Bergmann associates
architects // engineers // planners

TRAFFIC IMPACT ASSESSMENT

MARCY NANOCENTER
INFRASTRUCTURE IMPROVEMENTS

TOWN OF MARCY
ONEIDA COUNTY
NEW YORK

August 2009

PREPARED FOR:
Mohawk Valley Edge
153 Brooks Road
Rome, NY 13441

28 East Main Street // 200 First Federal Plaza // Rochester, NY 14614-1909

www.bergmannpc.com

To:	Mohawk Valley Edge 153 Brooks Road Rome, NY 13441	**Date:**	August 21, 2009
Attn:	Mark Reynolds (MVEDGE)	**From:**	Frank Dolan, P.E., PTOE
Cc:	Nicholas Choubah (NYSDOT Region 2) Donald Nims, PE (Bergmann) Mike Croce, PE (Bergmann) Mark McAnany, PE (Bergmann)		
Re:	**Marcy NanoCenter Infrastructure Improvements** Edic Road Bypass Trip Generation, Distribution, and Capacity Analysis of Intersections		

The purpose of this technical memorandum is to summarize the analysis completed to assess the potential traffic impacts of the proposed Marcy NanoCenter and Edic Road Bypass on the surrounding transportation network and to provide the basis for the selection of alternative intersection designs to be forwarded to detailed design and construction.

I. TRIP GENERATION

The Marcy NanoCenter is expected to contain a set of two (2) fully operational chip manufacturing plants by 2020. The project area includes 250 +/- acres of land bounded to the north by Hazard Road, to the south by River Road (formerly New York State (NYS) Route 49), to the west by Morris Road, and to the east by Edic Road. The proposed manufacturing facility would be located adjacent to the State University of New York Institute of Technology (SUNY-IT) and constructed in phases. At full build-out, it would include approximately 1,188,000 gross square feet (gsf) of building area.

Expected employment and trip generation data were provided by the Mohawk Valley EDGE, are attached to this document, and are representative of other chip fabrication developments nationwide such as the Luther Forest Technology Park in Malta, New York. The complete chip fabrication facility is expected to employ 3,415 persons for its manufacturing operation. These employees would be divided into four groups. A typical shift for each group would last 12 hours. Due to the extensive length of each shift, working days would be staggered (i.e. all employees would not work 5 days a week). This would result in 2 shifts of manufacturing employees accessing the facility per calendar day. The total number of manufacturing employee trips expected would be 1,666 and 1,750 in the morning (AM) and evening (PM) peaks, respectively. A breakdown of the entering and exiting manufacturing trips is provided in Table 1. These trips would occur between 6:00 and 7:00 AM in the morning and between 6:00 and 7:00 PM in the evening.

28 East Main Street // 200 First Federal Plaza // Rochester, NY 14614-1909 // tel: 585.232.5135 www.bergmannpc.com

Table 1 Manufacturing Peak Hour Trip Generation Estimate (Approximately 6:00 AM to 7:00 AM and 6:00 to 7:00 PM)				
	AM Peak		PM Peak	
	Entering	Exiting	Entering	Exiting
Manufacturing Trips	833	833	833	917
Construction /Service Trips	100	8	-	-
Subtotal	933	841	833	917
Additional Trips (10%)	93	84	83	92
Total	1026	925	916	1009
	1951		1925	

It is expected that there will be temporary construction or service workers on site each day once the facility is in operation. These workers would generate an estimated 108 total trips during each peak hour. A total of 100 trips are assumed to be entering and 8 trips exiting during the morning peak. The reverse would be true during the evening peak with 8 trips entering and 100 trips exiting. The morning flow of service traffic is expected to overlap with the peak hour of manufacturing trips. The afternoon flow of service traffic is expected to occur prior to both the administrative and manufacturing peaks.

Office and support staff would account for approximately 20% off the total employees working on site each day. It is expected that 496 trips would be generated during the AM peak hour and 434 trips would be generated during the PM peak hour. A breakdown of the entering and exiting administrative trips is provided in Table 2. These trips would occur between 7:00 AM and 8:00 AM in the morning and between 4:00 PM and 5:00 PM in the evening.

Table 2 Administrative Peak Hour Trip Generation Estimate (Approximately 7:00 AM to 8:00 AM & 4:30 PM to 5:00 PM)				
	AM Peak		PM Peak	
	Entering	Exiting	Entering	Exiting
Administrative Trips	422	74	97	337
Additional Trips (15%)	63	11	15	51
Total	485	85	112	388
	570		500	

To preserve the Mohawk Valley EDGE's investment in engineering studies, design, and construction of off-site highway improvements, the number of trips was increased by a factor to accommodate future traffic growth that may occur above and beyond the annually expected background growth. An additional 10% of the traffic generated by the proposed development was added to the trip generation estimate for the manufacturing peaks. An additional 15% of the traffic to be generated by the proposed development during the administrative peaks was also added. These increases are reflected in Tables 1 and 2.

In comparing the trip generation estimates, it is evident that the volume of manufacturing trips would exceed those generated by administrative and service employees. Therefore, the manufacturing trip generation estimate and time periods were selected as the basis for the analysis of future traffic conditions with development.

28 East Main Street // 200 First Federal Plaza // Rochester, NY 14614-1909 // tel: 585.232.5135 www.bergmannpc.com

II. TRIP DISTRIBUTION AND ASSIGNMENT

The proposed trip distribution and assignment for the proposed development are shown in Figures 1 and 2, respectively. Most trips going to and coming from the site (39%) are expected to arrive from the south. The next largest proportion (27%) is expected to travel to and arrive from the west. It is anticipated that 17% would arrive from and go to the east. The remaining 17% of the site generated traffic would arrive from or go to the north. This distribution is consistent with past studies of the proposed development including the Final Generic Environmental Impact Study (GEIS) prepared by O'Brien and Gere Engineers, Inc. in 2001 and the Traffic Impact Study for the Marcy Semi Conductor Facility prepared by FRA in 2000. It is based on work originally done by the Herkimer-Oneida Counties Transportation Study (HOCTS).

The number of employees projected to enter and exit the site per shift differs from that presented in the 2000 FRA document because that study assumed all employees would be divided into two shifts. As previously discussed, at this time it is expected that all employees will be divided into four shifts.

Current plans call for the construction of a new road, bypassing the existing alignment of Edic Road from River Road to the NanoCenter's main entrance. Two access points would be provided to the site from the new bypass. The main entrance would be located at the northern end of the proposed development and the end of the Edic Road Bypass. A supplemental driveway would be located along the Edic Road Bypass between the SUNY-IT entrance road (Technology Drive) and the chip fabrication facility's main entrance. The supplementary driveway would have right-in, right-out access only. Left turns off of and on to the Edic Road Bypass would be restricted by a median. The new Edic Road Bypass would also intersect Technology Drive and Old Edic Road approximately half way along its length. This would provide access to SUNY-IT and existing homes along Old Edic Road.

III. TRAFFIC VOLUMES

Existing turning movement volumes during the proposed manufacturing peaks were adapted from 2006 data presented in a traffic impact study completed by Lochner Engineering, P.C. for the proposed chip manufacturing facility in 2007. Base volumes from that study were initially increased by 1.5% per year over three years to represent existing conditions. The volumes were then factored based upon a relationship to recent counts taken by the New York State Department of Transportation (NYSDOT) on the ramps connecting NYS Route 49 with River Road in 2009. This step was necessary to estimate volumes representative of the 6:00 AM to 7:00 AM and 6:00 PM to 7:00 PM time periods. Existing turning movement volumes during these time periods are shown on Figure 3.

The existing volumes were next increased by 1.5% per year over eleven (11) years to estimate background traffic conditions in 2020. That is the estimated time of completion (ETC) for the proposed development. That growth rate is consistent with the GEIS and a growth rate derived from historic NYSDOT volumes available for NYS Route 49 in 2005 and 2007. Projected background turning movement volumes for the year 2020 are shown in Figure 4.

The future build volumes are the sum of the background traffic volumes and the manufacturing peak hour trips that would be generated by the proposed development. As shown in Figure 5, traffic volumes on the proposed Edic Road Bypass would be expected to range from 1300 to 1800 vehicles per hour during each peak period.

28 East Main Street // 200 First Federal Plaza // Rochester, NY 14614-1909 // tel: 585.232.5135 www.bergmannpc.com

IV. RIVER ROAD INTERSECTION CAPACITY ANALYSIS

Level of Service (LOS) is a qualitative measure describing motorist satisfaction with various factors influencing traffic congestion including travel time, speed maneuverability, and delay. The methodology for performing capacity analyses and determining level of service is documented in the Highway Capacity Manual (HCM) (Transportation Research Board, Washington D.C., 2000). Levels of service range from A to F. LOS A describes conditions with free-flow operation at desirable travel speeds and little or no delay. LOS F denotes highly congested conditions with stop and go traffic, low speeds, significant congestion, and substantial delays.

LOS for signalized and unsignalized intersections is derived from the average seconds of delay per vehicle (sec/veh). Signalized intersection analyses yield LOS for lane groups (those lanes shared by similar movements), each approach, and the intersection as a whole. LOS D or better is generally considered acceptable during peak commuter periods in urbanized areas. LOS C is generally preferred as a minimum in rural settings.

The four-way intersection of Edic Road, River Road, and the NYS Route 49 Ramps is currently controlled by an actuated, three-color traffic signal. With the exception of its western leg, all approaches have one exclusive left turn lane and a lane shared by through movements and right turns. The eastbound approach includes an exclusive left turn lane, a dedicated through lane, and a channelized right turn lane.

Synchro (Version 7) software was utilized to complete signalized intersection analyses for this assessment. Synchro is useful for optimizing timings, developing phasing, and performing capacity analyses for actuated traffic signal installations. It is a NYSDOT approved traffic analysis software program.

Results of the level of service analyses for existing and no-build conditions are summarized in Table 3. Under existing conditions, the Edic Road, River Road, and NYS Route 49 Ramps intersection operates at LOS A and B during the AM and PM peak periods, respectively. All individual lane groups operate at LOS B or better. This is projected to continue throughout the year 2020 (ETC) without development of the Marcy NanoCenter.

With full development of the Marcy NanoCenter by the year 2020, projected northbound and southbound through volumes would exceed available intersection capacity. LOS F conditions would be experienced on the northbound and southbound approaches during both the AM and PM peaks. LOS E and F conditions would be experienced by eastbound left turning traffic during the AM and PM peaks, respectively. Southbound left turning traffic would experience LOS F conditions during the PM peak hour. As a result, the intersection would function at LOS F overall.

A set of signalized intersection improvements were developed to mitigate these issues. They include the addition of a second through lane to the northbound and southbound approaches, an exclusive right turn lane to the westbound and southbound approaches, and extension of the exclusive left turn lane on the eastbound approach. Together these modifications would improve the quality of operation to LOS C overall during both the AM and PM peak periods. The proposed improvements also fit within existing highway boundaries. The existing channelized eastbound right turn lane, while not required for capacity, could be retained to remove turning traffic from the through lane.

As shown in Table 3, all lane groups would function at LOS D or better during the AM and PM peak periods. The northbound approach would experience the most delay, functioning at LOS D. Delays to through traffic on this approach would range from approximately 40 to 50 seconds per vehicle on average.

28 East Main Street // 200 First Federal Plaza // Rochester, NY 14614-1909 // tel: 585.232.5135 www.bergmannpc.com

Table 3
Signalized Intersection Level of Service – Edic Road (Bypass), River Road, and the NYS Route 49 Ramps

Approach		Existing (2009)				No Build (2020)				Full Build with Mitigation (2020)			
		AM		PM		AM		PM		AM		PM	
		LOS	Control Delay (sec/veh)	LOS	Control Delay (sec/veh)	LOS	Control Delay (sec/veh)	LOS	Control Delay (sec/veh)	LOS	Control Delay (sec/veh)	LOS	Control Delay (sec/veh)
Eastbound	L	A	5.7	A	7.9	A	5.7	A	8.0				
	TR	A	6.6	A	9.7	A	6.8	B	10.2				
	Approach	A	6.5	A	9.5	A	6.7	A	9.9				
Westbound	L	A	5.8	A	8.0	A	5.8	A	8.1				
	TR	A	7.9	B	10.5	A	8.1	B	13.1				
	Approach	A	7.7	B	10.3	A	7.9	B	12.8				
Northbound	L	A	9.7	B	10.6	B	10.2	B	12.6				
	TR	B	10.9	B	11.7	B	11.3	B	13.3				
	Approach	B	10.4	B	11.2	B	10.9	B	13.0				
Southbound	L	B	10.5	B	11.0	B	11.0	B	13.2				
	TR	B	12.6	B	10.7	B	13.1	B	12.2				
	Approach	B	12.0	B	10.7	B	12.5	B	12.3				
Overall		**A**	**8.2**	**B**	**10.2**	**A**	**8.4**	**B**	**11.7**				
Eastbound	L									C	25.4	C	28.7
	T									B	19.9	C	23.3
	R									A	4.3	A	4.3
	Approach									B	21.9	C	23.3
Westbound	L									B	16.7	B	16.8
	T									D	41.8	D	46.6
	R									A	8.7	A	8.5
	Approach									C	24.4	C	30.4
Northbound	L									B	15.7	B	18.7
	TTR									D	42.6	D	47.0
	Approach									D	40.2	D	44.2
Southbound	L									C	26.1	D	36.7
	TT									C	26.1	C	29.9
	R									A	2.2	A	2.9
	Approach									B	18.4	C	22.1
Overall										**C**	**25.4**	**C**	**28.5**

The distance between the proposed stop line on the northbound approach and the point where the NYS Route 49 ramps converge would be limited. Given the freeway approach character, increased volumes, cyclical queuing, and limited storage space, this area presents a potential safety concern. If during peak periods standing queues were to extend from the stop line to the convergence of the ramps, this would leave no space for an approaching vehicle to maneuver (weave) into their intended lane. For example, a motorist arriving from NYS Route 49 westbound may not be able to reach the exclusive left turn lane without an eastbound exiting motorist cooperating and providing a gap. This would add turbulence to the traffic stream, increase congestion, and potentially degrade safety performance at the end of the NYS Route 49 Ramps.

Based upon results from Synchro, the projected northbound queue under average peak hour traffic conditions could extend just over 220 feet from the stop line. Using a conceptual layout for proposed signalized intersection improvements (Figure 6), approximately 300 feet of space would be provided between the northbound stop line

and the point where the NYS Route 49 ramps converge. Therefore at peak times, approximately 80 feet would remain for vehicles to maneuver (weave) into the proper lane behind a standing queue.

Chapter 5 of the NYSDOT Highway Design Manual recommends that intersection approaches be designed to accommodate, at minimum, 1.5 times the average queue length predicted by Synchro. Under this scenario, the northbound approach should be designed for up to 330 feet of vehicular storage. This exceeds the space available by just over one car length.

Exclusive turn lanes on the southbound approach should be designed with consideration for 250 feet of queuing in the dominant through lane under average peak hour traffic conditions. Unbalanced vehicle stacking in the through lanes would be caused by the merge located just downstream of the intersection. Those familiar (e.g. commuters) with the downstream merge would anticipate it and tend to avoid the lane that drops until the queue in the dominant lane becomes long enough for them to perceive a time benefit in jumping ahead of those vehicles. For the purposes of this analysis, a 65% to 35% split was assumed for southbound lane use. Building each exclusive turn lane with 250 feet of storage would minimize the potential for turning traffic to become blocked by through traffic as it waits for a green light.

One possible alternative to signalized intersection improvements would involve the construction of a modern roundabout. Per the NYSDOT Highway Design Manual, Chapter 5, when a project involves reconstructing or constructing new intersections, a roundabout alternative should be considered.

Roundabouts are circular intersections designed to maximize safety and minimize delay. They have been installed at numerous locations throughout the United States, including more than 50 across New York State. Roundabouts eliminate potential conflicts commonly experienced at conventional intersections such as those that involve left turns and through movements. Entry and exit are accomplished by right turns. The driver's decision making task is simplified. Entrances are channelized by raised mountable splitter islands. The horizontal curvature (deflection) at each entrance slows vehicles upon approach. Entering traffic must yield to circulating traffic.The central island often provides an excellent "stage" for landscaping elements, public art, or other prominent features.

A modern roundabout alternative was examined to assess its ability to mitigate traffic impacts that would be generated by the proposed Marcy NanoCenter using Sidra Intersection software (Version 3.2). Sidra Intersection is a NYSDOT approved traffic analysis package and is capable of modeling uneven approach demands at multilane roundabouts courtesy of a "lane by lane" model.

Though roundabouts have become more common throughout the United States (U.S.), capacity analysis techniques reflective of North American driver behavior are still under development. As discussed in the National Cooperative Highway Research Project (NCHRP) Report 572 titled Roundabouts in the United States, the default values contained in many international capacity models, including Sidra Intersection which was originally developed in Australia, do not completely represent U.S. conditions. NCHRP Report 572 suggests that international models tend to over predict capacity for U.S. locations for a variety of reasons. To help address this concern, calibration parameters exist within Sidra Intersection to help improve the validity of its results for U.S. locations. Gap acceptance parameters including follow-up headway and critical gap as well as the environmental factor, negotiation speed, negotiation radius, and heavy vehicle length were adjusted for this study based upon information contained in NCHRP Report 572 and engineering judgment. Adjustments were also made to model the effect of unbalanced lane use due to the distribution of northbound traffic arriving from the NYS Route 49 ramps (eastbound and westbound) and the merge located just south of the intersection.

Based upon the Sidra Intersection results, a roundabout where the Edic Road Bypass, River Road, and NYS Route 49 Ramps intersect would require two circulating lanes. These lanes would be striped per current Manual of Uniform Traffic Control Devices and New York State Supplement (MUTCD) guidance to discourage traffic from

changing lanes within the circulatory roadway. The northbound and southbound approaches would each require two entering lanes. The left lane would be shared by left turns and through movements while the right lane would accommodate through movements and right turns. The eastbound approach would require an exclusive left turn lane and a lane shared by through movements and right turns. The westbound approach could mirror the eastbound approach upon completion of the Edic Road Bypass and the first chip fabrication facility in 2010. This would allow the proposed roundabout to initially fit within existing highway boundaries. It would however, require at least one temporary easement for grading purposes. An additional exclusive right turn lane would be required to accommodate full build out of the Marcy NanoCenter by 2020. Property acquisition would be required to accommodate the exclusive right turn lane. The original westbound through and right turn lane would be restriped to carry through movements at that time.

Sidra Intersection software provides reports of level of service and delay data for each movement, approach, and for the roundabout overall. As shown in Table 4, projected delays in 2020 (ETC) would be less than 20 seconds per vehicle on average. LOS C or better operation is projected for all movements. Overall the roundabout alternative is projected to operate at LOS B during each peak period.

Table 4
Roundabout Level of Service – Edic Road Bypass, River Road, and NYS Route 49 Ramps

Intersection	Approach		Full Build with Mitigation (2020)			
			AM		PM	
			LOS	Control Delay (sec/veh)	LOS	Control Delay (sec/veh)
Edic Road Bypass at River Road and the NYS Route 49 Ramps	Eastbound	L	B	15.0	B	16.9
		T	A	6.8	B	10.7
		R	A	12.5	B	16.5
		Approach	B	13.0	B	14.8
	Westbound	L	B	12.4	B	11.7
		T	B	12.0	B	12.9
		R	B	18.3	B	15.7
		Approach	B	15.1	B	14.0
	Northbound	L	B	10.6	B	10.9
		T	B	12.9	B	13.5
		R	B	19.9	C	20.4
		Approach	B	13.0	B	13.5
	Southbound	L	B	11.6	B	19.1
		T	A	7.4	B	14.9
		R	B	10.0	B	11.1
		Approach	A	9.1	B	14.5
	Overall		**B**	**11.9**	**B**	**14.2**

The segment of northbound approach between the proposed yield line and the point where the NYS Route 49 ramps converge was also closely examined under the roundabout scenario. The analysis results suggest that queues in this area would extend less than 80 feet from the yield line under average peak hour traffic conditions. Using the same NYSDOT guidance applied to the Synchro output, this approach should be designed to accommodate a minimum of 120 feet of vehicular storage. Using a conceptual roundabout design (Figure 7), approximately 360 feet would be provided between the yield line and the point where the NYS Route 49 ramps converge. This would allow up to 280 feet of space for vehicles to maneuver into the proper lane behind a queue.

During the highest volume period of the evening peak, queues could reach as far as 200 ft from the yield line. Under these conditions, a total of 160 feet would still remain for a vehicle to complete a lane change if required to reach its destination.

Up to 250 feet of queuing would be expected under average peak hour traffic conditions in the dominant lane on the southbound approach to the roundabout. Unbalanced queues would likely form as a result of the merge area located just downstream of the intersection.

In comparison, both the signalized and modern roundabout alternatives would provide adequate levels of service at the estimated time of completion of the Marcy NanoCenter in 2020. The modern roundabout option is projected to cause fewer peak hour delays. The signalized intersection and modern roundabout alternatives would each require three westbound approach lanes at full build out, however the modern roundabout option would require fewer auxiliary lanes on the northbound and southbound approaches. The modern roundabout alternative has the added benefit of eliminating right angle conflicts, thus improving safety. While both intersection alternatives require a wide apron in the southeast quadrant to accommodate turning tractor trailers, the potential for improper use of this area by passenger cars is of greater concern under the roundabout alternative. The signalized intersection alternative has fewer potential impacts to neighboring property. Both alternatives could potentially impact contaminated soils known to exist within the highway boundary and under the northbound approach to River Road. Though the development of cost estimates was beyond the scope of this study, it is reasonable to assume that the modern roundabout alternative would have a higher initial construction cost.

The Synchro and Sidra results suggest that the modern roundabout alternative would result in less queuing between the proposed intersection and the convergence of the NYS Route 49 ramps. Safety considerations related to traffic operations in this area must play a pivotal role in any decision to recommend one of the two standing alternatives. Maximizing the space between the expected back of queue and ramp convergence should result in a safer condition for the traveling public.

To fully examine projected operations in this area, the next step is to develop a VISSIM microsimulation model for each intersection alternative and to examine the resulting simulations. If the results verify that the modern roundabout alternative does indeed minimize queuing between the yield line and NYS Route 49 ramp convergence, it could be considered the preferred alternative from a traffic analysis perspective. Other factors such as the need to acquire property and construction cost will play a role in the final selection of a preferred alternative.

V. TECHNOLOGY DRIVE AND EDIC ROAD INTERSECTION CAPACITY ANALYSES

For treatment of the remaining two intersections proposed along the Edic Road Bypass, the Mohawk Valley EDGE has indicated a preference for modern roundabouts at Technology Drive and Edic Road. This is in keeping with a “green”, high-tech, and energy efficient theme. This intersection configuration also facilitates U-turn movements along the median divided corridor and provides an excellent opportunity for the development of a visual gateway for both the Marcy Technology Park and SUNY-IT campus.

The intersection of the Edic Road Bypass, Technology Drive, and Old Edic Road would require a four legged, multi-lane roundabout. The circulatory roadway would include two lanes. The lanes would be striped per current MUTCD guidance to discourage lane changing within the circulatory roadway. The northbound and southbound approaches on the Edic Road Bypass would each consist of two lanes. The left lane would accommodate left turns and through movements. The right lane would be shared by through movements and right turns. The Technology Drive and Old Edic Road approaches would each consist of an exclusive left turn lane and one lane shared by through movements and right turns.

28 East Main Street // 200 First Federal Plaza // Rochester, NY 14614-1909 // tel: 585.232.5135 www.bergmannpc.com

The Edic Road Bypass, Edic Road, and Marcy Technology Park Entrance would require a three-legged, multi-lane roundabout. The Edic Road Bypass approach would consist of two lanes. The left lane would accommodate U-turns and through movements. The right lane would be shared by through movements and right turns. The Marcy Technology Park approach would consist of one lane shared by left turns and through movements and a second lane exclusively for use by through traffic. The Edic Road approach would consist of a single lane serving both left and right turns.

The results of capacity analyses for proposed roundabouts at Technology Drive and Edic Road are summarized in Table 5. As shown, both roundabouts are projected to operate at LOS A overall during the AM and PM peak hours at full build out of the development in 2020. All movements would operate at LOS B or better. Based upon these results and a review of Sidra Intersection queuing data, it has been determined that modern roundabout configurations are both the feasible, and preferred treatments for the these intersections along the proposed Edic Road Bypass.

Table 5
Roundabout Level of Service – Edic Road Bypass at Technology Drive and Edic Road

Intersection	Approach		Full Build (2020) AM LOS	AM Control Delay (sec/veh)	PM LOS	PM Control Delay (sec/veh)
Edic Road Bypass at Technology Drive and Old Edic Road (Roundabout)	Eastbound	L	B	12.4	B	13.0
		T	A	8.4	A	9.2
		R	B	13.5	B	14.3
		Approach	B	13.1	B	13.8
	Westbound	L	B	12.9	B	12.5
		T	A	9.4	A	8.4
		R	B	14.4	A	13.5
		Approach	B	13.1	B	12.6
	Northbound	L	A	8.1	A	8.1
		T	A	4.0	A	4.0
		R	A	9.1	A	9.0
		Approach	A	4.8	A	4.8
	Southbound	L	A	8.6	A	8.9
		T	A	4.5	A	4.8
		R	A	9.5	A	9.8
		Approach	A	4.6	A	4.9
	Overall		**A**	**5.2**	**A**	**5.5**
Edic Road Bypass at Edic Road and the Marcy Technology Park Entrance (Roundabout)	Eastbound	L	A	8.9	A	8.8
		T	A	5.0	A	4.9
		Approach	A	5.8	A	5.6
	Westbound	U-Turn	B	10.7	B	10.9
		T	A	4.8	A	5.0
		R	B	10.1	A	10.3
		Approach	A	5.8	A	6.1
	Southbound	L	B	14.4	B	16.9
		R	B	15.8	B	18.3
		Approach	B	15.5	B	18.0
	Overall		**A**	**6.9**	**A**	**7.1**

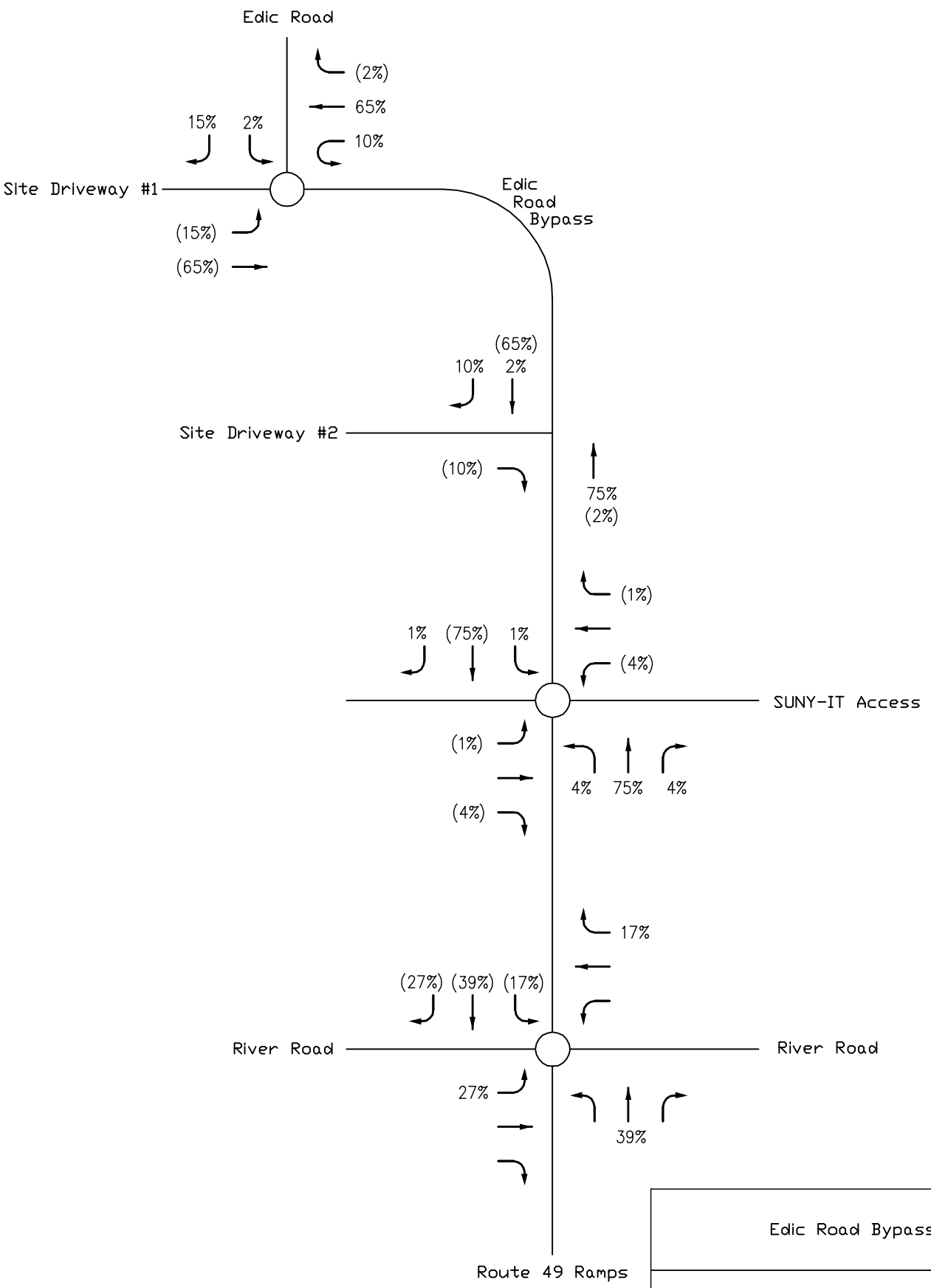
Personnel	Annual cost $/Yr Salary+Benefits	Annual cost $/Yr Salary+Benefits	Head Count	Total ($)/yr	Incentive	Total ($)/yr	Shift
Management (PtMgr, Mfg Mgr, Eng Mgr, 4ModMgr, EE, Product Eng, Yld,	166,980.00	166,980.00	33	$5,591,238	$1,500	$50,227	6am-7pm
Engineering	105,122.00	105,122.00	174	$18,240,578	$1,500	$260,277	6am-7pm
Technician (both facility, process equipment and process engineering)	76,574.00	76,574.00	410	$31,357,349	$1,500	$614,256	6am-7pm
Operators	52,293.00	52,293.00	1256	$65,687,063	$1,500	$1,884,202	5:30a/6:30a-5:30p/6:30p
Administration	40,507.04	40,507.04	128	$5,166,753	$1,500	$191,328	8-4:30p
			2000	$126,042,980		$1,500,145	
Total Personal Labot (direct + indirect)			2000	$126,030,793		$1,500,145	
						$124,530,648	
				$63,015			
			Avg Cost	$63,015			

Investment	2007	2008	2009	2010	2011	2012	2013
Phase	Site Prep	Construction	Construction	Ramp	Ramp	Ramp	100% Ramp
Headcount	0	500	667	1,333	2,000	2,001	2,002
Labor Cost (AVG)	$0	$31,507,698	$42,010,264	$84,020,529	$126,030,793	$126,093,808	$126,156,824
Qualified Wage Tax Credit ($1500 per employee)	$0	$0	$1,000,000	$2,000,000	$3,000,000	$3,001,500	$3,003,000
Cash Refund	$0	$0	$500,000	$1,000,000	$1,500,000	$1,500,750	$1,501,500
Carryforward Wage Tax Credit	$0	$0	$500,000	$1,000,000	$1,500,000	$1,500,750	$1,501,500
Total Labor with Applied WTC Refund	$0	$31,507,698	$41,510,264	$83,020,529	$124,530,793	$124,593,058	$124,655,324

NEW BUSINESS PERIOD

Traffic Analysis (Table 22 Reference Feb 2000 OBG Report). Trip Generation for road project

	inbound	outbound	peak	total	
Phase 1 - Single FAB + Construction					
FAB Staff (4 Shifts)	416	417	6-7 am	833	
Temporary Construction	1000	10	6-7 am	1010	Temporary; <8mo.
Office and Support Staff	234	46	7-8 am	281	
Buildout - Two FABs in Operation					
FAB Staff (4 Shifts)	833	833	6-7 am	1666	
Temporary Construction	100	8	6-7 am	108	Temporary; <8mo.
Office and Support Staff	422	74	7-8 am	496	
Phase 1 - Single FAB + Construction					
FAB Staff (4 Shifts)	417	463	6-7 pm	880	
Temporary Construction	10	1000	3-4 pm	1010	Temporary; <8mo.
Office and Support Staff	54	187	4-5 pm	241	
Buildout - Two FABs in Operation					
FAB Staff (4 Shifts)	833	917	6-7 pm	1750	
Temporary Construction	8	100	3-4 pm	108	Temporary; <8mo.
Office and Support Staff	97	337	4-5 pm	434	
Phase 1 - Single FAB + Construction					
FAB Staff (4 Shifts)	0	0	11:30pm- 12:30am	0	
Temporary Construction	10	10	11:30pm- 12:30am	20	Temporary; <8mo.
Office and Support Staff	46	54	11:30pm- 12:30am	100	
Buildout - Two FABs in Operation					
FAB Staff (4 Shifts)	0	0	11:30pm- 12:30am	0	
Temporary Construction	8	8	11:30pm- 12:30am	16	Temporary; <8mo.
Office and Support Staff	74	97	11:30pm- 12:30am	171	
Total trips (phase one) w/o temp construction	2001	2001			
Total trips (buildout) w/o temp construction	3924	3924			



LEGEND

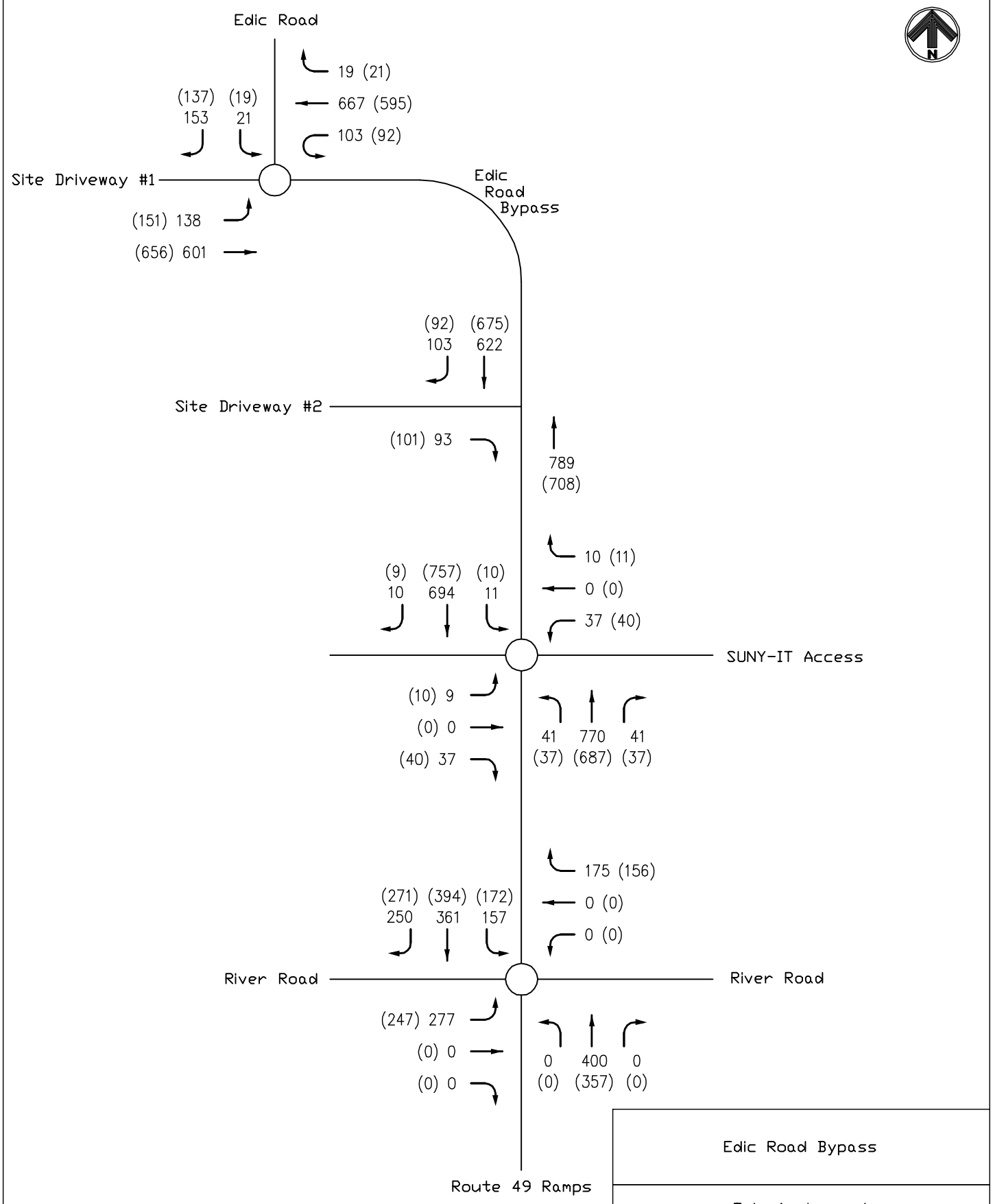
XXX – Entering
(XXX) – Exiting

○ – Proposed Roundabout

Edic Road Bypass

Trip Distribution (%)
Peak Hour Turning Movement Volumes

FIGURE NO.	SCALE	DATE	
1	No Scale	6/09	Bergmann associates



LEGEND

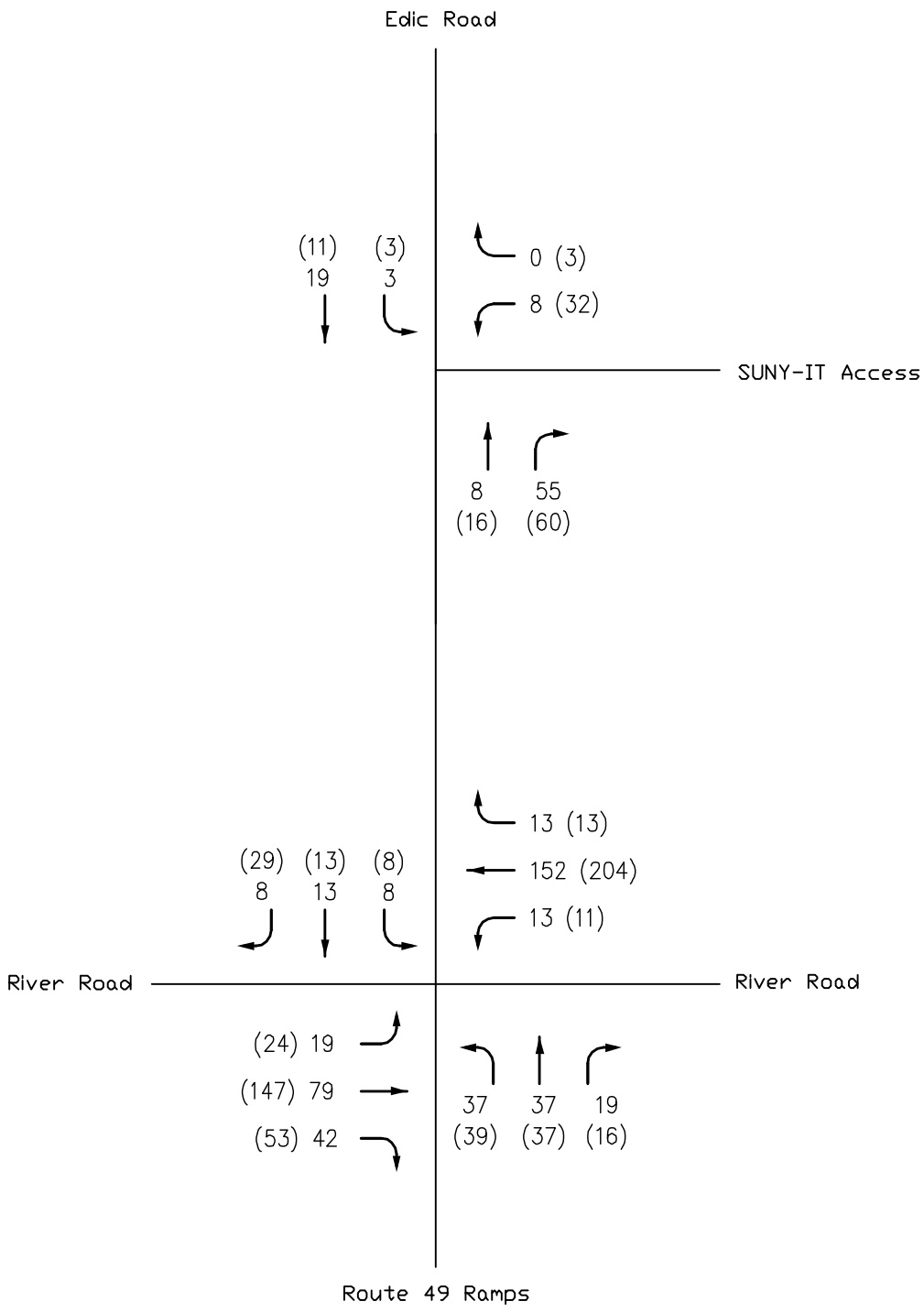
XXX – AM Weekday Peak Hour Traffic (6AM TO 7AM)
(XXX) – PM Weekday Peak Hour Traffic (6PM TO 7PM)

○ – Proposed Roundabout

Edic Road Bypass

Trip Assignment
Peak Hour Turning Movement Volumes

FIGURE NO.	SCALE	DATE	
2	No Scale	6/09	Bergmann associates



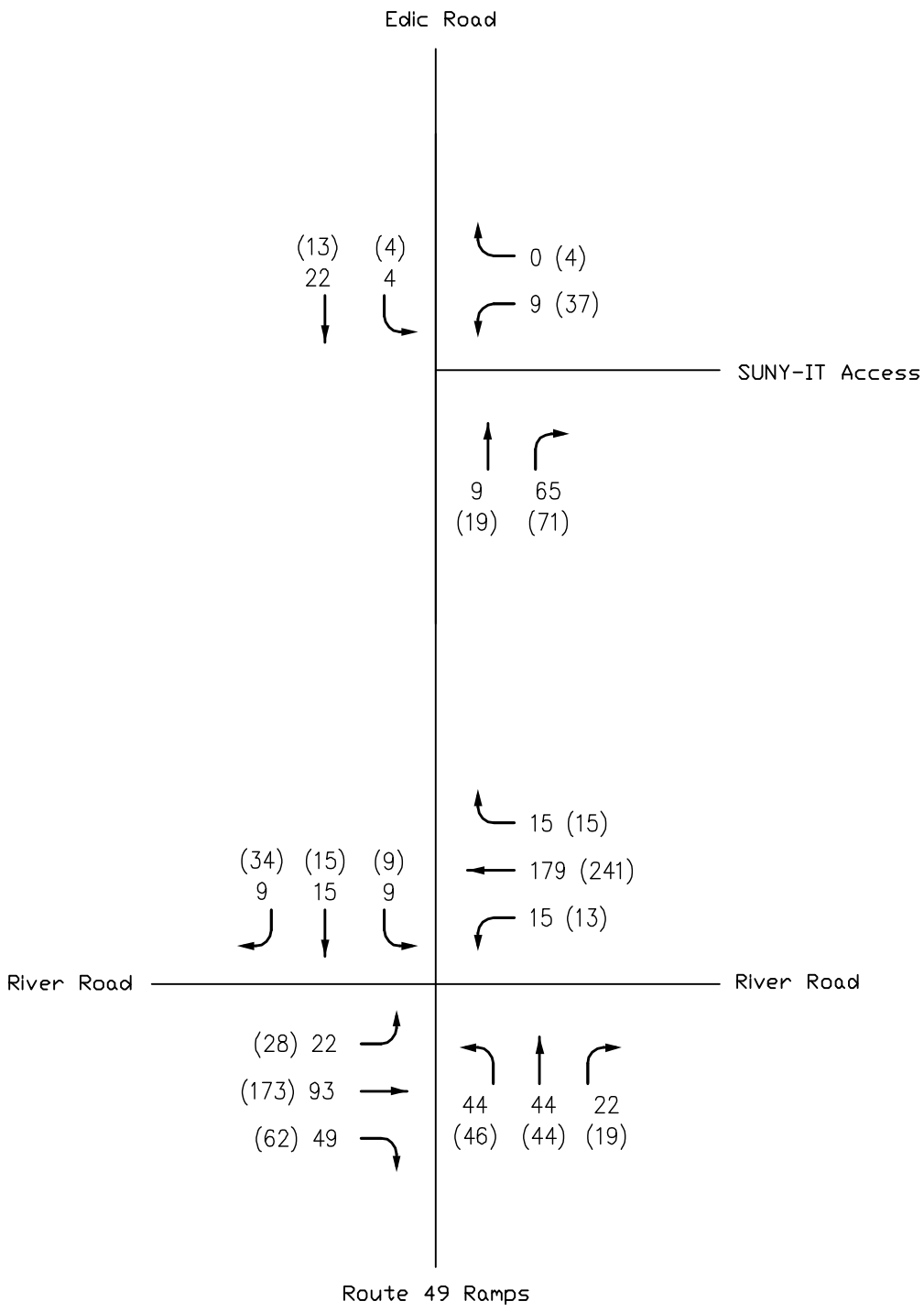
LEGEND

XXX – AM Weekday Peak Hour Traffic (6AM TO 7AM)
(XXX) – PM Weekday Peak Hour Traffic (6PM TO 7PM)

Edic Road Bypass

Existing (2009)
Peak Hour Turning Movement Volumes

FIGURE NO.	SCALE	DATE	
3	No Scale	6/09	Bergmann associates



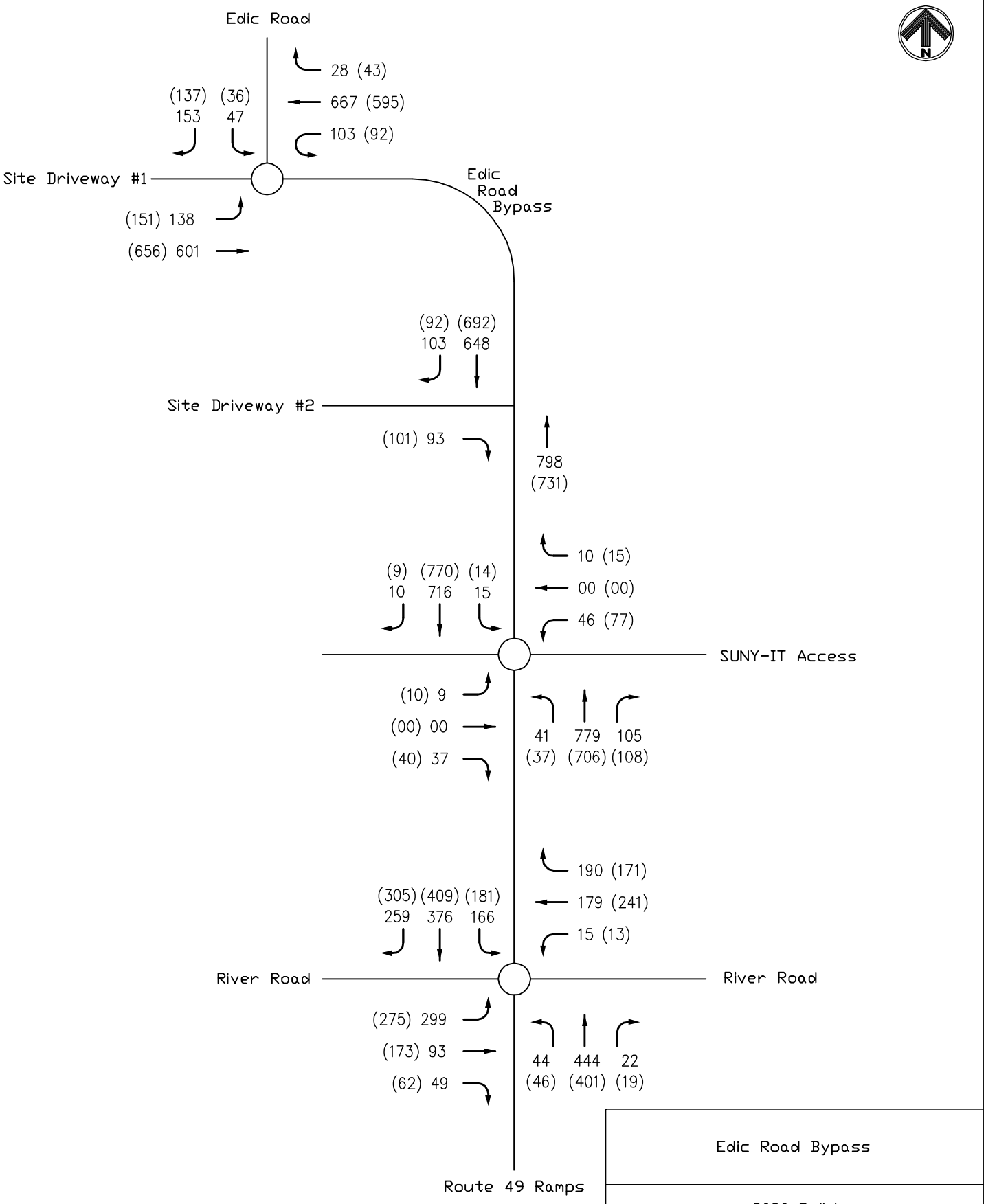
LEGEND

XXX – AM Weekday Peak Hour Traffic (6AM TO 7AM)
(XXX) – PM Weekday Peak Hour Traffic (6PM TO 7PM)

Edic Road Bypass

2020 No Build
Peak Hour Turning Movement Volumes

FIGURE NO.	SCALE	DATE	
4	No Scale	6/09	Bergmann associates



LEGEND

XXX – AM Weekday Peak Hour Traffic (6AM TO 7AM)
(XXX) – PM Weekday Peak Hour Traffic (6PM TO 7PM)

○ – Proposed Roundabout

Edic Road Bypass

2020 Build
Peak Hour Turning Movement Volumes

FIGURE NO.	SCALE	DATE	
5	No Scale	6/09	Bergmann associates

HIGHWAY BOUNDARY

HIGHWAY BOUNDARY

HIGHWAY BOUNDARY

6 ft CHAIN LINK FENCE

JEFFREY THIBAULT
KATIE THIBAULT
TAX ID 293.00-1-46.4

NOW OR FORMERLY
ALFONSO CAVO
TAX ID 306.00-2-18

"NASH" REBAR

GOLDEN SUN REALTY CORP.
TAX ID 306.00-2-15

SCALE: 1" = 50'

SCALE

SHADOWS

PARKING

CAVO ROAD

NYS ROUTE 49

FLUSH MEDIAN

NYS ROUTE 49

MOHAWK, ADIRONDACK & NORTHERN RAILROAD CORPORATION (LESSEE) L.2844 P.321

MOHAWK, ADIRONDACK & NORTHERN RAILROAD CORPORATION (LESSEE) L.2844 P.321

ONEIDA COUNTY INDUSTRIAL DEVELOPMENT AGENCY (REPUTED OWNER)

TANK

OPEN STORAGE

SUNCO INC
TAX ID 306.00-2-14

SUNCO INC
TAX ID 306.00-2-14

MOHAWK VALLEY OIL, INC.
(REPUTED OWNER)

CONC

PATIO

GRIDLEY CREEK

HIGHWAY BOUNDARY

HIGHWAY BOUNDARY

HIGHWAY BOUNDARY

6 ft CHAIN LINK FENCE

JEFFREY THIBAULT
KATIE THIBAULT
TAX ID 293.00-1-46.4

NOW OR FORMERLY
ALFONSO CAVO
TAX ID 306.00-2-18

"NASH" REBAR

GOLDEN SUN REALTY CORP.
TAX ID 306.00-2-15

SCALE: 1" = 50'

SCALE

SHADOWS

PARKING

CMO Rd 10

SHADOWS

PARKING

SHADOWS

TE

TE

EXIT 6 ROAD

NYS ROUTE 49

NYS ROUTE 49

FLUSH MEDIAN

NYS ROUTE 49

FLUSH MEDIAN

NYS ROUTE 49

SIGN

SIGN

SHADOWS

SHADOWS

SHADOWS

6 ft CHAIN LINK FENCE

PARKING

SUNCO INC
TAX ID 306.00-2-14

PARKING

PATIO

SUNCO INC
TAX ID 306.00-2-14

PARKING

MOHAWK VALLEY OIL, INC.
(REPUTED OWNER)

CONC

GRIDLEY CREEK

MOHAWK, ADIRONDACK & NORTHERN RAILROAD CORPORATION
(LESSEE)
L.2644 P.321

MOHAWK, ADIRONDACK & NORTHERN RAILROAD CORPORATION
(LESSEE)
L.2644 P.321

ONEIDA COUNTY INDUSTRIAL DEVELOPMENT AGENCY
(REPUTED OWNER)

6 ft CHAIN LINK FENCE

OPEN STORAGE

TANK

TANK

TANK

TANK

TANK

FINAL

TRAFFIC IMPACT STUDY

for

Proposed Development of the Farmer Property
Marcy, New York

Prepared for

Mohawk Valley Economic Development Growth Enterprises Corporation (EDGE)

By

LOCHNER

181 Genesee Street, Suite 300
Utica, NY 13501

January 29, 2013

TABLE OF CONTENTS

TABLES

APPENDICES

Purpose of the Study

The purpose of the study is to identify traffic impacts along Edic Road associated with the development of a 50-acre parcel known as the Farmer property and whether needed roadway improvements are required.

Improvements to the southern portion of Edic Road were recently completed and will accommodate the anticipated traffic generated by the Nanocenter and provide excess capacity. Therefore, this study focuses on the northerly section of Edic Road from the northerly Nanocenter site driveway to Glass Factory Road.

Project Description

The proposed project is the development of the 50-acre parcel into a manufacturing facility which would be associated with the adjacent proposed Nanocenter. The development is assumed to include a 500,000 SF manufacturing facility and 50,000 SF of associated office space. Access into and out of the Farmer property would be via a new access road along the northern boundary of the Nanocenter site. This new access road will be integrated with a portion of the proposed Nanocenter Ring Road/North Drive. There will be no direct connection to Hazard Road. Figure 1 (Appendix A) depicts the location of this parcel in relationship to the Nanocenter site.

Previous Studies

The traffic impacts associated with the proposed Nanocenter were previously studied and summarized in a final report entitled "Traffic Impact Study for Proposed Marcy Nanocenter, Marcy, New York, April 2007." Traffic generated by the proposed Nanocenter and its distribution patterns were obtained from the April 2007 report and utilized in this study. Recommendations from that study were incorporated into the recently constructed improvements along Edic Road from River Road to the location of the future Middle Drive to the Nanocenter site.

Existing Traffic

Existing traffic data were obtained in early December 2012 while SUNYIT was still in session. Since Edic Road improvements have already been made to the south of the site, the updated traffic counts were taken at the three Edic Road intersections to the north of the proposed site (Hazard Road, Mulaney Road, and Glass Factory Road). Existing morning (AM) and afternoon (PM) peak hour volumes are shown in Figure 2. The December 2012 traffic data shows that there has been little to no change in existing traffic volumes since 2006.

Trip Generation

For this study, trip generation information for the full build out of the Nanocenter was obtained from the April 2007 report. Figures 3 and 4 depict the AM and PM Nanocenter trip generation and its distribution along Edic Road.

For this study, it is assumed that the Farmer property will be developed and it will include 500,000 SF of manufacturing space and 50,000 SF of office space. Table 1 summarizes the trips expected to be generated by the development of the Farmer property.

TABLE 1
Farmer Property Trip Generation

	Office		Manufacturing		TOTAL	
Time Period	**Enter**	**Exit**	**Enter**	**Exit**	**Enter**	**Exit**
Daily	202	202	964	964	1,166	1,166
AM	65	5	380	30	445	35
PM	10	75	200	175	210	250

Appendix B summarizes the trip generation calculations. For study purposes, it was assumed that the AM and PM peak periods of trip generation for the Nanocenter and the Farmer property development would occur at the same time.

Distribution of Farmer Property Traffic

The April 2007 report documented the distribution of traffic generated by the Nanocenter development. That report documented the projected traffic would have origins or destinations in relation to the site as follows:

North: 15%
South: 39%
East: 17%
West: 27%

Those same distribution patterns have been used for this study. All traffic generated by the Farmer property development was assigned to the northerly entrance drive to the Nanocenter. Figure 5 depicts the distribution of the Farmer property traffic north along Edic Road.

Future Traffic Volumes

Future traffic volumes are based on existing volumes and traffic generated by both the Nanocenter and Farmer property developments. Because of the very low existing volumes along Edic Road and no reportable increase in volumes between 2006 and 2012, background growth was assumed to be minimal along Edic Road. Figure 6 depicts the future traffic volumes along Edic Road from the northerly drive to Glass Factory Road.

Existing and Future Levels of Service

Levels of service analyses were performed for each intersection along Edic Road from the northerly Nanocenter driveway to Glass Factory Road to determine both existing and future levels of service. Future levels of service have been determined for conditions which reflect just the Nanocenter and which reflect the combined impact of the Nanocenter and Farmer property generated traffic volumes.

The levels of service for the future condition with only the Nanocenter generated traffic were obtained from the April 2007 report. The 2007 report recommended the following improvements be made as part of the Nanocenter development:

North Drive / Edic Road

- Install traffic signal
- Provide dual NB Edic Road left turn lane
- Provide separate right turn and left turn lanes on driveway
- Reconstruct Edic Road between the middle and north driveways

Edic Road / Hazard Road
Edic Road / Mulaney Road

- No improvement recommended

The analysis for the Farmer Property Development reflected the above-noted improvements as recommended in the 2007 study. The analysis also assumed no additional improvements would be required at the Edic Road / Glass Factory Road intersection. The results for the levels of service for the Farmer Property Development were in addition to the traffic generated by full build out of the Nanocenter Facility. The results are shown in Table 2.

TABLE 2
Level of Service Summary Table

Intersection/Movement	Control Type	Existing		with Nanocenter Development Only[1]		Combined Nanocenter and Farmer Property Developments	
		AM	PM	AM	PM	AM	PM
Edic Road / North Drive	Signal	N/A	N/A	B(12.9)[2]	B(12.7)	B(16.1)	B(15.1)
Edic Road / Hazard Road	Stop						
NB Edic Road LT		A(7.2)	A(7.3)	A(7.6)	A(7.6)	A(7.6)	A (7.7)
EB Hazard Road		A(8.5)	A(8.7)	A-B(9.8)	A-B(9.5)	A-B(9.6)	A-B(9.8)
Edic Road / Mulaney Road	Stop						
SB Edic Road LT		A(7.2)	A(7.4)	A(7.5)	A(7.6)	A(7.5)	A (7.7)
WB Mulaney Road		A(8.5)	A(8.6)	A-B(9.8)	A-B(10.1)	A-B(10.0)	A-B(10.0)
Edic Road/Glass Factory Road	Stop						
NB Edic Road		A(9.3)	A-B(9.7)	[3]	[3]	A-B(9.7)	A-B(10.2)
WB Glass Factory Road LT		A(7.5)	A(7.5)	[3]	[3]	A(7.6)	A(7.5)

[1] Source: Traffic Impact Study for Proposed Marcy Nanocenter, April 2007.
[2] Delay in seconds.
[3] Not included in previous study.

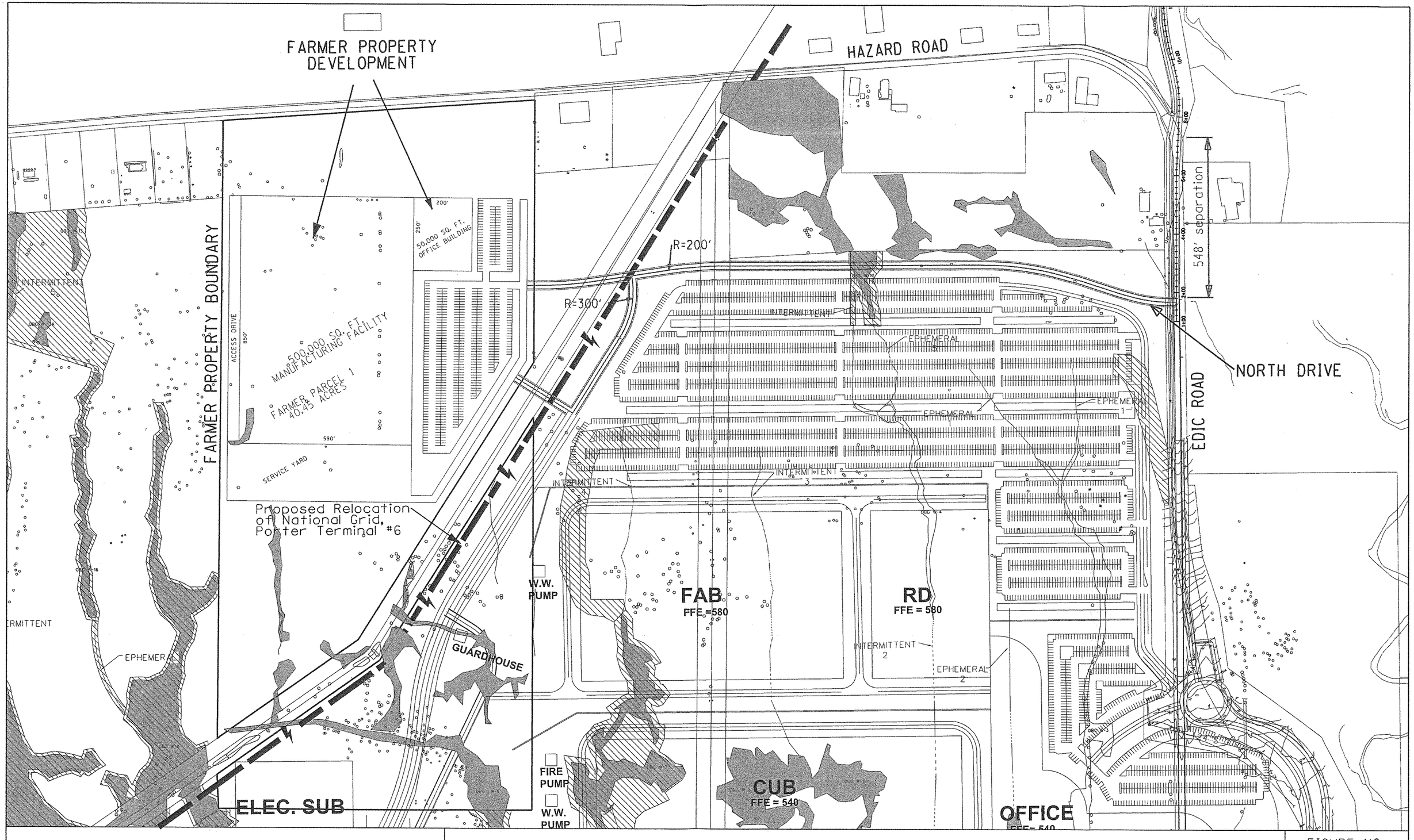
As shown in Table 2, all intersections will operate at high levels of service (B or better) under the future conditions. The increase in expected delay caused by the addition of the Farmer property generated traffic will be minimal (maximum of 3.2 seconds).

Conclusions / Recommendations

As shown by this study no additional improvements, beyond those recommended in the 2007 report, to accommodate traffic generated by the proposed Nanocenter will be required as a result of the development of the Farmer property.

APPENDIX A

FIGURES



LOCHNER

181 GENESEE STREET UTICA, NEW YORK 13501
TEL 315.793.9500 FAX 315.793.9530

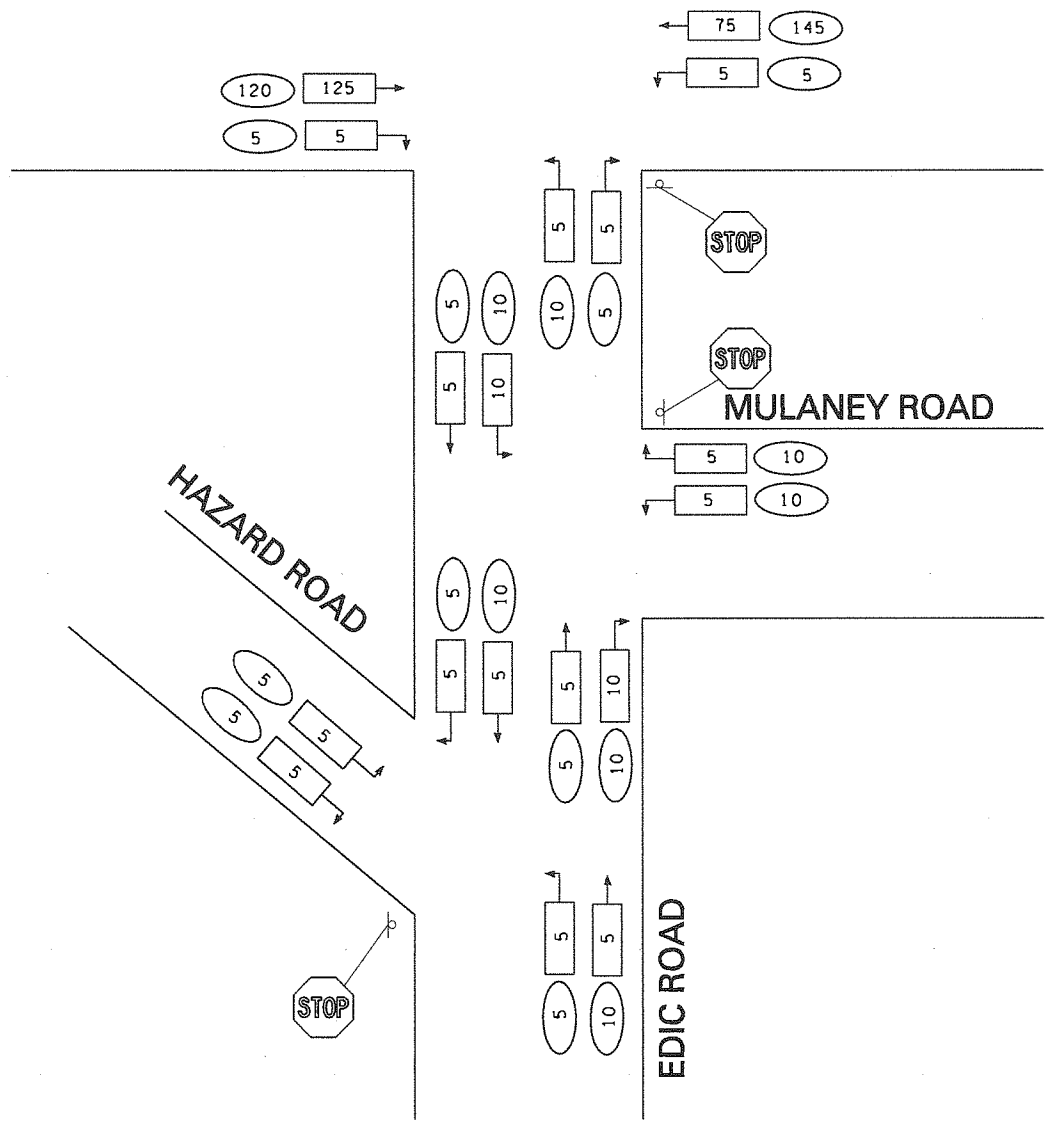
PROJECT LOCATION MAP

DATE: FEBRUARY 2013

PROJECT NO. 8305

FIGURE NO.

1



LEGEND

XXX	AM PEAK HOUR
XXX	PM PEAK HOUR

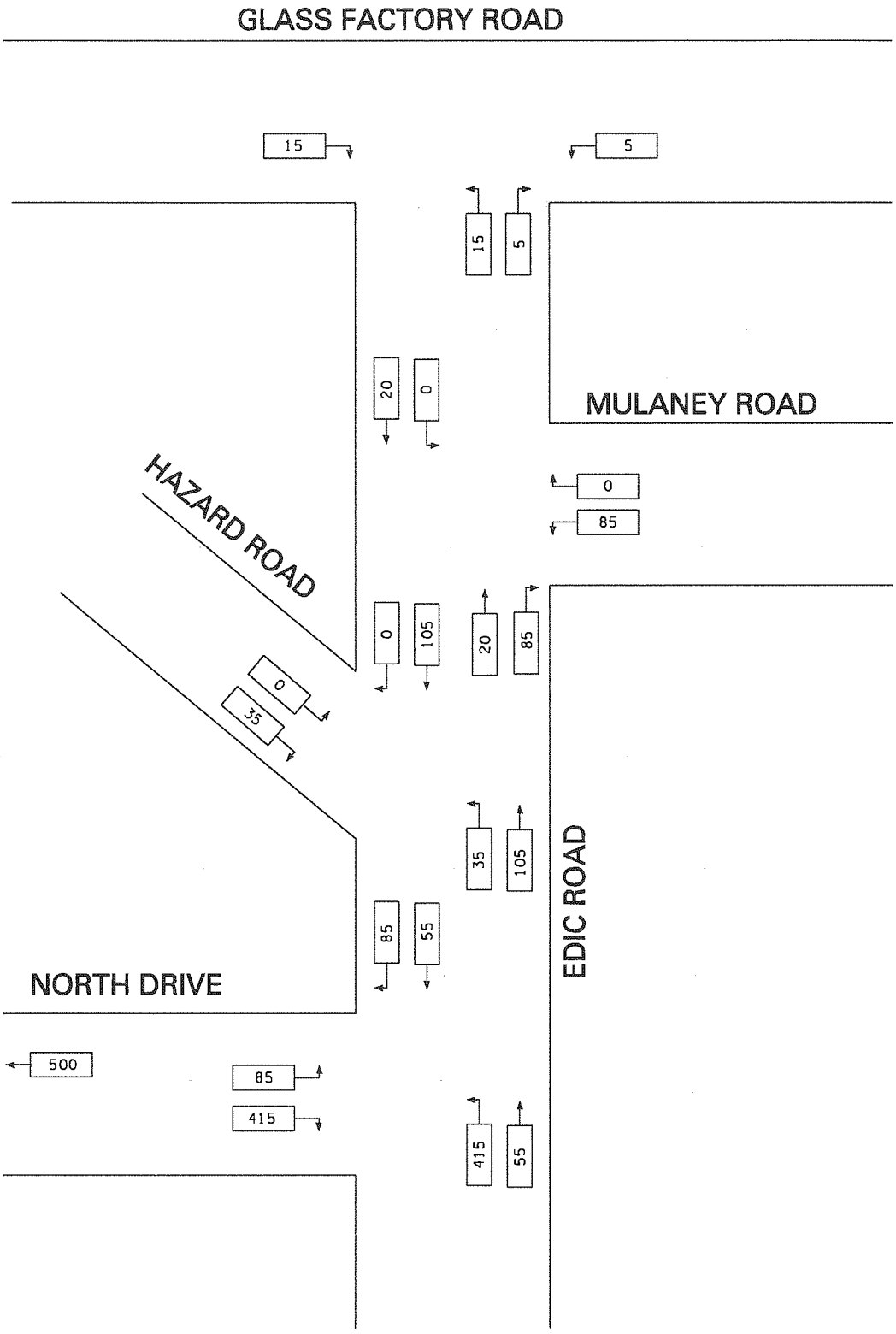
LOCHNER
181 GENESEE STREET UTICA, NEW YORK 13501
TEL 315.793.9500 FAX 315.793.9530

EXISTING
TRAFFIC VOLUMES

DATE: DECEMBER 2012

PROJECT NO. 8305

FIGURE NO.
2



SOURCE:
APRIL 2007 TRAFFIC IMPACT STUDY FOR PROPOSED NANOCENTER.

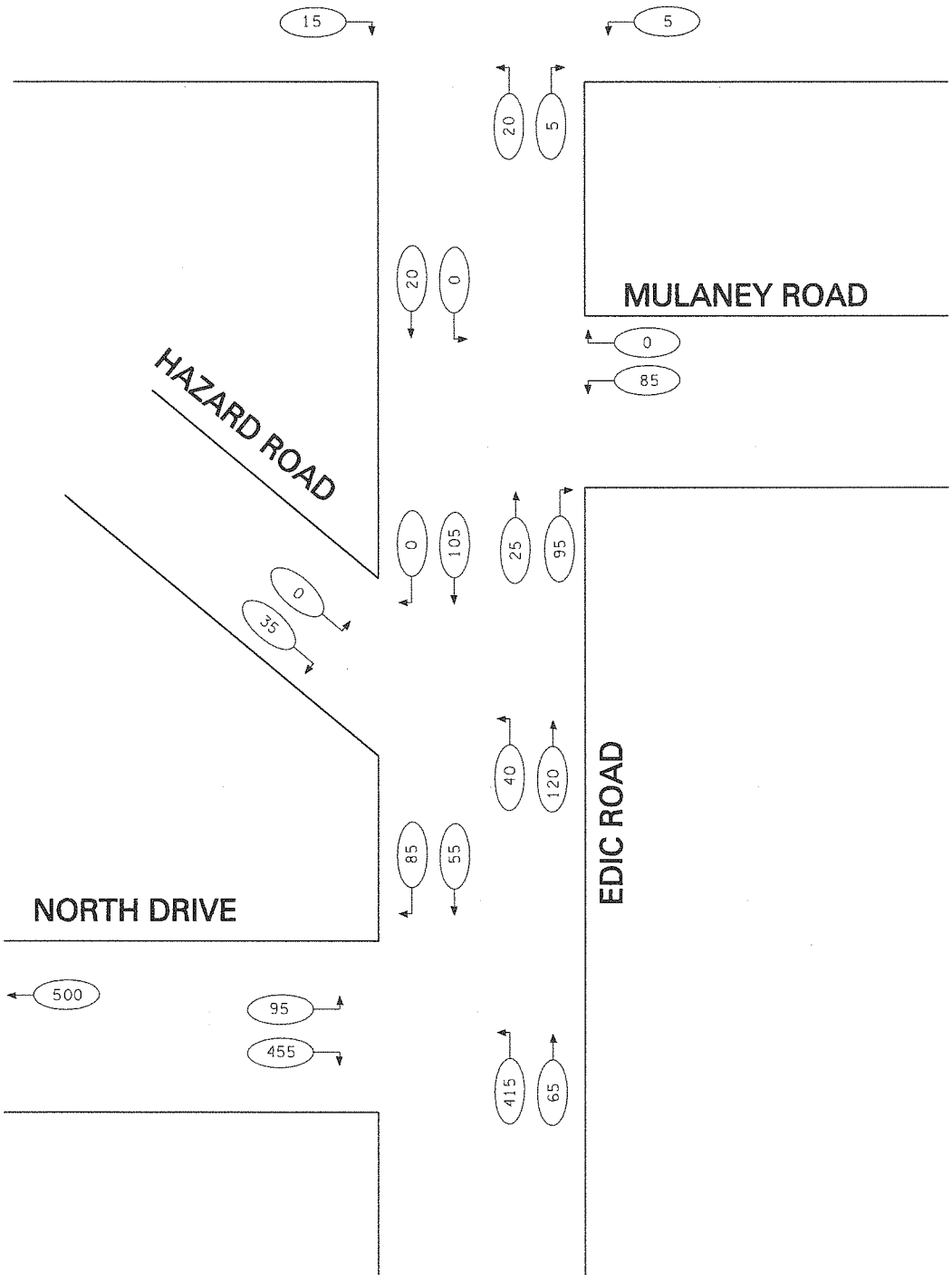
LOCHNER
181 GENESEE STREET UTICA, NEW YORK 13501
TEL 315.793.9500 FAX 315.793.9530

DISTRIBUTION OF NANOCENTER
SITE TRAFFIC
PHASE 2 (AM)

FIGURE NO.
3

DATE: DECEMBER 2012

PROJECT NO. 8305



SOURCE:
APRIL 2007 TRAFFIC IMPACT STUDY FOR PROPOSED NANOCENTER.

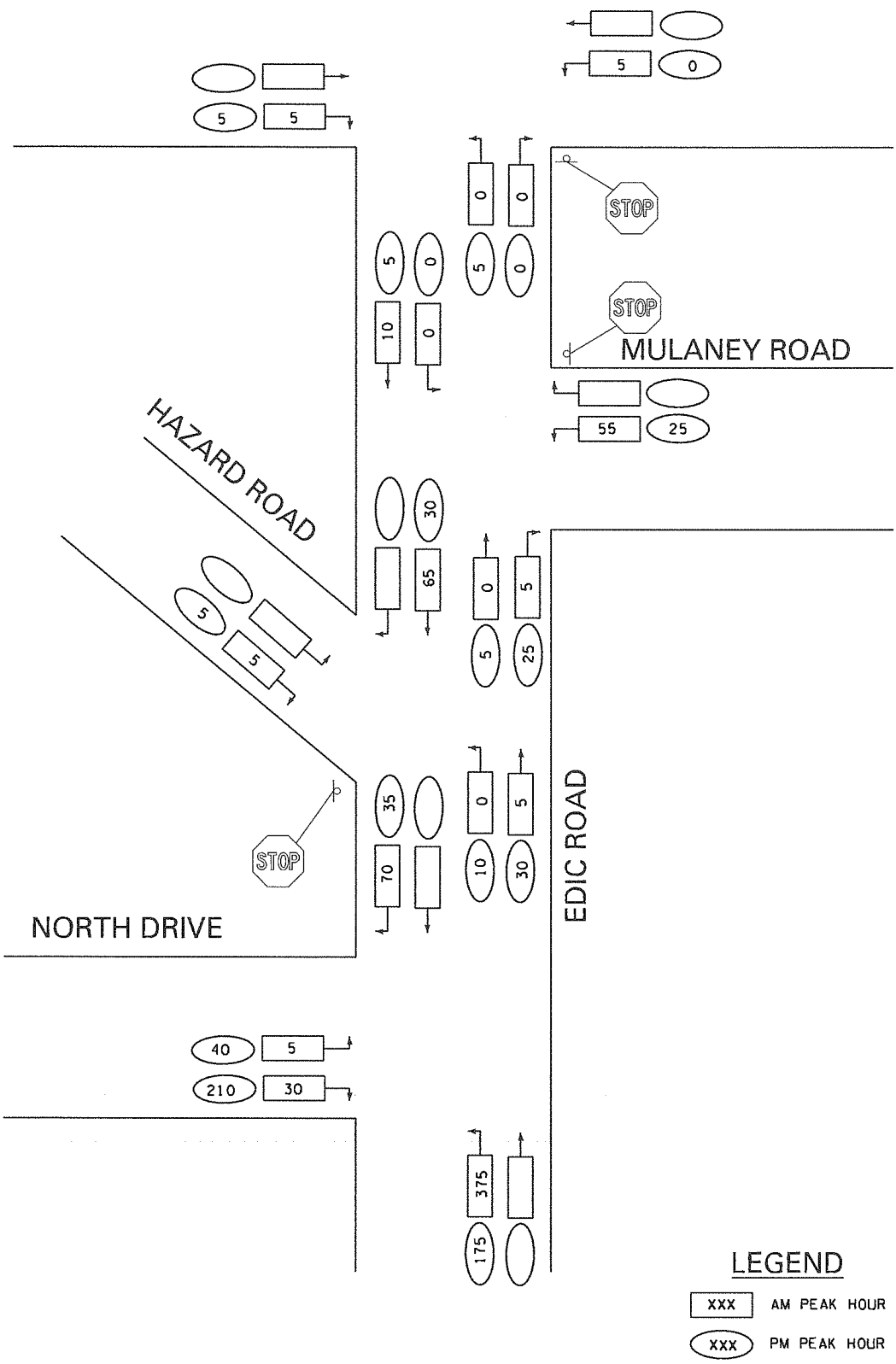
LOCHNER
181 GENESEE STREET UTICA, NEW YORK 13501
TEL 315.793.9500 FAX 315.793.9530

DISTRIBUTION OF NANOCENTER
SITE TRAFFIC
PHASE 2 (PM)

FIGURE NO.
4

DATE: DECEMBER 2012

PROJECT NO. 8305

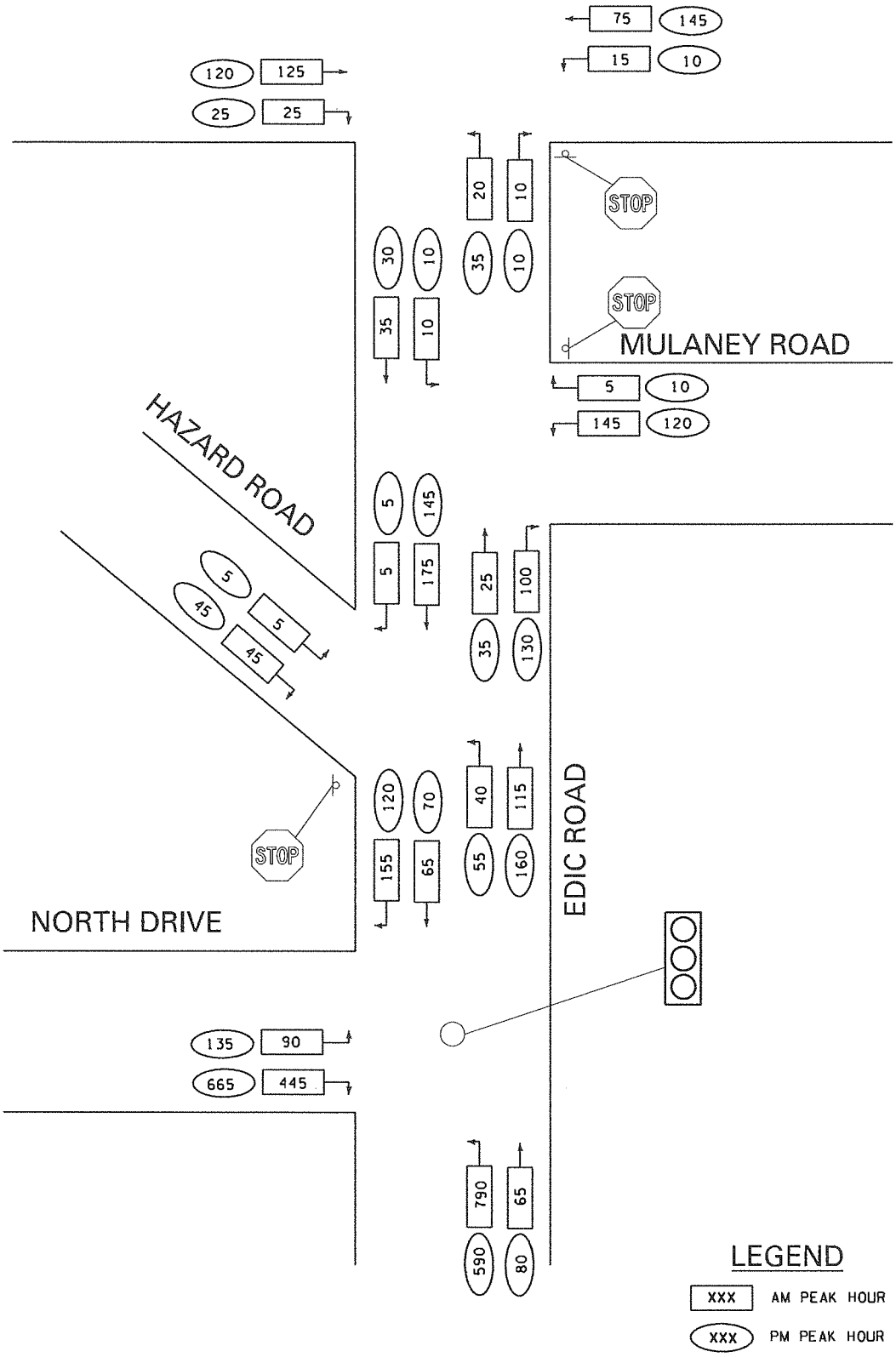


LOCHNER
181 GENESEE STREET UTICA, NEW YORK 13501
TEL 315.793.9500 FAX 315.793.9530

DISTRIBUTION OF FARMER PROPERTY GENERATED TRAFFIC VOLUMES

DATE: DECEMBER 2012 PROJECT NO. 8305

FIGURE NO.
5



LOCHNER
181 GENESEE STREET UTICA, NEW YORK 13501
TEL 315.793.9500 FAX 315.793.9530

FUTURE
TRAFFIC VOLUMES

DATE: DECEMBER 2012

PROJECT NO. 8305

FIGURE NO.

6

APPENDIX B

TRIP GENERATION CALCULATIONS

LOCHNER
181 Genesee Street, Suite 300
Utica, NY 13501-2104
P: 315-793-9500 F: 315-793-9530

Project: Farmer TIS
Subject: Trip Generation
Calc. By: BDH Date: 1-2-13
Checked By: Date:

Sheet of
Job No. 8305

Reference

TRIP GENERATION

(2) MANUFACTURING FACILITY - LAND USE #140

AREA = 450,000 sf

A. WEEK DAY $T = 3.883(500) - 13.112 = 1928$ Trips

B. AM $T = 0.850(x) - 21.617$

$= 0.850(500) - 21.617$

$= 404$ trips

93% Enter = 376 trips
7% Exit = 28 trips
say 380 enter
30 exit

C. PM $T = 0.748(x) + 0.100$

$= 0.748(500) + 0.100$

$= 374$ trips

53% Enter = 198 trips
47% Exit = 176 trips

Say 200 enter
175 exit

LOCHNER
181 Genesee Street, Suite 300
Utica, NY 13501-2104
P: 315-793-9500 F: 315-793-9530

Project: FARMER TIS
Subject: TRIP GENERATION
Calc. By: BAM Date: 1-2-13
Checked By: Date:

Sheet of
Job No. 8305

Reference

TRIP GENERATION

(1) OFFICE BLDG - LAND USE # 714

AREA = 50,000 sf

A. WEEKDAY: $Ln(T) = 0.874 Ln(50) + 2.584$
$= 0.874(3.912) + 2.584$
$= 6.0013$
Trips = 404 / day

B. AM $T = [(0.741/x) - .00003]^{-1}$
$= [(0.741/50) - .00003]^{-1}$
$= [0.0148 - .00003]^{-1}$
$= [.0148]^{-1}$
= 68 trips

93% Enter = 63 trips
7% Exit = 5 trips

C. PM $T = Ln(T) = 0.861 Ln x + 1.085$
$= 0.861 Ln(50) + 1.085$
$Ln(T) = 4.4533$
$T = 86$ Trips

11% Enter = 9 trips
89% Exit = 77 trips

LOCHNER
181 Genesee Street, Suite 300
Utica, NY 13501-2104
P: 315-793-9500 F: 315-793-9530

Project: FARMER TIS
Subject: TRIP GENERATION
Calc. By: BAM Date: 12-2-13
Checked By: Date:

Sheet ____ of ____
Job No. 8305

Reference

TOTALS

	OFFICE		MANUFACTURING		TOTAL	
	ENTER	EXIT	ENTER	EXIT	ENTER	EXIT
DAILY	202	202	867	867	1069	1069
AM	63	5	335	25	398	30
PM	9	77	178	159	187	236

APPENDIX C

LEVEL OF SERVICE ANALYSES

TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	AWK
Agency/Co.	HW Lochner
Date Performed	1/3/2013
Analysis Time Period	AM

Site Information

Intersection	Edic Rd and Glass Factory Rd
Jurisdiction	Marcy, NY
Analysis Year	2013

Project Description 8305

East/West Street: Glass Factory Road | North/South Street: Edic Road

Intersection Orientation: East-West | Study Period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	0	125	5	5	75	0
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR	0	125	5	5	75	0
Percent Heavy Vehicles	0	--	--	3	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration			TR	LT		
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	5	0	5	0	0	0
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR	5	0	5	0	0	0
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	0	0	0	0	0
Configuration		LR				

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		LT		LR				
v (vph)		5		10				
C (m) (vph)		1449		845				
v/c		0.00		0.01				
95% queue length		0.01		0.04				
Control Delay		7.5		9.3				
LOS		A		A				
Approach Delay	--	--	9.3					
Approach LOS	--	--	A					

TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*AWK*
Agency/Co.	*HW Lochner*
Date Performed	*1/3/2013*
Analysis Time Period	*AM*

Site Information

Intersection	*Edic Rd and Glass Factory Rd*
Jurisdiction	*Marcy, NY*
Analysis Year	*2013 - FUTURE*

Project Description *8305*

East/West Street: *Glass Factory Road* | North/South Street: *Edic Road*

Intersection Orientation: *East-West* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*0*	*125*	*25*	*15*	*75*	*0*
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR	*0*	*125*	*25*	*15*	*75*	*0*
Percent Heavy Vehicles	*0*	--	--	*3*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration			*TR*	*LT*		
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*20*	*0*	*10*	*0*	*0*	*0*
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR	*20*	*0*	*10*	*0*	*0*	*0*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration		*LR*				

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*LT*		*LR*				
v (vph)		*15*		*30*				
C (m) (vph)		*1425*		*792*				
v/c		*0.01*		*0.04*				
95% queue length		*0.03*		*0.12*				
Control Delay		*7.6*		*9.7*				
LOS		*A*		*A*				
Approach Delay	--	--	*9.7*					
Approach LOS	--	--	*A*					

TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*AWK*
Agency/Co.	*HW Lochner*
Date Performed	*1/3/2013*
Analysis Time Period	*PM*

Site Information

Intersection	*Edic Rd and Glass Factory Rd*
Jurisdiction	*Marcy, NY*
Analysis Year	*2013*

Project Description *8305*

East/West Street: *Glass Factory Road* | North/South Street: *Edic Road*

Intersection Orientation: *East-West* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*0*	*120*	*5*	*5*	*145*	*0*
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR	*0*	*120*	*5*	*5*	*145*	*0*
Percent Heavy Vehicles	*0*	--	--	*4*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration			*TR*	*LT*		
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*10*	*0*	*5*	*0*	*0*	*0*
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR	*10*	*0*	*5*	*0*	*0*	*0*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration		*LR*				

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*LT*		*LR*				
v (vph)		*5*		*15*				
C (m) (vph)		*1449*		*776*				
v/c		*0.00*		*0.02*				
95% queue length		*0.01*		*0.06*				
Control Delay		*7.5*		*9.7*				
LOS		*A*		*A*				
Approach Delay	--	--	*9.7*					
Approach LOS	--	--	*A*					

TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*AWK*
Agency/Co.	*HW Lochner*
Date Performed	*1/3/2013*
Analysis Time Period	*PM*

Site Information

Intersection	*Edic Rd and Glass Factory Rd*
Jurisdiction	*Marcy, NY*
Analysis Year	*2013 - FUTURE*

Project Description *8305*

East/West Street: *Glass Factory Road* | North/South Street: *Edic Road*

Intersection Orientation: *East-West* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*0*	*120*	*25*	*10*	*145*	*0*
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR	*0*	*120*	*25*	*10*	*145*	*0*
Percent Heavy Vehicles	*0*	--	--	*4*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration			*TR*	*LT*		
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*35*	*0*	*10*	*0*	*0*	*0*
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR	*35*	*0*	*10*	*0*	*0*	*0*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration		*LR*				

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*LT*		*LR*				
v (vph)		*10*		*45*				
C (m) (vph)		*1425*		*734*				
v/c		*0.01*		*0.06*				
95% queue length		*0.02*		*0.20*				
Control Delay		*7.5*		*10.2*				
LOS		*A*		*B*				
Approach Delay	--	--	*10.2*					
Approach LOS	--	--	*B*					

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*AWK*	Intersection	*Edic Rd and Hazard Rd*
Agency/Co.	*HW Lochner*	Jurisdiction	*Marcy, NY*
Date Performed	*1/3/2013*	Analysis Year	*2013*
Analysis Time Period	*AM*		
Project Description	*8305*		
East/West Street:		North/South Street:	*Edic Road*
Intersection Orientation:	*North-South*	Study Period (hrs):	*0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*5*	*5*	*0*	*0*	*5*	*5*
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR	*5*	*5*	*0*	*0*	*5*	*5*
Percent Heavy Vehicles	*0*	--	--	*12*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LT*					*TR*
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*0*	*0*	*0*	*5*	*0*	*5*
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR	*0*	*0*	*0*	*5*	*0*	*5*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration					*LR*	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*						*LR*	
v (vph)	*5*						*10*	
C (m) (vph)	*1623*						*1036*	
v/c	*0.00*						*0.01*	
95% queue length	*0.01*						*0.03*	
Control Delay	*7.2*						*8.5*	
LOS	*A*						*A*	
Approach Delay	--	--					*8.5*	
Approach LOS	--	--					*A*	

>

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*AWK*	Intersection	*Edic Rd and Hazard Rd*
Agency/Co.	*HW Lochner*	Jurisdiction	*Marcy, NY*
Date Performed	*1/29/2013*	Analysis Year	*Future*
Analysis Time Period	*AM*		
Project Description	*8305*		
East/West Street:	*Hazard Road*	North/South Street:	*Edic Road*
Intersection Orientation:	*North-South*	Study Period (hrs):	*0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*40*	*115*	*0*	*0*	*175*	*5*
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR	*40*	*115*	*0*	*0*	*175*	*5*
Percent Heavy Vehicles	*0*	--	--	*12*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LT*					*TR*
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*0*	*0*	*0*	*5*	*0*	*45*
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR	*0*	*0*	*0*	*5*	*0*	*45*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration					*LR*	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*						*LR*	
v (vph)	*40*						*50*	
C (m) (vph)	*1408*						*835*	
v/c	*0.03*						*0.06*	
95% queue length	*0.09*						*0.19*	
Control Delay	*7.6*						*9.6*	
LOS	*A*						*A*	
Approach Delay	--	--				*9.6*		
Approach LOS	--	--				*A*		

>

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*AWK*	Intersection	*Edic Rd and Hazard Rd*
Agency/Co.	*HW Lochner*	Jurisdiction	*Marcy, NY*
Date Performed	*1/3/2013*	Analysis Year	*2013*
Analysis Time Period	*PM*		
Project Description	*8305*		
East/West Street:	*Hazard Road*	North/South Street:	*Edic Road*
Intersection Orientation:	*North-South*	Study Period (hrs):	*0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*5*	*10*	*0*	*0*	*10*	*5*
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR	*5*	*10*	*0*	*0*	*10*	*5*
Percent Heavy Vehicles	*10*	--	--	*12*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LT*					*TR*
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*0*	*0*	*0*	*5*	*0*	*5*
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR	*0*	*0*	*0*	*5*	*0*	*5*
Percent Heavy Vehicles	*0*	*0*	*0*	*20*	*0*	*20*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration					*LR*	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*						*LR*	
v (vph)	*5*						*10*	
C (m) (vph)	*1552*						*975*	
v/c	*0.00*						*0.01*	
95% queue length	*0.01*						*0.03*	
Control Delay	*7.3*						*8.7*	
LOS	*A*						*A*	
Approach Delay	--	--				*8.7*		
Approach LOS	--	--				*A*		

>

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*AWK*	Intersection	*Edic Rd and Hazard Rd*
Agency/Co.	*HW Lochner*	Jurisdiction	*Marcy, NY*
Date Performed	*1/29/2013*	Analysis Year	*Future*
Analysis Time Period	*PM*		

Project Description	*8305*
East/West Street: *Hazard Road*	North/South Street: *Edic Road*
Intersection Orientation: *North-South*	Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*55*	*160*	*0*	*0*	*145*	*5*
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR	*55*	*160*	*0*	*0*	*145*	*5*
Percent Heavy Vehicles	*10*	--	--	*12*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LT*					*TR*
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*0*	*0*	*0*	*5*	*0*	*45*
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR	*0*	*0*	*0*	*5*	*0*	*45*
Percent Heavy Vehicles	*0*	*0*	*0*	*20*	*0*	*20*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration					*LR*	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*						*LR*	
v (vph)	*55*						*50*	
C (m) (vph)	*1384*						*806*	
v/c	*0.04*						*0.06*	
95% queue length	*0.12*						*0.20*	
Control Delay	*7.7*						*9.8*	
LOS	*A*						*A*	
Approach Delay	--	--				*9.8*		
Approach LOS	--	--				*A*		

>

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*AWK*	Intersection	*Edic Rd and Mulaney Rd*
Agency/Co.	*HW Lochner*	Jurisdiction	*Marcy, NY*
Date Performed	*1/3/2013*	Analysis Year	*2013*
Analysis Time Period	*AM*		
Project Description	*8305*		
East/West Street:	*Mulaney Road*	North/South Street:	*Edic Road*
Intersection Orientation:	*North-South*	Study Period (hrs):	*0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*0*	*5*	*10*	*10*	*5*	*0*
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR	*0*	*5*	*10*	*10*	*5*	*0*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration			*TR*	*LT*		
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*5*	*0*	*5*	*0*	*0*	*0*
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR	*5*	*0*	*5*	*0*	*0*	*0*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration		*LR*				

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*LT*		*LR*				
v (vph)		*10*		*10*				
C (m) (vph)		*1616*		*1025*				
v/c		*0.01*		*0.01*				
95% queue length		*0.02*		*0.03*				
Control Delay		*7.2*		*8.5*				
LOS		*A*		*A*				
Approach Delay	--	--	*8.5*					
Approach LOS	--	--	*A*					

>

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*AWK*	Intersection	*Edic Rd and Mulaney Rd*
Agency/Co.	*HW Lochner*	Jurisdiction	*Marcy, NY*
Date Performed	*1/29/2013*	Analysis Year	*Future*
Analysis Time Period	*AM*		
Project Description	*8305*		
East/West Street:	*Mulaney Road*	North/South Street:	*Edic Road*
Intersection Orientation:	*North-South*	Study Period (hrs):	*0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*0*	*25*	*100*	*10*	*35*	*0*
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR	*0*	*25*	*100*	*10*	*35*	*0*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration			*TR*	*LT*		
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*145*	*0*	*5*	*0*	*0*	*0*
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR	*145*	*0*	*5*	*0*	*0*	*0*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration		*LR*				

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*LT*		*LR*				
v (vph)		*10*		*150*				
C (m) (vph)		*1474*		*867*				
v/c		*0.01*		*0.17*				
95% queue length		*0.02*		*0.62*				
Control Delay		*7.5*		*10.0+*				
LOS		*A*		*B*				
Approach Delay	--	--	*10.0+*					
Approach LOS	--	--	*B*					

>

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*AWK*	Intersection	*Edic Rd and Mulaney Rd*
Agency/Co.	*HW Lochner*	Jurisdiction	*Marcy, NY*
Date Performed	*1/3/2013*	Analysis Year	*2013*
Analysis Time Period	*PM*		

Project Description	*8305*
East/West Street:	*Mulaney Road*
North/South Street:	*Edic Road*
Intersection Orientation:	*North-South*
Study Period (hrs):	*0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*0*	*5*	*10*	*10*	*5*	*0*
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR	*0*	*5*	*10*	*10*	*5*	*0*
Percent Heavy Vehicles	*0*	--	--	*12*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration			*TR*	*LT*		
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*10*	*0*	*10*	*0*	*0*	*0*
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR	*10*	*0*	*10*	*0*	*0*	*0*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration		*LR*				

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*LT*		*LR*				
v (vph)		*10*		*20*				
C (m) (vph)		*1540*		*1025*				
v/c		*0.01*		*0.02*				
95% queue length		*0.02*		*0.06*				
Control Delay		*7.4*		*8.6*				
LOS		*A*		*A*				
Approach Delay	--	--	*8.6*					
Approach LOS	--	--	*A*					

>

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*AWK*	Intersection	*Edic Rd and Mulaney Rd*
Agency/Co.	*HW Lochner*	Jurisdiction	*Marcy, NY*
Date Performed	*1/29/2013*	Analysis Year	*Future*
Analysis Time Period	*PM*		
Project Description	*8305*		
East/West Street:	*Mulaney Road*	North/South Street:	*Edic Road*
Intersection Orientation:	*North-South*	Study Period (hrs):	*0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*0*	*35*	*130*	*10*	*30*	*0*
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR	*0*	*35*	*130*	*10*	*30*	*0*
Percent Heavy Vehicles	*0*	--	--	*12*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration			*TR*	*LT*		
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*120*	*0*	*10*	*0*	*0*	*0*
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR	*120*	*0*	*10*	*0*	*0*	*0*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration		*LR*				

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*LT*		*LR*				
v (vph)		*10*		*130*				
C (m) (vph)		*1355*		*849*				
v/c		*0.01*		*0.15*				
95% queue length		*0.02*		*0.54*				
Control Delay		*7.7*		*10.0+*				
LOS		*A*		*B*				
Approach Delay	--	--	*10.0+*					
Approach LOS	--	--	*B*					

>

HCS2000™ DETAILED REPORT

General Information		Site Information	
Analyst	AWK	Intersection	Edic Road and North Drive
Agency or Co.	HW Lochner	Area Type	All other areas
Date Performed	1/29/2013	Jurisdiction	Marcy, NY
Time Period	AM	Analysis Year	Future
		Project ID	Signalized Intersection of Edic Road and North Drive

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of lanes, N_1	1	0	1	0	0	0	2	1	0	0	1	0
Lane group	L		R				L	T			TR	
Volume, V (vph)	90		445				790	65			65	155
% Heavy vehicles, %HV	0		0				0	0			0	0
Peak-hour factor, PHF	0.90		0.90				0.90	0.90			0.90	0.90
Pretimed (P) or actuated (A)	A		A				A	A			A	A
Start-up lost time, l_1	2.0		2.0				2.0	2.0			2.0	
Extension of effective green, e	2.0		2.0				2.0	2.0			2.0	
Arrival type, AT	3		3				3	3			3	
Unit extension, UE	3.0		3.0				3.0	3.0			3.0	
Filtering/metering, I	1.000	1.000	1.000				1.000	1.000			1.000	
Initial unmet demand, Q_b	0.0		0.0				0.0	0.0			0.0	
Ped / Bike / RTOR volumes	0		45	0						0		15
Lane width	12.0		12.0				12.0	12.0			12.0	
Parking / Grade / Parking	N	0	N	N		N	N	0	N	N	0	N
Parking maneuvers, N_m												
Buses stopping, N_B	0		0				0	0			0	
Min. time for pedestrians, G_p	3.2			3.2						3.2		

Phasing	EB Only	02	03	04	NB Only	SB Only	07	08
Timing	G = 7.0	G =	G =	G =	G = 27.0	G = 10.0	G =	G =
	Y = 6	Y =	Y =	Y =	Y = 6	Y = 6	Y =	Y =
Duration of Analysis, T = 0.25						Cycle Length, C = 62.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted flow rate, v	100		444				878	72			228	
Lane group capacity, c	204		1042				1525	827			278	
v/c ratio, X	0.49		0.43				0.58	0.09			0.82	
Total green ratio, g/C	0.11		0.65				0.44	0.44			0.16	
Uniform delay, d_1	25.8		5.4				13.2	10.3			25.1	

Progression factor, PF	1.000		1.000				1.000	1.000			1.000	
Delay calibration, k	0.11		0.11				0.17	0.11			0.36	
Incremental delay, d_2	1.9		0.3				0.5	0.0			17.5	
Initial queue delay, d_3												
Control delay	27.7		5.7				13.7	10.3			42.6	
Lane group LOS	C		A				B	B			D	
Approach delay	9.7						13.5			42.6		
Approach LOS	A						B			D		
Intersection delay	16.1						Intersection LOS			B		

HCS2000™ DETAILED REPORT

General Information		Site Information	
Analyst	AWK	Intersection	Edic Road and North Drive
Agency or Co.	HW Lochner	Area Type	All other areas
Date Performed	1/29/2013	Jurisdiction	Marcy, NY
Time Period	PM	Analysis Year	Future
		Project ID	Signalized Intersection of Edic Road and North Drive

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of lanes, N_1	1	0	1	0	0	0	2	1	0	0	1	0
Lane group	L		R				L	T			TR	
Volume, V (vph)	135		665				590	80			70	120
% Heavy vehicles, %HV	0		0				0	0			0	0
Peak-hour factor, PHF	0.90		0.90				0.90	0.90			0.90	0.90
Pretimed (P) or actuated (A)	A		A				A	A			A	A
Start-up lost time, l_1	2.0		2.0				2.0	2.0			2.0	
Extension of effective green, e	2.0		2.0				2.0	2.0			2.0	
Arrival type, AT	3		3				3	3			3	
Unit extension, UE	3.0		3.0				3.0	3.0			3.0	
Filtering/metering, I	1.000	1.000	1.000				1.000	1.000			1.000	
Initial unmet demand, Q_b	0.0		0.0				0.0	0.0			0.0	
Ped / Bike / RTOR volumes	0		45	0						0		15
Lane width	12.0		12.0				12.0	12.0			12.0	
Parking / Grade / Parking	N	0	N	N		N	N	0	N	N	0	N
Parking maneuvers, N_m												
Buses stopping, N_B	0		0				0	0			0	
Min. time for pedestrians, G_p	3.2			3.2						3.2		

Phasing	EB Only	02	03	04	NB Only	SB Only	07	08
Timing	G = 7.0	G =	G =	G =	G = 27.0	G = 10.0	G =	G =
	Y = 6	Y =	Y =	Y =	Y = 6	Y = 6	Y =	Y =

Duration of Analysis, T = 0.25 | Cycle Length, C = 62.0

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted flow rate, v	150		689				656	89			195	
Lane group capacity, c	204		1042				1525	827			282	
v/c ratio, X	0.74		0.66				0.43	0.11			0.69	
Total green ratio, g/C	0.11		0.65				0.44	0.44			0.16	
Uniform delay, d_1	26.6		6.8				12.2	10.4			24.5	

Progression factor, PF	*1.000*		*1.000*				*1.000*	*1.000*			*1.000*	
Delay calibration, k	*0.29*		*0.24*				*0.11*	*0.11*			*0.26*	
Incremental delay, d_2	*13.0*		*1.6*				*0.2*	*0.1*			*7.1*	
Initial queue delay, d_3												
Control delay	*39.6*		*8.4*				*12.4*	*10.4*			*31.6*	
Lane group LOS	*D*		*A*				*B*	*B*			*C*	
Approach delay	*14.0*						*12.1*			*31.6*		
Approach LOS	*B*						*B*			*C*		
Intersection delay	*15.1*						Intersection LOS			*B*		