

Intersection

Intersection Delay, s/veh 28.7  
 Intersection LOS D

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations			↕	↗			↕			↖	↘	
Traffic Vol, veh/h	0	5	56	5	0	1	56	10	0	526	40	10
Future Vol, veh/h	0	5	56	5	0	1	56	10	0	526	40	10
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
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	5	61	5	0	1	61	11	0	572	43	11
Number of Lanes	0	0	1	1	0	0	1	0	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	2	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	2	2
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	2	1	1
HCM Control Delay	10.6	11	38.8
HCM LOS	B	B	E

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	SBLn1
Vol Left, %	100%	0%	8%	0%	1%	1%
Vol Thru, %	0%	80%	91%	0%	84%	19%
Vol Right, %	0%	20%	1%	100%	15%	81%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	526	50	62	5	67	193
LT Vol	526	0	5	0	1	1
Through Vol	0	40	56	0	56	36
RT Vol	0	10	1	5	10	156
Lane Flow Rate	572	54	67	5	73	210
Geometry Grp	7	7	7	7	6	6
Degree of Util (X)	0.915	0.077	0.129	0.008	0.138	0.314
Departure Headway (Hd)	5.76	5.115	6.952	6.203	6.822	5.397
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	635	705	515	576	525	667
Service Time	3.46	2.815	4.698	3.948	4.867	3.427
HCM Lane V/C Ratio	0.901	0.077	0.13	0.009	0.139	0.315
HCM Control Delay	41.7	8.2	10.7	9	11	10.9
HCM Lane LOS	E	A	B	A	B	B
HCM 95th-tile Q	11.7	0.2	0.4	0	0.5	1.3

Intersection

Intersection Delay, s/veh

Intersection LOS

Movement	SBU	SBL	SBT	SBR
Lane Configurations			↕	
Traffic Vol, veh/h	0	1	36	156
Future Vol, veh/h	0	1	36	156
Peak Hour Factor	0.92	0.92	0.92	0.92
Heavy Vehicles, %	0	0	0	0
Mvmt Flow	0	1	39	170
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	2
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	2
HCM Control Delay	10.9
HCM LOS	B

Intersection	
Intersection Delay, s/veh	11.3
Intersection LOS	B

Movement	WBU	WBL	WBR	NBU	NBT	NBR	SBU	SBL	SBT
Lane Configurations		Y			↑↑				↑↑
Traffic Vol, veh/h	0	10	348	0	375	5	0	8	51
Future Vol, veh/h	0	10	348	0	375	5	0	8	51
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	11	378	0	408	5	0	9	55
Number of Lanes	0	1	0	0	2	0	0	0	2

Approach	WB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	2	2
Conflicting Approach Left	NB		WB
Conflicting Lanes Left	2	0	1
Conflicting Approach Right	SB	WB	
Conflicting Lanes Right	2	1	0
HCM Control Delay	11.6	11.3	9.1
HCM LOS	B	B	A

Lane	NBLn1	NBLn2	WBLn1	SBLn1	SBLn2
Vol Left, %	0%	0%	3%	32%	0%
Vol Thru, %	100%	96%	0%	68%	100%
Vol Right, %	0%	4%	97%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	250	130	358	25	34
LT Vol	0	0	10	8	0
Through Vol	250	125	0	17	34
RT Vol	0	5	348	0	0
Lane Flow Rate	272	141	389	27	37
Geometry Grp	7	7	2	7	7
Degree of Util (X)	0.412	0.213	0.482	0.047	0.062
Departure Headway (Hd)	5.462	5.435	4.46	6.165	6.003
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	652	653	806	584	600
Service Time	3.26	3.233	2.51	3.865	3.703
HCM Lane V/C Ratio	0.417	0.216	0.483	0.046	0.062
HCM Control Delay	12.1	9.7	11.6	9.2	9.1
HCM Lane LOS	B	A	B	A	A
HCM 95th-tile Q	2	0.8	2.7	0.1	0.2

Intersection	
Intersection Delay, s/veh	10
Intersection LOS	A

Movement	EBU	EBT	EBR	WBU	WBL	WBT	NBU	NBL	NBR
Lane Configurations		↔				↔		↔	↔
Traffic Vol, veh/h	0	158	34	0	5	11	0	34	342
Future Vol, veh/h	0	158	34	0	5	11	0	34	342
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	172	37	0	5	12	0	37	372
Number of Lanes	0	1	0	0	0	1	0	1	1

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	2	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	2	0	1
HCM Control Delay	9.5	8.3	10.4
HCM LOS	A	A	B

Lane	NBLn1	NBLn2	EBLn1	WBLn1
Vol Left, %	100%	0%	0%	31%
Vol Thru, %	0%	0%	82%	69%
Vol Right, %	0%	100%	18%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	34	342	192	16
LT Vol	34	0	0	5
Through Vol	0	0	158	11
RT Vol	0	342	34	0
Lane Flow Rate	37	372	209	17
Geometry Grp	7	7	2	2
Degree of Util (X)	0.057	0.449	0.274	0.025
Departure Headway (Hd)	5.555	4.35	4.721	5.139
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	645	829	760	694
Service Time	3.284	2.079	2.755	3.187
HCM Lane V/C Ratio	0.057	0.449	0.275	0.024
HCM Control Delay	8.6	10.6	9.5	8.3
HCM Lane LOS	A	B	A	A
HCM 95th-tile Q	0.2	2.3	1.1	0.1



Intersection	
Intersection Delay, s/veh	16.4
Intersection LOS	C

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations			↕				↕				↕	
Traffic Vol, veh/h	0	257	0	343	0	0	0	0	0	2	119	0
Future Vol, veh/h	0	257	0	343	0	0	0	0	0	2	119	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	279	0	373	0	0	0	0	0	2	129	0
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	1
HCM Control Delay	18.2	0	9.8
HCM LOS	C	-	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	2%	43%	0%	0%
Vol Thru, %	98%	0%	100%	87%
Vol Right, %	0%	57%	0%	13%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	121	600	0	39
LT Vol	2	257	0	0
Through Vol	119	0	0	34
RT Vol	0	343	0	5
Lane Flow Rate	132	652	0	42
Geometry Grp	1	1	1	1
Degree of Util (X)	0.197	0.745	0	0.064
Departure Headway (Hd)	5.38	4.115	5.053	5.442
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	663	880	0	653
Service Time	3.446	2.143	3.117	3.518
HCM Lane V/C Ratio	0.199	0.741	0	0.064
HCM Control Delay	9.8	18.2	8.1	8.9
HCM Lane LOS	A	C	N	A
HCM 95th-tile Q	0.7	7	0	0.2

Intersection				
Intersection Delay, s/veh				
Intersection LOS				
Movement	SBU	SBL	SBT	SBR
Lane Configurations			↕	
Traffic Vol, veh/h	0	0	34	5
Future Vol, veh/h	0	0	34	5
Peak Hour Factor	0.92	0.92	0.92	0.92
Heavy Vehicles, %	0	0	0	0
Mvmt Flow	0	0	37	5
Number of Lanes	0	0	1	0
Approach			SB	
Opposing Approach			NB	
Opposing Lanes			1	
Conflicting Approach Left			WB	
Conflicting Lanes Left			1	
Conflicting Approach Right			EB	
Conflicting Lanes Right			1	
HCM Control Delay			8.9	
HCM LOS			A	

Intersection	
Intersection Delay, s/veh	16.5
Intersection LOS	C

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations			↕↕				↕↕				↕↕	
Traffic Vol, veh/h	0	304	32	23	0	1	13	12	0	107	208	8
Future Vol, veh/h	0	304	32	23	0	1	13	12	0	107	208	8
Peak Hour Factor	0.92	0.85	0.85	0.85	0.92	0.85	0.85	0.85	0.92	0.85	0.85	0.85
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	358	38	27	0	1	15	14	0	126	245	9
Number of Lanes	0	0	2	0	0	0	2	0	0	0	2	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	2	2	2
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	2	2	2
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	2	2	2
HCM Control Delay	22.5	9.8	13.5
HCM LOS	C	A	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	51%	0%	95%	0%	13%	0%	25%	0%
Vol Thru, %	49%	93%	5%	41%	87%	35%	75%	19%
Vol Right, %	0%	7%	0%	59%	0%	65%	0%	81%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	211	112	320	39	8	19	37	148
LT Vol	107	0	304	0	1	0	9	0
Through Vol	104	104	16	16	7	7	28	28
RT Vol	0	8	0	23	0	12	0	120
Lane Flow Rate	248	132	376	46	9	22	43	174
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.456	0.231	0.705	0.074	0.017	0.04	0.081	0.292
Departure Headway (Hd)	6.617	6.309	6.74	5.841	7.133	6.6	6.774	6.068
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	544	567	535	612	499	539	526	588
Service Time	4.379	4.071	4.492	3.592	4.92	4.386	4.544	3.838
HCM Lane V/C Ratio	0.456	0.233	0.703	0.075	0.018	0.041	0.082	0.296
HCM Control Delay	14.9	11	24.1	9.1	10	9.7	10.1	11.3
HCM Lane LOS	B	B	C	A	A	A	B	B
HCM 95th-tile Q	2.4	0.9	5.6	0.2	0.1	0.1	0.3	1.2

Intersection

Intersection Delay, s/veh  
 Intersection LOS

Movement	SBU	SBL	SBT	SBR
Lane Configurations			TT	
Traffic Vol, veh/h	0	9	55	120
Future Vol, veh/h	0	9	55	120
Peak Hour Factor	0.92	0.85	0.85	0.85
Heavy Vehicles, %	0	0	0	0
Mvmt Flow	0	11	65	141
Number of Lanes	0	0	2	0
Approach	SB			
Opposing Approach	NB			
Opposing Lanes	2			
Conflicting Approach Left	WB			
Conflicting Lanes Left	2			
Conflicting Approach Right	EB			
Conflicting Lanes Right	2			
HCM Control Delay	11.1			
HCM LOS	B			

**Intersection**

Int Delay, s/veh 7.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↑↑		↑	
Traffic Vol, veh/h	8	1	241	482	120	51
Future Vol, veh/h	8	1	241	482	120	51
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	9	1	262	524	130	55

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	10	0	795	5
Stage 1	-	-	-	-	9	-
Stage 2	-	-	-	-	786	-
Critical Hdwy	-	-	4.1	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1623	-	329	1083
Stage 1	-	-	-	-	1018	-
Stage 2	-	-	-	-	415	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1623	-	254	1083
Mov Cap-2 Maneuver	-	-	-	-	254	-
Stage 1	-	-	-	-	1018	-
Stage 2	-	-	-	-	320	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.8	29.2
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	329	-	-	1623	-
HCM Lane V/C Ratio	0.565	-	-	0.161	-
HCM Control Delay (s)	29.2	-	-	7.6	0.4
HCM Lane LOS	D	-	-	A	A
HCM 95th %tile Q(veh)	3.3	-	-	0.6	-

Intersection												
Int Delay, s/veh	9.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔			↔			↔	↔
Traffic Vol, veh/h	150	381	14	5	635	27	12	40	20	18	31	109
Future Vol, veh/h	150	381	14	5	635	27	12	40	20	18	31	109
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	175	-	-	-	-	-	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	160	405	15	5	676	29	13	43	21	19	33	116

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	704	0	0	420	0	0	1097	1447	210	1244	1440	352
Stage 1	-	-	-	-	-	-	732	732	-	701	701	-
Stage 2	-	-	-	-	-	-	365	715	-	543	739	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.5	6.5	6.9	7.5	6.5	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	903	-	-	1150	-	-	170	133	802	133	134	650
Stage 1	-	-	-	-	-	-	383	430	-	400	444	-
Stage 2	-	-	-	-	-	-	632	438	-	497	427	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	903	-	-	1150	-	-	87	102	802	73	102	650
Mov Cap-2 Maneuver	-	-	-	-	-	-	87	102	-	73	102	-
Stage 1	-	-	-	-	-	-	294	330	-	307	442	-
Stage 2	-	-	-	-	-	-	478	436	-	324	328	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	3.1	0.1	66.3	41.9
HCM LOS			F	E

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	130	903	-	-	1150	-	-	141	650
HCM Lane V/C Ratio	0.589	0.177	-	-	0.005	-	-	0.644	0.119
HCM Control Delay (s)	66.3	9.8	0.6	-	8.1	-	-	67.9	11.3
HCM Lane LOS	F	A	A	-	A	-	-	F	B
HCM 95th %tile Q(veh)	3	0.6	-	-	0	-	-	3.5	0.4

Intersection												
Int Delay, s/veh	1.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔				↔		↔	↔
Traffic Vol, veh/h	7	378	60	5	484	34	0	0	132	3	5	2
Future Vol, veh/h	7	378	60	5	484	34	0	0	132	3	5	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	Yield	-	-	None	-	-	None
Storage Length	-	-	-	15	-	125	-	-	0	-	-	100
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	8	411	65	5	526	37	0	0	143	3	5	2

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	526	0	0	476	0	0	-	-	238	758	1028	263
Stage 1	-	-	-	-	-	-	-	-	-	537	537	-
Stage 2	-	-	-	-	-	-	-	-	-	221	491	-
Critical Hdwy	5.3	-	-	4.1	-	-	-	-	6.9	6.95	6.5	7.1
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	7.3	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	6.5	5.5	-
Follow-up Hdwy	3.1	-	-	2.2	-	-	-	-	3.3	3.65	4	3.9
Pot Cap-1 Maneuver	666	-	-	1097	-	-	0	0	769	327	236	631
Stage 1	-	-	-	-	-	-	0	0	-	431	526	-
Stage 2	-	-	-	-	-	-	0	0	-	739	552	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	666	-	-	1097	-	-	-	-	769	262	231	631
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	262	231	-
Stage 1	-	-	-	-	-	-	-	-	-	424	524	-
Stage 2	-	-	-	-	-	-	-	-	-	592	543	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	0.1	10.8	18.5
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	769	666	-	-	1097	-	-	242	631
HCM Lane V/C Ratio	0.187	0.011	-	-	0.005	-	-	0.036	0.003
HCM Control Delay (s)	10.8	10.5	0.1	-	8.3	-	-	20.4	10.7
HCM Lane LOS	B	B	A	-	A	-	-	C	B
HCM 95th %tile Q(veh)	0.7	0	-	-	0	-	-	0.1	0

Lanes, Volumes, Timings

3: New Hampshire Ave (MD 650) & Schindler Drive/Mahan Road

10/31/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇄		↔	↔	↔	↔		↔	↔	↑↑↑	↔
Traffic Volume (vph)	51	17	50	68	5	64	5	1635	623	274	2537	25
Future Volume (vph)	51	17	50	68	5	64	5	1635	623	274	2537	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	11	12	12	10	12	12	10	12	12
Storage Length (ft)	0		0	230		0	320		220	500		0
Storage Lanes	0		0	1		1	1		1	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	0.91	0.91	1.00	1.00	0.86	1.00	0.97	0.91	0.91
Frt		0.943				0.850			0.850		0.999	
Flt Protected		0.979		0.950	0.962		0.950			0.950		
Satd. Flow (prot)	0	1754	0	3176	1663	1615	1620	6285	1553	3143	4983	0
Flt Permitted		0.979		0.950	0.962		0.950			0.950		
Satd. Flow (perm)	0	1754	0	3176	1663	1615	1620	6285	1553	3143	4983	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		15				117			275		1	
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		292			449			1203			1530	
Travel Time (s)		8.0			12.2			20.5			26.1	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	4%	4%	4%	4%	4%	4%
Adj. Flow (vph)	53	18	52	70	5	66	5	1686	642	282	2615	26
Shared Lane Traffic (%)				29%								
Lane Group Flow (vph)	0	123	0	50	25	66	5	1686	642	282	2641	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		22			30			23			31	
Link Offset(ft)		0			3			0			0	
Crosswalk Width(ft)		48			25			32			62	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.04	1.00	1.00	1.09	1.00	1.00	1.09	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1		1	1	1	1	1	1	1	1	
Detector Template	Left			Left		Right	Left			Left		
Leading Detector (ft)	20	100		100	100	100	100	100	100	100	100	
Trailing Detector (ft)	0	0		0	0	0	0	0	0	0	0	
Detector 1 Position(ft)	0	0		0	0	0	0	0	0	0	0	
Detector 1 Size(ft)	20	100		100	100	100	100	100	100	100	100	
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Turn Type	Split	NA		Split	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	3	3		4	4		1	5		6	2	
Permitted Phases						4			5			
Detector Phase	3	3		4	4	4	1	5	5	6	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	3.0	3.0	3.0	7.0	7.0	



Lanes, Volumes, Timings

3: New Hampshire Ave (MD 650) & Schindler Drive/Mahan Road

10/31/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Split (s)	12.5	12.5		12.0	12.0	12.0	8.5	8.5	8.5	13.0	13.0	
Total Split (s)	33.0	33.0		42.0	42.0	42.0	24.0	36.0	36.0	89.0	101.0	
Total Split (%)	16.5%	16.5%		21.0%	21.0%	21.0%	12.0%	18.0%	18.0%	44.5%	50.5%	
Maximum Green (s)	25.5	25.5		35.0	35.0	35.0	18.5	30.5	30.5	83.0	95.0	
Yellow Time (s)	3.5	3.5		3.5	3.5	3.5	3.5	3.5	3.5	4.5	4.5	
All-Red Time (s)	4.0	4.0		3.5	3.5	3.5	2.0	2.0	2.0	1.5	1.5	
Lost Time Adjust (s)		-1.5		-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	
Total Lost Time (s)		6.0		5.5	5.5	5.5	4.0	4.0	4.0	4.5	4.5	
Lead/Lag	Lead	Lead		Lag	Lag	Lag	Lead	Lead	Lead	Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	5.0	5.0	0.2	0.2	
Recall Mode	None	None		None	None	None	None	Max	Max	C-Max	C-Max	
Act Effct Green (s)		19.2		10.2	10.2	10.2	7.8	66.0	66.0	84.5	151.9	
Actuated g/C Ratio		0.10		0.05	0.05	0.05	0.04	0.33	0.33	0.42	0.76	
v/c Ratio		0.68		0.31	0.29	0.34	0.08	0.81	0.92	0.21	0.70	
Control Delay		94.2		95.8	99.5	4.8	94.8	65.3	55.3	20.1	6.9	
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		94.2		95.8	99.5	4.8	94.8	65.3	55.3	20.1	6.9	
LOS		F		F	F	A	F	E	E	C	A	
Approach Delay		94.2			53.8			62.6			8.2	
Approach LOS		F			D			E			A	
Queue Length 50th (ft)		140		35	35	0	7	594	536	69	162	
Queue Length 95th (ft)		214		63	76	0	25	#690	#870	93	278	
Internal Link Dist (ft)		212			369			1123			1450	
Turn Bay Length (ft)				230			320		220	500		
Base Capacity (vph)		249		579	303	390	162	2075	697	1327	3785	
Starvation Cap Reductn		0		0	0	0	0	0	0	0	0	
Spillback Cap Reductn		0		0	0	0	0	0	0	0	0	
Storage Cap Reductn		0		0	0	0	0	0	0	0	0	
Reduced v/c Ratio		0.49		0.09	0.08	0.17	0.03	0.81	0.92	0.21	0.70	

Intersection Summary

Area Type: Other

Cycle Length: 200

Actuated Cycle Length: 200

Offset: 60 (30%), Referenced to phase 2:SBT and 6:SBL, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.92

Intersection Signal Delay: 34.3

Intersection LOS: C

Intersection Capacity Utilization 78.4%

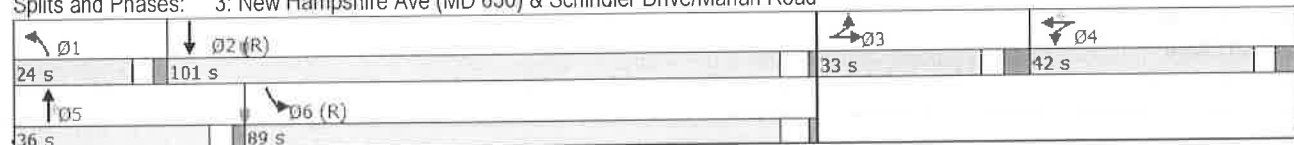
ICU Level of Service D

Analysis Period (min) 15

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 3: New Hampshire Ave (MD 650) & Schindler Drive/Mahan Road



Lanes, Volumes, Timings

6: New Hampshire Ave (MD 650) & Powder Mill Road

10/31/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	105	137	55	843	214	136	70	2169	176	112	2515	265
Future Volume (vph)	105	137	55	843	214	136	70	2169	176	112	2515	265
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	12	12	12	12	12	12	12	12	12
Storage Length (ft)	0		0	425		50	225		100	250		0
Storage Lanes	1		1	1		1	1		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	0.91	0.91	1.00	1.00	0.91	1.00	1.00	0.91	0.91
Flt Protected	0.950		0.850	0.950	0.980		0.950		0.850	0.950		0.986
Satd. Flow (prot)	1685	1773	1507	3285	1694	1615	1736	4988	1553	1736	4918	0
Flt Permitted	0.950			0.950	0.980		0.950			0.950		0
Satd. Flow (perm)	1685	1773	1507	3285	1694	1615	1736	4988	1553	1736	4918	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			145			142			106			13
Link Speed (mph)		25			35			40				40
Link Distance (ft)		217			757			487			2380	
Travel Time (s)		5.9			14.7			8.3			40.6	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	4%	4%	4%	4%	4%	4%
Adj. Flow (vph)	108	141	57	869	221	140	72	2236	181	115	2593	273
Shared Lane Traffic (%)				17%								
Lane Group Flow (vph)	108	141	57	721	369	140	72	2236	181	115	2866	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			28			20			12	
Link Offset(ft)		0			-14			10			0	
Crosswalk Width(ft)		16			28			58			28	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	1	1	1	1	1	0	1	1	0	
Detector Template	Left		Right	Left		Right	Left		Right	Left		
Leading Detector (ft)	100	100	100	100	100	100	100	0	100	100	0	
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	
Detector 1 Size(ft)	100	100	100	100	100	100	100	6	100	100	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Turn Type	Split	NA	Prot	Split	NA	Prot	Prot	NA	Perm	Prot	NA	
Protected Phases	3	3	3	4	4	4	1	5		6	2	
Permitted Phases									5			
Detector Phase	3	3	3	4	4	4	1	5	5	6	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	3.0	7.0	7.0	3.0	7.0	

Lanes, Volumes, Timings  
 6: New Hampshire Ave (MD 650) & Powder Mill Road

10/31/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Split (s)	11.5	11.5	11.5	12.0	12.0	12.0	9.0	14.0	14.0	10.0	14.0	
Total Split (s)	35.0	35.0	35.0	35.0	35.0	35.0	25.0	89.0	89.0	21.0	85.0	
Total Split (%)	19.4%	19.4%	19.4%	19.4%	19.4%	19.4%	13.9%	49.4%	49.4%	11.7%	47.2%	
Maximum Green (s)	28.5	28.5	28.5	28.0	28.0	28.0	19.0	82.0	82.0	14.0	78.0	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.5	4.5	4.5	4.5	4.5	
All-Red Time (s)	2.5	2.5	2.5	3.0	3.0	3.0	2.5	2.5	2.5	2.5	2.5	
Lost Time Adjust (s)	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	
Total Lost Time (s)	5.0	5.0	5.0	5.5	5.5	5.5	4.5	5.5	5.5	5.5	5.5	
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lag	Lead	Lead	Lead	Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	0.2	0.2	3.0	0.2	
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	
Act Effct Green (s)	21.3	21.3	21.3	38.2	38.2	38.2	14.3	83.5	83.5	15.5	85.7	
Actuated g/C Ratio	0.12	0.12	0.12	0.21	0.21	0.21	0.08	0.46	0.46	0.09	0.48	
v/c Ratio	0.55	0.67	0.19	1.03	1.03	0.31	0.53	0.97	0.23	0.77	1.22	
Control Delay	84.1	91.4	1.3	108.9	120.3	10.0	92.3	59.0	12.4	111.1	143.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	84.1	91.4	1.3	108.9	120.3	10.0	92.3	59.0	12.4	111.1	143.7	
LOS	F	F	A	F	F	B	F	E	B	F	F	
Approach Delay		72.0			101.1			56.6			142.4	
Approach LOS		E			F			E			F	
Queue Length 50th (ft)	123	163	0	-497	-505	0	83	932	50	136	~1517	
Queue Length 95th (ft)	186	234	0	#733	#843	64	140	#1013	104	#245	#1641	
Internal Link Dist (ft)		137			677			407			2300	
Turn Bay Length (ft)				425		50	225		100	250		
Base Capacity (vph)	280	295	372	697	359	455	197	2313	777	149	2348	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.39	0.48	0.15	1.03	1.03	0.31	0.37	0.97	0.23	0.77	1.22	

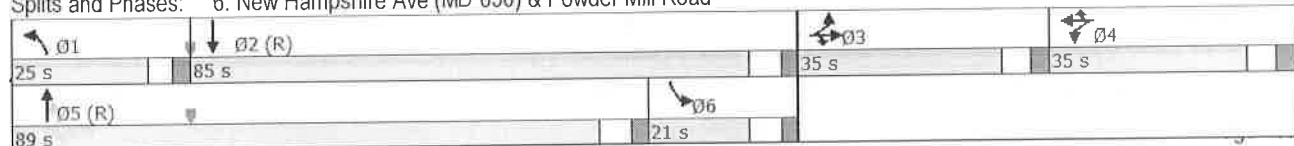
Intersection Summary

Area Type: Other  
 Cycle Length: 180  
 Actuated Cycle Length: 180  
 Offset: 90 (50%), Referenced to phase 2:SBT and 5:NBT, Start of Green  
 Natural Cycle: 130  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.22  
 Intersection Signal Delay: 101.6  
 Intersection Capacity Utilization 102.0%  
 Analysis Period (min) 15

Intersection LOS: F  
 ICU Level of Service G

- ~ 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: 6: New Hampshire Ave (MD 650) & Powder Mill Road



Lanes, Volumes, Timings

9: New Hampshire Ave (MD 650) & Northwest Drive/Michelson Road

10/31/2017

	↖	→	↗	↙	←	↖	↙	↑	↗	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↘	↙	↖	↘	↑↑↑		↘	↑↑↑	
Traffic Volume (vph)	11	22	20	15	1	25	20	1581	125	418	2852	10
Future Volume (vph)	11	22	20	15	1	25	20	1581	125	418	2852	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	280		0	225		0
Storage Lanes	0		0	1		1	1		0	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.86	0.86	0.97	0.91	0.91
Frt		0.949				0.850		0.989			0.999	
Flt Protected		0.990		0.950	0.958		0.950			0.950		
Satd. Flow (prot)	0	1785	0	1715	1729	1615	1736	6215	0	3367	4983	0
Flt Permitted		0.926		0.662	0.669		0.950			0.950		
Satd. Flow (perm)	0	1670	0	1195	1208	1615	1736	6215	0	3367	4983	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		13				120		13			1	
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		183			270			1530			1123	
Travel Time (s)		5.0			7.4			26.1			19.1	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	4%	4%	4%	4%	4%	4%
Adj. Flow (vph)	11	22	20	15	1	26	20	1613	128	427	2910	10
Shared Lane Traffic (%)				47%								
Lane Group Flow (vph)	0	53	0	8	8	26	20	1741	0	427	2920	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			48			27			30	
Link Offset(ft)		0			6			7			-10	
Crosswalk Width(ft)		40			45			33			53	
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1		1	1	1	1	0		1	0	
Detector Template	Left			Left		Right	Left			Left		
Leading Detector (ft)	20	100		100	100	100	100	0		100	0	
Trailing Detector (ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Size(ft)	20	100		100	100	100	100	6		100	6	
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex		CI+Ex	CI+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		4			8		1	6		5	2	
Permitted Phases	4			8		8						
Detector Phase	4	4		8	8	8	1	6		5	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	3.0	7.0		5.0	7.0	
Minimum Split (s)	13.0	13.0		13.0	13.0	13.0	12.0	14.0		14.0	14.0	

Lanes, Volumes, Timings

9: New Hampshire Ave (MD 650) & Northwest Drive/Michelson Road

10/31/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (s)	42.0	42.0		42.0	42.0	42.0	20.0	113.0		45.0	138.0	
Total Split (%)	21.0%	21.0%		21.0%	21.0%	21.0%	10.0%	56.5%		22.5%	69.0%	
Maximum Green (s)	34.0	34.0		34.0	34.0	34.0	11.0	106.0		36.0	131.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.5		4.0	4.5	
All-Red Time (s)	4.0	4.0		4.0	4.0	4.0	5.0	2.5		5.0	2.5	
Lost Time Adjust (s)				-1.5	-1.5	-1.5	-1.5	-1.5		-1.5	-1.5	
Total Lost Time (s)		6.5		6.5	6.5	6.5	7.5	5.5		7.5	5.5	
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	0.2		3.0	0.2	
Recall Mode	None	None		None	None	None	None	C-Max		None	C-Max	
Act Effct Green (s)		11.6		11.6	11.6	11.6	9.3	136.7		32.2	165.6	
Actuated g/C Ratio		0.06		0.06	0.06	0.06	0.05	0.68		0.16	0.83	
v/c Ratio		0.49		0.12	0.11	0.13	0.25	0.41		0.79	0.71	
Control Delay		82.6		90.8	90.6	1.2	148.0	17.2		93.9	7.4	
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0		0.0	1.4	
Total Delay		82.6		90.8	90.6	1.2	148.0	17.2		93.9	8.8	
LOS		F		F	F	A	F	B		F	A	
Approach Delay		82.6						18.7			19.6	
Approach LOS		F			D			B			B	
Queue Length 50th (ft)		52		10	10	0	28	678		301	353	
Queue Length 95th (ft)		105		33	33	0	m36	726		m289	m325	
Internal Link Dist (ft)		103			190			1450			1043	
Turn Bay Length (ft)							280			225		
Base Capacity (vph)		307		212	214	385	108	4251		637	4125	
Starvation Cap Reductn		0		0	0	0	0	0		0	927	
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		0.17		0.04	0.04	0.07	0.19	0.41		0.67	0.91	

Intersection Summary

Area Type: Other  
 Cycle Length: 200  
 Actuated Cycle Length: 200  
 Offset: 60 (30%), Referenced to phase 2:SBT and 6:NBT, Start of Green  
 Natural Cycle: 80  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.79  
 Intersection Signal Delay: 20.1  
 Intersection Capacity Utilization 84.6%  
 Analysis Period (min) 15  
 Intersection LOS: C  
 ICU Level of Service E  
 m Volume for 95th percentile queue is metered by upstream signal.

























Splits and Phases: 9: New Hampshire Ave (MD 650) & Northwest Drive/Michelson Road

Ø1	Ø2 (R)	Ø4
20 s	138 s	42 s
Ø5	Ø6 (R)	Ø8
45 s	113 s	42 s

Lanes, Volumes, Timings

15: New Hampshire Ave (MD 650) & Lockwood Drive

10/31/2017

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	130	180	301	759	450	195	200	1161	241	35	2273	250
Future Volume (vph)	130	180	301	759	450	195	200	1161	241	35	2273	250
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	11	12	11	12	12	12
Storage Length (ft)	150		180	0		215	300		225	315		0
Storage Lanes	1		1	2		1	2		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.91	0.91	1.00	0.86	0.86	1.00	0.97	0.86	1.00	1.00	0.91	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950	0.993		0.950	0.987		0.950			0.950		
Satd. Flow (prot)	1643	3434	1615	3105	3226	1615	3255	6285	1501	1703	4893	1524
Flt Permitted	0.950	0.993		0.950	0.987		0.950			0.950		
Satd. Flow (perm)	1643	3434	1615	3105	3226	1615	3255	6285	1501	1703	4893	1524
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			115			116			222			115
Link Speed (mph)		30			30			40				40
Link Distance (ft)		537			500			1123				377
Travel Time (s)		12.2			11.4			19.1				6.4
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	4%	4%	4%	6%	6%	6%
Adj. Flow (vph)	135	188	314	791	469	203	208	1209	251	36	2368	260
Shared Lane Traffic (%)	22%			22%								
Lane Group Flow (vph)	105	218	314	617	643	203	208	1209	251	36	2368	260
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		20			40			27			30	
Link Offset(ft)		-15			30			15			-15	
Crosswalk Width(ft)		26			23			35			25	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.04	1.00	1.04	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	1	1	0	0	1	0	0	1	0	0
Detector Template	Left			Left		Right	Left			Left		
Leading Detector (ft)	100	100	100	100	0	0	100	0	0	100	0	0
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	100	100	100	100	6	20	100	6	20	100	6	20
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	3	3		4	4		1	6		5	2	
Permitted Phases			3			4			6			2
Detector Phase	3	3	3	4	4	4	1	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	7.0	7.0	5.0	7.0	7.0



Lanes, Volumes, Timings  
 15: New Hampshire Ave (MD 650) & Lockwood Drive

10/31/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Split (s)	12.5	12.5	12.5	12.5	12.5	12.5	14.0	16.0	16.0	14.0	16.0	16.0
Total Split (s)	44.0	44.0	44.0	44.0	44.0	44.0	22.0	90.0	90.0	22.0	90.0	90.0
Total Split (%)	22.0%	22.0%	22.0%	22.0%	22.0%	22.0%	11.0%	45.0%	45.0%	11.0%	45.0%	45.0%
Maximum Green (s)	36.5	36.5	36.5	36.5	36.5	36.5	13.0	82.5	82.5	13.0	82.5	82.5
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.5	4.5	4.0	4.5	4.5
All-Red Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	5.0	3.0	3.0	5.0	3.0	3.0
Lost Time Adjust (s)	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	7.5	6.0	6.0	7.5	6.0	6.0
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	0.2	0.2	3.0	0.2	0.2
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	32.3	32.3	32.3	43.7	43.7	43.7	14.5	90.4	90.4	11.0	84.0	84.0
Actuated g/C Ratio	0.16	0.16	0.16	0.22	0.22	0.22	0.07	0.45	0.45	0.06	0.42	0.42
v/c Ratio	0.40	0.39	0.88	0.91	0.91	0.46	0.89	0.43	0.31	0.39	1.15	0.37
Control Delay	78.2	76.2	76.0	92.7	92.5	33.2	154.8	12.3	4.0	102.1	125.2	22.8
Queue Delay	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0
Total Delay	78.2	76.2	76.1	92.7	92.5	33.2	154.8	12.3	4.0	102.1	125.3	22.8
LOS	E	E	E	F	F	C	F	B	A	F	F	C
Approach Delay		76.5			84.4			28.8			114.9	
Approach LOS		E			F			C			F	
Queue Length 50th (ft)	136	141	267	476	496	101	148	16	0	47	~1336	128
Queue Length 95th (ft)	209	187	394	#658	#683	198	#228	163	99	91	#1405	210
Internal Link Dist (ft)		457			420			1043			297	
Turn Bay Length (ft)	150		180			215	300		225	315		
Base Capacity (vph)	312	652	400	678	705	443	235	2842	800	123	2055	706
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	1	0	0	0	0	0	0	0	70	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.34	0.33	0.79	0.91	0.91	0.46	0.89	0.43	0.31	0.29	1.19	0.37

Intersection Summary

Area Type: Other

Cycle Length: 200

Actuated Cycle Length: 200

Offset: 22 (11%), Referenced to phase 2:SBT and 6:NBT, Start of Green

Natural Cycle: 140

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.15

Intersection Signal Delay: 81.8

Intersection LOS: F

Intersection Capacity Utilization 94.8%

ICU Level of Service F

Analysis Period (min) 15

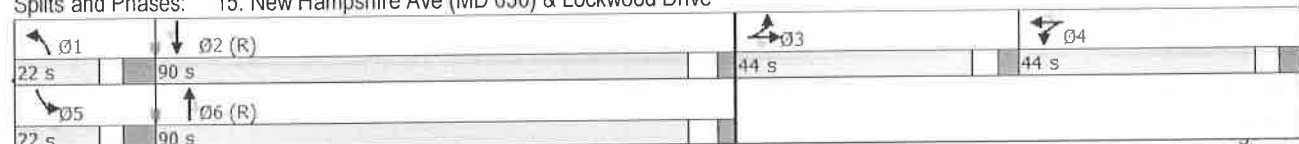
~ Volume exceeds capacity, queue is theoretically infinite.

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: 15: New Hampshire Ave (MD 650) & Lockwood Drive



Lanes, Volumes, Timings

39: Columbia Pike (US 29) & Colesville Business Park Driveway/Lockwood Drive

10/31/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	0	5	850	0	5	0	3090	0	10	3591	20
Future Volume (vph)	5	0	5	850	0	5	0	3090	0	10	3591	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	11	11	11	11	11	11
Storage Length (ft)	0		50	0		105	250		0	220		0
Storage Lanes	1		1	2		1	0		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.86	1.00	1.00	0.86	0.86
Frnt			0.850		0.850						0.999	
Flt Protected	0.950			0.950						0.950		
Satd. Flow (prot)	1805	0	1615	3502	1615	0	0	6075	0	1694	6128	0
Flt Permitted	0.754			0.950						0.029		
Satd. Flow (perm)	1433	0	1615	3502	1615	0	0	6075	0	52	6128	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			24		24							2
Link Speed (mph)		25			30			40				40
Link Distance (ft)		156			227			370				609
Travel Time (s)		4.3			5.2			6.3				10.4
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
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	4%	4%	4%	3%	3%	3%
Adj. Flow (vph)	5	0	5	924	0	5	0	3359	0	11	3903	22
Shared Lane Traffic (%)												
Lane Group Flow (vph)	5	0	5	924	5	0	0	3359	0	11	3925	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		26			24			11			11	
Link Offset(ft)		-45			22			0			0	
Crosswalk Width(ft)		16			14			19			28	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.04	1.04	1.04	1.04	1.04	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1		0	1	1			0		0	0	
Detector Template												
Leading Detector (ft)	20		0	100	100			0		0	0	
Trailing Detector (ft)	0		0	0	0			0		0	0	
Detector 1 Position(ft)	0		0	0	0			0		0	0	
Detector 1 Size(ft)	20		100	100	100			6		80	6	
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0		0.0	0.0	0.0			0.0		0.0	0.0	
Detector 1 Queue (s)	0.0		0.0	0.0	0.0			0.0		0.0	0.0	
Detector 1 Delay (s)	0.0		0.0	0.0	0.0			0.0		0.0	0.0	
Turn Type	Perm		Prot	Perm	NA			NA		Perm	NA	
Protected Phases			4		8						2	
Permitted Phases	4			8				6		2		
Detector Phase	4		4	8	8			6		2	2	
Switch Phase												
Minimum Initial (s)	5.0		5.0	5.0	5.0			10.0		10.0	10.0	



Lanes, Volumes, Timings

39: Columbia Pike (US 29) & Colesville Business Park Driveway/Lockwood Drive

10/31/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Split (s)	12.0		12.0	12.0	12.0			17.0		17.0	17.0	
Total Split (s)	35.0		35.0	35.0	35.0			145.0		145.0	145.0	
Total Split (%)	19.4%		19.4%	19.4%	19.4%			80.6%		80.6%	80.6%	
Maximum Green (s)	28.0		28.0	28.0	28.0			138.0		138.0	138.0	
Yellow Time (s)	4.0		4.0	4.0	4.0			5.0		5.0	5.0	
All-Red Time (s)	3.0		3.0	3.0	3.0			2.0		2.0	2.0	
Lost Time Adjust (s)	-1.5		-1.5	-1.5	-1.5			-1.5		-1.5	-1.5	
Total Lost Time (s)	5.5		5.5	5.5	5.5			5.5		5.5	5.5	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	5.0		5.0	5.0	5.0			0.2		0.2	0.2	
Recall Mode	None		None	None	None			C-Max		C-Max	C-Max	
Act Effect Green (s)	29.5		29.5	29.5	29.5			139.5		139.5	139.5	
Actuated g/C Ratio	0.16		0.16	0.16	0.16			0.78		0.78	0.78	
v/c Ratio	0.02		0.02	1.61	0.02			0.71		0.28	0.83	
Control Delay	63.6		0.2	326.7	0.2			11.3		12.2	9.6	
Queue Delay	0.0		0.0	0.0	0.0			0.0		0.0	0.0	
Total Delay	63.6		0.2	326.7	0.2			11.3		12.2	9.6	
LOS	E		A	F	A			B		B	A	
Approach Delay		31.9				325.0		11.3				9.6
Approach LOS		C				F		B				A
Queue Length 50th (ft)	5		0	-803	0			523		3	565	
Queue Length 95th (ft)	19		0	#940	0			540		m3	m328	
Internal Link Dist (ft)		76			147			290			529	
Turn Bay Length (ft)			50							220		
Base Capacity (vph)	234		284	573	284			4708		40	4749	
Starvation Cap Reductn	0		0	0	0			0		0	0	
Spillback Cap Reductn	0		0	0	0			0		0	0	
Storage Cap Reductn	0		0	0	0			0		0	0	
Reduced v/c Ratio	0.02		0.02	1.61	0.02			0.71		0.28	0.83	

Intersection Summary

Area Type: Other

Cycle Length: 180

Actuated Cycle Length: 180

Offset: 90 (50%), Referenced to phase 2:SBTL and 6:NBT, Start of Green

Natural Cycle: 100

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.61

Intersection Signal Delay: 45.9

Intersection LOS: D

Intersection Capacity Utilization 94.5%

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.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 39: Columbia Pike (US 29) & Colesville Business Park Driveway/Lockwood Drive

Ø2 (R)	Ø4
145 s	35 s
Ø6 (R)	Ø8
145 s	35 s

Lanes, Volumes, Timings  
66: Columbia Pike (US 29) & Stewart Lane

10/31/2017

	↖	→	↗	↖	←	↖	↖	↑	↗	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗			↖	↗	↖	↑↑↑	↗	↖	↑↑↑	↗
Traffic Volume (vph)	66	45	33	147	11	37	12	3027	213	505	3372	59
Future Volume (vph)	66	45	33	147	11	37	12	3027	213	505	3372	59
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	12	12	12	12	12	12
Storage Length (ft)	0		0	0		0	240		0	250		700
Storage Lanes	1		0	0		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	1.00	1.00	0.86	0.86
Frt		0.936					0.850		0.850			0.850
Flt Protected	0.950				0.956		0.950			0.950		
Satd. Flow (prot)	1745	1719	0	0	1756	1561	1736	4988	1553	1736	4713	1335
Flt Permitted	0.250				0.590		0.950			0.950		
Satd. Flow (perm)	459	1719	0	0	1084	1561	1736	4988	1553	1736	4713	1335
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		16				70			151			73
Link Speed (mph)		30			30			45			50	
Link Distance (ft)		274			223			422			4978	
Travel Time (s)		6.2			5.1			6.4			67.9	
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
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	4%	4%	4%	4%	4%	4%
Adj. Flow (vph)	72	49	36	160	12	40	13	3290	232	549	3665	64
Shared Lane Traffic (%)												10%
Lane Group Flow (vph)	72	85	0	0	172	40	13	3290	232	549	3671	58
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		11			40			20			20	
Link Offset(ft)		15			-15			5			-3	
Crosswalk Width(ft)		25			25			15			18	
Two way Left Turn Lane												
Headway Factor	1.04	1.04	1.04	1.04	1.04	1.04	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1		1	1	1	1	0	0	1	0	0
Detector Template				Left								
Leading Detector (ft)	35	35		20	35	35	80	0	0	80	0	0
Trailing Detector (ft)	0	0		0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0		0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	35	35		20	35	35	80	6	20	80	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA	Prot	Prot	NA	Prot
Protected Phases		4			8		5	2	2	1	6	6
Permitted Phases	4			8		8						
Detector Phase	4	4		8	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	3.0	7.0	7.0	3.0	7.0	7.0

Lanes, Volumes, Timings  
66: Columbia Pike (US 29) & Stewart Lane

10/31/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Split (s)	12.5	12.5		12.5	12.5	12.5	12.5	14.0	14.0	10.5	14.0	14.0
Total Split (s)	22.0	22.0		22.0	22.0	22.0	23.0	135.0	135.0	23.0	135.0	135.0
Total Split (%)	12.2%	12.2%		12.2%	12.2%	12.2%	12.8%	75.0%	75.0%	12.8%	75.0%	75.0%
Maximum Green (s)	14.5	14.5		14.5	14.5	14.5	15.5	128.0	128.0	15.5	128.0	128.0
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	3.5	5.0	5.0	3.5	5.0	5.0
All-Red Time (s)	3.5	3.5		3.5	3.5	3.5	4.0	2.0	2.0	4.0	2.0	2.0
Lost Time Adjust (s)	-1.5	-1.5			-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5
Total Lost Time (s)	6.0	6.0			6.0	6.0	6.0	5.5	5.5	6.0	5.5	5.5
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	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	3.0
Recall Mode	None	None		None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effect Green (s)	16.0	16.0			16.0	16.0	8.5	129.5	129.5	17.0	146.2	146.2
Actuated g/C Ratio	0.09	0.09			0.09	0.09	0.05	0.72	0.72	0.09	0.81	0.81
v/c Ratio	1.80	0.51			1.79	0.20	0.16	0.92	0.20	3.37	0.96	0.05
Control Delay	481.8	74.6			434.9	4.4	105.0	15.2	0.4	1089.8	12.3	0.2
Queue Delay	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	481.8	74.6			434.9	4.4	105.0	15.2	0.4	1089.8	12.3	0.2
LOS	F	E			F	A	F	B	A	F	B	A
Approach Delay		261.3			353.7			14.6			150.4	
Approach LOS		F			F			B			F	
Queue Length 50th (ft)	-126	79			~303	0	16	1095	0	~1154	481	0
Queue Length 95th (ft)	#246	145			#472	9	m24	1147	1	m#1185	m#1175	m0
Internal Link Dist (ft)		194			143			342			4898	
Turn Bay Length (ft)							240			250		700
Base Capacity (vph)	40	167			96	202	163	3588	1159	163	3827	1098
Starvation Cap Reductn	0	0			0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0			0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0			0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.80	0.51			1.79	0.20	0.08	0.92	0.20	3.37	0.96	0.05

Intersection Summary

Area Type: Other

Cycle Length: 180

Actuated Cycle Length: 180

Offset: 18 (10%), Referenced to phase 2:NBT and 6:SBT, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 3.37

Intersection Signal Delay: 99.1

Intersection LOS: F

Intersection Capacity Utilization 116.4%

ICU Level of Service H

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.













m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 66: Columbia Pike (US 29) & Stewart Lane

Ø1	Ø2 (R)	Ø4
23 s	135 s	22 s
Ø5	Ø6 (R)	Ø8
23 s	135 s	22 s

Lanes, Volumes, Timings  
74: Cherry Hill Road & FDA Boulevard

10/31/2017

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	241	150	615	1120	1277	883
Future Volume (vph)	241	150	615	1120	1277	883
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	300	250			400
Storage Lanes	2	1	1			1
Taper Length (ft)	25		25			
Lane Util. Factor	0.97	1.00	1.00	0.95	0.95	1.00
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	3502	1615	1805	3610	3610	1615
Flt Permitted	0.950		0.057			
Satd. Flow (perm)	3502	1615	108	3610	3610	1615
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		167				729
Link Speed (mph)	25			30	30	
Link Distance (ft)	933			373	580	
Travel Time (s)	25.4			8.5	13.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	268	167	683	1244	1419	981
Shared Lane Traffic (%)						
Lane Group Flow (vph)	268	167	683	1244	1419	981
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	24			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	37			48	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Number of Detectors	1	1	1	0	0	0
Detector Template	Left	Right				
Leading Detector (ft)	25	25	25	0	0	0
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	25	25	25	6	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Turn Type	Prot	Prot	pm+pt	NA	NA	Prot
Protected Phases	4	4	1	6	2	2
Permitted Phases			6			
Detector Phase	4	4	1	6	2	2
Switch Phase						
Minimum Initial (s)	7.0	7.0	3.0	7.0	7.0	7.0
Minimum Split (s)	13.0	13.0	9.0	13.0	13.0	13.0
Total Split (s)	46.0	46.0	26.0	104.0	78.0	78.0

Lanes, Volumes, Timings  
74: Cherry Hill Road & FDA Boulevard

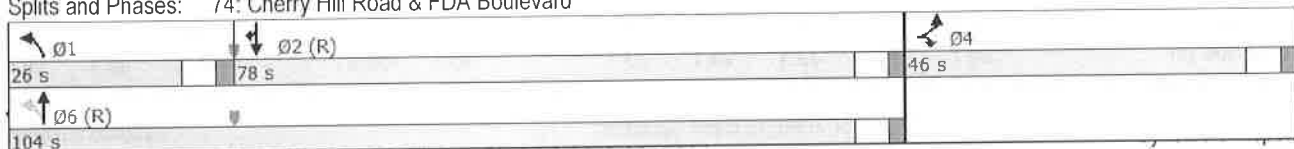
10/31/2017

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Total Split (%)	30.7%	30.7%	17.3%	69.3%	52.0%	52.0%
Maximum Green (s)	40.0	40.0	20.0	98.0	72.0	72.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	0.2	0.2	0.2
Recall Mode	None	None	None	C-Max	C-Max	C-Max
Act Effct Green (s)	18.4	18.4	122.6	122.6	73.5	73.5
Actuated g/C Ratio	0.12	0.12	0.82	0.82	0.49	0.49
v/c Ratio	0.62	0.49	1.15	0.42	0.80	0.84
Control Delay	48.3	7.6	110.0	3.9	29.9	12.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.3	7.6	110.0	3.9	29.9	12.4
LOS	D	A	F	A	C	B
Approach Delay	32.7			41.5	22.8	
Approach LOS	C			D	C	
Queue Length 50th (ft)	94	0	~703	123	336	187
Queue Length 95th (ft)	117	0	m#969	219	525	m334
Internal Link Dist (ft)	853			293	500	
Turn Bay Length (ft)		300	250			400
Base Capacity (vph)	968	567	592	2950	1768	1163
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.28	0.29	1.15	0.42	0.80	0.84

Intersection Summary

Area Type: Other  
 Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBTL, Start of Green  
 Natural Cycle: 100  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.15  
 Intersection Signal Delay: 31.3  
 Intersection Capacity Utilization 96.2%  
 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.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 74: Cherry Hill Road & FDA Boulevard



Lanes, Volumes, Timings

81: Cherry Hill Road & Plum Orchard Drive/Clover Patch Drive

10/31/2017

	↖	→	↗	↖	←	↖	↖	↑	↗	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑	↗	↖	↑↑		↖	↑↑		↖	↑↑	↗
Traffic Volume (vph)	60	15	328	35	25	25	350	991	20	15	1797	205
Future Volume (vph)	60	15	328	35	25	25	350	991	20	15	1797	205
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	250		0	0		0	215		0	150		500
Storage Lanes	1		1	1		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	1.00
Frt			0.850		0.925			0.997				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1805	1900	1615	1805	3339	0	1805	3599	0	1805	3610	1615
Flt Permitted	0.719			0.746			0.041			0.254		
Satd. Flow (perm)	1366	1900	1615	1417	3339	0	78	3599	0	483	3610	1615
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			239		28			5				228
Link Speed (mph)		25			25			30			30	
Link Distance (ft)		397			415			343			258	
Travel Time (s)		10.8			11.3			7.8			5.9	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	67	17	364	39	28	28	389	1101	22	17	1997	228
Shared Lane Traffic (%)												
Lane Group Flow (vph)	67	17	364	39	56	0	389	1123	0	17	1997	228
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		10			0			0			0	
Crosswalk Width(ft)		20			20			35			34	
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	0	0	1	0		1	0		0	0	1
Detector Template	Left			Left								Right
Leading Detector (ft)	30	0	0	30	0		40	0		0	0	20
Trailing Detector (ft)	0	0	0	0	0		10	0		0	0	0
Detector 1 Position(ft)	0	0	0	0	0		10	0		0	0	0
Detector 1 Size(ft)	30	6	20	30	6		30	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA		Perm	NA	Perm
Protected Phases		8			4		5	2			6	
Permitted Phases	8		8	4			2			6		6
Detector Phase	8	8	8	4	4		5	2		6	6	6
Switch Phase												
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0		3.0	7.0		7.0	7.0	7.0
Minimum Split (s)	9.5	9.5	9.5	9.5	9.5		9.0	13.5		13.5	13.5	13.5
Total Split (s)	23.1	23.1	23.1	23.1	23.1		30.0	126.9		96.9	96.9	96.9



Lanes, Volumes, Timings

81: Cherry Hill Road & Plum Orchard Drive/Clover Patch Drive

10/31/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (%)	15.4%	15.4%	15.4%	15.4%	15.4%		20.0%	84.6%		64.6%	64.6%	64.6%
Maximum Green (s)	16.6	16.6	16.6	16.6	16.6		24.0	120.4		90.4	90.4	90.4
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		4.0	4.5		4.5	4.5	4.5
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	-1.5	-1.5	-1.5	-1.5	-1.5		-1.5	-1.5		-1.5	-1.5	-1.5
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0		4.5	5.0		5.0	5.0	5.0
Lead/Lag							Lead			Lag	Lag	Lag
Lead-Lag Optimize?							Yes			Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		5.0	0.2		0.2	0.2	0.2
Recall Mode	None	None	None	None	None		None	C-Max		C-Max	C-Max	C-Max
Act Effct Green (s)	16.6	16.6	16.6	16.6	16.6		123.9	123.4		91.9	91.9	91.9
Actuated g/C Ratio	0.11	0.11	0.11	0.11	0.11		0.83	0.82		0.61	0.61	0.61
v/c Ratio	0.45	0.08	0.93	0.25	0.14		1.04	0.38		0.06	0.90	0.21
Control Delay	71.5	59.7	53.0	64.2	34.2		113.9	1.7		21.9	51.0	16.0
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	71.5	59.7	53.0	64.2	34.2		113.9	1.7		21.9	51.0	16.0
LOS	E	E	D	E	C		F	A		C	D	B
Approach Delay		56.0			46.5			30.5			47.2	
Approach LOS		E			D			C			D	
Queue Length 50th (ft)	62	15	128	35	13		~383	50		14	1073	133
Queue Length 95th (ft)	115	40	#317	74	35		#597	50		m12	m743	m101
Internal Link Dist (ft)		317			335			263			178	
Turn Bay Length (ft)	250						215			150		500
Base Capacity (vph)	164	229	405	170	427		375	2961		295	2211	1077
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	0
Reduced v/c Ratio	0.41	0.07	0.90	0.23	0.13		1.04	0.38		0.06	0.90	0.21

Intersection Summary

Area Type: Other

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 120 (80%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 100

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.04

Intersection Signal Delay: 42.2

Intersection LOS: D

Intersection Capacity Utilization 91.1%

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.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 81: Cherry Hill Road & Plum Orchard Drive/Clover Patch Drive

Ø2 (R)	Ø4
126.9 s	23.1 s
Ø5	Ø8
30 s	23.1 s
Ø6 (R)	
96.9 s	

Lanes, Volumes, Timings  
 84: Cherry Hill Road & Powder Mill Road (MD 212)

10/31/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	263	470	0	520	800	517	81	955	65	233	1071	273
Future Volume (vph)	263	470	0	520	800	517	81	955	65	233	1071	273
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	11	11	10	12	12	12	11	12	11
Storage Length (ft)	420		0	200		410	190		0	450		360
Storage Lanes	2		0	1		1	1		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frnt						0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3335	3438	0	1646	3292	1422	1805	3610	1615	3385	3610	1561
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3335	3438	0	1646	3292	1422	1805	3610	1615	3385	3610	1561
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)						513						262
Link Speed (mph)		40			40			40			40	
Link Distance (ft)		605			616			491			636	
Travel Time (s)		10.3			10.5			8.4			10.8	
Peak Hour 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
Heavy Vehicles (%)	5%	5%	5%	6%	6%	6%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	263	470	0	520	800	517	81	955	65	233	1071	273
Shared Lane Traffic (%)												
Lane Group Flow (vph)	263	470	0	520	800	517	81	955	65	233	1071	273
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			28			30	
Link Offset(ft)		-12			10			0			1	
Crosswalk Width(ft)		28			36			16			31	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.04	1.04	1.09	1.00	1.00	1.00	1.04	1.00	1.04
Turning Speed (mph)	15		9	15	15	9	15	15	9	15	15	9
Turn Type	Prot	NA		Prot	NA	Free	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases						Free			4			8
Minimum Split (s)	11.0	27.0		11.0	27.0		13.0	13.0	13.0	14.0	14.0	14.0
Total Split (s)	22.0	30.0		55.0	63.0		13.0	49.0	49.0	16.0	52.0	52.0
Total Split (%)	14.7%	20.0%		36.7%	42.0%		8.7%	32.7%	32.7%	10.7%	34.7%	34.7%
Maximum Green (s)	17.0	23.0		50.0	56.0		8.0	43.0	43.0	11.0	46.0	46.0
Yellow Time (s)	4.0	5.0		4.0	5.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	2.0		1.0	2.0		1.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	-1.5	-1.5		-1.5	-1.5		-1.5	-1.5	-1.5	-1.5	-1.5	-1.5
Total Lost Time (s)	3.5	5.5		3.5	5.5		3.5	4.5	4.5	3.5	4.5	4.5
Lead/Lag	Lag	Lag		Lead	Lead		Lead	Lead	Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Act Effct Green (s)	18.5	24.5		51.5	57.5	150.0	9.5	44.5	44.5	12.5	47.5	47.5
Actuated g/C Ratio	0.12	0.16		0.34	0.38	1.00	0.06	0.30	0.30	0.08	0.32	0.32
v/c Ratio	0.64	0.84		0.92	0.63	0.36	0.71	0.89	0.14	0.83	0.94	0.41
Control Delay	70.4	74.8		43.1	19.6	0.4	100.0	61.9	39.7	70.1	48.0	4.6



Lanes, Volumes, Timings

84: Cherry Hill Road & Powder Mill Road (MD 212)

10/31/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	70.4	74.8		43.1	19.6	0.4	100.0	61.9	39.7	70.1	48.0	4.6
LOS	E	E		D	B	A	F	E	D	E	D	A
Approach Delay		73.2			20.8			63.4			43.7	
Approach LOS		E			C			E			D	
Queue Length 50th (ft)	128	237		489	300	0	79	472	47	113	471	21
Queue Length 95th (ft)	178	#320		m#662	317	m0	#166	#573	87	m#156	#657	m52
Internal Link Dist (ft)		525			536			411			556	
Turn Bay Length (ft)	420			200		410	190			450		360
Base Capacity (vph)	411	561		565	1261	1422	114	1070	479	282	1143	673
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.64	0.84		0.92	0.63	0.36	0.71	0.89	0.14	0.83	0.94	0.41

Intersection Summary

Area Type: Other

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 16 (11%), Referenced to phase 2:WBT and 6:EBT, Start of Green

Natural Cycle: 120

Control Type: Pretimed

Maximum v/c Ratio: 0.94

Intersection Signal Delay: 44.0

Intersection LOS: D

Intersection Capacity Utilization 95.9%

ICU Level of Service F

Analysis Period (min) 15

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.


















m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 84: Cherry Hill Road & Powder Mill Road (MD 212)

Ø2 (R)	Ø1	Ø4	Ø3
63 s	22 s	49 s	16 s
Ø5	Ø6 (R)	Ø7	Ø8
55 s	30 s	13 s	52 s

Lanes, Volumes, Timings  
 94: Columbia Pike (US 29) & Industrial Parkway

10/31/2017

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	 		  		 	  
Traffic Volume (vph)	836	97	1667	0	856	3100
Future Volume (vph)	836	97	1667	0	856	3100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	12	12
Storage Length (ft)	0	0		500	0	
Storage Lanes	2	1		0	2	
Taper Length (ft)	25				25	
Lane Util. Factor	0.97	1.00	0.91	1.00	0.97	0.91
Frt		0.850				
Flt Protected	0.950				0.950	
Satd. Flow (prot)	3385	1561	4988	0	3367	4988
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	3385	1561	4988	0	3367	4988
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		71				
Link Speed (mph)	30		50			50
Link Distance (ft)	156		386			541
Travel Time (s)	3.5		5.3			7.4
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	4%	4%	4%	4%
Adj. Flow (vph)	880	102	1755	0	901	3263
Shared Lane Traffic (%)						
Lane Group Flow (vph)	880	102	1755	0	901	3263
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	10		50			50
Link Offset(ft)	25		-3			0
Crosswalk Width(ft)	20		65			30
Two way Left Turn Lane						
Headway Factor	1.04	1.04	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Number of Detectors	1	1	0		1	0
Detector Template						
Leading Detector (ft)	25	25	0		25	0
Trailing Detector (ft)	0	0	0		0	0
Detector 1 Position(ft)	0	0	0		0	0
Detector 1 Size(ft)	25	25	6		25	6
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Turn Type	Prot	Prot	NA		Prot	NA
Protected Phases	8	8	6		5	2
Permitted Phases						
Detector Phase	8	8	6		5	2
Switch Phase						
Minimum Initial (s)	4.0	4.0	7.0		5.0	7.0

Lanes, Volumes, Timings  
 94: Columbia Pike (US 29) & Industrial Parkway

10/31/2017

	↙	↖	↑	↗	↘	↓
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Minimum Split (s)	11.0	11.0	14.0		11.0	14.0
Total Split (s)	60.0	60.0	80.0		40.0	120.0
Total Split (%)	33.3%	33.3%	44.4%		22.2%	66.7%
Maximum Green (s)	53.0	53.0	73.0		34.0	113.0
Yellow Time (s)	4.0	4.0	5.5		4.0	5.5
All-Red Time (s)	3.0	3.0	1.5		2.0	1.5
Lost Time Adjust (s)	-1.5	-1.5	-1.5		-1.5	-1.5
Total Lost Time (s)	5.5	5.5	5.5		4.5	5.5
Lead/Lag			Lead		Lag	
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)	4.0	4.0	0.2		5.0	0.2
Recall Mode	None	None	C-Max		None	C-Max
Act Effct Green (s)	54.5	54.5	74.5		35.5	114.5
Actuated g/C Ratio	0.30	0.30	0.41		0.20	0.64
v/c Ratio	0.86	0.20	0.85		1.36	1.03
Control Delay	18.6	0.7	31.1		199.0	36.4
Queue Delay	0.0	1.9	0.0		0.2	29.7
Total Delay	18.6	2.6	31.1		199.2	66.1
LOS	B	A	C		F	E
Approach Delay	16.9		31.1			94.9
Approach LOS	B		C			F
Queue Length 50th (ft)	120	1	690		~733	~454
Queue Length 95th (ft)	594	1	m664		m338	m79
Internal Link Dist (ft)	76		306			461
Turn Bay Length (ft)						
Base Capacity (vph)	1024	522	2064		664	3172
Starvation Cap Reductn	0	302	0		0	527
Spillback Cap Reductn	0	0	0		23	0
Storage Cap Reductn	0	0	0		0	0
Reduced v/c Ratio	0.86	0.46	0.85		1.41	1.23

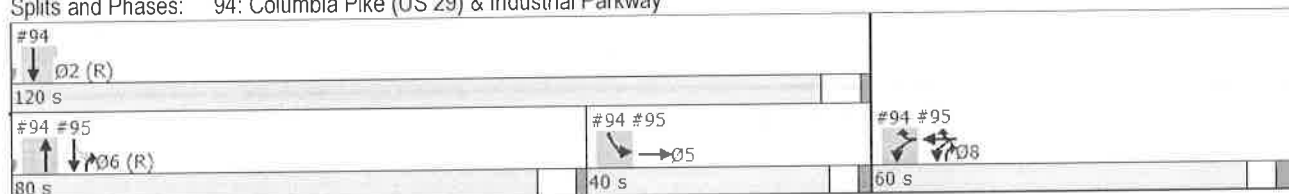
Intersection Summary

Area Type: Other  
 Cycle Length: 180  
 Actuated Cycle Length: 180  
 Offset: 147 (82%), Referenced to phase 2:SBT and 6:NBT, Start of Green  
 Natural Cycle: 75  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.36  
 Intersection Signal Delay: 67.6  
 Intersection Capacity Utilization 93.4%  
 Analysis Period (min) 15

Intersection LOS: E  
 ICU Level of Service F

- ~ Volume exceeds capacity, queue is theoretically infinite.
- Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 94: Columbia Pike (US 29) & Industrial Parkway



Lanes, Volumes, Timings  
95: Old Columbia Pike & Industrial Parkway

10/31/2017

	↖	→	↗	↖	←	↖	↗	↑	↖	↗	↓	↖
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↖	↑↑↑	↗			↗↗		↓↑	
Traffic Volume (vph)	0	756	100	30	888	235	0	0	2182	100	45	45
Future Volume (vph)	0	756	100	30	888	235	0	0	2182	100	45	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	16	11	11	16	12	12	11	12	12	12
Storage Length (ft)	0		0	50		500	0		0	0		100
Storage Lanes	0		0	1		1	0		2	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.91	1.00	1.00	1.00	0.88	0.95	0.95	0.95
Frt		0.982				0.850			0.850		0.965	
Flt Protected				0.950							0.974	
Satd. Flow (prot)	0	4018	0	1745	5014	1830	0	0	2748	0	3393	0
Flt Permitted				0.950							0.974	
Satd. Flow (perm)	0	4018	0	1745	5014	1830	0	0	2748	0	3393	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		7				253			24			28
Link Speed (mph)		30			30			30				30
Link Distance (ft)		156			235			272				1014
Travel Time (s)		3.5			5.3			6.2				23.0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	0	813	108	32	955	253	0	0	2346	108	48	48
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	921	0	32	955	253	0	0	2346	0	204	0
Enter Blocked Intersection	No	No	No	Yes	1 veh	No	No	No	1 veh	No	Yes	1 veh
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		10			15			0				0
Link Offset(ft)		-10			10			10				-5
Crosswalk Width(ft)		16			16			35				16
Two way Left Turn Lane												
Headway Factor	0.85	0.85	0.85	1.04	1.04	0.85	1.00	1.00	1.04	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		1		1	2	1			1	1		2
Detector Template				Left	Thru	Right			Right	Left		Thru
Leading Detector (ft)		25		20	100	20			20	20		100
Trailing Detector (ft)		0		0	0	0			0	0		0
Detector 1 Position(ft)		0		0	0	0			0	0		0
Detector 1 Size(ft)		25		20	6	20			20	20		6
Detector 1 Type		CI+Ex		CI+Ex	CI+Ex	CI+Ex			CI+Ex	CI+Ex		CI+Ex
Detector 1 Channel												
Detector 1 Extend (s)		0.0		0.0	0.0	0.0			0.0	0.0		0.0
Detector 1 Queue (s)		0.0		0.0	0.0	0.0			0.0	0.0		0.0
Detector 1 Delay (s)		0.0		0.0	0.0	0.0			0.0	0.0		0.0
Detector 2 Position(ft)					94							94
Detector 2 Size(ft)					6							6
Detector 2 Type					CI+Ex							CI+Ex
Detector 2 Channel												
Detector 2 Extend (s)					0.0							0.0
Turn Type		NA		Split	NA	Prot			pt+ov	Perm		NA
Protected Phases		5		8	8	8			8 6			6

Lane Group	Ø2
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
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)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (mph)	
Number of Detectors	
Detector Template	
Leading Detector (ft)	
Trailing Detector (ft)	
Detector 1 Position(ft)	
Detector 1 Size(ft)	
Detector 1 Type	
Detector 1 Channel	
Detector 1 Extend (s)	
Detector 1 Queue (s)	
Detector 1 Delay (s)	
Detector 2 Position(ft)	
Detector 2 Size(ft)	
Detector 2 Type	
Detector 2 Channel	
Detector 2 Extend (s)	
Turn Type	
Protected Phases	2

Lanes, Volumes, Timings  
 95: Old Columbia Pike & Industrial Parkway

10/31/2017

	↖	→	↘	↙	←	↖	↙	↑	↗	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases										6		
Detector Phase		5		8	8	8			8 6	6	6	
Switch Phase												
Minimum Initial (s)		5.0		4.0	4.0	4.0				7.0	7.0	
Minimum Split (s)		11.0		11.0	11.0	11.0				14.0	14.0	
Total Split (s)		40.0		60.0	60.0	60.0				80.0	80.0	
Total Split (%)		22.2%		33.3%	33.3%	33.3%				44.4%	44.4%	
Maximum Green (s)		34.0		53.0	53.0	53.0				73.0	73.0	
Yellow Time (s)		4.0		4.0	4.0	4.0				5.5	5.5	
All-Red Time (s)		2.0		3.0	3.0	3.0				1.5	1.5	
Lost Time Adjust (s)		-1.5		-1.5	-1.5	-1.5					-1.5	
Total Lost Time (s)		4.5		5.5	5.5	5.5					5.5	
Lead/Lag		Lag								Lead	Lead	
Lead-Lag Optimize?		Yes								Yes	Yes	
Vehicle Extension (s)		5.0		4.0	4.0	4.0				0.2	0.2	
Recall Mode		None		None	None	None				C-Max	C-Max	
Act Effct Green (s)		35.5		54.5	54.5	54.5			134.5		74.5	
Actuated g/C Ratio		0.20		0.30	0.30	0.30			0.75		0.41	
v/c Ratio		1.15		0.06	0.63	0.35			1.14		0.14	
Control Delay		89.2		40.5	51.2	16.4			87.5		25.0	
Queue Delay		0.9		0.0	0.2	0.0			0.8		0.0	
Total Delay		90.1		40.5	51.4	16.4			88.3		25.1	
LOS		F		D	D	B			F		C	
Approach Delay		90.1			43.9			88.3			25.1	
Approach LOS		F			D			F			C	
Queue Length 50th (ft)		~617		28	352	103			~1816		58	
Queue Length 95th (ft)		m46		m45	m383	m143			#1942		m37	
Internal Link Dist (ft)		76			155			192			934	
Turn Bay Length (ft)				50		500						
Base Capacity (vph)		798		528	1518	730			2059		1420	
Starvation Cap Reductn		105		0	0	0			91		0	
Spillback Cap Reductn		1		0	107	0			505		311	
Storage Cap Reductn		0		0	0	0			0		0	
Reduced v/c Ratio		1.33		0.06	0.68	0.35			1.51		0.18	

Intersection Summary

Area Type: Other  
 Cycle Length: 180  
 Actuated Cycle Length: 180  
 Offset: 147 (82%), Referenced to phase 2:SBT and 6:NBT, Start of Green  
 Natural Cycle: 75  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.36  
 Intersection Signal Delay: 74.2  
 Intersection Capacity Utilization 119.2%  
 Analysis Period (min) 15  
 Intersection LOS: E  
 ICU Level of Service H

~ 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.

Lane Group	Ø2
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	7.0
Minimum Split (s)	14.0
Total Split (s)	120.0
Total Split (%)	67%
Maximum Green (s)	113.0
Yellow Time (s)	5.5
All-Red Time (s)	1.5
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	0.2
Recall Mode	C-Max
Act Effect Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
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	

Lanes, Volumes, Timings  
 95: Old Columbia Pike & Industrial Parkway

10/31/2017

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 95: Old Columbia Pike & Industrial Parkway

#94 			
120 s			
#94 #95 	#94 #95 	#94 #95 	
80 s	40 s	60 s	



Lanes, Volumes, Timings  
 96: Columbia Pike (US 29) & Tech Road

10/31/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	30	640	152	342	240	406	206	1558	0	655	3462	225
Future Volume (vph)	30	640	152	342	240	406	206	1558	0	655	3462	225
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	400		400	300		0
Storage Lanes	1		1	1		0	2		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	0.91	0.91	0.95	0.97	0.91	1.00	1.00	0.91	1.00
Frt			0.850		0.926							0.850
Flt Protected	0.950			0.950	0.990		0.950			0.950		
Satd. Flow (prot)	1805	1900	1615	1643	3170	0	3367	4988	0	1736	4988	1553
Flt Permitted	0.170			0.400	0.683		0.950			0.950		
Satd. Flow (perm)	323	1900	1615	692	2187	0	3367	4988	0	1736	4988	1553
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			161		131							124
Link Speed (mph)		30			30			50				50
Link Distance (ft)		269			161			495				453
Travel Time (s)		6.1			3.7			6.8				6.2
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
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	4%	4%	4%	4%	4%	4%
Adj. Flow (vph)	33	696	165	372	261	441	224	1693	0	712	3763	245
Shared Lane Traffic (%)				50%								
Lane Group Flow (vph)	33	696	165	186	888	0	224	1693	0	712	3763	245
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			9			38				50
Link Offset(ft)		0			-10			12				0
Crosswalk Width(ft)		50			28			15				16
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	1	1	1		1	0		1	0	0
Detector Template							Left			Left	Thru	Right
Leading Detector (ft)	25	25	25	50	50		80	0		80	0	0
Trailing Detector (ft)	0	0	0	0	0		0	0		0	0	0
Detector 1 Position(ft)	0	0	0	0	0		0	0		0	0	0
Detector 1 Size(ft)	25	25	25	50	50		80	6		80	6	20
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Turn Type	Perm	NA	Prot	Perm	NA		Prot	NA		Prot	NA	Prot
Protected Phases		3	3		4		6	2		1	5	5
Permitted Phases	3			4								
Detector Phase	3	3	3	4	4		6	2		1	5	5
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0		3.0	7.0		4.0	7.0	7.0
Minimum Split (s)	12.0	12.0	12.0	12.0	12.0		10.5	14.5		11.5	14.5	14.5

Lanes, Volumes, Timings  
 96: Columbia Pike (US 29) & Tech Road

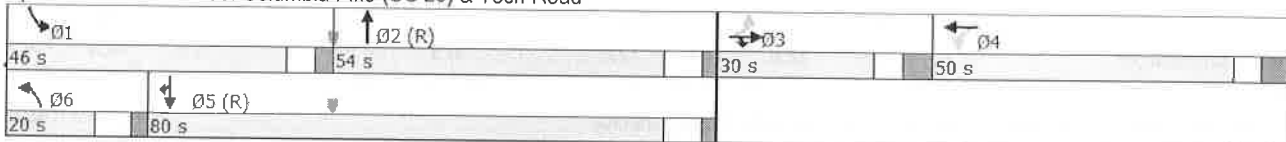
10/31/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (s)	30.0	30.0	30.0	50.0	50.0		20.0	54.0		46.0	80.0	80.0
Total Split (%)	16.7%	16.7%	16.7%	27.8%	27.8%		11.1%	30.0%		25.6%	44.4%	44.4%
Maximum Green (s)	22.0	22.0	22.0	42.0	42.0		12.5	46.5		39.5	72.5	72.5
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		5.0	5.5		4.0	5.5	5.5
All-Red Time (s)	4.0	4.0	4.0	4.0	4.0		2.5	2.0		2.5	2.0	2.0
Lost Time Adjust (s)	-1.5	-1.5	-1.5	-1.5	-1.5		-1.5	-1.5		-1.5	-1.5	-1.5
Total Lost Time (s)	6.5	6.5	6.5	6.5	6.5		6.0	6.0		5.0	6.0	6.0
Lead/Lag	Lead	Lead	Lead	Lag	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	4.0	4.0	4.0	4.0	4.0		3.0	0.2		4.0	0.2	0.2
Recall Mode	None	None	None	None	None		Max	C-Max		None	C-Max	C-Max
Act Effct Green (s)	23.5	23.5	23.5	43.5	43.5		14.0	48.0		41.0	74.0	74.0
Actuated g/C Ratio	0.13	0.13	0.13	0.24	0.24		0.08	0.27		0.23	0.41	0.41
v/c Ratio	0.79	2.81	0.47	1.11	1.42		0.86	1.27		1.80	1.84	0.34
Control Delay	157.9	847.7	14.5	162.4	236.0		136.2	151.2		401.5	410.9	34.1
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	157.9	847.7	14.5	162.4	236.0		136.2	151.2		401.5	410.9	34.1
LOS	F	F	B	F	F		F	F		F	F	C
Approach Delay		668.5			223.2			149.5			389.9	
Approach LOS		F			F			F			F	
Queue Length 50th (ft)	38	~1399	4	~274	~707		143	~926		~1286	~2450	140
Queue Length 95th (ft)	#115	#1655	80	#465	#853		m#173	#994		m#722	m#1323	m93
Internal Link Dist (ft)		189			81			415			373	
Turn Bay Length (ft)							400			300		
Base Capacity (vph)	42	248	350	167	627		261	1330		395	2050	711
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	0
Reduced v/c Ratio	0.79	2.81	0.47	1.11	1.42		0.86	1.27		1.80	1.84	0.34

Intersection Summary

Area Type: Other  
 Cycle Length: 180  
 Actuated Cycle Length: 180  
 Offset: 0 (0%), Referenced to phase 2:NBT and 5:SBT, Start of Green  
 Natural Cycle: 140  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 2.81  
 Intersection Signal Delay: 344.5  
 Intersection LOS: F  
 Intersection Capacity Utilization 147.0%  
 ICU Level of Service H  
 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.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 96: Columbia Pike (US 29) & Tech Road



Lanes, Volumes, Timings  
 107: Columbia Pike (US 29) & Cherry Hill Road

10/31/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	110	1337	20	251	1146	429	21	0	113	1151	0	80
Future Volume (vph)	110	1337	20	251	1146	429	21	0	113	1151	0	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	11	11	12	12	12	12	12	12	12
Storage Length (ft)	0		0	410		350	0		0	0		0
Storage Lanes	2		0	2		1	1		2	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	0.91	0.97	0.95	1.00	1.00	1.00	0.88	0.91	0.91	1.00
Frt		0.998				0.850			0.850		0.970	
Flt Protected	0.950			0.950			0.950			0.950	0.961	
Satd. Flow (prot)	3502	5177	0	3385	3490	1615	1805	0	2842	3285	1612	0
Flt Permitted	0.950			0.950			0.950			0.950	0.961	
Satd. Flow (perm)	3502	5177	0	3385	3490	1615	1805	0	2842	3285	1612	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2				421			153		156	
Link Speed (mph)		30			30			40			40	
Link Distance (ft)		368			689			473			677	
Travel Time (s)		8.4			15.7			8.1			11.5	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	117	1422	21	267	1219	456	22	0	120	1224	0	85
Shared Lane Traffic (%)									28%			
Lane Group Flow (vph)	117	1443	0	267	1219	456	22	0	120	881	428	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		40			40			200			250	
Link Offset(ft)		0			15			10			0	
Crosswalk Width(ft)		16			0			30			35	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.04	1.04	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	0		1	0	0	1		1	1	0	
Detector Template												
Leading Detector (ft)	100	0		100	0	0	100		100	100	0	
Trailing Detector (ft)	0	0		0	0	0	0		0	0	0	
Detector 1 Position(ft)	0	0		0	0	0	0		0	0	0	
Detector 1 Size(ft)	100	6		100	6	20	100		100	100	6	
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex	CI+Ex	CI+Ex		CI+Ex	CI+Ex	CI+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0	
Turn Type	Prot	NA		Prot	NA	Prot	Prot		Prot	Split	NA	
Protected Phases	1	6		5	2	2	3		3	4	4	
Permitted Phases												
Detector Phase	1	6		5	2	2	3		3	4	4	
Switch Phase												
Minimum Initial (s)	3.0	7.0		3.0	7.0	7.0	7.0		7.0	5.0	5.0	
Minimum Split (s)	10.0	16.0		10.0	16.0	16.0	15.5		15.5	26.0	26.0	

Lanes, Volumes, Timings  
 107: Columbia Pike (US 29) & Cherry Hill Road

10/31/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (s)	12.0	58.5		20.0	66.5	66.5	15.5		15.5	56.0	56.0	
Total Split (%)	8.0%	39.0%		13.3%	44.3%	44.3%	10.3%		10.3%	37.3%	37.3%	
Maximum Green (s)	5.0	49.5		13.0	57.5	57.5	7.0		7.0	48.0	48.0	
Yellow Time (s)	3.5	4.5		3.5	4.5	4.5	3.5		3.5	3.5	3.5	
All-Red Time (s)	3.5	4.5		3.5	4.5	4.5	5.0		5.0	4.5	4.5	
Lost Time Adjust (s)	-1.5	-1.5		-1.5	-1.5	-1.5	-1.5		-1.5	-1.5	-1.5	
Total Lost Time (s)	5.5	7.5		5.5	7.5	7.5	7.0		7.0	6.5	6.5	
Lead/Lag	Lag	Lead		Lag	Lead	Lead	Lead		Lead	Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes		Yes	Yes	Yes	
Vehicle Extension (s)	6.0	0.2		6.0	0.2	0.2	6.0		6.0	6.0	6.0	
Recall Mode	None	C-Max		None	C-Max	C-Max	None		None	None	None	
Act Effect Green (s)	6.5	51.1		14.5	59.1	59.1	8.5		8.5	49.4	49.4	
Actuated g/C Ratio	0.04	0.34		0.10	0.39	0.39	0.06		0.06	0.33	0.33	
v/c Ratio	0.77	0.82		0.82	0.89	0.51	0.22		0.39	0.81	0.67	
Control Delay	101.8	49.8		77.5	39.4	3.2	72.9		7.8	53.3	32.8	
Queue Delay	0.0	0.0		0.0	2.6	0.1	0.0		0.0	0.0	0.0	
Total Delay	101.8	49.8		77.5	42.0	3.4	72.9		7.8	53.3	32.8	
LOS	F	D		E	D	A	E		A	D	C	
Approach Delay		53.7			37.8			17.9				46.6
Approach LOS		D			D			B				D
Queue Length 50th (ft)	59	472		139	643	50	21		0	434	257	
Queue Length 95th (ft)	#112	534		#206	693	53	52		18	524	400	
Internal Link Dist (ft)		288			609			393				597
Turn Bay Length (ft)				410		350						
Base Capacity (vph)	151	1764		327	1374	891	102		305	1084	636	
Starvation Cap Reductn	0	0		0	79	57	0		0	0	0	
Spillback Cap Reductn	0	0		0	0	0	0		0	0	0	
Storage Cap Reductn	0	0		0	0	0	0		0	0	0	
Reduced v/c Ratio	0.77	0.82		0.82	0.94	0.55	0.22		0.39	0.81	0.67	

Intersection Summary

Area Type: Other  
 Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 118 (79%), Referenced to phase 2:WBT and 6:EBT, Start of Green  
 Natural Cycle: 100  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.89  
 Intersection Signal Delay: 44.6  
 Intersection Capacity Utilization 80.8%  
 Analysis Period (min) 15  
 Intersection LOS: D  
 ICU Level of Service D  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 107: Columbia Pike (US 29) & Cherry Hill Road

Ø2 (R)	Ø1	Ø3	Ø4
66.5 s	12 s	15.5 s	56 s
Ø6 (R)	Ø5		
58.5 s	20 s		

Lanes, Volumes, Timings  
109: Prosperity Drive & Cherry Hill Road

10/31/2017

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑	↗	↙	↑↑	↖	↗
Traffic Volume (vph)	2153	448	170	1623	203	121
Future Volume (vph)	2153	448	170	1623	203	121
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		250	400		0	0
Storage Lanes		1	1		1	1
Taper Length (ft)			25		25	
Lane Util. Factor	0.91	1.00	1.00	0.95	1.00	1.00
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	5187	1615	1805	3610	1805	1615
Flt Permitted			0.039		0.950	
Satd. Flow (perm)	5187	1615	74	3610	1805	1615
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		425				96
Link Speed (mph)	30			30	30	
Link Distance (ft)	689			612	401	
Travel Time (s)	15.7			13.9	9.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2340	487	185	1764	221	132
Shared Lane Traffic (%)						
Lane Group Flow (vph)	2340	487	185	1764	221	132
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	38			30	12	
Link Offset(ft)	-12			8	0	
Crosswalk Width(ft)	30			30	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Number of Detectors	0	0	1	0	1	1
Detector Template			Left			Right
Leading Detector (ft)	0	0	80	0	80	80
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	6	80	80	6	80	80
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Turn Type	NA	Perm	pm+pt	NA	Prot	Prot
Protected Phases	6		5	2	4	4
Permitted Phases		6	2			
Detector Phase	6	6	5	2	4	4
Switch Phase						
Minimum Initial (s)	7.0	7.0	3.0	7.0	5.0	5.0
Minimum Split (s)	13.5	13.5	9.5	13.5	11.0	11.0
Total Split (s)	102.0	102.0	15.0	117.0	33.0	33.0

Lanes, Volumes, Timings  
 109: Prosperity Drive & Cherry Hill Road

10/31/2017

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Total Split (%)	68.0%	68.0%	10.0%	78.0%	22.0%	22.0%
Maximum Green (s)	95.5	95.5	8.5	110.5	27.0	27.0
Yellow Time (s)	4.5	4.5	4.0	4.5	4.0	4.0
All-Red Time (s)	2.0	2.0	2.5	2.0	2.0	2.0
Lost Time Adjust (s)	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5
Total Lost Time (s)	5.0	5.0	5.0	5.0	4.5	4.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Vehicle Extension (s)	0.2	0.2	5.0	0.2	5.0	5.0
Recall Mode	C-Max	C-Max	None	C-Max	None	None
Act Effct Green (s)	97.0	97.0	115.2	115.2	25.3	25.3
Actuated g/C Ratio	0.65	0.65	0.77	0.77	0.17	0.17
v/c Ratio	0.70	0.41	0.89	0.64	0.73	0.38
Control Delay	9.3	2.5	70.8	10.1	72.9	20.1
Queue Delay	0.7	0.5	0.0	0.2	0.0	0.0
Total Delay	10.0	3.0	70.8	10.2	72.9	20.1
LOS	A	A	E	B	E	C
Approach Delay	8.8			16.0	53.2	
Approach LOS	A			B	D	
Queue Length 50th (ft)	388	60	133	324	205	30
Queue Length 95th (ft)	424	m59	m#212	m484	297	94
Internal Link Dist (ft)	609			532	321	
Turn Bay Length (ft)		250	400			
Base Capacity (vph)	3354	1194	208	2771	342	384
Starvation Cap Reductn	582	320	0	0	0	0
Spillback Cap Reductn	0	0	0	272	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.84	0.56	0.89	0.71	0.65	0.34

Intersection Summary

Area Type: Other  
 Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 100 (67%), Referenced to phase 2:WBTL and 6:EBT, Start of Green  
 Natural Cycle: 60  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.89  
 Intersection Signal Delay: 14.6  
 Intersection Capacity Utilization 74.3%  
 Analysis Period (min) 15  
 Intersection LOS: B  
 ICU Level of Service D

# 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 109: Prosperity Drive & Cherry Hill Road

← Ø2 (R)		↖ Ø4
117 s		33 s
↙ Ø5	→ Ø6 (R)	
15 s	102 s	



Lanes, Volumes, Timings

114: Cherry Hill Road & Broadbirch Drive/Calverton Boulevard

10/31/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↵	↗	↘	↵	↗	↘	↵	↗	↘	↵	↗	↘
Traffic Volume (vph)	257	240	153	300	605	700	215	836	25	76	1564	634
Future Volume (vph)	257	240	153	300	605	700	215	836	25	76	1564	634
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		500	300		200	175		0	300		100
Storage Lanes	1		1	1		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95	1.00	0.91	1.00
Frt			0.850			0.850		0.996				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1805	3610	1615	1805	3610	1615	1805	3596	0	1805	5187	1615
Flt Permitted	0.264			0.582			0.099			0.141		
Satd. Flow (perm)	502	3610	1615	1106	3610	1615	188	3596	0	268	5187	1615
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			176			117		2				174
Link Speed (mph)		25			25			40				40
Link Distance (ft)		710			494			263				417
Travel Time (s)		19.4			13.5			4.5				7.1
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	295	276	176	345	695	805	247	961	29	87	1798	729
Shared Lane Traffic (%)												
Lane Group Flow (vph)	295	276	176	345	695	805	247	990	0	87	1798	729
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12				12
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		32			16			16				16
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	1	1	1	1	1	0		1	0	1
Detector Template	Left		Right	Left		Right	Left			Left		Right
Leading Detector (ft)	80	80	20	80	80	80	80	0		80	0	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0		0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0		0	0	0
Detector 1 Size(ft)	80	80	20	80	80	80	80	6		80	6	20
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex		CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA		Perm	NA	Perm
Protected Phases	1	6			2		7	4			8	
Permitted Phases	6		6	2		2	4			8		8
Detector Phase	1	6	6	2	2	2	7	4		8	8	8
Switch Phase												
Minimum Initial (s)	3.0	7.0	7.0	7.0	7.0	7.0	3.0	3.0		3.0	3.0	3.0
Minimum Split (s)	9.0	13.5	13.5	13.5	13.5	13.5	9.5	9.0		9.0	9.0	9.0
Total Split (s)	30.0	93.0	93.0	63.0	63.0	63.0	17.0	57.0		40.0	40.0	40.0

Lanes, Volumes, Timings

114: Cherry Hill Road & Broadbirch Drive/Calverton Boulevard

10/31/2017

	↖	→	↘	↙	←	↖	↙	↑	↗	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (%)	20.0%	62.0%	62.0%	42.0%	42.0%	42.0%	11.3%	38.0%		26.7%	26.7%	26.7%
Maximum Green (s)	24.0	86.5	86.5	56.5	56.5	56.5	10.5	51.0		34.0	34.0	34.0
Yellow Time (s)	4.0	4.5	4.5	4.5	4.5	4.5	4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.5	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5		-1.5	-1.5	-1.5
Total Lost Time (s)	4.5	5.0	5.0	5.0	5.0	5.0	5.0	4.5		4.5	4.5	4.5
Lead/Lag	Lead			Lag			Lead			Lag		
Lead-Lag Optimize?	Yes			Yes			Yes			Yes		
Vehicle Extension (s)	4.0	0.2	0.2	0.2	0.2	0.2	5.0	4.0		4.0	4.0	4.0
Recall Mode	None	C-Max	C-Max	C-Max	C-Max	C-Max	None	None		None	None	None
Act Effect Green (s)	88.5	88.0	88.0	63.4	63.4	63.4	52.0	52.5		35.5	35.5	35.5
Actuated g/C Ratio	0.59	0.59	0.59	0.42	0.42	0.42	0.35	0.35		0.24	0.24	0.24
v/c Ratio	0.63	0.13	0.17	0.74	0.46	1.07	1.27	0.79		1.38	1.47	1.42
Control Delay	21.5	14.1	2.2	48.5	32.8	89.8	189.3	33.8		260.8	241.1	217.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	21.5	14.1	2.2	48.5	32.8	89.8	189.3	33.8		260.8	241.1	217.4
LOS	C	B	A	D	C	F	F	C		F	F	F
Approach Delay		14.2				60.6				64.8		
Approach LOS		B				E				E		
Queue Length 50th (ft)	136	61	0	280	253	-802	-246	426		-111	-872	-814
Queue Length 95th (ft)	184	81	28	#428	317	#1050	#406	444		m#193	#923	#1010
Internal Link Dist (ft)		630				414				183		
Turn Bay Length (ft)			500	300		200	175			300		100
Base Capacity (vph)	517	2117	1020	467	1524	750	194	1259		63	1227	515
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.57	0.13	0.17	0.74	0.46	1.07	1.27	0.79		1.38	1.47	1.42

Intersection Summary

Area Type: Other  
 Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 120 (80%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green  
 Natural Cycle: 120  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.47  
 Intersection Signal Delay: 126.8  
 Intersection Capacity Utilization 93.2%  
 Analysis Period (min) 15  
 Intersection LOS: F  
 ICU Level of Service F

~ 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.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 114: Cherry Hill Road & Broadbirch Drive/Calverton Boulevard

↖ Ø1	↙ Ø2 (R)	↑ Ø4
30 s	63 s	57 s
↗ Ø6 (R)	↖ Ø7	↓ Ø8
93 s	17 s	40 s



Lanes, Volumes, Timings  
 120: Columbia Pike (US 29) & Musgrove Road

10/31/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	65	50	77	142	195	35	275	2059	65	20	5083	500
Future Volume (vph)	65	50	77	142	195	35	275	2059	65	20	5083	500
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	300		0	0		800
Storage Lanes	1		1	1		0	2		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.86	0.86	1.00	0.86	0.86
Frt			0.850		0.977			0.995			0.987	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1805	1900	1615	1805	1856	0	3367	6253	0	1736	6203	0
Flt Permitted	0.223			0.719			0.950			0.950		
Satd. Flow (perm)	424	1900	1615	1366	1856	0	3367	6253	0	1736	6203	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			103		5			6			20	
Link Speed (mph)		30			30			50			50	
Link Distance (ft)		537			573			626			2274	
Travel Time (s)		12.2			13.0			8.5			31.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	4%	4%	4%	4%	4%	4%
Adj. Flow (vph)	71	54	84	154	212	38	299	2238	71	22	5525	543
Shared Lane Traffic (%)												
Lane Group Flow (vph)	71	54	84	154	250	0	299	2309	0	22	6068	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			50			40	
Link Offset(ft)		0			0			10			-2	
Crosswalk Width(ft)		16			2			25			16	
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	1	1	0		1	0		1	0	
Detector Template												
Leading Detector (ft)	100	100	100	100	0		100	0		100	0	
Trailing Detector (ft)	0	0	0	0	0		0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0		0	0		0	0	
Detector 1 Size(ft)	100	100	100	100	100		100	0		100	0	
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Turn Type	Perm	NA	Perm	Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		6	2		1	5	
Permitted Phases	4		4	8								
Detector Phase	4	4	4	8	8		6	2		1	5	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		3.0	20.0		3.0	20.0	
Minimum Split (s)	11.0	11.0	11.0	11.0	11.0		10.0	27.0		9.0	27.0	

Lanes, Volumes, Timings  
 120: Columbia Pike (US 29) & Musgrove Road

10/31/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (s)	51.0	51.0	51.0	51.0	51.0		25.0	117.0		12.0	104.0	
Total Split (%)	28.3%	28.3%	28.3%	28.3%	28.3%		13.9%	65.0%		6.7%	57.8%	
Maximum Green (s)	45.0	45.0	45.0	45.0	45.0		18.0	110.0		6.0	97.0	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		5.0	5.0		4.0	5.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.5	-1.5	-1.5	-1.5	-1.5		-1.5	-1.5		-1.5	-1.5	
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5		5.5	5.5		4.5	5.5	
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	3.0	
Recall Mode	None	None	None	None	None		None	C-Max		None	C-Max	
Act Effect Green (s)	31.0	31.0	31.0	31.0	31.0		22.6	130.0		9.3	110.9	
Actuated g/C Ratio	0.17	0.17	0.17	0.17	0.17		0.13	0.72		0.05	0.62	
v/c Ratio	0.97	0.17	0.23	0.66	0.77		0.71	0.51		0.25	1.59	
Control Delay	170.7	62.2	6.4	81.8	85.1		50.8	33.8		118.0	285.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	170.7	62.2	6.4	81.8	85.1		50.8	33.8		118.0	285.4	
LOS	F	E	A	F	F		D	C		F	F	
Approach Delay		76.6			83.9			35.8			284.8	
Approach LOS		E			F			D			F	
Queue Length 50th (ft)	85	55	0	173	281		180	669		27	~3018	
Queue Length 95th (ft)	#178	95	31	245	366		m165	m570		m19	m#1829	
Internal Link Dist (ft)		457			493			546			2194	
Turn Bay Length (ft)							300					
Base Capacity (vph)	109	490	493	352	483		428	4516		90	3828	
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	
Reduced v/c Ratio	0.65	0.11	0.17	0.44	0.52		0.70	0.51		0.24	1.59	

Intersection Summary

Area Type: Other  
 Cycle Length: 180  
 Actuated Cycle Length: 180  
 Offset: 142 (79%), Referenced to phase 2:NBT and 5:SBT, Start of Green  
 Natural Cycle: 120  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.59  
 Intersection Signal Delay: 201.7  
 Intersection Capacity Utilization 123.1%  
 Analysis Period (min) 15  
 Intersection LOS: F  
 ICU Level of Service H

- 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.

























m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 120: Columbia Pike (US 29) & Musgrove Road

Ø1	Ø2 (R)	Ø4	Ø8
12 s	117 s	51 s	51 s
Ø6	Ø5 (R)		
25 s	104 s		

Lanes, Volumes, Timings  
123: Columbia Pike (US 29) & Fairland Road

10/31/2017

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	625	390	97	142	310	210	56	2077	26	0	5364	0
Future Volume (vph)	625	390	97	142	310	210	56	2077	26	0	5364	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	325		0	0		0
Storage Lanes	1		1	1		1	1		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.91	0.91	1.00	0.91	0.91	1.00	1.00	0.86	0.86	1.00	0.81	1.00
Frnt			0.850			0.850		0.998				
Fit Protected	0.950	0.979		0.950	0.998		0.950					
Satd. Flow (prot)	1643	3385	1615	1643	3451	1615	1736	6272	0	0	7399	0
Fit Permitted	0.950	0.979		0.950	0.998		0.950					
Satd. Flow (perm)	1643	3385	1615	1643	3451	1615	1736	6272	0	0	7399	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			127			127		3				
Link Speed (mph)		30			30			50			50	
Link Distance (ft)		414			440			2274			551	
Travel Time (s)		9.4			10.0			31.0			7.5	
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
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	4%	4%	4%	4%	4%	4%
Adj. Flow (vph)	679	424	105	154	337	228	61	2258	28	0	5830	0
Shared Lane Traffic (%)	47%			10%								
Lane Group Flow (vph)	360	743	105	139	352	228	61	2286	0	0	5830	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			40			40	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	1	1	1	1	1	0			0	
Detector Template												
Leading Detector (ft)	100	100	100	100	100	100	100	0			0	
Trailing Detector (ft)	0	0	0	0	0	0	0	0			0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0			0	
Detector 1 Size(ft)	100	100	100	100	100	100	100	6			6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0	
Turn Type	Split	NA	Prot	Split	NA	Prot	Prot	NA			NA	
Protected Phases	3	3	3	4	4	4	1	6			2	
Permitted Phases												
Detector Phase	3	3	3	4	4	4	1	6			2	
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	5.0	10.0			10.0	
Minimum Split (s)	12.5	12.5	12.5	12.5	12.5	12.5	13.5	17.0			17.0	

Lanes, Volumes, Timings  
 123: Columbia Pike (US 29) & Fairland Road

10/31/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (s)	30.0	30.0	30.0	26.0	26.0	26.0	24.0	124.0			100.0	
Total Split (%)	16.7%	16.7%	16.7%	14.4%	14.4%	14.4%	13.3%	68.9%			55.6%	
Maximum Green (s)	21.5	21.5	21.5	17.5	17.5	17.5	15.5	117.0			93.0	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	5.0			5.0	
All-Red Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	2.0			2.0	
Lost Time Adjust (s)	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5			-1.5	
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	5.5			5.5	
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lag	Lead				Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes				Yes	
Vehicle Extension (s)	4.0	4.0	4.0	4.0	4.0	4.0	5.0	0.2			0.2	
Recall Mode	None	None	None	None	None	None	None	C-Max			C-Max	
Act Effct Green (s)	23.0	23.0	23.0	19.0	19.0	19.0	14.6	118.5			96.9	
Actuated g/C Ratio	0.13	0.13	0.13	0.11	0.11	0.11	0.08	0.66			0.54	
v/c Ratio	1.72	1.72	0.33	0.80	0.97	0.80	0.44	0.55			1.46	
Control Delay	385.5	374.7	8.0	109.4	117.8	55.1	78.9	21.7			242.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0	
Total Delay	385.5	374.7	8.0	109.4	117.8	55.1	78.9	21.7			242.4	
LOS	F	F	A	F	F	E	E	C			F	
Approach Delay		346.1			96.3			23.2			242.4	
Approach LOS		F			F			C			F	
Queue Length 50th (ft)	~685	~707	0	180	231	120	75	325			~2323	
Queue Length 95th (ft)	#927	#851	38	#312	#347	#257	m130	535			#2300	
Internal Link Dist (ft)		334			360			2194			471	
Turn Bay Length (ft)							325					
Base Capacity (vph)	209	432	317	173	364	284	163	4130			3983	
Starvation Cap Reductn	0	0	0	0	0	0	0	0			0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0			0	
Storage Cap Reductn	0	0	0	0	0	0	0	0			0	
Reduced v/c Ratio	1.72	1.72	0.33	0.80	0.97	0.80	0.37	0.55			1.46	

Intersection Summary

Area Type: Other  
 Cycle Length: 180  
 Actuated Cycle Length: 180  
 Offset: 90 (50%), Referenced to phase 2:SBT and 6:NBT, Start of Green  
 Natural Cycle: 150  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.72  
 Intersection Signal Delay: 193.5  
 Intersection LOS: F  
 Intersection Capacity Utilization 106.3%  
 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.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 123: Columbia Pike (US 29) & Fairland Road

Ø1 24 s	Ø2 (R) 100 s	Ø3 30 s	Ø4 26 s
Ø6 (R) 124 s			

Lanes, Volumes, Timings

130: Centerpark Driveway/Beltsville Drive & Powder Mill Road (MD 212)

10/31/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	230	753	45	65	1711	1076	10	15	50	285	5	111
Future Volume (vph)	230	753	45	65	1711	1076	10	15	50	285	5	111
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	16	12	12	12	12	12	12	12	12	12
Storage Length (ft)	350		360	350		0	0		0	0		250
Storage Lanes	1		1	1		1	0		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.95	0.95	1.00	0.91	0.91	1.00
Frnt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950				0.980		0.950	0.955	
Satd. Flow (prot)	1646	3292	1727	1703	3406	1524	0	3538	1615	3285	1651	1615
Flt Permitted	0.042			0.343				0.980		0.950	0.955	
Satd. Flow (perm)	73	3292	1727	615	3406	1524	0	3538	1615	3285	1651	1615
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			102			607			138			138
Link Speed (mph)		40			40			35				35
Link Distance (ft)		921			477			217				528
Travel Time (s)		15.7			8.1			4.2				10.3
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
Heavy Vehicles (%)	6%	6%	6%	6%	6%	6%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	250	818	49	71	1860	1170	11	16	54	310	5	121
Shared Lane Traffic (%)										32%		
Lane Group Flow (vph)	250	818	49	71	1860	1170	0	27	54	211	104	121
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		18			18			30			30	
Link Offset(ft)		5			-5			-25			15	
Crosswalk Width(ft)		30			20			17			37	
Two way Left Turn Lane												
Headway Factor	1.04	1.04	0.85	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	1	1	1	1	1	1	1	1	1	1
Detector Template							Left		Right			
Leading Detector (ft)	30	300	5	30	300	5	20	30	5	30	30	5
Trailing Detector (ft)	0	294	0	0	394	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	294	0	0	394	0	0	0	0	0	0	0
Detector 1 Size(ft)	30	6	5	30	-94	5	20	30	5	30	30	5
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	1	6		5	2		4	4		8	8	
Permitted Phases	6		6	2		2			4			8
Detector Phase	1	6	6	5	2	2	4	4	4	8	8	8
Switch Phase												
Minimum Initial (s)	5.0	20.0	20.0	5.0	20.0	20.0	7.0	7.0	7.0	8.0	8.0	8.0

# Lanes, Volumes, Timings

130: Centerpark Driveway/Beltsville Drive & Powder Mill Road (MD 212)

10/31/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Split (s)	10.0	26.0	26.0	10.0	26.0	26.0	13.0	13.0	13.0	14.0	14.0	14.0
Total Split (s)	21.0	112.0	112.0	10.0	101.0	101.0	13.0	13.0	13.0	15.0	15.0	15.0
Total Split (%)	14.0%	74.7%	74.7%	6.7%	67.3%	67.3%	8.7%	8.7%	8.7%	10.0%	10.0%	10.0%
Maximum Green (s)	16.0	106.0	106.0	5.0	95.0	95.0	7.0	7.0	7.0	9.0	9.0	9.0
Yellow Time (s)	4.0	5.0	5.0	4.0	5.0	5.0	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	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5		-1.5	-1.5	-1.5	-1.5	-1.5
Total Lost Time (s)	3.5	4.5	4.5	3.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?												
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
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	None
Act Effect Green (s)	120.4	109.3	109.3	104.2	96.6	96.6		8.5	8.5	11.2	11.2	11.2
Actuated g/C Ratio	0.80	0.73	0.73	0.69	0.64	0.64		0.06	0.06	0.07	0.07	0.07
v/c Ratio	0.96	0.34	0.04	0.15	0.85	0.98		0.14	0.24	0.86	0.85	0.49
Control Delay	91.5	5.9	0.4	4.9	25.8	34.0		69.0	2.6	98.9	115.4	13.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Delay	91.5	5.9	0.4	4.9	25.8	34.0		69.0	2.6	98.9	115.4	13.7
LOS	F	A	A	A	C	C		E	A	F	F	B
Approach Delay		24.9			28.5			24.7			79.2	
Approach LOS		C			C			C			E	
Queue Length 50th (ft)	~217	72	0	13	711	693		13	0	114	113	0
Queue Length 95th (ft)	m#350	123	m0	24	828	#1202		31	0	#200	#243	49
Internal Link Dist (ft)		841			397			137			448	
Turn Bay Length (ft)	350		360	350								250
Base Capacity (vph)	261	2398	1285	475	2193	1197		200	221	244	123	248
Starvation Cap Reductn	0	0	0	0	0	0		0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0		0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0		0	0	0	0	0
Reduced v/c Ratio	0.96	0.34	0.04	0.15	0.85	0.98		0.14	0.24	0.86	0.85	0.49

## Intersection Summary

Area Type: Other  
 Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 8 (5%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green  
 Natural Cycle: 100  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.98  
 Intersection Signal Delay: 32.2  
 Intersection LOS: C  
 Intersection Capacity Utilization 96.0%  
 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.
- m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 130: Centerpark Driveway/Beltsville Drive & Powder Mill Road (MD 212)

21 s	101 s	13 s	15 s
10 s	112 s		



Lanes, Volumes, Timings

160: New Hampshire Ave (MD 650) & Quaint Acres Drive/Heartfields Drive

10/31/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇄			↑	↗	↘	↑↑↑		↘	↑↑↑	
Traffic Volume (vph)	20	0	27	21	0	26	11	1394	16	25	2796	10
Future Volume (vph)	20	0	27	21	0	26	11	1394	16	25	2796	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	9	12	12	12	12	12	11	12	12	11	12
Storage Length (ft)	0		0	65		0	225		0	235		0
Storage Lanes	0		0	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Frt		0.923				0.850		0.998			0.999	
Flt Protected		0.979			0.950		0.950			0.950		
Satd. Flow (prot)	0	1545	0	0	1805	1615	1736	4812	0	1736	4816	0
Flt Permitted		0.850			0.811		0.950			0.950		
Satd. Flow (perm)	0	1342	0	0	1541	1615	1736	4812	0	1736	4816	0
Right Turn on Red			Yes			Yes			No			No
Satd. Flow (RTOR)		136				136						
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		249			185			622			424	
Travel Time (s)		6.8			5.0			10.6			7.2	
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
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	4%	4%	4%	4%	4%	4%
Adj. Flow (vph)	22	0	29	23	0	28	12	1515	17	27	3039	11
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	51	0	0	23	28	12	1532	0	27	3050	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			18			18	
Link Offset(ft)		-2			14			5			0	
Crosswalk Width(ft)		10			18			26			22	
Two way Left Turn Lane												
Headway Factor	1.00	1.14	1.00	1.00	1.00	1.00	1.00	1.04	1.00	1.00	1.04	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1		1	2	1	1	0		1	0	
Detector Template	Left			Left								
Leading Detector (ft)	20	20		20	100	40	80	0		80	0	
Trailing Detector (ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Size(ft)	20	20		20	40	40	80	6		80	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)					94							
Detector 2 Size(ft)					6							
Detector 2 Type					Cl+Ex							
Detector 2 Channel												
Detector 2 Extend (s)					0.0							
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA		Prot	NA	

Lanes, Volumes, Timings

160: New Hampshire Ave (MD 650) & Quaint Acres Drive/Heartfields Drive

10/31/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases		4			8		1	6		5	2	
Permitted Phases	4			8		8						
Detector Phase	4	4		8	8	8	1	6		5	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	10.0		5.0	10.0	
Minimum Split (s)	11.5	11.5		11.5	11.5	11.5	11.0	22.5		11.0	22.5	
Total Split (s)	12.6	12.6		12.6	12.6	12.6	11.0	96.4		11.0	96.4	
Total Split (%)	10.5%	10.5%		10.5%	10.5%	10.5%	9.2%	80.3%		9.2%	80.3%	
Maximum Green (s)	6.1	6.1		6.1	6.1	6.1	5.0	90.4		5.0	90.4	
Yellow Time (s)	3.5	3.5		3.5	3.5	3.5	3.5	4.5		3.5	4.5	
All-Red Time (s)	3.0	3.0		3.0	3.0	3.0	2.5	1.5		2.5	1.5	
Lost Time Adjust (s)		-1.5			-1.5	-1.5	-1.5	-1.5		-1.5	-1.5	
Total Lost Time (s)		5.0			5.0	5.0	4.5	4.5		4.5	4.5	
Lead/Lag							Lag	Lag		Lead	Lead	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	5.0	5.0		5.0	5.0	5.0	5.0	0.2		5.0	0.2	
Recall Mode	None	None		None	None	None	None	C-Max		None	C-Max	
Act Effct Green (s)		7.6			7.6	7.6	6.5	99.7		7.0	101.9	
Actuated g/C Ratio		0.06			0.06	0.06	0.05	0.83		0.06	0.85	
v/c Ratio		0.24			0.24	0.12	0.13	0.38		0.27	0.75	
Control Delay		2.7			59.8	1.1	57.3	3.9		61.5	7.2	
Queue Delay		0.0			0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay		2.7			59.8	1.1	57.3	3.9		61.5	7.2	
LOS		A			E	A	E	A		E	A	
Approach Delay		2.7			27.5			4.3			7.7	
Approach LOS		A			C			A			A	
Queue Length 50th (ft)		0			17	0	9	126		20	235	
Queue Length 95th (ft)		0			45	0	30	147		52	533	
Internal Link Dist (ft)		169			105			542			344	
Turn Bay Length (ft)							225			235		
Base Capacity (vph)		212			97	229	94	3999		101	4090	
Starvation Cap Reductn		0			0	0	0	0		0	0	
Spillback Cap Reductn		0			0	0	0	0		0	0	
Storage Cap Reductn		0			0	0	0	0		0	0	
Reduced v/c Ratio		0.24			0.24	0.12	0.13	0.38		0.27	0.75	

Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBT, Start of Green  
 Natural Cycle: 80  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.75  
 Intersection Signal Delay: 6.7  
 Intersection Capacity Utilization 71.6%  
 Analysis Period (min) 15  
 Intersection LOS: A  
 ICU Level of Service C

Splits and Phases: 160: New Hampshire Ave (MD 650) & Quaint Acres Drive/Heartfields Drive

	Ø2 (R)		Ø1		Ø4
96.4 s			11 s		12.6 s
	Ø5		Ø6 (R)		Ø8
11 s		96.4 s			12.6 s



Lanes, Volumes, Timings  
170: Tech Road & Industrial Parkway

10/31/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	695	1878	85	0	603	221	50	45	5	986	190	350
Future Volume (vph)	695	1878	85	0	603	221	50	45	5	986	190	350
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	12	12	12	12	12	12	12	12
Storage Length (ft)	425		425	0		500	0		0	0		0
Storage Lanes	2		0	0		1	0		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	0.91	0.91	0.95
Frt		0.994				0.850		0.994			0.948	
Flt Protected	0.950							0.976		0.950	0.977	
Satd. Flow (prot)	3385	3469	0	0	3610	1615	0	1843	0	1643	3203	0
Flt Permitted	0.201							0.976		0.950	0.977	
Satd. Flow (perm)	716	3469	0	0	3610	1615	0	1843	0	1643	3203	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4				235		1			50	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		546			886			326			280	
Travel Time (s)		12.4			20.1			7.4			6.4	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	739	1998	90	0	641	235	53	48	5	1049	202	372
Shared Lane Traffic (%)										47%		
Lane Group Flow (vph)	739	2088	0	0	641	235	0	106	0	556	1067	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		22			16			10			12	
Link Offset(ft)		0			-5			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.04	1.04	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100	20	20	100		20	100	
Trailing Detector (ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Size(ft)	20	6		20	6	20	20	6		20	6	
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex		CI+Ex	CI+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		CI+Ex			CI+Ex			CI+Ex			CI+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA			NA	Free	Split	NA		Split	NA	
Protected Phases	1	6			2		4	4		8	8	

Lanes, Volumes, Timings  
170: Tech Road & Industrial Parkway

10/31/2017

	↖	→	↘	↙	←	↖	↘	↑	↗	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	6			2		Free						
Detector Phase	1	6		2	2		4	4		8	8	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	11.5	24.0		26.0	26.0		24.0	24.0		24.0	24.0	
Total Split (s)	46.0	97.0		51.0	51.0		24.0	24.0		59.0	59.0	
Total Split (%)	25.6%	53.9%		28.3%	28.3%		13.3%	13.3%		32.8%	32.8%	
Maximum Green (s)	40.0	91.0		45.0	45.0		18.0	18.0		53.0	53.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.5	-1.5			-1.5			-1.5		-1.5	-1.5	
Total Lost Time (s)	4.5	4.5			4.5			4.5		4.5	4.5	
Lead/Lag	Lead			Lag	Lag							
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	
Recall Mode	None	C-Max		C-Max	C-Max		None	None		None	None	
Act Effct Green (s)	92.5	92.5			53.2	180.0		16.4		57.6	57.6	
Actuated g/C Ratio	0.51	0.51			0.30	1.00		0.09		0.32	0.32	
v/c Ratio	0.84	1.17			0.60	0.15		0.63		1.06	1.01	
Control Delay	32.5	115.8			58.2	0.2		94.2		112.0	86.1	
Queue Delay	0.0	0.0			0.0	0.0		0.0		0.0	0.0	
Total Delay	32.5	115.8			58.2	0.2		94.2		112.0	86.1	
LOS	C	F			E	A		F		F	F	
Approach Delay		94.0			42.6			94.2			95.0	
Approach LOS		F			D			F			F	
Queue Length 50th (ft)	284	~1543			347	0		121		~796	~707	
Queue Length 95th (ft)	m229	m#1217			436	0		192		#1094	#883	
Internal Link Dist (ft)		466			806			246			200	
Turn Bay Length (ft)	425					500						
Base Capacity (vph)	983	1784			1066	1615		200		525	1058	
Starvation Cap Reductn	0	25			0	0		0		0	0	
Spillback Cap Reductn	0	0			0	0		0		0	0	
Storage Cap Reductn	0	0			0	0		0		0	0	
Reduced v/c Ratio	0.75	1.19			0.60	0.15		0.53		1.06	1.01	

Intersection Summary

Area Type: Other  
 Cycle Length: 180  
 Actuated Cycle Length: 180  
 Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green  
 Natural Cycle: 150  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.17  
 Intersection Signal Delay: 86.0  
 Intersection Capacity Utilization 121.8%  
 Analysis Period (min) 15  
 Intersection LOS: F  
 ICU Level of Service H

~ 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.

Lanes, Volumes, Timings  
 170: Tech Road & Industrial Parkway

10/31/2017

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 170: Tech Road & Industrial Parkway

Ø1	Ø2 (R)	Ø4	Ø8
46 s	51 s	24 s	59 s
Ø6 (R)			
97 s			

Lanes, Volumes, Timings

181: Beltsville Drive & Calverton Boulevard/Calverton Tower Driveway

10/31/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	27	2	488	2	0	0	986	188	9	1	369	39
Future Volume (vph)	27	2	488	2	0	0	986	188	9	1	369	39
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	10	10	12	12	12	12	12	12	12
Storage Length (ft)	200		0	0		0	200		0	125		0
Storage Lanes	1		1	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95	0.97	1.00	1.00	1.00	1.00	1.00
Fr <sub>t</sub>			0.850					0.993			0.986	
Fl <sub>t</sub> Protected	0.950				0.950		0.950			0.950		
Satd. Flow (prot)	1736	1900	1568	0	3201	0	3433	1769	0	1805	1787	0
Fl <sub>t</sub> Permitted	0.756				0.757		0.950			0.626		
Satd. Flow (perm)	1381	1900	1568	0	2551	0	3433	1769	0	1189	1787	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			519					7			8	
Link Speed (mph)		30			30			35			35	
Link Distance (ft)		690			171			458			205	
Travel Time (s)		15.7			3.9			8.9			4.0	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	4%	0%	3%	0%	0%	0%	2%	7%	0%	0%	5%	3%
Adj. Flow (vph)	29	2	519	2	0	0	1049	200	10	1	393	41
Shared Lane Traffic (%)												
Lane Group Flow (vph)	29	2	519	0	2	0	1049	210	0	1	434	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			6			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.09	1.09	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA	Perm	Perm	NA		Prot	NA		Perm	NA	
Protected Phases		4			8		5	2			6	
Permitted Phases	4		4	8						6		
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5		9.5	22.5		22.5	22.5	
Total Split (s)	22.5	22.5	22.5	22.5	22.5		24.2	47.0		22.8	22.8	
Total Split (%)	32.4%	32.4%	32.4%	32.4%	32.4%		34.8%	67.6%		32.8%	32.8%	
Maximum Green (s)	18.0	18.0	18.0	18.0	18.0		19.7	42.5		18.3	18.3	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	
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)	-1.5	-1.5	-1.5	-1.5	-1.5		-1.5	-1.5		-1.5	-1.5	
Total Lost Time (s)	3.0	3.0	3.0		3.0		3.0	3.0		3.0	3.0	
Lead/Lag							Lead			Lag	Lag	
Lead-Lag Optimize?							Yes			Yes	Yes	
Walk Time (s)	7.0	7.0	7.0	7.0	7.0			7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0			11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0	0	0	0			0		0	0	
Act Effct Green (s)	19.5	19.5	19.5		19.5		21.2	44.0		19.8	19.8	

Lanes, Volumes, Timings

181: Beltsville Drive & Calverton Boulevard/Calverton Tower Driveway

10/31/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio	0.28	0.28	0.28		0.28		0.31	0.63		0.28	0.28	
v/c Ratio	0.07	0.00	0.64		0.00		1.00	0.19		0.00	0.84	
Control Delay	19.1	18.0	6.3		18.0		54.7	5.6		18.0	40.5	
Queue Delay	0.0	0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Delay	19.1	18.0	6.3		18.0		54.7	5.6		18.0	40.5	
LOS	B	B	A		B		D	A		B	D	
Approach Delay		7.0			18.0			46.5			40.5	
Approach LOS		A			B			D			D	
Queue Length 50th (ft)	9	1	0		0		~229	31		0	170	
Queue Length 95th (ft)	27	5	68		2		#359	57		4	#324	
Internal Link Dist (ft)		610			91			378			125	
Turn Bay Length (ft)	200						200			125		
Base Capacity (vph)	387	533	813		715		1047	1122		338	514	
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	0.07	0.00	0.64		0.00		1.00	0.19		0.00	0.84	

Intersection Summary

Area Type: Other  
 Cycle Length: 69.5  
 Actuated Cycle Length: 69.5  
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green  
 Natural Cycle: 80  
 Control Type: Pretimed  
 Maximum v/c Ratio: 1.00  
 Intersection Signal Delay: 35.6  
 Intersection LOS: D  
 Intersection Capacity Utilization 68.1%  
 ICU Level of Service C  
 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: 181: Beltsville Drive & Calverton Boulevard/Calverton Tower Driveway

Ø2 (R)		Ø4
47 s		22.5 s
Ø5	Ø6 (R)	Ø8
24.2 s	22.8 s	22.5 s

Lanes, Volumes, Timings

185: Old Columbia Pike & Columbia Pike (US 29) Right Turn

10/31/2017

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↘↘			↑↑	↑↑	
Traffic Volume (vph)	1463	0	0	719	175	0
Future Volume (vph)	1463	0	0	719	175	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11
Lane Util. Factor	0.97	1.00	1.00	0.95	0.95	1.00
Frt						
Flt Protected	0.950					
Satd. Flow (prot)	3385	0	0	3490	3490	0
Flt Permitted	0.950					
Satd. Flow (perm)	3385	0	0	3490	3490	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)						
Link Speed (mph)	30			30	30	
Link Distance (ft)	152			343	133	
Travel Time (s)	3.5			7.8	3.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1590	0	0	782	190	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1590	0	0	782	190	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	22			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	5			16	16	
Two way Left Turn Lane						
Headway Factor	1.04	1.04	1.04	1.04	1.04	1.04
Turning Speed (mph)	15	9	15			9
Number of Detectors	1			2	2	
Detector Template	Left			Thru	Thru	
Leading Detector (ft)	20			100	100	
Trailing Detector (ft)	0			0	0	
Detector 1 Position(ft)	0			0	0	
Detector 1 Size(ft)	20			6	6	
Detector 1 Type	CI+Ex			CI+Ex	CI+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0			0.0	0.0	
Detector 1 Queue (s)	0.0			0.0	0.0	
Detector 1 Delay (s)	0.0			0.0	0.0	
Detector 2 Position(ft)				94	94	
Detector 2 Size(ft)				6	6	
Detector 2 Type				CI+Ex	CI+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot			NA	NA	
Protected Phases	2			4	8	
Permitted Phases						
Detector Phase	2			4	8	
Switch Phase						

Lanes, Volumes, Timings

185: Old Columbia Pike & Columbia Pike (US 29) Right Turn

10/31/2017



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Minimum Initial (s)	5.0			5.0	5.0	
Minimum Split (s)	22.5			22.5	22.5	
Total Split (s)	119.0			61.0	61.0	
Total Split (%)	66.1%			33.9%	33.9%	
Maximum Green (s)	114.5			56.5	56.5	
Yellow Time (s)	3.5			3.5	3.5	
All-Red Time (s)	1.0			1.0	1.0	
Lost Time Adjust (s)	-1.5			-1.5	-1.5	
Total Lost Time (s)	3.0			3.0	3.0	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0			3.0	3.0	
Recall Mode	C-Max			None	None	
Walk Time (s)	7.0			7.0	7.0	
Flash Dont Walk (s)	11.0			11.0	11.0	
Pedestrian Calls (#/hr)	0			0	0	
Act Effct Green (s)	124.8			49.2	49.2	
Actuated g/C Ratio	0.69			0.27	0.27	
v/c Ratio	0.68			0.82	0.20	
Control Delay	32.2			68.6	45.9	
Queue Delay	1.5			0.0	0.0	
Total Delay	33.7			68.6	45.9	
LOS	C			E	D	
Approach Delay	33.7			68.6	45.9	
Approach LOS	C			E	D	
Queue Length 50th (ft)	814			457	105	
Queue Length 95th (ft)	m893			507	m112	
Internal Link Dist (ft)	72			263	53	
Turn Bay Length (ft)						
Base Capacity (vph)	2346			1124	1124	
Starvation Cap Reductn	0			0	0	
Spillback Cap Reductn	524			0	0	
Storage Cap Reductn	0			0	0	
Reduced v/c Ratio	0.87			0.70	0.17	

Intersection Summary

Area Type: Other  
 Cycle Length: 180  
 Actuated Cycle Length: 180  
 Offset: 0 (0%), Referenced to phase 2:EBL and 6:, Start of Green  
 Natural Cycle: 60  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.82  
 Intersection Signal Delay: 45.2  
 Intersection Capacity Utilization 68.3%  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 185: Old Columbia Pike & Columbia Pike (US 29) Right Turn

	07 (R)		04
119 s		61 s	
			08
		61 s	

Lanes, Volumes, Timings  
193: FDA Boulevard & B-5

10/31/2017

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	140	146	1343	155	245	945
Future Volume (vph)	140	146	1343	155	245	945
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	900			0	0	100
Storage Lanes	1			0	1	1
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Frnt			0.985			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1805	3610	3556	0	1805	1615
Flt Permitted	0.047				0.950	
Satd. Flow (perm)	89	3610	3556	0	1805	1615
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			13			451
Link Speed (mph)		25	30		30	
Link Distance (ft)		1125	338		801	
Travel Time (s)		30.7	7.7		18.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	152	159	1460	168	266	1027
Shared Lane Traffic (%)						
Lane Group Flow (vph)	152	159	1628	0	266	1027
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		12	12		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		20	30		25	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Number of Detectors	1	2	2		1	1
Detector Template	Left	Thru	Thru		Left	Right
Leading Detector (ft)	20	100	100		20	20
Trailing Detector (ft)	0	0	0		0	0
Detector 1 Position(ft)	0	0	0		0	0
Detector 1 Size(ft)	20	6	6		20	20
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex		CI+Ex	CI+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(ft)		94	94			
Detector 2 Size(ft)		6	6			
Detector 2 Type		CI+Ex	CI+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type	pm+pt	NA	NA		Prot	Free
Protected Phases	7	4	8		6	
Permitted Phases	4					Free



Lanes, Volumes, Timings  
193: FDA Boulevard & B-5

10/31/2017



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Detector Phase	7	4	8		6	
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0		5.0	
Minimum Split (s)	9.5	22.5	22.5		22.5	
Total Split (s)	22.0	109.0	87.0		41.0	
Total Split (%)	14.7%	72.7%	58.0%		27.3%	
Maximum Green (s)	17.5	104.5	82.5		36.5	
Yellow Time (s)	3.5	3.5	3.5		3.5	
All-Red Time (s)	1.0	1.0	1.0		1.0	
Lost Time Adjust (s)	-1.5	-1.5	-1.5		-1.5	
Total Lost Time (s)	3.0	3.0	3.0		3.0	
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?	Yes		Yes			
Vehicle Extension (s)	3.0	3.0	3.0		3.0	
Recall Mode	None	None	None		C-Max	
Walk Time (s)		7.0	7.0		7.0	
Flash Dont Walk (s)		11.0	11.0		11.0	
Pedestrian Calls (#/hr)		0	0		0	
Act Effct Green (s)	101.9	101.9	81.5		42.1	150.0
Actuated g/C Ratio	0.68	0.68	0.54		0.28	1.00
v/c Ratio	0.59	0.06	0.84		0.53	0.64
Control Delay	41.3	7.7	19.5		51.4	1.9
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	41.3	7.7	19.5		51.4	1.9
LOS	D	A	B		D	A
Approach Delay		24.1	19.5		12.1	
Approach LOS		C	B		B	
Queue Length 50th (ft)	86	23	390		228	0
Queue Length 95th (ft)	163	34	m407		328	0
Internal Link Dist (ft)		1045	258		721	
Turn Bay Length (ft)	900					100
Base Capacity (vph)	277	2551	1997		506	1615
Starvation Cap Reductn	0	0	0		0	0
Spillback Cap Reductn	0	0	0		0	0
Storage Cap Reductn	0	0	0		0	0
Reduced v/c Ratio	0.55	0.06	0.82		0.53	0.64

**Intersection Summary**


















Area Type: Other  
 Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 38 (25%), Referenced to phase 2: and 6:SBL, Start of Green  
 Natural Cycle: 70  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.84  
 Intersection Signal Delay: 17.0  
 Intersection Capacity Utilization 73.4%  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 193: FDA Boulevard & B-5

	→ Ø4	
	109 s	
↘ Ø6 (R)	↗ Ø7	← Ø8
41 s	22 s	87 s

HCM Unsignalized Intersection Capacity Analysis  
 72: Old Columbia Pike/Prosperity Drive & Tech Road

08/16/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	123	982	190	70	888	138	0	0	125	0	0	100
Future Volume (Veh/h)	123	982	190	70	888	138	0	0	125	0	0	100
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	132	1056	204	75	955	148	0	0	134	0	0	108
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		161										
pX, platoon unblocked												
vC, conflicting volume	1103			1260			2050	2675	630	1971	2703	552
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1103			1260			2050	2675	630	1971	2703	552
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	79			87			100	100	69	100	100	78
cM capacity (veh/h)	640			559			20	15	429	20	15	483
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1	SB 2			
Volume Total	660	732	75	637	466	67	67	54	54			
Volume Left	132	0	75	0	0	0	0	0	0			
Volume Right	0	204	0	0	148	67	67	54	54			
cSH	640	1700	559	1700	1700	429	429	483	483			
Volume to Capacity	0.21	0.43	0.13	0.37	0.27	0.16	0.16	0.11	0.11			
Queue Length 95th (ft)	19	0	12	0	0	14	14	9	9			
Control Delay (s)	5.3	0.0	12.4	0.0	0.0	14.9	14.9	13.4	13.4			
Lane LOS	A		B			B	B	B	B			
Approach Delay (s)	2.5		0.8			14.9		13.4				
Approach LOS						B		B				
<b>Intersection Summary</b>												
Average Delay			2.8									
Intersection Capacity Utilization			72.4%		ICU Level of Service					C		
Analysis Period (min)			15									

Intersection	
Intersection Delay, s/veh	17
Intersection LOS	C

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations			↕	↗			↕			↖	↘	
Traffic Vol, veh/h	0	224	90	600	0	5	94	5	0	33	40	5
Future Vol, veh/h	0	224	90	600	0	5	94	5	0	33	40	5
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
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	243	98	652	0	5	102	5	0	36	43	5
Number of Lanes	0	0	1	1	0	0	1	0	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	2	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	2	2
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	2	1	1
HCM Control Delay	18.9	10.6	10.6
HCM LOS	C	B	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	SBLn1
Vol Left, %	100%	0%	47%	0%	5%	8%
Vol Thru, %	0%	89%	19%	0%	90%	83%
Vol Right, %	0%	11%	34%	100%	5%	9%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	33	45	476	438	104	109
LT Vol	33	0	224	0	5	9
Through Vol	0	40	90	0	94	90
RT Vol	0	5	162	438	5	10
Lane Flow Rate	36	49	517	476	113	118
Geometry Grp	7	7	7	7	6	6
Degree of Util (X)	0.076	0.095	0.76	0.606	0.193	0.221
Departure Headway (Hd)	7.593	7.004	5.288	4.586	6.134	6.73
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	474	514	678	776	587	536
Service Time	5.302	4.713	3.086	2.384	4.15	4.742
HCM Lane V/C Ratio	0.076	0.095	0.763	0.613	0.193	0.22
HCM Control Delay	10.9	10.4	23.1	14.3	10.6	11.6
HCM Lane LOS	B	B	C	B	B	B
HCM 95th-tile Q	0.2	0.3	7	4.2	0.7	0.8

Intersection

Intersection Delay, s/veh  
 Intersection LOS

Movement	SBU	SBL	SBT	SBR
Lane Configurations			↕	
Traffic Vol, veh/h	0	9	90	10
Future Vol, veh/h	0	9	90	10
Peak Hour Factor	0.92	0.92	0.92	0.92
Heavy Vehicles, %	0	0	0	0
Mvmt Flow	0	10	98	11
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	2
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	2
HCM Control Delay	11.6
HCM LOS	B

Intersection	
Intersection Delay, s/veh	30.2
Intersection LOS	D

Movement	WBU	WBL	WBR	NBU	NBT	NBR	SBU	SBL	SBT
Lane Configurations		Y			↑↓				↑↑
Traffic Vol, veh/h	0	100	10	0	39	5	0	490	263
Future Vol, veh/h	0	100	10	0	39	5	0	490	263
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	109	11	0	42	5	0	533	286
Number of Lanes	0	1	0	0	2	0	0	0	2

Approach	WB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	2	2
Conflicting Approach Left	NB		WB
Conflicting Lanes Left	2	0	1
Conflicting Approach Right	SB	WB	
Conflicting Lanes Right	2	1	0
HCM Control Delay	10.4	8.6	34.3
HCM LOS	B	A	D

Lane	NBLn1	NBLn2	WBLn1	SBLn1	SBLn2
Vol Left, %	0%	0%	91%	85%	0%
Vol Thru, %	100%	72%	0%	15%	100%
Vol Right, %	0%	28%	9%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	26	18	110	578	175
LT Vol	0	0	100	490	0
Through Vol	26	13	0	88	175
RT Vol	0	5	10	0	0
Lane Flow Rate	28	20	120	628	191
Geometry Grp	7	7	2	7	7
Degree of Util (X)	0.045	0.03	0.195	0.928	0.259
Departure Headway (Hd)	5.69	5.493	5.881	5.323	4.897
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	625	647	609	678	732
Service Time	3.465	3.268	3.929	3.067	2.641
HCM Lane V/C Ratio	0.045	0.031	0.197	0.926	0.261
HCM Control Delay	8.7	8.4	10.4	41.9	9.4
HCM Lane LOS	A	A	B	E	A
HCM 95th-tile Q	0.1	0.1	0.7	12.6	1

Intersection

Intersection Delay, s/veh	23.3
Intersection LOS	C

Movement	EBU	EBT	EBR	WBU	WBL	WBT	NBU	NBL	NBR
Lane Configurations		↑				↑		↑	↑
Traffic Vol, veh/h	0	15	260	0	256	409	0	25	3
Future Vol, veh/h	0	15	260	0	256	409	0	25	3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	16	283	0	278	445	0	27	3
Number of Lanes	0	1	0	0	0	1	0	1	1

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	2	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	2	0	1
HCM Control Delay	9.4	29.6	10.1
HCM LOS	A	D	B

Lane	NBLn1	NBLn2	EBLn1	WBLn1
Vol Left, %	100%	0%	0%	38%
Vol Thru, %	0%	0%	5%	62%
Vol Right, %	0%	100%	95%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	25	3	275	665
LT Vol	25	0	0	256
Through Vol	0	0	15	409
RT Vol	0	3	260	0
Lane Flow Rate	27	3	299	723
Geometry Grp	7	7	2	2
Degree of Util (X)	0.054	0.005	0.346	0.876
Departure Headway (Hd)	7.135	5.912	4.166	4.363
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	500	602	864	831
Service Time	4.9	3.678	2.195	2.389
HCM Lane V/C Ratio	0.054	0.005	0.346	0.87
HCM Control Delay	10.3	8.7	9.4	29.6
HCM Lane LOS	B	A	A	D
HCM 95th-tile Q	0.2	0	1.6	11.2



**Intersection**

Intersection Delay, s/veh	11.2
Intersection LOS	B

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations			↕				↕				↕	
Traffic Vol, veh/h	0	2	0	6	0	0	0	0	0	75	20	4
Future Vol, veh/h	0	2	0	6	0	0	0	0	0	75	20	4
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
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	2	0	7	0	0	0	0	0	82	22	4
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	1
HCM Control Delay	7.9	0	8.2
HCM LOS	A	-	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	76%	25%	0%	3%
Vol Thru, %	20%	0%	100%	48%
Vol Right, %	4%	75%	0%	48%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	99	8	0	516
LT Vol	75	2	0	16
Through Vol	20	0	0	250
RT Vol	4	6	0	250
Lane Flow Rate	108	9	0	561
Geometry Grp	1	1	1	1
Degree of Util (X)	0.133	0.012	0	0.578
Departure Headway (Hd)	4.461	4.832	5.254	3.711
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	795	745	0	970
Service Time	2.536	2.832	3.255	1.75
HCM Lane V/C Ratio	0.136	0.012	0	0.578
HCM Control Delay	8.2	7.9	8.3	11.8
HCM Lane LOS	A	A	N	B
HCM 95th-tile Q	0.5	0	0	3.8

Intersection

Intersection Delay, s/veh  
 Intersection LOS

Movement	SBU	SBL	SBT	SBR
Lane Configurations			↕	
Traffic Vol, veh/h	0	16	250	250
Future Vol, veh/h	0	16	250	250
Peak Hour Factor	0.92	0.92	0.92	0.92
Heavy Vehicles, %	0	0	0	0
Mvmt Flow	0	17	272	272
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	11.8
HCM LOS	B

HCM 2010 Roundabout  
73: FDA Boulevard & Industrial Parkway

08/16/2017

Intersection							
Intersection Delay, s/veh	2.5						
Intersection LOS	A						
Approach	WB		NB		SB		
Entry Lanes	2		2		2		
Conflicting Circle Lanes	2		2		2		
Adj Approach Flow, veh/h	2487		19		445		
Demand Flow Rate, veh/h	2487		19		445		
Vehicles Circulating, veh/h	4		296		574		
Vehicles Exiting, veh/h	311		723		4		
Follow-Up Headway, s	3.186		3.186		3.186		
Ped Vol Crossing Leg, #/h	0		0		0		
Ped Cap Adj	1.000		1.000		1.000		
Approach Delay, s/veh	1.3		4.1		9.1		
Approach LOS	A		A		A		
Lane	Left	Right	Bypass	Left	Right	Left	Right
Designated Moves	L	LTR	R	LT	R	L	TR
Assumed Moves	L	LTR	R	LT	R	L	TR
RT Channelized			Free				
Lane Util	0.530	0.470		0.211	0.789	0.665	0.335
Critical Headway, s	4.293	4.113		4.293	4.113	4.293	4.113
Entry Flow, veh/h	304	270	1913	4	15	296	149
Cap Entry Lane, veh/h	1127	1127	1900	905	918	735	756
Entry HV Adj Factor	1.001	0.999	1.000	1.000	1.000	1.000	1.000
Flow Entry, veh/h	304	270	1913	4	15	296	149
Cap Entry, veh/h	1127	1126	1900	905	918	735	756
V/C Ratio	0.270	0.240	1.007	0.004	0.016	0.403	0.197
Control Delay, s/veh	5.7	5.4	0.0	4.0	4.1	10.2	6.9
LOS	A	A	F	A	A	B	A
95th %tile Queue, veh	1	1	28	0	0	2	1

**Intersection**

Int Delay, s/veh 4.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↑↑		↑↑	
Traffic Vol, veh/h	490	75	34	15	26	243
Future Vol, veh/h	490	75	34	15	26	243
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	533	82	37	16	28	264

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	614	0	655	307
Stage 1	-	-	-	-	573	-
Stage 2	-	-	-	-	82	-
Critical Hdwy	-	-	4.1	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	975	-	404	695
Stage 1	-	-	-	-	533	-
Stage 2	-	-	-	-	938	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	975	-	389	695
Mov Cap-2 Maneuver	-	-	-	-	389	-
Stage 1	-	-	-	-	533	-
Stage 2	-	-	-	-	902	-

Approach	EB	WB	NB
HCM Control Delay, s	0	6.1	15.1
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	646	-	-	975	-
HCM Lane V/C Ratio	0.453	-	-	0.038	-
HCM Control Delay (s)	15.1	-	-	8.8	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	2.4	-	-	0.1	-

Lanes, Volumes, Timings

3: New Hampshire Ave (MD 650) & Schindler Drive/Mahan Road

08/16/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔	↔	↔		↔	↔	↔↔	↔
Traffic Volume (vph)	51	4	10	447	0	291	5	2498	37	25	2212	70
Future Volume (vph)	51	4	10	447	0	291	5	2498	37	25	2212	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	11	12	12	10	12	12	10	12	12
Storage Length (ft)	0		0	230		0	320		220	500		0
Storage Lanes	0		0	1		1	1		1	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	0.91	0.91	1.00	1.00	0.86	1.00	0.97	0.91	0.91
Frt		0.980				0.850			0.850		0.995	
Flt Protected		0.962		0.950	0.950		0.950			0.950		
Satd. Flow (prot)	0	1791	0	3176	1643	1615	1620	6285	1553	3143	4963	0
Flt Permitted		0.962		0.950	0.950		0.950			0.950		
Satd. Flow (perm)	0	1791	0	3176	1643	1615	1620	6285	1553	3143	4963	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4				300			95		3	
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		292			449			1203			1530	
Travel Time (s)		8.0			12.2			20.5			26.1	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	4%	4%	4%	4%	4%	4%
Adj. Flow (vph)	53	4	10	461	0	300	5	2575	38	26	2280	72
Shared Lane Traffic (%)				33%								
Lane Group Flow (vph)	0	67	0	309	152	300	5	2575	38	26	2352	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		22			30			23			31	
Link Offset(ft)		0			3			0			0	
Crosswalk Width(ft)		48			25			32			62	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.04	1.00	1.00	1.09	1.00	1.00	1.09	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1		1	1	1	1	1	1	1	1	1
Detector Template	Left			Left		Right	Left			Left		
Leading Detector (ft)	20	100		100	100	100	100	100	100	100	100	100
Trailing Detector (ft)	0	0		0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0		0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	100		100	100	100	100	100	100	100	100	100
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Turn Type	Split	NA		Split	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	3	3		4	4		1	5		6	2	
Permitted Phases						4			5			
Detector Phase	3	3		4	4	4	1	5	5	6	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	3.0	3.0	3.0	7.0	7.0	

Lanes, Volumes, Timings

3: New Hampshire Ave (MD 650) & Schindler Drive/Mahan Road

08/16/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Split (s)	12.5	12.5		12.0	12.0	12.0	8.5	8.5	8.5	13.0	13.0	
Total Split (s)	33.0	33.0		42.0	42.0	42.0	24.0	36.0	36.0	89.0	101.0	
Total Split (%)	16.5%	16.5%		21.0%	21.0%	21.0%	12.0%	18.0%	18.0%	44.5%	50.5%	
Maximum Green (s)	25.5	25.5		35.0	35.0	35.0	18.5	30.5	30.5	83.0	95.0	
Yellow Time (s)	3.5	3.5		3.5	3.5	3.5	3.5	3.5	3.5	4.5	4.5	
All-Red Time (s)	4.0	4.0		3.5	3.5	3.5	2.0	2.0	2.0	1.5	1.5	
Lost Time Adjust (s)		-1.5		-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	
Total Lost Time (s)		6.0		5.5	5.5	5.5	4.0	4.0	4.0	4.5	4.5	
Lead/Lag	Lead	Lead		Lag	Lag	Lag	Lead	Lead	Lead	Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	5.0	5.0	0.2	0.2	
Recall Mode	None	None		None	None	None	None	Max	Max	C-Max	C-Max	
Act Effct Green (s)		13.9		29.3	29.3	29.3	7.8	52.3	52.3	84.5	138.2	
Actuated g/C Ratio		0.07		0.15	0.15	0.15	0.04	0.26	0.26	0.42	0.69	
v/c Ratio		0.52		0.67	0.63	0.61	0.08	1.57	0.08	0.02	0.69	
Control Delay		98.1		87.3	91.5	11.8	94.8	301.3	0.3	13.8	6.2	
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		98.1		87.3	91.5	11.8	94.8	301.3	0.3	13.8	6.2	
LOS		F		F	F	B	F	F	A	B	A	
Approach Delay		98.1			58.4			296.5			6.3	
Approach LOS		F			E			F			A	
Queue Length 50th (ft)		82		215	210	0	7	~1382	0	5	151	
Queue Length 95th (ft)		140		263	292	95	25	#1611	0	m6	236	
Internal Link Dist (ft)		212			369			1123			1450	
Turn Bay Length (ft)				230			320		220	500		
Base Capacity (vph)		245		585	302	542	162	1644	476	1327	3431	
Starvation Cap Reductn		0		0	0	0	0	0	0	0	0	
Spillback Cap Reductn		0		0	0	0	0	0	0	0	0	
Storage Cap Reductn		0		0	0	0	0	0	0	0	0	
Reduced v/c Ratio		0.27		0.53	0.50	0.55	0.03	1.57	0.08	0.02	0.69	

Intersection Summary

Area Type: Other  
 Cycle Length: 200  
 Actuated Cycle Length: 200  
 Offset: 60 (30%), Referenced to phase 2:SBT and 6:SBL, Start of Green  
 Natural Cycle: 80  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.57  
 Intersection Signal Delay: 144.6  
 Intersection Capacity Utilization 71.3%  
 Analysis Period (min) 15  
 Intersection LOS: F  
 ICU Level of Service C

~ 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.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: New Hampshire Ave (MD 650) & Schindler Drive/Mahan Road

Ø1	Ø2 (R)	Ø3	Ø4
24 s	101 s	33 s	42 s
Ø5	Ø6 (R)		
36 s	89 s		

Lanes, Volumes, Timings

6: New Hampshire Ave (MD 650) & Powder Mill Road

08/16/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	179	96	132	481	76	298	102	2160	250	244	2451	62
Future Volume (vph)	179	96	132	481	76	298	102	2160	250	244	2451	62
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	12	12	12	12	12	12	12	12	12
Storage Length (ft)	0		0	425		50	225		100	250		0
Storage Lanes	1		1	1		1	1		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	0.91	0.91	1.00	1.00	0.91	1.00	1.00	0.91	0.91
Frt			0.850			0.850			0.850		0.996	
Flt Protected	0.950			0.950	0.971		0.950			0.950		
Satd. Flow (prot)	1685	1773	1507	3285	1679	1615	1736	4988	1553	1736	4968	0
Flt Permitted	0.950			0.950	0.971		0.950			0.950		
Satd. Flow (perm)	1685	1773	1507	3285	1679	1615	1736	4988	1553	1736	4968	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			145			142			106		3	
Link Speed (mph)		25			35			40			40	
Link Distance (ft)		217			757			487			2380	
Travel Time (s)		5.9			14.7			8.3			40.6	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	4%	4%	4%	4%	4%	4%
Adj. Flow (vph)	185	99	136	496	78	307	105	2227	258	252	2527	64
Shared Lane Traffic (%)				23%								
Lane Group Flow (vph)	185	99	136	382	192	307	105	2227	258	252	2591	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			28			20			12	
Link Offset(ft)		0			-14			10			0	
Crosswalk Width(ft)		16			28			58			28	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	1	1	1	1	1	0	1	1	0	
Detector Template	Left		Right	Left		Right	Left		Right	Left		
Leading Detector (ft)	100	100	100	100	100	100	100	0	100	100	0	
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	
Detector 1 Size(ft)	100	100	100	100	100	100	100	6	100	100	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Turn Type	Split	NA	Prot	Split	NA	Prot	Prot	NA	Perm	Prot	NA	
Protected Phases	3	3	3	4	4	4	1	5		6	2	
Permitted Phases									5			
Detector Phase	3	3	3	4	4	4	1	5	5	6	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	3.0	7.0	7.0	3.0	7.0	



Lanes, Volumes, Timings

6: New Hampshire Ave (MD 650) & Powder Mill Road

08/16/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Split (s)	11.5	11.5	11.5	12.0	12.0	12.0	9.0	14.0	14.0	10.0	14.0	
Total Split (s)	35.0	35.0	35.0	35.0	35.0	35.0	25.0	89.0	89.0	21.0	85.0	
Total Split (%)	19.4%	19.4%	19.4%	19.4%	19.4%	19.4%	13.9%	49.4%	49.4%	11.7%	47.2%	
Maximum Green (s)	28.5	28.5	28.5	28.0	28.0	28.0	19.0	82.0	82.0	14.0	78.0	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.5	4.5	4.5	4.5	4.5	
All-Red Time (s)	2.5	2.5	2.5	3.0	3.0	3.0	2.5	2.5	2.5	2.5	2.5	
Lost Time Adjust (s)	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	
Total Lost Time (s)	5.0	5.0	5.0	5.5	5.5	5.5	4.5	5.5	5.5	5.5	5.5	
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lag	Lead	Lead	Lead	Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	0.2	0.2	3.0	0.2	
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	
Act Effect Green (s)	25.5	25.5	25.5	27.7	27.7	27.7	17.0	89.7	89.7	15.5	89.2	
Actuated g/C Ratio	0.14	0.14	0.14	0.15	0.15	0.15	0.09	0.50	0.50	0.09	0.50	
v/c Ratio	0.77	0.39	0.40	0.76	0.74	0.83	0.64	0.90	0.31	1.69	1.05	
Control Delay	95.5	73.9	10.8	82.9	90.5	58.2	95.9	47.3	17.3	381.5	76.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	95.5	73.9	10.8	82.9	90.5	58.2	95.9	47.3	17.3	381.5	76.2	
LOS	F	E	B	F	F	E	F	D	B	F	E	
Approach Delay		63.0			76.0			46.3			103.3	
Approach LOS		E			E			D			F	
Queue Length 50th (ft)	213	108	0	237	237	196	121	896	106	-433	-1268	
Queue Length 95th (ft)	303	170	57	304	347	#342	191	#999	181	#629	#1410	
Internal Link Dist (ft)		137			677			407			2300	
Turn Bay Length (ft)				425		50	225		100	250		
Base Capacity (vph)	280	295	372	541	276	384	197	2486	827	149	2463	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.66	0.34	0.37	0.71	0.70	0.80	0.53	0.90	0.31	1.69	1.05	

Intersection Summary

Area Type: Other

Cycle Length: 180

Actuated Cycle Length: 180

Offset: 88 (49%), Referenced to phase 2:SBT and 5:NBT, Start of Green

Natural Cycle: 120

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.69

Intersection Signal Delay: 75.3

Intersection LOS: E

Intersection Capacity Utilization 85.9%

ICU Level of Service E

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: 6: New Hampshire Ave (MD 650) & Powder Mill Road

Ø1	Ø2 (R)	Ø3	Ø4
25 s	85 s	35 s	35 s
Ø5 (R)	Ø6		
89 s	21 s		



Lanes, Volumes, Timings

9: New Hampshire Ave (MD 650) & Northwest Drive/Michelson Road

08/16/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	6	0	20	154	21	427	10	2873	1	8	2122	25
Future Volume (vph)	6	0	20	154	21	427	10	2873	1	8	2122	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	280		0	225		0
Storage Lanes	0		0	1		1	1		0	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.86	0.86	0.97	0.91	0.91
Fit		0.896				0.850					0.998	
Fit Protected		0.989		0.950	0.963		0.950			0.950		
Satd. Flow (prot)	0	1684	0	1715	1738	1615	1736	6285	0	3367	4978	0
Fit Permitted		0.938		0.740	0.759		0.950			0.950		
Satd. Flow (perm)	0	1597	0	1336	1370	1615	1736	6285	0	3367	4978	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		120				222					2	
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		183			270			1530			1123	
Travel Time (s)		5.0			7.4			26.1			19.1	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	4%	4%	4%	4%	4%	4%
Adj. Flow (vph)	6	0	20	157	21	436	10	2932	1	8	2165	26
Shared Lane Traffic (%)				44%								
Lane Group Flow (vph)	0	26	0	88	90	436	10	2933	0	8	2191	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			48			27			30	
Link Offset(ft)		0			6			7			-10	
Crosswalk Width(ft)		40			45			33			53	
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1		1	1	1	1	0		1	1	0
Detector Template	Left			Left		Right	Left			Left		
Leading Detector (ft)	20	100		100	100	100	100	0		100		0
Trailing Detector (ft)	0	0		0	0	0	0	0		0		0
Detector 1 Position(ft)	0	0		0	0	0	0	0		0		0
Detector 1 Size(ft)	20	100		100	100	100	100	6		100		6
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex		CI+Ex		CI+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0		0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0		0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0		0.0
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA		Prot		NA
Protected Phases		4			8		1	6		5		2
Permitted Phases	4			8		8						
Detector Phase	4	4		8	8	8	1	6		5		2
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	3.0	7.0		5.0		7.0
Minimum Split (s)	13.0	13.0		13.0	13.0	13.0	12.0	14.0		14.0		14.0

Lanes, Volumes, Timings

9: New Hampshire Ave (MD 650) & Northwest Drive/Michelson Road

08/16/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (s)	42.0	42.0		42.0	42.0	42.0	20.0	113.0		45.0	138.0	
Total Split (%)	21.0%	21.0%		21.0%	21.0%	21.0%	10.0%	56.5%		22.5%	69.0%	
Maximum Green (s)	34.0	34.0		34.0	34.0	34.0	11.0	106.0		36.0	131.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.5		4.0	4.5	
All-Red Time (s)	4.0	4.0		4.0	4.0	4.0	5.0	2.5		5.0	2.5	
Lost Time Adjust (s)		-1.5		-1.5	-1.5	-1.5	-1.5	-1.5		-1.5	-1.5	
Total Lost Time (s)		6.5		6.5	6.5	6.5	7.5	5.5		7.5	5.5	
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	0.2		3.0	0.2	
Recall Mode	None	None		None	None	None	None	C-Max		None	C-Max	
Act Effect Green (s)		33.5		33.5	33.5	33.5	8.3	148.2		7.5	147.7	
Actuated g/C Ratio		0.17		0.17	0.17	0.17	0.04	0.74		0.04	0.74	
v/c Ratio		0.07		0.39	0.39	0.96	0.14	0.63		0.06	0.60	
Control Delay		0.4		79.1	78.9	71.5	154.2	17.1		102.8	19.9	
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.4	
Total Delay		0.4		79.1	78.9	71.5	154.2	17.1		102.8	20.3	
LOS		A		E	E	E	F	B		F	C	
Approach Delay		0.4			73.7			17.6			20.6	
Approach LOS		A			E			B			C	
Queue Length 50th (ft)		0		109	111	310	14	420		5	368	
Queue Length 95th (ft)		0		177	181	#536	m13	m245		m7	1014	
Internal Link Dist (ft)		103			190			1450			1043	
Turn Bay Length (ft)							280			225		
Base Capacity (vph)		382		237	243	469	108	4658		631	3676	
Starvation Cap Reductn		0		0	0	0	0	0		0	846	
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		0.07		0.37	0.37	0.93	0.09	0.63		0.01	0.77	

Intersection Summary

Area Type: Other

Cycle Length: 200

Actuated Cycle Length: 200

Offset: 60 (30%), Referenced to phase 2:SBT and 6:NBT, Start of Green

Natural Cycle: 75

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.96

Intersection Signal Delay: 24.6

Intersection LOS: C

Intersection Capacity Utilization 87.7%

ICU Level of Service E

Analysis Period (min) 15

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 9: New Hampshire Ave (MD 650) & Northwest Drive/Michelson Road

Ø1	Ø2 (R)	Ø4
20 s	138 s	42 s
Ø5	Ø6 (R)	Ø8
45 s	113 s	42 s

Lanes, Volumes, Timings  
 15: New Hampshire Ave (MD 650) & Lockwood Drive

08/16/2017

	↖	→	↘	↙	←	↖	↙	↑	↗	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↖	↖	↖↖	↖↖	↖	↖↖		↖	↖	↖↖↖	↖
Traffic Volume (vph)	245	430	212	740	275	150	307	2609	521	136	1406	190
Future Volume (vph)	245	430	212	740	275	150	307	2609	521	136	1406	190
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	11	12	11	12	12	12
Storage Length (ft)	150		180	0		215	300		225	315		0
Storage Lanes	1		1	2		1	2		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.91	0.91	1.00	0.86	0.86	1.00	0.97	0.86	1.00	1.00	0.91	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950	0.997		0.950	0.977		0.950			0.950		
Satd. Flow (prot)	1643	3448	1615	3105	3193	1615	3255	6285	1501	1703	4893	1524
Flt Permitted	0.950	0.997		0.950	0.977		0.950			0.950		
Satd. Flow (perm)	1643	3448	1615	3105	3193	1615	3255	6285	1501	1703	4893	1524
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			115			115			213			126
Link Speed (mph)		30			30			40			40	
Link Distance (ft)		537			500			1123			377	
Travel Time (s)		12.2			11.4			19.1			6.4	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	4%	4%	4%	6%	6%	6%
Adj. Flow (vph)	255	448	221	771	286	156	320	2718	543	142	1465	198
Shared Lane Traffic (%)	11%			32%								
Lane Group Flow (vph)	227	476	221	524	533	156	320	2718	543	142	1465	198
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		20			40			27			30	
Link Offset(ft)		-15			30			15			-15	
Crosswalk Width(ft)		26			23			35			25	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.04	1.00	1.04	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	1	1	0	0	1	0	0	1	0	0
Detector Template	Left			Left		Right	Left			Left		
Leading Detector (ft)	100	100	100	100	0	0	100	0	0	100	0	0
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	100	100	100	100	6	20	100	6	20	100	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	3	3		4	4		1	6		5	2	
Permitted Phases			3			4			6			2
Detector Phase	3	3	3	4	4	4	1	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	7.0	7.0	5.0	7.0	7.0

Lanes, Volumes, Timings

15: New Hampshire Ave (MD 650) & Lockwood Drive

08/16/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Split (s)	12.5	12.5	12.5	12.5	12.5	12.5	14.0	16.0	16.0	14.0	16.0	16.0
Total Split (s)	44.0	44.0	44.0	44.0	44.0	44.0	22.0	90.0	90.0	22.0	90.0	90.0
Total Split (%)	22.0%	22.0%	22.0%	22.0%	22.0%	22.0%	11.0%	45.0%	45.0%	11.0%	45.0%	45.0%
Maximum Green (s)	36.5	36.5	36.5	36.5	36.5	36.5	13.0	82.5	82.5	13.0	82.5	82.5
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.5	4.5	4.0	4.5	4.5
All-Red Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	5.0	3.0	3.0	5.0	3.0	3.0
Lost Time Adjust (s)	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	7.5	6.0	6.0	7.5	6.0	6.0
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	0.2	0.2	3.0	0.2	0.2
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effect Green (s)	35.4	35.4	35.4	38.6	38.6	38.6	16.5	84.0	84.0	16.5	84.0	84.0
Actuated g/C Ratio	0.18	0.18	0.18	0.19	0.19	0.19	0.08	0.42	0.42	0.08	0.42	0.42
v/c Ratio	0.78	0.78	0.58	0.87	0.87	0.39	1.20	1.03	0.72	1.01	0.71	0.28
Control Delay	97.3	88.0	41.4	94.2	92.9	23.3	192.4	65.0	26.4	163.5	50.4	14.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0
Total Delay	97.3	88.0	41.4	94.2	92.9	23.3	192.4	65.0	26.4	163.5	50.5	14.4
LOS	F	F	D	F	F	C	F	E	C	F	D	B
Approach Delay		79.2			84.5			70.5			55.4	
Approach LOS		E			F			E			E	
Queue Length 50th (ft)	314	329	128	395	401	45	-286	-1089	168	-219	585	58
Queue Length 95th (ft)	435	402	230	#508	#509	125	m#392	#1136	m325	#385	640	123
Internal Link Dist (ft)		457			420			1043			297	
Turn Bay Length (ft)	150		180			215	300		225	315		
Base Capacity (vph)	312	655	400	603	620	406	267	2639	753	140	2055	713
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	1	0	0	0	0	0	0	0	54	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.73	0.73	0.55	0.87	0.86	0.38	1.20	1.03	0.72	1.01	0.73	0.28

Intersection Summary

Area Type: Other

Cycle Length: 200

Actuated Cycle Length: 200

Offset: 22 (11%), Referenced to phase 2:SBT and 6:NBT, Start of Green

Natural Cycle: 140

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.20

Intersection Signal Delay: 70.2

Intersection LOS: E

Intersection Capacity Utilization 93.8%

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.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 15: New Hampshire Ave (MD 650) & Lockwood Drive

Ø1	Ø2 (R)	Ø3	Ø4
22 s	90 s	44 s	44 s
Ø5	Ø6 (R)		
22 s	90 s		

Lanes, Volumes, Timings

39: Columbia Pike (US 29) & Colesville Business Park Driveway/Lockwood Drive

08/16/2017

	↖	→	↘	↙	←	↖	↙	↑	↗	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖		↗	↖↗	↗			↑↑↑↑		↖	↑↑↑↑	
Traffic Volume (vph)	30	0	10	622	5	10	0	4717	0	5	3239	5
Future Volume (vph)	30	0	10	622	5	10	0	4717	0	5	3239	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	11	11	11	11	11	11
Storage Length (ft)	0		50	0		105	250		0	220		0
Storage Lanes	1		1	2		1	0		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.86	1.00	1.00	0.86	0.86
Fr			0.850		0.897							
Flt Protected	0.950			0.950						0.950		
Satd. Flow (prot)	1805	0	1615	3502	1704	0	0	6075	0	1694	6134	0
Flt Permitted	0.747			0.950						0.029		
Satd. Flow (perm)	1419	0	1615	3502	1704	0	0	6075	0	52	6134	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			24									
Link Speed (mph)		25			30			40			40	
Link Distance (ft)		156			227			370			609	
Travel Time (s)		4.3			5.2			6.3			10.4	
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
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	4%	4%	4%	3%	3%	3%
Adj. Flow (vph)	33	0	11	676	5	11	0	5127	0	5	3521	5
Shared Lane Traffic (%)												
Lane Group Flow (vph)	33	0	11	676	16	0	0	5127	0	5	3526	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		26			24			11			11	
Link Offset(ft)		-45			22			0			0	
Crosswalk Width(ft)		16			14			19			28	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.04	1.04	1.04	1.04	1.04	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1		0	1	1			0		0	0	
Detector Template												
Leading Detector (ft)	20		0	100	100			0		0	0	
Trailing Detector (ft)	0		0	0	0			0		0	0	
Detector 1 Position(ft)	0		0	0	0			0		0	0	
Detector 1 Size(ft)	20		100	100	100			6		80	6	
Detector 1 Type	CI+Ex		CI+Ex	CI+Ex	CI+Ex			CI+Ex		CI+Ex	CI+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0		0.0	0.0	0.0			0.0		0.0	0.0	
Detector 1 Queue (s)	0.0		0.0	0.0	0.0			0.0		0.0	0.0	
Detector 1 Delay (s)	0.0		0.0	0.0	0.0			0.0		0.0	0.0	
Turn Type	Perm		Prot	Perm	NA			NA		Perm	NA	
Protected Phases			4		8						2	
Permitted Phases	4			8				6		2		
Detector Phase	4		4	8	8			6		2	2	
Switch Phase												
Minimum Initial (s)	5.0		5.0	5.0	5.0			10.0		10.0	10.0	

Lanes, Volumes, Timings

39: Columbia Pike (US 29) & Colesville Business Park Driveway/Lockwood Drive

08/16/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Split (s)	12.0		12.0	12.0	12.0			17.0		17.0	17.0	
Total Split (s)	35.0		35.0	35.0	35.0			145.0		145.0	145.0	
Total Split (%)	19.4%		19.4%	19.4%	19.4%			80.6%		80.6%	80.6%	
Maximum Green (s)	28.0		28.0	28.0	28.0			138.0		138.0	138.0	
Yellow Time (s)	4.0		4.0	4.0	4.0			5.0		5.0	5.0	
All-Red Time (s)	3.0		3.0	3.0	3.0			2.0		2.0	2.0	
Lost Time Adjust (s)	-1.5		-1.5	-1.5	-1.5			-1.5		-1.5	-1.5	
Total Lost Time (s)	5.5		5.5	5.5	5.5			5.5		5.5	5.5	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	5.0		5.0	5.0	5.0			0.2		0.2	0.2	
Recall Mode	None		None	None	None			C-Max		C-Max	C-Max	
Act Effect Green (s)	29.5		29.5	29.5	29.5			139.5		139.5	139.5	
Actuated g/C Ratio	0.16		0.16	0.16	0.16			0.78		0.78	0.78	
v/c Ratio	0.14		0.04	1.18	0.06			1.09		0.12	0.74	
Control Delay	66.4		6.3	159.4	64.3			65.8		7.6	7.6	
Queue Delay	0.0		0.0	0.0	0.0			0.0		0.0	0.0	
Total Delay	66.4		6.3	159.4	64.3			65.8		7.6	7.6	
LOS	E		A	F	E			E		A	A	
Approach Delay		51.4				157.2		65.8			7.6	
Approach LOS		D				F		E			A	
Queue Length 50th (ft)	34		0	-490	16			-1970		1	283	
Queue Length 95th (ft)	72		8	#621	42			#1943		m1	m273	
Internal Link Dist (ft)		76			147			290			529	
Turn Bay Length (ft)			50							220		
Base Capacity (vph)	232		284	573	279			4708		40	4753	
Starvation Cap Reductn	0		0	0	0			0		0	0	
Spillback Cap Reductn	0		0	0	0			0		0	0	
Storage Cap Reductn	0		0	0	0			0		0	0	
Reduced v/c Ratio	0.14		0.04	1.18	0.06			1.09		0.13	0.74	

Intersection Summary

Area Type: Other

Cycle Length: 180

Actuated Cycle Length: 180

Offset: 88 (49%), Referenced to phase 2:SBTL and 6:NBT, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.18

Intersection Signal Delay: 50.6

Intersection LOS: D

Intersection Capacity Utilization 95.3%

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.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 39: Columbia Pike (US 29) & Colesville Business Park Driveway/Lockwood Drive

Ø2 (R)	Ø4
145 s	35 s
Ø6 (R)	Ø8
145 s	35 s



Lanes, Volumes, Timings  
66: Columbia Pike (US 29) & Stewart Lane

08/16/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	47	55	15	101	20	41	42	4452	440	699	3500	52
Future Volume (vph)	47	55	15	101	20	41	42	4452	440	699	3500	52
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	12	12	12	12	12	12
Storage Length (ft)	0		0	0		0	240		0	250		700
Storage Lanes	1		0	0		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	1.00	1.00	0.86	0.86
Frt		0.968				0.850			0.850			0.850
Flt Protected	0.950				0.960		0.950			0.950		
Satd. Flow (prot)	1745	1778	0	0	1763	1561	1736	4988	1553	1736	4713	1335
Flt Permitted	0.379				0.655		0.950			0.950		
Satd. Flow (perm)	696	1778	0	0	1203	1561	1736	4988	1553	1736	4713	1335
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		6				70			211			73
Link Speed (mph)		30			30			45			50	
Link Distance (ft)		274			223			422			4978	
Travel Time (s)		6.2			5.1			6.4			67.9	
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
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	4%	4%	4%	4%	4%	4%
Adj. Flow (vph)	51	60	16	110	22	45	46	4839	478	760	3804	57
Shared Lane Traffic (%)												10%
Lane Group Flow (vph)	51	76	0	0	132	45	46	4839	478	760	3810	51
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		11			40			20			20	
Link Offset(ft)		15			-15			5			-3	
Crosswalk Width(ft)		25			25			15			18	
Two way Left Turn Lane												
Headway Factor	1.04	1.04	1.04	1.04	1.04	1.04	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1		1	1	1	1	0	0	1	0	0
Detector Template				Left								
Leading Detector (ft)	35	35		20	35	35	80	0	0	80	0	0
Trailing Detector (ft)	0	0		0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0		0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	35	35		20	35	35	80	6	20	80	6	20
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA	Prot	Prot	NA	Prot
Protected Phases		4			8		5	2	2	1	6	6
Permitted Phases	4			8		8						
Detector Phase	4	4		8	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	3.0	7.0	7.0	3.0	7.0	7.0

Lanes, Volumes, Timings  
66: Columbia Pike (US 29) & Stewart Lane

08/16/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Split (s)	12.5	12.5		12.5	12.5	12.5	12.5	14.0	14.0	10.5	14.0	14.0
Total Split (s)	22.0	22.0		22.0	22.0	22.0	23.0	135.0	135.0	23.0	135.0	135.0
Total Split (%)	12.2%	12.2%		12.2%	12.2%	12.2%	12.8%	75.0%	75.0%	12.8%	75.0%	75.0%
Maximum Green (s)	14.5	14.5		14.5	14.5	14.5	15.5	128.0	128.0	15.5	128.0	128.0
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	3.5	5.0	5.0	3.5	5.0	5.0
All-Red Time (s)	3.5	3.5		3.5	3.5	3.5	4.0	2.0	2.0	4.0	2.0	2.0
Lost Time Adjust (s)	-1.5	-1.5			-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5
Total Lost Time (s)	6.0	6.0			6.0	6.0	6.0	5.5	5.5	6.0	5.5	5.5
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	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	3.0
Recall Mode	None	None		None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	16.0	16.0			16.0	16.0	11.6	129.5	129.5	17.0	137.6	137.6
Actuated g/C Ratio	0.09	0.09			0.09	0.09	0.06	0.72	0.72	0.09	0.76	0.76
v/c Ratio	0.84	0.47			1.25	0.22	0.41	1.35	0.41	4.66	1.06	0.05
Control Delay	152.4	81.6			228.2	6.9	95.7	172.8	0.5	1676.0	55.2	0.6
Queue Delay	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	152.4	81.6			228.2	6.9	95.7	172.8	0.5	1676.0	55.2	0.6
LOS	F	F			F	A	F	F	A	F	E	A
Approach Delay		110.1			172.0			156.8			321.1	
Approach LOS		F			F			F			F	
Queue Length 50th (ft)	60	80			~192	0	58	~2726	2	~1658	~1937	0
Queue Length 95th (ft)	#154	142			#346	17	m55 m#2384	m1	#1920	#2013	6	
Internal Link Dist (ft)		194			143			342			4898	
Turn Bay Length (ft)							240			250		700
Base Capacity (vph)	61	163			106	202	163	3588	1176	163	3602	1037
Starvation Cap Reductn	0	0			0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0			0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0			0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.84	0.47			1.25	0.22	0.28	1.35	0.41	4.66	1.06	0.05

Intersection Summary

Area Type: Other

Cycle Length: 180

Actuated Cycle Length: 180

Offset: 16 (9%), Referenced to phase 2:NBT and 6:SBT, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 4.66

Intersection Signal Delay: 230.3

Intersection LOS: F

Intersection Capacity Utilization 152.6%

ICU Level of Service H

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.

m Volume for 95th percentile queue is metered by upstream signal.













Splits and Phases: 66: Columbia Pike (US 29) & Stewart Lane

23 s	135 s	22 s
23 s	135 s	22 s



Lanes, Volumes, Timings  
74: Cherry Hill Road & FDA Boulevard

08/16/2017

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	579	400	350	1070	1616	451
Future Volume (vph)	579	400	350	1070	1616	451
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	300	250			400
Storage Lanes	2	1	1			1
Taper Length (ft)	25		25			
Lane Util. Factor	0.97	1.00	1.00	0.95	0.95	1.00
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	3502	1615	1805	3610	3610	1615
Flt Permitted	0.950		0.051			
Satd. Flow (perm)	3502	1615	97	3610	3610	1615
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		243				424
Link Speed (mph)	25			30	30	
Link Distance (ft)	933			373	580	
Travel Time (s)	25.4			8.5	13.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	643	444	389	1189	1796	501
Shared Lane Traffic (%)						
Lane Group Flow (vph)	643	444	389	1189	1796	501
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	24			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	37			48	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Number of Detectors	1	1	1	0	0	0
Detector Template	Left	Right				
Leading Detector (ft)	25	25	25	0	0	0
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	25	25	25	6	6	20
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Turn Type	Prot	Prot	pm+pt	NA	NA	Prot
Protected Phases	4	4	1	6	2	2
Permitted Phases			6			
Detector Phase	4	4	1	6	2	2
Switch Phase						
Minimum Initial (s)	7.0	7.0	3.0	7.0	7.0	7.0
Minimum Split (s)	13.0	13.0	9.0	13.0	13.0	13.0
Total Split (s)	46.0	46.0	26.0	104.0	78.0	78.0

Lanes, Volumes, Timings  
74: Cherry Hill Road & FDA Boulevard

08/16/2017

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Total Split (%)	30.7%	30.7%	17.3%	69.3%	52.0%	52.0%
Maximum Green (s)	40.0	40.0	20.0	98.0	72.0	72.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	0.2	0.2	0.2
Recall Mode	None	None	None	C-Max	C-Max	C-Max
Act Effct Green (s)	35.7	35.7	105.3	105.3	73.5	73.5
Actuated g/C Ratio	0.24	0.24	0.70	0.70	0.49	0.49
v/c Ratio	0.77	0.78	1.03	0.47	1.02	0.50
Control Delay	49.8	24.2	85.5	3.7	34.6	2.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.8	24.2	85.5	3.7	34.6	2.5
LOS	D	C	F	A	C	A
Approach Delay	39.3			23.8	27.6	
Approach LOS	D			C	C	
Queue Length 50th (ft)	239	128	~310	48	~683	22
Queue Length 95th (ft)	286	207	m#608	181	m493	m21
Internal Link Dist (ft)	853			293	500	
Turn Bay Length (ft)		300	250			400
Base Capacity (vph)	968	622	379	2535	1768	1007
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.66	0.71	1.03	0.47	1.02	0.50

Intersection Summary

Area Type: Other  
 Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBTL, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.03  
 Intersection Signal Delay: 29.0  
 Intersection Capacity Utilization 91.8%  
 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.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 74: Cherry Hill Road & FDA Boulevard

Ø1	Ø2 (R)	Ø4
26 s	78 s	46 s
Ø6 (R)		
104 s		

Lanes, Volumes, Timings

81: Cherry Hill Road & Plum Orchard Drive/Clover Patch Drive

08/16/2017

	↖	→	↗	↖	←	↖	↖	↑	↗	↘	↓	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑	↗	↖	↑↑		↖	↑↑		↖	↑↑	↗
Traffic Volume (vph)	150	85	655	15	45	10	413	1186	50	30	1397	145
Future Volume (vph)	150	85	655	15	45	10	413	1186	50	30	1397	145
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	250		0	0		0	215		0	150		500
Storage Lanes	1		1	1		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	1.00
Frt			0.850		0.973			0.994				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1805	1900	1615	1805	3513	0	1805	3588	0	1805	3610	1615
Flt Permitted	0.715			0.680			0.058			0.197		
Satd. Flow (perm)	1358	1900	1615	1292	3513	0	110	3588	0	374	3610	1615
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			342		11			6				161
Link Speed (mph)		25			25			30			30	
Link Distance (ft)		345			415			343			258	
Travel Time (s)		9.4			11.3			7.8			5.9	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	167	94	728	17	50	11	459	1318	56	33	1552	161
Shared Lane Traffic (%)												
Lane Group Flow (vph)	167	94	728	17	61	0	459	1374	0	33	1552	161
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		10			0			0			0	
Crosswalk Width(ft)		20			20			35			34	
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	0	0	1	0		1	0		0	0	1
Detector Template	Left			Left								Right
Leading Detector (ft)	30	0	0	30	0		40	0		0	0	20
Trailing Detector (ft)	0	0	0	0	0		10	0		0	0	0
Detector 1 Position(ft)	0	0	0	0	0		10	0		0	0	0
Detector 1 Size(ft)	30	6	20	30	6		30	6		20	6	20
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA		Perm	NA	Perm
Protected Phases		8			4		5	2			6	
Permitted Phases	8		8	4			2			6		6
Detector Phase	8	8	8	4	4		5	2		6	6	6
Switch Phase												
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0		3.0	7.0		7.0	7.0	7.0
Minimum Split (s)	9.5	9.5	9.5	9.5	9.5		9.0	13.5		13.5	13.5	13.5
Total Split (s)	47.0	47.0	47.0	47.0	47.0		34.0	103.0		69.0	69.0	69.0

Lanes, Volumes, Timings

81: Cherry Hill Road & Plum Orchard Drive/Clover Patch Drive

08/16/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (%)	31.3%	31.3%	31.3%	31.3%	31.3%		22.7%	68.7%		46.0%	46.0%	46.0%
Maximum Green (s)	40.5	40.5	40.5	40.5	40.5		28.0	96.5		62.5	62.5	62.5
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		4.0	4.5		4.5	4.5	4.5
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	-1.5	-1.5	-1.5	-1.5	-1.5		-1.5	-1.5		-1.5	-1.5	-1.5
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0		4.5	5.0		5.0	5.0	5.0
Lead/Lag							Lead			Lag	Lag	Lag
Lead-Lag Optimize?							Yes			Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		5.0	0.2		0.2	0.2	0.2
Recall Mode	None	None	None	None	None		None	C-Max		C-Max	C-Max	C-Max
Act Effct Green (s)	42.0	42.0	42.0	42.0	42.0		98.5	98.0		64.0	64.0	64.0
Actuated g/C Ratio	0.28	0.28	0.28	0.28	0.28		0.66	0.65		0.43	0.43	0.43
v/c Ratio	0.44	0.18	1.04	0.05	0.06		1.13	0.59		0.21	1.01	0.21
Control Delay	48.8	42.0	73.1	40.1	32.7		132.4	14.7		31.0	57.9	16.0
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	48.8	42.0	73.1	40.1	32.7		132.4	14.7		31.0	57.9	16.0
LOS	D	D	E	D	C		F	B		C	E	B
Approach Delay		66.1			34.3			44.1			53.6	
Approach LOS		E			C			D			D	
Queue Length 50th (ft)	135	70	~513	12	18		~467	203		30	~853	97
Queue Length 95th (ft)	211	120	#766	33	38		#690	378		m29	m740	m86
Internal Link Dist (ft)		265			335			263			178	
Turn Bay Length (ft)	250						215			150		500
Base Capacity (vph)	380	532	698	361	991		405	2346		159	1540	781
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	0
Reduced v/c Ratio	0.44	0.18	1.04	0.05	0.06		1.13	0.59		0.21	1.01	0.21

Intersection Summary

Area Type: Other

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 120 (80%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 120

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.13

Intersection Signal Delay: 52.2

Intersection LOS: D

Intersection Capacity Utilization 95.0%

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.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 81: Cherry Hill Road & Plum Orchard Drive/Clover Patch Drive

Ø2 (R)		Ø4
103 s		47 s
Ø5	Ø6 (R)	Ø8
34 s	69 s	47 s

Lanes, Volumes, Timings

84: Cherry Hill Road & Powder Mill Road (MD 212)

08/16/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	367	596	30	80	853	45	80	853	35	349	1326	436
Future Volume (vph)	367	596	30	80	853	45	80	853	35	349	1326	436
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	11	11	10	12	12	12	11	12	11
Storage Length (ft)	420		0	200		410	190		0	450		360
Storage Lanes	2		0	1		1	1		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frt		0.993				0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3335	3414	0	1646	3292	1422	1805	3610	1615	3385	3610	1561
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3335	3414	0	1646	3292	1422	1805	3610	1615	3385	3610	1561
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)		4				240						361
Link Speed (mph)		40			40			40			40	
Link Distance (ft)		605			616			491			636	
Travel Time (s)		10.3			10.5			8.4			10.8	
Peak Hour 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
Heavy Vehicles (%)	5%	5%	5%	6%	6%	6%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	367	596	30	80	853	45	80	853	35	349	1326	436
Shared Lane Traffic (%)												
Lane Group Flow (vph)	367	626	0	80	853	45	80	853	35	349	1326	436
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			28			30	
Link Offset(ft)		-12			10			0			1	
Crosswalk Width(ft)		28			36			16			31	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.04	1.04	1.09	1.00	1.00	1.00	1.04	1.00	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot	NA		Prot	NA	Free	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases						Free			4			8
Minimum Split (s)	11.0	27.0		11.0	27.0		13.0	13.0	13.0	14.0	14.0	14.0
Total Split (s)	23.0	55.0		17.0	49.0		13.0	52.0	52.0	26.0	65.0	65.0
Total Split (%)	15.3%	36.7%		11.3%	32.7%		8.7%	34.7%	34.7%	17.3%	43.3%	43.3%
Maximum Green (s)	18.0	48.0		12.0	42.0		8.0	46.0	46.0	21.0	59.0	59.0
Yellow Time (s)	4.0	5.0		4.0	5.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	2.0		1.0	2.0		1.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	-1.5	-1.5		-1.5	-1.5		-1.5	-1.5	-1.5	-1.5	-1.5	-1.5
Total Lost Time (s)	3.5	5.5		3.5	5.5		3.5	4.5	4.5	3.5	4.5	4.5
Lead/Lag	Lead	Lead		Lag	Lag		Lead	Lead	Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Act Effct Green (s)	19.5	49.5		13.5	43.5	150.0	9.5	47.5	47.5	22.5	60.5	60.5
Actuated g/C Ratio	0.13	0.33		0.09	0.29	1.00	0.06	0.32	0.32	0.15	0.40	0.40
v/c Ratio	0.85	0.55		0.54	0.89	0.03	0.70	0.75	0.07	0.69	0.91	0.52
Control Delay	82.0	43.2		42.5	27.0	0.0	99.0	50.7	36.4	38.0	21.8	1.5

Lanes, Volumes, Timings

84: Cherry Hill Road & Powder Mill Road (MD 212)

08/16/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	82.0	43.2		42.5	27.0	0.0	99.0	50.7	36.4	38.0	21.8	1.5
LOS	F	D		D	C	A	F	D	D	D	C	A
Approach Delay		57.5			27.0			54.2			20.3	
Approach LOS		E			C			D			C	
Queue Length 50th (ft)	184	263		75	331	0	78	394	24	153	460	24
Queue Length 95th (ft)	#263	327		m88	m#431	m0	#162	474	53	m162	m480	m25
Internal Link Dist (ft)		525			536			411			556	
Turn Bay Length (ft)	420			200		410	190			450		360
Base Capacity (vph)	433	1129		148	954	1422	114	1143	511	507	1456	845
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.85	0.55		0.54	0.89	0.03	0.70	0.75	0.07	0.69	0.91	0.52

Intersection Summary

Area Type: Other

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 9 (6%), Referenced to phase 2:WBT and 6:EBT, Start of Green

Natural Cycle: 100

Control Type: Pretimed

Maximum v/c Ratio: 0.91

Intersection Signal Delay: 35.4

Intersection LOS: D

Intersection Capacity Utilization 91.5%

ICU Level of Service F

Analysis Period (min) 15

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 84: Cherry Hill Road & Powder Mill Road (MD 212)

23 s	49 s	52 s	26 s
55 s	17 s	13 s	65 s

Lanes, Volumes, Timings  
 94: Columbia Pike (US 29) & Industrial Parkway

08/16/2017

	↙	↖	↑	↗	↘	↓
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↖↖	↖	↑↑↑		↖↖	↑↑↑
Traffic Volume (vph)	1486	362	3115	0	360	2765
Future Volume (vph)	1486	362	3115	0	360	2765
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	12	12
Storage Length (ft)	0	0		500	0	
Storage Lanes	2	1		0	2	
Taper Length (ft)	25				25	
Lane Util. Factor	0.97	1.00	0.91	1.00	0.97	0.91
Friction		0.850				
Flt Protected	0.950				0.950	
Satd. Flow (prot)	3385	1561	4988	0	3367	4988
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	3385	1561	4988	0	3367	4988
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		132				
Link Speed (mph)	30		50			50
Link Distance (ft)	156		386			541
Travel Time (s)	3.5		5.3			7.4
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	4%	4%	4%	4%
Adj. Flow (vph)	1564	381	3279	0	379	2911
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1564	381	3279	0	379	2911
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	10		50			50
Link Offset(ft)	25		-3			0
Crosswalk Width(ft)	20		65			30
Two way Left Turn Lane						
Headway Factor	1.04	1.04	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Number of Detectors	1	1	0		1	0
Detector Template						
Leading Detector (ft)	25	25	0		25	0
Trailing Detector (ft)	0	0	0		0	0
Detector 1 Position(ft)	0	0	0		0	0
Detector 1 Size(ft)	25	25	6		25	6
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex		CI+Ex	CI+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Turn Type	Prot	Prot	NA		Prot	NA
Protected Phases	8	8	6		5	2
Permitted Phases						
Detector Phase	8	8	6		5	2
Switch Phase						
Minimum Initial (s)	5.0	5.0	7.0		5.0	7.0



Lanes, Volumes, Timings  
 94: Columbia Pike (US 29) & Industrial Parkway

08/16/2017

	↙	↖	↑	↗	↘	↓
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Minimum Split (s)	24.5	24.5	15.0		11.0	14.0
Total Split (s)	53.0	53.0	81.0		16.0	97.0
Total Split (%)	35.3%	35.3%	54.0%		10.7%	64.7%
Maximum Green (s)	46.5	46.5	73.0		10.0	90.0
Yellow Time (s)	4.0	4.0	5.5		4.0	5.5
All-Red Time (s)	2.5	2.5	2.5		2.0	1.5
Lost Time Adjust (s)	-1.5	-1.5	-1.5		-1.5	-1.5
Total Lost Time (s)	5.0	5.0	6.5		4.5	5.5
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)	3.0	3.0	0.2		5.0	0.2
Recall Mode	None	None	C-Max		None	C-Max
Walk Time (s)	7.0	7.0				
Flash Dont Walk (s)	11.0	11.0				
Pedestrian Calls (#/hr)	0	0				
Act Effect Green (s)	48.0	48.0	74.5		11.5	91.5
Actuated g/C Ratio	0.32	0.32	0.50		0.08	0.61
v/c Ratio	1.44	0.65	1.32		1.47	0.96
Control Delay	219.9	2.2	181.2		276.1	36.6
Queue Delay	0.0	8.9	0.0		1.3	4.9
Total Delay	219.9	11.1	181.2		277.4	41.5
LOS	F	B	F		F	D
Approach Delay	179.0		181.2			68.7
Approach LOS	F		F			E
Queue Length 50th (ft)	~1036	9	~1516		~261	934
Queue Length 95th (ft)	m#923	m4	#1580		#369	1014
Internal Link Dist (ft)	76		306			461
Turn Bay Length (ft)						
Base Capacity (vph)	1083	589	2477		258	3042
Starvation Cap Reductn	0	171	0		0	120
Spillback Cap Reductn	0	0	0		23	0
Storage Cap Reductn	0	0	0		0	0
Reduced v/c Ratio	1.44	0.91	1.32		1.61	1.00

Intersection Summary

Area Type: Other  
 Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBT, Start of Green  
 Natural Cycle: 150  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.47  
 Intersection Signal Delay: 137.2  
 Intersection LOS: F  
 Intersection Capacity Utilization 126.2%  
 ICU Level of Service H  
 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.  
 m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings  
 94: Columbia Pike (US 29) & Industrial Parkway

08/16/2017

Splits and Phases: 94: Columbia Pike (US 29) & Industrial Parkway

#94 ↓ Ø2 (R)		
97 s		
#94 #95 ↘ → Ø5	#94 #95 ↑ ↓ ↗ Ø6 (R)	#94 #95 ↘ ↙ ↗ ↖ Ø8
16 s	81 s	53 s

Lanes, Volumes, Timings  
 95: Old Columbia Pike & Industrial Parkway

08/16/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↙	↑↑↑	↗			↗↗		↑↑	
Traffic Volume (vph)	0	230	130	25	1639	398	0	0	2229	15	505	209
Future Volume (vph)	0	230	130	25	1639	398	0	0	2229	15	505	209
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	16	11	11	16	12	12	11	12	12	12
Storage Length (ft)	0		0	50		500	0		0	0		100
Storage Lanes	0		0	1		1	0		2	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.91	1.00	1.00	1.00	0.88	0.95	0.95	0.95
Fr <sub>t</sub>		0.946				0.850			0.850		0.957	
Flt Protected				0.950							0.999	
Satd. Flow (prot)	0	3870	0	1745	5014	1830	0	0	2748	0	3451	0
Flt Permitted				0.950							0.999	
Satd. Flow (perm)	0	3870	0	1745	5014	1830	0	0	2748	0	3451	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		57				428			23		57	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		156			235			272			1014	
Travel Time (s)		3.5			5.3			6.2			23.0	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	0	247	140	27	1762	428	0	0	2397	16	543	225
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	387	0	27	1762	428	0	0	2397	0	784	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	1 veh	1 veh	Yes	Yes
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		10			15			0			0	
Link Offset(ft)		-10			10			10			-5	
Crosswalk Width(ft)		16			16			35			16	
Two way Left Turn Lane												
Headway Factor	0.85	0.85	0.85	1.04	1.04	0.85	1.00	1.00	1.04	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		1		1	2	1			1	1	2	
Detector Template				Left	Thru	Right			Right	Left	Thru	
Leading Detector (ft)		25		20	100	20			20	20	100	
Trailing Detector (ft)		0		0	0	0			0	0	0	
Detector 1 Position(ft)		0		0	0	0			0	0	0	
Detector 1 Size(ft)		25		20	6	20			20	20	6	
Detector 1 Type		CI+Ex		CI+Ex	CI+Ex	CI+Ex			CI+Ex	CI+Ex	CI+Ex	
Detector 1 Channel												
Detector 1 Extend (s)		0.0		0.0	0.0	0.0			0.0	0.0	0.0	
Detector 1 Queue (s)		0.0		0.0	0.0	0.0			0.0	0.0	0.0	
Detector 1 Delay (s)		0.0		0.0	0.0	0.0			0.0	0.0	0.0	
Detector 2 Position(ft)					94						94	
Detector 2 Size(ft)					6						6	
Detector 2 Type					CI+Ex						CI+Ex	
Detector 2 Channel												
Detector 2 Extend (s)					0.0						0.0	
Turn Type		NA		Split	NA	Prot			pt+ov	Perm	NA	
Protected Phases		5		8	8	8			8 6		6	












Lanes, Volumes, Timings  
 95: Old Columbia Pike & Industrial Parkway

08/16/2017

Lane Group	Ø2
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
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)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (mph)	
Number of Detectors	
Detector Template	
Leading Detector (ft)	
Trailing Detector (ft)	
Detector 1 Position(ft)	
Detector 1 Size(ft)	
Detector 1 Type	
Detector 1 Channel	
Detector 1 Extend (s)	
Detector 1 Queue (s)	
Detector 1 Delay (s)	
Detector 2 Position(ft)	
Detector 2 Size(ft)	
Detector 2 Type	
Detector 2 Channel	
Detector 2 Extend (s)	
Turn Type	
Protected Phases	2

Lanes, Volumes, Timings  
 95: Old Columbia Pike & Industrial Parkway

08/16/2017

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases										6		
Detector Phase		5		8	8	8			8 6	6	6	
Switch Phase												
Minimum Initial (s)		5.0		5.0	5.0	5.0				7.0	7.0	
Minimum Split (s)		11.0		24.5	24.5	24.5				15.0	15.0	
Total Split (s)		16.0		53.0	53.0	53.0				81.0	81.0	
Total Split (%)		10.7%		35.3%	35.3%	35.3%				54.0%	54.0%	
Maximum Green (s)		10.0		46.5	46.5	46.5				73.0	73.0	
Yellow Time (s)		4.0		4.0	4.0	4.0				5.5	5.5	
All-Red Time (s)		2.0		2.5	2.5	2.5				2.5	2.5	
Lost Time Adjust (s)		-1.5		-1.5	-1.5	-1.5					-1.5	
Total Lost Time (s)		4.5		5.0	5.0	5.0					6.5	
Lead/Lag		Lead								Lag	Lag	
Lead-Lag Optimize?		Yes								Yes	Yes	
Vehicle Extension (s)		5.0		3.0	3.0	3.0				0.2	0.2	
Recall Mode		None		None	None	None				C-Max	C-Max	
Walk Time (s)				7.0	7.0	7.0						
Flash Dont Walk (s)				11.0	11.0	11.0						
Pedestrian Calls (#/hr)				0	0	0						
Act Effct Green (s)		11.5		48.0	48.0	48.0			129.0		74.5	
Actuated g/C Ratio		0.08		0.32	0.32	0.32			0.86		0.50	
v/c Ratio		1.11		0.05	1.10	0.49			1.01		0.45	
Control Delay		93.3		35.7	101.5	5.2			33.1		23.5	
Queue Delay		2.2		0.0	0.8	0.0			27.6		2.1	
Total Delay		95.6		35.7	102.3	5.2			60.7		25.5	
LOS		F		D	F	A			E		C	
Approach Delay		95.6			82.7			60.7			25.5	
Approach LOS		F			F			E			C	
Queue Length 50th (ft)		~21		18	~713	0			~1242		237	
Queue Length 95th (ft)		m0		43	#808	77			#1532		292	
Internal Link Dist (ft)		76			155			192			934	
Turn Bay Length (ft)				50		500						
Base Capacity (vph)		349		558	1604	876			2366		1742	
Starvation Cap Reductn		62		0	0	0			157		0	
Spillback Cap Reductn		0		0	64	0			0		774	
Storage Cap Reductn		0		0	0	0			0		0	
Reduced v/c Ratio		1.35		0.05	1.14	0.49			1.09		0.81	
<b>Intersection Summary</b>												
Area Type:	Other											
Cycle Length:	150											
Actuated Cycle Length:	150											
Offset:	0 (0%), Referenced to phase 2:SBT and 6:NBT, Start of Green											
Natural Cycle:	150											
Control Type:	Actuated-Coordinated											
Maximum v/c Ratio:	1.47											
Intersection Signal Delay:	66.7						Intersection LOS: E					
Intersection Capacity Utilization:	122.9%						ICU Level of Service H					
Analysis Period (min):	15											
~ Volume exceeds capacity, queue is theoretically infinite.												

Lane Group	Ø2
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	7.0
Minimum Split (s)	14.0
Total Split (s)	97.0
Total Split (%)	65%
Maximum Green (s)	90.0
Yellow Time (s)	5.5
All-Red Time (s)	1.5
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	0.2
Recall Mode	C-Max
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	
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	
<b>Intersection Summary</b>	

Lanes, Volumes, Timings  
 95: Old Columbia Pike & Industrial Parkway

08/16/2017

- Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
- Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 95: Old Columbia Pike & Industrial Parkway

#94 ↓ 02 (R)			
97 s			
#94 #95 ↘ 05	#94 #95 ↑ ↓ 06 (R)	#94 #95 ↙ ↘ 08	
16 s	81 s	53 s	



Lanes, Volumes, Timings  
 96: Columbia Pike (US 29) & Tech Road

08/16/2017

	↖	→	↗	↖	←	↖	↖	↑	↗	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑	↗	↖	↕		↖	↑↑↑		↖	↑↑↑	↗
Traffic Volume (vph)	25	605	142	603	805	858	283	3194	0	309	2380	150
Future Volume (vph)	25	605	142	603	805	858	283	3194	0	309	2380	150
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	400		400	300		0
Storage Lanes	1		1	1		0	2		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	0.91	0.91	0.95	0.97	0.91	1.00	1.00	0.91	1.00
Frt			0.850		0.933							0.850
Flt Protected	0.950			0.950	0.994		0.950			0.950		
Satd. Flow (prot)	1805	1900	1615	1643	3207	0	3367	4988	0	1736	4988	1553
Flt Permitted	0.170			0.415	0.752		0.950			0.950		
Satd. Flow (perm)	323	1900	1615	718	2426	0	3367	4988	0	1736	4988	1553
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			161		108							124
Link Speed (mph)		30			30			50			50	
Link Distance (ft)		269			161			495			453	
Travel Time (s)		6.1			3.7			6.8			6.2	
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
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	4%	4%	4%	4%	4%	4%
Adj. Flow (vph)	27	658	154	655	875	933	308	3472	0	336	2587	163
Shared Lane Traffic (%)				41%								
Lane Group Flow (vph)	27	658	154	386	2077	0	308	3472	0	336	2587	163
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			9			38			50	
Link Offset(ft)		0			-10			12			0	
Crosswalk Width(ft)		50			28			15			16	
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	1	1	1		1	0		1	0	0
Detector Template							Left			Left	Thru	Right
Leading Detector (ft)	25	25	25	50	50		80	0		80	0	0
Trailing Detector (ft)	0	0	0	0	0		0	0		0	0	0
Detector 1 Position(ft)	0	0	0	0	0		0	0		0	0	0
Detector 1 Size(ft)	25	25	25	50	50		80	6		80	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Turn Type	Perm	NA	Prot	Perm	NA		Prot	NA		Prot	NA	Prot
Protected Phases		3	3		4		6	2		1	5	5
Permitted Phases	3			4								
Detector Phase	3	3	3	4	4		6	2		1	5	5
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0		3.0	7.0		4.0	7.0	7.0
Minimum Split (s)	12.0	12.0	12.0	12.0	12.0		10.5	14.5		11.5	14.5	14.5

Lanes, Volumes, Timings  
 96: Columbia Pike (US 29) & Tech Road

08/16/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (s)	30.0	30.0	30.0	50.0	50.0		20.0	54.0		46.0	80.0	80.0
Total Split (%)	16.7%	16.7%	16.7%	27.8%	27.8%		11.1%	30.0%		25.6%	44.4%	44.4%
Maximum Green (s)	22.0	22.0	22.0	42.0	42.0		12.5	46.5		39.5	72.5	72.5
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		5.0	5.5		4.0	5.5	5.5
All-Red Time (s)	4.0	4.0	4.0	4.0	4.0		2.5	2.0		2.5	2.0	2.0
Lost Time Adjust (s)	-1.5	-1.5	-1.5	-1.5	-1.5		-1.5	-1.5		-1.5	-1.5	-1.5
Total Lost Time (s)	6.5	6.5	6.5	6.5	6.5		6.0	6.0		5.0	6.0	6.0
Lead/Lag	Lead	Lead	Lead	Lag	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	4.0	4.0	4.0	4.0	4.0		3.0	0.2		4.0	0.2	0.2
Recall Mode	None	None	None	None	None		Max	C-Max		None	C-Max	C-Max
Act Effect Green (s)	23.5	23.5	23.5	43.5	43.5		14.0	50.1		38.9	74.0	74.0
Actuated g/C Ratio	0.13	0.13	0.13	0.24	0.24		0.08	0.28		0.22	0.41	0.41
v/c Ratio	0.64	2.65	0.44	2.23	3.11		1.18	2.50		0.90	1.26	0.23
Control Delay	131.4	780.6	11.9	600.8	972.1		179.8	703.4		81.5	172.7	23.0
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	131.4	780.6	11.9	600.8	972.1		179.8	703.4		81.5	172.7	23.0
LOS	F	F	B	F	F		F	F		F	F	C
Approach Delay		618.6			913.9			660.7			154.9	
Approach LOS		F			F			F			F	
Queue Length 50th (ft)	31	~1306	0	~804	~2306		~223	~2513		403	~1391	66
Queue Length 95th (ft)	#93	#1560	65	#1051	#2434		#330	#2552		m431	m#1436	m76
Internal Link Dist (ft)		189			81			415			373	
Turn Bay Length (ft)							400			300		
Base Capacity (vph)	42	248	350	173	668		261	1387		395	2050	711
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	0
Reduced v/c Ratio	0.64	2.65	0.44	2.23	3.11		1.18	2.50		0.85	1.26	0.23

Intersection Summary

Area Type: Other  
 Cycle Length: 180  
 Actuated Cycle Length: 180  
 Offset: 178 (99%), Referenced to phase 2:NBT and 5:SBT, Start of Green  
 Natural Cycle: 150  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 3.11  
 Intersection Signal Delay: 565.1  
 Intersection Capacity Utilization 175.5%  
 Analysis Period (min) 15  
 Intersection LOS: F  
 ICU Level of Service H

~ 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.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 96: Columbia Pike (US 29) & Tech Road



Lanes, Volumes, Timings  
107: Columbia Pike (US 29) & Cherry Hill Road

08/16/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	185	1067	31	189	1161	832	26	0	105	674	0	70
Future Volume (vph)	185	1067	31	189	1161	832	26	0	105	674	0	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	11	11	12	12	12	12	12	12	12
Storage Length (ft)	0		0	410		350	0		0	0		0
Storage Lanes	2		0	2		1	1		2	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	0.91	0.97	0.95	1.00	1.00	1.00	0.88	0.91	0.91	1.00
Frt		0.996				0.850			0.850		0.957	
Flt Protected	0.950			0.950			0.950			0.950	0.965	
Satd. Flow (prot)	3502	5166	0	3385	3490	1615	1805	0	2842	3285	1597	0
Flt Permitted	0.950			0.950			0.950			0.950	0.965	
Satd. Flow (perm)	3502	5166	0	3385	3490	1615	1805	0	2842	3285	1597	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4				861			153		156	
Link Speed (mph)		30			30			40			40	
Link Distance (ft)		368			689			473			677	
Travel Time (s)		8.4			15.7			8.1			11.5	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	197	1135	33	201	1235	885	28	0	112	717	0	74
Shared Lane Traffic (%)										26%		
Lane Group Flow (vph)	197	1168	0	201	1235	885	28	0	112	531	260	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		40			40			200			250	
Link Offset(ft)		0			15			10			0	
Crosswalk Width(ft)		16			0			30			35	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.04	1.04	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	0		1	0	0	1		1	1	0	
Detector Template												
Leading Detector (ft)	100	0		100	0	0	100		100	100	0	
Trailing Detector (ft)	0	0		0	0	0	0		0	0	0	
Detector 1 Position(ft)	0	0		0	0	0	0		0	0	0	
Detector 1 Size(ft)	100	6		100	6	20	100		100	100	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0	
Turn Type	Prot	NA		Prot	NA	Prot	Prot		Prot	Split	NA	
Protected Phases	1	6		5	2	2	3		3	4	4	
Permitted Phases												
Detector Phase	1	6		5	2	2	3		3	4	4	
Switch Phase												
Minimum Initial (s)	3.0	7.0		3.0	7.0	7.0	7.0		7.0	5.0	5.0	
Minimum Split (s)	10.0	16.0		10.0	16.0	16.0	15.5		15.5	26.0	26.0	

Lanes, Volumes, Timings

107: Columbia Pike (US 29) & Cherry Hill Road

08/16/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (s)	17.0	77.5		20.0	80.5	80.5	15.5		15.5	37.0	37.0	
Total Split (%)	11.3%	51.7%		13.3%	53.7%	53.7%	10.3%		10.3%	24.7%	24.7%	
Maximum Green (s)	10.0	68.5		13.0	71.5	71.5	7.0		7.0	29.0	29.0	
Yellow Time (s)	3.5	4.5		3.5	4.5	4.5	3.5		3.5	3.5	3.5	
All-Red Time (s)	3.5	4.5		3.5	4.5	4.5	5.0		5.0	4.5	4.5	
Lost Time Adjust (s)	-1.5	-1.5		-1.5	-1.5	-1.5	-1.5		-1.5	-1.5	-1.5	
Total Lost Time (s)	5.5	7.5		5.5	7.5	7.5	7.0		7.0	6.5	6.5	
Lead/Lag	Lag	Lead		Lag	Lead	Lead	Lead		Lead	Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes		Yes	Yes	Yes	
Vehicle Extension (s)	6.0	0.2		6.0	0.2	0.2	6.0		6.0	6.0	6.0	
Recall Mode	None	C-Max		None	C-Max	C-Max	None		None	None	None	
Act Effct Green (s)	11.5	70.2		14.5	73.2	73.2	8.5		8.5	30.3	30.3	
Actuated g/C Ratio	0.08	0.47		0.10	0.49	0.49	0.06		0.06	0.20	0.20	
v/c Ratio	0.74	0.48		0.61	0.73	0.72	0.27		0.37	0.80	0.58	
Control Delay	84.2	28.2		70.9	22.7	3.2	75.0		6.4	67.1	26.7	
Queue Delay	0.0	0.0		0.0	1.2	0.8	0.0		0.0	0.0	0.0	
Total Delay	84.2	28.2		70.9	23.9	4.0	75.0		6.4	67.1	26.7	
LOS	F	C		E	C	A	E		A	E	C	
Approach Delay		36.3			20.4			20.1			53.8	
Approach LOS		D			C			C			D	
Queue Length 50th (ft)	98	283		106	455	21	27		0	274	98	
Queue Length 95th (ft)	#151	325		m132	m463	m29	62		13	347	207	
Internal Link Dist (ft)		288			609			393			597	
Turn Bay Length (ft)				410		350						
Base Capacity (vph)	268	2418		327	1702	1228	102		305	667	449	
Starvation Cap Reductn	0	0		0	249	124	0		0	0	0	
Spillback Cap Reductn	0	0		0	0	0	0		0	0	0	
Storage Cap Reductn	0	0		0	0	0	0		0	0	0	
Reduced v/c Ratio	0.74	0.48		0.61	0.85	0.80	0.27		0.37	0.80	0.58	

Intersection Summary

Area Type: Other

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 111 (74%), Referenced to phase 2:WBT and 6:EBT, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.80

Intersection Signal Delay: 30.8

Intersection LOS: C

Intersection Capacity Utilization 74.2%

ICU Level of Service D

Analysis Period (min) 15

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 107: Columbia Pike (US 29) & Cherry Hill Road

Ø2 (R)	Ø1	Ø3	Ø4
80.5 s	17 s	15.5 s	37 s
Ø6 (R)	Ø5		
77.5 s	20 s		

Lanes, Volumes, Timings  
109: Prosperity Drive & Cherry Hill Road

08/16/2017

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑	↗	↙	↑↑	↙	↗
Traffic Volume (vph)	1674	172	109	-1726	456	233
Future Volume (vph)	1674	172	109	1726	456	233
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		250	400		0	0
Storage Lanes		1	1		1	1
Taper Length (ft)			25		25	
Lane Util. Factor	0.91	1.00	1.00	0.95	1.00	1.00
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	5187	1615	1805	3610	1805	1615
Flt Permitted			0.080		0.950	
Satd. Flow (perm)	5187	1615	152	3610	1805	1615
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		187				111
Link Speed (mph)	30			30	30	
Link Distance (ft)	689			612	401	
Travel Time (s)	15.7			13.9	9.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1820	187	118	1876	496	253
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1820	187	118	1876	496	253
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	38			30	12	
Link Offset(ft)	-12			8	0	
Crosswalk Width(ft)	30			30	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Number of Detectors	0	0	1	0	1	1
Detector Template			Left			Right
Leading Detector (ft)	0	0	80	0	80	80
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	6	80	80	6	80	80
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Turn Type	NA	Perm	pm+pt	NA	Prot	Prot
Protected Phases	6		5	2	4	4
Permitted Phases		6	2			
Detector Phase	6	6	5	2	4	4
Switch Phase						
Minimum Initial (s)	7.0	7.0	3.0	7.0	5.0	5.0
Minimum Split (s)	13.5	13.5	9.5	13.5	11.0	11.0
Total Split (s)	102.0	102.0	15.0	117.0	33.0	33.0

Lanes, Volumes, Timings  
109: Prosperity Drive & Cherry Hill Road

08/16/2017

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Total Split (%)	68.0%	68.0%	10.0%	78.0%	22.0%	22.0%
Maximum Green (s)	95.5	95.5	8.5	110.5	27.0	27.0
Yellow Time (s)	4.5	4.5	4.0	4.5	4.0	4.0
All-Red Time (s)	2.0	2.0	2.5	2.0	2.0	2.0
Lost Time Adjust (s)	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5
Total Lost Time (s)	5.0	5.0	5.0	5.0	4.5	4.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Vehicle Extension (s)	0.2	0.2	5.0	0.2	5.0	5.0
Recall Mode	C-Max	C-Max	None	C-Max	None	None
Act Effct Green (s)	97.0	97.0	112.0	112.0	28.5	28.5
Actuated g/C Ratio	0.65	0.65	0.75	0.75	0.19	0.19
v/c Ratio	0.54	0.17	0.53	0.70	1.45	0.64
Control Delay	4.8	0.8	26.0	4.5	260.1	39.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.8	0.8	26.0	4.6	260.1	39.0
LOS	A	A	C	A	F	D
Approach Delay	4.4			5.8	185.4	
Approach LOS	A			A	F	
Queue Length 50th (ft)	230	8	22	143	~658	130
Queue Length 95th (ft)	205	m10	m32	m161	#886	230
Internal Link Dist (ft)	609			532	321	
Turn Bay Length (ft)		250	400			
Base Capacity (vph)	3354	1110	223	2695	342	396
Starvation Cap Reductn	195	0	0	0	0	0
Spillback Cap Reductn	0	0	0	44	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.58	0.17	0.53	0.71	1.45	0.64

Intersection Summary

Area Type: Other  
 Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 100 (67%), Referenced to phase 2:WBTL and 6:EBT, Start of Green  
 Natural Cycle: 70  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.45  
 Intersection Signal Delay: 33.5  
 Intersection Capacity Utilization 80.9%  
 Analysis Period (min) 15  
 Intersection LOS: C  
 ICU Level of Service D

~ 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.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 109: Prosperity Drive & Cherry Hill Road

← 02 (R)	↖ 04
117 s	33 s
↙ 05	→ 06 (R)
15 s	102 s



Lanes, Volumes, Timings

114: Cherry Hill Road & Broadbirch Drive/Calverton Boulevard

08/16/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	365	900	253	100	386	310	126	1160	60	205	1219	483
Future Volume (vph)	365	900	253	100	386	310	126	1160	60	205	1219	483
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		500	300		200	175		0	300		100
Storage Lanes	1		1	1		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95	1.00	0.91	1.00
Frt			0.850			0.850		0.993				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1805	3610	1615	1805	3610	1615	1805	3585	0	1805	5187	1615
Flt Permitted	0.394			0.277			0.099			0.113		
Satd. Flow (perm)	749	3610	1615	526	3610	1615	188	3585	0	215	5187	1615
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			270			113		4				160
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		710			494			263			417	
Travel Time (s)		19.4			13.5			4.5			7.1	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	420	1034	291	115	444	356	145	1333	69	236	1401	555
Shared Lane Traffic (%)												
Lane Group Flow (vph)	420	1034	291	115	444	356	145	1402	0	236	1401	555
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		32			16			16			16	
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	1	1	1	1	1	0		1	0	1
Detector Template	Left		Right	Left		Right	Left			Left		Right
Leading Detector (ft)	80	80	20	80	80	80	80	0		80	0	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0		0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0		0	0	0
Detector 1 Size(ft)	80	80	20	80	80	80	80	6		80	6	20
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex		CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Turn Type	pm+pt	NA	NA	Perm	NA	Perm	pm+pt	NA		Perm	NA	NA
Protected Phases	1	6			2		7	4			8	
Permitted Phases	6			2		2	4			8		
Detector Phase	1	6		2	2	2	7	4		8	8	
Switch Phase												
Minimum Initial (s)	3.0	7.0		7.0	7.0	7.0	3.0	5.0		3.0	3.0	
Minimum Split (s)	9.0	13.5		13.5	13.5	13.5	9.5	11.0		9.0	9.0	
Total Split (s)	30.0	93.0		63.0	63.0	63.0	17.0	57.0		40.0	40.0	



Lanes, Volumes, Timings

114: Cherry Hill Road & Broadbirch Drive/Calverton Boulevard

08/16/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (%)	20.0%	62.0%		42.0%	42.0%	42.0%	11.3%	38.0%		26.7%	26.7%	
Maximum Green (s)	24.0	86.5		56.5	56.5	56.5	10.5	51.0		34.0	34.0	
Yellow Time (s)	4.0	4.5		4.5	4.5	4.5	4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.5	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.5	-1.5		-1.5	-1.5	-1.5	-1.5	-1.5		-1.5	-1.5	
Total Lost Time (s)	4.5	5.0		5.0	5.0	5.0	5.0	4.5		4.5	4.5	
Lead/Lag	Lead			Lag	Lag	Lag	Lead			Lag	Lag	
Lead-Lag Optimize?	Yes			Yes	Yes	Yes	Yes			Yes	Yes	
Vehicle Extension (s)	4.0	0.2		0.2	0.2	0.2	5.0	4.0		4.0	4.0	
Recall Mode	None	C-Max		C-Max	C-Max	C-Max	None	None		None	None	
Act Effect Green (s)	88.5	88.0	0.0	59.5	59.5	59.5	52.0	52.5		35.5	35.5	0.0
Actuated g/C Ratio	0.59	0.59	0.00	0.40	0.40	0.40	0.35	0.35		0.24	0.24	0.00
v/c Ratio	0.69	0.49	1.08	0.55	0.31	0.50	0.75	1.12		4.72	1.14	3.47
Control Delay	23.0	18.9	85.2	47.8	32.2	25.7	54.1	105.1		1724.4	111.1	1139.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	23.0	18.9	85.2	47.8	32.2	25.7	54.1	105.1		1724.4	111.1	1139.3
LOS	C	B	F	D	C	C	D	F		F	F	F
Approach Delay		30.9			31.6			100.3			545.1	
Approach LOS		C			C			F			F	
Queue Length 50th (ft)	211	296	~43	88	159	180	108	~840		~412	~591	~945
Queue Length 95th (ft)	273	334	#207	157	196	264	#182	#921		#562	#652	#1136
Internal Link Dist (ft)		630			414			183			337	
Turn Bay Length (ft)			500	300		200	175			300		100
Base Capacity (vph)	621	2117	270	208	1432	708	194	1257		50	1227	160
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.68	0.49	1.08	0.55	0.31	0.50	0.75	1.12		4.72	1.14	3.47

Intersection Summary

Area Type: Other

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 120 (80%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green

Natural Cycle: 50

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 4.72

Intersection Signal Delay: 223.9

Intersection LOS: F

Intersection Capacity Utilization 91.9%

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: 114: Cherry Hill Road & Broadbirch Drive/Calverton Boulevard

Ø1	Ø2 (R)	Ø4
30 s	63 s	57 s
Ø6 (R)	Ø8	Ø7
93 s	40 s	17 s

Lanes, Volumes, Timings  
 120: Columbia Pike (US 29) & Musgrove Road

08/16/2017

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	330	125	492	108	60	30	203	4592	168	25	2763	280
Future Volume (vph)	330	125	492	108	60	30	203	4592	168	25	2763	280
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	300		0	0		800
Storage Lanes	1		1	1		0	2		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.86	0.86	1.00	0.86	0.86
Frt			0.850		0.949			0.995			0.986	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1805	1900	1615	1805	1803	0	3367	6253	0	1736	6197	0
Flt Permitted	0.646			0.578			0.950			0.950		
Satd. Flow (perm)	1227	1900	1615	1098	1803	0	3367	6253	0	1736	6197	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			120		14			7			20	
Link Speed (mph)		30			30			50			50	
Link Distance (ft)		537			573			626			2274	
Travel Time (s)		12.2			13.0			8.5			31.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	4%	4%	4%	4%	4%	4%
Adj. Flow (vph)	359	136	535	117	65	33	221	4991	183	27	3003	304
Shared Lane Traffic (%)												
Lane Group Flow (vph)	359	136	535	117	98	0	221	5174	0	27	3307	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			50			40	
Link Offset(ft)		0			0			10			-2	
Crosswalk Width(ft)		16			2			25			16	
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	1	1	0		1	0		1	0	
Detector Template												
Leading Detector (ft)	100	100	100	100	0		100	0		100	0	
Trailing Detector (ft)	0	0	0	0	0		0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0		0	0		0	0	
Detector 1 Size(ft)	100	100	100	100	100		100	0		100	0	
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Turn Type	Perm	NA	Perm	Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		6	2		1	5	
Permitted Phases	4		4	8								
Detector Phase	4	4	4	8	8		6	2		1	5	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		3.0	20.0		3.0	20.0	
Minimum Split (s)	11.0	11.0	11.0	11.0	11.0		10.0	27.0		9.0	27.0	

Lanes, Volumes, Timings  
 120: Columbia Pike (US 29) & Musgrove Road

08/16/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (s)	51.0	51.0	51.0	51.0	51.0		25.0	117.0		12.0	104.0	
Total Split (%)	28.3%	28.3%	28.3%	28.3%	28.3%		13.9%	65.0%		6.7%	57.8%	
Maximum Green (s)	45.0	45.0	45.0	45.0	45.0		18.0	110.0		6.0	97.0	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		5.0	5.0		4.0	5.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.5	-1.5	-1.5	-1.5	-1.5		-1.5	-1.5		-1.5	-1.5	
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5		5.5	5.5		4.5	5.5	
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	3.0	
Recall Mode	None	None	None	None	None		None	C-Max		None	C-Max	
Act Effect Green (s)	46.5	46.5	46.5	46.5	46.5		17.7	113.9		7.4	100.3	
Actuated g/C Ratio	0.26	0.26	0.26	0.26	0.26		0.10	0.63		0.04	0.56	
v/c Ratio	1.14	0.28	1.06	0.41	0.21		0.67	1.31		0.38	0.96	
Control Delay	149.9	55.2	103.5	60.8	46.0		59.7	188.8		136.7	34.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	149.9	55.2	103.5	60.8	46.0		59.7	188.8		136.7	34.4	
LOS	F	E	F	E	D		E	F		F	C	
Approach Delay		113.3			54.0			183.5			35.2	
Approach LOS		F			D			F			D	
Queue Length 50th (ft)	~490	130	~579	116	78		139	~2341		32	1196	
Queue Length 95th (ft)	#708	198	#826	187	135		m80	m900		m41	1215	
Internal Link Dist (ft)		457			493			546			2194	
Turn Bay Length (ft)							300					
Base Capacity (vph)	316	490	506	283	476		364	3959		72	3462	
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	
Reduced v/c Ratio	1.14	0.28	1.06	0.41	0.21		0.61	1.31		0.38	0.96	

Intersection Summary

Area Type: Other

Cycle Length: 180

Actuated Cycle Length: 180

Offset: 140 (78%), Referenced to phase 2:NBT and 5:SBT, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.31

Intersection Signal Delay: 123.9

Intersection LOS: F

Intersection Capacity Utilization 111.8%

ICU Level of Service H

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.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 120: Columbia Pike (US 29) & Musgrove Road

Ø1 12 s	Ø2 (R) 117 s	Ø4 51 s
Ø6 25 s	Ø5 (R) 104 s	Ø8 51 s

Lanes, Volumes, Timings  
 123: Columbia Pike (US 29) & Fairland Road

08/16/2017

	↖	→	↘	↙	←	↖	↘	↑	↗	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↖↖	↗	↘	↖↖	↗	↘	↑↑↑			↓↓↓↓	
Traffic Volume (vph)	620	470	92	83	250	135	138	4716	98	0	2893	0
Future Volume (vph)	620	470	92	83	250	135	138	4716	98	0	2893	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	325		0	0		0
Storage Lanes	1		1	1		1	1		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.91	0.91	1.00	0.91	0.91	1.00	1.00	0.86	0.86	1.00	0.81	1.00
Flt Protected	0.950	0.982	0.850	0.950	0.998	0.950	0.997					
Satd. Flow (prot)	1643	3396	1615	1643	3451	1615	1736	6266	0	0	7399	0
Flt Permitted	0.950	0.982	0.950	0.950	0.998	0.950						
Satd. Flow (perm)	1643	3396	1615	1643	3451	1615	1736	6266	0	0	7399	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			127			127		4				
Link Speed (mph)		30			30			50			50	
Link Distance (ft)		414			440			2274			551	
Travel Time (s)		9.4			10.0			31.0			7.5	
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
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	4%	4%	4%	4%	4%	4%
Adj. Flow (vph)	674	511	100	90	272	147	150	5126	107	0	3145	0
Shared Lane Traffic (%)	43%			10%								
Lane Group Flow (vph)	384	801	100	81	281	147	150	5233	0	0	3145	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			40			40	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	1	1	1	1	1	0				0
Detector Template												
Leading Detector (ft)	100	100	100	100	100	100	100	0			0	
Trailing Detector (ft)	0	0	0	0	0	0	0	0			0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0			0	
Detector 1 Size(ft)	100	100	100	100	100	100	100	6			6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0	
Turn Type	Split	NA	Prot	Split	NA	Prot	Prot	NA			NA	
Protected Phases	3	3	3	4	4	4	1	6			2	
Permitted Phases												
Detector Phase	3	3	3	4	4	4	1	6			2	
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	5.0	10.0			10.0	
Minimum Split (s)	12.5	12.5	12.5	12.5	12.5	12.5	13.5	17.0			17.0	

Lanes, Volumes, Timings  
123: Columbia Pike (US 29) & Fairland Road

08/16/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (s)	30.0	30.0	30.0	26.0	26.0	26.0	24.0	124.0			100.0	
Total Split (%)	16.7%	16.7%	16.7%	14.4%	14.4%	14.4%	13.3%	68.9%			55.6%	
Maximum Green (s)	21.5	21.5	21.5	17.5	17.5	17.5	15.5	117.0			93.0	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	5.0			5.0	
All-Red Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	2.0			2.0	
Lost Time Adjust (s)	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5			-1.5	
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	5.5			5.5	
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lag	Lead				Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes				Yes	
Vehicle Extension (s)	4.0	4.0	4.0	4.0	4.0	4.0	5.0	0.2			0.2	
Recall Mode	None	None	None	None	None	None	None	C-Max			C-Max	
Act Effect Green (s)	23.0	23.0	23.0	18.7	18.7	18.7	17.3	118.8			94.5	
Actuated g/C Ratio	0.13	0.13	0.13	0.10	0.10	0.10	0.10	0.66			0.52	
v/c Ratio	1.84	1.85	0.32	0.48	0.78	0.52	0.90	1.27			0.81	
Control Delay	432.9	429.1	6.8	85.8	94.3	23.0	65.7	157.8			37.5	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0	
Total Delay	432.9	429.1	6.8	85.8	94.3	23.0	65.7	157.8			37.5	
LOS	F	F	A	F	F	C	E	F			D	
Approach Delay		397.4			72.4			155.2			37.5	
Approach LOS		F			E			F			D	
Queue Length 50th (ft)	-749	-784	0	101	180	22	175	~2241			746	
Queue Length 95th (ft)	#994	#928	32	170	240	99	m131	m1171			770	
Internal Link Dist (ft)		334			360			2194			471	
Turn Bay Length (ft)							325					
Base Capacity (vph)	209	433	317	173	364	284	166	4136			3884	
Starvation Cap Reductn	0	0	0	0	0	0	0	0			0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0			0	
Storage Cap Reductn	0	0	0	0	0	0	0	0			0	
Reduced v/c Ratio	1.84	1.85	0.32	0.47	0.77	0.52	0.90	1.27			0.81	

Intersection Summary

Area Type: Other  
 Cycle Length: 180  
 Actuated Cycle Length: 180  
 Offset: 88 (49%), Referenced to phase 2:SBT and 6:NBT, Start of Green  
 Natural Cycle: 150  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.85  
 Intersection Signal Delay: 145.4  
 Intersection Capacity Utilization 115.3%  
 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.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 123: Columbia Pike (US 29) & Fairland Road

Ø1	Ø2 (R)	Ø3	Ø4
24 s	100 s	30 s	26 s
Ø6 (R)			
124 s			

Lanes, Volumes, Timings

130: Centerpark Driveway/Beltsville Drive & Powder Mill Road (MD 212)

08/16/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	296	1036	30	30	1024	646	20	30	75	1160	10	233
Future Volume (vph)	296	1036	30	30	1024	646	20	30	75	1160	10	233
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	16	12	12	12	12	12	12	12	12	12
Storage Length (ft)	350		360	350		0	0		0	0		250
Storage Lanes	1		1	1		1	0		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.95	0.95	1.00	0.91	0.91	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950				0.980		0.950	0.954	
Satd. Flow (prot)	1646	3292	1727	1703	3406	1524	0	3538	1615	3285	1649	1615
Flt Permitted	0.068			0.208				0.980		0.950	0.954	
Satd. Flow (perm)	118	3292	1727	373	3406	1524	0	3538	1615	3285	1649	1615
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			102			497			138			218
Link Speed (mph)		40			40			35				35
Link Distance (ft)		921			477			217				528
Travel Time (s)		15.7			8.1			4.2				10.3
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
Heavy Vehicles (%)	6%	6%	6%	6%	6%	6%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	322	1126	33	33	1113	702	22	33	82	1261	11	253
Shared Lane Traffic (%)										33%		
Lane Group Flow (vph)	322	1126	33	33	1113	702	0	55	82	845	427	253
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		18			18			30			30	
Link Offset(ft)		5			-5			-25			15	
Crosswalk Width(ft)		30			20			17			37	
Two way Left Turn Lane												
Headway Factor	1.04	1.04	0.85	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	1	1	1	1	1	1	1	1	1	1
Detector Template							Left		Right			
Leading Detector (ft)	30	300	5	30	300	5	20	30	5	30	30	5
Trailing Detector (ft)	0	294	0	0	394	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	294	0	0	394	0	0	0	0	0	0	0
Detector 1 Size(ft)	30	6	5	30	-94	5	20	30	5	30	30	5
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	1	6		5	2		4	4		8	8	
Permitted Phases	6		6	2		2			4			8
Detector Phase	1	6	6	5	2	2	4	4	4	8	8	8
Switch Phase												
Minimum Initial (s)	5.0	20.0	20.0	5.0	20.0	20.0	7.0	7.0	7.0	8.0	8.0	8.0



Lanes, Volumes, Timings

130: Centerpark Driveway/Beltsville Drive & Powder Mill Road (MD 212)

08/16/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Split (s)	10.0	26.0	26.0	10.0	26.0	26.0	13.0	13.0	13.0	14.0	14.0	14.0
Total Split (s)	31.0	80.0	80.0	10.0	59.0	59.0	13.0	13.0	13.0	47.0	47.0	47.0
Total Split (%)	20.7%	53.3%	53.3%	6.7%	39.3%	39.3%	8.7%	8.7%	8.7%	31.3%	31.3%	31.3%
Maximum Green (s)	26.0	74.0	74.0	5.0	53.0	53.0	7.0	7.0	7.0	41.0	41.0	41.0
Yellow Time (s)	4.0	5.0	5.0	4.0	5.0	5.0	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	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5		-1.5	-1.5	-1.5	-1.5	-1.5
Total Lost Time (s)	3.5	4.5	4.5	3.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?												
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
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	None
Act Effct Green (s)	87.1	78.1	78.1	63.3	55.7	55.7		8.5	8.5	41.9	41.9	41.9
Actuated g/C Ratio	0.58	0.52	0.52	0.42	0.37	0.37		0.06	0.06	0.28	0.28	0.28
v/c Ratio	0.94	0.66	0.03	0.15	0.88	0.80		0.28	0.37	0.92	0.93	0.42
Control Delay	61.5	26.1	0.7	17.7	53.6	19.7		71.5	4.9	68.1	79.5	10.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Delay	61.5	26.1	0.7	17.7	53.6	19.7		71.5	4.9	68.1	79.5	10.2
LOS	E	C	A	B	D	B		E	A	E	E	B
Approach Delay		33.3			40.1			31.6				61.7
Approach LOS		C			D			C				E
Queue Length 50th (ft)	194	544	0	14	541	198		27	0	440	446	25
Queue Length 95th (ft)	#440	631	m2	30	#646	398		53	2	#563	#671	100
Internal Link Dist (ft)		841			397			137			448	
Turn Bay Length (ft)	350		360	350								250
Base Capacity (vph)	348	1712	947	215	1264	878		200	221	930	467	613
Starvation Cap Reductn	0	0	0	0	0	0		0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0		0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0		0	0	0	0	0
Reduced v/c Ratio	0.93	0.66	0.03	0.15	0.88	0.80		0.28	0.37	0.91	0.91	0.41

Intersection Summary

Area Type: Other

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 79 (53%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.94

Intersection Signal Delay: 44.4

Intersection LOS: D

Intersection Capacity Utilization 84.3%

ICU Level of Service E

Analysis Period (min) 15

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 130: Centerpark Driveway/Beltsville Drive & Powder Mill Road (MD 212)

Ø1	Ø2 (R)	Ø4	Ø8
31 s	59 s	13 s	47 s
Ø5	Ø6 (R)		
10 s	80 s		



Lanes, Volumes, Timings

160: New Hampshire Ave (MD 650) & Quaint Acres Drive/Heartfields Drive

08/16/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔	↗	↖	↑↑↑		↖	↑↑↑	
Traffic Volume (vph)	5	0	1	26	0	21	17	2700	41	32	1553	10
Future Volume (vph)	5	0	1	26	0	21	17	2700	41	32	1553	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	9	12	12	12	12	12	11	12	12	11	12
Storage Length (ft)	0		0	65		0	225		0	235		0
Storage Lanes	0		0	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Frt		0.977				0.850		0.998			0.999	
Flt Protected		0.960			0.950		0.950			0.950		
Satd. Flow (prot)	0	1604	0	0	1805	1615	1736	4812	0	1736	4816	0
Flt Permitted		0.742			0.754		0.950			0.950		
Satd. Flow (perm)	0	1240	0	0	1433	1615	1736	4812	0	1736	4816	0
Right Turn on Red			Yes			Yes			No			No
Satd. Flow (RTOR)		82				82						
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		249			185			622			424	
Travel Time (s)		6.8			5.0			10.6			7.2	
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
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	4%	4%	4%	4%	4%	4%
Adj. Flow (vph)	5	0	1	28	0	23	18	2935	45	35	1688	11
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	6	0	0	28	23	18	2980	0	35	1699	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			18			18	
Link Offset(ft)		-2			14			5			0	
Crosswalk Width(ft)		10			18			26			22	
Two way Left Turn Lane												
Headway Factor	1.00	1.14	1.00	1.00	1.00	1.00	1.00	1.04	1.00	1.00	1.04	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1		1	2	1	1	0		1	0	
Detector Template	Left			Left								
Leading Detector (ft)	20	20		20	100	40	80	0		80	0	
Trailing Detector (ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Size(ft)	20	20		20	40	40	80	6		80	6	
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex		CI+Ex	CI+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)					94							
Detector 2 Size(ft)					6							
Detector 2 Type					CI+Ex							
Detector 2 Channel												
Detector 2 Extend (s)					0.0							
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA		Prot	NA	

Lanes, Volumes, Timings

160: New Hampshire Ave (MD 650) & Quaint Acres Drive/Heartfields Drive

08/16/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases		4			8	8	1	6		5	2	
Permitted Phases	4			8		8						
Detector Phase	4	4		8	8	8	1	6		5	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	10.0		5.0	10.0	
Minimum Split (s)	11.5	11.5		11.5	11.5	11.5	11.0	22.5		11.0	22.5	
Total Split (s)	12.4	12.4		12.4	12.4	12.4	11.0	96.6		11.0	96.6	
Total Split (%)	10.3%	10.3%		10.3%	10.3%	10.3%	9.2%	80.5%		9.2%	80.5%	
Maximum Green (s)	5.9	5.9		5.9	5.9	5.9	5.0	90.6		5.0	90.6	
Yellow Time (s)	3.5	3.5		3.5	3.5	3.5	3.5	4.5		3.5	4.5	
All-Red Time (s)	3.0	3.0		3.0	3.0	3.0	2.5	1.5		2.5	1.5	
Lost Time Adjust (s)		-1.5			-1.5	-1.5	-1.5	-1.5		-1.5	-1.5	
Total Lost Time (s)		5.0			5.0	5.0	4.5	4.5		4.5	4.5	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	5.0	5.0		5.0	5.0	5.0	5.0	0.2		5.0	0.2	
Recall Mode	None	None		None	None	None	None	C-Max		None	C-Max	
Act Effect Green (s)		7.4			7.4	7.4	7.0	99.9		7.0	102.1	
Actuated g/C Ratio		0.06			0.06	0.06	0.06	0.83		0.06	0.85	
v/c Ratio		0.04			0.32	0.13	0.18	0.74		0.35	0.41	
Control Delay		0.5			63.9	1.5	58.6	7.9		64.6	3.4	
Queue Delay		0.0			0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay		0.5			63.9	1.5	58.6	7.9		64.6	3.4	
LOS		A			E	A	E	A		E	A	
Approach Delay		0.5			35.8			8.2			4.6	
Approach LOS		A			D			A			A	
Queue Length 50th (ft)		0			21	0	14	436		27	73	
Queue Length 95th (ft)		0			53	0	38	497		62	169	
Internal Link Dist (ft)		169			105			542			344	
Turn Bay Length (ft)							225			235		
Base Capacity (vph)		153			88	176	101	4005		101	4096	
Starvation Cap Reductn		0			0	0	0	0		0	0	
Spillback Cap Reductn		0			0	0	0	0		0	0	
Storage Cap Reductn		0			0	0	0	0		0	0	
Reduced v/c Ratio		0.04			0.32	0.13	0.18	0.74		0.35	0.41	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBT, Start of Green

Natural Cycle: 80

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.74

Intersection Signal Delay: 7.2

Intersection LOS: A

Intersection Capacity Utilization 73.5%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 160: New Hampshire Ave (MD 650) & Quaint Acres Drive/Heartfields Drive

11 s	96.6 s	12.4 s
11 s	96.6 s	12.4 s

Lanes, Volumes, Timings  
170: Tech Road & Industrial Parkway

08/16/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	749	1305	25	5	1204	940	150	210	15	346	50	380
Future Volume (vph)	749	1305	25	5	1204	940	150	210	15	346	50	380
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	12	12	12	12	12	12	12	12
Storage Length (ft)	425		425	0		500	0		0	0		0
Storage Lanes	2		0	0		1	0		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	0.95	0.95	0.95	1.00	0.95	0.95	0.95	0.91	0.91	0.95
Frts		0.997				0.850		0.994			0.887	
Flt Protected	0.950							0.980		0.950	0.993	
Satd. Flow (prot)	3385	3479	0	0	3610	1615	0	3517	0	1643	3046	0
Flt Permitted	0.062				0.948			0.980		0.950	0.993	
Satd. Flow (perm)	221	3479	0	0	3422	1615	0	3517	0	1643	3046	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2				598		2			331	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		546			886			326			280	
Travel Time (s)		12.4			20.1			7.4			6.4	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	797	1388	27	5	1281	1000	160	223	16	368	53	404
Shared Lane Traffic (%)										21%		
Lane Group Flow (vph)	797	1415	0	0	1286	1000	0	399	0	291	534	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		22			16			10			12	
Link Offset(ft)		0			-5			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.04	1.04	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100	20	20	100		20	100	
Trailing Detector (ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Size(ft)	20	6		20	6	20	20	6		20	6	
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex		CI+Ex	CI+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		CI+Ex			CI+Ex			CI+Ex			CI+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA	Free	Split	NA		Split	NA	
Protected Phases	1	6			2		4	4		8	8	

Lanes, Volumes, Timings  
170: Tech Road & Industrial Parkway

08/16/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	6			2		Free						
Detector Phase	1	6		2	2		4	4		8	8	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	11.5	24.0		26.0	26.0		24.0	24.0		24.0	24.0	
Total Split (s)	33.5	98.0		64.5	64.5		24.0	24.0		33.0	33.0	
Total Split (%)	21.6%	63.2%		41.6%	41.6%		15.5%	15.5%		21.3%	21.3%	
Maximum Green (s)	27.5	92.0		58.5	58.5		18.0	18.0		27.0	27.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.5	-1.5			-1.5			-1.5		-1.5	-1.5	
Total Lost Time (s)	4.5	4.5			4.5			4.5		4.5	4.5	
Lead/Lag	Lead			Lag	Lag							
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	
Recall Mode	None	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)		7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)		0		0	0		0	0		0	0	
Act Effct Green (s)	93.5	93.5			60.0	155.0		19.5		28.5	28.5	
Actuated g/C Ratio	0.60	0.60			0.39	1.00		0.13		0.18	0.18	
v/c Ratio	1.10	0.67			0.97	0.62		0.90		0.96	0.64	
Control Delay	109.2	22.6			65.1	1.8		89.7		105.1	25.5	
Queue Delay	0.0	0.0			0.0	0.0		0.0		0.0	0.0	
Total Delay	109.2	22.6			65.1	1.8		89.7		105.1	25.5	
LOS	F	C			E	A		F		F	C	
Approach Delay		53.8			37.4			89.7			53.5	
Approach LOS		D			D			F			D	
Queue Length 50th (ft)	~419	483			670	0		212		325	103	
Queue Length 95th (ft)	#553	561			#828	0		#307		#535	173	
Internal Link Dist (ft)		466			806			246			200	
Turn Bay Length (ft)	425					500						
Base Capacity (vph)	725	2099			1324	1615		444		302	830	
Starvation Cap Reductn	0	0			0	0		0		0	0	
Spillback Cap Reductn	0	0			0	0		0		0	0	
Storage Cap Reductn	0	0			0	0		0		0	0	
Reduced v/c Ratio	1.10	0.67			0.97	0.62		0.90		0.96	0.64	
<b>Intersection Summary</b>												
Area Type:	Other											
Cycle Length:	155											
Actuated Cycle Length:	155											
Offset:	0 (0%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green											
Natural Cycle:	140											
Control Type:	Actuated-Coordinated											
Maximum v/c Ratio:	1.10											
Intersection Signal Delay:	49.7						Intersection LOS: D					
Intersection Capacity Utilization:	111.7%						ICU Level of Service H					
Analysis Period (min):	15											
~ Volume exceeds capacity, queue is theoretically infinite.												

Lanes, Volumes, Timings  
 170: Tech Road & Industrial Parkway

08/16/2017

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: 170: Tech Road & Industrial Parkway

↗ Ø1 33.5 s	↖ Ø2 (R) 64.5 s	↖↗ Ø4 24 s	↖↗ Ø8 33 s
→ Ø6 (R) 98 s			

Lanes, Volumes, Timings

181: Beltsville Drive & Calverton Boulevard/Calverton Tower Driveway

08/16/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	21	1	778	19	9	0	751	315	5	0	199	16
Future Volume (vph)	21	1	778	19	9	0	751	315	5	0	199	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	10	10	12	12	12	12	12	12	12
Storage Length (ft)	200		0	0		0	200		0	125		0
Storage Lanes	1		1	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95	0.97	1.00	1.00	1.00	1.00	1.00
Frnt			0.850					0.998			0.989	
Flt Protected	0.950				0.968		0.950					
Satd. Flow (prot)	1736	1900	1568	0	3262	0	3433	1774	0	1900	1792	0
Flt Permitted	0.737				0.866		0.950					
Satd. Flow (perm)	1346	1900	1568	0	2918	0	3433	1774	0	1900	1792	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			738					2			6	
Link Speed (mph)		30			30			35			35	
Link Distance (ft)		690			171			458			205	
Travel Time (s)		15.7			3.9			8.9			4.0	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	4%	0%	3%	0%	0%	0%	2%	7%	0%	0%	5%	3%
Adj. Flow (vph)	22	1	828	20	10	0	799	335	5	0	212	17
Shared Lane Traffic (%)												
Lane Group Flow (vph)	22	1	828	0	30	0	799	340	0	0	229	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			6			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.09	1.09	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA	Perm	Perm	NA		Prot	NA		Perm	NA	
Protected Phases		4			8		5	2			6	
Permitted Phases	4		4	8						6		
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5		9.5	22.5		22.5	22.5	
Total Split (s)	25.0	25.0	25.0	25.0	25.0		21.0	44.5		23.5	23.5	
Total Split (%)	36.0%	36.0%	36.0%	36.0%	36.0%		30.2%	64.0%		33.8%	33.8%	
Maximum Green (s)	20.5	20.5	20.5	20.5	20.5		16.5	40.0		19.0	19.0	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	
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)	-1.5	-1.5	-1.5		-1.5		-1.5	-1.5		-1.5	-1.5	
Total Lost Time (s)	3.0	3.0	3.0		3.0		3.0	3.0		3.0	3.0	
Lead/Lag							Lead			Lag	Lag	
Lead-Lag Optimize?							Yes			Yes	Yes	
Walk Time (s)	7.0	7.0	7.0	7.0	7.0			7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0			11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0	0	0	0			0		0	0	
Act Effct Green (s)	22.0	22.0	22.0		22.0		18.0	41.5			20.5	

Lanes, Volumes, Timings

181: Beltsville Drive & Calverton Boulevard/Calverton Tower Driveway

08/16/2017

	↖	→	↘	↙	←	↖	↙	↑	↗	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio	0.32	0.32	0.32		0.32		0.26	0.60				0.29
v/c Ratio	0.05	0.00	0.83		0.03		0.90	0.32				0.43
Control Delay	17.0	16.0	12.1		16.6		40.2	8.0				22.3
Queue Delay	0.0	0.0	0.0		0.0		0.0	0.0				0.0
Total Delay	17.0	16.0	12.1		16.6		40.2	8.0				22.3
LOS	B	B	B		B		D	A				C
Approach Delay		12.3			16.6			30.6				22.3
Approach LOS		B			B			C				C
Queue Length 50th (ft)	6	0	28		4		169	64				76
Queue Length 95th (ft)	21	3	#260		13		#270	107				135
Internal Link Dist (ft)		610			91			378				125
Turn Bay Length (ft)	200						200					
Base Capacity (vph)	426	601	1000		923		889	1060				532
Starvation Cap Reductn	0	0	0		0		0	0				0
Spillback Cap Reductn	0	0	0		0		0	0				0
Storage Cap Reductn	0	0	0		0		0	0				0
Reduced v/c Ratio	0.05	0.00	0.83		0.03		0.90	0.32				0.43

Intersection Summary

Area Type: Other  
 Cycle Length: 69.5  
 Actuated Cycle Length: 69.5  
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green  
 Natural Cycle: 70  
 Control Type: Pretimed  
 Maximum v/c Ratio: 0.90  
 Intersection Signal Delay: 22.6  
 Intersection LOS: C  
 Intersection Capacity Utilization 73.8%  
 ICU Level of Service D  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.










Splits and Phases: 181: Beltsville Drive & Calverton Boulevard/Calverton Tower Driveway

↑ Ø2 (R) 44.5 s					↗ Ø4 25 s
↙ Ø5 21 s		↓ Ø6 (R) 23.5 s			← Ø8 25 s



Lanes, Volumes, Timings  
185:

08/16/2017

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	1425	0	0	804	660	0
Future Volume (vph)	1425	0	0	804	660	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11
Lane Util. Factor	0.97	1.00	1.00	0.95	0.95	1.00
Frt						
Flt Protected	0.950					
Satd. Flow (prot)	3385	0	0	3490	3490	0
Flt Permitted	0.950					
Satd. Flow (perm)	3385	0	0	3490	3490	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)						
Link Speed (mph)	30			30	30	
Link Distance (ft)	152			343	133	
Travel Time (s)	3.5			7.8	3.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1549	0	0	874	717	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1549	0	0	874	717	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	22			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	5			16	16	
Two way Left Turn Lane						
Headway Factor	1.04	1.04	1.04	1.04	1.04	1.04
Turning Speed (mph)	15	9	15			9
Number of Detectors	1			2	2	
Detector Template	Left			Thru	Thru	
Leading Detector (ft)	20			100	100	
Trailing Detector (ft)	0			0	0	
Detector 1 Position(ft)	0			0	0	
Detector 1 Size(ft)	20			6	6	
Detector 1 Type	CI+Ex			CI+Ex	CI+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0			0.0	0.0	
Detector 1 Queue (s)	0.0			0.0	0.0	
Detector 1 Delay (s)	0.0			0.0	0.0	
Detector 2 Position(ft)				94	94	
Detector 2 Size(ft)				6	6	
Detector 2 Type				CI+Ex	CI+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot			NA	NA	
Protected Phases	4			2	6	
Permitted Phases						
Detector Phase	4			2	6	
Switch Phase						

Lanes, Volumes, Timings

185:

08/16/2017



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Minimum Initial (s)	5.0			5.0	5.0	
Minimum Split (s)	11.5			11.5	11.5	
Total Split (s)	36.0			24.0	24.0	
Total Split (%)	60.0%			40.0%	40.0%	
Maximum Green (s)	29.5			17.5	17.5	
Yellow Time (s)	4.0			4.0	4.0	
All-Red Time (s)	2.5			2.5	2.5	
Lost Time Adjust (s)	-1.5			-1.5	-1.5	
Total Lost Time (s)	5.0			5.0	5.0	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0			3.0	3.0	
Recall Mode	None			C-Max	C-Max	
Act Effect Green (s)	30.7			19.3	19.3	
Actuated g/C Ratio	0.51			0.32	0.32	
v/c Ratio	0.90			0.78	0.64	
Control Delay	22.1			24.6	20.6	
Queue Delay	0.0			0.0	0.0	
Total Delay	22.1			24.6	20.6	
LOS	C			C	C	
Approach Delay	22.1			24.6	20.6	
Approach LOS	C			C	C	
Queue Length 50th (ft)	235			148	115	
Queue Length 95th (ft)	#389			#218	167	
Internal Link Dist (ft)	72			263	53	
Turn Bay Length (ft)						
Base Capacity (vph)	1748			1125	1125	
Starvation Cap Reductn	0			0	0	
Spillback Cap Reductn	0			0	0	
Storage Cap Reductn	0			0	0	
Reduced v/c Ratio	0.89			0.78	0.64	

Intersection Summary












Area Type: Other  
 Cycle Length: 60  
 Actuated Cycle Length: 60  
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green  
 Natural Cycle: 60  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.90  
 Intersection Signal Delay: 22.4  
 Intersection LOS: C  
 Intersection Capacity Utilization 71.2%  
 ICU Level of Service C  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 185:

↑ Ø2 (R) 24 s	↘ Ø4 36 s
↓ Ø6 (R) 24 s	

Lanes, Volumes, Timings  
193: FDA Boulevard & B-5

08/16/2017

						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	675	804	301	500	175	90
Future Volume (vph)	675	804	301	500	175	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	900			0	0	100
Storage Lanes	1			0	1	1
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Frt			0.906			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1805	3610	3271	0	1805	1615
Flt Permitted	0.100				0.950	
Satd. Flow (perm)	190	3610	3271	0	1805	1615
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			276			62
Link Speed (mph)		25	30		30	
Link Distance (ft)		1125	338		801	
Travel Time (s)		30.7	7.7		18.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	734	874	327	543	190	98
Shared Lane Traffic (%)						
Lane Group Flow (vph)	734	874	870	0	190	98
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		12	12		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		20	30		25	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Number of Detectors	1	2	2		1	1
Detector Template	Left	Thru	Thru		Left	Right
Leading Detector (ft)	20	100	100		20	20
Trailing Detector (ft)	0	0	0		0	0
Detector 1 Position(ft)	0	0	0		0	0
Detector 1 Size(ft)	20	6	6		20	20
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex		CI+Ex	CI+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(ft)		94	94			
Detector 2 Size(ft)		6	6			
Detector 2 Type		CI+Ex	CI+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type	pm+pt	NA	NA		Prot	Free
Protected Phases	7	4	8		6	
Permitted Phases	4					Free

Lanes, Volumes, Timings  
193: FDA Boulevard & B-5

08/16/2017



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Detector Phase	7	4	8		6	
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0		5.0	
Minimum Split (s)	9.5	22.5	22.5		22.5	
Total Split (s)	75.0	119.0	44.0		31.0	
Total Split (%)	50.0%	79.3%	29.3%		20.7%	
Maximum Green (s)	70.5	114.5	39.5		26.5	
Yellow Time (s)	3.5	3.5	3.5		3.5	
All-Red Time (s)	1.0	1.0	1.0		1.0	
Lost Time Adjust (s)	-1.5	-1.5	-1.5		-1.5	
Total Lost Time (s)	3.0	3.0	3.0		3.0	
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?	Yes		Yes			
Vehicle Extension (s)	3.0	3.0	3.0		3.0	
Recall Mode	None	None	None		C-Max	
Walk Time (s)		7.0	7.0		7.0	
Flash Dont Walk (s)		11.0	11.0		11.0	
Pedestrian Calls (#/hr)		0	0		0	
Act Effct Green (s)	109.0	109.0	37.0		35.0	150.0
Actuated g/C Ratio	0.73	0.73	0.25		0.23	1.00
v/c Ratio	0.83	0.33	0.89dr		0.45	0.06
Control Delay	38.4	7.6	29.6		55.9	0.1
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	38.4	7.6	29.6		55.9	0.1
LOS	D	A	C		E	A
Approach Delay		21.6	29.6		36.9	
Approach LOS		C	C		D	
Queue Length 50th (ft)	526	127	159		168	0
Queue Length 95th (ft)	706	141	m172		257	0
Internal Link Dist (ft)		1045	258		721	
Turn Bay Length (ft)	900					100
Base Capacity (vph)	913	2791	1094		421	1615
Starvation Cap Reductn	0	0	0		0	0
Spillback Cap Reductn	0	0	0		0	0
Storage Cap Reductn	0	0	0		0	0
Reduced v/c Ratio	0.80	0.31	0.80		0.45	0.06

Area Type: Other

Actuated Cycle Length: 150

Natural Cycle: 80

Maximum v/c Ratio: 0.86

Intersection Capacity Utilization 81.5%

ICU Level of Service D

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 193: FDA Boulevard & B-5

	→ Ø4	
	119 s	
↙ Ø6 (R)	↗ Ø7	← Ø8
31 s	75 s	44 s

HCM Unsignalized Intersection Capacity Analysis  
 72: Old Columbia Pike/Prosperity Drive & Tech Road

08/16/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR												
Lane Configurations																								
Traffic Volume (veh/h)	185	626	103	350	2144	128	0	0	145	0	0	122												
Future Volume (Veh/h)	185	626	103	350	2144	128	0	0	145	0	0	122												
Sign Control		Free			Free			Stop			Stop													
Grade		0%			0%			0%			0%													
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93												
Hourly flow rate (vph)	199	673	111	376	2305	138	0	0	156	0	0	131												
Pedestrians																								
Lane Width (ft)																								
Walking Speed (ft/s)																								
Percent Blockage																								
Right turn flare (veh)																								
Median type	None			None																				
Median storage (veh)																								
Upstream signal (ft)	161																							
pX, platoon unblocked																								
vC, conflicting volume	2443			784			3031			4322			392			3860			4308			1222		
vC1, stage 1 conf vol																								
vC2, stage 2 conf vol																								
vCu, unblocked vol	2443			784			3031			4322			392			3860			4308			1222		
tC, single (s)	4.1			4.1			7.5			6.5			6.9			7.5			6.5			6.9		
tC, 2 stage (s)																								
tF (s)	2.2			2.2			3.5			4.0			3.3			3.5			4.0			3.3		
p0 queue free %	0			55			0			0			75			0			0			25		
cM capacity (veh/h)	195			843			0			0			613			0			0			174		
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1	SB 2															
Volume Total	536	448	376	1537	906	78	78	66	66															
Volume Left	199	0	376	0	0	0	0	0	0															
Volume Right	0	111	0	0	138	78	78	66	66															
cSH	195	1700	843	1700	1700	613	613	174	174															
Volume to Capacity	1.02	0.26	0.45	0.90	0.53	0.13	0.13	0.38	0.38															
Queue Length 95th (ft)	222	0	58	0	0	11	11	40	40															
Control Delay (s)	120.2	0.0	12.7	0.0	0.0	11.7	11.7	37.5	37.5															
Lane LOS	F		B			B	B	E	E															
Approach Delay (s)	65.5		1.7			11.7		37.5																
Approach LOS						B		E																
Intersection Summary																								
Average Delay			18.6																					
Intersection Capacity Utilization			96.0%					ICU Level of Service			F													
Analysis Period (min)	15																							

Intersection

Intersection Delay, s/veh	28.7
Intersection LOS	D

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations			↔	↗			↕			↖	↘	
Traffic Vol, veh/h	0	5	56	5	0	1	56	10	0	526	40	10
Future Vol, veh/h	0	5	56	5	0	1	56	10	0	526	40	10
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
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	5	61	5	0	1	61	11	0	572	43	11
Number of Lanes	0	0	1	1	0	0	1	0	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	2	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	2	2
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	2	1	1
HCM Control Delay	10.6	11	38.8
HCM LOS	B	B	E

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	SBLn1
Vol Left, %	100%	0%	8%	0%	1%	1%
Vol Thru, %	0%	80%	91%	0%	84%	19%
Vol Right, %	0%	20%	1%	100%	15%	81%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	526	50	62	5	67	193
LT Vol	526	0	5	0	1	1
Through Vol	0	40	56	0	56	36
RT Vol	0	10	1	5	10	156
Lane Flow Rate	572	54	67	5	73	210
Geometry Grp	7	7	7	7	6	6
Degree of Util (X)	0.915	0.077	0.129	0.008	0.138	0.314
Departure Headway (Hd)	5.76	5.115	6.952	6.203	6.822	5.397
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	635	705	515	576	525	667
Service Time	3.46	2.815	4.698	3.948	4.867	3.427
HCM Lane V/C Ratio	0.901	0.077	0.13	0.009	0.139	0.315
HCM Control Delay	41.7	8.2	10.7	9	11	10.9
HCM Lane LOS	E	A	B	A	B	B
HCM 95th-tile Q	11.7	0.2	0.4	0	0.5	1.3



Intersection

Intersection Delay, s/veh

Intersection LOS

Movement	SBU	SBL	SBT	SBR
Lane Configurations			↕	
Traffic Vol, veh/h	0	1	36	156
Future Vol, veh/h	0	1	36	156
Peak Hour Factor	0.92	0.92	0.92	0.92
Heavy Vehicles, %	0	0	0	0
Mvmt Flow	0	1	39	170
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	2
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	2
HCM Control Delay	10.9
HCM LOS	B

HCM 2010 AWSC  
 29: Taylor Road/Michelson Road & E Loop Road

08/16/2017

Intersection

Intersection Delay, s/veh	11.4
Intersection LOS	B

Movement	WBU	WBL	WBR	NBU	NBT	NBR	SBU	SBL	SBT
Lane Configurations		↘↗			↑↓				↗↘
Traffic Vol, veh/h	0	10	348	0	375	25	0	8	51
Future Vol, veh/h	0	10	348	0	375	25	0	8	51
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	11	378	0	408	27	0	9	55
Number of Lanes	0	1	0	0	2	0	0	0	2

Approach	WB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	2	2
Conflicting Approach Left	NB		WB
Conflicting Lanes Left	2	0	1
Conflicting Approach Right	SB	WB	
Conflicting Lanes Right	2	1	0
HCM Control Delay	11.8	11.3	9.1
HCM LOS	B	B	A

Lane	NBLn1	NBLn2	WBLn1	SBLn1	SBLn2
Vol Left, %	0%	0%	3%	32%	0%
Vol Thru, %	100%	83%	0%	68%	100%
Vol Right, %	0%	17%	97%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	250	150	358	25	34
LT Vol	0	0	10	8	0
Through Vol	250	125	0	17	34
RT Vol	0	25	348	0	0
Lane Flow Rate	272	163	389	27	37
Geometry Grp	7	7	2	7	7
Degree of Util (X)	0.413	0.247	0.486	0.047	0.062
Departure Headway (Hd)	5.468	5.45	4.492	6.199	6.036
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	649	664	798	581	596
Service Time	3.268	3.15	2.548	3.903	3.741
HCM Lane V/C Ratio	0.419	0.245	0.487	0.046	0.062
HCM Control Delay	12.1	9.9	11.8	9.2	9.1
HCM Lane LOS	B	A	B	A	A
HCM 95th-tile Q	2	1	2.7	0.1	0.2

**Intersection**

Intersection Delay, s/veh	10
Intersection LOS	A

Movement	EBU	EBT	EBR	WBU	WBL	WBT	NBU	NBL	NBR
Lane Configurations		↑				↔		↓	↗
Traffic Vol, veh/h	0	158	34	0	5	11	0	34	342
Future Vol, veh/h	0	158	34	0	5	11	0	34	342
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	172	37	0	5	12	0	37	372
Number of Lanes	0	1	0	0	0	1	0	1	1

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	2	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	2	0	1
HCM Control Delay	9.5	8.3	10.4
HCM LOS	A	A	B

Lane	NBLn1	NBLn2	EBLn1	WBLn1
Vol Left, %	100%	0%	0%	31%
Vol Thru, %	0%	0%	82%	69%
Vol Right, %	0%	100%	18%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	34	342	192	16
LT Vol	34	0	0	5
Through Vol	0	0	158	11
RT Vol	0	342	34	0
Lane Flow Rate	37	372	209	17
Geometry Grp	7	7	2	2
Degree of Util (X)	0.057	0.449	0.274	0.025
Departure Headway (Hd)	5.555	4.35	4.721	5.139
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	645	829	760	694
Service Time	3.284	2.079	2.755	3.187
HCM Lane V/C Ratio	0.057	0.449	0.275	0.024
HCM Control Delay	8.6	10.6	9.5	8.3
HCM Lane LOS	A	B	A	A
HCM 95th-tile Q	0.2	2.3	1.1	0.1

Intersection	
Intersection Delay, s/veh	16.4
Intersection LOS	C

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations			↕				↕				↕	
Traffic Vol, veh/h	0	257	0	343	0	0	0	0	0	2	119	0
Future Vol, veh/h	0	257	0	343	0	0	0	0	0	2	119	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	279	0	373	0	0	0	0	0	2	129	0
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	1
HCM Control Delay	18.2	0	9.8
HCM LOS	C	-	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	2%	43%	0%	0%
Vol Thru, %	98%	0%	100%	87%
Vol Right, %	0%	57%	0%	13%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	121	600	0	39
LT Vol	2	257	0	0
Through Vol	119	0	0	34
RT Vol	0	343	0	5
Lane Flow Rate	132	652	0	42
Geometry Grp	1	1	1	1
Degree of Util (X)	0.197	0.745	0	0.064
Departure Headway (Hd)	5.38	4.115	5.053	5.442
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	663	880	0	653
Service Time	3.446	2.143	3.117	3.518
HCM Lane V/C Ratio	0.199	0.741	0	0.064
HCM Control Delay	9.8	18.2	8.1	8.9
HCM Lane LOS	A	C	N	A
HCM 95th-tile Q	0.7	7	0	0.2

Intersection

Intersection Delay, s/veh

Intersection LOS

Movement	SBU	SBL	SBT	SBR
Lane Configurations			↕	
Traffic Vol, veh/h	0	0	34	5
Future Vol, veh/h	0	0	34	5
Peak Hour Factor	0.92	0.92	0.92	0.92
Heavy Vehicles, %	0	0	0	0
Mvmt Flow	0	0	37	5
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	8.9
HCM LOS	A

HCM 2010 Roundabout  
73: FDA Boulevard & Industrial Parkway

08/16/2017

Intersection							
Intersection Delay, s/veh	221.3						
Intersection LOS	F						
Approach	WB		NB			SB	
Entry Lanes	2		2			2	
Conflicting Circle Lanes	2		2			2	
Adj Approach Flow, veh/h	425		543			1797	
Demand Flow Rate, veh/h	425		543			1797	
Vehicles Circulating, veh/h	104		1793			13	
Vehicles Exiting, veh/h	2232		17			104	
Follow-Up Headway, s	3.186		3.186			3.186	
Ped Vol Crossing Leg, #/h	0		0			0	
Ped Cap Adj	1.000		1.000			1.000	
Approach Delay, s/veh	0.1		177.1			286.9	
Approach LOS	A		F			F	
Lane	Left	Right	Bypass	Left	Right	Left	Right
Designated Moves	L	LTR	R	LT	R	L	TR
Assumed Moves	L	LTR	R	LT	R	L	TR
RT Channelized	Free						
Lane Util	0.538	0.462		0.192	0.808	0.998	0.002
Critical Headway, s	4.293	4.113		4.293	4.113	4.293	4.113
Entry Flow, veh/h	7	6	412	104	439	1793	4
Cap Entry Lane, veh/h	1045	1051	1900	294	322	1119	1120
Entry HV Adj Factor	0.984	1.018	1.000	1.000	1.000	1.000	1.000
Flow Entry, veh/h	7	6	412	104	439	1793	4
Cap Entry, veh/h	1029	1070	1900	294	322	1119	1120
V/C Ratio	0.007	0.006	0.217	0.353	1.363	1.602	0.004
Control Delay, s/veh	3.6	3.4	0.0	20.5	214.1	287.6	3.2
LOS	A	A	A	C	F	F	A
95th %tile Queue, veh	0	0	1	2	22	92	0

Intersection						
Int Delay, s/veh	7.8					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↑↑		↑↑	
Traffic Vol, veh/h	8	1	241	482	120	51
Future Vol, veh/h	8	1	241	482	120	51
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	9	1	262	524	130	55

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	10	0	795	5
Stage 1	-	-	-	-	9	-
Stage 2	-	-	-	-	786	-
Critical Hdwy	-	-	4.1	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1623	-	329	1083
Stage 1	-	-	-	-	1018	-
Stage 2	-	-	-	-	415	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1623	-	254	1083
Mov Cap-2 Maneuver	-	-	-	-	254	-
Stage 1	-	-	-	-	1018	-
Stage 2	-	-	-	-	320	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.8	29.2
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	329	-	-	1623	-
HCM Lane V/C Ratio	0.565	-	-	0.161	-
HCM Control Delay (s)	29.2	-	-	7.6	0.4
HCM Lane LOS	D	-	-	A	A
HCM 95th %tile Q(veh)	3.3	-	-	0.6	-



Lanes, Volumes, Timings

3: New Hampshire Ave (MD 650) & Schindler Drive/Mahan Road

11/01/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇄		↔	↔	↔	↔	↑↑↑	↔	↔	↑↑↑	↔
Traffic Volume (vph)	51	17	50	80	5	95	5	1764	753	606	2548	25
Future Volume (vph)	51	17	50	80	5	95	5	1764	753	606	2548	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	11	12	12	10	12	12	10	12	12
Storage Length (ft)	0		0	230		0	320		220	500		0
Storage Lanes	0		0	1		1	1		1	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	0.91	0.91	1.00	1.00	0.86	1.00	0.97	0.91	0.91
Frt		0.943				0.850			0.850		0.999	
Flt Protected		0.979		0.950	0.960		0.950			0.950		
Satd. Flow (prot)	0	1754	0	3176	1660	1615	1620	6285	1553	3143	4983	0
Flt Permitted		0.979		0.950	0.960		0.950			0.950		
Satd. Flow (perm)	0	1754	0	3176	1660	1615	1620	6285	1553	3143	4983	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		15				117			308		1	
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		292			449			1203			1530	
Travel Time (s)		8.0			12.2			20.5			26.1	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	4%	4%	4%	4%	4%	4%
Adj. Flow (vph)	53	18	52	82	5	98	5	1819	776	625	2627	26
Shared Lane Traffic (%)				29%								
Lane Group Flow (vph)	0	123	0	58	29	98	5	1819	776	625	2653	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		22			30			23			31	
Link Offset(ft)		0			3			0			0	
Crosswalk Width(ft)		48			25			32			62	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.04	1.00	1.00	1.09	1.00	1.00	1.09	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1		1	1	1	1	1	1	1	1	
Detector Template	Left			Left		Right	Left			Left		
Leading Detector (ft)	20	100		100	100	100	100	100	100	100	100	
Trailing Detector (ft)	0	0		0	0	0	0	0	0	0	0	
Detector 1 Position(ft)	0	0		0	0	0	0	0	0	0	0	
Detector 1 Size(ft)	20	100		100	100	100	100	100	100	100	100	
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Turn Type	Split	NA		Split	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	3	3		4	4		4	1	5		6	2
Permitted Phases						4			5			
Detector Phase	3	3		4	4	4	1	5	5	6	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	3.0	3.0	3.0	7.0	7.0	

Lanes, Volumes, Timings

3: New Hampshire Ave (MD 650) & Schindler Drive/Mahan Road

11/01/2017

	↖	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Split (s)	12.5	12.5		12.0	12.0	12.0	8.5	8.5	8.5	13.0	13.0	
Total Split (s)	33.0	33.0		42.0	42.0	42.0	24.0	36.0	36.0	89.0	101.0	
Total Split (%)	16.5%	16.5%		21.0%	21.0%	21.0%	12.0%	18.0%	18.0%	44.5%	50.5%	
Maximum Green (s)	25.5	25.5		35.0	35.0	35.0	18.5	30.5	30.5	83.0	95.0	
Yellow Time (s)	3.5	3.5		3.5	3.5	3.5	3.5	3.5	3.5	4.5	4.5	
All-Red Time (s)	4.0	4.0		3.5	3.5	3.5	2.0	2.0	2.0	1.5	1.5	
Lost Time Adjust (s)		-1.5		-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	
Total Lost Time (s)		6.0		5.5	5.5	5.5	4.0	4.0	4.0	4.5	4.5	
Lead/Lag	Lead	Lead		Lag	Lag	Lag	Lead	Lead	Lead	Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	5.0	5.0	0.2	0.2	
Recall Mode	None	None		None	None	None	None	Max	Max	C-Max	C-Max	
Act Effect Green (s)		19.2		10.8	10.8	10.8	7.8	65.5	65.5	84.5	151.4	
Actuated g/C Ratio		0.10		0.05	0.05	0.05	0.04	0.33	0.33	0.42	0.76	
v/c Ratio		0.68		0.34	0.33	0.50	0.08	0.88	1.09	0.47	0.70	
Control Delay		94.2		96.0	100.1	15.6	94.8	69.2	94.5	28.0	8.0	
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		94.2		96.0	100.1	15.6	94.8	69.2	94.5	28.0	8.0	
LOS		F		F	F	B	F	E	F	C	A	
Approach Delay		94.2			54.0			76.8			11.8	
Approach LOS		F			D			E			B	
Queue Length 50th (ft)		140		41	41	0	7	663	-851	209	256	
Queue Length 95th (ft)		214		70	85	42	25	#816	#1184	257	324	
Internal Link Dist (ft)		212			369			1123			1450	
Turn Bay Length (ft)				230			320		220	500		
Base Capacity (vph)		249		579	302	390	162	2059	715	1327	3772	
Starvation Cap Reductn		0		0	0	0	0	0	0	0	0	
Spillback Cap Reductn		0		0	0	0	0	0	0	0	0	
Storage Cap Reductn		0		0	0	0	0	0	0	0	0	
Reduced v/c Ratio		0.49		0.10	0.10	0.25	0.03	0.88	1.09	0.47	0.70	

Intersection Summary

Area Type: Other  
 Cycle Length: 200  
 Actuated Cycle Length: 200  
 Offset: 60 (30%); Referenced to phase 2:SBT and 6:SBL, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.09  
 Intersection Signal Delay: 42.0 Intersection LOS: D  
 Intersection Capacity Utilization 82.8% ICU Level of Service E  
 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: 3: New Hampshire Ave (MD 650) & Schindler Drive/Mahan Road

↖ Ø1 24 s	↓ Ø2 (R) 101 s	↗ Ø3 33 s	↘ Ø4 47 s
↑ Ø5 36 s	↙ Ø6 (R) 89 s		

Lanes, Volumes, Timings  
 6: New Hampshire Ave (MD 650) & Powder Mill Road

11/01/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	105	137	55	843	214	136	70	2528	176	112	2538	265
Future Volume (vph)	105	137	55	843	214	136	70	2528	176	112	2538	265
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	12	12	12	12	12	12	12	12	12
Storage Length (ft)	0		0	425		50	225		100	250		0
Storage Lanes	1		1	1		1	1		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	0.91	0.91	1.00	1.00	0.91	1.00	1.00	0.91	0.91
Frt			0.850			0.850			0.850		0.986	
Flt Protected	0.950			0.950	0.980		0.950			0.950		
Satd. Flow (prot)	1685	1773	1507	3285	1694	1615	1736	4988	1553	1736	4918	0
Flt Permitted	0.950			0.950	0.980		0.950			0.950		
Satd. Flow (perm)	1685	1773	1507	3285	1694	1615	1736	4988	1553	1736	4918	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			145			142			106		12	
Link Speed (mph)		25			35			40			40	
Link Distance (ft)		217			757			487			2380	
Travel Time (s)		5.9			14.7			8.3			40.6	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	4%	4%	4%	4%	4%	4%
Adj. Flow (vph)	108	141	57	869	221	140	72	2606	181	115	2616	273
Shared Lane Traffic (%)				17%								
Lane Group Flow (vph)	108	141	57	721	369	140	72	2606	181	115	2889	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			28			20			12	
Link Offset(ft)		0			-14			10			0	
Crosswalk Width(ft)		16			28			58			28	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	1	1	1	1	1	0	1	1	0	
Detector Template	Left		Right	Left		Right	Left		Right	Left		
Leading Detector (ft)	100	100	100	100	100	100	100	0	100	100	0	
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	
Detector 1 Size(ft)	100	100	100	100	100	100	100	6	100	100	6	
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Turn Type	Split	NA	Prot	Split	NA	Prot	Prot	NA	Perm	Prot	NA	
Protected Phases	3	3	3	4	4	4	1	5		6	2	
Permitted Phases									5			
Detector Phase	3	3	3	4	4	4	1	5	5	6	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	3.0	7.0	7.0	3.0	7.0	

HCM 2010 Roundabout  
 91: Dahlgren Road & E Loop Road

11/01/2017

Intersection						
Intersection Delay, s/veh	9.8					
Intersection LOS	A					
Approach	EB		WB		SB	
Entry Lanes	2		2		2	
Conflicting Circle Lanes	2		2		2	
Adj Approach Flow, veh/h	87		1208		55	
Demand Flow Rate, veh/h	87		1208		55	
Vehicles Circulating, veh/h	43		65		641	
Vehicles Exiting, veh/h	653		65		632	
Follow-Up Headway, s	3.186		3.186		3.186	
Ped Vol Crossing Leg, #/h	0		0		0	
Ped Cap Adj	1.000		1.000		1.000	
Approach Delay, s/veh	3.7		10.4		5.5	
Approach LOS	A		B		A	
Lane	Left	Right	Left	Right	Left	Right
Designated Moves	LT	TR	LT	TR	L	LTR
Assumed Moves	L	TR	LT	TR	L	LTR
RT Channelized						
Lane Util	0.747	0.253	0.470	0.530	0.527	0.473
Critical Headway, s	4.293	4.113	4.293	4.113	4.293	4.113
Entry Flow, veh/h	65	22	568	640	29	26
Cap Entry Lane, veh/h	1094	1096	1076	1080	699	721
Entry HV Adj Factor	1.000	1.000	1.000	1.000	1.005	0.994
Flow Entry, veh/h	65	22	568	640	29	26
Cap Entry, veh/h	1094	1096	1076	1080	702	717
V/C Ratio	0.059	0.020	0.528	0.593	0.042	0.036
Control Delay, s/veh	3.8	3.5	9.7	11.0	5.6	5.4
LOS	A	A	A	B	A	A
95th %tile Queue, veh	0	0	3	4	0	0

Intersection						
Int Delay, s/veh	17.2					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↑↑	
Traffic Vol, veh/h	776	249	50	45	38	329
Future Vol, veh/h	776	249	50	45	38	329
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	843	271	54	49	41	358

Major/Minor	Major1	Major2	Minor1	Minor2	Minor3
Conflicting Flow All	0	0	1114	0	1112
Stage 1	-	-	-	-	979
Stage 2	-	-	-	-	133
Critical Hdwy	-	-	4.1	-	6.8
Critical Hdwy Stg 1	-	-	-	-	5.8
Critical Hdwy Stg 2	-	-	-	-	5.8
Follow-up Hdwy	-	-	2.2	-	3.5
Pot Cap-1 Maneuver	-	-	634	-	206
Stage 1	-	-	-	-	329
Stage 2	-	-	-	-	885
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	634	-	188
Mov Cap-2 Maneuver	-	-	-	-	188
Stage 1	-	-	-	-	329
Stage 2	-	-	-	-	807

Approach	EB	WB	NB
HCM Control Delay, s	0	6	68.1
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	413	-	-	634	-
HCM Lane V/C Ratio	0.966	-	-	0.086	-
HCM Control Delay (s)	68.1	-	-	11.2	0.2
HCM Lane LOS	F	-	-	B	A
HCM 95th %tile Q(veh)	11.4	-	-	0.3	-

Lanes, Volumes, Timings

3: New Hampshire Ave (MD 650) & Schindler Drive/Mahan Road

11/01/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔	↔	↔		↔	↔	↔↔	↔
Traffic Volume (vph)	51	4	10	523	0	576	5	2502	42	39	2286	70
Future Volume (vph)	51	4	10	523	0	576	5	2502	42	39	2286	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	11	12	12	10	12	12	10	12	12
Storage Length (ft)	0		0	230		0	320		220	500		0
Storage Lanes	0		0	1		1	1		1	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	0.91	0.91	1.00	1.00	0.86	1.00	0.97	0.91	0.91
Frt		0.980				0.850			0.850		0.996	
Flt Protected		0.962		0.950	0.950		0.950			0.950		
Satd. Flow (prot)	0	1791	0	3176	1643	1615	1620	6285	1553	3143	4968	0
Flt Permitted		0.962		0.950	0.950		0.950			0.950		
Satd. Flow (perm)	0	1791	0	3176	1643	1615	1620	6285	1553	3143	4968	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4				594			95		3	
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		292			449			1203			1530	
Travel Time (s)		8.0			12.2			20.5			26.1	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	4%	4%	4%	4%	4%	4%
Adj. Flow (vph)	53	4	10	539	0	594	5	2579	43	40	2357	72
Shared Lane Traffic (%)				33%								
Lane Group Flow (vph)	0	67	0	361	178	594	5	2579	43	40	2429	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		22			30			23			31	
Link Offset(ft)		0			3			0			0	
Crosswalk Width(ft)		48			25			32			62	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.04	1.00	1.00	1.09	1.00	1.00	1.09	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1		1	1	1	1	1	1	1	1	1
Detector Template	Left			Left		Right	Left			Left		
Leading Detector (ft)	20	100		100	100	100	100	100	100	100	100	
Trailing Detector (ft)	0	0		0	0	0	0	0	0	0	0	
Detector 1 Position(ft)	0	0		0	0	0	0	0	0	0	0	
Detector 1 Size(ft)	20	100		100	100	100	100	100	100	100	100	
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Turn Type	Split	NA		Split	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	3	3		4	4		1	5		6	2	
Permitted Phases						4			5			
Detector Phase	3	3		4	4	4	1	5	5	6	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	3.0	3.0	3.0	7.0	7.0	

Lanes, Volumes, Timings

3: New Hampshire Ave (MD 650) & Schindler Drive/Mahan Road

11/01/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Split (s)	12.5	12.5		12.0	12.0	12.0	8.5	8.5	8.5	13.0	13.0	
Total Split (s)	33.0	33.0		42.0	42.0	42.0	24.0	36.0	36.0	89.0	101.0	
Total Split (%)	16.5%	16.5%		21.0%	21.0%	21.0%	12.0%	18.0%	18.0%	44.5%	50.5%	
Maximum Green (s)	25.5	25.5		35.0	35.0	35.0	18.5	30.5	30.5	83.0	95.0	
Yellow Time (s)	3.5	3.5		3.5	3.5	3.5	3.5	3.5	3.5	4.5	4.5	
All-Red Time (s)	4.0	4.0		3.5	3.5	3.5	2.0	2.0	2.0	1.5	1.5	
Lost Time Adjust (s)		-1.5		-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	
Total Lost Time (s)		6.0		5.5	5.5	5.5	4.0	4.0	4.0	4.5	4.5	
Lead/Lag	Lead	Lead		Lag	Lag	Lag	Lead	Lead	Lead	Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	5.0	5.0	0.2	0.2	
Recall Mode	None	None		None	None	None	None	Max	Max	C-Max	C-Max	
Act Effct Green (s)		13.9		35.4	35.4	35.4	7.8	46.2	46.2	84.5	132.1	
Actuated g/C Ratio		0.07		0.18	0.18	0.18	0.04	0.23	0.23	0.42	0.66	
v/c Ratio		0.52		0.64	0.61	0.77	0.08	1.78	0.10	0.03	0.74	
Control Delay		98.1		81.2	84.3	11.5	94.8	391.3	0.5	14.8	8.2	
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		98.1		81.2	84.3	11.5	94.8	391.3	0.5	14.8	8.2	
LOS		F		F	F	B	F	F	A	B	A	
Approach Delay		98.1			45.1			384.3			8.3	
Approach LOS		F			D			F			A	
Queue Length 50th (ft)		82		246	241	0	7	~1469	0	8	201	
Queue Length 95th (ft)		140		295	326	127	25	#1691	0	m10	283	
Internal Link Dist (ft)		212			369			1123			1450	
Turn Bay Length (ft)				230			320		220	500		
Base Capacity (vph)		245		615	318	791	162	1451	431	1327	3282	
Starvation Cap Reductn		0		0	0	0	0	0	0	0	0	
Spillback Cap Reductn		0		0	0	0	0	0	0	0	0	
Storage Cap Reductn		0		0	0	0	0	0	0	0	0	
Reduced v/c Ratio		0.27		0.59	0.56	0.75	0.03	1.78	0.10	0.03	0.74	

Intersection Summary

Area Type: Other  
 Cycle Length: 200  
 Actuated Cycle Length: 200  
 Offset: 60 (30%), Referenced to phase 2:SBT and 6:SBL, Start of Green  
 Natural Cycle: 130  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.78  
 Intersection Signal Delay: 172.8  
 Intersection LOS: F  
 Intersection Capacity Utilization 89.0%  
 ICU Level of Service E  
 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.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: New Hampshire Ave (MD 650) & Schindler Drive/Mahan Road

24 s	101 s	33 s	42 s
36 s	89 s		



Lanes, Volumes, Timings

6: New Hampshire Ave (MD 650) & Powder Mill Road

11/01/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	179	96	132	481	84	298	102	2169	250	244	2601	62
Future Volume (vph)	179	96	132	481	84	298	102	2169	250	244	2601	62
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	12	12	12	12	12	12	12	12	12
Storage Length (ft)	0		0	425		50	225		100	250		0
Storage Lanes	1		1	1		1	1		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	0.91	0.91	1.00	1.00	0.91	1.00	1.00	0.91	0.91
Frt			0.850			0.850			0.850		0.997	
Flt Protected	0.950			0.950	0.973		0.950			0.950		
Satd. Flow (prot)	1685	1773	1507	3285	1682	1615	1736	4988	1553	1736	4973	0
Flt Permitted	0.950			0.950	0.973		0.950			0.950		
Satd. Flow (perm)	1685	1773	1507	3285	1682	1615	1736	4988	1553	1736	4973	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			145			142			106			2
Link Speed (mph)		25			35			40			40	
Link Distance (ft)		217			757			487			2380	
Travel Time (s)		5.9			14.7			8.3			40.6	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	4%	4%	4%	4%	4%	4%
Adj. Flow (vph)	185	99	136	496	87	307	105	2236	258	252	2681	64
Shared Lane Traffic (%)				22%								
Lane Group Flow (vph)	185	99	136	387	196	307	105	2236	258	252	2745	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			28			20			12	
Link Offset(ft)		0			-14			10			0	
Crosswalk Width(ft)		16			28			58			28	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	1	1	1	1	1	0	1	1	0	
Detector Template	Left		Right	Left		Right	Left		Right	Left		
Leading Detector (ft)	100	100	100	100	100	100	100	0	100	100	0	
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	
Detector 1 Size(ft)	100	100	100	100	100	100	100	6	100	100	6	
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Turn Type	Split	NA	Prot	Split	NA	Prot	Prot	NA	Perm	Prot	NA	
Protected Phases	3	3	3	4	4	4	1	5		6	2	
Permitted Phases									5			
Detector Phase	3	3	3	4	4	4	1	5	5	6	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	3.0	7.0	7.0	3.0	7.0	

Lanes, Volumes, Timings

6: New Hampshire Ave (MD 650) & Powder Mill Road

11/01/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Split (s)	11.5	11.5	11.5	12.0	12.0	12.0	9.0	14.0	14.0	10.0	14.0	
Total Split (s)	35.0	35.0	35.0	35.0	35.0	35.0	25.0	89.0	89.0	21.0	85.0	
Total Split (%)	19.4%	19.4%	19.4%	19.4%	19.4%	19.4%	13.9%	49.4%	49.4%	11.7%	47.2%	
Maximum Green (s)	28.5	28.5	28.5	28.0	28.0	28.0	19.0	82.0	82.0	14.0	78.0	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.5	4.5	4.5	4.5	4.5	
All-Red Time (s)	2.5	2.5	2.5	3.0	3.0	3.0	2.5	2.5	2.5	2.5	2.5	
Lost Time Adjust (s)	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	
Total Lost Time (s)	5.0	5.0	5.0	5.5	5.5	5.5	4.5	5.5	5.5	5.5	5.5	
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lag	Lead	Lead	Lead	Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	0.2	0.2	3.0	0.2	
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	
Act Effct Green (s)	25.5	25.5	25.5	27.9	27.9	27.9	17.0	89.6	89.6	15.5	89.1	
Actuated g/C Ratio	0.14	0.14	0.14	0.16	0.16	0.16	0.09	0.50	0.50	0.09	0.50	
v/c Ratio	0.77	0.39	0.40	0.76	0.75	0.83	0.64	0.90	0.31	1.69	1.12	
Control Delay	95.5	73.9	10.8	83.2	91.1	58.0	95.9	47.8	17.3	381.5	99.3	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	95.5	73.9	10.8	83.2	91.1	58.0	95.9	47.8	17.3	381.5	99.3	
LOS	F	E	B	F	F	E	F	D	B	F	F	
Approach Delay		63.0			76.2			46.7			123.1	
Approach LOS		E			E			D			F	
Queue Length 50th (ft)	213	108	0	240	242	196	121	905	106	~433	~1409	
Queue Length 95th (ft)	303	170	57	309	352	#342	191	#1013	181	#629	#1544	
Internal Link Dist (ft)		137			677			407			2300	
Turn Bay Length (ft)				425		50	225		100	250		
Base Capacity (vph)	280	295	372	541	277	384	197	2482	826	149	2461	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.66	0.34	0.37	0.72	0.71	0.80	0.53	0.90	0.31	1.69	1.12	

Intersection Summary

Area Type: Other  
 Cycle Length: 180  
 Actuated Cycle Length: 180  
 Offset: 88 (49%), Referenced to phase 2:SBT and 5:NBT, Start of Green  
 Natural Cycle: 120  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.69  
 Intersection Signal Delay: 84.6  
 Intersection Capacity Utilization 87.2%  
 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: 6: New Hampshire Ave (MD 650) & Powder Mill Road

25 s	85 s	35 s	35 s
89 s	21 s		

Lanes, Volumes, Timings

9: New Hampshire Ave (MD 650) & Northwest Drive/Michelson Road

11/01/2017

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↙	↔	↗	↙	↑↑↑		↗	↑↑↑	
Traffic Volume (vph)	6	0	20	228	21	712	10	3158	5	22	2136	25
Future Volume (vph)	6	0	20	228	21	712	10	3158	5	22	2136	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	280		0	225		0
Storage Lanes	0		0	1		1	1		0	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.86	0.86	0.97	0.91	0.91
Frt		0.896				0.850					0.998	
Flt Protected		0.989		0.950	0.960		0.950			0.950		
Satd. Flow (prot)	0	1684	0	1715	1733	1615	1736	6285	0	3367	4978	0
Flt Permitted		0.933		0.740	0.743		0.950			0.950		
Satd. Flow (perm)	0	1588	0	1336	1341	1615	1736	6285	0	3367	4978	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		120				222						2
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		183			270			1530			1123	
Travel Time (s)		5.0			7.4			26.1			19.1	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	4%	4%	4%	4%	4%	4%
Adj. Flow (vph)	6	0	20	233	21	727	10	3222	5	22	2180	26
Shared Lane Traffic (%)				46%								
Lane Group Flow (vph)	0	26	0	126	128	727	10	3227	0	22	2206	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			48			27			30	
Link Offset(ft)		0			6			7			-10	
Crosswalk Width(ft)		40			45			33			53	
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1		1	1	1	1	0		1	0	
Detector Template	Left			Left		Right	Left			Left		
Leading Detector (ft)	20	100		100	100	100	100	0		100	0	
Trailing Detector (ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Size(ft)	20	100		100	100	100	100	6		100	6	
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex		CI+Ex	CI+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		4			8		1	6		5	2	
Permitted Phases	4			8		8						
Detector Phase	4	4		8	8	8	1	6		5	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	3.0	7.0		5.0	7.0	
Minimum Split (s)	13.0	13.0		13.0	13.0	13.0	12.0	14.0		14.0	14.0	

Lanes, Volumes, Timings

9: New Hampshire Ave (MD 650) & Northwest Drive/Michelson Road

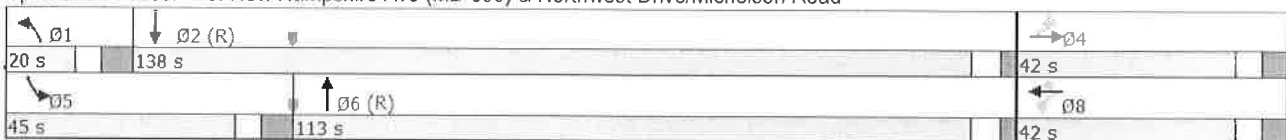
11/01/2017

	↖	→	↘	↙	←	↖	↗	↑	↘	↙	↓	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (s)	42.0	42.0		42.0	42.0	42.0	20.0	113.0		45.0	138.0	
Total Split (%)	21.0%	21.0%		21.0%	21.0%	21.0%	10.0%	56.5%		22.5%	69.0%	
Maximum Green (s)	34.0	34.0		34.0	34.0	34.0	11.0	106.0		36.0	131.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.5		4.0	4.5	
All-Red Time (s)	4.0	4.0		4.0	4.0	4.0	5.0	2.5		5.0	2.5	
Lost Time Adjust (s)		-1.5		-1.5	-1.5	-1.5	-1.5	-1.5		-1.5	-1.5	
Total Lost Time (s)		6.5		6.5	6.5	6.5	7.5	5.5		7.5	5.5	
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	0.2		3.0	0.2	
Recall Mode	None	None		None	None	None	None	C-Max		None	C-Max	
Act Effect Green (s)		35.5		35.5	35.5	35.5	8.3	142.6		8.3	145.7	
Actuated g/C Ratio		0.18		0.18	0.18	0.18	0.04	0.71		0.04	0.73	
v/c Ratio		0.07		0.53	0.54	1.55	0.14	0.72		0.16	0.61	
Control Delay		0.4		83.9	84.2	289.7	142.3	21.3		102.7	20.2	
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.5	
Total Delay		0.4		83.9	84.2	289.7	142.3	21.3		102.7	20.7	
LOS		A		F	F	F	F	C		F	C	
Approach Delay		0.4			236.4			21.6			21.5	
Approach LOS		A			F			C			C	
Queue Length 50th (ft)		0		161	164	~1094	14	1249		15	367	
Queue Length 95th (ft)		0		247	250	#1361	m8	m306		m21	1021	
Internal Link Dist (ft)		103			190			1450			1043	
Turn Bay Length (ft)							280			225		
Base Capacity (vph)		380		237	238	469	108	4482		631	3627	
Starvation Cap Reductn		0		0	0	0	0	0		0	848	
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		0.07		0.53	0.54	1.55	0.09	0.72		0.03	0.79	

Intersection Summary

Area Type: Other  
 Cycle Length: 200  
 Actuated Cycle Length: 200  
 Offset: 60 (30%), Referenced to phase 2:SBT and 6:NBT, Start of Green  
 Natural Cycle: 140  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.55  
 Intersection Signal Delay: 54.1  
 Intersection LOS: D  
 Intersection Capacity Utilization 109.5%  
 ICU Level of Service H  
 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.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 9: New Hampshire Ave (MD 650) & Northwest Drive/Michelson Road



Lanes, Volumes, Timings

15: New Hampshire Ave (MD 650) & Lockwood Drive

11/01/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	245	430	217	740	275	150	404	3082	521	136	1429	190
Future Volume (vph)	245	430	217	740	275	150	404	3082	521	136	1429	190
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	11	12	11	12	12	12
Storage Length (ft)	150		180	0		215	300		225	315		0
Storage Lanes	1		1	2		1	2		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.91	0.91	1.00	0.86	0.86	1.00	0.97	0.86	1.00	1.00	0.91	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950	0.997		0.950	0.977		0.950			0.950		
Satd. Flow (prot)	1643	3448	1615	3105	3193	1615	3255	6285	1501	1703	4893	1524
Flt Permitted	0.950	0.997		0.950	0.977		0.950			0.950		
Satd. Flow (perm)	1643	3448	1615	3105	3193	1615	3255	6285	1501	1703	4893	1524
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			115			115			181			124
Link Speed (mph)		30			30			40			40	
Link Distance (ft)		537			500			1123			377	
Travel Time (s)		12.2			11.4			19.1			6.4	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	4%	4%	4%	6%	6%	6%
Adj. Flow (vph)	255	448	226	771	286	156	421	3210	543	142	1489	198
Shared Lane Traffic (%)	11%			32%								
Lane Group Flow (vph)	227	476	226	524	533	156	421	3210	543	142	1489	198
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		20			40			27			30	
Link Offset(ft)		-15			30			15			-15	
Crosswalk Width(ft)		26			23			35			25	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.04	1.00	1.04	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	1	1	0	0	1	0	0	1	0	0
Detector Template	Left			Left		Right	Left			Left		
Leading Detector (ft)	100	100	100	100	0	0	100	0	0	100	0	0
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	100	100	100	100	6	20	100	6	20	100	6	20
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	3	3		4	4		1	6		5	2	
Permitted Phases			3			4			6			2
Detector Phase	3	3	3	4	4	4	1	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	7.0	7.0	5.0	7.0	7.0

Lanes, Volumes, Timings

15: New Hampshire Ave (MD 650) & Lockwood Drive

11/01/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Split (s)	12.5	12.5	12.5	12.5	12.5	12.5	14.0	16.0	16.0	14.0	16.0	16.0
Total Split (s)	44.0	44.0	44.0	44.0	44.0	44.0	22.0	90.0	90.0	22.0	90.0	90.0
Total Split (%)	22.0%	22.0%	22.0%	22.0%	22.0%	22.0%	11.0%	45.0%	45.0%	11.0%	45.0%	45.0%
Maximum Green (s)	36.5	36.5	36.5	36.5	36.5	36.5	13.0	82.5	82.5	13.0	82.5	82.5
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.5	4.5	4.0	4.5	4.5
All-Red Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	5.0	3.0	3.0	5.0	3.0	3.0
Lost Time Adjust (s)	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	7.5	6.0	6.0	7.5	6.0	6.0
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	0.2	0.2	3.0	0.2	0.2
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effect Green (s)	35.4	35.4	35.4	38.6	38.6	38.6	16.5	84.0	84.0	16.5	84.0	84.0
Actuated g/C Ratio	0.18	0.18	0.18	0.19	0.19	0.19	0.08	0.42	0.42	0.08	0.42	0.42
v/c Ratio	0.78	0.78	0.59	0.87	0.87	0.87	0.39	1.58	1.22	0.74	1.01	0.72
Control Delay	97.3	88.0	42.7	94.2	92.9	23.3	321.9	142.1	33.1	163.5	50.9	14.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0
Total Delay	97.3	88.0	42.7	94.2	92.9	23.3	321.9	142.1	33.1	163.5	51.0	14.7
LOS	F	F	D	F	F	C	F	F	C	F	D	B
Approach Delay		79.3			84.5			146.1			55.8	
Approach LOS		E			F			F			E	
Queue Length 50th (ft)	314	329	135	395	401	45	~430	~1485	256	~219	598	59
Queue Length 95th (ft)	435	402	237	#508	#509	125	m#494	m#1354	m361	#385	654	125
Internal Link Dist (ft)		457			420			1043			297	
Turn Bay Length (ft)	150		180			215	300		225	315		
Base Capacity (vph)	312	655	400	603	620	406	267	2639	735	140	2055	712
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	1	0	0	0	0	0	0	0	66	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.73	0.73	0.57	0.87	0.86	0.38	1.58	1.22	0.74	1.01	0.75	0.28

Intersection Summary

Area Type: Other  
 Cycle Length: 200  
 Actuated Cycle Length: 200  
 Offset: 22 (11%), Referenced to phase 2:SBT and 6:NBT, Start of Green  
 Natural Cycle: 140  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.58  
 Intersection Signal Delay: 109.0  
 Intersection LOS: F  
 Intersection Capacity Utilization 100.7%  
 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.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 15: New Hampshire Ave (MD 650) & Lockwood Drive

Ø1	Ø2 (R)	Ø3	Ø4
22 s	90 s	44 s	44 s
Ø5	Ø6 (R)		
22 s	90 s		



Lanes, Volumes, Timings

39: Columbia Pike (US 29) & Colesville Business Park Driveway/Lockwood Drive

11/01/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	30	0	10	719	5	10	0	4731	0	5	3559	5
Future Volume (vph)	30	0	10	719	5	10	0	4731	0	5	3559	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	11	11	11	11	11	11
Storage Length (ft)	0		50	0		105	250		0	220		0
Storage Lanes	1		1	2		1	0		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.86	1.00	1.00	0.86	0.86
Frnt			0.850		0.897							
Flt Protected	0.950			0.950						0.950		
Satd. Flow (prot)	1805	0	1615	3502	1704	0	0	6075	0	1694	6134	0
Flt Permitted	0.747			0.950						0.029		
Satd. Flow (perm)	1419	0	1615	3502	1704	0	0	6075	0	52	6134	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			24									
Link Speed (mph)		25			30			40			40	
Link Distance (ft)		156			227			370			609	
Travel Time (s)		4.3			5.2			6.3			10.4	
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
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	4%	4%	4%	3%	3%	3%
Adj. Flow (vph)	33	0	11	782	5	11	0	5142	0	5	3868	5
Shared Lane Traffic (%)												
Lane Group Flow (vph)	33	0	11	782	16	0	0	5142	0	5	3873	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		26			24			11			11	
Link Offset(ft)		-45			22			0			0	
Crosswalk Width(ft)		16			14			19			28	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.04	1.04	1.04	1.04	1.04	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1		0	1	1			0		0	0	
Detector Template												
Leading Detector (ft)	20		0	100	100			0		0	0	
Trailing Detector (ft)	0		0	0	0			0		0	0	
Detector 1 Position(ft)	0		0	0	0			0		0	0	
Detector 1 Size(ft)	20		100	100	100			6		80	6	
Detector 1 Type	CI+Ex		CI+Ex	CI+Ex	CI+Ex			CI+Ex		CI+Ex	CI+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0		0.0	0.0	0.0			0.0		0.0	0.0	
Detector 1 Queue (s)	0.0		0.0	0.0	0.0			0.0		0.0	0.0	
Detector 1 Delay (s)	0.0		0.0	0.0	0.0			0.0		0.0	0.0	
Turn Type	Perm		Prot	Perm	NA			NA		Perm	NA	
Protected Phases			4		8						2	
Permitted Phases	4			8				6		2		
Detector Phase	4		4	8	8			6		2	2	
Switch Phase												
Minimum Initial (s)	5.0		5.0	5.0	5.0			10.0		10.0	10.0	



Lanes, Volumes, Timings

39: Columbia Pike (US 29) & Colesville Business Park Driveway/Lockwood Drive

11/01/2017

	↖	→	↘	↙	←	↖	↙	↑	↗	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Split (s)	12.0		12.0	12.0	12.0			17.0		17.0	17.0	
Total Split (s)	35.0		35.0	35.0	35.0			145.0		145.0	145.0	
Total Split (%)	19.4%		19.4%	19.4%	19.4%			80.6%		80.6%	80.6%	
Maximum Green (s)	28.0		28.0	28.0	28.0			138.0		138.0	138.0	
Yellow Time (s)	4.0		4.0	4.0	4.0			5.0		5.0	5.0	
All-Red Time (s)	3.0		3.0	3.0	3.0			2.0		2.0	2.0	
Lost Time Adjust (s)	-1.5		-1.5	-1.5	-1.5			-1.5		-1.5	-1.5	
Total Lost Time (s)	5.5		5.5	5.5	5.5			5.5		5.5	5.5	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	5.0		5.0	5.0	5.0			0.2		0.2	0.2	
Recall Mode	None		None	None	None			C-Max		C-Max	C-Max	
Act Effct Green (s)	29.5		29.5	29.5	29.5			139.5		139.5	139.5	
Actuated g/C Ratio	0.16		0.16	0.16	0.16			0.78		0.78	0.78	
v/c Ratio	0.14		0.04	1.36	0.06			1.09		0.12	0.81	
Control Delay	66.4		6.3	227.3	64.3			67.2		7.6	7.9	
Queue Delay	0.0		0.0	0.0	0.0			0.0		0.0	0.0	
Total Delay	66.4		6.3	227.3	64.3			67.2		7.6	7.9	
LOS	E		A	F	E			E		A	A	
Approach Delay		51.4				224.0		67.2				7.9
Approach LOS		D				F		E				A
Queue Length 50th (ft)	34		0	~623	16			~1981		1	311	
Queue Length 95th (ft)	72		8	#758	42			#1954		m1	m300	
Internal Link Dist (ft)		76				147		290				529
Turn Bay Length (ft)			50							220		
Base Capacity (vph)	232		284	573	279			4708		40	4753	
Starvation Cap Reductn	0		0	0	0			0		0	0	
Spillback Cap Reductn	0		0	0	0			0		0	0	
Storage Cap Reductn	0		0	0	0			0		0	0	
Reduced v/c Ratio	0.14		0.04	1.36	0.06			1.09		0.13	0.81	

Intersection Summary

Area Type: Other

Cycle Length: 180

Actuated Cycle Length: 180

Offset: 88 (49%), Referenced to phase 2:SBTL and 6:NBT, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.36

Intersection Signal Delay: 56.5

Intersection LOS: E

Intersection Capacity Utilization 98.2%

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.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 39: Columbia Pike (US 29) & Colesville Business Park Driveway/Lockwood Drive

↓ Ø2 (R) 145 s	↗ Ø4 35 s
↑ Ø6 (R) 145 s	← Ø8 35 s

Lanes, Volumes, Timings  
66: Columbia Pike (US 29) & Stewart Lane

11/01/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	47	55	15	101	20	41	42	4452	440	699	3500	52
Future Volume (vph)	47	55	15	101	20	41	42	4452	440	699	3500	52
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	12	12	12	12	12	12
Storage Length (ft)	0		0	0		0	240		0	250		700
Storage Lanes	1		0	0		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	1.00	1.00	0.86	0.86
Frt		0.968				0.850			0.850			0.850
Flt Protected	0.950				0.960		0.950			0.950		
Satd. Flow (prot)	1745	1778	0	0	1763	1561	1736	4988	1553	1736	4713	1335
Flt Permitted	0.379				0.655		0.950			0.950		
Satd. Flow (perm)	696	1778	0	0	1203	1561	1736	4988	1553	1736	4713	1335
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		6				70			211			73
Link Speed (mph)		30			30				45			50
Link Distance (ft)		274			223				422			4978
Travel Time (s)		6.2			5.1				6.4			67.9
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
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	4%	4%	4%	4%	4%	4%
Adj. Flow (vph)	51	60	16	110	22	45	46	4839	478	760	3804	57
Shared Lane Traffic (%)												10%
Lane Group Flow (vph)	51	76	0	0	132	45	46	4839	478	760	3810	51
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		11			40			20			20	
Link Offset(ft)		15			-15			5			-3	
Crosswalk Width(ft)		25			25			15			18	
Two way Left Turn Lane												
Headway Factor	1.04	1.04	1.04	1.04	1.04	1.04	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1		1	1	1	1	0	0	1	0	0
Detector Template				Left								
Leading Detector (ft)	35	35		20	35	35	80	0	0	80	0	0
Trailing Detector (ft)	0	0		0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0		0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	35	35		20	35	35	80	6	20	80	6	20
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA	Prot	Prot	NA	Prot
Protected Phases		4			8		5	2	2	1	6	6
Permitted Phases	4			8		8						
Detector Phase	4	4		8	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	3.0	7.0	7.0	3.0	7.0	7.0

Lanes, Volumes, Timings  
66: Columbia Pike (US 29) & Stewart Lane

11/01/2017

	↖	→	↘	↙	←	↖	↙	↑	↗	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Split (s)	12.5	12.5		12.5	12.5	12.5	12.5	14.0	14.0	10.5	14.0	14.0
Total Split (s)	22.0	22.0		22.0	22.0	22.0	23.0	135.0	135.0	23.0	135.0	135.0
Total Split (%)	12.2%	12.2%		12.2%	12.2%	12.2%	12.8%	75.0%	75.0%	12.8%	75.0%	75.0%
Maximum Green (s)	14.5	14.5		14.5	14.5	14.5	15.5	128.0	128.0	15.5	128.0	128.0
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	3.5	5.0	5.0	3.5	5.0	5.0
All-Red Time (s)	3.5	3.5		3.5	3.5	3.5	4.0	2.0	2.0	4.0	2.0	2.0
Lost Time Adjust (s)	-1.5	-1.5			-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5
Total Lost Time (s)	6.0	6.0			6.0	6.0	6.0	5.5	5.5	6.0	5.5	5.5
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	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	3.0
Recall Mode	None	None		None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	16.0	16.0		16.0	16.0	16.0	11.6	129.5	129.5	17.0	137.6	137.6
Actuated g/C Ratio	0.09	0.09		0.09	0.09	0.09	0.06	0.72	0.72	0.09	0.76	0.76
v/c Ratio	0.84	0.47		1.25	0.22	0.22	0.41	1.35	0.41	4.66	1.06	0.05
Control Delay	152.4	81.6		228.2	6.9	95.6	172.8	0.4	1676.0	55.2	0.6	0.6
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	152.4	81.6		228.2	6.9	95.6	172.8	0.4	1676.0	55.2	0.6	0.6
LOS	F	F		F	A	F	F	A	F	E	A	A
Approach Delay		110.1		172.0			156.7			321.1		
Approach LOS		F		F			F			F		
Queue Length 50th (ft)	60	80		~192	0	58	~2726	2	~1658	~1937	0	0
Queue Length 95th (ft)	#154	142		#346	17	m55	m#2373	m1	#1920	#2013	6	6
Internal Link Dist (ft)		194		143			342			4898		
Turn Bay Length (ft)							240			250		700
Base Capacity (vph)	61	163		106	202	163	3588	1176	163	3602	1037	
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.84	0.47		1.25	0.22	0.28	1.35	0.41	4.66	1.06	0.05	

Intersection Summary

Area Type: Other  
 Cycle Length: 180  
 Actuated Cycle Length: 180  
 Offset: 16 (9%), Referenced to phase 2:NBT and 6:SBT, Start of Green  
 Natural Cycle: 150  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 4.66  
 Intersection Signal Delay: 230.3  
 Intersection Capacity Utilization 152.6%  
 Analysis Period (min) 15

Intersection LOS: F  
 ICU Level of Service H













- 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.
- m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 66: Columbia Pike (US 29) & Stewart Lane

↖ Ø1	↑ Ø2 (R)	→ Ø4
23 s	135 s	22 s
↙ Ø5	↓ Ø6 (R)	← Ø8
23 s	135 s	22 s

Lanes, Volumes, Timings  
74: Cherry Hill Road & FDA Boulevard

11/01/2017

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	734	551	358	1070	1616	459
Future Volume (vph)	734	551	358	1070	1616	459
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	300	250			400
Storage Lanes	2	1	1			1
Taper Length (ft)	25		25			
Lane Util. Factor	0.97	1.00	1.00	0.95	0.95	1.00
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	3502	1615	1805	3610	3610	1615
Flt Permitted	0.950		0.051			
Satd. Flow (perm)	3502	1615	97	3610	3610	1615
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		243				432
Link Speed (mph)	25			30	30	
Link Distance (ft)	933			373	580	
Travel Time (s)	25.4			8.5	13.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	816	612	398	1189	1796	510
Shared Lane Traffic (%)						
Lane Group Flow (vph)	816	612	398	1189	1796	510
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	24			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	37			48	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Number of Detectors	1	1	1	0	0	0
Detector Template	Left	Right				
Leading Detector (ft)	25	25	25	0	0	0
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	25	25	25	6	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Turn Type	Prot	Prot	pm+pt	NA	NA	Prot
Protected Phases	4	4	1	6	2	2
Permitted Phases			6			
Detector Phase	4	4	1	6	2	2
Switch Phase						
Minimum Initial (s)	7.0	7.0	3.0	7.0	7.0	7.0
Minimum Split (s)	13.0	13.0	9.0	13.0	13.0	13.0
Total Split (s)	46.0	46.0	26.0	104.0	78.0	78.0

Lanes, Volumes, Timings  
74: Cherry Hill Road & FDA Boulevard

11/01/2017

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Total Split (%)	30.7%	30.7%	17.3%	69.3%	52.0%	52.0%
Maximum Green (s)	40.0	40.0	20.0	98.0	72.0	72.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	0.2	0.2	0.2
Recall Mode	None	None	None	C-Max	C-Max	C-Max
Act Effct Green (s)	41.5	41.5	99.5	99.5	73.5	73.5
Actuated g/C Ratio	0.28	0.28	0.66	0.66	0.49	0.49
v/c Ratio	0.84	0.98	1.29	0.50	1.02	0.50
Control Delay	50.4	54.6	180.3	6.1	34.6	2.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.4	54.6	180.3	6.1	34.6	2.5
LOS	D	D	F	A	C	A
Approach Delay	52.2			49.8	27.5	
Approach LOS	D			D	C	
Queue Length 50th (ft)	310	253	-429	208	-679	23
Queue Length 95th (ft)	420	#704	m#631	185	m478	m21
Internal Link Dist (ft)	853			293	500	
Turn Bay Length (ft)		300	250			400
Base Capacity (vph)	968	622	309	2394	1768	1011
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.84	0.98	1.29	0.50	1.02	0.50

Intersection Summary

Area Type: Other  
 Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBTL, Start of Green  
 Natural Cycle: 120  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.29  
 Intersection Signal Delay: 40.8  
 Intersection Capacity Utilization 96.7%  
 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.  
 m Volume for 95th percentile queue is metered by upstream signal.

























Splits and Phases: 74: Cherry Hill Road & FDA Boulevard

Ø1	Ø2 (R)	Ø4
26 s	78 s	46 s
Ø6 (R)		
104 s		

Lanes, Volumes, Timings

81: Cherry Hill Road & Plum Orchard Drive/Clover Patch Drive

11/01/2017

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	150	85	655	15	45	10	413	1341	50	30	1405	145
Future Volume (vph)	150	85	655	15	45	10	413	1341	50	30	1405	145
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	250		0	0		0	215		0	150		500
Storage Lanes	1		1	1		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	1.00
Frt			0.850		0.973			0.995				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1805	1900	1615	1805	3513	0	1805	3592	0	1805	3610	1615
Flt Permitted	0.715			0.680			0.058			0.155		
Satd. Flow (perm)	1358	1900	1615	1292	3513	0	110	3592	0	294	3610	1615
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			342		11			5				161
Link Speed (mph)		25			25			30			30	
Link Distance (ft)		397			415			343			258	
Travel Time (s)		10.8			11.3			7.8			5.9	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	167	94	728	17	50	11	459	1490	56	33	1561	161
Shared Lane Traffic (%)												
Lane Group Flow (vph)	167	94	728	17	61	0	459	1546	0	33	1561	161
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		10			0			0			0	
Crosswalk Width(ft)		20			20			35			34	
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	0	0	1	0		1	0		0	0	1
Detector Template	Left			Left								Right
Leading Detector (ft)	30	0	0	30	0		40	0		0	0	20
Trailing Detector (ft)	0	0	0	0	0		10	0		0	0	0
Detector 1 Position(ft)	0	0	0	0	0		10	0		0	0	0
Detector 1 Size(ft)	30	6	20	30	6		30	6		20	6	20
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA		Perm	NA	Perm
Protected Phases		8			4		5	2			6	
Permitted Phases	8		8	4			2			6		6
Detector Phase	8	8	8	4	4		5	2		6	6	6
Switch Phase												
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0		3.0	7.0		7.0	7.0	7.0
Minimum Split (s)	9.5	9.5	9.5	9.5	9.5		9.0	13.5		13.5	13.5	13.5
Total Split (s)	47.0	47.0	47.0	47.0	47.0		34.0	103.0		69.0	69.0	69.0



Lanes, Volumes, Timings

81: Cherry Hill Road & Plum Orchard Drive/Clover Patch Drive

11/01/2017

	↖	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (%)	31.3%	31.3%	31.3%	31.3%	31.3%		22.7%	68.7%		46.0%	46.0%	46.0%
Maximum Green (s)	40.5	40.5	40.5	40.5	40.5		28.0	96.5		62.5	62.5	62.5
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		4.0	4.5		4.5	4.5	4.5
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	-1.5	-1.5	-1.5	-1.5	-1.5		-1.5	-1.5		-1.5	-1.5	-1.5
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0		4.5	5.0		5.0	5.0	5.0
Lead/Lag							Lead			Lag	Lag	Lag
Lead-Lag Optimize?							Yes			Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		5.0	0.2		0.2	0.2	0.2
Recall Mode	None	None	None	None	None		None	C-Max		C-Max	C-Max	C-Max
Act Effct Green (s)	42.0	42.0	42.0	42.0	42.0		98.5	98.0		64.0	64.0	64.0
Actuated g/C Ratio	0.28	0.28	0.28	0.28	0.28		0.66	0.65		0.43	0.43	0.43
v/c Ratio	0.44	0.18	1.04	0.05	0.06		1.13	0.66		0.26	1.01	0.21
Control Delay	48.8	42.0	73.1	40.1	32.7		131.1	16.6		33.7	59.5	16.0
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	48.8	42.0	73.1	40.1	32.7		131.1	16.6		33.7	59.5	16.0
LOS	D	D	E	D	C		F	B		C	E	B
Approach Delay		66.1			34.3			42.8			55.0	
Approach LOS		F			C			D			E	
Queue Length 50th (ft)	135	70	~513	12	18		~468	314		30	~863	97
Queue Length 95th (ft)	211	120	#766	33	38		m#671	395		m29	m741	m86
Internal Link Dist (ft)		317			335			263			178	
Turn Bay Length (ft)	250						215			150		500
Base Capacity (vph)	380	532	698	361	991		405	2348		125	1540	781
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	0
Reduced v/c Ratio	0.44	0.18	1.04	0.05	0.06		1.13	0.66		0.26	1.01	0.21

Intersection Summary

Area Type: Other  
 Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 120 (80%), Referenced to phase 2:NBT and 6:SBTL, Start of Green  
 Natural Cycle: 120  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.13  
 Intersection Signal Delay: 51.9  
 Intersection Capacity Utilization 95.2%  
 Analysis Period (min) 15

Intersection LOS: D  
 ICU Level of Service F

- ~ 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.
- m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 81: Cherry Hill Road & Plum Orchard Drive/Clover Patch Drive

↑ Ø2 (R)					↖ Ø4
103 s					47 s
↙ Ø5		↓ Ø6 (R)			→ Ø8
34 s		69 s			47 s



Lanes, Volumes, Timings

84: Cherry Hill Road & Powder Mill Road (MD 212)

11/01/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	367	596	30	80	853	52	80	854	35	489	1337	436
Future Volume (vph)	367	596	30	80	853	52	80	854	35	489	1337	436
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	11	11	10	12	12	12	11	12	11
Storage Length (ft)	420		0	200		410	190		0	450		360
Storage Lanes	2		0	1		1	1		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Fr		0.993				0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3335	3414	0	1646	3292	1422	1805	3610	1615	3385	3610	1561
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3335	3414	0	1646	3292	1422	1805	3610	1615	3385	3610	1561
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)		4				240						361
Link Speed (mph)		40			40			40			40	
Link Distance (ft)		605			616			491			636	
Travel Time (s)		10.3			10.5			8.4			10.8	
Peak Hour 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
Heavy Vehicles (%)	5%	5%	5%	6%	6%	6%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	367	596	30	80	853	52	80	854	35	489	1337	436
Shared Lane Traffic (%)												
Lane Group Flow (vph)	367	626	0	80	853	52	80	854	35	489	1337	436
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			28			30	
Link Offset(ft)		-12			10			0			1	
Crosswalk Width(ft)		28			36			16			31	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.04	1.04	1.09	1.00	1.00	1.00	1.04	1.00	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot	NA		Prot	NA	Free	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases						Free			4			8
Minimum Split (s)	11.0	27.0		11.0	27.0		13.0	13.0	13.0	14.0	14.0	14.0
Total Split (s)	23.0	55.0		17.0	49.0		13.0	52.0	52.0	26.0	65.0	65.0
Total Split (%)	15.3%	36.7%		11.3%	32.7%		8.7%	34.7%	34.7%	17.3%	43.3%	43.3%
Maximum Green (s)	18.0	48.0		12.0	42.0		8.0	46.0	46.0	21.0	59.0	59.0
Yellow Time (s)	4.0	5.0		4.0	5.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	2.0		1.0	2.0		1.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	-1.5	-1.5		-1.5	-1.5		-1.5	-1.5	-1.5	-1.5	-1.5	-1.5
Total Lost Time (s)	3.5	5.5		3.5	5.5		3.5	4.5	4.5	3.5	4.5	4.5
Lead/Lag	Lead	Lead		Lag	Lag		Lead	Lead	Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Act Effct Green (s)	19.5	49.5		13.5	43.5	150.0	9.5	47.5	47.5	22.5	60.5	60.5
Actuated g/C Ratio	0.13	0.33		0.09	0.29	1.00	0.06	0.32	0.32	0.15	0.40	0.40
v/c Ratio	0.85	0.55		0.54	0.89	0.04	0.70	0.75	0.07	0.96	0.92	0.52
Control Delay	82.0	43.2		42.3	26.7	0.0	99.0	50.7	36.4	49.5	24.0	0.9

Lanes, Volumes, Timings

84: Cherry Hill Road & Powder Mill Road (MD 212)

11/01/2017

	↖	→	↘	↙	←	↖	↙	↑	↗	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	82.0	43.2		42.3	26.7	0.0	99.0	50.7	36.4	49.5	24.0	0.9
LOS	F	D		D	C	A	F	D	D	D	C	A
Approach Delay		57.5			26.6			54.2			25.1	
Approach LOS		E			C			D			C	
Queue Length 50th (ft)	184	263		75	325	0	78	394	24	238	516	19
Queue Length 95th (ft)	#263	327		m87	m#406	m0	#162	475	53	m236	m509	m19
Internal Link Dist (ft)		525			536			411			556	
Turn Bay Length (ft)	420			200		410	190			450		360
Base Capacity (vph)	433	1129		148	954	1422	114	1143	511	507	1456	845
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.85	0.55		0.54	0.89	0.04	0.70	0.75	0.07	0.96	0.92	0.52

Intersection Summary

Area Type: Other  
 Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 9 (6%), Referenced to phase 2:WBT and 6:EBT, Start of Green  
 Natural Cycle: 100  
 Control Type: Pretimed  
 Maximum v/c Ratio: 0.96  
 Intersection Signal Delay: 37.0  
 Intersection LOS: D  
 Intersection Capacity Utilization 91.8%  
 ICU Level of Service F  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 84: Cherry Hill Road & Powder Mill Road (MD 212)

↖ Ø1 23 s	↙ Ø2 (R) 49 s	↑ Ø4 52 s	↘ Ø3 26 s
→ Ø6 (R) 55 s	↙ Ø5 17 s	↙ Ø7 13 s	↓ Ø8 65 s

Lanes, Volumes, Timings  
 94: Columbia Pike (US 29) & Industrial Parkway

11/01/2017

	↙	↖	↑	↗	↘	↓
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↙↖	↖	↑↑↑		↗↘	↑↑↑
Traffic Volume (vph)	1486	414	3115	0	362	2765
Future Volume (vph)	1486	414	3115	0	362	2765
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	12	12
Storage Length (ft)	0	0		500	0	
Storage Lanes	2	1		0	2	
Taper Length (ft)	25				25	
Lane Util. Factor	0.97	1.00	0.91	1.00	0.97	0.91
Frt		0.850				
Flt Protected	0.950				0.950	
Satd. Flow (prot)	3385	1561	4988	0	3367	4988
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	3385	1561	4988	0	3367	4988
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		132				
Link Speed (mph)	30		50			50
Link Distance (ft)	156		386			541
Travel Time (s)	3.5		5.3			7.4
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	4%	4%	4%	4%
Adj. Flow (vph)	1564	436	3279	0	381	2911
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1564	436	3279	0	381	2911
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	10		50			50
Link Offset(ft)	25		-3			0
Crosswalk Width(ft)	20		65			30
Two way Left Turn Lane						
Headway Factor	1.04	1.04	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Number of Detectors	1	1	0		1	0
Detector Template						
Leading Detector (ft)	25	25	0		25	0
Trailing Detector (ft)	0	0	0		0	0
Detector 1 Position(ft)	0	0	0		0	0
Detector 1 Size(ft)	25	25	6		25	6
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Turn Type	Prot	Prot	NA		Prot	NA
Protected Phases	8	8	6		5	2
Permitted Phases						
Detector Phase	8	8	6		5	2
Switch Phase						
Minimum Initial (s)	5.0	5.0	7.0		5.0	7.0

Lanes, Volumes, Timings  
 94: Columbia Pike (US 29) & Industrial Parkway

11/01/2017

	↙	↖	↑	↗	↘	↓
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Minimum Split (s)	24.5	24.5	15.0		11.0	14.0
Total Split (s)	53.0	53.0	81.0		16.0	97.0
Total Split (%)	35.3%	35.3%	54.0%		10.7%	64.7%
Maximum Green (s)	46.5	46.5	73.0		10.0	90.0
Yellow Time (s)	4.0	4.0	5.5		4.0	5.5
All-Red Time (s)	2.5	2.5	2.5		2.0	1.5
Lost Time Adjust (s)	-1.5	-1.5	-1.5		-1.5	-1.5
Total Lost Time (s)	5.0	5.0	6.5		4.5	5.5
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)	3.0	3.0	0.2		5.0	0.2
Recall Mode	None	None	C-Max		None	C-Max
Walk Time (s)	7.0	7.0				
Flash Dont Walk (s)	11.0	11.0				
Pedestrian Calls (#/hr)	0	0				
Act Effct Green (s)	48.0	48.0	74.5		11.5	91.5
Actuated g/C Ratio	0.32	0.32	0.50		0.08	0.61
v/c Ratio	1.44	0.74	1.32		1.48	0.96
Control Delay	219.9	3.5	181.2		279.2	36.6
Queue Delay	0.0	15.2	0.0		1.3	4.9
Total Delay	219.9	18.7	181.2		280.5	41.5
LOS	F	B	F		F	D
Approach Delay	176.0		181.2			69.2
Approach LOS	F		F			E
Queue Length 50th (ft)	~1037	14	~1516		~263	934
Queue Length 95th (ft)	m#881	m8	#1580		#371	1014
Internal Link Dist (ft)	76		306			461
Turn Bay Length (ft)						
Base Capacity (vph)	1083	589	2477		258	3042
Starvation Cap Reductn	0	141	0		0	120
Spillback Cap Reductn	0	0	0		24	0
Storage Cap Reductn	0	0	0		0	0
Reduced v/c Ratio	1.44	0.97	1.32		1.63	1.00

Intersection Summary

Area Type: Other  
 Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBT, Start of Green  
 Natural Cycle: 150  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.48  
 Intersection Signal Delay: 137.0  
 Intersection Capacity Utilization 126.2%  
 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.  
 m Volume for 95th percentile queue is metered by upstream signal.

Intersection LOS: F  
 ICU Level of Service H

Lanes, Volumes, Timings  
 94: Columbia Pike (US 29) & Industrial Parkway

11/01/2017

Splits and Phases: 94: Columbia Pike (US 29) & Industrial Parkway

#94 Ø2 (R)			
97 s			
#94 #95 Ø5	#94 #95 Ø6 (R)	#94 #95 Ø8	
16 s	81 s	53 s	

Lanes, Volumes, Timings  
 95: Old Columbia Pike & Industrial Parkway

11/01/2017

	↖	→	↘	↙	←	↖	↙	↑	↗	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↘	↑↑↑	↗			↗↗		↑↑	
Traffic Volume (vph)	0	232	130	25	1691	398	0	0	2229	15	505	209
Future Volume (vph)	0	232	130	25	1691	398	0	0	2229	15	505	209
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	16	11	11	16	12	12	11	12	12	12
Storage Length (ft)	0		0	50		500	0		0	0		100
Storage Lanes	0		0	1		1	0		2	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.91	1.00	1.00	1.00	0.88	0.95	0.95	0.95
Frt		0.946				0.850			0.850		0.957	
Flt Protected				0.950							0.999	
Satd. Flow (prot)	0	3870	0	1745	5014	1830	0	0	2748	0	3451	0
Flt Permitted				0.950							0.999	
Satd. Flow (perm)	0	3870	0	1745	5014	1830	0	0	2748	0	3451	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		56				428			22			57
Link Speed (mph)		30			30			30				30
Link Distance (ft)		156			235			272				1014
Travel Time (s)		3.5			5.3			6.2				23.0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	0	249	140	27	1818	428	0	0	2397	16	543	225
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	389	0	27	1818	428	0	0	2397	0	784	0
Enter Blocked Intersection	No	No	No	Yes	1 veh	No	No	No	1 veh	No	Yes	1 veh
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		10			15			0			0	
Link Offset(ft)		-10			10			10			-5	
Crosswalk Width(ft)		16			16			35			16	
Two way Left Turn Lane												
Headway Factor	0.85	0.85	0.85	1.04	1.04	0.85	1.00	1.00	1.04	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		1		1	2	1			1	1	2	
Detector Template				Left	Thru	Right			Right	Left	Thru	
Leading Detector (ft)		25		20	100	20			20	20	100	
Trailing Detector (ft)		0		0	0	0			0	0	0	
Detector 1 Position(ft)		0		0	0	0			0	0	0	
Detector 1 Size(ft)		25		20	6	20			20	20	6	
Detector 1 Type		CI+Ex		CI+Ex	CI+Ex	CI+Ex			CI+Ex	CI+Ex	CI+Ex	
Detector 1 Channel												
Detector 1 Extend (s)		0.0		0.0	0.0	0.0			0.0	0.0	0.0	
Detector 1 Queue (s)		0.0		0.0	0.0	0.0			0.0	0.0	0.0	
Detector 1 Delay (s)		0.0		0.0	0.0	0.0			0.0	0.0	0.0	
Detector 2 Position(ft)					94						94	
Detector 2 Size(ft)					6						6	
Detector 2 Type					CI+Ex						CI+Ex	
Detector 2 Channel												
Detector 2 Extend (s)					0.0						0.0	
Turn Type		NA		Split	NA	Prot			pt+ov	Perm	NA	
Protected Phases		5		8	8	8			8 6		6	

Lane Group	Ø2
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
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)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (mph)	
Number of Detectors	
Detector Template	
Leading Detector (ft)	
Trailing Detector (ft)	
Detector 1 Position(ft)	
Detector 1 Size(ft)	
Detector 1 Type	
Detector 1 Channel	
Detector 1 Extend (s)	
Detector 1 Queue (s)	
Detector 1 Delay (s)	
Detector 2 Position(ft)	
Detector 2 Size(ft)	
Detector 2 Type	
Detector 2 Channel	
Detector 2 Extend (s)	
Turn Type	
Protected Phases	2



Lanes, Volumes, Timings  
95: Old Columbia Pike & Industrial Parkway

11/01/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases										6		
Dctector Phase		5		8	8	8			8 6	6	6	
Switch Phase												
Minimum Initial (s)		5.0		5.0	5.0	5.0				7.0	7.0	
Minimum Split (s)		11.0		24.5	24.5	24.5				15.0	15.0	
Total Split (s)		16.0		53.0	53.0	53.0				81.0	81.0	
Total Split (%)		10.7%		35.3%	35.3%	35.3%				54.0%	54.0%	
Maximum Green (s)		10.0		46.5	46.5	46.5				73.0	73.0	
Yellow Time (s)		4.0		4.0	4.0	4.0				5.5	5.5	
All-Red Time (s)		2.0		2.5	2.5	2.5				2.5	2.5	
Lost Time Adjust (s)		-1.5		-1.5	-1.5	-1.5					-1.5	
Total Lost Time (s)		4.5		5.0	5.0	5.0					6.5	
Lead/Lag		Lead								Lag	Lag	
Lead-Lag Optimize?		Yes								Yes	Yes	
Vehicle Extension (s)		5.0		3.0	3.0	3.0				0.2	0.2	
Recall Mode		None		None	None	None				C-Max	C-Max	
Walk Time (s)				7.0	7.0	7.0						
Flash Dont Walk (s)				11.0	11.0	11.0						
Pedestrian Calls (#/hr)				0	0	0						
Act Effct Green (s)		11.5		48.0	48.0	48.0			129.0		74.5	
Actuated g/C Ratio		0.08		0.32	0.32	0.32			0.86		0.50	
v/c Ratio		1.12		0.05	1.13	0.49			1.01		0.45	
Control Delay		96.9		35.7	114.2	5.2			33.1		23.5	
Queue Delay		2.2		0.0	0.1	0.0			27.6		2.0	
Total Delay		99.1		35.7	114.4	5.2			60.7		25.5	
LOS		F		D	F	A			E		C	
Approach Delay		99.1			92.9			60.7			25.5	
Approach LOS		F			F			E			C	
Queue Length 50th (ft)		~22		18	~754	0			~1243		237	
Queue Length 95th (ft)		m0		43	#849	77			#1532		292	
Internal Link Dist (ft)		76			155			192			934	
Turn Bay Length (ft)				50		500						
Base Capacity (vph)		348		558	1604	876			2366		1742	
Starvation Cap Reductn		61		0	0	0			157		0	
Spillback Cap Reductn		0		0	64	0			0		773	
Storage Cap Reductn		0		0	0	0			0		0	
Reduced v/c Ratio		1.36		0.05	1.18	0.49			1.09		0.81	

Intersection Summary

Area Type: Other  
 Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBT, Start of Green  
 Natural Cycle: 150  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.48  
 Intersection Signal Delay: 71.1  
 Intersection Capacity Utilization 123.0%  
 Analysis Period (min) 15  
 Intersection LOS: E  
 ICU Level of Service H  
 ~ Volume exceeds capacity, queue is theoretically infinite.

Lane Group	Ø2
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	7.0
Minimum Split (s)	14.0
Total Split (s)	97.0
Total Split (%)	65%
Maximum Green (s)	90.0
Yellow Time (s)	5.5
All-Red Time (s)	1.5
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	0.2
Recall Mode	C-Max
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	
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	
<b>Intersection Summary</b>	

Lanes, Volumes, Timings

95: Old Columbia Pike & Industrial Parkway

11/01/2017

Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 95: Old Columbia Pike & Industrial Parkway

#94 ↓ Ø2 (R)					
97 s					
#94 #95 ↘ → Ø5	#94 #95 ↑ ↓ Ø6 (R)		#94 #95 ↘ ↗ Ø8		
16 s	81 s		53 s		

Lanes, Volumes, Timings  
 96: Columbia Pike (US 29) & Tech Road

11/01/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↵	→	↗	↵	↕	↗	↵	↕	↗	↵	↕	↗
Traffic Volume (vph)	25	605	142	603	805	884	283	3246	0	310	2382	150
Future Volume (vph)	25	605	142	603	805	884	283	3246	0	310	2382	150
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	400		400	300		0
Storage Lanes	1		1	1		0	2		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	0.91	0.91	0.95	0.97	0.91	1.00	1.00	0.91	1.00
Frt			0.850		0.932							0.850
Flt Protected	0.950			0.950	0.994		0.950			0.950		
Satd. Flow (prot)	1805	1900	1615	1643	3204	0	3367	4988	0	1736	4988	1553
Flt Permitted	0.170			0.415	0.754		0.950			0.950		
Satd. Flow (perm)	323	1900	1615	718	2430	0	3367	4988	0	1736	4988	1553
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			161		111							124
Link Speed (mph)		30			30			50			50	
Link Distance (ft)		269			161			495			453	
Travel Time (s)		6.1			3.7			6.8			6.2	
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
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	4%	4%	4%	4%	4%	4%
Adj. Flow (vph)	27	658	154	655	875	961	308	3528	0	337	2589	163
Shared Lane Traffic (%)				41%								
Lane Group Flow (vph)	27	658	154	386	2105	0	308	3528	0	337	2589	163
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			9			38			50	
Link Offset(ft)		0			-10			12			0	
Crosswalk Width(ft)		50			28			15			16	
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	1	1	1		1	0		1	0	0
Detector Template							Left			Left	Thru	Right
Leading Detector (ft)	25	25	25	50	50		80	0		80	0	0
Trailing Detector (ft)	0	0	0	0	0		0	0		0	0	0
Detector 1 Position(ft)	0	0	0	0	0		0	0		0	0	0
Detector 1 Size(ft)	25	25	25	50	50		80	6		80	6	20
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Turn Type	Perm	NA	Prot	Perm	NA		Prot	NA		Prot	NA	Prot
Protected Phases		3	3		4		6	2		1	5	5
Permitted Phases	3			4								
Detector Phase	3	3	3	4	4		6	2		1	5	5
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0		3.0	7.0		4.0	7.0	7.0
Minimum Split (s)	12.0	12.0	12.0	12.0	12.0		10.5	14.5		11.5	14.5	14.5

Lanes, Volumes, Timings  
 96: Columbia Pike (US 29) & Tech Road

11/01/2017

	↖	→	↘	↙	←	↖	↙	↑	↗	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (s)	30.0	30.0	30.0	50.0	50.0		20.0	54.0		46.0	80.0	80.0
Total Split (%)	16.7%	16.7%	16.7%	27.8%	27.8%		11.1%	30.0%		25.6%	44.4%	44.4%
Maximum Green (s)	22.0	22.0	22.0	42.0	42.0		12.5	46.5		39.5	72.5	72.5
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		5.0	5.5		4.0	5.5	5.5
All-Red Time (s)	4.0	4.0	4.0	4.0	4.0		2.5	2.0		2.5	2.0	2.0
Lost Time Adjust (s)	-1.5	-1.5	-1.5	-1.5	-1.5		-1.5	-1.5		-1.5	-1.5	-1.5
Total Lost Time (s)	6.5	6.5	6.5	6.5	6.5		6.0	6.0		5.0	6.0	6.0
Lead/Lag	Lead	Lead	Lead	Lag	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	4.0	4.0	4.0	4.0	4.0		3.0	0.2		4.0	0.2	0.2
Recall Mode	None	None	None	None	None		Max	C-Max		None	C-Max	C-Max
Act Effct Green (s)	23.5	23.5	23.5	43.5	43.5		14.0	50.0		39.0	74.0	74.0
Actuated g/C Ratio	0.13	0.13	0.13	0.24	0.24		0.08	0.28		0.22	0.41	0.41
v/c Ratio	0.64	2.65	0.44	2.23	3.14		1.18	2.55		0.90	1.26	0.23
Control Delay	131.4	780.6	11.9	600.8	984.4		179.8	722.6		81.4	173.1	23.0
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	131.4	780.6	11.9	600.8	984.4		179.8	722.6		81.4	173.1	23.0
LOS	F	F	B	F	F		F	F		F	F	C
Approach Delay		618.6			925.0			679.0			155.2	
Approach LOS		F			F			F			F	
Queue Length 50th (ft)	31	~1306	0	~804	~2340		~223	~2564		405	~1393	66
Queue Length 95th (ft)	#93	#1560	65	#1051	#2468		#330	#2601		m431	m#1436	m76
Internal Link Dist (ft)		189			81			415			373	
Turn Bay Length (ft)							400			300		
Base Capacity (vph)	42	248	350	173	671		261	1385		395	2050	711
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	0
Reduced v/c Ratio	0.64	2.65	0.44	2.23	3.14		1.18	2.55		0.85	1.26	0.23

Intersection Summary

Area Type: Other  
 Cycle Length: 180  
 Actuated Cycle Length: 180  
 Offset: 178 (99%), Referenced to phase 2:NBT and 5:SBT, Start of Green  
 Natural Cycle: 150  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 3.14  
 Intersection Signal Delay: 576.0  
 Intersection LOS: F  
 Intersection Capacity Utilization 177.2%  
 ICU Level of Service H  
 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.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 96: Columbia Pike (US 29) & Tech Road

↖ Ø1	↑ Ø2 (R)	↘ Ø3	↙ Ø4
46 s	54 s	30 s	50 s
↙ Ø6	↓ Ø5 (R)		
20 s	80 s		

Lanes, Volumes, Timings  
 107: Columbia Pike (US 29) & Cherry Hill Road

11/01/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↔↔↔		↔↔	↔↔	↔	↔		↔↔	↔↔	↔	
Traffic Volume (vph)	185	1067	31	189	1161	987	26	0	105	682	0	70
Future Volume (vph)	185	1067	31	189	1161	987	26	0	105	682	0	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	11	11	12	12	12	12	12	12	12
Storage Length (ft)	0		0	410		350	0		0	0		0
Storage Lanes	2		0	2		1	1		2	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	0.91	0.97	0.95	1.00	1.00	1.00	0.88	0.91	0.91	1.00
Frt		0.996				0.850			0.850		0.958	
Flt Protected	0.950			0.950			0.950			0.950	0.965	
Satd. Flow (prot)	3502	5166	0	3385	3490	1615	1805	0	2842	3285	1598	0
Flt Permitted	0.950			0.950			0.950			0.950	0.965	
Satd. Flow (perm)	3502	5166	0	3385	3490	1615	1805	0	2842	3285	1598	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4				861			153		156	
Link Speed (mph)		30			30			40			40	
Link Distance (ft)		368			689			473			677	
Travel Time (s)		8.4			15.7			8.1			11.5	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	197	1135	33	201	1235	1050	28	0	112	726	0	74
Shared Lane Traffic (%)										26%		
Lane Group Flow (vph)	197	1168	0	201	1235	1050	28	0	112	537	263	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		40			40			200			250	
Link Offset(ft)		0			15			10			0	
Crosswalk Width(ft)		16			0			30			35	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.04	1.04	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	0		1	0	0	1		1	1	0	
Detector Template												
Leading Detector (ft)	100	0		100	0	0	100		100	100	0	
Trailing Detector (ft)	0	0		0	0	0	0		0	0	0	
Detector 1 Position(ft)	0	0		0	0	0	0		0	0	0	
Detector 1 Size(ft)	100	6		100	6	20	100		100	100	6	
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex	CI+Ex	CI+Ex		CI+Ex	CI+Ex	CI+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0	
Turn Type	Prot	NA		Prot	NA	Prot	Prot		Prot	Split	NA	
Protected Phases	1	6		5	2	2	3		3	4	4	
Permitted Phases												
Detector Phase	1	6		5	2	2	3		3	4	4	
Switch Phase												
Minimum Initial (s)	3.0	7.0		3.0	7.0	7.0	7.0		7.0	5.0	5.0	
Minimum Split (s)	10.0	16.0		10.0	16.0	16.0	15.5		15.5	26.0	26.0	

Lanes, Volumes, Timings  
 107: Columbia Pike (US 29) & Cherry Hill Road

11/01/2017

	↖	→	↘	↙	←	↖	↗	↑	↘	↙	↓	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (s)	17.0	77.5		20.0	80.5	80.5	15.5		15.5	37.0	37.0	
Total Split (%)	11.3%	51.7%		13.3%	53.7%	53.7%	10.3%		10.3%	24.7%	24.7%	
Maximum Green (s)	10.0	68.5		13.0	71.5	71.5	7.0		7.0	29.0	29.0	
Yellow Time (s)	3.5	4.5		3.5	4.5	4.5	3.5		3.5	3.5	3.5	
All-Red Time (s)	3.5	4.5		3.5	4.5	4.5	5.0		5.0	4.5	4.5	
Lost Time Adjust (s)	-1.5	-1.5		-1.5	-1.5	-1.5	-1.5		-1.5	-1.5	-1.5	
Total Lost Time (s)	5.5	7.5		5.5	7.5	7.5	7.0		7.0	6.5	6.5	
Lead/Lag	Lag	Lead		Lag	Lead	Lead	Lead		Lead	Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes		Yes	Yes	Yes	
Vehicle Extension (s)	6.0	0.2		6.0	0.2	0.2	6.0		6.0	6.0	6.0	
Recall Mode	None	C-Max		None	C-Max	C-Max	None		None	None	None	
Act Effect Green (s)	11.5	70.1		14.5	73.1	73.1	8.5		8.5	30.4	30.4	
Actuated g/C Ratio	0.08	0.47		0.10	0.49	0.49	0.06		0.06	0.20	0.20	
v/c Ratio	0.74	0.48		0.61	0.73	0.86	0.27		0.37	0.81	0.59	
Control Delay	84.2	28.2		67.6	20.8	6.8	75.0		6.4	67.5	27.2	
Queue Delay	0.0	0.0		0.0	1.4	2.6	0.0		0.0	0.0	0.0	
Total Delay	84.2	28.2		67.6	22.2	9.4	75.0		6.4	67.5	27.2	
LOS	F	C		E	C	A	E		A	E	C	
Approach Delay		36.3			20.5			20.1				51.3
Approach LOS		D			C			C				D
Queue Length 50th (ft)	98	283		106	406	57	27		0	278	102	
Queue Length 95th (ft)	#151	325		m125	m436	m55	62		13	352	212	
Internal Link Dist (ft)		288			609			393				597
Turn Bay Length (ft)				410		350						
Base Capacity (vph)	268	2416		327	1701	1228	102		305	667	449	
Starvation Cap Reductn	0	0		0	268	92	0		0	0	0	
Spillback Cap Reductn	0	0		0	0	0	0		0	0	0	
Storage Cap Reductn	0	0		0	0	0	0		0	0	0	
Reduced v/c Ratio	0.74	0.48		0.61	0.86	0.92	0.27		0.37	0.81	0.59	

Intersection Summary

Area Type: Other  
 Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 111 (74%), Referenced to phase 2:WBT and 6:EBT, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.86  
 Intersection Signal Delay: 30.6  
 Intersection LOS: C  
 Intersection Capacity Utilization 77.2%  
 ICU Level of Service D  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 107: Columbia Pike (US 29) & Cherry Hill Road

↖ Ø2 (R)	↖ Ø1	↘ Ø3	↙ Ø4
80.5 s	17 s	15.5 s	37 s
→ Ø6 (R)	↙ Ø5		
77.5 s	20 s		



Lanes, Volumes, Timings  
 109: Prosperity Drive & Cherry Hill Road

11/01/2017

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑	↗	↖	↑↑	↖	↗
Traffic Volume (vph)	1682	172	102	1881	456	233
Future Volume (vph)	1682	172	102	1881	456	233
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		250	400		0	0
Storage Lanes		1	1		1	1
Taper Length (ft)			25		25	
Lane Util. Factor	0.91	1.00	1.00	0.95	1.00	1.00
Fr <sub>t</sub>		0.850				0.850
Fl <sub>t</sub> Protected			0.950		0.950	
Satd. Flow (prot)	5187	1615	1805	3610	1805	1615
Fl <sub>t</sub> Permitted			0.079		0.950	
Satd. Flow (perm)	5187	1615	150	3610	1805	1615
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		187				111
Link Speed (mph)	30			30	30	
Link Distance (ft)	689			612	401	
Travel Time (s)	15.7			13.9	9.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1828	187	111	2045	496	253
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1828	187	111	2045	496	253
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	38			30	12	
Link Offset(ft)	-12			8	0	
Crosswalk Width(ft)	30			30	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Number of Detectors	0	0	1	0	1	1
Detector Template			Left			Right
Leading Detector (ft)	0	0	80	0	80	80
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	6	80	80	6	80	80
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Turn Type	NA	Perm	pm+pt	NA	Prot	Prot
Protected Phases	6		5	2	4	4
Permitted Phases		6	2			
Detector Phase	6	6	5	2	4	4
Switch Phase						
Minimum Initial (s)	7.0	7.0	3.0	7.0	5.0	5.0
Minimum Split (s)	13.5	13.5	9.5	13.5	11.0	11.0
Total Split (s)	102.0	102.0	15.0	117.0	33.0	33.0

Lanes, Volumes, Timings  
 109: Prosperity Drive & Cherry Hill Road

11/01/2017

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Total Split (%)	68.0%	68.0%	10.0%	78.0%	22.0%	22.0%
Maximum Green (s)	95.5	95.5	8.5	110.5	27.0	27.0
Yellow Time (s)	4.5	4.5	4.0	4.5	4.0	4.0
All-Red Time (s)	2.0	2.0	2.5	2.0	2.0	2.0
Lost Time Adjust (s)	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5
Total Lost Time (s)	5.0	5.0	5.0	5.0	4.5	4.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Vehicle Extension (s)	0.2	0.2	5.0	0.2	5.0	5.0
Recall Mode	C-Max	C-Max	None	C-Max	None	None
Act Effct Green (s)	97.0	97.0	112.0	112.0	28.5	28.5
Actuated g/C Ratio	0.65	0.65	0.75	0.75	0.19	0.19
v/c Ratio	0.54	0.17	0.50	0.76	1.45	0.64
Control Delay	4.8	0.8	23.3	5.5	260.1	39.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.8	0.8	23.3	5.6	260.1	39.0
LOS	A	A	C	A	F	D
Approach Delay	4.4			6.5	185.4	
Approach LOS	A			A	F	
Queue Length 50th (ft)	231	8	22	144	~658	130
Queue Length 95th (ft)	209	m10	m24	m146	#886	230
Internal Link Dist (ft)	609			532	321	
Turn Bay Length (ft)		250	400			
Base Capacity (vph)	3355	1110	222	2695	342	396
Starvation Cap Reductn	194	0	0	0	0	0
Spillback Cap Reductn	0	0	0	13	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.58	0.17	0.50	0.76	1.45	0.64

Intersection Summary

Area Type: Other  
 Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 100 (67%), Referenced to phase 2:WBTL and 6:EBT, Start of Green  
 Natural Cycle: 80  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.45  
 Intersection Signal Delay: 32.9  
 Intersection LOS: C  
 Intersection Capacity Utilization 85.2%  
 ICU Level of Service E  
 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.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 109: Prosperity Drive & Cherry Hill Road

← 02 (R)	↖ 04
117 s	33 s
↘ 05	→ 06 (R)
15 s	102 s

Lanes, Volumes, Timings

114: Cherry Hill Road & Broadbirch Drive/Calverton Boulevard

11/01/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↵	↔	↗	↵	↔	↗	↵	↔	↗	↵	↔	↗
Traffic Volume (vph)	365	900	253	100	386	310	126	1315	60	205	1227	483
Future Volume (vph)	365	900	253	100	386	310	126	1315	60	205	1227	483
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		500	300		200	175		0	300		100
Storage Lanes	1		1	1		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95	1.00	0.91	1.00
Frt			0.850			0.850		0.993				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1805	3610	1615	1805	3610	1615	1805	3585	0	1805	5187	1615
Flt Permitted	0.394			0.277			0.099			0.113		
Satd. Flow (perm)	749	3610	1615	526	3610	1615	188	3585	0	215	5187	1615
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			270			113		3				160
Link Speed (mph)		25			25			40				40
Link Distance (ft)		710			494			263				417
Travel Time (s)		19.4			13.5			4.5				7.1
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	420	1034	291	115	444	356	145	1511	69	236	1410	555
Shared Lane Traffic (%)												
Lane Group Flow (vph)	420	1034	291	115	444	356	145	1580	0	236	1410	555
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12				12
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		32			16			16				16
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	1	1	1	1	1	0		1	0	1
Detector Template	Left		Right	Left		Right	Left			Left		Right
Leading Detector (ft)	80	80	20	80	80	80	80	0		80	0	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0		0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0		0	0	0
Detector 1 Size(ft)	80	80	20	80	80	80	80	6		80	6	20
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex		CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Turn Type	pm+pt	NA	NA	Perm	NA	Perm	pm+pt	NA		Perm	NA	NA
Protected Phases	1	6			2		7	4				8
Permitted Phases	6			2		2	4			8		
Detector Phase	1	6		2	2	2	7	4		8	8	
Switch Phase												
Minimum Initial (s)	3.0	7.0		7.0	7.0	7.0	3.0	5.0		3.0	3.0	
Minimum Split (s)	9.0	13.5		13.5	13.5	13.5	9.5	11.0		9.0	9.0	
Total Split (s)	30.0	93.0		63.0	63.0	63.0	17.0	57.0		40.0	40.0	

Lanes, Volumes, Timings

114: Cherry Hill Road & Broadbirch Drive/Calverton Boulevard

11/01/2017

	↖	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (%)	20.0%	62.0%		42.0%	42.0%	42.0%	11.3%	38.0%		26.7%	26.7%	
Maximum Green (s)	24.0	86.5		56.5	56.5	56.5	10.5	51.0		34.0	34.0	
Yellow Time (s)	4.0	4.5		4.5	4.5	4.5	4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.5	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.5	-1.5		-1.5	-1.5	-1.5	-1.5	-1.5		-1.5	-1.5	
Total Lost Time (s)	4.5	5.0		5.0	5.0	5.0	5.0	4.5		4.5	4.5	
Lead/Lag	Lead			Lag	Lag	Lag	Lead			Lag	Lag	
Lead-Lag Optimize?	Yes			Yes	Yes	Yes	Yes			Yes	Yes	
Vehicle Extension (s)	4.0	0.2		0.2	0.2	0.2	5.0	4.0		4.0	4.0	
Recall Mode	None	C-Max		C-Max	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	88.5	88.0	0.0	59.5	59.5	59.5	52.0	52.5		35.5	35.5	0.0
Actuated g/C Ratio	0.59	0.59	0.00	0.40	0.40	0.40	0.35	0.35		0.24	0.24	0.00
v/c Ratio	0.69	0.49	1.08	0.55	0.31	0.50	0.75	1.26		4.72	1.15	3.47
Control Delay	23.0	18.9	85.2	47.8	32.2	25.7	52.4	161.3		1724.3	113.9	1139.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	23.0	18.9	85.2	47.8	32.2	25.7	52.4	161.3		1724.3	113.9	1139.3
LOS	C	B	F	D	C	C	D	F		F	F	F
Approach Delay		30.9			31.6			152.1			545.1	
Approach LOS		C			C			F			F	
Queue Length 50th (ft)	211	296	-43	88	159	180	113	~1036		~412	~598	~945
Queue Length 95th (ft)	273	334	#207	157	196	264	#175	#1109		#561	#658	#1134
Internal Link Dist (ft)		630			414			183			337	
Turn Bay Length (ft)			500	300		200	175			300		100
Base Capacity (vph)	621	2117	270	208	1432	708	194	1256		50	1227	160
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.68	0.49	1.08	0.55	0.31	0.50	0.75	1.26		4.72	1.15	3.47

Intersection Summary

Area Type: Other  
 Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 120 (80%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green  
 Natural Cycle: 55  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 4.72  
 Intersection Signal Delay: 234.6  
 Intersection Capacity Utilization 96.2%  
 Analysis Period (min) 15

Intersection LOS: F  
 ICU Level of Service F

- ~ 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: 114: Cherry Hill Road & Broadbirch Drive/Calverton Boulevard

↖ Ø1 30 s	↙ Ø2 (R) 63 s	↑ Ø4 57 s
→ Ø6 (R) 93 s	↘ Ø7 17 s	↓ Ø8 40 s

Lanes, Volumes, Timings  
 120: Columbia Pike (US 29) & Musgrove Road

11/01/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	330	125	492	109	60	30	203	4808	185	25	2773	280
Future Volume (vph)	330	125	492	109	60	30	203	4808	185	25	2773	280
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	300		0	0		800
Storage Lanes	1		1	1		0	2		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.86	0.86	1.00	0.86	0.86
Fr			0.850		0.949			0.994			0.986	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1805	1900	1615	1805	1803	0	3367	6247	0	1736	6197	0
Flt Permitted	0.646			0.578			0.950			0.950		
Satd. Flow (perm)	1227	1900	1615	1098	1803	0	3367	6247	0	1736	6197	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			120		14			8			20	
Link Speed (mph)		30			30			50			50	
Link Distance (ft)		537			573			626			2274	
Travel Time (s)		12.2			13.0			8.5			31.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	4%	4%	4%	4%	4%	4%
Adj. Flow (vph)	359	136	535	118	65	33	221	5226	201	27	3014	304
Shared Lane Traffic (%)												
Lane Group Flow (vph)	359	136	535	118	98	0	221	5427	0	27	3318	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			50			40	
Link Offset(ft)		0			0			10			-2	
Crosswalk Width(ft)		16			2			25			16	
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	1	1	0		1	0		1	0	
Detector Template												
Leading Detector (ft)	100	100	100	100	0		100	0		100	0	
Trailing Detector (ft)	0	0	0	0	0		0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0		0	0		0	0	
Detector 1 Size(ft)	100	100	100	100	100		100	0		100	0	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Turn Type	Perm	NA	Perm	Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		6	2		1	5	
Permitted Phases	4		4	8								
Detector Phase	4	4	4	8	8		6	2		1	5	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		3.0	20.0		3.0	20.0	
Minimum Split (s)	11.0	11.0	11.0	11.0	11.0		10.0	27.0		9.0	27.0	

Lanes, Volumes, Timings  
120: Columbia Pike (US 29) & Musgrove Road

11/01/2017

	↖	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (s)	51.0	51.0	51.0	51.0	51.0		25.0	117.0		12.0	104.0	
Total Split (%)	28.3%	28.3%	28.3%	28.3%	28.3%		13.9%	65.0%		6.7%	57.8%	
Maximum Green (s)	45.0	45.0	45.0	45.0	45.0		18.0	110.0		6.0	97.0	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		5.0	5.0		4.0	5.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.5	-1.5	-1.5	-1.5	-1.5		-1.5	-1.5		-1.5	-1.5	
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5		5.5	5.5		4.5	5.5	
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	3.0	
Recall Mode	None	None	None	None	None		None	C-Max		None	C-Max	
Act Effct Green (s)	46.5	46.5	46.5	46.5	46.5		17.7	113.9		7.4	100.3	
Actuated g/C Ratio	0.26	0.26	0.26	0.26	0.26		0.10	0.63		0.04	0.56	
v/c Ratio	1.14	0.28	1.06	0.42	0.21		0.67	1.37		0.38	0.96	
Control Delay	149.9	55.2	103.5	60.9	46.0		60.2	214.9		136.5	34.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	149.9	55.2	103.5	60.9	46.0		60.2	214.9		136.5	34.7	
LOS	F	E	F	E	D		E	F		F	C	
Approach Delay		113.3			54.1			208.9				35.5
Approach LOS		F			D			F				D
Queue Length 50th (ft)	~490	130	~579	117	78		139	~2525		32	1200	
Queue Length 95th (ft)	#708	198	#826	188	135		m83	m960		m41	1219	
Internal Link Dist (ft)		457			493			546			2194	
Turn Bay Length (ft)							300					
Base Capacity (vph)	316	490	506	283	476		364	3955		72	3462	
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	
Reduced v/c Ratio	1.14	0.28	1.06	0.42	0.21		0.61	1.37		0.38	0.96	

Intersection Summary

Area Type: Other  
 Cycle Length: 180  
 Actuated Cycle Length: 180  
 Offset: 140 (78%), Referenced to phase 2:NBT and 5:SBT, Start of Green  
 Natural Cycle: 150  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.37  
 Intersection Signal Delay: 139.4  
 Intersection LOS: F  
 Intersection Capacity Utilization 115.2%  
 ICU Level of Service H  
 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.  
 m Volume for 95th percentile queue is metered by upstream signal.
























Splits and Phases: 120: Columbia Pike (US 29) & Musgrove Road

↖ Ø1	↑ Ø2 (R)	→ Ø4
12 s	117 s	51 s
↙ Ø6	↓ Ø5 (R)	← Ø8
25 s	104 s	51 s



Lanes, Volumes, Timings  
123: Columbia Pike (US 29) & Fairland Road

11/01/2017

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	620	470	92	84	250	135	138	4916	114	0	2902	0
Future Volume (vph)	620	470	92	84	250	135	138	4916	114	0	2902	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	325		0	0		0
Storage Lanes	1		1	1		1	1		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.91	0.91	1.00	0.91	0.91	1.00	1.00	0.86	0.86	1.00	0.81	1.00
Fr			0.850			0.850		0.997				
Flt Protected	0.950	0.982		0.950	0.998		0.950					
Satd. Flow (prot)	1643	3396	1615	1643	3451	1615	1736	6266	0	0	7399	0
Flt Permitted	0.950	0.982		0.950	0.998		0.950					
Satd. Flow (perm)	1643	3396	1615	1643	3451	1615	1736	6266	0	0	7399	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			127			127		5				
Link Speed (mph)		30			30			50				50
Link Distance (ft)		414			440			2274				551
Travel Time (s)		9.4			10.0			31.0				7.5
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
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	4%	4%	4%	4%	4%	4%
Adj. Flow (vph)	674	511	100	91	272	147	150	5343	124	0	3154	0
Shared Lane Traffic (%)	43%			10%								
Lane Group Flow (vph)	384	801	100	82	281	147	150	5467	0	0	3154	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			40			40	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	1	1	1	1	1	0			0	
Detector Template												
Leading Detector (ft)	100	100	100	100	100	100	100	0			0	
Trailing Detector (ft)	0	0	0	0	0	0	0	0			0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0			0	
Detector 1 Size(ft)	100	100	100	100	100	100	100	6			6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0	
Turn Type	Split	NA	Prot	Split	NA	Prot	Prot	NA			NA	
Protected Phases	3	3	3	4	4	4	1	6			2	
Permitted Phases												
Detector Phase	3	3	3	4	4	4	1	6			2	
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	5.0	10.0			10.0	
Minimum Split (s)	12.5	12.5	12.5	12.5	12.5	12.5	13.5	17.0			17.0	



Lanes, Volumes, Timings  
 123: Columbia Pike (US 29) & Fairland Road

11/01/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (s)	30.0	30.0	30.0	26.0	26.0	26.0	24.0	124.0				100.0
Total Split (%)	16.7%	16.7%	16.7%	14.4%	14.4%	14.4%	13.3%	68.9%				55.6%
Maximum Green (s)	21.5	21.5	21.5	17.5	17.5	17.5	15.5	117.0				93.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	5.0				5.0
All-Red Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	2.0				2.0
Lost Time Adjust (s)	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5				-1.5
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	5.5				5.5
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lag	Lead					Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes					Yes
Vehicle Extension (s)	4.0	4.0	4.0	4.0	4.0	4.0	5.0	0.2				0.2
Recall Mode	None	None	None	None	None	None	None	C-Max				C-Max
Act Effct Green (s)	23.0	23.0	23.0	18.7	18.7	18.7	17.3	118.8				94.5
Actuated g/C Ratio	0.13	0.13	0.13	0.10	0.10	0.10	0.10	0.66				0.52
v/c Ratio	1.84	1.85	0.32	0.48	0.78	0.52	0.90	1.32				0.81
Control Delay	432.9	429.1	6.8	86.1	94.3	23.0	65.5	182.0				37.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				0.0
Total Delay	432.9	429.1	6.8	86.1	94.3	23.0	65.5	182.0				37.6
LOS	F	F	A	F	F	C	E	F				D
Approach Delay		397.4			72.4			178.9				37.6
Approach LOS		F			E			F				D
Queue Length 50th (ft)	~749	~784	0	102	180	22	174	~2408				749
Queue Length 95th (ft)	#994	#928	32	172	240	99	m125	m1168				773
Internal Link Dist (ft)		334			360			2194				471
Turn Bay Length (ft)							325					
Base Capacity (vph)	209	433	317	173	364	284	166	4136				3884
Starvation Cap Reductn	0	0	0	0	0	0	0	0				0
Spillback Cap Reductn	0	0	0	0	0	0	0	0				0
Storage Cap Reductn	0	0	0	0	0	0	0	0				0
Reduced v/c Ratio	1.84	1.85	0.32	0.47	0.77	0.52	0.90	1.32				0.81

Intersection Summary

Area Type: Other  
 Cycle Length: 180  
 Actuated Cycle Length: 180  
 Offset: 88 (49%), Referenced to phase 2:SBT and 6:NBT, Start of Green  
 Natural Cycle: 150  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.85  
 Intersection Signal Delay: 158.1  
 Intersection LOS: F  
 Intersection Capacity Utilization 118.4%  
 ICU Level of Service H  
 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.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 123: Columbia Pike (US 29) & Fairland Road

Ø1	Ø2 (R)	Ø3	Ø4
24 s	100 s	30 s	26 s
Ø6 (R)			
124 s			

Lanes, Volumes, Timings

130: Centerpark Driveway/Beltsville Drive & Powder Mill Road (MD 212)

11/01/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	296	1176	30	30	1031	646	20	30	75	1160	10	233
Future Volume (vph)	296	1176	30	30	1031	646	20	30	75	1160	10	233
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	16	12	12	12	12	12	12	12	12	12
Storage Length (ft)	350		360	350		0	0		0	0		250
Storage Lanes	1		1	1		1	0		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.95	0.95	1.00	0.91	0.91	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950				0.980		0.950	0.954	
Satd. Flow (prot)	1646	3292	1727	1703	3406	1524	0	3538	1615	3285	1649	1615
Flt Permitted	0.068			0.148				0.980		0.950	0.954	
Satd. Flow (perm)	118	3292	1727	265	3406	1524	0	3538	1615	3285	1649	1615
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			102			493			138			218
Link Speed (mph)		40			40				35			35
Link Distance (ft)		921			477			217				528
Travel Time (s)		15.7			8.1			4.2				10.3
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
Heavy Vehicles (%)	6%	6%	6%	6%	6%	6%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	322	1278	33	33	1121	702	22	33	82	1261	11	253
Shared Lane Traffic (%)										33%		
Lane Group Flow (vph)	322	1278	33	33	1121	702	0	55	82	845	427	253
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		18			18			30			30	
Link Offset(ft)		5			-5			-25			15	
Crosswalk Width(ft)		30			20			17			37	
Two way Left Turn Lane												
Headway Factor	1.04	1.04	0.85	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	1	1	1	1	1	1	1	1	1	1
Detector Template							Left		Right			
Leading Detector (ft)	30	300	5	30	300	5	20	30	5	30	30	5
Trailing Detector (ft)	0	294	0	0	394	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	294	0	0	394	0	0	0	0	0	0	0
Detector 1 Size(ft)	30	6	5	30	-94	5	20	30	5	30	30	5
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	1	6		5	2		4	4		8	8	
Permitted Phases	6		6	2		2			4			8
Detector Phase	1	6	6	5	2	2	4	4	4	8	8	8
Switch Phase												
Minimum Initial (s)	5.0	20.0	20.0	5.0	20.0	20.0	7.0	7.0	7.0	8.0	8.0	8.0

Lanes, Volumes, Timings

130: Centerpark Driveway/Beltsville Drive & Powder Mill Road (MD 212)

11/01/2017

	↖	→	↘	↙	←	↖	↘	↑	↗	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Split (s)	10.0	26.0	26.0	10.0	26.0	26.0	13.0	13.0	13.0	14.0	14.0	14.0
Total Split (s)	31.0	80.0	80.0	10.0	59.0	59.0	13.0	13.0	13.0	47.0	47.0	47.0
Total Split (%)	20.7%	53.3%	53.3%	6.7%	39.3%	39.3%	8.7%	8.7%	8.7%	31.3%	31.3%	31.3%
Maximum Green (s)	26.0	74.0	74.0	5.0	53.0	53.0	7.0	7.0	7.0	41.0	41.0	41.0
Yellow Time (s)	4.0	5.0	5.0	4.0	5.0	5.0	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	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5		-1.5	-1.5	-1.5	-1.5	-1.5
Total Lost Time (s)	3.5	4.5	4.5	3.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?												
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
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	None
Act Effct Green (s)	87.1	78.1	78.1	63.3	55.7	55.7		8.5	8.5	41.9	41.9	41.9
Actuated g/C Ratio	0.58	0.52	0.52	0.42	0.37	0.37		0.06	0.06	0.28	0.28	0.28
v/c Ratio	0.94	0.75	0.03	0.19	0.89	0.80		0.28	0.37	0.92	0.93	0.42
Control Delay	58.3	31.0	1.1	18.7	54.1	20.1		71.5	4.9	68.1	79.5	10.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Delay	58.3	31.0	1.1	18.7	54.1	20.1		71.5	4.9	68.1	79.5	10.2
LOS	E	C	A	B	D	C		E	A	E	E	D
Approach Delay		35.8			40.6			31.6			61.7	
Approach LOS		D			D			C			E	
Queue Length 50th (ft)	209	649	0	14	546	203		27	0	440	446	25
Queue Length 95th (ft)	m#391	m712	m3	30	#660	403		53	2	#563	#671	100
Internal Link Dist (ft)		841			397			137			448	
Turn Bay Length (ft)	350		360	350								250
Base Capacity (vph)	348	1712	947	174	1264	875		200	221	930	467	613
Starvation Cap Reductn	0	0	0	0	0	0		0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0		0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0		0	0	0	0	0
Reduced v/c Ratio	0.93	0.75	0.03	0.19	0.89	0.80		0.28	0.37	0.91	0.91	0.41

Intersection Summary

Area Type: Other  
 Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 79 (53%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.94  
 Intersection Signal Delay: 45.1  
 Intersection LOS: D  
 Intersection Capacity Utilization 84.5%  
 ICU Level of Service E  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 130: Centerpark Driveway/Beltsville Drive & Powder Mill Road (MD 212)

↖ Ø1 31 s	↙ Ø2 (R) 59 s	↖ Ø4 13 s	↙ Ø8 47 s
↙ Ø5 10 s	↙ Ø6 (R) 80 s		

Lanes, Volumes, Timings

160: New Hampshire Ave (MD 650) & Quaint Acres Drive/Heartfields Drive

11/01/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔	↗	↖	↕		↖	↕	↗
Traffic Volume (vph)	5	0	1	26	0	21	17	2883	41	32	1562	10
Future Volume (vph)	5	0	1	26	0	21	17	2883	41	32	1562	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	9	12	12	12	12	12	11	12	12	11	12
Storage Length (ft)	0		0	65		0	225		0	235		0
Storage Lanes	0		0	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Frt		0.977				0.850		0.998			0.999	
Flt Protected		0.960			0.950		0.950			0.950		
Satd. Flow (prot)	0	1604	0	0	1805	1615	1736	4812	0	1736	4816	0
Flt Permitted		0.742			0.754		0.950			0.950		
Satd. Flow (perm)	0	1240	0	0	1433	1615	1736	4812	0	1736	4816	0
Right Turn on Red			Yes			Yes			No			No
Satd. Flow (RTOR)		82				82						
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		249			185			622			424	
Travel Time (s)		6.8			5.0			10.6			7.2	
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
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	4%	4%	4%	4%	4%	4%
Adj. Flow (vph)	5	0	1	28	0	23	18	3134	45	35	1698	11
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	6	0	0	28	23	18	3179	0	35	1709	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			18			18	
Link Offset(ft)		-2			14			5			0	
Crosswalk Width(ft)		10			18			26			22	
Two way Left Turn Lane												
Headway Factor	1.00	1.14	1.00	1.00	1.00	1.00	1.00	1.04	1.00	1.00	1.04	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1		1	2	1	1	0		1	0	
Detector Template	Left			Left								
Leading Detector (ft)	20	20		20	100	40	80	0		80	0	
Trailing Detector (ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Size(ft)	20	20		20	40	40	80	6		80	6	
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex		CI+Ex	CI+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)					94							
Detector 2 Size(ft)					6							
Detector 2 Type					CI+Ex							
Detector 2 Channel												
Detector 2 Extend (s)					0.0							
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA		Prot	NA	

Lanes, Volumes, Timings

160: New Hampshire Ave (MD 650) & Quaint Acres Drive/Heartfields Drive

11/01/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases		4			8		1	6		5	2	
Permitted Phases	4			8		8						
Detector Phase	4	4		8	8	8	1	6		5	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	10.0		5.0	10.0	
Minimum Split (s)	11.5	11.5		11.5	11.5	11.5	11.0	22.5		11.0	22.5	
Total Split (s)	12.4	12.4		12.4	12.4	12.4	11.0	96.6		11.0	96.6	
Total Split (%)	10.3%	10.3%		10.3%	10.3%	10.3%	9.2%	80.5%		9.2%	80.5%	
Maximum Green (s)	5.9	5.9		5.9	5.9	5.9	5.0	90.6		5.0	90.6	
Yellow Time (s)	3.5	3.5		3.5	3.5	3.5	3.5	4.5		3.5	4.5	
All-Red Time (s)	3.0	3.0		3.0	3.0	3.0	2.5	1.5		2.5	1.5	
Lost Time Adjust (s)		-1.5			-1.5	-1.5	-1.5	-1.5		-1.5	-1.5	
Total Lost Time (s)		5.0			5.0	5.0	4.5	4.5		4.5	4.5	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	5.0	5.0		5.0	5.0	5.0	5.0	0.2		5.0	0.2	
Recall Mode	None	None		None	None	None	None	C-Max		None	C-Max	
Act Effct Green (s)		7.4			7.4	7.4	7.0	99.9		7.0	102.1	
Actuated g/C Ratio		0.06			0.06	0.06	0.06	0.83		0.06	0.85	
v/c Ratio		0.04			0.32	0.13	0.18	0.79		0.35	0.42	
Control Delay		0.5			63.9	1.5	58.6	9.3		64.6	3.4	
Queue Delay		0.0			0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay		0.5			63.9	1.5	58.6	9.3		64.6	3.4	
LOS		A			E	A	E	A		E	A	
Approach Delay		0.5			35.8			9.6			4.7	
Approach LOS		A			D			A			A	
Queue Length 50th (ft)		0			21	0	14	522		27	73	
Queue Length 95th (ft)		0			53	0	38	596		62	170	
Internal Link Dist (ft)		169			105			542			344	
Turn Bay Length (ft)							225			235		
Base Capacity (vph)		153			88	176	101	4005		101	4096	
Starvation Cap Reductn		0			0	0	0	0		0	0	
Spillback Cap Reductn		0			0	0	0	0		0	0	
Storage Cap Reductn		0			0	0	0	0		0	0	
Reduced v/c Ratio		0.04			0.32	0.13	0.18	0.79		0.35	0.42	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBT, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.79

Intersection Signal Delay: 8.1

Intersection LOS: A

Intersection Capacity Utilization 77.0%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 160: New Hampshire Ave (MD 650) & Quaint Acres Drive/Heartfields Drive

Ø1	Ø2 (R)	Ø4
11 s	96.6 s	12.4 s
Ø5	Ø6 (R)	Ø8
11 s	96.6 s	12.4 s

Lanes, Volumes, Timings  
170: Tech Road & Industrial Parkway

11/01/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	749	1307	25	5	1256	966	150	210	15	347	50	380
Future Volume (vph)	749	1307	25	5	1256	966	150	210	15	347	50	380
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	12	12	12	12	12	12	12	12
Storage Length (ft)	425		425	0		500	0		0	0		0
Storage Lanes	2		0	0		1	0		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	0.91	0.91	0.95
Frt		0.997				0.850		0.995			0.887	
Flt Protected	0.950							0.980		0.950	0.993	
Satd. Flow (prot)	3385	3479	0	0	3610	1615	0	1853	0	1643	3046	0
Flt Permitted	0.062				0.948			0.980		0.950	0.993	
Satd. Flow (perm)	221	3479	0	0	3422	1615	0	1853	0	1643	3046	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2				598		1			330	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		546			886			326			280	
Travel Time (s)		12.4			20.1			7.4			6.4	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	797	1390	27	5	1336	1028	160	223	16	369	53	404
Shared Lane Traffic (%)										21%		
Lane Group Flow (vph)	797	1417	0	0	1341	1028	0	399	0	292	534	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		22			16			10			12	
Link Offset(ft)		0			-5			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.04	1.04	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100	20	20	100		20	100	
Trailing Detector (ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Size(ft)	20	6		20	6	20	20	6		20	6	
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex		CI+Ex	CI+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		CI+Ex			CI+Ex			CI+Ex			CI+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA	Free	Split	NA		Split	NA	
Protected Phases	1	6			2		4	4		8	8	



Lanes, Volumes, Timings  
170: Tech Road & Industrial Parkway

11/01/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	6			2		Free						
Detector Phase	1	6		2	2		4	4		8	8	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	11.5	24.0		26.0	26.0		24.0	24.0		24.0	24.0	
Total Split (s)	33.5	98.0		64.5	64.5		24.0	24.0		33.0	33.0	
Total Split (%)	21.6%	63.2%		41.6%	41.6%		15.5%	15.5%		21.3%	21.3%	
Maximum Green (s)	27.5	92.0		58.5	58.5		18.0	18.0		27.0	27.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.5	-1.5			-1.5			-1.5		-1.5	-1.5	
Total Lost Time (s)	4.5	4.5			4.5			4.5		4.5	4.5	
Lead/Lag	Lead			Lag	Lag							
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	
Recall Mode	None	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)		7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)		0		0	0		0	0		0	0	
Act Effct Green (s)	93.5	93.5			60.0	155.0		19.5		28.5	28.5	
Actuated g/C Ratio	0.60	0.60			0.39	1.00		0.13		0.18	0.18	
v/c Ratio	1.10	0.68			1.01	0.64		1.71		0.97	0.64	
Control Delay	109.2	22.6			74.5	1.9		375.8		105.8	25.6	
Queue Delay	0.0	0.0			0.0	0.0		0.0		0.0	0.0	
Total Delay	109.2	22.6			74.5	1.9		375.8		105.8	25.6	
LOS	F	C			E	A		F		F	C	
Approach Delay		53.8			43.0			375.8			53.9	
Approach LOS		D			D			F			D	
Queue Length 50th (ft)	~419	484			~732	0		~595		326	104	
Queue Length 95th (ft)	#553	563			#889	0		#812		#537	174	
Internal Link Dist (ft)		466			806			246			200	
Turn Bay Length (ft)	425					500						
Base Capacity (vph)	725	2099			1324	1615		233		302	829	
Starvation Cap Reductn	0	0			0	0		0		0	0	
Spillback Cap Reductn	0	0			0	0		0		0	0	
Storage Cap Reductn	0	0			0	0		0		0	0	
Reduced v/c Ratio	1.10	0.68			1.01	0.64		1.71		0.97	0.64	

Intersection Summary

Area Type: Other  
 Cycle Length: 155  
 Actuated Cycle Length: 155  
 Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green  
 Natural Cycle: 130  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.71  
 Intersection Signal Delay: 71.5  
 Intersection Capacity Utilization 122.9%  
 Analysis Period (min) 15  
 Intersection LOS: E  
 ICU Level of Service H  
 ~ Volume exceeds capacity, queue is theoretically infinite.



Lanes, Volumes, Timings  
 170: Tech Road & Industrial Parkway

11/01/2017

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: 170: Tech Road & Industrial Parkway

↗ Ø1	↘ Ø2 (R)	↖ Ø4	↗ Ø8
33.5 s	64.5 s	24 s	33 s
→ Ø6 (R)			
98 s			

Lanes, Volumes, Timings

181: Beltsville Drive & Calverton Boulevard/Calverton Tower Driveway

11/01/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	21	1	778	19	9	0	751	315	5	0	199	16
Future Volume (vph)	21	1	778	19	9	0	751	315	5	0	199	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	10	10	12	12	12	12	12	12	12
Storage Length (ft)	200		0	0		0	200		0	125		0
Storage Lanes	1		1	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95	0.97	1.00	1.00	1.00	1.00	1.00
Frt			0.850					0.998			0.989	
Fit Protected	0.950				0.968		0.950					
Satd. Flow (prot)	1736	1900	1568	0	3262	0	3433	1774	0	1900	1792	0
Fit Permitted	0.737				0.866		0.950					
Satd. Flow (perm)	1346	1900	1568	0	2918	0	3433	1774	0	1900	1792	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			738					2			6	
Link Speed (mph)		30			30			35			35	
Link Distance (ft)		690			171			458			205	
Travel Time (s)		15.7			3.9			8.9			4.0	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	4%	0%	3%	0%	0%	0%	2%	7%	0%	0%	5%	3%
Adj. Flow (vph)	22	1	828	20	10	0	799	335	5	0	212	17
Shared Lane Traffic (%)												
Lane Group Flow (vph)	22	1	828	0	30	0	799	340	0	0	229	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			6			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.09	1.09	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA	Perm	Perm	NA		Prot	NA		Perm	NA	
Protected Phases		4			8		5	2			6	
Permitted Phases	4		4	8						6		
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5		9.5	22.5		22.5	22.5	
Total Split (s)	25.0	25.0	25.0	25.0	25.0		21.0	44.5		23.5	23.5	
Total Split (%)	36.0%	36.0%	36.0%	36.0%	36.0%		30.2%	64.0%		33.8%	33.8%	
Maximum Green (s)	20.5	20.5	20.5	20.5	20.5		16.5	40.0		19.0	19.0	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	
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)	-1.5	-1.5	-1.5	-1.5	-1.5		-1.5	-1.5		-1.5	-1.5	
Total Lost Time (s)	3.0	3.0	3.0		3.0		3.0	3.0		3.0	3.0	
Lead/Lag							Lead			Lag	Lag	
Lead-Lag Optimize?							Yes			Yes	Yes	
Walk Time (s)	7.0	7.0	7.0	7.0	7.0			7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0			11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0	0	0	0			0		0	0	
Act Effct Green (s)	22.0	22.0	22.0		22.0		18.0	41.5			20.5	

Lanes, Volumes, Timings

181: Beltsville Drive & Calverton Boulevard/Calverton Tower Driveway

11/01/2017

	↖	→	↘	↙	←	↖	↘	↑	↗	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio	0.32	0.32	0.32		0.32		0.26	0.60				0.29
v/c Ratio	0.05	0.00	0.83		0.03		0.90	0.32				0.43
Control Delay	17.0	16.0	12.1		16.6		40.2	8.0				22.3
Queue Delay	0.0	0.0	0.0		0.0		0.0	0.0				0.0
Total Delay	17.0	16.0	12.1		16.6		40.2	8.0				22.3
LOS	B	B	B		B		D	A				C
Approach Delay		12.3			16.6			30.6				22.3
Approach LOS		B			B			C				C
Queue Length 50th (ft)	6	0	28		4		169	64				76
Queue Length 95th (ft)	21	3	#260		13		#270	107				135
Internal Link Dist (ft)		610			91			378				125
Turn Bay Length (ft)	200						200					
Base Capacity (vph)	426	601	1000		923		889	1060				532
Starvation Cap Reductn	0	0	0		0		0	0				0
Spillback Cap Reductn	0	0	0		0		0	0				0
Storage Cap Reductn	0	0	0		0		0	0				0
Reduced v/c Ratio	0.05	0.00	0.83		0.03		0.90	0.32				0.43

Intersection Summary

Area Type: Other  
 Cycle Length: 69.5  
 Actuated Cycle Length: 69.5  
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green  
 Natural Cycle: 70  
 Control Type: Pretimed  
 Maximum v/c Ratio: 0.90  
 Intersection Signal Delay: 22.6  
 Intersection Capacity Utilization 73.8%  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 181: Beltsville Drive & Calverton Boulevard/Calverton Tower Driveway

↑ Ø2 (R)				↘ Ø4
44.5 s				25 s
↙ Ø5		↓ Ø6 (R)		↘ Ø8
21 s		23.5 s		25 s

Lanes, Volumes, Timings

185: Old Columbia Pike & Columbia Pike (US 29) Right Turn

11/01/2017

	↖	↗	↙	↑	↓	↘
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↖↖			↑↑	↑↑	
Traffic Volume (vph)	1425	0	0	804	660	0
Future Volume (vph)	1425	0	0	804	660	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11
Lane Util. Factor	0.97	1.00	1.00	0.95	0.95	1.00
Frt						
Frt Protected	0.950					
Satd. Flow (prot)	3385	0	0	3490	3490	0
Frt Permitted	0.950					
Satd. Flow (perm)	3385	0	0	3490	3490	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)						
Link Speed (mph)	30			30	30	
Link Distance (ft)	152			343	133	
Travel Time (s)	3.5			7.8	3.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1549	0	0	874	717	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1549	0	0	874	717	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	22			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	5			16	16	
Two way Left Turn Lane						
Headway Factor	1.04	1.04	1.04	1.04	1.04	1.04
Turning Speed (mph)	15	9	15			9
Number of Detectors	1			2	2	
Detector Template	Left			Thru	Thru	
Leading Detector (ft)	20			100	100	
Trailing Detector (ft)	0			0	0	
Detector 1 Position(ft)	0			0	0	
Detector 1 Size(ft)	20			6	6	
Detector 1 Type	CI+Ex			CI+Ex	CI+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0			0.0	0.0	
Detector 1 Queue (s)	0.0			0.0	0.0	
Detector 1 Delay (s)	0.0			0.0	0.0	
Detector 2 Position(ft)				94	94	
Detector 2 Size(ft)				6	6	
Detector 2 Type				CI+Ex	CI+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot			NA	NA	
Protected Phases	4			2	6	
Permitted Phases						
Detector Phase	4			2	6	
Switch Phase						

Lanes, Volumes, Timings

185: Old Columbia Pike & Columbia Pike (US 29) Right Turn

11/01/2017

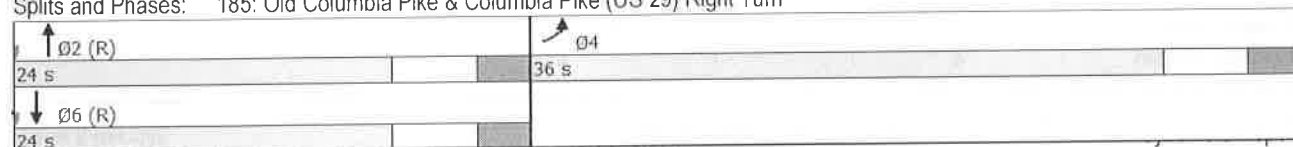


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Minimum Initial (s)	5.0			5.0	5.0	
Minimum Split (s)	11.5			11.5	11.5	
Total Split (s)	36.0			24.0	24.0	
Total Split (%)	60.0%			40.0%	40.0%	
Maximum Green (s)	29.5			17.5	17.5	
Yellow Time (s)	4.0			4.0	4.0	
All-Red Time (s)	2.5			2.5	2.5	
Lost Time Adjust (s)	-1.5			-1.5	-1.5	
Total Lost Time (s)	5.0			5.0	5.0	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0			3.0	3.0	
Recall Mode	None			C-Max	C-Max	
Act Effect Green (s)	30.7			19.3	19.3	
Actuated g/C Ratio	0.51			0.32	0.32	
v/c Ratio	0.90			0.78	0.64	
Control Delay	22.1			24.6	20.6	
Queue Delay	0.0			0.0	0.0	
Total Delay	22.1			24.6	20.6	
LOS	C			C	C	
Approach Delay	22.1			24.6	20.6	
Approach LOS	C			C	C	
Queue Length 50th (ft)	235			148	115	
Queue Length 95th (ft)	#389			#218	167	
Internal Link Dist (ft)	72			263	53	
Turn Bay Length (ft)						
Base Capacity (vph)	1748			1125	1125	
Starvation Cap Reductn	0			0	0	
Spillback Cap Reductn	0			0	0	
Storage Cap Reductn	0			0	0	
Reduced v/c Ratio	0.89			0.78	0.64	

Intersection Summary












Area Type: Other  
 Cycle Length: 60  
 Actuated Cycle Length: 60  
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green  
 Natural Cycle: 60  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.90  
 Intersection Signal Delay: 22.4  
 Intersection Capacity Utilization 71.2%  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 185: Old Columbia Pike & Columbia Pike (US 29) Right Turn



Lanes, Volumes, Timings  
193: FDA Boulevard & B-5

11/01/2017

						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	675	1110	317	500	175	90
Future Volume (vph)	675	1110	317	500	175	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	900			0	0	100
Storage Lanes	1			0	1	1
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Flt			0.908			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1805	3610	3278	0	1805	1615
Flt Permitted	0.098				0.950	
Satd. Flow (perm)	186	3610	3278	0	1805	1615
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			260			62
Link Speed (mph)		25	30		30	
Link Distance (ft)		1125	338		801	
Travel Time (s)		30.7	7.7		18.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	734	1207	345	543	190	98
Shared Lane Traffic (%)						
Lane Group Flow (vph)	734	1207	888	0	190	98
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		12	12		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		20	30		25	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Number of Detectors	1	2	2		1	1
Detector Template	Left	Thru	Thru		Left	Right
Leading Detector (ft)	20	100	100		20	20
Trailing Detector (ft)	0	0	0		0	0
Detector 1 Position(ft)	0	0	0		0	0
Detector 1 Size(ft)	20	6	6		20	20
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex		CI+Ex	CI+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(ft)		94	94			
Detector 2 Size(ft)		6	6			
Detector 2 Type		CI+Ex	CI+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type	pm+pt	NA	NA		Prot	Free
Protected Phases	7	4	8		6	
Permitted Phases	4					Free

Lanes, Volumes, Timings  
193: FDA Boulevard & B-5

11/01/2017



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Detector Phase	7	4	8		6	
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0		5.0	
Minimum Split (s)	9.5	22.5	22.5		22.5	
Total Split (s)	75.0	119.0	44.0		31.0	
Total Split (%)	50.0%	79.3%	29.3%		20.7%	
Maximum Green (s)	70.5	114.5	39.5		26.5	
Yellow Time (s)	3.5	3.5	3.5		3.5	
All-Red Time (s)	1.0	1.0	1.0		1.0	
Lost Time Adjust (s)	-1.5	-1.5	-1.5		-1.5	
Total Lost Time (s)	3.0	3.0	3.0		3.0	
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?	Yes		Yes			
Vehicle Extension (s)	3.0	3.0	3.0		3.0	
Recall Mode	None	None	None		C-Max	
Walk Time (s)		7.0	7.0		7.0	
Flash Dont Walk (s)		11.0	11.0		11.0	
Pedestrian Calls (#/hr)		0	0		0	
Act Effct Green (s)	109.4	109.4	37.8		34.6	150.0
Actuated g/C Ratio	0.73	0.73	0.25		0.23	1.00
v/c Ratio	0.84	0.46	0.89dr		0.46	0.06
Control Delay	38.9	8.7	34.4		56.5	0.1
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	38.9	8.7	34.4		56.5	0.1
LOS	D	A	C		E	A
Approach Delay		20.1	34.4		37.3	
Approach LOS		C	C		D	
Queue Length 50th (ft)	525	192	174		170	0
Queue Length 95th (ft)	708	217	m158		257	0
Internal Link Dist (ft)		1045	258		721	
Turn Bay Length (ft)	900					100
Base Capacity (vph)	912	2791	1084		415	1615
Starvation Cap Reductn	0	0	0		0	0
Spillback Cap Reductn	0	0	0		0	0
Storage Cap Reductn	0	0	0		0	0
Reduced v/c Ratio	0.80	0.43	0.82		0.46	0.06

Area Type: Other

Actuated Cycle Length: 150

Natural Cycle: 80

Maximum v/c Ratio: 0.87

Intersection Capacity Utilization 82.0% ICU Level of Service D

m Volume for 95th percentile queue is metered by upstream signal.



Lanes, Volumes, Timings  
193: FDA Boulevard & B-5


















11/01/2017

Splits and Phases: 193: FDA Boulevard & B-5

06 (R)	04	07	08
	119 s		
31 s	75 s	44 s	

HCM Unsignalized Intersection Capacity Analysis  
 72: Old Columbia Pike/Prosperity Drive & Tech Road

11/01/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	185	627	103	350	2170	128	0	0	145	0	0	122
Future Volume (Veh/h)	185	627	103	350	2170	128	0	0	145	0	0	122
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	199	674	111	376	2333	138	0	0	156	0	0	131
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		161										
pX, platoon unblocked												
vC, conflicting volume	2471			785			3046	4350	392	3889	4337	1236
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	2471			785			3046	4350	392	3889	4337	1236
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	0			55			0	0	75	0	0	23
cM capacity (veh/h)	190			843			0	0	612	0	0	171
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1	SB 2			
Volume Total	536	448	376	1555	916	78	78	66	66			
Volume Left	199	0	376	0	0	0	0	0	0			
Volume Right	0	111	0	0	138	78	78	66	66			
cSH	190	1700	843	1700	1700	612	612	171	171			
Volume to Capacity	1.05	0.26	0.45	0.91	0.54	0.13	0.13	0.38	0.38			
Queue Length 95th (ft)	230	0	58	0	0	11	11	41	41			
Control Delay (s)	129.4	0.0	12.7	0.0	0.0	11.7	11.7	38.6	38.6			
Lane LOS	F		B			B	B	E	E			
Approach Delay (s)	70.5		1.7			11.7		38.6				
Approach LOS						B		E				
Intersection Summary												
Average Delay			19.7									
Intersection Capacity Utilization			96.7%		ICU Level of Service			F				
Analysis Period (min)			15									

Intersection

Intersection Delay, s/veh	119.4
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↕		↖	↘			↕	
Traffic Vol, veh/h	12	56	17	1	56	10	753	68	10	1	42	290
Future Vol, veh/h	12	56	17	1	56	10	753	68	10	1	42	290
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
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	13	61	18	1	61	11	818	74	11	1	46	315
Number of Lanes	0	1	1	0	1	0	1	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	2	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	1	2
HCM Control Delay	11.9	12.4	180.5	15.9
HCM LOS	B	B	F	C

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	SBLn1
Vol Left, %	100%	0%	17%	0%	1%	0%
Vol Thru, %	0%	87%	80%	0%	84%	13%
Vol Right, %	0%	13%	2%	100%	15%	87%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	753	78	70	15	67	333
LT Vol	753	0	12	0	1	1
Through Vol	0	68	56	0	56	42
RT Vol	0	10	2	15	10	290
Lane Flow Rate	818	85	76	17	73	362
Geometry Grp	7	7	7	7	6	6
Degree of Util (X)	1.377	0.129	0.156	0.031	0.148	0.548
Departure Headway (Hd)	6.055	5.459	8.129	7.335	8.038	5.93
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	606	660	444	491	449	612
Service Time	3.766	3.17	5.829	5.035	6.038	3.93
HCM Lane V/C Ratio	1.35	0.129	0.171	0.035	0.163	0.592
HCM Control Delay	198.3	9	12.3	10.3	12.4	15.9
HCM Lane LOS	F	A	B	B	B	C
HCM 95th-tile Q	36.4	0.4	0.5	0.1	0.5	3.3

**Intersection**

Intersection Delay, s/veh	7.7
Intersection LOS	A

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↑↑	
Traffic Vol, veh/h	151	0	0	455	0	0
Future Vol, veh/h	151	0	0	455	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	164	0	0	495	0	0
Number of Lanes	2	0	0	2	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	2	2	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	2
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	2
HCM Control Delay	7.1	7.9	0
HCM LOS	A	A	-

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2
Vol Left, %	0%	0%	0%	0%	0%
Vol Thru, %	100%	100%	100%	100%	100%
Vol Right, %	0%	0%	0%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	0	76	76	228	228
LT Vol	0	0	0	0	0
Through Vol	0	76	76	228	228
RT Vol	0	0	0	0	0
Lane Flow Rate	0	82	82	247	247
Geometry Grp	2	7	7	7	7
Degree of Util (X)	0	0.109	0.07	0.315	0.198
Departure Headway (Hd)	5.038	4.762	3.059	4.58	2.878
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	0	750	1160	786	1246
Service Time	3.038	2.51	0.806	2.299	0.597
HCM Lane V/C Ratio	0	0.109	0.071	0.314	0.198
HCM Control Delay	8	8.1	6	9.4	6.3
HCM Lane LOS	N	A	A	A	A
HCM 95th-tile Q	0	0.4	0.2	1.4	0.7

**Intersection**

Intersection Delay, s/veh	9.2
Intersection LOS	A

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔		↔	↔	↔	↔
Traffic Vol, veh/h	0	0	109	0	0	547
Future Vol, veh/h	0	0	109	0	0	547
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	0	118	0	0	595
Number of Lanes	1	0	1	1	1	1

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Conflicting Approach Left		NB	EB
Conflicting Approach Right	NB		WB
HCM Control Delay	0	9.6	9.1

Vol Left, %	0%	0%	0%	100%	100%
Vol Right, %	100%	100%	0%	0%	0%
Traffic Vol by Lane	274	274	0	55	55
Through Vol	0	0	0	0	0
Lane Flow Rate	297	297	0	59	59
Degree of Util (X)	0.344	0.344	0	0.101	0.101
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Service Time	1.88	1.88	3.63	3.908	3.908
HCM Control Delay	9.1	9.1	8.6	9.6	9.6
HCM 95th-tile Q	1.5	1.5	0	0.3	0.3

HCM 2010 Roundabout  
 29: Taylor Road & Michelson Road/E Loop Road

11/01/2017

Intersection						
Intersection Delay, s/veh	8.2					
Intersection LOS	A					
Approach	EB		WB		NB	
Entry Lanes	2		2		2	
Conflicting Circle Lanes	2		2		2	
Adj Approach Flow, veh/h	81		494		877	
Demand Flow Rate, veh/h	81		494		877	
Vehicles Circulating, veh/h	18		743		13	
Vehicles Exiting, veh/h	1219		147		86	
Follow-Up Headway, s	3.186		3.186		3.186	
Ped Vol Crossing Leg, #/h	0		0		0	
Ped Cap Adj	1.000		1.000		1.000	
Approach Delay, s/veh	3.7		10.6		7.3	
Approach LOS	A		B		A	
Lane	Left	Right	Left	Right	Left	Right
Designated Moves	LT	TR	LT	TR	L	LTR
Assumed Moves	LT	R	LT	TR	L	LTR
RT Channelized						
Lane Util	0.160	0.840	0.470	0.530	0.530	0.470
Critical Headway, s	4.293	4.113	4.293	4.113	4.293	4.113
Entry Flow, veh/h	13	68	232	262	465	412
Cap Entry Lane, veh/h	1115	1116	647	672	1119	1120
Entry HV Adj Factor	1.000	1.000	1.001	0.999	1.000	1.000
Flow Entry, veh/h	13	68	232	262	465	412
Cap Entry, veh/h	1115	1116	648	671	1119	1120
V/C Ratio	0.012	0.061	0.358	0.390	0.416	0.368
Control Delay, s/veh	3.3	3.7	10.4	10.7	7.6	6.9
LOS	A	A	B	B	A	A
95th %tile Queue, veh	0	0	2	2	2	2

Intersection					
Intersection Delay, s/veh	5.3				
Intersection LOS	A				
Approach	WB	NB		SB	
Entry Lanes	1	2		2	
Conflicting Circle Lanes	2	2		2	
Adj Approach Flow, veh/h	0	595		118	
Demand Flow Rate, veh/h	0	595		118	
Vehicles Circulating, veh/h	595	0		0	
Vehicles Exiting, veh/h	0	118		595	
Follow-Up Headway, s	3.186	3.186		3.186	
Ped Vol Crossing Leg, #/h	0	0		0	
Ped Cap Adj	1.000	1.000		1.000	
Approach Delay, s/veh	0.0	5.6		3.6	
Approach LOS	-	A		A	
Lane	Left	Left	Right	Left	Right
Designated Moves	LR	LT	TR	LT	TR
Assumed Moves	LR	LT	TR	LT	TR
RT Channelized					
Lane Util	1.000	0.471	0.529	0.466	0.534
Critical Headway, s	4.113	4.293	4.113	4.293	4.113
Entry Flow, veh/h	0	280	315	55	63
Cap Entry Lane, veh/h	745	1130	1130	1130	1130
Entry HV Adj Factor	1.000	0.999	1.001	1.008	0.993
Flow Entry, veh/h	0	280	315	55	63
Cap Entry, veh/h	745	1129	1131	1139	1122
V/C Ratio	0.000	0.248	0.279	0.049	0.056
Control Delay, s/veh	4.8	5.5	5.8	3.6	3.7
LOS	A	A	A	A	A
95th %tile Queue, veh	0	1	1	0	0



Intersection							
Intersection Delay, s/veh	328.1						
Intersection LOS	F						
Approach	WB		NB		SB		
Entry Lanes	2		2		2		
Conflicting Circle Lanes	2		2		2		
Adj Approach Flow, veh/h	442		961		1801		
Demand Flow Rate, veh/h	442		961		1801		
Vehicles Circulating, veh/h	189		1793		30		
Vehicles Exiting, veh/h	2565		38		189		
Follow-Up Headway, s	3.186		3.186		3.186		
Ped Vol Crossing Leg, #/h	0		0		0		
Ped Cap Adj	1.000		1.000		1.000		
Approach Delay, s/veh	0.3		539.8		295.5		
Approach LOS	A		F		F		
Lane	Left	Right	Bypass	Left	Right	Left	Right
Designated Moves	L	LTR	R	LT	R	L	TR
Assumed Moves	L	LTR	R	LT	R	L	TR
RT Channelized	Free						
Lane Util	0.533	0.467		0.197	0.803	0.996	0.004
Critical Headway, s	4.293	4.113		4.293	4.113	4.293	4.113
Entry Flow, veh/h	16	14	412	189	772	1793	8
Cap Entry Lane, veh/h	981	990	1900	294	322	1105	1106
Entry HV Adj Factor	0.994	1.007	1.000	1.000	1.000	1.000	1.000
Flow Entry, veh/h	16	14	412	189	772	1793	8
Cap Entry, veh/h	974	997	1900	294	322	1105	1106
V/C Ratio	0.016	0.014	0.217	0.642	2.397	1.623	0.007
Control Delay, s/veh	3.8	3.7	0.0	35.0	663.4	296.8	3.3
LOS	A	A	A	D	F	F	A
95th %tile Queue, veh	0	0	1	4	61	93	0

Intersection						
Intersection Delay, s/veh	10.6					
Intersection LOS	B					
Approach	EB		WB		SB	
Entry Lanes	2		2		2	
Conflicting Circle Lanes	2		2		2	
Adj Approach Flow, veh/h	595		38		874	
Demand Flow Rate, veh/h	595		38		874	
Vehicles Circulating, veh/h	776		410		21	
Vehicles Exiting, veh/h	119		961		427	
Follow-Up Headway, s	3.186		3.186		3.186	
Ped Vol Crossing Leg, #/h	0		0		0	
Ped Cap Adj	1.000		1.000		1.000	
Approach Delay, s/veh	15.8		4.5		7.3	
Approach LOS	C		A		A	
Lane	Left	Right	Left	Right	Left	Right
Designated Moves	LT	TR	LT	TR	L	LTR
Assumed Moves	L	TR	LT	TR	L	LTR
RT Channelized						
Lane Util	0.689	0.311	0.474	0.526	0.530	0.470
Critical Headway, s	4.293	4.113	4.293	4.113	4.293	4.113
Entry Flow, veh/h	410	185	18	20	463	411
Cap Entry Lane, veh/h	631	656	831	848	1112	1113
Entry HV Adj Factor	1.000	1.000	0.992	1.007	1.000	0.999
Flow Entry, veh/h	410	185	18	20	463	411
Cap Entry, veh/h	631	656	824	854	1113	1113
V/C Ratio	0.649	0.282	0.022	0.024	0.416	0.369
Control Delay, s/veh	18.9	9.0	4.6	4.4	7.6	7.0
LOS	C	A	A	A	A	A
95th %tile Queue, veh	5	1	0	0	2	2

Intersection						
Int Delay, s/veh	158.5					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↓			↑↓	↑↓	↑↓
Traffic Vol, veh/h	20	7	375	747	214	55
Future Vol, veh/h	20	7	375	747	214	55
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	22	8	408	812	233	60

Major/Minor	Major1	Major2	Minor1	Minor2	Minor3
Conflicting Flow All	0	0	29	0	1247
Stage 1	-	-	-	-	26
Stage 2	-	-	-	-	1221
Critical Hdwy	-	-	4.1	-	6.8
Critical Hdwy Stg 1	-	-	-	-	5.8
Critical Hdwy Stg 2	-	-	-	-	5.8
Follow-up Hdwy	-	-	2.2	-	3.5
Pot Cap-1 Maneuver	-	-	1597	-	~ 168
Stage 1	-	-	-	-	999
Stage 2	-	-	-	-	246
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1597	-	~ 90
Mov Cap-2 Maneuver	-	-	-	-	~ 90
Stage 1	-	-	-	-	999
Stage 2	-	-	-	-	~ 132

Approach	EB	WB	NB
HCM Control Delay, s	0	3.3	\$ 821.8
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	111	-	-	1597	-
HCM Lane V/C Ratio	2.634	-	-	0.255	-
HCM Control Delay (s)	\$ 821.8	-	-	8	0.9
HCM Lane LOS	F	-	-	A	A
HCM 95th %tile Q(veh)	26.8	-	-	1	-

Notes  
 ~: Volume exceeds capacity    \$: Delay exceeds 300s    +: Computation Not Defined    \*: All major volume in platoon

Lanes, Volumes, Timings

3: New Hampshire Ave (MD 650) & Schindler Drive/Mahan Road

11/01/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇄		↔	↔	↔	↔	↑↑↑	↔	↔	↑↑↑	↔
Traffic Volume (vph)	51	17	50	80	5	95	5	1764	753	606	2548	25
Future Volume (vph)	51	17	50	80	5	95	5	1764	753	606	2548	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	11	12	12	10	12	12	10	12	12
Storage Length (ft)	0		0	230		0	320		220	500		0
Storage Lanes	0		0	1		1	1		1	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	0.97	0.95	0.95	1.00	0.86	1.00	0.97	0.91	0.91
Frt		0.943			0.864	0.850			0.850		0.999	
Flt Protected		0.979		0.950			0.950			0.950		
Satd. Flow (prot)	0	1754	0	3385	1560	1534	1620	6285	1553	3143	4983	0
Flt Permitted		0.979		0.950			0.950			0.950		
Satd. Flow (perm)	0	1754	0	3385	1560	1534	1620	6285	1553	3143	4983	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		20			47	156			345			2
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		292			449			1203			1530	
Travel Time (s)		8.0			12.2			20.5			26.1	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	4%	4%	4%	4%	4%	4%
Adj. Flow (vph)	53	18	52	82	5	98	5	1819	776	625	2627	26
Shared Lane Traffic (%)						48%						
Lane Group Flow (vph)	0	123	0	82	52	51	5	1819	776	625	2653	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		22			30			23			31	
Link Offset(ft)		0			3			0			0	
Crosswalk Width(ft)		48			25			32			62	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.04	1.00	1.00	1.09	1.00	1.00	1.09	1.00	1.00
Turning Speed (mph)	15		9	15			9	15		9	15	9
Number of Detectors	1	1		1	1	1	1	1	1	1	1	
Detector Template	Left			Left		Right	Left			Left		
Leading Detector (ft)	20	100		100	100	100	100	100	100	100	100	
Trailing Detector (ft)	0	0		0	0	0	0	0	0	0	0	
Detector 1 Position(ft)	0	0		0	0	0	0	0	0	0	0	
Detector 1 Size(ft)	20	100		100	100	100	100	100	100	100	100	
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Turn Type	Split	NA		Split	NA	Perm	Prot	NA	Free	Prot	NA	
Protected Phases	3	3		4	4		1	5		6	2	
Permitted Phases						4			Free			
Detector Phase	3	3		4	4	4	1	5		6	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	3.0	3.0		7.0	7.0	

Lanes, Volumes, Timings

3: New Hampshire Ave (MD 650) & Schindler Drive/Mahan Road

11/01/2017

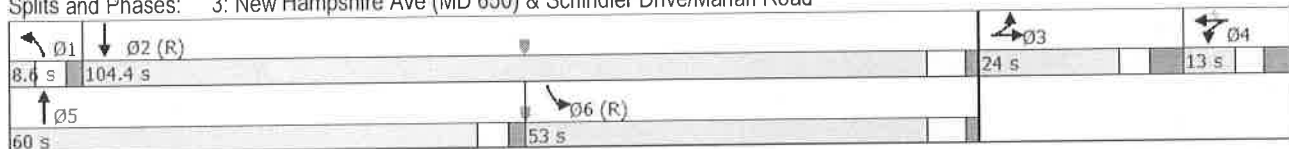
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Split (s)	12.5	12.5		12.0	12.0	12.0	8.5	8.5		13.0	13.0	
Total Split (s)	24.0	24.0		13.0	13.0	13.0	8.6	60.0		53.0	104.4	
Total Split (%)	16.0%	16.0%		8.7%	8.7%	8.7%	5.7%	40.0%		35.3%	69.6%	
Maximum Green (s)	16.5	16.5		6.0	6.0	6.0	3.1	54.5		47.0	98.4	
Yellow Time (s)	3.5	3.5		3.5	3.5	3.5	3.5	3.5		4.5	4.5	
All-Red Time (s)	4.0	4.0		3.5	3.5	3.5	2.0	2.0		1.5	1.5	
Lost Time Adjust (s)		-1.5		-1.5	-1.5	-1.5	-1.5	-1.5		-1.5	-1.5	
Total Lost Time (s)		6.0		5.5	5.5	5.5	4.0	4.0		4.5	4.5	
Lead/Lag	Lead	Lead		Lag	Lag	Lag	Lead	Lead		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	5.0		0.2	0.2	
Recall Mode	None	None		None	None	None	None	Min		C-Min	C-Min	
Act Effect Green (s)		15.0		9.4	9.4	9.4	6.8	65.0	150.0	40.7	107.9	
Actuated g/C Ratio		0.10		0.06	0.06	0.06	0.05	0.43	1.00	0.27	0.72	
v/c Ratio		0.64		0.39	0.37	0.21	0.07	0.67	0.50	0.73	0.74	
Control Delay		68.8		73.2	28.0	2.0	71.6	36.0	1.2	61.2	19.1	
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		68.8		73.2	28.0	2.0	71.6	36.0	1.2	61.2	19.1	
LOS		E		E	C	A	E	D	A	E	B	
Approach Delay		68.8			40.8			25.7			27.1	
Approach LOS		E			D			C			C	
Queue Length 50th (ft)		98		40	5	0	5	388	0	327	727	
Queue Length 95th (ft)		167		71	53	0	21	500	0	371	723	
Internal Link Dist (ft)		212			369			1123			1450	
Turn Bay Length (ft)				230			320		220	500		
Base Capacity (vph)		228		212	141	242	73	2722	1553	1016	3585	
Starvation Cap Reductn		0		0	0	0	0	0	0	0	0	
Spillback Cap Reductn		0		0	0	0	0	0	0	0	0	
Storage Cap Reductn		0		0	0	0	0	0	0	0	0	
Reduced v/c Ratio		0.54		0.39	0.37	0.21	0.07	0.67	0.50	0.62	0.74	

Intersection Summary

Area Type: Other  
 Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 9 (6%), Referenced to phase 2:SBT and 6:SBL, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.74  
 Intersection Signal Delay: 27.7  
 Intersection Capacity Utilization 78.6%  
 Analysis Period (min) 15

Intersection LOS: C  
 ICU Level of Service D

Splits and Phases: 3: New Hampshire Ave (MD 650) & Schindler Drive/Mahan Road



Lanes, Volumes, Timings

6: New Hampshire Ave (MD 650) & Powder Mill Road

11/01/2017

	↖	→	↗	↖	←	↖	↖	↑	↗	↘	↓	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑	↗	↖	←	↖	↖	↑↑↑	↗	↖	↑↑↑	↘
Traffic Volume (vph)	105	137	55	843	214	136	70	2528	176	112	2538	265
Future Volume (vph)	105	137	55	843	214	136	70	2528	176	112	2538	265
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	12	12	12	12	12	12	12	12	12
Storage Length (ft)	0		0	425		50	225		100	250		0
Storage Lanes	1		1	1		1	1		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	0.91	0.91	1.00	1.00	0.91	1.00	1.00	0.91	0.91
Frt			0.850			0.850			0.850		0.986	
Flt Protected	0.950			0.950	0.980		0.950			0.950		
Satd. Flow (prot)	1685	1773	1507	3285	1694	1615	1736	4988	1553	1736	4918	0
Flt Permitted	0.950			0.950	0.980		0.950			0.950		
Satd. Flow (perm)	1685	1773	1507	3285	1694	1615	1736	4988	1553	1736	4918	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			145			142			106		12	
Link Speed (mph)		25			35			40			40	
Link Distance (ft)		217			757			487			2380	
Travel Time (s)		5.9			11.7			8.3			40.6	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	4%	4%	4%	4%	4%	4%
Adj. Flow (vph)	108	141	57	869	221	140	72	2606	181	115	2616	273
Shared Lane Traffic (%)				17%								
Lane Group Flow (vph)	108	141	57	721	369	140	72	2606	181	115	2889	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			28			20			12	
Link Offset(ft)		0			-14			10			0	
Crosswalk Width(ft)		16			28			58			28	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	1	1	1	1	1	1	1	1	1	
Detector Template	Left		Right	Left		Right	Left		Right	Left		
Leading Detector (ft)	100	100	100	100	100	100	100	100	100	100	100	
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	
Detector 1 Size(ft)	100	100	100	100	100	100	100	100	100	100	100	
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Turn Type	Split	NA	Prot	Split	NA	Prot	Prot	NA	Perm	Prot	NA	
Protected Phases	3	3	3	4	4	4	1	5		6	2	
Permitted Phases									5			
Detector Phase	3	3	3	4	4	4	1	5	5	6	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	3.0	7.0	7.0	3.0	7.0	

Lanes, Volumes, Timings

6: New Hampshire Ave (MD 650) & Powder Mill Road

11/01/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Split (s)	11.5	11.5	11.5	12.0	12.0	12.0	9.0	14.0	14.0	10.0	14.0	
Total Split (s)	35.0	35.0	35.0	35.0	35.0	35.0	25.0	89.0	89.0	21.0	85.0	
Total Split (%)	19.4%	19.4%	19.4%	19.4%	19.4%	19.4%	13.9%	49.4%	49.4%	11.7%	47.2%	
Maximum Green (s)	28.5	28.5	28.5	28.0	28.0	28.0	19.0	82.0	82.0	14.0	78.0	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.5	4.5	4.5	4.5	4.5	
All-Red Time (s)	2.5	2.5	2.5	3.0	3.0	3.0	2.5	2.5	2.5	2.5	2.5	
Lost Time Adjust (s)	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	
Total Lost Time (s)	5.0	5.0	5.0	5.5	5.5	5.5	4.5	5.5	5.5	5.5	5.5	
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lag	Lead	Lead	Lead	Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	0.2	0.2	3.0	0.2	
Recall Mode	None	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	
Act Effct Green (s)	21.3	21.3	21.3	38.2	38.2	38.2	14.3	83.5	83.5	15.5	85.7	
Actuated g/C Ratio	0.12	0.12	0.12	0.21	0.21	0.21	0.08	0.46	0.46	0.09	0.48	
v/c Ratio	0.55	0.67	0.19	1.03	1.03	0.31	0.53	1.13	0.23	0.77	1.23	
Control Delay	84.1	91.4	1.3	108.9	120.3	10.0	92.3	107.2	12.4	111.1	147.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	84.1	91.4	1.3	108.9	120.3	10.0	92.3	107.2	12.4	111.1	147.8	
LOS	F	F	A	F	F	B	F	F	B	F	F	
Approach Delay		72.0			101.1			100.8			146.4	
Approach LOS		E			F			F			F	
Queue Length 50th (ft)	123	163	0	~497	~505	0	83	~1297	50	136	~1538	
Queue Length 95th (ft)	186	234	0	#733	#843	64	140	#1367	104	#245	#1661	
Internal Link Dist (ft)		137			677			407			2300	
Turn Bay Length (ft)				425		50	225		100	250		
Base Capacity (vph)	280	295	372	697	359	455	197	2313	777	149	2347	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.39	0.48	0.15	1.03	1.03	0.31	0.37	1.13	0.23	0.77	1.23	

Intersection Summary

Area Type: Other

Cycle Length: 180

Actuated Cycle Length: 180

Offset: 0 (0%), Referenced to phase 2:SBT and 5:NBT, Start of Green

Natural Cycle: 130

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.23

Intersection Signal Delay: 118.2

Intersection LOS: F

Intersection Capacity Utilization 102.4%

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: 6: New Hampshire Ave (MD 650) & Powder Mill Road

Ø1	Ø2 (R)	Ø3	Ø4
25 s	85 s	35 s	35 s
Ø5 (R)	Ø6		
89 s	21 s		



Lanes, Volumes, Timings

9: New Hampshire Ave (MD 650) & Northwest Drive/Michelson Road

11/01/2017

	↖	→	↘	↙	←	↖	↙	↑	↗	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↖		↗	↖	↑↑↑		↖	↑↑↑	
Traffic Volume (vph)	11	22	20	26	0	56	20	1612	254	749	2184	10
Future Volume (vph)	11	22	20	26	0	56	20	1612	254	749	2184	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	280		0	225		0
Storage Lanes	0		0	2		2	1		0	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	0.88	1.00	0.86	0.86	0.97	0.91	0.91
Frt		0.949				0.850		0.980			0.999	
Flt Protected		0.990		0.950			0.950			0.950		
Satd. Flow (prot)	0	1785	0	3502	0	2842	1736	6159	0	3367	4983	0
Flt Permitted		0.990		0.786			0.950			0.950		
Satd. Flow (perm)	0	1785	0	2897	0	2842	1736	6159	0	3367	4983	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		16				29		37				1
Link Speed (mph)		25			25			40				40
Link Distance (ft)		183			270			1530				1123
Travel Time (s)		5.0			7.4			26.1				19.1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	4%	4%	4%	4%	4%	4%
Adj. Flow (vph)	11	22	20	27	0	57	20	1645	259	764	2229	10
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	53	0	27	0	57	20	1904	0	764	2239	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			48			27			30	
Link Offset(ft)		0			6			7			-10	
Crosswalk Width(ft)		40			45			33			53	
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1		1		1	1	0		1	0	
Detector Template	Left			Left		Right	Left			Left		
Leading Detector (ft)	20	100		100		100	100	0		100	0	
Trailing Detector (ft)	0	0		0		0	0	0		0	0	
Detector 1 Position(ft)	0	0		0		0	0	0		0	0	
Detector 1 Size(ft)	20	100		100		100	100	6		100	6	
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex		CI+Ex	CI+Ex	CI+Ex		CI+Ex	CI+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0		0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0		0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0		0.0	0.0	0.0		0.0	0.0	
Turn Type	Perm	NA		Perm		pt+ov	Prot	NA		Prot	NA	
Protected Phases		4				8.5	1	6		5	2	
Permitted Phases	4			8								
Detector Phase	4	4		8		8.5	1	6		5	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0			3.0	7.0		5.0	7.0	
Minimum Split (s)	13.0	13.0		13.0			12.0	14.0		14.0	14.0	

Lanes, Volumes, Timings

9: New Hampshire Ave (MD 650) & Northwest Drive/Michelson Road

11/01/2017

	↖	→	↘	↙	←	↖	↙	↑	↗	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (s)	16.0	16.0		16.0			13.0	79.0		55.0	121.0	
Total Split (%)	10.7%	10.7%		10.7%			8.7%	52.7%		36.7%	80.7%	
Maximum Green (s)	8.0	8.0		8.0			4.0	72.0		46.0	114.0	
Yellow Time (s)	4.0	4.0		4.0			4.0	4.5		4.0	4.5	
All-Red Time (s)	4.0	4.0		4.0			5.0	2.5		5.0	2.5	
Lost Time Adjust (s)		-1.5		-1.5			-1.5	-1.5		-1.5	-1.5	
Total Lost Time (s)		6.5		6.5			7.5	5.5		7.5	5.5	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0			3.0	0.2		3.0	0.2	
Recall Mode	None	None		None			None	C-Min		None	C-Min	
Act Effect Green (s)		10.2		10.2			58.2	8.8	79.8	43.2	121.3	
Actuated g/C Ratio		0.07		0.07			0.39	0.06	0.53	0.29	0.81	
v/c Ratio		0.39		0.14			0.05	0.20	0.58	0.79	0.56	
Control Delay		56.5		66.0			13.0	45.5	14.9	45.1	11.2	
Queue Delay		0.0		0.0			0.0	0.0	0.0	0.0	0.0	
Total Delay		56.5		66.0			13.0	45.5	14.9	45.1	11.2	
LOS		E		E			B	D	B	D	B	
Approach Delay		56.5			30.0				15.2			19.9
Approach LOS		E			C				B			B
Queue Length 50th (ft)		35		12		9	19	131		385	461	
Queue Length 95th (ft)		81		29		22	m32	153		m338	m297	
Internal Link Dist (ft)		103			190			1450			1043	
Turn Bay Length (ft)							280			225		
Base Capacity (vph)		144		210		1194	101	3370		1084	4160	
Starvation Cap Reductn		0		0		0	0	0		0	0	
Spillback Cap Reductn		0		0		0	0	0		0	0	
Storage Cap Reductn		0		0		0	0	0		0	0	
Reduced v/c Ratio		0.37		0.13		0.05	0.20	0.56		0.70	0.54	

**Intersection Summary**

Area Type: Other

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 110 (73%), Referenced to phase 2:SBT and 6:NBT, Start of Green

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.79

Intersection Signal Delay: 18.7

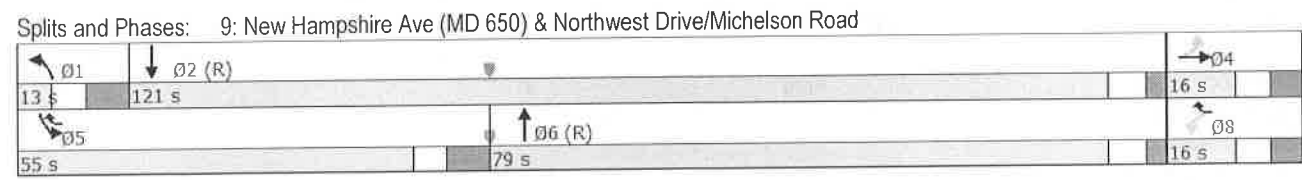
Intersection Capacity Utilization 74.9%

Analysis Period (min) 15

Intersection LOS: B

ICU Level of Service D

m Volume for 95th percentile queue is metered by upstream signal.



Lanes, Volumes, Timings  
 15: New Hampshire Ave (MD 650) & Lockwood Drive

11/01/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗	↖↖↖	↑	↗	↖↖	↑↑↑	↗	↖	↑↑↑	↗
Traffic Volume (vph)	0	180	436	759	450	195	211	1212	241	35	2801	250
Future Volume (vph)	0	180	436	759	450	195	211	1212	241	35	2801	250
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	11	12	11	12	12	12
Storage Length (ft)	150		180	0		215	300		225	315		0
Storage Lanes	0		1	3		1	2		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	0.94	1.00	1.00	0.97	0.86	1.00	1.00	0.91	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected				0.950			0.950			0.950		
Satd. Flow (prot)	0	3610	1615	5090	1900	1615	3255	6285	1501	1703	4893	1524
Flt Permitted				0.950			0.950			0.950		
Satd. Flow (perm)	0	3610	1615	5090	1900	1615	3255	6285	1501	1703	4893	1524
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			272			128			251			153
Link Speed (mph)		30			30			40				40
Link Distance (ft)		537			500			1123				377
Travel Time (s)		12.2			11.4			19.1				6.4
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	4%	4%	4%	6%	6%	6%
Adj. Flow (vph)	0	188	454	791	469	203	220	1263	251	36	2918	260
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	188	454	791	469	203	220	1263	251	36	2918	260
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		20			40			27			30	
Link Offset(ft)		-15			30			15			-15	
Crosswalk Width(ft)		26			23			35			25	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.04	1.00	1.04	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		1	1	1	1	1	1	1	1	1	1	1
Detector Template				Left			Left			Left		
Leading Detector (ft)		100	100	100	100	100	100	100	100	100	100	100
Trailing Detector (ft)		0	0	0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)		0	0	0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)		100	100	100	100	100	100	100	100	100	100	100
Detector 1 Type		CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel												
Detector 1 Extend (s)		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Turn Type		NA	Free	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		3		7	4		1	6		5	2	
Permitted Phases			Free			4			6			2
Detector Phase		3		7	4	4	1	6	6	5	2	2
Switch Phase												
Minimum Initial (s)		5.0		5.0	5.0	5.0	5.0	7.0	7.0	5.0	7.0	7.0

Lanes, Volumes, Timings

15: New Hampshire Ave (MD 650) & Lockwood Drive

11/01/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Split (s)		12.5		12.5	12.5	12.5	14.0	16.0	16.0	14.0	16.0	16.0
Total Split (s)		30.0		22.0	52.0	52.0	16.0	82.0	82.0	16.0	82.0	82.0
Total Split (%)		20.0%		14.7%	34.7%	34.7%	10.7%	54.7%	54.7%	10.7%	54.7%	54.7%
Maximum Green (s)		22.5		14.5	44.5	44.5	7.0	74.5	74.5	7.0	74.5	74.5
Yellow Time (s)		4.0		4.0	4.0	4.0	4.0	4.5	4.5	4.0	4.5	4.5
All-Red Time (s)		3.5		3.5	3.5	3.5	5.0	3.0	3.0	5.0	3.0	3.0
Lost Time Adjust (s)		-1.5		-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5
Total Lost Time (s)		6.0		6.0	6.0	6.0	7.5	6.0	6.0	7.5	6.0	6.0
Lead/Lag		Lead		Lag			Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?		Yes		Yes			Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)		3.0		3.0	3.0	3.0	3.0	0.2	0.2	3.0	0.2	0.2
Recall Mode		None		None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effect Green (s)		14.6	150.0	25.4	46.0	46.0	8.5	79.2	79.2	8.2	76.0	76.0
Actuated g/C Ratio		0.10	1.00	0.17	0.31	0.31	0.06	0.53	0.53	0.05	0.51	0.51
v/c Ratio		0.53	0.28	0.92	0.81	0.35	1.20	0.38	0.28	0.39	1.18	0.31
Control Delay		69.7	0.4	77.2	59.9	16.7	192.6	5.3	1.6	80.8	118.6	9.4
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		69.7	0.4	77.2	59.9	16.7	192.6	5.3	1.6	80.8	118.6	9.4
LOS		E	A	E	E	B	F	A	A	F	F	A
Approach Delay		20.7			63.3			28.6			109.4	
Approach LOS		C			E			C			F	
Queue Length 50th (ft)		93	0	273	424	54	-128	104	31	35	-1247	54
Queue Length 95th (ft)		133	0	#392	568	124	#227	29	0	75	#1321	113
Internal Link Dist (ft)		457			420			1043			297	
Turn Bay Length (ft)			180			215	300		225	315		
Base Capacity (vph)		577	1615	860	582	584	184	3318	911	96	2479	847
Starvation Cap Reductn		0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn		0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn		0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio		0.33	0.28	0.92	0.81	0.35	1.20	0.38	0.28	0.38	1.18	0.31

Intersection Summary

Area Type: Other

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 105 (70%), Referenced to phase 2:SBT and 6:NBT, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.20

Intersection Signal Delay: 71.9

Intersection LOS: E

Intersection Capacity Utilization 100.8%

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: 15: New Hampshire Ave (MD 650) & Lockwood Drive

Ø1	Ø2 (R)	Ø3	Ø7
16 s	82 s	30 s	22 s
Ø5	Ø6 (R)	Ø4	
16 s	82 s	52 s	

Lanes, Volumes, Timings

39: Columbia Pike (US 29) & Colesville Business Park Driveway/Lockwood Drive

11/01/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	0	5	861	0	5	0	3405	0	10	3622	20
Future Volume (vph)	5	0	5	861	0	5	0	3405	0	10	3622	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	11	11	11	11	11	11
Storage Length (ft)	0		50	0		105	250		0	220		0
Storage Lanes	1		1	2		1	0		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.86	1.00	1.00	0.86	0.86
Frt			0.850		0.850						0.999	
Flt Protected	0.950			0.950						0.950		
Satd. Flow (prot)	1805	0	1615	3502	1615	0	0	6075	0	1694	6128	0
Flt Permitted	0.754			0.950						0.041		
Satd. Flow (perm)	1433	0	1615	3502	1615	0	0	6075	0	73	6128	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			29		29							1
Link Speed (mph)		25			30			40				40
Link Distance (ft)		156			227			370				609
Travel Time (s)		4.3			5.2			6.3				10.4
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
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	4%	4%	4%	3%	3%	3%
Adj. Flow (vph)	5	0	5	936	0	5	0	3701	0	11	3937	22
Shared Lane Traffic (%)												
Lane Group Flow (vph)	5	0	5	936	5	0	0	3701	0	11	3959	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		26			24			11			11	
Link Offset(ft)		-45			22			0			0	
Crosswalk Width(ft)		16			14			19			28	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.04	1.04	1.04	1.04	1.04	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1		1	1	1			1		1	1	
Detector Template												
Leading Detector (ft)	100		100	100	100			100		100	100	
Trailing Detector (ft)	0		0	0	0			0		0	0	
Detector 1 Position(ft)	0		0	0	0			0		0	0	
Detector 1 Size(ft)	100		100	100	100			100		100	100	
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0		0.0	0.0	0.0			0.0		0.0	0.0	
Detector 1 Queue (s)	0.0		0.0	0.0	0.0			0.0		0.0	0.0	
Detector 1 Delay (s)	0.0		0.0	0.0	0.0			0.0		0.0	0.0	
Turn Type	Perm		Prot	Perm	NA			NA		Perm	NA	
Protected Phases			4		8						2	
Permitted Phases	4			8				6		2		
Detector Phase	4		4	8	8			6		2	2	
Switch Phase												
Minimum Initial (s)	5.0		5.0	5.0	5.0			10.0		10.0	10.0	

Lanes, Volumes, Timings

39: Columbia Pike (US 29) & Colesville Business Park Driveway/Lockwood Drive

11/01/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Split (s)	12.0		12.0	12.0	12.0			17.0		17.0	17.0	
Total Split (s)	46.0		46.0	46.0	46.0			104.0		104.0	104.0	
Total Split (%)	30.7%		30.7%	30.7%	30.7%			69.3%		69.3%	69.3%	
Maximum Green (s)	39.0		39.0	39.0	39.0			97.0		97.0	97.0	
Yellow Time (s)	4.0		4.0	4.0	4.0			5.0		5.0	5.0	
All-Red Time (s)	3.0		3.0	3.0	3.0			2.0		2.0	2.0	
Lost Time Adjust (s)	-1.5		-1.5	-1.5	-1.5			-1.5		-1.5	-1.5	
Total Lost Time (s)	5.5		5.5	5.5	5.5			5.5		5.5	5.5	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	5.0		5.0	5.0	5.0			0.2		0.2	0.2	
Recall Mode	None		None	None	None			C-Min		C-Min	C-Min	
Act Effect Green (s)	40.5		40.5	40.5	40.5			98.5		98.5	98.5	
Actuated g/C Ratio	0.27		0.27	0.27	0.27			0.66		0.66	0.66	
v/c Ratio	0.01		0.01	0.99	0.01			0.93		0.23	0.98	
Control Delay	40.4		0.0	50.9	0.2			28.0		20.7	26.6	
Queue Delay	0.0		0.0	0.0	0.0			0.0		0.0	0.0	
Total Delay	40.4		0.0	50.9	0.2			28.0		20.7	26.6	
LOS	D		A	D	A			C		C	C	
Approach Delay		20.2			50.6			28.0			26.5	
Approach LOS		C			D			C			C	
Queue Length 50th (ft)	4		0	385	0			870		4	872	
Queue Length 95th (ft)	15		0	m#515	m0			914		m5	m659	
Internal Link Dist (ft)		76			147			290			529	
Turn Bay Length (ft)			50							220		
Base Capacity (vph)	386		457	945	457			3989		47	4024	
Starvation Cap Reductn	0		0	0	0			0		0	0	
Spillback Cap Reductn	0		0	0	0			0		0	0	
Storage Cap Reductn	0		0	0	0			0		0	0	
Reduced v/c Ratio	0.01		0.01	0.99	0.01			0.93		0.23	0.98	

Intersection Summary

Area Type: Other  
 Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 48 (32%), Referenced to phase 2:SBTL and 6:NBT, Start of Green  
 Natural Cycle: 110  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.99  
 Intersection Signal Delay: 29.8  
 Intersection Capacity Utilization 95.3%  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 39: Columbia Pike (US 29) & Colesville Business Park Driveway/Lockwood Drive

Ø2 (R)	Ø4
104 s	46 s
Ø6 (R)	Ø8
104 s	46 s



Lanes, Volumes, Timings  
66: Columbia Pike (US 29) & Stewart Lane

11/01/2017

	↖	→	↘	↙	←	↖	↙	↑	↗	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗			↖	↗	↖	↑↑↑	↗	↖↗	↑↑↑	↗
Traffic Volume (vph)	66	45	33	147	11	37	12	3027	213	505	3372	59
Future Volume (vph)	66	45	33	147	11	37	12	3027	213	505	3372	59
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	12	12	12	12	12	12
Storage Length (ft)	0		0	0		0	240		0	400		700
Storage Lanes	1		0	0		1	1		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	1.00	0.97	0.91	1.00
Frnt		0.936				0.850			0.850			0.850
Flt Protected	0.950				0.956		0.950			0.950		
Satd. Flow (prot)	1745	1719	0	0	1756	1561	1736	4988	1553	3367	4988	1553
Flt Permitted	0.381				0.662		0.950			0.950		
Satd. Flow (perm)	700	1719	0	0	1216	1561	1736	4988	1553	3367	4988	1553
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		20				138			142			87
Link Speed (mph)		30			30			45			50	
Link Distance (ft)		274			223			422			4978	
Travel Time (s)		6.2			5.1			6.4			67.9	
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
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	4%	4%	4%	4%	4%	4%
Adj. Flow (vph)	72	49	36	160	12	40	13	3290	232	549	3665	64
Shared Lane Traffic (%)												
Lane Group Flow (vph)	72	85	0	0	172	40	13	3290	232	549	3665	64
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		11			40			20			20	
Link Offset(ft)		15			-15			5			-3	
Crosswalk Width(ft)		25			25			15			18	
Two way Left Turn Lane												
Headway Factor	1.04	1.04	1.04	1.04	1.04	1.04	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1		1	1	1	1	1	1	1	1	1
Detector Template				Left								
Leading Detector (ft)	100	100		20	100	100	100	100	100	100	100	100
Trailing Detector (ft)	0	0		0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0		0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	100	100		20	100	100	100	100	100	100	100	100
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA	Prot	Prot	NA	Prot
Protected Phases		4			8		5	2	2	1	6	6
Permitted Phases	4			8		8						
Detector Phase	4	4		8	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	3.0	7.0	7.0	3.0	7.0	7.0



Lanes, Volumes, Timings  
66: Columbia Pike (US 29) & Stewart Lane

11/01/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Split (s)	12.5	12.5		12.5	12.5	12.5	12.5	14.0	14.0	10.5	14.0	14.0
Total Split (s)	25.0	25.0		25.0	25.0	25.0	13.0	97.0	97.0	28.0	112.0	112.0
Total Split (%)	16.7%	16.7%		16.7%	16.7%	16.7%	8.7%	64.7%	64.7%	18.7%	74.7%	74.7%
Maximum Green (s)	17.5	17.5		17.5	17.5	17.5	5.5	90.0	90.0	20.5	105.0	105.0
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	3.5	5.0	5.0	3.5	5.0	5.0
All-Red Time (s)	3.5	3.5		3.5	3.5	3.5	4.0	2.0	2.0	4.0	2.0	2.0
Lost Time Adjust (s)	-1.5	-1.5			-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5
Total Lost Time (s)	6.0	6.0			6.0	6.0	6.0	5.5	5.5	6.0	5.5	5.5
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	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	3.0
Recall Mode	None	None		None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	19.0	19.0		19.0	19.0	7.0	91.5	91.5	22.0	114.3	114.3	114.3
Actuated g/C Ratio	0.13	0.13		0.13	0.13	0.05	0.61	0.61	0.15	0.76	0.76	0.76
v/c Ratio	0.82	0.36		1.12	0.13	0.16	1.08	0.23	1.11	0.96	0.05	0.05
Control Delay	118.6	50.5		164.5	0.8	69.3	51.3	1.5	115.1	20.8	1.3	1.3
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	118.6	50.5		164.5	0.8	69.3	51.3	1.5	115.1	20.8	1.3	1.3
LOS	F	D		F	A	E	D	A	F	C	A	A
Approach Delay		81.7			133.6			48.1			32.6	
Approach LOS		F			F			D			C	
Queue Length 50th (ft)	70	59		~193	0	13	~1311	6	~318	725	0	0
Queue Length 95th (ft)	#166	116		#351	0	m14	#1365	m19	m#330	m#1440	m0	m0
Internal Link Dist (ft)		194		143			342		4898			
Turn Bay Length (ft)						240			400		700	
Base Capacity (vph)	88	235		154	318	81	3042	1002	493	3800	1203	
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.82	0.36		1.12	0.13	0.16	1.08	0.23	1.11	0.96	0.05	0.05

Intersection Summary

Area Type: Other  
 Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 144 (96%), Referenced to phase 2:NBT and 6:SBT, Start of Green  
 Natural Cycle: 140  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.12  
 Intersection Signal Delay: 42.9  
 Intersection Capacity Utilization 102.9%  
 Analysis Period (min) 15  
 Intersection LOS: D  
 ICU Level of Service G













~ 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.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 66: Columbia Pike (US 29) & Stewart Lane

Ø1	Ø2 (R)	Ø4
28 s	97 s	25 s
Ø5	Ø6 (R)	Ø8
13 s	112 s	25 s

Lanes, Volumes, Timings  
74: Cherry Hill Road & FDA Boulevard

11/01/2017

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	258	166	792	1120	1277	1063
Future Volume (vph)	258	166	792	1120	1277	1063
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	300	400			400
Storage Lanes	2	1	2			1
Taper Length (ft)	25		25			
Lane Util. Factor	0.97	1.00	0.97	0.95	0.95	1.00
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	3502	1615	3502	3610	3610	1615
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	3502	1615	3502	3610	3610	1615
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		20				645
Link Speed (mph)	25			30	30	
Link Distance (ft)	1271			578	580	
Travel Time (s)	34.7			13.1	13.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	287	184	880	1244	1419	1181
Shared Lane Traffic (%)						
Lane Group Flow (vph)	287	184	880	1244	1419	1181
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	24			24	24	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	37			48	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Number of Detectors	1	1	1	1	1	1
Detector Template						
Leading Detector (ft)	100	100	100	100	100	100
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	100	100	100	100	100	100
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Turn Type	Prot	pt+ov	Prot	NA	NA	Free
Protected Phases	4	4 1	1	6	2	
Permitted Phases						Free
Detector Phase	4	4 1	1	6	2	
Switch Phase						
Minimum Initial (s)	7.0		3.0	7.0	7.0	
Minimum Split (s)	13.0		9.0	13.0	13.0	
Total Split (s)	21.0		52.0	129.0	77.0	

Lanes, Volumes, Timings  
74: Cherry Hill Road & FDA Boulevard

11/01/2017

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Total Split (%)	14.0%		34.7%	86.0%	51.3%	
Maximum Green (s)	15.0		46.0	123.0	71.0	
Yellow Time (s)	4.0		4.0	4.0	4.0	
All-Red Time (s)	2.0		2.0	2.0	2.0	
Lost Time Adjust (s)	-1.5		-1.5	-1.5	-1.5	
Total Lost Time (s)	4.5		4.5	4.5	4.5	
Lead/Lag			Lead		Lag	
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)	3.0		3.0	0.2	0.2	
Recall Mode	None		None	C-Min	C-Min	
Act Effct Green (s)	17.4	67.3	45.4	123.6	73.7	150.0
Actuated g/C Ratio	0.12	0.45	0.30	0.82	0.49	1.00
v/c Ratio	0.71	0.25	0.83	0.42	0.80	0.73
Control Delay	74.0	23.1	56.3	4.1	18.3	6.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	74.0	23.1	56.3	4.1	18.3	6.5
LOS	E	C	E	A	B	A
Approach Delay	54.1			25.7	13.0	
Approach LOS	D			C	B	
Queue Length 50th (ft)	138	91	402	160	542	750
Queue Length 95th (ft)	195	152	488	158	m605	m769
Internal Link Dist (ft)	1191			498	500	
Turn Bay Length (ft)		300	400			400
Base Capacity (vph)	414	753	1112	3005	1804	1615
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.69	0.24	0.79	0.41	0.79	0.73

Intersection Summary

Area Type: Other  
 Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 148 (99%), Referenced to phase 2:SBT and 6:NBT, Start of Green  
 Natural Cycle: 75  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.83  
 Intersection Signal Delay: 21.9  
 Intersection Capacity Utilization 76.5%  
 Analysis Period (min) 15  
 Intersection LOS: C  
 ICU Level of Service D  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 74: Cherry Hill Road & FDA Boulevard

52 s	77 s	21 s
129 s		

Lanes, Volumes, Timings

81: Cherry Hill Road & Plum Orchard Drive/Clover Patch Drive

11/01/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	60	15	328	35	25	25	350	1008	20	15	1977	205
Future Volume (vph)	60	15	328	35	25	25	350	1008	20	15	1977	205
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	250		0	0		0	215		0	150		500
Storage Lanes	1		1	1		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	1.00
Frt			0.850		0.925			0.997				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1805	1900	1615	1805	3339	0	1805	3599	0	1805	3610	1615
Flt Permitted	0.719			0.746			0.041			0.249		
Satd. Flow (perm)	1366	1900	1615	1417	3339	0	78	3599	0	473	3610	1615
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			235		28			5				228
Link Speed (mph)		25			25			30			30	
Link Distance (ft)		397			415			343			944	
Travel Time (s)		10.8			11.3			7.8			21.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	67	17	364	39	28	28	389	1120	22	17	2197	228
Shared Lane Traffic (%)												
Lane Group Flow (vph)	67	17	364	39	56	0	389	1142	0	17	2197	228
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		10			0			0			0	
Crosswalk Width(ft)		20			20			35			34	
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	1	1	1		1	1		1	1	1
Detector Template												
Leading Detector (ft)	100	100	100	100	100		110	100		100	100	100
Trailing Detector (ft)	0	0	0	0	0		10	0		0	0	0
Detector 1 Position(ft)	0	0	0	0	0		10	0		0	0	0
Detector 1 Size(ft)	100	100	100	100	100		100	100		100	100	100
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA		Perm	NA	Perm
Protected Phases		8			4		5	2			6	
Permitted Phases	8		8	4			2			6		6
Detector Phase	8	8	8	4	4		5	2		6	6	6
Switch Phase												
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0		3.0	7.0		7.0	7.0	7.0
Minimum Split (s)	9.5	9.5	9.5	9.5	9.5		9.0	13.5		13.5	13.5	13.5
Total Split (s)	23.0	23.0	23.0	23.0	23.0		30.0	127.0		97.0	97.0	97.0



Lanes, Volumes, Timings

84: Cherry Hill Road & Powder Mill Road (MD 212)

11/01/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	263	470	0	520	800	681	81	969	65	248	1072	273
Future Volume (vph)	263	470	0	520	800	681	81	969	65	248	1072	273
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	11	11	10	12	12	12	11	12	11
Storage Length (ft)	420		0	200		410	190		0	450		360
Storage Lanes	2		0	1		1	1		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Fr						0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3335	3438	0	1646	3292	1422	1805	3610	1615	3385	3610	1561
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3335	3438	0	1646	3292	1422	1805	3610	1615	3385	3610	1561
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)						596						262
Link Speed (mph)		40			40			40			40	
Link Distance (ft)		605			616			491			636	
Travel Time (s)		10.3			10.5			8.4			10.8	
Peak Hour 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
Heavy Vehicles (%)	5%	5%	5%	6%	6%	6%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	263	470	0	520	800	681	81	969	65	248	1072	273
Shared Lane Traffic (%)												
Lane Group Flow (vph)	263	470	0	520	800	681	81	969	65	248	1072	273
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			28			30	
Link Offset(ft)		-12			10			0			1	
Crosswalk Width(ft)		28			36			16			31	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.04	1.04	1.09	1.00	1.00	1.00	1.04	1.00	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1		1	1	1	1	1	1	1	1	1
Detector Template												
Leading Detector (ft)	100	394		100	394	100	100	100	100	100	100	100
Trailing Detector (ft)	0	294		0	294	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	294		0	294	0	0	0	0	0	0	0
Detector 1 Size(ft)	100	100		100	100	100	100	100	100	100	100	100
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Turn Type	Prot	NA		Prot	NA	Free	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases						Free			4			8
Detector Phase	1	6		5	2		7	4	4	3	8	8
Switch Phase												
Minimum Initial (s)	5.0	20.0		5.0	20.0		7.0	7.0	7.0	8.0	8.0	8.0

Lanes, Volumes, Timings

84: Cherry Hill Road & Powder Mill Road (MD 212)

11/01/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Split (s)	11.0	27.0		11.0	27.0		13.0	13.0	13.0	14.0	14.0	14.0
Total Split (s)	22.0	30.0		55.0	63.0		13.0	49.0	49.0	16.0	52.0	52.0
Total Split (%)	14.7%	20.0%		36.7%	42.0%		8.7%	32.7%	32.7%	10.7%	34.7%	34.7%
Maximum Green (s)	17.0	23.0		50.0	56.0		8.0	43.0	43.0	11.0	46.0	46.0
Yellow Time (s)	4.0	5.0		4.0	5.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	2.0		1.0	2.0		1.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	-1.5	-1.5		-1.5	-1.5		-1.5	-1.5	-1.5	-1.5	-1.5	-1.5
Total Lost Time (s)	3.5	5.5		3.5	5.5		3.5	4.5	4.5	3.5	4.5	4.5
Lead/Lag	Lag	Lag		Lead	Lead		Lead	Lead	Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	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	None	Min		None	Min		None	Min	Min	None	Min	Min
Act Effct Green (s)	30.2	23.4		49.1	42.3	145.7	9.5	43.1	43.1	13.0	46.7	46.7
Actuated g/C Ratio	0.21	0.16		0.34	0.29	1.00	0.07	0.30	0.30	0.09	0.32	0.32
v/c Ratio	0.38	0.85		0.94	0.84	0.48	0.69	0.91	0.14	0.82	0.93	0.40
Control Delay	53.3	75.2		72.7	56.8	1.2	96.8	62.4	39.4	87.3	62.2	6.7
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.3	75.2		72.7	56.8	1.2	96.8	62.4	39.4	87.3	62.2	6.7
LOS	D	E		E	E	A	F	E	D	F	E	A
Approach Delay		67.3			42.0			63.6			56.6	
Approach LOS		E			D			E			E	
Queue Length 50th (ft)	113	237		488	388	0	79	482	47	125	537	7
Queue Length 95th (ft)	170	#320		#713	433	0	#166	#600	87	#206	#673	76
Internal Link Dist (ft)		525			536			411			556	
Turn Bay Length (ft)	420			200		410	190			450		360
Base Capacity (vph)	691	579		583	1302	1422	118	1105	494	302	1180	686
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.38	0.81		0.89	0.61	0.48	0.69	0.88	0.13	0.82	0.91	0.40

Intersection Summary

Area Type: Other

Cycle Length: 150

Actuated Cycle Length: 145.7

Natural Cycle: 120

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.94

Intersection Signal Delay: 54.1

Intersection LOS: D

Intersection Capacity Utilization 95.9%

ICU Level of Service F

Analysis Period (min) 15

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 84: Cherry Hill Road & Powder Mill Road (MD 212)

Ø2	Ø1	Ø4	Ø3
63 s	22 s	49 s	16 s
Ø5	Ø6	Ø7	Ø8
55 s	30 s	13 s	52 s



Lanes, Volumes, Timings  
 94: Columbia Pike (US 29) & Industrial Parkway

11/01/2017

	↙	↖	↑	↗	↘	↓
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↖↖	↗	↑↑↑		↖↖↖	↑↑↑
Traffic Volume (vph)	836	103	1667	0	916	3100
Future Volume (vph)	836	103	1667	0	916	3100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	12	12
Storage Length (ft)	0	0		500	400	
Storage Lanes	2	1		0	1	
Taper Length (ft)	25				75	
Lane Util. Factor	0.97	1.00	0.91	1.00	0.94	0.91
Frt		0.850				
Flt Protected	0.950				0.950	
Satd. Flow (prot)	3385	1561	4988	0	4894	4988
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	3385	1561	4988	0	4894	4988
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		85				
Link Speed (mph)	30		50			50
Link Distance (ft)	156		386			541
Travel Time (s)	3.5		5.3			7.4
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	4%	4%	4%	4%
Adj. Flow (vph)	880	108	1755	0	964	3263
Shared Lane Traffic (%)						
Lane Group Flow (vph)	880	108	1755	0	964	3263
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	10		50			50
Link Offset(ft)	25		-3			0
Crosswalk Width(ft)	20		65			30
Two way Left Turn Lane						
Headway Factor	1.04	1.04	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Number of Detectors	1	1	1		1	1
Detector Template						
Leading Detector (ft)	25	25	100		100	100
Trailing Detector (ft)	0	0	0		0	0
Detector 1 Position(ft)	0	0	0		0	0
Detector 1 Size(ft)	25	25	100		100	100
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Turn Type	Prot	Prot	NA		Prot	NA
Protected Phases	8	8	6		5	2
Permitted Phases						
Detector Phase	8	8	6		5	2
Switch Phase						
Minimum Initial (s)	4.0	4.0	7.0		5.0	7.0

Lanes, Volumes, Timings

94: Columbia Pike (US 29) & Industrial Parkway

11/01/2017



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Minimum Split (s)	11.0	11.0	14.0		11.0	14.0
Total Split (s)	45.0	45.0	68.0		37.0	105.0
Total Split (%)	30.0%	30.0%	45.3%		24.7%	70.0%
Maximum Green (s)	38.0	38.0	61.0		31.0	98.0
Yellow Time (s)	4.0	4.0	5.5		4.0	5.5
All-Red Time (s)	3.0	3.0	1.5		2.0	1.5
Lost Time Adjust (s)	-1.5	-1.5	-1.5		-1.5	-1.5
Total Lost Time (s)	5.5	5.5	5.5		4.5	5.5
Lead/Lag			Lead		Lag	
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)	4.0	4.0	0.2		5.0	0.2
Recall Mode	None	None	C-Min		None	C-Min
Act Effct Green (s)	39.5	39.5	61.9		33.1	99.5
Actuated g/C Ratio	0.26	0.26	0.41		0.22	0.66
v/c Ratio	0.99	0.23	0.85		0.89	0.99
Control Delay	35.3	0.8	14.5		24.6	26.5
Queue Delay	0.0	2.2	0.0		0.0	11.6
Total Delay	35.3	3.0	14.5		24.6	38.1
LOS	D	A	B		C	D
Approach Delay	31.8		14.5			35.0
Approach LOS	C		B			C
Queue Length 50th (ft)	98	0	416		292	413
Queue Length 95th (ft)	#578	m0	m355		m133	m26
Internal Link Dist (ft)	76		306			461
Turn Bay Length (ft)					400	
Base Capacity (vph)	891	473	2078		1080	3308
Starvation Cap Reductn	0	259	0		0	137
Spillback Cap Reductn	0	0	0		0	0
Storage Cap Reductn	0	0	0		0	0
Reduced v/c Ratio	0.99	0.50	0.84		0.89	1.03

Intersection Summary

Area Type: Other

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 100 (67%), Referenced to phase 2:SBT and 6:NBT, Start of Green

Natural Cycle: 110

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.99

Intersection Signal Delay: 29.4

Intersection LOS: C

Intersection Capacity Utilization 92.9%

ICU Level of Service F

Analysis Period (min) 15

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 94: Columbia Pike (US 29) & Industrial Parkway

#94 ↓ Ø2 (R) 105 s		#94 #95 ↑ ↓ Ø6 (R) 68 s	#94 #95 → Ø5 37 s	#94 #95 ↘ ↙ Ø8 45 s
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Lanes, Volumes, Timings  
 95: Old Columbia Pike & Industrial Parkway

11/01/2017

	↖	→	↘	↙	←	↖	↙	↑	↘	↓	↙	
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑		↘	↑↑↑	↖			↑↑↑		↑↑	
Traffic Volume (vph)	0	816	100	30	894	235	0	0	2182	100	45	45
Future Volume (vph)	0	816	100	30	894	235	0	0	2182	100	45	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	16	11	11	16	12	12	11	12	12	12
Storage Length (ft)	0		0	50		500	0		0	0		100
Storage Lanes	0		0	1		1	0		3	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	1.00	1.00	1.00	0.76	0.95	0.95	0.95
Frt		0.984				0.850			0.850		0.965	
Flt Protected				0.950							0.974	
Satd. Flow (prot)	0	5785	0	1745	5014	1830	0	0	3559	0	3393	0
Flt Permitted				0.950							0.974	
Satd. Flow (perm)	0	5785	0	1745	5014	1830	0	0	3559	0	3393	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		13				253			29		33	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		156			1170			272			1014	
Travel Time (s)		3.5			26.6			6.2			23.0	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	0	877	108	32	961	253	0	0	2346	108	48	48
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	985	0	32	961	253	0	0	2346	0	204	0
Enter Blocked Intersection	No	No	No	Yes	1 veh	No	No	No	1 veh	No	Yes	1 veh
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		10			15			0			0	
Link Offset(ft)		-10			10			10			-5	
Crosswalk Width(ft)		16			16			35			16	
Two way Left Turn Lane												
Headway Factor	0.85	0.85	0.85	1.04	1.04	0.85	1.00	1.00	1.04	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		1		1	2	1			1	1	2	
Detector Template										Left		
Leading Detector (ft)		25		100	100	100			100	20	100	
Trailing Detector (ft)		0		0	0	0			0	0	0	
Detector 1 Position(ft)		0		0	0	0			0	0	0	
Detector 1 Size(ft)		25		100	100	100			100	20	100	
Detector 1 Type		CI+Ex		CI+Ex	CI+Ex	CI+Ex			CI+Ex	CI+Ex	CI+Ex	
Detector 1 Channel												
Detector 1 Extend (s)		0.0		0.0	0.0	0.0			0.0	0.0	0.0	
Detector 1 Queue (s)		0.0		0.0	0.0	0.0			0.0	0.0	0.0	
Detector 1 Delay (s)		0.0		0.0	0.0	0.0			0.0	0.0	0.0	
Detector 2 Position(ft)					94						94	
Detector 2 Size(ft)					6						6	
Detector 2 Type					CI+Ex						CI+Ex	
Detector 2 Channel												
Detector 2 Extend (s)					0.0						0.0	
Turn Type		NA		Split	NA	Prot			pt+ov	Perm	NA	
Protected Phases		5		8	8	8			8 6	6	6	

Lane Group	Ø2
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
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)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (mph)	
Number of Detectors	
Detector Template	
Leading Detector (ft)	
Trailing Detector (ft)	
Detector 1 Position(ft)	
Detector 1 Size(ft)	
Detector 1 Type	
Detector 1 Channel	
Detector 1 Extend (s)	
Detector 1 Queue (s)	
Detector 1 Delay (s)	
Detector 2 Position(ft)	
Detector 2 Size(ft)	
Detector 2 Type	
Detector 2 Channel	
Detector 2 Extend (s)	
Turn Type	
Protected Phases	2

Lanes, Volumes, Timings  
95: Old Columbia Pike & Industrial Parkway

11/01/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases										6		
Detector Phase		5		8	8	8			8 6	6	6	
Switch Phase												
Minimum Initial (s)		5.0		4.0	4.0	4.0				7.0	7.0	
Minimum Split (s)		11.0		11.0	11.0	11.0				14.0	14.0	
Total Split (s)		37.0		45.0	45.0	45.0				68.0	68.0	
Total Split (%)		24.7%		30.0%	30.0%	30.0%				45.3%	45.3%	
Maximum Green (s)		31.0		38.0	38.0	38.0				61.0	61.0	
Yellow Time (s)		4.0		4.0	4.0	4.0				5.5	5.5	
All-Red Time (s)		2.0		3.0	3.0	3.0				1.5	1.5	
Lost Time Adjust (s)		-1.5		-1.5	-1.5	-1.5					-1.5	
Total Lost Time (s)		4.5		5.5	5.5	5.5					5.5	
Lead/Lag		Lag								Lead	Lead	
Lead-Lag Optimize?		Yes								Yes	Yes	
Vehicle Extension (s)		5.0		4.0	4.0	4.0				0.2	0.2	
Recall Mode		None		None	None	None				C-Min	C-Min	
Act Effct Green (s)		33.1		39.5	39.5	39.5			106.9		61.9	
Actuated g/C Ratio		0.22		0.26	0.26	0.26			0.71		0.41	
v/c Ratio		0.77		0.07	0.73	0.38			0.92		0.14	
Control Delay		9.6		37.9	48.8	9.1			26.5		17.1	
Queue Delay		1.7		0.0	1.6	0.0			45.5		0.0	
Total Delay		11.3		37.9	50.4	9.1			72.0		17.1	
LOS		B		D	D	A			E		B	
Approach Delay		11.3			41.7			72.0			17.1	
Approach LOS		B			D			E			B	
Queue Length 50th (ft)		13		27	344	88			582		55	
Queue Length 95th (ft)		m47		m40	m393	m126			532		m40	
Internal Link Dist (ft)		76			1090			192			934	
Turn Bay Length (ft)				50		500						
Base Capacity (vph)		1286		459	1320	668			2558		1433	
Starvation Cap Reductn		156		0	0	0			481		0	
Spillback Cap Reductn		0		0	194	0			0		237	
Storage Cap Reductn		0		0	0	0			0		0	
Reduced v/c Ratio		0.87		0.07	0.85	0.38			1.13		0.17	

Intersection Summary

Area Type: Other  
 Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 100 (67%), Referenced to phase 2:SBT and 6:NBT, Start of Green  
 Natural Cycle: 110  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.99  
 Intersection Signal Delay: 49.2  
 Intersection Capacity Utilization 87.6%  
 Analysis Period (min) 15  
 Intersection LOS: D  
 ICU Level of Service E  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 95: Old Columbia Pike & Industrial Parkway

#94 ↓ 02 (R) 105 s		
#94 #95 ↑ ↓ 06 (R) 68 s	#94 #95 ↘ → 05 37 s	#94 #95 ↘ ↗ 08 45 s

Lane Group	Ø2
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	7.0
Minimum Split (s)	14.0
Total Split (s)	105.0
Total Split (%)	70%
Maximum Green (s)	98.0
Yellow Time (s)	5.5
All-Red Time (s)	1.5
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	0.2
Recall Mode	C-Min
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
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	
<b>Intersection Summary</b>	

Lanes, Volumes, Timings  
 96: Columbia Pike (US 29) & Tech Road

11/01/2017

	↖	→	↘	↙	←	↖	↙	↑	↘	↓	↙	
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑	↗	↘	↔		↘	↑↑↑		↘	↑↑↑	↗
Traffic Volume (vph)	30	640	152	342	240	408	206	1564	0	685	3522	225
Future Volume (vph)	30	640	152	342	240	408	206	1564	0	685	3522	225
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	400		400	300		0
Storage Lanes	1		1	1		0	2		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	0.91	0.91	0.95	0.97	0.91	1.00	1.00	0.91	1.00
Frt			0.850		0.925							0.850
Flt Protected	0.950			0.950	0.990		0.950			0.950		
Satd. Flow (prot)	1805	1900	1615	1643	3167	0	3367	4988	0	1736	4988	1553
Flt Permitted	0.136			0.400	0.696		0.950			0.950		
Satd. Flow (perm)	258	1900	1615	692	2226	0	3367	4988	0	1736	4988	1553
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			193		143							149
Link Speed (mph)		30			30			50			50	
Link Distance (ft)		269			161			495			453	
Travel Time (s)		6.1			3.7			6.8			6.2	
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
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	4%	4%	4%	4%	4%	4%
Adj. Flow (vph)	33	696	165	372	261	443	224	1700	0	745	3828	245
Shared Lane Traffic (%)				50%								
Lane Group Flow (vph)	33	696	165	186	890	0	224	1700	0	745	3828	245
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			9			38			50	
Link Offset(ft)		0			-10			12			0	
Crosswalk Width(ft)		50			28			15			16	
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	1	1	1		1	1		1	1	1
Detector Template												
Leading Detector (ft)	100	100	100	50	50		100	100		100	100	100
Trailing Detector (ft)	0	0	0	0	0		0	0		0	0	0
Detector 1 Position(ft)	0	0	0	0	0		0	0		0	0	0
Detector 1 Size(ft)	100	100	100	50	50		100	100		100	100	100
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Turn Type	Perm	NA	Prot	Perm	NA		Prot	NA		Prot	NA	Prot
Protected Phases		3	3		4		6	2		1	5	5
Permitted Phases	3			4								
Detector Phase	3	3	3	4	4		6	2		1	5	5
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0		3.0	7.0		4.0	7.0	7.0
Minimum Split (s)	12.0	12.0	12.0	12.0	12.0		10.5	14.5		11.5	14.5	14.5



Lanes, Volumes, Timings  
 96: Columbia Pike (US 29) & Tech Road

11/01/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (s)	36.0	36.0	36.0	31.0	31.0		12.0	43.0		40.0	71.0	71.0
Total Split (%)	24.0%	24.0%	24.0%	20.7%	20.7%		8.0%	28.7%		26.7%	47.3%	47.3%
Maximum Green (s)	28.0	28.0	28.0	23.0	23.0		4.5	35.5		33.5	63.5	63.5
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		5.0	5.5		4.0	5.5	5.5
All-Red Time (s)	4.0	4.0	4.0	4.0	4.0		2.5	2.0		2.5	2.0	2.0
Lost Time Adjust (s)	-1.5	-1.5	-1.5	-1.5	-1.5		-1.5	-1.5		-1.5	-1.5	-1.5
Total Lost Time (s)	6.5	6.5	6.5	6.5	6.5		6.0	6.0		5.0	6.0	6.0
Lead/Lag	Lead	Lead	Lead	Lag	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	4.0	4.0	4.0	4.0	4.0		3.0	0.2		4.0	0.2	0.2
Recall Mode	None	None	None	None	None		None	C-Min		None	C-Min	C-Min
Act Effct Green (s)	29.5	29.5	29.5	24.5	24.5		6.0	37.0		35.0	65.0	65.0
Actuated g/C Ratio	0.20	0.20	0.20	0.16	0.16		0.04	0.25		0.23	0.43	0.43
v/c Ratio	0.66	1.87	0.35	1.65	1.84		1.67	1.38		1.84	1.77	0.32
Control Delay	110.2	432.0	5.6	364.2	415.1		375.7	202.1		407.4	372.4	9.2
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	110.2	432.0	5.6	364.2	415.1		375.7	202.1		407.4	372.4	9.2
LOS	F	F	A	F	F		F	F		F	F	A
Approach Delay		341.4			406.3			222.3			359.3	
Approach LOS		F			F			F			F	
Queue Length 50th (ft)	30	~1033	0	~289	~660		~168	~827		~1102	~2089	81
Queue Length 95th (ft)	#93	#1280	40	#467	#803		m#217	#926		m#610	m#1110	m37
Internal Link Dist (ft)		189			81			415			373	
Turn Bay Length (ft)							400			300		
Base Capacity (vph)	50	373	472	113	483		134	1230		405	2161	757
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	0
Reduced v/c Ratio	0.66	1.87	0.35	1.65	1.84		1.67	1.38		1.84	1.77	0.32

Intersection Summary

Area Type: Other

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 148 (99%), Referenced to phase 2:NBT and 5:SBT, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.87

Intersection Signal Delay: 333.0

Intersection LOS: F

Intersection Capacity Utilization 148.2%

ICU Level of Service H

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

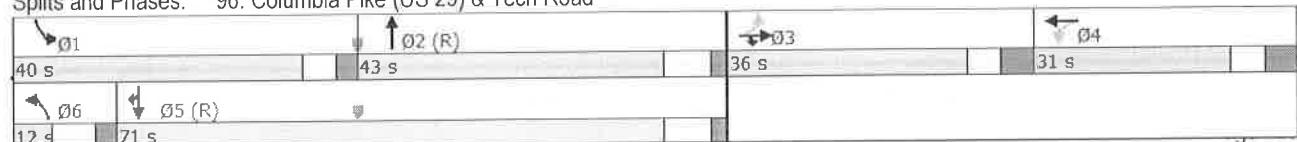
Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 96: Columbia Pike (US 29) & Tech Road



Lanes, Volumes, Timings

107: Columbia Pike (US 29) & Cherry Hill Road

11/01/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	110	1337	20	251	1146	446	21	0	113	1331	0	80
Future Volume (vph)	110	1337	20	251	1146	446	21	0	113	1331	0	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	11	11	12	12	12	12	12	12	12
Storage Length (ft)	0		0	410		350	0		0	0		0
Storage Lanes	2		0	2		1	1		2	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	0.91	0.97	0.95	1.00	1.00	1.00	0.88	0.91	0.91	1.00
Frnt		0.998				0.850			0.850		0.974	
Flt Protected	0.950			0.950			0.950			0.950	0.960	
Satd. Flow (prot)	3502	5177	0	3385	3490	1615	1805	0	2842	3285	1617	0
Flt Permitted	0.950			0.950			0.950			0.950	0.960	
Satd. Flow (perm)	3502	5177	0	3385	3490	1615	1805	0	2842	3285	1617	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1				433			153		156	
Link Speed (mph)		30			30			40			40	
Link Distance (ft)		368			689			473			677	
Travel Time (s)		8.4			15.7			8.1			11.5	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	117	1422	21	267	1219	474	22	0	120	1416	0	85
Shared Lane Traffic (%)										29%		
Lane Group Flow (vph)	117	1443	0	267	1219	474	22	0	120	1005	496	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		40			40			200			250	
Link Offset(ft)		0			15			10			0	
Crosswalk Width(ft)		16			0			30			35	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.04	1.04	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1		1	1	1	1		1	1	1	
Detector Template												
Leading Detector (ft)	100	100		100	100	100	100		100	100	100	
Trailing Detector (ft)	0	0		0	0	0	0		0	0	0	
Detector 1 Position(ft)	0	0		0	0	0	0		0	0	0	
Detector 1 Size(ft)	100	100		100	100	100	100		100	100	100	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0	
Turn Type	Prot	NA		Prot	NA	Prot	Prot		Prot	Split	NA	
Protected Phases	1	6		5	2	2	3		3	4	4	
Permitted Phases												
Detector Phase	1	6		5	2	2	3		3	4	4	
Switch Phase												
Minimum Initial (s)	3.0	7.0		3.0	7.0	7.0	7.0		7.0	5.0	5.0	
Minimum Split (s)	10.0	16.0		10.0	16.0	16.0	15.5		15.5	26.0	26.0	

Lanes, Volumes, Timings  
107: Columbia Pike (US 29) & Cherry Hill Road

11/01/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (s)	12.0	57.5		20.0	65.5	65.5	15.5		15.5	57.0	57.0	
Total Split (%)	8.0%	38.3%		13.3%	43.7%	43.7%	10.3%		10.3%	38.0%	38.0%	
Maximum Green (s)	5.0	48.5		13.0	56.5	56.5	7.0		7.0	49.0	49.0	
Yellow Time (s)	3.5	4.5		3.5	4.5	4.5	3.5		3.5	3.5	3.5	
All-Red Time (s)	3.5	4.5		3.5	4.5	4.5	5.0		5.0	4.5	4.5	
Lost Time Adjust (s)	-1.5	-1.5		-1.5	-1.5	-1.5	-1.5		-1.5	-1.5	-1.5	
Total Lost Time (s)	5.5	7.5		5.5	7.5	7.5	7.0		7.0	6.5	6.5	
Lead/Lag	Lag	Lead		Lag	Lead	Lead	Lead		Lead	Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes		Yes	Yes	Yes	
Vehicle Extension (s)	6.0	0.2		6.0	0.2	0.2	6.0		6.0	6.0	6.0	
Recall Mode	None	C-Min		None	C-Min	C-Min	None		None	None	None	
Act Effect Green (s)	8.2	46.6		17.5	56.0	56.0	8.8		8.8	50.6	50.6	
Actuated g/C Ratio	0.05	0.31		0.12	0.37	0.37	0.06		0.06	0.34	0.34	
v/c Ratio	0.62	0.90		0.67	0.94	0.54	0.21		0.39	0.91	0.77	
Control Delay	83.7	57.5		72.8	55.8	8.1	32.9		5.8	29.9	13.3	
Queue Delay	0.0	0.0		0.0	9.0	0.2	0.0		0.0	2.8	0.6	
Total Delay	83.7	57.5		72.8	64.8	8.2	32.9		5.8	32.8	13.9	
LOS	F	E		E	E	A	C		A	C	B	
Approach Delay		59.5			52.2			10.0				26.5
Approach LOS		E			D			B				C
Queue Length 50th (ft)	59	490		132	647	120	16		21	461	246	
Queue Length 95th (ft)	#112	540		#208	#699	176	m11		m10	m229	m98	
Internal Link Dist (ft)		288			609			393				597
Turn Bay Length (ft)				410		350						
Base Capacity (vph)	190	1726		396	1349	890	106		310	1106	648	
Starvation Cap Reductn	0	0		0	121	60	0		0	0	0	
Spillback Cap Reductn	0	0		0	0	0	0		2	47	24	
Storage Cap Reductn	0	0		0	0	0	0		0	0	0	
Reduced v/c Ratio	0.62	0.84		0.67	0.99	0.57	0.21		0.39	0.95	0.79	

Intersection Summary

Area Type: Other  
 Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 138 (92%), Referenced to phase 2:WBT and 6:EBT, Start of Green  
 Natural Cycle: 110  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.94  
 Intersection Signal Delay: 45.8  
 Intersection LOS: D  
 Intersection Capacity Utilization 84.1%  
 ICU Level of Service E  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 107: Columbia Pike (US 29) & Cherry Hill Road

Ø2 (R)	Ø1	Ø3	Ø4
65.5 s	12 s	15.5 s	57 s
Ø6 (R)	Ø5		
57.5 s	20 s		

Lanes, Volumes, Timings  
109: Prosperity Drive & Cherry Hill Road

11/01/2017

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑	↗	↙	↑↑	↖	↗
Traffic Volume (vph)	2333	448	170	1640	203	121
Future Volume (vph)	2333	448	170	1640	203	121
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		250	400		0	0
Storage Lanes		1	1		1	1
Taper Length (ft)			25		25	
Lane Util. Factor	0.91	1.00	1.00	0.95	1.00	1.00
Friction		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	5187	1615	1805	3610	1805	1615
Flt Permitted			0.041		0.950	
Satd. Flow (perm)	5187	1615	78	3610	1805	1615
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		331				132
Link Speed (mph)	30			30	30	
Link Distance (ft)	689			612	401	
Travel Time (s)	15.7			13.9	9.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2536	487	185	1783	221	132
Shared Lane Traffic (%)						
Lane Group Flow (vph)	2536	487	185	1783	221	132
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	38			30	12	
Link Offset(ft)	-12			8	0	
Crosswalk Width(ft)	30			30	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Number of Detectors	1	1	1	1	1	1
Detector Template						
Leading Detector (ft)	100	100	100	100	100	100
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	100	100	100	100	100	100
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Turn Type	NA	Perm	pm+pt	NA	Prot	Prot
Protected Phases	6		5	2	4	4
Permitted Phases		6	2			
Detector Phase	6	6	5	2	4	4
Switch Phase						
Minimum Initial (s)	7.0	7.0	3.0	7.0	5.0	5.0
Minimum Split (s)	13.5	13.5	9.5	13.5	11.0	11.0
Total Split (s)	92.3	92.3	25.7	118.0	32.0	32.0

Lanes, Volumes, Timings  
 109: Prosperity Drive & Cherry Hill Road

11/01/2017

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Total Split (%)	61.5%	61.5%	17.1%	78.7%	21.3%	21.3%
Maximum Green (s)	85.8	85.8	19.2	111.5	26.0	26.0
Yellow Time (s)	4.5	4.5	4.0	4.5	4.0	4.0
All-Red Time (s)	2.0	2.0	2.5	2.0	2.0	2.0
Lost Time Adjust (s)	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5
Total Lost Time (s)	5.0	5.0	5.0	5.0	4.5	4.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Vehicle Extension (s)	0.2	0.2	5.0	0.2	5.0	5.0
Recall Mode	C-Min	C-Min	None	C-Min	None	None
Act Effct Green (s)	92.6	92.6	115.4	115.4	25.1	25.1
Actuated g/C Ratio	0.62	0.62	0.77	0.77	0.17	0.17
v/c Ratio	0.79	0.43	0.70	0.64	0.73	0.35
Control Delay	19.0	4.8	62.6	6.1	66.4	9.2
Queue Delay	0.9	0.4	0.0	0.3	0.0	0.0
Total Delay	19.9	5.2	62.6	6.4	66.4	9.2
LOS	B	A	E	A	E	A
Approach Delay	17.6			11.7	45.0	
Approach LOS	B			B	D	
Queue Length 50th (ft)	505	64	133	250	189	12
Queue Length 95th (ft)	584	m46	m207	m182	m221	m19
Internal Link Dist (ft)	609			532	321	
Turn Bay Length (ft)		250	400			
Base Capacity (vph)	3202	1123	298	2777	330	403
Starvation Cap Reductn	360	251	0	0	0	0
Spillback Cap Reductn	0	0	0	383	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.89	0.56	0.62	0.74	0.67	0.33

Intersection Summary

Area Type: Other  
 Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 100 (67%), Referenced to phase 2:WBTL and 6:EBT, Start of Green  
 Natural Cycle: 70  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.79  
 Intersection Signal Delay: 17.2  
 Intersection Capacity Utilization 77.8%  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Intersection LOS: B  
 ICU Level of Service D

Splits and Phases: 109: Prosperity Drive & Cherry Hill Road

← 02 (R) 118 s		↖ 04 32 s
↙ 05 25.7 s	→ 06 (R) 92.3 s	

Lanes, Volumes, Timings

114: Cherry Hill Road & Broadbirch Drive/Calverton Boulevard

11/01/2017

	↖	→	↘	↙	←	↖	↙	↑	↗	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑	↗	↘	↑↑	↗	↘	↑↑		↘	↑↑↑	↗
Traffic Volume (vph)	257	240	153	300	605	700	215	853	25	76	1744	634
Future Volume (vph)	257	240	153	300	605	700	215	853	25	76	1744	634
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		500	300		200	175		0	300		100
Storage Lanes	1		1	1		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95	1.00	0.91	1.00
Frt			0.850			0.850		0.996				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1805	3610	1615	1805	3610	1615	1805	3596	0	1805	5187	1615
Flt Permitted	0.164			0.370			0.061			0.198		
Satd. Flow (perm)	312	3610	1615	703	3610	1615	116	3596	0	376	5187	1615
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			251			304		3				207
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		710			494			362			1433	
Travel Time (s)		19.4			13.5			6.2			24.4	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	295	276	176	345	695	805	247	980	29	87	2005	729
Shared Lane Traffic (%)												
Lane Group Flow (vph)	295	276	176	345	695	805	247	1009	0	87	2005	729
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		32			16			16			16	
Two way Left Turn Lane											Yes	
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	1	1	1	1	1	1		1	1	1
Detector Template												
Leading Detector (ft)	100	100	100	100	100	100	100	100		100	100	100
Trailing Detector (ft)	0	0	0	0	0	0	0	0		0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0		0	0	0
Detector 1 Size(ft)	100	100	100	100	100	100	100	100		100	100	100
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Turn Type	pm+pt	NA	Free	pm+pt	NA	Free	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases	6		Free	2		Free	4			8		8
Detector Phase	1	6		5	2		7	4		3	8	8
Switch Phase												
Minimum Initial (s)	3.0	7.0		5.0	7.0		3.0	3.0		5.0	3.0	3.0
Minimum Split (s)	9.0	13.5		11.0	13.5		9.5	9.0		11.5	9.0	9.0
Total Split (s)	24.0	29.0		34.0	39.0		22.0	73.0		14.0	65.0	65.0

Lanes, Volumes, Timings

114: Cherry Hill Road & Broadbirch Drive/Calverton Boulevard

11/01/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (%)	16.0%	19.3%		22.7%	26.0%		14.7%	48.7%		9.3%	43.3%	43.3%
Maximum Green (s)	18.0	22.5		28.0	32.5		15.5	67.0		7.5	59.0	59.0
Yellow Time (s)	4.0	4.5		4.0	4.5		4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.5	2.0		2.5	2.0	2.0
Lost Time Adjust (s)	-1.5	-1.5		-1.5	-1.5		-1.5	-1.5		-1.5	-1.5	-1.5
Total Lost Time (s)	4.5	5.0		4.5	5.0		5.0	4.5		5.0	4.5	4.5
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	4.0	0.2		3.0	0.2		5.0	4.0		3.0	4.0	4.0
Recall Mode	None	C-Min		None	C-Min		None	None		None	None	None
Act Effct Green (s)	44.4	24.4	150.0	55.8	31.8	150.0	84.2	70.7		68.9	60.5	60.5
Actuated g/C Ratio	0.30	0.16	1.00	0.37	0.21	1.00	0.56	0.47		0.46	0.40	0.40
v/c Ratio	1.03	0.47	0.11	0.75	0.91	0.50	0.88	0.59		0.34	0.96	0.94
Control Delay	105.0	60.0	0.1	47.1	74.0	1.1	72.1	29.5		10.8	48.7	47.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	105.0	60.0	0.1	47.1	74.0	1.1	72.1	29.5		10.8	48.7	47.3
LOS	F	E	A	D	E	A	E	C		B	D	D
Approach Delay		63.7			37.2			37.9				47.1
Approach LOS		E			D			D				D
Queue Length 50th (ft)	~253	130	0	255	347	0	202	353		24	759	668
Queue Length 95th (ft)	#425	173	0	336	405	0	#355	356		m12	741	#782
Internal Link Dist (ft)		630			414			282				1353
Turn Bay Length (ft)			500	300		200	175			300		100
Base Capacity (vph)	286	587	1615	480	818	1615	280	1697		260	2092	774
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	1.03	0.47	0.11	0.72	0.85	0.50	0.88	0.59		0.33	0.96	0.94

Intersection Summary

Area Type: Other

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 140 (93%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green

Natural Cycle: 80

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.03

Intersection Signal Delay: 44.5

Intersection LOS: D

Intersection Capacity Utilization 92.4%

ICU Level of Service F

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

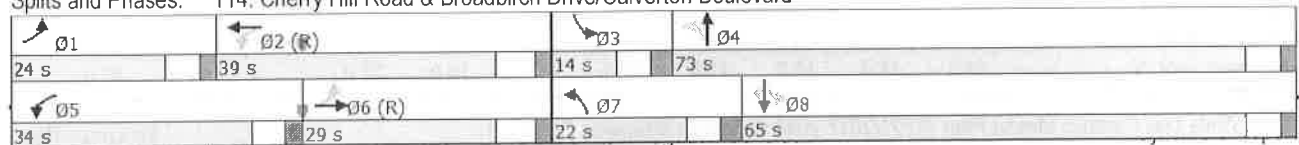
Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.























Splits and Phases: 114: Cherry Hill Road & Broadbirch Drive/Calverton Boulevard





Lanes, Volumes, Timings  
 120: Columbia Pike (US 29) & Musgrove Road

05/01/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	65	50	77	160	195	35	313	2044	67	20	5335	500
Future Volume (vph)	65	50	77	160	195	35	313	2044	67	20	5335	500
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	300		0	0		800
Storage Lanes	1		1	1		0	2		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.86	0.86	1.00	0.86	0.86
Frnt			0.850		0.977			0.995			0.987	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1805	1900	1615	1805	1856	0	3367	6253	0	1736	6203	0
Flt Permitted	0.235			0.722			0.950			0.950		
Satd. Flow (perm)	446	1900	1615	1372	1856	0	3367	6253	0	1736	6203	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			73		5			9			28	
Link Speed (mph)		30			30			50			50	
Link Distance (ft)		537			573			626			1366	
Travel Time (s)		12.2			13.0			8.5			18.6	
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
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	4%	4%	4%	4%	4%	4%
Adj. Flow (vph)	71	54	84	174	212	38	340	2222	73	22	5799	543
Shared Lane Traffic (%)												
Lane Group Flow (vph)	71	54	84	174	250	0	340	2295	0	22	6342	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			50			40	
Link Offset(ft)		0			0			10			-2	
Crosswalk Width(ft)		16			2			25			16	
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	1	1	1		1	1		1	1	
Detector Template												
Leading Detector (ft)	100	100	100	100	100		100	100		100	100	
Trailing Detector (ft)	0	0	0	0	0		0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0		0	0		0	0	
Detector 1 Size(ft)	100	100	100	100	100		100	100		100	100	
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Turn Type	Perm	NA	Perm	Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		6	2		1	5	
Permitted Phases	4		4	8								
Detector Phase	4	4	4	8	8		6	2		1	5	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		3.0	20.0		3.0	20.0	
Minimum Split (s)	11.0	11.0	11.0	11.0	11.0		10.0	27.0		9.0	27.0	

Lanes, Volumes, Timings  
 120: Columbia Pike (US 29) & Musgrove Road

05/01/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (s)	34.0	34.0	34.0	34.0	34.0		15.0	106.0		10.0	101.0	
Total Split (%)	22.7%	22.7%	22.7%	22.7%	22.7%		10.0%	70.7%		6.7%	67.3%	
Maximum Green (s)	28.0	28.0	28.0	28.0	28.0		8.0	99.0		4.0	94.0	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		5.0	5.0		4.0	5.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.5	-1.5	-1.5	-1.5	-1.5		-1.5	-1.5		-1.5	-1.5	
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5		5.5	5.5		4.5	5.5	
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	3.0	
Recall Mode	None	None	None	None	None		None	C-Min		None	C-Min	
Act Effect Green (s)	25.5	25.5	25.5	25.5	25.5		13.5	107.9		6.9	95.5	
Actuated g/C Ratio	0.17	0.17	0.17	0.17	0.17		0.09	0.72		0.05	0.64	
v/c Ratio	0.95	0.17	0.25	0.75	0.78		1.12	0.51		0.28	1.60	
Control Delay	149.2	52.9	15.6	78.5	75.3		117.4	3.6		97.1	289.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	149.2	52.9	15.6	78.5	75.3		117.4	3.6		97.1	289.2	
LOS	F	D	B	E	E		F	A		F	F	
Approach Delay		70.6			76.6			18.3			288.6	
Approach LOS		E			E			B			F	
Queue Length 50th (ft)	69	45	9	163	231		-210	88		22	-2611	
Queue Length 95th (ft)	#165	86	57	246	325		m#185	m54		m18	m#1821	
Internal Link Dist (ft)		457			493			546			1286	
Turn Bay Length (ft)							300					
Base Capacity (vph)	87	373	376	269	369		303	4501		79	3959	
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	
Reduced v/c Ratio	0.82	0.14	0.22	0.65	0.68		1.12	0.51		0.28	1.60	

Intersection Summary

Area Type: Other  
 Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 8 (5%), Referenced to phase 2:NBT and 5:SBT, Start of Green  
 Natural Cycle: 120  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.60  
 Intersection Signal Delay: 200.6  
 Intersection Capacity Utilization 127.8%  
 Analysis Period (min) 15  
 Intersection LOS: F  
 ICU Level of Service H























~ 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.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 120: Columbia Pike (US 29) & Musgrove Road

10 s	106 s	34 s
15 s	101 s	34 s

Lanes, Volumes, Timings  
 123: Columbia Pike (US 29) & Fairland Road

05/01/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	625	390	97	161	310	210	0	2099	45	0	5597	0
Future Volume (vph)	625	390	97	161	310	210	0	2099	45	0	5597	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	400		200	250		200	0		400	0		0
Storage Lanes	2		1	2		1	0		1	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	1.00	0.86	1.00	1.00	0.81	1.00
Frt			0.850			0.850			0.850			
Flt Protected	0.950			0.950								
Satd. Flow (prot)	3502	3610	1615	3502	3610	1615	0	6285	1553	0	7399	0
Flt Permitted	0.950			0.950								
Satd. Flow (perm)	3502	3610	1615	3502	3610	1615	0	6285	1553	0	7399	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			73			116			127			
Link Speed (mph)		30			30			50			50	
Link Distance (ft)		590			440			908			551	
Travel Time (s)		13.4			10.0			12.4			7.5	
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
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	4%	4%	4%	4%	4%	4%
Adj. Flow (vph)	679	424	105	175	337	228	0	2282	49	0	6084	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	679	424	105	175	337	228	0	2282	49	0	6084	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			40			40	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	1	1	1	1		1	1		1	
Detector Template												
Leading Detector (ft)	100	100	100	100	100	100		100	100		100	
Trailing Detector (ft)	0	0	0	0	0	0		0	0		0	
Detector 1 Position(ft)	0	0	0	0	0	0		0	0		0	
Detector 1 Size(ft)	100	100	100	100	100	100		100	100		100	
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	
Turn Type	Prot	NA	Prot	Prot	NA	Prot		NA	Perm		NA	
Protected Phases	3	8	8	7	4	4		6			2	
Permitted Phases									6			
Detector Phase	3	8	8	7	4	4		6	6		2	
Switch Phase												
Minimum Initial (s)	5.0	4.0	4.0	5.0	4.0	4.0		10.0	10.0		10.0	
Minimum Split (s)	11.0	12.5	12.5	11.0	12.5	12.5		17.0	17.0		17.0	

Lanes, Volumes, Timings  
123: Columbia Pike (US 29) & Fairland Road

05/01/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (s)	27.0	34.0	34.0	14.0	21.0	21.0		102.0	102.0		102.0	
Total Split (%)	18.0%	22.7%	22.7%	9.3%	14.0%	14.0%		68.0%	68.0%		68.0%	
Maximum Green (s)	21.0	25.5	25.5	8.0	12.5	12.5		95.0	95.0		95.0	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0		5.0	5.0		5.0	
All-Red Time (s)	2.0	4.5	4.5	2.0	4.5	4.5		2.0	2.0		2.0	
Lost Time Adjust (s)	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5		-1.5	-1.5		-1.5	
Total Lost Time (s)	4.5	7.0	7.0	4.5	7.0	7.0		5.5	5.5		5.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes						
Vehicle Extension (s)	3.0	4.0	4.0	3.0	4.0	4.0		0.2	0.2		0.2	
Recall Mode	None	None	None	None	None	None		C-Min	C-Min		C-Min	
Act Effct Green (s)	22.5	27.0	27.0	9.5	14.0	14.0		96.5	96.5		96.5	
Actuated g/C Ratio	0.15	0.18	0.18	0.06	0.09	0.09		0.64	0.64		0.64	
v/c Ratio	1.29	0.65	0.30	0.79	1.00	0.89		0.56	0.05		1.28	
Control Delay	194.3	62.6	21.5	93.5	116.4	67.0		17.6	0.9		153.5	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	
Total Delay	194.3	62.6	21.5	93.5	116.4	67.0		17.6	0.9		153.5	
LOS	F	E	C	F	F	E		B	A		F	
Approach Delay		133.0			95.7			17.3			153.5	
Approach LOS		F			F			B			F	
Queue Length 50th (ft)	-435	205	27	88	-176	112		503	0		-1855	
Queue Length 95th (ft)	#561	266	84	#149	#286	#272		507	m10		#1834	
Internal Link Dist (ft)		510			360			828			471	
Turn Bay Length (ft)	400		200	250		200			400			
Base Capacity (vph)	525	649	350	221	336	255		4043	1044		4760	
Starvation Cap Reductn	0	0	0	0	0	0		0	0		0	
Spillback Cap Reductn	0	0	0	0	0	0		0	0		0	
Storage Cap Reductn	0	0	0	0	0	0		0	0		0	
Reduced v/c Ratio	1.29	0.65	0.30	0.79	1.00	0.89		0.56	0.05		1.28	

Intersection Summary

Area Type: Other  
 Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 116 (77%), Referenced to phase 2:SBT and 6:NBT, Start of Green  
 Natural Cycle: 150  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.29  
 Intersection Signal Delay: 116.3  
 Intersection Capacity Utilization 105.5%  
 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.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 123: Columbia Pike (US 29) & Fairland Road

↓ Ø2 (R)	↗ Ø3	↖ Ø4
102 s	27 s	21 s
↑ Ø6 (R)	↙ Ø7	→ Ø8
102 s	14 s	34 s

Lanes, Volumes, Timings

130: Centerpark Driveway/Beltsville Drive & Powder Mill Road (MD 212)

11/01/2017

	↖	→	↗	↖	←	↖	↖	↑	↗	↘	↓	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↖	↗	↖	↖↖	↗		↖↖	↗	↖↖	↖	↗
Traffic Volume (vph)	230	768	45	65	1875	1076	10	15	50	285	5	111
Future Volume (vph)	230	768	45	65	1875	1076	10	15	50	285	5	111
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	16	12	12	12	12	12	12	12	12	12
Storage Length (ft)	350		360	350		0	0		0	0		250
Storage Lanes	1		1	1		1	0		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.95	0.95	1.00	0.91	0.91	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950				0.980		0.950	0.955	
Satd. Flow (prot)	1646	3292	1727	1703	3406	1524	0	3538	1615	3285	1651	1615
Flt Permitted	0.040			0.338				0.980		0.950	0.955	
Satd. Flow (perm)	69	3292	1727	606	3406	1524	0	3538	1615	3285	1651	1615
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			102			606			138			138
Link Speed (mph)		40			40			35			35	
Link Distance (ft)		921			477			217			528	
Travel Time (s)		15.7			8.1			4.2			10.3	
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
Heavy Vehicles (%)	6%	6%	6%	6%	6%	6%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	250	835	49	71	2038	1170	11	16	54	310	5	121
Shared Lane Traffic (%)										32%		
Lane Group Flow (vph)	250	835	49	71	2038	1170	0	27	54	211	104	121
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		18			18			30			30	
Link Offset(ft)		5			-5			-25			15	
Crosswalk Width(ft)		30			20			17			37	
Two way Left Turn Lane												
Headway Factor	1.04	1.04	0.85	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	1	1	1	1	1	1	1	1	1	1
Detector Template							Left					
Leading Detector (ft)	100	394	100	100	494	100	20	100	100	100	100	100
Trailing Detector (ft)	0	294	0	0	394	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	294	0	0	394	0	0	0	0	0	0	0
Detector 1 Size(ft)	100	100	100	100	100	100	20	100	100	100	100	100
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	1	6		5	2		4	4		8	8	
Permitted Phases	6		6	2		2			4			8
Detector Phase	1	6	6	5	2	2	4	4	4	8	8	8
Switch Phase												
Minimum Initial (s)	5.0	20.0	20.0	5.0	20.0	20.0	7.0	7.0	7.0	8.0	8.0	8.0

Lanes, Volumes, Timings

130: Centerpark Driveway/Beltsville Drive & Powder Mill Road (MD 212)

11/01/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Split (s)	10.0	26.0	26.0	10.0	26.0	26.0	13.0	13.0	13.0	14.0	14.0	14.0
Total Split (s)	21.0	112.0	112.0	10.0	101.0	101.0	13.0	13.0	13.0	15.0	15.0	15.0
Total Split (%)	14.0%	74.7%	74.7%	6.7%	67.3%	67.3%	8.7%	8.7%	8.7%	10.0%	10.0%	10.0%
Maximum Green (s)	16.0	106.0	106.0	5.0	95.0	95.0	7.0	7.0	7.0	9.0	9.0	9.0
Yellow Time (s)	4.0	5.0	5.0	4.0	5.0	5.0	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	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5		-1.5	-1.5	-1.5	-1.5	-1.5
Total Lost Time (s)	3.5	4.5	4.5	3.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?												
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
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None	None	None	None	None
Act Effct Green (s)	120.4	109.3	109.3	104.1	96.5	96.5		8.5	8.5	11.2	11.2	11.2
Actuated g/C Ratio	0.80	0.73	0.73	0.69	0.64	0.64		0.06	0.06	0.07	0.07	0.07
v/c Ratio	0.97	0.35	0.04	0.15	0.93	0.98		0.14	0.24	0.86	0.85	0.49
Control Delay	95.2	8.1	0.0	5.0	32.9	34.2		69.0	2.6	98.9	115.4	13.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Delay	95.2	8.1	0.0	5.0	32.9	34.2		69.0	2.6	98.9	115.4	13.7
LOS	F	A	A	A	C	C		E	A	F	F	B
Approach Delay		27.0			32.7			24.7			79.2	
Approach LOS		C			C			C			E	
Queue Length 50th (ft)	-217	149	0	13	881	693		13	0	114	113	0
Queue Length 95th (ft)	#400	181	0	24	1028	#1203		31	0	#200	#243	49
Internal Link Dist (ft)		841			397			137			448	
Turn Bay Length (ft)	350		360	350								250
Base Capacity (vph)	259	2398	1285	469	2191	1196		200	221	244	123	248
Starvation Cap Reductn	0	0	0	0	0	0		0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0		0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0		0	0	0	0	0
Reduced v/c Ratio	0.97	0.35	0.04	0.15	0.93	0.98		0.14	0.24	0.86	0.85	0.49

Intersection Summary

Area Type: Other  
 Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 19 (13%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green  
 Natural Cycle: 120  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.98  
 Intersection Signal Delay: 35.4  
 Intersection LOS: D  
 Intersection Capacity Utilization 96.0%  
 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: 130: Centerpark Driveway/Beltsville Drive & Powder Mill Road (MD 212)

21 s	101 s	13 s	15 s
10 s	112 s		



Lanes, Volumes, Timings

160: New Hampshire Ave (MD 650) & Quaint Acres Drive/Heartfields Drive

11/01/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔	↔	↔	↔↔↔		↔	↔↔↔	
Traffic Volume (vph)	20	0	27	21	0	26	11	1414	16	25	3009	10
Future Volume (vph)	20	0	27	21	0	26	11	1414	16	25	3009	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	9	12	12	12	12	12	11	12	12	11	12
Storage Length (ft)	0		0	65		0	225		0	235		0
Storage Lanes	0		0	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Frt		0.923				0.850		0.998			0.999	
Flt Protected		0.979			0.950		0.950			0.950		
Satd. Flow (prot)	0	1545	0	0	1805	1615	1736	4812	0	1736	4816	0
Flt Permitted		0.850			0.803		0.950			0.950		
Satd. Flow (perm)	0	1342	0	0	1526	1615	1736	4812	0	1736	4816	0
Right Turn on Red			Yes			Yes			No			No
Satd. Flow (RTOR)		136				136						
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		249			185			622			424	
Travel Time (s)		6.8			5.0			10.6			7.2	
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
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	4%	4%	4%	4%	4%	4%
Adj. Flow (vph)	22	0	29	23	0	28	12	1537	17	27	3271	11
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	51	0	0	23	28	12	1554	0	27	3282	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			18			18	
Link Offset(ft)		-2			14			5			0	
Crosswalk Width(ft)		10			18			26			22	
Two way Left Turn Lane												
Headway Factor	1.00	1.14	1.00	1.00	1.00	1.00	1.00	1.04	1.00	1.00	1.04	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1		1	1	1	1	1		1	1	
Detector Template	Left			Left								
Leading Detector (ft)	20	100		20	100	100	100	100		100	100	
Trailing Detector (ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Size(ft)	20	100		20	100	100	100	100		100	100	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		4			8		1	6		5	2	
Permitted Phases	4			8		8						
Detector Phase	4	4		8	8	8	1	6		5	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	10.0		5.0	10.0	



Lanes, Volumes, Timings

160: New Hampshire Ave (MD 650) & Quaint Acres Drive/Heartfields Drive

11/01/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Split (s)	11.5	11.5		11.5	11.5	11.5	11.0	22.5		11.0	22.5	
Total Split (s)	12.6	12.6		12.6	12.6	12.6	11.0	96.4		11.0	96.4	
Total Split (%)	10.5%	10.5%		10.5%	10.5%	10.5%	9.2%	80.3%		9.2%	80.3%	
Maximum Green (s)	6.1	6.1		6.1	6.1	6.1	5.0	90.4		5.0	90.4	
Yellow Time (s)	3.5	3.5		3.5	3.5	3.5	3.5	4.5		3.5	4.5	
All-Red Time (s)	3.0	3.0		3.0	3.0	3.0	2.5	1.5		2.5	1.5	
Lost Time Adjust (s)		-1.5			-1.5	-1.5	-1.5	-1.5		-1.5	-1.5	
Total Lost Time (s)		5.0			5.0	5.0	4.5	4.5		4.5	4.5	
Lead/Lag							Lag	Lag		Lead	Lead	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	5.0	5.0		5.0	5.0	5.0	5.0	0.2		5.0	0.2	
Recall Mode	None	None		None	None	None	None	C-Min		None	C-Min	
Act Effct Green (s)		8.9			8.9	8.9	8.2	97.9		8.5	100.9	
Actuated g/C Ratio		0.07			0.07	0.07	0.07	0.82		0.07	0.84	
v/c Ratio		0.23			0.20	0.11	0.10	0.40		0.22	0.81	
Control Delay		2.3			57.5	1.0	55.6	4.6		58.2	9.3	
Queue Delay		0.0			0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay		2.3			57.5	1.0	55.6	4.6		58.2	9.3	
LOS		A			E	A	E	A		E	A	
Approach Delay		2.3			26.4			5.0			9.7	
Approach LOS		A			C			A			A	
Queue Length 50th (ft)		0			17	0	9	171		20	373	
Queue Length 95th (ft)		0			45	0	30	150		52	663	
Internal Link Dist (ft)		169			105			542			344	
Turn Bay Length (ft)							225			235		
Base Capacity (vph)		225			113	245	118	3983		122	4049	
Starvation Cap Reductn		0			0	0	0	0		0	0	
Spillback Cap Reductn		0			0	0	0	0		0	0	
Storage Cap Reductn		0			0	0	0	0		0	0	
Reduced v/c Ratio		0.23			0.20	0.11	0.10	0.39		0.22	0.81	

Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBT, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.81  
 Intersection Signal Delay: 8.3  
 Intersection Capacity Utilization 75.7%  
 Analysis Period (min) 15  
 Intersection LOS: A  
 ICU Level of Service D

Splits and Phases: 160: New Hampshire Ave (MD 650) & Quaint Acres Drive/Heartfields Drive

Ø2 (R)	Ø1	Ø4
96.4 s	11 s	12.6 s
Ø5	Ø6 (R)	Ø8
11 s	96.4 s	12.6 s

Lanes, Volumes, Timings  
170: Tech Road & Industrial Parkway

11/01/2017

	↖	→	↗	↖	←	↖	↗	↑	↘	↓	↙	
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖↖	↖↖	↖		↖↖	↖	↖	↖		↖	↖↖	
Traffic Volume (vph)	695	1938	85	0	609	223	50	45	5	1016	190	350
Future Volume (vph)	695	1938	85	0	609	223	50	45	5	1016	190	350
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	12	12	12	12	12	12	12	12
Storage Length (ft)	425		0	0		500	100		0	0		0
Storage Lanes	2		1	0		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	0.91	0.91	0.95
Frt			0.850			0.850		0.986			0.949	
Flt Protected	0.950						0.950			0.950	0.977	
Satd. Flow (prot)	3385	3490	1615	0	3610	1615	1805	1873	0	1643	3206	0
Flt Permitted	0.175						0.950			0.950	0.977	
Satd. Flow (perm)	624	3490	1615	0	3610	1615	1805	1873	0	1643	3206	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			65			237		3			54	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1170			886			326			280	
Travel Time (s)		26.6			20.1			7.4			6.4	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	739	2062	90	0	648	237	53	48	5	1081	202	372
Shared Lane Traffic (%)										48%		
Lane Group Flow (vph)	739	2062	90	0	648	237	53	53	0	562	1093	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		22			16			10			12	
Link Offset(ft)		0			-5			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.04	1.04	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	1	1	1	1	1	1		1	1	
Detector Template				Left								
Leading Detector (ft)	100	100	100	20	100	100	100	100		100	100	
Trailing Detector (ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Size(ft)	100	100	100	20	100	100	100	100		100	100	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Turn Type	pm+pt	NA	Perm		NA	Free	Split	NA		Split	NA	
Protected Phases	1	6			2		4	4		8	8	
Permitted Phases	6		6	2		Free				8	8	
Detector Phase	1	6	6	2	2		4	4		8	8	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	11.5	24.0	24.0	26.0	26.0		24.0	24.0		24.0	24.0	

Lanes, Volumes, Timings  
 170: Tech Road & Industrial Parkway

11/01/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Total Split (s)	34.0	79.0	79.0	45.0	45.0		24.0	24.0		47.0	47.0		
Total Split (%)	22.7%	52.7%	52.7%	30.0%	30.0%		16.0%	16.0%		31.3%	31.3%		
Maximum Green (s)	28.0	73.0	73.0	39.0	39.0		18.0	18.0		41.0	41.0		
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0		
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0		
Lost Time Adjust (s)	-1.5	-1.5	-1.5		-1.5		-1.5	-1.5		-1.5	-1.5		
Total Lost Time (s)	4.5	4.5	4.5		4.5		4.5	4.5		4.5	4.5		
Lead/Lag	Lead			Lag			Lag			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	3.0		
Recall Mode	None	C-Min	C-Min	C-Min	C-Min		None	None		None	None		
Act Effct Green (s)	74.5	74.5	74.5		41.7	150.0	11.3	11.3		53.1	53.1		
Actuated g/C Ratio	0.50	0.50	0.50		0.28	1.00	0.08	0.08		0.35	0.35		
v/c Ratio	0.89	1.19	0.11		0.65	0.15	0.39	0.37		0.97	0.93		
Control Delay	40.4	122.9	8.3		51.5	0.2	73.7	68.7		77.7	59.4		
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0		
Total Delay	40.4	122.9	8.3		51.5	0.2	73.7	68.7		77.7	59.4		
LOS	D	F	A		D	A	E	E		E	E		
Approach Delay		98.2			37.8			71.2			65.6		
Approach LOS		F			D			E			E		
Queue Length 50th (ft)	265	~1289	14		298	0	50	47		-619	559		
Queue Length 95th (ft)	m313	#1424	m19		368	0	96	93		#937	#764		
Internal Link Dist (ft)		1090			806			246			200		
Turn Bay Length (ft)	425					500	100						
Base Capacity (vph)	852	1733	834		1002	1615	234	246		581	1170		
Starvation Cap Reductn	0	0	0		0	0	0	0		0	0		
Spillback Cap Reductn	0	0	0		0	0	0	0		0	0		
Storage Cap Reductn	0	0	0		0	0	0	0		0	0		
Reduced v/c Ratio	0.87	1.19	0.11		0.65	0.15	0.23	0.22		0.97	0.93		

Intersection Summary

Area Type: Other  
 Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green  
 Natural Cycle: 150  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.19  
 Intersection Signal Delay: 78.3  
 Intersection Capacity Utilization 120.2%  
 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.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 170: Tech Road & Industrial Parkway

Ø1	Ø2 (R)	Ø4	Ø8
34 s	45 s	24 s	47 s
Ø6 (R)			
79 s			

Lanes, Volumes, Timings

181: Beltsville Drive & Calverton Boulevard/Calverton Tower Driveway

11/01/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	27	2	488	2	0	0	986	188	9	1	369	39
Future Volume (vph)	27	2	488	2	0	0	986	188	9	1	369	39
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	10	10	12	12	12	12	12	12	12
Storage Length (ft)	200		0	0		0	200		0	125		0
Storage Lanes	1		1	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95	0.97	1.00	1.00	1.00	1.00	1.00
Frnt			0.850					0.993			0.986	
Flt Protected	0.950				0.950		0.950			0.950		
Satd. Flow (prot)	1736	1900	1568	0	3201	0	3433	1769	0	1805	1787	0
Flt Permitted	0.756				0.757		0.950			0.626		
Satd. Flow (perm)	1381	1900	1568	0	2551	0	3433	1769	0	1189	1787	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			519					7			8	
Link Speed (mph)		30			30			35			35	
Link Distance (ft)		690			171			458			205	
Travel Time (s)		15.7			3.9			8.9			4.0	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	4%	0%	3%	0%	0%	0%	2%	7%	0%	0%	5%	3%
Adj. Flow (vph)	29	2	519	2	0	0	1049	200	10	1	393	41
Shared Lane Traffic (%)												
Lane Group Flow (vph)	29	2	519	0	2	0	1049	210	0	1	434	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			6			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.09	1.09	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA	Perm	Perm	NA		Prot	NA		Perm	NA	
Protected Phases		4			8		5	2			6	
Permitted Phases	4		4	8						6		
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5		9.5	22.5		22.5	22.5	
Total Split (s)	22.5	22.5	22.5	22.5	22.5		24.2	47.0		22.8	22.8	
Total Split (%)	32.4%	32.4%	32.4%	32.4%	32.4%		34.8%	67.6%		32.8%	32.8%	
Maximum Green (s)	18.0	18.0	18.0	18.0	18.0		19.7	42.5		18.3	18.3	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	
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)	-1.5	-1.5	-1.5		-1.5		-1.5	-1.5		-1.5	-1.5	
Total Lost Time (s)	3.0	3.0	3.0		3.0		3.0	3.0		3.0	3.0	
Lead/Lag							Lead			Lag	Lag	
Lead-Lag Optimize?							Yes			Yes	Yes	
Walk Time (s)	7.0	7.0	7.0	7.0	7.0			7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0			11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0	0	0	0			0		0	0	
Act Effct Green (s)	19.5	19.5	19.5		19.5		21.2	44.0		19.8	19.8	

Lanes, Volumes, Timings

181: Beltsville Drive & Calverton Boulevard/Calverton Tower Driveway

11/01/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio	0.28	0.28	0.28		0.28		0.31	0.63		0.28	0.28	
v/c Ratio	0.07	0.00	0.64		0.00		1.00	0.19		0.00	0.84	
Control Delay	19.1	18.0	6.3		18.0		54.7	5.6		18.0	40.5	
Queue Delay	0.0	0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Delay	19.1	18.0	6.3		18.0		54.7	5.6		18.0	40.5	
LOS	B	B	A		B		D	A		B	D	
Approach Delay		7.0			18.0			46.5			40.5	
Approach LOS		A			B			D			D	
Queue Length 50th (ft)	9	1	0		0		~229	31		0	170	
Queue Length 95th (ft)	27	5	68		2		#359	57		4	#324	
Internal Link Dist (ft)		610			91			378			125	
Turn Bay Length (ft)	200						200			125		
Base Capacity (vph)	387	533	813		715		1047	1122		338	514	
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	0.07	0.00	0.64		0.00		1.00	0.19		0.00	0.84	

Intersection Summary

Area Type: Other  
 Cycle Length: 69.5  
 Actuated Cycle Length: 69.5  
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green  
 Natural Cycle: 80  
 Control Type: Pretimed  
 Maximum v/c Ratio: 1.00  
 Intersection Signal Delay: 35.6  
 Intersection Capacity Utilization 68.1%  
 Analysis Period (min) 15  
 Intersection LOS: D  
 ICU Level of Service C

- 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: 181: Beltsville Drive & Calverton Boulevard/Calverton Tower Driveway

Ø2 (R)		Ø4
47 s		22.5 s
Ø5	Ø6 (R)	Ø8
24.2 s	22.8 s	22.5 s

Lanes, Volumes, Timings

185: Old Columbia Pike & Columbia Pike (US 29) Right Turn

11/01/2017

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↘↘			↑↑	↑↑	
Traffic Volume (vph)	1463	0	0	719	175	0
Future Volume (vph)	1463	0	0	719	175	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11
Lane Util. Factor	0.97	1.00	1.00	0.95	0.95	1.00
Frt						
Flt Protected	0.950					
Satd. Flow (prot)	3385	0	0	3490	3490	0
Flt Permitted	0.950					
Satd. Flow (perm)	3385	0	0	3490	3490	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)						
Link Speed (mph)	30			30	30	
Link Distance (ft)	152			343	133	
Travel Time (s)	3.5			7.8	3.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1590	0	0	782	190	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1590	0	0	782	190	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	22			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	5			16	16	
Two way Left Turn Lane						
Headway Factor	1.04	1.04	1.04	1.04	1.04	1.04
Turning Speed (mph)	15	9	15			9
Turn Type	Prot			NA	NA	
Protected Phases	4!			4!	6	
Permitted Phases						
Minimum Split (s)				22.5	22.5	
Total Split (s)				51.0	24.0	
Total Split (%)				68.0%	32.0%	
Maximum Green (s)				46.5	19.5	
Yellow Time (s)				3.5	3.5	
All-Red Time (s)				1.0	1.0	
Lost Time Adjust (s)				-1.5	-1.5	
Total Lost Time (s)				3.0	3.0	
Lead/Lag						
Lead-Lag Optimize?						
Walk Time (s)				7.0	7.0	
Flash Dont Walk (s)				11.0	11.0	
Pedestrian Calls (#/hr)				0	0	
Act Effct Green (s)				48.0	21.0	
Actuated g/C Ratio				0.64	0.28	
v/c Ratio				0.35	0.19	
Control Delay				6.8	28.9	
Queue Delay				0.2	0.0	

Lanes, Volumes, Timings

185: Old Columbia Pike & Columbia Pike (US 29) Right Turn

11/01/2017

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Total Delay	39.0			7.0	28.9	
LOS	D			A	C	
Approach Delay	39.0			7.0	28.9	
Approach LOS	D			A	C	
Queue Length 50th (ft)	768			77	76	
Queue Length 95th (ft)	m588			106	m104	
Internal Link Dist (ft)	72			263	53	
Turn Bay Length (ft)						
Base Capacity (vph)	2166			2233	977	
Starvation Cap Reductn	0			0	0	
Spillback Cap Reductn	599			618	0	
Storage Cap Reductn	0			0	0	
Reduced v/c Ratio	1.01			0.48	0.19	

Intersection Summary

Area Type: Other  
 Cycle Length: 75  
 Actuated Cycle Length: 75  
 Offset: 0 (0%), Referenced to phase 2: and 6:SBT, Start of Green  
 Natural Cycle: 60  
 Control Type: Pretimed  
 Maximum v/c Ratio: 0.73  
 Intersection Signal Delay: 28.5  
 Intersection LOS: C  
 Intersection Capacity Utilization 68.3%  
 ICU Level of Service C  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.  
 ! Phase conflict between lane groups.













Splits and Phases: 185: Old Columbia Pike & Columbia Pike (US 29) Right Turn

	↑ Ø4	
	51 s	
↓ Ø6 (R)		
24 s		



Lanes, Volumes, Timings  
193: FDA Boulevard & B-5

11/01/2017

						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	140	179	1700	155	245	945
Future Volume (vph)	140	179	1700	155	245	945
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	600			0	0	100
Storage Lanes	1			1	1	1
Taper Length (ft)	75				25	
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Flt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1805	3610	3610	1615	1805	1615
Flt Permitted	0.071				0.950	
Satd. Flow (perm)	135	3610	3610	1615	1805	1615
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				168		367
Link Speed (mph)		25	30		30	
Link Distance (ft)		1125	1271		801	
Travel Time (s)		30.7	28.9		18.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	152	195	1848	168	266	1027
Shared Lane Traffic (%)						
Lane Group Flow (vph)	152	195	1848	168	266	1027
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		12	12		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		20	30		25	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Number of Detectors	1	2	2	1	1	1
Detector Template						
Leading Detector (ft)	50	100	100	50	50	50
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	50	50	50	50	50	50
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94	94			
Detector 2 Size(ft)		6	6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type	pm+pt	NA	NA	Perm	Prot	Free
Protected Phases	7	4	8		6	
Permitted Phases	4			8		Free

Lanes, Volumes, Timings  
193: FDA Boulevard & B-5

11/01/2017

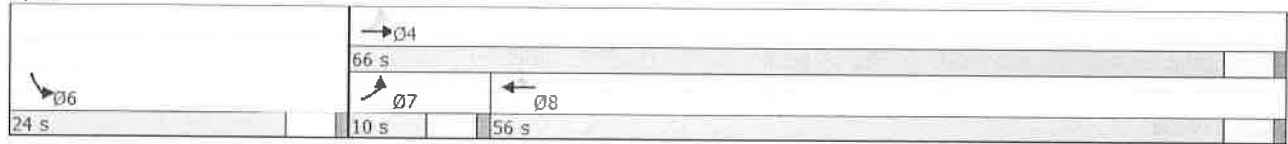


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Detector Phase	7	4	8	8	6	
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	9.5	22.5	22.5	22.5	22.5	
Total Split (s)	10.0	66.0	56.0	56.0	24.0	
Total Split (%)	11.1%	73.3%	62.2%	62.2%	26.7%	
Maximum Green (s)	5.5	61.5	51.5	51.5	19.5	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	-1.5	-1.5	-1.5	-1.5	-1.5	
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	Max	Max	Max	None	
Walk Time (s)		7.0	7.0	7.0	7.0	
Flash Dont Walk (s)		11.0	11.0	11.0	11.0	
Pedestrian Calls (#/hr)		0	0	0	0	
Act Effect Green (s)	63.1	63.1	53.1	53.1	18.1	87.2
Actuated g/C Ratio	0.72	0.72	0.61	0.61	0.21	1.00
v/c Ratio	0.66	0.07	0.84	0.16	0.71	0.64
Control Delay	28.0	4.0	19.0	1.8	43.2	1.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.0	4.0	19.0	1.8	43.2	1.9
LOS	C	A	B	A	D	A
Approach Delay		14.5	17.6		10.4	
Approach LOS		B	B		B	
Queue Length 50th (ft)	30	14	409	0	137	0
Queue Length 95th (ft)	#115	25	547	24	219	0
Internal Link Dist (ft)		1045	1191		721	
Turn Bay Length (ft)	600					100
Base Capacity (vph)	231	2611	2196	1048	435	1615
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.66	0.07	0.84	0.16	0.61	0.64

Intersection Summary

Area Type: Other  
 Cycle Length: 90  
 Actuated Cycle Length: 87.2  
 Natural Cycle: 80  
 Control Type: Semi Act-Uncoord  
 Maximum v/c Ratio: 0.84  
 Intersection Signal Delay: 14.7  
 Intersection Capacity Utilization 78.3%  
 Analysis Period (min) 15  
 Intersection LOS: B  
 ICU Level of Service D  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 193: FDA Boulevard & B-5



HCM Unsignalized Intersection Capacity Analysis  
 72: Old Columbia Pike/Prosperity Drive & Tech Road

11/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↵	↑↑				↑↑			↑↑
Traffic Volume (veh/h)	123	1012	190	70	890	138	0	0	125	0	0	100
Future Volume (Veh/h)	123	1012	190	70	890	138	0	0	125	0	0	100
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	132	1088	204	75	957	148	0	0	134	0	0	108
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		161										
pX, platoon unblocked												
vC, conflicting volume	1105			1292			2082	2709	646	1989	2737	552
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1105			1292			2082	2709	646	1989	2737	552
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	79			86			100	100	68	100	100	78
cM capacity (veh/h)	639			543			18	15	419	19	14	482
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1	SB 2			
Volume Total	676	748	75	638	467	67	67	54	54			
Volume Left	132	0	75	0	0	0	0	0	0			
Volume Right	0	204	0	0	148	67	67	54	54			
cSH	639	1700	543	1700	1700	419	419	482	482			
Volume to Capacity	0.21	0.44	0.14	0.38	0.27	0.16	0.16	0.11	0.11			
Queue Length 95th (ft)	19	0	12	0	0	14	14	9	9			
Control Delay (s)	5.3	0.0	12.7	0.0	0.0	15.2	15.2	13.4	13.4			
Lane LOS	A		B			C	C	B	B			
Approach Delay (s)	2.5		0.8			15.2		13.4				
Approach LOS						C		B				
<b>Intersection Summary</b>												
Average Delay			2.8									
Intersection Capacity Utilization			73.3%		ICU Level of Service			D				
Analysis Period (min)			15									

Intersection	
Intersection Delay, s/veh	39.7
Intersection LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↵	↵	↵		↕		↵	↵			↕	
Traffic Vol, veh/h	395	90	891	5	94	5	60	45	5	9	264	26
Future Vol, veh/h	395	90	891	5	94	5	60	45	5	9	264	26
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
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	429	98	968	5	102	5	65	49	5	10	287	28
Number of Lanes	1	1	1	0	1	0	1	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	3	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	3	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	1	3
HCM Control Delay	44.1	16.6	14.6	36.9
HCM LOS	E	C	B	E

Lane	NBLn1	NBLn2	EBLn1	EBLn2	EBLn3	WBLn1	SBLn1
Vol Left, %	100%	0%	100%	0%	0%	5%	3%
Vol Thru, %	0%	90%	0%	18%	0%	90%	88%
Vol Right, %	0%	10%	0%	82%	100%	5%	9%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	60	50	395	500	481	104	299
LT Vol	60	0	395	0	0	5	9
Through Vol	0	45	0	90	0	94	264
RT Vol	0	5	0	410	481	5	26
Lane Flow Rate	65	54	429	543	523	113	325
Geometry Grp	8	8	7	7	7	8	8
Degree of Util (X)	0.183	0.144	0.876	0.943	0.889	0.305	0.785
Departure Headway (Hd)	10.122	9.533	7.341	6.246	6.117	9.708	8.698
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	353	374	494	581	591	373	416
Service Time	7.921	7.332	5.1	4.004	3.875	7.408	6.479
HCM Lane V/C Ratio	0.184	0.144	0.868	0.935	0.885	0.303	0.781
HCM Control Delay	15.2	13.9	43	49.5	39.5	16.6	36.9
HCM Lane LOS	C	B	E	E	E	C	E
HCM 95th-tile Q	0.7	0.5	9.4	12.3	10.5	1.3	6.8

**Intersection**

Intersection Delay, s/veh	8.5
Intersection LOS	A

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↔			↔↑	↔	
Traffic Vol, veh/h	602	0	0	287	0	0
Future Vol, veh/h	602	0	0	287	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	654	0	0	312	0	0
Number of Lanes	2	0	0	2	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	2	2	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	2
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	2
HCM Control Delay	8.8	7.8	0
HCM LOS	A	A	-

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2
Vol Left, %	0%	0%	0%	0%	0%
Vol Thru, %	100%	100%	100%	100%	100%
Vol Right, %	0%	0%	0%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	0	301	301	144	144
LT Vol	0	0	0	0	0
Through Vol	0	301	301	144	144
RT Vol	0	0	0	0	0
Lane Flow Rate	0	327	327	156	156
Geometry Grp	2	7	7	7	7
Degree of Util (X)	0	0.423	0.269	0.211	0.139
Departure Headway (Hd)	5.501	4.658	2.956	4.861	3.2
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	0	769	1204	732	1115
Service Time	3.501	2.403	0.699	2.638	0.933
HCM Lane V/C Ratio	0	0.425	0.272	0.213	0.14
HCM Control Delay	8.5	10.8	6.8	9	6.5
HCM Lane LOS	N	B	A	A	A
HCM 95th-tile Q	0	2.1	1.1	0.8	0.5

Intersection	
Intersection Delay, s/veh	12
Intersection LOS	B

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔		↔	↔	↔	↔
Traffic Vol, veh/h	0	0	601	0	0	79
Future Vol, veh/h	0	0	601	0	0	79
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	0	653	0	0	86
Number of Lanes	1	0	1	1	1	1

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	2	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	2	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	2	0	2
HCM Control Delay	0	12.5	8.4
HCM LOS	-	B	A

Lane	NBLn1	NBLn2	EBLn1	WBLn1	WBLn2
Vol Left, %	0%	0%	0%	100%	100%
Vol Thru, %	0%	0%	100%	0%	0%
Vol Right, %	100%	100%	0%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	40	40	0	301	301
LT Vol	0	0	0	301	301
Through Vol	0	0	0	0	0
RT Vol	40	40	0	0	0
Lane Flow Rate	43	43	0	327	327
Geometry Grp	7	7	4	7	7
Degree of Util (X)	0.064	0.064	0	0.467	0.467
Departure Headway (Hd)	5.362	5.362	5.147	5.147	5.147
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	672	672	0	692	692
Service Time	3.062	3.062	3.173	2.945	2.945
HCM Lane V/C Ratio	0.064	0.064	0	0.473	0.473
HCM Control Delay	8.4	8.4	8.2	12.5	12.5
HCM Lane LOS	A	A	N	B	B
HCM 95th-tile Q	0.2	0.2	0	2.5	2.5



Intersection						
Intersection Delay, s/veh	12.3					
Intersection LOS	B					
Approach	EB		WB		NB	
Entry Lanes	2		2		2	
Conflicting Circle Lanes	2		2		2	
Adj Approach Flow, veh/h	1201		312		98	
Demand Flow Rate, veh/h	1201		312		98	
Vehicles Circulating, veh/h	289		80		636	
Vehicles Exiting, veh/h	103		654		854	
Follow-Up Headway, s	3.186		3.186		3.186	
Ped Vol Crossing Leg, #/h	0		0		0	
Ped Cap Adj	1.000		1.000		1.000	
Approach Delay, s/veh	14.5		5.8		5.8	
Approach LOS	B		A		A	
Lane	Left	Right	Left	Right	Left	Right
Designated Moves	LT	TR	LT	TR	L	LTR
Assumed Moves	LT	TR	L	TR	L	LTR
RT Channelized						
Lane Util	0.470	0.530	0.926	0.074	0.531	0.469
Critical Headway, s	4.293	4.113	4.293	4.113	4.293	4.113
Entry Flow, veh/h	564	637	289	23	52	46
Cap Entry Lane, veh/h	910	923	1064	1068	701	724
Entry HV Adj Factor	1.001	0.999	1.000	1.000	0.999	1.001
Flow Entry, veh/h	564	637	289	23	52	46
Cap Entry, veh/h	911	922	1064	1068	700	725
V/C Ratio	0.620	0.690	0.272	0.022	0.074	0.064
Control Delay, s/veh	13.3	15.6	6.0	3.6	5.9	5.6
LOS	B	C	A	A	A	A
95th %tile Queue, veh	4	6	1	0	0	0

HCM 2010 Roundabout  
 57: SW Loop Road & Proposed Access Road

11/01/2017

Intersection					
Intersection Delay, s/veh	5.7				
Intersection LOS	A				
Approach	WB	NB		SB	
Entry Lanes	1	2		2	
Conflicting Circle Lanes	2	2		2	
Adj Approach Flow, veh/h	0	86		653	
Demand Flow Rate, veh/h	0	86		653	
Vehicles Circulating, veh/h	86	0		0	
Vehicles Exiting, veh/h	0	653		86	
Follow-Up Headway, s	3.186	3.186		3.186	
Ped Vol Crossing Leg, #/h	0	0		0	
Ped Cap Adj	1.000	1.000		1.000	
Approach Delay, s/veh	0.0	3.5		5.9	
Approach LOS	-	A		A	
Lane	Left	Left	Right	Left	Right
Designated Moves	LR	LT	TR	LT	TR
Assumed Moves	LR	LT	TR	LT	TR
RT Channelized					
Lane Util	1.000	0.465	0.535	0.470	0.530
Critical Headway, s	4.113	4.293	4.113	4.293	4.113
Entry Flow, veh/h	0	40	46	307	346
Cap Entry Lane, veh/h	1064	1130	1130	1130	1130
Entry HV Adj Factor	1.000	1.010	0.991	1.000	1.000
Flow Entry, veh/h	0	40	46	307	346
Cap Entry, veh/h	1064	1142	1120	1130	1130
V/C Ratio	0.000	0.035	0.041	0.272	0.306
Control Delay, s/veh	3.4	3.4	3.6	5.7	6.1
LOS	A	A	A	A	A
95th %tile Queue, veh	0	0	0	1	1

Intersection							
Intersection Delay, s/veh	4.6						
Intersection LOS	A						
Approach	WB		NB			SB	
Entry Lanes	2		2			2	
Conflicting Circle Lanes	2		2			2	
Adj Approach Flow, veh/h	2875		64			543	
Demand Flow Rate, veh/h	2875		64			543	
Vehicles Circulating, veh/h	13		296			962	
Vehicles Exiting, veh/h	347		1209			13	
Follow-Up Headway, s	3.186		3.186			3.186	
Ped Vol Crossing Leg, #/h	0		0			0	
Ped Cap Adj	1.000		1.000			1.000	
Approach Delay, s/veh	2.6		4.4			15.0	
Approach LOS	A		A			B	
Lane	Left	Right	Bypass	Left	Right	Left	Right
Designated Moves	L	LTR	R	LT	R	L	TR
Assumed Moves	L	LTR	R	LT	R	L	TR
RT Channelized	Free						
Lane Util	0.530	0.470		0.203	0.797	0.545	0.455
Critical Headway, s	4.293	4.113		4.293	4.113	4.293	4.113
Entry Flow, veh/h	510	452	1913	13	51	296	247
Cap Entry Lane, veh/h	1119	1120	1900	905	918	549	576
Entry HV Adj Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Flow Entry, veh/h	510	452	1913	13	51	296	247
Cap Entry, veh/h	1119	1120	1900	905	918	549	576
V/C Ratio	0.456	0.404	1.007	0.014	0.056	0.539	0.429
Control Delay, s/veh	8.2	7.4	0.0	4.1	4.4	16.7	13.0
LOS	A	A	F	A	A	C	B
95th %tile Queue, veh	2	2	28	0	0	3	2

Intersection						
Intersection Delay, s/veh	9.8					
Intersection LOS	A					
Approach	EB		WB		SB	
Entry Lanes	2		2		2	
Conflicting Circle Lanes	2		2		2	
Adj Approach Flow, veh/h	87		1208		55	
Demand Flow Rate, veh/h	87		1208		55	
Vehicles Circulating, veh/h	43		65		641	
Vehicles Exiting, veh/h	653		65		632	
Follow-Up Headway, s	3.186		3.186		3.186	
Ped Vol Crossing Leg, #/h	0		0		0	
Ped Cap Adj	1.000		1.000		1.000	
Approach Delay, s/veh	3.7		10.4		5.5	
Approach LOS	A		B		A	
Lane	Left	Right	Left	Right	Left	Right
Designated Moves	LT	TR	LT	TR	L	LTR
Assumed Moves	L	TR	LT	TR	L	LTR
RT Channelized						
Lane Util	0.747	0.253	0.470	0.530	0.527	0.473
Critical Headway, s	4.293	4.113	4.293	4.113	4.293	4.113
Entry Flow, veh/h	65	22	568	640	29	26
Cap Entry Lane, veh/h	1094	1096	1076	1080	699	721
Entry HV Adj Factor	1.000	1.000	1.000	1.000	1.005	0.994
Flow Entry, veh/h	65	22	568	640	29	26
Cap Entry, veh/h	1094	1096	1076	1080	702	717
V/C Ratio	0.059	0.020	0.528	0.593	0.042	0.036
Control Delay, s/veh	3.8	3.5	9.7	11.0	5.6	5.4
LOS	A	A	A	B	A	A
95th %tile Queue, veh	0	0	3	4	0	0

Intersection						
Int Delay, s/veh	8.1					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↖	↗
Traffic Vol, veh/h	776	249	50	45	38	329
Future Vol, veh/h	776	249	50	45	38	329
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	Yield
Storage Length	-	-	-	-	0	200
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	843	271	54	49	41	358

Major/Minor	Major1	Major2	Minor1	Minor2	Minor3
Conflicting Flow All	0	0	1114	0	1112
Stage 1	-	-	-	-	979
Stage 2	-	-	-	-	133
Critical Hdwy	-	-	4.1	-	6.8
Critical Hdwy Stg 1	-	-	-	-	5.8
Critical Hdwy Stg 2	-	-	-	-	5.8
Follow-up Hdwy	-	-	2.2	-	3.5
Pot Cap-1 Maneuver	-	-	634	-	206
Stage 1	-	-	-	-	329
Stage 2	-	-	-	-	885
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	634	-	188
Mov Cap-2 Maneuver	-	-	-	-	188
Stage 1	-	-	-	-	329
Stage 2	-	-	-	-	807

Approach	EB	WB	NB
HCM Control Delay, s	0	6	31.3
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	188	479	-	-	634	-
HCM Lane V/C Ratio	0.22	0.747	-	-	0.086	-
HCM Control Delay (s)	29.5	31.5	-	-	11.2	0.2
HCM Lane LOS	D	D	-	-	B	A
HCM 95th %tile Q(veh)	0.8	6.3	-	-	0.3	-

Lanes, Volumes, Timings

3: New Hampshire Ave (MD 650) & Schindler Drive/Mahan Road

11/01/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔	↔	↔		↔	↔	↔↔	↔↔
Traffic Volume (vph)	51	4	10	523	0	576	5	2502	42	36	2286	70
Future Volume (vph)	51	4	10	523	0	576	5	2502	42	36	2286	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	11	12	12	10	12	12	10	12	12
Storage Length (ft)	0		0	230		0	320		220	500		0
Storage Lanes	0		0	1		1	1		1	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	0.97	0.95	0.95	1.00	0.86	1.00	0.97	0.91	0.91
Frt		0.980			0.850	0.850			0.850		0.996	
Flt Protected		0.962		0.950			0.950			0.950		
Satd. Flow (prot)	0	1791	0	3385	1534	1534	1620	6285	1553	3143	4968	0
Flt Permitted		0.962		0.950			0.950			0.950		
Satd. Flow (perm)	0	1791	0	3385	1534	1534	1620	6285	1553	3143	4968	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4			222	222			207			5
Link Speed (mph)		25			25			40				40
Link Distance (ft)		292			449			1203				1530
Travel Time (s)		8.0			12.2			20.5				26.1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	4%	4%	4%	4%	4%	4%
Adj. Flow (vph)	53	4	10	539	0	594	5	2579	43	37	2357	72
Shared Lane Traffic (%)						50%						
Lane Group Flow (vph)	0	67	0	539	297	297	5	2579	43	37	2429	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		22			30			23			31	
Link Offset(ft)		0			3			0			0	
Crosswalk Width(ft)		48			25			32			62	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.04	1.00	1.00	1.09	1.00	1.00	1.09	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1		1	1	1	1	1	1	1	1	1
Detector Template	Left			Left		Right	Left			Left		
Leading Detector (ft)	20	100		100	100	100	100	100	100	100	100	100
Trailing Detector (ft)	0	0		0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0		0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	100		100	100	100	100	100	100	100	100	100
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Turn Type	Split	NA		Split	NA	Perm	Prot	NA	Free	Prot	NA	
Protected Phases	3	3		4	4		1	5		6	2	
Permitted Phases						4			Free			
Detector Phase	3	3		4	4	4	1	5		6	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	3.0	3.0		7.0	7.0	

Lanes, Volumes, Timings

3: New Hampshire Ave (MD 650) & Schindler Drive/Mahan Road

11/01/2017

	↖	→	↘	↙	←	↖	↙	↑	↘	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Split (s)	12.5	12.5		12.0	12.0	12.0	8.5	8.5		13.0	13.0	
Total Split (s)	15.0	15.0		37.0	37.0	37.0	8.5	76.4		21.6	89.5	
Total Split (%)	10.0%	10.0%		24.7%	24.7%	24.7%	5.7%	50.9%		14.4%	59.7%	
Maximum Green (s)	7.5	7.5		30.0	30.0	30.0	3.0	70.9		15.6	83.5	
Yellow Time (s)	3.5	3.5		3.5	3.5	3.5	3.5	3.5		4.5	4.5	
All-Red Time (s)	4.0	4.0		3.5	3.5	3.5	2.0	2.0		1.5	1.5	
Lost Time Adjust (s)		-1.5		-1.5	-1.5	-1.5	-1.5	-1.5		-1.5	-1.5	
Total Lost Time (s)		6.0		5.5	5.5	5.5	4.0	4.0		4.5	4.5	
Lead/Lag	Lead	Lead		Lag	Lag	Lag	Lead	Lead		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	5.0		0.2	0.2	
Recall Mode	None	None		None	None	None	None	Min		C-Min	C-Min	
Act Effct Green (s)		10.8		32.3	32.3	32.3	5.6	76.7	150.0	10.2	89.2	
Actuated g/C Ratio		0.07		0.22	0.22	0.22	0.04	0.51	1.00	0.07	0.59	
v/c Ratio		0.51		0.74	0.59	0.59	0.08	0.80	0.03	0.17	0.82	
Control Delay		76.2		61.6	18.9	18.9	73.8	33.6	0.0	53.5	17.5	
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		76.2		61.6	18.9	18.9	73.8	33.6	0.0	53.5	17.5	
LOS		E		E	B	B	E	C	A	D	B	
Approach Delay		76.2			39.2			33.1			18.0	
Approach LOS		E			D			C			B	
Queue Length 50th (ft)		60		247	62	62	5	627	0	19	366	
Queue Length 95th (ft)		#127		325	174	174	21	679	0	m23	328	
Internal Link Dist (ft)		212			369			1123			1450	
Turn Bay Length (ft)				230			320		220	500		
Base Capacity (vph)		134		750	512	512	60	3211	1553	358	2956	
Starvation Cap Reductn		0		0	0	0	0	0	0	0	0	
Spillback Cap Reductn		0		0	0	0	0	0	0	0	0	
Storage Cap Reductn		0		0	0	0	0	0	0	0	0	
Reduced v/c Ratio		0.50		0.72	0.58	0.58	0.08	0.80	0.03	0.10	0.82	

Intersection Summary

Area Type: Other  
 Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 120 (80%), Referenced to phase 2:SBT and 6:SBL, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.82  
 Intersection Signal Delay: 28.8  
 Intersection LOS: C  
 Intersection Capacity Utilization 78.1%  
 ICU Level of Service D  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: New Hampshire Ave (MD 650) & Schindler Drive/Mahan Road

↖ Ø1	↓ Ø2 (R)	↖ Ø3	↙ Ø4
8.5 s	89.5 s	15 s	37 s
↑ Ø5	↘ Ø6 (R)		
76.4 s	21.6 s		



Lanes, Volumes, Timings

6: New Hampshire Ave (MD 650) & Powder Mill Road

11/01/2017

	↖	→	↗	↖	←	↖	↖	↑	↗	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑	↗	↖↗	←	↖	↖	↑↑↑	↖	↖	↑↑↑	↙
Traffic Volume (vph)	179	96	132	481	84	298	102	2169	250	244	2601	62
Future Volume (vph)	179	96	132	481	84	298	102	2169	250	244	2601	62
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	12	12	12	12	12	12	12	12	12
Storage Length (ft)	0		0	425		50	225		100	250		0
Storage Lanes	1		1	1		1	1		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	0.91	0.91	1.00	1.00	0.91	1.00	1.00	0.91	0.91
Frt			0.850			0.850			0.850		0.997	
Flt Protected	0.950			0.950	0.973		0.950			0.950		
Satd. Flow (prot)	1685	1773	1507	3285	1682	1615	1736	4988	1553	1736	4973	0
Flt Permitted	0.950			0.950	0.973		0.950			0.950		
Satd. Flow (perm)	1685	1773	1507	3285	1682	1615	1736	4988	1553	1736	4973	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			145			142			106		2	
Link Speed (mph)		25			35			40			40	
Link Distance (ft)		217			757			487			2380	
Travel Time (s)		5.9			14.7			8.3			40.6	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	4%	4%	4%	4%	4%	4%
Adj. Flow (vph)	185	99	136	496	87	307	105	2236	258	252	2681	64
Shared Lane Traffic (%)				22%								
Lane Group Flow (vph)	185	99	136	387	196	307	105	2236	258	252	2745	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			28			20			12	
Link Offset(ft)		0			-14			10			0	
Crosswalk Width(ft)		16			28			58			28	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	1	1	1	1	1	1	1	1	1	1
Detector Template	Left		Right	Left		Right	Left		Right	Left		
Leading Detector (ft)	100	100	100	100	100	100	100	100	100	100	100	100
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	100	100	100	100	100	100	100	100	100	100	100	100
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Turn Type	Split	NA	Prot	Split	NA	Prot	Prot	NA	Perm	Prot	NA	
Protected Phases	3	3	3	4	4	4	1	5		6	2	
Permitted Phases									5			
Detector Phase	3	3	3	4	4	4	1	5	5	6	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	3.0	7.0	7.0	3.0	7.0	

Lanes, Volumes, Timings

6: New Hampshire Ave (MD 650) & Powder Mill Road

11/01/2017

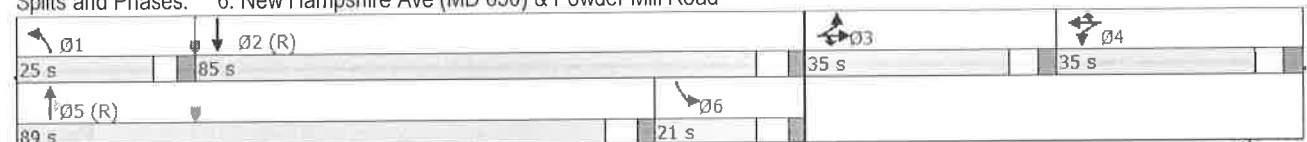
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Split (s)	11.5	11.5	11.5	12.0	12.0	12.0	9.0	14.0	14.0	10.0	14.0	
Total Split (s)	35.0	35.0	35.0	35.0	35.0	35.0	25.0	89.0	89.0	21.0	85.0	
Total Split (%)	19.4%	19.4%	19.4%	19.4%	19.4%	19.4%	13.9%	49.4%	49.4%	11.7%	47.2%	
Maximum Green (s)	28.5	28.5	28.5	28.0	28.0	28.0	19.0	82.0	82.0	14.0	78.0	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.5	4.5	4.5	4.5	4.5	
All-Red Time (s)	2.5	2.5	2.5	3.0	3.0	3.0	2.5	2.5	2.5	2.5	2.5	
Lost Time Adjust (s)	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	
Total Lost Time (s)	5.0	5.0	5.0	5.5	5.5	5.5	4.5	5.5	5.5	5.5	5.5	
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lag	Lead	Lead	Lead	Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	0.2	0.2	3.0	0.2	
Recall Mode	None	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	
Act Effct Green (s)	25.5	25.5	25.5	27.9	27.9	27.9	17.0	85.3	85.3	19.8	89.1	
Actuated g/C Ratio	0.14	0.14	0.14	0.16	0.16	0.16	0.09	0.47	0.47	0.11	0.50	
v/c Ratio	0.77	0.39	0.40	0.76	0.75	0.83	0.64	0.95	0.33	1.33	1.12	
Control Delay	95.5	73.9	10.8	83.2	91.1	58.0	95.9	54.6	18.1	232.3	99.3	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	95.5	73.9	10.8	83.2	91.1	58.0	95.9	54.6	18.1	232.3	99.3	
LOS	F	E	B	F	F	E	F	D	B	F	F	
Approach Delay		63.0			76.2			52.7			110.5	
Approach LOS		E			E			D			F	
Queue Length 50th (ft)	213	108	0	240	242	196	121	905	106	~433	~1409	
Queue Length 95th (ft)	303	170	57	309	352	#342	191	#1013	181	#629	#1544	
Internal Link Dist (ft)		137			677			407			2300	
Turn Bay Length (ft)				425		50	225		100	250		
Base Capacity (vph)	280	295	372	541	277	384	197	2364	791	190	2461	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.66	0.34	0.37	0.72	0.71	0.80	0.53	0.95	0.33	1.33	1.12	

Intersection Summary

Area Type: Other  
 Cycle Length: 180  
 Actuated Cycle Length: 180  
 Offset: 0 (0%), Referenced to phase 2:SBT and 5:NBT, Start of Green  
 Natural Cycle: 120  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.33  
 Intersection Signal Delay: 81.4  
 Intersection Capacity Utilization 87.2%  
 Analysis Period (min) 15  
 Intersection LOS: F  
 ICU Level of Service E

~ 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: 6: New Hampshire Ave (MD 650) & Powder Mill Road



Lanes, Volumes, Timings

9: New Hampshire Ave (MD 650) & Northwest Drive/Michelson Road

11/01/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔		↔	↔	↔		↔	↔	↔
Traffic Volume (vph)	6	0	20	228	0	712	10	3158	5	22	2136	25
Future Volume (vph)	6	0	20	228	0	712	10	3158	5	22	2136	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	280		0	225		0
Storage Lanes	0		0	2		2	1		0	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	0.88	1.00	0.86	0.86	0.97	0.91	0.91
Frt		0.896				0.850					0.998	
Flt Protected		0.989		0.950			0.950			0.950		
Satd. Flow (prot)	0	1684	0	3502	0	2842	1736	6285	0	3367	4978	0
Flt Permitted		0.989		0.740			0.950			0.950		
Satd. Flow (perm)	0	1684	0	2728	0	2842	1736	6285	0	3367	4978	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		95				29						2
Link Speed (mph)		25			25			40				40
Link Distance (ft)		183			270			1530				1123
Travel Time (s)		5.0			7.4			26.1				19.1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	4%	4%	4%	4%	4%	4%
Adj. Flow (vph)	6	0	20	233	0	727	10	3222	5	22	2180	26
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	26	0	233	0	727	10	3227	0	22	2206	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			48			27			30	
Link Offset(ft)		0			6			7			-10	
Crosswalk Width(ft)		40			45			33			53	
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1		1		1	1	1		1	1	
Detector Template	Left			Left		Right	Left			Left		
Leading Detector (ft)	20	100		100		100	100	100		100	100	
Trailing Detector (ft)	0	0		0		0	0	0		0	0	
Detector 1 Position(ft)	0	0		0		0	0	0		0	0	
Detector 1 Size(ft)	20	100		100		100	100	100		100	100	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0		0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0		0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0		0.0	0.0	0.0		0.0	0.0	
Turn Type	Perm	NA		Perm		pt+ov	Prot	NA		Prot	NA	
Protected Phases		4				8.5	1	6		5	2	
Permitted Phases	4			8								
Detector Phase	4	4		8		8.5	1	6		5	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0			3.0	7.0		5.0	7.0	
Minimum Split (s)	13.0	13.0		13.0			12.0	14.0		14.0	14.0	

Lanes, Volumes, Timings

9: New Hampshire Ave (MD 650) & Northwest Drive/Michelson Road

11/01/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (s)	42.0	42.0		42.0			12.0	94.0		14.0	96.0	
Total Split (%)	28.0%	28.0%		28.0%			8.0%	62.7%		9.3%	64.0%	
Maximum Green (s)	34.0	34.0		34.0			3.0	87.0		5.0	89.0	
Yellow Time (s)	4.0	4.0		4.0			4.0	4.5		4.0	4.5	
All-Red Time (s)	4.0	4.0		4.0			5.0	2.5		5.0	2.5	
Lost Time Adjust (s)		-1.5		-1.5			-1.5	-1.5		-1.5	-1.5	
Total Lost Time (s)		6.5		6.5			7.5	5.5		7.5	5.5	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0			3.0	0.2		3.0	0.2	
Recall Mode	None	None		None			None	C-Min		None	C-Min	
Act Effct Green (s)		35.6		35.6		50.8	5.5	87.2		7.6	97.6	
Actuated g/C Ratio		0.24		0.24		0.34	0.04	0.58		0.05	0.65	
v/c Ratio		0.06		0.36		0.74	0.16	0.88		0.13	0.68	
Control Delay		0.2		49.5		47.6	90.1	9.1		73.0	23.1	
Queue Delay		0.0		0.0		0.0	0.0	0.0		0.0	0.0	
Total Delay		0.2		49.5		47.6	90.1	9.1		73.0	23.1	
LOS		A		D		D	F	A		E	C	
Approach Delay		0.2			48.1			9.4			23.6	
Approach LOS		A			D			A			C	
Queue Length 50th (ft)		0		98		348	11	118		11	283	
Queue Length 95th (ft)		0		140		436	m14	144		m14	m624	
Internal Link Dist (ft)		103			190			1450			1043	
Turn Bay Length (ft)							280			225		
Base Capacity (vph)		480		661		970	64	3714		171	3239	
Starvation Cap Reductn		0		0		0	0	0		0	0	
Spillback Cap Reductn		0		0		0	0	0		0	0	
Storage Cap Reductn		0		0		0	0	0		0	0	
Reduced v/c Ratio		0.05		0.35		0.75	0.16	0.87		0.13	0.68	

Intersection Summary

Area Type: Other

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 56 (37%), Referenced to phase 2:SBT and 6:NBT, Start of Green

Natural Cycle: 70

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.88

Intersection Signal Delay: 20.0

Intersection LOS: C

Intersection Capacity Utilization 90.3%

ICU Level of Service E

Analysis Period (min) 15

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 9: New Hampshire Ave (MD 650) & Northwest Drive/Michelson Road

Ø1	Ø2 (R)	Ø4
12 s	96 s	42 s
Ø5	Ø6 (R)	Ø8
14 s	94 s	42 s

Lanes, Volumes, Timings

15: New Hampshire Ave (MD 650) & Lockwood Drive

11/01/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑↑↑	↑	↑	↑↑	↑↑↑	↑	↑	↑↑↑	↑
Traffic Volume (vph)	0	430	217	740	275	150	404	3082	521	136	1429	190
Future Volume (vph)	0	430	217	740	275	150	404	3082	521	136	1429	190
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	11	12	11	12	12	12
Storage Length (ft)	150		180	0		215	300		225	315		0
Storage Lanes	0		1	3		1	2		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	0.94	1.00	1.00	0.97	0.86	1.00	1.00	0.91	1.00
Frnt			0.850			0.850			0.850			0.850
Flt Protected				0.950			0.950			0.950		
Satd. Flow (prot)	0	3610	1615	5090	1900	1615	3255	6285	1501	1703	4893	1524
Flt Permitted				0.950			0.950			0.950		
Satd. Flow (perm)	0	3610	1615	5090	1900	1615	3255	6285	1501	1703	4893	1524
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			273			164			275			218
Link Speed (mph)		30			30			40				40
Link Distance (ft)		537			500			1123				377
Travel Time (s)		12.2			11.4			19.1				6.4
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	4%	4%	4%	6%	6%	6%
Adj. Flow (vph)	0	448	226	771	286	156	421	3210	543	142	1489	198
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	448	226	771	286	156	421	3210	543	142	1489	198
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		20			40			27			30	
Link Offset(ft)		-15			30			15			-15	
Crosswalk Width(ft)		26			23			35			25	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.04	1.00	1.04	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		1	1	1	1	1	1	1	1	1	1	1
Detector Template				Left		Right	Left			Left		
Leading Detector (ft)		100	100	100	100	100	100	100	100	100	100	100
Trailing Detector (ft)		0	0	0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)		0	0	0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)		100	100	100	100	100	100	100	100	100	100	100
Detector 1 Type		CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel												
Detector 1 Extend (s)		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Turn Type		NA	Free	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		3		7	4		1	6		5	2	
Permitted Phases			Free			4			6			2
Detector Phase		3		7	4	4	1	6	6	5	2	2
Switch Phase												
Minimum Initial (s)		5.0		5.0	5.0	5.0	5.0	7.0	7.0	5.0	7.0	7.0

Lanes, Volumes, Timings  
 15: New Hampshire Ave (MD 650) & Lockwood Drive

11/01/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Split (s)		12.5		12.5	12.5	12.5	14.0	16.0	16.0	14.0	16.0	16.0
Total Split (s)		24.0		27.2	51.2	51.2	35.0	79.8	79.8	19.0	63.8	63.8
Total Split (%)		16.0%		18.1%	34.1%	34.1%	23.3%	53.2%	53.2%	12.7%	42.5%	42.5%
Maximum Green (s)		16.5		19.7	43.7	43.7	26.0	72.3	72.3	10.0	56.3	56.3
Yellow Time (s)		4.0		4.0	4.0	4.0	4.0	4.5	4.5	4.0	4.5	4.5
All-Red Time (s)		3.5		3.5	3.5	3.5	5.0	3.0	3.0	5.0	3.0	3.0
Lost Time Adjust (s)		-1.5		-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5
Total Lost Time (s)		6.0		6.0	6.0	6.0	7.5	6.0	6.0	7.5	6.0	6.0
Lead/Lag		Lead		Lag			Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?		Yes		Yes			Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)		3.0		3.0	3.0	3.0	3.0	0.2	0.2	3.0	0.2	0.2
Recall Mode		None		None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)		18.0	150.0	21.2	45.2	45.2	25.0	73.8	73.8	11.5	60.3	60.3
Actuated g/C Ratio		0.12	1.00	0.14	0.30	0.30	0.17	0.49	0.49	0.08	0.40	0.40
v/c Ratio		1.03	0.14	1.07	0.50	0.26	0.78	1.04	0.62	1.09	0.76	0.27
Control Delay		115.2	0.2	114.0	46.8	5.6	76.7	49.6	5.1	167.2	42.0	3.4
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		115.2	0.2	114.0	46.8	5.6	76.7	49.6	5.1	167.2	42.0	3.4
LOS		F	A	F	D	A	E	D	A	F	D	A
Approach Delay		76.6			84.2			46.6			47.5	
Approach LOS		E			F			D			D	
Queue Length 50th (ft)		~246	0	~295	231	0	197	~989	26	~156	461	0
Queue Length 95th (ft)		#363	0	#385	326	48	m233	#1029	m81	#302	531	39
Internal Link Dist (ft)		457			420			1043			297	
Turn Bay Length (ft)			180			215	300		225	315		
Base Capacity (vph)		433	1615	719	572	601	596	3092	878	130	1968	743
Starvation Cap Reductn		0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn		0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn		0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio		1.03	0.14	1.07	0.50	0.26	0.71	1.04	0.62	1.09	0.76	0.27

Intersection Summary

Area Type: Other  
 Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 104 (69%), Referenced to phase 2:SBT and 6:NBT, Start of Green  
 Natural Cycle: 140  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.09  
 Intersection Signal Delay: 55.1  
 Intersection LOS: E  
 Intersection Capacity Utilization 99.4%  
 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.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 15: New Hampshire Ave (MD 650) & Lockwood Drive























Ø1	Ø2 (R)	Ø3	Ø7
35 s	63.8 s	24 s	27.2 s
Ø5	Ø6 (R)	Ø4	
19 s	79.8 s	51.2 s	



Lanes, Volumes, Timings

39: Columbia Pike (US 29) & Colesville Business Park Driveway/Lockwood Drive

05/01/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				 				 			 	
Traffic Volume (vph)	30	0	10	719	5	10	0	4731	0	5	3559	5
Future Volume (vph)	30	0	10	719	5	10	0	4731	0	5	3559	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	11	11	11	11	11	11
Storage Length (ft)	0		50	0		105	250		0	220		0
Storage Lanes	1		1	2		1	0		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.86	1.00	1.00	0.86	0.86
Frt			0.850		0.897							
Flt Protected	0.950			0.950						0.950		
Satd. Flow (prot)	1805	0	1615	3502	1704	0	0	6075	0	1694	6134	0
Flt Permitted	0.747			0.950						0.036		
Satd. Flow (perm)	1419	0	1615	3502	1704	0	0	6075	0	64	6134	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			29									
Link Speed (mph)		25			30			40			40	
Link Distance (ft)		156			227			370			609	
Travel Time (s)		4.3			5.2			6.3			10.4	
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
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	4%	4%	4%	3%	3%	3%
Adj. Flow (vph)	33	0	11	782	5	11	0	5142	0	5	3868	5
Shared Lane Traffic (%)												
Lane Group Flow (vph)	33	0	11	782	16	0	0	5142	0	5	3873	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		26			24			11			11	
Link Offset(ft)		-45			22			0			0	
Crosswalk Width(ft)		16			14			19			28	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.04	1.04	1.04	1.04	1.04	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1		1	1	1			1		1	1	
Detector Template												
Leading Detector (ft)	100		100	100	100			100		100	100	
Trailing Detector (ft)	0		0	0	0			0		0	0	
Detector 1 Position(ft)	0		0	0	0			0		0	0	
Detector 1 Size(ft)	100		100	100	100			100		100	100	
Detector 1 Type	CI+Ex		CI+Ex	CI+Ex	CI+Ex			CI+Ex		CI+Ex	CI+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0		0.0	0.0	0.0			0.0		0.0	0.0	
Detector 1 Queue (s)	0.0		0.0	0.0	0.0			0.0		0.0	0.0	
Detector 1 Delay (s)	0.0		0.0	0.0	0.0			0.0		0.0	0.0	
Turn Type	Perm		Prot	Perm	NA			NA		Perm	NA	
Protected Phases			4		8			6			2	
Permitted Phases	4			8						2		
Detector Phase	4		4	8	8			6		2	2	
Switch Phase												
Minimum Initial (s)	5.0		5.0	5.0	5.0			10.0		10.0	10.0	



Lanes, Volumes, Timings

39: Columbia Pike (US 29) & Colesville Business Park Driveway/Lockwood Drive

05/01/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Split (s)	12.0		12.0	12.0	12.0			17.0		17.0	17.0	
Total Split (s)	34.0		34.0	34.0	34.0			116.0		116.0	116.0	
Total Split (%)	22.7%		22.7%	22.7%	22.7%			77.3%		77.3%	77.3%	
Maximum Green (s)	27.0		27.0	27.0	27.0			109.0		109.0	109.0	
Yellow Time (s)	4.0		4.0	4.0	4.0			5.0		5.0	5.0	
All-Red Time (s)	3.0		3.0	3.0	3.0			2.0		2.0	2.0	
Lost Time Adjust (s)	-1.5		-1.5	-1.5	-1.5			-1.5		-1.5	-1.5	
Total Lost Time (s)	5.5		5.5	5.5	5.5			5.5		5.5	5.5	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	5.0		5.0	5.0	5.0			0.2		0.2	0.2	
Recall Mode	None		None	None	None			C-Min		C-Min	C-Min	
Act Effect Green (s)	28.5		28.5	28.5	28.5			110.5		110.5	110.5	
Actuated g/C Ratio	0.19		0.19	0.19	0.19			0.74		0.74	0.74	
v/c Ratio	0.12		0.03	1.18	0.05			1.15		0.11	0.86	
Control Delay	52.0		2.5	126.4	29.1			91.8		11.0	16.5	
Queue Delay	0.0		0.0	0.0	0.0			0.0		0.0	0.0	
Total Delay	52.0		2.5	126.4	29.1			91.8		11.0	16.5	
LOS	D		A	F	C			F		B	B	
Approach Delay		39.6				124.5		91.8				16.5
Approach LOS		D				F		F				B
Queue Length 50th (ft)	27		0	~472	9			~1712		2	572	
Queue Length 95th (ft)	60		4	#585	m19			#1716		m2	m580	
Internal Link Dist (ft)		76			147			290				529
Turn Bay Length (ft)			50							220		
Base Capacity (vph)	269		330	665	323			4475		47	4518	
Starvation Cap Reductn	0		0	0	0			0		0	0	
Spillback Cap Reductn	0		0	0	0			0		0	0	
Storage Cap Reductn	0		0	0	0			0		0	0	
Reduced v/c Ratio	0.12		0.03	1.18	0.05			1.15		0.11	0.86	

Intersection Summary

Area Type: Other

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 44 (29%), Referenced to phase 2:SBTL and 6:NBT, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.18

Intersection Signal Delay: 64.6

Intersection LOS: E

Intersection Capacity Utilization 98.2%

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.

m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings

39: Columbia Pike (US 29) & Colesville Business Park Driveway/Lockwood Drive

05/01/2018

Splits and Phases: 39: Columbia Pike (US 29) & Colesville Business Park Driveway/Lockwood Drive

↓ Ø2 (R)	↘ Ø4
116 s	34 s
↑ Ø6 (R)	← Ø8
116 s	34 s

Lanes, Volumes, Timings  
66: Columbia Pike (US 29) & Stewart Lane

11/01/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↵	↵			↵	↵	↵	↕↕↕	↵	↵↵	↕↕↕	↵
Traffic Volume (vph)	47	55	15	101	20	41	42	4452	440	699	3500	52
Future Volume (vph)	47	55	15	101	20	41	42	4452	440	699	3500	52
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	12	12	12	12	12	12
Storage Length (ft)	0		0	0		0	240		0	400		700
Storage Lanes	1		0	0		1	1		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	1.00	0.97	0.91	1.00
Frt		0.968					0.850		0.850			0.850
Flt Protected	0.950				0.960		0.950			0.950		
Satd. Flow (prot)	1745	1778	0	0	1763	1561	1736	4988	1553	3367	4988	1553
Flt Permitted	0.367				0.701		0.950			0.950		
Satd. Flow (perm)	674	1778	0	0	1288	1561	1736	4988	1553	3367	4988	1553
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		7				138			153			87
Link Speed (mph)		30			30			45			50	
Link Distance (ft)		274			223			422			4978	
Travel Time (s)		6.2			5.1			6.4			67.9	
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
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	4%	4%	4%	4%	4%	4%
Adj. Flow (vph)	51	60	16	110	22	45	46	4839	478	760	3804	57
Shared Lane Traffic (%)												
Lane Group Flow (vph)	51	76	0	0	132	45	46	4839	478	760	3804	57
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		11			40			20			20	
Link Offset(ft)		15			-15			5			-3	
Crosswalk Width(ft)		25			25			15			18	
Two way Left Turn Lane												
Headway Factor	1.04	1.04	1.04	1.04	1.04	1.04	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1		1	1	1	1	1	1	1	1	1
Detector Template				Left								
Leading Detector (ft)	100	100		20	100	100	100	100	100	100	100	100
Trailing Detector (ft)	0	0		0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0		0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	100	100		20	100	100	100	100	100	100	100	100
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA	Prot	Prot	NA	Prot
Protected Phases		4			8		5	2	2	1	6	6
Permitted Phases	4			8		8						
Detector Phase	4	4		8	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	3.0	7.0	7.0	3.0	7.0	7.0

Lanes, Volumes, Timings  
66: Columbia Pike (US 29) & Stewart Lane

11/01/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Split (s)	12.5	12.5		12.5	12.5	12.5	12.5	14.0	14.0	10.5	14.0	14.0
Total Split (s)	17.0	17.0		17.0	17.0	17.0	12.5	104.0	104.0	29.0	120.5	120.5
Total Split (%)	11.3%	11.3%		11.3%	11.3%	11.3%	8.3%	69.3%	69.3%	19.3%	80.3%	80.3%
Maximum Green (s)	9.5	9.5		9.5	9.5	9.5	5.0	97.0	97.0	21.5	113.5	113.5
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	3.5	5.0	5.0	3.5	5.0	5.0
All-Red Time (s)	3.5	3.5		3.5	3.5	3.5	4.0	2.0	2.0	4.0	2.0	2.0
Lost Time Adjust (s)	-1.5	-1.5			-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5
Total Lost Time (s)	6.0	6.0			6.0	6.0	6.0	5.5	5.5	6.0	5.5	5.5
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	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	3.0
Recall Mode	None	None		None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	11.0	11.0			11.0	11.0	6.5	98.5	98.5	23.0	117.5	117.5
Actuated g/C Ratio	0.07	0.07			0.07	0.07	0.04	0.66	0.66	0.15	0.78	0.78
v/c Ratio	1.04	0.56			1.40	0.19	0.61	1.48	0.45	1.47	0.97	0.05
Control Delay	204.6	77.1			280.7	1.7	78.5	230.0	0.2	256.6	14.7	0.2
Queue Delay	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	204.6	77.1			280.7	1.7	78.5	230.0	0.2	256.6	14.7	0.2
LOS	F	E			F	A	E	F	A	F	B	A
Approach Delay		128.3			209.8			208.3			54.3	
Approach LOS		F			F			F			D	
Queue Length 50th (ft)	~53	66			~172	0	48	~2374	0	~528	994	0
Queue Length 95th (ft)	#149	123			#316	0	m42	m#1734	m0	m#463	m671	m0
Internal Link Dist (ft)		194			143			342			4898	
Turn Bay Length (ft)							240			400		700
Base Capacity (vph)	49	136			94	242	75	3275	1072	516	3907	1235
Starvation Cap Reductn	0	0			0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0			0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0			0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.04	0.56			1.40	0.19	0.61	1.48	0.45	1.47	0.97	0.05

Intersection Summary













Area Type: Other  
 Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 2 (1%), Referenced to phase 2:NBT and 6:SBT, Start of Green  
 Natural Cycle: 150  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.48  
 Intersection Signal Delay: 138.2  
 Intersection LOS: F  
 Intersection Capacity Utilization 133.9%  
 ICU Level of Service H  
 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.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 66: Columbia Pike (US 29) & Stewart Lane

29 s	104 s	17 s
12.5 s	120.5 s	17 s

Lanes, Volumes, Timings  
74: Cherry Hill Road & FDA Boulevard

11/01/2017

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	734	551	358	1070	1616	459
Future Volume (vph)	734	551	358	1070	1616	459
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	300	400			400
Storage Lanes	2	1	2			1
Taper Length (ft)	25		25			
Lane Util. Factor	0.97	1.00	0.97	0.95	0.95	1.00
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	3502	1615	3502	3610	3610	1615
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	3502	1615	3502	3610	3610	1615
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		11				220
Link Speed (mph)	25			30	30	
Link Distance (ft)	1271			578	580	
Travel Time (s)	34.7			13.1	13.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	816	612	398	1189	1796	510
Shared Lane Traffic (%)						
Lane Group Flow (vph)	816	612	398	1189	1796	510
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	24			24	24	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	37			48	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Number of Detectors	1	1	1	1	1	1
Detector Template						
Leading Detector (ft)	100	100	100	100	100	100
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	100	100	100	100	100	100
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Turn Type	Prot	pt+ov	Prot	NA	NA	Free
Protected Phases	4	4 1	1	6	2	
Permitted Phases						Free
Detector Phase	4	4 1	1	6	2	
Switch Phase						
Minimum Initial (s)	7.0		3.0	7.0	7.0	
Minimum Split (s)	13.0		9.0	13.0	13.0	
Total Split (s)	42.0		23.0	108.0	85.0	

Lanes, Volumes, Timings  
74: Cherry Hill Road & FDA Boulevard

11/01/2017

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Total Split (%)	28.0%		15.3%	72.0%	56.7%	
Maximum Green (s)	36.0		17.0	102.0	79.0	
Yellow Time (s)	4.0		4.0	4.0	4.0	
All-Red Time (s)	2.0		2.0	2.0	2.0	
Lost Time Adjust (s)	-1.5		-1.5	-1.5	-1.5	
Total Lost Time (s)	4.5		4.5	4.5	4.5	
Lead/Lag			Lead		Lag	
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)	3.0		3.0	0.2	0.2	
Recall Mode	None		None	C-Min	C-Min	
Act Effct Green (s)	39.2	62.2	18.5	101.8	78.8	150.0
Actuated g/C Ratio	0.26	0.41	0.12	0.68	0.53	1.00
v/c Ratio	0.89	0.91	0.92	0.49	0.95	0.32
Control Delay	66.6	59.3	92.4	12.2	21.4	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	66.6	59.3	92.4	12.2	21.4	0.0
LOS	E	E	F	B	C	A
Approach Delay	63.5			32.3	16.7	
Approach LOS	E			C	B	
Queue Length 50th (ft)	405	561	201	262	917	0
Queue Length 95th (ft)	#526	#809	#300	308	m864	m0
Internal Link Dist (ft)	1191			498	500	
Turn Bay Length (ft)		300	400			400
Base Capacity (vph)	914	675	431	2490	1937	1615
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.89	0.91	0.92	0.48	0.93	0.32

Intersection Summary

Area Type: Other  
 Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 109 (73%), Referenced to phase 2:SBT and 6:NBT, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.95  
 Intersection Signal Delay: 33.9  
 Intersection LOS: C  
 Intersection Capacity Utilization 87.1%  
 ICU Level of Service E  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 74: Cherry Hill Road & FDA Boulevard

Ø1	Ø2 (R)	Ø4
23 s	85 s	42 s
Ø6 (R)		
108 s		

Lanes, Volumes, Timings

81: Cherry Hill Road & Plum Orchard Drive/Clover Patch Drive

11/01/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	150	85	655	15	45	10	413	1341	50	30	1405	145
Future Volume (vph)	150	85	655	15	45	10	413	1341	50	30	1405	145
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	250		0	0		0	215		0	150		500
Storage Lanes	1		1	1		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	1.00
Frt			0.850		0.973			0.995				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1805	1900	1615	1805	3513	0	1805	3592	0	1805	3610	1615
Flt Permitted	0.715			0.680			0.058			0.155		
Satd. Flow (perm)	1358	1900	1615	1292	3513	0	110	3592	0	294	3610	1615
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			342		11			5				161
Link Speed (mph)		25			25			30			30	
Link Distance (ft)		397			415			343			944	
Travel Time (s)		10.8			11.3			7.8			21.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	167	94	728	17	50	11	459	1490	56	33	1561	161
Shared Lane Traffic (%)												
Lane Group Flow (vph)	167	94	728	17	61	0	459	1546	0	33	1561	161
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		10			0			0			0	
Crosswalk Width(ft)		20			20			35			34	
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	1	1	1		1	1		1	1	1
Detector Template												
Leading Detector (ft)	100	100	100	100	100		110	100		100	100	100
Trailing Detector (ft)	0	0	0	0	0		10	0		0	0	0
Detector 1 Position(ft)	0	0	0	0	0		10	0		0	0	0
Detector 1 Size(ft)	100	100	100	100	100		100	100		100	100	100
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA		Perm	NA	Perm
Protected Phases		8			4		5	2			6	
Permitted Phases	8		8	4			2			6		6
Detector Phase	8	8	8	4	4		5	2		6	6	6
Switch Phase												
Minimum Initial (s)	3.0	3.0	3.0	3.0	3.0		3.0	7.0		7.0	7.0	7.0
Minimum Split (s)	9.5	9.5	9.5	9.5	9.5		9.0	13.5		13.5	13.5	13.5
Total Split (s)	47.0	47.0	47.0	47.0	47.0		34.0	103.0		69.0	69.0	69.0



Lanes, Volumes, Timings

81: Cherry Hill Road & Plum Orchard Drive/Clover Patch Drive

11/01/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (%)	31.3%	31.3%	31.3%	31.3%	31.3%		22.7%	68.7%		46.0%	46.0%	46.0%
Maximum Green (s)	40.5	40.5	40.5	40.5	40.5		28.0	96.5		62.5	62.5	62.5
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		4.0	4.5		4.5	4.5	4.5
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	-1.5	-1.5	-1.5	-1.5	-1.5		-1.5	-1.5		-1.5	-1.5	-1.5
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0		4.5	5.0		5.0	5.0	5.0
Lead/Lag							Lead			Lag	Lag	Lag
Lead-Lag Optimize?							Yes			Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		5.0	0.2		0.2	0.2	0.2
Recall Mode	None	None	None	None	None		None	C-Min		C-Min	C-Min	C-Min
Act Effct Green (s)	42.0	42.0	42.0	42.0	42.0		98.5	98.0		64.0	64.0	64.0
Actuated g/C Ratio	0.28	0.28	0.28	0.28	0.28		0.66	0.65		0.43	0.43	0.43
v/c Ratio	0.44	0.18	1.04	0.05	0.06		1.13	0.66		0.26	1.01	0.21
Control Delay	48.8	42.0	73.1	40.1	32.7		124.3	20.5		13.1	44.2	0.6
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	48.8	42.0	73.1	40.1	32.7		124.3	20.5		13.1	44.2	0.6
LOS	D	D	E	D	C		F	C		B	D	A
Approach Delay		66.1			34.3			44.3			39.6	
Approach LOS		E			C			D			D	
Queue Length 50th (ft)	135	70	~513	12	18		~474	456		5	~851	0
Queue Length 95th (ft)	211	120	#766	33	38		m#654	537		m9	#971	m0
Internal Link Dist (ft)		317			335			263			864	
Turn Bay Length (ft)	250						215			150		500
Base Capacity (vph)	380	532	698	361	991		405	2348		125	1540	781
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	0
Reduced v/c Ratio	0.44	0.18	1.04	0.05	0.06		1.13	0.66		0.26	1.01	0.21

Intersection Summary

Area Type: Other  
 Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 57 (38%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green  
 Natural Cycle: 120  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.13  
 Intersection Signal Delay: 46.9  
 Intersection LOS: D  
 Intersection Capacity Utilization 95.2%  
 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.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 81: Cherry Hill Road & Plum Orchard Drive/Clover Patch Drive

↑ Ø2 (R)		← Ø4
103 s		47 s
↙ Ø5	↓ Ø6 (R)	→ Ø8
34 s	59 s	47 s

Lanes, Volumes, Timings  
84: Cherry Hill Road & Powder Mill Road (MD 212)

11/01/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	367	596	30	80	853	52	80	854	35	489	1337	436
Future Volume (vph)	367	596	30	80	853	52	80	854	35	489	1337	436
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	11	11	10	12	12	12	11	12	11
Storage Length (ft)	420		0	200		410	190		0	450		360
Storage Lanes	2		0	1		1	1		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frt		0.993				0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3335	3414	0	1646	3292	1422	1805	3610	1615	3385	3610	1561
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3335	3414	0	1646	3292	1422	1805	3610	1615	3385	3610	1561
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)		4				240						325
Link Speed (mph)		40			40			40			40	
Link Distance (ft)		605			616			491			636	
Travel Time (s)		10.3			10.5			8.4			10.8	
Peak Hour 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
Heavy Vehicles (%)	5%	5%	5%	6%	6%	6%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	367	596	30	80	853	52	80	854	35	489	1337	436
Shared Lane Traffic (%)												
Lane Group Flow (vph)	367	626	0	80	853	52	80	854	35	489	1337	436
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			28			30	
Link Offset(ft)		-12			10			0			1	
Crosswalk Width(ft)		28			36			16			31	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.04	1.04	1.09	1.00	1.00	1.00	1.04	1.00	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1		1	1	1	1	1	1	1	1	1
Detector Template												
Leading Detector (ft)	100	100		100	100	100	100	100	100	100	100	100
Trailing Detector (ft)	0	0		0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0		0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	100	100		100	100	100	100	100	100	100	100	100
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Turn Type	Prot	NA		Prot	NA	Free	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases						Free			4			8
Detector Phase	1	6		5	2		7	4	4	3	8	8
Switch Phase												
Minimum Initial (s)	5.0	20.0		5.0	20.0		7.0	7.0	7.0	8.0	8.0	8.0

Lanes, Volumes, Timings

84: Cherry Hill Road & Powder Mill Road (MD 212)

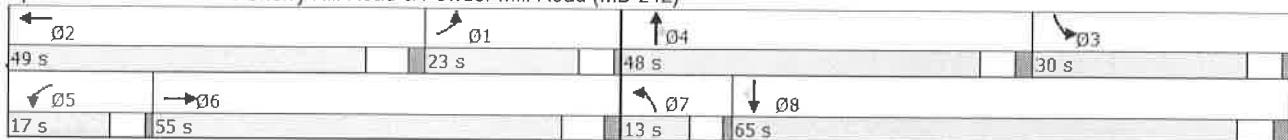
11/01/2017

	↖		→		↗		↖		↗		↘	
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Split (s)	11.0	27.0		11.0	27.0		13.0	13.0	13.0	14.0	14.0	14.0
Total Split (s)	23.0	55.0		17.0	49.0		13.0	48.0	48.0	30.0	65.0	65.0
Total Split (%)	15.3%	36.7%		11.3%	32.7%		8.7%	32.0%	32.0%	20.0%	43.3%	43.3%
Maximum Green (s)	18.0	48.0		12.0	42.0		8.0	42.0	42.0	25.0	59.0	59.0
Yellow Time (s)	4.0	5.0		4.0	5.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	2.0		1.0	2.0		1.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	-1.5	-1.5		-1.5	-1.5		-1.5	-1.5	-1.5	-1.5	-1.5	-1.5
Total Lost Time (s)	3.5	5.5		3.5	5.5		3.5	4.5	4.5	3.5	4.5	4.5
Lead/Lag	Lag	Lag		Lead	Lead		Lead	Lead	Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	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	None	Min		None	Min		None	Min	Min	None	Min	Min
Walk Time (s)					7.0							
Flash Dont Walk (s)					11.0							
Pedestrian Calls (#/hr)					0							
Act Effct Green (s)	19.1	48.9		12.2	42.0	146.8	9.5	40.7	40.7	27.9	59.2	59.2
Actuated g/C Ratio	0.13	0.33		0.08	0.29	1.00	0.06	0.28	0.28	0.19	0.40	0.40
v/c Ratio	0.85	0.55		0.58	0.91	0.04	0.69	0.85	0.08	0.76	0.92	0.53
Control Delay	80.9	42.2		83.1	64.7	0.0	96.9	59.7	39.7	65.7	52.8	10.7
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	80.9	42.2		83.1	64.7	0.0	96.9	59.7	39.7	65.7	52.8	10.7
LOS	F	D		F	E	A	F	E	D	E	D	B
Approach Delay		56.5			62.7			62.0			47.5	
Approach LOS		E			E			E			D	
Queue Length 50th (ft)	184	263		76	423	0	78	411	25	240	648	71
Queue Length 95th (ft)	#263	327		135	#535	0	#162	494	55	#308	#767	174
Internal Link Dist (ft)		525			536			411			556	
Turn Bay Length (ft)	420			200		410	190			450		360
Base Capacity (vph)	444	1163		152	977	1422	117	1071	479	643	1491	835
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.83	0.54		0.53	0.87	0.04	0.68	0.80	0.07	0.76	0.90	0.52

Intersection Summary

Area Type: Other  
 Cycle Length: 150  
 Actuated Cycle Length: 146.8  
 Natural Cycle: 100  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.92  
 Intersection Signal Delay: 54.8  
 Intersection LOS: D  
 Intersection Capacity Utilization 91.8%  
 ICU Level of Service F  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 84: Cherry Hill Road & Powder Mill Road (MD 212)



Lanes, Volumes, Timings  
 94: Columbia Pike (US 29) & Industrial Parkway

11/01/2017

	↙	↖	↑	↗	↘	↓
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↙↙	↖	↑↑↑		↗↗↗	↑↑↑
Traffic Volume (vph)	1486	414	3115	0	362	2765
Future Volume (vph)	1486	414	3115	0	362	2765
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	12	12
Storage Length (ft)	0	0		500	400	
Storage Lanes	2	1		0	1	
Taper Length (ft)	25				75	
Lane Util. Factor	0.97	1.00	0.91	1.00	0.94	0.91
Flt Protected	0.950				0.950	
Satd. Flow (prot)	3385	1561	4988	0	4894	4988
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	3385	1561	4988	0	4894	4988
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		136				
Link Speed (mph)	30		50			50
Link Distance (ft)	156		386			541
Travel Time (s)	3.5		5.3			7.4
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	4%	4%	4%	4%
Adj. Flow (vph)	1564	436	3279	0	381	2911
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1564	436	3279	0	381	2911
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	10		50			50
Link Offset(ft)	25		-3			0
Crosswalk Width(ft)	20		65			30
Two way Left Turn Lane						
Headway Factor	1.04	1.04	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Number of Detectors	1	1	1		1	1
Detector Template						
Leading Detector (ft)	50	50	100		100	100
Trailing Detector (ft)	0	0	0		0	0
Detector 1 Position(ft)	0	0	0		0	0
Detector 1 Size(ft)	50	50	100		100	100
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex		CI+Ex	CI+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Turn Type	Prot	Prot	NA		Prot	NA
Protected Phases	8	8	6		5	2
Permitted Phases						
Detector Phase	8	8	6		5	2
Switch Phase						
Minimum Initial (s)	4.0	4.0	7.0		5.0	7.0

Lanes, Volumes, Timings

94: Columbia Pike (US 29) & Industrial Parkway

11/01/2017

	↙	↖	↑	↗	↘	↓
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Minimum Split (s)	11.0	11.0	14.0		11.0	14.0
Total Split (s)	56.0	56.0	77.0		17.0	94.0
Total Split (%)	37.3%	37.3%	51.3%		11.3%	62.7%
Maximum Green (s)	49.0	49.0	70.0		11.0	87.0
Yellow Time (s)	4.0	4.0	5.5		4.0	5.5
All-Red Time (s)	3.0	3.0	1.5		2.0	1.5
Lost Time Adjust (s)	-1.5	-1.5	-1.5		-1.5	-1.5
Total Lost Time (s)	5.5	5.5	5.5		4.5	5.5
Lead/Lag			Lead		Lag	
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)	4.0	4.0	0.2		5.0	0.2
Recall Mode	None	None	C-Min		None	C-Min
Act Effct Green (s)	50.5	50.5	71.5		12.5	88.5
Actuated g/C Ratio	0.34	0.34	0.48		0.08	0.59
v/c Ratio	1.37	0.71	1.38		0.94	0.99
Control Delay	188.3	4.1	190.8		61.8	26.0
Queue Delay	0.0	9.8	0.0		0.0	19.0
Total Delay	188.3	13.9	190.8		61.8	44.9
LOS	F	B	F		E	D
Approach Delay	150.3		190.8			46.9
Approach LOS	F		F			D
Queue Length 50th (ft)	~1009	27	~1547		140	384
Queue Length 95th (ft)	m#921	m22	m591		m75	m117
Internal Link Dist (ft)	76		306			461
Turn Bay Length (ft)					400	
Base Capacity (vph)	1139	615	2377		407	2942
Starvation Cap Reductn	0	149	0		0	169
Spillback Cap Reductn	0	0	0		0	0
Storage Cap Reductn	0	0	0		0	0
Reduced v/c Ratio	1.37	0.94	1.38		0.94	1.05

Intersection Summary

Area Type: Other  
 Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 106 (71%), Referenced to phase 2:SBT and 6:NBT, Start of Green  
 Natural Cycle: 150  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.38  
 Intersection Signal Delay: 126.1  
 Intersection LOS: F  
 Intersection Capacity Utilization 122.4%  
 ICU Level of Service H  
 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.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 94: Columbia Pike (US 29) & Industrial Parkway

#94 ↓ Ø2 (R)			
94 s			
#94 #95 ↑ ↓ Ø6 (R)	#94 #95 ↘ → Ø5	#94 #95 ↙ ↗ Ø8	
77 s	17 s	56 s	

Lanes, Volumes, Timings

95: Old Columbia Pike & Industrial Parkway

11/01/2017













Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑		↵	↑↑↑	↶			↑↑↑		↵	
Traffic Volume (vph)	0	232	130	25	1691	398	0	0	2229	15	505	209
Future Volume (vph)	0	232	130	25	1691	398	0	0	2229	15	505	209
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	16	11	11	16	12	12	11	12	12	12
Storage Length (ft)	0		0	50		500	0		0	0		100
Storage Lanes	0		0	1		1	0		3	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	1.00	1.00	1.00	0.76	0.95	0.95	0.95
Flt Protected				0.950							0.999	
Satd. Flow (prot)	0	5561	0	1745	5014	1830	0	0	3559	0	3451	0
Flt Permitted				0.950							0.999	
Satd. Flow (perm)	0	5561	0	1745	5014	1830	0	0	3559	0	3451	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		75				428			42			55
Link Speed (mph)		30			30			30				30
Link Distance (ft)		156			1170			272				1014
Travel Time (s)		3.5			26.6			6.2				23.0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	0	249	140	27	1818	428	0	0	2397	16	543	225
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	389	0	27	1818	428	0	0	2397	0	784	0
Enter Blocked Intersection	No	No	No	Yes	1 veh	No	No	No	1 veh	No	Yes	1 veh
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		10			15			0				0
Link Offset(ft)		-10			10			10				-5
Crosswalk Width(ft)		16			16			35				16
Two way Left Turn Lane												
Headway Factor	0.85	0.85	0.85	1.04	1.04	0.85	1.00	1.00	1.04	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		1		1	2	1			1	1	2	
Detector Template										Left		
Leading Detector (ft)		50		100	100	100			100	20	100	
Trailing Detector (ft)		0		0	0	0			0	0	0	
Detector 1 Position(ft)		0		0	0	0			0	0	0	
Detector 1 Size(ft)		50		100	100	100			100	20	100	
Detector 1 Type		CI+Ex		CI+Ex	CI+Ex	CI+Ex			CI+Ex	CI+Ex	CI+Ex	
Detector 1 Channel												
Detector 1 Extend (s)		0.0		0.0	0.0	0.0			0.0	0.0	0.0	
Detector 1 Queue (s)		0.0		0.0	0.0	0.0			0.0	0.0	0.0	
Detector 1 Delay (s)		0.0		0.0	0.0	0.0			0.0	0.0	0.0	
Detector 2 Position(ft)					94							94
Detector 2 Size(ft)					6							6
Detector 2 Type					CI+Ex							CI+Ex
Detector 2 Channel												
Detector 2 Extend (s)					0.0							0.0
Turn Type		NA		Split	NA	Prot			pt+ov	Perm	NA	
Protected Phases		5		8	8	8			8 6		6	

Lane Group	Ø2
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
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)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (mph)	
Number of Detectors	
Detector Template	
Leading Detector (ft)	
Trailing Detector (ft)	
Detector 1 Position(ft)	
Detector 1 Size(ft)	
Detector 1 Type	
Detector 1 Channel	
Detector 1 Extend (s)	
Detector 1 Queue (s)	
Detector 1 Delay (s)	
Detector 2 Position(ft)	
Detector 2 Size(ft)	
Detector 2 Type	
Detector 2 Channel	
Detector 2 Extend (s)	
Turn Type	
Protected Phases	2



Lanes, Volumes, Timings  
 95: Old Columbia Pike & Industrial Parkway

11/01/2017

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases										6		
Detector Phase		5		8	8	8			8 6	6	6	
Switch Phase												
Minimum Initial (s)		5.0		4.0	4.0	4.0				7.0	7.0	
Minimum Split (s)		11.0		11.0	11.0	11.0				14.0	14.0	
Total Split (s)		17.0		56.0	56.0	56.0				77.0	77.0	
Total Split (%)		11.3%		37.3%	37.3%	37.3%				51.3%	51.3%	
Maximum Green (s)		11.0		49.0	49.0	49.0				70.0	70.0	
Yellow Time (s)		4.0		4.0	4.0	4.0				5.5	5.5	
All-Red Time (s)		2.0		3.0	3.0	3.0				1.5	1.5	
Lost Time Adjust (s)		-1.5		-1.5	-1.5	-1.5					-1.5	
Total Lost Time (s)		4.5		5.5	5.5	5.5					5.5	
Lead/Lag		Lag								Lead	Lead	
Lead-Lag Optimize?		Yes								Yes	Yes	
Vehicle Extension (s)		5.0		4.0	4.0	4.0				0.2	0.2	
Recall Mode		None		None	None	None				C-Min	C-Min	
Act Effct Green (s)		12.5		50.5	50.5	50.5			127.5		71.5	
Actuated g/C Ratio		0.08		0.34	0.34	0.34			0.85		0.48	
v/c Ratio		0.73		0.05	1.08	0.48			0.79		0.47	
Control Delay		24.4		21.0	73.6	1.7			18.2		28.9	
Queue Delay		5.0		0.0	9.7	0.0			19.8		2.4	
Total Delay		29.4		21.0	83.4	1.7			38.0		31.2	
LOS		C		C	F	A			D		C	
Approach Delay		29.4			67.2			38.0			31.2	
Approach LOS		C			E			D			C	
Queue Length 50th (ft)		0		10	~719	10			452		265	
Queue Length 95th (ft)		m0		m14	m#763	m12			1001		m288	
Internal Link Dist (ft)		76			1090			192			934	
Turn Bay Length (ft)				50		500						
Base Capacity (vph)		532		587	1688	900			3031		1673	
Starvation Cap Reductn		89		0	0	0			712		0	
Spillback Cap Reductn		0		0	64	0			0		727	
Storage Cap Reductn		0		0	0	0			0		0	
Reduced v/c Ratio		0.88		0.05	1.12	0.48			1.03		0.83	

Intersection Summary

Area Type: Other  
 Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 106 (71%), Referenced to phase 2:SBT and 6:NBT, Start of Green  
 Natural Cycle: 150  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.38  
 Intersection Signal Delay: 47.9  
 Intersection Capacity Utilization 93.4%  
 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.

Lane Group	Ø2
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	7.0
Minimum Split (s)	14.0
Total Split (s)	94.0
Total Split (%)	63%
Maximum Green (s)	87.0
Yellow Time (s)	5.5
All-Red Time (s)	1.5
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	0.2
Recall Mode	C-Min
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
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	
<b>Intersection Summary</b>	

Lanes, Volumes, Timings  
 95: Old Columbia Pike & Industrial Parkway

11/01/2017

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 95: Old Columbia Pike & Industrial Parkway

#94 ↓ Ø2 (R)				
94 s				
#94 #95 ↑ ↓ Ø6 (R)	#94 #95 ↘ → Ø5	#94 #95 ↘ ↙ ↗ ↘ Ø8		
77 s	17 s	56 s		

Lanes, Volumes, Timings  
 96: Columbia Pike (US 29) & Tech Road

11/01/2017

	↖	→	↘	↙	←	↖	↘	↑	↗	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑	↗	↘	↕		↗	↑↑↑		↘	↑↑↑	↗
Traffic Volume (vph)	25	605	142	603	805	884	283	3246	0	310	2382	150
Future Volume (vph)	25	605	142	603	805	884	283	3246	0	310	2382	150
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	400		400	300		0
Storage Lanes	1		1	1		0	2		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	0.91	0.91	0.95	0.97	0.91	1.00	1.00	0.91	1.00
Frnt			0.850		0.932							0.850
Flt Protected	0.950			0.950	0.994		0.950			0.950		
Satd. Flow (prot)	1805	1900	1615	1643	3204	0	3367	4988	0	1736	4988	1553
Flt Permitted	0.186			0.415	0.753		0.950			0.950		
Satd. Flow (perm)	353	1900	1615	718	2427	0	3367	4988	0	1736	4988	1553
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			193		144							196
Link Speed (mph)		30			30			50				50
Link Distance (ft)		269			161			495				453
Travel Time (s)		6.1			3.7			6.8				6.2
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
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	4%	4%	4%	4%	4%	4%
Adj. Flow (vph)	27	658	154	655	875	961	308	3528	0	337	2589	163
Shared Lane Traffic (%)				41%								
Lane Group Flow (vph)	27	658	154	386	2105	0	308	3528	0	337	2589	163
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			9			38				50
Link Offset(ft)		0			-10			12				0
Crosswalk Width(ft)		50			28			15				16
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	1	1	1		1	1		1	1	1
Detector Template												
Leading Detector (ft)	100	100	100	50	50		100	100		100	100	100
Trailing Detector (ft)	0	0	0	0	0		0	0		0	0	0
Detector 1 Position(ft)	0	0	0	0	0		0	0		0	0	0
Detector 1 Size(ft)	100	100	100	50	50		100	100		100	100	100
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Turn Type	Perm	NA	Prot	Perm	NA		Prot	NA		Prot	NA	Prot
Protected Phases		3	3		4		6	2		1	5	5
Permitted Phases	3			4								
Detector Phase	3	3	3	4	4		6	2		1	5	5
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0		3.0	7.0		4.0	7.0	7.0
Minimum Split (s)	12.0	12.0	12.0	12.0	12.0		10.5	14.5		11.5	14.5	14.5

Lanes, Volumes, Timings  
 96: Columbia Pike (US 29) & Tech Road

11/01/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (s)	28.0	28.0	28.0	51.0	51.0		29.0	52.0		19.0	42.0	42.0
Total Split (%)	18.7%	18.7%	18.7%	34.0%	34.0%		19.3%	34.7%		12.7%	28.0%	28.0%
Maximum Green (s)	20.0	20.0	20.0	43.0	43.0		21.5	44.5		12.5	34.5	34.5
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		5.0	5.5		4.0	5.5	5.5
All-Red Time (s)	4.0	4.0	4.0	4.0	4.0		2.5	2.0		2.5	2.0	2.0
Lost Time Adjust (s)	-1.5	-1.5	-1.5	-1.5	-1.5		-1.5	-1.5		-1.5	-1.5	-1.5
Total Lost Time (s)	6.5	6.5	6.5	6.5	6.5		6.0	6.0		5.0	6.0	6.0
Lead/Lag	Lead	Lead	Lead	Lag	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	4.0	4.0	4.0	4.0	4.0		3.0	0.2		4.0	0.2	0.2
Recall Mode	None	None	None	None	None		None	C-Min		None	C-Min	C-Min
Act Effect Green (s)	21.5	21.5	21.5	44.5	44.5		20.0	46.0		14.0	39.0	39.0
Actuated g/C Ratio	0.14	0.14	0.14	0.30	0.30		0.13	0.31		0.09	0.26	0.26
v/c Ratio	0.54	2.42	0.39	1.81	2.56		0.69	2.31		2.08	2.00	0.30
Control Delay	97.7	675.2	5.7	414.4	728.2		82.4	613.4		527.5	474.5	3.3
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	97.7	675.2	5.7	414.4	728.2		82.4	613.4		527.5	474.5	3.3
LOS	F	F	A	F	F		F	F		F	F	A
Approach Delay		533.7			679.6			570.8			455.4	
Approach LOS		F			F			F			F	
Queue Length 50th (ft)	25	~1059	0	~623	~1850		160	~2043		~526	~1450	8
Queue Length 95th (ft)	#75	#1304	31	#854	#1989		m128	m#1434		m#568	m#1512	m23
Internal Link Dist (ft)		189			81			415			373	
Turn Bay Length (ft)							400			300		
Base Capacity (vph)	50	272	396	213	821		516	1529		162	1297	549
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	0
Reduced v/c Ratio	0.54	2.42	0.39	1.81	2.56		0.60	2.31		2.08	2.00	0.30

Intersection Summary

Area Type: Other

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 116 (77%), Referenced to phase 2:NBT and 5:SBT, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 2.56

Intersection Signal Delay: 559.4

Intersection LOS: F

Intersection Capacity Utilization 177.2%

ICU Level of Service H

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

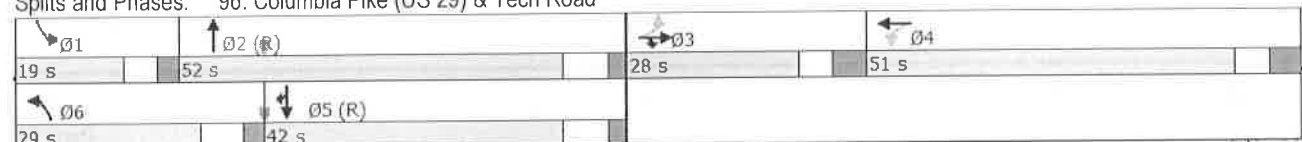
Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 96: Columbia Pike (US 29) & Tech Road



Lanes, Volumes, Timings  
107: Columbia Pike (US 29) & Cherry Hill Road

11/01/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	185	1067	31	189	1161	987	26	0	105	682	0	70
Future Volume (vph)	185	1067	31	189	1161	987	26	0	105	682	0	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	11	11	12	12	12	12	12	12	12
Storage Length (ft)	0		0	410		350	0		0	0		0
Storage Lanes	2		0	2		1	1		2	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	0.91	0.97	0.95	1.00	1.00	1.00	0.88	0.91	0.91	1.00
Frt		0.996				0.850			0.850		0.958	
Flt Protected	0.950			0.950			0.950			0.950	0.965	
Satd. Flow (prot)	3502	5166	0	3385	3490	1615	1805	0	2842	3285	1598	0
Flt Permitted	0.950			0.950			0.950			0.950	0.965	
Satd. Flow (perm)	3502	5166	0	3385	3490	1615	1805	0	2842	3285	1598	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4				868			153		156	
Link Speed (mph)		30			30			40			40	
Link Distance (ft)		368			689			473			677	
Travel Time (s)		8.4			15.7			8.1			11.5	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	197	1135	33	201	1235	1050	28	0	112	726	0	74
Shared Lane Traffic (%)										26%		
Lane Group Flow (vph)	197	1168	0	201	1235	1050	28	0	112	537	263	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		40			40			200			250	
Link Offset(ft)		0			15			10			0	
Crosswalk Width(ft)		16			0			30			35	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.04	1.04	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1		1	1	1	1		1	1	1	
Detector Template												
Leading Detector (ft)	100	100		100	100	100	100		100	100	100	
Trailing Detector (ft)	0	0		0	0	0	0		0	0	0	
Detector 1 Position(ft)	0	0		0	0	0	0		0	0	0	
Detector 1 Size(ft)	100	100		100	100	100	100		100	100	100	
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex	CI+Ex	CI+Ex		CI+Ex	CI+Ex	CI+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0	
Turn Type	Prot	NA		Prot	NA	Prot	Prot		Prot	Split	NA	
Protected Phases	1	6		5	2	2	3		3	4	4	
Permitted Phases												
Detector Phase	1	6		5	2	2	3		3	4	4	
Switch Phase												
Minimum Initial (s)	3.0	7.0		3.0	7.0	7.0	7.0		7.0	5.0	5.0	
Minimum Split (s)	10.0	16.0		10.0	16.0	16.0	15.5		15.5	26.0	26.0	

Lanes, Volumes, Timings  
 107: Columbia Pike (US 29) & Cherry Hill Road

11/01/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (s)	16.0	79.5		20.0	83.5	83.5	15.5		15.5	35.0	35.0	
Total Split (%)	10.7%	53.0%		13.3%	55.7%	55.7%	10.3%		10.3%	23.3%	23.3%	
Maximum Green (s)	9.0	70.5		13.0	74.5	74.5	7.0		7.0	27.0	27.0	
Yellow Time (s)	3.5	4.5		3.5	4.5	4.5	3.5		3.5	3.5	3.5	
All-Red Time (s)	3.5	4.5		3.5	4.5	4.5	5.0		5.0	4.5	4.5	
Lost Time Adjust (s)	-1.5	-1.5		-1.5	-1.5	-1.5	-1.5		-1.5	-1.5	-1.5	
Total Lost Time (s)	5.5	7.5		5.5	7.5	7.5	7.0		7.0	6.5	6.5	
Lead/Lag	Lag	Lead		Lag	Lead	Lead	Lead		Lead	Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes		Yes	Yes	Yes	
Vehicle Extension (s)	6.0	0.2		6.0	0.2	0.2	6.0		6.0	6.0	6.0	
Recall Mode	None	C-Min		None	C-Min	C-Min	None		None	None	None	
Act Effct Green (s)	15.8	45.6		37.6	67.4	67.4	10.0		10.0	30.3	30.3	
Actuated g/C Ratio	0.11	0.30		0.25	0.45	0.45	0.07		0.07	0.20	0.20	
v/c Ratio	0.54	0.74		0.24	0.79	0.87	0.23		0.34	0.81	0.59	
Control Delay	69.3	50.5		39.6	24.9	8.1	67.3		19.4	46.7	13.0	
Queue Delay	0.0	0.0		0.0	0.6	2.7	0.0		0.0	0.0	0.0	
Total Delay	69.3	50.5		39.6	25.5	10.8	67.3		19.4	46.7	13.0	
LOS	E	D		D	C	B	E		B	D	B	
Approach Delay		53.2			20.4			29.0				35.6
Approach LOS		D			C			C				D
Queue Length 50th (ft)	93	392		84	483	65	28		22	264	94	
Queue Length 95th (ft)	#163	420		m94	442	m98	m12		m0	m283	m100	
Internal Link Dist (ft)		288			609			393				597
Turn Bay Length (ft)				410		350						
Base Capacity (vph)	367	2481		849	1768	1246	120		332	663	447	
Starvation Cap Reductn	0	0		0	215	107	0		0	0	0	
Spillback Cap Reductn	0	0		0	0	0	0		0	0	0	
Storage Cap Reductn	0	0		0	0	0	0		0	0	0	
Reduced v/c Ratio	0.54	0.47		0.24	0.80	0.92	0.23		0.34	0.81	0.59	

Intersection Summary

Area Type: Other

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 129 (86%), Referenced to phase 2:WBT and 6:EBT, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.87

Intersection Signal Delay: 32.5

Intersection LOS: C

Intersection Capacity Utilization 77.2%

ICU Level of Service D

Analysis Period (min) 15

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 107: Columbia Pike (US 29) & Cherry Hill Road

Ø2 (R)	Ø1	Ø3	Ø4
83.5 s	16 s	15.5 s	35 s
Ø6 (R)	Ø5		
79.5 s	20 s		



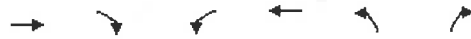
Lanes, Volumes, Timings  
109: Prosperity Drive & Cherry Hill Road

11/01/2017

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑	↗	↘	↑↑	↘	↗
Traffic Volume (vph)	1682	172	102	1881	456	233
Future Volume (vph)	1682	172	102	1881	456	233
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		250	400		0	0
Storage Lanes		1	1		1	1
Taper Length (ft)			25		25	
Lane Util. Factor	0.91	1.00	1.00	0.95	1.00	1.00
Frnt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	5187	1615	1805	3610	1805	1615
Flt Permitted			0.054		0.950	
Satd. Flow (perm)	5187	1615	103	3610	1805	1615
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		148				152
Link Speed (mph)	30			30	30	
Link Distance (ft)	689			612	401	
Travel Time (s)	15.7			13.9	9.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1828	187	111	2045	496	253
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1828	187	111	2045	496	253
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	38			30	12	
Link Offset(ft)	-12			8	0	
Crosswalk Width(ft)	30			30	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Number of Detectors	1	1	1	1	1	1
Detector Template						
Leading Detector (ft)	100	100	100	100	100	100
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	100	100	100	100	100	100
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Turn Type	NA	Perm	pm+pt	NA	Prot	Prot
Protected Phases	6		5	2	4	4
Permitted Phases		6	2			
Detector Phase	6	6	5	2	4	4
Switch Phase						
Minimum Initial (s)	7.0	7.0	3.0	7.0	5.0	5.0
Minimum Split (s)	13.5	13.5	9.5	13.5	11.0	11.0
Total Split (s)	80.1	80.1	17.9	98.0	52.0	52.0

Lanes, Volumes, Timings  
 109: Prosperity Drive & Cherry Hill Road

11/01/2017



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Total Split (%)	53.4%	53.4%	11.9%	65.3%	34.7%	34.7%
Maximum Green (s)	73.6	73.6	11.4	91.5	46.0	46.0
Yellow Time (s)	4.5	4.5	4.0	4.5	4.0	4.0
All-Red Time (s)	2.0	2.0	2.5	2.0	2.0	2.0
Lost Time Adjust (s)	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5
Total Lost Time (s)	5.0	5.0	5.0	5.0	4.5	4.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Vehicle Extension (s)	0.2	0.2	5.0	0.2	5.0	5.0
Recall Mode	C-Min	C-Min	None	C-Min	None	None
Act Effct Green (s)	77.0	77.0	94.1	94.1	46.4	46.4
Actuated g/C Ratio	0.51	0.51	0.63	0.63	0.31	0.31
v/c Ratio	0.69	0.21	0.55	0.90	0.89	0.42
Control Delay	6.7	0.7	41.8	13.6	61.9	15.9
Queue Delay	0.2	0.0	0.0	0.5	0.0	0.0
Total Delay	6.8	0.7	41.8	14.1	61.9	15.9
LOS	A	A	D	B	E	B
Approach Delay	6.2			15.5	46.4	
Approach LOS	A			B	D	
Queue Length 50th (ft)	189	1	39	918	383	55
Queue Length 95th (ft)	205	m1	m44	m752	m389	m74
Internal Link Dist (ft)	609			532	321	
Turn Bay Length (ft)		250	400			
Base Capacity (vph)	2661	900	211	2270	573	617
Starvation Cap Reductn	176	0	0	0	0	0
Spillback Cap Reductn	0	0	0	44	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.74	0.21	0.53	0.92	0.87	0.41

Intersection Summary

Area Type: Other  
 Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 116 (77%), Referenced to phase 2:WBTL and 6:EBT, Start of Green  
 Natural Cycle: 80  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.90  
 Intersection Signal Delay: 16.4  
 Intersection Capacity Utilization 85.2%  
 Analysis Period (min) 15  
 Intersection LOS: B  
 ICU Level of Service E  
 m Volume for 95th percentile queue is metered by upstream signal.

























Splits and Phases: 109: Prosperity Drive & Cherry Hill Road

← Ø2 (R)	↖ Ø4
98 s	52 s
↙ Ø5	→ Ø6 (R)
17.9 s	80.1 s

Lanes, Volumes, Timings

114: Cherry Hill Road & Broadbirch Drive/Calverton Boulevard

11/01/2017

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	365	900	253	100	386	310	126	1315	60	205	1227	483
Future Volume (vph)	365	900	253	100	386	310	126	1315	60	205	1227	483
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		500	300		200	175		0	300		100
Storage Lanes	1		1	1		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95	1.00	0.91	1.00
Frt			0.850			0.850		0.993				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1805	3610	1615	1805	3610	1615	1805	3585	0	1805	5187	1615
Flt Permitted	0.183			0.164			0.102			0.061		
Satd. Flow (perm)	348	3610	1615	312	3610	1615	194	3585	0	116	5187	1615
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			270			284		4				223
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		710			494			362			1433	
Travel Time (s)		19.4			13.5			6.2			24.4	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	420	1034	291	115	444	356	145	1511	69	236	1410	555
Shared Lane Traffic (%)												
Lane Group Flow (vph)	420	1034	291	115	444	356	145	1580	0	236	1410	555
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		32			16			16			16	
Two way Left Turn Lane											Yes	
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	1	1	1	1	1	1		1	1	1
Detector Template												
Leading Detector (ft)	100	100	100	100	100	100	100	100		100	100	100
Trailing Detector (ft)	0	0	0	0	0	0	0	0		0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0		0	0	0
Detector 1 Size(ft)	100	100	100	100	100	100	100	100		100	100	100
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Turn Type	pm+pt	NA	Free	pm+pt	NA	Free	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases	6		Free	2		Free	4			8		8
Detector Phase	1	6		5	2		7	4		3	8	8
Switch Phase												
Minimum Initial (s)	3.0	7.0		5.0	7.0		3.0	3.0		5.0	3.0	3.0
Minimum Split (s)	9.0	13.5		11.0	13.5		9.5	9.0		11.5	9.0	9.0
Total Split (s)	31.0	50.0		11.0	30.0		21.2	68.0		21.0	67.8	67.8

Lanes, Volumes, Timings

114: Cherry Hill Road & Broadbirch Drive/Calverton Boulevard

11/01/2017

	↖	→	↘	↙	←	↖	↙	↑	↗	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (%)	20.7%	33.3%		7.3%	20.0%		14.1%	45.3%		14.0%	45.2%	45.2%
Maximum Green (s)	25.0	43.5		5.0	23.5		14.7	62.0		14.5	61.8	61.8
Yellow Time (s)	4.0	4.5		4.0	4.5		4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.5	2.0		2.5	2.0	2.0
Lost Time Adjust (s)	-1.5	-1.5		-1.5	-1.5		-1.5	-1.5		-1.5	-1.5	-1.5
Total Lost Time (s)	4.5	5.0		4.5	5.0		5.0	4.5		5.0	4.5	4.5
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	4.0	0.2		3.0	0.2		5.0	4.0		3.0	4.0	4.0
Recall Mode	None	C-Min		None	C-Min		None	None		None	None	None
Act Effct Green (s)	55.9	44.4	150.0	31.4	24.4	150.0	77.4	63.5		81.3	65.7	65.7
Actuated g/C Ratio	0.37	0.30	1.00	0.21	0.16	1.00	0.52	0.42		0.54	0.44	0.44
v/c Ratio	1.09	0.97	0.18	0.88	0.76	0.22	0.57	1.04		0.94	0.62	0.67
Control Delay	109.4	72.6	0.2	92.0	69.0	0.3	37.5	65.3		104.6	12.8	6.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	109.4	72.6	0.2	92.0	69.0	0.3	37.5	65.3		104.6	12.8	6.0
LOS	F	E	A	F	E	A	D	E		F	B	A
Approach Delay		69.4			45.2			63.0			20.9	
Approach LOS		E			D			E			C	
Queue Length 50th (ft)	~386	524	0	75	220	0	80	~885		193	113	0
Queue Length 95th (ft)	#569	#623	0	#166	272	0	145	#936		#350	180	12
Internal Link Dist (ft)		630			414			282			1353	
Turn Bay Length (ft)			500	300		200	175			300		100
Base Capacity (vph)	387	1083	1615	130	601	1615	276	1519		250	2272	832
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	1.09	0.95	0.18	0.88	0.74	0.22	0.53	1.04		0.94	0.62	0.67

Intersection Summary

Area Type: Other

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 128 (85%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green

Natural Cycle: 120

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.09

Intersection Signal Delay: 48.2

Intersection LOS: D

Intersection Capacity Utilization 96.3%

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: 114: Cherry Hill Road & Broadbirch Drive/Calverton Boulevard

↖ Ø1	↙ Ø2 (R)	↘ Ø3	↑ Ø4
31 s	30 s	21 s	68 s
↙ Ø5	→ Ø6 (R)	↖ Ø7	↓ Ø8
11 s	50 s	21.2 s	67.8 s

Lanes, Volumes, Timings  
 120: Columbia Pike (US 29) & Musgrove Road

05/01/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	330	125	492	109	60	30	296	4715	185	25	2773	280
Future Volume (vph)	330	125	492	109	60	30	296	4715	185	25	2773	280
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	300		0	0		800
Storage Lanes	1		1	1		0	2		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.86	0.86	1.00	0.86	0.86
Frt			0.850		0.949			0.994			0.986	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1805	1900	1615	1805	1803	0	3367	6247	0	1736	6197	0
Flt Permitted	0.645			0.565			0.950			0.950		
Satd. Flow (perm)	1226	1900	1615	1074	1803	0	3367	6247	0	1736	6197	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			124		16			10			25	
Link Speed (mph)		30			30			50			50	
Link Distance (ft)		537			573			626			1366	
Travel Time (s)		12.2			13.0			8.5			18.6	
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
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	4%	4%	4%	4%	4%	4%
Adj. Flow (vph)	359	136	535	118	65	33	322	5125	201	27	3014	304
Shared Lane Traffic (%)												
Lane Group Flow (vph)	359	136	535	118	98	0	322	5326	0	27	3318	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			50			40	
Link Offset(ft)		0			0			10			-2	
Crosswalk Width(ft)		16			2			25			16	
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	1	1	1		1	1		1	1	
Detector Template												
Leading Detector (ft)	100	100	100	100	100		100	100		100	100	
Trailing Detector (ft)	0	0	0	0	0		0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0		0	0		0	0	
Detector 1 Size(ft)	100	100	100	100	100		100	100		100	100	
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Turn Type	Perm	NA	Perm	Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		6	2		1	5	
Permitted Phases	4		4	8								
Detector Phase	4	4	4	8	8		6	2		1	5	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		3.0	20.0		3.0	20.0	
Minimum Split (s)	11.0	11.0	11.0	11.0	11.0		10.0	27.0		9.0	27.0	

Lanes, Volumes, Timings  
120: Columbia Pike (US 29) & Musgrove Road

05/01/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (s)	37.0	37.0	37.0	37.0	37.0		23.0	104.0		9.0	90.0	
Total Split (%)	24.7%	24.7%	24.7%	24.7%	24.7%		15.3%	69.3%		6.0%	60.0%	
Maximum Green (s)	31.0	31.0	31.0	31.0	31.0		16.0	97.0		3.0	83.0	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		5.0	5.0		4.0	5.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.5	-1.5	-1.5	-1.5	-1.5		-1.5	-1.5		-1.5	-1.5	
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5		5.5	5.5		4.5	5.5	
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	3.0	
Recall Mode	None	None	None	None	None		None	C-Min		None	C-Min	
Act Effect Green (s)	32.5	32.5	32.5	32.5	32.5		17.3	102.1		4.5	84.7	
Actuated g/C Ratio	0.22	0.22	0.22	0.22	0.22		0.12	0.68		0.03	0.56	
v/c Ratio	1.35	0.33	1.20	0.51	0.24		0.83	1.25		0.52	0.95	
Control Delay	225.8	52.3	146.2	60.6	42.3		83.6	135.5		92.5	22.5	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	225.8	52.3	146.2	60.6	42.3		83.6	135.5		92.5	22.5	
LOS	F	D	F	E	D		F	F		F	C	
Approach Delay		161.5			52.3			132.5			23.0	
Approach LOS		F			D			F			C	
Queue Length 50th (ft)	~459	113	~533	103	67		171	~1970		28	259	
Queue Length 95th (ft)	#666	180	#767	173	122		m101	m216		m42	269	
Internal Link Dist (ft)		457			493			546			1286	
Turn Bay Length (ft)							300					
Base Capacity (vph)	265	411	447	232	403		392	4255		52	3508	
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	
Reduced v/c Ratio	1.35	0.33	1.20	0.51	0.24		0.82	1.25		0.52	0.95	

Intersection Summary

Area Type: Other  
 Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 10 (7%), Referenced to phase 2:NBT and 5:SBT, Start of Green  
 Natural Cycle: 150  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.35  
 Intersection Signal Delay: 98.0  
 Intersection Capacity Utilization 113.8%  
 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.  
 m Volume for 95th percentile queue is metered by upstream signal.

Intersection LOS: F  
 ICU Level of Service H
























Splits and Phases: 120: Columbia Pike (US 29) & Musgrove Road

9 s	104 s		37 s
23 s	90 s		37 s



Lanes, Volumes, Timings  
 123: Columbia Pike (US 29) & Fairland Road

05/01/2018

													
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	620	470	92	84	250	135	0	4916	159	0	2902	0	
Future Volume (vph)	620	470	92	84	250	135	0	4916	159	0	2902	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Storage Length (ft)	400		200	250		200	0		400	0		0	
Storage Lanes	2		1	2		1	0		1	0		0	
Taper Length (ft)	25			25			25			25			
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	1.00	0.86	1.00	1.00	0.81	1.00	
Frnt			0.850			0.850			0.850				
Flt Protected	0.950			0.950									
Satd. Flow (prot)	3502	3610	1615	3502	3610	1615	0	6285	1553	0	7399	0	
Flt Permitted	0.950			0.950									
Satd. Flow (perm)	3502	3610	1615	3502	3610	1615	0	6285	1553	0	7399	0	
Right Turn on Red			Yes			Yes			Yes			Yes	
Satd. Flow (RTOR)			73			116			127				
Link Speed (mph)		30			30			50			50		
Link Distance (ft)		590			440			908			551		
Travel Time (s)		13.4			10.0			12.4			7.5		
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	
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	4%	4%	4%	4%	4%	4%	
Adj. Flow (vph)	674	511	100	91	272	147	0	5343	173	0	3154	0	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	674	511	100	91	272	147	0	5343	173	0	3154	0	
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No	
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right	
Median Width(ft)		24			24			40			40		
Link Offset(ft)		0			0			0			0		
Crosswalk Width(ft)		16			16			16			16		
Two way Left Turn Lane													
Headway 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	
Turning Speed (mph)	15		9	15		9	15		9	15		9	
Number of Detectors	1	1	1	1	1	1		1	1		1		
Detector Template													
Leading Detector (ft)	100	100	100	100	100	100		100	100		100		
Trailing Detector (ft)	0	0	0	0	0	0		0	0		0		
Detector 1 Position(ft)	0	0	0	0	0	0		0	0		0		
Detector 1 Size(ft)	100	100	100	100	100	100		100	100		100		
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex		
Detector 1 Channel													
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0		
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0		
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0		
Turn Type	Prot	NA	Prot	Prot	NA	Prot		NA	Perm		NA		
Protected Phases	3	8	8	7	4	4		6			2		
Permitted Phases									6				
Detector Phase	3	8	8	7	4	4		6	6		2		
Switch Phase													
Minimum Initial (s)	5.0	4.0	4.0	5.0	4.0	4.0		10.0	10.0		10.0		
Minimum Split (s)	11.0	12.5	12.5	11.0	12.5	12.5		17.0	17.0		17.0		



Lanes, Volumes, Timings  
123: Columbia Pike (US 29) & Fairland Road

05/01/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (s)	27.0	37.0	37.0	11.0	21.0	21.0		102.0	102.0		102.0	
Total Split (%)	18.0%	24.7%	24.7%	7.3%	14.0%	14.0%		68.0%	68.0%		68.0%	
Maximum Green (s)	21.0	28.5	28.5	5.0	12.5	12.5		95.0	95.0		95.0	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0		5.0	5.0		5.0	
All-Red Time (s)	2.0	4.5	4.5	2.0	4.5	4.5		2.0	2.0		2.0	
Lost Time Adjust (s)	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5		-1.5	-1.5		-1.5	
Total Lost Time (s)	4.5	7.0	7.0	4.5	7.0	7.0		5.5	5.5		5.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes						
Vehicle Extension (s)	3.0	4.0	4.0	3.0	4.0	4.0		0.2	0.2		0.2	
Recall Mode	None	None	None	None	None	None		C-Min	C-Min		C-Min	
Act Effect Green (s)	22.5	30.0	30.0	6.5	14.0	14.0		96.5	96.5		96.5	
Actuated g/C Ratio	0.15	0.20	0.20	0.04	0.09	0.09		0.64	0.64		0.64	
v/c Ratio	1.28	0.71	0.26	0.60	0.81	0.58		1.32	0.17		0.66	
Control Delay	190.6	62.1	18.8	87.4	85.3	26.9		166.5	4.2		17.5	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	
Total Delay	190.6	62.1	18.8	87.4	85.3	26.9		166.5	4.2		17.5	
LOS	F	E	B	F	F	C		F	A		B	
Approach Delay		126.1			68.8			161.4			17.5	
Approach LOS		F			E			F			B	
Queue Length 50th (ft)	~429	247	22	45	140	29		~1951	20		448	
Queue Length 95th (ft)	#556	314	76	77	#210	104		m#1305	m11		471	
Internal Link Dist (ft)		510			360			828			471	
Turn Bay Length (ft)	400		200	250		200			400			
Base Capacity (vph)	525	722	381	151	336	255		4043	1044		4760	
Starvation Cap Reductn	0	0	0	0	0	0		0	0		0	
Spillback Cap Reductn	0	0	0	0	0	0		0	0		0	
Storage Cap Reductn	0	0	0	0	0	0		0	0		0	
Reduced v/c Ratio	1.28	0.71	0.26	0.60	0.81	0.58		1.32	0.17		0.66	

Intersection Summary

Area Type: Other

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 1 (1%), Referenced to phase 2:SBT and 6:NBT, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.32

Intersection Signal Delay: 109.2

Intersection LOS: F

Intersection Capacity Utilization 111.5%

ICU Level of Service H

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.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 123: Columbia Pike (US 29) & Fairland Road

Ø2 (R) 102 s	Ø6 (R) 102 s	Ø3 27 s	Ø4 21 s
		Ø7 11 s	Ø8 37 s

Lanes, Volumes, Timings

130: Centerpark Driveway/Beltsville Drive & Powder Mill Road (MD 212)

11/01/2017

	↖	→	↗	↖	←	↖	↖	↑	↗	↘	↓	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↖	↖	↖	↖↖	↖		↖↖	↖	↖↖	↖	↖
Traffic Volume (vph)	296	1176	30	30	1031	646	20	30	75	1160	10	233
Future Volume (vph)	296	1176	30	30	1031	646	20	30	75	1160	10	233
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	16	12	12	12	12	12	12	12	12	12
Storage Length (ft)	350		360	350		0	0		0	0		250
Storage Lanes	1		1	1		1	0		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.95	0.95	1.00	0.91	0.91	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950				0.980		0.950	0.954	
Satd. Flow (prot)	1646	3292	1727	1703	3406	1524	0	3538	1615	3285	1649	1615
Flt Permitted	0.122			0.142				0.980		0.950	0.954	
Satd. Flow (perm)	211	3292	1727	255	3406	1524	0	3538	1615	3285	1649	1615
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			102			552			138			168
Link Speed (mph)		40			40			35				35
Link Distance (ft)		921			477			217				528
Travel Time (s)		15.7			8.1			4.2				10.3
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
Heavy Vehicles (%)	6%	6%	6%	6%	6%	6%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	322	1278	33	33	1121	702	22	33	82	1261	11	253
Shared Lane Traffic (%)										33%		
Lane Group Flow (vph)	322	1278	33	33	1121	702	0	55	82	845	427	253
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		18			18			30			30	
Link Offset(ft)		5			-5			-25			15	
Crosswalk Width(ft)		30			20			17			37	
Two way Left Turn Lane												
Headway Factor	1.04	1.04	0.85	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	1	1	1	1	1	1	1	1	1	1
Detector Template							Left					
Leading Detector (ft)	100	394	100	100	494	100	20	100	100	100	100	100
Trailing Detector (ft)	0	294	0	0	394	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	294	0	0	394	0	0	0	0	0	0	0
Detector 1 Size(ft)	100	100	100	100	100	100	20	100	100	100	100	100
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	1	6		5	2		4	4		8	8	
Permitted Phases	6		6	2		2			4			8
Detector Phase	1	6	6	5	2	2	4	4	4	8	8	8
Switch Phase												
Minimum Initial (s)	5.0	20.0	20.0	5.0	20.0	20.0	7.0	7.0	7.0	8.0	8.0	8.0

Lanes, Volumes, Timings

130: Centerpark Driveway/Beltsville Drive & Powder Mill Road (MD 212)

11/01/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Split (s)	10.0	26.0	26.0	10.0	26.0	26.0	13.0	13.0	13.0	14.0	14.0	14.0
Total Split (s)	21.0	112.0	112.0	10.0	101.0	101.0	13.0	13.0	13.0	15.0	15.0	15.0
Total Split (%)	14.0%	74.7%	74.7%	6.7%	67.3%	67.3%	8.7%	8.7%	8.7%	10.0%	10.0%	10.0%
Maximum Green (s)	16.0	106.0	106.0	5.0	95.0	95.0	7.0	7.0	7.0	9.0	9.0	9.0
Yellow Time (s)	4.0	5.0	5.0	4.0	5.0	5.0	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	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5		-1.5	-1.5	-1.5	-1.5	-1.5
Total Lost Time (s)	3.5	4.5	4.5	3.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?												
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
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None	None	None	None	None
Act Effct Green (s)	91.9	82.9	82.9	77.4	69.9	69.9		9.5	9.5	36.1	36.1	36.1
Actuated g/C Ratio	0.61	0.55	0.55	0.52	0.47	0.47		0.06	0.06	0.24	0.24	0.24
v/c Ratio	1.09	0.70	0.03	0.17	0.71	0.70		0.25	0.35	1.07	1.08	0.49
Control Delay	106.9	26.5	0.1	11.7	33.9	9.0		69.3	4.4	103.2	118.1	22.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Delay	106.9	26.5	0.1	11.7	33.9	9.0		69.3	4.4	103.2	118.1	22.6
LOS	F	C	A	B	C	A		E	A	F	F	C
Approach Delay		41.8			24.1			30.4			94.0	
Approach LOS		D			C			C			F	
Queue Length 50th (ft)	-245	483	0	12	453	101		27	0	-495	-503	67
Queue Length 95th (ft)	#400	428	0	19	423	191		52	2	#852	#962	184
Internal Link Dist (ft)		841			397			137			448	
Turn Bay Length (ft)	350		360	350								250
Base Capacity (vph)	296	2359	1266	194	2191	1177		223	231	791	397	516
Starvation Cap Reductn	0	0	0	0	0	0		0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0		0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0		0	0	0	0	0
Reduced v/c Ratio	1.09	0.54	0.03	0.17	0.51	0.60		0.25	0.35	1.07	1.08	0.49

Intersection Summary

Area Type: Other

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.09

Intersection Signal Delay: 50.6

Intersection LOS: D

Intersection Capacity Utilization 84.5%

ICU Level of Service E

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: 130: Centerpark Driveway/Beltsville Drive & Powder Mill Road (MD 212)

21 s	101 s	13 s	15 s
10 s	112 s		

Lanes, Volumes, Timings

160: New Hampshire Ave (MD 650) & Quaint Acres Drive/Heartfields Drive

11/01/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔	↔	↔	↔↔↔		↔	↔↔↔	
Traffic Volume (vph)	5	0	1	26	0	21	17	2883	41	32	1562	10
Future Volume (vph)	5	0	1	26	0	21	17	2883	41	32	1562	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	9	12	12	12	12	12	11	12	12	11	12
Storage Length (ft)	0		0	65		0	225		0	235		0
Storage Lanes	0		0	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Flt		0.977				0.850		0.998			0.999	
Flt Protected		0.960			0.950		0.950			0.950		
Satd. Flow (prot)	0	1604	0	0	1805	1615	1736	4812	0	1736	4816	0
Flt Permitted		0.742			0.754		0.950			0.950		
Satd. Flow (perm)	0	1240	0	0	1433	1615	1736	4812	0	1736	4816	0
Right Turn on Red			Yes			Yes			No			No
Satd. Flow (RTOR)		136				136						
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		249			185			622			424	
Travel Time (s)		6.8			5.0			10.6			7.2	
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
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	4%	4%	4%	4%	4%	4%
Adj. Flow (vph)	5	0	1	28	0	23	18	3134	45	35	1698	11
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	6	0	0	28	23	18	3179	0	35	1709	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			18			18	
Link Offset(ft)		-2			14			5			0	
Crosswalk Width(ft)		10			18			26			22	
Two way Left Turn Lane												
Headway Factor	1.00	1.14	1.00	1.00	1.00	1.00	1.00	1.04	1.00	1.00	1.04	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1		1	2	1	1	1		1	1	
Detector Template	Left			Left								
Leading Detector (ft)	20	100		20	100	100	100	100		100	100	
Trailing Detector (ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Size(ft)	20	100		20	40	100	100	100		100	100	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)					94							
Detector 2 Size(ft)					6							
Detector 2 Type					Cl+Ex							
Detector 2 Channel												
Detector 2 Extend (s)					0.0							
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA		Prot	NA	

Lanes, Volumes, Timings

160: New Hampshire Ave (MD 650) & Quaint Acres Drive/Heartfields Drive

11/01/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases		4			8		1	6		5	2	
Permitted Phases	4			8		8						
Detector Phase	4	4		8	8	8	1	6		5	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	10.0		5.0	10.0	
Minimum Split (s)	11.5	11.5		11.5	11.5	11.5	11.0	22.5		11.0	22.5	
Total Split (s)	12.6	12.6		12.6	12.6	12.6	11.0	96.4		11.0	96.4	
Total Split (%)	10.5%	10.5%		10.5%	10.5%	10.5%	9.2%	80.3%		9.2%	80.3%	
Maximum Green (s)	6.1	6.1		6.1	6.1	6.1	5.0	90.4		5.0	90.4	
Yellow Time (s)	3.5	3.5		3.5	3.5	3.5	3.5	4.5		3.5	4.5	
All-Red Time (s)	3.0	3.0		3.0	3.0	3.0	2.5	1.5		2.5	1.5	
Lost Time Adjust (s)		-1.5			-1.5	-1.5	-1.5	-1.5		-1.5	-1.5	
Total Lost Time (s)		5.0			5.0	5.0	4.5	4.5		4.5	4.5	
Lead/Lag							Lag	Lag		Lead	Lead	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	5.0	5.0		5.0	5.0	5.0	5.0	0.2		5.0	0.2	
Recall Mode	None	None		None	None	None	None	C-Min		None	C-Min	
Act Effect Green (s)		9.1			9.1	9.1	12.6	98.3		7.9	99.3	
Actuated g/C Ratio		0.08			0.08	0.08	0.10	0.82		0.07	0.83	
v/c Ratio		0.03			0.26	0.09	0.10	0.81		0.31	0.43	
Control Delay		0.2			59.3	0.8	46.4	10.4		61.8	5.3	
Queue Delay		0.0			0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay		0.2			59.3	0.8	46.4	10.4		61.8	5.3	
LOS		A			E	A	D	B		E	A	
Approach Delay		0.2			32.9			10.6			6.5	
Approach LOS		A			C			B			A	
Queue Length 50th (ft)		0			20	0	13	634		26	98	
Queue Length 95th (ft)		0			53	0	32	602		62	315	
Internal Link Dist (ft)		169			105			542			344	
Turn Bay Length (ft)							225			235		
Base Capacity (vph)		219			108	247	182	3979		114	4130	
Starvation Cap Reductn		0			0	0	0	0		0	0	
Spillback Cap Reductn		0			0	0	0	0		0	0	
Storage Cap Reductn		0			0	0	0	0		0	0	
Reduced v/c Ratio		0.03			0.26	0.09	0.10	0.80		0.31	0.41	

**Intersection Summary**

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBT, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.81

Intersection Signal Delay: 9.4

Intersection Capacity Utilization 77.0%

Analysis Period (min) 15

Intersection LOS: A  
ICU Level of Service D

Splits and Phases: 160: New Hampshire Ave (MD 650) & Quaint Acres Drive/Heartfields Drive

Ø2 (R)	Ø1	Ø4
96.4 s	11 s	12.6 s
Ø5	Ø6 (R)	Ø8
11 s	96.4 s	12.6 s

Lanes, Volumes, Timings  
170: Tech Road & Industrial Parkway

11/01/2017

	↖	→	↗	↖	←	↖	↖	↑	↗	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖↖	↖↖	↖		↖↖	↖	↖	↖	↖	↖	↖↖	
Traffic Volume (vph)	749	1307	25	5	1256	966	150	210	15	347	50	380
Future Volume (vph)	749	1307	25	5	1256	966	150	210	15	347	50	380
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	12	12	12	12	12	12	12	12
Storage Length (ft)	425		0	0		500	100		0	0		0
Storage Lanes	2		1	0		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	0.91	0.91	0.95
Flt Protected	0.950		0.850			0.850		0.990			0.887	
Satd. Flow (prot)	3385	3490	1615	0	3610	1615	1805	1881	0	1643	3046	0
Flt Permitted	0.063				0.948		0.950			0.950	0.993	
Satd. Flow (perm)	224	3490	1615	0	3422	1615	1805	1881	0	1643	3046	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			65			590		2			325	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1170			886			326			280	
Travel Time (s)		26.6			20.1			7.4			6.4	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	797	1390	27	5	1336	1028	160	223	16	369	53	404
Shared Lane Traffic (%)										21%		
Lane Group Flow (vph)	797	1390	27	0	1341	1028	160	239	0	292	534	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		22			16			10			12	
Link Offset(ft)		0			-5			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.04	1.04	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	1	1	1	1	1	1		1	1	
Detector Template				Left								
Leading Detector (ft)	100	100	100	20	100	100	100	100		100	100	
Trailing Detector (ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Size(ft)	100	100	100	20	100	100	100	100		100	100	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Turn Type	pm+pt	NA	Perm	Perm	NA	Free	Split	NA		Split	NA	
Protected Phases	1	6			2		4	4		8	8	
Permitted Phases	6		6	2		Free						
Detector Phase	1	6	6	2	2		4	4		8	8	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	11.5	24.0	24.0	26.0	26.0		24.0	24.0		24.0	24.0	



Lanes, Volumes, Timings  
170: Tech Road & Industrial Parkway

11/01/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (s)	32.2	96.0	96.0	63.8	63.8		24.0	24.0		30.0	30.0	
Total Split (%)	21.5%	64.0%	64.0%	42.5%	42.5%		16.0%	16.0%		20.0%	20.0%	
Maximum Green (s)	26.2	90.0	90.0	57.8	57.8		18.0	18.0		24.0	24.0	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.5	-1.5	-1.5		-1.5		-1.5	-1.5		-1.5	-1.5	
Total Lost Time (s)	4.5	4.5	4.5		4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead			Lag								
Lead-Lag Optimize?	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	None	C-Min	C-Min	C-Min	C-Min		None	None		None	None	
Act Effect Green (s)	91.5	91.5	91.5		59.3	150.0	19.5	19.5		25.5	25.5	
Actuated g/C Ratio	0.61	0.61	0.61		0.40	1.00	0.13	0.13		0.17	0.17	
v/c Ratio	1.11	0.65	0.03		0.99	0.64	0.68	0.97		1.05	0.68	
Control Delay	95.4	27.8	0.6		67.4	1.9	78.0	113.8		125.0	27.0	
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	95.4	27.8	0.6		67.4	1.9	78.0	113.8		125.0	27.0	
LOS	F	C	A		E	A	E	F		F	C	
Approach Delay		51.8			39.0			99.5			61.7	
Approach LOS		D			D			F			E	
Queue Length 50th (ft)	~403	606	0		682	0	152	235		~339	105	
Queue Length 95th (ft)	#538	673	m0		#849	0	#236	#416		#551	175	
Internal Link Dist (ft)		1090			806			246			200	
Turn Bay Length (ft)	425					500	100					
Base Capacity (vph)	720	2128	1010		1352	1615	234	246		279	787	
Starvation Cap Reductn	0	0	0		0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0		0	0	0	0		0	0	
Storage Cap Reductn	0	0	0		0	0	0	0		0	0	
Reduced v/c Ratio	1.11	0.65	0.03		0.99	0.64	0.68	0.97		1.05	0.68	

Intersection Summary

Area Type: Other

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 14 (9%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.11

Intersection Signal Delay: 51.2

Intersection LOS: D

Intersection Capacity Utilization 113.8%

ICU Level of Service H

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.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 170: Tech Road & Industrial Parkway

32.2 s	63.8 s	24 s	30 s
96 s			



Lanes, Volumes, Timings

181: Beltsville Drive & Calverton Boulevard/Calverton Tower Driveway

11/01/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	21	1	778	19	9	0	751	315	5	0	199	16
Future Volume (vph)	21	1	778	19	9	0	751	315	5	0	199	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	10	10	12	12	12	12	12	12	12
Storage Length (ft)	200		0	0		0	200		0	125		0
Storage Lanes	1		1	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95	0.97	1.00	1.00	1.00	1.00	1.00
Flt			0.850					0.998			0.989	
Flt Protected	0.950				0.968		0.950					
Satd. Flow (prot)	1736	1900	1568	0	3262	0	3433	1774	0	1900	1792	0
Flt Permitted	0.737				0.863		0.950					
Satd. Flow (perm)	1346	1900	1568	0	2908	0	3433	1774	0	1900	1792	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			767					2			6	
Link Speed (mph)		30			30			35			35	
Link Distance (ft)		690			171			458			205	
Travel Time (s)		15.7			3.9			8.9			4.0	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	4%	0%	3%	0%	0%	0%	2%	7%	0%	0%	5%	3%
Adj. Flow (vph)	22	1	828	20	10	0	799	335	5	0	212	17
Shared Lane Traffic (%)												
Lane Group Flow (vph)	22	1	828	0	30	0	799	340	0	0	229	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			6			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.09	1.09	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA	Perm	Perm	NA		Prot	NA		Perm	NA	
Protected Phases		4			8		5	2			6	
Permitted Phases	4		4	8						6		
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5		9.5	22.5		22.5	22.5	
Total Split (s)	22.5	22.5	22.5	22.5	22.5		24.2	47.0		22.8	22.8	
Total Split (%)	32.4%	32.4%	32.4%	32.4%	32.4%		34.8%	67.6%		32.8%	32.8%	
Maximum Green (s)	18.0	18.0	18.0	18.0	18.0		19.7	42.5		18.3	18.3	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	
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)	-1.5	-1.5	-1.5		-1.5		-1.5	-1.5		-1.5	-1.5	
Total Lost Time (s)	3.0	3.0	3.0		3.0		3.0	3.0		3.0	3.0	
Lead/Lag							Lead			Lag	Lag	
Lead-Lag Optimize?							Yes			Yes	Yes	
Walk Time (s)	7.0	7.0	7.0	7.0	7.0			7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0			11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0	0	0	0			0		0	0	
Act Effct Green (s)	19.5	19.5	19.5		19.5		21.2	44.0			19.8	

Lanes, Volumes, Timings

181: Beltsville Drive & Calverton Boulevard/Calverton Tower Driveway

11/01/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio	0.28	0.28	0.28		0.28		0.31	0.63			0.28	
v/c Ratio	0.06	0.00	0.84		0.04		0.76	0.30			0.45	
Control Delay	19.0	18.0	12.3		18.4		27.6	6.6			23.1	
Queue Delay	0.0	0.0	0.0		0.0		0.0	0.0			0.0	
Total Delay	19.0	18.0	12.3		18.4		27.6	6.6			23.1	
LOS	B	B	B		B		C	A			C	
Approach Delay		12.5			18.4			21.4			23.1	
Approach LOS		B			B			C			C	
Queue Length 50th (ft)	7	0	19		4		157	57			77	
Queue Length 95th (ft)	23	4	#242		14		220	95			137	
Internal Link Dist (ft)		610			91			378			125	
Turn Bay Length (ft)	200						200					
Base Capacity (vph)	377	533	991		815		1047	1123			514	
Starvation Cap Reductn	0	0	0		0		0	0			0	
Spillback Cap Reductn	0	0	0		0		0	0			0	
Storage Cap Reductn	0	0	0		0		0	0			0	
Reduced v/c Ratio	0.06	0.00	0.84		0.04		0.76	0.30			0.45	

Intersection Summary

Area Type: Other  
 Cycle Length: 69.5  
 Actuated Cycle Length: 69.5  
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green  
 Natural Cycle: 70  
 Control Type: Pretimed  
 Maximum v/c Ratio: 0.84  
 Intersection Signal Delay: 18.2  
 Intersection Capacity Utilization 73.8%  
 Analysis Period (min) 15  
 Intersection LOS: B  
 ICU Level of Service D  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 181: Beltsville Drive & Calverton Boulevard/Calverton Tower Driveway

Ø2 (R)			Ø4
47 s			22.5 s
Ø5		Ø6 (R)	Ø8
24.2 s		22.8 s	22.5 s

Lanes, Volumes, Timings

185: Old Columbia Pike & Columbia Pike (US 29) Right Turn







11/01/2017

	↗	↘	↖	↑	↓	↙
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↗↗			↑↑	↑↑	
Traffic Volume (vph)	1425	0	0	804	660	0
Future Volume (vph)	1425	0	0	804	660	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11
Lane Util. Factor	0.97	1.00	1.00	0.95	0.95	1.00
Frt						
Flt Protected	0.950					
Satd. Flow (prot)	3385	0	0	3490	3490	0
Flt Permitted	0.950					
Satd. Flow (perm)	3385	0	0	3490	3490	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)						
Link Speed (mph)	30			30	30	
Link Distance (ft)	152			343	133	
Travel Time (s)	3.5			7.8	3.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1549	0	0	874	717	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1549	0	0	874	717	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	22			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	5			16	16	
Two way Left Turn Lane						
Headway Factor	1.04	1.04	1.04	1.04	1.04	1.04
Turning Speed (mph)	15	9	15			9
Turn Type	Prot			NA	NA	
Protected Phases	4!			4!	6	
Permitted Phases						
Minimum Split (s)	22.5			22.5	22.5	
Total Split (s)	48.0			48.0	27.0	
Total Split (%)	64.0%			64.0%	36.0%	
Maximum Green (s)	43.5			43.5	22.5	
Yellow Time (s)	3.5			3.5	3.5	
All-Red Time (s)	1.0			1.0	1.0	
Lost Time Adjust (s)	-1.5			-1.5	-1.5	
Total Lost Time (s)	3.0			3.0	3.0	
Lead/Lag						
Lead-Lag Optimize?						
Walk Time (s)	7.0			7.0	7.0	
Flash Dont Walk (s)	11.0			11.0	11.0	
Pedestrian Calls (#/hr)	0			0	0	
Act Effct Green (s)	45.0			45.0	24.0	
Actuated g/C Ratio	0.60			0.60	0.32	
v/c Ratio	0.76			0.42	0.64	
Control Delay	11.8			8.8	17.3	
Queue Delay	1.0			0.1	0.0	

Lanes, Volumes, Timings

185: Old Columbia Pike & Columbia Pike (US 29) Right Turn



11/01/2017

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Total Delay	12.8			8.8	17.3	
LOS	B			A	B	
Approach Delay	12.8			8.8	17.3	
Approach LOS	B			A	B	
Queue Length 50th (ft)	424			102	225	
Queue Length 95th (ft)	m257			139	221	
Internal Link Dist (ft)	72			263	53	
Turn Bay Length (ft)						
Base Capacity (vph)	2031			2094	1116	
Starvation Cap Reductn	0			0	0	
Spillback Cap Reductn	232			239	0	
Storage Cap Reductn	0			0	0	
Reduced v/c Ratio	0.86			0.47	0.64	

Intersection Summary













Area Type: Other  
 Cycle Length: 75  
 Actuated Cycle Length: 75  
 Offset: 53 (71%), Referenced to phase 2: and 6:SBT, Start of Green  
 Natural Cycle: 60  
 Control Type: Pretimed  
 Maximum v/c Ratio: 0.76  
 Intersection Signal Delay: 12.7 Intersection LOS: B  
 Intersection Capacity Utilization 69.5% ICU Level of Service C  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.  
 ! Phase conflict between lane groups.

Splits and Phases: 185: Old Columbia Pike & Columbia Pike (US 29) Right Turn

 Ø6 (R) 27 s	 Ø4 48 s
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Lanes, Volumes, Timings  
193: FDA Boulevard & B-5

11/01/2017

						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	675	1148	318	500	175	90
Future Volume (vph)	675	1148	318	500	175	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	600			0	0	100
Storage Lanes	1			1	1	1
Taper Length (ft)	75				25	
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Fr <sub>t</sub>				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1805	3610	3610	1615	1805	1615
Flt Permitted	0.510				0.950	
Satd. Flow (perm)	969	3610	3610	1615	1805	1615
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				543		98
Link Speed (mph)		25	30		30	
Link Distance (ft)		1125	1271		801	
Travel Time (s)		30.7	28.9		18.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	734	1248	346	543	190	98
Shared Lane Traffic (%)						
Lane Group Flow (vph)	734	1248	346	543	190	98
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		12	12		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		20	30		25	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Number of Detectors	1	2	2	1	1	1
Detector Template						
Leading Detector (ft)	50	100	100	50	50	50
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	50	50	50	50	50	50
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94	94			
Detector 2 Size(ft)		6	6			
Detector 2 Type		CI+Ex	CI+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type	pm+pt	NA	NA	Perm	Prot	Free
Protected Phases	7	4	8		6	
Permitted Phases	4			8		Free

Lanes, Volumes, Timings  
193: FDA Boulevard & B-5

11/01/2017




Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Detector Phase	7	4	8	8	6	
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	9.5	22.5	22.5	22.5	22.5	
Total Split (s)	10.0	66.0	56.0	56.0	24.0	
Total Split (%)	11.1%	73.3%	62.2%	62.2%	26.7%	
Maximum Green (s)	5.5	61.5	51.5	51.5	19.5	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	-1.5	-1.5	-1.5	-1.5	-1.5	
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	Max	Max	Max	None	
Walk Time (s)		7.0	7.0	7.0	7.0	
Flash Dont Walk (s)		11.0	11.0	11.0	11.0	
Pedestrian Calls (#/hr)		0	0	0	0	
Act Effct Green (s)	63.1	63.1	53.1	53.1	15.5	84.6
Actuated g/C Ratio	0.75	0.75	0.63	0.63	0.18	1.00
v/c Ratio	0.93	0.46	0.15	0.45	0.58	0.06
Control Delay	29.4	5.2	7.2	2.0	38.7	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.4	5.2	7.2	2.0	38.7	0.1
LOS	C	A	A	A	D	A
Approach Delay		14.2	4.0		25.6	
Approach LOS		B	A		C	
Queue Length 50th (ft)	133	108	35	0	93	0
Queue Length 95th (ft)	#439	187	63	39	157	0
Internal Link Dist (ft)		1045	1191		721	
Turn Bay Length (ft)	600					100
Base Capacity (vph)	792	2694	2266	1216	449	1615
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.93	0.46	0.15	0.45	0.42	0.06

Intersection Summary

Area Type: Other  
 Cycle Length: 90  
 Actuated Cycle Length: 84.6  
 Natural Cycle: 75  
 Control Type: Semi Act-Uncoord  
 Maximum v/c Ratio: 0.93  
 Intersection Signal Delay: 12.4  
 Intersection Capacity Utilization 75.0%  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.













Splits and Phases: 193: FDA Boulevard & B-5

 Ø6	 Ø4	
	66 s	
 Ø7	 Ø8	
		10 s
24 s		



HCM Unsignalized Intersection Capacity Analysis  
 72: Old Columbia Pike/Prosperity Drive & Tech Road

11/01/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		←↑→		←	↑↓				↑↑			↑↑
Traffic Volume (veh/h)	185	627	103	350	2170	128	0	0	145	0	0	122
Future Volume (Veh/h)	185	627	103	350	2170	128	0	0	145	0	0	122
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	199	674	111	376	2333	138	0	0	156	0	0	131
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh												
Upstream signal (ft)		161										
pX, platoon unblocked												
vC, conflicting volume	2471			785			3046	4350	392	3889	4337	1236
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	2471			785			3046	4350	392	3889	4337	1236
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	0			55			0	0	75	0	0	23
cM capacity (veh/h)	190			843			0	0	612	0	0	171
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1	SB 2			
Volume Total	536	448	376	1555	916	78	78	66	66			
Volume Left	199	0	376	0	0	0	0	0	0			
Volume Right	0	111	0	0	138	78	78	66	66			
cSH	190	1700	843	1700	1700	612	612	171	171			
Volume to Capacity	1.05	0.26	0.45	0.91	0.54	0.13	0.13	0.38	0.38			
Queue Length 95th (ft)	230	0	58	0	0	11	11	41	41			
Control Delay (s)	129.4	0.0	12.7	0.0	0.0	11.7	11.7	38.6	38.6			
Lane LOS	F		B			B	B	E	E			
Approach Delay (s)	70.5		1.7			11.7		38.6				
Approach LOS						B		E				
<b>Intersection Summary</b>												
Average Delay			19.7									
Intersection Capacity Utilization			96.7%		ICU Level of Service			F				
Analysis Period (min)			15									

Intersection	
Intersection Delay, s/veh	28.9
Intersection LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↵	↵	↵		↕		↵	↕			↕	
Traffic Vol, veh/h	12	56	17	1	56	10	753	68	10	1	42	290
Future Vol, veh/h	12	56	17	1	56	10	753	68	10	1	42	290
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
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	13	61	18	1	61	11	818	74	11	1	46	315
Number of Lanes	1	1	1	0	1	0	1	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	3	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	3	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	1	3
HCM Control Delay	11.3	12.9	35	21.4
HCM LOS	B	B	D	C

Lane	NBLn1	NBLn2	EBLn1	EBLn2	EBLn3	WBLn1	SBLn1
Vol Left, %	100%	81%	100%	0%	0%	1%	0%
Vol Thru, %	0%	16%	0%	97%	0%	84%	13%
Vol Right, %	0%	2%	0%	3%	100%	15%	87%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	414	417	12	58	15	67	333
LT Vol	414	339	12	0	0	1	1
Through Vol	0	68	0	56	0	56	42
RT Vol	0	10	0	2	15	10	290
Lane Flow Rate	450	453	13	63	17	73	362
Geometry Grp	8	8	7	7	7	8	8
Degree of Util (X)	0.84	0.832	0.03	0.134	0.032	0.171	0.661
Departure Headway (Hd)	6.718	6.607	8.251	7.716	7.018	8.435	6.579
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	536	544	432	462	507	428	547
Service Time	4.493	4.381	6.038	5.502	4.804	6.135	4.374
HCM Lane V/C Ratio	0.84	0.833	0.03	0.136	0.034	0.171	0.662
HCM Control Delay	35.7	34.3	11.3	11.7	10	12.9	21.4
HCM Lane LOS	E	D	B	B	A	B	C
HCM 95th-tile Q	8.7	8.5	0.1	0.5	0.1	0.6	4.8

Intersection

Intersection Delay, s/veh	7.7
Intersection LOS	A

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↑↑	
Traffic Vol, veh/h	151	0	0	455	0	0
Future Vol, veh/h	151	0	0	455	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	164	0	0	495	0	0
Number of Lanes	2	0	0	2	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	2	2	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	2
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	2
HCM Control Delay	7.1	7.9	0
HCM LOS	A	A	-

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2
Vol Left, %	0%	0%	0%	0%	0%
Vol Thru, %	100%	100%	100%	100%	100%
Vol Right, %	0%	0%	0%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	0	76	76	228	228
LT Vol	0	0	0	0	0
Through Vol	0	76	76	228	228
RT Vol	0	0	0	0	0
Lane Flow Rate	0	82	82	247	247
Geometry Grp	2	7	7	7	7
Degree of Util (X)	0	0.109	0.07	0.315	0.198
Departure Headway (Hd)	5.038	4.762	3.059	4.58	2.878
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	0	750	1160	786	1246
Service Time	3.038	2.51	0.806	2.299	0.597
HCM Lane V/C Ratio	0	0.109	0.071	0.314	0.198
HCM Control Delay	8	8.1	6	9.4	6.3
HCM Lane LOS	N	A	A	A	A
HCM 95th-tile Q	0	0.4	0.2	1.4	0.7

Intersection	
Intersection Delay, s/veh	9.2
Intersection LOS	A

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔		↔	↔	↔	↔
Traffic Vol, veh/h	0	0	109	0	0	547
Future Vol, veh/h	0	0	109	0	0	547
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	0	118	0	0	595
Number of Lanes	1	0	1	1	1	1

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	2	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	2	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	2	0	2
HCM Control Delay	0	9.6	9.1
HCM LOS	-	A	A

Lane	NBLn1	NBLn2	EBLn1	WBLn1	WBLn2
Vol Left, %	0%	0%	0%	100%	100%
Vol Thru, %	0%	0%	100%	0%	0%
Vol Right, %	100%	100%	0%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	274	274	0	55	55
LT Vol	0	0	0	55	55
Through Vol	0	0	0	0	0
RT Vol	274	274	0	0	0
Lane Flow Rate	297	297	0	59	59
Geometry Grp	7	7	4	7	7
Degree of Util (X)	0.344	0.344	0	0.101	0.101
Departure Headway (Hd)	4.169	4.169	5.586	6.164	6.164
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	865	865	0	581	581
Service Time	1.88	1.88	3.63	3.908	3.908
HCM Lane V/C Ratio	0.343	0.343	0	0.102	0.102
HCM Control Delay	9.1	9.1	8.6	9.6	9.6
HCM Lane LOS	A	A	N	A	A
HCM 95th-lile Q	1.5	1.5	0	0.3	0.3