

APPENDIX D

OPERATIONAL ANALYSIS - 2040 CONDITIONS

Lanes, Volumes, Timings
1: Commerce Rd & Orchard Lake Rd

01/20/2021



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	424	74	64	325	679	335
Future Volume (vph)	424	74	64	325	679	335
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11
Storage Length (ft)	500	500	0			0
Storage Lanes	1	0	0			1
Taper Length (ft)	50		25			
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	1.00
Fr _t		0.850				0.850
Fl _t Protected	0.950			0.992		
Satd. Flow (prot)	1678	1501	0	3329	1766	1501
Fl _t Permitted	0.950			0.598		
Satd. Flow (perm)	1678	1501	0	2007	1766	1501
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		67				285
Link Speed (mph)	35			35	35	
Link Distance (ft)	916			721	733	
Travel Time (s)	17.8			14.0	14.3	
Peak Hour Factor	0.91	0.91	0.92	0.91	0.91	0.91
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%
Adj. Flow (vph)	466	81	70	357	746	368
Shared Lane Traffic (%)						
Lane Group Flow (vph)	466	81	0	427	746	368
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	R NA
Median Width(ft)	11			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	30			16	60	
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	1	1	2	2	1
Detector Template	Left	Right	Left	Thru	Thru	Right
Leading Detector (ft)	20	20	20	100	100	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	20	20	20	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
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	Perm	Over	pm+pt	NA	NA	Perm

Lanes, Volumes, Timings
 1: Commerce Rd & Orchard Lake Rd

01/20/2021



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Protected Phases		5	5	2	6	
Permitted Phases	8		2			6
Detector Phase	8	5	5	2	6	6
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	23.8	23.8	23.8	23.8	23.8	23.8
Total Split (s)	39.0	23.8	23.8	81.0	57.2	57.2
Total Split (%)	32.5%	19.8%	19.8%	67.5%	47.7%	47.7%
Maximum Green (s)	33.5	18.0	18.0	75.2	51.4	51.4
Yellow Time (s)	3.6	3.6	3.6	3.6	3.6	3.6
All-Red Time (s)	1.9	2.2	2.2	2.2	2.2	2.2
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.5	5.8		5.8	5.8	5.8
Lead/Lag		Lead	Lead		Lag	Lag
Lead-Lag Optimize?		Yes	Yes		Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	Min	Min	Min	C-Min	C-Min	C-Min
Walk Time (s)	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
Pedestrian Calls (#/hr)	0	0	0	0	0	0
Act Effct Green (s)	33.5	10.4		75.2	59.0	59.0
Actuated g/C Ratio	0.28	0.09		0.63	0.49	0.49
v/c Ratio	1.00	0.43		0.31	0.86	0.42
Control Delay	84.1	23.5		10.3	33.5	4.4
Queue Delay	0.0	0.0		0.0	0.0	0.0
Total Delay	84.1	23.5		10.3	33.5	4.4
LOS	F	C		B	C	A
Approach Delay	75.1			10.3	23.9	
Approach LOS	E			B	C	

Intersection Summary






















Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 43 (36%), Referenced to phase 2:NBT and 6:SBT, Start of Green
 Natural Cycle: 120
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.00
 Intersection Signal Delay: 34.5
 Intersection LOS: C
 Intersection Capacity Utilization 84.3%
 ICU Level of Service E
 Analysis Period (min) 15

Splits and Phases: 1: Commerce Rd & Orchard Lake Rd



Lanes, Volumes, Timings
2: Cass Lake Rd & Orchard Lake Rd

01/20/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	92	660	5	0	631	117	17	5	15	566	6	368
Future Volume (vph)	92	660	5	0	631	117	17	5	15	566	6	368
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)	190		0	100		435	0		0	125		300
Storage Lanes	1		0	1		1	0		0	1		1
Taper Length (ft)	50			50			25			50		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	0.95	0.95	1.00
Fr _t		0.999				0.850		0.945				0.850
Fl _t Protected	0.950							0.978		0.950	0.953	
Satd. Flow (prot)	1694	3385	0	1783	3388	1516	0	1705	0	1665	1670	1568
Fl _t Permitted	0.137							0.978		0.950	0.953	
Satd. Flow (perm)	244	3385	0	1783	3388	1516	0	1705	0	1665	1670	1568
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1				137		17				413
Link Speed (mph)		35			35			35				35
Link Distance (ft)		701			1268			549				607
Travel Time (s)		13.7			24.7			10.7				11.8
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	103	742	6	0	709	131	19	6	17	636	7	413
Shared Lane Traffic (%)										49%		
Lane Group Flow (vph)	103	748	0	0	709	131	0	42	0	324	319	413
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			11			20				12
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		20			40			16				16
Two way Left Turn Lane												Yes
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	2		1	2	1	1	2		1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100		20	100	20	20	100		20	100	20
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	6	20	20	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
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		pm+pt	NA	custom	Split	NA		Split	NA	pm+ov

Lanes, Volumes, Timings
 2: Cass Lake Rd & Orchard Lake Rd

01/20/2021



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases	1	6		5	2	3	8	8		4	4	1
Permitted Phases	6			2		2						4
Detector Phase	1	6		5	2	3	8	8		4	4	1
Switch Phase												
Minimum Initial (s)	4.0	10.0		4.0	10.0	10.0	7.0	7.0		7.0	7.0	4.0
Minimum Split (s)	10.5	28.0		10.1	28.4	24.1	29.0	29.0		28.0	28.0	10.5
Total Split (s)	10.5	28.8		10.1	28.4	24.1	29.0	29.0		28.0	28.0	10.5
Total Split (%)	8.8%	24.0%		8.4%	23.7%	20.1%	24.2%	24.2%		23.3%	23.3%	8.8%
Maximum Green (s)	4.4	22.7		4.0	22.3	18.0	23.0	23.0		22.0	22.0	4.4
Yellow Time (s)	3.6	3.6		3.6	3.6	3.6	3.5	3.5		3.5	3.5	3.6
All-Red Time (s)	2.5	2.5		2.5	2.5	2.5	2.5	2.5		2.5	2.5	2.5
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0		0.0	0.0	0.0
Total Lost Time (s)	6.1	6.1		6.1	6.1	6.1		6.0		6.0	6.0	6.1
Lead/Lag	Lead	Lag		Lead	Lag	Lead				Lag	Lag	Lead
Lead-Lag Optimize?	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	Min	C-Min		Min	C-Min	Min	Min	Min		Min	Min	Min
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)	46.9	36.2			30.2	46.3		8.0		30.0	30.0	41.3
Actuated g/C Ratio	0.39	0.30			0.25	0.39		0.07		0.25	0.25	0.34
v/c Ratio	0.44	0.73			0.83	0.20		0.33		0.78	0.76	0.51
Control Delay	30.7	47.3			54.8	10.1		42.6		56.2	55.1	3.8
Queue Delay	0.0	0.0			0.0	0.0		0.0		0.0	0.0	0.0
Total Delay	30.7	47.3			54.8	10.1		42.6		56.2	55.1	3.8
LOS	C	D			D	B		D		E	E	A
Approach Delay		45.3			47.9			42.6			35.4	
Approach LOS		D			D			D			D	

Intersection Summary

Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 120
 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: 0.83
 Intersection Signal Delay: 42.3
 Intersection LOS: D
 Intersection Capacity Utilization 61.2%
 ICU Level of Service B
 Analysis Period (min) 15

Splits and Phases: 2: Cass Lake Rd & Orchard Lake Rd



Lanes, Volumes, Timings
7: Orchard Lake Rd & Wards Point Dr

01/20/2021



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	7	5	2	721	979	3
Future Volume (vph)	7	5	2	721	979	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	0.95	0.95	0.95	0.95
Fr't	0.942					
Flt Protected	0.972					
Satd. Flow (prot)	1673	0	0	3471	3471	0
Flt Permitted	0.972			0.954		
Satd. Flow (perm)	1673	0	0	3311	3471	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	6				1	
Link Speed (mph)	25			35	35	
Link Distance (ft)	486			946	708	
Travel Time (s)	13.3			18.4	13.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%
Adj. Flow (vph)	8	6	2	801	1088	3
Shared Lane Traffic (%)						
Lane Group Flow (vph)	14	0	0	803	1091	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			0	0	
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)	15	9	15			9
Number of Detectors	1		1	2	2	
Detector Template	Left		Left	Thru	Thru	
Leading Detector (ft)	20		20	100	100	
Trailing Detector (ft)	0		0	0	0	
Detector 1 Position(ft)	0		0	0	0	
Detector 1 Size(ft)	20		20	6	6	
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0		0.0	0.0	0.0	
Detector 1 Queue (s)	0.0		0.0	0.0	0.0	
Detector 1 Delay (s)	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	Prot		Perm	NA	NA	
Protected Phases	4			2	6	
Permitted Phases			2			
Detector Phase	4		2	2	6	
Switch Phase						

Lanes, Volumes, Timings
7: Orchard Lake Rd & Wards Point Dr

01/20/2021



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Minimum Initial (s)	5.0		5.0	5.0	5.0	
Minimum Split (s)	23.8		23.3	23.3	23.3	
Total Split (s)	26.0		94.0	94.0	94.0	
Total Split (%)	21.7%		78.3%	78.3%	78.3%	
Maximum Green (s)	20.2		88.7	88.7	88.7	
Yellow Time (s)	3.5		3.6	3.6	3.6	
All-Red Time (s)	2.3		1.7	1.7	1.7	
Lost Time Adjust (s)	0.0			0.0	0.0	
Total Lost Time (s)	5.8			5.3	5.3	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Recall Mode	Min		C-Min	C-Min	C-Min	
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)	6.3			102.6	102.6	
Actuated g/C Ratio	0.05			0.86	0.86	
v/c Ratio	0.15			0.28	0.37	
Control Delay	43.4			5.4	9.9	
Queue Delay	0.0			0.0	0.0	
Total Delay	43.4			5.4	9.9	
LOS	D			A	A	
Approach Delay	43.4			5.4	9.9	
Approach LOS	D			A	A	

Intersection Summary

Area Type:	Other
Cycle Length:	120
Actuated Cycle Length:	120
Offset:	114 (95%), Referenced to phase 2:NBTL and 6:SBT, Start of Green
Natural Cycle:	50
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.37
Intersection Signal Delay:	8.2
Intersection LOS:	A
Intersection Capacity Utilization:	40.6%
ICU Level of Service:	A
Analysis Period (min):	15

Splits and Phases: 7: Orchard Lake Rd & Wards Point Dr



Lanes, Volumes, Timings
9: Orchard Lake Rd & Warwick St

01/20/2021



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕↕	↕↔		↔↕	
Traffic Volume (vph)	3	1270	765	0	18	2
Future Volume (vph)	3	1270	765	0	18	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	12	12
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Frt					0.988	
Flt Protected					0.957	
Satd. Flow (prot)	0	3355	3355	0	1727	0
Flt Permitted		0.954			0.957	
Satd. Flow (perm)	0	3201	3355	0	1727	0
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)					2	
Link Speed (mph)		35	35		25	
Link Distance (ft)		794	1452		338	
Travel Time (s)		15.5	28.3		9.2	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%
Adj. Flow (vph)	3	1427	860	0	20	2
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1430	860	0	22	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		35	30		30	
Two way Left Turn Lane			Yes			
Headway Factor	1.04	1.04	1.04	1.04	1.00	1.00
Turning Speed (mph)	15			9	15	9
Number of Detectors	1	2	2		1	
Detector Template	Left	Thru	Thru		Left	
Leading Detector (ft)	20	100	100		20	
Trailing Detector (ft)	0	0	0		0	
Detector 1 Position(ft)	0	0	0		0	
Detector 1 Size(ft)	20	6	6		20	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	
Detector 1 Delay (s)	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	Perm	NA	NA		Perm	
Protected Phases		6	2			
Permitted Phases	6				4	
Detector Phase	6	6	2		4	

Lanes, Volumes, Timings
 9: Orchard Lake Rd & Warwick St

01/20/2021



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0		7.0	
Minimum Split (s)	23.7	23.7	23.7		24.0	
Total Split (s)	95.0	95.0	95.0		25.0	
Total Split (%)	79.2%	79.2%	79.2%		20.8%	
Maximum Green (s)	89.3	89.3	89.3		19.0	
Yellow Time (s)	3.6	3.6	3.6		3.5	
All-Red Time (s)	2.1	2.1	2.1		2.5	
Lost Time Adjust (s)		0.0	0.0		0.0	
Total Lost Time (s)		5.7	5.7		6.0	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	
Recall Mode	C-Min	C-Min	C-Min		Min	
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)		100.7	100.7		7.6	
Actuated g/C Ratio		0.84	0.84		0.06	
v/c Ratio		0.53	0.31		0.20	
Control Delay		4.1	2.1		53.8	
Queue Delay		0.0	0.0		0.0	
Total Delay		4.1	2.1		53.8	
LOS		A	A		D	
Approach Delay		4.1	2.1		53.8	
Approach LOS		A	A		D	

Intersection Summary

Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 38 (32%), Referenced to phase 2:WBT and 6:EBTL, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.53
 Intersection Signal Delay: 3.8
 Intersection Capacity Utilization 52.8%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service A

Splits and Phases: 9: Orchard Lake Rd & Warwick St



Lanes, Volumes, Timings

11: Middlebelt Rd/Inverness St & Orchard Lake Rd

01/20/2021



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	1099	152	244	698	5	66	4	209	8	14	20
Future Volume (vph)	16	1099	152	244	698	5	66	4	209	8	14	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	10	10	10	10	10	10
Storage Length (ft)	100		200	200		0	100		500	50		0
Storage Lanes	1		1	1		0	1		1	1		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t			0.850		0.999				0.850		0.911	
Fl _t Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1678	3355	1501	1678	3352	0	1620	1705	1449	1620	1553	0
Fl _t Permitted	0.300			0.201			0.733			0.755		
Satd. Flow (perm)	530	3355	1501	355	3352	0	1250	1705	1449	1287	1553	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			139		1				227			22
Link Speed (mph)		35			35			40				25
Link Distance (ft)		1026			825			884				562
Travel Time (s)		20.0			16.1			15.1				15.3
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 (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Adj. Flow (vph)	17	1195	165	265	759	5	72	4	227	9	15	22
Shared Lane Traffic (%)												
Lane Group Flow (vph)	17	1195	165	265	764	0	72	4	227	9	37	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)		11			11			10				10
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		55			16			25				25
Two way Left Turn Lane		Yes			Yes			Yes				
Headway Factor	1.04	1.04	1.04	1.04	1.04	1.04	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100	20	20	100		20	100	20	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	6	20	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	NA	Perm	Perm	NA	

Lanes, Volumes, Timings
11: Middlebelt Rd/Inverness St & Orchard Lake Rd

01/20/2021



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases	1	6		5	2			8				4
Permitted Phases	6		6	2			8		8	4		
Detector Phase	1	6	6	5	2		8	8	8	4		4
Switch Phase												
Minimum Initial (s)	4.0	10.0	10.0	4.0	7.9		7.0	7.0	7.0	7.0		7.0
Minimum Split (s)	10.1	37.0	37.0	11.1	24.1		24.4	24.4	24.4	24.4		24.4
Total Split (s)	10.2	65.0	65.0	28.0	82.8		27.0	27.0	27.0	27.0		27.0
Total Split (%)	8.5%	54.2%	54.2%	23.3%	69.0%		22.5%	22.5%	22.5%	22.5%		22.5%
Maximum Green (s)	4.1	58.9	58.9	21.9	76.7		20.6	20.6	20.6	20.6		20.6
Yellow Time (s)	3.6	3.6	3.6	3.6	3.6		3.9	3.9	3.9	3.9		3.9
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5		2.5	2.5	2.5	2.5		2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0
Total Lost Time (s)	6.1	6.1	6.1	6.1	6.1		6.4	6.4	6.4	6.4		6.4
Lead/Lag	Lead	Lead	Lead	Lag	Lag							
Lead-Lag Optimize?	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	Min	C-Min	C-Min	Min	C-Min		Min	Min	Min	Min		Min
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)	68.6	68.6	68.6	83.0	83.0		12.3	12.3	12.3	12.3		12.3
Actuated g/C Ratio	0.57	0.57	0.57	0.69	0.69		0.10	0.10	0.10	0.10		0.10
v/c Ratio	0.05	0.62	0.18	0.56	0.33		0.56	0.02	0.64	0.07		0.21
Control Delay	18.2	27.1	8.2	26.1	8.3		67.0	45.5	15.1	47.0		28.1
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0
Total Delay	18.2	27.1	8.2	26.1	8.3		67.0	45.5	15.1	47.0		28.1
LOS	B	C	A	C	A		E	D	B	D		C
Approach Delay		24.7			12.9			27.8				31.8
Approach LOS		C			B			C				C

Intersection Summary

Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 114 (95%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.64
 Intersection Signal Delay: 20.8
 Intersection LOS: C
 Intersection Capacity Utilization 69.7%
 ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 11: Middlebelt Rd/Inverness St & Orchard Lake Rd



Lanes, Volumes, Timings
 15: Orchard Lake Rd & Summers Rd

01/20/2021



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	29	0	723	16	0	984
Future Volume (vph)	29	0	723	16	0	984
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	0.95	0.95	0.95	0.95
Fr t	0.997					
Flt Protected	0.950					
Satd. Flow (prot)	1770	0	3529	0	0	3539
Flt Permitted	0.950					
Satd. Flow (perm)	1770	0	3529	0	0	3539
Link Speed (mph)	25	35		35		
Link Distance (ft)	592	733		946		
Travel Time (s)	16.1	14.3		18.4		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	32	0	786	17	0	1070
Shared Lane Traffic (%)						
Lane Group Flow (vph)	32	0	803	0	0	1070
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	R NA
Median Width(ft)	12	0		0		
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)	15	9	9		15	
Sign Control	Stop	Free		Free		

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	37.2%
Analysis Period (min)	15
	ICU Level of Service A

Lanes, Volumes, Timings
17: Willow Beach St & Orchard Lake Rd

01/20/2021



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↑↑	
Traffic Volume (vph)	728	0	25	982	0	29
Future Volume (vph)	728	0	25	982	0	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Fr t					0.865	
Flt Protected				0.999		
Satd. Flow (prot)	3539	0	0	3536	1611	0
Flt Permitted				0.999		
Satd. Flow (perm)	3539	0	0	3536	1611	0
Link Speed (mph)	35			35	25	
Link Distance (ft)	708			701	392	
Travel Time (s)	13.8			13.7	10.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	791	0	27	1067	0	32
Shared Lane Traffic (%)						
Lane Group Flow (vph)	791	0	0	1094	32	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	5			10	12	
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
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	55.1%
ICU Level of Service	B
Analysis Period (min)	15

Lanes, Volumes, Timings
 19: Maddy Ln & Orchard Lake Rd

01/20/2021



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕			↕			↕	
Traffic Volume (vph)	0	1227	0	0	748	18	0	0	45	0	0	0
Future Volume (vph)	0	1227	0	0	748	18	0	0	45	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t					0.996			0.865				
Fl _t Protected												
Satd. Flow (prot)	0	3539	0	0	3525	0	0	1611	0	0	1863	0
Fl _t Permitted												
Satd. Flow (perm)	0	3539	0	0	3525	0	0	1611	0	0	1863	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		1268			794			484			384	
Travel Time (s)		24.7			15.5			13.2			10.5	
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
Adj. Flow (vph)	0	1334	0	0	813	20	0	0	49	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1334	0	0	833	0	0	49	0	0	0	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)		10			5			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
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	43.9%
ICU Level of Service	A
Analysis Period (min)	15

Lanes, Volumes, Timings
 22: Figa Ave & Orchard Lake Rd

01/20/2021



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↑↑	
Traffic Volume (vph)	1267	22	18	765	0	0
Future Volume (vph)	1267	22	18	765	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	12	12
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Frt	0.997					
Flt Protected				0.999		
Satd. Flow (prot)	3411	0	0	3418	1863	0
Flt Permitted	0.999					
Satd. Flow (perm)	3411	0	0	3418	1863	0
Link Speed (mph)	35			35	25	
Link Distance (ft)	1452			1026	225	
Travel Time (s)	28.3			20.0	6.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1377	24	20	832	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1401	0	0	852	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	5			10	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane	Yes			Yes		
Headway Factor	1.04	1.04	1.04	1.04	1.00	1.00
Turning Speed (mph)	9		15	15		9
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	39.1% ICU Level of Service A
Analysis Period (min)	15

Lanes, Volumes, Timings
1: Commerce Rd & Orchard Lake Rd

01/20/2021



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	382	36	50	731	530	503
Future Volume (vph)	382	36	50	731	530	503
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11
Storage Length (ft)	500	500	0			0
Storage Lanes	1	0	0			1
Taper Length (ft)	50		25			
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	1.00
Fr _t		0.850				0.850
Fl _t Protected	0.950			0.997		
Satd. Flow (prot)	1711	1531	0	3411	1801	1531
Fl _t Permitted	0.950			0.789		
Satd. Flow (perm)	1711	1531	0	2699	1801	1531
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		37				525
Link Speed (mph)	35			35	35	
Link Distance (ft)	916			721	733	
Travel Time (s)	17.8			14.0	14.3	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	411	39	54	786	570	541
Shared Lane Traffic (%)						
Lane Group Flow (vph)	411	39	0	840	570	541
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	R NA
Median Width(ft)	11			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	30			16	60	
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	1	1	2	2	1
Detector Template	Left	Right	Left	Thru	Thru	Right
Leading Detector (ft)	20	20	20	100	100	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	20	20	20	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
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	Perm	Over	pm+pt	NA	NA	Perm
Protected Phases		5	5	2	6	

Lanes, Volumes, Timings
1: Commerce Rd & Orchard Lake Rd

01/20/2021

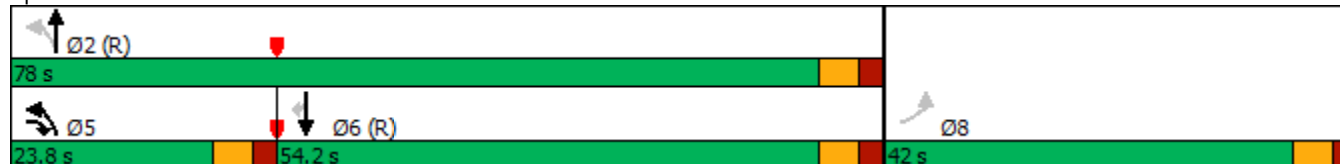


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Permitted Phases	8		2			6
Detector Phase	8	5	5	2	6	6
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	23.8	23.8	23.8	23.8	23.8	23.8
Total Split (s)	42.0	23.8	23.8	78.0	54.2	54.2
Total Split (%)	35.0%	19.8%	19.8%	65.0%	45.2%	45.2%
Maximum Green (s)	36.5	18.0	18.0	72.2	48.4	48.4
Yellow Time (s)	3.6	3.6	3.6	3.6	3.6	3.6
All-Red Time (s)	1.9	2.2	2.2	2.2	2.2	2.2
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.5	5.8		5.8	5.8	5.8
Lead/Lag		Lead	Lead		Lag	Lag
Lead-Lag Optimize?		Yes	Yes		Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	Min	Min	Min	C-Min	C-Min	C-Min
Walk Time (s)	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
Pedestrian Calls (#/hr)	0	0	0	0	0	0
Act Effct Green (s)	32.6	10.0		76.1	60.3	60.3
Actuated g/C Ratio	0.27	0.08		0.63	0.50	0.50
v/c Ratio	0.88	0.24		0.47	0.63	0.53
Control Delay	62.8	21.1		12.5	12.2	3.2
Queue Delay	0.0	0.0		0.0	0.0	0.0
Total Delay	62.8	21.1		12.5	12.2	3.2
LOS	E	C		B	B	A
Approach Delay	59.2			12.5	7.8	
Approach LOS	E			B	A	

Intersection Summary

Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 64 (53%), Referenced to phase 2:NBT and 6:SBT, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.88
 Intersection Signal Delay: 19.1
 Intersection Capacity Utilization 85.0%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service E

Splits and Phases: 1: Commerce Rd & Orchard Lake Rd



Lanes, Volumes, Timings
2: Cass Lake Rd & Orchard Lake Rd

01/20/2021



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	360	748	8	2	860	603	5	21	6	316	14	214
Future Volume (vph)	360	748	8	2	860	603	5	21	6	316	14	214
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)	190		0	100		435	0		0	125		300
Storage Lanes	1		0	1		1	0		0	1		1
Taper Length (ft)	50			50			25			50		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	0.95	0.95	1.00
Fr _t		0.998				0.850		0.973				0.850
Fl _t Protected	0.950			0.950				0.993		0.950	0.956	
Satd. Flow (prot)	1711	3414	0	1711	3421	1531	0	1800	0	1681	1692	1583
Fl _t Permitted	0.141			0.342				0.993		0.950	0.956	
Satd. Flow (perm)	254	3414	0	616	3421	1531	0	1800	0	1681	1692	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1				655		7				233
Link Speed (mph)		35			35			35				35
Link Distance (ft)		701			1268			549				607
Travel Time (s)		13.7			24.7			10.7				11.8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	391	813	9	2	935	655	5	23	7	343	15	233
Shared Lane Traffic (%)										48%		
Lane Group Flow (vph)	391	822	0	2	935	655	0	35	0	178	180	233
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			11			20				12
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		20			40			16				16
Two way Left Turn Lane												Yes
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	2		1	2	1	1	2		1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100		20	100	20	20	100		20	100	20
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	6	20	20	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
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		pm+pt	NA	custom	Split	NA		Split	NA	pm+ov
Protected Phases	1	6		5	2	3	8	8		4	4	1

Lanes, Volumes, Timings
2: Cass Lake Rd & Orchard Lake Rd

01/20/2021

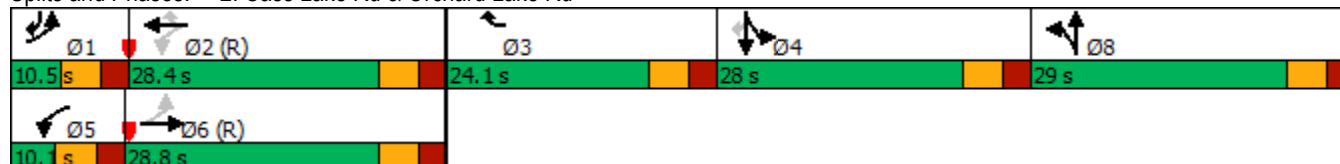


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	6			2		2						4
Detector Phase	1	6		5	2	3	8	8		4	4	1
Switch Phase												
Minimum Initial (s)	4.0	10.0		4.0	10.0	10.0	7.0	7.0		7.0	7.0	4.0
Minimum Split (s)	10.5	28.0		10.1	28.4	24.1	29.0	29.0		28.0	28.0	10.5
Total Split (s)	10.5	28.8		10.1	28.4	24.1	29.0	29.0		28.0	28.0	10.5
Total Split (%)	8.8%	24.0%		8.4%	23.7%	20.1%	24.2%	24.2%		23.3%	23.3%	8.8%
Maximum Green (s)	4.4	22.7		4.0	22.3	18.0	23.0	23.0		22.0	22.0	4.4
Yellow Time (s)	3.6	3.6		3.6	3.6	3.6	3.5	3.5		3.5	3.5	3.6
All-Red Time (s)	2.5	2.5		2.5	2.5	2.5	2.5	2.5		2.5	2.5	2.5
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0		0.0	0.0	0.0
Total Lost Time (s)	6.1	6.1		6.1	6.1	6.1		6.0		6.0	6.0	6.1
Lead/Lag	Lead	Lag		Lead	Lag	Lead				Lag	Lag	Lead
Lead-Lag Optimize?	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	Min	C-Min		Min	C-Min	Min	Min	Min		Min	Min	Min
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)	59.8	48.1		27.9	22.3	38.4		7.9		18.1	18.1	49.4
Actuated g/C Ratio	0.50	0.40		0.23	0.19	0.32		0.07		0.15	0.15	0.41
v/c Ratio	0.77	0.60		0.01	1.47	0.70		0.28		0.70	0.71	0.30
Control Delay	43.9	26.2		23.0	252.1	10.4		50.3		62.8	63.0	2.7
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0		0.0	0.0	0.0
Total Delay	43.9	26.2		23.0	252.1	10.4		50.3		62.8	63.0	2.7
LOS	D	C		C	F	B		D		E	E	A
Approach Delay		31.9			152.4			50.3			39.1	
Approach LOS		C			F			D			D	

Intersection Summary

Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 120
 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: 1.47
 Intersection Signal Delay: 89.2
 Intersection Capacity Utilization 78.3%
 Analysis Period (min) 15
 Intersection LOS: F
 ICU Level of Service D

Splits and Phases: 2: Cass Lake Rd & Orchard Lake Rd



Lanes, Volumes, Timings
7: Orchard Lake Rd & Wards Point Dr

01/20/2021



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	11	10	11	1073	1028	12
Future Volume (vph)	11	10	11	1073	1028	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	0.95	0.95	0.95	0.95
Fr't	0.935				0.998	
Flt Protected	0.975			0.999		
Satd. Flow (prot)	1698	0	0	3536	3532	0
Flt Permitted	0.975			0.939		
Satd. Flow (perm)	1698	0	0	3323	3532	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	11				3	
Link Speed (mph)	25			35	35	
Link Distance (ft)	486			946	708	
Travel Time (s)	13.3			18.4	13.8	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	12	11	12	1141	1094	13
Shared Lane Traffic (%)						
Lane Group Flow (vph)	23	0	0	1153	1107	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			0	0	
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)	15	9	15			9
Number of Detectors	1		1	2	2	
Detector Template	Left		Left	Thru	Thru	
Leading Detector (ft)	20		20	100	100	
Trailing Detector (ft)	0		0	0	0	
Detector 1 Position(ft)	0		0	0	0	
Detector 1 Size(ft)	20		20	6	6	
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0		0.0	0.0	0.0	
Detector 1 Queue (s)	0.0		0.0	0.0	0.0	
Detector 1 Delay (s)	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	Prot		Perm	NA	NA	
Protected Phases	4			2	6	
Permitted Phases			2			
Detector Phase	4		2	2	6	
Switch Phase						
Minimum Initial (s)	5.0		5.0	5.0	5.0	

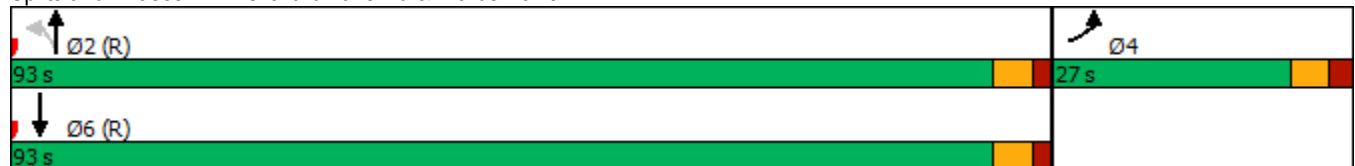
Lanes, Volumes, Timings
 7: Orchard Lake Rd & Wards Point Dr

01/20/2021

	EBL	EBR	NBL	NBT	SBT	SBR
Minimum Split (s)	23.8		23.3	23.3	23.3	
Total Split (s)	27.0		93.0	93.0	93.0	
Total Split (%)	22.5%		77.5%	77.5%	77.5%	
Maximum Green (s)	21.2		87.7	87.7	87.7	
Yellow Time (s)	3.5		3.6	3.6	3.6	
All-Red Time (s)	2.3		1.7	1.7	1.7	
Lost Time Adjust (s)	0.0			0.0	0.0	
Total Lost Time (s)	5.8			5.3	5.3	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Recall Mode	Min		C-Min	C-Min	C-Min	
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)	6.7			102.2	102.2	
Actuated g/C Ratio	0.06			0.85	0.85	
v/c Ratio	0.22			0.41	0.37	
Control Delay	40.5			4.0	4.9	
Queue Delay	0.0			0.0	0.0	
Total Delay	40.5			4.0	4.9	
LOS	D			A	A	
Approach Delay	40.5			4.0	4.9	
Approach LOS	D			A	A	

Intersection Summary	
Area Type:	Other
Cycle Length:	120
Actuated Cycle Length:	120
Offset:	37 (31%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle:	55
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.41
Intersection Signal Delay:	4.8
Intersection LOS:	A
Intersection Capacity Utilization	50.8%
ICU Level of Service	A
Analysis Period (min)	15

Splits and Phases: 7: Orchard Lake Rd & Wards Point Dr



Lanes, Volumes, Timings
9: Orchard Lake Rd & Warwick St

01/20/2021



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕↕	↕↔		↔↕	
Traffic Volume (vph)	11	1076	1481	6	5	8
Future Volume (vph)	11	1076	1481	6	5	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	12	12
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Frt			0.999		0.913	
Flt Protected		0.999			0.982	
Satd. Flow (prot)	0	3418	3418	0	1670	0
Flt Permitted		0.927			0.982	
Satd. Flow (perm)	0	3171	3418	0	1670	0
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			1		9	
Link Speed (mph)		35	35		25	
Link Distance (ft)		794	1452		338	
Travel Time (s)		15.5	28.3		9.2	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	12	1145	1576	6	5	9
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1157	1582	0	14	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		35	30		30	
Two way Left Turn Lane			Yes			
Headway Factor	1.04	1.04	1.04	1.04	1.00	1.00
Turning Speed (mph)	15			9	15	9
Number of Detectors	1	2	2		1	
Detector Template	Left	Thru	Thru		Left	
Leading Detector (ft)	20	100	100		20	
Trailing Detector (ft)	0	0	0		0	
Detector 1 Position(ft)	0	0	0		0	
Detector 1 Size(ft)	20	6	6		20	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	
Detector 1 Delay (s)	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	Perm	NA	NA		Perm	
Protected Phases		6	2			
Permitted Phases	6				4	
Detector Phase	6	6	2		4	
Switch Phase						

Lanes, Volumes, Timings
 9: Orchard Lake Rd & Warwick St

01/20/2021



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Minimum Initial (s)	10.0	10.0	10.0		7.0	
Minimum Split (s)	23.7	23.7	23.7		24.0	
Total Split (s)	96.0	96.0	96.0		24.0	
Total Split (%)	80.0%	80.0%	80.0%		20.0%	
Maximum Green (s)	90.3	90.3	90.3		18.0	
Yellow Time (s)	3.6	3.6	3.6		3.5	
All-Red Time (s)	2.1	2.1	2.1		2.5	
Lost Time Adjust (s)		0.0	0.0		0.0	
Total Lost Time (s)		5.7	5.7		6.0	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	
Recall Mode	C-Min	C-Min	C-Min		Min	
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)		101.2	101.2		7.1	
Actuated g/C Ratio		0.84	0.84		0.06	
v/c Ratio		0.43	0.55		0.13	
Control Delay		1.7	1.9		36.5	
Queue Delay		0.0	0.0		0.0	
Total Delay		1.7	1.9		36.5	
LOS		A	A		D	
Approach Delay		1.7	1.9		36.5	
Approach LOS		A	A		D	

Intersection Summary

Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 80 (67%), Referenced to phase 2:WBT and 6:EBTL, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.55
 Intersection Signal Delay: 2.0
 Intersection LOS: A
 Intersection Capacity Utilization 56.7%
 ICU Level of Service B
 Analysis Period (min) 15























Splits and Phases: 9: Orchard Lake Rd & Warwick St



Lanes, Volumes, Timings

11: Middlebelt Rd/Inverness St & Orchard Lake Rd

01/20/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	32	948	87	185	1218	25	248	27	280	30	16	33
Future Volume (vph)	32	948	87	185	1218	25	248	27	280	30	16	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	10	10	10	10	10	10
Storage Length (ft)	100		200	200		0	100		500	50		0
Storage Lanes	1		1	1		0	1		1	1		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.997				0.850		0.899	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1694	3388	1516	1694	3378	0	1636	1722	1463	1636	1548	0
Flt Permitted	0.079			0.231			0.723			0.738		
Satd. Flow (perm)	141	3388	1516	412	3378	0	1245	1722	1463	1271	1548	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			86		2				301			35
Link Speed (mph)		35			35			40				25
Link Distance (ft)		1026			825			884				562
Travel Time (s)		20.0			16.1			15.1				15.3
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
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	34	1019	94	199	1310	27	267	29	301	32	17	35
Shared Lane Traffic (%)												
Lane Group Flow (vph)	34	1019	94	199	1337	0	267	29	301	32	52	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)		11			11			10				10
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		55			16			25				25
Two way Left Turn Lane		Yes			Yes			Yes				
Headway Factor	1.04	1.04	1.04	1.04	1.04	1.04	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100	20	20	100		20	100	20	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	6	20	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	NA	Perm	Perm	NA	

Lanes, Volumes, Timings

11: Middlebelt Rd/Inverness St & Orchard Lake Rd

01/20/2021

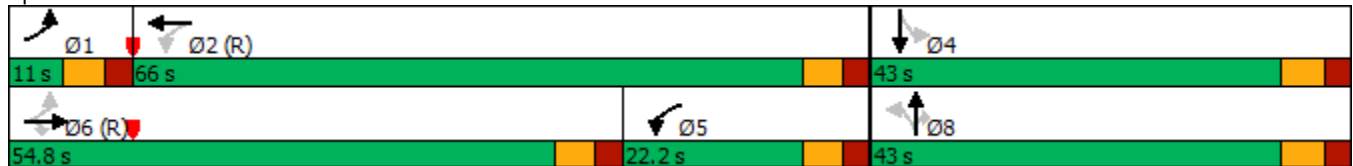


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases	1	6		5	2			8			4	
Permitted Phases	6		6	2			8		8	4		
Detector Phase	1	6	6	5	2		8	8	8	4	4	
Switch Phase												
Minimum Initial (s)	4.0	10.0	10.0	4.0	7.9		7.0	7.0	7.0	7.0	7.0	
Minimum Split (s)	10.1	37.0	37.0	11.1	24.1		24.4	24.4	24.4	24.4	24.4	
Total Split (s)	11.0	54.8	54.8	22.2	66.0		43.0	43.0	43.0	43.0	43.0	
Total Split (%)	9.2%	45.7%	45.7%	18.5%	55.0%		35.8%	35.8%	35.8%	35.8%	35.8%	
Maximum Green (s)	4.9	48.7	48.7	16.1	59.9		36.6	36.6	36.6	36.6	36.6	
Yellow Time (s)	3.6	3.6	3.6	3.6	3.6		3.9	3.9	3.9	3.9	3.9	
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5		2.5	2.5	2.5	2.5	2.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.1	6.1	6.1	6.1	6.1		6.4	6.4	6.4	6.4	6.4	
Lead/Lag	Lead	Lead	Lead	Lag	Lag							
Lead-Lag Optimize?	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	Min	C-Min	C-Min	Min	C-Min		Min	Min	Min	Min	Min	
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)	56.4	56.4	56.4	65.4	65.4		30.2	30.2	30.2	30.2	30.2	
Actuated g/C Ratio	0.47	0.47	0.47	0.54	0.54		0.25	0.25	0.25	0.25	0.25	
v/c Ratio	0.24	0.64	0.12	0.52	0.73		0.85	0.07	0.51	0.10	0.13	
Control Delay	30.0	35.6	16.0	32.4	24.6		66.5	31.6	6.7	32.4	15.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	30.0	35.6	16.0	32.4	24.6		66.5	31.6	6.7	32.4	15.1	
LOS	C	D	B	C	C		E	C	A	C	B	
Approach Delay		33.8			25.6			34.7			21.7	
Approach LOS		C			C			C			C	

Intersection Summary

Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 19 (16%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.85
 Intersection Signal Delay: 29.9
 Intersection LOS: C
 Intersection Capacity Utilization 73.7%
 ICU Level of Service D
 Analysis Period (min) 15

Splits and Phases: 11: Middlebelt Rd/Inverness St & Orchard Lake Rd



Lanes, Volumes, Timings
15: Orchard Lake Rd & Summers Rd

01/20/2021



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	48	0	1084	19	54	984
Future Volume (vph)	48	0	1084	19	54	984
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	0.95	0.95	0.95	0.95
Frt			0.997			
Flt Protected	0.950					0.997
Satd. Flow (prot)	1770	0	3529	0	0	3529
Flt Permitted	0.950					0.997
Satd. Flow (perm)	1770	0	3529	0	0	3529
Link Speed (mph)	25		35			35
Link Distance (ft)	592		733			946
Travel Time (s)	16.1		14.3			18.4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	52	0	1178	21	59	1070
Shared Lane Traffic (%)						
Lane Group Flow (vph)	52	0	1199	0	0	1129
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	R NA
Median Width(ft)	12		0			0
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)	15	9		9	15	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	72.7%
Analysis Period (min)	15
	ICU Level of Service C

Lanes, Volumes, Timings
17: Willow Beach St & Orchard Lake Rd

01/20/2021



















Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↑↑	
Traffic Volume (vph)	1084	0	39	1040	0	31
Future Volume (vph)	1084	0	39	1040	0	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Fr t					0.865	
Flt Protected				0.998		
Satd. Flow (prot)	3539	0	0	3532	1611	0
Flt Permitted				0.998		
Satd. Flow (perm)	3539	0	0	3532	1611	0
Link Speed (mph)	35			35	25	
Link Distance (ft)	708			701	392	
Travel Time (s)	13.8			13.7	10.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1178	0	42	1130	0	34
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1178	0	0	1172	34	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	5			10	12	
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
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	67.2%
Analysis Period (min)	15
	ICU Level of Service C

Lanes, Volumes, Timings
 19: Maddy Ln & Orchard Lake Rd

01/20/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1062	0	0	1465	25	0	0	24	0	0	0
Future Volume (vph)	0	1062	0	0	1465	25	0	0	24	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t					0.997			0.865				
Fl _t Protected												
Satd. Flow (prot)	0	3539	0	0	3529	0	0	1611	0	0	1863	0
Fl _t Permitted												
Satd. Flow (perm)	0	3539	0	0	3529	0	0	1611	0	0	1863	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		1268			794			484			384	
Travel Time (s)		24.7			15.5			13.2			10.5	
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
Adj. Flow (vph)	0	1154	0	0	1592	27	0	0	26	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1154	0	0	1619	0	0	26	0	0	0	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)		10			5			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
Sign Control		Free			Free			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	51.3%						ICU Level of Service A					
Analysis Period (min)	15											

Lanes, Volumes, Timings
22: Figa Ave & Orchard Lake Rd

01/20/2021



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↑↑	
Traffic Volume (vph)	1067	14	6	1487	0	0
Future Volume (vph)	1067	14	6	1487	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	12	12
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Frt	0.998					
Flt Protected						
Satd. Flow (prot)	3414	0	0	3421	1863	0
Flt Permitted						
Satd. Flow (perm)	3414	0	0	3421	1863	0
Link Speed (mph)	35			35	25	
Link Distance (ft)	1452			1026	225	
Travel Time (s)	28.3			20.0	6.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1160	15	7	1616	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1175	0	0	1623	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	5			10	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane	Yes			Yes		
Headway Factor	1.04	1.04	1.04	1.04	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	48.6%
ICU Level of Service	A
Analysis Period (min)	15

Lanes, Volumes, Timings
1: Commerce Rd & Orchard Lake Rd

01/20/2021



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	424	74	64	325	679	335
Future Volume (vph)	424	74	64	325	679	335
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11
Storage Length (ft)	500	500	150			450
Storage Lanes	1	0	1			1
Taper Length (ft)	50		50			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.850				0.850
Fl _t Protected	0.950		0.950			
Satd. Flow (prot)	1678	1501	1678	1766	1766	1501
Fl _t Permitted	0.950		0.119			
Satd. Flow (perm)	1678	1501	210	1766	1766	1501
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		60				368
Link Speed (mph)	35			35	35	
Link Distance (ft)	916			721	733	
Travel Time (s)	17.8			14.0	14.3	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%
Adj. Flow (vph)	466	81	70	357	746	368
Shared Lane Traffic (%)						
Lane Group Flow (vph)	466	81	70	357	746	368
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	R NA
Median Width(ft)	11			11	11	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	30			16	60	
Two way Left Turn Lane					Yes	
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	1	1	2	2	1
Detector Template	Left	Right	Left	Thru	Thru	Right
Leading Detector (ft)	20	20	20	100	100	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	20	20	20	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
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	Perm	Over	pm+pt	NA	NA	Perm

Lanes, Volumes, Timings
 1: Commerce Rd & Orchard Lake Rd

01/20/2021



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Protected Phases		5	5	2	6	
Permitted Phases	8		2			6
Detector Phase	8	5	5	2	6	6
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	23.5	15.8	15.8	23.8	23.8	23.8
Total Split (s)	44.4	15.8	15.8	79.8	64.0	64.0
Total Split (%)	35.7%	12.7%	12.7%	64.3%	51.5%	51.5%
Maximum Green (s)	38.9	10.0	10.0	74.0	58.2	58.2
Yellow Time (s)	3.6	3.6	3.6	3.6	3.6	3.6
All-Red Time (s)	1.9	2.2	2.2	2.2	2.2	2.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.8	5.8	5.8	5.8	5.8
Lead/Lag		Lead	Lead		Lag	Lag
Lead-Lag Optimize?		Yes	Yes		Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	Min	Min	Min	C-Min	C-Min	C-Min
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)	37.0	10.0	75.9	75.9	60.1	60.1
Actuated g/C Ratio	0.30	0.08	0.61	0.61	0.48	0.48
v/c Ratio	0.93	0.46	0.28	0.33	0.87	0.40
Control Delay	69.2	28.8	13.4	13.2	42.2	3.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	69.2	28.8	13.4	13.2	42.2	3.3
LOS	E	C	B	B	D	A
Approach Delay	63.2			13.3	29.3	
Approach LOS	E			B	C	

Intersection Summary























Area Type: Other
 Cycle Length: 124.2
 Actuated Cycle Length: 124.2
 Offset: 43 (35%), Referenced to phase 2:NBT and 6:SBT, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.93
 Intersection Signal Delay: 34.9
 Intersection LOS: C
 Intersection Capacity Utilization 81.8%
 ICU Level of Service D
 Analysis Period (min) 15

Splits and Phases: 1: Commerce Rd & Orchard Lake Rd



Lanes, Volumes, Timings
2: Cass Lake Rd & Orchard Lake Rd

01/14/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	92	660	5	0	631	117	17	5	15	566	6	368
Future Volume (vph)	92	660	5	0	631	117	17	5	15	566	6	368
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)	190		100	100		435	0		0	300		300
Storage Lanes	1		1	1		1	0		0	1		1
Taper Length (ft)	50			50			25			50		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t			0.850			0.850		0.945				0.850
Fl _t Protected	0.950							0.978		0.950		
Satd. Flow (prot)	1694	1783	1516	1783	3388	1516	0	1705	0	1752	1845	1568
Fl _t Permitted	0.211							0.852		0.640		
Satd. Flow (perm)	376	1783	1516	1783	3388	1516	0	1485	0	1181	1845	1568
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			138			138		17				63
Link Speed (mph)		35			35			35				35
Link Distance (ft)		701			1268			549				607
Travel Time (s)		13.7			24.7			10.7				11.8
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	103	742	6	0	709	131	19	6	17	636	7	413
Shared Lane Traffic (%)												
Lane Group Flow (vph)	103	742	6	0	709	131	0	42	0	636	7	413
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			11			20				12
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		20			40			16				16
Two way Left Turn Lane		Yes			Yes							Yes
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	2	1	1	2	1	1	2		1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100	20	20	100		20	100	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)	20	6	20	20	6	20	20	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	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
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	pm+ov	Perm	NA		pm+pt	NA	pm+ov

Lanes, Volumes, Timings
2: Cass Lake Rd & Orchard Lake Rd

01/14/2021

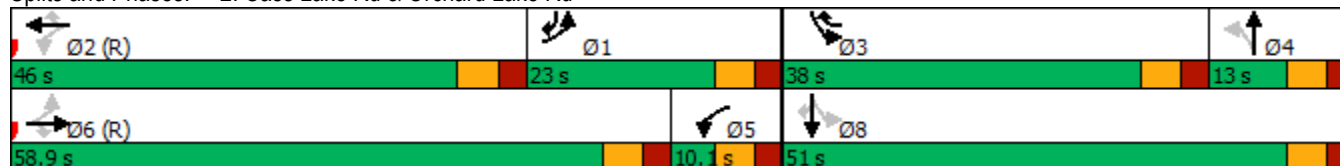


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases	1	6		5	2	3		4		3	8	1
Permitted Phases	6		6	2		2	4			8		8
Detector Phase	1	6	6	5	2	3	4	4		3	8	1
Switch Phase												
Minimum Initial (s)	4.0	10.0	10.0	4.0	10.0	10.0	7.0	7.0		10.0	7.0	4.0
Minimum Split (s)	10.1	28.0	28.0	10.1	28.0	16.1	13.0	13.0		16.1	29.0	10.1
Total Split (s)	23.0	58.9	58.9	10.1	46.0	38.0	13.0	13.0		38.0	51.0	23.0
Total Split (%)	19.2%	49.1%	49.1%	8.4%	38.3%	31.7%	10.8%	10.8%		31.7%	42.5%	19.2%
Maximum Green (s)	16.9	52.8	52.8	4.0	39.9	31.9	7.0	7.0		31.9	45.0	16.9
Yellow Time (s)	3.6	3.6	3.6	3.6	3.6	3.6	3.5	3.5		3.6	3.5	3.6
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5		2.5	2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0		0.0	0.0	0.0
Total Lost Time (s)	6.1	6.1	6.1	6.1	6.1	6.1		6.0		6.1	6.0	6.1
Lead/Lag	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lag		Lead		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	3.0
Recall Mode	Min	C-Min	C-Min	Min	C-Min	Min	Min	Min		Min	Min	Min
Walk Time (s)		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	
Pedestrian Calls (#/hr)		0	0		0		0	0			0	
Act Effct Green (s)	62.3	51.9	51.9		31.8	64.3		7.0		45.5	45.6	76.0
Actuated g/C Ratio	0.52	0.43	0.43		0.26	0.54		0.06		0.38	0.38	0.63
v/c Ratio	0.22	0.96	0.01		0.79	0.15		0.41		1.06	0.01	0.41
Control Delay	22.2	58.1	0.0		45.9	0.9		49.5		88.2	23.7	11.2
Queue Delay	0.0	0.0	0.0		0.0	0.0		0.0		0.0	0.0	0.0
Total Delay	22.2	58.1	0.0		45.9	0.9		49.5		88.2	23.7	11.2
LOS	C	E	A		D	A		D		F	C	B
Approach Delay		53.4			38.9			49.5			57.7	
Approach LOS		D			D			D			E	

Intersection Summary












Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green
 Natural Cycle: 120
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.06
 Intersection Signal Delay: 50.6
 Intersection LOS: D
 Intersection Capacity Utilization 91.3%
 ICU Level of Service F
 Analysis Period (min) 15

Splits and Phases: 2: Cass Lake Rd & Orchard Lake Rd



Lanes, Volumes, Timings
8: Orchard Lake Rd & Wards Point Dr

01/20/2021

						
Lane Group	NBL	NBT	SBT	SBR	SEL	SER
Lane Configurations						
Traffic Volume (vph)	2	721	979	3	7	5
Future Volume (vph)	2	721	979	3	7	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	14	12
Storage Length (ft)	100			0	0	0
Storage Lanes	1			0	1	0
Taper Length (ft)	50				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t					0.942	
Fl _t Protected	0.950				0.972	
Satd. Flow (prot)	1678	1766	1766	0	1784	0
Fl _t Permitted	0.214				0.822	
Satd. Flow (perm)	378	1766	1766	0	1509	0
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)					6	
Link Speed (mph)		35	35		25	
Link Distance (ft)		1020	743		595	
Travel Time (s)		19.9	14.5		16.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%
Adj. Flow (vph)	2	801	1088	3	8	6
Shared Lane Traffic (%)						
Lane Group Flow (vph)	2	801	1091	0	14	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		11	11		14	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		50	16		16	
Two way Left Turn Lane		Yes	Yes			
Headway Factor	1.04	1.04	1.04	1.04	0.92	1.00
Turning Speed (mph)	15			9	15	9
Number of Detectors	1	2	2		1	
Detector Template	Left	Thru	Thru		Left	
Leading Detector (ft)	20	100	100		20	
Trailing Detector (ft)	0	0	0		0	
Detector 1 Position(ft)	0	0	0		0	
Detector 1 Size(ft)	20	6	6		20	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	
Detector 1 Delay (s)	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	custom	NA	NA		Perm	

Lanes, Volumes, Timings
8: Orchard Lake Rd & Wards Point Dr

01/20/2021



Lane Group	NBL	NBT	SBT	SBR	SEL	SER
Protected Phases						
Permitted Phases	2	2	2		4	
Detector Phase	2	2	2		4	
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0		7.0	
Minimum Split (s)	23.3	23.3	23.3		23.8	
Total Split (s)	96.2	96.2	96.2		23.8	
Total Split (%)	80.2%	80.2%	80.2%		19.8%	
Maximum Green (s)	90.9	90.9	90.9		18.0	
Yellow Time (s)	3.6	3.6	3.6		3.5	
All-Red Time (s)	1.7	1.7	1.7		2.3	
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	
Total Lost Time (s)	5.3	5.3	5.3		5.8	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	
Recall Mode	C-Min	C-Min	C-Min		Min	
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)	101.7	101.7	101.7		7.2	
Actuated g/C Ratio	0.85	0.85	0.85		0.06	
v/c Ratio	0.01	0.54	0.73		0.15	
Control Delay	1.5	4.1	18.6		43.2	
Queue Delay	0.0	0.0	0.0		0.0	
Total Delay	1.5	4.1	18.6		43.2	
LOS	A	A	B		D	
Approach Delay		4.1	18.6		43.2	
Approach LOS		A	B		D	

Intersection Summary

Area Type:	Other
Cycle Length:	120
Actuated Cycle Length:	120
Offset:	114 (95%), Referenced to phase 2:NBSB and 6:, Start of Green
Natural Cycle:	90
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.73
Intersection Signal Delay:	12.7
Intersection LOS:	B
Intersection Capacity Utilization:	66.8%
ICU Level of Service:	C
Analysis Period (min):	15

Splits and Phases: 8: Orchard Lake Rd & Wards Point Dr



Lanes, Volumes, Timings
9: Orchard Lake Rd & Warwick St

01/20/2021



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	3	1270	765	0	18	2
Future Volume (vph)	3	1270	765	0	18	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	12	12
Storage Length (ft)	100			0	0	0
Storage Lanes	1			0	1	0
Taper Length (ft)	50				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t					0.988	
Fl _t Protected	0.950				0.957	
Satd. Flow (prot)	1678	1766	1766	0	1727	0
Fl _t Permitted	0.310				0.957	
Satd. Flow (perm)	547	1766	1766	0	1727	0
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)					2	
Link Speed (mph)		35	35		25	
Link Distance (ft)		794	1452		338	
Travel Time (s)		15.5	28.3		9.2	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%
Adj. Flow (vph)	3	1427	860	0	20	2
Shared Lane Traffic (%)						
Lane Group Flow (vph)	3	1427	860	0	22	0
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)		35	30		30	
Two way Left Turn Lane		Yes	Yes			
Headway Factor	1.04	1.04	1.04	1.04	1.00	1.00
Turning Speed (mph)	15			9	15	9
Number of Detectors	1	2	2		1	
Detector Template	Left	Thru	Thru		Left	
Leading Detector (ft)	20	100	100		20	
Trailing Detector (ft)	0	0	0		0	
Detector 1 Position(ft)	0	0	0		0	
Detector 1 Size(ft)	20	6	6		20	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	
Detector 1 Delay (s)	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	Perm	NA	NA		Perm	

Lanes, Volumes, Timings
9: Orchard Lake Rd & Warwick St

01/20/2021



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Protected Phases		6	2			
Permitted Phases	6				4	
Detector Phase	6	6	2		4	
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0		5.0	
Minimum Split (s)	22.5	22.5	22.5		22.5	
Total Split (s)	97.5	97.5	97.5		22.5	
Total Split (%)	81.3%	81.3%	81.3%		18.8%	
Maximum Green (s)	93.0	93.0	93.0		18.0	
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)	0.0	0.0	0.0		0.0	
Total Lost Time (s)	4.5	4.5	4.5		4.5	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	
Recall Mode	C-Min	C-Min	C-Min		Min	
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)	104.0	104.0	104.0		7.0	
Actuated g/C Ratio	0.87	0.87	0.87		0.06	
v/c Ratio	0.01	0.93	0.56		0.22	
Control Delay	0.0	12.3	1.6		54.6	
Queue Delay	0.0	0.0	0.0		0.0	
Total Delay	0.0	12.3	1.6		54.6	
LOS	A	B	A		D	
Approach Delay		12.3	1.6		54.6	
Approach LOS		B	A		D	

Intersection Summary

Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 38 (32%), Referenced to phase 2:WBT and 6:EBTL, Start of Green
 Natural Cycle: 140
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.93
 Intersection Signal Delay: 8.7
 Intersection Capacity Utilization 78.5%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service D

























Splits and Phases: 9: Orchard Lake Rd & Warwick St



Lanes, Volumes, Timings

11: Middlebelt Rd/Inverness St & Orchard Lake Rd

01/20/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	1099	152	244	698	5	64	4	209	8	14	20
Future Volume (vph)	16	1099	152	244	698	5	64	4	209	8	14	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	10	10	10	10	10	10
Storage Length (ft)	100		200	200		0	100		500	50		0
Storage Lanes	1		1	1		1	1		1	1		0
Taper Length (ft)	50			50			50			50		
Lane Util. 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
Frt			0.850			0.850			0.850		0.911	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1678	1766	1501	1678	1766	1501	1620	1705	1449	1620	1553	0
Flt Permitted	0.354			0.050			0.733			0.755		
Satd. Flow (perm)	625	1766	1501	88	1766	1501	1250	1705	1449	1287	1553	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			100			55			190			22
Link Speed (mph)		35			35			40				25
Link Distance (ft)		1026			825			884				562
Travel Time (s)		20.0			16.1			15.1				15.3
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 (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Adj. Flow (vph)	17	1195	165	265	759	5	70	4	227	9	15	22
Shared Lane Traffic (%)												
Lane Group Flow (vph)	17	1195	165	265	759	5	70	4	227	9	37	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)		11			11			10				10
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		55			16			25				25
Two way Left Turn Lane		Yes			Yes			Yes				
Headway Factor	1.04	1.04	1.04	1.04	1.04	1.04	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	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	6	20	20	6	20	20	6	20	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	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	
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	Perm	NA	

Lanes, Volumes, Timings
 11: Middlebelt Rd/Inverness St & Orchard Lake Rd

01/20/2021

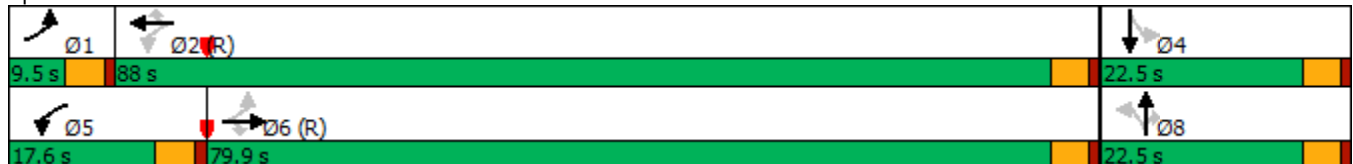


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases	1	6		5	2			8			4	
Permitted Phases	6		6	2		2	8		8	4		
Detector Phase	1	6	6	5	2	2	8	8	8	4	4	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	9.5	79.9	79.9	17.6	88.0	88.0	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (%)	7.9%	66.6%	66.6%	14.7%	73.3%	73.3%	18.8%	18.8%	18.8%	18.8%	18.8%	18.8%
Maximum Green (s)	5.0	75.4	75.4	13.1	83.5	83.5	18.0	18.0	18.0	18.0	18.0	18.0
Yellow Time (s)	3.5	3.5	3.5	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	1.0	1.0	1.0
Lost Time Adjust (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
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	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?	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	3.0
Recall Mode	Min	C-Min	C-Min	Min	C-Min	C-Min	Min	Min	Min	Min	Min	Min
Walk Time (s)		7.0	7.0		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	11.0	11.0
Pedestrian Calls (#/hr)		0	0		0	0	0	0	0	0	0	0
Act Effct Green (s)	80.9	75.4	75.4	98.9	88.9	88.9	12.1	12.1	12.1	12.1	12.1	12.1
Actuated g/C Ratio	0.67	0.63	0.63	0.82	0.74	0.74	0.10	0.10	0.10	0.10	0.10	0.10
v/c Ratio	0.04	1.08	0.17	0.82	0.58	0.00	0.56	0.02	0.72	0.07	0.21	0.21
Control Delay	2.8	67.3	4.3	55.2	9.9	0.0	66.8	45.5	24.4	47.0	28.2	28.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	2.8	67.3	4.3	55.2	9.9	0.0	66.8	45.5	24.4	47.0	28.2	28.2
LOS	A	E	A	E	A	A	E	D	C	D	C	C
Approach Delay		59.0			21.5			34.5				31.9
Approach LOS		E			C			C				C

Intersection Summary

Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 114 (95%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green
 Natural Cycle: 150
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.08
 Intersection Signal Delay: 41.8
 Intersection LOS: D
 Intersection Capacity Utilization 92.8%
 ICU Level of Service F
 Analysis Period (min) 15

Splits and Phases: 11: Middlebelt Rd/Inverness St & Orchard Lake Rd



Lanes, Volumes, Timings
15: Orchard Lake Rd & Summers Rd

01/20/2021



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	29	0	723	16	0	984
Future Volume (vph)	29	0	723	16	0	984
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0		0	100	
Storage Lanes	1	0		0	1	
Taper Length (ft)	25				50	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.997			
Flt Protected	0.950					
Satd. Flow (prot)	1770	0	1857	0	1863	1863
Flt Permitted	0.950					
Satd. Flow (perm)	1770	0	1857	0	1863	1863
Link Speed (mph)	25		35			35
Link Distance (ft)	592		733			1020
Travel Time (s)	16.1		14.3			19.9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	32	0	786	17	0	1070
Shared Lane Traffic (%)						
Lane Group Flow (vph)	32	0	803	0	0	1070
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	R NA
Median Width(ft)	12		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane			Yes			Yes
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	61.8%
ICU Level of Service	B
Analysis Period (min)	15

Lanes, Volumes, Timings
 17: Willow Beach St & Orchard Lake Rd

01/20/2021



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	728	0	25	982	0	29
Future Volume (vph)	728	0	25	982	0	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	100		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)			50		25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.865	
Flt Protected			0.950			
Satd. Flow (prot)	1863	0	1770	1863	1611	0
Flt Permitted			0.950			
Satd. Flow (perm)	1863	0	1770	1863	1611	0
Link Speed (mph)	35			35	25	
Link Distance (ft)	743			701	392	
Travel Time (s)	14.5			13.7	10.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	791	0	27	1067	0	32
Shared Lane Traffic (%)						
Lane Group Flow (vph)	791	0	27	1067	32	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	11			11	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane	Yes			Yes		
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	61.7%
ICU Level of Service	B
Analysis Period (min)	15

Lanes, Volumes, Timings
19: Maddy Ln & Orchard Lake Rd

01/20/2021

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1227	0	0	748	18	0	0	45	0	0	0
Future Volume (vph)	0	1227	0	0	748	18	0	0	45	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	100		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	50			50			25			25		
Lane Util. 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
Frt					0.996			0.865				
Flt Protected												
Satd. Flow (prot)	1863	1863	0	1863	1855	0	0	1611	0	0	1863	0
Flt Permitted												
Satd. Flow (perm)	1863	1863	0	1863	1855	0	0	1611	0	0	1863	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		1268			794			484			384	
Travel Time (s)		24.7			15.5			13.2			10.5	
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
Adj. Flow (vph)	0	1334	0	0	813	20	0	0	49	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1334	0	0	833	0	0	49	0	0	0	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)		11			11			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane		Yes			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
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	74.6%
ICU Level of Service	D
Analysis Period (min)	15

Lanes, Volumes, Timings
 22: Figa Ave & Orchard Lake Rd

01/20/2021



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1267	22	18	765	0	0
Future Volume (vph)	1267	22	18	765	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	12	12
Storage Length (ft)		0	100		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)			50		25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t	0.998					
Fl _t Protected			0.950			
Satd. Flow (prot)	1797	0	1711	1801	1863	0
Fl _t Permitted			0.950			
Satd. Flow (perm)	1797	0	1711	1801	1863	0
Link Speed (mph)	35			35	25	
Link Distance (ft)	1452			1026	225	
Travel Time (s)	28.3			20.0	6.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1377	24	20	832	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1401	0	20	832	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	11			11	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane	Yes			Yes		
Headway Factor	1.04	1.04	1.04	1.04	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	71.3%
Analysis Period (min)	15
	ICU Level of Service C

Lanes, Volumes, Timings
1: Commerce Rd & Orchard Lake Rd

01/20/2021



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	382	36	50	731	530	503
Future Volume (vph)	382	36	50	731	530	503
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11
Storage Length (ft)	500	500	150			450
Storage Lanes	1	0	1			1
Taper Length (ft)	50		50			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.850				0.850
Fl _t Protected	0.950		0.950			
Satd. Flow (prot)	1678	1501	1678	1766	1766	1501
Fl _t Permitted	0.950		0.250			
Satd. Flow (perm)	1678	1501	442	1766	1766	1501
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		33				553
Link Speed (mph)	35			35	35	
Link Distance (ft)	916			721	733	
Travel Time (s)	17.8			14.0	14.3	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%
Adj. Flow (vph)	420	40	55	803	582	553
Shared Lane Traffic (%)						
Lane Group Flow (vph)	420	40	55	803	582	553
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	R NA
Median Width(ft)	11			11	11	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	30			16	60	
Two way Left Turn Lane					Yes	
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	1	1	2	2	1
Detector Template	Left	Right	Left	Thru	Thru	Right
Leading Detector (ft)	20	20	20	100	100	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	20	20	20	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
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	Perm	Over	pm+pt	NA	NA	Perm

Lanes, Volumes, Timings
 1: Commerce Rd & Orchard Lake Rd

01/20/2021



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Protected Phases		5	5	2	6	
Permitted Phases	8		2			6
Detector Phase	8	5	5	2	6	6
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	23.5	15.8	15.8	23.8	23.8	23.8
Total Split (s)	44.4	15.8	15.8	79.8	64.0	64.0
Total Split (%)	35.7%	12.7%	12.7%	64.3%	51.5%	51.5%
Maximum Green (s)	38.9	10.0	10.0	74.0	58.2	58.2
Yellow Time (s)	3.6	3.6	3.6	3.6	3.6	3.6
All-Red Time (s)	1.9	2.2	2.2	2.2	2.2	2.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.8	5.8	5.8	5.8	5.8
Lead/Lag		Lead	Lead		Lag	Lag
Lead-Lag Optimize?		Yes	Yes		Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	Min	Min	Min	C-Min	C-Min	C-Min
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)	35.1	10.0	77.8	77.8	62.0	62.0
Actuated g/C Ratio	0.28	0.08	0.63	0.63	0.50	0.50
v/c Ratio	0.89	0.26	0.15	0.73	0.66	0.54
Control Delay	63.3	26.2	11.1	21.9	28.9	3.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.3	26.2	11.1	21.9	28.9	3.7
LOS	E	C	B	C	C	A
Approach Delay	60.1			21.2	16.6	
Approach LOS	E			C	B	

Intersection Summary























Area Type: Other
 Cycle Length: 124.2
 Actuated Cycle Length: 124.2
 Offset: 43 (35%), Referenced to phase 2:NBT and 6:SBT, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.89
 Intersection Signal Delay: 26.4
 Intersection LOS: C
 Intersection Capacity Utilization 71.6%
 ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 1: Commerce Rd & Orchard Lake Rd



Lanes, Volumes, Timings
2: Cass Lake Rd & Orchard Lake Rd

01/14/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	360	748	8	2	860	603	5	21	6	316	14	214
Future Volume (vph)	360	748	8	2	860	603	5	21	6	316	14	214
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)	190		100	100		435	0		0	125		300
Storage Lanes	1		1	1		1	0		0	1		1
Taper Length (ft)	50			50			25			50		
Lane Util. Factor	1.00	1.00	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		0.974				0.850
Flt Protected	0.950			0.950				0.992		0.950		
Satd. Flow (prot)	1694	1783	1516	1694	3388	1516	0	1782	0	1752	1845	1568
Flt Permitted	0.101			0.252				0.939		0.585		
Satd. Flow (perm)	180	1783	1516	449	3388	1516	0	1687	0	1079	1845	1568
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			138			559		7				28
Link Speed (mph)		35			35			35				35
Link Distance (ft)		701			1268			549				607
Travel Time (s)		13.7			24.7			10.7				11.8
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	404	840	9	2	966	678	6	24	7	355	16	240
Shared Lane Traffic (%)												
Lane Group Flow (vph)	404	840	9	2	966	678	0	37	0	355	16	240
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			11			20				12
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		20			40			16				16
Two way Left Turn Lane		Yes			Yes							Yes
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	2	1	1	2	1	1	2		1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100	20	20	100		20	100	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)	20	6	20	20	6	20	20	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	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
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	pm+ov	Perm	NA		pm+pt	NA	pm+ov

Lanes, Volumes, Timings
2: Cass Lake Rd & Orchard Lake Rd

01/14/2021



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases	1	6		5	2	3		4		3	8	1
Permitted Phases	6		6	2		2	4			8		8
Detector Phase	1	6	6	5	2	3	4	4		3	8	1
Switch Phase												
Minimum Initial (s)	4.0	10.0	10.0	4.0	10.0	10.0	7.0	7.0		10.0	7.0	4.0
Minimum Split (s)	10.1	28.0	28.0	10.1	28.0	16.1	28.0	28.0		16.1	29.0	10.1
Total Split (s)	30.4	63.6	63.6	10.1	43.3	18.3	28.0	28.0		18.3	46.3	30.4
Total Split (%)	25.3%	53.0%	53.0%	8.4%	36.1%	15.3%	23.3%	23.3%		15.3%	38.6%	25.3%
Maximum Green (s)	24.3	57.5	57.5	4.0	37.2	12.2	22.0	22.0		12.2	40.3	24.3
Yellow Time (s)	3.6	3.6	3.6	3.6	3.6	3.6	3.5	3.5		3.6	3.5	3.6
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5		2.5	2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0		0.0	0.0	0.0
Total Lost Time (s)	6.1	6.1	6.1	6.1	6.1	6.1		6.0		6.1	6.0	6.1
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag		Lead		Lead
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	3.0
Recall Mode	Min	C-Min	C-Min	Min	C-Min	Min	Min	Min		Min	Min	Min
Walk Time (s)		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	
Pedestrian Calls (#/hr)		0	0		0		0	0			0	
Act Effct Green (s)	80.2	68.6	68.6	46.7	41.2	60.7		8.1		27.6	27.7	66.6
Actuated g/C Ratio	0.67	0.57	0.57	0.39	0.34	0.51		0.07		0.23	0.23	0.56
v/c Ratio	0.75	0.83	0.01	0.01	0.83	0.65		0.31		1.10	0.04	0.27
Control Delay	35.9	29.3	0.0	12.0	44.0	7.3		51.7		122.1	36.4	12.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0		0.0	0.0	0.0
Total Delay	35.9	29.3	0.0	12.0	44.0	7.3		51.7		122.1	36.4	12.9
LOS	D	C	A	B	D	A		D		F	D	B
Approach Delay		31.2			28.9			51.7			77.0	
Approach LOS		C			C			D			E	

Intersection Summary












Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green
 Natural Cycle: 115
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.10
 Intersection Signal Delay: 38.2
 Intersection LOS: D
 Intersection Capacity Utilization 83.1%
 ICU Level of Service E
 Analysis Period (min) 15

Splits and Phases: 2: Cass Lake Rd & Orchard Lake Rd



Lanes, Volumes, Timings
8: Orchard Lake Rd & Wards Point Dr

01/20/2021

						
Lane Group	NBL	NBT	SBT	SBR	SEL	SER
Lane Configurations						
Traffic Volume (vph)	11	1073	1028	12	11	10
Future Volume (vph)	11	1073	1028	12	11	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	14	12
Storage Length (ft)	100			0	0	0
Storage Lanes	1			0	1	0
Taper Length (ft)	50				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t			0.998		0.935	
Fl _t Protected	0.950				0.975	
Satd. Flow (prot)	1678	1766	1762	0	1777	0
Fl _t Permitted	0.189				0.830	
Satd. Flow (perm)	334	1766	1762	0	1512	0
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			1		11	
Link Speed (mph)		35	35		25	
Link Distance (ft)		1020	743		595	
Travel Time (s)		19.9	14.5		16.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%
Adj. Flow (vph)	12	1192	1142	13	12	11
Shared Lane Traffic (%)						
Lane Group Flow (vph)	12	1192	1155	0	23	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		11	11		14	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		50	16		16	
Two way Left Turn Lane		Yes	Yes			
Headway Factor	1.04	1.04	1.04	1.04	0.92	1.00
Turning Speed (mph)	15			9	15	9
Number of Detectors	1	2	2		1	
Detector Template	Left	Thru	Thru		Left	
Leading Detector (ft)	20	100	100		20	
Trailing Detector (ft)	0	0	0		0	
Detector 1 Position(ft)	0	0	0		0	
Detector 1 Size(ft)	20	6	6		20	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	
Detector 1 Delay (s)	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	custom	NA	NA		Perm	

Lanes, Volumes, Timings
 8: Orchard Lake Rd & Wards Point Dr

01/20/2021



Lane Group	NBL	NBT	SBT	SBR	SEL	SER
Protected Phases						
Permitted Phases	2	2	2		4	
Detector Phase	2	2	2		4	
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0		7.0	
Minimum Split (s)	23.3	23.3	23.3		23.8	
Total Split (s)	96.2	96.2	96.2		23.8	
Total Split (%)	80.2%	80.2%	80.2%		19.8%	
Maximum Green (s)	90.9	90.9	90.9		18.0	
Yellow Time (s)	3.6	3.6	3.6		3.5	
All-Red Time (s)	1.7	1.7	1.7		2.3	
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	
Total Lost Time (s)	5.3	5.3	5.3		5.8	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	
Recall Mode	C-Min	C-Min	C-Min		Min	
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)	101.5	101.5	101.5		7.4	
Actuated g/C Ratio	0.85	0.85	0.85		0.06	
v/c Ratio	0.04	0.80	0.78		0.22	
Control Delay	2.0	9.8	25.1		40.5	
Queue Delay	0.0	0.0	0.0		0.0	
Total Delay	2.0	9.8	25.1		40.5	
LOS	A	A	C		D	
Approach Delay		9.7	25.1		40.5	
Approach LOS		A	C		D	

Intersection Summary

Area Type:	Other
Cycle Length:	120
Actuated Cycle Length:	120
Offset:	114 (95%), Referenced to phase 2:NBSB and 6:, Start of Green
Natural Cycle:	90
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.80
Intersection Signal Delay:	17.5
Intersection LOS:	B
Intersection Capacity Utilization	71.6%
ICU Level of Service	C
Analysis Period (min)	15

Splits and Phases: 8: Orchard Lake Rd & Wards Point Dr



Lanes, Volumes, Timings
9: Orchard Lake Rd & Warwick St

01/20/2021



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	11	1076	1481	6	5	8
Future Volume (vph)	11	1076	1481	6	5	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	12	12
Storage Length (ft)	100			0	0	0
Storage Lanes	1			0	1	0
Taper Length (ft)	50				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t			0.999		0.919	
Fl _t Protected	0.950				0.980	
Satd. Flow (prot)	1678	1766	1764	0	1645	0
Fl _t Permitted	0.038				0.980	
Satd. Flow (perm)	67	1766	1764	0	1645	0
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			1		9	
Link Speed (mph)		35	35		25	
Link Distance (ft)		794	1452		338	
Travel Time (s)		15.5	28.3		9.2	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%
Adj. Flow (vph)	12	1209	1664	7	6	9
Shared Lane Traffic (%)						
Lane Group Flow (vph)	12	1209	1671	0	15	0
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)		35	30		30	
Two way Left Turn Lane		Yes	Yes			
Headway Factor	1.04	1.04	1.04	1.04	1.00	1.00
Turning Speed (mph)	15			9	15	9
Number of Detectors	1	2	2		1	
Detector Template	Left	Thru	Thru		Left	
Leading Detector (ft)	20	100	100		20	
Trailing Detector (ft)	0	0	0		0	
Detector 1 Position(ft)	0	0	0		0	
Detector 1 Size(ft)	20	6	6		20	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	
Detector 1 Delay (s)	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	Perm	NA	NA		Perm	

Lanes, Volumes, Timings
9: Orchard Lake Rd & Warwick St

01/20/2021



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Protected Phases		6	2			
Permitted Phases	6				4	
Detector Phase	6	6	2		4	
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0		5.0	
Minimum Split (s)	22.5	22.5	22.5		22.5	
Total Split (s)	97.5	97.5	97.5		22.5	
Total Split (%)	81.3%	81.3%	81.3%		18.8%	
Maximum Green (s)	93.0	93.0	93.0		18.0	
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)	0.0	0.0	0.0		0.0	
Total Lost Time (s)	4.5	4.5	4.5		4.5	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	
Recall Mode	C-Min	C-Min	C-Min		Min	
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)	104.7	104.7	104.7		6.3	
Actuated g/C Ratio	0.87	0.87	0.87		0.05	
v/c Ratio	0.21	0.79	1.09		0.16	
Control Delay	1.8	7.1	48.7		38.2	
Queue Delay	0.0	0.0	0.0		0.0	
Total Delay	1.8	7.1	48.7		38.2	
LOS	A	A	D		D	
Approach Delay		7.0	48.7		38.2	
Approach LOS		A	D		D	

Intersection Summary

Area Type:	Other
Cycle Length:	120
Actuated Cycle Length:	120
Offset:	38 (32%), Referenced to phase 2:WBT and 6:EBTL, Start of Green
Natural Cycle:	150
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	1.09
Intersection Signal Delay:	31.1
Intersection LOS:	C
Intersection Capacity Utilization:	90.0%
ICU Level of Service:	E
Analysis Period (min):	15

























Splits and Phases: 9: Orchard Lake Rd & Warwick St



Lanes, Volumes, Timings

11: Middlebelt Rd/Inverness St & Orchard Lake Rd

01/20/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	32	948	87	185	1218	25	248	27	280	30	16	33
Future Volume (vph)	32	948	87	185	1218	25	248	27	280	30	16	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	10	10	10	10	10	10
Storage Length (ft)	100		200	200		0	100		500	50		0
Storage Lanes	1		1	1		1	1		1	1		0
Taper Length (ft)	50			50			50			50		
Lane Util. 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
Fr _t			0.850			0.850			0.850		0.898	
Fl _t Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1678	1766	1501	1678	1766	1501	1620	1705	1449	1620	1531	0
Fl _t Permitted	0.052			0.085			0.722			0.738		
Satd. Flow (perm)	92	1766	1501	150	1766	1501	1231	1705	1449	1258	1531	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			95			55			224			36
Link Speed (mph)		35			35			40				25
Link Distance (ft)		1026			825			884				562
Travel Time (s)		20.0			16.1			15.1				15.3
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 (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Adj. Flow (vph)	35	1030	95	201	1324	27	270	29	304	33	17	36
Shared Lane Traffic (%)												
Lane Group Flow (vph)	35	1030	95	201	1324	27	270	29	304	33	53	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)		11			11			10				10
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		55			16			25				25
Two way Left Turn Lane		Yes			Yes			Yes				
Headway Factor	1.04	1.04	1.04	1.04	1.04	1.04	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	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	6	20	20	6	20	20	6	20	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	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	
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	Perm	NA	

Lanes, Volumes, Timings
 11: Middlebelt Rd/Inverness St & Orchard Lake Rd

01/20/2021



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases	1	6		5	2			8				4
Permitted Phases	6		6	2		2	8		8	4		
Detector Phase	1	6	6	5	2	2	8	8	8	4		4
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	9.5	79.9	79.9	17.6	88.0	88.0	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (%)	7.9%	66.6%	66.6%	14.7%	73.3%	73.3%	18.8%	18.8%	18.8%	18.8%	18.8%	18.8%
Maximum Green (s)	5.0	75.4	75.4	13.1	83.5	83.5	18.0	18.0	18.0	18.0	18.0	18.0
Yellow Time (s)	3.5	3.5	3.5	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	1.0	1.0	1.0
Lost Time Adjust (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
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	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?	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	3.0
Recall Mode	Min	C-Min	C-Min	Min	C-Min	C-Min	Min	Min	Min	Min	Min	Min
Walk Time (s)		7.0	7.0		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	11.0	11.0
Pedestrian Calls (#/hr)		0	0		0	0	0	0	0	0	0	0
Act Effct Green (s)	81.9	76.9	76.9	92.7	83.5	83.5	18.0	18.0	18.0	18.0	18.0	18.0
Actuated g/C Ratio	0.68	0.64	0.64	0.77	0.70	0.70	0.15	0.15	0.15	0.15	0.15	0.15
v/c Ratio	0.27	0.91	0.10	0.76	1.08	0.03	1.47	0.11	0.75	0.18	0.20	0.20
Control Delay	11.4	37.3	3.1	37.6	69.6	0.4	274.2	45.5	26.2	47.3	22.6	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	0.0
Total Delay	11.4	37.3	3.1	37.6	69.6	0.4	274.2	45.5	26.2	47.3	22.6	22.6
LOS	B	D	A	D	E	A	F	D	C	D	C	C
Approach Delay		33.7			64.2			138.2				32.1
Approach LOS		C			E			F				C

Intersection Summary

Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 114 (95%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green
 Natural Cycle: 150
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.47
 Intersection Signal Delay: 66.1
 Intersection LOS: E
 Intersection Capacity Utilization 99.9%
 ICU Level of Service F
 Analysis Period (min) 15

Splits and Phases: 11: Middlebelt Rd/Inverness St & Orchard Lake Rd



Lanes, Volumes, Timings
15: Orchard Lake Rd & Summers Rd

01/20/2021



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	48	0	1084	19	54	984
Future Volume (vph)	48	0	1084	19	54	984
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0		0	100	
Storage Lanes	1	0		0	1	
Taper Length (ft)	25				50	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.998			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	0	1859	0	1770	1863
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1770	0	1859	0	1770	1863
Link Speed (mph)	25		35			35
Link Distance (ft)	592		733			1020
Travel Time (s)	16.1		14.3			19.9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	52	0	1178	21	59	1070
Shared Lane Traffic (%)						
Lane Group Flow (vph)	52	0	1199	0	59	1070
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	R NA
Median Width(ft)	12		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane			Yes			Yes
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	68.2%
ICU Level of Service	C
Analysis Period (min)	15

Lanes, Volumes, Timings
 17: Willow Beach St & Orchard Lake Rd

01/20/2021






















Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1084	0	39	1040	0	31
Future Volume (vph)	1084	0	39	1040	0	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	100		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)			50		25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.865	
Flt Protected			0.950			
Satd. Flow (prot)	1863	0	1770	1863	1611	0
Flt Permitted			0.950			
Satd. Flow (perm)	1863	0	1770	1863	1611	0
Link Speed (mph)	35			35	25	
Link Distance (ft)	743			701	392	
Travel Time (s)	14.5			13.7	10.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1178	0	42	1130	0	34
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1178	0	42	1130	34	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	11			11	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane	Yes			Yes		
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	67.1%
ICU Level of Service	C
Analysis Period (min)	15

Lanes, Volumes, Timings
 19: Maddy Ln & Orchard Lake Rd

01/20/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1062	0	0	1465	25	0	0	24	0	0	0
Future Volume (vph)	0	1062	0	0	1465	25	0	0	24	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	100		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	50			50			25			25		
Lane Util. 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
Frt					0.997			0.865				
Flt Protected												
Satd. Flow (prot)	1863	1863	0	1863	1857	0	0	1611	0	0	1863	0
Flt Permitted												
Satd. Flow (perm)	1863	1863	0	1863	1857	0	0	1611	0	0	1863	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		1268			794			484			384	
Travel Time (s)		24.7			15.5			13.2			10.5	
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
Adj. Flow (vph)	0	1154	0	0	1592	27	0	0	26	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1154	0	0	1619	0	0	26	0	0	0	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)		11			11			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane		Yes			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
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	88.6%
ICU Level of Service	E
Analysis Period (min)	15

Lanes, Volumes, Timings
 22: Figa Ave & Orchard Lake Rd

01/20/2021



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1067	14	6	1487	0	0
Future Volume (vph)	1067	14	6	1487	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	12	12
Storage Length (ft)		0	100		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)			50		25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t	0.998					
Fl _t Protected			0.950			
Satd. Flow (prot)	1797	0	1711	1801	1863	0
Fl _t Permitted			0.950			
Satd. Flow (perm)	1797	0	1711	1801	1863	0
Link Speed (mph)	35			35	25	
Link Distance (ft)	1452			1026	225	
Travel Time (s)	28.3			20.0	6.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1160	15	7	1616	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1175	0	7	1616	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	11			11	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane	Yes			Yes		
Headway Factor	1.04	1.04	1.04	1.04	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	81.6%
Analysis Period (min)	15
	ICU Level of Service D

Lanes, Volumes, Timings
1: Commerce Rd & Orchard Lake Rd

01/20/2021



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	424	74	64	325	679	335
Future Volume (vph)	424	74	64	325	679	335
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11
Storage Length (ft)	500	500	150			450
Storage Lanes	1	0	1			0
Taper Length (ft)	50		50			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.850				0.850
Fl _t Protected	0.950		0.950			
Satd. Flow (prot)	1678	1501	1678	1766	1766	1501
Fl _t Permitted	0.950		0.104			
Satd. Flow (perm)	1678	1501	184	1766	1766	1501
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		63				280
Link Speed (mph)	35			35	35	
Link Distance (ft)	916			721	733	
Travel Time (s)	17.8			14.0	14.3	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%
Adj. Flow (vph)	466	81	70	357	746	368
Shared Lane Traffic (%)						
Lane Group Flow (vph)	466	81	70	357	746	368
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	R NA
Median Width(ft)	11			11	11	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	30			16	60	
Two way Left Turn Lane					Yes	
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	1	1	2	2	1
Detector Template	Left	Right	Left	Thru	Thru	Right
Leading Detector (ft)	20	20	20	100	100	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	20	20	20	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
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	Prot	Over	pm+pt	NA	NA	Perm

Lanes, Volumes, Timings
 1: Commerce Rd & Orchard Lake Rd

01/20/2021

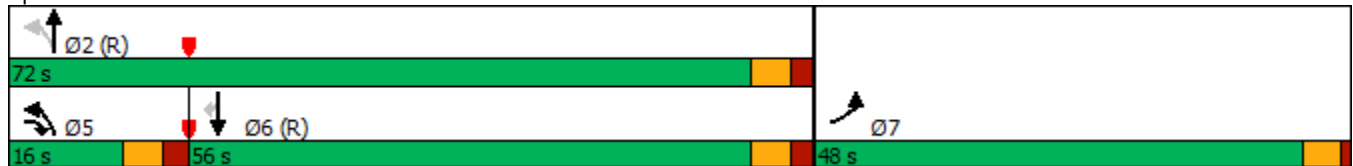


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Protected Phases	7	5	5	2	6	
Permitted Phases			2			6
Detector Phase	7	5	5	2	6	6
Switch Phase						
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	9.5	15.8	15.8	23.8	23.8	23.8
Total Split (s)	48.0	16.0	16.0	72.0	56.0	56.0
Total Split (%)	40.0%	13.3%	13.3%	60.0%	46.7%	46.7%
Maximum Green (s)	43.5	10.2	10.2	66.2	50.2	50.2
Yellow Time (s)	3.5	3.6	3.6	3.6	3.6	3.6
All-Red Time (s)	1.0	2.2	2.2	2.2	2.2	2.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	5.8	5.8	5.8	5.8	5.8
Lead/Lag		Lead	Lead		Lag	Lag
Lead-Lag Optimize?		Yes	Yes		Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	Min	Min	C-Min	C-Min	C-Min
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)	37.7	10.0	72.0	72.0	56.2	56.2
Actuated g/C Ratio	0.31	0.08	0.60	0.60	0.47	0.47
v/c Ratio	0.89	0.44	0.30	0.34	0.90	0.43
Control Delay	58.0	26.2	14.8	14.1	46.5	7.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.0	26.2	14.8	14.1	46.5	7.5
LOS	E	C	B	B	D	A
Approach Delay	53.3			14.2	33.6	
Approach LOS	D			B	C	

Intersection Summary























Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.90
 Intersection Signal Delay: 34.8
 Intersection LOS: C
 Intersection Capacity Utilization 81.0%
 ICU Level of Service D
 Analysis Period (min) 15

Splits and Phases: 1: Commerce Rd & Orchard Lake Rd



Lanes, Volumes, Timings
2: Cass Lake Rd & Orchard Lake Rd

01/20/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	92	660	5	0	631	117	17	5	15	566	6	368
Future Volume (vph)	92	660	5	0	631	117	17	5	15	566	6	368
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)	190		100	100		435	0		0	300		300
Storage Lanes	1		1	1		1	0		0	1		1
Taper Length (ft)	50			50			25			50		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t			0.850			0.850		0.945				0.850
Fl _t Protected	0.950							0.978		0.950		
Satd. Flow (prot)	1694	1783	1516	1783	3388	1516	0	1705	0	1752	1845	1568
Fl _t Permitted	0.211							0.852		0.640		
Satd. Flow (perm)	376	1783	1516	1783	3388	1516	0	1485	0	1181	1845	1568
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			138			138		17				63
Link Speed (mph)		35			35			35				35
Link Distance (ft)		701			1268			549				607
Travel Time (s)		13.7			24.7			10.7				11.8
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	103	742	6	0	709	131	19	6	17	636	7	413
Shared Lane Traffic (%)												
Lane Group Flow (vph)	103	742	6	0	709	131	0	42	0	636	7	413
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			11			20				12
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		20			40			16				16
Two way Left Turn Lane		Yes			Yes							Yes
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	2	1	1	2	1	1	2		1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100	20	20	100		20	100	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)	20	6	20	20	6	20	20	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	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
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	pm+ov	Perm	NA		pm+pt	NA	pm+ov

Lanes, Volumes, Timings
2: Cass Lake Rd & Orchard Lake Rd

01/20/2021

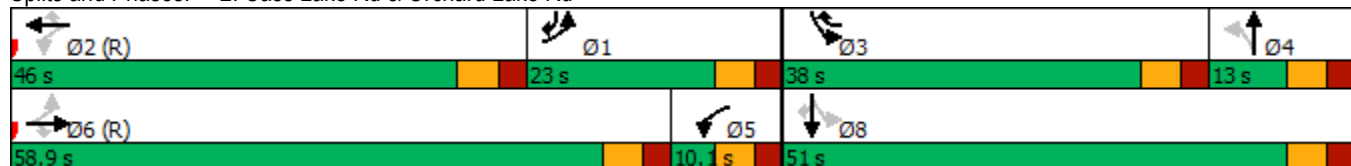


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases	1	6		5	2	3		4		3	8	1
Permitted Phases	6		6	2		2	4			8		8
Detector Phase	1	6	6	5	2	3	4	4		3	8	1
Switch Phase												
Minimum Initial (s)	4.0	10.0	10.0	4.0	10.0	10.0	7.0	7.0		10.0	7.0	4.0
Minimum Split (s)	10.1	28.0	28.0	10.1	28.0	16.1	13.0	13.0		16.1	29.0	10.1
Total Split (s)	23.0	58.9	58.9	10.1	46.0	38.0	13.0	13.0		38.0	51.0	23.0
Total Split (%)	19.2%	49.1%	49.1%	8.4%	38.3%	31.7%	10.8%	10.8%		31.7%	42.5%	19.2%
Maximum Green (s)	16.9	52.8	52.8	4.0	39.9	31.9	7.0	7.0		31.9	45.0	16.9
Yellow Time (s)	3.6	3.6	3.6	3.6	3.6	3.6	3.5	3.5		3.6	3.5	3.6
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5		2.5	2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0		0.0	0.0	0.0
Total Lost Time (s)	6.1	6.1	6.1	6.1	6.1	6.1		6.0		6.1	6.0	6.1
Lead/Lag	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lag		Lead		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	3.0
Recall Mode	Min	C-Min	C-Min	Min	C-Min	Min	Min	Min		Min	Min	Min
Walk Time (s)		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	
Pedestrian Calls (#/hr)		0	0		0		0	0			0	
Act Effct Green (s)	62.3	51.9	51.9		31.8	64.3		7.0		45.5	45.6	76.0
Actuated g/C Ratio	0.52	0.43	0.43		0.26	0.54		0.06		0.38	0.38	0.63
v/c Ratio	0.22	0.96	0.01		0.79	0.15		0.41		1.06	0.01	0.41
Control Delay	22.2	58.1	0.0		45.9	0.9		49.5		88.2	23.7	11.2
Queue Delay	0.0	0.0	0.0		0.0	0.0		0.0		0.0	0.0	0.0
Total Delay	22.2	58.1	0.0		45.9	0.9		49.5		88.2	23.7	11.2
LOS	C	E	A		D	A		D		F	C	B
Approach Delay		53.4			38.9			49.5			57.7	
Approach LOS		D			D			D			E	

Intersection Summary











Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green
 Natural Cycle: 120
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.06
 Intersection Signal Delay: 50.6
 Intersection LOS: D
 Intersection Capacity Utilization 91.3%
 ICU Level of Service F
 Analysis Period (min) 15

Splits and Phases: 2: Cass Lake Rd & Orchard Lake Rd



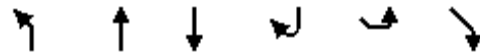
Lanes, Volumes, Timings
8: Orchard Lake Rd & Wards Point Dr

01/20/2021

						
Lane Group	NBL	NBT	SBT	SBR	SEL	SER
Lane Configurations						
Traffic Volume (vph)	2	721	979	3	7	5
Future Volume (vph)	2	721	979	3	7	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	14	12
Storage Length (ft)	100			0	0	0
Storage Lanes	1			0	1	0
Taper Length (ft)	50				25	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	1.00
Fr _t					0.942	
Fl _t Protected	0.950				0.972	
Satd. Flow (prot)	1678	1766	3355	0	1784	0
Fl _t Permitted	0.259				0.972	
Satd. Flow (perm)	457	1766	3355	0	1784	0
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			1		6	
Link Speed (mph)		35	35		25	
Link Distance (ft)		1020	743		595	
Travel Time (s)		19.9	14.5		16.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%
Adj. Flow (vph)	2	801	1088	3	8	6
Shared Lane Traffic (%)						
Lane Group Flow (vph)	2	801	1091	0	14	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		11	11		14	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		50	16		16	
Two way Left Turn Lane		Yes	Yes			
Headway Factor	1.04	1.04	1.04	1.04	0.92	1.00
Turning Speed (mph)	15			9	15	9
Number of Detectors	1	2	2		1	
Detector Template	Left	Thru	Thru		Left	
Leading Detector (ft)	20	100	100		20	
Trailing Detector (ft)	0	0	0		0	
Detector 1 Position(ft)	0	0	0		0	
Detector 1 Size(ft)	20	6	6		20	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	
Detector 1 Delay (s)	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	Perm	NA	NA		Prot	

Lanes, Volumes, Timings
8: Orchard Lake Rd & Wards Point Dr

01/20/2021



Lane Group	NBL	NBT	SBT	SBR	SEL	SER
Protected Phases		2	6		7	
Permitted Phases	2	2				
Detector Phase	2	2	6		7	
Switch Phase						
Minimum Initial (s)	10.0	10.0	5.0		5.0	
Minimum Split (s)	23.3	23.3	23.3		10.8	
Total Split (s)	39.2	39.2	39.2		10.8	
Total Split (%)	78.4%	78.4%	78.4%		21.6%	
Maximum Green (s)	33.9	33.9	33.9		5.0	
Yellow Time (s)	3.6	3.6	3.6		3.5	
All-Red Time (s)	1.7	1.7	1.7		2.3	
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	
Total Lost Time (s)	5.3	5.3	5.3		5.8	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	
Recall Mode	C-Min	C-Min	C-Max		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)	46.8	46.8	46.8		5.0	
Actuated g/C Ratio	0.94	0.94	0.94		0.10	
v/c Ratio	0.00	0.48	0.35		0.08	
Control Delay	1.5	2.9	1.5		17.8	
Queue Delay	0.0	0.0	0.0		0.0	
Total Delay	1.5	2.9	1.5		17.8	
LOS	A	A	A		B	
Approach Delay		2.9	1.5		17.8	
Approach LOS		A	A		B	

Intersection Summary

Area Type:	Other
Cycle Length:	50
Actuated Cycle Length:	50
Offset:	0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green
Natural Cycle:	50
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.48
Intersection Signal Delay:	2.2
Intersection LOS:	A
Intersection Capacity Utilization:	51.4%
ICU Level of Service:	A
Analysis Period (min):	15

Splits and Phases: 8: Orchard Lake Rd & Wards Point Dr



Lanes, Volumes, Timings
9: Orchard Lake Rd & Warwick St

01/20/2021



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	3	1270	765	0	18	2
Future Volume (vph)	3	1270	765	0	18	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	12	12
Storage Length (ft)	100			0	0	0
Storage Lanes	1			0	1	0
Taper Length (ft)	50				25	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	1.00
Fr _t					0.988	
Fl _t Protected	0.950				0.957	
Satd. Flow (prot)	1678	1766	3355	0	1727	0
Fl _t Permitted	0.327				0.957	
Satd. Flow (perm)	577	1766	3355	0	1727	0
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)					2	
Link Speed (mph)		35	35		25	
Link Distance (ft)		794	1452		338	
Travel Time (s)		15.5	28.3		9.2	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%
Adj. Flow (vph)	3	1427	860	0	20	2
Shared Lane Traffic (%)						
Lane Group Flow (vph)	3	1427	860	0	22	0
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)		35	30		30	
Two way Left Turn Lane		Yes	Yes			
Headway Factor	1.04	1.04	1.04	1.04	1.00	1.00
Turning Speed (mph)	15			9	15	9
Number of Detectors	1	2	2		1	
Detector Template	Left	Thru	Thru		Left	
Leading Detector (ft)	20	100	100		20	
Trailing Detector (ft)	0	0	0		0	
Detector 1 Position(ft)	0	0	0		0	
Detector 1 Size(ft)	20	6	6		20	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	
Detector 1 Delay (s)	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	Perm	NA	NA		Prot	

Lanes, Volumes, Timings
 9: Orchard Lake Rd & Warwick St

01/20/2021



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Protected Phases		6	2		4	
Permitted Phases	6					
Detector Phase	6	6	2		4	
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0		5.0	
Minimum Split (s)	22.5	22.5	22.5		22.5	
Total Split (s)	95.0	95.0	95.0		25.0	
Total Split (%)	79.2%	79.2%	79.2%		20.8%	
Maximum Green (s)	90.5	90.5	90.5		20.5	
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)	0.0	0.0	0.0		0.0	
Total Lost Time (s)	4.5	4.5	4.5		4.5	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	
Recall Mode	C-Min	C-Min	C-Min		Min	
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)	104.0	104.0	104.0		7.0	
Actuated g/C Ratio	0.87	0.87	0.87		0.06	
v/c Ratio	0.01	0.93	0.30		0.22	
Control Delay	1.7	16.6	1.8		54.6	
Queue Delay	0.0	0.0	0.0		0.0	
Total Delay	1.7	16.6	1.8		54.6	
LOS	A	B	A		D	
Approach Delay		16.6	1.8		54.6	
Approach LOS		B	A		D	

Intersection Summary

Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 38 (32%), Referenced to phase 2:WBT and 6:EBTL, Start of Green
 Natural Cycle: 140
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.93
 Intersection Signal Delay: 11.4
 Intersection LOS: B
 Intersection Capacity Utilization 78.5%
 ICU Level of Service D
 Analysis Period (min) 15

Splits and Phases: 9: Orchard Lake Rd & Warwick St



Lanes, Volumes, Timings

11: Middlebelt Rd/Inverness St & Orchard Lake Rd

01/20/2021



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	1099	152	244	698	5	64	4	209	8	14	20
Future Volume (vph)	16	1099	152	244	698	5	64	4	209	8	14	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	10	10	10	10	10	10
Storage Length (ft)	100		200	200		0	100		500	50		0
Storage Lanes	1		1	1		0	1		1	1		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.999				0.850		0.911	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1678	3355	1501	1678	3352	0	1620	1705	1449	1620	1553	0
Flt Permitted	0.362			0.125			0.733			0.755		
Satd. Flow (perm)	639	3355	1501	221	3352	0	1250	1705	1449	1287	1553	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			165		1				177			22
Link Speed (mph)		35			35			40				25
Link Distance (ft)		1026			825			884				562
Travel Time (s)		20.0			16.1			15.1				15.3
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 (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Adj. Flow (vph)	17	1195	165	265	759	5	70	4	227	9	15	22
Shared Lane Traffic (%)												
Lane Group Flow (vph)	17	1195	165	265	764	0	70	4	227	9	37	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)		11			11			10				10
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		55			16			25				25
Two way Left Turn Lane		Yes			Yes			Yes				
Headway Factor	1.04	1.04	1.04	1.04	1.04	1.04	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100	20	20	100		20	100	20	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	6	20	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	NA	Perm	Perm	NA	

Lanes, Volumes, Timings
 11: Middlebelt Rd/Inverness St & Orchard Lake Rd

01/20/2021

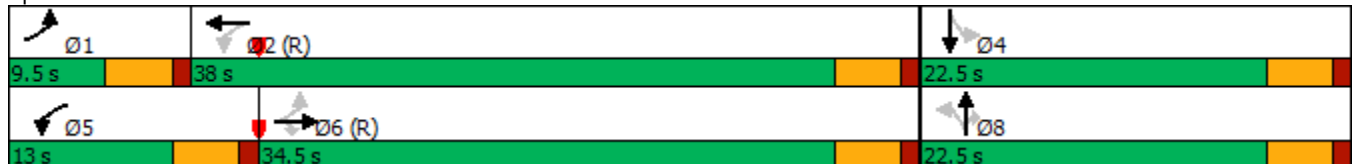


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases	1	6		5	2			8				4
Permitted Phases	6		6	2			8		8	4		
Detector Phase	1	6	6	5	2		8	8	8	4	4	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5		22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	9.5	34.5	34.5	13.0	38.0		22.5	22.5	22.5	22.5	22.5	22.5
Total Split (%)	13.6%	49.3%	49.3%	18.6%	54.3%		32.1%	32.1%	32.1%	32.1%	32.1%	32.1%
Maximum Green (s)	5.0	30.0	30.0	8.5	33.5		18.0	18.0	18.0	18.0	18.0	18.0
Yellow Time (s)	3.5	3.5	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	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag							
Lead-Lag Optimize?	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	Min	C-Min	C-Min	Min	C-Min		Min	Min	Min	Min	Min	Min
Walk Time (s)		7.0	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	11.0
Pedestrian Calls (#/hr)		0	0		0		0	0	0	0	0	0
Act Effct Green (s)	41.1	35.3	35.3	50.7	40.8		9.9	9.9	9.9	9.9	9.9	9.9
Actuated g/C Ratio	0.59	0.50	0.50	0.72	0.58		0.14	0.14	0.14	0.14	0.14	0.14
v/c Ratio	0.04	0.71	0.20	0.67	0.39		0.40	0.02	0.64	0.05	0.15	0.15
Control Delay	4.8	17.8	3.0	20.3	9.4		32.3	22.8	16.1	23.6	15.6	15.6
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	4.8	17.8	3.0	20.3	9.4		32.3	22.8	16.1	23.6	15.6	15.6
LOS	A	B	A	C	A		C	C	B	C	B	B
Approach Delay		15.9			12.2			20.0				17.2
Approach LOS		B			B			B				B

Intersection Summary

Area Type: Other
 Cycle Length: 70
 Actuated Cycle Length: 70
 Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green
 Natural Cycle: 70
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.71
 Intersection Signal Delay: 15.0
 Intersection LOS: B
 Intersection Capacity Utilization 65.4%
 ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 11: Middlebelt Rd/Inverness St & Orchard Lake Rd



Lanes, Volumes, Timings
15: Orchard Lake Rd & Summers Rd

01/20/2021



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	29	0	723	16	0	984
Future Volume (vph)	29	0	723	16	0	984
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0		0	100	
Storage Lanes	1	0		0	1	
Taper Length (ft)	25				50	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	0.95
Frt			0.997			
Flt Protected	0.950					
Satd. Flow (prot)	1770	0	1857	0	1863	3539
Flt Permitted	0.950					
Satd. Flow (perm)	1770	0	1857	0	1863	3539
Link Speed (mph)	25		35			35
Link Distance (ft)	592		733			1020
Travel Time (s)	16.1		14.3			19.9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	32	0	786	17	0	1070
Shared Lane Traffic (%)						
Lane Group Flow (vph)	32	0	803	0	0	1070
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	R NA
Median Width(ft)	12		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane			Yes			Yes
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	49.0%
ICU Level of Service	A
Analysis Period (min)	15

Lanes, Volumes, Timings
 17: Willow Beach St & Orchard Lake Rd

01/20/2021



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	728	0	25	982	0	29
Future Volume (vph)	728	0	25	982	0	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	100		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)			50		25	
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	1.00
Frt					0.865	
Flt Protected			0.950			
Satd. Flow (prot)	1863	0	1770	3539	1611	0
Flt Permitted			0.950			
Satd. Flow (perm)	1863	0	1770	3539	1611	0
Link Speed (mph)	35			35	25	
Link Distance (ft)	743			701	392	
Travel Time (s)	14.5			13.7	10.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	791	0	27	1067	0	32
Shared Lane Traffic (%)						
Lane Group Flow (vph)	791	0	27	1067	32	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	11			11	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane	Yes			Yes		
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	48.3%
ICU Level of Service	A
Analysis Period (min)	15

Lanes, Volumes, Timings
 19: Maddy Ln & Orchard Lake Rd

01/20/2021



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1227	0	0	748	18	0	0	45	0	0	0
Future Volume (vph)	0	1227	0	0	748	18	0	0	45	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	100		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	50			50			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.996			0.865				
Flt Protected												
Satd. Flow (prot)	1863	1863	0	1863	3525	0	0	1611	0	0	1863	0
Flt Permitted												
Satd. Flow (perm)	1863	1863	0	1863	3525	0	0	1611	0	0	1863	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		1268			794			484			384	
Travel Time (s)		24.7			15.5			13.2			10.5	
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
Adj. Flow (vph)	0	1334	0	0	813	20	0	0	49	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1334	0	0	833	0	0	49	0	0	0	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)		11			11			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane		Yes			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
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	74.6%
ICU Level of Service	D
Analysis Period (min)	15

Lanes, Volumes, Timings
 22: Figa Ave & Orchard Lake Rd

01/20/2021



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1267	22	18	765	0	0
Future Volume (vph)	1267	22	18	765	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	12	12
Storage Length (ft)		0	100		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)			50		25	
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	1.00
Fr _t	0.998					
Fl _t Protected			0.950			
Satd. Flow (prot)	1797	0	1711	3421	1863	0
Fl _t Permitted			0.950			
Satd. Flow (perm)	1797	0	1711	3421	1863	0
Link Speed (mph)	35			35	25	
Link Distance (ft)	1452			1026	225	
Travel Time (s)	28.3			20.0	6.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1377	24	20	832	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1401	0	20	832	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	11			11	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane	Yes			Yes		
Headway Factor	1.04	1.04	1.04	1.04	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	71.3%			ICU Level of Service C		
Analysis Period (min)	15					

Lanes, Volumes, Timings
1: Commerce Rd & Orchard Lake Rd

01/20/2021



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	382	36	50	731	530	503
Future Volume (vph)	382	36	50	731	530	503
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11
Storage Length (ft)	500	500	150			450
Storage Lanes	1	0	1			0
Taper Length (ft)	50		50			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.850				0.850
Fl _t Protected	0.950		0.950			
Satd. Flow (prot)	1678	1501	1678	1766	1766	1501
Fl _t Permitted	0.950		0.124			
Satd. Flow (perm)	1678	1501	219	1766	1766	1501
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		40				553
Link Speed (mph)	35			35	35	
Link Distance (ft)	916			721	733	
Travel Time (s)	17.8			14.0	14.3	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%
Adj. Flow (vph)	420	40	55	803	582	553
Shared Lane Traffic (%)						
Lane Group Flow (vph)	420	40	55	803	582	553
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	R NA
Median Width(ft)	11			11	11	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	30			16	60	
Two way Left Turn Lane					Yes	
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	1	1	2	2	1
Detector Template	Left	Right	Left	Thru	Thru	Right
Leading Detector (ft)	20	20	20	100	100	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	20	20	20	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
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	Prot	Over	pm+pt	NA	NA	Perm

Lanes, Volumes, Timings
 1: Commerce Rd & Orchard Lake Rd

01/20/2021

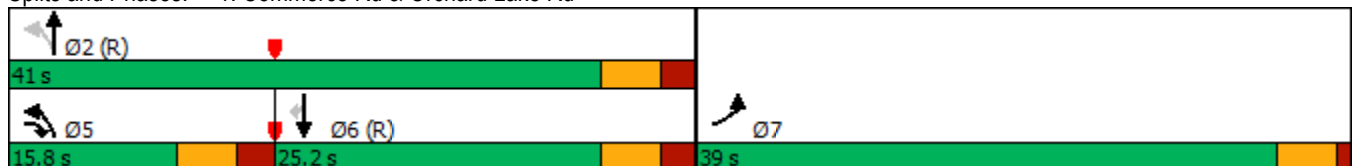


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Protected Phases	7	5	5	2	6	
Permitted Phases			2			6
Detector Phase	7	5	5	2	6	6
Switch Phase						
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	9.5	15.8	15.8	23.8	23.8	23.8
Total Split (s)	39.0	15.8	15.8	41.0	25.2	25.2
Total Split (%)	48.8%	19.8%	19.8%	51.3%	31.5%	31.5%
Maximum Green (s)	34.5	10.0	10.0	35.2	19.4	19.4
Yellow Time (s)	3.5	3.6	3.6	3.6	3.6	3.6
All-Red Time (s)	1.0	2.2	2.2	2.2	2.2	2.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	5.8	5.8	5.8	5.8	5.8
Lead/Lag		Lead	Lead		Lag	Lag
Lead-Lag Optimize?		Yes	Yes		Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	Min	Min	C-Min	C-Min	C-Min
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)	25.5	10.0	44.2	44.2	28.4	28.4
Actuated g/C Ratio	0.32	0.12	0.55	0.55	0.36	0.36
v/c Ratio	0.79	0.18	0.18	0.82	0.93	0.62
Control Delay	35.0	13.0	11.9	26.2	52.0	5.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.0	13.0	11.9	26.2	52.0	5.9
LOS	C	B	B	C	D	A
Approach Delay	33.0			25.3	29.6	
Approach LOS	C			C	C	

Intersection Summary























Area Type: Other
 Cycle Length: 80
 Actuated Cycle Length: 80
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.93
 Intersection Signal Delay: 28.7
 Intersection LOS: C
 Intersection Capacity Utilization 70.8%
 ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 1: Commerce Rd & Orchard Lake Rd



Lanes, Volumes, Timings
2: Cass Lake Rd & Orchard Lake Rd

01/20/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	360	748	8	2	860	603	5	21	6	316	14	214
Future Volume (vph)	360	748	8	2	860	603	5	21	6	316	14	214
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)	190		100	100		435	0		0	125		300
Storage Lanes	1		1	1		1	0		0	1		1
Taper Length (ft)	50			50			25			50		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t			0.850			0.850		0.974				0.850
Fl _t Protected	0.950			0.950				0.992		0.950		
Satd. Flow (prot)	1694	1783	1516	1694	3388	1516	0	1782	0	1752	1845	1568
Fl _t Permitted	0.101			0.252				0.939		0.585		
Satd. Flow (perm)	180	1783	1516	449	3388	1516	0	1687	0	1079	1845	1568
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			138			559		7				28
Link Speed (mph)		35			35			35				35
Link Distance (ft)		701			1268			549				607
Travel Time (s)		13.7			24.7			10.7				11.8
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	404	840	9	2	966	678	6	24	7	355	16	240
Shared Lane Traffic (%)												
Lane Group Flow (vph)	404	840	9	2	966	678	0	37	0	355	16	240
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			11			20				12
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		20			40			16				16
Two way Left Turn Lane		Yes			Yes							Yes
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	2	1	1	2	1	1	2		1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100	20	20	100		20	100	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)	20	6	20	20	6	20	20	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	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
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	pm+ov	Perm	NA		pm+pt	NA	pm+ov

Lanes, Volumes, Timings

2: Cass Lake Rd & Orchard Lake Rd

01/20/2021



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases	1	6		5	2	3		4		3	8	1
Permitted Phases	6		6	2		2	4			8		8
Detector Phase	1	6	6	5	2	3	4	4		3	8	1
Switch Phase												
Minimum Initial (s)	4.0	10.0	10.0	4.0	10.0	10.0	7.0	7.0		10.0	7.0	4.0
Minimum Split (s)	10.1	28.0	28.0	10.1	28.0	16.1	28.0	28.0		16.1	29.0	10.1
Total Split (s)	30.4	63.6	63.6	10.1	43.3	18.3	28.0	28.0		18.3	46.3	30.4
Total Split (%)	25.3%	53.0%	53.0%	8.4%	36.1%	15.3%	23.3%	23.3%		15.3%	38.6%	25.3%
Maximum Green (s)	24.3	57.5	57.5	4.0	37.2	12.2	22.0	22.0		12.2	40.3	24.3
Yellow Time (s)	3.6	3.6	3.6	3.6	3.6	3.6	3.5	3.5		3.6	3.5	3.6
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5		2.5	2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0		0.0	0.0	0.0
Total Lost Time (s)	6.1	6.1	6.1	6.1	6.1	6.1		6.0		6.1	6.0	6.1
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag		Lead		Lead
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	3.0
Recall Mode	Min	C-Min	C-Min	Min	C-Min	Min	Min	Min		Min	Min	Min
Walk Time (s)		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	
Pedestrian Calls (#/hr)		0	0		0		0	0			0	
Act Effct Green (s)	80.2	68.6	68.6	46.7	41.2	60.7		8.1		27.6	27.7	66.6
Actuated g/C Ratio	0.67	0.57	0.57	0.39	0.34	0.51		0.07		0.23	0.23	0.56
v/c Ratio	0.75	0.83	0.01	0.01	0.83	0.65		0.31		1.10	0.04	0.27
Control Delay	35.9	29.3	0.0	12.0	44.0	7.3		51.7		122.1	36.4	12.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0		0.0	0.0	0.0
Total Delay	35.9	29.3	0.0	12.0	44.0	7.3		51.7		122.1	36.4	12.9
LOS	D	C	A	B	D	A		D		F	D	B
Approach Delay		31.2			28.9			51.7			77.0	
Approach LOS		C			C			D			E	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

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

Natural Cycle: 115

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.10

Intersection Signal Delay: 38.2

Intersection LOS: D

Intersection Capacity Utilization 83.1%

ICU Level of Service E











Analysis Period (min) 15

Splits and Phases: 2: Cass Lake Rd & Orchard Lake Rd



Lanes, Volumes, Timings
8: Orchard Lake Rd & Wards Point Dr

01/20/2021

						
Lane Group	NBL	NBT	SBT	SBR	SEL	SER
Lane Configurations						
Traffic Volume (vph)	11	1073	1028	12	11	10
Future Volume (vph)	11	1073	1028	12	11	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	14	12
Storage Length (ft)	100			0	0	0
Storage Lanes	1			0	1	0
Taper Length (ft)	50				25	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	1.00
Frt			0.998		0.935	
Flt Protected	0.950				0.975	
Satd. Flow (prot)	1678	1766	3349	0	1777	0
Flt Permitted	0.240				0.975	
Satd. Flow (perm)	424	1766	3349	0	1777	0
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			5		11	
Link Speed (mph)		35	35		25	
Link Distance (ft)		1020	743		595	
Travel Time (s)		19.9	14.5		16.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%
Adj. Flow (vph)	12	1192	1142	13	12	11
Shared Lane Traffic (%)						
Lane Group Flow (vph)	12	1192	1155	0	23	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		11	11		14	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		50	16		16	
Two way Left Turn Lane		Yes	Yes			
Headway Factor	1.04	1.04	1.04	1.04	0.92	1.00
Turning Speed (mph)	15			9	15	9
Number of Detectors	1	2	2		1	
Detector Template	Left	Thru	Thru		Left	
Leading Detector (ft)	20	100	100		20	
Trailing Detector (ft)	0	0	0		0	
Detector 1 Position(ft)	0	0	0		0	
Detector 1 Size(ft)	20	6	6		20	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	
Detector 1 Delay (s)	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	Perm	NA	NA		Prot	

Lanes, Volumes, Timings
8: Orchard Lake Rd & Wards Point Dr

01/20/2021



Lane Group	NBL	NBT	SBT	SBR	SEL	SER
Protected Phases		2	6		7	
Permitted Phases	2	2				
Detector Phase	2	2	6		7	
Switch Phase						
Minimum Initial (s)	10.0	10.0	5.0		5.0	
Minimum Split (s)	23.3	23.3	23.3		10.8	
Total Split (s)	59.2	59.2	59.2		10.8	
Total Split (%)	84.6%	84.6%	84.6%		15.4%	
Maximum Green (s)	53.9	53.9	53.9		5.0	
Yellow Time (s)	3.6	3.6	3.6		3.5	
All-Red Time (s)	1.7	1.7	1.7		2.3	
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	
Total Lost Time (s)	5.3	5.3	5.3		5.8	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	
Recall Mode	C-Min	C-Min	C-Max		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)	63.6	63.6	63.6		5.0	
Actuated g/C Ratio	0.91	0.91	0.91		0.07	
v/c Ratio	0.03	0.74	0.38		0.17	
Control Delay	1.9	8.1	1.9		24.9	
Queue Delay	0.0	0.0	0.0		0.0	
Total Delay	1.9	8.1	1.9		24.9	
LOS	A	A	A		C	
Approach Delay		8.1	1.9		24.9	
Approach LOS		A	A		C	

Intersection Summary

Area Type: Other
 Cycle Length: 70
 Actuated Cycle Length: 70
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green
 Natural Cycle: 70
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.74
 Intersection Signal Delay: 5.2
 Intersection LOS: A
 Intersection Capacity Utilization 69.9%
 ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 8: Orchard Lake Rd & Wards Point Dr



Lanes, Volumes, Timings
9: Orchard Lake Rd & Warwick St

01/20/2021



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	11	1076	1481	6	5	8
Future Volume (vph)	11	1076	1481	6	5	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	12	12
Storage Length (ft)	100			0	0	0
Storage Lanes	1			0	1	0
Taper Length (ft)	50				25	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	1.00
Frt			0.999		0.919	
Flt Protected	0.950				0.980	
Satd. Flow (prot)	1678	1766	3352	0	1645	0
Flt Permitted	0.126				0.980	
Satd. Flow (perm)	223	1766	3352	0	1645	0
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			1		9	
Link Speed (mph)		35	35		25	
Link Distance (ft)		794	1452		338	
Travel Time (s)		15.5	28.3		9.2	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%
Adj. Flow (vph)	12	1209	1664	7	6	9
Shared Lane Traffic (%)						
Lane Group Flow (vph)	12	1209	1671	0	15	0
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)		35	30		30	
Two way Left Turn Lane		Yes	Yes			
Headway Factor	1.04	1.04	1.04	1.04	1.00	1.00
Turning Speed (mph)	15			9	15	9
Number of Detectors	1	2	2		1	
Detector Template	Left	Thru	Thru		Left	
Leading Detector (ft)	20	100	100		20	
Trailing Detector (ft)	0	0	0		0	
Detector 1 Position(ft)	0	0	0		0	
Detector 1 Size(ft)	20	6	6		20	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	
Detector 1 Delay (s)	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	Perm	NA	NA		Prot	

Lanes, Volumes, Timings
 9: Orchard Lake Rd & Warwick St

01/20/2021



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Protected Phases		6	2		4	
Permitted Phases	6					
Detector Phase	6	6	2		4	
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0		5.0	
Minimum Split (s)	22.5	22.5	22.5		22.5	
Total Split (s)	67.5	67.5	67.5		22.5	
Total Split (%)	75.0%	75.0%	75.0%		25.0%	
Maximum Green (s)	63.0	63.0	63.0		18.0	
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)	0.0	0.0	0.0		0.0	
Total Lost Time (s)	4.5	4.5	4.5		4.5	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	
Recall Mode	C-Min	C-Min	C-Min		Min	
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)	74.9	74.9	74.9		6.1	
Actuated g/C Ratio	0.83	0.83	0.83		0.07	
v/c Ratio	0.06	0.82	0.60		0.12	
Control Delay	2.3	10.6	3.7		28.7	
Queue Delay	0.0	0.0	0.0		0.0	
Total Delay	2.3	10.6	3.7		28.7	
LOS	A	B	A		C	
Approach Delay		10.6	3.7		28.7	
Approach LOS		B	A		C	

Intersection Summary

Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBTL, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.82
 Intersection Signal Delay: 6.7
 Intersection LOS: A
 Intersection Capacity Utilization 68.3%
 ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 9: Orchard Lake Rd & Warwick St



Lanes, Volumes, Timings

11: Middlebelt Rd/Inverness St & Orchard Lake Rd

01/20/2021



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	32	948	87	185	1218	25	248	27	280	30	16	33
Future Volume (vph)	32	948	87	185	1218	25	248	27	280	30	16	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	10	10	10	10	10	10
Storage Length (ft)	100		200	200		0	100		500	50		0
Storage Lanes	1		1	1		0	1		1	1		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.997				0.850		0.898	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1678	3355	1501	1678	3345	0	1620	1705	1449	1620	1531	0
Flt Permitted	0.132			0.148			0.722			0.738		
Satd. Flow (perm)	233	3355	1501	261	3345	0	1231	1705	1449	1258	1531	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			95		4				194			36
Link Speed (mph)		35			35			40				25
Link Distance (ft)		1026			825			884				562
Travel Time (s)		20.0			16.1			15.1				15.3
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 (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Adj. Flow (vph)	35	1030	95	201	1324	27	270	29	304	33	17	36
Shared Lane Traffic (%)												
Lane Group Flow (vph)	35	1030	95	201	1351	0	270	29	304	33	53	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)		11			11			10				10
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		55			16			25				25
Two way Left Turn Lane		Yes			Yes			Yes				
Headway Factor	1.04	1.04	1.04	1.04	1.04	1.04	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2	1	1		2
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100	20	20	100		20	100	20	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	6	20	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	NA	Perm	Perm		NA

Lanes, Volumes, Timings
 11: Middlebelt Rd/Inverness St & Orchard Lake Rd

01/20/2021

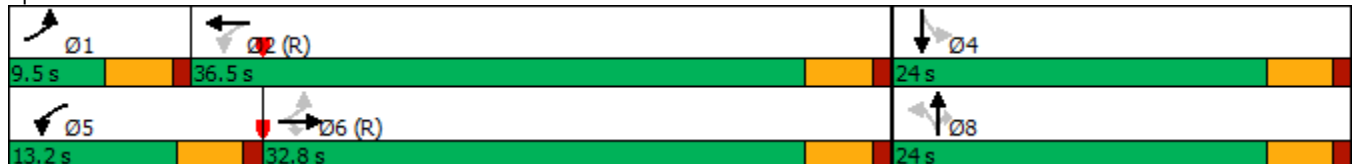


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases	1	6		5	2			8				4
Permitted Phases	6		6	2			8		8	4		
Detector Phase	1	6	6	5	2		8	8	8	4		4
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0		5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5		22.5	22.5	22.5	22.5		22.5
Total Split (s)	9.5	32.8	32.8	13.2	36.5		24.0	24.0	24.0	24.0		24.0
Total Split (%)	13.6%	46.9%	46.9%	18.9%	52.1%		34.3%	34.3%	34.3%	34.3%		34.3%
Maximum Green (s)	5.0	28.3	28.3	8.7	32.0		19.5	19.5	19.5	19.5		19.5
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)	1.0	1.0	1.0	1.0	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	0.0	0.0	0.0		0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5	4.5		4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag							
Lead-Lag Optimize?	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	Min	C-Min	C-Min	Min	C-Min		Min	Min	Min	Min		Min
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)	35.6	30.3	30.3	41.5	33.3		18.0	18.0	18.0	18.0		18.0
Actuated g/C Ratio	0.51	0.43	0.43	0.59	0.48		0.26	0.26	0.26	0.26		0.26
v/c Ratio	0.15	0.71	0.13	0.63	0.85		0.86	0.07	0.59	0.10		0.13
Control Delay	8.1	20.2	3.9	17.6	23.4		51.1	19.2	13.5	19.9		10.5
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0
Total Delay	8.1	20.2	3.9	17.6	23.4		51.1	19.2	13.5	19.9		10.5
LOS	A	C	A	B	C		D	B	B	B		B
Approach Delay		18.5			22.7			30.6				14.1
Approach LOS		B			C			C				B

Intersection Summary

Area Type: Other
 Cycle Length: 70
 Actuated Cycle Length: 70
 Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green
 Natural Cycle: 70
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.86
 Intersection Signal Delay: 22.5
 Intersection LOS: C
 Intersection Capacity Utilization 70.3%
 ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 11: Middlebelt Rd/Inverness St & Orchard Lake Rd



Lanes, Volumes, Timings
15: Orchard Lake Rd & Summers Rd

01/20/2021



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	48	0	1084	19	54	984
Future Volume (vph)	48	0	1084	19	54	984
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0		0	100	
Storage Lanes	1	0		0	1	
Taper Length (ft)	25				50	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	0.95
Frt			0.998			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	0	1859	0	1770	3539
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1770	0	1859	0	1770	3539
Link Speed (mph)	25		35			35
Link Distance (ft)	592		733			1020
Travel Time (s)	16.1		14.3			19.9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	52	0	1178	21	59	1070
Shared Lane Traffic (%)						
Lane Group Flow (vph)	52	0	1199	0	59	1070
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	R NA
Median Width(ft)	12		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane			Yes			Yes
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	68.2%
ICU Level of Service	C
Analysis Period (min)	15

Lanes, Volumes, Timings
 17: Willow Beach St & Orchard Lake Rd

01/20/2021



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1084	0	39	1040	0	31
Future Volume (vph)	1084	0	39	1040	0	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	100		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)			50		25	
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	1.00
Frt					0.865	
Flt Protected			0.950			
Satd. Flow (prot)	1863	0	1770	3539	1611	0
Flt Permitted			0.950			
Satd. Flow (perm)	1863	0	1770	3539	1611	0
Link Speed (mph)	35			35	25	
Link Distance (ft)	743			701	392	
Travel Time (s)	14.5			13.7	10.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1178	0	42	1130	0	34
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1178	0	42	1130	34	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	11			11	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane	Yes			Yes		
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	67.1%
ICU Level of Service	C
Analysis Period (min)	15

Lanes, Volumes, Timings
19: Maddy Ln & Orchard Lake Rd

01/20/2021



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1062	0	0	1465	25	0	0	24	0	0	0
Future Volume (vph)	0	1062	0	0	1465	25	0	0	24	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	100		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	50			50			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.997			0.865				
Flt Protected												
Satd. Flow (prot)	1863	1863	0	1863	3529	0	0	1611	0	0	1863	0
Flt Permitted												
Satd. Flow (perm)	1863	1863	0	1863	3529	0	0	1611	0	0	1863	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		1268			794			484			384	
Travel Time (s)		24.7			15.5			13.2			10.5	
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
Adj. Flow (vph)	0	1154	0	0	1592	27	0	0	26	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1154	0	0	1619	0	0	26	0	0	0	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)		11			11			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane		Yes			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
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 65.9% ICU Level of Service C

Analysis Period (min) 15

Lanes, Volumes, Timings
 22: Figa Ave & Orchard Lake Rd

01/20/2021



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1067	14	6	1487	0	0
Future Volume (vph)	1067	14	6	1487	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	12	12
Storage Length (ft)		0	100		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)			50		25	
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	1.00
Fr _t	0.998					
Fl _t Protected			0.950			
Satd. Flow (prot)	1797	0	1711	3421	1863	0
Fl _t Permitted			0.950			
Satd. Flow (perm)	1797	0	1711	3421	1863	0
Link Speed (mph)	35			35	25	
Link Distance (ft)	1452			1026	225	
Travel Time (s)	28.3			20.0	6.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1160	15	7	1616	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1175	0	7	1616	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	11			11	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane	Yes			Yes		
Headway Factor	1.04	1.04	1.04	1.04	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	60.3%
Analysis Period (min)	15
	ICU Level of Service B