

APPENDIX C

Capacity Analysis

Dover Greens - Trip Generations

	ITE Land Use Code	Peak AM Hour			Peak PM Hour			Peak Saturday Hour		
		Trip Type			Trip Type			Trip Type		
		Potential Driveway	Transit/Local Trips	Auto Trips	Potential Driveway	Transit/Local Trips	Auto Trips	Potential Driveway	Transit/Local Trips	Auto Trips
Phase 1										
University 131 students	550	37	4	33	81	8	73	41	4	37
K-12 Private School 20 students	536	4	0	4	1	0	1	1	0	1
Partner Organization 100 Staff	760	61	6	55	62	6	56	18	2	16
Resident Staff & Family 60 residents	220	27	24	3	25	23	3	16	14	2
Total Phase 1		128	34	95	170	37	133	75	20	55
Master Plan Full Buildout										
University 2500 students	550	495	50	446	700	70	630	350	35	315
K-12 Private School 210 students	536	43	0	43	9	0	9	8	0	8
Partner Organization 200 Staff	760	107	11	96	109	11	98	22	2	20
Resident Staff & Family 156 residents	220	52	46	5	63	57	6	41	37	4
Total Master Plan Full Buildout		697	107	590	881	138	744	420	74	347

Credits

Transit = 10% (all except K-12 school and resident staff & family housing)

Local = 90% reduction for resident & staff housing who live/work on campus

Private School (K-12) - assume 75% of trips will be internal.

Land Uses:

550 University/College

536 Private School (K-12) (AM Peak Hour; PM Peak Hour of Adjacent Traffic; Saturday 85% of PM trips)

760 Research & Development Center

220 Apartment (persons)

Existing AM
2: Route 22 & Pleasant Ridge Rd

9/3/2015



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (vph)	81	40	20	10	40	75	16	237	16	46	235	40
Satd. Flow (prot)	0	1776	0	0	1705	0	0	1842	0	0	1818	0
Flt Permitted		0.766			0.975			0.974			0.920	
Satd. Flow (perm)	0	1400	0	0	1669	0	0	1800	0	0	1685	0
Satd. Flow (RTOR)		9			82			6			15	
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
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	153	0	0	136	0	0	292	0	0	348	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		1			1			5			5	
Permitted Phases	1			1			5			5		
Total Split (s)	30.0	30.0		30.0	30.0		60.0	60.0		60.0	60.0	
Total Lost Time (s)		5.0			5.0			5.0			5.0	
Act Effct Green (s)		25.0			25.0			55.0			55.0	
Actuated g/C Ratio		0.28			0.28			0.61			0.61	
v/c Ratio		0.39			0.26			0.26			0.34	
Control Delay		28.2			12.7			8.7			9.2	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		28.2			12.7			8.7			9.2	
LOS		C			B			A			A	
Approach Delay		28.2			12.7			8.7			9.2	
Approach LOS		C			B			A			A	
Queue Length 50th (ft)		66			23			69			84	
Queue Length 95th (ft)		122			67			109			133	
Internal Link Dist (ft)		846			419			539			621	
Turn Bay Length (ft)												
Base Capacity (vph)		395			522			1102			1035	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.39			0.26			0.26			0.34	

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 42 (47%), Referenced to phase 6:, Start of Green
 Control Type: Pretimed
 Maximum v/c Ratio: 0.39
 Intersection Signal Delay: 12.7
 Intersection Capacity Utilization 53.2%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service A

Splits and Phases: 2: Route 22 & Pleasant Ridge Rd



Existing PM
2: Route 22 & Pleasant Ridge Rd

9/3/2015



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (vph)	26	57	15	5	35	44	16	243	8	64	223	46
Satd. Flow (prot)	0	1802	0	0	1725	0	0	1850	0	0	1809	0
Flt Permitted		0.916			0.988			0.973			0.886	
Satd. Flow (perm)	0	1672	0	0	1710	0	0	1805	0	0	1619	0
Satd. Flow (RTOR)		10			48			3			16	
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
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	106	0	0	91	0	0	290	0	0	362	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		1			1			5			5	
Permitted Phases	1			1			5			5		
Total Split (s)	30.0	30.0		30.0	30.0		60.0	60.0		60.0	60.0	
Total Lost Time (s)		5.0			5.0			5.0			5.0	
Act Effct Green (s)		25.0			25.0			55.0			55.0	
Actuated g/C Ratio		0.28			0.28			0.61			0.61	
v/c Ratio		0.23			0.18			0.26			0.36	
Control Delay		24.2			14.3			8.8			9.6	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		24.2			14.3			8.8			9.6	
LOS		C			B			A			A	
Approach Delay		24.2			14.3			8.8			9.6	
Approach LOS		C			B			A			A	
Queue Length 50th (ft)		42			18			69			89	
Queue Length 95th (ft)		84			54			109			142	
Internal Link Dist (ft)		846			419			539			621	
Turn Bay Length (ft)												
Base Capacity (vph)		471			509			1104			995	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.23			0.18			0.26			0.36	

Intersection Summary

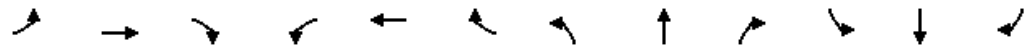
Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 42 (47%), Referenced to phase 6:, Start of Green
 Control Type: Pretimed
 Maximum v/c Ratio: 0.36
 Intersection Signal Delay: 11.6
 Intersection Capacity Utilization 56.7%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service B

Splits and Phases: 2: Route 22 & Pleasant Ridge Rd



Phase 1 No-Build AM
2: Route 22 & Pleasant Ridge Rd

9/3/2015



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (vph)	92	47	20	10	43	77	16	304	16	48	340	44
Satd. Flow (prot)	0	1780	0	0	1707	0	0	1848	0	0	1826	0
Flt Permitted		0.737			0.975			0.974			0.927	
Satd. Flow (perm)	0	1350	0	0	1671	0	0	1803	0	0	1703	0
Satd. Flow (RTOR)		8			80			5			12	
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
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	173	0	0	142	0	0	364	0	0	470	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		1			1			5			5	
Permitted Phases	1			1			5			5		
Total Split (s)	30.0	30.0		30.0	30.0		60.0	60.0		60.0	60.0	
Total Lost Time (s)		5.0			5.0			5.0			5.0	
Act Effct Green (s)		25.0			25.0			55.0			55.0	
Actuated g/C Ratio		0.28			0.28			0.61			0.61	
v/c Ratio		0.46			0.27			0.33			0.45	
Control Delay		30.2			13.6			9.4			10.8	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		30.2			13.6			9.4			10.8	
LOS		C			B			A			B	
Approach Delay		30.2			13.6			9.4			10.8	
Approach LOS		C			B			A			B	
Queue Length 50th (ft)		77			26			90			127	
Queue Length 95th (ft)		140			72			140			195	
Internal Link Dist (ft)		846			419			539			621	
Turn Bay Length (ft)												
Base Capacity (vph)		380			521			1103			1045	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.46			0.27			0.33			0.45	

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 42 (47%), Referenced to phase 6:, Start of Green
 Control Type: Pretimed
 Maximum v/c Ratio: 0.46
 Intersection Signal Delay: 13.6
 Intersection Capacity Utilization 62.3%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service B

Splits and Phases: 2: Route 22 & Pleasant Ridge Rd



Phase 1 No-Build PM
2: Route 22 & Pleasant Ridge Rd

9/3/2015



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (vph)	32	62	15	5	43	45	16	362	8	65	299	57
Satd. Flow (prot)	0	1802	0	0	1738	0	0	1853	0	0	1815	0
Flt Permitted		0.898			0.989			0.977			0.882	
Satd. Flow (perm)	0	1643	0	0	1723	0	0	1814	0	0	1613	0
Satd. Flow (RTOR)		9			49			2			16	
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
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	118	0	0	101	0	0	419	0	0	458	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		1			1			5			5	
Permitted Phases	1			1			5			5		
Total Split (s)	30.0	30.0		30.0	30.0		60.0	60.0		60.0	60.0	
Total Lost Time (s)		5.0			5.0			5.0			5.0	
Act Effct Green (s)		25.0			25.0			55.0			55.0	
Actuated g/C Ratio		0.28			0.28			0.61			0.61	
v/c Ratio		0.26			0.20			0.38			0.46	
Control Delay		25.1			15.1			10.0			11.0	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		25.1			15.1			10.0			11.0	
LOS		C			B			B			B	
Approach Delay		25.1			15.1			10.0			11.0	
Approach LOS		C			B			B			B	
Queue Length 50th (ft)		48			22			109			124	
Queue Length 95th (ft)		93			61			166			193	
Internal Link Dist (ft)		846			419			539			621	
Turn Bay Length (ft)												
Base Capacity (vph)		462			514			1109			991	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.26			0.20			0.38			0.46	

Intersection Summary

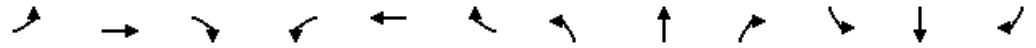
Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 42 (47%), Referenced to phase 6:, Start of Green
 Control Type: Pretimed
 Maximum v/c Ratio: 0.46
 Intersection Signal Delay: 12.5
 Intersection Capacity Utilization 67.4%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service C

Splits and Phases: 2: Route 22 & Pleasant Ridge Rd



Phase 1 Build AM
2: Route 22 & Pleasant Ridge Rd

9/3/2015



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (vph)	92	47	28	10	43	77	18	309	16	48	351	44
Satd. Flow (prot)	0	1773	0	0	1707	0	0	1846	0	0	1829	0
Flt Permitted		0.746			0.975			0.967			0.927	
Satd. Flow (perm)	0	1359	0	0	1671	0	0	1790	0	0	1704	0
Satd. Flow (RTOR)		11			80			5			11	
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
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	181	0	0	142	0	0	373	0	0	482	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		1			1			5			5	
Permitted Phases	1			1			5			5		
Total Split (s)	30.0	30.0		30.0	30.0		60.0	60.0		60.0	60.0	
Total Lost Time (s)		5.0			5.0			5.0			5.0	
Act Effct Green (s)		25.0			25.0			55.0			55.0	
Actuated g/C Ratio		0.28			0.28			0.61			0.61	
v/c Ratio		0.47			0.27			0.34			0.46	
Control Delay		30.1			13.6			9.5			11.0	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		30.1			13.6			9.5			11.0	
LOS		C			B			A			B	
Approach Delay		30.1			13.6			9.5			11.0	
Approach LOS		C			B			A			B	
Queue Length 50th (ft)		80			26			93			132	
Queue Length 95th (ft)		144			72			145			202	
Internal Link Dist (ft)		846			419			539			621	
Turn Bay Length (ft)												
Base Capacity (vph)		385			521			1095			1045	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.47			0.27			0.34			0.46	

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 42 (47%), Referenced to phase 6:, Start of Green
 Control Type: Pretimed
 Maximum v/c Ratio: 0.47
 Intersection Signal Delay: 13.8
 Intersection Capacity Utilization 62.3%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service B

Splits and Phases: 2: Route 22 & Pleasant Ridge Rd



Phase 1 Build PM
1: Route 55 & Wheeler Road/Wheeler Rd

9/3/2015



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (vph)	27	5	20	65	5	38	12	575	18	16	395	36
Satd. Flow (prot)	0	1720	0	0	1724	0	0	1853	0	0	1839	0
Flt Permitted		0.850			0.811			0.989			0.973	
Satd. Flow (perm)	0	1499	0	0	1440	0	0	1835	0	0	1793	0
Satd. Flow (RTOR)		22			41			4			10	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	56	0	0	117	0	0	658	0	0	485	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		1			1			5			5	
Permitted Phases	1			1			5			5		
Total Split (s)	25.0	25.0		25.0	25.0		35.0	35.0		35.0	35.0	
Total Lost Time (s)		5.0			5.0			5.0			5.0	
Act Effct Green (s)		20.0			20.0			30.0			30.0	
Actuated g/C Ratio		0.33			0.33			0.50			0.50	
v/c Ratio		0.11			0.23			0.72			0.54	
Control Delay		10.4			11.4			17.1			12.8	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		10.4			11.4			17.1			12.8	
LOS		B			B			B			B	
Approach Delay		10.4			11.4			17.1			12.8	
Approach LOS		B			B			B			B	
Queue Length 50th (ft)		8			19			170			108	
Queue Length 95th (ft)		29			51			285			183	
Internal Link Dist (ft)		1394			1015			567			1804	
Turn Bay Length (ft)												
Base Capacity (vph)		514			507			919			901	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.11			0.23			0.72			0.54	

Intersection Summary

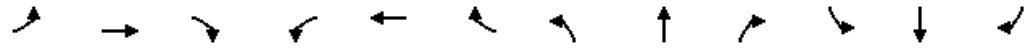
Cycle Length: 60
 Actuated Cycle Length: 60
 Offset: 29 (48%), Referenced to phase 6:, Start of Green
 Control Type: Pretimed
 Maximum v/c Ratio: 0.72
 Intersection Signal Delay: 14.7
 Intersection Capacity Utilization 52.5%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service A

Splits and Phases: 1: Route 55 & Wheeler Road/Wheeler Rd



Phase 1 Build PM
2: Route 22 & Pleasant Ridge Rd

9/3/2015



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (vph)	32	62	18	5	43	45	26	378	8	65	304	57
Satd. Flow (prot)	0	1796	0	0	1738	0	0	1852	0	0	1815	0
Flt Permitted		0.901			0.989			0.958			0.877	
Satd. Flow (perm)	0	1641	0	0	1723	0	0	1779	0	0	1604	0
Satd. Flow (RTOR)		11			49			2			16	
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
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	122	0	0	101	0	0	448	0	0	463	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		1			1			5			5	
Permitted Phases	1			1			5			5		
Total Split (s)	30.0	30.0		30.0	30.0		60.0	60.0		60.0	60.0	
Total Lost Time (s)		5.0			5.0			5.0			5.0	
Act Effct Green (s)		25.0			25.0			55.0			55.0	
Actuated g/C Ratio		0.28			0.28			0.61			0.61	
v/c Ratio		0.26			0.20			0.41			0.47	
Control Delay		24.8			15.1			10.5			11.1	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		24.8			15.1			10.5			11.1	
LOS		C			B			B			B	
Approach Delay		24.8			15.1			10.5			11.1	
Approach LOS		C			B			B			B	
Queue Length 50th (ft)		49			22			120			126	
Queue Length 95th (ft)		95			61			182			196	
Internal Link Dist (ft)		846			419			539			621	
Turn Bay Length (ft)												
Base Capacity (vph)		463			514			1087			986	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.26			0.20			0.41			0.47	

Intersection Summary

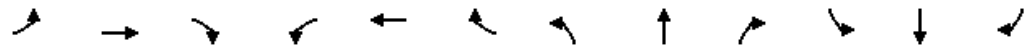
Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 42 (47%), Referenced to phase 6:, Start of Green
 Control Type: Pretimed
 Maximum v/c Ratio: 0.47
 Intersection Signal Delay: 12.7
 Intersection Capacity Utilization 62.0%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service B

Splits and Phases: 2: Route 22 & Pleasant Ridge Rd



Full Buildout No-Build AM
2: Route 22 & Pleasant Ridge Rd

9/3/2015



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (vph)	103	54	21	10	46	80	17	372	17	49	444	48
Satd. Flow (prot)	0	1782	0	0	1709	0	0	1848	0	0	1833	0
Flt Permitted		0.715			0.975			0.971			0.930	
Satd. Flow (perm)	0	1311	0	0	1673	0	0	1798	0	0	1712	0
Satd. Flow (RTOR)		7			79			4			10	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	194	0	0	148	0	0	440	0	0	588	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		1			1			5			5	
Permitted Phases	1			1			5			5		
Total Split (s)	30.0	30.0		30.0	30.0		60.0	60.0		60.0	60.0	
Total Lost Time (s)		5.0			5.0			5.0			5.0	
Act Effct Green (s)		25.0			25.0			55.0			55.0	
Actuated g/C Ratio		0.28			0.28			0.61			0.61	
v/c Ratio		0.53			0.28			0.40			0.56	
Control Delay		32.6			14.2			10.3			12.7	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		32.6			14.2			10.3			12.7	
LOS		C			B			B			B	
Approach Delay		32.6			14.2			10.3			12.7	
Approach LOS		C			B			B			B	
Queue Length 50th (ft)		90			30			116			177	
Queue Length 95th (ft)		159			78			176			269	
Internal Link Dist (ft)		846			419			539			621	
Turn Bay Length (ft)												
Base Capacity (vph)		369			521			1100			1050	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.53			0.28			0.40			0.56	

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 42 (47%), Referenced to phase 6:, Start of Green
 Control Type: Pretimed
 Maximum v/c Ratio: 0.56
 Intersection Signal Delay: 14.9
 Intersection Capacity Utilization 75.7%
 Analysis Period (min) 15

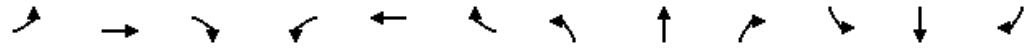
Intersection LOS: B
 ICU Level of Service D

Splits and Phases: 2: Route 22 & Pleasant Ridge Rd



Full Buildout No-Build PM
2: Route 22 & Pleasant Ridge Rd

9/3/2015



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (vph)	38	67	16	5	50	46	17	480	8	67	375	68
Satd. Flow (prot)	0	1802	0	0	1744	0	0	1855	0	0	1816	0
Flt Permitted		0.886			0.989			0.978			0.874	
Satd. Flow (perm)	0	1621	0	0	1728	0	0	1818	0	0	1599	0
Satd. Flow (RTOR)		8			47			2			16	
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
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	131	0	0	109	0	0	549	0	0	555	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		1			1			5			5	
Permitted Phases	1			1			5			5		
Total Split (s)	30.0	30.0		30.0	30.0		60.0	60.0		60.0	60.0	
Total Lost Time (s)		5.0			5.0			5.0			5.0	
Act Effct Green (s)		25.0			25.0			55.0			55.0	
Actuated g/C Ratio		0.28			0.28			0.61			0.61	
v/c Ratio		0.29			0.21			0.49			0.56	
Control Delay		26.0			16.3			11.6			12.8	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		26.0			16.3			11.6			12.8	
LOS		C			B			B			B	
Approach Delay		26.0			16.3			11.6			12.8	
Approach LOS		C			B			B			B	
Queue Length 50th (ft)		55			26			158			165	
Queue Length 95th (ft)		103			67			236			257	
Internal Link Dist (ft)		846			419			539			621	
Turn Bay Length (ft)												
Base Capacity (vph)		456			513			1111			983	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.29			0.21			0.49			0.56	

Intersection Summary

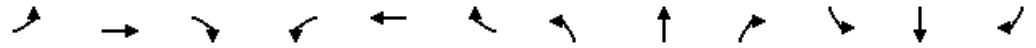
Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 42 (47%), Referenced to phase 6:, Start of Green
 Control Type: Pretimed
 Maximum v/c Ratio: 0.56
 Intersection Signal Delay: 13.9
 Intersection Capacity Utilization 76.0%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service D

Splits and Phases: 2: Route 22 & Pleasant Ridge Rd



Full Buildout Build w/o Improve AM
2: Route 22 & Pleasant Ridge Rd

9/3/2015



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (vph)	103	54	66	10	46	80	30	392	17	49	513	48
Satd. Flow (prot)	0	1747	0	0	1709	0	0	1848	0	0	1835	0
Flt Permitted		0.758			0.972			0.934			0.934	
Satd. Flow (perm)	0	1355	0	0	1668	0	0	1731	0	0	1721	0
Satd. Flow (RTOR)		23			79			4			9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	243	0	0	148	0	0	477	0	0	663	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		1			1			5			5	
Permitted Phases	1			1			5			5		
Total Split (s)	30.0	30.0		30.0	30.0		60.0	60.0		60.0	60.0	
Total Lost Time (s)		5.0			5.0			5.0			5.0	
Act Effct Green (s)		25.0			25.0			55.0			55.0	
Actuated g/C Ratio		0.28			0.28			0.61			0.61	
v/c Ratio		0.62			0.28			0.45			0.63	
Control Delay		33.5			14.2			11.0			14.2	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		33.5			14.2			11.0			14.2	
LOS		C			B			B			B	
Approach Delay		33.5			14.3			11.0			14.2	
Approach LOS		C			B			B			B	
Queue Length 50th (ft)		109			30			131			214	
Queue Length 95th (ft)		191			78			201			325	
Internal Link Dist (ft)		846			419			539			621	
Turn Bay Length (ft)												
Base Capacity (vph)		393			520			1059			1055	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.62			0.28			0.45			0.63	

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 42 (47%), Referenced to phase 6:, Start of Green
 Control Type: Pretimed
 Maximum v/c Ratio: 0.63
 Intersection Signal Delay: 16.3
 Intersection Capacity Utilization 77.1%
 Analysis Period (min) 15

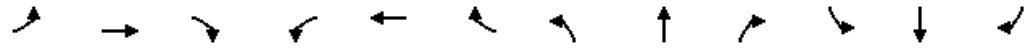
Intersection LOS: B
 ICU Level of Service D

Splits and Phases: 2: Route 22 & Pleasant Ridge Rd



Full Buildout Build w/o Improve PM
2: Route 22 & Pleasant Ridge Rd

9/3/2015



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (vph)	38	67	38	5	50	46	69	559	8	67	408	68
Satd. Flow (prot)	0	1772	0	0	1744	0	0	1850	0	0	1820	0
Flt Permitted		0.902			0.989			0.886			0.856	
Satd. Flow (perm)	0	1620	0	0	1728	0	0	1647	0	0	1567	0
Satd. Flow (RTOR)		20			47			1			15	
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
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	155	0	0	109	0	0	692	0	0	590	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		1			1			5			5	
Permitted Phases	1			1			5			5		
Total Split (s)	30.0	30.0		30.0	30.0		60.0	60.0		60.0	60.0	
Total Lost Time (s)		5.0			5.0			5.0			5.0	
Act Effct Green (s)		25.0			25.0			55.0			55.0	
Actuated g/C Ratio		0.28			0.28			0.61			0.61	
v/c Ratio		0.33			0.21			0.69			0.61	
Control Delay		24.8			16.3			16.2			14.0	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		24.8			16.3			16.2			14.0	
LOS		C			B			B			B	
Approach Delay		24.8			16.3			16.2			14.0	
Approach LOS		C			B			B			B	
Queue Length 50th (ft)		60			26			240			185	
Queue Length 95th (ft)		115			67			371			290	
Internal Link Dist (ft)		846			419			539			621	
Turn Bay Length (ft)												
Base Capacity (vph)		464			513			1006			963	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.33			0.21			0.69			0.61	

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 42 (47%), Referenced to phase 6:, Start of Green
 Control Type: Pretimed
 Maximum v/c Ratio: 0.69
 Intersection Signal Delay: 16.2
 Intersection Capacity Utilization 66.3%
 Analysis Period (min) 15

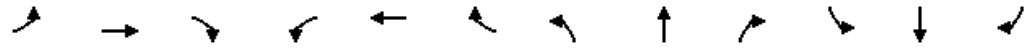
Intersection LOS: B
 ICU Level of Service C

Splits and Phases: 2: Route 22 & Pleasant Ridge Rd



Full Buildout Build w/ Improve AM
2: Route 22 & Pleasant Ridge Rd

9/3/2015



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (vph)	103	54	66	10	46	80	30	392	17	49	513	48
Satd. Flow (prot)	0	1747	0	0	1709	0	0	1848	0	0	1835	0
Flt Permitted		0.758			0.972			0.934			0.934	
Satd. Flow (perm)	0	1355	0	0	1668	0	0	1731	0	0	1721	0
Satd. Flow (RTOR)		23			79			4			9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	243	0	0	148	0	0	477	0	0	663	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		1			1			5			5	
Permitted Phases	1			1			5			5		
Total Split (s)	30.0	30.0		30.0	30.0		60.0	60.0		60.0	60.0	
Total Lost Time (s)		5.0			5.0			5.0			5.0	
Act Effct Green (s)		25.0			25.0			55.0			55.0	
Actuated g/C Ratio		0.28			0.28			0.61			0.61	
v/c Ratio		0.62			0.28			0.45			0.63	
Control Delay		33.5			14.2			11.0			14.2	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		33.5			14.2			11.0			14.2	
LOS		C			B			B			B	
Approach Delay		33.5			14.3			11.0			14.2	
Approach LOS		C			B			B			B	
Queue Length 50th (ft)		109			30			131			214	
Queue Length 95th (ft)		191			78			201			325	
Internal Link Dist (ft)		846			419			539			621	
Turn Bay Length (ft)												
Base Capacity (vph)		393			520			1059			1055	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.62			0.28			0.45			0.63	

Intersection Summary






















Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 42 (47%), Referenced to phase 6:, Start of Green
 Control Type: Pretimed
 Maximum v/c Ratio: 0.63
 Intersection Signal Delay: 16.3
 Intersection Capacity Utilization 77.1%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service D

Splits and Phases: 2: Route 22 & Pleasant Ridge Rd



Full Buildout Build w/ Improve PM
1: Route 55 & Wheeler Road/Wheeler Rd

9/3/2015

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	28	5	21	312	5	170	13	724	128	94	484	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	0	1718	0	1770	1591	0	1770	1863	1583	1770	1842	0
Flt Permitted		0.824		0.719			0.320			0.143		
Satd. Flow (perm)	0	1452	0	1339	1591	0	596	1863	1583	266	1842	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		23			137				139			9
Link Speed (mph)		30			30			30				30
Link Distance (ft)		1474			1095			647				500
Travel Time (s)		33.5			24.9			14.7				11.4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	58	0	339	190	0	14	787	139	102	566	0
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		1			1			5				5
Permitted Phases	1			1			5		5	5		
Total Split (s)	25.0	25.0		25.0	25.0		35.0	35.0	35.0	35.0		35.0
Total Lost Time (s)		5.0		5.0	5.0		5.0	5.0	5.0	5.0		5.0
Act Effct Green (s)		20.0		20.0	20.0		30.0	30.0	30.0	30.0		30.0
Actuated g/C Ratio		0.33		0.33	0.33		0.50	0.50	0.50	0.50		0.50
v/c Ratio		0.12		0.76	0.31		0.05	0.85	0.16	0.77		0.61
Control Delay		10.4		31.7	6.8		8.3	24.2	2.3	54.4		14.2
Queue Delay		0.0		0.0	0.0		0.0	0.0	0.0	0.0		0.0
Total Delay		10.4		31.7	6.8		8.3	24.2	2.3	54.4		14.2
LOS		B		C	A		A	C	A	D		B
Approach Delay		10.4			22.8			20.7				20.3
Approach LOS		B			C			C				C
Queue Length 50th (ft)		9		107	13		2	228	0	28		134
Queue Length 95th (ft)		30		#229	52		10	#439	22	#110		223
Internal Link Dist (ft)		1394			1015			567				420
Turn Bay Length (ft)												
Base Capacity (vph)		499		446	621		298	931	861	133		925
Starvation Cap Reductn		0		0	0		0	0	0	0		0
Spillback Cap Reductn		0		0	0		0	0	0	0		0
Storage Cap Reductn		0		0	0		0	0	0	0		0
Reduced v/c Ratio		0.12		0.76	0.31		0.05	0.85	0.16	0.77		0.61

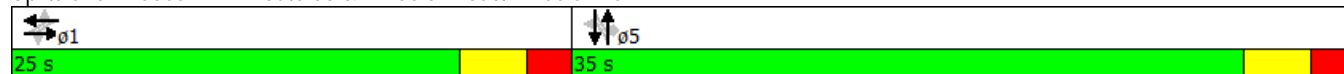
Intersection Summary

Area Type: Other
 Cycle Length: 60
 Actuated Cycle Length: 60
 Offset: 29 (48%), Referenced to phase 6:, Start of Green
 Control Type: Pretimed
 Maximum v/c Ratio: 0.85
 Intersection Signal Delay: 20.8 Intersection LOS: C
 Intersection Capacity Utilization 80.6% ICU Level of Service D
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Full Buildout Build w/ Improve PM
1: Route 55 & Wheeler Road/Wheeler Rd

















9/3/2015

Splits and Phases: 1: Route 55 & Wheeler Road/Wheeler Rd



Full Buildout Build w/ Improve PM
2: Route 22 & Pleasant Ridge Rd

9/3/2015

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	38	67	38	5	50	46	69	559	8	67	408	68
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	0	1772	0	0	1744	0	0	1850	0	0	1820	0
Flt Permitted		0.902			0.989			0.886			0.856	
Satd. Flow (perm)	0	1620	0	0	1728	0	0	1647	0	0	1567	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		20			47			1			15	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		926			499			619			701	
Travel Time (s)		21.0			11.3			14.1			15.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	155	0	0	109	0	0	692	0	0	590	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		1			1			5			5	
Permitted Phases	1			1			5			5		
Total Split (s)	30.0	30.0		30.0	30.0		60.0	60.0		60.0	60.0	
Total Lost Time (s)		5.0			5.0			5.0			5.0	
Act Effct Green (s)		25.0			25.0			55.0			55.0	
Actuated g/C Ratio		0.28			0.28			0.61			0.61	
v/c Ratio		0.33			0.21			0.69			0.61	
Control Delay		24.8			16.3			16.2			14.0	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		24.8			16.3			16.2			14.0	
LOS		C			B			B			B	
Approach Delay		24.8			16.3			16.2			14.0	
Approach LOS		C			B			B			B	
Queue Length 50th (ft)		60			26			240			185	
Queue Length 95th (ft)		115			67			371			290	
Internal Link Dist (ft)		846			419			539			621	
Turn Bay Length (ft)												
Base Capacity (vph)		464			513			1006			963	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.33			0.21			0.69			0.61	

Intersection Summary

Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 42 (47%), Referenced to phase 6:, Start of Green
 Control Type: Pretimed
 Maximum v/c Ratio: 0.69
 Intersection Signal Delay: 16.2
 Intersection Capacity Utilization 66.3%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service C

Full Buildout Build w/ Improve PM
2: Route 22 & Pleasant Ridge Rd

9/3/2015

Splits and Phases: 2: Route 22 & Pleasant Ridge Rd

