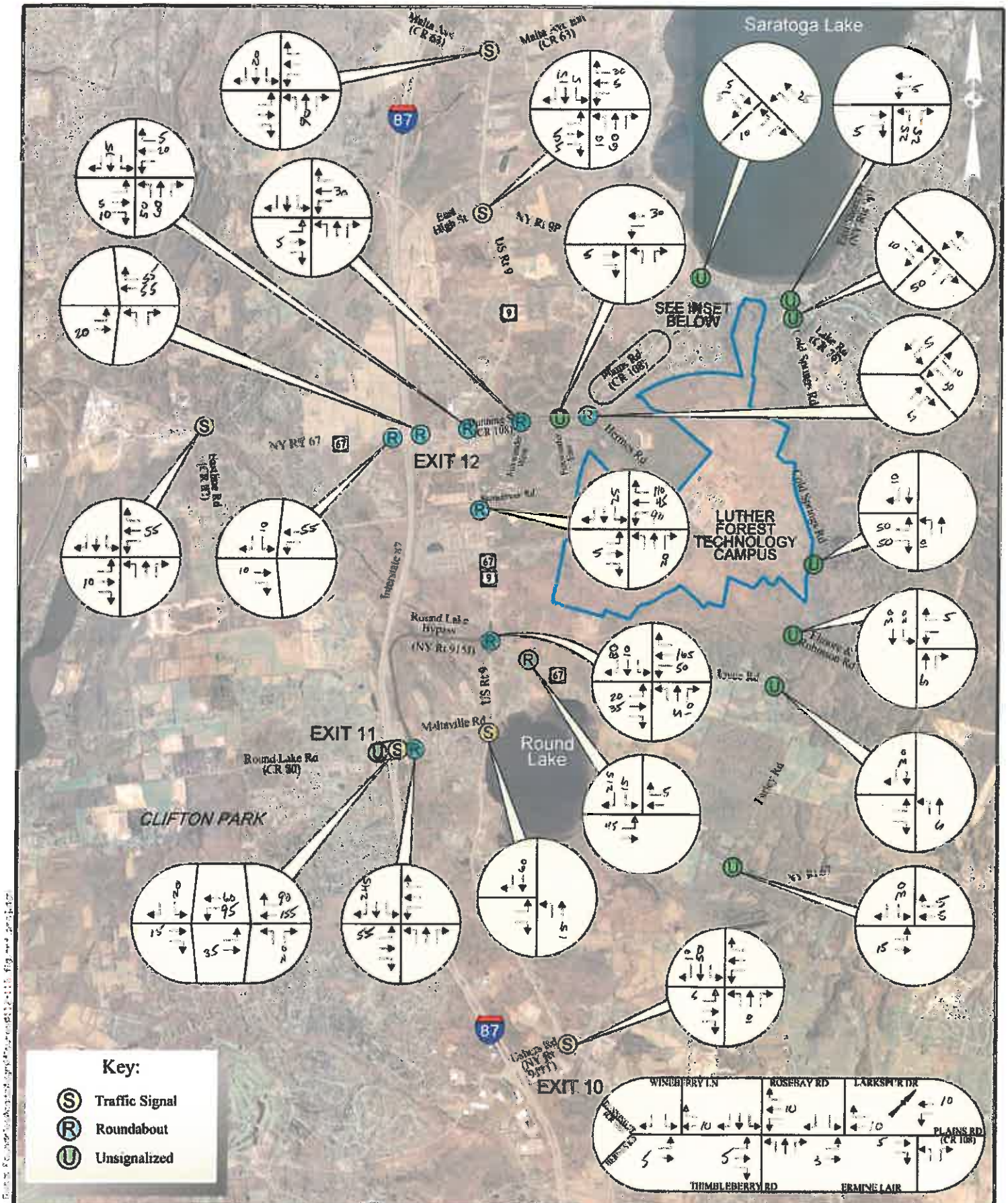
Comment 1-61:

Ancillary Development Evaluation
- AM and PM Peak Hour Traffic Volume Figures

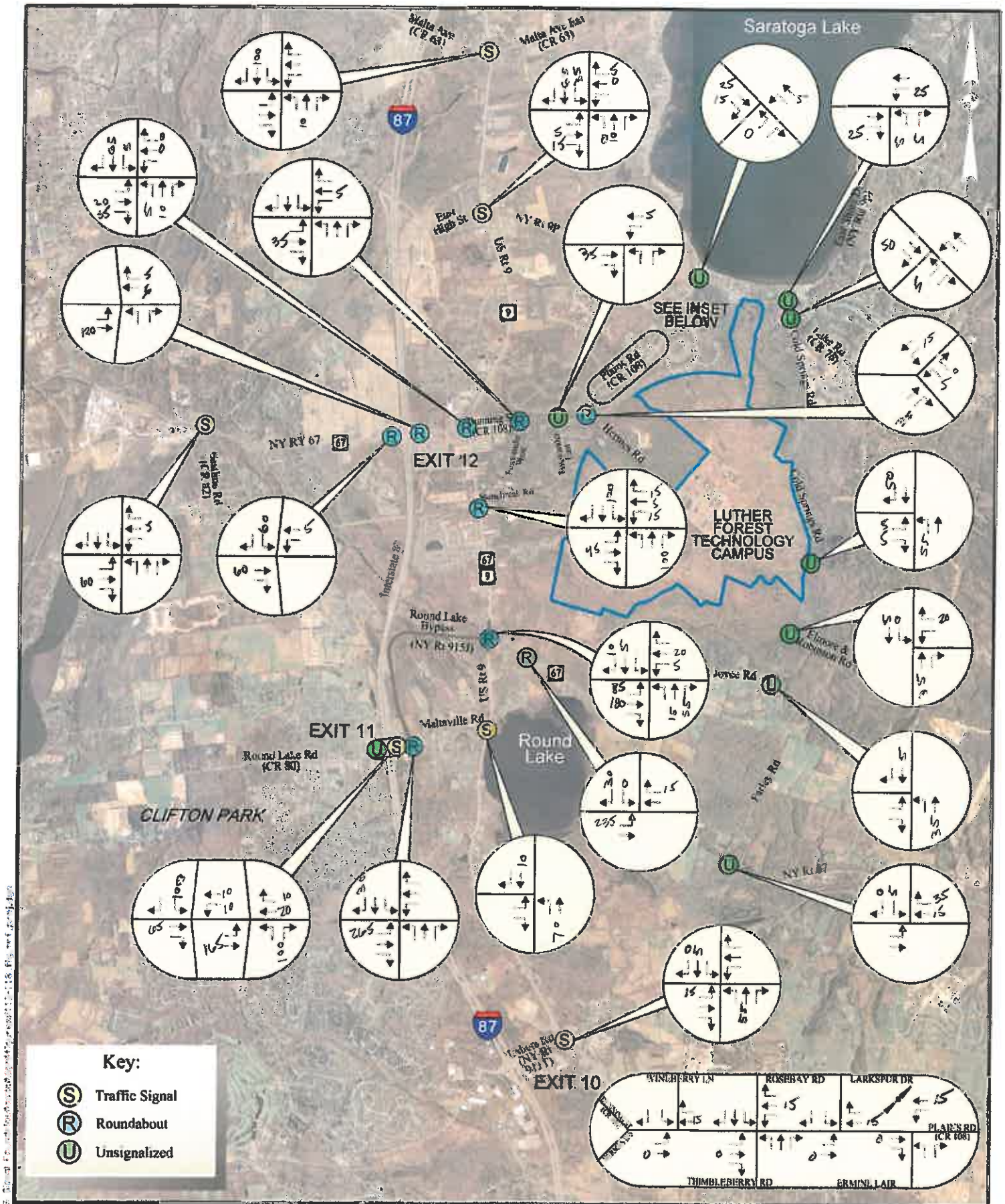


ANCILLARY DEVELOPMENT - 750 TRIPS
PM PEAK HOUR

GLOBALFOUNDRIES DEVELOPMENT
TOWNS OF MALTA AND STILLWATER, NEW YORK

Creighton Manning

PROJECT: 112-118	DATE: 03/2013	FIGURE:



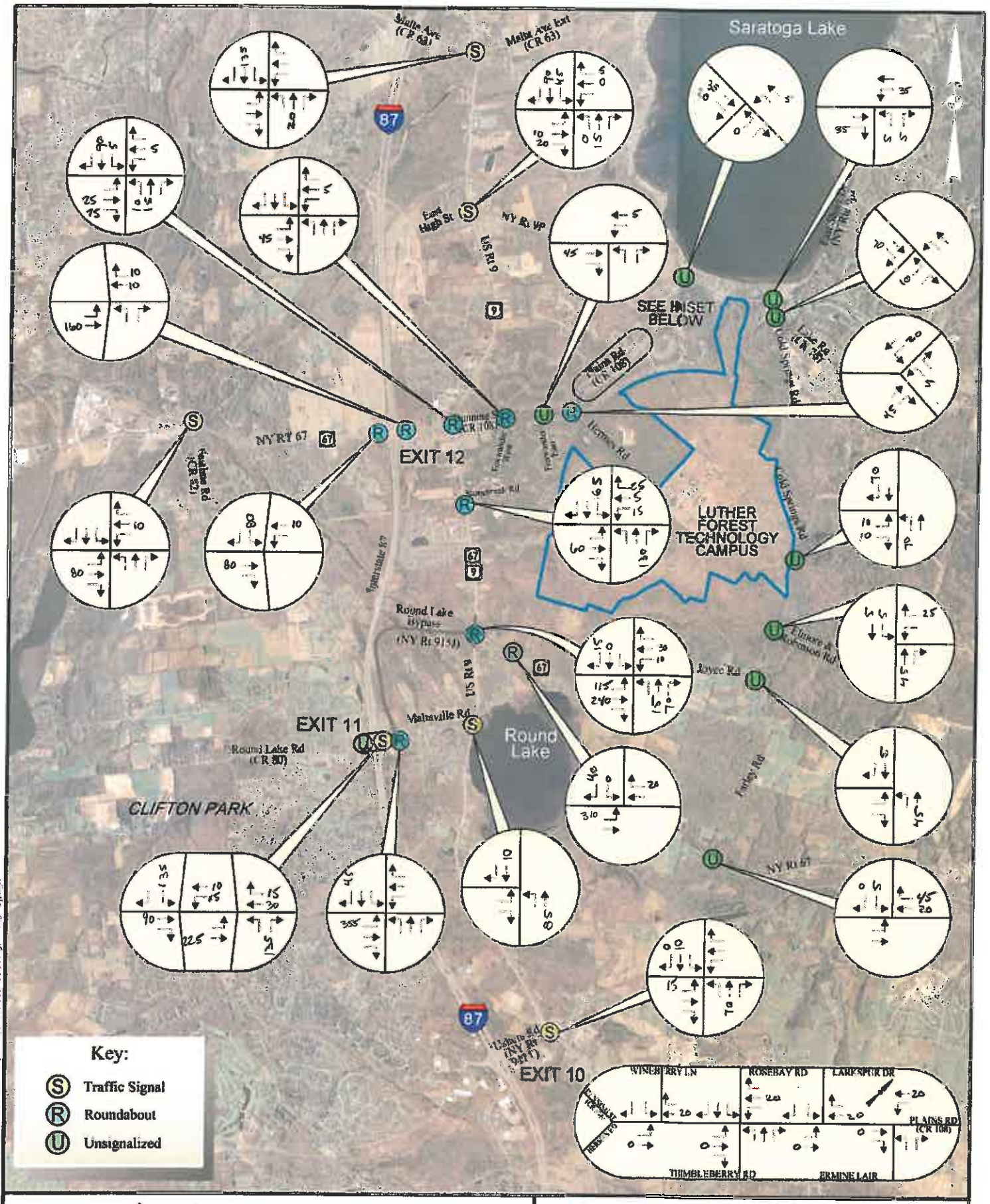
ANCILLARY DEVELOPMENT - 750 TRIPS

AM PEAK HOUR

GLOBALFOUNDRIES DEVELOPMENT
TOWNS OF MALTA AND STILLWATER, NEW YORK

Creighton Manning

PROJECT: 112-118	DATE: 03/2013	FIGURE:

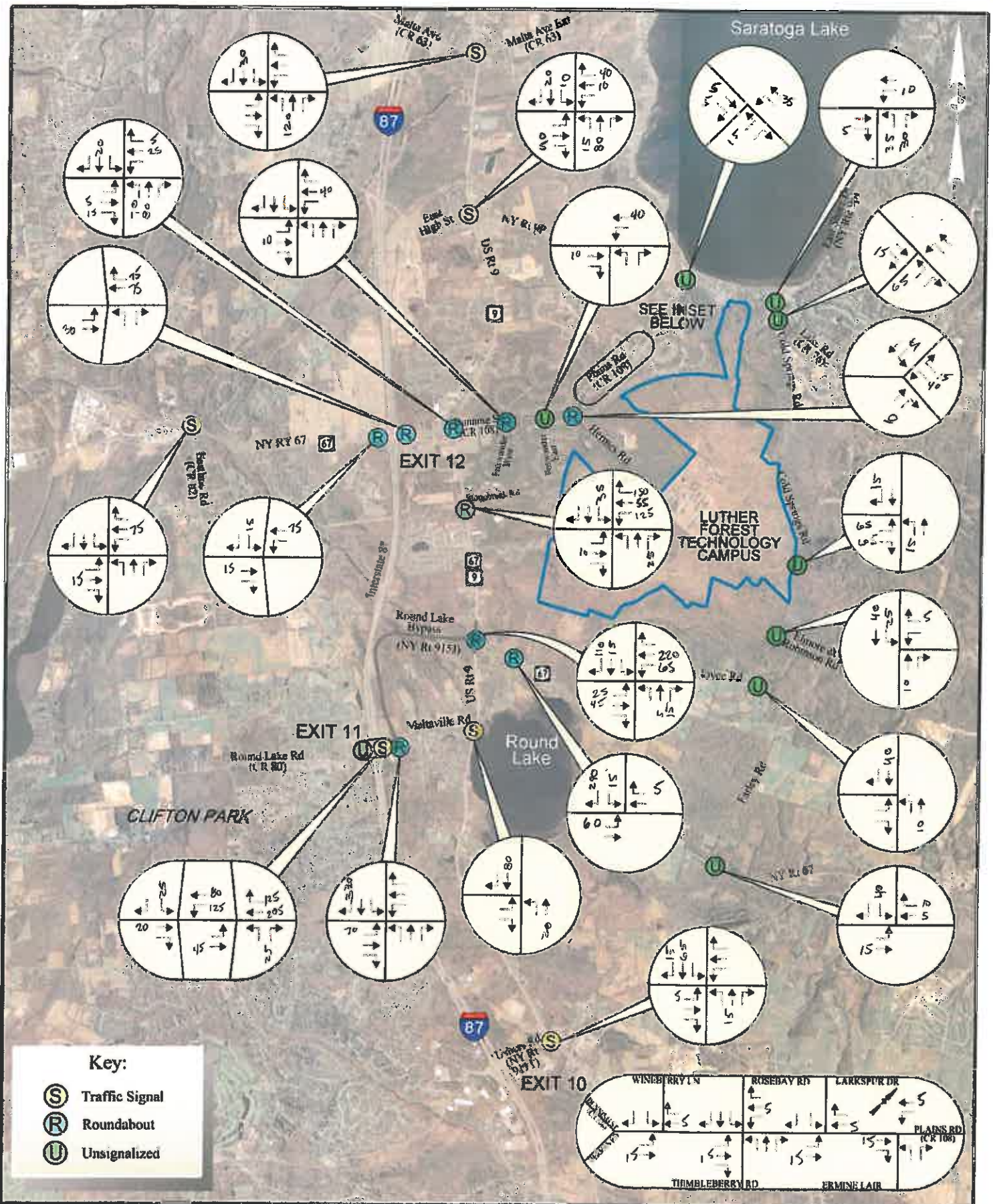


ANCILLARY DEVELOPMENT - 1,000 TRIPS
AM PEAK HOUR

GLOBALFOUNDRIES DEVELOPMENT
TOWNS OF MALTA AND STILLWATER, NEW YORK

Creighton Manning

PROJECT: 112-118	DATE: 03/2013	FIGURE:



ANCILLARY DEVELOPMENT- 1,000 TRIPS
PM PEAK HOUR

GLOBALFOUNDRIES DEVELOPMENT
TOWNS OF MALTA AND STILLWATER, NEW YORK

Creighton Manning

PROJECT: 112-118	DATE: 03/2013	FIGURE:

LANE SUMMARY

Site: Route 9/Route 67/Dunning Street - PM Peak - Build 2022 - EB/WB - B @750

Route 9/Route 67/Dunning Street
Build 2022
PM Peak Hour
Roundabout

Lane Use and Performance

	Demand Flows L veh/h	T veh/h	R veh/h	Total veh/h	HV %	Cap veh/h	Deg Satn v/c	Lane Util %	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Lane Length ft	SL Type	Cap Adj %	Prob Block %
South: Route 9 NB																
Lane 1	359	266	0	625	0.9	590	1.059	100	80.0	LOS E	26.9	677.2	2500	–	0.0	0.0
Lane 2	0	521	145	666	1.6	629	1.059	100	77.9	LOS E	28.2	713.8	2500	–	0.0	0.0
Approach	359	787	145	1291	1.2		1.059		78.9	LOS E	28.2	713.8				
East: Dunning Street WB																
Lane 1	139	235	0	373	0.6	379	0.986	100	76.3	LOS E	13.7	345.1	350	–	0.0	4.6
Lane 2	0	274	162	436	0.6	442	0.986	100	70.1	LOS E	15.2	382.8	1600	–	0.0	0.0
Approach	139	509	162	810	0.6		0.986		73.0	LOS E	15.2	382.8				
North: Route 9 SB																
Lane 1	124	279	0	403	1.4	556	0.725	100	25.3	LOS C	6.1	155.1	725	–	0.0	0.0
Lane 2	0	220	215	435	2.0	600	0.725	100	23.8	LOS C	6.3	161.1	725	–	0.0	0.0
Approach	124	499	215	838	1.7		0.725		24.5	LOS C	6.3	161.1				
West: Route 67 EB																
Lane 1	320	203	0	523	0.4	694	0.753	100	23.0	LOS C	7.0	176.5	1225	–	0.0	0.0
Lane 2	0	291	241	532	2.4	706	0.753	100	22.7	LOS C	7.1	180.3	1225	–	0.0	0.0
Approach	320	494	241	1055	1.4		0.753		22.9	LOS C	7.1	180.3				
Intersection				3994	1.3		1.059		51.5	LOS D	28.2	713.8				

Level of Service (LOS) Method: Delay (HCM 2000).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
Roundabout Capacity Model: SIDRA Standard.
HCM Delay Model used. Geometric Delay not included.

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SIDRA INTERSECTION

LANE SUMMARY

Site: Route 9/Route 67/Dunning Street - PM Peak - Build 2022 - EB/WB - B @1000

Route 9/Route 67/Dunning Street
Build 2022
PM Peak Hour
Roundabout

Lane Use and Performance

	Demand Flows L veh/h	T veh/h	R veh/h	Total veh/h	HV %	Cap veh/h	Deg Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Lane Length ft	SL Type	Cap Adj. %	Prob. Block. %
South: Route 9 NB																
Lane 1	377	267	0	644	0.8	589	1.095	100	91.3	LOS F	32.3	811.8	2500	–	0.0	0.0
Lane 2	0	542	145	687	1.6	627	1.095	100	89.3	LOS F	33.9	858.3	2500	–	0.0	0.0
Approach	377	809	145	1331	1.2		1.095		90.3	LOS F	33.9	858.3				
East: Dunning Street WB																
Lane 1	139	239	0	377	0.6	379	0.996	100	79.0	LOS E	14.5	363.1	350	–	0.0	6.1
Lane 2	0	278	163	441	0.6	443	0.996	100	72.7	LOS E	16.1	403.7	1600	–	0.0	0.0
Approach	139	516	163	818	0.6		0.996		75.6	LOS E	16.1	403.7				
North: Route 9 SB																
Lane 1	124	281	0	405	1.4	549	0.736	100	26.4	LOS C	6.3	160.4	725	–	0.0	0.0
Lane 2	0	222	215	437	2.0	594	0.736	100	24.8	LOS C	6.6	166.9	725	–	0.0	0.0
Approach	124	503	215	842	1.7		0.736		25.5	LOS C	6.6	166.9				
West: Route 67 EB																
Lane 1	320	205	0	526	0.4	691	0.761	100	23.6	LOS C	7.2	180.5	1225	–	0.0	0.0
Lane 2	0	289	245	534	2.4	703	0.761	100	23.3	LOS C	7.2	184.4	1225	–	0.0	0.0
Approach	320	495	245	1060	1.4		0.761		23.4	LOS C	7.2	184.4				
Intersection				4052	1.3		1.095		56.4	LOS E	33.9	858.3				

Level of Service (LOS) Method: Delay (HCM 2000).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
Roundabout Capacity Model: SIDRA Standard.
HCM Delay Model used. Geometric Delay not included.

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SIDRA INTERSECTION

Comment 13-1:

Round Lake Road/Ruhle Road/Raylinsky Road Intersection Evaluation

- AM and PM Peak Hour Traffic Volumes
- Level of Service Reports
- Back of Queue Reports

Intersection/Approach		AM Peak Hour					
		Existing 2012	Total Other Development GF8 Study	Background Growth 0.5% 10 yrs 1.05114	2022 No-Build	GF8 Trip Assigment	2022 Build
Round Lake Rd/Ruhle Rd/Raylinski Rd							
Round Lake Rd EB	L	15	0	16	15	0	15
	T	605	37	636	675	110	785
	R	0	0	0	0	0	0
Round Lake Rd WB	L	15	0	16	15	0	15
	T	410	23	431	455	15	470
	R	25	0	26	25	0	25
Raylinski Rd NB	L	0	0	0	0	0	0
	T	10	0	11	10	0	10
	R	115	0	121	120	0	120
Ruhle Rd SB	L	190	0	200	200	0	200
	T	5	0	5	5	0	5
	R	45	0	47	45	0	45

Intersection/Approach		PM Peak Hour					
		Existing 2012	Total Other Development GF8 Study	Background Growth 0.5% 10 yrs 1.05114	2022 No-Build	GF8 Trip Assigment	2022 Build
Round Lake Rd/Ruhle Rd/Raylinski Rd							
Round Lake Rd EB	L	25	0	26	25	0	25
	T	450	33	473	505	20	525
	R	10	0	11	10	0	10
Round Lake Rd WB	L	110	0	116	115	0	115
	T	595	30	625	655	100	755
	R	150	0	158	160	0	160
Raylinski Rd NB	L	5	0	5	5	0	5
	T	10	0	11	10	0	10
	R	25	0	26	25	0	25
Ruhle Rd SB	L	90	0	95	95	0	95
	T	10	0	11	10	0	10
	R	40	0	42	40	0	40

SHORT REPORT

General Information		Site Information	
Analyst	*MDN*	Intersection	*Round Lake Rd/Rhule Rd*
Agency or Co.	*CME, RLRRRnbam*	Area Type	*All other areas*
Date Performed	*4/11/13*	Jurisdiction	*Town of Malta, NY*
Time Period	*AM Peak Hour*	Analysis Year	*No-Build 2022*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Lane Group		LTR			LTR			LTR			LTR	
Volume (vph)	15	675	0	15	455	25	0	10	120	200	5	45
% Heavy Vehicles	6	2	50	6	4	11	0	0	2	2	0	9
PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time		2.0			2.0			2.0			2.0	
Extension of Effective Green		2.0			2.0			2.0			2.0	
Arrival Type		3			3			3			3	
Unit Extension		3.0			3.0			3.0			3.0	
Ped/Bike/RTOR Volume	0	0	0	0	0	5	0	0	60	0	0	10
Lane Width		12.0			12.0			12.0			12.0	
Parking/Grade/Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking/Hour												
Bus Stops/Hour		0			0			0			0	
Minimum Pedestrian Time		3.2			3.2			3.2			3.2	

Phasing	EW Perm	02	03	04	NS Perm	06	07	08
Timing	G = 47.0	G =	G =	G =	G = 20.0	G =	G =	G =
	Y = 5	Y =	Y =	Y =	Y = 5	Y =	Y =	Y =
Duration of Analysis (hrs) = 0.25						Cycle Length C = 77.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate		734			521			75			255	
Lane Group Capacity		1121			1077			429			331	
v/c Ratio		0.65			0.48			0.17			0.77	
Green Ratio		0.61			0.61			0.26			0.26	
Uniform Delay d_1		9.7			8.3			22.1			26.4	
Delay Factor k		0.23			0.11			0.11			0.32	
Incremental Delay d_2		1.1			0.3			0.2			10.6	
PF Factor		1.000			1.000			1.000			1.000	
Control Delay		10.9			8.6			22.3			37.0	
Lane Group LOS		B			A			C			D	
Approach Delay	10.9			8.6			22.3			37.0		
Approach LOS	B			A			C			D		
Intersection Delay	14.8			Intersection LOS						B		

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BACK-OF-QUEUE WORKSHEET

General Information

Project Description *112-118, GF Study - No-Build 2022 (AM Peak)*

Average Back of Queue

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Lane Group		LTR			LTR			LTR			LTR	
Initial Queue/Lane		0.0			0.0			0.0			0.0	
Flow Rate/Lane Group		734			521			75			255	
Satflow/Lane		1837			1765			1653			1274	
Capacity/Lane Group		1121			1077			429			331	
Flow Ratio		0.4			0.3			0.0			0.2	
v/c Ratio		0.65			0.48			0.17			0.77	
I Factor		0.800			0.800			1.000			1.000	
Arrival Type		3			3			3			3	
Platoon Ratio		1.00			1.00			1.00			1.00	
PF Factor		1.00			1.00			1.00			1.00	
Q_1		10.2			6.2			1.2			5.0	
k_B		0.5			0.5			0.4			0.3	
Q_2		1.0			0.5			0.1			1.0	
Q Average		11.2			6.6			1.3			6.0	

Percentile Back of Queue (95th percentile)

$f_{B\%}$		1.8			1.9			2.1			1.9	
Back of Queue		20.4			12.7			2.7			11.6	

Queue Storage Ratio

Queue Spacing		25.0			25.0			25.0			25.0	
Queue Storage		1000			775			1000			1000	
Average Queue Storage Ratio		0.3			0.2			0.0			0.2	
95% Queue Storage Ratio		0.5			0.4			0.1			0.3	

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SHORT REPORT

General Information		Site Information	
Analyst	*MDN*	Intersection	*Round Lake Rd/Rhule Rd*
Agency or Co.	*CME, RLRRRnbami*	Area Type	*All other areas*
Date Performed	*4/11/13*	Jurisdiction	*Town of Malta, NY*
Time Period	*AM Peak Hour*	Analysis Year	*No-Build 2022 with Imp*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	1	1	0	1	1	0	0	1	0	0	1	0
Lane Group	L	TR		L	TR			LTR			LTR	
Volume (vph)	15	675	0	15	455	25	0	10	120	200	5	45
% Heavy Vehicles	6	2	50	6	4	11	0	0	2	2	0	9
PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time	2.0	2.0		2.0	2.0			2.0			2.0	
Extension of Effective Green	2.0	2.0		2.0	2.0			2.0			2.0	
Arrival Type	3	3		3	3			3			3	
Unit Extension	3.0	3.0		3.0	3.0			3.0			3.0	
Ped/Bike/RTOR Volume	0	0	0	0	0	5	0	0	60	0	0	10
Lane Width	12.0	12.0		12.0	12.0			12.0			12.0	
Parking/Grade/Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking/Hour												
Bus Stops/Hour	0	0		0	0			0			0	
Minimum Pedestrian Time		3.2			3.2			3.2			3.2	

Phasing	EW Perm	02	03	04	NS Perm	06	07	08
Timing	G = 47.0	G =	G =	G =	G = 20.0	G =	G =	G =
	Y = 5	Y =	Y =	Y =	Y = 5	Y =	Y =	Y =
Duration of Analysis (hrs) = 0.25						Cycle Length C = 77.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate	16	718		16	505			75			255	
Lane Group Capacity	449	1137		293	1105			429			331	
v/c Ratio	0.04	0.63		0.05	0.46			0.17			0.77	
Green Ratio	0.61	0.61		0.61	0.61			0.26			0.26	
Uniform Delay d_1	6.0	9.5		6.0	8.1			22.1			26.4	
Delay Factor k	0.11	0.21		0.11	0.11			0.11			0.32	
Incremental Delay d_2	0.0	0.9		0.1	0.2			0.2			10.6	
PF Factor	1.000	1.000		1.000	1.000			1.000			1.000	
Control Delay	6.0	10.4		6.1	8.3			22.3			37.0	
Lane Group LOS	A	B		A	A			C			D	
Approach Delay	10.3			8.3			22.3			37.0		
Approach LOS	B			A			C			D		
Intersection Delay	14.5			Intersection LOS						B		

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BACK-OF-QUEUE WORKSHEET

General Information

Project Description *112-118, GF Study - No-Build 2022 (AM Peak) with Imp*

Average Back of Queue

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Lane Group	*L*	*TR*		*L*	*TR*			*LTR*			*LTR*	
Initial Queue/Lane	*0.0*	*0.0*		*0.0*	*0.0*			*0.0*			*0.0*	
Flow Rate/Lane Group	*16*	*718*		*16*	*505*			*75*			*255*	
Satflow/Lane	*735*	*1863*		*480*	*1810*			*1653*			*1274*	
Capacity/Lane Group	*449*	*1137*		*293*	*1105*			*429*			*331*	
Flow Ratio	*0.0*	*0.4*		*0.0*	*0.3*			*0.0*			*0.2*	
v/c Ratio	*0.04*	*0.63*		*0.05*	*0.46*			*0.17*			*0.77*	
I Factor	*0.800*	*0.800*		*0.800*	*0.800*			*1.000*			*1.000*	
Arrival Type	*3*	*3*		*3*	*3*			*3*			*3*	
Platoon Ratio	*1.00*	*1.00*		*1.00*	*1.00*			*1.00*			*1.00*	
PF Factor	*1.00*	*1.00*		*1.00*	*1.00*			*1.00*			*1.00*	
Q_1	*0.1*	*9.7*		*0.1*	*5.8*			*1.2*			*5.0*	
k_B	*0.3*	*0.5*		*0.2*	*0.5*			*0.4*			*0.3*	
Q_2	*0.0*	*0.9*		*0.0*	*0.4*			*0.1*			*1.0*	
Q Average	*0.1*	*10.7*		*0.2*	*6.3*			*1.3*			*6.0*	

Percentile Back of Queue (95th percentile)

$f_{B\%}$	*2.1*	*1.8*		*2.1*	*1.9*			*2.1*			*1.9*	
Back of Queue	*0.3*	*19.5*		*0.3*	*12.1*			*2.7*			*11.6*	

Queue Storage Ratio

Queue Spacing	*25.0*	*25.0*		*25.0*	*25.0*			*25.0*			*25.0*	
Queue Storage	*100*	*1000*		*100*	*775*			*1000*			*1000*	
Average Queue Storage Ratio	*0.0*	*0.3*		*0.0*	*0.2*			*0.0*			*0.2*	
95% Queue Storage Ratio	*0.1*	*0.5*		*0.1*	*0.4*			*0.1*			*0.3*	

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LANE SUMMARY

Site: Ruhle Rd/Round Lake Rd/ Raylinsky Rd - AM Peak - No-Build 2022

Ruhle Rd/Round Lake Rd/Raylinski Rd
No-Build 2022
AM Peak Hour
Roundabout

Lane Use and Performance

	Demand Flows L veh/h	T veh/h	R veh/h	Total veh/h	HV %	Cap veh/h	Deg Satn v/c	Lane Util. %	Average Delay sec	Level of Service	50% Back of Queue Vehicles veh	Distance ft	Lane Length ft	SL Type	Cap Adj. %	Prob. Block. %
South: Raylinski Rd NB																
Lane 1	1	11	128	139	1.8	383	0.364	100	16.5	LOS B	1.0	25.2	1600	–	0.0	0.0
Approach	1	11	128	139	1.8		0.364		16.5	LOS B	1.0	25.2				
East: Round Lake Rd WB																
Lane 1	16	484	27	527	4.4	1366	0.385	100	6.2	LOS A	1.2	30.5	775	–	0.0	0.0
Approach	16	484	27	527	4.4		0.385		6.2	LOS A	1.2	30.5				
North: Ruhle Rd SB																
Lane 1	213	5	48	266	3.2	714	0.373	100	9.9	LOS A	0.9	23.0	1600	–	0.0	0.0
Approach	213	5	48	266	3.2		0.373		9.9	LOS A	0.9	23.0				
West: Round Lake Rd EB																
Lane 1	16	718	1	735	2.2	976	0.754	100	17.8	LOS B	4.1	105.1	1430	–	0.0	0.0
Approach	16	718	1	735	2.2		0.754		17.8	LOS B	4.1	105.1				
Intersection				1667	3.0		0.754		12.8	LOS B	4.1	105.1				

Level of Service (LOS) Method: Delay (HCM 2000).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
Roundabout Capacity Model: SIDRA Standard.
HCM Delay Model used. Geometric Delay not included.

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SIDRA INTERSECTION

SHORT REPORT

General Information		Site Information	
Analyst	*MDN*	Intersection	*Round Lake Rd/Rhule Rd*
Agency or Co.	*CME, RLRRRbuam*	Area Type	*All other areas*
Date Performed	*4/11/13*	Jurisdiction	*Town of Malta, NY*
Time Period	*AM Peak Hour*	Analysis Year	*Build 2022*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Lane Group		LTR			LTR			LTR			LTR	
Volume (vph)	15	785	0	15	470	25	0	10	120	200	5	45
% Heavy Vehicles	6	2	50	6	4	11	0	0	2	2	0	9
PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time		2.0			2.0			2.0			2.0	
Extension of Effective Green		2.0			2.0			2.0			2.0	
Arrival Type		3			3			3			3	
Unit Extension		3.0			3.0			3.0			3.0	
Ped/Bike/RTOR Volume	0	0	0	0	0	5	0	0	60	0	0	10
Lane Width		12.0			12.0			12.0			12.0	
Parking/Grade/Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking/Hour												
Bus Stops/Hour		0			0			0			0	
Minimum Pedestrian Time		3.2			3.2			3.2			3.2	

Phasing	EW Perm	02	03	04	NS Perm	06	07	08
Timing	G = 47.0	G =	G =	G =	G = 20.0	G =	G =	G =
	Y = 5	Y =	Y =	Y =	Y = 5	Y =	Y =	Y =

Duration of Analysis (hrs) = *0.25*

Cycle Length C = *77.0*

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate		851			537			75			255	
Lane Group Capacity		1123			1074			429			331	
v/c Ratio		0.76			0.50			0.17			0.77	
Green Ratio		0.61			0.61			0.26			0.26	
Uniform Delay d_1		10.9			8.4			22.1			26.4	
Delay Factor k		0.31			0.11			0.11			0.32	
Incremental Delay d_2		2.4			0.3			0.2			10.6	
PF Factor		1.000			1.000			1.000			1.000	
Control Delay		13.3			8.7			22.3			37.0	
Lane Group LOS		B			A			C			D	
Approach Delay	13.3			8.7			22.3			37.0		
Approach LOS	B			A			C			D		
Intersection Delay	15.8			Intersection LOS						B		

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BACK-OF-QUEUE WORKSHEET

General Information

Project Description *112-118, GF Study - Build 2022 (AM Peak)*

Average Back of Queue

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Lane Group		LTR			LTR			LTR			LTR	
Initial Queue/Lane		0.0			0.0			0.0			0.0	
Flow Rate/Lane Group		851			537			75			255	
Satflow/Lane		1840			1759			1653			1274	
Capacity/Lane Group		1123			1074			429			331	
Flow Ratio		0.5			0.3			0.0			0.2	
v/c Ratio		0.76			0.50			0.17			0.77	
I Factor		0.800			0.800			1.000			1.000	
Arrival Type		3			3			3			3	
Platoon Ratio		1.00			1.00			1.00			1.00	
PF Factor		1.00			1.00			1.00			1.00	
Q_1		13.2			6.4			1.2			5.0	
k_B		0.5			0.5			0.4			0.3	
Q_2		1.6			0.5			0.1			1.0	
Q Average		14.8			7.0			1.3			6.0	

Percentile Back of Queue (95th percentile)

$f_{B\%}$		1.8			1.9			2.1			1.9	
Back of Queue		26.1			13.3			2.7			11.6	

Queue Storage Ratio

Queue Spacing		25.0			25.0			25.0			25.0	
Queue Storage		1000			775			1000			1000	
Average Queue Storage Ratio		0.4			0.2			0.0			0.2	
95% Queue Storage Ratio		0.7			0.4			0.1			0.3	

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SHORT REPORT

General Information		Site Information	
Analyst	*MDN*	Intersection	*Round Lake Rd/Rhule Rd*
Agency or Co.	*CME, RLRRRbuami*	Area Type	*All other areas*
Date Performed	*4/11/13*	Jurisdiction	*Town of Malta, NY*
Time Period	*AM Peak Hour*	Analysis Year	*Build 2022 with Imp*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	1	1	0	1	1	0	0	1	0	0	1	0
Lane Group	L	TR		L	TR			LTR			LTR	
Volume (vph)	25	785	0	15	470	25	0	10	120	200	5	45
% Heavy Vehicles	6	2	50	6	4	11	0	0	2	2	0	9
PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time	2.0	2.0		2.0	2.0			2.0			2.0	
Extension of Effective Green	2.0	2.0		2.0	2.0			2.0			2.0	
Arrival Type	3	3		3	3			3			3	
Unit Extension	3.0	3.0		3.0	3.0			3.0			3.0	
Ped/Bike/RTOR Volume	0	0	0	0	0	5	0	0	60	0	0	10
Lane Width	12.0	12.0		12.0	12.0			12.0			12.0	
Parking/Grade/Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking/Hour												
Bus Stops/Hour	0	0		0	0			0			0	
Minimum Pedestrian Time		3.2			3.2			3.2			3.2	

Phasing	EW Perm	02	03	04	NS Perm	06	07	08
Timing	G = 47.0	G =	G =	G =	G = 20.0	G =	G =	G =
	Y = 5	Y =	Y =	Y =	Y = 5	Y =	Y =	Y =
Duration of Analysis (hrs) = 0.25						Cycle Length C = 77.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate	27	835		16	521			75			255	
Lane Group Capacity	436	1137		213	1105			429			331	
v/c Ratio	0.06	0.73		0.08	0.47			0.17			0.77	
Green Ratio	0.61	0.61		0.61	0.61			0.26			0.26	
Uniform Delay d_1	6.1	10.6		6.1	8.2			22.1			26.4	
Delay Factor k	0.11	0.29		0.11	0.11			0.11			0.32	
Incremental Delay d_2	0.0	2.0		0.1	0.3			0.2			10.6	
PF Factor	1.000	1.000		1.000	1.000			1.000			1.000	
Control Delay	6.1	12.6		6.2	8.5			22.3			37.0	
Lane Group LOS	A	B		A	A			C			D	
Approach Delay	12.4			8.4			22.3			37.0		
Approach LOS	B			A			C			D		
Intersection Delay	15.2			Intersection LOS						B		

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BACK-OF-QUEUE WORKSHEET

General Information

Project Description *112-118, GF Study - Build 2022 (AM Peak) with Imp*

Average Back of Queue

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Lane Group	L	TR		L	TR			LTR			LTR	
Initial Queue/Lane	0.0	0.0		0.0	0.0			0.0			0.0	
Flow Rate/Lane Group	27	835		16	521			75			255	
Satflow/Lane	714	1863		349	1811			1653			1274	
Capacity/Lane Group	436	1137		213	1105			429			331	
Flow Ratio	0.0	0.4		0.0	0.3			0.0			0.2	
v/c Ratio	0.06	0.73		0.08	0.47			0.17			0.77	
I Factor	0.800	0.800		0.800	0.800			1.000			1.000	
Arrival Type	3	3		3	3			3			3	
Platoon Ratio	1.00	1.00		1.00	1.00			1.00			1.00	
PF Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Q_1	0.2	12.6		0.1	6.1			1.2			5.0	
k_B	0.3	0.5		0.2	0.5			0.4			0.3	
Q_2	0.0	1.4		0.0	0.5			0.1			1.0	
Q Average	0.3	14.1		0.2	6.6			1.3			6.0	
Percentile Back of Queue (95th percentile)												
$f_{B\%}$	2.1	1.8		2.1	1.9			2.1			1.9	
Back of Queue	0.5	24.9		0.3	12.6			2.7			11.6	
Queue Storage Ratio												
Queue Spacing	25.0	25.0		25.0	25.0			25.0			25.0	
Queue Storage	100	1000		100	775			1000			1000	
Average Queue Storage Ratio	0.1	0.4		0.0	0.2			0.0			0.2	
95% Queue Storage Ratio	0.1	0.6		0.1	0.4			0.1			0.3	

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LANE SUMMARY

Site: Ruhle Rd/Round Lake Rd/ Raylinsky Rd - AM Peak - Build 2022

Ruhle Rd/Round Lake Rd/Raylinski Rd
Build 2022
AM Peak Hour
Roundabout

Lane Use and Performance

	Demand Flows L veh/h	T veh/h	R veh/h	Total veh/h	HV %	Cap veh/h	Deg Satn v/c	Lane Util %	Average Delay sec	Level of Service	50% Back of Queue Vehicles veh	Distance ft	Lane Length ft	SL Type	Cap Adj %	Prob Block %
South: Raylinski Rd NB																
Lane 1	1	11	128	139	1.8	295	0.472	100	25.0	LOS C	1.5	36.9	1600	–	0.0	0.0
Approach	1	11	128	139	1.8		0.472		25.0	LOS C	1.5	36.9				
East: Round Lake Rd WB																
Lane 1	16	500	27	543	4.4	1368	0.397	100	6.3	LOS A	1.3	32.5	775	–	0.0	0.0
Approach	16	500	27	543	4.4		0.397		6.3	LOS A	1.3	32.5				
North: Ruhle Rd SB																
Lane 1	213	5	48	266	3.2	703	0.379	100	10.1	LOS B	0.9	23.4	1600	–	0.0	0.0
Approach	213	5	48	266	3.2		0.379		10.1	LOS B	0.9	23.4				
West: Round Lake Rd EB																
Lane 1	16	835	1	852	2.1	986	0.864	100	25.9	LOS C	6.9	175.4	1430	–	0.0	0.0
Approach	16	835	1	852	2.1		0.864		25.9	LOS C	6.9	175.4				
Intersection				1800	3.0		0.864		17.6	LOS B	6.9	175.4				

Level of Service (LOS) Method: Delay (HCM 2000).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
Roundabout Capacity Model: SIDRA Standard.
HCM Delay Model used. Geometric Delay not included.

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SIDRA INTERSECTION

SHORT REPORT

General Information		Site Information	
Analyst	*MDN*	Intersection	*Round Lake Rd/Rhule Rd*
Agency or Co.	*CME, RLRRRnbpmt*	Area Type	*All other areas*
Date Performed	*4/11/13*	Jurisdiction	*Town of Malta, NY*
Time Period	*PM Peak Hour*	Analysis Year	*No-Build 2022*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Lane Group		LTR			LTR			LTR			LTR	
Volume (vph)	25	505	10	115	655	160	5	10	25	95	10	40
% Heavy Vehicles	0	0	0	0	1	1	0	0	0	1	0	4
PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time		2.0			2.0			2.0			2.0	
Extension of Effective Green		2.0			2.0			2.0			2.0	
Arrival Type		3			3			3			3	
Unit Extension		3.0			3.0			3.0			3.0	
Ped/Bike/RTOR Volume	0	0	0	0	0	10	0	0	10	0	0	10
Lane Width		12.0			12.0			12.0			12.0	
Parking/Grade/Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking/Hour												
Bus Stops/Hour		0			0			0			0	
Minimum Pedestrian Time		3.2			3.2			3.2			3.2	

Phasing	EW Perm	02	03	04	NS Perm	06	07	08
Timing	G = 62.0	G =	G =	G =	G = 13.0	G =	G =	G =
	Y = 5	Y =	Y =	Y =	Y = 5	Y =	Y =	Y =

Duration of Analysis (hrs) = *0.25*

Cycle Length C = *85.0*

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate		557			949			30			139	
Lane Group Capacity		1301			1162			257			214	
v/c Ratio		0.43			0.82			0.12			0.65	
Green Ratio		0.73			0.73			0.15			0.15	
Uniform Delay d_1		4.5			7.7			31.0			33.9	
Delay Factor k		0.11			0.36			0.11			0.23	
Incremental Delay d_2		0.2			3.3			0.2			6.8	
PF Factor		1.000			1.000			1.000			1.000	
Control Delay		4.7			11.0			31.3			40.6	
Lane Group LOS		A			B			C			D	
Approach Delay	4.7			11.0			31.3			40.6		
Approach LOS	A			B			C			D		
Intersection Delay	11.7			Intersection LOS						B		

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BACK-OF-QUEUE WORKSHEET

General Information

Project Description *112-118, GF Study - No-Build 2022 (PM Peak)*

Average Back of Queue

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Lane Group		LTR			LTR			LTR			LTR	
Initial Queue/Lane		0.0			0.0			0.0			0.0	
Flow Rate/Lane Group		557			949			30			139	
Satflow/Lane		1784			1593			1678			1399	
Capacity/Lane Group		1301			1162			257			214	
Flow Ratio		0.3			0.6			0.0			0.1	
v/c Ratio		0.43			0.82			0.12			0.65	
I Factor		0.800			0.700			1.000			1.000	
Arrival Type		3			3			3			3	
Platoon Ratio		1.00			1.00			1.00			1.00	
PF Factor		1.00			1.00			1.00			1.00	
Q_1		5.2			15.0			0.6			3.1	
k_B		0.6			0.5			0.3			0.3	
Q_2		0.5			2.1			0.0			0.5	
Q Average		5.6			17.1			0.6			3.6	

Percentile Back of Queue (95th percentile)

$f_{B\%}$		1.9			1.7			2.1			2.0	
Back of Queue		10.9			29.6			1.4			7.1	

Queue Storage Ratio

Queue Spacing		25.0			25.0			25.0			25.0	
Queue Storage		1000			775			1000			1000	
Average Queue Storage Ratio		0.1			0.6			0.0			0.1	
95% Queue Storage Ratio		0.3			1.0			0.0			0.2	

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SHORT REPORT

General Information		Site Information	
Analyst	*MDN*	Intersection	*Round Lake Rd/Rhule Rd*
Agency or Co.	*CME, RLRRRnbpmti*	Area Type	*All other areas*
Date Performed	*4/11/13*	Jurisdiction	*Town of Malta, NY*
Time Period	*PM Peak Hour*	Analysis Year	*No-Build 2022 with Imp*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	1	1	0	1	1	0	0	1	0	0	1	0
Lane Group	L	TR		L	TR			LTR			LTR	
Volume (vph)	25	505	10	115	655	160	5	10	25	95	10	40
% Heavy Vehicles	0	0	0	0	1	1	0	0	0	1	0	4
PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time	2.0	2.0		2.0	2.0			2.0			2.0	
Extension of Effective Green	2.0	2.0		2.0	2.0			2.0			2.0	
Arrival Type	3	3		3	3			3			3	
Unit Extension	3.0	3.0		3.0	3.0			3.0			3.0	
Ped/Bike/RTOR Volume	0	0	0	0	0	10	0	0	10	0	0	10
Lane Width	12.0	12.0		12.0	12.0			12.0			12.0	
Parking/Grade/Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking/Hour												
Bus Stops/Hour	0	0		0	0			0			0	
Minimum Pedestrian Time		3.2			3.2			3.2			3.2	

Phasing	EW Perm	02	03	04	NS Perm	06	07	08
Timing	G = 62.0	G =	G =	G =	G = 13.0	G =	G =	G =
	Y = 5	Y =	Y =	Y =	Y = 5	Y =	Y =	Y =
Duration of Analysis (hrs) = 0.25						Cycle Length C = 85.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate	26	531		119	830			30			139	
Lane Group Capacity	373	1382		598	1333			257			214	
v/c Ratio	0.07	0.38		0.20	0.62			0.12			0.65	
Green Ratio	0.73	0.73		0.73	0.73			0.15			0.15	
Uniform Delay d_1	3.3	4.3		3.6	5.7			31.0			33.9	
Delay Factor k	0.11	0.11		0.11	0.21			0.11			0.23	
Incremental Delay d_2	0.1	0.1		0.1	0.6			0.2			6.8	
PF Factor	1.000	1.000		1.000	1.000			1.000			1.000	
Control Delay	3.3	4.5		3.8	6.3			31.3			40.6	
Lane Group LOS	A	A		A	A			C			D	
Approach Delay	4.4			6.0			31.3			40.6		
Approach LOS	A			A			C			D		
Intersection Delay	8.8			Intersection LOS						A		

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BACK-OF-QUEUE WORKSHEET

General Information

Project Description *112-118, GF Study - No-Build 2022 (PM Peak) with Imp*

Average Back of Queue

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Lane Group	L	TR		L	TR			LTR			LTR	
Initial Queue/Lane	0.0	0.0		0.0	0.0			0.0			0.0	
Flow Rate/Lane Group	26	531		119	830			30			139	
Satflow/Lane	512	1895		820	1828			1678			1399	
Capacity/Lane Group	373	1382		598	1333			257			214	
Flow Ratio	0.1	0.3		0.1	0.5			0.0			0.1	
v/c Ratio	0.07	0.38		0.20	0.62			0.12			0.65	
I Factor	0.800	0.800		0.700	0.700			1.000			1.000	
Arrival Type	3	3		3	3			3			3	
Platoon Ratio	1.00	1.00		1.00	1.00			1.00			1.00	
PF Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Q_1	0.2	4.7		0.9	9.7			0.6			3.1	
k_B	0.3	0.6		0.3	0.6			0.3			0.3	
Q_2	0.0	0.4		0.1	0.9			0.0			0.5	
Q Average	0.2	5.1		1.0	10.6			0.6			3.6	

Percentile Back of Queue (95th percentile)

$f_{B\%}$	2.1	2.0		2.1	1.8			2.1			2.0	
Back of Queue	0.4	10.0		2.0	19.5			1.4			7.1	

Queue Storage Ratio

Queue Spacing	25.0	25.0		25.0	25.0			25.0			25.0	
Queue Storage	100	1000		100	775			1000			1000	
Average Queue Storage Ratio	0.0	0.1		0.2	0.3			0.0			0.1	
95% Queue Storage Ratio	0.1	0.2		0.5	0.6			0.0			0.2	

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LANE SUMMARY

Site: Ruhle Rd/Round Lake Rd/ Raylinsky Rd - PM Peak - No-Build 2022

Ruhle Rd/Round Lake Rd/Raylinski Rd
No-Build 2022
PM Peak Hour
Roundabout

Lane Use and Performance

	Demand Flows L veh/h	T veh/h	R veh/h	Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	50% Back of Queue Vehicles veh	Distance ft	Lane Length ft	SL Type	Cap. Adj. %	Prob. Block. %
South: Raylinski Rd NB																
Lane 1	5	10	26	41	3.8	585	0.071	100	7.0	LOS A	0.2	4.0	1600	–	0.0	0.0
Approach	5	10	26	41	3.8		0.071		7.0	LOS A	0.2	4.0				
East: Round Lake Rd WB																
Lane 1	119	675	165	959	1.7	1402	0.684	100	11.3	LOS B	3.4	86.0	775	–	0.0	0.0
Approach	119	675	165	959	1.7		0.684		11.3	LOS B	3.4	86.0				
North: Ruhle Rd SB																
Lane 1	98	10	41	149	1.5	529	0.282	100	10.9	LOS B	0.7	17.3	1600	–	0.0	0.0
Approach	98	10	41	149	1.5		0.282		10.9	LOS B	0.7	17.3				
West: Round Lake Rd EB																
Lane 1	26	521	10	557	0.9	996	0.559	100	10.9	LOS B	1.8	45.2	1430	–	0.0	0.0
Approach	26	521	10	557	0.9		0.559		10.9	LOS B	1.8	45.2				
Intersection				1706	1.5		0.684		11.0	LOS B	3.4	86.0				

Level of Service (LOS) Method: Delay (HCM 2000).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
Roundabout Capacity Model: SIDRA Standard.
HCM Delay Model used. Geometric Delay not included.

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SHORT REPORT

General Information		Site Information	
Analyst	*MDN*	Intersection	*Round Lake Rd/Rhule Rd*
Agency or Co.	*CME, RLRRRbupmt*	Area Type	*All other areas*
Date Performed	*4/11/13*	Jurisdiction	*Town of Malta, NY*
Time Period	*PM Peak Hour*	Analysis Year	*Build 2022*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Lane Group		LTR			LTR			LTR			LTR	
Volume (vph)	25	525	10	115	755	160	5	10	25	95	10	40
% Heavy Vehicles	0	0	0	0	1	1	0	0	0	1	0	4
PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time		2.0			2.0			2.0			2.0	
Extension of Effective Green		2.0			2.0			2.0			2.0	
Arrival Type		3			3			3			3	
Unit Extension		3.0			3.0			3.0			3.0	
Ped/Bike/RTOR Volume	0	0	0	0	0	10	0	0	10	0	0	10
Lane Width		12.0			12.0			12.0			12.0	
Parking/Grade/Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking/Hour												
Bus Stops/Hour		0			0			0			0	
Minimum Pedestrian Time		3.2			3.2			3.2			3.2	

Phasing	EW Perm	02	03	04	NS Perm	06	07	08
Timing	G = 62.0	G =	G =	G =	G = 13.0	G =	G =	G =
	Y = 5	Y =	Y =	Y =	Y = 5	Y =	Y =	Y =
Duration of Analysis (hrs) = 0.25					Cycle Length C = 85.0			

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate		577			1052			30			139	
Lane Group Capacity		1294			1175			257			214	
v/c Ratio		0.45			0.90			0.12			0.65	
Green Ratio		0.73			0.73			0.15			0.15	
Uniform Delay d_1		4.6			9.0			31.0			33.9	
Delay Factor k		0.11			0.42			0.11			0.23	
Incremental Delay d_2		0.2			6.7			0.2			6.8	
PF Factor		1.000			1.000			1.000			1.000	
Control Delay		4.8			15.7			31.3			40.6	
Lane Group LOS		A			B			C			D	
Approach Delay	4.8			15.7			31.3			40.6		
Approach LOS	A			B			C			D		
Intersection Delay	14.4			Intersection LOS						B		

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BACK-OF-QUEUE WORKSHEET

General Information

Project Description *112-118, GF Study - Build 2022 (PM Peak)*

Average Back of Queue

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Lane Group		LTR			LTR			LTR			LTR	
Initial Queue/Lane		0.0			0.0			0.0			0.0	
Flow Rate/Lane Group		577			1052			30			139	
Satflow/Lane		1774			1611			1678			1399	
Capacity/Lane Group		1294			1175			257			214	
Flow Ratio		0.3			0.7			0.0			0.1	
v/c Ratio		0.45			0.90			0.12			0.65	
I Factor		0.800			0.700			1.000			1.000	
Arrival Type		3			3			3			3	
Platoon Ratio		1.00			1.00			1.00			1.00	
PF Factor		1.00			1.00			1.00			1.00	
Q_1		5.5			19.4			0.6			3.1	
k_B		0.6			0.5			0.3			0.3	
Q_2		0.5			3.6			0.0			0.5	
Q Average		6.0			22.9			0.6			3.6	

Percentile Back of Queue (95th percentile)

$f_{B\%}$		1.9			1.7			2.1			2.0	
Back of Queue		11.5			38.3			1.4			7.1	

Queue Storage Ratio

Queue Spacing		25.0			25.0			25.0			25.0	
Queue Storage		1000			775			1000			1000	
Average Queue Storage Ratio		0.1			0.7			0.0			0.1	
95% Queue Storage Ratio		0.3			1.2			0.0			0.2	

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SHORT REPORT

General Information		Site Information	
Analyst	*MDN*	Intersection	*Round Lake Rd/Rhule Rd*
Agency or Co.	*CME, RLRRRbupmi*	Area Type	*All other areas*
Date Performed	*4/11/13*	Jurisdiction	*Town of Malta, NY*
Time Period	*PM Peak Hour*	Analysis Year	*Build 2022 with Imp*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	1	1	0	1	1	0	0	1	0	0	1	0
Lane Group	L	TR		L	TR			LTR			LTR	
Volume (vph)	25	525	10	115	755	160	5	10	25	95	10	40
% Heavy Vehicles	0	0	0	0	1	1	0	0	0	1	0	4
PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time	2.0	2.0		2.0	2.0			2.0			2.0	
Extension of Effective Green	2.0	2.0		2.0	2.0			2.0			2.0	
Arrival Type	3	3		3	3			3			3	
Unit Extension	3.0	3.0		3.0	3.0			3.0			3.0	
Ped/Bike/RTOR Volume	0	0	0	0	0	10	0	0	10	0	0	10
Lane Width	12.0	12.0		12.0	12.0			12.0			12.0	
Parking/Grade/Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking/Hour												
Bus Stops/Hour	0	0		0	0			0			0	
Minimum Pedestrian Time		3.2			3.2			3.2			3.2	

Phasing	EW Perm	02	03	04	NS Perm	06	07	08
Timing	G = 62.0	G =	G =	G =	G = 13.0	G =	G =	G =
	Y = 5	Y =	Y =	Y =	Y = 5	Y =	Y =	Y =

Duration of Analysis (hrs) = *0.25* Cycle Length C = *85.0*

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate	26	551		119	933			30			139	
Lane Group Capacity	303	1382		582	1338			257			214	
v/c Ratio	0.09	0.40		0.20	0.70			0.12			0.65	
Green Ratio	0.73	0.73		0.73	0.73			0.15			0.15	
Uniform Delay d_1	3.3	4.4		3.7	6.3			31.0			33.9	
Delay Factor k	0.11	0.11		0.11	0.26			0.11			0.23	
Incremental Delay d_2	0.1	0.2		0.1	1.1			0.2			6.8	
PF Factor	1.000	1.000		1.000	1.000			1.000			1.000	
Control Delay	3.4	4.5		3.8	7.5			31.3			40.6	
Lane Group LOS	A	A		A	A			C			D	
Approach Delay	4.5			7.1			31.3			40.6		
Approach LOS	A			A			C			D		
Intersection Delay	9.2			Intersection LOS						A		

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BACK-OF-QUEUE WORKSHEET

General Information

Project Description *112-118, GF Study - Build 2022 (PM Peak) with Imp*

Average Back of Queue

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Lane Group	L	TR		L	TR			LTR			LTR	
Initial Queue/Lane	0.0	0.0		0.0	0.0			0.0			0.0	
Flow Rate/Lane Group	26	551		119	933			30			139	
Satflow/Lane	415	1895		798	1834			1678			1399	
Capacity/Lane Group	303	1382		582	1338			257			214	
Flow Ratio	0.1	0.3		0.1	0.5			0.0			0.1	
v/c Ratio	0.09	0.40		0.20	0.70			0.12			0.65	
I Factor	0.800	0.800		0.700	0.700			1.000			1.000	
Arrival Type	3	3		3	3			3			3	
Platoon Ratio	1.00	1.00		1.00	1.00			1.00			1.00	
PF Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Q_1	0.2	5.0		0.9	12.1			0.6			3.1	
k_B	0.3	0.6		0.3	0.6			0.3			0.3	
Q_2	0.0	0.4		0.1	1.2			0.0			0.5	
Q Average	0.2	5.4		1.0	13.4			0.6			3.6	

Percentile Back of Queue (95th percentile)

$f_{B\%}$	2.1	1.9		2.1	1.8			2.1			2.0	
Back of Queue	0.4	10.5		2.0	23.9			1.4			7.1	

Queue Storage Ratio

Queue Spacing	25.0	25.0		25.0	25.0			25.0			25.0	
Queue Storage	100	1000		100	775			1000			1000	
Average Queue Storage Ratio	0.1	0.1		0.2	0.4			0.0			0.1	
95% Queue Storage Ratio	0.1	0.3		0.5	0.8			0.0			0.2	

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LANE SUMMARY

Site: Ruhle Rd/Round Lake Rd/ Raylinsky Rd - PM Peak - Build 2022

Ruhle Rd/Round Lake Rd/Raylinski Rd
Build 2022
PM Peak Hour
Roundabout

Lane Use and Performance

	Demand Flows L veh/h	T veh/h	R veh/h	Total veh/h	HV %	Cap veh/h	Deg Satn v/c	Lane Util %	Average Delay sec	Level of Service	50% Back of Queue Vehicles veh	Distance ft	Lane Length ft	SL Type	Cap Adj %	Prob Block %
South: Raylinski Rd NB																
Lane 1	5	10	26	41	3.8	569	0.073	100	7.2	LOS A	0.2	4.2	1600	–	0.0	0.0
Approach	5	10	26	41	3.8		0.073		7.2	LOS A	0.2	4.2				
East: Round Lake Rd WB																
Lane 1	119	778	165	1062	1.7	1411	0.752	100	13.6	LOS B	4.5	114.0	775	–	0.0	0.0
Approach	119	778	165	1062	1.7		0.752		13.6	LOS B	4.5	114.0				
North: Ruhle Rd SB																
Lane 1	98	10	41	149	1.5	456	0.328	100	13.3	LOS B	0.8	21.0	1600	–	0.0	0.0
Approach	98	10	41	149	1.5		0.328		13.3	LOS B	0.8	21.0				
West: Round Lake Rd EB																
Lane 1	26	541	10	577	0.9	998	0.579	100	11.3	LOS B	1.9	48.2	1430	–	0.0	0.0
Approach	26	541	10	577	0.9		0.579		11.3	LOS B	1.9	48.2				
Intersection				1830	1.5		0.752		12.7	LOS B	4.5	114.0				

Level of Service (LOS) Method: Delay (HCM 2000).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
Roundabout Capacity Model: SIDRA Standard.
HCM Delay Model used. Geometric Delay not included.

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