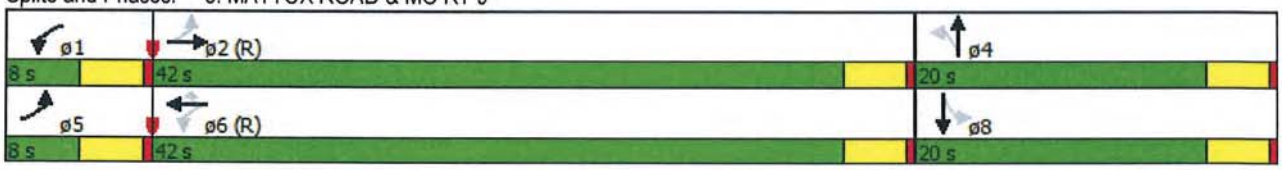
Intersection Summary	
Area Type: Other	
Cycle Length: 70	
Actuated Cycle Length: 70	
Offset: 54 (77%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.55	
Intersection Signal Delay: 6.5	Intersection LOS: A
Intersection Capacity Utilization 47.9%	ICU Level of Service A
Analysis Period (min) 15	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 3: MATTOX ROAD & MO RT 9



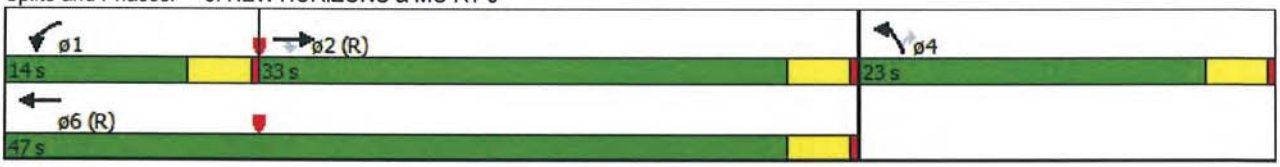
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	560	139	152	1011	271	198
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		250	570		470	0
Storage Lanes		1	2		2	2
Taper Length (ft)			25		25	
Lane Util. Factor	0.91	1.00	0.97	0.95	0.97	0.88
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	4803	1495	3242	3343	3242	2632
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	4803	1495	3242	3343	3242	2632
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		156				222
Link Speed (mph)	55			55	45	
Link Distance (ft)	1314			1700	640	
Travel Time (s)	16.3			21.1	9.7	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	8%	8%	8%	8%	8%	8%
Adj. Flow (vph)	629	156	171	1136	304	222
Shared Lane Traffic (%)						
Lane Group Flow (vph)	629	156	171	1136	304	222
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)	16			16	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	2	1	1	2	1	1
Detector Template	Thru	Right	Left	Thru	Left	Right
Leading Detector (ft)	100	20	20	100	20	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	6	20	20	6	20	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
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	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	4	
Permitted Phases		2				4

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Detector Phase	2	2	1	6	4	4
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	8.0	20.0	20.0	20.0
Total Split (s)	33.0	33.0	14.0	47.0	23.0	23.0
Total Split (%)	47.1%	47.1%	20.0%	67.1%	32.9%	32.9%
Maximum Green (s)	29.0	29.0	10.0	43.0	19.0	19.0
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max	None	C-Max	None	None
Walk Time (s)	5.0	5.0		5.0	5.0	5.0
Flash Dont Walk (s)	11.0	11.0		11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0		0	0	0
Act Effct Green (s)	37.0	37.0	9.0	50.0	12.0	12.0
Actuated g/C Ratio	0.53	0.53	0.13	0.71	0.17	0.17
v/c Ratio	0.25	0.18	0.41	0.48	0.55	0.35
Control Delay	8.7	1.8	30.6	5.5	29.9	5.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.7	1.8	30.6	5.5	29.9	5.4
LOS	A	A	C	A	C	A
Approach Delay	7.3			8.8	19.6	
Approach LOS	A			A	B	
90th %ile Green (s)	30.5	30.5	11.5	46.0	16.0	16.0
90th %ile Term Code	Coord	Coord	Gap	Coord	Gap	Gap
70th %ile Green (s)	34.8	34.8	10.0	48.8	13.2	13.2
70th %ile Term Code	Coord	Coord	Gap	Coord	Gap	Gap
50th %ile Green (s)	37.2	37.2	9.0	50.2	11.8	11.8
50th %ile Term Code	Coord	Coord	Gap	Coord	Gap	Gap
30th %ile Green (s)	39.6	39.6	8.0	51.6	10.4	10.4
30th %ile Term Code	Coord	Coord	Gap	Coord	Gap	Gap
10th %ile Green (s)	43.0	43.0	6.5	53.5	8.5	8.5
10th %ile Term Code	Coord	Coord	Gap	Coord	Gap	Gap
Stops (vph)	244	14	132	400	235	28
Fuel Used(gal)	10	1	5	19	6	1
CO Emissions (g/hr)	712	103	352	1360	398	97
NOx Emissions (g/hr)	139	20	68	265	78	19
VOC Emissions (g/hr)	165	24	82	315	92	23
Dilemma Vehicles (#)	43	0	0	72	0	0
Queue Length 50th (ft)	41	0	35	86	62	0
Queue Length 95th (ft)	69	15	59	152	90	26
Internal Link Dist (ft)	1234			1620	560	
Turn Bay Length (ft)		250	570		470	
Base Capacity (vph)	2540	864	477	2388	879	876
Starvation Cap Reductn	0	0	0	0	0	0

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.18	0.36	0.48	0.35	0.25

Intersection Summary	
Area Type: Other	
Cycle Length: 70	
Actuated Cycle Length: 70	
Offset: 64 (91%), Referenced to phase 2:EBT and 6:WBT, Start of Green	
Natural Cycle: 50	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.55	
Intersection Signal Delay: 10.5	Intersection LOS: B
Intersection Capacity Utilization 42.3%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 5: NEW HORIZONS & MO RT 9



Appendix VI Synchro Analysis – 2015 AM PM Existing, Mattox with Signal and EB Rt. Lane

3: MATTOX & MO RT 9
EXISTING AM PEAK HOUR (SIG & RT MATTOX)

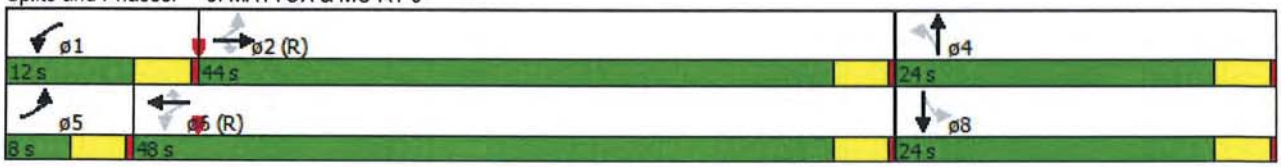
8/20/2015

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	886	23	78	435	21	6	0	29	107	3	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	230		230	290		210	0		0	0		0
Storage Lanes	1		1	1		1	0		0	0		0
Taper Length (ft)	100			100			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850		0.888			0.984	
Flt Protected	0.950			0.950				0.992			0.959	
Satd. Flow (prot)	1770	3343	1495	1671	3343	1583	0	1550	0	0	1758	0
Flt Permitted	0.463			0.203				0.950			0.729	
Satd. Flow (perm)	862	3343	1495	357	3343	1583	0	1484	0	0	1336	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			68			68		68			8	
Link Speed (mph)		55			55			30			30	
Link Distance (ft)		1213			950			605			134	
Travel Time (s)		15.0			11.8			13.8			3.0	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Heavy Vehicles (%)	2%	8%	8%	8%	8%	2%	8%	2%	8%	2%	2%	2%
Adj. Flow (vph)	12	1042	27	92	512	25	7	0	34	126	4	18
Shared Lane Traffic (%)												
Lane Group Flow (vph)	12	1042	27	92	512	25	0	41	0	0	148	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			0			0	
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	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100	20	20	100	20	20	100		20	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	6	20	20	6	20	20	6		20	6	
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	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			4			8	
Permitted Phases	2		2	6		6	4			8		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	5	2	2	1	6	6	4	4		8	8	
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Minimum Split (s)	8.0	20.0	20.0	8.0	20.0	20.0	20.0	20.0		20.0	20.0	
Total Split (s)	8.0	44.0	44.0	12.0	48.0	48.0	24.0	24.0		24.0	24.0	
Total Split (%)	10.0%	55.0%	55.0%	15.0%	60.0%	60.0%	30.0%	30.0%		30.0%	30.0%	
Maximum Green (s)	4.0	40.0	40.0	8.0	44.0	44.0	20.0	20.0		20.0	20.0	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5		3.5	3.5	
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5		0.5	0.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0			0.0	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0		4.0			4.0	
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	
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	53.7	49.5	49.5	58.4	56.7	56.7		13.6			13.6	
Actuated g/C Ratio	0.67	0.62	0.62	0.73	0.71	0.71		0.17			0.17	
v/c Ratio	0.02	0.50	0.03	0.25	0.22	0.02		0.13			0.63	
Control Delay	4.6	11.2	0.3	6.7	4.3	0.0		3.9			40.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0			0.0	
Total Delay	4.6	11.2	0.3	6.7	4.3	0.0		3.9			40.4	
LOS	A	B	A	A	A	A		A			D	
Approach Delay		10.9			4.5			3.9			40.4	
Approach LOS		B			A			A			D	
90th %ile Green (s)	4.3	40.0	40.0	8.3	44.0	44.0	19.7	19.7		19.7	19.7	
90th %ile Term Code	Max	Coord	Coord	Max	Coord	Coord	Hold	Hold		Gap	Gap	
70th %ile Green (s)	0.0	44.4	44.4	7.4	55.8	55.8	16.2	16.2		16.2	16.2	
70th %ile Term Code	Skip	Coord	Coord	Gap	Coord	Coord	Hold	Hold		Gap	Gap	
50th %ile Green (s)	0.0	47.6	47.6	6.7	58.3	58.3	13.7	13.7		13.7	13.7	
50th %ile Term Code	Skip	Coord	Coord	Gap	Coord	Coord	Hold	Hold		Gap	Gap	
30th %ile Green (s)	0.0	50.8	50.8	6.1	60.9	60.9	11.1	11.1		11.1	11.1	
30th %ile Term Code	Skip	Coord	Coord	Gap	Coord	Coord	Hold	Hold		Gap	Gap	
10th %ile Green (s)	0.0	64.5	64.5	0.0	64.5	64.5	7.5	7.5		7.5	7.5	
10th %ile Term Code	Skip	Coord	Coord	Skip	Coord	Coord	Hold	Hold		Gap	Gap	
Stops (vph)	4	488	0	25	115	0		3			106	
Fuel Used(gal)	0	18	0	1	5	0		0			2	
CO Emissions (g/hr)	11	1251	12	73	359	9		15			123	
NOx Emissions (g/hr)	2	243	2	14	70	2		3			24	
VOC Emissions (g/hr)	3	290	3	17	83	2		3			28	
Dilemma Vehicles (#)	0	55	0	0	31	0		0			0	
Queue Length 50th (ft)	1	146	0	9	27	0		0			66	
Queue Length 95th (ft)	7	228	1	31	68	0		10			106	
Internal Link Dist (ft)		1133			870			525			54	
Turn Bay Length (ft)	230		230	290		210						
Base Capacity (vph)	639	2066	950	392	2369	1141		422			340	
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	0.02	0.50	0.03	0.23	0.22	0.02		0.10			0.44	

Intersection Summary	
Area Type: Other	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 48 (60%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.63	
Intersection Signal Delay: 10.9	Intersection LOS: B
Intersection Capacity Utilization 52.5%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 3: MATTOX & MO RT 9



5: NEW HORIZONS & MO RT 9
EXISTING AM PEAK HOUR (SIG & RT MATTOX)

8/20/2015

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	764	258	136	434	100	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		250	570		470	0
Storage Lanes		1	2		2	2
Taper Length (ft)			25		25	
Lane Util. Factor	0.91	1.00	0.97	0.95	0.97	0.88
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	5085	1583	3433	3539	3433	2787
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	5085	1583	3433	3539	3433	2787
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		304				45
Link Speed (mph)	55			55	45	
Link Distance (ft)	1314			1700	640	
Travel Time (s)	16.3			21.1	9.7	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	899	304	160	511	118	45
Shared Lane Traffic (%)						
Lane Group Flow (vph)	899	304	160	511	118	45
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)	16			16	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	2	1	1	2	1	1
Detector Template	Thru	Right	Left	Thru	Left	Right
Leading Detector (ft)	100	20	20	100	20	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	6	20	20	6	20	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
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	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	4	
Permitted Phases		2				4
Detector Phase	2	2	1	6	4	4

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	8.0	20.0	20.0	20.0
Total Split (s)	41.0	41.0	17.0	58.0	22.0	22.0
Total Split (%)	51.3%	51.3%	21.3%	72.5%	27.5%	27.5%
Maximum Green (s)	37.0	37.0	13.0	54.0	18.0	18.0
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max	None	C-Max	None	None
Act Effct Green (s)	52.8	52.8	9.1	66.7	8.1	8.1
Actuated g/C Ratio	0.66	0.66	0.11	0.83	0.10	0.10
v/c Ratio	0.27	0.26	0.41	0.17	0.34	0.14
Control Delay	2.5	0.5	35.8	2.0	35.7	11.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	2.5	0.5	35.8	2.0	35.7	11.7
LOS	A	A	D	A	D	B
Approach Delay	2.0			10.1	29.0	
Approach LOS	A			B	C	
90th %ile Green (s)	46.3	46.3	11.5	61.8	10.2	10.2
90th %ile Term Code	Coord	Coord	Gap	Coord	Gap	Gap
70th %ile Green (s)	48.9	48.9	10.1	63.0	9.0	9.0
70th %ile Term Code	Coord	Coord	Gap	Coord	Gap	Gap
50th %ile Green (s)	50.8	50.8	9.1	63.9	8.1	8.1
50th %ile Term Code	Coord	Coord	Gap	Coord	Gap	Gap
30th %ile Green (s)	52.7	52.7	8.0	64.7	7.3	7.3
30th %ile Term Code	Coord	Coord	Gap	Coord	Gap	Gap
10th %ile Green (s)	65.4	65.4	6.6	76.0	0.0	0.0
10th %ile Term Code	Coord	Coord	Gap	Coord	Skip	Skip
Stops (vph)	87	0	122	80	89	12
Fuel Used(gal)	8	2	5	6	2	0
CO Emissions (g/hr)	585	152	330	443	157	28
NOx Emissions (g/hr)	114	30	64	86	31	5
VOC Emissions (g/hr)	136	35	76	103	36	6
Dilemma Vehicles (#)	11	0	0	24	0	0
Queue Length 50th (ft)	20	0	39	22	28	0
Queue Length 95th (ft)	25	0	61	35	48	14
Internal Link Dist (ft)	1234			1620	560	
Turn Bay Length (ft)		250	570		470	
Base Capacity (vph)	3357	1148	557	2949	772	661
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	0.27	0.26	0.29	0.17	0.15	0.07

Intersection Summary

Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green			
Natural Cycle: 50			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.41			
Intersection Signal Delay: 6.8		Intersection LOS: A	
Intersection Capacity Utilization 32.0%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 5: NEW HORIZONS & MO RT 9

3: MATTOX & MO RT 9
EXISTING PM PEAK HOUR (SIG & RT MATTOX)

8/20/2015

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	31	575	6	34	1098	122	9	1	103	59	1	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	230		230	290		210	0		0	0		0
Storage Lanes	1		1	1		1	0		0	0		0
Taper Length (ft)	100			100			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850		0.877			0.974	
Flt Protected	0.950			0.950				0.996			0.962	
Satd. Flow (prot)	1770	3343	1495	1671	3343	1583	0	1537	0	0	1745	0
Flt Permitted	0.190			0.400				0.972			0.614	
Satd. Flow (perm)	354	3343	1495	704	3343	1583	0	1500	0	0	1114	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			78			134		113			16	
Link Speed (mph)		55			55			30			30	
Link Distance (ft)		1213			950			605			134	
Travel Time (s)		15.0			11.8			13.8			3.0	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	2%	8%	8%	8%	8%	2%	8%	2%	8%	2%	2%	2%
Adj. Flow (vph)	34	632	7	37	1207	134	10	1	113	65	1	16
Shared Lane Traffic (%)												
Lane Group Flow (vph)	34	632	7	37	1207	134	0	124	0	0	82	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			0			0	
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	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100	20	20	100	20	20	100		20	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	6	20	20	6	20	20	6		20	6	
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	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			4			8	
Permitted Phases	2		2	6		6	4			8		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	5	2	2	1	6	6	4	4		8	8	
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Minimum Split (s)	8.0	20.0	20.0	8.0	20.0	20.0	20.0	20.0		20.0	20.0	
Total Split (s)	8.0	42.0	42.0	8.0	42.0	42.0	20.0	20.0		20.0	20.0	
Total Split (%)	11.4%	60.0%	60.0%	11.4%	60.0%	60.0%	28.6%	28.6%		28.6%	28.6%	
Maximum Green (s)	4.0	38.0	38.0	4.0	38.0	38.0	16.0	16.0		16.0	16.0	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5		3.5	3.5	
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5		0.5	0.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0			0.0	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0		4.0			4.0	
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	
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	Min	Min		Min	Min	
Walk Time (s)		5.0	5.0		5.0	5.0	5.0	5.0		5.0	5.0	
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)	51.5	49.0	49.0	51.7	49.1	49.1		8.8			8.8	
Actuated g/C Ratio	0.74	0.70	0.70	0.74	0.70	0.70		0.13			0.13	
v/c Ratio	0.09	0.27	0.01	0.06	0.51	0.12		0.43			0.54	
Control Delay	3.2	5.5	0.0	2.5	5.6	1.1		12.1			36.3	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0			0.0	
Total Delay	3.2	5.5	0.0	2.5	5.6	1.1		12.1			36.3	
LOS	A	A	A	A	A	A		B			D	
Approach Delay		5.4			5.1			12.1			36.3	
Approach LOS		A			A			B			D	
90th %ile Green (s)	6.5	38.7	38.7	6.7	38.9	38.9	12.6	12.6		12.6	12.6	
90th %ile Term Code	Gap	Coord	Coord	Gap	Coord	Coord	Hold	Hold		Gap	Gap	
70th %ile Green (s)	6.0	41.6	41.6	6.1	41.7	41.7	10.3	10.3		10.3	10.3	
70th %ile Term Code	Gap	Coord	Coord	Gap	Coord	Coord	Hold	Hold		Gap	Gap	
50th %ile Green (s)	0.0	53.4	53.4	0.0	53.4	53.4	8.6	8.6		8.6	8.6	
50th %ile Term Code	Skip	Coord	Coord	Skip	Coord	Coord	Hold	Hold		Gap	Gap	
30th %ile Green (s)	0.0	55.0	55.0	0.0	55.0	55.0	7.0	7.0		7.0	7.0	
30th %ile Term Code	Skip	Coord	Coord	Skip	Coord	Coord	Hold	Hold		Gap	Gap	
10th %ile Green (s)	0.0	56.5	56.5	0.0	56.5	56.5	5.5	5.5		5.5	5.5	
10th %ile Term Code	Skip	Coord	Coord	Skip	Coord	Coord	Gap	Gap		Gap	Gap	
Stops (vph)	8	207	0	7	378	5		28			59	
Fuel Used(gal)	0	9	0	0	15	1		1			1	
CO Emissions (g/hr)	28	623	3	25	1041	60		68			67	
NOx Emissions (g/hr)	6	121	1	5	203	12		13			13	
VOC Emissions (g/hr)	7	144	1	6	241	14		16			16	
Dilemma Vehicles (#)	0	41	0	0	76	0		0			0	
Queue Length 50th (ft)	3	30	0	2	52	0		4			27	
Queue Length 95th (ft)	10	103	0	m8	190	13		45			64	
Internal Link Dist (ft)		1133			870			525			54	
Turn Bay Length (ft)	230		230	290		210						
Base Capacity (vph)	379	2342	1070	601	2344	1150		430			266	
Starvation Cap Reductn	0	0	0	0	0	0		0			0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
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	0.09	0.27	0.01	0.06	0.51	0.12		0.29			0.31	

Intersection Summary

Area Type: Other
Cycle Length: 70
Actuated Cycle Length: 70
Offset: 54 (77%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.54
Intersection Signal Delay: 6.7 Intersection LOS: A
Intersection Capacity Utilization 47.9% ICU Level of Service A
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: MATTOX & MO RT 9

5: NEW HORIZONS & MO RT 9
EXISTING PM PEAK HOUR (SIG & RT MATTOX)

8/20/2015

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	560	139	152	1011	271	198
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		250	570		470	0
Storage Lanes		1	2		2	2
Taper Length (ft)			25		25	
Lane Util. Factor	0.91	1.00	0.97	0.95	0.97	0.88
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	4803	1495	3242	3343	3242	2632
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	4803	1495	3242	3343	3242	2632
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		156				222
Link Speed (mph)	55			55	45	
Link Distance (ft)	1314			1700	640	
Travel Time (s)	16.3			21.1	9.7	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	8%	8%	8%	8%	8%	8%
Adj. Flow (vph)	629	156	171	1136	304	222
Shared Lane Traffic (%)						
Lane Group Flow (vph)	629	156	171	1136	304	222
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)	16			16	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	2	1	1	2	1	1
Detector Template	Thru	Right	Left	Thru	Left	Right
Leading Detector (ft)	100	20	20	100	20	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	6	20	20	6	20	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
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	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	4	
Permitted Phases		2				4

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Detector Phase	2	2	1	6	4	4
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	8.0	20.0	20.0	20.0
Total Split (s)	33.0	33.0	14.0	47.0	23.0	23.0
Total Split (%)	47.1%	47.1%	20.0%	67.1%	32.9%	32.9%
Maximum Green (s)	29.0	29.0	10.0	43.0	19.0	19.0
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max	None	C-Max	None	None
Act Effct Green (s)	37.0	37.0	9.0	50.0	12.0	12.0
Actuated g/C Ratio	0.53	0.53	0.13	0.71	0.17	0.17
v/c Ratio	0.25	0.18	0.41	0.48	0.55	0.35
Control Delay	8.7	1.8	30.6	5.5	29.9	5.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.7	1.8	30.6	5.5	29.9	5.4
LOS	A	A	C	A	C	A
Approach Delay	7.3			8.8	19.6	
Approach LOS	A			A	B	
90th %ile Green (s)	30.5	30.5	11.5	46.0	16.0	16.0
90th %ile Term Code	Coord	Coord	Gap	Coord	Gap	Gap
70th %ile Green (s)	34.8	34.8	10.0	48.8	13.2	13.2
70th %ile Term Code	Coord	Coord	Gap	Coord	Gap	Gap
50th %ile Green (s)	37.2	37.2	9.0	50.2	11.8	11.8
50th %ile Term Code	Coord	Coord	Gap	Coord	Gap	Gap
30th %ile Green (s)	39.6	39.6	8.0	51.6	10.4	10.4
30th %ile Term Code	Coord	Coord	Gap	Coord	Gap	Gap
10th %ile Green (s)	43.0	43.0	6.5	53.5	8.5	8.5
10th %ile Term Code	Coord	Coord	Gap	Coord	Gap	Gap
Stops (vph)	245	14	132	400	235	28
Fuel Used(gal)	10	1	5	19	6	1
CO Emissions (g/hr)	713	103	352	1360	398	97
NOx Emissions (g/hr)	139	20	68	265	78	19
VOC Emissions (g/hr)	165	24	82	315	92	23
Dilemma Vehicles (#)	43	0	0	72	0	0
Queue Length 50th (ft)	41	0	35	86	62	0
Queue Length 95th (ft)	69	15	59	152	90	26
Internal Link Dist (ft)	1234			1620	560	
Turn Bay Length (ft)		250	570		470	
Base Capacity (vph)	2540	864	477	2388	879	876
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	0.25	0.18	0.36	0.48	0.35	0.25

Intersection Summary		
Area Type:	Other	
Cycle Length: 70		
Actuated Cycle Length: 70		
Offset: 64 (91%), Referenced to phase 2:EBT and 6:WBT, Start of Green		
Natural Cycle: 50		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 0.55		
Intersection Signal Delay: 10.5		Intersection LOS: B
Intersection Capacity Utilization 42.3%		ICU Level of Service A
Analysis Period (min) 15		

Splits and Phases: 5: NEW HORIZONS & MO RT 9

Appendix VII Synchro Analysis – 2035 AM PM Projected

Intersection	
Int Delay, s/veh	71.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	12	1081	28	95	531	26	7	0	35	131	4	18
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	230	-	-	290	-	210	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	85	85	85	85	85	85
Heavy Vehicles, %	2	8	8	8	8	2	8	2	8	2	2	2
Mvmt Flow	14	1272	33	112	625	31	8	0	41	154	5	21

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	625	0	0	1305	0	0	1854	2164	652	1512	2181	312
Stage 1	-	-	-	-	-	-	1316	1316	-	848	848	-
Stage 2	-	-	-	-	-	-	538	848	-	664	1333	-
Critical Hdwy	4.14	-	-	4.26	-	-	7.66	6.54	7.06	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.66	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.66	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.28	-	-	3.58	4.02	3.38	3.52	4.02	3.32
Pot Cap-1 Maneuver	952	-	-	495	-	-	43	47	397	~ 83	45	684
Stage 1	-	-	-	-	-	-	158	226	-	322	376	-
Stage 2	-	-	-	-	-	-	480	376	-	416	221	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	952	-	-	495	-	-	31	36	397	~ 61	34	684
Mov Cap-2 Maneuver	-	-	-	-	-	-	31	36	-	~ 61	34	-
Stage 1	-	-	-	-	-	-	156	223	-	317	291	-
Stage 2	-	-	-	-	-	-	354	291	-	367	218	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	2.1	46.8	$ 895.3
HCM LOS			E	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	134	952	-	-	495	-	-	67
HCM Lane V/C Ratio	0.369	0.015	-	-	0.226	-	-	2.687
HCM Control Delay (s)	46.8	8.8	-	-	14.4	-	-	$ 895.3
HCM Lane LOS	E	A	-	-	B	-	-	F
HCM 95th %tile Q(veh)	1.5	0	-	-	0.9	-	-	17.9

Notes

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

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	932	315	166	530	122	46
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		250	570		470	0
Storage Lanes		1	2		2	2
Taper Length (ft)			25		25	
Lane Util. Factor	0.91	1.00	0.97	0.95	0.97	0.88
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	4803	1495	3242	3343	3242	2632
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	4803	1495	3242	3343	3242	2632
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		371				54
Link Speed (mph)	55			55	45	
Link Distance (ft)	1308			1700	640	
Travel Time (s)	16.2			21.1	9.7	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Heavy Vehicles (%)	8%	8%	8%	8%	8%	8%
Adj. Flow (vph)	1096	371	195	624	144	54
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1096	371	195	624	144	54
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)	16			16	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	2	1	1	2	1	1
Detector Template	Thru	Right	Left	Thru	Left	Right
Leading Detector (ft)	100	20	20	100	20	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	6	20	20	6	20	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
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	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	4	
Permitted Phases		2				4

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Detector Phase	2	2	1	6	4	4
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	21.0	21.0	9.0	21.0	21.0	21.0
Total Split (s)	23.0	23.0	11.0	34.0	21.0	21.0
Total Split (%)	41.8%	41.8%	20.0%	61.8%	38.2%	38.2%
Maximum Green (s)	18.0	18.0	6.0	29.0	16.0	16.0
Yellow Time (s)	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
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	Max	Max	None	Max	None	None
Act Effct Green (s)	23.1	23.1	6.0	31.6	7.4	7.4
Actuated g/C Ratio	0.51	0.51	0.13	0.69	0.16	0.16
v/c Ratio	0.45	0.39	0.46	0.27	0.27	0.11
Control Delay	11.1	3.1	22.9	4.3	18.5	6.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.1	3.1	22.9	4.3	18.5	6.8
LOS	B	A	C	A	B	A
Approach Delay	9.1			8.7	15.3	
Approach LOS	A			A	B	
90th %ile Green (s)	18.0	18.0	6.0	29.0	9.2	9.2
90th %ile Term Code	MaxR	MaxR	Max	MaxR	Gap	Gap
70th %ile Green (s)	18.0	18.0	6.0	29.0	8.1	8.1
70th %ile Term Code	MaxR	MaxR	Max	MaxR	Gap	Gap
50th %ile Green (s)	18.0	18.0	6.0	29.0	7.4	7.4
50th %ile Term Code	MaxR	MaxR	Max	MaxR	Gap	Gap
30th %ile Green (s)	18.0	18.0	6.0	29.0	6.7	6.7
30th %ile Term Code	MaxR	MaxR	Max	MaxR	Gap	Gap
10th %ile Green (s)	35.2	35.2	0.0	35.2	0.0	0.0
10th %ile Term Code	Dwell	Dwell	Skip	Dwell	Skip	Skip
Stops (vph)	604	38	145	194	97	15
Fuel Used(gal)	21	4	5	10	2	0
CO Emissions (g/hr)	1471	246	367	683	152	31
NOx Emissions (g/hr)	286	48	71	133	30	6
VOC Emissions (g/hr)	341	57	85	158	35	7
Dilemma Vehicles (#)	86	0	0	50	0	0
Queue Length 50th (ft)	80	0	25	32	18	0
Queue Length 95th (ft)	113	34	48	53	34	10
Internal Link Dist (ft)	1228			1620	560	
Turn Bay Length (ft)		250	570		470	
Base Capacity (vph)	2437	941	428	2324	1144	963
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	0.45	0.39	0.46	0.27	0.13	0.06

Intersection Summary	
Area Type: Other	
Cycle Length: 55	
Actuated Cycle Length: 45.5	
Natural Cycle: 55	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.46	
Intersection Signal Delay: 9.4	Intersection LOS: A
Intersection Capacity Utilization 38.7%	ICU Level of Service A
Analysis Period (min) 15	
90th %ile Actuated Cycle: 48.2	
70th %ile Actuated Cycle: 47.1	
50th %ile Actuated Cycle: 46.4	
30th %ile Actuated Cycle: 45.7	
10th %ile Actuated Cycle: 40.2	

Splits and Phases: 5: NEW HORIZONS & MO RT 9

Intersection	
Int Delay, s/veh	63

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	38	702	7	41	1340	149	11	1	126	72	1	31
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	230	-	-	290	-	210	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	2	8	8	8	8	2	8	2	8	2	2	2
Mvmt Flow	42	771	8	45	1473	164	12	1	138	79	1	34

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1473	0	0	779	0	0	1686	2422	390	2033	2426	736
Stage 1	-	-	-	-	-	-	859	859	-	1563	1563	-
Stage 2	-	-	-	-	-	-	827	1563	-	470	863	-
Critical Hdwy	4.14	-	-	4.26	-	-	7.66	6.54	7.06	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.66	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.66	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.28	-	-	3.58	4.02	3.38	3.52	4.02	3.32
Pot Cap-1 Maneuver	454	-	-	796	-	-	57	32	592	~ 33	32	361
Stage 1	-	-	-	-	-	-	305	371	-	117	171	-
Stage 2	-	-	-	-	-	-	319	171	-	543	370	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	454	-	-	796	-	-	45	27	592	~ 22	27	361
Mov Cap-2 Maneuver	-	-	-	-	-	-	45	27	-	~ 22	27	-
Stage 1	-	-	-	-	-	-	277	337	-	106	161	-
Stage 2	-	-	-	-	-	-	271	161	-	376	336	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.7	0.3	32.3	$ 1472.7
HCM LOS			D	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	279	454	-	-	796	-	-	31
HCM Lane V/C Ratio	0.544	0.092	-	-	0.057	-	-	3.687
HCM Control Delay (s)	32.3	13.7	-	-	9.8	-		$ 1472.7
HCM Lane LOS	D	B	-	-	A	-	-	F
HCM 95th %tile Q(veh)	3	0.3	-	-	0.2	-	-	13.6

Notes

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

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	683	170	185	1234	331	242
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		250	570		470	0
Storage Lanes		1	2		2	2
Taper Length (ft)			25		25	
Lane Util. Factor	0.91	1.00	0.97	0.95	0.97	0.88
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	4803	1495	3242	3343	3242	2632
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	4803	1495	3242	3343	3242	2632
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		191				272
Link Speed (mph)	55			55	45	
Link Distance (ft)	1308			1700	640	
Travel Time (s)	16.2			21.1	9.7	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	8%	8%	8%	8%	8%	8%
Adj. Flow (vph)	767	191	208	1387	372	272
Shared Lane Traffic (%)						
Lane Group Flow (vph)	767	191	208	1387	372	272
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)	16			16	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	2	1	1	2	1	1
Detector Template	Thru	Right	Left	Thru	Left	Right
Leading Detector (ft)	100	20	20	100	20	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	6	20	20	6	20	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
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	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	4	
Permitted Phases		2				4

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Detector Phase	2	2	1	6	4	4
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	21.0	21.0	9.0	21.0	21.0	21.0
Total Split (s)	23.0	23.0	11.0	34.0	21.0	21.0
Total Split (%)	41.8%	41.8%	20.0%	61.8%	38.2%	38.2%
Maximum Green (s)	18.0	18.0	6.0	29.0	16.0	16.0
Yellow Time (s)	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
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	Max	None	None
Act Effct Green (s)	20.4	20.4	6.0	29.1	11.2	11.2
Actuated g/C Ratio	0.41	0.41	0.12	0.58	0.22	0.22
v/c Ratio	0.39	0.27	0.54	0.72	0.52	0.34
Control Delay	12.8	3.7	27.3	11.0	19.7	3.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.8	3.7	27.3	11.0	19.7	3.9
LOS	B	A	C	B	B	A
Approach Delay	11.0			13.1	13.0	
Approach LOS	B			B	B	
90th %ile Green (s)	18.0	18.0	6.0	29.0	15.3	15.3
90th %ile Term Code	Max	Max	Max	MaxR	Gap	Gap
70th %ile Green (s)	18.0	18.0	6.0	29.0	13.2	13.2
70th %ile Term Code	Hold	Hold	Max	MaxR	Gap	Gap
50th %ile Green (s)	18.0	18.0	6.0	29.0	10.8	10.8
50th %ile Term Code	Hold	Hold	Max	MaxR	Gap	Gap
30th %ile Green (s)	18.0	18.0	6.0	29.0	9.5	9.5
30th %ile Term Code	Hold	Hold	Max	MaxR	Gap	Gap
10th %ile Green (s)	29.0	29.0	0.0	29.0	7.8	7.8
10th %ile Term Code	Hold	Hold	Skip	MaxR	Gap	Gap
Stops (vph)	461	26	165	825	265	31
Fuel Used(gal)	16	2	6	31	6	2
CO Emissions (g/hr)	1119	141	425	2193	419	111
NOx Emissions (g/hr)	218	27	83	427	82	22
VOC Emissions (g/hr)	259	33	99	508	97	26
Dilemma Vehicles (#)	60	0	0	122	0	0
Queue Length 50th (ft)	60	0	29	128	49	0
Queue Length 95th (ft)	99	34	60	238	80	23
Internal Link Dist (ft)	1228			1620	560	
Turn Bay Length (ft)		250	570		470	
Base Capacity (vph)	1948	720	387	1931	1033	1024
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	0.39	0.27	0.54	0.72	0.36	0.27

Intersection Summary		
Area Type:	Other	
Cycle Length: 55		
Actuated Cycle Length: 50.3		
Natural Cycle: 55		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 0.72		
Intersection Signal Delay: 12.5		Intersection LOS: B
Intersection Capacity Utilization 51.9%		ICU Level of Service A
Analysis Period (min) 15		
90th %ile Actuated Cycle: 54.3		
70th %ile Actuated Cycle: 52.2		
50th %ile Actuated Cycle: 49.8		
30th %ile Actuated Cycle: 48.5		
10th %ile Actuated Cycle: 46.8		

Splits and Phases: 5: NEW HORIZONS & MO RT 9

Appendix VIII Synchro Analysis – 2035 AM PM Projected, Mattox with EB Rt. Lane

3: MATTOX ROAD & MO RT 9
2035 AM PEAK HOUR (TWSC & RT MATTOX)

8/20/2015

Intersection	
Int Delay, s/veh	71.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	12	1081	28	95	531	26	7	0	35	131	4	18
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	230	-	230	290	-	210	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	85	85	85	85	85	85
Heavy Vehicles, %	2	8	8	8	8	2	8	2	8	2	2	2
Mvmt Flow	14	1272	33	112	625	31	8	0	41	154	5	21

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	625	0	0	1272	0	0	1838	2148	636	1512	2148	312
Stage 1	-	-	-	-	-	-	1300	1300	-	848	848	-
Stage 2	-	-	-	-	-	-	538	848	-	664	1300	-
Critical Hdwy	4.14	-	-	4.26	-	-	7.66	6.54	7.06	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.66	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.66	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.28	-	-	3.58	4.02	3.38	3.52	4.02	3.32
Pot Cap-1 Maneuver	952	-	-	510	-	-	44	48	406	~ 83	48	684
Stage 1	-	-	-	-	-	-	162	230	-	322	376	-
Stage 2	-	-	-	-	-	-	480	376	-	416	230	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	952	-	-	510	-	-	32	37	406	~ 61	37	684
Mov Cap-2 Maneuver	-	-	-	-	-	-	32	37	-	~ 61	37	-
Stage 1	-	-	-	-	-	-	160	227	-	317	293	-
Stage 2	-	-	-	-	-	-	357	293	-	368	227	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	2	45	$ 895.3
HCM LOS			E	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	138	952	-	-	510	-	-	67
HCM Lane V/C Ratio	0.358	0.015	-	-	0.219	-	-	2.687
HCM Control Delay (s)	45	8.8	-	-	14	-	-	$ 895.3
HCM Lane LOS	E	A	-	-	B	-	-	F
HCM 95th %tile Q(veh)	1.5	0	-	-	0.8	-	-	17.9

Notes

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

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	932	315	166	530	122	46
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		250	570		470	0
Storage Lanes		1	2		2	2
Taper Length (ft)			25		25	
Lane Util. Factor	0.91	1.00	0.97	0.95	0.97	0.88
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	4803	1495	3242	3343	3242	2632
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	4803	1495	3242	3343	3242	2632
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		371				54
Link Speed (mph)	55			55	45	
Link Distance (ft)	1307			1700	640	
Travel Time (s)	16.2			21.1	9.7	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Heavy Vehicles (%)	8%	8%	8%	8%	8%	8%
Adj. Flow (vph)	1096	371	195	624	144	54
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1096	371	195	624	144	54
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)	16			16	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	2	1	1	2	1	1
Detector Template	Thru	Right	Left	Thru	Left	Right
Leading Detector (ft)	100	20	20	100	20	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	6	20	20	6	20	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
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	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	4		3	8	2	
Permitted Phases		4				2