cSH	749	1700	1700	159	1700	1700	0	0	386	0	1700	0
Volume to Capacity	0.01	1.02	0.53	1.51	0.35	0.18	Err	Err	0.00	Err	0.00	Err
Queue Length 95th (ft)	1	0	0	575	0	0	Err	Err	0	Err	0	Err
Control Delay (s)	9.8	0.0	0.0	479.8	0.0	0.0	Err	Err	0.0	Err	0.0	Err
Lane LOS	A	F	F	F	F	F	F	F	F	A	F	F
Approach Delay (s)	0.0			120.6			Err	Err	0.0	Err	0.0	Err
Approach LOS				F			F	F	F	A	F	F
Intersection Summary												
Average Delay	Err											
Intersection Capacity Utilization	85.9%											
Analysis Period (min)	15											
ICU Level of Service	F											

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	1	1	1	1	1	1	1	1	1	1	1	1
Volume (vph)	10	1669	893	317	516	75	161	175	372	36	289	71
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost (s)	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.95	0.95	0.95	0.95	0.95	0.95
Fit	1.00	0.94	1.00	1.00	0.92	1.00	0.92	0.99	0.99	1.00	0.97	1.00
Fit Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.99	0.99	1.00	0.97	1.00
Satd. Flow (vph)	1770	3335	1770	3489	3215	3215	3215	3215	3215	3428	3428	3428
Satd. Flow (perm)	0.30	1.00	1.00	0.68	1.00	1.00	0.68	1.00	1.00	0.99	0.99	1.00
Peak-hour factor, PHF	1.00	0.94	0.72	0.88	0.72	1.00	0.73	1.00	0.83	1.00	1.00	1.00
Adj. Flow (vph)	10	1568	1240	360	471	75	221	175	448	36	289	71
RTOR Reduction (vph)	0	79	0	0	0	0	0	0	148	0	0	15
Lane Group Flow (vph)	10	3149	0	360	766	0	0	696	0	0	381	0
Turn Type	Perm	NA	Perm	NA	Perm	NA	Split	NA	Split	NA	Split	NA
Protected Phases	6			2			4			4		8
Permitted Phases	6			2			4			4		8
Actuated Green, G (s)	69.3	69.3	69.3	69.3	69.3	69.3	18.2	18.2	18.2	69.3	69.3	16.9
Effective Green, g (s)	69.3	69.3	69.3	69.3	69.3	69.3	18.2	18.2	18.2	69.3	69.3	16.9
Actuated g/C Ratio	0.98	0.98	0.98	0.98	0.98	0.98	0.15	0.15	0.15	0.98	0.98	0.14
Clearance Time (s)	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8	4.0
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	3.0
Lane Grp Cap (vph)	326	1925	62	2014	487	62	2014	487	62	2014	487	30
v/s Ratio, Prot	0.02	0.94		0.23			0.23			0.23		0.11
v/s Ratio Perm	0.03	1.64		0.39			0.39			0.39		0.79
Uniform Delay, d1	10.9	25.4		13.8			50.9			50.9		49.8
Progression Factor	0.51	0.35		1.39			1.00			1.00		1.00
Incremental Delay, d2	0.0	286.2		2187.7			204.3			204.3		8.4
Delay (s)	5.5	295.2		2223.1			255.2			255.2		58.2
Level of Service	A	F		F			C			F		E
Approach Delay (s)	294.3			709.1			255.2			255.2		58.2
Approach LOS	F			F			F			F		E
Intersection Summary												
HCM 2000 Control Delay	356.7											
HCM 2000 Level of Service	F											
Actuated Cycle Length (s)	120.0											
Sum of lost time (s)	15.6											
Intersection Capacity Utilization	148.4%											
ICU Level of Service	H											
Analysis Period (min)	15											
Critical Lane Group	E											

EXHIBIT (C) - TRAFFIC IMPACT ANALYSIS

PART 4 OF 4

HCM Signalized Intersection Capacity Analysis

13: Micron & Potranco Rd

HCM Unsignalized Intersection Capacity Analysis

14: Micron & Ingram Rd

Scenario 2 AM-2023
2/5/2014

Scenario 2 AM-2023
2/5/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	4L	1R	5L	2R	4R	1L	1L	1R	1R	2R	5L	3R
Volume (vph)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Fit Protected	1.00	1.00	0.95	1.00	0.99	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Fit Permitted	0.95	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00
Satd. Flow (prot.)	1770	3539	1583	1770	3516	1770	1762	1770	1762	1770	1665	1665
Satd. Flow (perm)	685	3539	1583	144	3516	144	257	1762	1762	1319	1665	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)	94	1297	856	389	600	28	31	48	27	390	184	443
RTOR Reduction (vph)	0	0	224	0	0	0	0	0	17	0	0	66
Lane Group Flow (vph)	54	1297	432	389	626	0	31	58	0	390	351	6
Turn Type	D.P.P	NA	Perm	D.P.P	NA	D.P.P	NA	NA	NA	Perm	NA	NA
Protected Phases	1	6	6	5	2	2	7	4	4	8	8	8
Permitted Phases	2	6	6	6	6	6	8	8	8	8	8	8
Actuated Green, G (s)	67.9	51.7	51.7	67.9	63.7	32.5	36.5	36.5	29.0	29.0	29.0	29.0
Effective Green, g (s)	67.9	51.7	51.7	67.9	63.7	32.5	36.5	36.5	29.0	29.0	29.0	29.0
Actuated g/C Ratio	0.57	0.43	0.43	0.57	0.53	0.27	0.30	0.27	0.24	0.24	0.24	0.24
Clearance Time (s)	4.8	5.7	5.7	4.8	5.1	5.1	5.1	5.1	5.1	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	1.0	1.0	1.0
Lane Grp Cap (vph)	426	1824	682	300	1866	113	535	318	402	318	402	402
v/s Ratio Prot.	0.00	0.37	0.37	0.17	0.18	0.01	0.03	0.03	0.03	0.03	0.03	0.03
v/s Ratio Perm	0.07	0.27	0.27	0.15	0.15	0.07	0.07	0.07	0.07	0.07	0.07	0.07
v/s Ratio	0.13	0.85	0.83	1.30	0.34	0.27	0.11	0.11	0.11	0.11	0.11	0.11
Uniform Delay, d1	11.9	30.7	26.7	43.5	16.1	35.1	30.0	30.0	45.5	45.5	45.5	45.5
Progression Factor	1.02	0.75	0.90	1.00	1.00	1.00	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	0.0	126.6	192.6	192.6	192.6
Delay (s)	12.2	23.7	24.6	199.4	16.6	35.6	30.1	30.1	172.1	238.1	238.1	238.1
Level of Service	B	C	C	F	B	D	C	C	F	F	F	F
Approach Delay (s)	23.7	24.6	24.6	199.4	16.6	35.6	30.1	30.1	172.1	238.1	238.1	238.1
Approach LOS	C	C	C	F	F	F	C	C	F	F	F	F
Intersection Summary												
HCM 2000 Control Delay	85.7											
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											
Critical Lane Group	S											

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	1	1	1	1	1	1	1	1	1	1	1	1
Volume (vph)	106	106	106	106	106	106	106	106	106	106	106	106
Ideal Flow (vphpl)	106	106	106	106	106	106	106	106	106	106	106	106
Total Lost time (s)	0.25	1.00	1.00	0.70	0.25	0.74	0.25	0.66	0.66	0.98	0.89	0.25
Lane Util. Factor	0.25	1.00	1.00	0.70	0.25	0.74	0.25	0.66	0.66	0.98	0.89	0.25
Fit Protected	0	0	0	0	0	0	0	0	0	0	0	0
Fit Permitted	0	0	0	0	0	0	0	0	0	0	0	0
Satd. Flow (prot.)	0	0	0	0	0	0	0	0	0	0	0	0
Satd. Flow (perm)	0	0	0	0	0	0	0	0	0	0	0	0
Peak-hour factor, PHF	0.53	0.00	0.63	0.66	0.09	0.08	0.08	0.08	0.08	0.08	0.08	0.08
Adj. Flow (vph)	8.0	7.5	7.3	6.1	5.7	5.3	5.3	5.3	5.3	5.3	5.3	5.3
RTOR Reduction (vph)	0.07	0.00	0.30	0.26	0.32	1.12	1.12	1.12	1.12	1.12	1.12	1.12
Lane Group Flow (vph)	424	464	479	574	611	675	675	675	675	675	675	675
Turn Type	A	A	A	B	B	B	B	B	B	B	B	B
Protected Phases	1	1	1	1	1	1	1	1	1	1	1	1
Permitted Phases	1	1	1	1	1	1	1	1	1	1	1	1
Actuated Green, G (s)	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2
Effective Green, g (s)	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2
Actuated g/C Ratio	0.99	0.93	0.93	12.3	10.1	11.4	93.3	93.3	93.3	93.3	93.3	93.3
Clearance Time (s)	9.9	9.3	9.3	12.3	10.1	11.4	93.3	93.3	93.3	93.3	93.3	93.3
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)	9.9	9.3	9.3	12.3	10.1	11.4	93.3	93.3	93.3	93.3	93.3	93.3
v/s Ratio Prot.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
v/s Ratio Perm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
v/s Ratio	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay, d1	60.5	60.5	60.5	60.5	60.5	60.5	60.5	60.5	60.5	60.5	60.5	60.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Delay (s)	60.5	60.5	60.5	60.5	60.5	60.5	60.5	60.5	60.5	60.5	60.5	60.5
Level of Service	F	F	F	F	F	F	F	F	F	F	F	F
Approach Delay (s)	60.5	60.5	60.5	60.5	60.5	60.5	60.5	60.5	60.5	60.5	60.5	60.5
Approach LOS	F	F	F	F	F	F	F	F	F	F	F	F
Intersection Summary												
HCM 2000 Control Delay	60.5											
HCM 2000 Level of Service	F											
Actuated Cycle Length (s)	15											
Sum of lost time (s)	15											
Intersection Capacity Utilization	67.0%											
ICU Level of Service	C											
Analysis Period (min)	15											

EXHIBIT (C) - TRAFFIC IMPACT ANALYSIS

PART 4 OF 4

HCM Unsignalized Intersection Capacity Analysis

16: Military Dr & Reed Rd

HCM Signalized Intersection Capacity Analysis

17: Richland Hills & Military Dr

Scenario 2 AM-2023
2/5/2014

Scenario 2 AM-2023
2/5/2014

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	4	4	4	4	4	4
Volume (vph)	296	268	364	12	4	166
Sign Control	Free	Free	Stop	Stop	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.88	0.88	0.74	0.75	0.38	0.70
Hourly flow rate (vph)	344	305	492	16	11	237
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None	None	None	None	None	None
Median storage (veh)						
Upstream signal (ft)						
pX platoon unblocked	751					
vC conflicting volume	508					
vC1, stage 1 conf vol					1493	500
vC2, stage 2 conf vol						
vCu, unblocked vol	508				1493	500
IC, single (s)	4.1				6.4	6.2
IC, 2 stage (s)						
IF (s)	2.2				3.5	3.3
pl queue free %	67				89	58
ch capacity (veh/h)	1057				92	571
Direction Lane	EBL	EBT	WBT	WBR	SBL	SBR
Volume Total	649	508	11	237		
Volume Left	344	0	11	0		
Volume Right	0	16	0	237		
CSH	1057	1700	92	571		
Volume to Capacity	0.33	0.30	0.11	0.42		
Queue Length 95th (ft)	36	0	0	51		
Control Delay (s)	7.2	0.0	49.4	15.7		
Lane LOS	A	E	E	C		
Approach Delay (s)	7.2	0.0	17.1			
Approach LOS	C	C	C			
Intersection Summary						
Average Delay	6.3					
Intersection Capacity Utilization	63.7%					
Analysis Period (min)	15					

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	4	4	4	4	4	4
Volume (vph)	334	295	111	325	3	148
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.3	5.4	5.4	4.3	4.3	4.3
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
FF	0.94	1.00	0.86	1.00	0.97	1.00
Flt Protected	1.00	0.99	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1742	1836	1770	1603	1770	1816
Flt Permitted	1.00	0.50	0.66	1.00	0.50	1.00
Satd. Flow (perm)	1742	938	1223	1603	558	1816
Peak-hour factor, PHF	1.00	0.83	0.79	0.82	0.50	0.73
Adj. Flow (vph)	402	373	144	359	6	203
RTOR Reduction (vph)	0	19	0	0	0	239
Lane Group Flow (vph)	758	0	0	548	0	203
Turn Type	Perm	NA	pm-pt	NA	DP-p	NA
Projected Phases	6	5	2	7	4	8
Permitted Phases	6	2	2	8	4	4
Actuated Green, G (s)	58.8	58.7	17.1	13.4	17.0	6.9
Effective Green, g (s)	58.8	58.7	17.1	13.4	17.0	6.9
Actuated g/C Ratio	0.65	0.65	0.19	0.15	0.19	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)	1138	611	264	238	163	139
v/s Ratio Prot	0.43		0.08	0.04	0.01	0.05
v/s Ratio Perm	0.66		0.05		0.04	
Uniform Delay, d1	9.6	13.1	33.6	33.9	30.8	40.3
Progression Factor	1.17	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.1	15.4	5.5	0.2	0.3	6.1
Delay (s)	13.3	28.5	39.1	34.1	31.1	46.4
Level of Service	B	C	D	C	C	D
Approach Delay (s)	13.3	28.5	36.1		42.1	
Approach LOS	B	C	D		D	
Intersection Summary						
HCM 2000 Control Delay	25.4					
HCM 2000 Volume to Capacity Ratio	0.69					
Actuated Cycle Length (s)	90.0					
Intersection Capacity Utilization	90.7%					
Analysis Period (min)	15					
Critical Lane Group	E					

EXHIBIT (C) - TRAFFIC IMPACT ANALYSIS

PART 4 OF 4

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

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

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Volume (veh/h)	273	360	290	4	198	477
Sign Control	4					
Stop	Free					
Grade	0%					
Peak Hour Factor	0.65	0.70	0.74	0.74	0.76	0.85
Hourly flow rate (vph)	420	514	392	49	462	561
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)	None					
Median type	None					
Median storage (veh)	1086					
Upstream signal (ft)						
pX platoon unblocked						
vC1, conflicting volume	1375	542	823			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol	1375	542	823			
vCu, unblocked vol	6.4	6.2	4.1			
IC, 2 stage (s)						
IF (s)	3.5	3.3	2.2			
p0 queue free %	0	5	51			
cM capacity (veh/h)	82	540	807			
Direction/Lane #	EB1	EB2	NB1	NB2	SB1	SB2
Volume Total	420	514	441	823		
Volume Left	420	0	392	0		
Volume Right	0	514	0	561		
cSH	82	540	807	1700		
Volume to Capacity	S 10	0.95	0.48	0.48		
Queue Length 95th (ft)	Err	308	67	0		
Control Delay (s)	F	55.4	12.9	0.0		
Lane LOS	F	F	B	B		
Approach Delay (s)	4525.5	12.9		0.0		
Approach LOS	F	B		B		
Intersection Summary						
Average Delay	1926.3					
Intersection Capacity Utilization	82.9%					
ICU Level of Service	E					
Analysis Period (min)	15					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Volume (veh/h)	27	40	96	381	524	35
Sign Control	4					
Stop	Free					
Grade	0%					
Peak Hour Factor	0.42	0.47	0.68	0.78	0.94	0.50
Hourly flow rate (vph)	84	85	53	488	557	70
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)	None					
Median type	None					
Median storage (veh)						
Upstream signal (ft)						
pX platoon unblocked						
vC, conflicting volume	1187	592	627			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol	1187	592	627			
vCu, unblocked vol	6.4	6.2	4.1			
IC, single (s)						
IC, 2 stage (s)						
IF (s)	3.5	3.3	2.2			
p0 queue free %	67	83	94			
cM capacity (veh/h)	197	506	954			
Direction/Lane #	EB1	NB1	SB1			
Volume Total	149	541	627			
Volume Left	64	53	0			
Volume Right	85	0	70			
cSH	302	954	1700			
Volume to Capacity	0.50	0.06	0.37			
Queue Length 95th (ft)	65	4	0			
Control Delay (s)	26.1	1.5	0.0			
Lane LOS	D	A	A			
Approach Delay (s)	26.1	1.5	0.0			
Approach LOS	D	A	D			
Intersection Summary						
Average Delay	3.8					
Intersection Capacity Utilization	80.5%					
ICU Level of Service	B					
Analysis Period (min)	15					

EXHIBIT (C) - TRAFFIC IMPACT ANALYSIS

PART 4 OF 4

HCM Signalized Intersection Capacity Analysis
 20: Military Dr & Earl Warren High School
 Scenario 2 AM-2023
 2/5/2014

Movement	EBL	EBT	WBL	WBT	SEBL	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	5.1	5.1	5.1
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Flt Protected	0.95	1.00	1.00	0.95	1.00	0.95
Satd. Flow (prot)	1770	1963	1583	1770	1583	1770
Satd. Flow (perm)	1770	1863	1583	1770	1583	1770
Peak-hour factor, PHF	0.93	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	93
Turn Type	Prot	NA	NA	Perm	NA	Perm
Protected Phases	1	0	2	0	8	0
Permitted Phases	4	0	0	0	8	0
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)	263	1486	1101	935	161	144
v/s Ratio Prot	0.11	60.61	6.33	0.03	60.05	0.01
v/s Ratio Perm	0.74	0.77	0.96	0.05	0.53	0.06
v/c Ratio	36.5	4.8	11.3	7.7	39.1	37.4
Uniform Delay, d1	1.09	0.46	0.95	1.08	1.00	1.00
Progression Factor	0.9	0.4	1.6	0.1	1.7	0.1
Incremental Delay, d2	40.7	2.5	12.3	8.4	40.8	37.5
Delay (s)	D	A	B	A	D	D
Level of Service	D	A	B	A	D	D
Approach Delay (s)	A	B	A	B	39.0	D
Approach LOS	A	B	A	B	D	D
Intersection Summary						
HCM 2000 Control Delay	12.0		0.78		HCM 2000 Level of Service	
HCM 2000 Volume to Capacity ratio	0.78		39.1		B	
Actuated Cycle Length (s)	90.0		14.9		Sum of lost time (s)	
Intersection Capacity Utilization	96.0%		15		ICU Level of Service	
Analysis Period (min)	15		15		E	
Critical Lane Group						

Synchro 7 Report 5:00 pm Baseline
 Pace-Dawson Engineers, Inc.
 Synchro 7 - Report
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HCM Signalized Intersection Capacity Analysis
 21: Hunt Ln & Military Dr
 Scenario 2 AM-2023
 2/5/2014

Movement	EBL	EBT	WBL	WBT	SEBL	SBR
Lane Configurations	↑	↑	↑	↑	↑	↑
Volume (vph)	103	516	82	203	234	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.7	5.0	5.8	5.2	5.6
Lane Util. Factor	1.00	0.98	1.00	0.91	1.00	0.95
Flt Protected	0.95	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1770	3451	1770	3214	1770	3381
Satd. Flow (perm)	1770	3451	1770	3214	1770	3381
Peak-hour factor, PHF	0.92	0.80	0.84	0.89	0.87	0.80
Adj. Flow (vph)	112	645	128	228	233	368
RTOR Reduction (vph)	0	18	0	0	283	0
Lane Group Flow (vph)	112	755	0	228	318	0
Turn Type	pm-pt	NA	pm-pt	NA	Prot	NA
Protected Phases	7	4	3	8	5	2
Permitted Phases	4	0	0	8	0	0
Actuated Green, G (s)	24.0	17.6	30.5	20.8	3.9	11.4
Effective Green, g (s)	24.0	17.6	30.5	20.8	3.9	11.4
Actuated g/C Ratio	0.27	0.20	0.34	0.23	0.04	0.13
Clearance Time (s)	5.0	5.7	5.0	5.8	5.2	5.6
Vehicle Extension (s)	1.0	2.5	1.0	2.0	1.0	2.5
Lane Grp Cap (vph)	230	674	273	742	76	425
v/s Ratio Prot	0.03	60.22	60.09	0.10	0.02	60.18
v/s Ratio Perm	0.09	0.19	0.64	0.43	0.50	1.41
v/c Ratio	26.0	36.2	24.4	29.5	42.1	39.3
Uniform Delay, d1	1.00	1.00	0.87	0.58	1.00	1.00
Progression Factor	0.6	72.8	17.5	0.1	1.9	187.1
Incremental Delay, d2	26.6	109.0	38.7	17.3	44.0	236.4
Delay (s)	C	F	D	B	D	F
Level of Service	C	F	D	B	D	F
Approach Delay (s)	F	F	C	C	F	F
Approach LOS	F	F	C	C	F	F
Intersection Summary						
HCM 2000 Control Delay	95.5		11.9		HCM 2000 Level of Service	
HCM 2000 Volume to Capacity ratio	11.9		90.0		F	
Actuated Cycle Length (s)	90.0		21.6		Sum of lost time (s)	
Intersection Capacity Utilization	87.8%		15		ICU Level of Service	
Analysis Period (min)	15		15		E	
Critical Lane Group						

Synchro 7 Report 5:00 pm Baseline
 Pace-Dawson Engineers, Inc.
 Synchro 7 - Report
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EXHIBIT (C) - TRAFFIC IMPACT ANALYSIS

PART 4 OF 4

HCM Signalized Intersection Capacity Analysis

22: SH 151 NB Frit Rd & Hunt Ln

HCM Signalized Intersection Capacity Analysis

23: SH 151 SB Frit Rd & Hunt Ln

Scenario 2 AM-2023
2/5/2014

Scenario 2 AM-2023
2/5/2014

Movement	EB	EBB	WB	WBL	WB	WBL	NB	NBL	NB	SBL	SBL
Lane Configurations	4T		4T		4T		4T		4T		4T
Volume (vph)	22	25	0	0	1379	51	53	654	392	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost Time (s)	5.3	5.3	5.3	5.3	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	0.95	0.95	1.00	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Fit Protected	1.00	1.00	1.00	0.85	1.00	0.94	1.00	1.00	1.00	1.00	1.00
Satd. Flow (prot)	3457	3457	3457	3539	3539	3539	3539	3539	3539	3539	3539
Peak-hour factor, PHF	0.57	0.58	1.00	0.80	0.75	0.96	0.73	0.69	0.89	1.00	1.00
Adj. Flow (vph)	39	43	0	0	1724	68	95	588	588	0	0
RTOR Reduction (vph)	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
Turn Type	Perm	NA	NA	Perm	Split	NA	Split	NA	NA	NA	NA
Protected Phases	6	6	6	6	8.16	8.16	8.16	8.16	8.16	8.16	8.16
Permitted Phases	6	6	6	6	6	6	6	6	6	6	6
Actuated Green, G (s)	34.7	34.7	34.7	34.7	74.6	74.6	74.6	74.6	74.6	74.6	74.6
Effective Green, g (s)	34.7	34.7	34.7	34.7	74.6	74.6	74.6	74.6	74.6	74.6	74.6
Actuated g/C Ratio	0.29	0.29	0.29	0.29	0.62	0.62	0.62	0.62	0.62	0.62	0.62
Clearance Time (s)	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	565	1025	458	1002	1988	1002	1988	1002	1988	1002	1988
v/s Ratio Prot.	0.04	0.04	0.04	0.04	0.05	0.05	0.05	0.05	0.05	0.05	0.05
v/s Ratio Perm	0.15	0.15	0.15	0.15	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Uniform Delay, d1	31.6	42.5	30.6	9.0	15.2	9.0	15.2	9.0	15.2	9.0	15.2
Progression Factor	0.87	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.5	311.1	0.2	0.0	1.2	0.0	1.2	0.0	1.2	0.0	1.2
Delay (s)	28.0	353.7	30.8	9.0	16.4	9.0	16.4	9.0	16.4	9.0	16.4
Level of Service	C	F	C	A	B	A	B	A	B	A	B
Approach Delay (s)	28.0	341.4	30.8	9.0	16.0	9.0	16.0	9.0	16.0	9.0	16.0
Approach LOS	C	F	C	A	B	A	B	A	B	A	B
Intersection Summary											
HCM 2000 Control Delay	186.2										
HCM 2000 Volume to Capacity Ratio	1.08										
Actuated Cycle Length (s)	119.8										
Intersection Capacity Utilization	89.0%										
Analysis Period (min)	15										
Critical Lane Group	6										

Movement	EB	EBB	WB	WBL	WB	WBL	NB	NBL	NB	SBL	SBL
Lane Configurations	4T		4T		4T		4T		4T		4T
Volume (vph)	1454	0	0	0	48	1564	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost Time (s)	5.2	5.2	5.2	5.2	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	0.97	1.00	1.00	1.00	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Fit Protected	0.95	1.00	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Satd. Flow (prot)	3433	3433	3433	3433	3433	3433	3433	3433	3433	3433	3433
Peak-hour factor, PHF	0.83	1.00	1.00	1.00	0.67	0.85	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1752	0	0	0	72	1840	0	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	1752	0	0	0	65	1847	0	0	0	0	0
Turn Type	NA	NA	NA	NA	Split	NA	Split	NA	NA	NA	NA
Protected Phases	1	1	1	1	4.12	4.12	4.12	4.12	4.12	4.12	4.12
Permitted Phases	1	1	1	1	1	1	1	1	1	1	1
Actuated Green, G (s)	62.6	62.6	62.6	62.6	46.8	46.8	46.8	46.8	46.8	46.8	46.8
Effective Green, g (s)	62.6	62.6	62.6	62.6	46.8	46.8	46.8	46.8	46.8	46.8	46.8
Actuated g/C Ratio	0.52	0.52	0.52	0.52	0.39	0.39	0.39	0.39	0.39	0.39	0.39
Clearance Time (s)	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1793	1793	1793	1793	628	1324	1793	1793	1793	1793	1793
v/s Ratio Prot.	0.51	0.51	0.51	0.51	0.04	0.04	0.04	0.04	0.04	0.04	0.04
v/s Ratio Perm	0.98	0.98	0.98	0.98	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Uniform Delay, d1	27.9	27.9	27.9	27.9	23.2	36.5	23.2	36.5	23.2	36.5	36.5
Progression Factor	0.72	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.9	0.1	0.1	0.1	182.4	0.1	182.4	0.1	182.4	0.1	182.4
Delay (s)	22.9	22.9	22.9	22.9	23.3	218.9	23.3	218.9	23.3	218.9	218.9
Level of Service	C	C	C	C	C	F	C	F	C	F	F
Approach Delay (s)	22.9	22.9	22.9	22.9	0.0	212.3	0.0	212.3	0.0	212.3	212.3
Approach LOS	C	C	C	C	A	F	A	F	A	F	F
Intersection Summary											
HCM 2000 Control Delay	121.7										
HCM 2000 Volume to Capacity Ratio	1.23										
Actuated Cycle Length (s)	119.8										
Intersection Capacity Utilization	85.0%										
Analysis Period (min)	15										
Critical Lane Group	6										

EXHIBIT (C) - TRAFFIC IMPACT ANALYSIS

PART 4 OF 4

HCM Signalized Intersection Capacity Analysis
 2: Military Dr & IH-410 SB Frnt Rd
 Scenario 2 PM-2023
 2/5/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SSR	
Lane Configurations	4T	4T	4T	4T	4T	4T	4T	4T	4T	4T	4T	4T	
Volume (vph)	192	246	58	0	0	0	992	895	713	1201	0	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	5.1	5.1	5.1	5.1	5.1	5.1	5.1	
Lane Util. Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	
Flt	1.00	0.97	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Flt Protected	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	
Satd. Flow (prot)	1610	3294	1610	4707	1610	3355	1610	3355	1610	3374	1610	3449	
Flt Permitted	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	
Satd. Flow (perm)	1610	3294	1610	4707	1610	3355	1610	3355	1610	3374	1610	3449	
Peak-hour factor, PHF	0.91	0.86	0.90	1.00	1.00	1.00	0.93	0.94	0.86	0.96	1.00	1.00	
Adj. Flow (vph)	167	266	64	0	0	0	970	952	829	1251	0	0	
RTOR Reduction (vph)	0	14	0	0	0	0	129	0	0	0	0	0	
Lane Group Flow (vph)	150	353	0	0	0	0	1793	0	505	1574	0	0	
Turn Type	Split	NA	NA	Split	NA	NA	pm-plt	NA	NA	NA	NA	NA	
Protected Phases	3.16	8.16	6	5	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	
Permitted Phases	32.9	32.9	32.9	24.9	68.9	68.9	68.9	68.9	68.9	68.9	68.9	68.9	
Actuated Green, G (s)	32.9	32.9	32.9	24.9	68.9	68.9	68.9	68.9	68.9	68.9	68.9	68.9	
Effective Green, g (s)	0.28	0.28	0.28	0.21	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	
Actuated g/C Ratio	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	
Clearance Time (s)	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	448	918	933	634	1597	1597	634	1597	634	1597	634	1597	
v/s Ratio Prot	0.09	0.11	0.11	0.15	0.20	0.20	0.15	0.20	0.15	0.20	0.15	0.20	
v/s Ratio Perm	0.33	0.38	0.38	0.42	0.57	0.57	0.42	0.57	0.42	0.57	0.42	0.57	
Uniform Delay, d1	33.8	34.4	34.4	46.5	24.5	23.1	46.5	24.5	46.5	24.5	46.5	24.5	
Progression Factor	1.00	1.00	1.00	1.00	0.47	0.67	1.00	0.47	1.00	0.67	1.00	0.67	
Incremental Delay, d2	2.0	1.2	1.2	366.4	0.5	1.8	366.4	0.5	360.1	450.2	0.0	485.6	
Delay (s)	35.9	35.6	35.6	412.9	12.0	17.2	412.9	12.0	401.6	491.8	4.2	532.1	
Level of Service	D	D	D	F	F	F	F	F	F	F	A	F	
Approach Delay (s)	35.7	35.7	35.7	412.9	12.0	17.2	412.9	12.0	401.6	491.8	4.2	532.1	
Approach LOS	D	D	D	F	F	F	F	F	F	F	A	F	
Intersection Summary													
HCM 2000 Control Delay	187.0											HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.04												
Actuated Cycle Length (s)	118.0											Sum of lost time (s)	22.2
Intersection Capacity Utilization	141.7%											ICU Level of Service	H
Analysis Period (min)	15												
d1 - Detour Right Lane - Recode with 1 through lane as a right lane.													
c - Critical Lane Group													

Synchro 7 Report 5:00 pm Baseline
 Page-Dawson Engineers, Inc.
 Synchro 7 - Report Page 2

HCM Signalized Intersection Capacity Analysis
 1: Military Dr & IH-410 NB Frnt Rd
 Scenario 2 PM-2023
 2/5/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SSR	
Lane Configurations	4T	4T	4T	4T	4T	4T	4T	4T	4T	4T	4T	4T	
Volume (vph)	192	246	58	0	0	0	992	895	713	1201	0	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	5.1	5.1	5.1	5.1	5.1	5.1	5.1	
Lane Util. Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	
Flt	1.00	0.97	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Flt Protected	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	
Satd. Flow (prot)	1610	3294	1610	4707	1610	3355	1610	3355	1610	3374	1610	3449	
Flt Permitted	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	
Satd. Flow (perm)	1610	3294	1610	4707	1610	3355	1610	3355	1610	3374	1610	3449	
Peak-hour factor, PHF	0.91	0.86	0.90	1.00	1.00	1.00	0.93	0.94	0.86	0.96	1.00	1.00	
Adj. Flow (vph)	167	266	64	0	0	0	970	952	829	1251	0	0	
RTOR Reduction (vph)	0	14	0	0	0	0	129	0	0	0	0	0	
Lane Group Flow (vph)	150	353	0	0	0	0	1793	0	505	1574	0	0	
Turn Type	Split	NA	NA	Split	NA	NA	pm-plt	NA	NA	NA	NA	NA	
Protected Phases	3.16	8.16	6	5	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	
Permitted Phases	32.9	32.9	32.9	24.9	68.9	68.9	68.9	68.9	68.9	68.9	68.9	68.9	
Actuated Green, G (s)	32.9	32.9	32.9	24.9	68.9	68.9	68.9	68.9	68.9	68.9	68.9	68.9	
Effective Green, g (s)	0.28	0.28	0.28	0.21	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	
Actuated g/C Ratio	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	
Clearance Time (s)	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	448	918	933	634	1597	1597	634	1597	634	1597	634	1597	
v/s Ratio Prot	0.09	0.11	0.11	0.15	0.20	0.20	0.15	0.20	0.15	0.20	0.15	0.20	
v/s Ratio Perm	0.33	0.38	0.38	0.42	0.57	0.57	0.42	0.57	0.42	0.57	0.42	0.57	
Uniform Delay, d1	33.8	34.4	34.4	46.5	24.5	23.1	46.5	24.5	46.5	24.5	46.5	24.5	
Progression Factor	1.00	1.00	1.00	1.00	0.47	0.67	1.00	0.47	1.00	0.67	1.00	0.67	
Incremental Delay, d2	2.0	1.2	1.2	366.4	0.5	1.8	366.4	0.5	360.1	450.2	0.0	485.6	
Delay (s)	35.9	35.6	35.6	412.9	12.0	17.2	412.9	12.0	401.6	491.8	4.2	532.1	
Level of Service	D	D	D	F	F	F	F	F	F	F	A	F	
Approach Delay (s)	35.7	35.7	35.7	412.9	12.0	17.2	412.9	12.0	401.6	491.8	4.2	532.1	
Approach LOS	D	D	D	F	F	F	F	F	F	F	A	F	
Intersection Summary													
HCM 2000 Control Delay	187.0											HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.04												
Actuated Cycle Length (s)	118.0											Sum of lost time (s)	22.2
Intersection Capacity Utilization	141.7%											ICU Level of Service	H
Analysis Period (min)	15												
d1 - Detour Right Lane - Recode with 1 through lane as a right lane.													
c - Critical Lane Group													

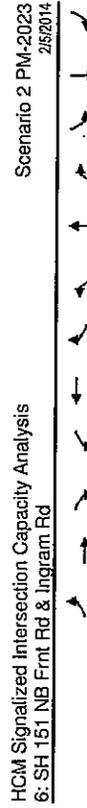
Synchro 7 Report 5:00 pm Baseline
 Page-Dawson Engineers, Inc.
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EXHIBIT (C) - TRAFFIC IMPACT ANALYSIS

PART 4 OF 4

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

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBR		
Lane Configurations	4	4	4	4	4	4	4	4	4	4	4		
Volumes (vph)	397	663	0	0	889	245	1006	1658	331	0	0		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900		
Total Lost time (s)	5.4	6.4	0	0	5.0	6.4	6.4	6.4	6.4	0	0		
Lane Util. Factor	0.91	0.91	0	0	0.95	0.91	0.91	0.91	0.91	0	0		
Flt. Protected	1.00	1.00	0	0	0.97	1.00	1.00	1.00	0.85	0	0		
Flt. Permitted	0.95	0.99	0	0	1.00	0.95	1.00	1.00	1.00	0	0		
Satd. Flow (pc/m)	1610	3354	0	0	3418	1610	3374	5883	1583	0	0		
Satd. Flow (pc/m)	219	1847	0	0	3418	1610	3374	5883	1583	0	0		
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		
Adj. Flow (vph)	503	737	0	0	926	275	1118	1784	368	0	0		
RTOR Reduction (vph)	0	0	0	0	18	0	0	0	85	0	0		
Lane Group Flow (vph)	302	338	0	0	1183	0	928	1954	283	0	0		
Turn Type	pm+pl	NA	NA	NA	NA	Split	NA	NA	Perm	NA	NA		
Protected Phases	5	5.6	0	0	6	8.16	8.16	8.16	8.16	0	0		
Permitted Phases	5.6	5.6	0	0	6	8.16	8.16	8.16	8.16	0	0		
Actuated Green, G (s)	84.6	84.6	0	0	31.0	53.0	53.0	53.0	53.0	0	0		
Effective Green, g (s)	84.6	84.6	0	0	31.0	53.0	53.0	53.0	53.0	0	0		
Actuated g/C Ratio	0.55	0.55	0	0	0.20	0.34	0.34	0.34	0.34	0	0		
Clearance Time (s)	6.4	6.4	0	0	5.0	6.4	6.4	6.4	6.4	0	0		
Vehicle Extension (s)	3.0	2.5	0	0	2.5	3.0	3.0	3.0	3.0	0	0		
Lane Grp Cap (vph)	604	1539	0	0	688	554	1161	544	544	0	0		
v/s Ratio Prt	0.17	0.21	0	0	0.35	0.58	0.58	0.58	0.58	0	0		
v/s Ratio Perm	0.10	0.12	0	0	0.21	0.35	0.35	0.35	0.35	0	0		
v/s Ratio	0.50	0.61	0	0	0.61	1.72	1.68	1.68	1.68	0	0		
Uniform Delay, d1	28.9	23.5	0	0	61.5	50.5	50.5	50.5	40.3	0	0		
Progression Factor	0.28	0.64	0	0	1.00	1.00	1.00	1.00	1.00	0	0		
Incremental Delay, d2	0.0	0.1	0	0	329.7	311.6	311.1	311.1	3.5	0	0		
Delay (s)	7.7	15.2	0	0	391.2	392.1	391.6	391.6	43.9	0	0		
Level of Service	A	B	0	0	F	F	F	F	D	0	0		
Approach Delay (s)	13.4	13.4	0	0	391.2	391.2	391.2	391.2	43.9	0	0		
Approach LOS	F	F	0	0	F	F	F	F	A	0	0		
Intersection Summary													
HCM 2000 Control Delay											271.5	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio											133		
Actuated Cycle Length (s)											154.0	Sum of lost time (s)	22.8
Intersection Capacity Utilization											146.2%	ICU Level of Service	H
Analysis Period (min)											15		
c. Critical Lane Group													

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBR		
Lane Configurations	4	4	4	4	4	4	4	4	4	4	4		
Volumes (vph)	842	259	670	1142	0	0	0	204	917	301	0		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900		
Total Lost time (s)	5.5	5.5	0	0	6.4	6.4	6.4	6.4	6.4	0	0		
Lane Util. Factor	0.95	0.91	0.91	0.91	0	0	0	0.91	0.91	0	0		
Flt. Protected	1.00	1.00	1.00	1.00	0	0	0	1.00	1.00	0	0		
Flt. Permitted	0.95	0.99	0.99	0.99	0	0	0	0.95	1.00	0	0		
Satd. Flow (pc/m)	3411	1610	3359	3411	0	0	0	1610	3385	1583	0		
Satd. Flow (pc/m)	3411	271	1851	1851	0	0	0	1610	3385	1583	0		
Peak-hour factor, PHF	1.00	0.94	0.94	0.97	1.00	1.00	1.00	0.77	0.86	0.81	0		
Adj. Flow (vph)	0	995	285	722	1177	0	0	265	1056	372	0		
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	85	0		
Lane Group Flow (vph)	0	1161	0	455	1444	0	0	238	1093	287	0		
Turn Type	NA	pm+pl	NA	NA	NA	Split	NA	NA	Perm	NA	NA		
Protected Phases	2	1	1	1.2	0	4.12	4.12	4.12	4.12	0	0		
Permitted Phases	2	1.2	1.2	1.2	0	4.12	4.12	4.12	4.12	0	0		
Actuated Green, G (s)	25.0	85.5	85.5	85.5	0	53.0	53.0	53.0	53.0	0	0		
Effective Green, g (s)	25.0	85.5	85.5	85.5	0	53.0	53.0	53.0	53.0	0	0		
Actuated g/C Ratio	0.16	0.56	0.56	0.56	0	0.34	0.34	0.34	0.34	0	0		
Clearance Time (s)	5.0	5.5	5.5	5.5	0	6.4	6.4	6.4	6.4	0	0		
Vehicle Extension (s)	2.5	3.0	3.0	3.0	0	2.5	3.0	3.0	3.0	0	0		
Lane Grp Cap (vph)	553	676	1820	1820	0	554	1165	544	544	0	0		
v/s Ratio Prt	0.34	0.26	0.35	0.35	0	0.15	0.32	0.32	0.32	0	0		
v/s Ratio Perm	0.11	0.14	0.14	0.14	0	0.21	0.21	0.21	0.21	0	0		
v/s Ratio	0.43	0.67	0.67	0.67	0	0.43	0.94	0.94	0.94	0	0		
Uniform Delay, d1	64.5	29.5	30.2	30.2	0	38.9	48.9	40.5	40.5	0	0		
Progression Factor	1.00	0.45	0.26	0.26	0	1.00	1.00	1.00	1.00	0	0		
Incremental Delay, d2	600.8	0.2	0.7	0.7	0	2.4	15.2	3.6	3.6	0	0		
Delay (s)	565.3	13.4	9.5	9.5	0	41.3	64.1	44.1	44.1	0	0		
Level of Service	F	B	A	A	0	D	E	D	D	0	0		
Approach Delay (s)	565.3	9.7	9.7	9.7	0	56.5	56.5	56.5	56.5	0	0		
Approach LOS	F	F	A	A	0	E	E	E	E	0	0		
Intersection Summary													
HCM 2000 Control Delay											163.6	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio											1.18		
Actuated Cycle Length (s)											154.0	Sum of lost time (s)	22.8
Intersection Capacity Utilization											146.2%	ICU Level of Service	H
Analysis Period (min)											15		
c. Critical Lane Group													

EXHIBIT (C) - TRAFFIC IMPACT ANALYSIS

PART 4 OF 4

Scenario 2 PM-2023
2/5/2014

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

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.

Scenario 2 PM-2023
2/5/2014

HCM Signalized Intersection Capacity Analysis
8: SH 151 SB Fint Rd & Poitranco Rd

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	4+T	4+T	4+T	4+T	4+T	4+T	4+T	4+T	4+T	4+T	4+T	4+T
Volume (vph)	0	1234	697	329	2341	0	0	0	0	451	363	266
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lane Util. Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Flt. Protected	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Satd. Flow (prot)	4798	1610	3388	1610	3388	1610	3341	3341	1583	1583	1583	1583
Flt. Permitted	1.00	0.12	0.88	0.12	0.88	0.12	0.88	0.12	0.88	0.12	0.88	0.12
Satd. Flow (perm)	4798	197	2986	197	2986	197	3341	3341	1583	1583	1583	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	362	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	2088	0	326	2425	0	0	0	0	314	658	214
Turn Type	NA	NA	pm+pt	NA								
Protected Phases	6	5	5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
Permitted Phases	34.5	107.2	107.2	107.2	107.2	107.2	107.2	107.2	107.2	107.2	107.2	107.2
Actuated Green, G (s)	34.5	107.2	107.2	107.2	107.2	107.2	107.2	107.2	107.2	107.2	107.2	107.2
Effective Green, g (s)	34.5	107.2	107.2	107.2	107.2	107.2	107.2	107.2	107.2	107.2	107.2	107.2
Actuated g/C Ratio	0.25	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77
Clearance Time (s)	5.5	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	2.5	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)	1182	884	2495	884	2495	884	381	381	180	180	180	180
v/s Ratio Prot	0.044	0.19	0.50	0.19	0.50	0.19	0.19	0.20	0.14	0.19	0.20	0.14
v/s Ratio Perm	1.78	0.37	0.97	0.37	0.97	0.37	1.71	1.73	1.19	1.71	1.73	1.19
v/c Ratio	52.8	13.0	15.0	13.0	15.0	13.0	62.0	62.0	62.0	62.0	62.0	62.0
Uniform Delay, d1	1.00	0.35	0.88	0.35	0.88	0.35	1.00	1.00	1.00	1.00	1.00	1.00
Progression Factor	352.3	0.0	1.9	0.0	1.9	0.0	340.0	338.0	127.9	340.0	338.0	127.9
Incremental Delay, d2	405.1	4.8	15.1	4.8	15.1	4.8	402.0	400.0	188.9	402.0	400.0	188.9
Delay (s)	F	A	B	A	B	A	F	F	F	F	F	F
Level of Service	F	A	B	A	B	A	F	F	F	F	F	F
Approach Delay (s)	405.1	3.8	13.8	3.8	13.8	3.8	344.1	344.1	188.9	344.1	344.1	188.9
Approach LOS	F	B	B	B	B	B	A	A	A	A	A	A
Intersection Summary												
HCM 2000 Control Delay	220.1											
HCM 2000 Level of Service	F											
HCM 2000 Volume to Capacity ratio	1.37											
Actuated Cycle Length (s)	140.0											
Intersection Capacity Utilization	143.0%											
Analysis Period (min)	15											
Critical Lane Group	F											

EXHIBIT (C) - TRAFFIC IMPACT ANALYSIS

PART 4 OF 4

HCM 2010 AWSC Scenario 2 PM-2023
 2/5/2014
 Z: Richland Hills & Ingram Rd

Intersection	Richland Hills & Ingram Rd											
Intersection Delay, s/veh	73.3											
Intersection LOS	F											
Movement	EB	EBT	EBR	WB	WBT	WBR	NB	NBT	NBR	SB	SBT	SBR
Vol, veh/h	277	343	40	48	415	59	280	311	77	9	145	221
Peak Hour Factor	0.87	0.81	0.86	0.79	0.87	0.69	0.67	0.86	0.80	0.44	0.83	0.88
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Movt Flow	413	423	47	61	477	86	418	349	96	20	175	251
Number of Lanes	1	2	0	1	2	0	1	2	0	1	2	0

Approach	EB	EBT	EBR	WB	WBT	WBR	NB	NBT	NBR	SB	SBT	SBR
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	78.8			72.7			70.1			69.7		
HCM LOS	F			F			F			F		

Lane	NB(L1)	NB(L2)	NB(L3)	EB(L1)	EB(L2)	EB(L3)	WB(L1)	WB(L2)	WB(L3)	SB(L1)	SB(L2)	SB(L3)
Vol Left, %	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Vol Thru, %	0%	100%	57%	0%	100%	74%	0%	100%	70%	0%	100%	0%
Vol Right, %	0%	0%	43%	0%	0%	26%	0%	0%	30%	0%	0%	0%
Sign Control	Stop											
Traffic Vol by Lane	280	207	181	277	229	154	48	277	197	9	97	97
LT Vol	0	207	104	0	229	114	0	277	138	0	97	0
Through Vol	0	0	77	0	0	0	40	0	0	0	59	0
RT Vol	280	0	0	277	0	0	0	48	0	0	0	97
Lane Flow Rate	418	233	213	413	282	188	61	318	245	20	116	0
Geometry Grp	8	8	8	8	8	8	8	8	8	8	8	8
Degree of Uln (X)	1	0.819	0.731	1	0.987	0.647	0.226	1	0.861	0.078	0.419	0
Departure Headway (ft/s)	13.163	12.663	12.37	13.079	12.568	12.41	13.368	12.877	12.672	13.433	12.943	0
Convergence, Y/N	Yes											
Cap	280	287	284	281	291	283	270	283	289	267	278	0
Service Time	10.879	10.389	10.696	10.804	10.314	10.135	11.088	10.597	10.391	11.226	10.736	0
HCM Lane V/C Ratio	1.483	0.812	0.724	1.47	0.969	0.642	0.226	1.124	0.848	0.075	0.417	0
HCM Control Delay	92.9	54.3	42.6	92.6	87.3	35.4	20	91.8	60.9	17.3	24.8	0
HCM Lane LOS	F	F	F	F	F	E	C	F	F	F	C	C
HCM 95th-ile D	10.1	6.7	5.3	10.1	10	4.2	0.8	10.2	7.4	0.2	2	0

Notes: - : Volume Exceeds Capacity; S : Delay Exceeds 300 Seconds; Error : Computation Not Defined

EXHIBIT (C) - TRAFFIC IMPACT ANALYSIS

PART 4 OF 4

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

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

Scenario 2 PM-2023
 2/5/2014

Scenario 2 PM-2023
 2/5/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	4+1	4+1	4+1	4+1	4+1	4+1	4+1	4+1	4+1	4+1	4+1	4+1
Volume (vph)	357	763	0	1350	498	498	1350	705	151	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.5	0	5.5	6.3	6.3	6.3	6.3	6.3	0	0	0
Lane Util. Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Flt. Protected	1.00	1.00	0.96	1.00	1.00	1.00	1.00	0.95	1.00	1.00	1.00	1.00
Flt. Permitted	0.95	1.00	1.00	0.95	0.98	1.00	0.95	0.98	1.00	1.00	1.00	1.00
Satd. Flow (prot)	1610	3365	4884	1610	3310	1583	1610	3310	1583	1610	3310	1583
Satd. Flow (perm)	160	2377	4884	1610	3310	1583	1610	3310	1583	1610	3310	1583
Peak-hour factor, PHF	0.98	0.95	1.00	0.96	0.93	0.99	0.95	0.93	0.83	1.00	1.00	1.00
Adj. Flow (vph)	359	729	0	1406	503	503	1378	742	162	0	0	0
RTOR Reduction (vph)	0	0	0	46	0	0	0	0	113	0	0	0
Lane Group Flow (vph)	323	1355	0	1863	0	689	1451	69	0	0	0	0
Turn Type	pm-rt	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Protected Phases	1	2	1	2	1	2	1	2	1	2	1	2
Permitted Phases	2	1	2	1	2	1	2	1	2	1	2	1
Actuated Green, G (s)	81.2	81.2	42.5	42.5	42.0	42.0	42.0	42.0	41.2	41.2	41.2	41.2
Effective Green, g (s)	81.2	81.2	42.5	42.5	42.0	42.0	42.0	42.0	42.0	42.0	42.0	42.0
Actuated g/C Ratio	0.58	0.58	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
Clearance Time (s)	5.0	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Vehicle Extension (s)	1.0	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Lane Grp Cap (vph)	483	1657	1482	483	933	474	483	933	474	483	1657	1657
v/s Ratio Prot	0.18	0.23	0.38	0.18	0.23	0.38	0.18	0.23	0.38	0.18	0.23	0.23
v/s Ratio Perm	0.20	0.25	0.43	0.20	0.25	0.43	0.20	0.25	0.43	0.20	0.25	0.25
v/c Ratio	0.86	0.82	1.28	0.86	0.82	1.28	0.86	0.82	1.28	0.86	0.82	0.82
Uniform Delay, d1	33.3	23.6	48.8	33.3	23.6	48.8	33.3	23.6	48.8	33.3	23.6	23.6
Progression Factor	0.49	0.53	0.70	0.49	0.53	0.70	0.49	0.53	0.70	0.49	0.53	0.53
Incremental Delay, d2	0.2	0.3	116.2	0.2	0.3	116.2	0.2	0.3	116.2	0.2	0.3	0.3
Delay (s)	16.5	12.8	190.3	16.5	12.8	190.3	16.5	12.8	190.3	16.5	12.8	12.8
Level of Service	B	B	F	B	B	F	B	B	F	B	B	B
Approach Delay (s)	13.5	19.3	190.3	13.5	19.3	190.3	13.5	19.3	190.3	13.5	19.3	19.3
Approach LOS	B	B	F	B	B	F	B	B	F	B	B	B
Intersection Summary												
HCM 2000 Control Delay	144.6											
HCM 2000 Volume to Capacity ratio	1.25											
Actuated Cycle Length (s)	140.0											
Intersection Capacity Utilization	143.0%											
Analysis Period (min)	15											
Critical Lane Group	S...											

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	4+1	4+1	4+1	4+1	4+1	4+1	4+1	4+1	4+1	4+1	4+1	4+1
Volume (vph)	337	1044	166	141	150	126	301	402	213	166	240	264
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	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	1.00	1.00	1.00	1.00	1.00
Flt. Protected	1.00	0.97	1.00	0.96	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt. Permitted	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Satd. Flow (prot)	1770	3450	1770	3494	1770	1863	1863	1863	1863	1770	3494	3297
Satd. Flow (perm)	146	3450	133	3494	1770	1863	1863	1863	1863	1770	3494	3297
Peak-hour factor, PHF	0.82	0.85	0.75	0.87	0.83	0.87	0.79	0.83	0.59	0.80	0.76	0.82
Adj. Flow (vph)	411	1228	248	231	1564	145	381	484	361	208	316	322
RTOR Reduction (vph)	0	12	0	5	0	0	0	0	0	181	0	68
Lane Group Flow (vph)	411	1064	0	231	1704	0	381	484	180	0	778	0
Turn Type	DP-P	NA	DP-P	NA	DP-P	NA	DP-P	NA	DP-P	NA	DP-P	NA
Protected Phases	1	6	1	5	2	4	4	4	4	3	3	3
Permitted Phases	2	6	2	6	2	4	4	4	4	3	3	3
Actuated Green, G (s)	57.5	56.2	57.5	51.2	51.2	25.8	25.8	25.8	25.8	57.5	56.2	25.8
Effective Green, g (s)	57.5	56.2	57.5	51.2	51.2	25.8	25.8	25.8	25.8	57.5	56.2	25.8
Actuated g/C Ratio	0.48	0.40	0.48	0.37	0.37	0.18	0.18	0.18	0.18	0.48	0.40	0.18
Clearance Time (s)	4.7	5.8	4.7	5.8	5.2	5.2	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)	269	1384	186	1277	326	343	281	281	281	269	1384	697
v/s Ratio Prot	0.18	0.42	0.10	0.49	0.22	0.26	0.11	0.11	0.11	0.18	0.42	0.24
v/s Ratio Perm	0.20	0.47	0.10	0.49	0.22	0.26	0.11	0.11	0.11	0.18	0.42	0.24
v/c Ratio	1.59	1.06	1.18	1.33	1.17	1.41	0.62	0.62	0.62	1.28	1.06	0.62
Uniform Delay, d1	44.9	41.9	42.6	44.4	57.1	57.1	52.6	52.6	52.6	44.9	41.9	57.1
Progression Factor	1.52	0.74	1.59	0.71	1.00	1.00	1.00	1.00	1.00	1.52	0.74	1.00
Incremental Delay, d2	278.9	39.2	85.5	150.9	103.9	201.5	2.7	2.7	2.7	278.9	39.2	150.9
Delay (s)	341.1	70.0	153.1	162.3	161.0	258.6	55.3	55.3	55.3	341.1	70.0	162.3
Level of Service	F	E	F	F	F	F	E	E	E	F	E	F
Approach Delay (s)	30.4	179.0	168.4	168.4	168.4	168.4	168.4	168.4	168.4	30.4	179.0	168.4
Approach LOS	F	F	F	F	F	F	F	F	F	F	F	F
Intersection Summary												
HCM 2000 Control Delay	163.7											
HCM 2000 Volume to Capacity ratio	1.48											
Actuated Cycle Length (s)	140.0											
Intersection Capacity Utilization	122.7%											
Analysis Period (min)	15											
Critical Lane Group	S...											

EXHIBIT (C) - TRAFFIC IMPACT ANALYSIS

PART 4 OF 4

HCM Signalized Intersection Capacity Analysis

12: Military Dr & Potranco Rd

Scenario 2 PM-2023
2/5/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBR																																																																		
Lane Configurations	<table border="1"> <tr> <td>Volume (veh/h)</td> <td>28</td> <td>1154</td> <td>592</td> <td>216</td> <td>1391</td> <td>64</td> <td>459</td> <td>494</td> <td>560</td> <td>13</td> <td>287</td> </tr> <tr> <td>Ideal Flow (veh/h)</td> <td>1900</td> </tr> <tr> <td>Total Lost time (s)</td> <td>5.8</td> </tr> <tr> <td>Lane Util. Factor</td> <td>1.00</td> <td>0.95</td> <td>1.00</td> <td>0.95</td> <td>1.00</td> <td>0.95</td> <td>1.00</td> <td>0.95</td> <td>1.00</td> <td>0.95</td> <td>1.00</td> </tr> </table>												Volume (veh/h)	28	1154	592	216	1391	64	459	494	560	13	287	Ideal Flow (veh/h)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	Total Lost time (s)	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8	Lane Util. Factor	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00																	
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Pedestrians	0																																																																												
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Intersection Summary	<table border="1"> <tr> <td>HCM 2000 Control Delay</td> <td>281.4</td> <td colspan="11">HCM 2000 Level of Service</td> </tr> <tr> <td>HCM 2000 Volume to Capacity ratio</td> <td>2.43</td> <td colspan="11">16.8</td> </tr> <tr> <td>Actuated Cycle Length (s)</td> <td>140.0</td> <td colspan="11">Sum of lost time (s)</td> </tr> <tr> <td>Intersection Capacity Utilization</td> <td>136.3%</td> <td colspan="11">LCU Level of Service</td> </tr> <tr> <td>Analysis Period (min)</td> <td>15</td> <td colspan="11">5 - Critical Lane Group</td> </tr> </table>												HCM 2000 Control Delay	281.4	HCM 2000 Level of Service											HCM 2000 Volume to Capacity ratio	2.43	16.8											Actuated Cycle Length (s)	140.0	Sum of lost time (s)											Intersection Capacity Utilization	136.3%	LCU Level of Service											Analysis Period (min)	15	5 - Critical Lane Group										
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HCM Unsignalized Intersection Capacity Analysis

11: Ingram Rd & Potranco Rd

Scenario 2 PM-2023
2/5/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBR																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
Lane Configurations	<table border="1"> <tr> <td>Volume (veh/h)</td> <td>13</td> <td>1205</td> <td>20</td> <td>313</td> <td>1676</td> <td>0</td> <td>11</td> <td>85</td> <td>535</td> <td>0</td> <td>44</td> </tr> <tr> <td>Sign Control</td> <td colspan="12">Free</td> </tr> <tr> <td>Grade</td> <td colspan="12">0%</td> </tr> <tr> <td>Peak Hour Factor</td> <td colspan="12">1.00</td> </tr> <tr> <td>Priority flow rate (veh/h)</td> <td colspan="12">13</td> </tr> <tr> <td>Pedestrians</td> <td colspan="12">0</td> </tr> <tr> <td>Lane Width (ft)</td> <td colspan="12">12</td> </tr> <tr> <td>Walking Speed (ft/s)</td> <td colspan="12">4.0</td> </tr> <tr> <td>Percent Blockage</td> <td colspan="12">0</td> </tr> <tr> <td>Right turn flare (veh)</td> <td colspan="12">0</td> </tr> <tr> <td>Median Type</td> <td colspan="12">TWTTL</td> </tr> <tr> <td>Median storage (veh)</td> <td colspan="12">2</td> </tr> <tr> <td>Upstream signal (ft)</td> <td colspan="12">2</td> </tr> <tr> <td>PK platoon unblocked</td> <td colspan="12">0</td> </tr> <tr> <td>LC conflicting volume</td> <td colspan="12">1883</td> </tr> <tr> <td>vC1, stage 1 conf vol</td> <td colspan="12">1305</td> </tr> <tr> <td>vC2, stage 2 conf vol</td> <td colspan="12">1868</td> </tr> <tr> <td>vCU, unblocked vol</td> <td colspan="12">3173</td> </tr> <tr> <td>IC, single (s)</td> <td colspan="12">4.1</td> </tr> <tr> <td>IC, 2 stage (s)</td> <td colspan="12">2.2</td> </tr> <tr> <td>p0 queue free %</td> <td colspan="12">96</td> </tr> <tr> <td>SM capacity (veh/h)</td> <td colspan="12">314</td> </tr> <tr> <td>Direction Lane #</td> <td>EBL</td> <td>EBT</td> <td>EBR</td> <td>WBL</td> <td>WBT</td> <td>WBR</td> <td>NBL</td> <td>NBT</td> <td>NBR</td> <td>SBL</td> <td>SBR</td> </tr> <tr> <td>Volume Total</td> <td>13</td> <td>846</td> <td>444</td> <td>447</td> <td>1255</td> <td>628</td> <td>16</td> <td>57</td> <td>698</td> <td>0</td> <td>29</td> </tr> <tr> <td>Volume Left</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>16</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>Volume Right</td> <td>0</td> </tr> <tr> <td>esH</td> <td>314</td> <td>1700</td> <td>1700</td> <td>534</td> <td>1700</td> <td>1700</td> <td>0</td> <td>0</td> <td>9</td> <td>1700</td> <td>0</td> </tr> <tr> <td>Volume to Capacity</td> <td>0.04</td> <td>0.80</td> <td>0.26</td> <td>0.84</td> <td>0.74</td> <td>0.37</td> <td>Err.</td> <td>147.21</td> <td>75.22</td> <td>0.00</td> <td>77.50</td> </tr> <tr> <td>Queue Length 95th (ft)</td> <td>3</td> <td>0</td> <td>0</td> <td>216</td> <td>0</td> <td>0</td> <td>Err.</td> <td>Err.</td> <td>Err.</td> <td>0</td> <td>Err.</td> </tr> <tr> <td>Control Delay (s)</td> <td>15.9</td> <td>0.0</td> <td>0.0</td> <td>37.5</td> <td>0.0</td> <td>0.0</td> <td>Err.</td> <td>Err.</td> <td>Err.</td> <td>0.0</td> <td>Err.</td> </tr> <tr> <td>Lane LOS</td> <td>C</td> <td>E</td> <td>E</td> <td>E</td> <td>E</td> <td>E</td> <td>F</td> <td>F</td> <td>F</td> <td>A</td> <td>F</td> </tr> <tr> <td>Approach Delay (s)</td> <td colspan="12">0.2</td> </tr> <tr> <td>Approach LOS</td> <td colspan="12">E</td> </tr> <tr> <td>Intersection Summary</td> <td colspan="12"> <table border="1"> <tr> <td>Average Delay</td> <td>Err.</td> <td colspan="11">D</td> </tr> <tr> <td>Intersection Capacity Utilization</td> <td>81.0%</td> <td colspan="11">ICU Level of Service</td> </tr> <tr> <td>Analysis Period (min)</td> <td>15</td> <td colspan="11">5 - Critical Lane Group</td> </tr> </table> </td> </tr> </table>												Volume (veh/h)	13	1205	20	313	1676	0	11	85	535	0	44	Sign Control	Free												Grade	0%												Peak Hour Factor	1.00												Priority flow rate (veh/h)	13												Pedestrians	0												Lane Width (ft)	12												Walking Speed (ft/s)	4.0												Percent Blockage	0												Right turn flare (veh)	0												Median Type	TWTTL												Median storage (veh)	2												Upstream signal (ft)	2												PK platoon unblocked	0												LC conflicting volume	1883												vC1, stage 1 conf vol	1305												vC2, stage 2 conf vol	1868												vCU, unblocked vol	3173												IC, single (s)	4.1												IC, 2 stage (s)	2.2												p0 queue free %	96												SM capacity (veh/h)	314												Direction Lane #	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBR	Volume Total	13	846	444	447	1255	628	16	57	698	0	29	Volume Left	0	0	0	0	0	0	16	0	0	0	0	Volume Right	0	0	0	0	0	0	0	0	0	0	0	esH	314	1700	1700	534	1700	1700	0	0	9	1700	0	Volume to Capacity	0.04	0.80	0.26	0.84	0.74	0.37	Err.	147.21	75.22	0.00	77.50	Queue Length 95th (ft)	3	0	0	216	0	0	Err.	Err.	Err.	0	Err.	Control Delay (s)	15.9	0.0	0.0	37.5	0.0	0.0	Err.	Err.	Err.	0.0	Err.	Lane LOS	C	E	E	E	E	E	F	F	F	A	F	Approach Delay (s)	0.2												Approach LOS	E												Intersection Summary	<table border="1"> <tr> <td>Average Delay</td> <td>Err.</td> <td colspan="11">D</td> </tr> <tr> <td>Intersection Capacity Utilization</td> <td>81.0%</td> <td colspan="11">ICU Level of Service</td> </tr> <tr> <td>Analysis Period (min)</td> <td>15</td> <td colspan="11">5 - Critical Lane Group</td> </tr> </table>												Average Delay	Err.	D											Intersection Capacity Utilization	81.0%	ICU Level of Service											Analysis Period (min)	15	5 - Critical Lane Group										
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Intersection Summary	<table border="1"> <tr> <td>Average Delay</td> <td>Err.</td> <td colspan="11">D</td> </tr> <tr> <td>Intersection Capacity Utilization</td> <td>81.0%</td> <td colspan="11">ICU Level of Service</td> </tr> <tr> <td>Analysis Period (min)</td> <td>15</td> <td colspan="11">5 - Critical Lane Group</td> </tr> </table>												Average Delay	Err.	D											Intersection Capacity Utilization	81.0%	ICU Level of Service											Analysis Period (min)	15	5 - Critical Lane Group																																																																																																																																																																																																																																																																																																																																																																																																																																																										
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EXHIBIT (C) - TRAFFIC IMPACT ANALYSIS

PART 4 OF 4

HCM Signalized Intersection Capacity Analysis

13: Micron & Potranco Rd

Scenario 2 PM-2023

2/5/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	1	0	0	0	0	0	0	0	0	0	0	0
Volume (vph)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Ideal Flow (vphpl)	4.8	5.7	5.7	4.8	5.7	5.7	4.8	5.7	5.7	5.7	4.8	5.7
Total Lost Time (s)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	0.95	1.00
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	0.95	1.00
Std. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.06	1.00	1.00	0.10	1.00	1.00	0.30	1.00	1.00	0.63	1.00	1.00
Std. Flow (norm)	112	3539	1583	150	3530	552	1620	1181	1587	1181	1587	552
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	82	0	81	83	0
Turn Type	D,P-P	NA	Perm	D,P-P	NA	D,P-P	NA	D,P-P	NA	Perm	NA	NA
Protected Phases	1	6	NA	3	2	7	4	8	NA	8	NA	8
Permitted Phases	2	6	6	6	6	6	6	6	6	6	6	6
Actuated Green, G (s)	94.9	91.2	91.2	94.9	73.8	24.5	29.5	24.5	29.5	13.5	13.5	13.5
Effective Green, g (s)	94.9	91.2	91.2	94.9	73.8	24.5	29.5	24.5	29.5	13.5	13.5	13.5
Actuated, g/C Ratio	0.68	0.65	0.65	0.68	0.53	0.18	0.21	0.18	0.21	0.10	0.10	0.10
Clearance Time (s)	4.8	5.7	5.7	4.8	5.7	5.0	5.1	5.0	5.1	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	1.0	1.0	1.0
Lane Grp Cap (vph)	325	2305	1031	170	1860	192	341	113	153	113	153	153
v/s Ratio Perm	0.20	0.44	0.01	0.43	0.10	0.04	0.12	0.07	0.05	0.07	0.05	0.05
v/s Ratio	1.33	0.67	0.03	0.22	0.82	1.23	0.18	0.72	0.54	0.72	0.54	0.54
Uniform Delay, d1	46.4	15.1	8.7	12.3	27.5	55.7	45.3	61.4	60.3	61.4	60.3	60.3
Progression Factor	0.79	0.83	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	148.8	0.1	0.0	0.2	4.2	142.1	0.1	16.4	2.1	16.4	2.1	2.1
Delay (s)	185.6	12.8	8.7	12.6	31.7	197.8	45.4	77.8	62.4	77.8	62.4	62.4
Level of Service	F	B	A	B	C	F	D	E	E	E	E	E
Approach Delay (s)	49.5	31.2	128.6	31.2	128.6	31.2	128.6	31.2	128.6	31.2	128.6	31.2
Approach LOS	D	D	F	D	F	D	F	D	F	D	F	D
Intersection Summary												
HCM 2000 Control Delay	52.3											
HCM 2000 Volume to Capacity Ratio	1.30											
Actuated Cycle Length (s)	140.0											
Intersection Capacity Utilization	103.6%											
Analysis Period (min)	15											
c - Critical Lane Group	15											

Scenario 2 PM-2023

2/5/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	1	0	0	0	0	0	0	0	0	0	0	0
Volume (vph)	409	1428	30	20	1347	23	173	13	120	34	1	281
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	5.7	4.8	5.7	5.7	5.7	4.8	5.7
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	0.95	1.00	1.00	0.95
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	0.95	1.00
Std. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.06	1.00	1.00	0.10	1.00	1.00	0.30	1.00	1.00	0.63	1.00	1.00
Std. Flow (norm)	112	3539	1583	150	3530	552	1620	1181	1587	1181	1587	552
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	82	0	81	83	0
Turn Type	D,P-P	NA	Perm	D,P-P	NA	D,P-P	NA	D,P-P	NA	Perm	NA	NA
Protected Phases	1	6	NA	3	2	7	4	8	NA	8	NA	8
Permitted Phases	2	6	6	6	6	6	6	6	6	6	6	6
Actuated Green, G (s)	94.9	91.2	91.2	94.9	73.8	24.5	29.5	24.5	29.5	13.5	13.5	13.5
Effective Green, g (s)	94.9	91.2	91.2	94.9	73.8	24.5	29.5	24.5	29.5	13.5	13.5	13.5
Actuated, g/C Ratio	0.68	0.65	0.65	0.68	0.53	0.18	0.21	0.18	0.21	0.10	0.10	0.10
Clearance Time (s)	4.8	5.7	5.7	4.8	5.7	5.0	5.1	5.0	5.1	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	1.0	1.0	1.0
Lane Grp Cap (vph)	325	2305	1031	170	1860	192	341	113	153	113	153	153
v/s Ratio Perm	0.20	0.44	0.01	0.43	0.10	0.04	0.12	0.07	0.05	0.07	0.05	0.05
v/s Ratio	1.33	0.67	0.03	0.22	0.82	1.23	0.18	0.72	0.54	0.72	0.54	0.54
Uniform Delay, d1	46.4	15.1	8.7	12.3	27.5	55.7	45.3	61.4	60.3	61.4	60.3	60.3
Progression Factor	0.79	0.83	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	148.8	0.1	0.0	0.2	4.2	142.1	0.1	16.4	2.1	16.4	2.1	2.1
Delay (s)	185.6	12.8	8.7	12.6	31.7	197.8	45.4	77.8	62.4	77.8	62.4	62.4
Level of Service	F	B	A	B	C	F	D	E	E	E	E	E
Approach Delay (s)	49.5	31.2	128.6	31.2	128.6	31.2	128.6	31.2	128.6	31.2	128.6	31.2
Approach LOS	D	D	F	D	F	D	F	D	F	D	F	D
Intersection Summary												
HCM 2000 Control Delay	52.3											
HCM 2000 Volume to Capacity Ratio	1.30											
Actuated Cycle Length (s)	140.0											
Intersection Capacity Utilization	103.6%											
Analysis Period (min)	15											
c - Critical Lane Group	15											

EXHIBIT (C) - TRAFFIC IMPACT ANALYSIS

PART 4 OF 4

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

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	4	4	4	4	4	4
Volume (vph)	9	456	218	283	537	39
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.3	5.4	5.4	4.3	4.3	4.3
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
FI	0.96	0.99	0.99	1.00	0.98	1.00
FI Protected	1.00	0.98	0.98	1.00	0.98	1.00
Satd. Flow (prot)	1775	1818	1818	1770	1831	1787
FI Permitted	0.97	0.95	0.95	1.00	0.95	1.00
Satd. Flow (perm)	1730	1821	1821	1783	1831	1787
Peak-hour factor, PHF	0.88	0.91	0.81	0.77	0.87	0.44
Adj. Flow (vph)	16	501	269	368	617	50
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	776	0	0	1034	0
Turn Type	Perm	NA	NA	NA	NA	DP+P
Protected Phases	6	8	5	2	7	4
Permitted Phases	6	8	5	2	7	4
Activated Green, G (s)	67.0	67.0	66.9	66.9	66.9	66.9
Effective Green, g (s)	67.0	67.0	66.9	66.9	66.9	66.9
Activated Q/C Ratio	0.67	0.67	0.67	0.67	0.67	0.67
Clearance Time (s)	5.3	5.4	5.4	4.3	4.3	4.3
Vehicle Extension (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lane Grp Cap (vph)	1159	683	338	290	683	82
v/s Ratio Prot	0.45	0.67	0.67	0.67	0.67	0.67
v/s Ratio Perm	0.45	0.67	0.67	0.67	0.67	0.67
Uniform Delay, d1	9.9	16.5	36.0	38.6	34.1	46.9
Progression Factor	0.78	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.6	238.6	1.8	6.2	0.2	1.4
Delay (s)	10.3	255.1	37.8	44.9	34.3	48.3
Level of Service	B	F	D	D	C	D
Approach Delay (s)	10.3	255.1	42.4	45.1	45.1	45.1
Approach LOS	B	F	D	D	D	D
Intersection Summary						
HCM 2000 Control Delay	122.1		HCM 2000 Level of Service		F	
HCM 2000 Volume to Capacity ratio	1.42		Sum of lost time (s)		18.4	
Actuated Cycle Length (s)	100.0		ICU Level of Service		H	
Intersection Capacity Utilization	114.8%		Analysis Period (min)		15	
Analysis Period (min)	15		Critical Lane Group			

Synchro 7 - Report
 Page 16
 Synchro 7 Report 5:00 pm Baseline
 Page-Dawson Engineers, Inc.

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

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	4	4	4	4	4	4
Volume (vph)	347	425	542	11	3	406
Sign Control	Free	Free	Free	Free	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.84	0.83	0.86	0.50	0.25	0.88
Hourly flow rate (vph)	369	457	630	22	12	461
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn lane (veh)						
Median Type	None	None	None	None	None	None
Upstream signal (ft)						
pX, platoon unblocked	751					
IC, conflicting volume					0.85	
IC, conflicting volume	652				1837	641
IC, stage 1 conf vol						
IC, stage 2 conf vol	652				1897	641
IC, unblocked vol	4.1				6.4	6.2
IC, single (s)						
IC, 2 stage (s)						
IF (s)	2.2	3.5	3.3			
p0 queue free %	80	68	3			
IC capacity (veh/h)	934	39	475			
Direction Lane #						
Volume Total	820	652	12	461		
Volume Left	369	0	12	0		
Volume Right	0	22	0	461		
CSH	934	1700	39	475		
Volume to Capacity	0.40	0.38	0.31	0.97		
Queue Length 95th (ft)	48	0	25	309		
Control Delay (s)	8.5	0.0	133.4	64.3		
Lane LOS	A	F	F	F		
Approach Delay (s)	8.5	0.0	66.0	66.0		
Approach LOS	A	F	F	F		
Intersection Summary						
Average Delay	19.8		ICU Level of Service		E	
Intersection Capacity Utilization	84.1%		Analysis Period (min)		15	

Synchro 7 - Report
 Page 15
 Synchro 7 Report 5:00 pm Baseline
 Page-Dawson Engineers, Inc.

EXHIBIT (C) - TRAFFIC IMPACT ANALYSIS

PART 4 OF 4

HCM Unsignalized Intersection Capacity Analysis
 19: Richland Hills & Christian Evers ES
 Scenario 2 PM-2023
 2/5/2014

Movement	EBL	EBR	NBL	NBR	SBT	SBR
Volume (veh/h)	38	52	47	437	437	20
Stop	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.91	0.89	0.67	0.89	0.89	0.83
Hourly flow rate (vph)	43	58	70	508	491	32
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	None
Median storage (veh)						
Upstream signal (ft)						
PX platoon unblocked						
VC, conflicting volume	1155	507	523			
VC1, stage 1 conf vol						
VC2, stage 2 conf vol	1155	507	523			
VCu, unblocked vol	6.4	6.2	4.1			
IC, single (s)						
IC, 2 stage (s)	3.5	3.3	2.2			
pl queue free %	79	90	93			
pl capacity (veh/h)	203	566	1044			
Direction Lane #	EB1	NB1	SB1			
Volume Total	101	578	523			
Volume Left	43	70	0			
Volume Right	58	0	32			
csH	322	1044	1700			
Volume to Capacity	0.31	0.07	0.31			
Queue Length 95th (ft)	33	5	0			
Control Delay (s)	21.2	1.8	0.0			
Lane LOS	C	A				
Approach Delay (s)	21.2	1.8	0.0			
Approach LOS	C	C				
Intersection Summary						
Average Delay	2.6					
Intersection Capacity Utilization	65.2%					
Analysis Period (min)	15					
	C					

Synchro 7 Report 5:00 pm Baseline
 Page-Dawson Engineers, Inc.
 Synchro 7 - Report Page 18

HCM Unsignalized Intersection Capacity Analysis
 18: Richland Hills & Jack Jordan MS
 Scenario 2 PM-2023
 2/5/2014

Movement	EBL	EBR	NBL	NBR	SBT	SBR
Volume (veh/h)	74	39	51	312	446	74
Stop	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.86	0.91	0.63	0.66	0.80	0.81
Hourly flow rate (vph)	86	43	81	363	558	91
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	None
Median storage (veh)						
Upstream signal (ft)						
PX platoon unblocked						
VC, conflicting volume	1128	603	649			
VC1, stage 1 conf vol						
VC2, stage 2 conf vol	1128	603	649			
VCu, unblocked vol	6.4	6.2	4.1			
IC, single (s)						
IC, 2 stage (s)	3.5	3.3	2.2			
pl queue free %	58	91	91			
pl capacity (veh/h)	206	499	937			
Direction Lane #	EB1	EB2	NB1	NB2	SB1	SBR
Volume Total	86	43	444	649		
Volume Left	86	0	81	0		
Volume Right	0	43	0	91		
csH	206	499	937	1700		
Volume to Capacity	0.42	0.09	0.09	0.38		
Queue Length 95th (ft)	48	7	7	0		
Control Delay (s)	34.4	12.9	2.5	0.0		
Lane LOS	D	B	A			
Approach Delay (s)	27.2		2.5	0.0		
Approach LOS	D		A			
Intersection Summary						
Average Delay	3.8					
Intersection Capacity Utilization	61.3%					
Analysis Period (min)	15					
	B					

Synchro 7 Report 5:00 pm Baseline
 Page-Dawson Engineers, Inc.
 Synchro 7 - Report Page 17

EXHIBIT (C) - TRAFFIC IMPACT ANALYSIS

PART 4 OF 4

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

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

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	108	715	675	121	151	168
Volume (vph)	1900	1900	1900	1900	1900	1900
Ideal Flow (vphpl)	4.9	4.9	5.1	5.1	5.1	5.1
Total Lost time (s)	1.00	1.00	1.00	1.00	1.00	1.00
Lane Util. Factor	1.00	1.00	1.00	0.85	1.00	0.85
Flt	0.95	1.00	1.00	1.00	0.95	1.00
Flt Protected	1.00	1.00	1.00	1.00	1.00	1.00
Satd. Flow (vph)	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	796	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
Projected Phases	1	5	2		3	
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	60.42	60.42		60.11	
v/s Ratio Perm	0.05	0.57	0.76	0.35	0.66	0.14
Uniform Delay, d1	40.8	6.1	17.6	37.0	35.2	35.7
Progression Factor	0.86	1.33	0.96	0.96	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	17.3	35.5	44.8	35.9
Level of Service	D	A	B	D	D	D
Approach Delay (s)	19.8	21.2		40.1		
Approach LOS	B	C		D		
Intersection Summary						
HCM 2000 Control Delay	21.5		HCM 2000 Level of Service		C	
HCM 2000 Volume to Capacity ratio	0.73		Sum of lost time (s)		14.9	
Actuated Cycle Length (s)	100.0		ICU Level of Service		B	
Intersection Capacity Utilization	82.0%		Analysis Period (min)		15	
5. Critical Lane Group						

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	121	328	28	402	415	29
Volume (vph)	1900	1900	1900	1900	1900	1900
Ideal Flow (vphpl)	5.0	5.7	5.0	5.6	5.2	5.6
Total Lost time (s)	1.00	0.95	1.00	0.95	1.00	0.95
Lane Util. Factor	1.00	0.99	1.00	0.92	1.00	0.96
Flt	1.00	1.00	1.00	0.97	1.00	0.96
Flt Protected	0.95	1.00	0.95	1.00	0.95	1.00
Satd. Flow (vph)	1770	3501	1770	3260	1770	3445
Flt Permitted	0.19	1.00	0.32	1.00	0.95	1.00
Satd. Flow (perm)	345	3501	583	3260	1770	3445
Peak-hour factor, PHF	0.70	0.79	0.88	0.78	0.81	0.70
Adj. Flow (vph)	173	415	32	212	462	512
RTOR Reduction (vph)	0	5	0	0	159	0
Lane Group Flow (vph)	173	442	0	212	775	0
Turn Type	pm-pt	NA	pm-pt	NA	Prot	NA
Projected Phases	7	4	3	8	5	2
Permitted Phases	4		8		5	1
Actuated Green, G (s)	30.9	21.6	35.6	23.9	4.2	17.0
Effective Green, g (s)	30.9	21.6	35.6	23.9	4.2	17.0
Actuated g/C Ratio	0.31	0.22	0.36	0.24	0.04	0.17
Clearance Time (s)	5.0	5.7	5.0	5.8	5.2	5.6
Vehicle Extension (s)	1.0	2.5	1.0	2.0	1.0	2.5
Lane Grp Cap (vph)	239	756	349	779	74	585
v/s Ratio Prot	0.07	0.19	0.07	0.24	0.02	0.32
v/s Ratio Perm	0.16		0.15			
v/s Ratio	0.72	0.58	0.61	1.00	0.55	1.91
Uniform Delay, d1	28.2	35.2	24.0	38.0	47.0	41.5
Progression Factor	1.00	1.00	1.45	1.33	1.00	1.00
Incremental Delay, d2	8.8	1.0	1.8	28.6	5.0	415.4
Delay (s)	37.0	36.1	36.5	79.1	52.0	456.9
Level of Service	D	D	D	E	D	F
Approach Delay (s)	36.4		71.5		442.8	
Approach LOS	D		E		F	
Intersection Summary						
HCM 2000 Control Delay	184.9		HCM 2000 Level of Service		F	
HCM 2000 Volume to Capacity ratio	1.16		Sum of lost time (s)		21.6	
Actuated Cycle Length (s)	100.0		ICU Level of Service		G	
Intersection Capacity Utilization	100.5%		Analysis Period (min)		15	
5. Critical Lane Group						

Scenario 2 PM-2023
2/5/2014

Scenario 2 PM-2023
2/5/2014

EXHIBIT (C) - TRAFFIC IMPACT ANALYSIS

PART 4 OF 4

HCM Signalized Intersection Capacity Analysis
 23: SH 151 SB Frnt Rd & Hunt Ln
 Scenario 2 PM-2023
 2/5/2014

Movement	NBL	NBR	NBT	SBL	SBR	
Lane Configurations						
Volume (vph)	643	0	0	142	766	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	
Total Lost time (s)	5.2	6.0	6.0	6.0	6.0	
Lane Util. Factor	0.97	0.91	0.91	1.00	1.00	
Flt Protected	0.95	0.95	1.00	0.95	1.00	
Satd. Flow (prot)	3433	1610	3387	1610	3387	
Flt Permitted	0.95	0.95	1.00	0.95	1.00	
Satd. Flow (perm)	3433	1610	3387	1610	3387	
Peak-hour factor, PHF	0.93	1.00	1.00	0.75	0.91	
Adj. Flow (vph)	691	0	0	189	864	
RTOR Reduction (vph)	0	0	0	0	0	
Lane Group Flow (vph)	691	0	0	170	883	
Turn Type	NA	NA	Split	NA	NA	
Protected Phases	1	6	8	12	4	
Permitted Phases	6	6	8	12	4	
Actuated Green, G (s)	56.5	28.3	75.0	46.9	46.9	
Effective Green, g (s)	56.5	28.3	75.0	46.9	46.9	
Actuated g/C Ratio	0.90	0.25	0.66	0.41	0.41	
Clearance Time (s)	5.2	5.3	5.3	5.2	5.2	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	1704	880	1061	663	1305	
v/s Ratio Prot	0.20	0.19	0.05	0.11	0.26	
v/s Ratio Perm	0.41	0.76	0.07	0.26	0.53	
Uniform Delay, d1	18.1	39.6	7.0	22.0	26.6	
Progression Factor	0.46	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.1	4.0	0.1	0.9	2.2	
Delay (s)	8.4	43.6	7.1	22.9	28.8	
Level of Service	A	D	C	C	C	
Approach Delay (s)	8.4	42.3	43.9	27.9	27.9	
Approach LOS	A	D	D	A	C	
Intersection Summary						
HCM 2000 Control Delay	20.1				HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.57				Sum of lost time (s)	21.7
Actuated Cycle Length (s)	113.8				ICU Level of Service	A
Intersection Capacity Utilization	49.3%				Analysis Period (min)	15
Analysis Period (min)	15				Critical Lane Group	15

Synchro 7 - Report
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HCM Signalized Intersection Capacity Analysis
 22: SH 151 NB Frnt Rd & Hunt Ln
 Scenario 2 PM-2023
 2/5/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBR	
Lane Configurations												
Volume (vph)	52	89	0	596	56	60	996	1002	0	0	0	
Ideal Flow (vphpl)	1500	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	5.3	5.3	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	
Lane Util. Factor	0.95	1.00	0.91	0.91	0.91	0.91	1.00	1.00	0.93	0.95	1.00	
Flt Protected	0.98	1.00	0.85	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	3469	3539	1683	1610	3145	3145	3433	3433	1610	3145	3145	
Flt Permitted	0.55	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (perm)	1944	3539	1683	1610	3145	3145	3433	3433	1610	3145	3145	
Peak-hour factor, PHF	0.70	0.82	1.00	0.89	0.60	0.69	0.88	0.88	0.95	1.00	1.00	
Adj. Flow (vph)	74	109	0	672	93	87	132	1055	0	0	0	
RTOR Reduction (vph)	0	0	0	70	0	77	0	0	0	0	0	
Lane Group Flow (vph)	0	183	0	672	23	78	2119	0	0	0	0	
Turn Type	NA	NA	NA	Perm	Split	NA	NA	NA	Split	NA	NA	
Protected Phases	5	6	6	6	8	16	6	8	16	6	8	
Permitted Phases	6	6	6	6	8	16	6	8	16	6	8	
Actuated Green, G (s)	28.3	28.3	28.3	75.0	75.0	75.0	28.3	75.0	75.0	28.3	75.0	
Effective Green, g (s)	28.3	28.3	28.3	75.0	75.0	75.0	28.3	75.0	75.0	28.3	75.0	
Actuated g/C Ratio	0.25	0.25	0.25	0.66	0.66	0.66	0.25	0.66	0.66	0.25	0.66	
Clearance Time (s)	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	483	880	393	1061	2072	2072	880	1061	2072	483	880	
v/s Ratio Prot	0.09	0.19	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	
v/s Ratio Perm	0.90	0.76	0.06	0.07	1.02	1.02	0.06	0.07	1.02	0.06	0.07	
Uniform Delay, d1	35.5	39.6	32.6	7.0	19.4	19.4	39.6	32.6	7.0	19.4	19.4	
Progression Factor	0.82	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.5	4.0	0.1	0.1	25.8	25.8	4.0	0.1	0.1	25.8	25.8	
Delay (s)	29.5	43.6	32.7	7.1	45.2	45.2	43.6	32.7	7.1	45.2	45.2	
Level of Service	C	D	C	A	D	D	D	C	A	D	D	
Approach Delay (s)	29.5	42.3	43.9	43.9	43.9	43.9	42.3	43.9	43.9	43.9	43.9	
Approach LOS	C	D	D	D	D	D	D	D	A	D	D	
Intersection Summary												
HCM 2000 Control Delay	42.7										HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.07										Sum of lost time (s)	21.7
Actuated Cycle Length (s)	113.8										ICU Level of Service	D
Intersection Capacity Utilization	77.2%										Analysis Period (min)	15
Analysis Period (min)	15										Critical Lane Group	15

Synchro 7 - Report
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EXHIBIT (C) - TRAFFIC IMPACT ANALYSIS

PART 4 OF 4

HCM Signalized Intersection Capacity Analysis
 1: Military Dr & IH-410 NB Frnt Rd
 Scenario 2 AM-2023-Improvements
 2/5/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBR
Lane Configurations											
Volume (vph)	187	1235	22	0	0	0	341	821	698	1418	0
Legal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0	5.1	5.1	6.0	6.0	6.0
Lane Util. Factor	0.91	0.91	1.00	0.85	1.00	0.91	1.00	0.91	0.91	0.91	0.91
Fit Protected	1.00	1.00	0.85	1.00	0.85	1.00	1.00	0.85	1.00	1.00	1.00
Fit Permitted	0.95	1.00	1.00	1.00	1.00	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1610	3388	1583	1610	3388	1583	1610	3387	1610	3376	1583
Satd. Flow (perm)	1610	3388	1583	1610	3388	1583	1610	3387	1610	3376	1583
Peak-hour factor, PHF	0.89	0.81	0.57	1.00	1.00	0.86	0.86	0.86	0.88	0.91	1.00
Adj. Flow (vph)	176	1525	39	0	0	0	397	955	793	1558	0
RTOR Reduction (vph)	0	0	28	0	0	0	0	140	0	0	0
Lane Group Flow (vph)	168	1543	11	0	0	0	397	815	650	1701	0
Turn Type	Split	NA	Perm	NA	Perm	pm+pt	NA	pm+pt	NA	Perm	NA
Protected Phases	8,16	8,16	6	6	5	5,6	6	6	5,6	6	6
Permitted Phases			8,16			6		6	5,6		
Actuated Green, G (s)	32.9	32.9	32.9	68.9	68.9	68.9	24.9	24.9	68.9	68.9	68.9
Effective Green, g (s)	32.9	32.9	32.9	68.9	68.9	68.9	24.9	24.9	68.9	68.9	68.9
Actuated g/C Ratio	0.28	0.28	0.28	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21
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	1831				
v/s Ratio Prot	0.10	0.46		0.08		0.32	0.35				
v/s Ratio Perm			0.01		0.18	0.20					
v/c Ratio	0.35	1.63	0.02	0.37	2.24	0.86	0.93				
Uniform Delay, d1	34.0	42.5	30.9	39.8	46.5	17.3	22.3				
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.88				
Incremental Delay, d2	2.2	290.4	0.1	0.2	656.5	1.0	1.0				
Delay (s)	36.2	392.9	31.0	40.1	703.0	18.2	20.7				
Level of Service	D	F	C	D	F	B	C				
Approach Delay (s)	299.2			508.3		20.0					
Approach LOS	F			F		A					
Intersection Summary											
HCM 2000 Control Delay	230.6										
HCM 2000 Volume to Capacity ratio	1.62										
Actuated Cycle Length (s)	118.0										
Intersection Capacity Utilization	143.6%										
Analysis Period (min)	15										
c. Critical Lane Group											

HCM Signalized Intersection Capacity Analysis
 2: Military Dr & IH-410 SB Frnt Rd
 Scenario 2 AM-2023-Improvements
 2/5/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBR
Lane Configurations											
Volume (vph)	0	0	0	1251	310	360	83	407	0	0	1000
Legal Flow (vphpl)	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	5.7	5.7	5.7	5.7	5.7	5.7
Lane Util. Factor	0.91	0.91	1.00	0.91	0.91	0.91	1.00	0.91	0.91	0.91	0.91
Fit Protected	1.00	1.00	0.85	1.00	1.00	1.00	1.00	0.85	1.00	1.00	1.00
Fit Permitted	0.95	0.97	1.00	0.95	1.00	1.00	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1610	3286	1583	1610	3387	1610	3387	1610	3376	1583	1583
Satd. Flow (perm)	1610	3286	1583	1610	3388	1583	3388	1610	3376	1583	1583
Peak-hour factor, PHF	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	388	385	112	543	0	0	1190
RTOR Reduction (vph)	0	0	0	0	0	218	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	680	1068	107	101	554	0	0	1190
Turn Type	Split	NA	Perm	NA	Perm	pm+pt	NA	pm+pt	NA	Perm	NA
Protected Phases	4,12	4,12	4,12	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2
Permitted Phases				4,12	4,12	4,12	4,12	4,12	4,12	4,12	4,12
Actuated Green, G (s)	34.9	34.9	34.9	67.2	67.2	67.2	67.2	67.2	67.2	67.2	67.2
Effective Green, g (s)	34.9	34.9	34.9	67.2	67.2	67.2	67.2	67.2	67.2	67.2	67.2
Actuated g/C Ratio	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
Clearance Time (s)				5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7
Vehicle Extension (s)				3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	476	971	468	634	1897						
v/s Ratio Prot	0.42	0.33		0.11	0.03	0.06					
v/s Ratio Perm			0.11		0.03	0.06					
v/c Ratio	1.43	1.40	0.36	0.16	0.29	1.00	0.04				
Uniform Delay, d1	41.5	41.5	32.7	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	60.2	2.1	0.1	0.1	274.1	0.1				
Delay (s)	246.3	101.7	34.8	6.0	5.0	320.7	37.1				
Level of Service	F	F	C	A	A	F	F				
Approach Delay (s)	135.7			5.2		306.0					
Approach LOS	F			A		F					
Intersection Summary											
HCM 2000 Control Delay	167.4										
HCM 2000 Volume to Capacity ratio	1.06										
Actuated Cycle Length (s)	118.0										
Intersection Capacity Utilization	143.6%										
Analysis Period (min)	15										
c. Critical Lane Group											

EXHIBIT (C) - TRAFFIC IMPACT ANALYSIS

PART 4 OF 4

HCM Unsignalized Intersection Capacity Analysis

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

Movement	EBL	EBT	WBL	WBT	SBL	SBR
Lane Configurations	↑↑↑	↑↑↑	↑↑↑	↑↑↑	↑↑↑	↑↑↑
Volume (veh/h)	0	0	2736	215	0	299
Sign Control	Free	Free	Stop	Stop	0%	0%
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	1.00	1.00	0.95	0.70	1.00	0.81
Heavy flow rate (vph)	0	0	3181	307	0	369
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	3489				3335	1214
vC1, stage 1 cont vol						
vC2, stage 2 cont vol						
vCU, unblocked vol	3489				3335	1214
IC, 1 stage (s)	4.1				6.6	6.9
IC, 2 stage (s)						
pl queue free %	2.2				3.5	3.3
pl queue free %	109				100	0
pl capacity (veh/h)	71				6	174
Effective Lane #	148.1	148.2	145.3	145.1	145.1	145.1
Volume Total	1273	1273	943	369		
Volume Left	0	0	0	0		
Volume Right	0	0	307	369		
cSH	1700	1700	1700	174		
Volume to Capacity	0.75	0.75	0.55	2.13		
Queue Length 95th (ft)	0	0	0	730		
Control Delay (s)	0.0	0.0	0.0	569.4		
Lane LOS				F		
Approach Delay (s)				569.4		
Approach LOS				F		
Intersection Summary						
Average Delay	54.5					
Intersection Capacity Utilization	82.8%					
Analysis Period (min)	15					
ICU Level of Service	E					

HCM Signalized Intersection Capacity Analysis

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

Movement	EBL	EBT	WBL	WBT	SBL	SBR
Lane Configurations	↑	↑	↑	↑	↑	↑
Volume (vph)	46	0	40	0	0	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost Time (s)	4.7	5.2	5.0	5.9	5.9	5.9
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.99
Fit Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	1770	3539	1770	3503
Fit Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	1770	3539	1770	3503
Peak-hour factor, PHF	1.00	1.00	0.83	1.00	1.00	0.82
Adj. Flow (vph)	46	0	48	0	0	27
RTOR Restriction (vph)	0	0	45	0	0	0
Lane Group Flow (vph)	46	0	3	0	0	27
Turn Type	custom	custom	Perm	Perm	pm-pt	NA
Protected Phases	7	6	4	8	5	2
Permitted Phases	4	4	8	8	2	6
Actuated Green, G (s)	3.9	3.4	3.4	41.5	41.5	34.7
Effective Green, g (s)	3.9	3.4	3.4	41.5	41.5	34.7
Actuated g/C Ratio	0.97	0.06	0.06	0.74	0.74	0.62
Clearance Time (s)	4.7	5.2	5.0	5.9	5.9	5.9
Vehicle Extension (s)	1.0	1.0	1.0	2.5	2.5	2.5
Lane Grp Cap (vph)	123	96	288	2622	2170	2170
vis Ratio/Prot	0.03	0.00	0.00	0.24	0.24	0.24
vis Ratio Perm	0.39	0.03	0.07	0.32	0.32	0.32
Uniform Delay, d1	24.9	24.7	2.9	2.5	2.5	6.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.7	0.0	0.1	0.1	0.1	0.2
Delay (s)	25.7	24.8	3.0	2.5	2.5	6.3
Level of Service	C	C	C	A	A	A
Approach Delay (s)	25.2	25.2	0.0	2.5	2.5	6.3
Approach LOS	C	C	A	A	A	A
Intersection Summary						
HCM 2000 Control Delay	5.6					
HCM 2000 Volume to Capacity Ratio	0.63					
Actuated Cycle Length (s)	55.0					
Intersection Capacity Utilization	43.1%					
Analysis Period (min)	15					
ICU Level of Service	A					
Sum of lost time (s)	21.1					
Sum of lost time (s)	21.1					
ICU Level of Service	A					
Analysis Period (min)	15					
Critical Lane Group	6.3					

EXHIBIT (C) - TRAFFIC IMPACT ANALYSIS

PART 4 OF 4

HCM Signalized Intersection Capacity Analysis
 Scenario 2 AM-2023-Improvements
 2/5/2014
 6: SH 151 NB Frnt Rd & Ingram Rd

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBR
Lane Configurations	4↑	4↑	4↑	4↑	4↑	4↑	4↑	4↑	4↑	4↑	4↑
Volume (vph)	352	620	0	0	460	39	355	560	219	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4
Lane Util. Factor	0.95	1.00	0.91	0.91	0.95	1.00	0.91	0.91	1.00	1.00	1.00
Flt Protected	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Satd. Flow (prot)	1610	3364	3539	1610	3364	3539	1610	3364	3539	1610	3364
Satd. Flow (perm)	0.17	0.55	0.55	0.17	0.55	0.55	0.17	0.55	0.55	0.17	0.55
Peak-hour factor, PHF	0.78	0.83	1.00	0.83	0.86	0.92	0.86	0.92	0.86	1.00	1.00
Adj. Flow (vph)	451	747	0	0	554	59	386	666	353	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	316	882	0	0	554	12	347	725	224	0	0
Turn Type	pm-plt	NA	NA	NA	pm-plt	NA	Split	NA	NA	NA	Perm
Protected Phases	5	5,6	6	6	5	6	8,16	8,16	8,16	8,16	6
Permitted Phases	5,6	5,6	6	6	5,6	6	6	6	6	6	6
Actuated Green, G (s)	83.7	83.7	30.1	30.1	83.7	83.7	53.0	53.0	53.0	53.0	53.0
Effective Green, g (s)	83.7	83.7	30.1	30.1	83.7	83.7	53.0	53.0	53.0	53.0	53.0
Actuated g/C Ratio	0.59	0.55	0.20	0.20	0.59	0.55	0.35	0.35	0.35	0.35	0.35
Clearance Time (s)	6.4	6.4	5.0	5.0	6.4	6.4	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	619	1543	695	311	567	1170	548	548	548	548	548
v/s Ratio Prot	0.19	0.20	0.16	0.16	0.19	0.20	0.22	0.21	0.21	0.21	0.21
v/s Ratio Perm	0.10	0.11	0.07	0.07	0.10	0.11	0.07	0.07	0.07	0.07	0.07
v/c Ratio	0.51	0.57	0.80	0.80	0.51	0.57	0.62	0.62	0.62	0.62	0.62
Uniform Delay, d1	23.3	22.9	58.6	48.8	41.7	41.7	38.1	38.1	38.1	38.1	38.1
Progression Factor	0.34	0.66	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	0.0	6.3	0.0	8.2	2.5	2.2	2.2	2.2	2.2	2.2
Delay (s)	43.3	1230.7	2.5	3.3	37.2	71.9	40.1	40.1	40.1	40.1	40.1
Level of Service	F	F	A	A	F	F	D	D	D	D	D
Approach Delay (s)	83.7	F	3.1	A	0.0	A	62.4	E	E	E	E
Approach LOS	F	F	A	A	A	A	A	A	A	A	A
Intersection Summary											
HCM 2000 Control Delay	400.5 HCM 2000 Level of Service F										
HCM 2000 Volume to Capacity ratio	1.26										
Actuated Cycle Length (s)	153.1 Sum of lost time (s) 22.8										
Intersection Capacity Utilization	78.5% ICU Level of Service D										
Analysis Period (min)	15										
Critical Lane Group	5										

Synchro 7 Report 5:00 pm Baseline
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HCM Signalized Intersection Capacity Analysis
 Scenario 2 AM-2023-Improvements
 2/5/2014
 5: SH 151 SB Frnt Rd & Ingram Rd

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBR
Lane Configurations	4↑	4↑	4↑	4↑	4↑	4↑	4↑	4↑	4↑	4↑	4↑
Volume (vph)	886	770	477	291	0	0	0	0	0	119	1932
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4
Lane Util. Factor	0.95	1.00	0.91	0.91	0.91	0.91	0.91	0.91	0.91	1.00	1.00
Flt Protected	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Satd. Flow (prot)	3539	1583	1610	324	1610	3388	1583	1610	3388	1583	1583
Satd. Flow (perm)	3539	1583	271	2051	1610	3388	1583	1610	3388	1583	1583
Peak-hour factor, PHF	1.00	0.85	0.74	0.95	0.77	1.00	1.00	1.00	0.72	0.91	0.61
Adj. Flow (vph)	1042	1041	502	378	0	0	0	0	165	1134	325
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	1042	921	251	629	0	0	0	0	148	1151	218
Turn Type	MA	Perm	pm-plt	NA	NA	Split	NA	NA	NA	NA	Perm
Protected Phases	2	2	1,2	1,2	4,12	4,12	4,12	4,12	4,12	4,12	4,12
Permitted Phases	2	2	1,2	1,2	4,12	4,12	4,12	4,12	4,12	4,12	4,12
Actuated Green, G (s)	25.0	25.0	84.6	84.6	53.0	53.0	53.0	53.0	53.0	53.0	53.0
Effective Green, g (s)	25.0	25.0	84.6	84.6	53.0	53.0	53.0	53.0	53.0	53.0	53.0
Actuated g/C Ratio	0.16	0.16	0.45	0.55	0.28	0.28	0.28	0.28	0.28	0.28	0.28
Clearance Time (s)	5.0	5.0	5.5	5.5	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	577	268	671	1628	557	1172	548	548	548	548	548
v/s Ratio Prot	0.29	0.15	0.15	0.15	0.09	0.09	0.09	0.09	0.09	0.09	0.09
v/s Ratio Perm	0.58	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
v/c Ratio	1.81	3.37	0.37	0.39	0.27	0.98	0.40	0.40	0.40	0.40	0.40
Uniform Delay, d1	64.0	64.0	19.8	19.5	36.0	49.5	38.0	38.0	38.0	38.0	38.0
Progression Factor	1.00	1.00	0.11	0.15	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	369.5	1166.6	0.2	0.1	1.2	22.3	2.2	2.2	2.2	2.2	2.2
Delay (s)	433.5	1230.7	2.5	3.3	37.2	71.9	40.1	40.1	40.1	40.1	40.1
Level of Service	F	F	A	A	F	F	D	D	D	D	D
Approach Delay (s)	83.7	F	3.1	A	0.0	A	62.4	E	E	E	E
Approach LOS	F	F	A	A	A	A	A	A	A	A	A
Intersection Summary											
HCM 2000 Control Delay	400.5 HCM 2000 Level of Service F										
HCM 2000 Volume to Capacity ratio	1.26										
Actuated Cycle Length (s)	153.1 Sum of lost time (s) 22.8										
Intersection Capacity Utilization	78.5% ICU Level of Service D										
Analysis Period (min)	15										
Critical Lane Group	5										

Synchro 7 Report 5:00 pm Baseline
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 Synchro 7 - Report Page 5

EXHIBIT (C) - TRAFFIC IMPACT ANALYSIS

PART 4 OF 4

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

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

HCM Signalized Intersection Capacity Analysis Scenario 2 AM-2023-Improvements

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBR
Lane Configurations	↑↑	↑↑	↑↑	↑↑	↑↑	↑↑	↑↑	↑↑	↑↑	↑↑	↑↑
Volume (vph)	215	394	112	74	180	12	28	51	30	52	257
Ideal Flow (vphpl)	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	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	1.00	0.95	1.00
Fit Protected	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95
Satd. Flow (prot)	1770	3377	1770	3484	1770	3251	1770	3255	1770	3255	1770
Fit Permitted	0.63	1.00	0.40	1.00	0.15	1.00	0.66	1.00	0.66	1.00	0.66
Satd. Flow (perm)	965	3377	735	3484	278	3251	1238	3255	1238	3255	1238
Peak-hour factor, PHF	0.88	0.89	0.88	0.77	0.45	0.99	0.81	0.40	0.75	0.83	0.85
Adj. Flow (vph)	244	431	190	84	234	27	47	63	75	89	310
RTOR Reduction (vph)	0	36	0	0	0	0	0	54	0	0	149
Lane Group Flow (vph)	244	385	0	84	255	0	47	84	0	68	519
Turn Type	pm-pt	NA	pm-pt								
Protected Phases	5	2	1	6	3	8	7	4	7	4	7
Permitted Phases	2	6	6	6	6	8	4	4	6	6	4
Actuated Green, G (s)	71.2	60.4	60.5	53.7	40.0	33.6	33.6	30.4	33.6	30.4	30.4
Effective Green, g (s)	71.2	60.4	60.5	53.7	40.0	33.6	33.6	30.4	33.6	30.4	30.4
Actuated g/C Ratio	0.69	0.50	0.60	0.45	0.33	0.28	0.28	0.25	0.28	0.25	0.25
Clearance Time (s)	4.0	4.0	4.0	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	3.0	3.0	3.0
Lane Grp Cap (vph)	678	1689	431	1559	172	910	360	824	360	824	360
v/s Ratio Prot	0.04	0.17	0.01	0.07	0.01	0.03	0.01	0.16	0.01	0.16	0.16
v/s Ratio Perm	0.17	0.09	0.09	0.08	0.08	0.08	0.05	0.05	0.08	0.05	0.05
v/c Ratio	0.36	0.34	0.19	0.16	0.27	0.09	0.19	0.63	0.19	0.63	0.63
Uniform Delay, d1	11.7	17.9	15.5	19.8	28.3	31.9	32.4	39.8	32.4	39.8	39.8
Progression Factor	1.00	1.00	0.57	0.54	1.00	1.00	1.05	1.03	1.00	1.00	1.00
Incremental Delay, d2	0.3	0.5	0.1	0.1	0.9	0.0	0.2	1.3	0.9	0.0	0.0
Delay (s)	12.0	18.5	8.9	10.9	30.2	32.0	34.3	42.1	34.3	42.1	42.1
Level of Service	B	B	A	B	B	C	C	D	C	C	D
Approach Delay (s)	16.5	16.5	10.4	10.4	31.5	31.5	41.4	41.4	31.5	41.4	41.4
Approach LOS	B	B	B	B	C	C	D	D	C	C	D
Intersection Summary											
HCM 2000 Control Delay	25.5										
HCM 2000 Volume to Capacity ratio	0.45										
Actuated Cycle Length (s)	120.0										
Intersection Capacity Utilization	51.8%										
Analysis Period (min)	15										
Critical Lane Group	C										

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBR
Lane Configurations	↑↑↑	↑↑↑	↑↑	↑↑	↑↑	↑↑	↑↑	↑↑	↑↑	↑↑	↑↑
Volume (vph)	0	1363	661	312	831	0	0	0	0	1050	509
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3
Lane Util. Factor	0.91	1.00	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Fit Protected	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95
Satd. Flow (prot)	5095	1583	1610	3377	1610	3377	1610	3377	1610	3377	1610
Fit Permitted	5085	1583	154	2104	1583	154	2104	1583	154	2104	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
Adj. Flow (vph)	0	1420	734	390	966	0	0	0	0	1154	582
RTOR Reduction (vph)	0	0	115	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1420	619	308	1048	0	0	0	0	577	1169
Turn Type	NA	pm-pt	NA	pm-pt	NA	pm-pt	NA	pm-pt	NA	pm-pt	NA
Protected Phases	6	5	5	5	5	5	5	5	5	5	5
Permitted Phases	6	6	6	6	6	6	6	6	6	6	6
Actuated Green, G (s)	48.7	48.7	76.7	75.7	75.7	75.7	75.7	75.7	75.7	75.7	75.7
Effective Green, g (s)	48.7	48.7	75.7	75.7	75.7	75.7	75.7	75.7	75.7	75.7	75.7
Actuated g/C Ratio	0.41	0.41	0.41	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63
Clearance Time (s)	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3
Vehicle Extension (s)	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Lane Grp Cap (vph)	2063	642	424	1613	1613	1613	1613	1613	1613	362	744
v/s Ratio Prot	0.28	0.39	0.29	0.26	0.26	0.26	0.26	0.26	0.26	0.36	0.35
v/s Ratio Perm	0.69	0.96	0.73	0.65	0.65	0.65	0.65	0.65	0.65	1.59	1.57
v/c Ratio	29.4	34.8	29.2	13.9	13.9	13.9	13.9	13.9	13.9	46.5	39.6
Uniform Delay, d1	1.00	1.00	0.76	0.68	0.68	0.68	0.68	0.68	0.68	1.00	1.00
Progression Factor	0.9	26.7	0.5	0.1	0.1	0.1	0.1	0.1	0.1	280.0	283.5
Incremental Delay, d2	30.3	61.5	22.5	9.5	9.5	9.5	9.5	9.5	9.5	326.5	310.0
Delay (s)	30.3	61.5	22.5	9.5	9.5	9.5	9.5	9.5	9.5	326.5	310.0
Level of Service	C	E	C	A	A	A	A	A	A	F	F
Approach Delay (s)	40.9	40.9	12.5	12.5	12.5	12.5	12.5	12.5	12.5	276.8	276.8
Approach LOS	D	D	B	B	B	B	B	B	B	F	F
Intersection Summary											
HCM 2000 Control Delay	120.4										
HCM 2000 Volume to Capacity ratio	1.14										
Actuated Cycle Length (s)	120.0										
Intersection Capacity Utilization	115.6%										
Analysis Period (min)	15										
Critical Lane Group	C										

EXHIBIT (C) - TRAFFIC IMPACT ANALYSIS

PART 4 OF 4

HCM Signalized Intersection Capacity Analysis
 9: SH 151 NB Frnt Rd & Potranco Rd
 Scenario 2 AM-2023-Improvements
 2/5/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (vph)	296	2073	0	0	0	0	0	0	0	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	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3
Lane Util. Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Fit Protected	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fit Permitted	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Satd. Flow (prot)	1610	3387	5085	5085	5085	5085	5085	5085	5085	5085	5085	5085
Satd. Flow (perm)	328	3234	5085	5085	5085	5085	5085	5085	5085	5085	5085	5085
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	880	460	570	681	149	0	0	0
RTOR Reduction (vph)	0	0	0	0	264	0	0	0	125	0	0	0
Lane Group Flow (vph)	409	2275	0	0	880	136	405	846	24	0	0	0
Turn Type	pm-tp	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Protected Phases	1	2	2	2	2	2	2	2	2	2	2	2
Permitted Phases	2	1	1	1	1	1	1	1	1	1	1	1
Actuated Green, G (s)	83.7	83.7	20.7	20.7	20.7	20.7	19.0	19.0	19.0	19.0	19.0	19.0
Effective Green, g (s)	83.7	83.7	20.7	20.7	20.7	19.0	19.0	19.0	19.0	19.0	19.0	19.0
Actuated g/C Ratio	0.70	0.70	0.17	0.17	0.17	0.16	0.16	0.16	0.16	0.16	0.16	0.16
Clearance Time (s)	5.7	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3
Vehicle Extension (s)	1.0	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Lane Grp Cap (vph)	901	2336	877	273	254	531	250					
vis Ratio Prot	0.24	60.51	0.13	0.09	0.25	0.25	0.01					
vis Ratio Perm	0.08	0.97	0.45	0.37	0.78	0.50	1.59	0.09				
vis Ratio	10.1	17.1	47.4	44.9	50.5	50.5	43.1					
Uniform Delay, d1	0.73	0.83	0.81	0.65	1.00	1.00	1.00					
Progression Factor	0.0	2.1	6.2	5.9	285.3	275.8	0.1					
Incremental Delay, d2	7.4	16.2	44.4	35.1	335.6	326.3	43.3					
Delay (s)	A	B	D	D	F	F	D					
Level of Service	A	B	D	D	F	F	D					
Approach Delay (s)	14.9	40.9	288.9	0.0								
Approach LOS	B	D	D	A								

Intersection Summary	
HCM 2000 Control Delay	97.3
HCM 2000 Volume to Capacity ratio	1.16
Actuated Cycle Length (s)	120.0
Intersection Capacity Utilization	115.6%
Analysis Period (min)	15
Critical Lane Group	

HCM Signalized Intersection Capacity Analysis
 10: Richland Hills & Potranco Rd
 Scenario 2 AM-2023-Improvements
 2/5/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (vph)	383	2035	241	102	569	77	64	120	178	296	308	268
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
Fit Protected	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fit Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	3539	583	1770	3539	583	1770	1863	1863	1770	3539	1863
Satd. Flow (perm)	472	3539	1583	128	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)	292	2366	548	185	785	91	142	174	274	340	321	319
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	282	2366	456	185	785	93	142	174	128	340	321	319
Turn Type	pm-tp	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Protected Phases	1	6	6	6	6	6	6	6	6	6	6	6
Permitted Phases	2	1	1	1	1	1	1	1	1	1	1	1
Actuated Green, G (s)	65.2	65.0	65.0	65.2	65.2	65.2	65.2	65.2	65.2	65.2	65.2	65.2
Effective Green, g (s)	65.2	65.0	65.0	65.2	65.2	65.2	65.2	65.2	65.2	65.2	65.2	65.2
Actuated g/C Ratio	0.54	0.48	0.48	0.54	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43
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)	406	1710	765	168	1512	676	129	136	116	370	740	331
vis Ratio Prot	0.08	60.97	0.29	0.07	0.22	0.08	0.06	0.09	0.08	0.19	0.09	0.05
vis Ratio Perm	0.30	0.38	0.60	0.10	0.52	0.06	1.10	1.28	1.10	0.92	0.43	0.22
vis Ratio	16.4	31.0	22.5	34.1	25.3	20.2	55.6	55.6	55.6	46.5	41.3	39.3
Uniform Delay, d1	1.19	0.91	0.85	1.49	0.87	1.76	0.91	0.91	0.78	1.00	1.00	1.00
Progression Factor	3.1	175.4	2.5	98.5	1.3	0.2	108.7	170.3	112.8	26.7	0.1	0.1
Incremental Delay, d2	22.6	203.5	21.6	149.2	23.4	36.0	159.4	221.0	166.2	73.1	41.4	38.4
Delay (s)	C	F	C	F	C	D	F	F	F	E	D	D
Level of Service	C	F	C	F	C	D	F	F	F	E	D	D
Approach Delay (s)	156.4	46.4	46.4	176.1	51.8							
Approach LOS	F	F	F	F	F							

Intersection Summary	
HCM 2000 Control Delay	120.7
HCM 2000 Volume to Capacity ratio	1.24
Actuated Cycle Length (s)	120.0
Intersection Capacity Utilization	102.0%
Analysis Period (min)	15
Critical Lane Group	

EXHIBIT (C) - TRAFFIC IMPACT ANALYSIS

PART 4 OF 4

HCM Signalized Intersection Capacity Analysis
 11: Ingram Rd & Potranco Rd
 Scenario 2 AM-2023-Improvements
 2/5/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBR
Volume (vph)	5	2268	19	191	722	0	1	25	332	0	70
Peak Hour Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95
Actuated Green, G (s)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Effective Green, g (s)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Actuated g/C Ratio	0.61	0.61	0.61	0.78	0.78	0.14	0.14	0.14	0.14	0.14	0.14
Clearance Time (s)	4.0	4.0	4.0	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	3.0	3.0	3.0
Lane Grp Cap (vph)	369	2158	322	2801	184	430	488	602	602	0	602
vs Ratio Prot	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
vs Ratio Perm	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Uniform Delay, d1	9.2	23.4	43.3	3.5	44.3	47.7	45.1	45.1	45.1	45.1	45.1
Progression Factor	0.45	0.27	0.71	0.87	0.81	0.60	0.60	0.60	0.60	0.60	0.60
Incremental Delay, d2	0.0	99.3	32.8	0.3	0.2	4.4	0.6	0.6	0.6	0.6	0.6
Delay (s)	4.1	105.7	63.6	3.3	36.1	32.9	44.1	44.1	44.1	44.1	44.1
Level of Service	A	F	E	A	D	C	D	C	D	D	D
Approach Delay (s)		105.5		18.5	32.9		44.1	44.1	44.1		44.1
Approach LOS		F		B	C		C	C	C		D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBR
Volume (vph)	5	2268	19	191	722	0	1	25	332	0	70
Peak Hour Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95
Actuated Green, G (s)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Effective Green, g (s)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Actuated g/C Ratio	0.61	0.61	0.61	0.78	0.78	0.14	0.14	0.14	0.14	0.14	0.14
Clearance Time (s)	4.0	4.0	4.0	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	3.0	3.0	3.0
Lane Grp Cap (vph)	369	2158	322	2801	184	430	488	602	602	0	602
vs Ratio Prot	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
vs Ratio Perm	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Uniform Delay, d1	9.2	23.4	43.3	3.5	44.3	47.7	45.1	45.1	45.1	45.1	45.1
Progression Factor	0.45	0.27	0.71	0.87	0.81	0.60	0.60	0.60	0.60	0.60	0.60
Incremental Delay, d2	0.0	99.3	32.8	0.3	0.2	4.4	0.6	0.6	0.6	0.6	0.6
Delay (s)	4.1	105.7	63.6	3.3	36.1	32.9	44.1	44.1	44.1	44.1	44.1
Level of Service	A	F	E	A	D	C	D	C	D	D	D
Approach Delay (s)		105.5		18.5	32.9		44.1	44.1	44.1		44.1
Approach LOS		F		B	C		C	C	C		D

Intersection Summary	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBR
HCM 2000 Control Delay	73.2	73.2	73.2	73.2	73.2	73.2	73.2	73.2	73.2	73.2	73.2
HCM 2000 Volume to Capacity ratio	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Actuated Cycle Length (s)	120.0	120.0	120.0	120.0	120.0	120.0	120.0	120.0	120.0	120.0	120.0
Intersection Capacity Utilization	95.9%	95.9%	95.9%	95.9%	95.9%	95.9%	95.9%	95.9%	95.9%	95.9%	95.9%
Analysis Period (min)	15	15	15	15	15	15	15	15	15	15	15
dt - Defacto Right Lane - Recode with 1 through lane as a right lane.											
c - Critical Lane Group											

HCM Signalized Intersection Capacity Analysis
 12: Military Dr & Potranco Rd
 Scenario 2 AM-2023-Improvements
 2/5/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBR
Volume (vph)	10	1869	883	317	516	75	161	175	372	36	289
Peak Hour Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95
Actuated Green, G (s)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Effective Green, g (s)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Actuated g/C Ratio	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59
Clearance Time (s)	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8
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
Lane Grp Cap (vph)	340	2099	939	62	2070	224	605	515	179	515	179
vs Ratio Prot	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
vs Ratio Perm	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Uniform Delay, d1	10.1	22.7	24.4	24.4	12.8	52.3	50.4	49.4	48.1	48.1	48.1
Progression Factor	0.47	0.82	1.30	0.98	1.13	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.0	1.3	45.6	2187.7	0.4	58.8	53.5	53.5	53.5	53.5	53.5
Delay (s)	4.7	19.9	77.2	2211.7	14.9	109.1	103.9	103.9	103.9	103.9	103.9
Level of Service	A	B	E	F	B	F	F	F	F	F	F
Approach Delay (s)		41.8		701.4		105.3	105.3	105.3	105.3	105.3	105.3
Approach LOS		D		F		F	F	F	F	F	F

Intersection Summary	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBR
HCM 2000 Control Delay	187.0	187.0	187.0	187.0	187.0	187.0	187.0	187.0	187.0	187.0	187.0
HCM 2000 Volume to Capacity ratio	4.35	4.35	4.35	4.35	4.35	4.35	4.35	4.35	4.35	4.35	4.35
Actuated Cycle Length (s)	120.0	120.0	120.0	120.0	120.0	120.0	120.0	120.0	120.0	120.0	120.0
Intersection Capacity Utilization	113.7%	113.7%	113.7%	113.7%	113.7%	113.7%	113.7%	113.7%	113.7%	113.7%	113.7%
Analysis Period (min)	15	15	15	15	15	15	15	15	15	15	15
dt - Defacto Right Lane - Recode with 1 through lane as a right lane.											
c - Critical Lane Group											

EXHIBIT (C) - TRAFFIC IMPACT ANALYSIS

PART 4 OF 4

HCM Signalized Intersection Capacity Analysis

13: Micron & Potranco Rd

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	4	4	4	4	4	4	4	4	4	4	4	4	
Volume (vph)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Ideal Flow (vphpl)	4.8	5.7	5.7	4.8	5.7	4.0	5.1	5.1	4.0	5.1	5.1	4.8	
Total Lost Time (s)	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	
Lane Util. Factor	0.95	1.00	0.95	1.00	0.99	1.00	0.95	1.00	0.95	1.00	0.99	1.00	
Fit Procced	0.95	1.00	0.95	1.00	0.99	1.00	0.95	1.00	0.95	1.00	0.99	1.00	
Satd. Flow (prot)	1770	3539	1583	1770	3516	1770	1762	1770	1762	1770	1665	1770	
Fit Permitted	0.37	1.00	1.00	0.08	1.00	0.14	1.00	1.00	1.00	0.71	1.00	1.00	
Satd. Flow (perm)	686	3539	1583	144	3516	257	1762	1319	1665	1319	1665	1319	
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	956	399	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	Perm	NA	MA	
Prohibited Phases	1	6	6	5	6	7	4	8	8	8	8	8	
Permitted Phases	2	6	6	6	6	6	6	6	6	6	6	6	
Actuated Green, G (s)	67.9	51.7	51.7	67.9	63.7	32.5	36.5	29.0	29.0	29.0	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	29.0	29.0	29.0	
Actuated v/c Ratio	0.57	0.43	0.43	0.57	0.53	0.27	0.30	0.24	0.24	0.24	0.24	0.24	
Clearance Time (s)	4.8	5.7	5.7	4.8	5.7	4.0	5.1	5.1	4.0	5.1	5.1	4.8	
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 Cap (vph)	426	1524	682	300	1866	113	535	318	402	318	402	402	
v/s Ratio Prot	0.00	0.37	0.27	0.18	0.17	0.01	0.03	0.07	0.07	0.07	0.07	0.07	
v/s Ratio Perm	0.07	0.27	0.27	0.18	0.17	0.01	0.03	0.07	0.07	0.07	0.07	0.07	
v/c Ratio	0.13	0.85	0.85	0.30	0.34	0.27	0.11	0.11	0.11	0.11	0.11	0.11	
Uniform Delay, d1	11.9	30.7	26.7	43.5	16.1	35.1	30.0	45.5	45.5	45.5	45.5	45.5	
Progression Factor	0.85	0.55	0.47	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.0	2.1	1.4	156.9	0.5	0.5	0.0	126.6	192.6	192.6	192.6	192.6	
Delay (s)	10.1	18.9	14.1	198.4	16.6	35.6	30.1	172.1	238.1	238.1	238.1	238.1	
Level of Service	B	B	B	F	B	D	C	F	F	F	F	F	
Approach Delay (s)	17.1	86.5	31.7	86.5	31.7	86.5	31.7	86.5	31.7	86.5	31.7	86.5	
Approach LOS	B	B	B	F	B	F	C	F	F	F	F	F	
Intersection Summary													
HCM 2000 Control Delay	82.5											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 2 AM-2023-Improvements
2/5/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	1	1	1	1	1	1	1	1	1	1	1	1	
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	
Volume (vph)	105	105	105	105	105	105	105	105	105	105	105	105	
Peak Hour Factor	0.25	1.00	1.00	0.70	0.25	0.74	0.25	0.68	0.66	0.98	0.99	0.25	
Hourly flow rate (vph)	4	0	0	150	4	151	4	155	42	183	581	4	
Direction Lane #	EB1	EB2	WB1	WB2	NB1	NB2	SB1	SB2	SB3	SB4	SB5	SB6	
Volume Total (vph)	4	0	0	150	155	202	788						
Volume Left (vph)	4	0	0	150	0	4	183						
Volume Right (vph)	0	0	0	0	151	42	4						
Headway (s)	0.53	0.00	0.53	-0.66	-0.69	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	0.12							
Capacity (veh/s)	424	484	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	11.2	11.4	11.4	93.3							
Approach LOS	A	B	B	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 4 OF 4

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

Movement	EBL	EBT	EBR	WBT	WBR	SEL	SEB
Volume (vph)	298	298	364	12	4	166	
Sign Control	Free	Free	Stop				
Grade	0%	0%	0%				
Peak Hour Factor	0.88	0.74	0.75	0.38	0.70		
Heavy flow rate (vph)	344	305	492	16	11	237	
Pedestrians							
Lane Width (ft)							
Percent Blockage							
Right turn flare (veh)							
Median type	None	None	None				
Median storage (veh)							
Upstream signal (ft)							
pX, platoon unblocked							
vC, conflicting volume	508			1341	254		
vC1, stage 1 cont vol							
vC2, stage 2 cont vol	508			1341	254		
vC3, unblocked vol	41			6.8	6.9		
IC, 2 stage (s)							
IC, 2 stage (s)							
pl queue free %	67			89	68		
pl capacity (veh/h)	1053			97	745		
Direction Lane #	EB1	EB2	EB3	WBT	WBR	SEB1	SEB2
Volume Total	344	152	328	180	11	237	0
Volume Left	344	0	0	0	0	11	0
Volume Right	0	0	0	16	0	237	0
Volume Through	0	0	0	0	0	0	0
Volume to Capacity	0.33	0.09	0.09	0.19	0.11	0.11	0.32
Queue Length 85th (ft)	36	0	0	0	0	9	34
Control Delay (s)	10.1	0.0	0.0	0.0	0.0	16.7	12.1
Lane LOS	B					E	B
Approach Delay (s)	5.3			0.0		13.5	
Approach LOS	B					B	
Intersection Summary							
Average Delay	4.9						
Intersection Capacity Utilization	40.2%						
ICU Level of Service	A						
Analysis Period (min)	15						

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

Movement	EBL	EBT	EBR	WBT	WBR	SEL	SEB	SSU	SSB	SSR
Volume (vph)	0	334	285	111	326	3	148	8	197	23
Sign Control		1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade		5.3	4.2	5.4	4.5	4.3	4.6	4.6	4.6	4.3
Peak Hour Factor		0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Heavy flow rate (vph)		393	300	300	386	300	386	300	386	300
Pedestrians		1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Lane Width (ft)		3284	1770	3531	1770	6003	1770	1816	1770	1816
Percent Blockage		1.00	0.29	1.00	0.70	1.00	0.29	1.00	0.29	1.00
Right turn flare (veh)		3284	537	3531	1307	6003	544	1816	1307	1816
Median type										
Median storage (veh)										
Upstream signal (ft)										
pX, platoon unblocked										
vC, conflicting volume		1.00	0.83	0.79	0.77	0.82	0.50	0.73	0.38	0.70
vC1, stage 1 cont vol		0	402	373	144	398	6	203	21	281
vC2, stage 2 cont vol		0	165	0	0	1	0	0	238	0
vC3, unblocked vol		0	510	0	144	403	0	203	64	0
IC, 2 stage (s)										
IC, 2 stage (s)										
pl queue free %										
pl capacity (veh/h)										
Direction Lane #	pm-pt	NA	pm-pt	NA	D,P-P	NA	D,P-P	NA	D,P-P	NA
Volume Total	6	60.1	60.1	60.1	15.7	13.7	15.6	5.7	15.6	5.7
Volume Left	6	60.1	60.1	60.1	15.7	13.7	15.6	5.7	15.6	5.7
Volume Right	0	0	0	0	0	0	0	0	0	0
Volume Through	0	0	0	0	0	0	0	0	0	0
Volume to Capacity	0.56	0.67	0.67	0.67	0.17	0.17	0.17	0.06	0.17	0.06
Queue Length 85th (ft)	5.3	4.2	5.4	4.5	4.3	4.6	4.6	4.3	4.6	4.3
Control Delay (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lane LOS										
Approach Delay (s)	18.28	4.39	2157	279	244	120	115			
Approach LOS	E									
Intersection Summary										
HCM 2000 Control Delay	15.6									
HCM 2000 Volume to Capacity Ratio	0.42									
Actuated Cycle Length (s)	90.0									
Sum of lost time (s)	18.4									
Intersection Capacity Utilization	55.5%									
ICU Level of Service	B									
Analysis Period (min)	15									
Critical Lane Group	E									

EXHIBIT (C) - TRAFFIC IMPACT ANALYSIS

PART 4 OF 4

HCM Unsignalized Intersection Capacity Analysis
 18: Richland Hills & Jack Jordan MS
 Scenario 2 AM-2023-Improvements
 2/5/2014

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Stop	Stop	Stop	Stop	Stop	Stop
Volume (vph)	273	360	290	36	199	477
Peak Hour Factor	0.85	0.70	0.74	0.74	0.76	0.85
Hourly flow rate (vph)	420	514	392	49	262	561
Direction Lane #	EB1	EB2	NB1	NB2	SB1	SB2
Volume Total (vph)	420	514	392	49	449	374
Volume Left (vph)	420	0	392	0	0	0
Volume Right (vph)	0	514	0	0	187	374
Head (s)	0.53	-0.67	0.53	0.03	-0.26	-0.67
Departure Headway (s)	8.4	7.2	9.1	8.6	7.6	7.2
Degree Utilization	0.98	1.03	0.99	0.12	0.95	0.75
Capacity (veh/h)	420	514	392	403	462	492
Control Delay (s)	67.0	72.8	71.6	11.5	55.4	27.2
Approach Delay (s)	70.2		64.9		42.6	
Approach LOS	F	F	E	E	F	E
Intersection Summary						
Delay	58.8					
Level of Service	F					
Intersection Capacity Utilization	81.4%					
Analysis Period (min)	15					
ICU Level of Service B						

HCM Unsignalized Intersection Capacity Analysis
 19: Richland Hills & Christian Evers ES
 Scenario 2 AM-2023-Improvements
 2/5/2014

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y			4	4	SB
Volume (veh/h)	27	40	36	381	524	35
Sign Control	Stop			Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.42	0.47	0.68	0.78	0.94	0.50
Hourly flow rate (vph)	84	85	53	488	657	70
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	None
Median storage (veh)						
Lost time signal (s)						
Lost time signal (s)						
pk, platoon unblocked						
vc, conflicting volume	1187	592	527			
vc1, stage 1 conf vol						
vc2, stage 2 conf vol						
vcu, unblocked vol	1187	592	527			
ic, single (s)	6.4	6.2	4.1			
ic, 2 stage (s)						
lf (s)	3.5	3.3	2.2			
p0 queue free %	67	83	94			
pl capacity (veh/h)	197	506	954			
Direction Lane #	EB1	EB2	NB1	NB2	SB1	SB2
Volume Total	149	541	627			
Volume Left	64	53	0			
Volume Right	85	0	70			
csh	302	954	1700			
Volume to Capacity	0.50	0.06	0.37			
Queue Length 95th (ft)	65	4	0			
Control Delay (s)	28.1	1.5	0.0			
Lane LOS	D	A	A			
Approach Delay (s)	28.1	1.5	0.0			
Approach LOS	D	D	D			
Intersection Summary						
Average Delay	3.8					
Intersection Capacity Utilization	60.5%					
Analysis Period (min)	15					
ICU Level of Service B						

EXHIBIT (C) - TRAFFIC IMPACT ANALYSIS

PART 4 OF 4

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

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

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

Movement	EBL	EBT	WBL	WBT	SBL	SBT	EBL	EBT	WBL	WBT	SBL	SBT
Lane Configurations	103	516	82	203	294	21	334	188	478	915	59	59
Volume (vph)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Ideal Flow (vphpl)	5.0	5.7	5.0	5.8	5.8	3.2	5.6	5.6	5.6	5.2	5.6	5.6
Total Lost time (s)	1.00	0.95	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Lane Util. Factor	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Flt Protected	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1770	3451	1770	3539	1583	1770	3539	1583	1770	3510	1583	1770
Flt Permitted	0.61	1.00	0.22	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95
Satd. Flow (perm)	1130	3451	414	3539	1583	1770	3539	1583	1770	3510	1583	1770
Peak-hour factor, PHF	0.82	0.80	0.64	0.87	0.80	0.56	0.75	0.84	0.65	0.76	0.85	0.85
Adj. Flow (vph)	112	645	128	228	233	368	38	445	224	735	1204	65
RTOR Reduction (vph)	0	18	0	0	0	294	0	186	0	5	0	0
Lane Group Flow (vph)	112	758	0	228	233	74	38	445	38	735	1268	0
Turn Type	Prot	NA	NA	Perm	NA	Perm	Prot	NA	Perm	Prot	NA	NA
Protected Phases	7	4	3	8	5	2	5	2	5	2	1	6
Permitted Phases	4	8	8	8	8	2	8	2	8	2	1	6
Actuated Green, G (s)	20.5	17.3	22.0	18.0	18.0	2.6	14.4	14.4	14.4	32.8	44.6	44.6
Effective Green, g (s)	20.5	17.3	22.0	18.0	18.0	2.6	14.4	14.4	14.4	32.8	44.6	44.6
Actuated g/C Ratio	0.23	0.19	0.24	0.20	0.20	0.03	0.16	0.16	0.16	0.36	0.50	0.50
Clearance Time (s)	5.0	5.7	5.0	5.8	5.8	5.2	5.6	5.6	5.6	5.2	5.6	5.6
Vehicle Extension (s)	1.0	2.5	1.0	2.0	2.0	1.0	2.5	2.5	2.5	1.0	2.5	2.5
Lane Grp Cap (vph)	280	663	161	707	316	51	566	263	645	1739	6036	6036
v/s Ratio Prot	0.01	0.22	0.06	0.07	0.02	0.13	0.02	0.02	0.02	0.02	0.02	0.02
v/s Ratio Perm	0.08	1.14	0.40	1.42	0.33	0.23	0.75	0.79	0.15	1.14	0.73	0.73
Uniform Delay, d1	28.8	36.4	34.2	30.8	30.2	43.4	38.3	32.5	28.6	17.9	1.00	1.00
Progression Factor	1.00	1.00	0.68	0.73	1.13	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3	80.0	219.3	0.1	0.1	39.8	10.5	1.3	80.8	2.7	0.0	0.0
Delay (s)	29.1	116.3	242.6	34.1	34.1	83.2	46.9	33.8	108.2	20.7	0.0	0.0
Level of Service	C	F	F	C	C	F	D	C	F	C	F	C
Approach Delay (s)	105.3	88.2	44.7	53.1	53.1	53.1	53.1	53.1	53.1	53.1	53.1	53.1
Approach LOS	F	F	F	D	D	D	D	D	D	D	D	D
Intersection Summary												
HCM 2000 Control Delay	68.7											
HCM 2000 Volume to Capacity ratio	1.18											
Actuated Cycle Length (s)	90.0											
Intersection Capacity Utilization	81.8%											
Analysis Period (min)	15											
Critical Lane Group	5											

Movement	EBL	EBT	WBL	WBT	SBL	SBT	EBL	EBT	WBL	WBT	SBL	SBT
Lane Configurations	106	823	951	86	76	63	13.7	71.8	53.2	8.2	8.2	8.2
Volume (vph)	1900	1900	1900	1900	1900	1900	13.7	71.8	53.2	8.2	8.2	8.2
Ideal Flow (vphpl)	4.9	4.9	4.9	4.9	4.9	5.1	0.15	0.80	0.59	0.59	0.09	0.09
Total Lost time (s)	1.00	0.95	0.95	1.00	1.00	1.00	4.9	4.9	4.9	5.1	5.1	5.1
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	0.95	1.0	2.0	2.0	1.0	1.0	1.0
Flt Protected	0.95	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	3539	1583	1770	1583	269	2823	2091	935	161	144
Flt Permitted	0.95	1.00	1.00	0.95	1.00	0.95	0.11	60.32	0.17	0.03	0.05	0.01
Satd. Flow (perm)	1130	3451	3451	1583	1770	1583	0.74	0.40	0.30	0.05	0.53	0.06
Peak-hour factor, PHF	0.83	0.72	0.89	0.88	0.91	0.82	36.5	2.7	9.1	7.7	38.1	37.4
Adj. Flow (vph)	200	1143	819	75	86	102	1.05	0.26	0.64	0.25	1.00	1.00
RTOR Reduction (vph)	0	0	0	31	0	93	3.3	0.1	0.3	0.1	1.7	0.1
Lane Group Flow (vph)	200	1143	819	44	86	9	41.6	0.9	6.2	2.0	40.8	37.5
Turn Type	Prot	NA	NA	Perm	NA	Perm	D	A	A	A	D	D
Protected Phases	7	6	2	8	3	9	6.9	5.7	39.0	39.0	39.0	39.0
Permitted Phases	2	8	8	8	8	2	A	A	A	A	D	D
Actuated Green, G (s)	13.7	71.8	53.2	8.2	8.2	8.2	9.3	9.3	9.3	9.3	9.3	9.3
Effective Green, g (s)	13.7	71.8	53.2	8.2	8.2	8.2	9.3	9.3	9.3	9.3	9.3	9.3
Actuated g/C Ratio	0.15	0.80	0.59	0.59	0.09	0.09	0.49	0.49	0.49	0.49	0.49	0.49
Clearance Time (s)	4.9	4.9	4.9	4.9	4.9	5.1	5.1	5.1	5.1	5.1	5.1	5.1
Vehicle Extension (s)	1.0	2.0	2.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lane Grp Cap (vph)	269	2823	2091	935	161	144	9.3	9.3	9.3	9.3	9.3	9.3
v/s Ratio Prot	0.11	60.32	0.17	0.03	0.03	0.01	0.49	0.49	0.49	0.49	0.49	0.49
v/s Ratio Perm	0.74	0.40	0.30	0.05	0.53	0.06	0.49	0.49	0.49	0.49	0.49	0.49
Uniform Delay, d1	36.5	2.7	9.1	7.7	38.1	37.4	14.9	14.9	14.9	14.9	14.9	14.9
Progression Factor	1.05	0.26	0.64	0.25	1.00	1.00	38.5%	38.5%	38.5%	38.5%	38.5%	38.5%
Incremental Delay, d2	3.3	0.1	0.3	0.1	1.7	0.1	15	15	15	15	15	15
Delay (s)	41.6	0.9	6.2	2.0	40.8	37.5	15	15	15	15	15	15
Level of Service	D	A	A	A	D	D	A	A	A	A	A	A
Approach Delay (s)	6.9	5.7	39.0	39.0	39.0	39.0	39.0	39.0	39.0	39.0	39.0	39.0
Approach LOS	A	A	A	A	D	D	A	A	A	A	A	A
Intersection Summary												
HCM 2000 Control Delay	9.3											
HCM 2000 Volume to Capacity ratio	0.49											
Actuated Cycle Length (s)	90.0											
Intersection Capacity Utilization	38.5%											
Analysis Period (min)	15											
Critical Lane Group	5											

EXHIBIT (C) - TRAFFIC IMPACT ANALYSIS

PART 4 OF 4

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

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

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

Scenario 2 AM-2023-Improvements
2/6/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBR
Lane Configurations	4↑	↑	↑	↑	↑	↑	4↑	↑	↑	↑	↑
Volume (vph)	22	25	0	0	1379	51	53	654	392	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.3	5.3	5.3	5.3	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	0.95	0.95	1.00	0.91	0.91	1.00	0.95	0.91	1.00	0.95	1.00
Flt Protected	1.00	1.00	0.85	1.00	1.00	1.00	0.85	1.00	1.00	0.85	1.00
Flt Permitted	0.98	0.98	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3457	3457	3539	1583	1610	3388	1583	1610	3388	1583	1610
Satd. Flow (perm)	2039	2039	3539	1583	1610	3388	1583	1610	3388	1583	1610
Peak-hour factor, PHF	0.57	0.58	1.00	1.00	0.80	0.75	0.96	0.73	0.69	1.00	1.00
Adj. Flow (vph)	39	43	0	0	1724	68	95	896	568	0	0
RTOR Reduction (vph)	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
Turn Type	NA	NA	Perm	NA	Perm	Split	NA	Perm	NA	Perm	NA
Projected Phases	5	6	6	6	8.16	8.16	8.16	8.16	8.16	8.16	8.16
Permitted Phases	6	6	6	6	6	6	6	6	6	6	6
Actuated Green, G (s)	51.7	51.7	51.7	51.7	57.8	57.8	57.8	57.8	57.8	57.8	57.8
Effective Green, g (s)	51.7	51.7	51.7	51.7	57.8	57.8	57.8	57.8	57.8	57.8	57.8
Actuated g/C Ratio	0.43	0.43	0.43	0.43	0.48	0.48	0.48	0.48	0.48	0.48	0.48
Clearance Time (s)	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	878	1524	682	775	1631	762	1631	762	1631	762	1631
v/s Ratio Prot	0.49	0.49	0.02	0.02	0.05	0.02	0.05	0.02	0.05	0.02	0.05
v/s Ratio Perm	0.04	0.04	0.02	0.02	0.05	0.02	0.05	0.02	0.05	0.02	0.05
v/c Ratio	0.09	0.09	0.04	0.04	0.11	0.06	0.11	0.06	0.11	0.06	0.11
Uniform Delay, d1	20.3	34.1	19.8	17.0	22.0	20.1	22.0	20.1	22.0	20.1	22.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	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	0.4	0.4	0.4	0.4	0.4
Delay (s)	26.3	102.1	19.9	17.1	22.4	20.5	22.4	20.5	22.4	20.5	22.4
Level of Service	C	F	B	B	C	C	C	C	C	C	C
Approach Delay (s)	26.3	98.9	19.9	17.1	22.4	20.5	22.4	20.5	22.4	20.5	22.4
Approach LOS	C	F	B	B	C	C	C	C	C	C	C
Intersection Summary											
HCM 2000 Control Delay	62.0										
HCM 2000 Volume to Capacity ratio	0.91										
Actuated Cycle Length (s)	120.0										
Intersection Capacity Utilization	85.0%										
Analysis Period (min)	15										
Critical Lane Group	E										

Movement	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBR
Lane Configurations	↑	↑	↑	4↑	↑	↑	↑	↑
Volume (vph)	1454	0	0	0	0	48	1564	1564
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	5.2	5.2	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00	0.91	0.91
Flt Protected	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00
Flt Permitted	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3433	3433	1610	1610	3380	3380	1610	3380
Satd. Flow (perm)	3433	3433	1610	1610	3380	3380	1610	3380
Peak-hour factor, PHF	0.83	1.00	1.00	1.00	0.67	0.85	1.00	1.00
Adj. Flow (vph)	1752	0	0	0	72	1840	1752	1840
RTOR Reduction (vph)	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	1752	0	0	0	65	1847	1752	1847
Turn Type	NA	NA	Split	NA	Split	NA	NA	NA
Projected Phases	1	1	4.12	4.12	4.12	4.12	4.12	4.12
Permitted Phases	1	1	4.12	4.12	4.12	4.12	4.12	4.12
Actuated Green, G (s)	57.8	57.8	51.8	51.8	51.8	51.8	51.8	51.8
Effective Green, g (s)	57.8	57.8	51.8	51.8	51.8	51.8	51.8	51.8
Actuated g/C Ratio	0.48	0.48	0.43	0.43	0.43	0.43	0.43	0.43
Clearance Time (s)	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1663	1663	694	1463	1463	1463	694	1463
v/s Ratio Prot	0.51	0.51	0.04	0.04	0.04	0.04	0.04	0.04
v/s Ratio Perm	0.06	0.06	0.05	0.05	0.05	0.05	0.05	0.05
v/c Ratio	1.06	1.06	0.20	0.20	0.20	0.20	0.20	0.20
Uniform Delay, d1	31.1	31.1	20.2	34.1	34.1	34.1	20.2	34.1
Progression Factor	0.43	0.43	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	28.6	28.6	0.1	123.8	123.8	123.8	0.1	123.8
Delay (s)	51.8	51.8	20.3	157.9	157.9	157.9	20.3	157.9
Level of Service	D	D	C	F	F	F	C	F
Approach Delay (s)	41.8	41.8	0.0	153.2	153.2	153.2	0.0	153.2
Approach LOS	D	D	A	F	F	F	A	F
Intersection Summary								
HCM 2000 Control Delay	69.9							
HCM 2000 Volume to Capacity ratio	1.27							
Actuated Cycle Length (s)	120.0							
Intersection Capacity Utilization	85.0%							
Analysis Period (min)	15							
Critical Lane Group	E							

EXHIBIT (C) - TRAFFIC IMPACT ANALYSIS

PART 4 OF 4

HCM Signalized Intersection Capacity Analysis
 2: Military Dr & IH-410 SB Frnt Rd
 Scenario 2 PM-2023-Improvements
 2/5/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBR
Lane Configurations	4↑	↑	↑	4↑	↑	↑	4↑	↑	↑	↑	↑
Volume (vph)	182	296	58	0	0	0	992	885	713	1201	0
Ideal Flow (vphpl)	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	5.1	5.1	5.1	5.1	5.1	5.1
Lane Util. Factor	0.91	0.91	1.00	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Flt Protected	1.00	1.00	0.85	1.00	0.85	1.00	1.00	1.00	1.00	1.00	1.00
Flt Permitted	0.95	1.00	1.00	1.00	1.00	0.95	0.99	1.00	1.00	1.00	1.00
Satd. Flow (prot)	1610	3379	1583	1610	3350	1583	1610	3374	1610	3374	1583
Satd. Flow (perm)	1610	3379	1583	1610	3350	1583	1610	3374	1610	3374	1583
Peak-hour factor, PHF	0.91	0.86	0.80	1.00	1.00	0.93	0.94	0.86	0.96	0.96	1.00
Adj. Flow (vph)	157	256	54	0	0	0	970	952	829	1251	0
RTOR Reduction (vph)	0	0	46	0	0	0	0	0	140	0	0
Lane Group Flow (vph)	147	306	18	0	0	0	970	812	506	1574	0
Turn Type	Split	NA	Perm	Split	NA	Perm	pm+pt	NA	NA	NA	Perm
Protected Phases	8-16	8-16	8-16	6	6	6	5	5	5	5	5
Permitted Phases											
Actuated Green, G (s)	32.9	32.9	32.9	24.9	24.9	24.9	68.9	68.9	68.9	68.9	24.9
Effective Green, g (s)	32.9	32.9	32.9	24.9	24.9	24.9	68.9	68.9	68.9	68.9	24.9
Actuated g/C Ratio	0.26	0.26	0.26	0.21	0.21	0.21	0.68	0.68	0.68	0.68	0.21
Clearance Time (s)				5.1	5.1	5.1	6.0	6.0	6.0	6.0	5.1
Vehicle Extension (s)				3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	448	942	441	1073	334	657	1635	1635	1635	1635	441
v/s Ratio Prot	0.09	0.09	0.01	0.19	0.19	0.29	0.36	0.36	0.36	0.36	0.01
v/s Ratio Perm											
v/c Ratio	0.33	0.32	0.04	0.90	0.90	0.77	0.96	0.96	0.96	0.96	0.04
Uniform Delay, d1	33.8	33.7	31.0	45.4	46.5	24.4	23.3	23.3	23.3	23.3	31.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.47	0.67	0.67	0.67	1.00
Incremental Delay, d2	1.9	0.9	0.2	10.6	652.5	0.5	2.1	2.1	2.1	2.1	10.6
Delay (s)	35.7	34.7	31.2	56.0	699.0	11.9	17.8	17.8	17.8	17.8	21.6
Level of Service	D	C	C	E	F	B	B	B	B	B	D
Approach Delay (s)				34.5	34.5	34.5	16.4	16.4	16.4	16.4	31.2
Approach LOS				C	C	A	B	B	B	B	D
Intersection Summary											
HCM 2000 Control Delay	170.8										
HCM 2000 Volume to Capacity Ratio	1.19										
Actuated Cycle Length (s)	118.0										
Intersection Capacity Utilization	154.0%										
Analysis Period (min)	15										
Critical Lane Group	E										

HCM Signalized Intersection Capacity Analysis
 1: Military Dr & IH-410 NB Frnt Rd
 Scenario 2 PM-2023-Improvements
 2/5/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBR
Lane Configurations	4↑	↑	↑	4↑	↑	↑	4↑	↑	↑	↑	↑
Volume (vph)	182	296	58	0	0	0	992	885	713	1201	0
Ideal Flow (vphpl)	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	5.1	5.1	5.1	5.1	5.1	5.1
Lane Util. Factor	0.91	0.91	1.00	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Flt Protected	1.00	1.00	0.85	1.00	0.85	1.00	1.00	1.00	1.00	1.00	1.00
Flt Permitted	0.95	1.00	1.00	1.00	1.00	0.95	0.99	1.00	1.00	1.00	1.00
Satd. Flow (prot)	1610	3379	1583	1610	3350	1583	1610	3355	1610	3355	1583
Satd. Flow (perm)	1610	3379	1583	1610	3350	1583	1610	3372	1610	3372	1583
Peak-hour factor, PHF	0.91	0.86	0.80	1.00	1.00	0.93	0.94	0.86	0.96	0.96	1.00
Adj. Flow (vph)	157	256	54	0	0	0	970	952	829	1251	0
RTOR Reduction (vph)	0	0	46	0	0	0	0	0	140	0	0
Lane Group Flow (vph)	147	306	18	0	0	0	970	812	506	1574	0
Turn Type	Split	NA	Perm	Split	NA	Perm	pm+pt	NA	NA	NA	Perm
Protected Phases	8-16	8-16	8-16	6	6	6	5	5	5	5	5
Permitted Phases											
Actuated Green, G (s)	32.9	32.9	32.9	24.9	24.9	24.9	68.9	68.9	68.9	68.9	24.9
Effective Green, g (s)	32.9	32.9	32.9	24.9	24.9	24.9	68.9	68.9	68.9	68.9	24.9
Actuated g/C Ratio	0.26	0.26	0.26	0.21	0.21	0.21	0.68	0.68	0.68	0.68	0.21
Clearance Time (s)				5.1	5.1	5.1	6.0	6.0	6.0	6.0	5.1
Vehicle Extension (s)				3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	448	942	441	1073	334	657	1635	1635	1635	1635	441
v/s Ratio Prot	0.09	0.09	0.01	0.19	0.19	0.29	0.36	0.36	0.36	0.36	0.01
v/s Ratio Perm											
v/c Ratio	0.33	0.32	0.04	0.90	0.90	0.77	0.96	0.96	0.96	0.96	0.04
Uniform Delay, d1	33.8	33.7	31.0	45.4	46.5	24.4	23.3	23.3	23.3	23.3	31.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.47	0.67	0.67	0.67	1.00
Incremental Delay, d2	1.9	0.9	0.2	10.6	652.5	0.5	2.1	2.1	2.1	2.1	10.6
Delay (s)	35.7	34.7	31.2	56.0	699.0	11.9	17.8	17.8	17.8	17.8	21.6
Level of Service	D	C	C	E	F	B	B	B	B	B	D
Approach Delay (s)				34.5	34.5	34.5	16.4	16.4	16.4	16.4	31.2
Approach LOS				C	C	A	B	B	B	B	D
Intersection Summary											
HCM 2000 Control Delay	170.8										
HCM 2000 Volume to Capacity Ratio	1.19										
Actuated Cycle Length (s)	118.0										
Intersection Capacity Utilization	154.0%										
Analysis Period (min)	15										
Critical Lane Group	E										

EXHIBIT (C) - TRAFFIC IMPACT ANALYSIS

PART 4 OF 4

HCM Unsignalized Intersection Capacity Analysis
 Scenario 2 PM-2023-Improvements
 3: IH-410 SB Fmt Rd & Richland Hills
 2/5/2014

Movement	EBL	EBT	WBL	WBT	WBR	SBL	SBR
Volume (veh/h)	0	0	3247	465	0	0	202
Sign Control	Free	Free	Free	Free	Stop	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%	0%
Peak Hour Factor	1.00	1.00	0.97	0.84	1.00	1.00	0.77
Hourly flow rate (veh/h)	0	0	3399	564	0	0	282
Pedestrians							
Lane Width (ft)							
Walking Speed (ft/s)							
Percent Blockage							
Right turn flare (veh)							
Median Type	None	None	None	None	None	None	None
Median storage (veh)							
Upstream signal (ft)							
pX, platoon unblocked							
vC, conflicting volume	3953					3676	1410
vC1, stage 1 cont vol							
vC2, stage 2 cont vol	3953					3676	1410
vCu, unblocked vol							
IC, 1 stage (s)	4.1					6.6	6.9
IC, 2 stage (s)							
pl queue free %	2.2					3.5	3.3
pl queue free %	100					100	0
pl capacity (veh/h)	46					4	128
Direction Lane #	WBL	WBT	WBR	SBL	SBR		
Volume Total	1360	1360	1233	282	282		
Volume Left	0	0	0	0	0		
Volume Right	0	0	554	262	262		
cSH	1700	1700	1700	128	128		
Volumes to Capacity	0.80	0.80	0.73	2.05	2.05		
Queue Length 95th (ft)	0	0	0	535	535		
Control Delay (s)	0.0	0.0	0.0	555.5	555.5		
Lane LOS				F	F		
Approach Delay (s)				555.5	555.5		
Approach LOS				F	F		
Intersection Summary							
Average Delay	34.6						
Intersection Capacity Utilization	93.2%						
ICU Level of Service	F						
Analysis Period (min)	15						

HCM Signalized Intersection Capacity Analysis
 Scenario 2 PM-2023-Improvements
 4: Military Dr & Walmart/Sony Pl
 2/5/2014

Movement	EBL	EBT	WBL	WBT	WBR	SBL	SBR
Volume (veh/h)	234	0	91	0	0	59	1357
Ideal Flow (veh/h)	1900	1900	1900	1900	1900	1900	1900
Total Lost Time (s)	4.7	5.2	5.2	5.2	5.9	5.9	5.9
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	0.95	0.95
Fit Protected	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	1770	1770	3539	3425	3425
Fit Permitted	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	1770	1770	3539	3425	3425
Peak-hour factor, PHF	0.79	1.00	0.74	1.00	1.00	0.85	0.92
Adj. Flow (vph)	296	0	123	0	0	69	1475
RTOR Reduction (vph)	0	0	99	0	0	0	0
Lane Group Flow (vph)	296	0	24	0	0	89	1475
Turn Type	custom	custom	perm	perm	pl	NA	NA
Protected Phases	7	4	4	8	5	2	6
Permitted Phases	4	6	8	8	2	2	6
Actuated Green, G (s)	16.5	16.0	16.0	53.8	53.8	53.8	44.5
Effective Green, g (s)	16.5	16.0	16.0	53.8	53.8	53.8	44.5
Actuated g/C Ratio	0.20	0.20	0.20	0.67	0.67	0.67	0.55
Clearance Time (s)	4.7	5.2	5.2	5.0	5.9	5.9	5.9
Vehicle Extension (s)	1.0	1.0	1.0	1.0	2.5	2.5	2.5
Lane Grn Cap (vph)	361	313	313	218	253	253	1893
v/s Ratio Prot.	0.17	0.02	0.02	0.02	0.42	0.42	0.39
v/s Ratio Perm				0.19			
Uniform Delay, d1	0.82	0.06	0.06	0.32	0.63	0.71	0.71
Progression Factor	1.00	1.00	1.00	0.66	0.78	0.88	1.00
Incremental Delay, d2	12.9	0.0	0.0	0.3	0.5	0.5	1.2
Delay (s)	43.7	28.5	28.5	8.9	8.2	8.2	14.6
Level of Service	D	C	C	A	A	A	B
Approach Delay (s)	38.6	0.0	0.0	8.3	8.3	8.3	14.6
Approach LOS	D	C	C	A	A	A	B
Intersection Summary							
HCM 2000 Control Delay	14.7						
HCM 2000 Volume to Capacity ratio	0.82						
Actuated Cycle Length (s)	80.9						
Intersection Capacity Utilization	61.5%						
ICU Level of Service	B						
Analysis Period (min)	15						
Critical Lane Group	E						

EXHIBIT (C) - TRAFFIC IMPACT ANALYSIS

PART 4 OF 4

HCM Signalized Intersection Capacity Analysis
 Scenario 2 PM-2023-Improvements
 6: SH 151 NB Fmrt Rd & Ingram Rd
 2/6/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	4↑	4↑	4↑	4↑	4↑	4↑	4↑	4↑	4↑	4↑	4↑	4↑
Volume (vph)	397	663	0	0	889	245	1006	1658	331	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	6.4	6.4	6.4	6.4	6.4
Lane Util. Factor	0.91	0.91	0.95	0.95	1.00	0.91	0.91	0.91	0.91	1.00	1.00	1.00
Flph, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flph, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fl Protected	0.95	0.99	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1610	3554	3539	3539	1333	1670	3374	1583	100	100	100	100
Fl Permitted	0.73	0.54	1.00	1.00	0.95	1.00	1.00	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	219	1847	3539	3539	1333	1610	3374	1583	100	100	100	100
Peak-hour factor, PHF	0.79	0.90	1.00	1.00	0.95	0.89	0.90	0.94	0.90	1.00	1.00	1.00
Adj. Flow (vph)	503	737	0	0	928	275	1118	1764	368	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	112	0	85	0	0	0	0
Lane Group Flow (vph)	302	938	0	0	828	163	928	1954	283	0	0	0
Conf. Peds. (#/hr)												
Turn Type	NA	pm/pt	NA	NA	pm	Split	NA	NA	Perm	NA	NA	Perm
Protected Phases	5	5.6	6	6	6	8.16	8.16	8.16	8.16	8.16	8.16	8.16
Permitted Phases	5.6	84.6	84.6	84.6	31.0	31.0	53.0	53.0	53.0	53.0	53.0	53.0
Effective Green, G (s)	84.6	84.6	31.0	31.0	53.0	53.0	53.0	53.0	53.0	53.0	53.0	53.0
Effective Green, g (s)	84.6	84.6	31.0	31.0	53.0	53.0	53.0	53.0	53.0	53.0	53.0	53.0
Actuated g/C Ratio	0.55	0.55	0.20	0.20	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34
Clearance Time (s)	5.4	5.4	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Lane Grp Cap (vph)	604	1539	712	268	544	1161	544	544	544	544	544	544
v/s Ratio Prot	0.17	0.21	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26
v/s Ratio Perm	0.10	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12
v/c Ratio	0.50	0.61	1.30	0.81	1.68	1.68	1.68	1.68	1.68	1.68	1.68	1.68
Uniform Delay, d1	28.9	23.5	61.5	50.5	50.5	50.5	50.5	50.5	50.5	50.5	50.5	50.5
Progression Factor	0.28	0.65	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.0	0.1	145.4	3.3	311.6	311.1	311.1	311.1	311.1	311.1	311.1	311.1
Delay (s)	7.6	15.3	206.9	59.3	362.1	361.6	361.6	361.6	361.6	361.6	361.6	361.6
Level of Service	A	B	F	E	F	F	F	F	F	F	F	F
Approach Delay (s)	13.4	173.1	325.8	325.8	325.8	325.8	325.8	325.8	325.8	325.8	325.8	325.8
Approach LOS	B	F	F	F	F	F	F	F	F	F	F	F
Intersection Summary												
HCM 2000 Control Delay			225.5	1.24	225.5	225.5	225.5	225.5	225.5	225.5	225.5	225.5
HCM 2000 Volume to Capacity ratio			1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24
Actuated Cycle Length (s)			154.0	154.0	154.0	154.0	154.0	154.0	154.0	154.0	154.0	154.0
Intersection Capacity Utilization			130.1%	130.1%	130.1%	130.1%	130.1%	130.1%	130.1%	130.1%	130.1%	130.1%
Analysis Period (min)			15	15	15	15	15	15	15	15	15	15
c Critical Lane Group												

Synchro 7 Report 5:00 pm, Baseline
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HCM Signalized Intersection Capacity Analysis
 Scenario 2 PM-2023-Improvements
 5: SH 151 SB Fmrt Rd & Ingram Rd
 2/5/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	4↑	4↑	4↑	4↑	4↑	4↑	4↑	4↑	4↑	4↑	4↑	4↑
Volume (vph)	842	289	679	1142	0	0	0	0	204	817	307	307
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	6.4	6.4	6.4	6.4	6.4
Lane Util. Factor	0.95	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flph, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flph, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fl Protected	0.95	1.00	0.95	0.99	1.00	1.00	1.00	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	3539	1278	1610	3359	1610	3388	1583	100	100	100	100	100
Fl Permitted	0.95	1.00	0.95	0.99	1.00	1.00	1.00	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	3539	1278	1610	3359	1610	3388	1583	100	100	100	100	100
Peak-hour factor, PHF	1.00	0.94	0.91	0.94	0.97	1.00	1.00	1.00	0.77	0.86	0.81	0.81
Adj. Flow (vph)	896	285	722	1177	0	0	0	0	265	1056	372	372
RTOR Reduction (vph)	0	117	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	896	168	455	1444	0	0	0	0	238	1093	287	287
Conf. Peds. (#/hr)												
Turn Type	NA	Perm	pm/pt	NA	NA	Split	NA	NA	Perm	NA	NA	Perm
Protected Phases	2	2	1.2	1.2	4.12	4.12	4.12	4.12	4.12	4.12	4.12	4.12
Permitted Phases	25.0	25.0	85.5	85.5	53.0	53.0	53.0	53.0	53.0	53.0	53.0	53.0
Effective Green, G (s)	25.0	25.0	85.5	85.5	53.0	53.0	53.0	53.0	53.0	53.0	53.0	53.0
Effective Green, g (s)	25.0	25.0	85.5	85.5	53.0	53.0	53.0	53.0	53.0	53.0	53.0	53.0
Actuated g/C Ratio	0.16	0.16	0.56	0.56	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34
Clearance Time (s)	5.0	5.0	5.5	5.5	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	2.5	2.5	3.0	3.0	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Lane Grp Cap (vph)	574	207	676	1620	554	1165	544	544	544	544	544	544
v/s Ratio Prot	0.25	0.26	0.35	0.35	0.15	0.32	0.32	0.32	0.32	0.32	0.32	0.32
v/s Ratio Perm	0.13	0.11	0.14	0.14	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
v/c Ratio	1.56	0.81	0.67	0.89	0.43	0.94	0.53	0.53	0.53	0.53	0.53	0.53
Uniform Delay, d1	84.5	82.2	29.5	30.2	38.9	48.9	40.5	40.5	40.5	40.5	40.5	40.5
Progression Factor	1.00	1.00	0.43	0.26	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	260.9	20.3	0.2	0.7	2.4	15.2	3.6	3.6	3.6	3.6	3.6	3.6
Delay (s)	326.4	82.5	13.0	8.4	41.3	64.1	44.1	44.1	44.1	44.1	44.1	44.1
Level of Service	F	F	B	A	D	E	D	D	E	E	D	D
Approach Delay (s)	266.8	173.1	325.8	325.8	325.8	325.8	325.8	325.8	325.8	325.8	325.8	325.8
Approach LOS	F	F	F	F	F	F	F	F	F	F	F	F
Intersection Summary												
HCM 2000 Control Delay			89.8	1.09	89.8	89.8	89.8	89.8	89.8	89.8	89.8	89.8
HCM 2000 Volume to Capacity ratio			1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Actuated Cycle Length (s)			154.0	154.0	154.0	154.0	154.0	154.0	154.0	154.0	154.0	154.0
Intersection Capacity Utilization			130.1%	130.1%	130.1%	130.1%	130.1%	130.1%	130.1%	130.1%	130.1%	130.1%
Analysis Period (min)			15	15	15	15	15	15	15	15	15	15
c Critical Lane Group												

Synchro 7 Report 5:00 pm, Baseline
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EXHIBIT (C) - TRAFFIC IMPACT ANALYSIS

PART 4 OF 4

HCM Signalized Intersection Capacity Analysis
 7: Richland Hills & Ingram Rd
 Scenario 2 PM-2023-Improvements
 2/5/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	←	←	←	←	←	←	←	←	←	←	←	←
Volume (vph)	277	343	40	48	415	59	280	311	77	9	145	221
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	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	1.00	0.95	1.00	0.91
Flt Proceeded	0.95	1.00	0.98	1.00	0.98	1.00	0.97	1.00	0.97	1.00	0.91	0.91
Satd. Flow (vph)	1770	3486	1770	3458	1770	3425	1770	3226	1770	3226	1770	3226
Flt Permitted	0.27	1.00	0.48	1.00	0.22	1.00	0.49	1.00	0.22	1.00	0.49	1.00
Satd. Flow (perm)	498	3486	498	3458	405	3425	491	3226	491	3226	491	3226
Peak-hour factor, PHF	0.87	0.81	0.86	0.79	0.87	0.89	0.87	0.89	0.80	0.44	0.83	0.88
Adj. Flow (vph)	413	423	47	61	477	85	418	349	96	70	175	251
RTOR Reduction (vph)	0	0	0	0	11	0	0	22	0	0	218	0
Lane Group Flow (vph)	413	464	0	61	552	0	418	423	0	20	208	0
Turn Type	pm-plt	NA										
Protected Phases	5	2	1	6	3	8	7	4				
Permitted Phases	2	6	6	6	6	6	6	6				
Actuated Green, G (s)	65.1	56.1	42.4	37.4	46.9	41.3	36.0	14.3				
Effective Green, g (s)	65.1	56.1	42.4	37.4	46.9	41.3	36.0	14.4				
Actuated g/C Ratio	0.54	0.47	0.35	0.31	0.39	0.34	0.43	0.12				
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)	521	1629	353	1077	482	1178	134	387				
v/s Ratio Prot	0.16	0.13	0.01	0.15	0.21	0.12	0.00	0.06				
v/s Ratio Perm	0.27	0.05	0.05	0.05	0.13	0.02	0.02	0.02				
v/c Ratio	0.79	0.28	0.17	0.51	0.87	0.36	0.15	0.54				
Uniform Delay, d1	18.6	19.6	28.0	33.8	30.7	29.4	45.6	49.7				
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				
Incremental Delay, d2	8.1	0.4	0.2	1.7	15.1	0.2	0.5	1.4				
Delay (s)	26.7	20.1	28.2	35.6	45.8	29.6	46.1	51.1				
Level of Service	C	C	C	D	D	C	D	D				
Approach Delay (s)	23.2	34.7	37.5	37.5	50.9	34.7	50.9	34.7				
Approach LOS	C	C	C	C	D	D	D	D				
Intersection Summary												
HCM 2000 Control Delay	34.5											
HCM 2000 Volume to Capacity ratio	0.87											
Actuated Cycle Length (s)	120.0											
Intersection Capacity Utilization	68.7%											
Analysis Period (min)	15											
Critical Lane Group	C											

HCM Signalized Intersection Capacity Analysis
 8: SH 151 SB Frnt Rd & Potranco Rd
 Scenario 2 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	2341	0	0	0	0	0	451	363	266
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lane Util. Factor	0.91	1.00	0.91	0.91	1.00	0.95	1.00	0.95	1.00	0.91	0.91	1.00
Flt Proceeded	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00	0.95	0.99	0.99	1.00
Satd. Flow (vph)	5085	1583	1610	3388	5085	1583	1610	3388	5085	1583	1610	3388
Flt Permitted	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Satd. Flow (perm)	5085	1583	1610	2986	5085	1583	1610	2986	5085	1583	1610	2986
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	1355	820	362	2389	0	0	0	0	507	465	343
RTOR Reduction (vph)	0	287	0	0	0	0	0	0	0	0	0	143
Lane Group Flow (vph)	0	1356	523	328	2425	0	0	0	0	314	658	214
Turn Type	NA	pm-plt	NA	pm-plt	NA	pm-plt	NA	pm-plt	NA	pm-plt	NA	pm-plt
Protected Phases	6	6	6	6	6	6	6	6				
Permitted Phases	6	6	6	6	6	6	6	6				
Actuated Green, G (s)	34.5	34.5	107.2	107.2	34.5	34.5	107.2	107.2				
Effective Green, g (s)	34.5	34.5	107.2	107.2	34.5	34.5	107.2	107.2				
Actuated g/C Ratio	0.25	0.25	0.25	0.27	0.27	0.27	0.27	0.27				
Clearance Time (s)	5.5	5.5	5.0	5.0	5.5	5.5	5.0	5.0				
Vehicle Extension (s)	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5				
Lane Grp Cap (vph)	1253	390	884	2495	1253	390	884	2495				
v/s Ratio Prot	0.27	0.19	0.19	0.20	0.27	0.19	0.20	0.20				
v/s Ratio Perm	0.33	0.09	0.24	0.24	0.33	0.09	0.24	0.24				
v/c Ratio	1.08	1.54	0.37	0.97	1.71	1.71	0.37	0.97				
Uniform Delay, d1	52.8	52.8	13.0	15.0	62.0	62.0	13.0	15.0				
Progression Factor	1.00	1.00	0.33	1.01	1.00	1.00	0.33	1.01				
Incremental Delay, d2	50.8	170.0	0.0	1.9	103.8	222.7	4.2	17.0				
Delay (s)	103.8	222.7	4.2	17.0	148.4	344.1	4.2	17.0				
Level of Service	F	F	F	A	B	B	F	F				
Approach Delay (s)	148.4	15.5	15.5	15.5	344.1	15.5	15.5	15.5				
Approach LOS	F	B	B	B	A	B	F	F				
Intersection Summary												
HCM 2000 Control Delay	131.5											
HCM 2000 Volume to Capacity ratio	1.74											
Actuated Cycle Length (s)	140.0											
Intersection Capacity Utilization	138.1%											
Analysis Period (min)	15											
Critical Lane Group	C											

EXHIBIT (C) - TRAFFIC IMPACT ANALYSIS

PART 4 OF 4

HCM Signalized Intersection Capacity Analysis
 10: Richland Hills & Potranco Rd
 Scenario 2 PM-2023-Improvements
 2/5/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBR
Lane Configurations	4T	4T	4T	4T	4T	4T	4T	4T	4T	4T	4T
Volume (vph)	352	1263	0	1360	468	1350	705	161	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost Time (s)	5.0	5.5	5.5	5.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3
Lane Util. Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Flt	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Satd. Flow (prot)	1610	3385	5085	1610	3310	1610	3310	1610	3310	1610	3310
Flt Permitted	0.09	0.78	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Satd. Flow (perm)	160	2639	5085	1610	3310	1610	3310	1610	3310	1610	3310
Peak-hour factor, PHF	0.98	0.95	1.00	0.96	0.93	0.88	0.95	0.83	1.00	1.00	1.00
Adj. Flow (vph)	359	1329	0	1406	503	1378	742	162	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	116	0	113	0	0	0
Lane Group Flow (vph)	323	1355	0	1406	387	689	1431	69	0	0	0
Turn Type	pm-rt	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Protected Phases	1	2	2	2	2	2	2	2	2	2	2
Permitted Phases	2	1	1	2	1	1	2	1	1	2	1
Actuated Green, G (s)	81.2	81.2	42.5	42.5	42.0	42.0	42.0	42.0	42.0	42.0	42.0
Effective Green, g (s)	81.2	81.2	42.5	42.5	42.0	42.0	42.0	42.0	42.0	42.0	42.0
Actuated g/C Ratio	0.58	0.58	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
Clearance Time (s)	5.0	5.0	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Vehicle Extension (s)	1.0	1.0	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Lane Grp Cap (vph)	493	1737	1543	480	483	993	474	0	0	0	0
v/s Ratio Prot	0.18	0.22	0.28	0.28	0.24	0.43	0.43	0.04	0.04	0.04	0.04
v/s Ratio Perm	0.20	0.24	0.24	0.24	0.24	0.43	0.43	0.04	0.04	0.04	0.04
v/c Ratio	0.66	0.79	0.91	0.81	1.43	1.44	0.15	0.15	0.15	0.15	0.15
Uniform Delay, d1	32.9	22.7	46.9	44.9	48.0	49.0	35.9	0.0	0.0	0.0	0.0
Progression Factor	0.41	0.52	0.68	0.52	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	0.2	3.4	4.5	203.7	204.2	0.1	0.1	0.1	0.1	0.1
Delay (s)	13.7	11.9	35.2	21.7	252.7	253.2	36.0	36.0	36.0	36.0	36.0
Level of Service	B	B	D	C	F	F	D	D	D	D	D
Approach Delay (s)	12.3	12.3	33.2	33.2	235.9	235.9	0.0	0.0	0.0	0.0	0.0
Approach LOS	B	B	C	C	F	F	A	A	A	A	A
Intersection Summary											
HCM 2000 Control Delay	106.3										
HCM 2000 Volume to Capacity ratio	1.11										
Actuated Cycle Length (s)	140.0										
Intersection Capacity Utilization	138.1%										
Analysis Period (min)	15										
Critical Lane Group	E										

HCM Signalized Intersection Capacity Analysis
 9: SH 151 NB Frnt Rd & Potranco Rd
 Scenario 2 PM-2023-Improvements
 2/5/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBR
Lane Configurations	4T	4T	4T	4T	4T	4T	4T	4T	4T	4T	4T
Volume (vph)	352	1263	0	1360	468	1350	705	161	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost Time (s)	5.0	5.5	5.5	5.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3
Lane Util. Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Flt	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Satd. Flow (prot)	1610	3385	5085	1610	3310	1610	3310	1610	3310	1610	3310
Flt Permitted	0.09	0.78	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Satd. Flow (perm)	160	2639	5085	1610	3310	1610	3310	1610	3310	1610	3310
Peak-hour factor, PHF	0.98	0.95	1.00	0.96	0.93	0.88	0.95	0.83	1.00	1.00	1.00
Adj. Flow (vph)	359	1329	0	1406	503	1378	742	162	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	116	0	113	0	0	0
Lane Group Flow (vph)	323	1355	0	1406	387	689	1431	69	0	0	0
Turn Type	pm-rt	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Protected Phases	1	2	2	2	2	2	2	2	2	2	2
Permitted Phases	2	1	1	2	1	1	2	1	1	2	1
Actuated Green, G (s)	81.2	81.2	42.5	42.5	42.0	42.0	42.0	42.0	42.0	42.0	42.0
Effective Green, g (s)	81.2	81.2	42.5	42.5	42.0	42.0	42.0	42.0	42.0	42.0	42.0
Actuated g/C Ratio	0.58	0.58	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
Clearance Time (s)	5.0	5.0	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Vehicle Extension (s)	1.0	1.0	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Lane Grp Cap (vph)	493	1737	1543	480	483	993	474	0	0	0	0
v/s Ratio Prot	0.18	0.22	0.28	0.28	0.24	0.43	0.43	0.04	0.04	0.04	0.04
v/s Ratio Perm	0.20	0.24	0.24	0.24	0.24	0.43	0.43	0.04	0.04	0.04	0.04
v/c Ratio	0.66	0.79	0.91	0.81	1.43	1.44	0.15	0.15	0.15	0.15	0.15
Uniform Delay, d1	32.9	22.7	46.9	44.9	48.0	49.0	35.9	0.0	0.0	0.0	0.0
Progression Factor	0.41	0.52	0.68	0.52	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	0.2	3.4	4.5	203.7	204.2	0.1	0.1	0.1	0.1	0.1
Delay (s)	13.7	11.9	35.2	21.7	252.7	253.2	36.0	36.0	36.0	36.0	36.0
Level of Service	B	B	D	C	F	F	D	D	D	D	D
Approach Delay (s)	12.3	12.3	33.2	33.2	235.9	235.9	0.0	0.0	0.0	0.0	0.0
Approach LOS	B	B	C	C	F	F	A	A	A	A	A
Intersection Summary											
HCM 2000 Control Delay	106.3										
HCM 2000 Volume to Capacity ratio	1.11										
Actuated Cycle Length (s)	140.0										
Intersection Capacity Utilization	138.1%										
Analysis Period (min)	15										
Critical Lane Group	E										

EXHIBIT (C) - TRAFFIC IMPACT ANALYSIS

PART 4 OF 4

HCM Signalized Intersection Capacity Analysis
 11: Ingram Rd & Potranco Rd
 Scenario 2 PM-2023-Improvements
 2/5/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	13	1205	20	313	1676	0	11	85	535	0	44	10
Volume (vph)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Ideal Flow (vphpl)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Total Lost time (s)	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	0.87	1.00	0.97	1.00	1.00	1.00	0.97
Flt Protected	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Flt Permitted	1770	3539	1770	3539	1770	3068	1770	3068	1770	3441	1770	3441
Satd. Flow (prot)	126	3531	118	3539	1341	3068	118	3068	1341	3441	118	3441
Satd. Flow (perm)	1.00	0.95	0.94	0.70	0.89	1.00	0.67	1.00	0.80	1.00	1.00	1.00
Peak-hour factor, PHF	13	1268	21	447	1883	0	16	85	670	0	44	10
Adj. Flow (vph)	0	1	0	0	0	0	0	350	0	0	0	0
RTOR Reduction (vph)	0	1	0	0	0	0	0	350	0	0	0	0
Lane Group Flow (vph)	13	1268	0	447	1883	0	16	405	0	0	46	0
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	4			3			8		2		6	
Permitted Phases	4			8			2		6		6	
Actuated Green, G (s)	59.0	59.0	102.0	102.0	102.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0
Effective Green, g (s)	59.0	59.0	102.0	102.0	102.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0
Actuated g/C Ratio	0.42	0.42	0.73	0.73	0.73	0.21	0.21	0.21	0.21	0.21	0.21	0.21
Clearance Time (s)	4.0	4.0	4.0	4.0	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	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	53	1488	546	2578	287	657	737					
vs Ratio Prot	0.10	0.36	0.23	0.53	0.13	0.01						
vs Ratio Perm	0.25	0.87	0.82	0.73	0.06	0.37						
g/C Ratio	26.1	36.9	38.6	11.0	43.7	49.8						
Uniform Delay, d1	0.66	0.70	1.07	1.62	1.00	1.00						
Progression Factor	5.9	4.0	2.7	0.5	0.4	4.3						
Incremental Delay, d2	28.4	29.9	43.9	18.4	44.1	54.1						
Delay (s)	C	C	C	D	D	D						
Level of Service	C	C	C	D	D	D						
Approach Delay (s)	29.9		23.3		53.9							
Approach LOS	C		C		D							
Intersection Summary												
HCM 2000 Control Delay	30.6											
HCM 2000 Volume to Capacity ratio	0.79											
Actuated Cycle Length (s)	140.0											
Intersection Capacity Utilization	81.0%											
Analysis Period (min)	15											
Deflecto Right Lane, Recode with 1 though lane as a right lane	D											
Critical Lane Group	C											

HCM Signalized Intersection Capacity Analysis
 12: Military Dr & Potranco Rd
 Scenario 2 PM-2023-Improvements
 2/5/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	26	1154	592	216	1391	64	494	560	13	287	42	
Volume (vph)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Ideal Flow (vphpl)	5.8	5.8	5.8	5.8	5.8	5.8	5.2	5.2	5.2	5.2	5.8	5.8
Total Lost time (s)	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95
Lane Util. Factor	1.00	1.00	1.00	0.85	1.00	0.89	1.00	0.92	1.00	0.92	1.00	0.98
Flt Protected	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Flt Permitted	1770	3539	1583	1770	3518	1770	3245	1770	3471	1770	3471	
Satd. Flow (prot)	138	3539	1583	138	3518		1770	3245	1770	3471		
Satd. Flow (perm)	1.00	0.96	0.91	0.94	0.91	1.00	0.92	1.00	0.91	1.00	1.00	1.00
Peak-hour factor, PHF	29	1202	651	230	1529	64	499	494	615	13	287	42
Adj. Flow (vph)	0	0	247	0	2	0	0	112	0	0	0	0
RTOR Reduction (vph)	29	1202	404	230	1591	0	499	997	0	13	321	0
Lane Group Flow (vph)	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	NA	Perm	NA	
Turn Type	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	NA	Perm	NA	
Protected Phases	6			2			2		4		3	
Permitted Phases	6			2			2		4		3	
Actuated Green, G (s)	54.0	54.0	54.0	54.0	54.0	54.0	54.0	54.0	54.0	54.0	54.0	54.0
Effective Green, g (s)	54.0	54.0	54.0	54.0	54.0	54.0	54.0	54.0	54.0	54.0	54.0	54.0
Actuated g/C Ratio	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39
Clearance Time (s)	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8
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)	53	1365	610	53	1356	439	1559	31	852			
vs Ratio Prot	0.21	0.34	0.26	0.167			0.28		0.31			
vs Ratio Perm	0.55	0.88	0.66	0.434	1.17		1.14		0.64			
g/C Ratio	33.5	40.0	35.5	43.0	43.0	52.6	27.3		68.0			
Uniform Delay, d1	0.39	0.39	0.27	0.88	0.88	1.00	1.00		1.00			
Progression Factor	20.0	4.8	3.0	1526.1	82.4	85.9	0.6		3.3			
Incremental Delay, d2	32.9	20.6	12.5	1563.9	121.2	138.5	27.9		71.3			
Delay (s)	C	C	C	B	F	F	C		E			
Level of Service	C	C	C	B	F	F	C		E			
Approach Delay (s)	18.0		302.3		62.2				46.2			
Approach LOS	B		F		E				D			
Intersection Summary												
HCM 2000 Control Delay	123.9											
HCM 2000 Volume to Capacity ratio	2.41											
Actuated Cycle Length (s)	140.0											
Intersection Capacity Utilization	103.8%											
Analysis Period (min)	15											
Deflecto Right Lane, Recode with 1 though lane as a right lane	F											
Critical Lane Group	G											

EXHIBIT (C) - TRAFFIC IMPACT ANALYSIS

PART 4 OF 4

HCM Signalized Intersection Capacity Analysis

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBR
Lane Configurations	4	4	4	4	4	4	4	4	4	4	4
Volumes (vph)	409	1426	30	20	1347	23	173	13	120	34	261
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.8	5.7	4.8	5.7	4.8	5.0	5.1	5.1	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	1.00	1.00
Flt Protected	0.95	1.00	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	1587	1587
Flt Permitted	0.06	1.00	1.00	0.10	1.00	0.30	1.00	0.63	1.00	0.63	1.00
Std. Flow (perm)	112	3539	1583	190	3530	562	1620	1181	1587	1181	1587
Peak-hour factor, PHF	0.95	0.92	0.89	0.94	0.90	0.85	0.73	0.50	0.70	0.42	0.25
Adj. Flow (vph)	431	1550	43	37	1497	27	237	26	171	81	4
RTOR Reduction (vph)	0	0	15	0	1	0	0	135	0	0	243
Lane Group Flow (vph)	431	1550	28	37	1523	0	237	52	0	81	33
Turn Types	D,P,P	NA	Perm	D,P,P	NA	D,P,P	NA	Perm	NA	Perm	NA
Prohibited Phases	1	6		5	2		7	4		8	
Permitted Phases	2		6	6	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	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	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	0.10	0.10
Clearance Time (s)	4.8	5.7	4.8	5.7	4.8	5.0	5.1	5.1	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	1.0	1.0
Lane Grp Cap (vph)	325	2305	1031	170	1860	192	343	113	153	113	153
v/s Ratio Etc.	60.20	0.44	0.01	0.43	60.10	0.04	0.04	0.07	0.07	0.07	0.05
v/s Ratio Perm.	60.70	0.02	0.14	0.14	60.12						
w/C Ratio	1.33	0.67	0.03	0.22	0.82	1.23	0.18	0.72	0.54	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	61.4	60.3
Progression Factor	0.84	0.60	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	161.3	1.1	0.0	0.2	4.2	142.1	0.1	16.4	2.1	16.4	2.1
Delay (s)	200.1	10.2	8.7	12.6	31.7	197.8	45.4	77.8	62.4	77.8	62.4
Level of Service	F	B	A	B	C	F	D	E	E	E	E
Approach Delay (s)		50.6		31.2		128.6		65.5		65.5	
Approach LOS		D		C		F		E		E	
Intersection Summary											
HCM 2000 Control Delay	52.8										
HCM 2000 Volume to Capacity Ratio	1.30										
Actuated Cycle Length (s)	140.0										
Intersection Capacity Utilization	103.6%										
Analysis Period (min)	15										
Critical Lane Group	G										

HCM Unsignalized Intersection Capacity Analysis

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBR
Lane Configurations	1	1	1	1	1	1	1	1	1	1	1
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Volume (vph)	0.25	1.00	1.00	1.00	0.94	0.50	0.79	1.00	0.66	0.70	0.88
Peak-Hour Factor	0.25	1.00	1.00	1.00	0.94	0.50	0.79	1.00	0.66	0.70	0.88
Hourly flow rate (vph)	4	0	0	0	113	6	248	0	265	74	166
Desired Label	EB1	EB2	EB3	WB1	WB2	WB3	NB1	NB2	NB3	SB1	SB2
Volume Total (vph)	4	0	0	113	254	339	257	0	92	0	0
Volume Left (vph)	4	0	0	113	0	0	0	0	92	0	0
Volume Right (vph)	0	0	0	0	248	74	0	0	0	0	0
Head (s)	0.53	0.00	0.53	0.65	0.10	0.11	0.11	0.00	0.53	0.00	0.53
Departure Headway (s)	7.3	6.8	6.8	6.6	5.4	5.2	5.5	0.00	0.21	0.38	0.49
Degrees Utilization, X	0.01	0.00	0.01	0.01	0.01	0.01	0.01	0.00	0.01	0.00	0.01
Capacity Utilization, X	422	467	467	511	624	655	621	0	624	655	621
Control Delay (s)	9.2	8.6	8.6	10.2	10.6	13.0	12.0	0	10.6	13.0	12.0
Approach Delay (s)	9.2	8.6	8.6	10.2	10.6	13.0	12.0	0	10.6	13.0	12.0
Approach LOS	A	A	A	B	B	B	B	B	B	B	B
Intersection Summary											
Delay	11.8										
Level of Service	B										
Intersection Capacity Utilization	90.3%										
Analysis Period (min)	15										

EXHIBIT (C) - TRAFFIC IMPACT ANALYSIS

PART 4 OF 4

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

Movement	EBL	EBT	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↑↑	↑↑	↑↑	↑↑	↑↑	↑↑	↑↑	↑↑
Volume (veh/h)	397	425	542	542	11	3	406	7
Sign Control	Free	Free	Free	Free	Stop	Stop	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.94	0.93	0.86	0.50	0.25	0.88	0.88	0.88
Hourly flow rate (vph)	369	457	530	22	12	12	461	461
Pedestrians								
Lane Width (ft)								
Walking Speed (ft/s)								
Percent Blockage								
Right turn flare (vph)	None	None	None	None				
Median type								
Median storage (veh)								
Upstream signal (ft)								
pX, platoon unblocked								
vC, conflicting volume	552						1608	326
vC1, stage 1 conf vol								
vC2, stage 2 conf vol	552						1608	326
vC, unblocked vol	41						5.8	6.9
IC, 2 stage (s)								
IC, 2 stage (s)								
IC, 2 stage (s)								
pl queue free %	60						79	31
pl capacity (veh/h)	930						58	670
Direction Lane #	EB1	EB2	EB3	EB4	WB1	WB2	SB1	SB2
Volume Total	369	228	228	420	232	12	461	461
Volume Left	369	0	0	0	0	0	12	0
Volume Right	0	0	0	0	22	0	461	461
CSH	930	1700	1700	1700	1700	58	670	670
Volumes to Capacity	0.40	0.13	0.13	0.25	0.14	0.21	0.69	0.69
Queue Length 95th (ft)	48	0	0	0	0	0	18	137
Control Delay (s)	11.4	0.0	0.0	0.0	0.0	0.0	83.1	21.4
Lane LOS	B						F	C
Approach Delay (s)	5.1				0.0		23.0	
Approach LOS								C
Intersection Summary								
Average Delay	7.7							
Intersection Capacity Utilization	47.9%							
Analysis Period (min)	15							
F. Critical Lane Group								

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

Movement	EBL	EBT	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↑↑	↑↑	↑↑	↑↑	↑↑	↑↑	↑↑	↑↑
Volume (vph)	9	455	218	283	537	22	168	39
Ideal Flow (vphpl)	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	0.95	1.00	0.95	1.00	1.00	1.00	1.00
Flt Protected	1.00	0.99	1.00	0.99	1.00	0.88	1.00	0.96
Flt Permitted	1.00	0.95	1.00	0.95	1.00	1.00	1.00	0.95
Satd. Flow (vphpl)	1770	3354	1770	3499	1770	1631	1770	1787
Satd. Flow (vphpl)	742	3354	523	3499	1663	1631	449	1787
Peak-hour factor, PHF	0.58	0.91	0.81	0.77	0.87	0.44	0.84	0.60
Adj. Flow (vph)	16	501	289	368	617	50	200	65
RTOR Reduction (vph)	0	61	0	0	6	0	172	0
Lane Group Flow (vph)	16	709	0	368	661	0	200	206
Turn Type	pm-pt	NA	pm-pt	NA	pm-pt	NA	pm-pt	NA
Protected Phases	1	6	5	2	7	4	3	8
Permitted Phases	6	2	8	8	8	8	4	4
Actuated Green, G (s)	54.6	53.0	68.5	62.9	17.3	16.6	17.2	3.9
Effective Green, g (s)	54.6	53.0	68.5	62.9	17.3	16.6	17.2	3.9
Actuated g/C Ratio	0.95	0.53	0.68	0.63	0.17	0.17	0.17	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)	421	1777	500	200	309	270	85	69
vs Ratio Pct	0.00	0.21	0.08	0.19	0.09	0.13	0.00	0.02
vs Ratio Perm	0.02	0.42	0.03	0.03	0.03	0.03	0.02	0.02
vs Ratio	0.04	0.40	0.74	0.30	0.65	0.76	0.13	0.40
Uniform Delay, d1	10.4	14.0	8.0	8.5	37.4	39.8	35.3	46.9
Progression Factor, p	0.45	0.28	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.0	0.6	4.8	0.4	3.5	10.9	0.3	1.4
Delay (s)	4.7	4.8	12.8	8.8	40.9	50.8	35.5	48.3
Level of Service	A	A	B	A	D	D	D	D
Approach Delay (s)	4.8	10.3	47.3	45.4				
Approach LOS	A	B	D	D				
Intersection Summary								
HCM 2000 Control Delay	17.9							
HCM 2000 Volume to Capacity Ratio	0.78							
Actuated Cycle Length (s)	100.0							
Intersection Capacity Utilization	68.0%							
Analysis Period (min)	15							
F. Critical Lane Group								

EXHIBIT (C) - TRAFFIC IMPACT ANALYSIS

PART 4 OF 4

HCM Unsignalized Intersection Capacity Analysis
 18: Richland Hills & Jack Jordan MS
 Scenario 2 PM-2023-Improvements
 2/5/2014

Movement	EBL	EBR	NBL	NBT	SBT	EBR	SBR
Lane Configurations							
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Volume (vph)	74	39	51	312	446	74	74
Peak Hour Factor	0.86	0.91	0.63	0.85	0.80	0.81	0.81
Hourly flow rate (vph)	86	43	81	363	558	91	91
Direction Lane #	EB1	EB2	NB1	NB2	SB1	SB2	
Volume Total (vph)	86	43	81	363	558	91	
Volume Left (vph)	86	0	81	0	0	0	
Volume Right (vph)	0	43	0	0	0	91	
Head (s)	0.53	0.67	0.53	0.03	0.03	0.67	
Departure Headway (s)	7.6	6.3	6.2	5.7	5.5	4.8	
Degree Utilization, X	0.18	0.08	0.14	0.57	0.85	0.12	
Capacity (veh/h)	449	528	659	618	638	721	
Control Delay (s)	11.8	8.7	9.0	14.9	31.0	7.3	
Approach Delay (s)	10.2		13.8		27.7		
Approach LOS	B		B		D		
Intersection Summary							
Delay	20.8						
Level of Service	C						
Intersection Capacity Utilization	40.9%						
ICU Level of Service	A						
Analysis Period (min)	15						

Synchro 7 Report 5:00 pm Baseline
 Page-Dawson Engineers, Inc.
 Synchro 7 - Report
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HCM Unsignalized Intersection Capacity Analysis
 19: Richland Hills & Christian Evers ES
 Scenario 2 PM-2023-Improvements
 2/5/2014

Movement	EBL	EBR	NBL	NBT	SBT	EBR	SBR
Lane Configurations							
Sign Control	Stop	Stop	Free	Free	Free	Free	Free
Volume (veh/h)	39	52	47	437	437	20	20
Peak Hour Factor	0.91	0.89	0.87	0.86	0.89	0.83	0.83
Hourly flow rate (vph)	43	58	70	508	491	32	32
Direction Lane #	EB1	EB2	NB1	NB2	SB1	SB2	
Volume Total (veh/h)	1155	507	523				
Volume Left (veh/h)	1155	507	523				
Volume Right (veh/h)	6.4	6.2	4.1				
ICU, unblocked vol	3.5	3.3	2.2				
ICU, single (s)	79	90	93				
ICU, 2 stage (s)	203	566	1044				
ICU capacity (veh/h)							
ICU queue free %							
ICU delay (s)							
ICU LOS							
Approach Delay (s)	21.2	1.8	0.0				
Approach LOS	C	A					
Intersection Summary							
Average Delay	2.6						
Intersection Capacity Utilization	65.2%						
ICU Level of Service	C						
Analysis Period (min)	15						

Synchro 7 Report 5:00 pm Baseline
 Page-Dawson Engineers, Inc.
 Synchro 7 - Report
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EXHIBIT (C) - TRAFFIC IMPACT ANALYSIS

PART 4 OF 4

HCM Signalized Intersection Capacity Analysis
 20: Military Dr & Earl Warren High School
 Scenario 2 PM-2023-Improvements
 2/6/2014

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↑↑	↑↑	↑↑	↑↑	↑	↑
Volume (vph)	103	715	975	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	0.95	0.95	1.00	1.00	1.00
Flt	1.00	1.00	1.00	0.95	1.00	0.95
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	3539	3539	1583	1770	1583
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	3539	3539	1583	1770	1583
Peak-hour factor, PHF	0.84	0.91	0.87	0.98	0.78	0.88
Adj. Flow (vph)	161	766	776	209	194	214
RTOR Reduction (vph)	0	0	0	175	0	179
Lane Group Flow (vph)	161	766	776	34	194	35
Turn Type	Prot	NA	NA	custom	NA	Perm
Protected Phases	1	6	2		8	
Permitted Phases	13.9	73.5	54.7	16.5	16.5	8
Actuated Green, G (s)	13.9	73.5	54.7	16.5	16.5	16.5
Effective Green, g (s)	0.14	0.74	0.55	0.16	0.16	0.16
Actuated g/C Ratio	4.9	4.9	4.9	5.1	5.1	5.1
Clearance Time (s)	3.0	3.0	3.0	3.0	3.0	3.0
Vehicle Extension (s)	246	2601	1935	261	292	261
Lane Grp Cap (vph)	60.08	622	622	60.11		
v/s Ratio Prot	0.65	0.30	0.40	0.13	0.66	0.14
v/s Ratio Perm	40.8	4.5	13.1	35.6	39.2	35.7
Uniform Delay, d1	0.68	1.61	0.83	1.92	1.00	1.00
Progression Factor	3.9	0.2	0.6	0.2	5.6	0.2
Incremental Delay, d2	31.7	7.4	11.5	68.6	44.8	35.9
Delay (s)	C	A	B	E	D	D
Level of Service	C	A	B	E	D	D
Approach Delay (s)	B	11.6	23.6	40.1		
Approach LOS	B		C		D	D
Intersection Summary						
HCM 2000 Control Delay	21.6		HCM 2000 Level of Service		C	
HCM 2000 Volume to Capacity Ratio	0.49		Sum of lost time (s)		14.9	
Actuated Cycle Length (s)	100.0		ICU Level of Service		A	
Intersection Capacity Utilization	45.1%		Analysis Period (min)		15	
C Critical Lane Group						

HCM Signalized Intersection Capacity Analysis
 21: Hunt Ln & Military Dr
 Scenario 2 PM-2023-Improvements
 2/6/2014

Movement	EBL	EBT	EBR	WBT	WBR	SBL	SBR
Lane Configurations	↑↑	↑↑	↑↑	↑↑	↑↑	↑↑	↑↑
Volume (vph)	121	328	20	165	402	415	29
Ideal Flow (vphpl)	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
Lane Util. Factor	1.00	0.95	1.00	0.95	1.00	1.00	0.95
Flt	1.00	0.99	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	3501	1770	3539	1583	1770	1583
Flt Permitted	0.95	1.00	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	3501	1770	3539	1583	1770	1583
Peak-hour factor, PHF	0.70	0.79	0.88	0.78	0.87	0.81	0.70
Adj. Flow (vph)	173	415	32	212	462	512	41
RTOR Reduction (vph)	0	6	0	0	0	357	0
Lane Group Flow (vph)	173	441	0	212	462	125	41
Turn Type	pm-prot	NA	pm-prot	NA	Perm	Prot	NA
Protected Phases	7	4		3	8	5	2
Permitted Phases	4		8		8	2	
Actuated Green, G (s)	18.5	13.5	26.4	17.4	17.4	3.8	27.9
Effective Green, g (s)	18.5	13.5	26.4	17.4	17.4	3.8	27.9
Actuated g/C Ratio	0.18	0.14	0.28	0.17	0.17	0.04	0.28
Clearance Time (s)	5.0	5.7	5.0	5.8	5.8	5.2	5.6
Vehicle Extension (s)	1.0	2.5	1.0	2.0	2.0	1.0	2.5
Lane Grp Cap (vph)	182	472	233	615	275	67	987
v/s Ratio Prot	0.05	0.13	0.08	0.43	0.02	0.26	0.17
v/s Ratio Perm	0.13		0.16		0.08		0.04
Uniform Delay, d1	39.0	42.8	32.6	39.2	37.1	47.4	35.3
Progression Factor	1.00	1.00	1.38	1.15	2.54	1.00	1.00
Incremental Delay, d2	51.9	25.7	33.8	4.4	0.4	11.1	18.3
Delay (s)	F	E	E	D	F	E	C
Level of Service	F	E	E	D	F	E	C
Approach Delay (s)	E	74.8		74.2		48.3	
Approach LOS	E					D	
Intersection Summary							
HCM 2000 Control Delay	57.4		HCM 2000 Level of Service		E		
HCM 2000 Volume to Capacity Ratio	0.98		Sum of lost time (s)		21.6		
Actuated Cycle Length (s)	100.0		ICU Level of Service		E		
Intersection Capacity Utilization	82.2%		Analysis Period (min)		15		
C Critical Lane Group							

EXHIBIT (C) - TRAFFIC IMPACT ANALYSIS

PART 4 OF 4

HCM Signalized Intersection Capacity Analysis
 Scenario 2 PM-2023-Improvements
 2/5/2014
 22: SH 151 NB Frnt Rd & Hunt Ln

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SEB	SBR
Lane Configurations	4↑	4↑	4↑	4↑	4↑	4↑	4↑	4↑	4↑	4↑	4↑	4↑
Volume (vph)	52	88	0	598	56	60	595	1002	0	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	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3
Lane Util. Factor	0.95	1.00	0.95	1.00	0.91	0.91	0.91	1.00	0.91	0.91	0.91	0.91
Flt	1.00	1.00	0.85	1.00	1.00	1.00	0.85	1.00	0.85	1.00	1.00	1.00
Flt Protected	0.98	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	3469	3538	1583	1610	3389	1583	1610	3389	1583	1610	3389	1583
Satd. Flow (norm)	2100	2100	983	1610	3389	983	1610	3389	983	1610	3389	983
Peak-hour factor, PHF	0.70	0.82	1.00	0.89	0.60	0.69	0.88	0.95	1.00	1.00	1.00	1.00
Adj. Flow (vph)	74	109	0	672	93	87	1132	1055	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	183	0	672	19	78	1141	958	0	0	0	0
Turn Type	pm-pt	NA	NA	Perm								
Protected Phases	5	6	6	6	6	6	6	6	6	6	6	6
Permitted Phases	6	6	6	6	6	6	6	6	6	6	6	6
Activated Green, G (s)	18.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5
Effective Green, g (s)	18.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5
Activated g/C Ratio	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21
Clearance Time (s)	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	431	727	375	1091	2306	1072	1091	2306	1072	1091	2306	1072
Vis Ratio Pct	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09
Vis Ratio Perm	0.92	0.06	0.07	0.50	0.80	0.54	0.50	0.80	0.54	0.50	0.80	0.54
Vis Ratio	31.1	35.1	28.7	4.9	7.0	10.2	4.9	7.0	10.2	4.9	7.0	10.2
Uniform Delay, d1	0.39	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Progression Factor	0.6	17.4	0.1	0.1	0.1	0.8	0.3	0.8	0.3	0.8	0.3	0.8
Incremental Delay, d2	12.8	52.5	28.8	5.0	7.8	16.5	5.0	7.8	16.5	5.0	7.8	16.5
Delay (s)	B	D	C	A	A	B	A	A	B	A	B	A
Level of Service	B	D	C	A	A	B	A	A	B	A	B	A
Approach Delay (s)	12.8	49.6	28.8	11.8	11.8	11.8	11.8	11.8	11.8	11.8	11.8	11.8
Approach LOS	B	D	C	A	A	B	A	A	B	A	B	A
Intersection Summary												
HCM 2000 Control Delay	20.8											
HCM 2000 Volume to Capacity ratio	0.96											
Actuated Cycle Length (s)	90.0											
Intersection Capacity Utilization	77.3%											
Analysis Period (min)	15											
d1 - Default Left Lane, Record with 1 through lane as a left lane.	15											
d2 - Critical Lane Group	15											

Synchro 7 Report 5:00 pm Baseline
 Page-Dawson Engineers, Inc.
 Synchro 7 - Report
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HCM Signalized Intersection Capacity Analysis
 Scenario 2 PM-2023-Improvements
 2/5/2014
 23: SH 151 SB Frnt Rd & Hunt Ln

Movement	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SEB	SBR
Lane Configurations	4↑	4↑	4↑	4↑	4↑	4↑	4↑	4↑	4↑
Volume (vph)	643	0	0	0	0	0	142	766	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00	0.91	0.91	0.91
Flt	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	1610	1610	3387	1610	3387	1610	3387	1610
Satd. Flow (norm)	3433	1610	1610	3387	1610	3387	1610	3387	1610
Peak-hour factor, PHF	0.83	1.00	1.00	0.75	0.91	0.91	0.75	0.91	0.91
Adj. Flow (vph)	691	0	0	0	0	188	664	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	691	0	0	0	0	170	883	0	0
Turn Type	NA	NA	NA	NA	NA	NA	NA	NA	NA
Protected Phases	1	1	1	1	1	1	1	1	1
Permitted Phases	1	1	1	1	1	1	1	1	1
Activated Green, G (s)	51.8	51.8	51.8	51.8	51.8	51.8	51.8	51.8	51.8
Effective Green, g (s)	51.8	51.8	51.8	51.8	51.8	51.8	51.8	51.8	51.8
Activated g/C Ratio	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58
Clearance Time (s)	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1975	497	1046	497	1046	1046	497	1046	1046
Vis Ratio Pct	0.20	0.11	0.26	0.11	0.26	0.26	0.11	0.26	0.26
Vis Ratio Perm	0.35	0.34	0.84	0.34	0.84	0.84	0.34	0.84	0.84
Vis Ratio	10.2	24.0	29.1	24.0	29.1	29.1	24.0	29.1	29.1
Uniform Delay, d1	0.83	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Progression Factor	0.1	8.5	25.9	8.5	25.9	25.9	8.5	25.9	25.9
Incremental Delay, d2	8.5	25.9	37.4	25.9	37.4	37.4	25.9	37.4	37.4
Delay (s)	A	A	C	A	C	C	A	C	C
Level of Service	A	A	C	A	C	C	A	C	C
Approach Delay (s)	8.5	0.0	35.5	0.0	35.5	35.5	0.0	35.5	35.5
Approach LOS	A	A	D	A	D	D	A	D	D
Intersection Summary									
HCM 2000 Control Delay	24.8								
HCM 2000 Volume to Capacity ratio	0.61								
Actuated Cycle Length (s)	90.0								
Intersection Capacity Utilization	48.3%								
Analysis Period (min)	15								
d1 - Default Left Lane, Record with 1 through lane as a left lane.	15								
d2 - Critical Lane Group	15								

Synchro 7 Report 5:00 pm Baseline
 Page-Dawson Engineers, Inc.
 Synchro 7 - Report
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EXHIBIT (C) - TRAFFIC IMPACT ANALYSIS

PART 4 OF 4

HCM Signalized Intersection Capacity Analysis
 Scenario 2 AM-3 Lanes on Potranco
 9: SH 151 NB Fmt Rd & Potranco Rd

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBR	SSR
Lane Configurations	4	4	4	4	4	4	4	4	4	4	4	4
Volume (vph)	236	2073	0	0	646	288	480	455	109	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	5.3	5.3	6.3	6.3	6.3	6.3	6.3	6.3
Lane Util. Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.91	0.91	0.91	0.91	0.91	0.91
Fit	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fit Protected	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Satd. Flow (prot)	6403	583	1522	4772	6403	583	1522	4772	6403	583	1522	4772
Fit Permitted	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Satd. Flow (perm)	6403	1583	175	3151	6403	1583	175	3151	6403	1583	175	3151
Peak-hour factor, PHF	1.00	0.99	0.80	0.85	1.00	1.00	1.00	1.00	0.91	0.85	0.81	0.81
Adj. Flow (vph)	0	1420	734	380	966	0	0	0	1154	592	285	285
RTOR Reduction (vph)	0	0	134	0	0	0	0	0	0	0	0	127
Lane Group Flow (vph)	0	1420	600	230	1126	0	0	0	577	1169	158	158
Turn Type	NA	Perm	pm-pt	NA	NA	Perm	NA	Perm	NA	Perm	NA	Perm
Protected Phases	5	5	5	5	5	5	5	5	5	5	5	5
Permitted Phases	6	6	6	6	6	6	6	6	6	6	6	6
Actuated Green, G (s)	36.7	36.7	65.8	65.8	36.7	36.7	65.8	65.8	36.9	36.9	36.9	36.9
Effective Green, g (s)	36.7	36.7	65.8	65.8	36.7	36.7	65.8	65.8	36.9	36.9	36.9	36.9
Actuated g/C Ratio	0.31	0.31	0.35	0.35	0.31	0.31	0.35	0.35	0.31	0.31	0.31	0.31
Clearance Time (s)	5.3	5.3	5.7	5.7	5.3	5.3	5.7	5.7	5.3	5.3	5.3	5.3
Vehicle Extension (s)	2.5	2.5	1.0	1.0	2.5	2.5	1.0	1.0	2.5	2.5	1.0	1.0
Lane Grp Cap (vph)	1959	484	422	2120	1959	484	422	2120	1959	484	422	2120
v/s Ratio Prot	0.22	0.38	0.17	0.16	0.22	0.38	0.17	0.16	0.22	0.38	0.17	0.16
v/s Ratio Perm	0.72	1.24	0.85	0.83	0.72	1.24	0.85	0.83	0.72	1.24	0.85	0.83
Uniform Delay, d1	37.1	41.5	22.8	17.3	37.1	41.5	22.8	17.3	37.1	41.5	22.8	17.3
Progression Factor	1.00	1.00	0.63	0.47	1.00	1.00	0.63	0.47	1.00	1.00	0.63	0.47
Incremental Delay, d2	1.3	124.5	0.4	0.1	1.3	124.5	0.4	0.1	1.3	124.5	0.4	0.1
Delay (s)	38.4	166.2	14.8	8.3	38.4	166.2	14.8	8.3	38.4	166.2	14.8	8.3
Level of Service	D	F	B	A	D	F	B	A	D	F	B	A
Approach Delay (s)	82.0	F	94	A	82.0	F	94	A	82.0	F	94	A
Approach LOS	F	F	B	A	F	F	B	A	F	F	B	A
Intersection Summary												
HCM 2000 Control Delay	75.4	HCM 2000 Level of Service										
HCM 2000 Volume to Capacity ratio	1.09	E										
Actuated Cycle Length (s)	120.0	Sum of lost time (s)										
Intersection Capacity Utilization	115.6%	LCU Level of Service										
Analysis Period (min)	15	H										
Critical Lane Group	5 - Critical Lane Group											

HCM Signalized Intersection Capacity Analysis
 Scenario 2 AM-3 Lanes on Potranco
 8: SH 151 SB Fmt Rd & Potranco Rd

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBR	SSR
Lane Configurations	4	4	4	4	4	4	4	4	4	4	4	4
Volume (vph)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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	5.3	5.3	5.3	6.3	6.3	6.3	6.3	6.3	6.3
Lane Util. Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.91	0.91	0.91	0.91	0.91	0.91
Fit	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fit Protected	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Satd. Flow (prot)	6403	583	1522	4772	6403	583	1522	4772	6403	583	1522	4772
Fit Permitted	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Satd. Flow (perm)	6403	1583	175	3151	6403	1583	175	3151	6403	1583	175	3151
Peak-hour factor, PHF	1.00	0.99	0.80	0.85	1.00	1.00	1.00	1.00	0.91	0.85	0.81	0.81
Adj. Flow (vph)	0	1420	734	380	966	0	0	0	1154	592	285	285
RTOR Reduction (vph)	0	0	134	0	0	0	0	0	0	0	0	127
Lane Group Flow (vph)	0	1420	600	230	1126	0	0	0	577	1169	158	158
Turn Type	NA	Perm	pm-pt	NA	NA	Perm	NA	Perm	NA	Perm	NA	Perm
Protected Phases	5	5	5	5	5	5	5	5	5	5	5	5
Permitted Phases	6	6	6	6	6	6	6	6	6	6	6	6
Actuated Green, G (s)	36.7	36.7	65.8	65.8	36.7	36.7	65.8	65.8	36.9	36.9	36.9	36.9
Effective Green, g (s)	36.7	36.7	65.8	65.8	36.7	36.7	65.8	65.8	36.9	36.9	36.9	36.9
Actuated g/C Ratio	0.31	0.31	0.35	0.35	0.31	0.31	0.35	0.35	0.31	0.31	0.31	0.31
Clearance Time (s)	5.3	5.3	5.7	5.7	5.3	5.3	5.7	5.7	5.3	5.3	5.3	5.3
Vehicle Extension (s)	2.5	2.5	1.0	1.0	2.5	2.5	1.0	1.0	2.5	2.5	1.0	1.0
Lane Grp Cap (vph)	1959	484	422	2120	1959	484	422	2120	1959	484	422	2120
v/s Ratio Prot	0.22	0.38	0.17	0.16	0.22	0.38	0.17	0.16	0.22	0.38	0.17	0.16
v/s Ratio Perm	0.72	1.24	0.85	0.83	0.72	1.24	0.85	0.83	0.72	1.24	0.85	0.83
Uniform Delay, d1	37.1	41.5	22.8	17.3	37.1	41.5	22.8	17.3	37.1	41.5	22.8	17.3
Progression Factor	1.00	1.00	0.63	0.47	1.00	1.00	0.63	0.47	1.00	1.00	0.63	0.47
Incremental Delay, d2	1.3	124.5	0.4	0.1	1.3	124.5	0.4	0.1	1.3	124.5	0.4	0.1
Delay (s)	38.4	166.2	14.8	8.3	38.4	166.2	14.8	8.3	38.4	166.2	14.8	8.3
Level of Service	D	F	B	A	D	F	B	A	D	F	B	A
Approach Delay (s)	82.0	F	94	A	82.0	F	94	A	82.0	F	94	A
Approach LOS	F	F	B	A	F	F	B	A	F	F	B	A
Intersection Summary												
HCM 2000 Control Delay	75.4	HCM 2000 Level of Service										
HCM 2000 Volume to Capacity ratio	1.09	E										
Actuated Cycle Length (s)	120.0	Sum of lost time (s)										
Intersection Capacity Utilization	115.6%	LCU Level of Service										
Analysis Period (min)	15	H										
Critical Lane Group	5 - Critical Lane Group											

EXHIBIT (C) - TRAFFIC IMPACT ANALYSIS

PART 4 OF 4

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

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	←	←	←	←	←	←	←	←	←	←	←	←
Volume (vph)	5	2266	19	191	722	0	26	332	0	70	14	1900
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.91	1.00	0.91	1.00	0.95	1.00	0.85	1.00	0.95	1.00	0.95
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00	1.00	0.97
Satd. Flow (prot)	1770	5076	1770	5085	1770	3042	1770	3042	1770	3042	1770	3451
Satd. Flow (norm)	568	5076	568	5085	568	3042	568	3042	568	3042	568	3451
Peak-hour factor, PHF	1.00	0.88	0.88	0.88	0.88	1.00	0.25	1.00	0.88	1.00	1.00	1.00
Adj. Flow (vph)	5	2600	33	303	902	0	4	26	386	0	70	17.0
RTOR Reduction (vph)	0	1	0	0	0	0	0	0	187	0	0	12
Lane Group Flow (vph)	5	2632	0	303	902	0	4	225	0	0	0	72
Turn Type	Perm	NA	NA	pm-pt	NA	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	4	4	4	3	6	2	2	2	6	6	6	6
Permitted Phases	4	8	8	8	8	2	2	2	6	6	6	6
Actuated Green, G (s)	73.3	73.3	73.3	95.0	95.0	17.0	17.0	17.0	77.0	77.0	77.0	77.0
Effective Green, g (s)	73.3	73.3	73.3	95.0	95.0	17.0	17.0	17.0	77.0	77.0	77.0	77.0
Actuated g/C Ratio	0.61	0.61	0.61	0.78	0.78	0.14	0.14	0.14	0.34	0.34	0.34	0.34
Clearance Time (s)	4.0	4.0	4.0	4.0	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	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	345	3100	322	4025	184	430	488	488	488	488	488	488
v/s Ratio Prot	0.52	0.52	0.52	0.18	0.18	0.07	0.07	0.07	0.22	0.22	0.22	0.22
v/s Ratio Perm	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
v/s Ratio	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Uniform Delay, d1	92	18.9	41.3	3.2	44.3	47.7	45.1	45.1	45.1	45.1	45.1	45.1
Progression Factor	0.43	0.29	0.79	2.22	0.78	0.59	1.00	1.00	0.59	0.59	0.59	0.59
Incremental Delay, d2	0.0	0.3	0.1	0.1	0.2	0.4	0.6	0.6	0.6	0.6	0.6	0.6
Delay (s)	3.9	5.8	66.0	7.2	34.9	32.7	45.6	45.6	45.6	45.6	45.6	45.6
Level of Service	A	A	E	A	A	C	D	D	D	D	D	D
Approach Delay (s)	5.8	5.8	21.9	32.7	45.6	45.6	45.6	45.6	45.6	45.6	45.6	45.6
Approach LOS	A	A	C	C	C	D	D	D	D	D	D	D
Intersection Summary												
HCM 2000 Control Delay	13.7											
HCM 2000 Volume to Capacity ratio	0.90											
Actuated Cycle Length (s)	120.0											
Intersection Capacity Utilization	76.7%											
Analysis Period (min)	15											
c. Critical Lane Group												

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	←	←	←	←	←	←	←	←	←	←	←	←
Volume (vph)	183	2038	241	102	589	77	64	170	178	296	306	2668
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost (s)	4.7	5.8	4.7	5.8	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2
Lane Util. Factor	1.00	0.91	1.00	0.91	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00	1.00	0.95
Satd. Flow (prot)	1770	5085	1770	5085	1770	1863	1770	1863	1770	3539	3539	1583
Satd. Flow (norm)	540	5085	1583	140	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	0.95	0.87	0.96	0.84
Adj. Flow (vph)	282	2366	548	185	785	91	142	174	274	340	321	319
RTOR Reduction (vph)	0	0	132	0	0	54	0	0	143	0	0	242
Lane Group Flow (vph)	282	2366	416	185	785	37	142	174	131	340	321	77
Turn Type	D,P-P	NA	Perm	D,P-P	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	1	6	2	5	2	4	4	4	4	3	3	3
Permitted Phases	2	6	6	6	6	2	4	4	4	3	3	3
Actuated Green, G (s)	62.9	53.4	53.4	62.9	49.4	11.1	11.1	11.1	11.1	25.1	25.1	25.1
Effective Green, g (s)	62.9	53.4	53.4	62.9	49.4	11.1	11.1	11.1	11.1	25.1	25.1	25.1
Actuated g/C Ratio	0.52	0.44	0.44	0.52	0.41	0.09	0.09	0.09	0.09	0.21	0.21	0.21
Clearance Time (s)	4.7	5.8	5.8	4.7	5.8	5.2	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)	421	2262	704	202	2093	651	163	172	146	370	740	331
v/s Ratio Prot	0.08	0.07	0.07	0.07	0.15	0.08	0.08	0.08	0.08	0.19	0.19	0.09
v/s Ratio Perm	0.28	0.26	0.26	0.26	0.41	0.02	0.02	0.02	0.02	0.08	0.08	0.05
v/s Ratio	0.67	0.67	0.67	0.67	0.67	0.08	0.08	0.08	0.08	0.27	0.27	0.23
Uniform Delay, d1	16.6	33.3	25.1	33.4	24.6	21.3	53.7	54.5	53.9	46.5	41.3	39.4
Progression Factor	1.13	0.84	0.70	1.42	0.82	1.24	0.90	0.90	0.78	1.00	1.00	1.00
Incremental Delay, d2	2.7	31.2	3.2	39.5	0.5	0.2	35.4	71.5	43.6	28.7	0.1	0.1
Delay (s)	21.4	59.1	20.8	86.9	20.3	26.6	89.9	120.7	85.4	74.1	41.4	39.6
Level of Service	C	E	C	F	C	C	F	F	F	F	E	D
Approach Delay (s)	49.2	49.2	32.8	95.5	95.5	95.5	95.5	95.5	95.5	95.5	95.5	95.5
Approach LOS	D	D	C	D	D	D	D	D	D	D	D	D
Intersection Summary												
HCM 2000 Control Delay	51.4											
HCM 2000 Volume to Capacity ratio	1.00											
Actuated Cycle Length (s)	120.0											
Intersection Capacity Utilization	85.1%											
Analysis Period (min)	15											
c. Critical Lane Group												

EXHIBIT (C) - TRAFFIC IMPACT ANALYSIS

PART 4 OF 4

HCM Signalized Intersection Capacity Analysis
 12: Military Dr & Potranco Rd
 Scenario 2 AM-3 Lanes on Potranco
 2/5/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	10	10	10	10	10	10	10	10	10	10	10	10
Volume (vph)	1899	893	317	516	75	161	75	372	36	288	71	71
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.8	4.0	5.8	4.0	5.8	4.0	5.8	4.0	5.8	4.0	5.8
Lane Util. Factor	1.00	0.91	1.00	0.91	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95
Eff.	1.00	1.00	0.85	0.99	1.00	0.99	1.00	0.89	1.00	0.97	1.00	0.97
Flt Protected	0.95	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95
Satd. Flow (prot)	1770	5085	1583	1770	5013	1770	3157	1770	3157	1770	3435	3435
Flt Permitted	0.33	1.00	1.00	0.07	1.00	0.26	1.00	0.28	1.00	0.28	1.00	0.28
Satd. Flow (perm)	607	5085	1583	122	5013	485	3157	517	3435	517	3435	3435
Peak-hour factor, PHF	1.00	0.94	0.72	0.88	0.72	1.00	0.73	1.00	0.83	1.00	1.00	1.00
Adj. Flow (vph)	10	1988	1240	360	717	75	221	75	448	36	288	71
RTOR Reduction (vph)	0	0	178	0	10	0	192	0	0	0	18	0
Lane Group Flow (vph)	10	1988	1052	360	782	0	221	431	0	36	342	0
Turn Type	D-P-P	NA	Perm	D-P-P	NA	D-P-P	NA	D-P-P	NA	D-P-P	NA	NA
Protected Phases	1	6	6	5	2	7	4	7	4	3	3	3
Permitted Phases	2	74.2	61.2	74.2	73.4	26.2	14.4	24.4	16.0	24.4	16.0	16.0
Actuated Green, G (s)	74.2	61.2	61.2	74.2	73.4	26.2	14.4	24.4	16.0	24.4	16.0	16.0
Effective Green, g (s)	0.62	0.51	0.51	0.62	0.61	0.22	0.12	0.20	0.13	0.20	0.13	0.13
Actuated g/C Ratio	4.0	5.8	5.8	4.0	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8
Clearance Time (s)	3.0	1.0	1.0	3.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Vehicle Extension (s)	383	2583	807	253	3066	215	378	209	458	209	458	458
Lane Grp Cap (vph)	0.00	0.39	0.67	0.15	0.16	c0.09	0.14	c0.01	0.10	0.01	0.10	0.10
v/s Ratio Prot.	0.03	0.77	1.32	1.42	0.26	0.14	1.03	1.16	0.17	0.17	0.75	0.75
v/s Ratio Perm	8.8	23.7	29.4	37.3	10.7	44.1	52.8	39.3	50.0	39.3	50.0	50.0
Uniform Delay, d1	0.25	0.82	0.76	0.65	1.08	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Progression Factor	0.0	1.4	147.5	209.2	0.2	68.8	90.3	1.8	6.5	1.8	6.5	6.5
Incremental Delay, d2	2.3	13.7	170.0	233.6	11.7	112.9	145.1	41.1	56.6	41.1	56.6	56.6
Delay (s)	A	B	F	F	B	F	F	F	D	F	D	E
Level of Service	E	E	F	F	F	F	F	F	F	F	F	F
Approach Delay (s)	74.5	81.0	81.0	81.0	81.0	135.2	135.2	135.2	135.2	135.2	135.2	135.2
Approach LOS	E	F	F	F	F	F	F	F	F	F	F	F
Intersection Summary												
HCM 2000 Control Delay	83.0											
HCM 2000 Volume to Capacity Ratio	1.34											
Actuated Cycle Length (s)	120.0											
Intersection Capacity Utilization	36.7%											
Analysis Period (min)	15											
dr. Defectio Right Lane - Recode with 1 though lane as a right lane.												
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
 13: Micron & Potranco Rd
 Scenario 2 AM-3 Lanes on Potranco
 2/5/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	4	4	4	4	4	4	4	4	4	4	4	4
Volume (vph)	1154	551	245	480	11	13	16	19	269	151	310	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	4.8	5.7	4.8	5.7	4.8	5.7	4.8
Lane Util. Factor	1.00	0.91	1.00	0.91	1.00	0.91	1.00	0.91	1.00	0.91	1.00	0.91
Eff.	1.00	1.00	0.85	0.99	1.00	0.99	1.00	0.99	1.00	0.89	1.00	0.89
Flt Protected	0.95	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95
Satd. Flow (prot)	1770	5085	1583	1770	5051	1770	1762	1770	1762	1770	1665	1665
Flt Permitted	0.37	1.00	1.00	0.12	1.00	0.10	1.00	0.10	1.00	0.71	1.00	0.71
Satd. Flow (perm)	694	5085	1583	226	5051	179	1762	1319	1665	1319	1665	1665
Peak-hour factor, PHF	0.78	0.85	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	243
RTOR Reduction (vph)	0	0	309	0	4	0	0	16	0	0	72	0
Lane Group Flow (vph)	54	1297	347	389	624	0	31	59	0	390	555	0
Turn Type	D-P-P	NA	Perm	D-P-P	NA	D-P-P	NA	D-P-P	NA	Perm	NA	NA
Protected Phases	1	6	6	5	2	7	4	7	4	3	3	3
Permitted Phases	2	57.0	32.9	57.0	53.6	43.4	47.4	41.6	41.6	41.6	41.6	41.6
Actuated Green, G (s)	57.0	32.9	32.9	57.0	53.6	43.4	47.4	41.6	41.6	41.6	41.6	41.6
Effective Green, g (s)	0.48	0.27	0.27	0.48	0.45	0.36	0.39	0.35	0.35	0.35	0.35	0.35
Actuated g/C Ratio	4.8	5.7	5.7	4.8	5.7	4.8	5.7	4.8	5.7	4.8	5.7	4.8
Clearance Time (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
Vehicle Extension (s)	360	1394	434	417	2256	88	695	457	577	457	577	577
Lane Grp Cap (vph)	0.00	0.26	0.22	c0.19	0.12	c0.01	0.03	0.30	0.30	0.30	0.30	0.30
v/s Ratio Prot.	0.07	0.15	0.93	0.80	0.93	0.28	0.35	0.08	0.96	0.96	0.96	0.96
v/s Ratio Perm	17.1	42.4	40.5	42.3	21.0	30.6	22.7	36.4	38.4	36.4	38.4	38.4
Uniform Delay, d1	0.79	0.69	1.07	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Progression Factor	0.0	7.6	8.3	27.5	0.3	0.9	0.0	0.0	0.0	0.0	0.0	0.0
Incremental Delay, d2	13.5	38.9	51.6	69.8	21.3	31.5	22.7	13.8	27.9	13.8	27.9	27.9
Delay (s)	B	D	D	E	C	C	C	D	D	D	E	E
Level of Service	E	E	E	E	C	C	C	D	D	D	E	E
Approach Delay (s)	41.1	39.8	39.8	39.8	25.3	25.3	25.3	25.3	25.3	25.3	25.3	25.3
Approach LOS	D	D	D	D	C	C	C	C	C	C	D	E
Intersection Summary												
HCM 2000 Control Delay	45.1											
HCM 2000 Volume to Capacity Ratio	0.93											
Actuated Cycle Length (s)	120.0											
Intersection Capacity Utilization	87.7%											
Analysis Period (min)	15											
c Critical Lane Group												

EXHIBIT (C) - TRAFFIC IMPACT ANALYSIS

PART 4 OF 4

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

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBR
Lane Configurations	TH	TH	TH	TH	TH	TH	TH	TH	TH	TH	TH
Volume (vph)	0	1234	667	329	2341	0	0	0	0	451	363
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lane Util. Factor	0.96	1.00	0.86	0.86	1.00	0.95	1.00	0.95	1.00	0.91	0.91
Flt Protected	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.99
Satd. Flow (prot)	6408	583	1522	4802	1810	3041	1589	1810	3041	1589	1589
Flt Permitted	1.00	1.00	0.09	0.92	1.00	1.00	1.00	1.00	1.00	0.95	0.99
Satd. Flow (perm)	6408	583	151	4403	1610	3341	1583	1610	3341	1583	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
Adj. Flow (vph)	0	1356	820	362	2389	0	0	0	0	597	465
RTOR Reduction (vph)	0	240	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1356	580	326	2425	0	0	0	0	314	658
Turn Type	NA	Perm	pm-plt	NA	Perm	NA	Perm	NA	Perm	NA	Perm
Protected Phases	6	5	5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
Permitted Phases	6	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
Actuated Green, G (s)	42.5	42.5	104.5	104.5	104.5	104.5	104.5	104.5	104.5	18.7	18.7
Effective Green, g (s)	42.5	42.5	104.5	104.5	104.5	104.5	104.5	104.5	104.5	18.7	18.7
Actuated g/C Ratio	0.30	0.30	0.30	0.75	0.75	0.75	0.75	0.75	0.75	0.13	0.13
Clearance Time (s)	5.5	5.5	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	2.5	2.5	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lane Grp Cap (vph)	1845	480	719	3463	215	446	211	215	446	211	211
v/s Ratio Prot	0.21	0.20	0.20	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31
v/s Ratio Perm	0.37	0.14	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21
v/c Ratio	0.70	1.21	0.45	0.70	0.70	0.70	0.70	0.70	0.70	0.14	0.14
Uniform Delay, d1	43.1	48.8	18.6	9.4	9.4	9.4	9.4	9.4	9.4	60.6	60.6
Progression Factor	1.00	1.00	0.75	0.75	0.75	0.75	0.75	0.75	0.75	1.00	1.00
Incremental Delay, d2	1.0	111.7	0.0	0.1	0.1	0.1	0.1	0.1	0.1	231.0	225.8
Delay (s)	44.1	160.5	18.6	9.5	9.5	9.5	9.5	9.5	9.5	291.7	286.4
Level of Service	D	F	A	A	A	A	A	A	A	F	F
Approach Delay (s)	88.0	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	245.9	245.9
Approach LOS	F	A	A	A	A	A	A	A	A	F	F
Intersection Summary											
HCM 2000 Control Delay	85.8										
HCM 2000 Volume to Capacity ratio	1.05										
Actuated Cycle Length (s)	140.0										
Intersection Capacity Utilization	135.1%										
Analysis Period (min)	15										
Critical Lane Group	15										

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBR
Lane Configurations	TH	TH	TH	TH	TH	TH	TH	TH	TH	TH	TH
Volume (vph)	277	343	40	415	59	280	311	77	77	145	221
Ideal Flow (vphpl)	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	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	1.00	0.95	0.95
Flt Protected	1.00	0.98	1.00	0.98	1.00	0.97	1.00	0.97	1.00	0.91	0.91
Satd. Flow (prot)	473	423	47	61	477	86	418	349	96	20	175
Flt Permitted	0.27	1.00	0.48	1.00	0.22	1.00	0.48	1.00	0.48	1.00	0.91
Satd. Flow (perm)	468	3485	899	3458	405	3425	921	3226	921	3226	3226
Peak-hour factor, PHF	0.87	0.81	0.86	0.79	0.87	0.89	0.80	0.44	0.83	0.83	0.88
Adj. Flow (vph)	473	423	47	61	477	86	418	349	96	20	175
RTOR Reduction (vph)	0	6	0	0	11	0	0	22	0	0	218
Lane Group Flow (vph)	413	464	0	61	552	0	418	423	0	20	208
Turn Type	NA	pm-plt	NA	pm-plt	NA	pm-plt	NA	pm-plt	NA	pm-plt	NA
Protected Phases	5	2	1	6	3	8	3	8	3	7	4
Permitted Phases	2	6	6	6	6	6	6	6	6	6	4
Actuated Green, G (s)	55.1	56.1	42.4	37.4	46.9	41.3	46.9	41.3	46.9	16.0	14.4
Effective Green, g (s)	55.1	56.1	42.4	37.4	46.9	41.3	46.9	41.3	46.9	16.0	14.4
Actuated g/C Ratio	0.64	0.47	0.35	0.31	0.39	0.34	0.39	0.34	0.39	0.13	0.12
Clearance Time (s)	4.0	4.0	4.0	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	3.0	3.0	3.0
Lane Grp Cap (vph)	521	1629	353	1077	482	1178	134	387	134	387	387
v/s Ratio Prot	0.16	0.13	0.01	0.16	0.16	0.12	0.12	0.12	0.12	0.06	0.06
v/s Ratio Perm	0.27	0.28	0.05	0.13	0.13	0.13	0.13	0.13	0.13	0.02	0.02
v/c Ratio	0.79	0.51	0.17	0.51	0.87	0.36	0.36	0.36	0.36	0.15	0.54
Uniform Delay, d1	18.6	19.6	26.0	33.8	30.7	29.4	45.6	49.7	45.6	49.7	49.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	8.1	0.4	0.2	1.7	15.1	0.2	0.5	1.4	0.5	1.4	1.4
Delay (s)	26.7	20.1	26.2	35.5	45.8	29.6	46.1	51.1	46.1	51.1	51.1
Level of Service	C	C	C	D	D	C	C	D	C	D	D
Approach Delay (s)	23.2	34.7	34.7	37.5	37.5	37.5	37.5	37.5	37.5	50.9	50.9
Approach LOS	C	C	C	D	D	C	D	D	C	D	D
Intersection Summary											
HCM 2000 Control Delay	34.5										
HCM 2000 Volume to Capacity ratio	0.87										
Actuated Cycle Length (s)	120.0										
Intersection Capacity Utilization	88.7%										
Analysis Period (min)	15										
Critical Lane Group	15										

EXHIBIT (C) - TRAFFIC IMPACT ANALYSIS

PART 4 OF 4

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

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	4	4	4	4	4	4	4	4	4	4	4	4
Volume (vph)	352	1263	0	0	1350	468	1350	705	161	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lane Util. Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Fit	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fit Protected	0.95	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00
Satd. Flow (prot)	1522	4791	6408	1522	4791	6408	1522	4791	6408	1522	4791	6408
Fit Permitted	0.14	0.66	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00
Satd. Flow (perm)	217	3185	6408	217	3185	6408	217	3185	6408	217	3185	6408
Peak-hour factor, PHF	0.99	0.95	1.00	1.00	0.96	0.93	0.96	0.95	0.93	1.00	1.00	1.00
Adj. Flow (vph)	359	1228	0	0	1406	503	1378	742	162	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	111	0	0
Lane Group Flow (vph)	273	1415	0	0	1406	339	669	1431	71	0	0	0
Turn Type	pm-vt	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Protected Phases	1	2	2	2	2	2	2	2	2	2	2	2
Permitted Phases	2	1	2	2	2	2	2	2	2	2	2	2
Actuated Green, G (s)	79.5	79.5	29.5	29.5	43.7	43.7	43.7	43.7	43.7	43.7	43.7	43.7
Effective Green, g (s)	79.5	79.5	29.5	29.5	43.7	43.7	43.7	43.7	43.7	43.7	43.7	43.7
Actuated g/C Ratio	0.37	0.57	0.21	0.21	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31
Clearance Time (s)	5.0	5.0	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Vehicle Extension (s)	1.0	1.0	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Lane Grp Cap (vph)	589	2382	1350	333	502	1033	464	464	464	464	464	464
v/s Ratio Prot.	0.17	0.21	0.22	0.22	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21
v/s Ratio Perm	0.10	0.13	0.10	0.13	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14
v/c Ratio	0.46	0.59	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21
Uniform Delay, d1	21.9	19.7	55.2	55.2	48.1	48.1	48.1	48.1	48.1	48.1	48.1	48.1
Progression Factor	0.28	0.19	0.63	0.38	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	0.1	29.5	39.9	179.9	179.9	179.9	179.9	179.9	179.9	179.9	179.9
Delay (s)	5.3	3.9	64.3	69.9	228.1	227.6	227.6	227.6	227.6	227.6	227.6	227.6
Level of Service	A	A	E	E	F	F	F	F	F	F	F	F
Approach Delay (s)	A	A	E	E	F	F	F	F	F	F	F	F
Approach LOS	A	A	E	E	F	F	F	F	F	F	F	F
Intersection Summary												
HCM 2000 Control Delay	104.7											
HCM 2000 Volume to Capacity ratio	1.04											
Actuated Cycle Length (s)	140.0											
Intersection Capacity Utilization	139.1%											
Analysis Period (min)	15											
Critical Lane Group	A											

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	4	4	4	4	4	4	4	4	4	4	4	4
Volume (vph)	337	1044	166	141	1501	126	301	402	213	166	240	264
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
Fit	1.00	1.00	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fit Protected	0.95	1.00	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Satd. Flow (prot)	1770	5085	1583	1770	5085	1583	1770	1663	1583	1770	3539	1583
Fit Permitted	0.09	1.00	1.00	1.00	0.12	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)	173	5085	1583	223	5085	1583	1770	1663	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)	411	1228	248	231	1564	145	381	484	361	208	316	322
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	411	1228	195	231	1564	89	381	484	361	208	316	322
Turn Type	D-P-P	NA	NA	D-P-P	NA	NA	NA	NA	NA	NA	NA	NA
Protected Phases	1	6	6	6	6	6	6	6	6	6	6	6
Permitted Phases	2	1	2	2	2	2	2	2	2	2	2	2
Actuated Green, G (s)	68.4	52.4	52.4	68.4	43.1	43.1	43.1	43.1	43.1	43.1	43.1	43.1
Effective Green, g (s)	68.4	52.4	52.4	68.4	43.1	43.1	43.1	43.1	43.1	43.1	43.1	43.1
Actuated g/C Ratio	0.49	0.37	0.37	0.49	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31
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)	373	1903	592	285	1655	487	439	463	393	201	401	179
v/s Ratio Prot.	0.20	0.24	0.24	0.20	0.30	0.30	0.22	0.26	0.26	0.26	0.26	0.26
v/s Ratio Perm	0.34	0.10	0.10	0.30	0.05	0.05	0.09	0.09	0.09	0.09	0.09	0.09
v/c Ratio	1.10	0.65	0.26	0.81	1.00	0.16	0.37	0.38	0.38	0.38	0.38	0.38
Uniform Delay, d1	45.0	36.1	30.4	26.7	48.4	35.3	50.4	52.6	43.7	62.0	60.4	57.5
Progression Factor	1.62	0.69	0.44	1.16	1.06	1.53	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	75.3	1.6	1.0	13.6	21.2	0.6	15.9	54.2	0.2	72.9	9.1	0.5
Delay (s)	148.1	26.6	14.4	44.7	71.9	54.7	66.3	106.8	43.9	134.9	69.5	58.0
Level of Service	F	C	B	D	E	D	E	F	D	F	F	E
Approach Delay (s)	F	D	D	D	E	D	E	F	D	F	F	E
Approach LOS	F	D	D	D	E	D	E	F	D	F	F	E
Intersection Summary												
HCM 2000 Control Delay	66.0											
HCM 2000 Volume to Capacity ratio	1.08											
Actuated Cycle Length (s)	140.0											
Intersection Capacity Utilization	95.4%											
Analysis Period (min)	15											
Critical Lane Group	15											

EXHIBIT (C) - TRAFFIC IMPACT ANALYSIS

PART 4 OF 4

HCM Signalized Intersection Capacity Analysis
 1.1. Ingram Rd & Potranco Rd

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (vph)	13	1288	20	313	1676	0	11	85	536	0	44	10
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	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.91	1.00	0.91	1.00	0.91	1.00	0.95	0.95	1.00	0.97	1.00
Flt Protected	0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	5973	1770	5985	1770	5985	1770	3068	3441	1770	3068	3441
Flt Permitted	0.07	1.00	0.12	1.00	0.72	1.00	0.72	1.00	1.00	0.12	1.00	1.00
Satd. Flow (perm)	134	5073	134	229	5085	1341	3068	3441	3441	134	229	5085
Peak-hour factor, PHF	1.00	0.95	0.94	0.70	0.89	1.00	0.67	1.00	0.80	1.00	1.00	1.00
Adj. Flow (vph)	13	1288	21	447	1883	0	16	85	570	0	44	10
RTOR Reduction (vph)	0	1	0	0	0	0	0	350	0	0	8	0
Lane Group Flow (vph)	13	1288	0	447	1883	0	16	405	0	0	46	0
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Prohibited Phases	4	5	3	3	3	3	2	2	2	6	6	6
Permitted Phases	4	5	3	3	3	3	2	2	2	6	6	6
Actuated Green, G (s)	59.0	59.0	102.0	102.0	102.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0
Effective Green, g (s)	59.0	59.0	102.0	102.0	102.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0
Actuated g/C Ratio	0.42	0.42	0.73	0.73	0.73	0.21	0.21	0.21	0.21	0.21	0.21	0.21
Clearance Time (s)	4.0	4.0	4.0	4.0	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	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	56	2137	596	3704	287	657	737	737	737	287	657	737
v/s Ratio Prot	0.10	0.25	c0.21	0.37	c0.13	0.01	0.01	0.01	0.01	0.01	0.01	0.01
v/s Ratio Perm	0.23	0.60	0.75	0.51	0.06	0.9701	0.06	0.9701	0.06	0.9701	0.06	0.9701
Uniform Delay, d1	26.0	31.4	28.5	8.2	43.7	49.8	28.5	8.2	43.7	49.8	28.5	8.2
Progression Factor	0.80	0.66	0.60	0.64	1.00	1.00	1.00	1.00	1.00	0.87	0.87	0.87
Incremental Delay, d2	6.9	0.9	3.6	0.3	0.4	4.3	0.4	0.3	4.3	0.4	4.3	0.4
Delay (s)	27.8	21.7	20.6	5.6	44.1	54.1	20.6	5.6	44.1	54.1	20.6	5.6
Level of Service	C	C	C	A	A	D	A	A	D	D	C	D
Approach Delay (s)	21.8	21.8	21.8	21.8	21.8	21.8	21.8	21.8	21.8	21.8	21.8	21.8
Approach LOS	C	C	C	A	A	D	A	A	D	D	C	D
Intersection Summary												
HCM 2000 Control Delay	20.6											
HCM 2000 Volume to Capacity ratio	0.73											
Actuated Cycle Length (s)	140.0											
Intersection Capacity Utilization	70.8%											
Analysis Period (min)	15											
dr. Defacto Right Lane, Recode with 1 through lane as a right lane.	C											

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (vph)	28	1154	592	216	1391	64	459	494	560	13	267	42
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost Time (s)	4.0	5.8	5.8	4.0	5.8	5.2	5.2	5.2	5.2	5.2	5.2	5.8
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Flt Protected	0.95	1.00	0.95	1.00	0.99	1.00	0.92	1.00	0.92	1.00	0.98	1.00
Satd. Flow (prot)	1770	5085	1770	5055	1770	3245	1770	3245	1770	3245	1770	3245
Flt Permitted	0.09	1.00	0.12	1.00	0.49	1.00	0.49	1.00	0.49	1.00	0.16	1.00
Satd. Flow (perm)	161	5085	161	232	5055	912	3245	912	3245	161	232	5055
Peak-hour factor, PHF	1.00	0.96	0.91	0.94	0.91	1.00	0.92	1.00	0.91	1.00	1.00	1.00
Adj. Flow (vph)	28	1202	551	230	1529	64	499	494	615	13	287	42
RTOR Reduction (vph)	0	0	353	0	3	0	0	116	0	0	0	7
Lane Group Flow (vph)	28	1202	283	230	1590	0	499	993	0	13	322	0
Turn Type	D,P+P	NA	Perm	D,P+P	NA	D,P+P	NA	D,P+P	NA	D,P+P	NA	NA
Prohibited Phases	1	6	5	2	7	4	3	8	3	8	3	8
Permitted Phases	2	6	6	6	6	6	6	6	6	6	6	6
Actuated Green, G (s)	48.7	32.1	32.1	48.7	46.3	70.5	68.7	71.1	71.1	41.1	41.1	41.1
Effective Green, g (s)	48.7	32.1	32.1	48.7	46.3	70.5	68.7	71.1	71.1	41.1	41.1	41.1
Actuated g/C Ratio	0.35	0.23	0.23	0.35	0.33	0.50	0.49	0.51	0.51	0.29	0.29	0.29
Clearance Time (s)	4.0	5.8	5.8	4.0	5.8	5.2	5.2	5.2	5.2	5.2	5.2	5.8
Vehicle Extension (s)	3.0	1.0	1.0	3.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lane Grp Cap (vph)	83	1165	362	263	1671	639	1692	168	168	1018	168	1018
v/s Ratio Prot	0.01	c0.24	0.18	0.20	c0.31	c0.16	0.31	0.00	0.09	0.09	0.09	0.09
v/s Ratio Perm	0.11	0.35	1.03	0.81	0.87	0.95	0.78	0.62	0.08	0.32	0.08	0.32
Uniform Delay, d1	35.9	54.0	51.0	57.1	45.7	24.2	26.2	20.2	20.2	38.5	20.2	38.5
Progression Factor	1.21	1.18	1.89	1.38	1.47	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.9	31.4	13.6	20.9	10.7	5.7	0.6	0.1	0.1	0.8	0.1	0.8
Delay (s)	45.2	95.5	110.1	98.4	78.0	29.9	26.7	20.2	20.2	39.3	20.2	39.3
Level of Service	D	F	F	F	E	C	C	C	C	D	C	D
Approach Delay (s)	99.3	99.3	99.3	99.3	99.3	99.3	99.3	99.3	99.3	99.3	99.3	99.3
Approach LOS	F	F	F	F	F	F	F	F	F	F	F	F
Intersection Summary												
HCM 2000 Control Delay	69.4											
HCM 2000 Volume to Capacity ratio	0.68											
Actuated Cycle Length (s)	140.0											
Intersection Capacity Utilization	87.8%											
Analysis Period (min)	15											
dr. Defacto Right Lane, Recode with 1 through lane as a right lane.	E											