APPENDIX L

2017 No Build Highland Avenue Intersection Analysis

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	205	841	54	388	556	295	37	119	223	256	138	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.991			0.948				0.850		0.979	
Flt Protected	0.950			0.950				0.988		0.950		
Satd. Flow (prot)	1770	3507	0	1770	3355	0	0	1840	1583	1770	1824	0
Flt Permitted	0.950			0.950				0.988		0.950		
Satd. Flow (perm)	1770	3507	0	1770	3355	0	0	1840	1583	1770	1824	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4			72				242		5	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		552			1005			281			235	
Travel Time (s)		12.5			22.8			6.4			5.3	
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
Adj. Flow (vph)	223	914	59	422	604	321	40	129	242	278	150	25
Shared Lane Traffic (%)												
Lane Group Flow (vph)	223	973	0	422	925	0	0	169	242	278	175	0
Turn Type	Prot			Prot			custom		custom	custom		
Protected Phases	1	6		5	2		8	8		4	4	
Permitted Phases		6			2		8		8 5	4		
Detector Phase	1	6		5	2		8	8	8 5	4	4	
Switch Phase												
Minimum Initial (s)	4.0	10.0		6.0	10.0		6.0	6.0		6.0	6.0	
Minimum Split (s)	9.0	15.0		11.0	15.0		11.0	11.0		11.0	11.0	
Total Split (s)	15.0	33.0	0.0	31.0	49.0	0.0	27.0	27.0	58.0	29.0	29.0	0.0
Total Split (%)	10.6%	23.2%	0.0%	21.8%	34.5%	0.0%	19.0%	19.0%	40.8%	20.4%	20.4%	0.0%
Maximum Green (s)	10.0	28.0		26.0	44.0		22.0	22.0		24.0	24.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	-1.0	-1.0	0.0	-1.0	-1.0	0.0	-1.0	-1.0	-1.0	-1.0	-1.0	0.0
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
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	Min	Min		Min	Min		None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)	11.1	29.4		27.3	45.6			16.6	47.4	23.4	23.4	
Actuated g/C Ratio	0.10	0.25		0.23	0.39			0.14	0.41	0.20	0.20	
v/c Ratio	1.32	1.10		1.01	0.68			0.65	0.31	0.78	0.47	
Control Delay	220.0	101.2		93.4	32.1			60.4	3.4	61.7	46.7	
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Total Delay	220.0	101.2		93.4	32.1			60.4	3.4	61.7	46.7	
LOS	F	F		F	C			E	A	E	D	
Approach Delay		123.4			51.3			26.8			55.9	
Approach LOS		F			D			C			E	
90th %ile Green (s)	10.0	28.0		26.0	44.0		22.0	22.0		24.0	24.0	

Lane Group	ø9
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	19.0
Minimum Split (s)	22.0
Total Split (s)	22.0
Total Split (%)	15%
Maximum Green (s)	19.0
Yellow Time (s)	2.0
All-Red Time (s)	1.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	6.0
Flash Dont Walk (s)	12.0
Pedestrian Calls (#/hr)	2
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
90th %ile Green (s)	19.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
90th %ile Term Code	Max	Max		Max	Max		Max	Max		Max	Max	
70th %ile Green (s)	10.0	28.0		26.0	44.0		17.9	17.9		24.0	24.0	
70th %ile Term Code	Max	Max		Max	Hold		Gap	Gap		Max	Max	
50th %ile Green (s)	10.0	28.0		26.0	44.0		15.6	15.6		24.0	24.0	
50th %ile Term Code	Max	Max		Max	Hold		Gap	Gap		Max	Max	
30th %ile Green (s)	10.0	28.0		26.0	44.0		13.4	13.4		22.0	22.0	
30th %ile Term Code	Max	Max		Max	Hold		Gap	Gap		Gap	Gap	
10th %ile Green (s)	10.0	28.0		26.0	44.0		10.2	10.2		17.3	17.3	
10th %ile Term Code	Max	Max		Max	Hold		Gap	Gap		Gap	Gap	
Queue Length 50th (ft)	~209	~420		~312	267			118	0	189	108	
Queue Length 95th (ft)	#467	#758		#699	477			226	41	#418	226	
Internal Link Dist (ft)		472			925			201			155	
Turn Bay Length (ft)												
Base Capacity (vph)	169	887		416	1356			368	787	385	400	
Starvation Cap Reductn	0	0		0	0			0	0	0	0	
Spillback Cap Reductn	0	0		0	0			0	0	0	0	
Storage Cap Reductn	0	0		0	0			0	0	0	0	
Reduced v/c Ratio	1.32	1.10		1.01	0.68			0.46	0.31	0.72	0.44	

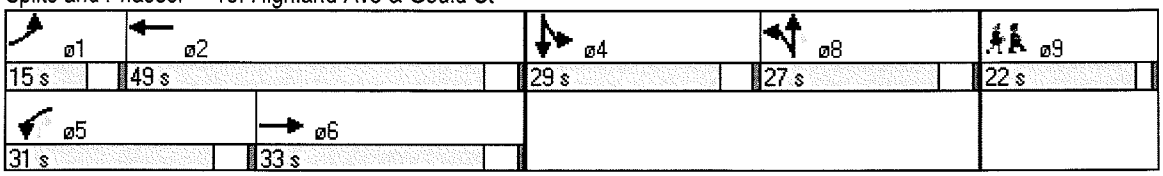
Intersection Summary

Area Type: Other
Cycle Length: 142
Actuated Cycle Length: 116.5
Natural Cycle: 140
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.32
Intersection Signal Delay: 74.2 Intersection LOS: E
Intersection Capacity Utilization 82.3% ICU Level of Service E
Analysis Period (min) 15
90th %ile Actuated Cycle: 142
70th %ile Actuated Cycle: 115.9
50th %ile Actuated Cycle: 113.6
30th %ile Actuated Cycle: 109.4
10th %ile Actuated Cycle: 101.5

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 15: Highland Ave & Gould St



Lane Group	ø9
90th %ile Term Code	Max
70th %ile Green (s)	0.0
70th %ile Term Code	Skip
50th %ile Green (s)	0.0
50th %ile Term Code	Skip
30th %ile Green (s)	0.0
30th %ile Term Code	Skip
10th %ile Green (s)	0.0
10th %ile Term Code	Skip
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1797	946	0	1051	0	68
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1953	1028	0	1142	0	74
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)				767		
pX, platoon unblocked					0.96	
vC, conflicting volume			2982		3039	1491
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			2982		3040	1491
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	34
cM capacity (veh/h)			115		10	113

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	1302	1679	571	571	74
Volume Left	0	0	0	0	0
Volume Right	0	1028	0	0	74
cSH	1700	1700	1700	1700	113
Volume to Capacity	0.77	0.99	0.34	0.34	0.66
Queue Length 95th (ft)	0	0	0	0	84
Control Delay (s)	0.0	0.0	0.0	0.0	83.7
Lane LOS					F
Approach Delay (s)	0.0		0.0		83.7
Approach LOS					F

Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	90.8%	ICU Level of Service	E
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	36	805	506	448	600	174	380	18	234	59	31	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	0.95	1.00	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00
Frt		0.944			0.966				0.850			0.850
Flt Protected		0.999		0.950			0.950	0.957			0.968	
Satd. Flow (prot)	0	3338	0	1770	3419	0	1681	1694	1583	0	1803	1583
Flt Permitted		0.899		0.062			0.950	0.957			0.968	
Satd. Flow (perm)	0	3004	0	115	3419	0	1681	1694	1583	0	1803	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		132			67				254			5
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		767			913			427			522	
Travel Time (s)		17.4			20.8			9.7			11.9	
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
Adj. Flow (vph)	39	875	550	487	652	189	413	20	254	64	34	5
Shared Lane Traffic (%)							48%					
Lane Group Flow (vph)	0	1464	0	487	841	0	215	218	254	0	98	5
Turn Type	Perm			pm+pt			custom		Perm	custom		Perm
Protected Phases		6		5	2		8	8		4	4	
Permitted Phases	6			2			8		8	4		4
Detector Phase	6	6		5	2		8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	4.0	4.0		3.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	40.0	40.0		8.0	21.0		12.0	12.0	12.0	8.0	8.0	8.0
Total Split (s)	64.0	64.0	0.0	28.0	92.0	0.0	26.0	26.0	26.0	10.0	10.0	10.0
Total Split (%)	50.0%	50.0%	0.0%	21.9%	71.9%	0.0%	20.3%	20.3%	20.3%	7.8%	7.8%	7.8%
Maximum Green (s)	59.0	59.0		23.0	87.0		21.0	21.0	21.0	6.0	6.0	6.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	3.0	3.0	3.0
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	-1.0	-1.0	0.0	-1.0	-1.0	0.0	-1.0	-1.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	5.0	4.0	4.0	4.0
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Min	C-Min		None	C-Min		None	None	None	None	None	None
Walk Time (s)	6.0	6.0					6.0	6.0	6.0			
Flash Dont Walk (s)	24.0	24.0					14.0	14.0	14.0			
Pedestrian Calls (#/hr)	4	4					4	4	4			
Act Effct Green (s)		60.0		89.6	89.6		20.4	20.4	19.4		6.0	6.0
Actuated g/C Ratio		0.47		0.70	0.70		0.16	0.16	0.15		0.05	0.05
v/c Ratio		0.99		1.18	0.35		0.81	0.81	0.56		1.15	0.06
Control Delay		52.2		140.6	7.5		74.0	74.4	10.6		197.2	35.8
Queue Delay		0.0		0.0	0.0		0.0	0.0	0.0		0.0	0.0
Total Delay		52.2		140.6	7.5		74.0	74.4	10.6		197.2	35.8
LOS		D		F	A		E	E	B		F	D
Approach Delay		52.2			56.3			50.7			189.4	
Approach LOS		D			E			D			F	
90th %ile Green (s)	59.0	59.0		23.0	87.0		21.0	21.0	21.0	6.0	6.0	6.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
90th %ile Term Code	Coord	Coord		Max	Coord		Max	Max	Max	Max	Max	Max
70th %ile Green (s)	59.0	59.0		23.0	87.0		21.0	21.0	21.0	6.0	6.0	6.0
70th %ile Term Code	Coord	Coord		Max	Coord		Max	Max	Max	Max	Max	Max
50th %ile Green (s)	59.0	59.0		23.0	87.0		21.0	21.0	21.0	6.0	6.0	6.0
50th %ile Term Code	Coord	Coord		Max	Coord		Max	Max	Max	Max	Max	Max
30th %ile Green (s)	59.0	59.0		24.9	88.9		19.1	19.1	19.1	6.0	6.0	6.0
30th %ile Term Code	Coord	Coord		Max	Coord		Gap	Gap	Gap	Max	Max	Max
10th %ile Green (s)	59.0	59.0		29.3	93.3		14.7	14.7	14.7	6.0	6.0	6.0
10th %ile Term Code	Coord	Coord		Max	Coord		Gap	Gap	Gap	Max	Max	Max
Queue Length 50th (ft)		583		~455	125		180	183	0		~96	0
Queue Length 95th (ft)		#766		#674	158		#298	#302	77		#213	15
Internal Link Dist (ft)		687			833			347			442	
Turn Bay Length (ft)												
Base Capacity (vph)		1478		412	2415		289	291	472		85	79
Starvation Cap Reductn		0		0	0		0	0	0		0	0
Spillback Cap Reductn		0		0	0		0	0	0		0	0
Storage Cap Reductn		0		0	0		0	0	0		0	0
Reduced v/c Ratio		0.99		1.18	0.35		0.74	0.75	0.54		1.15	0.06

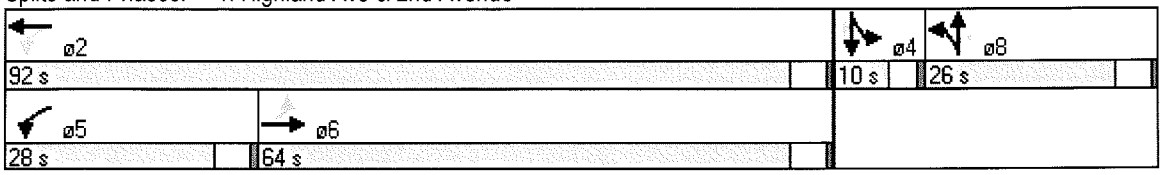
Intersection Summary

Area Type: Other
Cycle Length: 128
Actuated Cycle Length: 128
Offset: 20 (16%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green
Natural Cycle: 110
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.18
Intersection Signal Delay: 57.4 Intersection LOS: E
Intersection Capacity Utilization 92.0% ICU Level of Service F
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Highland Ave & 2nd Avenue



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	57	653	50	473	698	194	23	130	384	328	169	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.989			0.967				0.850		0.963	
Flt Protected	0.950			0.950				0.993		0.950		
Satd. Flow (prot)	1770	3500	0	1770	3422	0	0	1850	1583	1770	1794	0
Flt Permitted	0.950			0.950				0.993		0.950		
Satd. Flow (perm)	1770	3500	0	1770	3422	0	0	1850	1583	1770	1794	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5			27				316		10	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		552			1005			281			235	
Travel Time (s)		12.5			22.8			6.4			5.3	
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
Adj. Flow (vph)	62	710	54	514	759	211	25	141	417	357	184	60
Shared Lane Traffic (%)												
Lane Group Flow (vph)	62	764	0	514	970	0	0	166	417	357	244	0
Turn Type	Prot			Prot			custom		custom	custom		
Protected Phases	1	6		5	2		8	8		4	4	
Permitted Phases		6			2		8		8 5	4		
Detector Phase	1	6		5	2		8	8	8 5	4	4	
Switch Phase												
Minimum Initial (s)	4.0	10.0		6.0	10.0		6.0	6.0		6.0	6.0	
Minimum Split (s)	9.0	15.0		11.0	15.0		11.0	11.0		11.0	11.0	
Total Split (s)	11.0	35.0	0.0	35.0	59.0	0.0	17.0	17.0	52.0	41.0	41.0	0.0
Total Split (%)	7.3%	23.3%	0.0%	23.3%	39.3%	0.0%	11.3%	11.3%	34.7%	27.3%	27.3%	0.0%
Maximum Green (s)	6.0	30.0		30.0	54.0		12.0	12.0		36.0	36.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	-1.0	-1.0	0.0	-1.0	-1.0	0.0	-1.0	-1.0	-1.0	-1.0	-1.0	0.0
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
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	Min		None	Min		None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)	7.1	31.3		31.3	55.5			13.1	47.8	30.8	30.8	
Actuated g/C Ratio	0.06	0.25		0.25	0.44			0.10	0.38	0.24	0.24	
v/c Ratio	0.63	0.88		1.17	0.64			0.86	0.52	0.83	0.55	
Control Delay	87.6	58.5		141.5	31.0			94.2	10.0	62.7	45.7	
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Total Delay	87.6	58.5		141.5	31.0			94.2	10.0	62.7	45.7	
LOS	F	E		F	C			F	A	E	D	
Approach Delay		60.7			69.2			33.9			55.8	
Approach LOS		E			E			C			E	
90th %ile Green (s)	6.0	30.0		30.0	54.0		12.0	12.0		36.0	36.0	

Lane Group	ø9
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	19.0
Minimum Split (s)	22.0
Total Split (s)	22.0
Total Split (%)	15%
Maximum Green (s)	19.0
Yellow Time (s)	2.0
All-Red Time (s)	1.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	6.0
Flash Dont Walk (s)	12.0
Pedestrian Calls (#/hr)	2
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
90th %ile Green (s)	19.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
90th %ile Term Code	Max	Max		Max	Max		Max	Max		Max	Max	
70th %ile Green (s)	6.0	30.0		30.0	54.0		12.0	12.0		35.7	35.7	
70th %ile Term Code	Max	Max		Max	Hold		Max	Max		Gap	Gap	
50th %ile Green (s)	6.0	30.0		30.0	54.0		12.0	12.0		30.4	30.4	
50th %ile Term Code	Max	Max		Max	Hold		Max	Max		Gap	Gap	
30th %ile Green (s)	6.0	30.0		30.0	54.0		12.0	12.0		26.4	26.4	
30th %ile Term Code	Max	Max		Max	Hold		Max	Max		Gap	Gap	
10th %ile Green (s)	6.0	30.0		30.0	54.0		12.0	12.0		21.1	21.1	
10th %ile Term Code	Max	Max		Max	Hold		Max	Max		Gap	Gap	
Queue Length 50th (ft)	49	302		~477	294			131	51	264	159	
Queue Length 95th (ft)	#145	#560		#901	513			#330	141	#486	294	
Internal Link Dist (ft)		472			925			201			155	
Turn Bay Length (ft)												
Base Capacity (vph)	99	871		438	1519			192	795	523	538	
Starvation Cap Reductn	0	0		0	0			0	0	0	0	
Spillback Cap Reductn	0	0		0	0			0	0	0	0	
Storage Cap Reductn	0	0		0	0			0	0	0	0	
Reduced v/c Ratio	0.63	0.88		1.17	0.64			0.86	0.52	0.68	0.45	

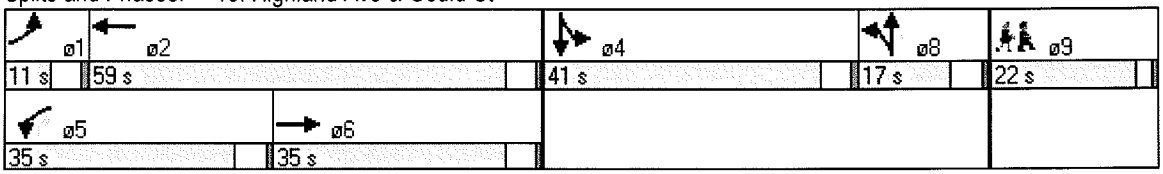
Intersection Summary

Area Type: Other
Cycle Length: 150
Actuated Cycle Length: 126.3
Natural Cycle: 150
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.17
Intersection Signal Delay: 59.0 Intersection LOS: E
Intersection Capacity Utilization 85.5% ICU Level of Service E
Analysis Period (min) 15
90th %ile Actuated Cycle: 150
70th %ile Actuated Cycle: 127.7
50th %ile Actuated Cycle: 122.4
30th %ile Actuated Cycle: 118.4
10th %ile Actuated Cycle: 113.1

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 15: Highland Ave & Gould St



Lane Group	ø9
90th %ile Term Code	Max
70th %ile Green (s)	0.0
70th %ile Term Code	Skip
50th %ile Green (s)	0.0
50th %ile Term Code	Skip
30th %ile Green (s)	0.0
30th %ile Term Code	Skip
10th %ile Green (s)	0.0
10th %ile Term Code	Skip
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1065	396	0	2472	0	133
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1158	430	0	2687	0	145
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)				767		
pX, platoon unblocked					0.84	
vC, conflicting volume			1588		2716	794
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1588		2662	794
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	56
cM capacity (veh/h)			409		15	331

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	772	816	1343	1343	145
Volume Left	0	0	0	0	0
Volume Right	0	430	0	0	145
cSH	1700	1700	1700	1700	331
Volume to Capacity	0.45	0.48	0.79	0.79	0.44
Queue Length 95th (ft)	0	0	0	0	53
Control Delay (s)	0.0	0.0	0.0	0.0	24.1
Lane LOS					C
Approach Delay (s)	0.0		0.0		24.1
Approach LOS					C

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	71.7%	ICU Level of Service	C
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	40	757	251	158	797	109	1115	30	300	96	48	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	0.95	1.00	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00
Frt		0.964			0.982				0.850			0.850
Flt Protected		0.998		0.950			0.950	0.955			0.968	
Satd. Flow (prot)	0	3405	0	1770	3476	0	1681	1690	1583	0	1803	1583
Flt Permitted		0.873		0.096			0.950	0.955			0.968	
Satd. Flow (perm)	0	2979	0	179	3476	0	1681	1690	1583	0	1803	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		59			24				152			30
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		767			913			427			522	
Travel Time (s)		17.4			20.8			9.7			11.9	
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
Adj. Flow (vph)	43	823	273	172	866	118	1212	33	326	104	52	30
Shared Lane Traffic (%)							49%					
Lane Group Flow (vph)	0	1139	0	172	984	0	618	627	326	0	156	30
Turn Type	Perm			custom			custom		Perm	custom		Perm
Protected Phases		6		5	2 5		8	8		4	4	
Permitted Phases	6			2			8		8	4		4
Detector Phase	6	6		5	2 5		8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	4.0	4.0		3.0			4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0		8.0			12.0	12.0	12.0	8.0	8.0	8.0
Total Split (s)	42.5	42.5	0.0	8.0	50.5	0.0	30.5	30.5	30.5	9.0	9.0	9.0
Total Split (%)	47.2%	47.2%	0.0%	8.9%	56.1%	0.0%	33.9%	33.9%	33.9%	10.0%	10.0%	10.0%
Maximum Green (s)	37.5	37.5		3.0			25.5	25.5	25.5	5.0	5.0	5.0
Yellow Time (s)	4.0	4.0		4.0			4.0	4.0	4.0	3.0	3.0	3.0
All-Red Time (s)	1.0	1.0		1.0			1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	-1.0	-1.0	0.0	-1.0	-1.0	0.0	-1.0	-1.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	5.0	4.0	4.0	4.0
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	3.0	3.0		3.0			3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Min	C-Min		None			None	None	None	None	None	None
Walk Time (s)	6.0	6.0					6.0	6.0	6.0			
Flash Dont Walk (s)	24.0	24.0					14.0	14.0	14.0			
Pedestrian Calls (#/hr)	4	4					4	4	4			
Act Effct Green (s)		37.5		45.5	45.5		26.5	26.5	25.5		6.0	6.0
Actuated g/C Ratio		0.42		0.51	0.51		0.29	0.29	0.28		0.07	0.07
v/c Ratio		0.89		1.07	0.56		1.25	1.26	0.59		1.29	0.22
Control Delay		33.5		111.1	16.2		158.1	162.2	19.2		217.5	19.4
Queue Delay		0.0		0.0	0.0		0.0	0.0	0.0		0.0	0.0
Total Delay		33.5		111.1	16.2		158.1	162.2	19.2		217.5	19.4
LOS		C		F	B		F	F	B		F	B
Approach Delay		33.5			30.3			130.9			185.5	
Approach LOS		C			C			F			F	
90th %ile Green (s)	37.5	37.5		3.0			25.5	25.5	25.5	5.0	5.0	5.0

Lane Group	ø2
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	4.0
Minimum Split (s)	21.0
Total Split (s)	42.5
Total Split (%)	47%
Maximum Green (s)	37.5
Yellow Time (s)	4.0
All-Red Time (s)	1.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	C-Min
Walk Time (s)	
Flash Dont Walk (s)	
Pedestrian Calls (#/hr)	
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
90th %ile Green (s)	45.5

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
90th %ile Term Code	Coord	Coord		Max			Max	Max	Max	Max	Max	Max
70th %ile Green (s)	37.5	37.5		3.0			25.5	25.5	25.5	5.0	5.0	5.0
70th %ile Term Code	Coord	Coord		Max			Max	Max	Max	Max	Max	Max
50th %ile Green (s)	37.5	37.5		3.0			25.5	25.5	25.5	5.0	5.0	5.0
50th %ile Term Code	Coord	Coord		Max			Max	Max	Max	Max	Max	Max
30th %ile Green (s)	37.2	37.2		3.0			25.5	25.5	25.5	5.3	5.3	5.3
30th %ile Term Code	Coord	Coord		Max			Max	Max	Max	Max	Max	Max
10th %ile Green (s)	32.6	32.6		3.0			25.5	25.5	25.5	9.9	9.9	9.9
10th %ile Term Code	Coord	Coord		Max			Max	Max	Max	Max	Max	Max
Queue Length 50th (ft)		288		~55	182		~466	~475	81		~127	0
Queue Length 95th (ft)		#421		#159	238		#681	#692	170		#247	27
Internal Link Dist (ft)		687			833			347			442	
Turn Bay Length (ft)												
Base Capacity (vph)		1308		161	1808		495	498	557		121	134
Starvation Cap Reductn		0		0	0		0	0	0		0	0
Spillback Cap Reductn		0		0	0		0	0	0		0	0
Storage Cap Reductn		0		0	0		0	0	0		0	0
Reduced v/c Ratio		0.87		1.07	0.54		1.25	1.26	0.59		1.29	0.22

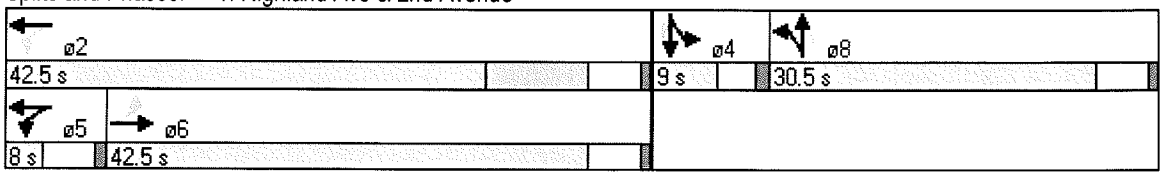
Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 20 (22%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.29
Intersection Signal Delay: 77.3 Intersection LOS: E
Intersection Capacity Utilization 104.0% ICU Level of Service G
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Highland Ave & 2nd Avenue



Lane Group	ø2
90th %ile Term Code	Coord
70th %ile Green (s)	45.5
70th %ile Term Code	Coord
50th %ile Green (s)	45.5
50th %ile Term Code	Coord
30th %ile Green (s)	45.2
30th %ile Term Code	Coord
10th %ile Green (s)	40.6
10th %ile Term Code	Coord
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary