Appendix E

Total Future Levels of Service

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	0	112	0	0	649	56
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	122	0	0	705	61
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	736	383	766			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	736	383	766			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	80	100			
cM capacity (veh/h)	354	615	843			

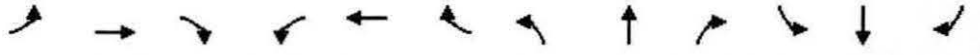
Direction, Lane #	EB 1	SB 1	SB 2
Volume Total	122	470	296
Volume Left	0	0	0
Volume Right	122	0	61
cSH	615	1700	1700
Volume to Capacity	0.20	0.28	0.17
Queue Length 95th (ft)	18	0	0
Control Delay (s)	12.3	0.0	0.0
Lane LOS	B		
Approach Delay (s)	12.3	0.0	
Approach LOS	B		

Intersection Summary			
Average Delay	1.7		
Intersection Capacity Utilization	33.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Volume (vph)	0	0	59	133	7	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	64	145	8	0

Direction, Lane #	WB 1	NB 1
Volume Total (vph)	209	8
Volume Left (vph)	64	8
Volume Right (vph)	0	0
Hadj (s)	0.10	0.23
Departure Headway (s)	4.0	4.6
Degree Utilization, x	0.23	0.01
Capacity (veh/h)	889	743
Control Delay (s)	8.2	7.6
Approach Delay (s)	8.2	7.6
Approach LOS	A	A

Intersection Summary			
Delay	8.2		
HCM Level of Service	A		
Intersection Capacity Utilization	34.2%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	11	11	0	14	108	10	6	124	111	117	68	207
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	12	12	0	15	117	11	7	135	121	127	74	225

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	24	143	262	426
Volume Left (vph)	12	15	7	127
Volume Right (vph)	0	11	121	225
Hadj (s)	0.13	0.01	-0.24	-0.22
Departure Headway (s)	5.9	5.5	4.7	4.5
Degree Utilization, x	0.04	0.22	0.34	0.53
Capacity (veh/h)	517	583	737	774
Control Delay (s)	9.1	10.1	10.0	12.5
Approach Delay (s)	9.1	10.1	10.0	12.5
Approach LOS	A	B	B	B

Intersection Summary			
Delay	11.2		
HCM Level of Service	B		
Intersection Capacity Utilization	61.0%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	0	246	0	0	1307	130
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	267	0	0	1421	141
Pedestrians	66					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	4.0					
Percent Blockage	6					
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1557	847	1628			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1557	847	1628			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	7	100			
cM capacity (veh/h)	98	288	373			

Direction, Lane #	EB 1	SB 1	SB 2
Volume Total	267	947	615
Volume Left	0	0	0
Volume Right	267	0	141
cSH	288	1700	1700
Volume to Capacity	0.93	0.56	0.36
Queue Length 95th (ft)	220	0	0
Control Delay (s)	75.0	0.0	0.0
Lane LOS	F		
Approach Delay (s)	75.0	0.0	
Approach LOS	F		

Intersection Summary			
Average Delay	11.0		
Intersection Capacity Utilization	62.6%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	0	16	0	7	58	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	17	0	8	63	1
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	71	64	64			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	71	64	64			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	98	100			
cM capacity (veh/h)	933	1001	1538			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	17	8	64
Volume Left	0	0	0
Volume Right	17	0	1
cSH	1001	1538	1700
Volume to Capacity	0.02	0.00	0.04
Queue Length 95th (ft)	1	0	0
Control Delay (s)	8.7	0.0	0.0
Lane LOS	A		
Approach Delay (s)	8.7	0.0	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	1.7		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.0	4.0	
Lane Util. Factor				1.00	1.00	
Frt				1.00	1.00	
Flt Protected				1.00	0.95	
Satd. Flow (prot)				1862	1770	
Flt Permitted				1.00	0.95	
Satd. Flow (perm)				1862	1770	
Volume (vph)	0	0	2	138	4	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	2	150	4	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	152	4	0
Turn Type			Perm			
Protected Phases				2	4	
Permitted Phases			2			
Actuated Green, G (s)				16.0	16.0	
Effective Green, g (s)				16.0	16.0	
Actuated g/C Ratio				0.40	0.40	
Clearance Time (s)				4.0	4.0	
Lane Grp Cap (vph)				745	708	
v/s Ratio Prot					c0.00	
v/s Ratio Perm				0.08		
v/c Ratio				0.20	0.01	
Uniform Delay, d1				7.8	7.2	
Progression Factor				1.00	1.00	
Incremental Delay, d2				0.6	0.0	
Delay (s)				8.5	7.2	
Level of Service				A	A	
Approach Delay (s)	0.0			8.5	7.2	
Approach LOS	A			A	A	

Intersection Summary			
HCM Average Control Delay	8.4	HCM Level of Service	A
HCM Volume to Capacity ratio	0.10		
Actuated Cycle Length (s)	40.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	17.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.0		
Lane Util. Factor				1.00		
Frt				1.00		
Flt Protected				1.00		
Satd. Flow (prot)				1862		
Flt Permitted				1.00		
Satd. Flow (perm)				1862		
Volume (vph)	0	0	1	192	0	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	1	209	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	210	0	0
Turn Type			Perm			
Protected Phases				2	4	
Permitted Phases			2			
Actuated Green, G (s)				16.0		
Effective Green, g (s)				16.0		
Actuated g/C Ratio				0.40		
Clearance Time (s)				4.0		
Lane Grp Cap (vph)				745		
v/s Ratio Prot						
v/s Ratio Perm				0.11		
v/c Ratio				0.28		
Uniform Delay, d1				8.1		
Progression Factor				1.00		
Incremental Delay, d2				0.9		
Delay (s)				9.1		
Level of Service				A		
Approach Delay (s)	0.0			9.1	0.0	
Approach LOS	A			A	A	

Intersection Summary			
HCM Average Control Delay	9.1	HCM Level of Service	A
HCM Volume to Capacity ratio	0.28		
Actuated Cycle Length (s)	40.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	13.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	0	46	0	0	387	76
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	50	0	0	421	83
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	462	252	503			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	462	252	503			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	93	100			
cM capacity (veh/h)	528	748	1057			

Direction, Lane #	EB 1	SB 1	SB 2
Volume Total	50	280	223
Volume Left	0	0	0
Volume Right	50	0	83
cSH	748	1700	1700
Volume to Capacity	0.07	0.16	0.13
Queue Length 95th (ft)	5	0	0
Control Delay (s)	10.2	0.0	0.0
Lane LOS	B		
Approach Delay (s)	10.2	0.0	
Approach LOS	B		

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	23.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Volume (vph)	0	0	46	260	14	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	50	283	15	0

Direction, Lane #	WB 1	NB 1
Volume Total (vph)	333	15
Volume Left (vph)	50	15
Volume Right (vph)	0	0
Hadj (s)	0.06	0.23
Departure Headway (s)	4.0	4.9
Degree Utilization, x	0.37	0.02
Capacity (veh/h)	891	688
Control Delay (s)	9.3	8.0
Approach Delay (s)	9.3	8.0
Approach LOS	A	A

Intersection Summary				
Delay	9.3			
HCM Level of Service	A			
Intersection Capacity Utilization	36.0%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	9	9	0	42	129	15	8	110	88	62	59	221
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	10	0	46	140	16	9	120	96	67	64	240

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	20	202	224	372
Volume Left (vph)	10	46	9	67
Volume Right (vph)	0	16	96	240
Hadj (s)	0.13	0.03	-0.21	-0.32
Departure Headway (s)	5.8	5.4	4.8	4.5
Degree Utilization, x	0.03	0.30	0.30	0.47
Capacity (veh/h)	529	614	711	764
Control Delay (s)	9.0	10.6	9.8	11.4
Approach Delay (s)	9.0	10.6	9.8	11.4
Approach LOS	A	B	A	B

Intersection Summary			
Delay	10.7		
HCM Level of Service	B		
Intersection Capacity Utilization	56.9%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	0	166	0	0	514	173
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	180	0	0	559	188
Pedestrians	75					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	4.0					
Percent Blockage	6					
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	728	448	822			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	728	448	822			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	65	100			
cM capacity (veh/h)	336	523	753			

Direction, Lane #	EB 1	SB 1	SB 2
Volume Total	180	372	374
Volume Left	0	0	0
Volume Right	180	0	188
cSH	523	1700	1700
Volume to Capacity	0.35	0.22	0.22
Queue Length 95th (ft)	38	0	0
Control Delay (s)	15.5	0.0	0.0
Lane LOS	C		
Approach Delay (s)	15.5	0.0	
Approach LOS	C		

Intersection Summary			
Average Delay	3.0		
Intersection Capacity Utilization	38.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	0	7	0	7	39	7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	8	0	8	42	8
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	54	46	50			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	54	46	50			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	99	100			
cM capacity (veh/h)	954	1023	1557			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	8	8	50
Volume Left	0	0	0
Volume Right	8	0	8
cSH	1023	1557	1700
Volume to Capacity	0.01	0.00	0.03
Queue Length 95th (ft)	1	0	0
Control Delay (s)	8.5	0.0	0.0
Lane LOS	A		
Approach Delay (s)	8.5	0.0	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	0	0	9	265	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	10	288	2	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			0		308	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			0		308	0
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		100	100
cM capacity (veh/h)			1623		680	1085

Direction, Lane #	WB 1	NB 1
Volume Total	298	2
Volume Left	10	2
Volume Right	0	0
cSH	1623	680
Volume to Capacity	0.01	0.00
Queue Length 95th (ft)	0	0
Control Delay (s)	0.3	10.3
Lane LOS	A	B
Approach Delay (s)	0.3	10.3
Approach LOS		B

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	24.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	0	0	4	306	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	4	333	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			0		341	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			0		341	0
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1623		653	1085

Direction, Lane #	WB 1	NB 1
Volume Total	337	0
Volume Left	4	0
Volume Right	0	0
cSH	1623	1700
Volume to Capacity	0.00	0.00
Queue Length 95th (ft)	0	0
Control Delay (s)	0.1	0.0
Lane LOS	A	A
Approach Delay (s)	0.1	0.0
Approach LOS		A

Intersection Summary				
Average Delay	0.1			
Intersection Capacity Utilization	19.7%	ICU Level of Service		A
Analysis Period (min)	15			