EXHIBIT IX.A.2.b.Attachment "A"

Traffic Impact Study

Mohawk Harbor

Casino Alternate

City of Schenectady, New York

TRJE Project No. 001-13-004

Prepared for:

Maxon Alco Holdings, LLC
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Report Date: June 16, 2014

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1.0 INTRODUCTION

1.1 Planned Project

Maxon ALCO Holdings, LLC is proposing to redevelop the American Locomotive (ALCO) site adjacent to Erie Boulevard in the City of Schenectady for mixed-use development, known as Mohawk Harbor. Included in the proposed uses for Mohawk Harbor are:

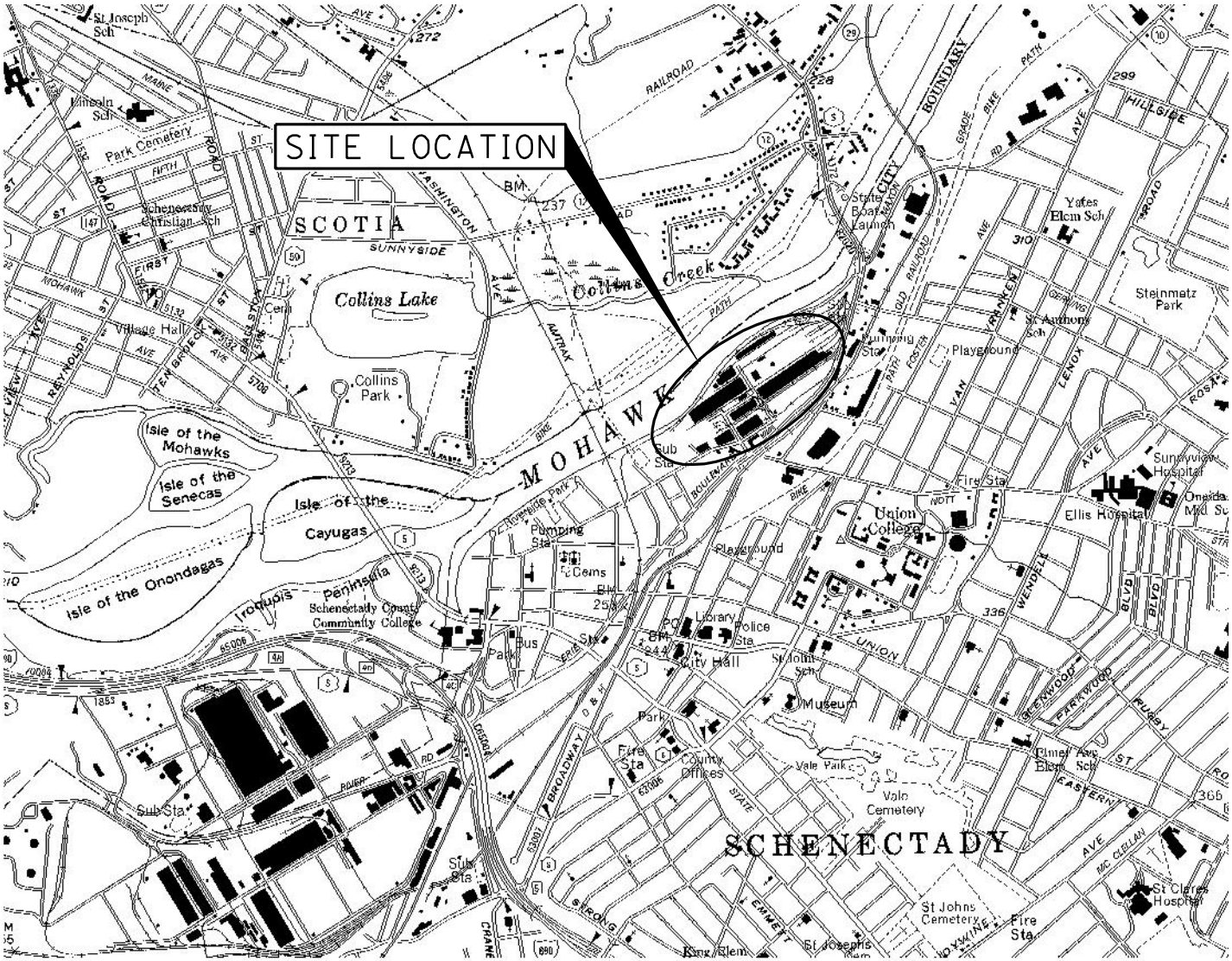
- 304 Residential Apartment Units
- 70 Condominium Units
- 124 Room Hotel
- 130,000 square feet (SF) of Retail Space
- 60,000 SF of General Office Space
- 160,000 SF Casino
- 450 Seat Banquet Facility
- 185 Room Hotel
- 72,000 SF of Light Industrial Use

This program shown above for the Casino, Banquet facility and attached Hotel is somewhat larger than what is currently contemplated but it is being used for the purposes of this report.

The purpose of this Casino Alternate is to update the traffic analysis prepared for the *Traffic Impact Study* of January 2014 due to a change in land use of the proposed redevelopment. Notably, the project dropped the Movie/TV Studio and now includes a Casino with a Banquet Facility and Hotel. The project location is shown on Figure 1 and a conceptual site plan is included in Appendix A.

The potential traffic impact of the proposed project was determined by projecting future traffic volumes, including the peak hour trip generation of the site, and determining the operating conditions of the study area intersections after development of the proposed project.

FILE NAME = L:\MSTN Projects\1300\1368.002.001\FIGURES\Casino\1368002001 A site location map.dgn



2.0 EXISTING CONDITIONS

2.1 Roadway Network

The study area for the January 2014 report included the following intersections:

- Erie Boulevard & Maxon Road Extension (signalized)
- Erie Boulevard & Seneca Street (unsignalized)
- Erie Boulevard & Maxon Road (unsignalized)
- Erie Boulevard & Nott Street (signalized)
- Erie Boulevard & N. Jay Street (unsignalized)
- Nott Street & Maxon Road (signalized)
- Front Street & Green Street/N. Ferry Street (all-way stop)
- Front Street & Mohawk Harbor Driveway (unsignalized)

With the removal of the Movie/TV Studio and the addition of the Casino, the potential traffic impacts may extend beyond the intersections above such that the following locations are included in this Casino Alternate:

- Freemans Bridge Road & Maple Avenue
- Freemans Bridge Road & Sunnyside Road
- Erie Boulevard & Union Street
- Erie Boulevard & Liberty Street
- Erie Boulevard & State Street
- State Street & Broadway
- State Street & Washington Avenue

It is noted that the intersections along Erie Boulevard and at Sunnyside Road were included in the original traffic study of January 2010, then known as Alco Development, by CHA.

Vehicular access to the site will be provided regionally by Interstate 90 and Interstate I-890, NY Routes 5, 7, 50, and 911F (Erie Boulevard/Freemans Bridge Road), and numerous local streets such as Broadway, Nott Street, Maxon Road Extension, Union Street, and Front Street. Access will also be provided by passenger rail at the nearby Amtrak station at Liberty Street, interstate bus at Church Street, and local bus service via CDTA along the highly traveled corridor of Route 5 (State Street.)

Additional access will be provided from the regional Mohawk Hudson multi-use trail as well as a new marina to be constructed on the adjoining Mohawk River.

A number of network improvements have been recently made, are currently being, and are in the plans to be made in the near future. These include the upgrade of bus transit

facilities, bus routing, and express bus service along Route 5; reconstruction of Erie Boulevard from I-890 to Union Street; design of reconstruction of the Amtrak rail station on Liberty Street, and roadway improvements to the intersection of Erie Boulevard and Nott Street to address safety and capacity issues.

2.2 Existing Traffic Volumes

Existing traffic volumes were shown in the January 2010 study and the January 2014 study with the exception of Freemans Bridge Road & Maple Avenue, State Street & Broadway, and State Street & Washington Avenue. For these three intersections, traffic count data was collected in May 2014 for the weekday AM and PM peak hours and the counts are included in Appendix B.

In addition, counts were collected for the intersections along Erie Boulevard to compare against those in the January 2010 study. Further, counts were collected for the Saturday morning and afternoon periods at Erie Boulevard & Nott Street to compare Saturday volumes against the weekday AM and PM peaks.

The results of the comparisons of the additional counts indicates that the volumes along Eire Boulevard in the January 2010 study are consistent and slightly higher than those collected in May 2014; therefore, the 2010 volumes were used to develop the 2016 No-build and Build volumes in this Casino Alternate.

Also, the data shows that the weekday PM peak hour volumes are higher than the weekday AM peak hour by 25%, and are double the volume of the Saturday PM peak hour. Therefore, traffic volumes for this Casino Alternate are shown for the weekday PM peak hour, and the weekday PM peak hour is considered the critical peak hour for analysis.

Pedestrian facilities and transit services are provided within the study area and they were presented in the January 2014 report.

3.0 FUTURE CONDITIONS

3.1 2016 No-Build Condition

The full build-out of the site, for purposes of this report, is assumed to be completed by the end of 2016, which is sooner than 2023 build-out year presented in the January 2014 study. To evaluate the traffic impacts of the project in the context of background conditions in this future year, No-Build condition traffic volumes were developed for this future year of 2016. Based on information obtained from the Capital District Transportation Committee (CDTC), there is not expected to be significant background vehicular traffic growth in the project study area. To make a conservative estimate of the future traffic volumes without the site development, a growth rate of 0.25% per year was applied to the 2010 and 2013 existing volumes shown in the January 2010 and January 2014 studies. Discussions with the City indicated that no projects within the study area are in the process of review/approval.

The 2016 No-Build weekday PM peak hour traffic volumes are shown on Figures 2A and 2B.

3.2 Trip Generation

To evaluate the future impacts of the proposed Mohawk Harbor site on the transportation system, an estimate of the trip generating potential of the site was calculated. *Trip Generation, 9th Edition* published by the Institute of Transportation Engineers (ITE) is an industry-standard resource for estimating the traffic generated by various types of land uses. The data provided in *Trip Generation* was used to estimate the site generated trips for the following proposed mix of land-uses for the weekday AM and PM peak hours:

- 304 Residential Apartment Units
- 70 Condominium Units
- 124 Room Hotel
- 130,000 square feet (SF) of Retail Space
- 60,000 SF of General Office Space
- 160,000 SF Casino
- 450 Seat Banquet Facility
- 185 Room Hotel
- 72,000 SF of Light Industrial Use

Trip generation for the Casino was estimated based on visitors to a similar facility in Des Plaines, Illinois. According to the Illinois Gaming Board report, the Des Plaines facility had 3.969 million visitors in 2012. A market analysis prepared by The Innovation Group, the premier provider of consulting services for the gaming, entertainment, and hospitality

industries, estimates that the Schenectady casino will attract 2.780 million visitors in the stabilized third year. Therefore, it is anticipated that the Schenectady site will attract visitors at a rate of 70% of Des Plaines. Using traffic count data collected by KLOA, Inc., a premier traffic and transportation planning and engineering firm, on an hourly basis for a one-week period in 2012 at the Des Plaines site of vehicles entering and exiting, and the 70% ratio noted above, it is estimated that the Schenectady Casino will generate 674 total trips for the weekday PM peak hour.

It is noted that the Des Plaines casino is one of the busiest casinos in the country. As such, the casino is capacity-constrained and the PM peak hour is actually spread out over a several-hour period as visitors are forced to arrive earlier and later, from about 5:00 to 8:00 p.m. Because of this, the traffic counts at the Des Plaines casino are higher at 5:00 p.m., as a percentage of traffic for the entire day, than would normally be expected for a new casino at Schenectady. Therefore, by using the traffic data from the Des Plaines casino at 5:00 p.m., the trip generation of 674 trips for Schenectady can be considered conservative.

For the banquet facility of 450 seats, it was assumed that an event would not coincide with the PM peak hour of 4:30 – 5:50, but would most likely begin later. However, it was assumed that some people would arrive early, 20%, and would arrive at a vehicle occupancy rate of 1.5 persons per vehicle for total of 60 trips. Minimal traffic during the AM peak hour was assumed to consist of only a cleaning staff.

The 124-room hotel on the northern part of the Mohawk Harbor project will be similar to a hotel with additional amenities such as meeting rooms, room service, restaurants, etc. while the 185-room hotel associated with the casino will not have those amenities, other than a small meeting room, similar to the limited services at an all-suites hotel.

As this is an integrated mixed-use site, some of the trips generated by the site will remain on-site, such as trips between the residential, office, and retail uses. The amount of these “internal capture” trips were estimated from data and methods recommended in the ITE *Trip Generation Handbook*. Based on this data, it is estimated that the percentage of the total residential, office, and retail trips that will be internal to the site is 9% during the AM peak hour and 17% during the PM peak hour. The calculations of internal trips are provided in Appendix C. No internal trip credit was taken for the Casino.

The traffic data provided in *Trip Generation* is based primarily on case studies of land development in suburban locations. Because of the urban context of the project site the estimated trip generation of the site was also adjusted to account for other urban travel modes such as transit, walking and bicycling. To account for these urban travel mode characteristics, the external site generated vehicle trips, excluding the Light Industrial trips,

were reduced by a multi-modal credit of 10% to reflect the amount of new vehicle trips arriving by alternative modes. The estimated site generated trips are summarized in Table 3.1 below.

Table 3.1
Peak Hour Site Generated Trips

Land Use	AM Peak Hour			PM Peak Hour		
	Enter	Exit	Total	Enter	Exit	Total
Apartments (ITE LUC 220): 304 Units	25	116	141	84	40	124
Condominiums (ITE LUC 230): 70 Units	6	27	33	19	9	28
Hotel (ITE LUC 310): 124 Rooms	39	27	66	38	36	74
Retail (ITE LUC 820): 130,000 SF	101	61	162	305	318	623
Office (ITE LUC 710): 60,000 SF	108	12	120	17	112	129
Casino: 160,000 SF	69	69	138	357	317	674
Banquet Facility: 450 Seats	10	10	20	57	3	60
Hotel (ITE LUC 311): 185 Rooms	37	32	69	34	40	74
Subtotal	**395**	**354**	**749**	**911**	**875**	**1,786**
Multi-modal Adjustment	-40	-35	-75	-91	-87	-178
Light-Industrial (ITE LUC 110): 72,000 SF	58	8	66	9	61	70
Total Net Vehicle Trip Generation	**413**	**327**	**740**	**829**	**849**	**1,678**

3.3 Trip Distribution

Trip distribution patterns were estimated from existing peak hour traffic patterns in the vicinity of the site and considering the relationship of the project site to area population and activity centers. Trip distributions for the Casino and related uses were calculated based on a zip code analysis and surrounding populations. Given that the there are two distinct areas of redevelopment at the site, namely, the casino and the non-casino land uses, the trip distributions percentages are slightly different on the perimeter of the study area and are more pronounced at the entrances to the site. The trip distribution percentages for entering and exiting from the site are shown on Figures 3A, 3B, 3C and 4A, 4B, 4C.

Based on these trip distribution patterns, the site generated trips were assigned to the study area intersections. Figures 5A, 5B and 6A, 6B illustrate the estimated Mohawk Harbor site traffic assignment to the study intersections for the PM peak hour.

3.4 2016 Build Condition

As presented in the January 2014 study, Maxon Road will be modified to allow two-way traffic flow at Erie Boulevard and this is accounted for in the distributions. The traffic diversions for this network change are shown on Figure 7.

The site-generated trips for the Mohawk Harbor site were combined with the 2016 No-Build traffic volumes and the network diversions to obtain the 2016 Build traffic volumes for the weekday PM peak hour. These Build condition volumes are presented on Figures 8A and 8B.

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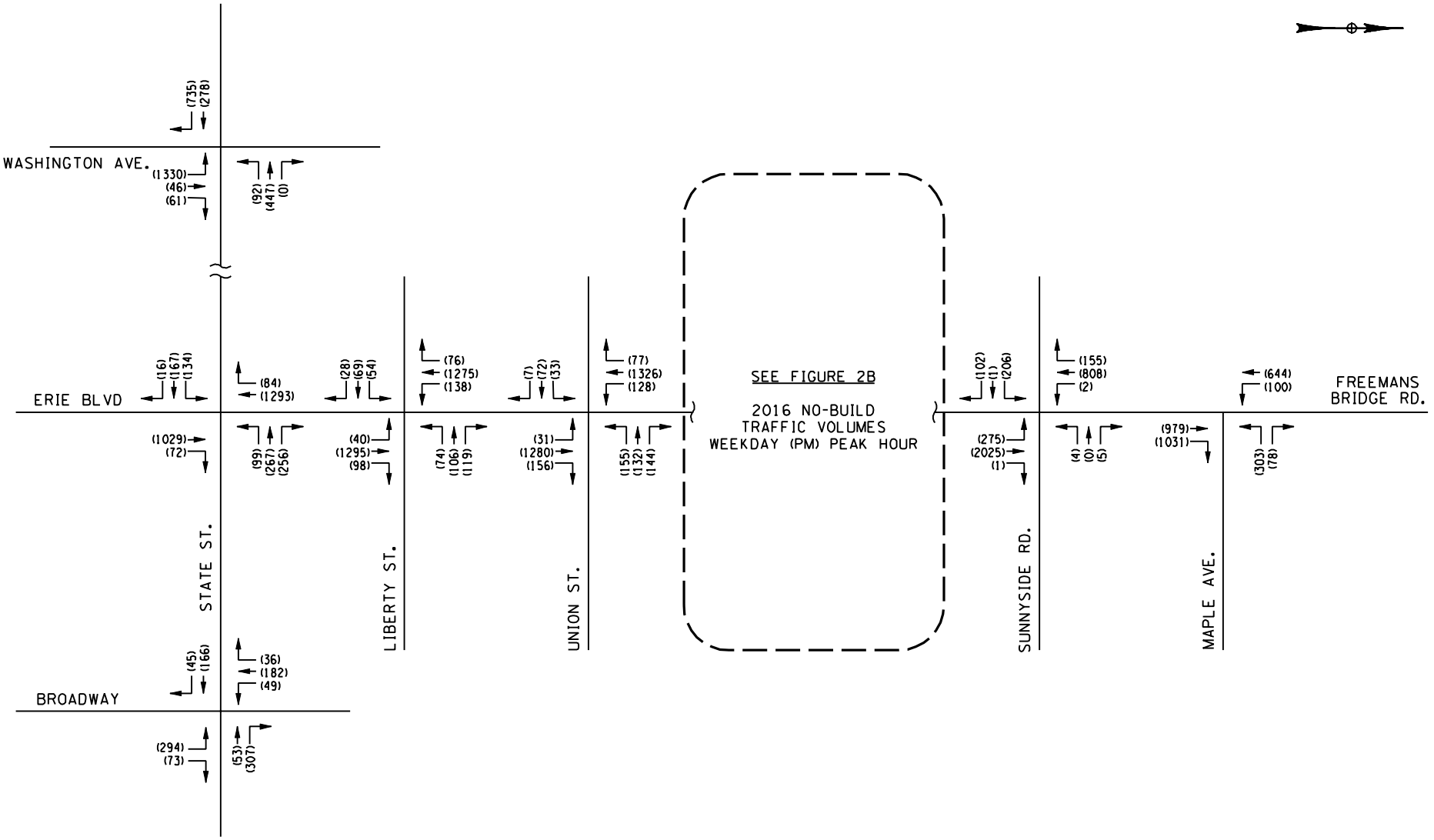

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TRAFFIC ENGINEERING & TRANSPORTATION PLANNING

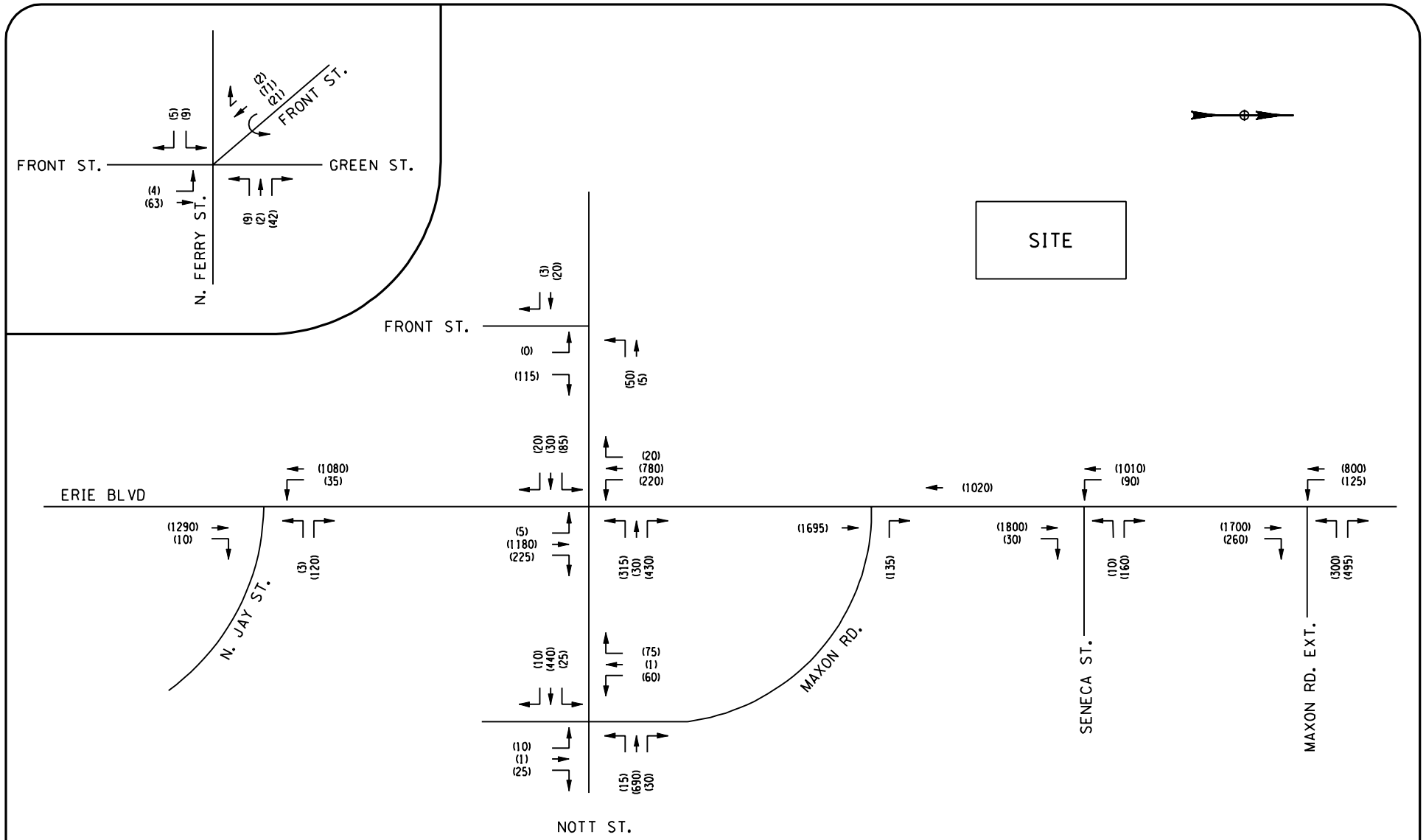
MOHAWK HARBOR
SCHENECTADY, NEW YORK

2016 NO-BUILD
TRAFFIC VOLUMES
WEEKDAY (PM) PEAK HOUR

DATE: JUNE 2014

Figure
2A
Project No.
1368.002.001

FILE NAME = L:\MSTN Projects\1300\1368.002.001\FIGURES\Casino\1368002001 Casino no build 2016 Fig B.dgn



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MOHAWK HARBOR
SCHENECTADY, NEW YORK

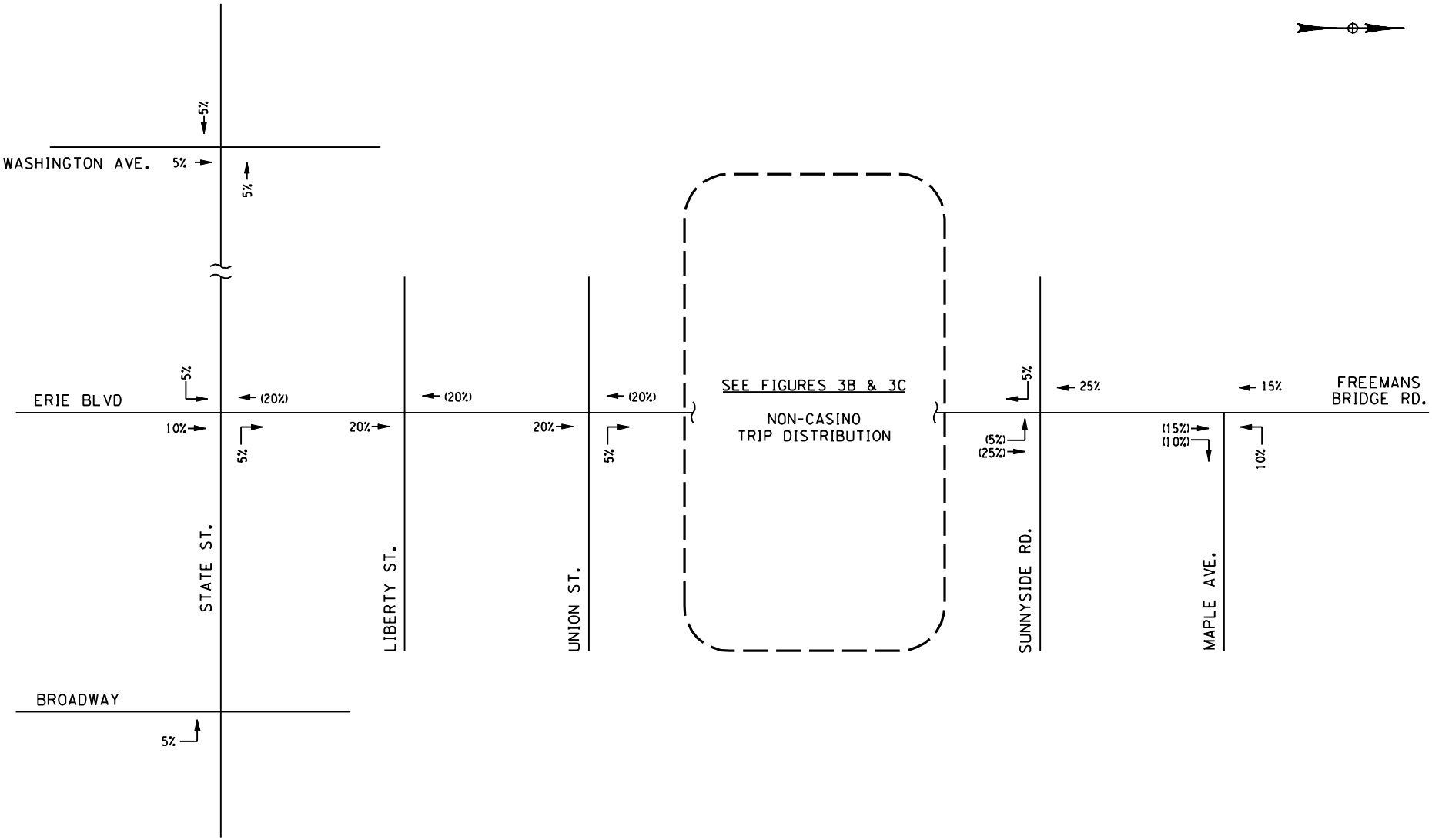
2016 NO BUILD
TRAFFIC VOLUMES
WEEKDAY (PM) PEAK HOUR

DATE: JUNE 2014

Figure
2B

Project No.
1368.002.001

FILE NAME = I:\mstn projects\1300\1368.002.001\figures\casino\1368002001 Casino no build trip dist Fig A.dgn



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MOHAWK HARBOR
SCHENECTADY, NEW YORK

NON-CASINO
TRIP DISTRIBUTION

DATE: JUNE 2014

Figure
3A
Project No.
1368.002.001

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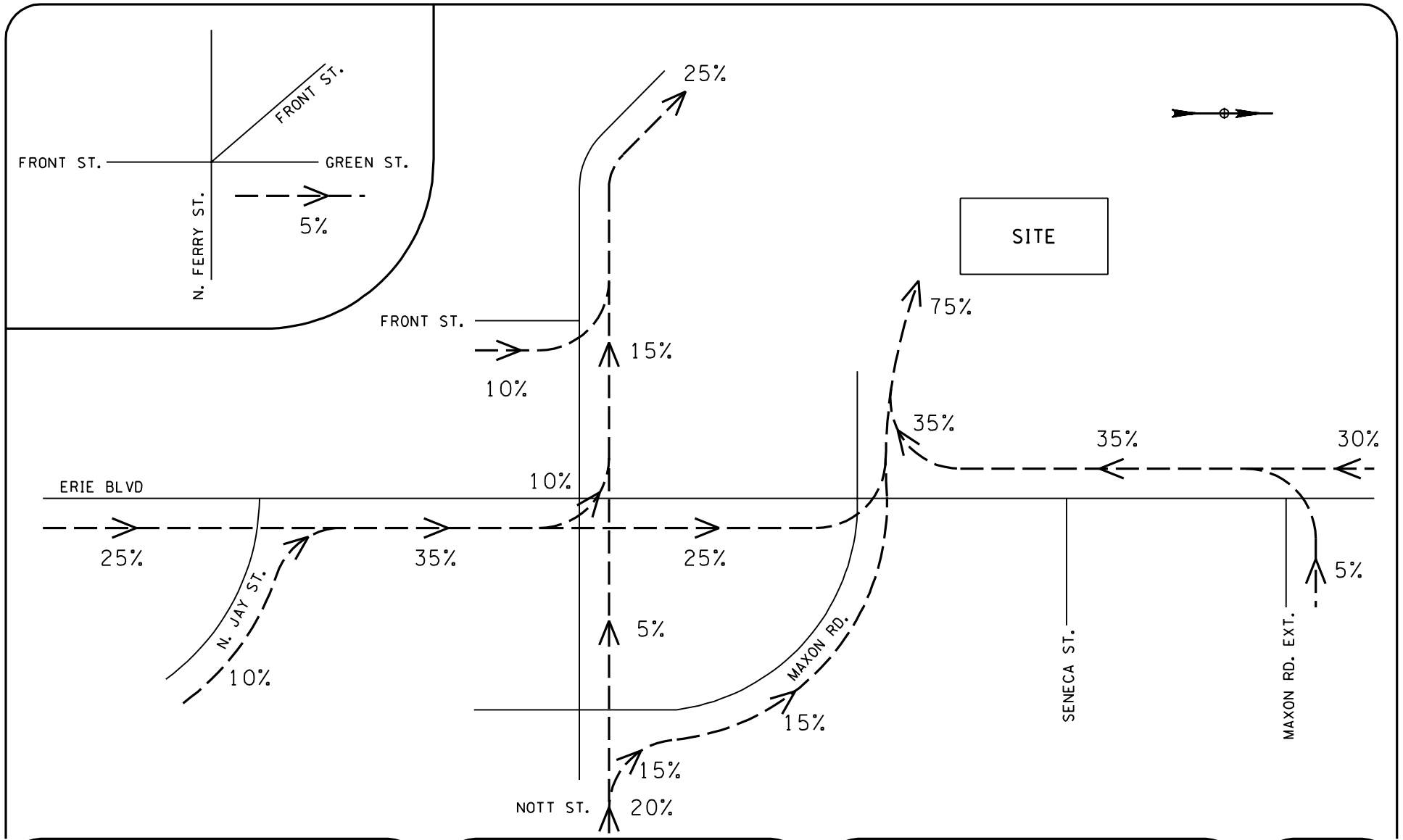

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MOHAWK HARBOR
SCHENECTADY, NEW YORK

NON-CASINO
TRIP DISTRIBUTION
ENTERING
DATE: JUNE 2014

Figure
3B
Project No.
1368.002.001

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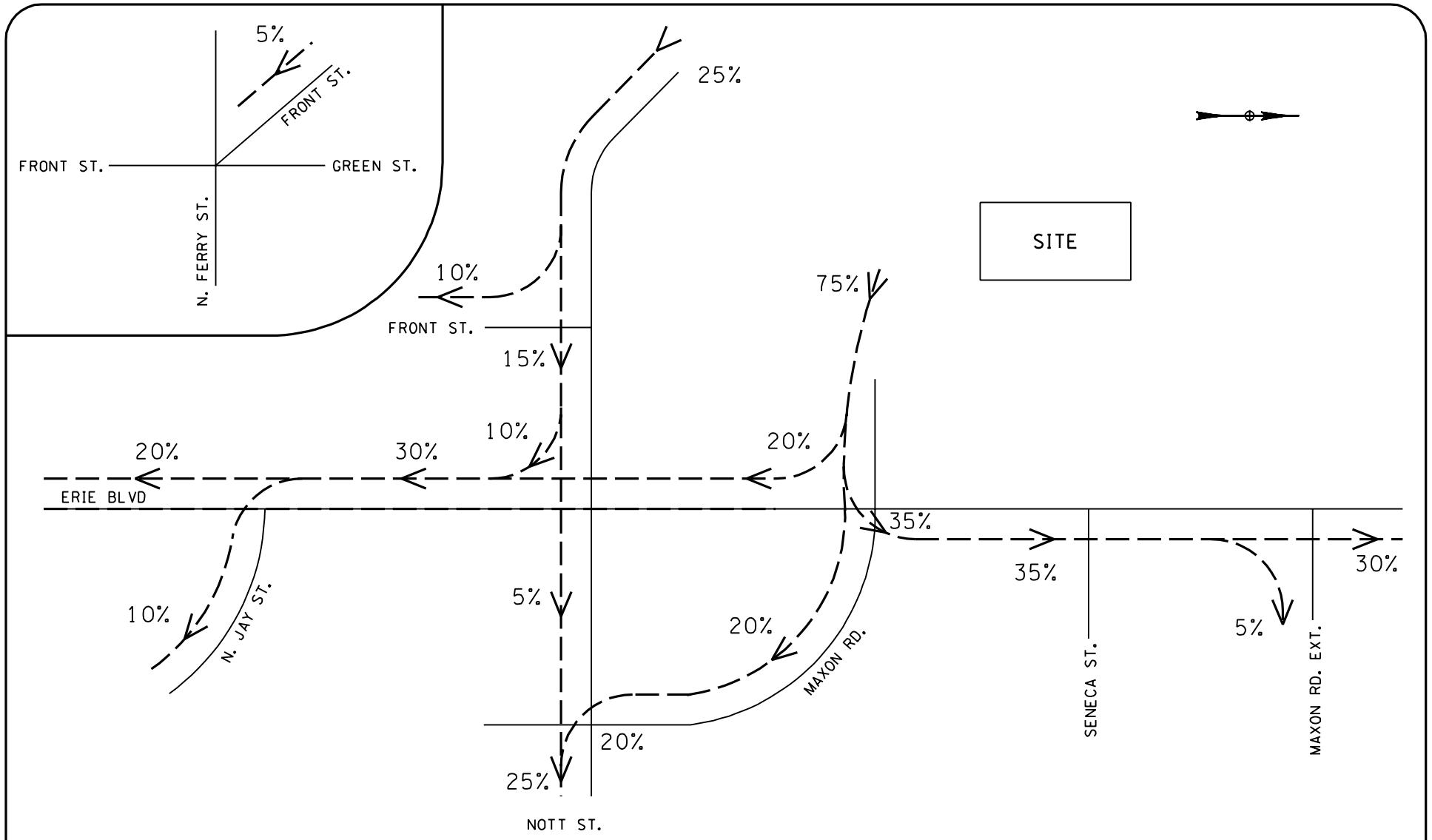

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MOHAWK HARBOR
SCHENECTADY, NEW YORK

NON-CASINO
TRIP DISTRIBUTION
EXITING

DATE: JUNE 2014

Figure
3C

Project No.
1368.002.001

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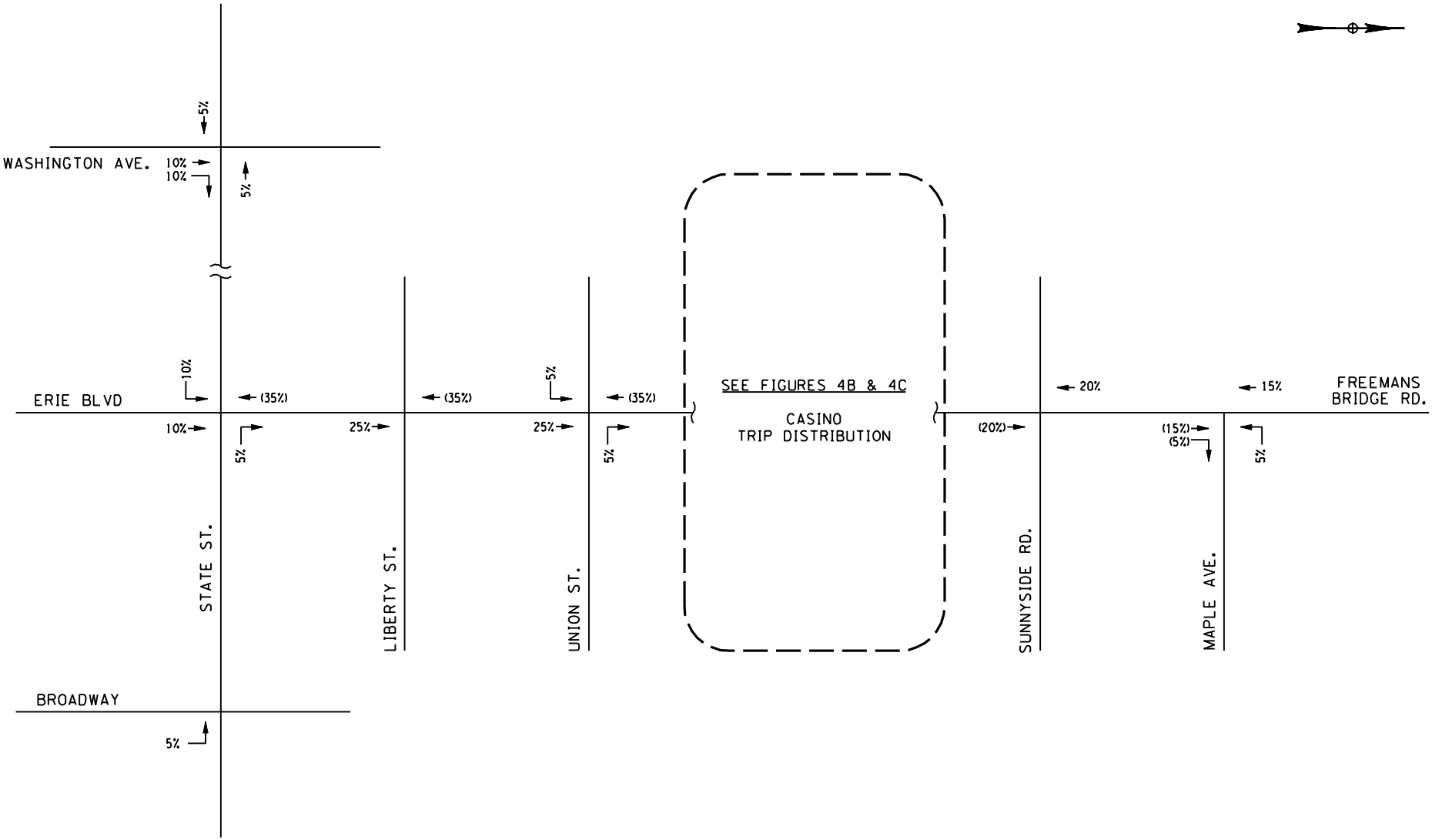

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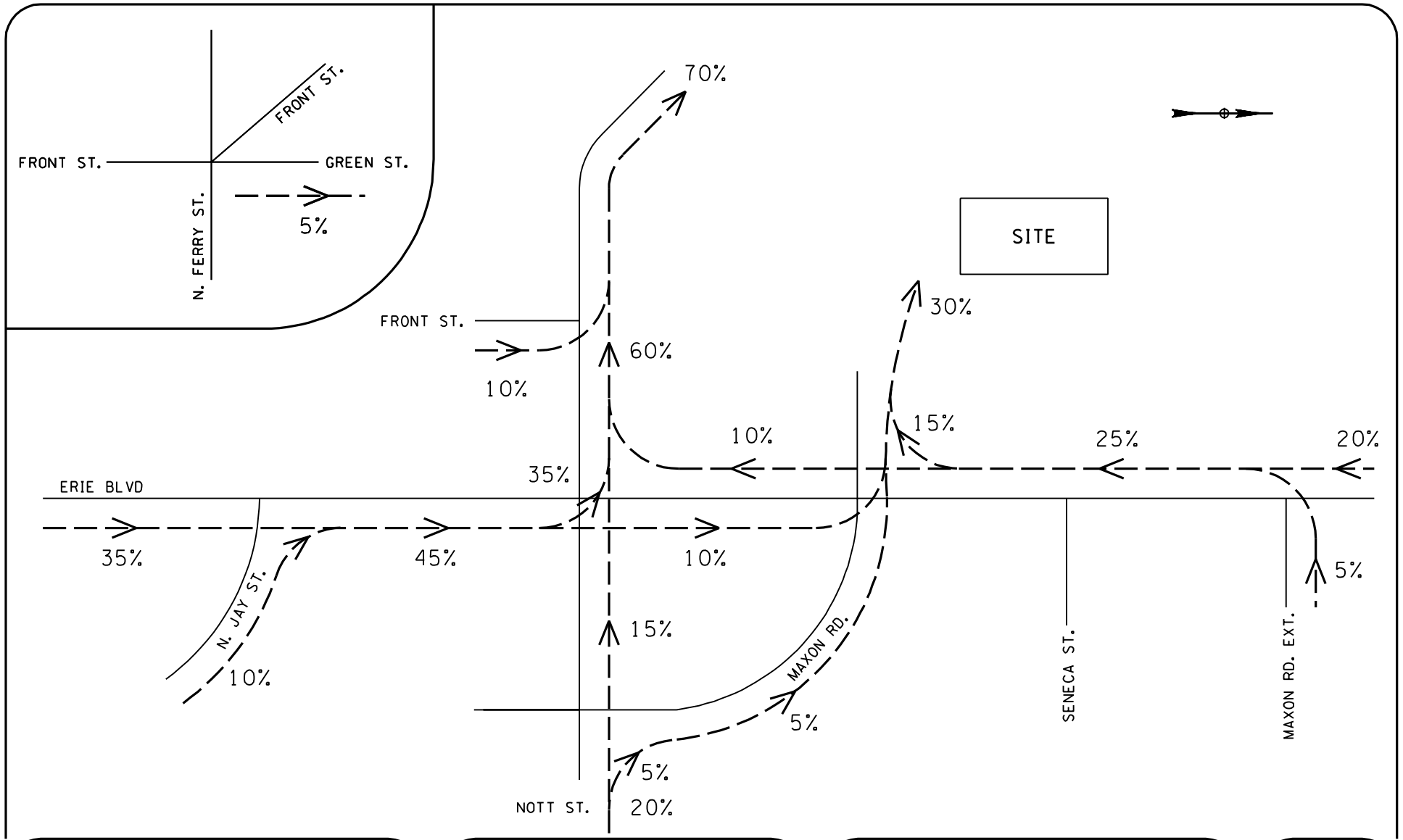
MOHAWK HARBOR
SCHENECTADY, NEW YORK

CASINO
TRIP DISTRIBUTION

DATE: JUNE 2014

Figure
4A
Project No.
1368.002.001

FILE NAME = I:\mstn projects\1300\1368.002.001\figures\casino\1368002001 Casino trip dist entering Fig B.dgn



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MOHAWK HARBOR
SCHENECTADY, NEW YORK

CASINO
TRIP DISTRIBUTION
ENTERING
DATE: JUNE 2014

Figure
4B
Project No.
1368.002.001

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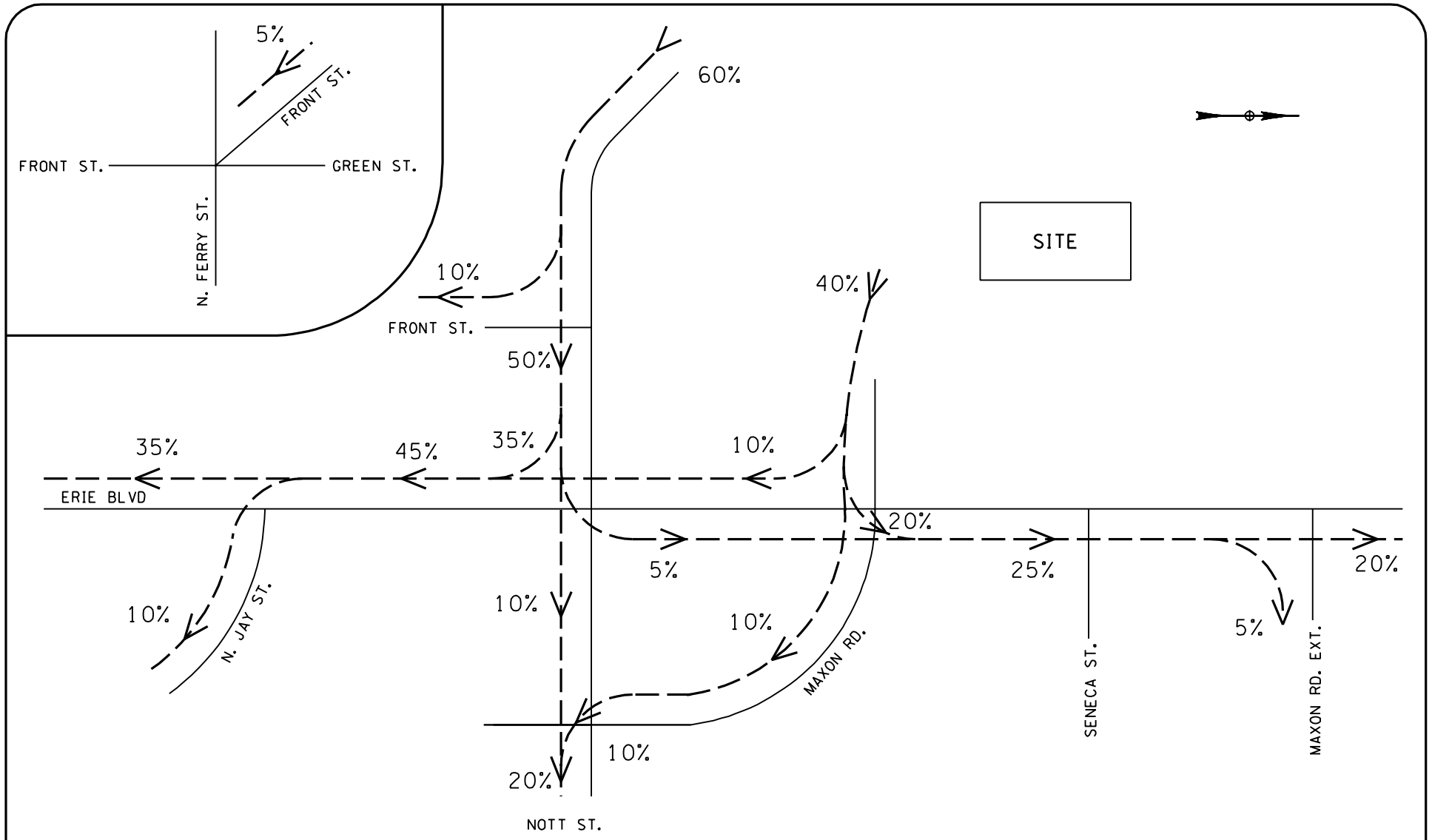

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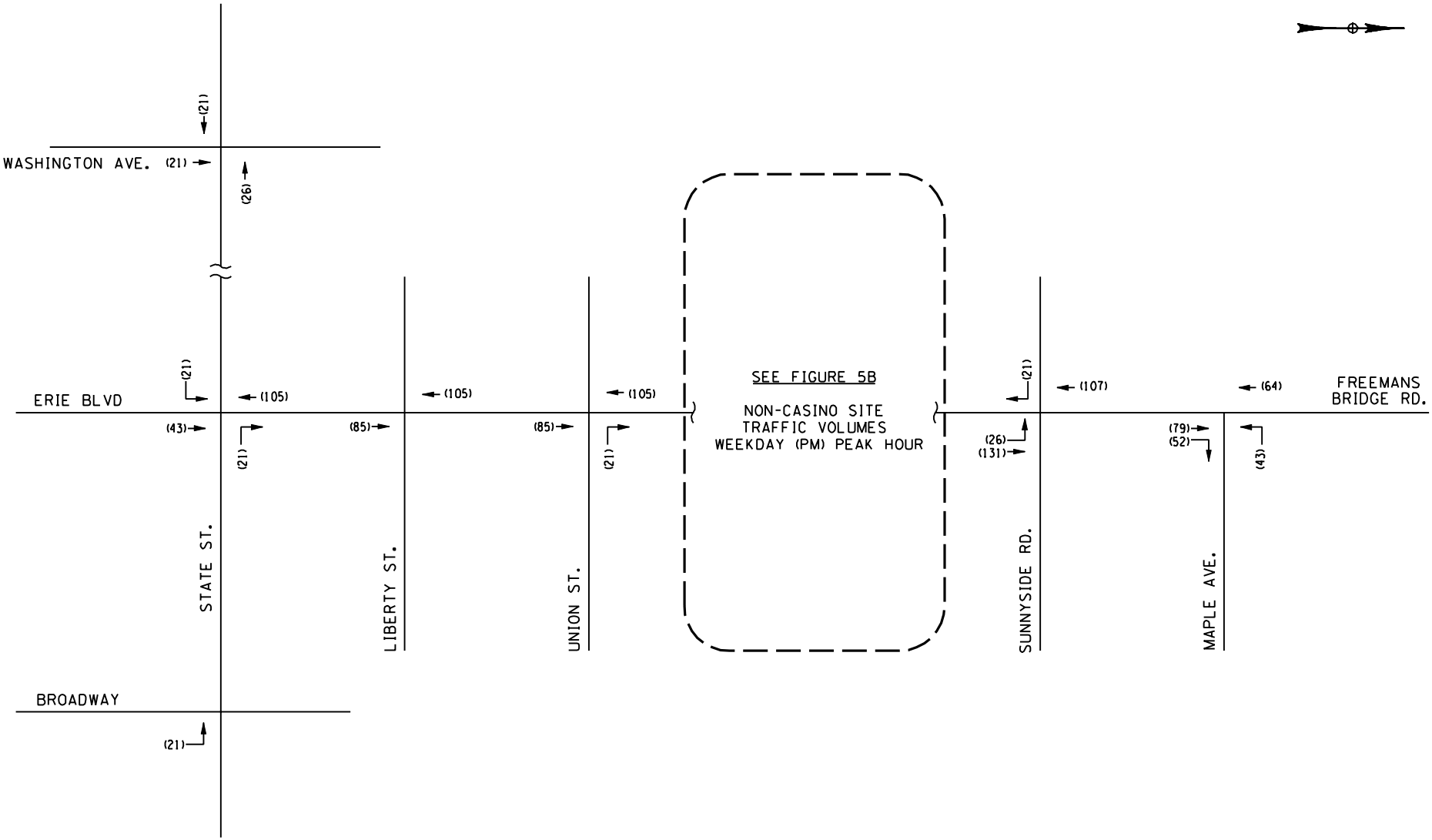
MOHAWK HARBOR
SCHENECTADY, NEW YORK

CASINO
TRIP DISTRIBUTION
EXITING
DATE: JUNE 2014

Figure
4C
Project No.
1368.002.001

FILE NAME = l:\mstn projects\1300\1368.002.001\figures\casino\1368002001 Casino no build site Fig A.dgn



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MOHAWK HARBOR
SCHENECTADY, NEW YORK

NON-CASINO SITE
TRAFFIC VOLUMES
WEEKDAY (PM) PEAK HOUR

DATE: JUNE 2014

Figure
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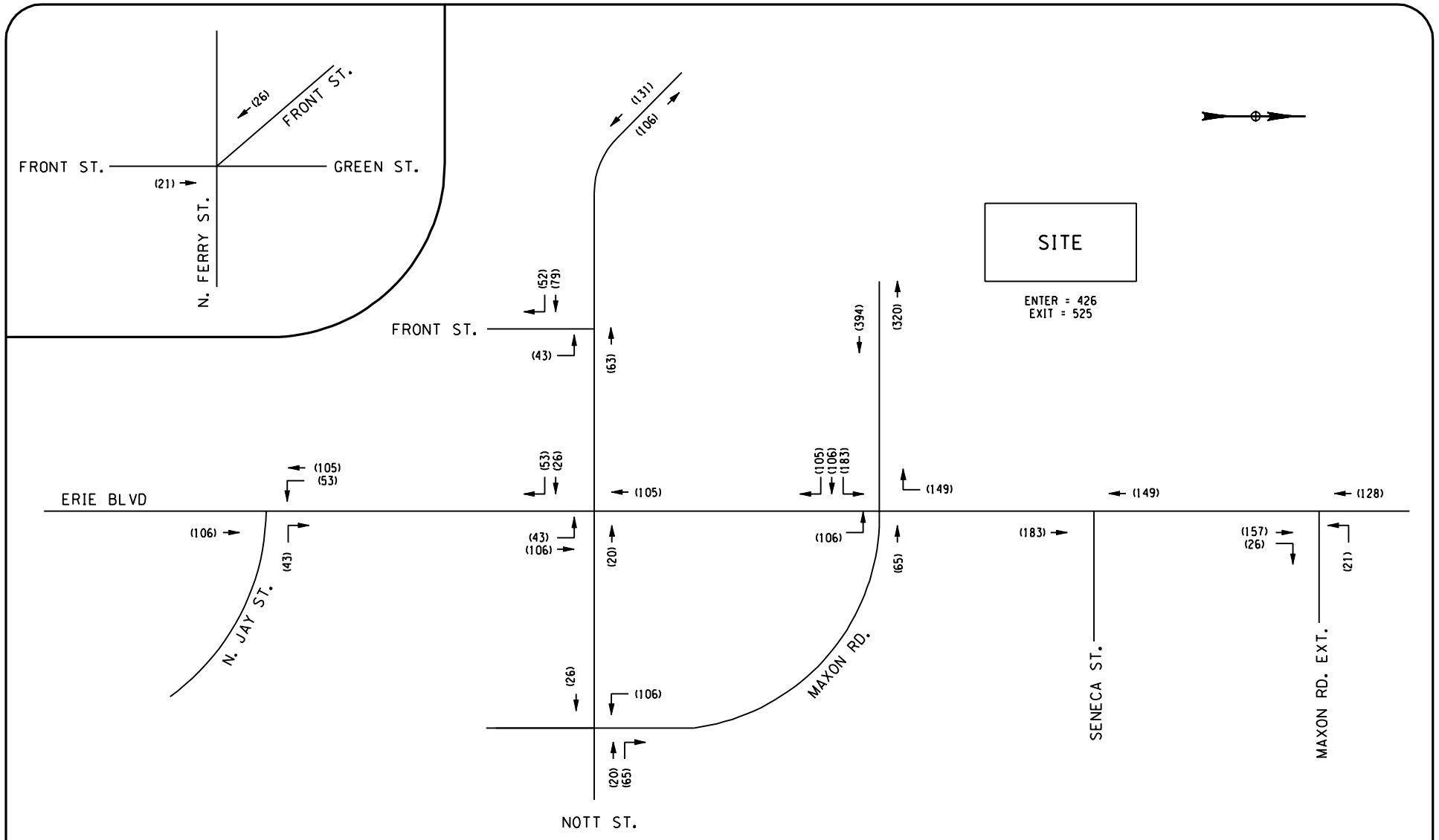
Project No.
1368.002.001

FILE NAME = I:\mstn projects\1300\1368.002.001\figures\casino\1368002001 Casino no build site Fig B.dgn



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MOHAWK HARBOR
SCHENECTADY, NEW YORK

NON-CASINO SITE
TRAFFIC VOLUMES
WEEKDAY (PM) PEAK HOUR

DATE: JUNE 2014

Figure
5B
Project No.
1368.002.001

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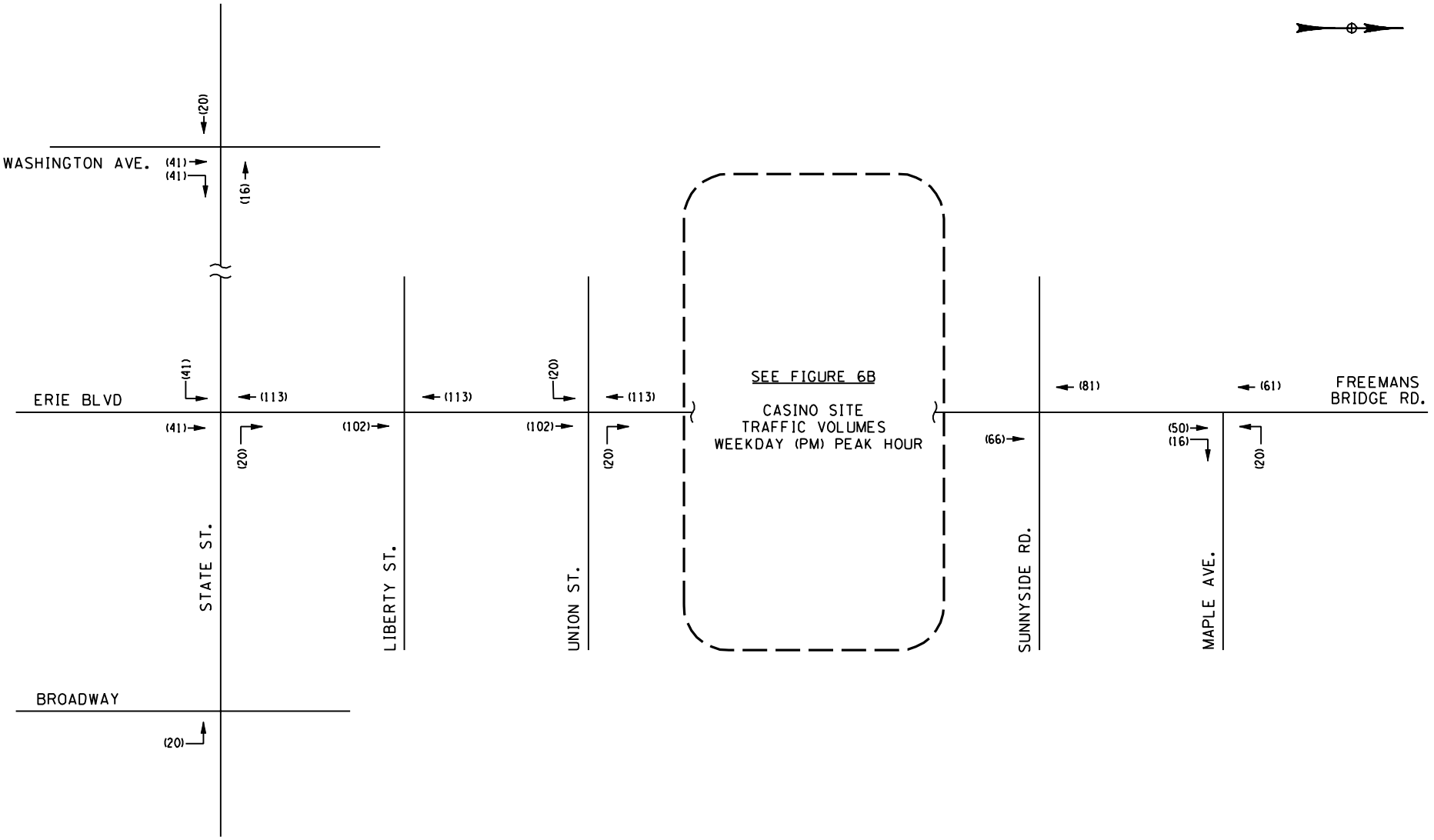

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MOHAWK HARBOR
SCHENECTADY, NEW YORK

CASINO SITE
TRAFFIC VOLUMES
WEEKDAY (PM) PEAK HOUR

DATE: JUNE 2014

Figure
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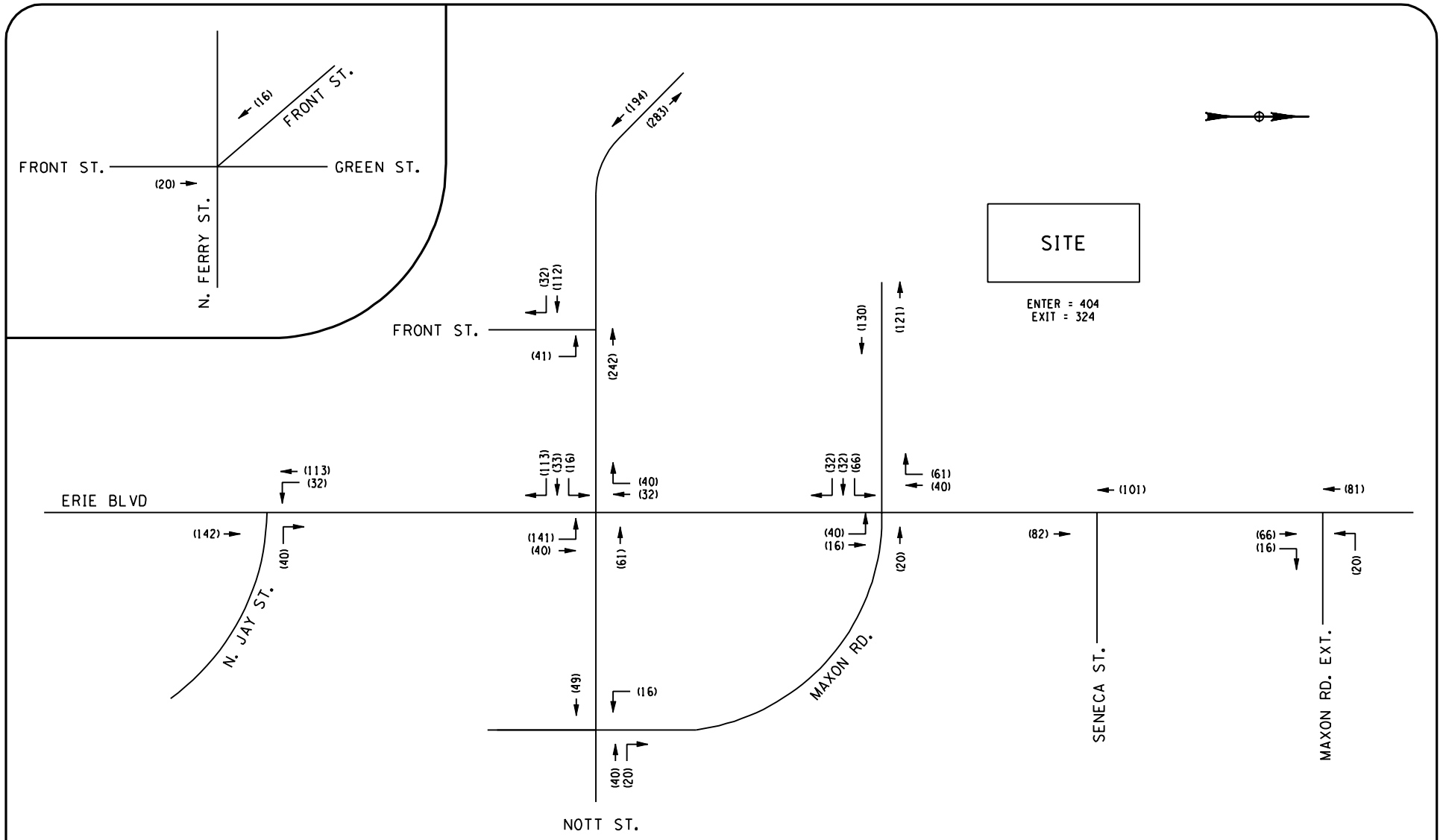

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MOHAWK HARBOR
SCHENECTADY, NEW YORK

CASINO SITE
TRAFFIC VOLUMES
WEEKDAY (PM) PEAK HOUR

DATE: JUNE 2014

Figure
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Project No.
1368.002.001

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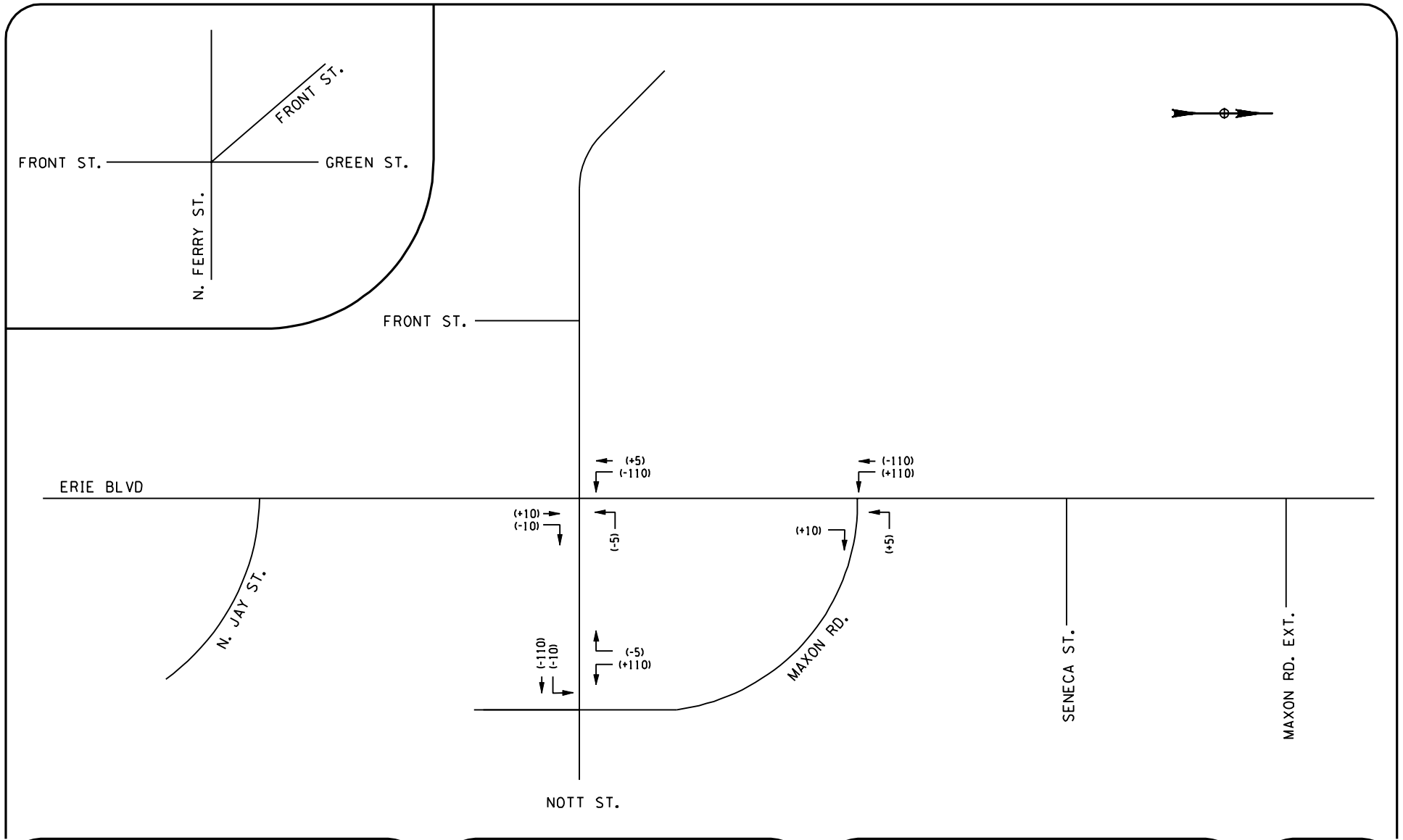

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MOHAWK HARBOR
SCHENECTADY, NEW YORK

MAXON RD. DIVERSIONS
(OPEN TO TWO-WAY)
TRAFFIC VOLUMES
WEEKDAY (PM) PEAK HOUR
DATE: JUNE 2014

Figure
7
Project No.
1368.002.001

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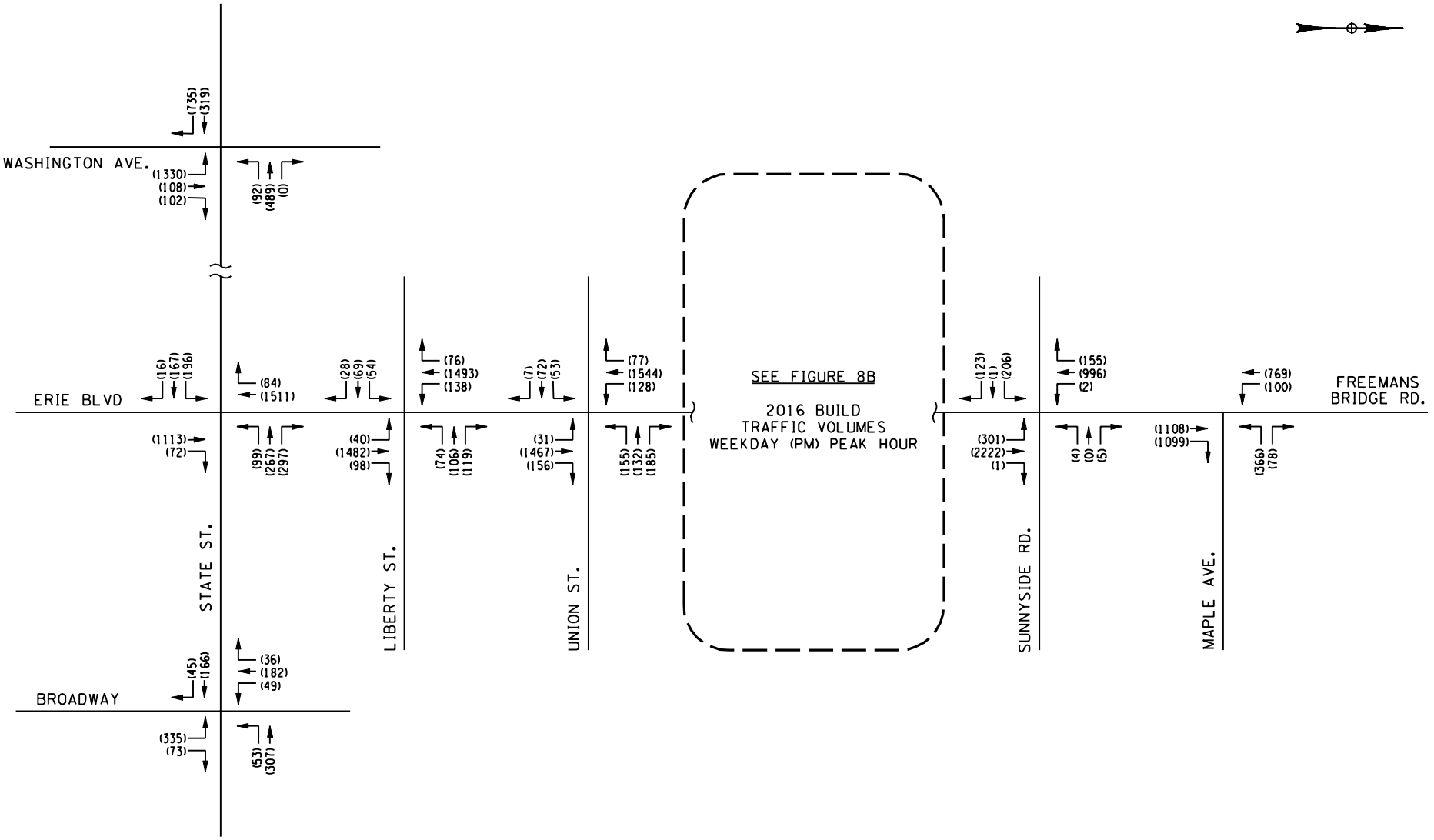

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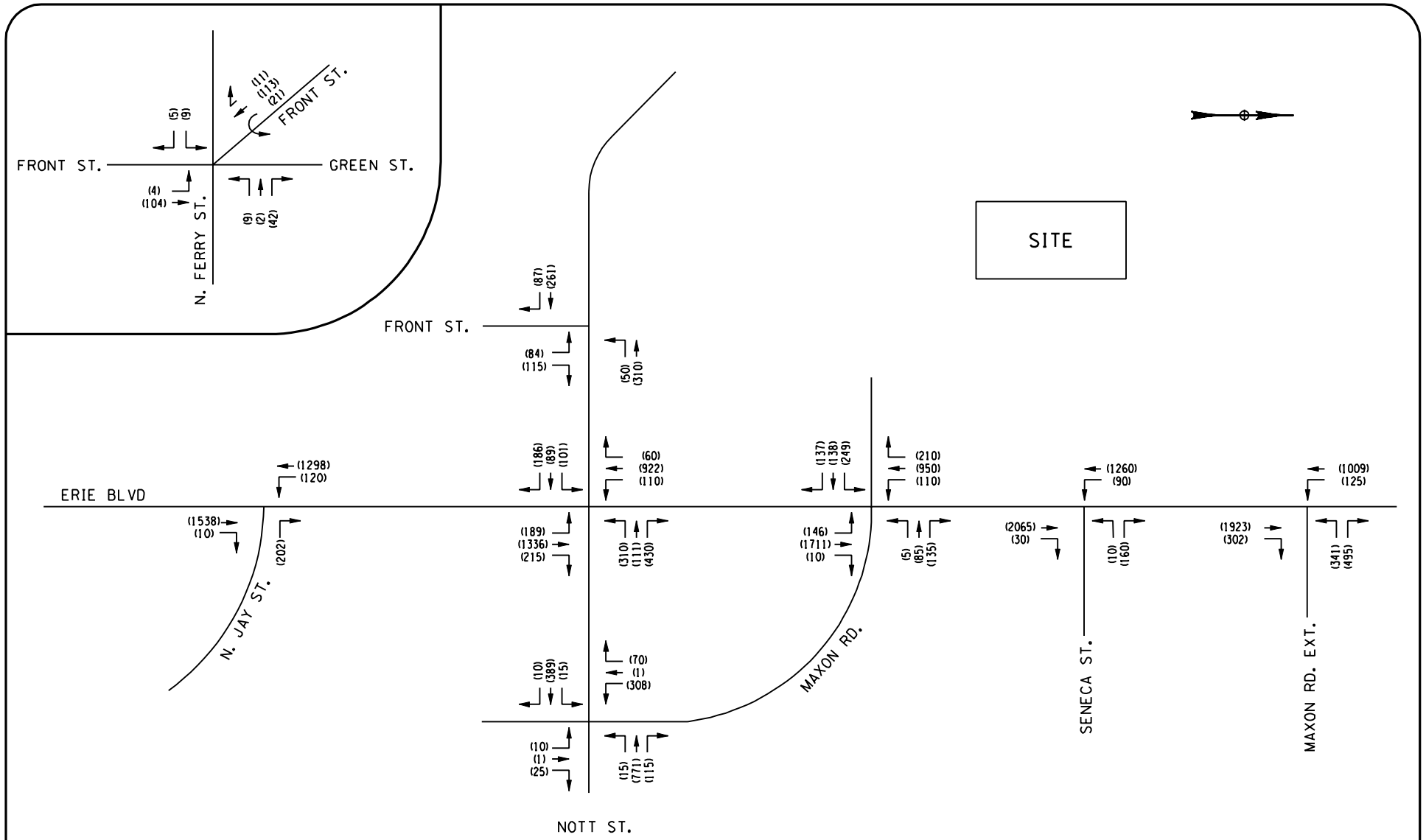
MOHAWK HARBOR
SCHENECTADY, NEW YORK

2016 BUILDTRAFFIC VOLUMES
WEEKDAY (PM) PEAK HOUR

DATE: JUNE 2014

Figure
8A
Project No.
1368.002.001

FILE NAME = I:\mstn projects\1300\1368.002.001\figures\casino\1368002001 Casino 2016 Fig B.dgn



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MOHAWK HARBOR
SCHENECTADY, NEW YORK

2016 BUILD
TRAFFIC VOLUMES
WEEKDAY (PM) PEAK HOUR

DATE: JUNE 2014

Figure
8B

Project No.
1368.002.001

4.0 ANALYSIS

4.1 Sight Distance Evaluation

A sight distance evaluation was completed at the proposed site driveway intersection on Erie Boulevard opposite Maxon Road. The available intersection sight distances were measured from the perspective of a driver exiting the project site looking left and right along Erie Boulevard. In addition, the intersection sight distance looking straight for vehicles traveling northbound on Erie Boulevard making a left-turn onto the project site was also measured. The speed limit on Erie Boulevard is 40 mph so the sight distances measured in the field were compared to the guidelines presented by AASHTO in *A Policy on Geometric Design of Highways and Streets*, 2011, for a 45-mph, multi-lane roadway. The sight distance evaluation is summarized in Table 4.1. The 45 mph speed used in the analysis is appropriate based on running speed trial runs to determine free-flow speed.

Table 4.1 – Sight Distance Summary

Intersection		Intersection Sight Distance (feet)				Stopping Sight Distance (feet)
		Right-Turn from Site Drwy (Looking Left)	Left-Turn from Site Drwy		Left-Turn from Erie Blvd (Looking Straight)	Erie Blvd Southbound
			Looking Left	Looking Right		
Erie Blvd/Site Drwy	Available	500	500	950	575	400
	Recommended	430	565	565	400	360

The results of the analysis indicate that the measured intersection sight distances at the Erie Boulevard /Alco Site Driveway intersection exceed the AASHTO recommended sight distances except for the left-turn movement exiting the site when looking left (i.e., to the north), which is just slightly less than the recommended distance. However, this available sight distance is not critically limited as the minimum stopping sight distance is exceeded as discussed below. The sight distance restriction looking left beyond 500 feet is the chain link fence atop the concrete barrier along the west-side of Erie Boulevard. It is noted that the sight distance measurements take into account removal of overgrown brush at the proposed driveway location. No other intersection sight distance improvements are required at the proposed site driveway location.

The stopping sight distance on Erie Boulevard southbound was also measured along the horizontal curve north of the site driveway from the perspective of a driver being able to see a vehicle stopped at a proposed traffic signal. The stopping sight distance is measured from the perspective of a driver approaching a 2-foot object such as the brake lights of another vehicle. The available stopping sight distance should be of sufficient distance to allow a driver to stop in an emergency.

The results of the stopping sight distance analysis indicate that the available sight distance

is more than recommended traveling southbound on Erie Boulevard. The restrictions preventing a longer sight distance are the horizontal curvature of Erie Boulevard and the fence atop the concrete barrier.

Further, it is noted that this intersection will operate under traffic signal control and the intersection sight distance will only be applicable if the signal operates in its emergency flash mode.

4.2 Signal Warrant Analysis

An analysis was conducted in the January 2014 report for the proposed Erie Boulevard/ Maxon Road/Mohawk Harbor Site Driveway intersection to determine if the traffic volumes would meet the warrants for the installation of a traffic signal after completion of the project. The analysis indicated that a traffic signal is warranted at this intersection and will continue to be warranted for this Casino Alternate. Therefore, it is recommended that this intersection operate under signal control.

4.3 Capacity Analysis

The operating conditions of transportation facilities are evaluated based on the relationship of existing or projected traffic volumes to the theoretical capacity of the highway facility. Various factors affect capacity including traffic volume, travel speed, roadway geometry, grade, number and width of travel lanes and intersection control. The current standards for evaluating capacity and operating conditions are contained in the *2010 Highway Capacity Manual (HCM)*, published by the Transportation Research Board. The procedures describe operating conditions in terms of Level of Service (LOS). In general, "A" represents the best operating condition and "F" represents the worst. Descriptions of LOS and the associated performance measures set forth in the HCM are provided in Appendix D.

To determine the impact of the proposed project on the operations of the adjacent intersections, traffic operations were analyzed for the weekday PM peak hour for the following conditions:

- 2016 No-Build Conditions
- 2016 Build Conditions

The traffic operations within the study area for these conditions are listed in Table 4.2. The computation worksheet summaries are provided in Appendix D. The existing traffic conditions were presented in the January 2010 and January 2014 traffic studies.

As noted in Section 2.2, the data shows that the weekday PM peak hour volumes are higher than the weekday AM peak hour by 25% and are double the volume for the

Saturday PM peak hour. Therefore, detailed analysis for this Casino Alternate was conducted for the weekday PM peak hour, the critical peak hour. For verification, an analysis for the weekday AM peak hour for two key intersections, Erie Boulevard/Nott Street and Erie Boulevard/Maxon Road/Mohawk Harbor Drive was conducted and the results show less delay than the PM peak hour. The results can be found in Appendix D.

Table 4.2 – Level of Service Summary
Weekday PM Peak Hour

Intersection Approach		Control	2016 No-Build	2016 Build	2016 Build w/ Improve-ments
Erie Blvd/Maxon Rd Ext		S			
Erie Blvd NB	T		F (128.4)	F (197.4)	F (76.7)
	TR		F (151.3)	F (225.1)	F (96.0)
Erie Blvd SB	L		C (34.9)	C (34.9)	D (41.5)
	TR		A (6.0)	A (6.6)	A (4.2)
Maxon Rd Ext WB	L		F (81.3)	F (120.0)	D (47.9)
Overall			F (96.8)	F (141.3)	E (59.0)
Erie Blvd/Seneca St		U			
Erie Blvd SB	L		C (23.2)	D (32.5)	D (32.5)
Seneca St WB	LR		F (77.6)	F (156.9)	F (86.1)
Erie Blvd/Maxon Rd		U			
Maxon Rd	R		D (31.9)		
Erie Blvd/Maxon Rd/Harbor Dr		S			
Erie Blvd NB	L			C (20.6)	
	T			D (47.5)	
	TR			D (47.3)	
Erie Blvd SB	L			D (51.1)	
	T			C (24.1)	
	TR			C (24.2)	
Alco Dr EB	L			D (43.2)	
	TR			D (37.3)	
Maxon Rd WB	LT			D (51.9)	
	R			D (49.6)	
Overall				D (38.8)	
Erie Blvd/Nott St		R			
Erie Blvd NB	LT		A (7.4)	B (10.7)	B (10.7)
	TR		A (6.7)	A (8.4)	A (8.4)
Erie Blvd SB	LT		A (8.4)	A (8.8)	A (9.1)
	TR		A (5.1)	A (6.8)	A (7.1)
Nott St EB	LTR		B (10.2)	C (15.3)	B (12.9)
Nott St WB	L		C (16.7)	D (31.4)	C (15.3)
	TR/LT		B (10.2)	F (74.5)	B (12.4)
	/R		---	---	B (11.8)
Overall			A (8.4)	C (19.9)	B (10.1)
Erie Blvd/N Jay St		U			
Erie Blvd SB	L		B (12.5)	C (17.6)	
N Jay St WB	R		C (18.0)	D (33.5)	
Nott St/Maxon Rd		S			
Maxon Rd NB	LTR		D (39.9)	D (38.1)	B (16.1)
Maxon Rd SB	LT/L		D (43.6)	F (402.2)	C (24.4)
	R/TR		C (25.1)	C (35.0)	B (16.7)
Nott St EB	L		B (16.8)	D (39.5)	C (25.7)
	TR		A (3.2)	A (7.4)	A (8.0)
Nott St WB	LTR/LT		B (19.4)	E (64.0)	C (20.0)
Overall			B (16.0)	F (109.4)	B (17.9)
Front St/Harbor Dr		U			
Front St WB	L			A (8.3)	
Front St NB	LR			C (21.8)	
Front St/N Ferry St/Green St		AS			
N Ferry St NB	LTR		A (7.2)	A (7.4)	
N Ferry St SB	LR		A (7.4)	A (7.6)	
Front St EB	LT		A (7.6)	A (7.9)	
Front St WB	LTR		A (7.7)	A (8.1)	

Table 4.2 – Level of Service Summary
Weekday PM Peak Hour
(continued)

Intersection Approach		Control	2016 No-Build	2016 Build	2016 Build w/ Improve-ments
Freemans Br Rd/Maple Ave		S			
FBR NB	T		B (11.6)	B (13.0)	B (11.7)
	R		F (42.8)	F (64.6)	F (42.6)
FBR SB	L		A (9.5)	B (11.2)	B (11.5)
	T		A (4.7)	A (5.1)	A (4.9)
Maple Ave WB	LR		C (23.6)	C (22.3)	C (26.2)
Overall			C (21.9)	C (28.5)	C (21.7)
Freemans Br Rd/Sunnyside Rd		S			
FBR NB	L		B (15.0)	C (26.8)	C (22.8)
	T		C (25.4)	F (44.1)	C (30.5)
	TR		C (24.9)	D (43.5)	C (29.9)
FBR SB	L		C (29.7)	D (37.9)	D (39.2)
	T		B (18.0)	C (22.6)	B (19.0)
	TR		B (18.0)	C (22.7)	B (19.1)
Sunnyside Rd EB	L		D (39.8)	D (44.4)	D (45.3)
	TR		C (25.5)	C (26.1)	C (33.0)
Driveway WB	LTR		C (23.4)	C (23.4)	D (42.1)
Overall			C (23.3)	D (35.9)	C (27.3)
Erie Blvd/Union St		S			
Erie Blvd NB	L		A (6.3)	B (11.4)	B (17.8)
	T		A (2.2)	A (2.5)	A (4.2)
	TR		A (2.3)	A (2.7)	A (4.8)
Erie Blvd SB	L		B (12.3)	B (16.8)	C (21.8)
	T		B (10.6)	B (14.2)	C (21.1)
	TR		B (10.6)	B (14.4)	C (21.6)
Union St EB	L		D (42.2)	D (54.7)	D (41.2)
	TR		C (27.4)	C (27.4)	C (23.6)
Union ST WB	L		D (37.0)	D (37.0)	C (29.7)
	TR		E (74.0)	F (119.9)	D (47.7)
Overall			B (14.0)	B (19.6)	B (17.2)
Erie Blvd/Liberty St		S			
Erie Blvd NB	L		A (6.3)	A (6.5)	A (6.8)
	T		A (4.5)	A (5.5)	B (12.4)
	TR		A (4.5)	A (6.0)	B (13.7)
Erie Blvd SB	L		A (8.1)	A (9.6)	A (9.8)
	T		A (3.1)	A (4.4)	A (5.0)
	TR		A (3.0)	A (4.5)	A (5.2)
Liberty St EB	L		C (32.3)	C (32.3)	C (29.4)
	TR		C (28.9)	C (28.9)	C (26.3)
Liberty St WB	L		C (33.0)	C (33.0)	C (30.0)
	T		C (29.0)	C (29.0)	C (26.4)
Overall			A (6.7)	A (7.6)	B (10.8)
Erie Blvd/State St		S			
Erie Blvd NB	T		B (14.7)	B (15.3)	B (17.6)
	R		A (4.4)	A (4.4)	A (3.9)
Erie Blvd SB	TR		B (12.7)	C (31.5)	D (43.7)
State St EB	L		F (169.6)	F (376.1)	F (155.3)
	TR		D (38.6)	D (38.6)	D (38.0)
State St WB	L		F (110.1)	F (110.1)	E (55.5)
	T		E (56.6)	E (56.6)	E (75.0)
	R		F (89.4)	F (137.5)	C (25.2)
Overall			C (32.7)	E (56.5)	D (41.8)

Table 4.2 – Level of Service Summary
Weekday PM Peak Hour
(continued)

Intersection Approach		Control	2016 No-Build	2016 Build	2016 Build w/ Improve-ments
State St/Broadway		S			
Broadway NB	L		D (45.1)	D (53.1)	
	R		B (11.8)	B (11.8)	
Broadway SB	LTR		D (36.5)	D (36.5)	
State St EB	T		D (52.2)	D (52.2)	
	R		A (4.3)	A (4.3)	
State St WB	L		C (29.5)	C (29.5)	
	TR		D (47.7)	D (47.7)	
	Overall		D (40.6)	D (42.9)	
State St/Washington Ave		S			
Wash Ave NB	L		D (40.7)	D (54.0)	
	LT		D (38.5)	D (51.7)	
	R		A (2.0)	A (1.9)	
State St EB	T		D (40.9)	D (41.4)	
	R		A (0.7)	A (4.1)	
State St WB	L		D (42.4)	D (44.3)	
	TR		B (17.7)	B (17.5)	
	Overall		C (26.2)	C (33.1)	

Key: X (Y.Y) = Level of Service (Delay, seconds per vehicle).
S = Signalized intersection; U = Unsignalized intersection; AS = All-way Stop; R = Roundabout
NB, SB, WB, EB = Northbound, Southbound, Westbound, Eastbound intersection approaches.
LTR = Left-turn, thru, and/or right-turn movements.

The following observations are evident from this analysis:

- Erie Boulevard/Maxon Road Extension – During the No-Build and Build conditions, the overall intersection LOS is F in the PM peak hour with LOS F delays increasing. However, restriping the westbound Maxon Road Extension exclusive right-turn lane to a shared left-turn/right-turn lane to provide two left-turn lanes will significantly reduce intersection delays. Also included is widening the westbound approach for a short slip lane for right-turn traffic. The overall intersection LOS improves from F to E. Figure 9 shows a concept plan for this intersection. No additional right-of-way is needed.

- Erie Boulevard/Seneca Street – The Seneca Street westbound approach operates at LOS F for all conditions. This is the result of left-turns waiting to enter Erie Boulevard southbound. This left-turn movement is restricted weekdays during the afternoon from 3 – 6 p.m. but field observations and traffic counts show that this movement still occurs. Enhanced enforcement during the PM peak hour will improve the operating conditions on this approach.

- Erie Boulevard/Maxon Road/Mohawk Harbor Drive – This intersection is restricted to Maxon Road westbound right-turns only. This movement operates at LOS D in the PM peak hour.

  The construction of a full access roadway to the Mohawk Harbor site directly from Erie Boulevard opposite Maxon Road is recommended to facilitate on-site traffic circulation and to better distribute traffic to the adjacent street network. It will also create a second driveway to the site for emergency access. The location of the site driveway opposite Maxon Road is the approximate mid-point between the signalized intersections of Erie Boulevard/Nott Street and Erie Boulevard/ Maxon Road Extension and it would create uniform spacing between signalized intersections. This access would also reduce the traffic load from the site through the Erie Boulevard/Nott Street intersection.

  It is noted that the highway right-of-way in this area was acquired "Without Access" by New York State when the current Erie Boulevard was constructed. This right-of-way condition will involve agency approvals from both NYSDOT and FHWA for allowing a break-in-access for the Mohawk Harbor driveway.

  This new intersection will also be signalized. A signalized intersection at this location will allow two-way vehicular and pedestrian connectivity between the College Park/Peek Street neighborhood, and the mixed uses of the Mohawk Harbor site. Figure 10 shows a concept plan for this intersection. With this concept, the intersection operates at LOS D for the PM peak hour.

- Erie Boulevard/Nott Street – A separate intersection improvement project is currently underway by the City of Schenectady (NYSDOT PIN 1758.00) to address long-term operations and safety considerations. The preferred improvement, which has been approved by NYSDOT, is to construct a roundabout. This option will significantly improve the operating and safety conditions of the entire intersection resulting in an overall LOS A for the 2016 No-build PM peak hour. This project is in the Design Approval stage with approval expected by the end of July 2014.

  With the project the westbound approach of Nott Street to the roundabout will operate at LOS F and a C for the overall intersection. To mitigate this impact, an additional lane on Nott Street for the westbound approach is needed. Figure 11 shows a concept of the roundabout. The LOS with this mitigation is B with an increase of about two seconds from No-build conditions.

- Erie Boulevard/N. Jay Street – With the construction of a roundabout at Erie Boulevard/Nott Street, the N. Jay Street approach will be restricted to right-turns only. The LOS for this movement will be a D for the PM peak hour.

- Nott Street/Maxon Road – This intersection operates at LOS B for No-build conditions during the PM peak hour and will operate at LOS F for Build conditions. It is recommended that the Maxon Road southbound approach be restriped for an exclusive left-turn lane and a shared thru/right-turn lane. The LOS improves to a B. No roadway widening is needed.

- Nott Street/Front Street/Mohawk Harbor Drive – It is recommended that the Front Street approach be controlled with a Stop sign with the project. This intersection will operate with LOS A for Nott Street left-turns and LOS C for the Front Street approach. No mitigation is recommended.

- Front Street/Green Street/N. Ferry Street – This intersection currently operates at an overall LOS A during the PM peak hour and will continue to operate at this level of service through the 2016 Build condition with no significant changes in delays. No mitigation is recommended.

- Freemans Bridge Road/Maple Avenue – This intersection operates at LOS C for the PM peak hour with a LOS F for the northbound right-turn lane. Delays increase further for this movement under Build conditions. Retiming the signal will reduce delays to No-build conditions. No further mitigation is recommended.

- Freemans Bridge Road/Sunnyside Road – This intersection operates at LOS C for the PM peak hour. With the project, the northbound through movement will be LOS F. Providing a separate left-turn phase for the eastbound Sunnyside Road approach will free up green time for the northbound movement. With this mitigation, the LOS will be C.

- Erie Boulevard/Union Street – This intersection is part of the City's reconstruction project of Erie Boulevard and its signal will be interconnected with that at Liberty Street and State Street. It is anticipated that the intersection will operate at LOS B for No-build conditions with coordination green time heavily favoring the northbound and southbound movements of Erie Boulevard. With the project, the increases in delay to the Union Street westbound through/right-turn lane results in LOS F. Providing more green time to the side streets will improve this movement to D while at the same time still providing good coordination timing for the Erie Boulevard movements.

- Erie Boulevard/Liberty Street – This intersection will operate at LOS A for the PM peak hour for the No-build and Build conditions. With more green time provided to the side streets as recommended for at Union Street, the LOS will be a B with an increase in delay of less than three seconds.

- Erie Boulevard/State Street – This intersection operates at LOS C for No-build conditions and LOS E for Build conditions, although there are several movements that operate at LOS E and F. The exclusive pedestrian phase, when no vehicular movements occur, and No Turn On Red (NTOR) restrictions on all approaches significantly reduce the capacity of the intersection. To improve the LOS for the Build conditions, signal timing changes were noted above to give more green time to the side street, namely State Street at this intersection.

  In addition, replacing the full-time NTOR for the State Street westbound approach with an LED blankout sign for NTOR only during the pedestrian phase is recommended. This will increase the capacity of the westbound right-turn lane such that the LOS will be improved from F in the No-build condition to C in the Build condition. This operation will be similar to that at State Street/Washington Avenue.

- State Street/Broadway – This intersection will operate at LOS D for the No-build and Build conditions. No mitigation is recommended.

- State Street/Washington Avenue – This intersection will operate at LOS C for the No-build and Build conditions. No mitigation is recommended.

In addition to the intersection improvements, it is recommended that the developer work with appropriate governmental jurisdictions to develop an effective way-finding system to locate the project for visitors.

4.4 Pedestrian & Bicycle Activity

The Mohawk Harbor project is a multi-use project that will be inviting to the non-auto user. The layout of the development will be arranged so that complementary land uses are located within close proximity to each other to promote walking and bicycle use, and the Mohawk Hudson Bike Trail will be routed through the site. To encourage pedestrian trips between the site and Union College, adjacent residential/business areas, and downtown uses along State Street, pedestrian signals and crosswalks will be included with intersection improvements. Further, the construction of a roundabout at Erie Boulevard and Nott Street will reduce crossing distances for pedestrians while speeds of vehicles on Erie Boulevard will decrease to negotiate the roundabout.

The *Pedestrian Generator Checklist* provided in the NYSDOT *Highway Design Manual*, which is required for Highway Work Permit projects, has been completed and is included in Appendix E. The checklist shows “Yes” answers to several questions which is an indication of a potential need to accommodate pedestrians. As noted above, improvements to intersections will include pedestrian amenities such as crosswalks and signals where appropriate.

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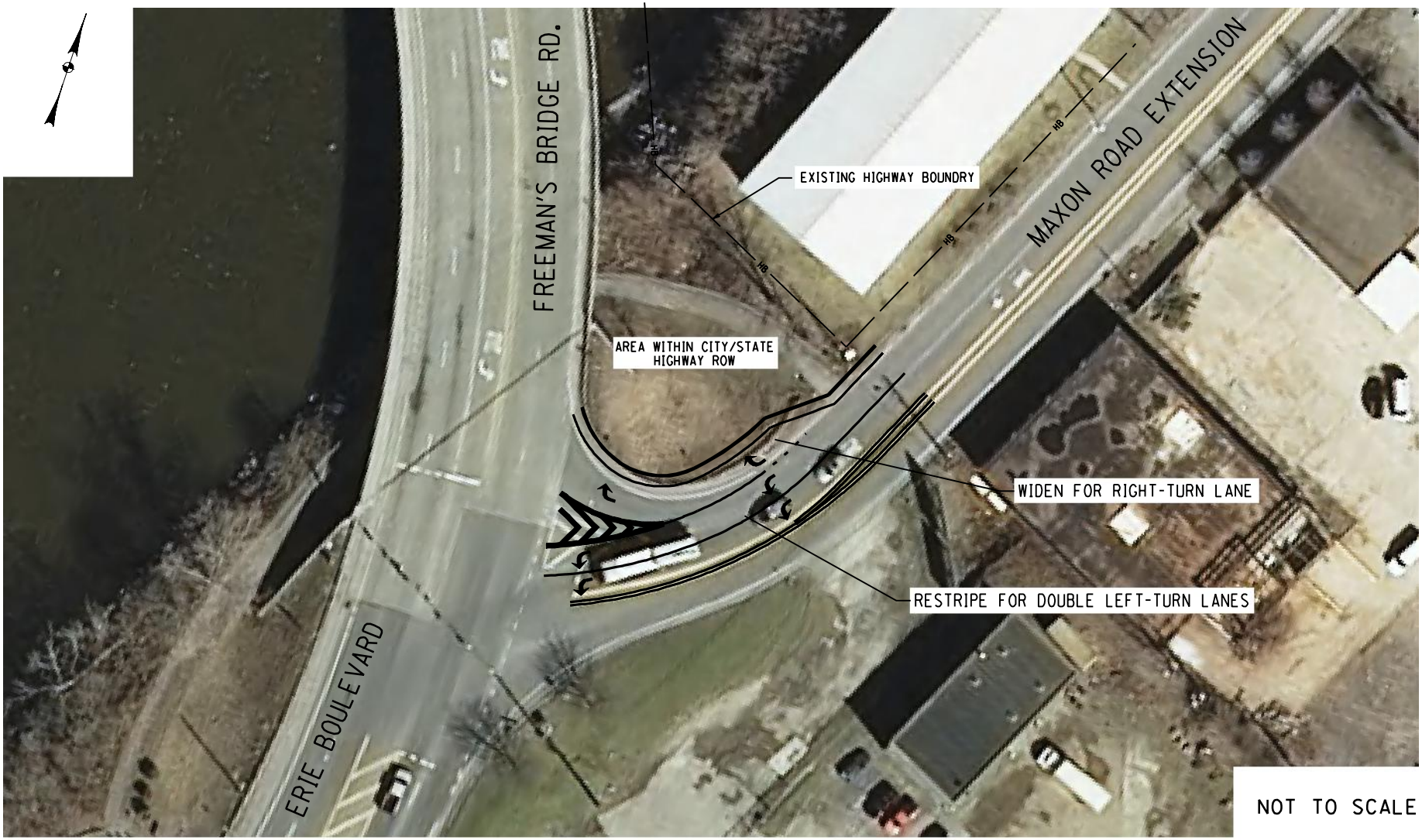

NOT TO SCALE

Barton & Loguidice, D.P.C.

T.R. Johnson Engineering, PLLC
Traffic Engineering & Transportation Planning

MOHAWK HARBOR
SCHENECTADY, NEW YORK

ERIE BOULEVARD AND
MAXON ROAD EXTENSION
INTERSECTION IMPROVEMENTS

DATE: JUNE 2014

Figure
9

Project No.
1368.002.001

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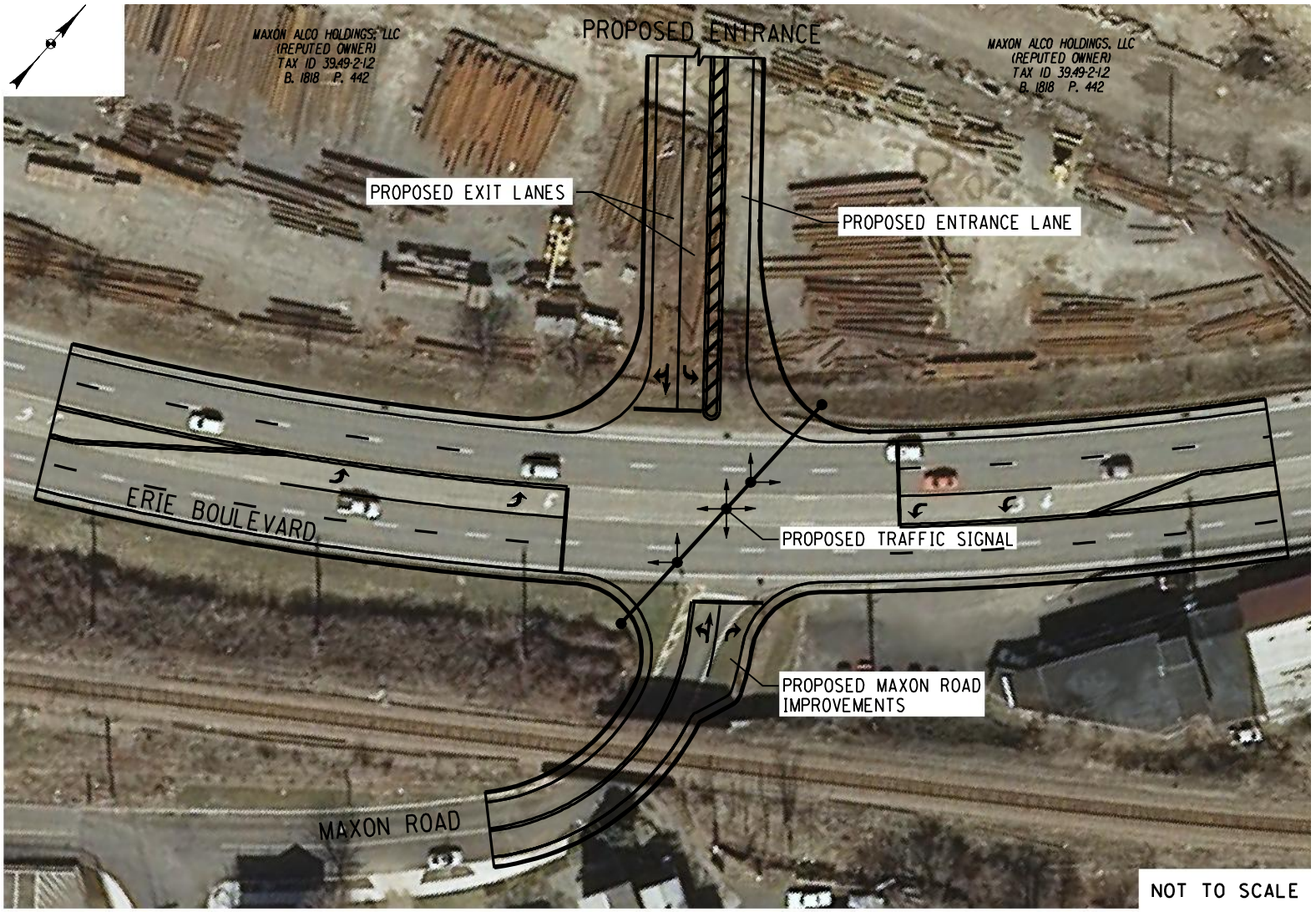

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Traffic Engineering & Transportation Planning

MOHAWK HARBOR
SCHENECTADY, NEW YORK

ERIE BOULEVARD AND
PROPOSED SITE DRIVEWAY

DATE: JUNE 2014

Figure
10

Project No.
1368.002.001

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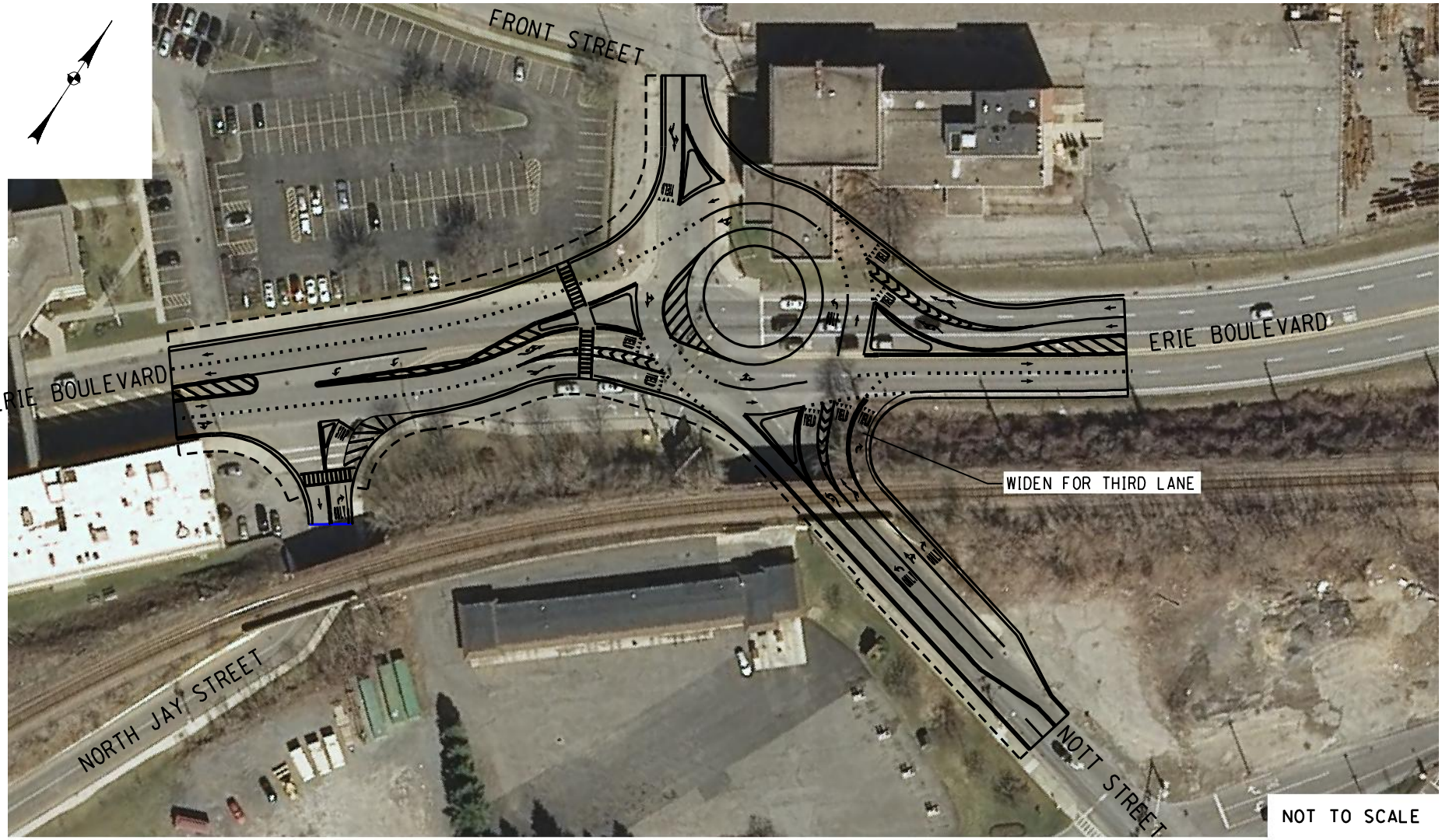

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MOHAWK HARBOR
SCHENECTADY, NEW YORK

ERIE BOULEVARD AND NOTT STREET
ROUNDABOUT MODIFICATIONS

DATE: JUNE 2014

Figure
11

Project No.
1368.002.001

5.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the results of this *Traffic Impact Study Casino Alternate* completed for the proposed Mohawk Harbor project, the following conclusions and recommendations are offered:

1. The proposed Mohawk Harbor development includes an urban mixed-use development consisting of residential, office, retail, light-industrial, and Casino with a Banquet facility and a hotel. For purposes of this report, construction of the project is assumed to be complete by the end of 2016.

2. It is estimated that this site will generate approximately 740 new vehicular trips during the AM peak hour and 1,678 new vehicular trips during the PM peak hour, after considerations of internal trips between uses and trips by other modes (transit, pedestrian, bicycle).

3. The level of service analysis indicates that restriping the Maxon Road Extension approach and widening for a short right-turn lane will mitigate the project's traffic impacts at the intersection of Erie Boulevard/Maxon Road Extension, and the LOS will be an E which is an improvement from F conditions for No-build conditions.

4. The site driveway intersection on Erie Boulevard is expected to operate at an overall LOS D for the PM peak hour. It is recommended that the site driveway be signalized and constructed opposite Maxon Road for uniform spacing between signalized intersections along the corridor. It is also recommended that the Maxon Road turning restrictions be removed to allow all movements through the intersection.

5. The intersection improvement needed at the proposed Erie Boulevard/Nott Street roundabout to mitigate the project's traffic impacts is a third westbound lane on the Nott Street approach. With this additional lane the intersection LOS will be B with all movements at LOS C or better.

6. For the intersection of Nott Street/Maxon Road, restriping the Maxon Road southbound two-lane approach from a left/thru, right-turn lane configuration to a left-turn, thru/right-turn lane will mitigate the project's impacts, resulting in a LOS B.

7. For the intersections of Union Street, Liberty Street, and State Street along Erie Boulevard, signal timing modifications will mitigate the project's impacts. At State Street, it is also recommended to remove the full-time NTOR restriction for the westbound State Street right-turn with a NTOR restriction during the exclusive pedestrian phase. The intersection LOS will be D.

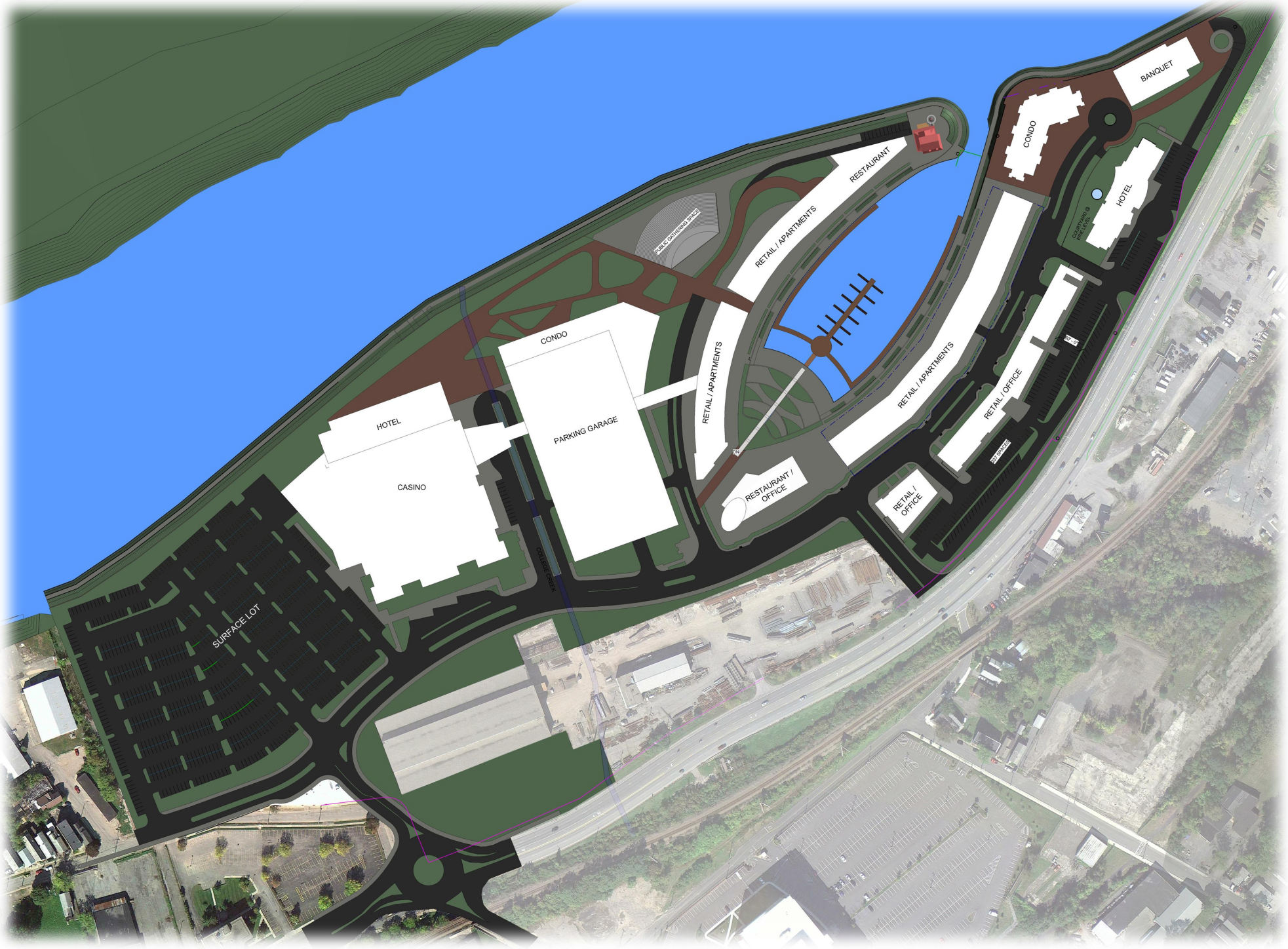
8. Work with appropriate governmental jurisdictions to develop an effective way-finding system.

The proposed Mohawk Harbor project, with the Casino Alternate, will have traffic impacts to the study area intersections; however, increases in delays will be minimized with the improvements noted above and in some cases, operating conditions will be better than those without the project.

The January 2010 study evaluated a land use scenario that consisted of 1,215 trips for the weekday PM peak hour. The January 2014 study evaluated a land use scenario that consisted of 1,350 trips for the weekday PM peak hour. This study, the Casino Alternate, evaluated a land use scenario that consisted of 1,678 trips for the weekday PM peak hour. This reflects a more accurate representation of the program and the number of trips for the northern part of the project at 951 trips, while the Casino, Banquet facility, and 185-room hotel will generate 727 trips. It is noted that the improvements recommended in each study are consistent with each other with only slight modifications.

Appendix A – Conceptual Site Plan

Traffic Impact Study
Mohawk Harbor Redevelopment
City of Schenectady, New York



MOHAWK HARBOR CASINO

SCHENECTADY, NY

MASTER PLAN CON

Appendix B – Traffic Count Data

Traffic Impact Study
Mohawk Harbor Redevelopment
City of Schenectady, New York

Default Comments
Change These in The Preferences Window

Barton & Loguidice
10 Airline Drive - Suite 200
Albany, New York 12205
(518) 218-1801

File Name : Maple Avenue_PM
Site Code : 11223344
Start Date : 5/14/2014

Groups Printed- Unshifted - Bank 1 - Bank 2

	Freemans Bridge Road From North					Maple Avenue From East					Freemans Bridge Road From South					Maple Avenue From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
04:00 PM	2	172	37	0	211	23	4	103	0	130	164	202	0	0	366	0	5	0	0	5	712
04:15 PM	0	169	23	0	192	20	0	67	0	87	185	250	0	1	436	0	0	0	0	0	715
04:30 PM	0	150	24	0	174	21	0	74	1	96	234	235	0	2	471	0	0	0	0	0	741
04:45 PM	0	149	29	0	178	19	0	80	0	99	222	248	0	0	470	0	0	0	0	0	747
Total	2	640	113	0	755	83	4	324	1	412	805	935	0	3	1743	0	5	0	0	5	2915
05:00 PM	0	180	27	0	207	15	0	70	0	85	285	235	0	0	520	0	0	0	0	0	812
05:15 PM	0	165	20	0	185	23	0	79	0	102	290	261	0	0	551	0	0	0	0	0	838
05:30 PM	0	112	25	0	137	21	0	65	0	86	225	231	0	0	456	0	0	0	0	0	679
05:45 PM	0	134	28	0	162	13	0	63	0	76	150	189	0	0	339	0	0	0	0	0	577
Total	0	591	100	0	691	72	0	277	0	349	950	916	0	0	1866	0	0	0	0	0	2906
Grand Total	2	1231	213	0	1446	155	4	601	1	761	1755	1851	0	3	3609	0	5	0	0	5	5821
Apprch %	0.1	85.1	14.7	0.0		20.4	0.5	79.0	0.1		48.6	51.3	0.0	0.1		0.0	100.0	0.0	0.0		
Total %	0.0	21.1	3.7	0.0	24.8	2.7	0.1	10.3	0.0	13.1	30.1	31.8	0.0	0.1	62.0	0.0	0.1	0.0	0.0	0.1	

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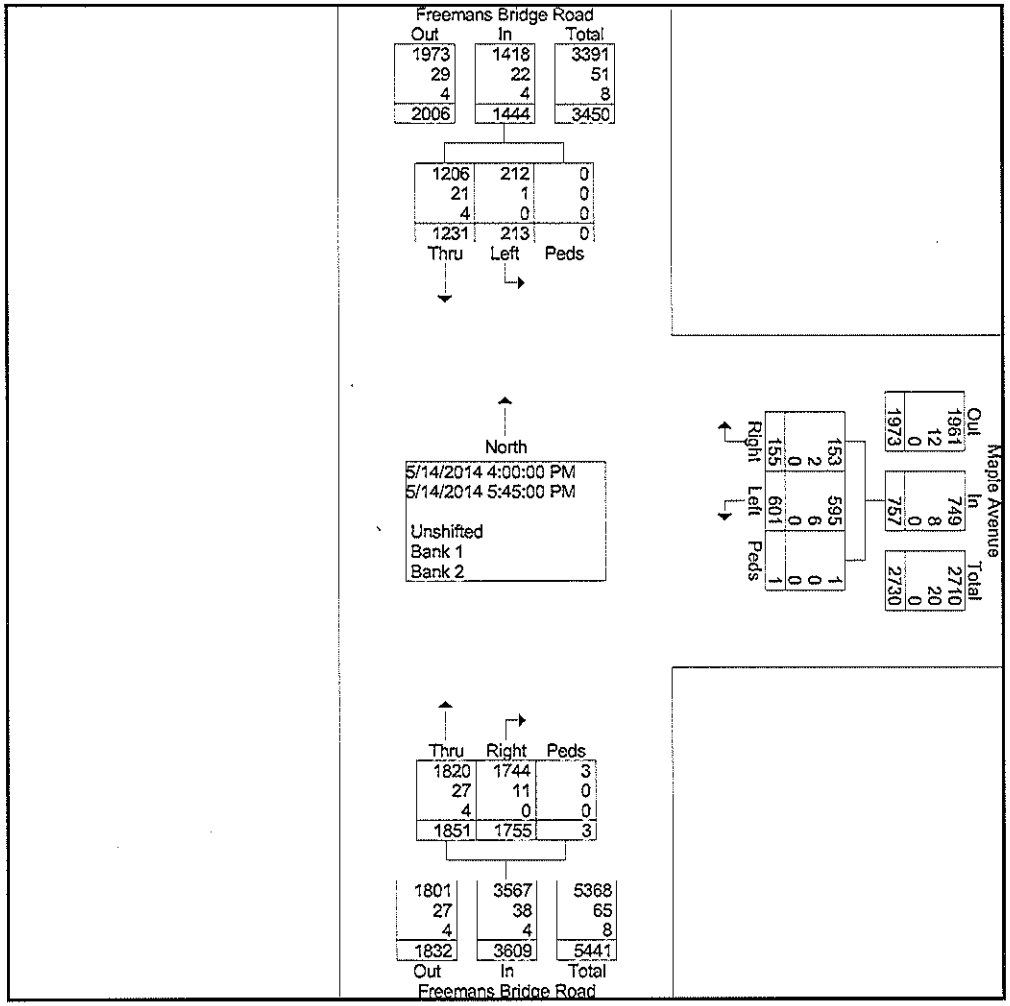

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File Name : Broadway at State_PM
Site Code : 44444444
Start Date : 5/14/2014
Page No : 1

Groups Printed- Unshifted - Bank 1 - Bank 2

	Broadway From North					State Street From East					Broadway From South					State Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
04:00 PM	12	43	16	5	76	0	70	12	6	88	27	0	72	5	104	17	49	0	16	82	350
04:15 PM	8	51	8	7	74	0	68	10	16	94	8	0	69	4	81	18	71	0	10	99	348
04:30 PM	7	50	16	1	74	0	76	17	14	107	8	0	64	10	82	10	41	0	17	68	331
04:45 PM	16	37	10	2	65	0	64	8	15	87	18	0	71	1	90	19	50	0	13	82	324
Total	43	181	50	15	289	0	278	47	51	376	61	0	276	20	357	64	211	0	56	331	1353
05:00 PM	14	47	19	9	89	0	85	13	11	109	18	0	80	15	113	14	46	0	13	73	384
05:15 PM	9	52	13	1	75	3	79	11	19	112	20	0	74	8	102	9	45	0	15	69	358
05:30 PM	8	43	8	2	61	0	67	15	14	96	18	0	82	12	112	6	39	0	15	60	329
05:45 PM	5	40	9	10	64	0	76	14	15	105	17	0	58	13	88	16	36	0	25	77	334
Total	36	182	49	22	289	3	307	53	59	422	73	0	294	48	415	45	166	0	68	279	1405
Grand Total	79	363	99	37	578	3	585	100	110	798	134	0	570	68	772	109	377	0	124	610	2758
Apprch %	13.7	62.8	17.1	6.4		0.4	73.3	12.5	13.8		17.4	0	73.8	8.8		17.9	61.8	0	20.3		
Total %	2.9	13.2	3.6	1.3	21	0.1	21.2	3.6	4	28.9	4.9	0	20.7	2.5	28	4	13.7	0	4.5	22.1	
Unshifted	78	355	98	37	568	3	557	98	110	768	127	0	560	68	755	106	353	0	124	583	2674
% Unshifted	98.7	97.8	99	100	98.3	100	95.2	98	100	96.2	94.8	0	98.2	100	97.8	97.2	93.6	0	100	95.6	97
Bank 1	1	8	1	0	10	0	27	2	0	29	7	0	9	0	16	3	24	0	0	27	82
% Bank 1	1.3	2.2	1	0	1.7	0	4.6	2	0	3.6	5.2	0	1.6	0	2.1	2.8	6.4	0	0	4.4	3
Bank 2	0	0	0	0	0	0	1	0	0	1	0	0	1	0	1	0	0	0	0	0	2
% Bank 2	0	0	0	0	0	0	0.2	0	0	0.1	0	0	0.2	0	0.1	0	0	0	0	0	0.1

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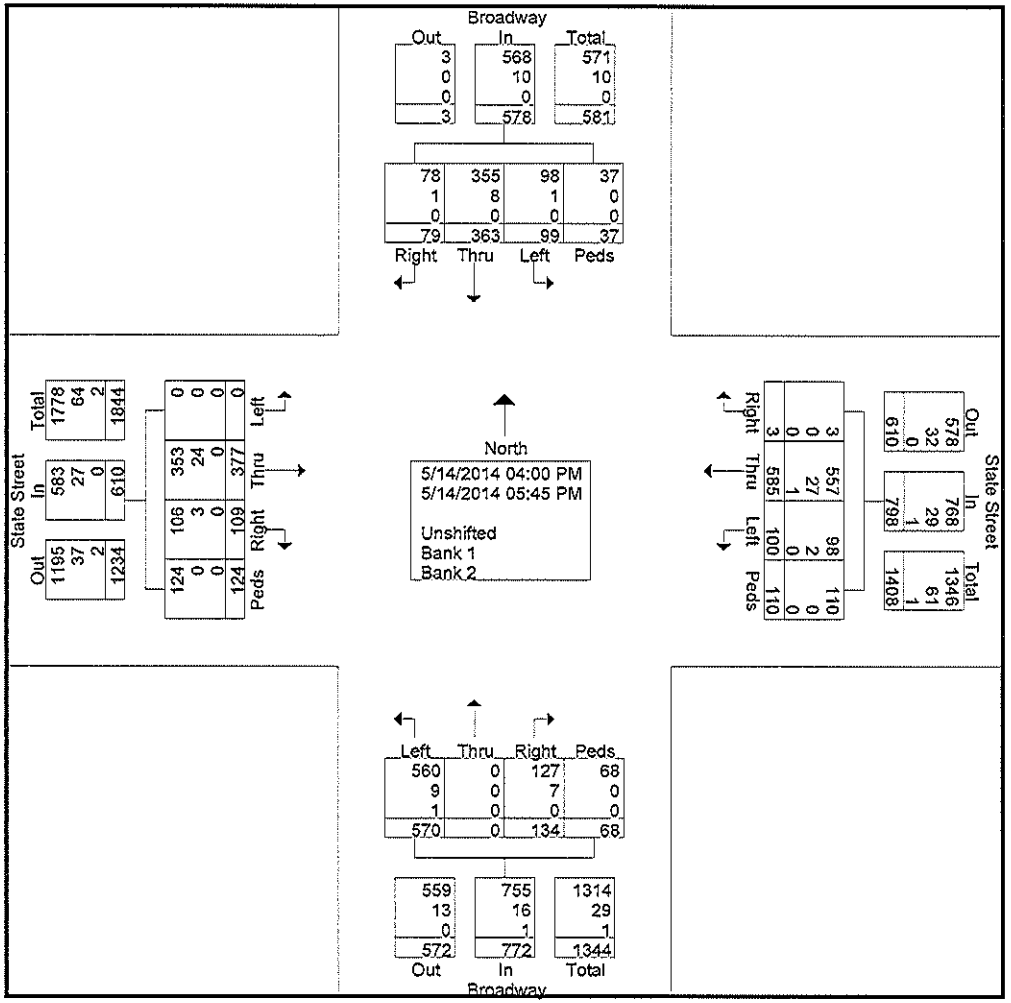

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File Name : Washington at State_LFH_PM
Site Code : 00000001
Start Date : 5/14/2014
Page No : 1

Groups Printed- Unshifted - Bank 1 - Bank 2

	Washington Avenue From North					State Street From East					Washington Avenue From South					State Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Left	Left	Peds	App. Total	Right	Thru	Illegal Left	Right	App. Total	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	147	161	0	308	109	72	1	62	244	552
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	127	148	0	275	101	85	0	62	248	523
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	155	161	0	316	83	77	2	71	233	549
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	168	177	0	345	100	61	2	71	234	579
Total	0	0	0	0	0	0	0	0	0	0	0	597	647	0	1244	393	295	5	266	959	2203
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	149	158	0	307	115	75	4	82	276	583
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	156	151	0	307	95	76	1	89	261	568
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	177	194	0	371	109	66	1	74	250	621
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	162	174	0	336	83	50	1	70	204	540
Total	0	0	0	0	0	0	0	0	0	0	0	644	677	0	1321	402	267	7	315	991	2312
Grand Total	0	0	0	0	0	0	0	0	0	0	0	1241	1324	0	2565	795	562	12	581	1950	4515
Apprch %	0	0	0	0		0	0	0	0		0	48.4	51.6	0		40.8	28.8	0.6	29.8		
Total %	0	0	0	0	0	0	0	0	0	0	0	27.5	29.3	0	56.8	17.6	12.4	0.3	12.9	43.2	
Unshifted	0	0	0	0	0	0	0	0	0	0	0	1222	1298	0	2520	771	544	11	570	1896	4416
% Unshifted	0	0	0	0	0	0	0	0	0	0	0	98.5	98	0	98.2	97	96.8	91.7	98.1	97.2	97.8
Bank 1	0	0	0	0	0	0	0	0	0	0	0	14	25	0	39	20	16	1	8	45	84
% Bank 1	0	0	0	0	0	0	0	0	0	0	0	1.1	1.9	0	1.5	2.5	2.8	8.3	1.4	2.3	1.9
Bank 2	0	0	0	0	0	0	0	0	0	0	0	5	1	0	6	4	2	0	3	9	15
% Bank 2	0	0	0	0	0	0	0	0	0	0	0	0.4	0.1	0	0.2	0.5	0.4	0	0.5	0.5	0.3

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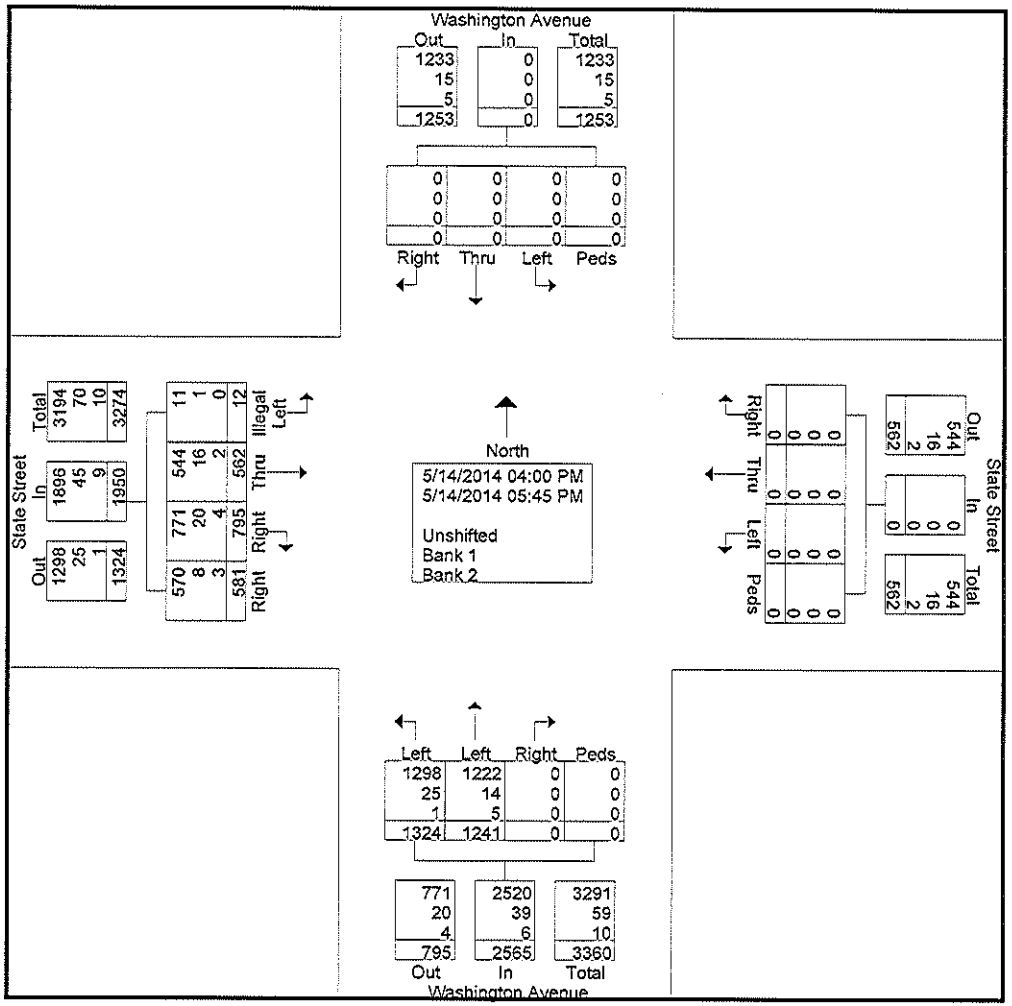

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Groups Printed- Unshifted - Bank 1 - Bank 2

	Washington From North					State Street From East					Washington From South					State Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
04:00 PM	0	0	0	0	0	43	49	26	4	122	17	11	0	15	43	0	0	0	0	0	165
04:15 PM	0	0	0	0	0	52	61	15	4	132	16	8	0	15	39	0	0	0	0	0	171
04:30 PM	0	0	0	0	0	59	65	18	5	147	23	4	0	14	41	0	0	0	0	0	188
04:45 PM	0	0	0	0	0	39	48	27	4	118	18	15	0	14	47	0	0	0	0	0	165
Total	0	0	0	0	0	193	223	86	17	519	74	38	0	58	170	0	0	0	0	0	689
05:00 PM	0	0	0	0	0	46	79	14	8	147	15	9	0	8	32	0	0	0	0	0	179
05:15 PM	0	0	0	0	0	59	66	22	3	150	9	6	0	12	27	0	0	0	0	0	177
05:30 PM	0	0	0	0	0	53	57	29	3	142	19	16	0	19	54	0	0	0	0	0	196
05:45 PM	0	0	0	0	0	44	37	13	4	98	23	10	0	7	40	0	0	0	0	0	138
Total	0	0	0	0	0	202	239	78	18	537	66	41	0	46	153	0	0	0	0	0	690
Grand Total	0	0	0	0	0	395	462	164	35	1056	140	79	0	104	323	0	0	0	0	0	1379
Apprch %	0.0	0.0	0.0	0.0		37.4	43.8	15.5	3.3		43.3	24.5	0.0	32.2		0.0	0.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	28.6	33.5	11.9	2.5	76.6	10.2	5.7	0.0	7.5	23.4	0.0	0.0	0.0	0.0	0.0	

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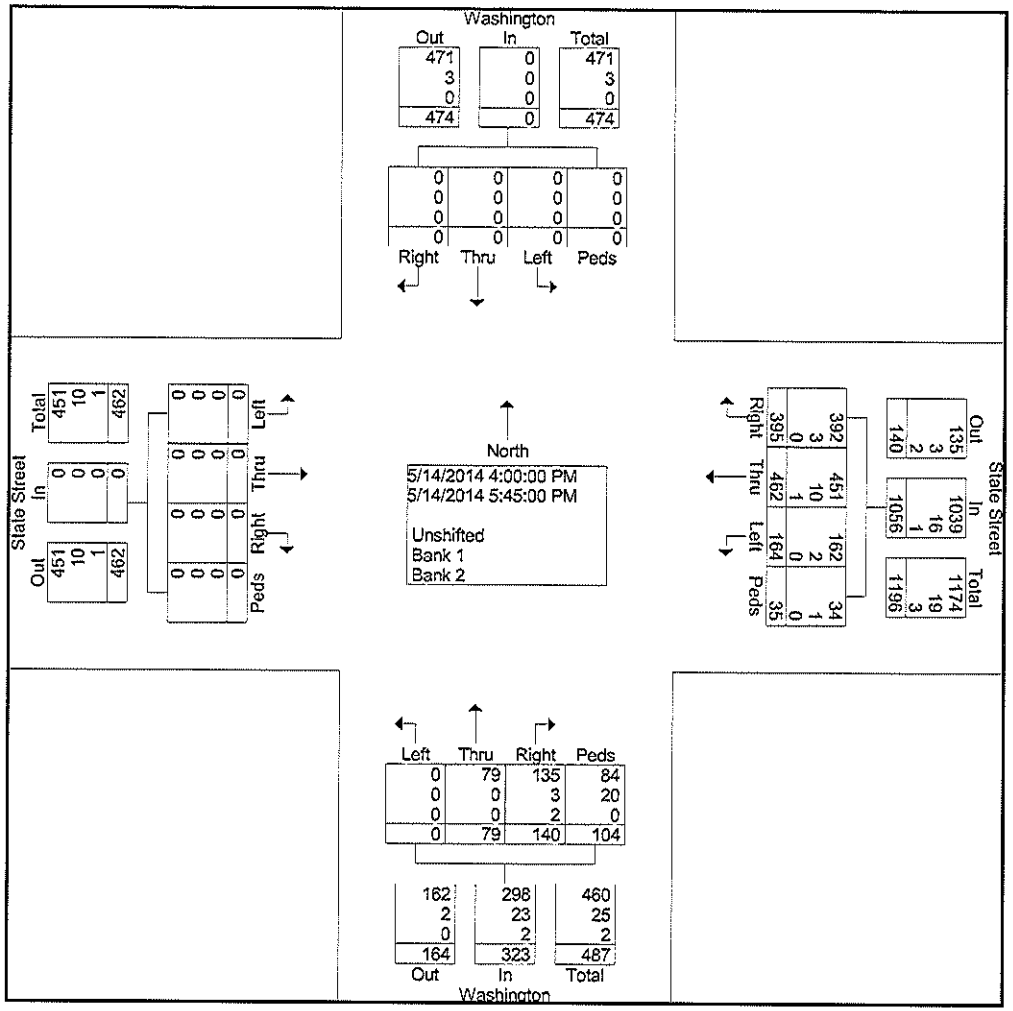


Appendix C – Internal Trip Capture Calculations

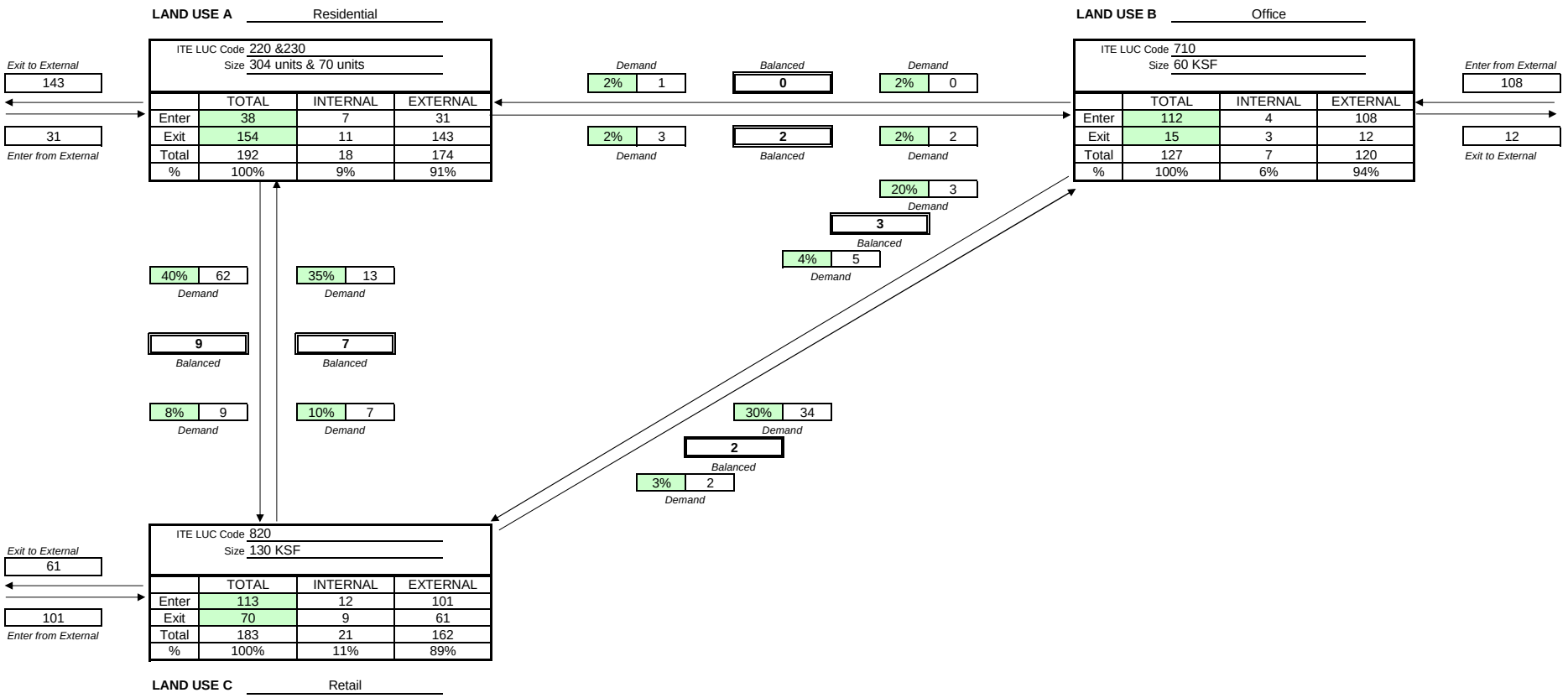
Traffic Impact Study
Mohawk Harbor Redevelopment
City of Schenectady, New York

MULTI-USE DEVELOPMENT
TRIP GENERATION & INTERNAL CAPTURE SUMMARY

Analyst: TRJohnson
Date: 26-May-14

TRJE Project Number: 001-13-004
Project Name: Mohawk Harbor
Location: Schenectady

TIME PERIOD: AM Peak Hour



Net External Trips for Multi-Use Development

	LAND USE A	LAND USE B	LAND USE C	TOTAL	
Enter	31	108	101	240	
Exit	143	12	61	216	
Total	174	120	162	456	**INTERNAL CAPTURE**
Single-Use Trip Gen. Est.	192	127	183	502	**9%**

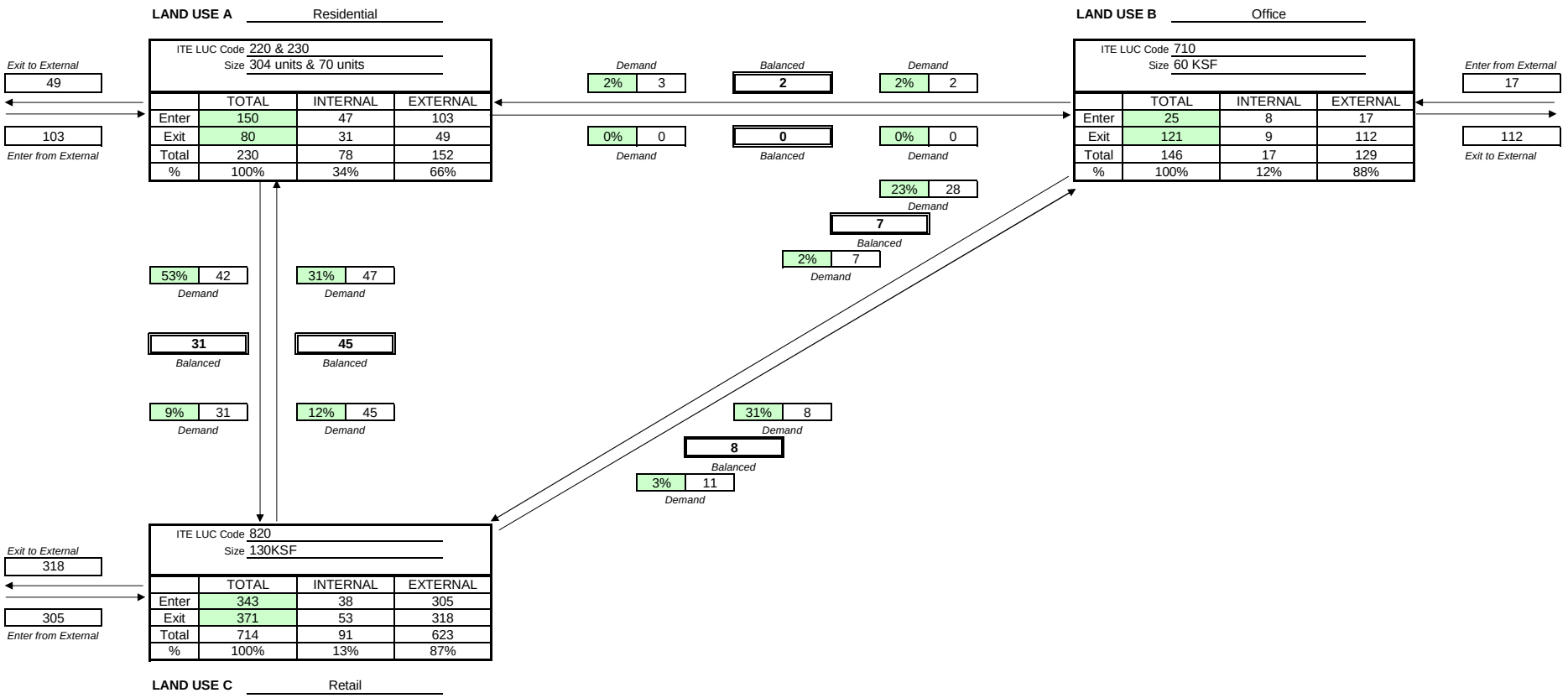
Based on ITE *Trip Generation Handbook,* 2nd Edition, 2004

MULTI-USE DEVELOPMENT
TRIP GENERATION & INTERNAL CAPTURE SUMMARY

Analyst: TRJohnson
Date: 26-May-14

TRJE Project Number: 001-13-004
Project Name: Alco Redevelopment
Location: Schenectady

TIME PERIOD: PM Peak Hour



Net External Trips for Multi-Use Development

	LAND USE A	LAND USE B	LAND USE C	TOTAL	
Enter	103	17	305	425	
Exit	49	112	318	479	
Total	152	129	623	904	**INTERNAL CAPTURE**
Single-Use Trip Gen. Est.	230	146	714	1,090	**17%**

Based on ITE *Trip Generation Handbook,* 2nd Edition, 2004

Appendix D - Level of Service Analysis

Traffic Impact Study
Mohawk Harbor Redevelopment
City of Schenectady, New York

Traffic: Performance Measures

Introduction

The HCM 2010 Highway Capacity Manual[1] and the *Synchro 8 Software*[2] procedures document the methodology used for modeling levels of service, average vehicle delay, and volume -to-capacity ratios at both signalized and unsignalized intersections. Level of service is a measure of the operational quality of an intersection; level of service A is the highest, most efficient level, and level of service F is the lowest level. The operational quality of an intersection for the automobile mode is based on the average amount of time a vehicle is delayed. Levels of service are examined by 'lane group', the set of lanes allowing common movement(s) on an approach. Approaches to intersections are assigned primary directions for clarity as depicted on the traffic volume figures.

The *Synchro 8 Software* modeled results are applied to peak hour periods only. During off peak periods, which is the majority of the time, drivers typically will find operations better than the modeled peak hour results. During peak periods the experience of individual drivers can vary, because the model calculates average delay.

Level of Service Criteria Signalized Intersections

When analyzing activity at signalized intersections, an understanding of the definition of level of service for the Automobile mode is essential:

Automobile Mode

Level of service can be characterized for the entire intersection, each intersection approach, and each lane group. Control delay alone is used to characterize level of service for the entire intersection or an approach. Control delay and volume-to-capacity ratio are used to characterize level of service for a lane group. Delay quantifies the increase in travel time due to traffic signal control. It is also a surrogate measure to driver discomfort and fuel consumption. The volume-to-capacity ratio quantifies the degree to which a phase's capacity is utilized by a lane group. The following paragraphs describe each level of service.

Level of service A describes operations with a control delay of 10 seconds per vehicle or less and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when the volume-to-capacity ratio is low and either progression is exceptionally favorable or the cycle length is very short. If it is due to favorable progression, most vehicles arrive during the green indication and travel through the intersection without stopping.

Level of service B describes operations with control delay between 10 and 20 seconds per vehicle and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when the volume-to-capacity ratio is low and either progression is highly favorable or the cycle length is short. More vehicles stop than with Level of service A.

Level of service C describes operations with control delay between 20 and 35 seconds per vehicle and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when progression is favorable or the cycle length is moderate. Individual cycle failures (i.e., one or more queued vehicles are not able to depart as a result of depart as a result of insufficient capacity during the cycle) may begin to appear at this level. The number of

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[1] Transportation Research Board of the National Academies, HCM 2010 Highway Capacity Manual, Washington D.C., 2010.

[2] Synchro 8, Computer software, Trafficware, Sugar Land, Texas, 2011, revised 2012.

vehicles stopping is significant, although many vehicles still pass through the intersection without stopping.

Level of service D describes operations with control delay between 35 and 55 seconds per vehicle and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when the volume-to-capacity ratio is higher and either progression is ineffective or the cycle length is long. Many vehicles stop and individual cycle failures are noticeable.

Level of service E describes operations with control delay between 55 and 80 seconds per vehicle and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when the volume-to-capacity ratio is high, progression is unfavorable, and the cycle length is long. Individual cycle failures are frequent.

Level of service F describes operations with control delay exceeding 80 seconds per vehicle or a volume-to-capacity ratio greater than 1.0. This level is typically assigned when the volume-to-capacity ratio is very high, progression is very poor, and the cycle length is long. Most cycles fail to clear the queue.

A lane group can incur a delay less than 80 seconds per vehicle when the volume-to-capacity ratio exceeds 1.0. This condition typically occurs when the cycle length is short, the signal progression is favorable, or both. As a result, both the delay and volume-to-capacity ratio are considered when lane group level of service is established. A ratio of 1.0 or more indicates that cycle capacity is fully utilized and represents failure from a capacity perspective (just as delay in excess of 80 seconds per vehicle represents failure from a delay perspective).

Exhibit 18-4 lists the level of service thresholds established for the automobile mode at a signalized intersection.[3]

Signalized Intersections Level of Service Criteria Automobile Mode For Lane Groups		
Average Control Delay (Seconds Per Vehicle)	Volume-to-capacity Ratio less than or equal to one **Level of Service**	Volume-to-capacity Ratio greater than one **Level of Service**
less than or equal to 10	A	F
greater than 10 and less than or equal to 20	B	F
greater than 20 and less than or equal to 35	C	F
greater than 35 and less than or equal to 55	D	F
greater than 55 and less than or equal to 80	E	F
greater than 80	F	F

[1] From Transportation Research Board of the National Academies, HCM 2010 Highway Capacity Manual, Washington D.C., Volume 3 page 18-6, Exhibit 18-4, 2010. Abbreviations and mathematical symbols have been replaced for reader clarity. Table limited to lane groups (lane or group of lanes sharing a common movement)

[3] From Transportation Research Board of the National Academies, HCM 2010 Highway Capacity Manual, Washington D.C., Volume 3 page 18-6, 2010. Abbreviations and mathematical symbols replaced for reader clarity.

In some cases, it may be necessary to accept level of service E or F on individual lane groups due to unreasonable costs or impacts associated with improving the level of service.[4]

Level of Service Criteria for Two-way STOP-Controlled intersections

The Highway Capacity Manual[5] describes the level of service criteria as:

Level of service for two way stop controlled intersections is determined by the computed or measure control delay. For motor vehicles, level of service is determined for each minor-street movement (or shared movement) as well as major-street left turns by using criteria given in Exhibit 19-1 . Level of service is not defined for the intersection as a whole or for the major street-street approaches for three primary reasons: (a) major-street through vehicles are assumed to experience zero delay; (b) the disproportionate number of major-street through vehicles at a typical two way stopped controlled intersection skews the weighted average of all movements, resulting in a very low overall average delay for all vehicles; and (c) the resulting low delay can mask important level of service deficiencies for minor movements. As Exhibit 19-1 notes, level of service is assigned to the movements if the volume-to-capacity ratio for the movement exceeds 1.0, regardless of the control delay.

The level of service criteria for two-way stop-controlled intersections are somewhat different from the criteria used in Chapter 18 for signalized intersections, primarily because user perceptions differ among transportation facility types. the expectation is that a signalized intersection is designed to carry higher traffic volumes and will present greater delay than unsignalized intersection. Unsignalized intersections are also associated with more uncertainty for users, as delays are less predictable than they are at signals, which can reduce user's delay tolerance.

The Highway Capacity Manual[6] includes the following concerning level of service F at two-way stop-controlled intersection lane groups:

Level of service F occurs when there are not enough gaps of suitable size to allow minor street vehicles to enter or cross through traffic on the major-street, resulting in long average control delays (greater than 50 seconds per vehicle). Depending on the demand on the approach, long queues on the minor approaches may result....

Level of service F may also appear in the form of drivers on the minor street selecting smaller-than-usual gaps...

Even with a level of service F estimate, most low-volume minor-street approaches would not meet any of the Manual on Uniform Traffic Control Devices volume or delay warrants for signalization...

---

[4] From NYS DOT, Highway Design Manual, Revision 62, April 13, 2011, (page 5-103) with abbreviations replaced for reader clarity.

[5] From Transportation Research Board of the National Academies, HCM 2010 Highway Capacity Manual, Washington D.C., Volume 3 page 19-1 and 19-2, 2010. Abbreviations and mathematical symbols have been replaced for reader clarity.

[6] From Transportation Research Board of the National Academies, HCM 2010 Highway Capacity Manual, Washington D.C., Volume 3 page 19-40, 2010. Abbreviations and mathematical symbols have been replaced for reader clarity.

In some cases, the delay equations predict delays greater than 50 seconds for miinor -street movements under very low volumes conditions on the minor street (fewer than 25 vehicles per hour). On the basis of the first term of the delay equation, the level of service F threshold is reached with a movement capacity of approximately 85 vehicles per hour or less, regardless of the minor-street movement volume.

Two-Way Stop Controlled (Unsignalized) Intersections Level of Service Criteria Automobile Mode For Lane Groups		
Average Control Delay (Seconds Per Vehicle)	Volume-to-capacity Ratio less than or equal to one **Level of Service**	Volume-to-capacity Ratio greater than one **Level of Service**
less than or equal to 10	A	F
greater than 10 and less than or equal to 15	B	F
greater than 15 and less than or equal to 25	C	F
greater than 25 and less than or equal to 35	D	F
greater than 35 and less than or equal to 50	E	F
greater than 50	F	F
Modified from Transportation Research Board of the National Academies, HCM 2010 Highway Capacity Manual, Washington D.C., Volume 3 page 19-2, Exhibit 19-1, 2010. Abbreviations and mathematical symbols have been replaced for reader clarity. Level of service is not calculated for major street approaches or for the intersection as a whole. Major Street through vehicles are assumed to experience no delay.		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	300	495	1700	260	125	800
Number	3	18	2	12	1	6
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1827	1881	1874	1900	1863	1881
Adj Flow Rate, veh/h	319	0	1809	277	133	851
Adj No. of Lanes	1	1	2	0	1	2
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	4	1	1	1	2	1
Cap, veh/h	331	305	1480	221	406	2553
Arrive On Green	0.19	0.00	0.48	0.48	0.19	0.71
Sat Flow, veh/h	1740	1599	3202	464	1774	3668
Grp Volume(v), veh/h	319	0	1016	1070	133	851
Grp Sat Flow(s),veh/h/ln	1740	1599	1780	1792	1774	1787
Q Serve(g_s), s	19.1	0.0	50.0	50.0	2.5	9.4
Cycle Q Clear(g_c), s	19.1	0.0	50.0	50.0	2.5	9.4
Prop In Lane	1.00	1.00		0.26	1.00	
Lane Grp Cap(c), veh/h	331	305	848	853	406	2553
V/C Ratio(X)	0.96	0.00	1.20	1.25	0.33	0.33
Avail Cap(c_a), veh/h	331	305	848	853	406	2553
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.1	0.0	27.5	27.5	34.8	5.6
Incr Delay (d2), s/veh	39.1	0.0	100.9	123.8	0.2	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.7	0.0	48.2	54.0	3.2	4.7
LnGrp Delay(d),s/veh	81.3	0.0	128.4	151.3	34.9	6.0
LnGrp LOS	F		F	F	C	A
Approach Vol, veh/h	319		2086			984
Approach Delay, s/veh	81.3		140.1			9.9
Approach LOS	F		F			A

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	25.0	55.0				80.0		25.0
Change Period (Y+Rc), s	5.0	5.0				5.0		5.0
Max Green Setting (Gmax), s	20.0	50.0				75.0		20.0
Max Q Clear Time (g_c+I1), s	4.5	52.0				11.4		21.1
Green Ext Time (p_c), s	7.4	0.0				12.2		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	96.8
HCM 2010 LOS	F

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	341	495	1923	302	125	1009
Number	3	18	2	12	1	6
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1827	1881	1874	1900	1863	1881
Adj Flow Rate, veh/h	363	0	2046	321	133	1073
Adj No. of Lanes	1	1	2	0	1	2
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	4	1	1	1	2	1
Cap, veh/h	331	305	1475	225	406	2553
Arrive On Green	0.19	0.00	0.48	0.48	0.19	0.71
Sat Flow, veh/h	1740	1599	3190	473	1774	3668
Grp Volume(v), veh/h	363	0	1153	1214	133	1073
Grp Sat Flow(s),veh/h/ln	1740	1599	1780	1790	1774	1787
Q Serve(g_s), s	20.0	0.0	50.0	50.0	2.5	12.9
Cycle Q Clear(g_c), s	20.0	0.0	50.0	50.0	2.5	12.9
Prop In Lane	1.00	1.00		0.26	1.00	
Lane Grp Cap(c), veh/h	331	305	848	852	406	2553
V/C Ratio(X)	1.10	0.00	1.36	1.42	0.33	0.42
Avail Cap(c_a), veh/h	331	305	848	852	406	2553
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.5	0.0	27.5	27.5	34.8	6.1
Incr Delay (d2), s/veh	77.5	0.0	169.9	197.6	0.2	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	16.7	0.0	64.5	71.4	3.2	6.4
LnGrp Delay(d),s/veh	120.0	0.0	197.4	225.1	34.9	6.6
LnGrp LOS	F		F	F	C	A
Approach Vol, veh/h	363		2367			1206
Approach Delay, s/veh	120.0		211.6			9.8
Approach LOS	F		F			A

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	25.0	55.0				80.0		25.0
Change Period (Y+Rc), s	5.0	5.0				5.0		5.0
Max Green Setting (Gmax), s	20.0	50.0				75.0		20.0
Max Q Clear Time (g_c+I1), s	4.5	52.0				14.9		22.0
Green Ext Time (p_c), s	9.3	0.0				17.5		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	141.3
HCM 2010 LOS	F

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	341	495	1923	302	125	1009
Number	3	18	2	12	1	6
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1827	1881	1874	1900	1863	1881
Adj Flow Rate, veh/h	363	0	2046	321	133	1073
Adj No. of Lanes	2	1	2	0	1	2
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	4	1	1	1	2	1
Cap, veh/h	437	207	1845	282	310	2784
Arrive On Green	0.13	0.00	0.60	0.60	0.14	0.78
Sat Flow, veh/h	3375	1599	3190	473	1774	3668
Grp Volume(v), veh/h	363	0	1153	1214	133	1073
Grp Sat Flow(s),veh/h/ln	1688	1599	1780	1790	1774	1787
Q Serve(g_s), s	11.4	0.0	65.0	65.0	3.2	10.3
Cycle Q Clear(g_c), s	11.4	0.0	65.0	65.0	3.2	10.3
Prop In Lane	1.00	1.00		0.26	1.00	
Lane Grp Cap(c), veh/h	437	207	1060	1066	310	2784
V/C Ratio(X)	0.83	0.00	1.09	1.14	0.43	0.39
Avail Cap(c_a), veh/h	1083	513	1060	1066	310	2784
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	46.3	0.0	22.1	22.1	41.2	3.8
Incr Delay (d2), s/veh	1.6	0.0	54.6	73.9	0.4	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.4	0.0	47.6	53.6	3.6	5.2
LnGrp Delay(d),s/veh	47.9	0.0	76.7	96.0	41.5	4.2
LnGrp LOS	D		F	F	D	A
Approach Vol, veh/h	363		2367			1206
Approach Delay, s/veh	47.9		86.6			8.3
Approach LOS	D		F			A

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	20.0	70.0				90.0		19.1
Change Period (Y+Rc), s	5.0	5.0				5.0		5.0
Max Green Setting (Gmax), s	15.0	65.0				85.0		35.0
Max Q Clear Time (g_c+I1), s	5.2	67.0				12.3		13.4
Green Ext Time (p_c), s	6.5	0.0				18.1		0.7

Intersection Summary	
HCM 2010 Ctrl Delay	59.0
HCM 2010 LOS	E

Intersection	
Int Delay, s/veh	4.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	10	160	1800	30	90	1010
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	10	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	1	1	0	0	1
Mvmt Flow	11	174	1957	33	98	1098

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2718	995	0	0	1989	0
Stage 1	1973	-	-	-	-	-
Stage 2	745	-	-	-	-	-
Critical Hdwy	6.8	6.92	-	-	4.1	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.31	-	-	2.2	-
Pot Cap-1 Maneuver	17	245	-	-	294	-
Stage 1	96	-	-	-	-	-
Stage 2	435	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	11	245	-	-	294	-
Mov Cap-2 Maneuver	70	-	-	-	-	-
Stage 1	96	-	-	-	-	-
Stage 2	290	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	77.6	0	1.9
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	- 214	294	-
HCM Lane V/C Ratio	-	- 0.863	0.333	-
HCM Control Delay (s)	-	- 77.6	23.2	-
HCM Lane LOS	-	- F	C	-
HCM 95th %tile Q(veh)	-	- 6.7	1.4	-

Intersection	
Int Delay, s/veh	8.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	10	160	2065	30	90	1260
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	10	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	1	1	0	0	1
Mvmt Flow	11	174	2245	33	98	1370

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	3141	1139	0	0	2277	0
Stage 1	2261	-	-	-	-	-
Stage 2	880	-	-	-	-	-
Critical Hdwy	6.8	6.92	-	-	4.1	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.31	-	-	2.2	-
Pot Cap-1 Maneuver	~ 9	197	-	-	227	-
Stage 1	67	-	-	-	-	-
Stage 2	371	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 5	197	-	-	227	-
Mov Cap-2 Maneuver	48	-	-	-	-	-
Stage 1	67	-	-	-	-	-
Stage 2	211	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	156.9	0	2.2
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	167	227	-
HCM Lane V/C Ratio	-	-	1.106	0.431	-
HCM Control Delay (s)	-	-	156.9	32.4	-
HCM Lane LOS	-	-	F	D	-
HCM 95th %tile Q(veh)	-	-	9.5	2	-

Notes

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

Intersection	
Int Delay, s/veh	4.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	0	160	2065	30	90	1260
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	10	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	1	1	0	0	1
Mvmt Flow	0	174	2245	33	98	1370

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	3141	1139	0	0	2277	0
Stage 1	2261	-	-	-	-	-
Stage 2	880	-	-	-	-	-
Critical Hdwy	6.8	6.92	-	-	4.1	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.31	-	-	2.2	-
Pot Cap-1 Maneuver	9	197	-	-	227	-
Stage 1	67	-	-	-	-	-
Stage 2	371	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	5	197	-	-	227	-
Mov Cap-2 Maneuver	48	-	-	-	-	-
Stage 1	67	-	-	-	-	-
Stage 2	211	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	86.1	0	2.2
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	197	227	-
HCM Lane V/C Ratio	-	-	0.883	0.431	-
HCM Control Delay (s)	-	-	86.1	32.4	-
HCM Lane LOS	-	-	F	D	-
HCM 95th %tile Q(veh)	-	-	6.8	2	-

Intersection	
Int Delay, s/veh	1.5

Movement	NBT	NBR	SBL	SBT	NWL	NWR
Vol, veh/h	1695	0	0	1020	0	135
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	1	0	0	1	0	0
Mvmt Flow	1842	0	0	1109	0	147

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1842	0	2396	921
Stage 1	-	-	-	-	1842	-
Stage 2	-	-	-	-	554	-
Critical Hdwy	-	-	4.1	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	335	-	29	276
Stage 1	-	-	-	-	114	-
Stage 2	-	-	-	-	545	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	335	-	29	276
Mov Cap-2 Maneuver	-	-	-	-	29	-
Stage 1	-	-	-	-	114	-
Stage 2	-	-	-	-	545	-

Approach	NB	SB	NW
HCM Control Delay, s	0	0	31.9
HCM LOS			D

Minor Lane/Major Mvmt	NBT	NBR	NWLn1	SBL	SBT
Capacity (veh/h)	-	-	276	335	-
HCM Lane V/C Ratio	-	-	0.532	-	-
HCM Control Delay (s)	-	-	31.9	0	-
HCM Lane LOS	-	-	D	A	-
HCM 95th %tile Q(veh)	-	-	2.9	0	-

HCM 2010 Signalized Intersection Summary
1: Erie Blvd & Maxon Rd/Alco Dr

6/10/2014

Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (veh/h)	146	1711	10	110	950	210	249	138	137	5	85	135
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1881	1900	1900	1885	1900	1863	1881	1900	1900	1900	1900
Adj Flow Rate, veh/h	159	1860	11	120	1033	228	271	150	149	5	92	147
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	0	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	1	1	0	1	1	2	0	0	0	0	0
Cap, veh/h	277	1932	11	153	1513	333	394	261	259	35	209	259
Arrive On Green	0.06	0.53	0.53	0.05	0.52	0.52	0.15	0.30	0.30	0.11	0.11	0.11
Sat Flow, veh/h	1810	3643	22	1810	2919	642	1774	867	862	34	1841	1615
Grp Volume(v), veh/h	159	912	959	120	632	629	271	0	299	97	0	147
Grp Sat Flow(s),veh/h/ln	1810	1787	1877	1810	1790	1771	1774	0	1729	1875	0	1615
Q Serve(g_s), s	5.0	60.1	60.3	3.8	32.3	32.6	16.0	0.0	17.9	0.0	0.0	10.3
Cycle Q Clear(g_c), s	5.0	60.1	60.3	3.8	32.3	32.6	16.0	0.0	17.9	5.9	0.0	10.3
Prop In Lane	1.00		0.01	1.00		0.36	1.00		0.50	0.05		1.00
Lane Grp Cap(c), veh/h	277	948	996	153	928	918	394	0	521	244	0	259
V/C Ratio(X)	0.57	0.96	0.96	0.79	0.68	0.68	0.69	0.00	0.57	0.40	0.00	0.57
Avail Cap(c_a), veh/h	363	975	1024	157	928	918	394	0	591	319	0	325
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	18.8	27.6	27.7	28.8	22.0	22.1	38.3	0.0	36.3	50.8	0.0	47.6
Incr Delay (d2), s/veh	1.9	19.9	19.6	22.3	2.0	2.1	5.0	0.0	1.0	1.0	0.0	2.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	34.6	36.3	3.0	16.3	16.4	8.3	0.0	8.7	3.1	0.0	4.8
LnGrp Delay(d),s/veh	20.6	47.5	47.3	51.1	24.1	24.2	43.2	0.0	37.3	51.9	0.0	49.6
LnGrp LOS	C	D	D	D	C	C	D		D	D		D
Approach Vol, veh/h		2030			1381			570			244	
Approach Delay, s/veh		45.3			26.5			40.1			50.5	
Approach LOS		D			C			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.7	70.1		42.0	12.2	68.7	23.0	19.0
Change Period (Y+Rc), s	5.0	5.0		5.0	5.0	5.0	5.0	5.0
Max Green Setting (Gmax), s	6.0	67.0		42.0	13.0	60.0	18.0	19.0
Max Q Clear Time (g_c+I1), s	5.8	62.3		19.9	7.0	34.6	18.0	12.3
Green Ext Time (p_c), s	0.0	2.9		3.0	0.2	23.1	0.0	1.7

Intersection Summary	
HCM 2010 Ctrl Delay	38.8
HCM 2010 LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

LANE SUMMARY

Site: Erie-Nott

2016 PM No-Build
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Erie Blvd													
Lane 1	663	2.0	1034	0.641	100	7.4	LOS A	5.9	42.0	Full	500	0.0	0.0
Lane 2[d]	759	1.4	1183	0.641	100	6.7	LOS A	6.0	42.5	Full	500	0.0	0.0
Approach	1421	1.7		0.641		7.0	LOS A	6.0	42.5				
East: Nott St													
Lane 1	332	1.0	556	0.597	100	16.7	LOS C	3.9	27.3	Full	120	0.0	0.0
Lane 2[d]	484	1.0	739	0.655	100	10.2	LOS B	5.1	36.1	Full	120	0.0	0.0
Approach	816	1.0		0.655		12.8	LOS B	5.1	36.1				
North: Erie Blvd													
Lane 1	505	1.5	1033	0.488	100	8.4	LOS A	3.2	22.9	Full	500	0.0	0.0
Lane 2[d]	569	2.0	1165	0.488	100	5.1	LOS A	3.3	23.7	Full	500	0.0	0.0
Approach	1074	1.8		0.488		6.6	LOS A	3.3	23.7				
West: Front St													
Lane 1[d]	142	0.0	581	0.244	100	10.2	LOS B	1.2	8.1	Full	45	0.0	0.0
Approach	142	0.0		0.244		10.2	LOS B	1.2	8.1				
Intersection	3453	1.5		0.655		8.4	LOS A	6.0	42.5				

Level of Service (LOS) Method: Delay (HCM 2000).
Roundabout LOS Method: Same as Sign Control.
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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

LANE SUMMARY

Site: Alco Redevelopment

2016 PM Build
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Erie Blvd													
Lane 1	857	1.5	1048	0.817	100	10.7	LOS B	11.2	79.2	Full	500	0.0	0.0
Lane 2[d]	975	1.5	1193	0.817	100	8.4	LOS A	11.3	80.1	Full	500	0.0	0.0
Approach	1832	1.5		0.817		9.5	LOS A	11.3	80.1				
East: Nott St													
Lane 1	326	1.0	387	0.842	100	31.4	LOS D	7.2	50.9	Full	120	0.0	0.0
Lane 2[d]	569	1.0	551	1.033	100	74.5	LOS F	29.9	210.8	Full	120	0.0	25.5
Approach	896	1.0		1.033		58.8	LOS F	29.9	210.8				
North: Erie Blvd													
Lane 1	528	1.8	853	0.618	100	8.8	LOS A	4.3	30.6	Full	500	0.0	0.0
Lane 2[d]	622	2.0	1006	0.618	100	6.8	LOS A	4.5	31.9	Full	500	0.0	0.0
Approach	1149	1.9		0.618		7.7	LOS A	4.5	31.9				
West: Nott St													
Lane 1[d]	396	0.8	540	0.733	100	15.3	LOS C	5.7	40.3	Full	45	0.0	1.8
Approach	396	0.8		0.733		15.3	LOS C	5.7	40.3				
Intersection	4273	1.4		1.033		19.9	LOS C	29.9	210.8				

Level of Service (LOS) Method: Delay (HCM 2000).
Roundabout LOS Method: Same as Sign Control.
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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

LANE SUMMARY

Site: Alco Redevelopment

2016 PM Build IMP1
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Erie Blvd													
Lane 1	857	1.5	1050	0.816	100	10.7	LOS B	11.1	78.5	Full	500	0.0	0.0
Lane 2[d]	975	1.5	1195	0.816	100	8.4	LOS A	11.2	79.4	Full	500	0.0	0.0
Approach	1832	1.5		0.816		9.5	LOS A	11.2	79.4				
East: Nott St													
Lane 1	222	1.0	525	0.422	100	15.3	LOS C	2.6	18.4	Full	120	0.0	0.0
Lane 2	222	1.0	525	0.422	100	12.4	LOS B	2.6	18.4	Full	120	0.0	0.0
Lane 3[d]	453	1.0	733	0.617	100	11.8	LOS B	5.5	39.0	Full	120	0.0	0.0
Approach	896	1.0		0.617		12.8	LOS B	5.5	39.0				
North: Erie Blvd													
Lane 1	528	1.8	852	0.620	100	9.1	LOS A	4.5	32.0	Full	500	0.0	0.0
Lane 2[d]	622	2.0	1003	0.620	100	7.1	LOS A	4.7	33.4	Full	500	0.0	0.0
Approach	1149	1.9		0.620		8.0	LOS A	4.7	33.4				
West: Nott St													
Lane 1[d]	396	0.8	570	0.694	100	12.9	LOS B	4.9	34.4	Full	45	0.0	0.0
Approach	396	0.8		0.694		12.9	LOS B	4.9	34.4				
Intersection	4273	1.4		0.816		10.1	LOS B	11.2	79.4				

Level of Service (LOS) Method: Delay (HCM 2000).
Roundabout LOS Method: Same as Sign Control.
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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Intersection	
Int Delay, s/veh	1

Movement	NWL	NWR	NET	NER	SWL	SWT
Vol, veh/h	0	120	1290	10	35	1080
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	30	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	0	0	3	0	0	6
Mvmt Flow	0	125	1344	10	36	1125

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1984	677	0	0	1354	0
Stage 1	1349	-	-	-	-	-
Stage 2	635	-	-	-	-	-
Critical Hdwy	6.8	6.9	-	-	4.1	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	55	400	-	-	515	-
Stage 1	210	-	-	-	-	-
Stage 2	496	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	51	400	-	-	515	-
Mov Cap-2 Maneuver	51	-	-	-	-	-
Stage 1	210	-	-	-	-	-
Stage 2	461	-	-	-	-	-

Approach	NW	NE	SW
HCM Control Delay, s	18	0	0.4
HCM LOS	C		

Minor Lane/Major Mvmt	NET	NER	NWLn1	SWL	SWT
Capacity (veh/h)	-	-	400	515	-
HCM Lane V/C Ratio	-	-	0.313	0.071	-
HCM Control Delay (s)	-	-	18	12.5	-
HCM Lane LOS	-	-	C	B	-
HCM 95th %tile Q(veh)	-	-	1.3	0.2	-

Intersection	
Int Delay, s/veh	2.8

Movement	NWL	NWR	NET	NER	SWL	SWT
Vol, veh/h	0	202	1538	10	120	1298
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	30	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	0	0	3	0	0	6
Mvmt Flow	0	210	1602	10	125	1352

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2533	806	0	0	1613	0
Stage 1	1607	-	-	-	-	-
Stage 2	926	-	-	-	-	-
Critical Hdwy	6.8	6.9	-	-	4.1	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	23	329	-	-	410	-
Stage 1	153	-	-	-	-	-
Stage 2	351	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	16	329	-	-	410	-
Mov Cap-2 Maneuver	16	-	-	-	-	-
Stage 1	153	-	-	-	-	-
Stage 2	244	-	-	-	-	-

Approach	NW	NE	SW
HCM Control Delay, s	33.5	0	1.5
HCM LOS	D		

Minor Lane/Major Mvmt	NET	NER	NWLn1	SWL	SWT
Capacity (veh/h)	-	-	329	410	-
HCM Lane V/C Ratio	-	-	0.64	0.305	-
HCM Control Delay (s)	-	-	33.5	17.6	-
HCM Lane LOS	-	-	D	C	-
HCM 95th %tile Q(veh)	-	-	4.2	1.3	-

HCM 2010 Signalized Intersection Summary
16: Maxon Rd & Nott St

6/10/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	25	440	10	15	690	30	10	1	25	60	1	75
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1882	1900	1900	1882	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	27	473	11	16	742	32	11	1	27	65	1	81
Adj No. of Lanes	1	1	0	0	1	0	0	1	0	0	1	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	1	1	1	1	1	0	0	0	0	0	0
Cap, veh/h	577	1463	34	47	1010	43	59	24	82	174	2	491
Arrive On Green	0.18	0.80	0.80	0.57	0.57	0.57	0.12	0.12	0.12	0.12	0.12	0.12
Sat Flow, veh/h	1810	1832	43	16	1761	75	102	204	687	843	18	1615
Grp Volume(v), veh/h	27	0	484	790	0	0	39	0	0	66	0	81
Grp Sat Flow(s),veh/h/ln	1810	0	1874	1852	0	0	992	0	0	861	0	1615
Q Serve(g_s), s	0.0	0.0	6.8	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	6.8	30.5	0.0	0.0	9.0	0.0	0.0	8.9	0.0	0.0
Prop In Lane	1.00		0.02	0.02		0.04	0.28		0.69	0.98		1.00
Lane Grp Cap(c), veh/h	577	0	1497	1100	0	0	166	0	0	176	0	491
V/C Ratio(X)	0.05	0.00	0.32	0.72	0.00	0.00	0.24	0.00	0.00	0.37	0.00	0.17
Avail Cap(c_a), veh/h	577	0	1497	1100	0	0	390	0	0	383	0	728
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	16.8	0.0	2.7	15.4	0.0	0.0	38.9	0.0	0.0	41.8	0.0	24.9
Incr Delay (d2), s/veh	0.0	0.0	0.6	4.0	0.0	0.0	1.0	0.0	0.0	1.9	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	3.7	16.8	0.0	0.0	1.0	0.0	0.0	1.8	0.0	1.6
LnGrp Delay(d),s/veh	16.8	0.0	3.2	19.4	0.0	0.0	39.9	0.0	0.0	43.6	0.0	25.1
LnGrp LOS	B		A	B			D			D		C
Approach Vol, veh/h		511			790			39			147	
Approach Delay, s/veh		4.0			19.4			39.9			33.4	
Approach LOS		A			B			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		8
Phs Duration (G+Y+Rc), s		82.0		15.7	22.0	60.0		15.7
Change Period (Y+Rc), s		4.0		4.0	4.0	4.0		4.0
Max Green Setting (Gmax), s		78.0		26.0	18.0	56.0		26.0
Max Q Clear Time (g_c+I1), s		8.8		10.9	2.0	32.5		11.0
Green Ext Time (p_c), s		5.1		0.7	3.8	6.4		0.7

Intersection Summary	
HCM 2010 Ctrl Delay	16.0
HCM 2010 LOS	B

HCM 2010 Signalized Intersection Summary
16: Maxon Rd & Nott St

6/10/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	15	389	10	15	771	115	10	1	25	308	1	70
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1882	1900	1900	1884	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	16	418	11	16	829	124	11	1	27	331	1	75
Adj No. of Lanes	1	1	0	0	1	0	0	1	0	0	1	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	1	1	1	1	1	0	0	0	0	0	0
Cap, veh/h	355	1271	33	40	791	117	41	23	53	190	0	375
Arrive On Green	0.16	0.70	0.70	0.50	0.50	0.50	0.23	0.23	0.23	0.23	0.23	0.23
Sat Flow, veh/h	1810	1825	48	14	1581	234	0	101	226	543	2	1615
Grp Volume(v), veh/h	16	0	429	969	0	0	39	0	0	332	0	75
Grp Sat Flow(s),veh/h/ln	1810	0	1873	1829	0	0	327	0	0	544	0	1615
Q Serve(g_s), s	0.0	0.0	10.1	25.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.2
Cycle Q Clear(g_c), s	0.0	0.0	10.1	56.0	0.0	0.0	26.0	0.0	0.0	26.0	0.0	4.2
Prop In Lane	1.00		0.03	0.02		0.13	0.28		0.69	1.00		1.00
Lane Grp Cap(c), veh/h	355	0	1305	947	0	0	117	0	0	191	0	375
V/C Ratio(X)	0.05	0.00	0.33	1.02	0.00	0.00	0.33	0.00	0.00	1.74	0.00	0.20
Avail Cap(c_a), veh/h	355	0	1305	947	0	0	117	0	0	191	0	375
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	39.4	0.0	6.7	28.9	0.0	0.0	35.8	0.0	0.0	47.4	0.0	34.6
Incr Delay (d2), s/veh	0.1	0.0	0.7	35.1	0.0	0.0	2.3	0.0	0.0	354.9	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	5.4	38.5	0.0	0.0	1.0	0.0	0.0	24.7	0.0	1.9
LnGrp Delay(d),s/veh	39.5	0.0	7.4	64.0	0.0	0.0	38.1	0.0	0.0	402.2	0.0	35.0
LnGrp LOS	D		A	F			D			F		C
Approach Vol, veh/h		445			969			39			407	
Approach Delay, s/veh		8.5			64.0			38.1			334.6	
Approach LOS		A			E			D			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		8
Phs Duration (G+Y+Rc), s		82.0		30.0	22.0	60.0		30.0
Change Period (Y+Rc), s		4.0		4.0	4.0	4.0		4.0
Max Green Setting (Gmax), s		78.0		26.0	18.0	56.0		26.0
Max Q Clear Time (g_c+I1), s		12.1		28.0	2.0	58.0		28.0
Green Ext Time (p_c), s		4.3		0.0	3.2	0.0		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	109.4
HCM 2010 LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	15	389	10	15	771	115	10	1	25	308	1	70
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1882	1900	1900	1884	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	16	418	11	16	829	124	11	1	27	331	1	75
Adj No. of Lanes	1	1	0	0	1	0	0	1	0	1	1	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	1	1	1	1	1	0	0	0	0	0	0
Cap, veh/h	186	1063	28	66	924	137	165	49	314	497	6	460
Arrive On Green	0.58	0.58	0.58	0.58	0.58	0.58	0.29	0.29	0.29	0.29	0.29	0.29
Sat Flow, veh/h	598	1825	48	11	1586	234	315	170	1092	1404	21	1597
Grp Volume(v), veh/h	16	0	429	969	0	0	39	0	0	331	0	76
Grp Sat Flow(s),veh/h/ln	598	0	1873	1832	0	0	1577	0	0	1404	0	1618
Q Serve(g_s), s	1.5	0.0	7.7	6.2	0.0	0.0	0.0	0.0	0.0	13.9	0.0	2.2
Cycle Q Clear(g_c), s	30.3	0.0	7.7	28.8	0.0	0.0	1.0	0.0	0.0	14.9	0.0	2.2
Prop In Lane	1.00		0.03	0.02		0.13	0.28		0.69	1.00		0.99
Lane Grp Cap(c), veh/h	186	0	1091	1126	0	0	529	0	0	497	0	466
V/C Ratio(X)	0.09	0.00	0.39	0.86	0.00	0.00	0.07	0.00	0.00	0.67	0.00	0.16
Avail Cap(c_a), veh/h	186	0	1091	1126	0	0	608	0	0	570	0	550
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	24.8	0.0	7.0	11.4	0.0	0.0	16.0	0.0	0.0	21.5	0.0	16.4
Incr Delay (d2), s/veh	0.9	0.0	1.1	8.6	0.0	0.0	0.1	0.0	0.0	3.0	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	4.3	17.0	0.0	0.0	0.5	0.0	0.0	5.7	0.0	1.0
LnGrp Delay(d),s/veh	25.7	0.0	8.0	20.0	0.0	0.0	16.1	0.0	0.0	24.4	0.0	16.7
LnGrp LOS	C		A	C			B			C		B
Approach Vol, veh/h		445			969			39			407	
Approach Delay, s/veh		8.7			20.0			16.1			23.0	
Approach LOS		A			C			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		40.0		21.8		40.0		21.8
Change Period (Y+Rc), s		4.0		4.0		4.0		4.0
Max Green Setting (Gmax), s		36.0		21.0		36.0		21.0
Max Q Clear Time (g_c+I1), s		32.3		16.9		30.8		3.0
Green Ext Time (p_c), s		2.9		0.9		4.0		2.1

Intersection Summary	
HCM 2010 Ctrl Delay	17.9
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	5.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	84	115	50	310	261	87
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	83	83	83	83	83	83
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	101	139	60	373	314	105

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	861	367	419	0	-	0
Stage 1	367	-	-	-	-	-
Stage 2	494	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	329	683	1151	-	-	-
Stage 1	705	-	-	-	-	-
Stage 2	617	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	307	683	1151	-	-	-
Mov Cap-2 Maneuver	307	-	-	-	-	-
Stage 1	705	-	-	-	-	-
Stage 2	576	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	21.8	1.2	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1151	-	450	-	-
HCM Lane V/C Ratio	0.052	-	0.533	-	-
HCM Control Delay (s)	8.3	0	21.8	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0.2	-	3.1	-	-

Intersection	
Intersection Delay, s/veh	7.5
Intersection LOS	A

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Vol, veh/h	0	4	63	0	0	21	71	11	0	9	2	42
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	4	68	0	0	23	77	12	0	10	2	46
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	1
HCM Control Delay	7.6	7.7	7.2
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	17%	6%	20%	64%
Vol Thru, %	4%	94%	69%	0%
Vol Right, %	79%	0%	11%	36%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	53	67	103	14
LT Vol	2	63	71	0
Through Vol	42	0	11	5
RT Vol	9	4	21	9
Lane Flow Rate	58	73	112	15
Geometry Grp	1	1	1	1
Degree of Util (X)	0.061	0.084	0.127	0.018
Departure Headway (Hd)	3.823	4.159	4.094	4.213
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	921	856	872	835
Service Time	1.914	2.21	2.138	2.311
HCM Lane V/C Ratio	0.063	0.085	0.128	0.018
HCM Control Delay	7.2	7.6	7.7	7.4
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.2	0.3	0.4	0.1

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Vol, veh/h	0	9	0	5
Peak Hour Factor	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	10	0	5
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	7.4
HCM LOS	A

Lane

Intersection	
Intersection Delay, s/veh	7.9
Intersection LOS	A

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Vol, veh/h	0	4	104	0	0	21	113	11	0	9	2	42
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	4	113	0	0	23	123	12	0	10	2	46
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	1
HCM Control Delay	7.9	8.1	7.4
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	17%	4%	14%	64%
Vol Thru, %	4%	96%	78%	0%
Vol Right, %	79%	0%	8%	36%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	53	108	145	14
LT Vol	2	104	113	0
Through Vol	42	0	11	5
RT Vol	9	4	21	9
Lane Flow Rate	58	117	158	15
Geometry Grp	1	1	1	1
Degree of Util (X)	0.066	0.137	0.181	0.019
Departure Headway (Hd)	4.114	4.189	4.134	4.518
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	876	846	859	797
Service Time	2.115	2.265	2.203	2.52
HCM Lane V/C Ratio	0.066	0.138	0.184	0.019
HCM Control Delay	7.4	7.9	8.1	7.6
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.2	0.5	0.7	0.1

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Vol, veh/h	0	9	0	5
Peak Hour Factor	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	10	0	5
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	7.6
HCM LOS	A

Lane

Movement	SBL	SBR	SEL	SET	NWT	NWR
Lane Configurations						
Volume (veh/h)	303	78	100	644	979	1031
Number	3	18	1	6	2	12
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1900	1900	1863	1881	1900
Adj Flow Rate, veh/h	202	211	106	685	1041	1097
Adj No. of Lanes	1	1	1	2	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	1	0	0	2	1	0
Cap, veh/h	316	285	294	2252	1728	1066
Arrive On Green	0.18	0.18	0.06	0.64	0.48	0.48
Sat Flow, veh/h	1792	1615	1810	3632	3668	1615
Grp Volume(v), veh/h	202	211	106	685	1041	1097
Grp Sat Flow(s),veh/h/ln	1792	1615	1810	1770	1787	1615
Q Serve(g_s), s	5.6	6.6	1.4	4.7	11.3	25.8
Cycle Q Clear(g_c), s	5.6	6.6	1.4	4.7	11.3	25.8
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	316	285	294	2252	1728	1066
V/C Ratio(X)	0.64	0.74	0.36	0.30	0.60	1.03
Avail Cap(c_a), veh/h	537	484	322	2252	1728	1066
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.4	20.8	8.7	4.4	10.1	7.5
Incr Delay (d2), s/veh	2.1	3.8	0.7	0.3	1.6	35.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.9	3.2	0.9	2.3	5.9	25.9
LnGrp Delay(d),s/veh	22.6	24.6	9.5	4.7	11.6	42.8
LnGrp LOS	C	C	A	A	B	F
Approach Vol, veh/h	413			791	2138	
Approach Delay, s/veh	23.6			5.4	27.6	
Approach LOS	C			A	C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	8.2	30.8				39.0		14.4
Change Period (Y+Rc), s	5.0	5.0				5.0		5.0
Max Green Setting (Gmax), s	4.0	25.0				34.0		16.0
Max Q Clear Time (g_c+I1), s	3.4	27.8				6.7		8.6
Green Ext Time (p_c), s	0.0	0.0				20.7		0.8

Intersection Summary	
HCM 2010 Ctrl Delay	21.9
HCM 2010 LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

Movement	SBL	SBR	SEL	SET	NWT	NWR
Lane Configurations						
Volume (veh/h)	366	78	100	769	1108	1099
Number	3	18	1	6	2	12
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1900	1900	1863	1881	1900
Adj Flow Rate, veh/h	466	0	106	818	1179	1169
Adj No. of Lanes	2	1	1	2	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	1	0	0	2	1	0
Cap, veh/h	644	290	276	2243	1721	1068
Arrive On Green	0.18	0.00	0.06	0.63	0.48	0.48
Sat Flow, veh/h	3583	1615	1810	3632	3668	1615
Grp Volume(v), veh/h	466	0	106	818	1179	1169
Grp Sat Flow(s),veh/h/ln	1792	1615	1810	1770	1787	1615
Q Serve(g_s), s	6.6	0.0	1.4	5.9	13.7	25.8
Cycle Q Clear(g_c), s	6.6	0.0	1.4	5.9	13.7	25.8
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	644	290	276	2243	1721	1068
V/C Ratio(X)	0.72	0.00	0.38	0.36	0.69	1.09
Avail Cap(c_a), veh/h	1069	482	304	2243	1721	1068
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.7	0.0	10.3	4.7	10.8	7.5
Incr Delay (d2), s/veh	1.6	0.0	0.9	0.5	2.2	57.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.4	0.0	0.9	3.0	7.2	32.4
LnGrp Delay(d),s/veh	22.3	0.0	11.2	5.1	13.0	64.6
LnGrp LOS	C		B	A	B	F
Approach Vol, veh/h	466			924	2348	
Approach Delay, s/veh	22.3			5.8	38.7	
Approach LOS	C			A	D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	8.2	30.8				39.0		14.6
Change Period (Y+Rc), s	5.0	5.0				5.0		5.0
Max Green Setting (Gmax), s	4.0	25.0				34.0		16.0
Max Q Clear Time (g_c+I1), s	3.4	27.8				7.9		8.6
Green Ext Time (p_c), s	0.0	0.0				22.0		1.1

Intersection Summary	
HCM 2010 Ctrl Delay	28.5
HCM 2010 LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

HCM 2010 Signalized Intersection Summary
4: FBR & Maple

6/10/2014

Movement	SBL	SBR	SEL	SET	NWT	NWR
Lane Configurations						
Volume (veh/h)	366	78	100	769	1108	1099
Number	3	18	1	6	2	12
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1900	1900	1863	1881	1900
Adj Flow Rate, veh/h	466	0	106	818	1179	1169
Adj No. of Lanes	2	1	1	2	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	1	0	0	2	1	0
Cap, veh/h	617	278	262	2356	1895	1134
Arrive On Green	0.17	0.00	0.05	0.67	0.53	0.53
Sat Flow, veh/h	3583	1615	1810	3632	3668	1615
Grp Volume(v), veh/h	466	0	106	818	1179	1169
Grp Sat Flow(s),veh/h/ln	1792	1615	1810	1770	1787	1615
Q Serve(g_s), s	7.6	0.0	1.5	6.2	14.2	32.7
Cycle Q Clear(g_c), s	7.6	0.0	1.5	6.2	14.2	32.7
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	617	278	262	2356	1895	1134
V/C Ratio(X)	0.76	0.00	0.41	0.35	0.62	1.03
Avail Cap(c_a), veh/h	931	419	281	2356	1895	1134
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.3	0.0	10.5	4.5	10.2	7.6
Incr Delay (d2), s/veh	1.9	0.0	1.0	0.4	1.6	35.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.9	0.0	1.1	3.1	7.3	29.9
LnGrp Delay(d),s/veh	26.2	0.0	11.5	4.9	11.7	42.6
LnGrp LOS	C		B	A	B	F
Approach Vol, veh/h	466			924	2348	
Approach Delay, s/veh	26.2			5.6	27.1	
Approach LOS	C			A	C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	8.3	37.7				46.0		15.6
Change Period (Y+Rc), s	5.0	5.0				5.0		5.0
Max Green Setting (Gmax), s	4.0	32.0				41.0		16.0
Max Q Clear Time (g_c+I1), s	3.5	34.7				8.2		9.6
Green Ext Time (p_c), s	0.0	0.0				26.6		1.0

Intersection Summary	
HCM 2010 Ctrl Delay	21.7
HCM 2010 LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

HCM 2010 Signalized Intersection Summary
5: FBR & Sunnyside

6/10/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	206	1	102	4	0	5	275	2025	1	2	808	155
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1900	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	224	1	111	4	0	5	299	2201	1	2	878	168
Adj No. of Lanes	1	1	0	0	1	0	1	2	0	1	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	312	3	335	167	25	153	428	2372	1	117	1415	271
Arrive On Green	0.21	0.21	0.21	0.21	0.00	0.21	0.11	0.65	0.65	0.48	0.48	0.48
Sat Flow, veh/h	1405	14	1571	457	117	718	1774	3630	2	176	2965	567
Grp Volume(v), veh/h	224	0	112	9	0	0	299	1073	1129	2	524	522
Grp Sat Flow(s),veh/h/ln	1405	0	1585	1292	0	0	1774	1770	1862	176	1770	1763
Q Serve(g_s), s	11.5	0.0	4.5	0.0	0.0	0.0	5.9	40.0	40.0	0.8	16.5	16.5
Cycle Q Clear(g_c), s	16.0	0.0	4.5	4.5	0.0	0.0	5.9	40.0	40.0	27.6	16.5	16.5
Prop In Lane	1.00		0.99	0.44		0.56	1.00		0.00	1.00		0.32
Lane Grp Cap(c), veh/h	312	0	338	345	0	0	428	1156	1217	117	844	841
V/C Ratio(X)	0.72	0.00	0.33	0.03	0.00	0.00	0.70	0.93	0.93	0.02	0.62	0.62
Avail Cap(c_a), veh/h	312	0	338	345	0	0	518	1156	1217	117	844	841
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.0	0.0	25.0	23.4	0.0	0.0	11.8	11.4	11.4	29.4	14.6	14.6
Incr Delay (d2), s/veh	7.8	0.0	0.6	0.0	0.0	0.0	3.2	14.0	13.5	0.3	3.4	3.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.3	0.0	2.0	0.2	0.0	0.0	3.5	23.6	24.6	0.0	8.8	8.8
LnGrp Delay(d),s/veh	39.8	0.0	25.5	23.4	0.0	0.0	15.0	25.4	24.9	29.7	18.0	18.0
LnGrp LOS	D		C	C			B	C	C	C	B	B
Approach Vol, veh/h		336			9			2501			1048	
Approach Delay, s/veh		35.0			23.4			24.0			18.0	
Approach LOS		D			C			C			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		8
Phs Duration (G+Y+Rc), s		54.0		21.0	13.2	40.8		21.0
Change Period (Y+Rc), s		5.0		5.0	5.0	5.0		5.0
Max Green Setting (Gmax), s		49.0		16.0	12.0	32.0		16.0
Max Q Clear Time (g_c+I1), s		42.0		18.0	7.9	29.6		6.5
Green Ext Time (p_c), s		6.7		0.0	0.3	2.4		1.0

Intersection Summary	
HCM 2010 Ctrl Delay	23.3
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	206	1	123	4	0	5	301	2222	1	2	996	155
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1900	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	224	1	134	4	0	5	327	2415	1	2	1083	168
Adj No. of Lanes	1	1	0	0	1	0	1	2	0	1	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	293	3	336	157	25	141	385	2372	1	96	1439	223
Arrive On Green	0.21	0.21	0.21	0.21	0.00	0.21	0.12	0.65	0.65	0.47	0.47	0.47
Sat Flow, veh/h	1405	12	1573	413	117	662	1774	3631	2	142	3073	476
Grp Volume(v), veh/h	224	0	135	9	0	0	327	1177	1239	2	623	628
Grp Sat Flow(s),veh/h/ln	1405	0	1585	1192	0	0	1774	1770	1862	142	1770	1779
Q Serve(g_s), s	10.5	0.0	5.5	0.0	0.0	0.0	6.6	49.0	49.0	0.0	21.7	21.8
Cycle Q Clear(g_c), s	16.0	0.0	5.5	5.5	0.0	0.0	6.6	49.0	49.0	35.1	21.7	21.8
Prop In Lane	1.00		0.99	0.44		0.56	1.00		0.00	1.00		0.27
Lane Grp Cap(c), veh/h	293	0	338	324	0	0	385	1156	1217	96	829	833
V/C Ratio(X)	0.77	0.00	0.40	0.03	0.00	0.00	0.85	1.02	1.02	0.02	0.75	0.75
Avail Cap(c_a), veh/h	293	0	338	324	0	0	458	1156	1217	96	829	833
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.9	0.0	25.4	23.4	0.0	0.0	14.5	13.0	13.0	37.5	16.4	16.4
Incr Delay (d2), s/veh	11.5	0.0	0.8	0.0	0.0	0.0	12.3	31.1	30.5	0.4	6.2	6.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.5	0.0	2.5	0.2	0.0	0.0	4.7	33.4	35.0	0.1	12.0	12.1
LnGrp Delay(d),s/veh	44.4	0.0	26.1	23.4	0.0	0.0	26.8	44.1	43.5	37.9	22.6	22.7
LnGrp LOS	D		C	C			C	F	F	D	C	C
Approach Vol, veh/h		359			9			2743			1253	
Approach Delay, s/veh		37.5			23.4			41.7			22.7	
Approach LOS		D			C			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		8
Phs Duration (G+Y+Rc), s		54.0		21.0	13.9	40.1		21.0
Change Period (Y+Rc), s		5.0		5.0	5.0	5.0		5.0
Max Green Setting (Gmax), s		49.0		16.0	12.0	32.0		16.0
Max Q Clear Time (g_c+I1), s		51.0		18.0	8.6	37.1		7.5
Green Ext Time (p_c), s		0.0		0.0	0.3	0.0		1.0

Intersection Summary	
HCM 2010 Ctrl Delay	35.9
HCM 2010 LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	206	1	123	4	0	5	301	2222	1	2	996	155
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1900	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	224	1	134	4	0	5	327	2415	1	2	1083	168
Adj No. of Lanes	1	1	0	0	1	0	1	2	0	1	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	308	2	310	76	10	36	390	2516	1	91	1634	253
Arrive On Green	0.10	0.20	0.20	0.04	0.00	0.04	0.11	0.69	0.69	0.53	0.53	0.53
Sat Flow, veh/h	1774	12	1573	439	228	833	1774	3631	2	142	3073	476
Grp Volume(v), veh/h	224	0	135	9	0	0	327	1177	1239	2	623	628
Grp Sat Flow(s),veh/h/ln	1774	0	1585	1500	0	0	1774	1770	1862	142	1770	1779
Q Serve(g_s), s	9.0	0.0	6.8	0.0	0.0	0.0	7.0	55.4	55.4	1.2	23.1	23.2
Cycle Q Clear(g_c), s	9.0	0.0	6.8	0.5	0.0	0.0	7.0	55.4	55.4	41.9	23.1	23.2
Prop In Lane	1.00		0.99	0.44		0.56	1.00		0.00	1.00		0.27
Lane Grp Cap(c), veh/h	308	0	312	121	0	0	390	1227	1291	91	941	946
V/C Ratio(X)	0.73	0.00	0.43	0.07	0.00	0.00	0.84	0.96	0.96	0.02	0.66	0.66
Avail Cap(c_a), veh/h	308	0	471	263	0	0	572	1227	1291	91	941	946
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.9	0.0	32.0	41.9	0.0	0.0	15.7	12.8	12.8	38.7	15.4	15.4
Incr Delay (d2), s/veh	8.4	0.0	0.9	0.3	0.0	0.0	7.1	17.7	17.1	0.4	3.7	3.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.9	0.0	3.0	0.2	0.0	0.0	5.3	32.5	34.0	0.1	12.2	12.3
LnGrp Delay(d),s/veh	45.3	0.0	33.0	42.1	0.0	0.0	22.8	30.5	29.9	39.2	19.0	19.1
LnGrp LOS	D		C	D			C	C	C	D	B	B
Approach Vol, veh/h		359			9			2743			1253	
Approach Delay, s/veh		40.6			42.1			29.3			19.1	
Approach LOS		D			D			C			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6	7	8
Phs Duration (G+Y+Rc), s		68.0		22.9	14.7	53.3	14.0	8.9
Change Period (Y+Rc), s		5.0		5.0	5.0	5.0	5.0	5.0
Max Green Setting (Gmax), s		63.0		27.0	19.0	39.0	9.0	13.0
Max Q Clear Time (g_c+I1), s		57.4		8.8	9.0	43.9	11.0	2.5
Green Ext Time (p_c), s		5.5		0.7	0.7	0.0	0.0	0.5

Intersection Summary	
HCM 2010 Ctrl Delay	27.3
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	33	72	7	155	132	144	31	1280	156	128	1326	77
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1761	1693	1710	1693	1693	1710	1693	1678	1710	1693	1677	1710
Adj Flow Rate, veh/h	36	78	8	168	143	157	34	1391	170	139	1441	84
Adj No. of Lanes	1	1	0	1	1	0	1	2	0	1	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	1	1	1	1	1	1	1	2	2	1	2	2
Cap, veh/h	98	302	31	276	148	162	216	1969	239	295	2105	122
Arrive On Green	0.20	0.20	0.20	0.20	0.20	0.20	1.00	1.00	1.00	0.69	0.69	0.69
Sat Flow, veh/h	1016	1511	155	1187	739	811	309	2864	347	299	3062	178
Grp Volume(v), veh/h	36	0	86	168	0	300	34	770	791	139	748	777
Grp Sat Flow(s),veh/h/ln	1016	0	1666	1187	0	1550	309	1594	1617	299	1594	1646
Q Serve(g_s), s	0.6	0.0	3.5	11.1	0.0	15.4	4.3	0.0	0.0	21.8	22.1	22.4
Cycle Q Clear(g_c), s	16.0	0.0	3.5	14.6	0.0	15.4	26.6	0.0	0.0	21.8	22.1	22.4
Prop In Lane	1.00		0.09	1.00		0.52	1.00		0.21	1.00		0.11
Lane Grp Cap(c), veh/h	98	0	333	276	0	310	216	1096	1112	295	1096	1132
V/C Ratio(X)	0.37	0.00	0.26	0.61	0.00	0.97	0.16	0.70	0.71	0.47	0.68	0.69
Avail Cap(c_a), veh/h	98	0	333	276	0	310	216	1096	1112	295	1096	1132
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.58	0.58	0.58	0.93	0.93	0.93
Uniform Delay (d), s/veh	39.9	0.0	27.0	33.2	0.0	31.7	5.4	0.0	0.0	7.3	7.4	7.4
Incr Delay (d2), s/veh	2.3	0.0	0.4	3.9	0.0	42.3	0.9	2.2	2.3	4.9	3.2	3.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.0	1.6	3.9	0.0	10.2	0.4	0.7	0.7	2.2	10.5	10.9
LnGrp Delay(d),s/veh	42.2	0.0	27.4	37.0	0.0	74.0	6.3	2.2	2.3	12.3	10.6	10.6
LnGrp LOS	D		C	D		E	A	A	A	B	B	B
Approach Vol, veh/h		122			468			1595			1664	
Approach Delay, s/veh		31.8			60.7			2.3			10.7	
Approach LOS		C			E			A			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		59.5		20.5		59.5		20.5
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5
Max Green Setting (Gmax), s		55.0		16.0		55.0		16.0
Max Q Clear Time (g_c+I1), s		28.6		18.0		24.4		17.4
Green Ext Time (p_c), s		24.7		0.0		28.4		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	14.0
HCM 2010 LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	53	72	7	155	132	185	31	1467	156	128	1544	77
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1761	1693	1710	1693	1693	1710	1693	1678	1710	1693	1677	1710
Adj Flow Rate, veh/h	58	78	8	168	143	201	34	1595	170	139	1678	84
Adj No. of Lanes	1	1	0	1	1	0	1	2	0	1	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	1	1	1	1	1	1	1	2	2	1	2	2
Cap, veh/h	90	302	31	276	128	179	167	2002	211	259	2124	106
Arrive On Green	0.20	0.20	0.20	0.20	0.20	0.20	1.00	1.00	1.00	0.69	0.69	0.69
Sat Flow, veh/h	976	1511	155	1187	638	897	246	2911	307	245	3090	154
Grp Volume(v), veh/h	58	0	86	168	0	344	34	865	900	139	861	901
Grp Sat Flow(s),veh/h/ln	976	0	1666	1187	0	1535	246	1594	1624	245	1593	1650
Q Serve(g_s), s	0.0	0.0	3.5	11.1	0.0	16.0	7.6	0.0	0.0	32.7	29.4	30.1
Cycle Q Clear(g_c), s	16.0	0.0	3.5	14.6	0.0	16.0	37.7	0.0	0.0	32.7	29.4	30.1
Prop In Lane	1.00		0.09	1.00		0.58	1.00		0.19	1.00		0.09
Lane Grp Cap(c), veh/h	90	0	333	276	0	307	167	1096	1116	259	1095	1134
V/C Ratio(X)	0.64	0.00	0.26	0.61	0.00	1.12	0.20	0.79	0.81	0.54	0.79	0.79
Avail Cap(c_a), veh/h	90	0	333	276	0	307	167	1096	1116	259	1095	1134
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.41	0.41	0.41	1.00	1.00	1.00
Uniform Delay (d), s/veh	40.0	0.0	27.0	33.2	0.0	32.0	10.3	0.0	0.0	9.0	8.5	8.6
Incr Delay (d2), s/veh	14.7	0.0	0.4	3.9	0.0	87.9	1.1	2.5	2.7	7.8	5.7	5.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	0.0	1.6	3.9	0.0	14.2	0.6	0.8	0.8	2.7	14.4	15.1
LnGrp Delay(d),s/veh	54.7	0.0	27.4	37.0	0.0	119.9	11.4	2.5	2.7	16.8	14.2	14.4
LnGrp LOS	D		C	D		F	B	A	A	B	B	B
Approach Vol, veh/h		144			512			1799			1901	
Approach Delay, s/veh		38.4			92.7			2.8			14.5	
Approach LOS		D			F			A			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		59.5		20.5		59.5		20.5
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5
Max Green Setting (Gmax), s		55.0		16.0		55.0		16.0
Max Q Clear Time (g_c+I1), s		39.7		18.0		34.7		18.0
Green Ext Time (p_c), s		15.1		0.0		19.8		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	19.6
HCM 2010 LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	53	72	7	155	132	185	31	1467	156	128	1544	77
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1761	1693	1710	1693	1693	1710	1693	1678	1710	1693	1677	1710
Adj Flow Rate, veh/h	58	78	8	168	143	201	34	1595	170	139	1678	84
Adj No. of Lanes	1	1	0	1	1	0	1	2	0	1	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	1	1	1	1	1	1	1	2	2	1	2	2
Cap, veh/h	130	387	40	346	163	230	136	1838	194	245	1950	97
Arrive On Green	0.26	0.26	0.26	0.26	0.26	0.26	1.00	1.00	1.00	0.63	0.63	0.63
Sat Flow, veh/h	976	1511	155	1187	638	897	246	2911	307	245	3090	154
Grp Volume(v), veh/h	58	0	86	168	0	344	34	865	900	139	861	901
Grp Sat Flow(s),veh/h/ln	976	0	1666	1187	0	1535	246	1594	1624	245	1593	1650
Q Serve(g_s), s	3.3	0.0	3.2	10.3	0.0	17.2	10.0	0.0	0.0	38.6	34.7	35.5
Cycle Q Clear(g_c), s	20.5	0.0	3.2	13.6	0.0	17.2	45.4	0.0	0.0	38.6	34.7	35.5
Prop In Lane	1.00		0.09	1.00		0.58	1.00		0.19	1.00		0.09
Lane Grp Cap(c), veh/h	130	0	427	346	0	393	136	1006	1025	245	1006	1042
V/C Ratio(X)	0.44	0.00	0.20	0.49	0.00	0.87	0.25	0.86	0.88	0.57	0.86	0.87
Avail Cap(c_a), veh/h	130	0	427	346	0	393	136	1006	1025	245	1006	1042
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.41	0.41	0.41	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.8	0.0	23.3	28.7	0.0	28.5	16.0	0.0	0.0	12.6	11.8	12.0
Incr Delay (d2), s/veh	2.4	0.0	0.2	1.1	0.0	19.2	1.8	4.2	4.8	9.2	9.3	9.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	0.0	1.5	3.5	0.0	9.4	0.7	1.2	1.4	3.2	17.4	18.5
LnGrp Delay(d),s/veh	41.2	0.0	23.6	29.7	0.0	47.7	17.8	4.2	4.8	21.8	21.1	21.6
LnGrp LOS	D		C	C		D	B	A	A	C	C	C
Approach Vol, veh/h		144			512			1799			1901	
Approach Delay, s/veh		30.7			41.8			4.7			21.4	
Approach LOS		C			D			A			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		55.0		25.0		55.0		25.0
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5
Max Green Setting (Gmax), s		50.5		20.5		50.5		20.5
Max Q Clear Time (g_c+I1), s		47.4		22.5		40.6		19.2
Green Ext Time (p_c), s		3.0		0.0		9.8		0.5

Intersection Summary	
HCM 2010 Ctrl Delay	17.2
HCM 2010 LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	54	69	28	74	106	119	40	1295	98	138	1275	79
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1693	1693	1710	1693	1693	1693	1693	1678	1710	1693	1677	1710
Adj Flow Rate, veh/h	59	75	30	80	115	0	43	1408	107	150	1386	86
Adj No. of Lanes	1	1	0	1	1	1	1	2	0	1	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	1	1	1	1	1	1	1	2	2	1	2	2
Cap, veh/h	213	186	74	218	274	233	337	1738	132	399	1904	118
Arrive On Green	0.16	0.16	0.16	0.16	0.16	0.00	0.06	1.00	1.00	0.16	1.00	1.00
Sat Flow, veh/h	1156	1151	461	1167	1693	1439	1612	3004	227	1612	3049	189
Grp Volume(v), veh/h	59	0	105	80	115	0	43	744	771	150	723	749
Grp Sat Flow(s),veh/h/ln	1156	0	1612	1167	1693	1439	1612	1594	1638	1612	1594	1644
Q Serve(g_s), s	3.6	0.0	4.3	4.9	4.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	8.1	0.0	4.3	9.2	4.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop In Lane	1.00		0.29	1.00		1.00	1.00		0.14	1.00		0.11
Lane Grp Cap(c), veh/h	213	0	261	218	274	233	337	922	948	399	995	1027
V/C Ratio(X)	0.28	0.00	0.40	0.37	0.42	0.00	0.13	0.81	0.81	0.38	0.73	0.73
Avail Cap(c_a), veh/h	278	0	350	282	368	313	375	922	948	437	995	1027
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00	0.57	0.57	0.57	0.65	0.65	0.65
Uniform Delay (d), s/veh	31.6	0.0	27.9	32.0	28.0	0.0	6.2	0.0	0.0	7.7	0.0	0.0
Incr Delay (d2), s/veh	0.7	0.0	1.0	1.0	1.0	0.0	0.1	4.5	4.5	0.4	3.1	3.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	0.0	2.0	1.6	2.2	0.0	0.4	1.1	1.2	1.8	0.8	0.9
LnGrp Delay(d),s/veh	32.3	0.0	28.9	33.0	29.0	0.0	6.3	4.5	4.5	8.1	3.1	3.0
LnGrp LOS	C		C	C	C		A	A	A	A	A	A
Approach Vol, veh/h		164			195			1558			1622	
Approach Delay, s/veh		30.1			30.6			4.5			3.5	
Approach LOS		C			C			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	16.1	47.4		16.5	12.7	50.8		16.5
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s	7.5	42.9		16.1	4.1	46.3		16.1
Max Q Clear Time (g_c+I1), s	2.0	2.0		10.1	2.0	2.0		11.2
Green Ext Time (p_c), s	0.2	16.0		0.9	0.1	15.6		0.8

Intersection Summary	
HCM 2010 Ctrl Delay	6.7
HCM 2010 LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	54	69	28	74	106	119	40	1482	98	138	1493	76
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1693	1693	1710	1693	1693	1693	1693	1677	1710	1693	1677	1710
Adj Flow Rate, veh/h	59	75	30	80	115	0	43	1611	107	150	1623	83
Adj No. of Lanes	1	1	0	1	1	1	1	2	0	1	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	1	1	1	1	1	1	1	2	2	1	2	2
Cap, veh/h	213	186	74	218	274	233	298	1757	116	368	1927	98
Arrive On Green	0.16	0.16	0.16	0.16	0.16	0.00	0.06	1.00	1.00	0.16	1.00	1.00
Sat Flow, veh/h	1156	1151	461	1167	1693	1439	1612	3035	200	1612	3086	157
Grp Volume(v), veh/h	59	0	105	80	115	0	43	841	877	150	834	872
Grp Sat Flow(s),veh/h/ln	1156	0	1612	1167	1693	1439	1612	1594	1642	1612	1593	1650
Q Serve(g_s), s	3.6	0.0	4.3	4.9	4.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	8.1	0.0	4.3	9.2	4.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop In Lane	1.00		0.29	1.00		1.00	1.00		0.12	1.00		0.10
Lane Grp Cap(c), veh/h	213	0	261	218	274	233	298	922	950	368	995	1030
V/C Ratio(X)	0.28	0.00	0.40	0.37	0.42	0.00	0.14	0.91	0.92	0.41	0.84	0.85
Avail Cap(c_a), veh/h	278	0	350	282	368	313	337	922	950	406	995	1030
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00	0.31	0.31	0.31	0.50	0.50	0.50
Uniform Delay (d), s/veh	31.6	0.0	27.9	32.0	28.0	0.0	6.5	0.0	0.0	9.3	0.0	0.0
Incr Delay (d2), s/veh	0.7	0.0	1.0	1.0	1.0	0.0	0.1	5.5	6.0	0.4	4.4	4.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	0.0	2.0	1.6	2.2	0.0	0.4	1.4	1.6	2.1	1.2	1.3
LnGrp Delay(d),s/veh	32.3	0.0	28.9	33.0	29.0	0.0	6.5	5.5	6.0	9.6	4.4	4.5
LnGrp LOS	C		C	C	C		A	A	A	A	A	A
Approach Vol, veh/h		164			195			1761			1856	
Approach Delay, s/veh		30.1			30.6			5.8			4.9	
Approach LOS		C			C			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	16.1	47.4		16.5	12.7	50.8		16.5
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s	7.5	42.9		16.1	4.1	46.3		16.1
Max Q Clear Time (g_c+I1), s	2.0	2.0		10.1	2.0	2.0		11.2
Green Ext Time (p_c), s	0.2	20.0		0.9	0.1	20.4		0.8

Intersection Summary	
HCM 2010 Ctrl Delay	7.6
HCM 2010 LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	54	69	28	74	106	119	40	1482	98	138	1493	76
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1693	1693	1710	1693	1693	1693	1693	1677	1710	1693	1677	1710
Adj Flow Rate, veh/h	59	75	30	80	115	0	43	1611	107	150	1623	83
Adj No. of Lanes	1	1	0	1	1	1	1	2	0	1	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	1	1	1	1	1	1	1	2	2	1	2	2
Cap, veh/h	231	196	78	235	288	245	302	1694	112	368	1857	94
Arrive On Green	0.17	0.17	0.17	0.17	0.17	0.00	0.07	1.00	1.00	0.15	1.00	1.00
Sat Flow, veh/h	1156	1151	461	1167	1693	1439	1612	3035	200	1612	3086	157
Grp Volume(v), veh/h	59	0	105	80	115	0	43	841	877	150	834	872
Grp Sat Flow(s),veh/h/ln	1156	0	1612	1167	1693	1439	1612	1594	1642	1612	1593	1650
Q Serve(g_s), s	3.3	0.0	4.0	4.5	4.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	7.5	0.0	4.0	8.5	4.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop In Lane	1.00		0.29	1.00		1.00	1.00		0.12	1.00		0.10
Lane Grp Cap(c), veh/h	231	0	274	235	288	245	302	890	917	368	959	992
V/C Ratio(X)	0.26	0.00	0.38	0.34	0.40	0.00	0.14	0.95	0.96	0.41	0.87	0.88
Avail Cap(c_a), veh/h	378	0	479	384	503	428	354	890	917	421	959	992
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00	0.53	0.53	0.53	0.43	0.43	0.43
Uniform Delay (d), s/veh	28.8	0.0	25.4	29.2	25.5	0.0	6.6	0.0	0.0	9.5	0.0	0.0
Incr Delay (d2), s/veh	0.6	0.0	0.9	0.8	0.9	0.0	0.1	12.4	13.7	0.3	5.0	5.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	0.0	1.8	1.5	2.0	0.0	0.4	3.1	3.5	2.1	1.3	1.4
LnGrp Delay(d),s/veh	29.4	0.0	26.3	30.0	26.4	0.0	6.8	12.4	13.7	9.8	5.0	5.2
LnGrp LOS	C		C	C	C		A	B	B	A	A	A
Approach Vol, veh/h		164			195			1761			1856	
Approach Delay, s/veh		27.4			27.9			12.9			5.5	
Approach LOS		C			C			B			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	20.8	43.0		16.2	17.8	46.0		16.2
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s	7.5	38.5		20.5	4.5	41.5		20.5
Max Q Clear Time (g_c+I1), s	2.0	2.0		9.5	2.0	2.0		10.5
Green Ext Time (p_c), s	0.2	18.9		1.3	0.1	19.4		1.2

Intersection Summary		
HCM 2010 Ctrl Delay	10.8	
HCM 2010 LOS	B	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	134	167	16	99	267	256	0	1029	72	0	1293	84
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	10	12	11	12	12	13	12	12	12
Storage Length (ft)	190		0	75		360	0		225	0		0
Storage Lanes	1		0	1		1	0		1	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1540	1600	0	1444	1693	1391	0	3185	1473	0	3155	0
Flt Permitted	0.950			0.950								
Satd. Flow (perm)	1540	1600	0	1444	1693	1391	0	3185	1473	0	3155	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		581			538			1052			442	
Travel Time (s)		13.2			12.2			23.9			10.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	2%	5%	1%	1%	0%	2%	2%	0%	2%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	146	199	0	108	290	278	0	1118	78	0	1496	0
Turn Type	Prot	NA		Prot	NA	Perm		NA	pm+ov		NA	
Protected Phases	7	4		3	8			2	3		6	
Permitted Phases						8			2			
Detector Phase	7	4		3	8	8		2	3		6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0		4.0	
Minimum Split (s)	8.5	20.5		8.5	20.5	20.5		20.5	8.5		20.5	
Total Split (s)	11.0	20.6		10.9	20.5	20.5		36.5	10.9		36.5	
Total Split (%)	13.8%	25.8%		13.6%	25.6%	25.6%		45.6%	13.6%		45.6%	
Yellow Time (s)	3.5	3.5		3.5	3.5	3.5		3.5	3.5		3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0		1.0	1.0		1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0	0.0		0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5	4.5		4.5	4.5		4.5	
Lead/Lag	Lead	Lag		Lead	Lag	Lag			Lead			
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes			Yes			
Recall Mode	None	None		None	None	None		C-Max	None		C-Max	
Act Effct Green (s)	6.5	16.1		6.4	16.0	16.0		44.0	54.9		44.0	
Actuated g/C Ratio	0.08	0.20		0.08	0.20	0.20		0.55	0.69		0.55	
v/c Ratio	1.17	0.62		0.94	0.86	1.00		0.64	0.08		0.86	
Control Delay	169.6	38.6		110.1	56.6	89.4		14.6	4.4		12.5	
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.1	0.0		0.3	
Total Delay	169.6	38.6		110.1	56.6	89.4		14.7	4.4		12.7	
LOS	F	D		F	E	F		B	A		B	
Approach Delay		94.0			78.6			14.0			12.7	
Approach LOS		F			E			B			B	

Intersection Summary

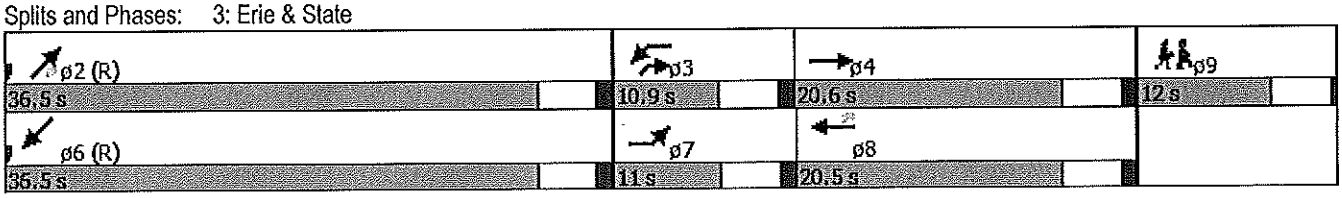
Area Type: CBD
Cycle Length: 80
Actuated Cycle Length: 80

Lane Group	ø9
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	4.0
Minimum Split (s)	12.0
Total Split (s)	12.0
Total Split (%)	15%
Yellow Time (s)	3.5
All-Red Time (s)	0.5
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	

Intersection Summary

Offset: 18 (23%), Referenced to phase 2:NET and 6:SWT, Start of Green
Natural Cycle: 120
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.17
Intersection Signal Delay: 32.7 Intersection LOS: C
Intersection Capacity Utilization 77.8% ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 3: Erie & State



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	196	167	16	99	267	297	0	1113	72	0	1511	84
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	10	12	11	12	12	13	12	12	12
Storage Length (ft)	190		0	75		360	0		225	0		0
Storage Lanes	1		0	1		1	0		1	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1540	1600	0	1444	1693	1391	0	3185	1473	0	3158	0
Flt Permitted	0.950			0.950								
Satd. Flow (perm)	1540	1600	0	1444	1693	1391	0	3185	1473	0	3158	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		581			538			1052			442	
Travel Time (s)		13.2			12.2			23.9			10.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	2%	5%	1%	1%	0%	2%	2%	0%	2%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	213	199	0	108	290	323	0	1210	78	0	1733	0
Turn Type	Prot	NA		Prot	NA	Perm		NA	pm+ov		NA	
Protected Phases	7	4		3	8			2	3		6	
Permitted Phases						8			2			
Detector Phase	7	4		3	8	8		2	3		6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0		4.0	
Minimum Split (s)	8.5	20.5		8.5	20.5	20.5		20.5	8.5		20.5	
Total Split (s)	11.0	20.6		10.9	20.5	20.5		36.5	10.9		36.5	
Total Split (%)	13.8%	25.8%		13.6%	25.6%	25.6%		45.6%	13.6%		45.6%	
Yellow Time (s)	3.5	3.5		3.5	3.5	3.5		3.5	3.5		3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0		1.0	1.0		1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0	0.0		0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5	4.5		4.5	4.5		4.5	
Lead/Lag	Lead	Lag		Lead	Lag	Lag			Lead			
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes			Yes			
Recall Mode	None	None		None	None	None		C-Max	None		C-Max	
Act Effct Green (s)	6.5	16.1		6.4	16.0	16.0		44.0	54.9		44.0	
Actuated g/C Ratio	0.08	0.20		0.08	0.20	0.20		0.55	0.69		0.55	
v/c Ratio	1.70	0.62		0.94	0.86	1.16		0.69	0.08		1.00	
Control Delay	376.1	38.6		110.1	56.6	137.5		15.7	4.4		28.3	
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.3	0.0		3.3	
Total Delay	376.1	38.6		110.1	56.6	137.5		16.0	4.4		31.5	
LOS	F	D		F	E	F		B	A		C	
Approach Delay		213.1			100.9			15.3			31.5	
Approach LOS		F			F			B			C	

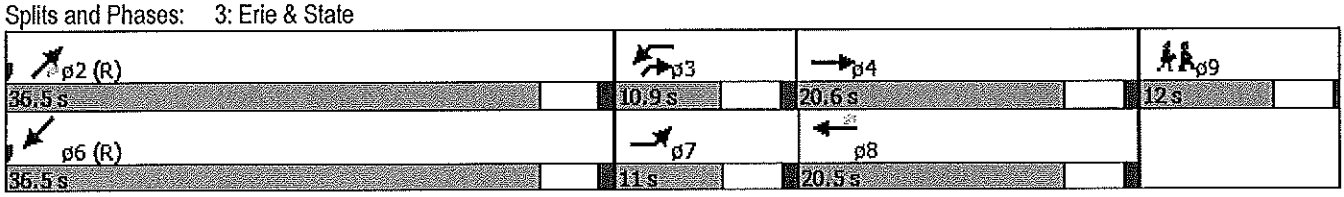
Intersection Summary	
Area Type:	CBD
Cycle Length: 80	
Actuated Cycle Length: 80	

Lane Group	ø9
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	4.0
Minimum Split (s)	12.0
Total Split (s)	12.0
Total Split (%)	15%
Yellow Time (s)	3.5
All-Red Time (s)	0.5
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	

Intersection Summary

Offset: 18 (23%), Referenced to phase 2:NET and 6:SWT, Start of Green
Natural Cycle: 150
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.70
Intersection Signal Delay: 56.5 Intersection LOS: E
Intersection Capacity Utilization 88.3% ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 3: Erie & State



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	196	167	16	99	267	297	0	1113	72	0	1511	84
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	10	12	11	12	12	13	12	12	12
Storage Length (ft)	190		0	75		360	0		225	0		0
Storage Lanes	1		0	1		1	0		1	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1540	1600	0	1444	1693	1391	0	3185	1473	0	3158	0
Flt Permitted	0.950			0.950								
Satd. Flow (perm)	1540	1600	0	1444	1693	1391	0	3185	1473	0	3158	0
Right Turn on Red			No			Yes			No			No
Satd. Flow (RTOR)						211						
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		581			538			1052			442	
Travel Time (s)		13.2			12.2			23.9			10.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	2%	5%	1%	1%	0%	2%	2%	0%	2%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	213	199	0	108	290	323	0	1210	78	0	1733	0
Turn Type	Prot	NA		Prot	NA	Perm		NA	pm+ov		NA	
Protected Phases	7	4		3	8			2	3		6	
Permitted Phases						8			2			
Detector Phase	7	4		3	8	8		2	3		6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0		4.0	
Minimum Split (s)	8.5	20.5		8.5	20.5	20.5		20.5	8.5		20.5	
Total Split (s)	14.0	19.0		14.0	19.0	19.0		35.0	14.0		35.0	
Total Split (%)	17.5%	23.8%		17.5%	23.8%	23.8%		43.8%	17.5%		43.8%	
Yellow Time (s)	3.5	3.5		3.5	3.5	3.5		3.5	3.5		3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0		1.0	1.0		1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0	0.0		0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5	4.5		4.5	4.5		4.5	
Lead/Lag	Lead	Lag		Lead	Lag	Lag			Lead			
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes			Yes			
Recall Mode	None	None		None	None	None		C-Max	None		C-Max	
Act Effct Green (s)	9.5	17.3		9.0	14.5	14.5		42.5	56.0		42.5	
Actuated g/C Ratio	0.12	0.22		0.11	0.18	0.18		0.53	0.70		0.53	
v/c Ratio	1.17	0.58		0.67	0.95	0.76		0.72	0.08		1.03	
Control Delay	155.3	38.0		55.5	75.0	24.8		17.2	3.9		39.1	
Queue Delay	0.0	0.0		0.0	0.0	0.4		0.4	0.0		4.6	
Total Delay	155.3	38.0		55.5	75.0	25.2		17.6	3.9		43.7	
LOS	F	D		E	E	C		B	A		D	
Approach Delay		98.6			49.8			16.8			43.7	
Approach LOS		F			D			B			D	

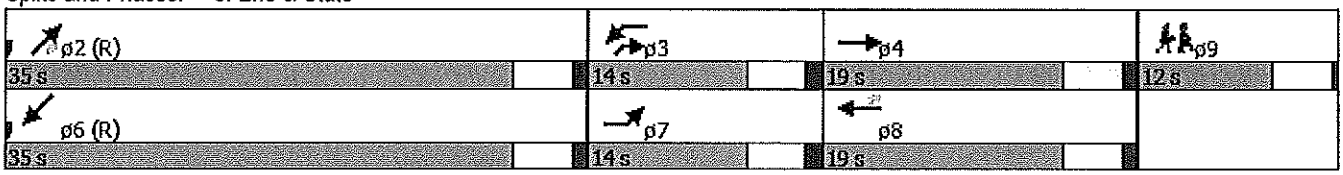
Intersection Summary

Area Type: CBD
Cycle Length: 80
Actuated Cycle Length: 80

Lane Group	ø9
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	4.0
Minimum Split (s)	12.0
Total Split (s)	12.0
Total Split (%)	15%
Yellow Time (s)	3.5
All-Red Time (s)	0.5
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Intersection Summary	

Offset: 18 (23%), Referenced to phase 2:NET and 6:SWT, Start of Green
Natural Cycle: 150
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.17
Intersection Signal Delay: 41.8 Intersection LOS: D
Intersection Capacity Utilization 88.3% ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 3: Erie & State



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	166	45	53	307	0	294	0	73	49	182	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	13	10	9	11	12	10	12	12	12	13	12
Storage Length (ft)	0		100	50		0	150		0	0		0
Storage Lanes	0		1	1		0	1		1	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1716	1343	1303	1459	0	1486	0	1411	0	1703	0
Flt Permitted				0.340			0.950				0.991	
Satd. Flow (perm)	0	1716	1343	466	1459	0	1486	0	1411	0	1703	0
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)			79								5	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		538			434			481			310	
Travel Time (s)		12.2			9.9			10.9			7.0	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	0%	3%	1%	1%	2%	0%	2%	0%	3%	1%	1%	1%
Parking (#/hr)				0	0							
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	182	49	58	337	0	323	0	80	0	294	0
Turn Type		NA	Perm	pm+pt	NA		Prot		pt+ov	Split	NA	
Protected Phases		4		3	8		5		5 3	6	6	
Permitted Phases			4	8								
Detector Phase		4	4	3	8		5		5 3	6	6	
Switch Phase												
Minimum Initial (s)		12.0	12.0	8.0	12.0		12.0			12.0	12.0	
Minimum Split (s)		24.0	24.0	12.0	24.0		24.0			24.0	24.0	
Total Split (s)		45.0	45.0	19.0	64.0		34.0			34.0	34.0	
Total Split (%)		29.6%	29.6%	12.5%	42.1%		22.4%			22.4%	22.4%	
Yellow Time (s)		3.0	3.0	3.0	3.0		3.0			3.0	3.0	
All-Red Time (s)		1.0	1.0	1.0	1.0		1.0			1.0	1.0	
Lost Time Adjust (s)		0.0	0.0	0.0	0.0		0.0				0.0	
Total Lost Time (s)		4.0	4.0	4.0	4.0		4.0				4.0	
Lead/Lag		Lag	Lag	Lead			Lead			Lag	Lag	
Lead-Lag Optimize?		Yes	Yes	Yes			Yes			Yes	Yes	
Recall Mode		None	None	None	None		None			Max	Max	
Act Effct Green (s)		16.4	16.4	29.7	29.7		30.1		39.4		30.1	
Actuated g/C Ratio		0.16	0.16	0.29	0.29		0.30		0.39		0.30	
v/c Ratio		0.66	0.17	0.27	0.79		0.74		0.15		0.58	
Control Delay		52.2	4.3	29.5	47.7		45.1		11.8		36.5	
Queue Delay		0.0	0.0	0.0	0.0		0.0		0.0		0.0	
Total Delay		52.2	4.3	29.5	47.7		45.1		11.8		36.5	
LOS		D	A	C	D		D		B		D	
Approach Delay		42.1			45.1						36.5	
Approach LOS		D			D						D	

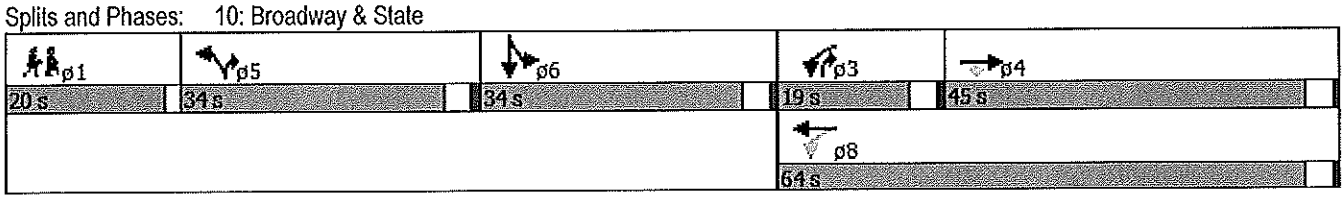
Intersection Summary	
Area Type:	CBD
Cycle Length: 152	

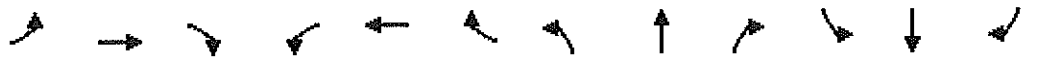
Lane Group	ø1
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Parking (#/hr)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	1
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	7.0
Minimum Split (s)	20.0
Total Split (s)	20.0
Total Split (%)	13%
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	

Intersection Summary

Actuated Cycle Length: 101.9
Natural Cycle: 105
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.79
Intersection Signal Delay: 40.6 Intersection LOS: D
Intersection Capacity Utilization 64.2% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 10: Broadway & State





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑	↱	↰	↑		↰		↱		↕	
Volume (vph)	0	166	45	53	307	0	335	0	73	49	182	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	13	10	9	11	12	10	12	12	12	13	12
Storage Length (ft)	0		100	50		0	150		0	0		0
Storage Lanes	0		1	1		0	1		1	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1716	1343	1303	1459	0	1486	0	1411	0	1703	0
Flt Permitted				0.340			0.950				0.991	
Satd. Flow (perm)	0	1716	1343	466	1459	0	1486	0	1411	0	1703	0
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)			79								5	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		538			434			481			310	
Travel Time (s)		12.2			9.9			10.9			7.0	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	0%	3%	1%	1%	2%	0%	2%	0%	3%	1%	1%	1%
Parking (#/hr)				0	0							
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	182	49	58	337	0	368	0	80	0	294	0
Turn Type		NA	Perm	pm+pt	NA		Prot		pt+ov	Split	NA	
Protected Phases		4		3	8		5		5 3	6	6	
Permitted Phases			4	8								
Detector Phase		4	4	3	8		5		5 3	6	6	
Switch Phase												
Minimum Initial (s)		12.0	12.0	8.0	12.0		12.0			12.0	12.0	
Minimum Split (s)		24.0	24.0	12.0	24.0		24.0			24.0	24.0	
Total Split (s)		45.0	45.0	19.0	64.0		34.0			34.0	34.0	
Total Split (%)		29.6%	29.6%	12.5%	42.1%		22.4%			22.4%	22.4%	
Yellow Time (s)		3.0	3.0	3.0	3.0		3.0			3.0	3.0	
All-Red Time (s)		1.0	1.0	1.0	1.0		1.0			1.0	1.0	
Lost Time Adjust (s)		0.0	0.0	0.0	0.0		0.0				0.0	
Total Lost Time (s)		4.0	4.0	4.0	4.0		4.0				4.0	
Lead/Lag		Lag	Lag	Lead			Lead			Lag	Lag	
Lead-Lag Optimize?		Yes	Yes	Yes			Yes			Yes	Yes	
Recall Mode		None	None	None	None		None			Max	Max	
Act Effct Green (s)		16.4	16.4	29.7	29.7		30.1		39.4		30.1	
Actuated g/C Ratio		0.16	0.16	0.29	0.29		0.30		0.39		0.30	
v/c Ratio		0.66	0.17	0.27	0.79		0.84		0.15		0.58	
Control Delay		52.2	4.3	29.5	47.7		53.1		11.8		36.5	
Queue Delay		0.0	0.0	0.0	0.0		0.0		0.0		0.0	
Total Delay		52.2	4.3	29.5	47.7		53.1		11.8		36.5	
LOS		D	A	C	D		D		B		D	
Approach Delay		42.1			45.1						36.5	
Approach LOS		D			D						D	

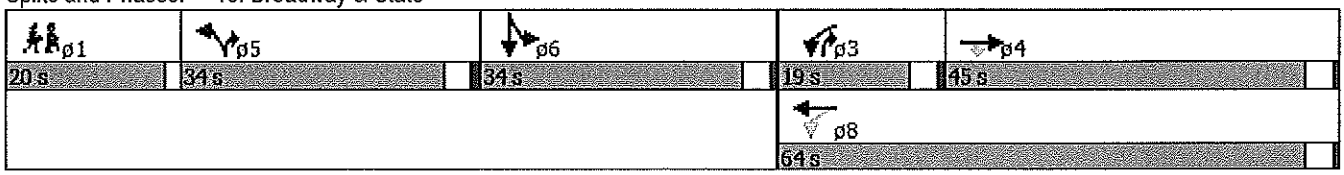
Intersection Summary	
Area Type:	CBD
Cycle Length: 152	

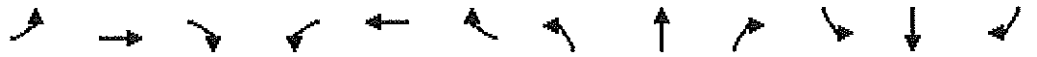
Lane Group	ø1
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Parking (#/hr)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	1
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	7.0
Minimum Split (s)	20.0
Total Split (s)	20.0
Total Split (%)	13%
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	

Intersection Summary

Actuated Cycle Length: 101.9
Natural Cycle: 105
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.84
Intersection Signal Delay: 42.9 Intersection LOS: D
Intersection Capacity Utilization 66.7% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 10: Broadway & State





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	8	278	735	92	447	0	1330	46	61	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		500	140		0	500		350	0		0
Storage Lanes	1		2	1		0	1		1	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1805	1881	2787	1787	3471	0	1681	1692	1599	0	0	0
Flt Permitted	0.480			0.950			0.950	0.955				
Satd. Flow (perm)	912	1881	2787	1787	3471	0	1681	1692	1599	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			782						65			
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1311			394			457			506	
Travel Time (s)		29.8			9.0			10.4			11.5	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	0%	1%	2%	1%	4%	2%	2%	0%	1%	2%	2%	2%
Shared Lane Traffic (%)							48%					
Lane Group Flow (vph)	9	296	782	98	476	0	736	728	65	0	0	0
Turn Type	Perm	NA	pm+ov	Prot	NA		Prot	NA	pm+ov			
Protected Phases		4	5	3	8		5	2	3			
Permitted Phases	4		4						2			
Detector Phase	4	4	5	3	8		5	2	3			
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0			
Minimum Split (s)	21.0	21.0	9.0	9.0	21.0		9.0	21.0	9.0			
Total Split (s)	40.0	40.0	45.0	25.0	65.0		45.0	45.0	25.0			
Total Split (%)	30.8%	30.8%	34.6%	19.2%	50.0%		34.6%	34.6%	19.2%			
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0			
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0			
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0			
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0			
Lead/Lag	Lag	Lag		Lead					Lead			
Lead-Lag Optimize?	Yes	Yes		Yes					Yes			
Recall Mode	None	None	None	None	None		None	Max	None			
Act Effct Green (s)	18.5	18.5	63.9	10.2	33.8		40.3	40.3	55.6			
Actuated g/C Ratio	0.22	0.22	0.76	0.12	0.40		0.48	0.48	0.66			
v/c Ratio	0.04	0.71	0.34	0.45	0.34		0.92	0.90	0.06			
Control Delay	26.5	40.9	0.7	42.4	17.7		40.7	38.5	2.0			
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0			
Total Delay	26.5	40.9	0.7	42.4	17.7		40.7	38.5	2.0			
LOS	C	D	A	D	B		D	D	A			
Approach Delay		11.8			21.9			38.0				
Approach LOS		B			C			D				

Intersection Summary

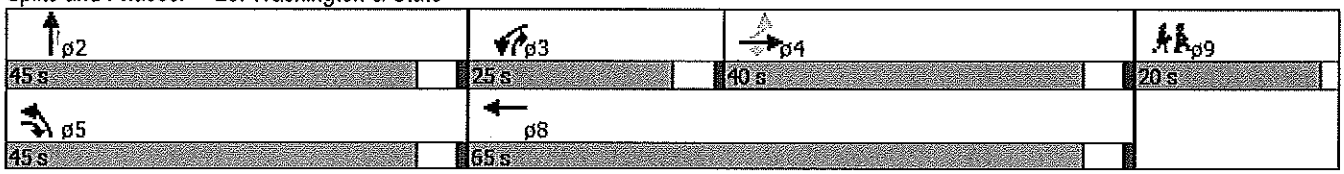
Area Type: Other
Cycle Length: 130
Actuated Cycle Length: 84.2
Natural Cycle: 90

Lane Group	ø9
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	7.0
Minimum Split (s)	20.0
Total Split (s)	20.0
Total Split (%)	15%
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	

Intersection Summary

Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.92
Intersection Signal Delay: 26.2 Intersection LOS: C
Intersection Capacity Utilization 70.3% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 25: Washington & State



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	8	319	735	92	489	0	1330	108	102	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		500	140		0	500		350	0		0
Storage Lanes	1		2	1		0	1		1	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1805	1881	2787	1787	3471	0	1681	1702	1599	0	0	0
Flt Permitted	0.460			0.950			0.950	0.959				
Satd. Flow (perm)	874	1881	2787	1787	3471	0	1681	1702	1599	0	0	0
Right Turn on Red			No			Yes			Yes			Yes
Satd. Flow (RTOR)									109			
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1311			394			457			506	
Travel Time (s)		29.8			9.0			10.4			11.5	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	0%	1%	2%	1%	4%	2%	2%	0%	1%	2%	2%	2%
Shared Lane Traffic (%)							46%					
Lane Group Flow (vph)	9	339	782	98	520	0	764	766	109	0	0	0
Turn Type	Perm	NA	pm+ov	Prot	NA		Prot	NA	pm+ov			
Protected Phases		4	5	3	8		5	2	3			
Permitted Phases	4		4						2			
Detector Phase	4	4	5	3	8		5	2	3			
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0			
Minimum Split (s)	21.0	21.0	9.0	9.0	21.0		9.0	21.0	9.0			
Total Split (s)	40.0	40.0	45.0	25.0	65.0		45.0	45.0	25.0			
Total Split (%)	30.8%	30.8%	34.6%	19.2%	50.0%		34.6%	34.6%	19.2%			
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0			
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0			
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0			
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0			
Lead/Lag	Lag	Lag		Lead					Lead			
Lead-Lag Optimize?	Yes	Yes		Yes					Yes			
Recall Mode	None	None	None	None	None		None	Max	None			
Act Effct Green (s)	21.1	21.1	66.5	10.4	36.5		40.4	40.4	55.9			
Actuated g/C Ratio	0.24	0.24	0.76	0.12	0.42		0.46	0.46	0.64			
v/c Ratio	0.04	0.75	0.37	0.46	0.36		0.98	0.97	0.10			
Control Delay	25.5	41.4	4.1	44.3	17.4		54.0	51.7	1.9			
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0			
Total Delay	25.5	41.4	4.1	44.3	17.5		54.0	51.7	1.9			
LOS	C	D	A	D	B		D	D	A			
Approach Delay		15.4			21.7			49.5				
Approach LOS		B			C			D				

Intersection Summary

Area Type: Other
Cycle Length: 130
Actuated Cycle Length: 87
Natural Cycle: 100

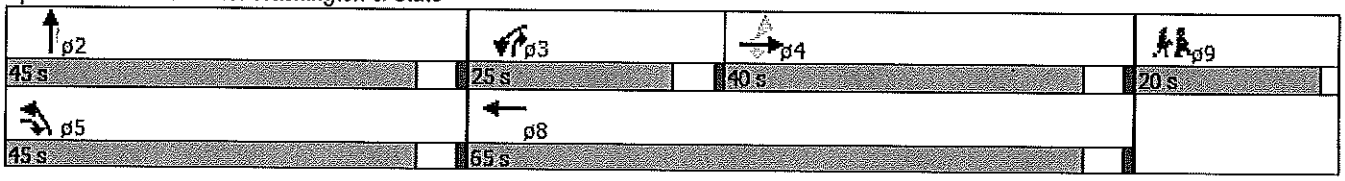
Lane Group	ø9
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	7.0
Minimum Split (s)	20.0
Total Split (s)	20.0
Total Split (%)	15%
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	

Intersection Summary

Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.98
Intersection Signal Delay: 33.1
Intersection Capacity Utilization 74.1%
Analysis Period (min) 15

Intersection LOS: C
ICU Level of Service D

Splits and Phases: 25: Washington & State



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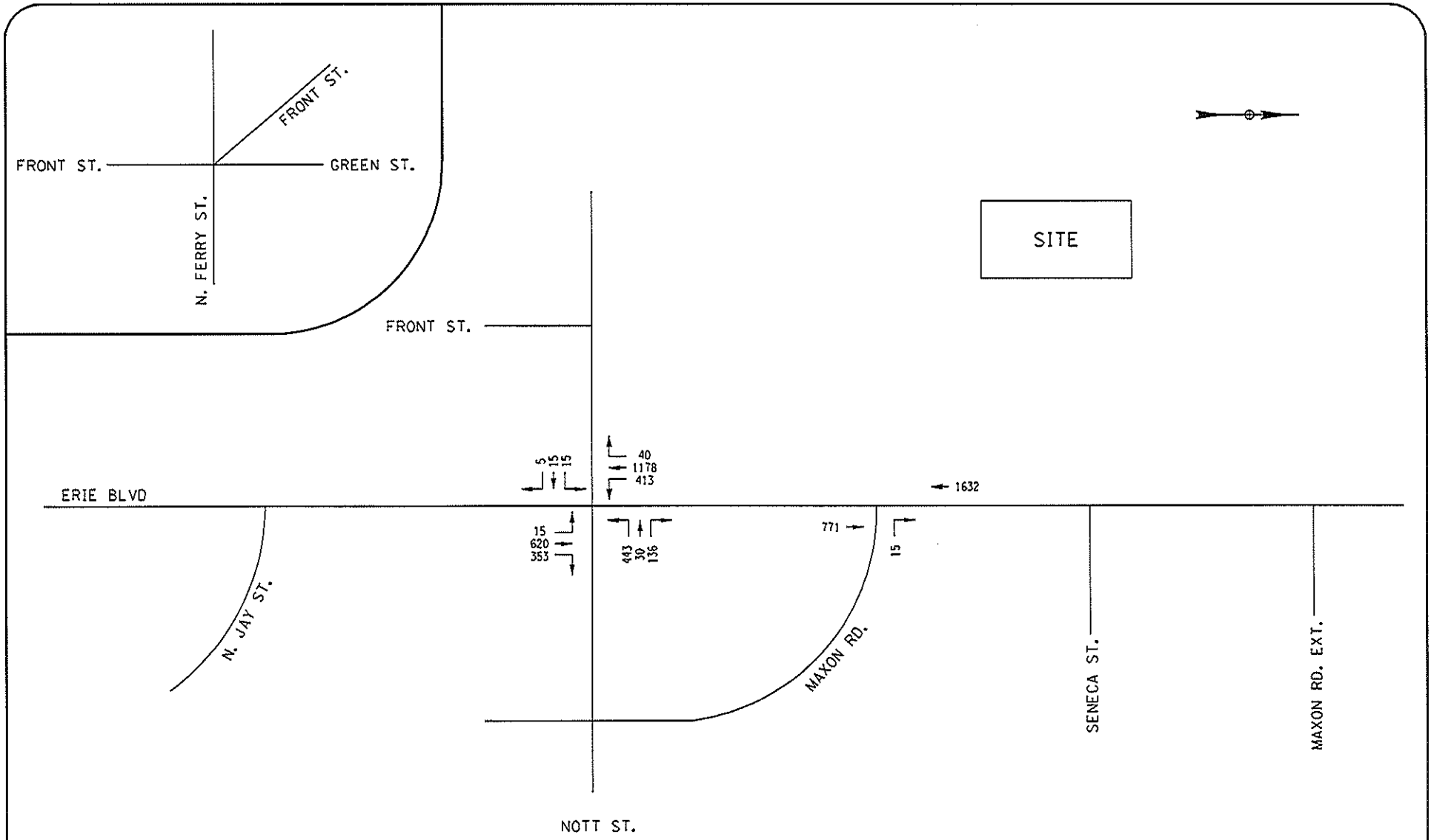

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TRAFFIC ENGINEERING & TRANSPORTATION PLANNING

MOHAWK HARBOR
SCHENECTADY, NEW YORK

2016 NO-BUILD
TRAFFIC VOLUMES
WEEKDAY AM PEAK HOUR

DATE: JUNE 2014

Figure
D1
Project No.
1368.002.001

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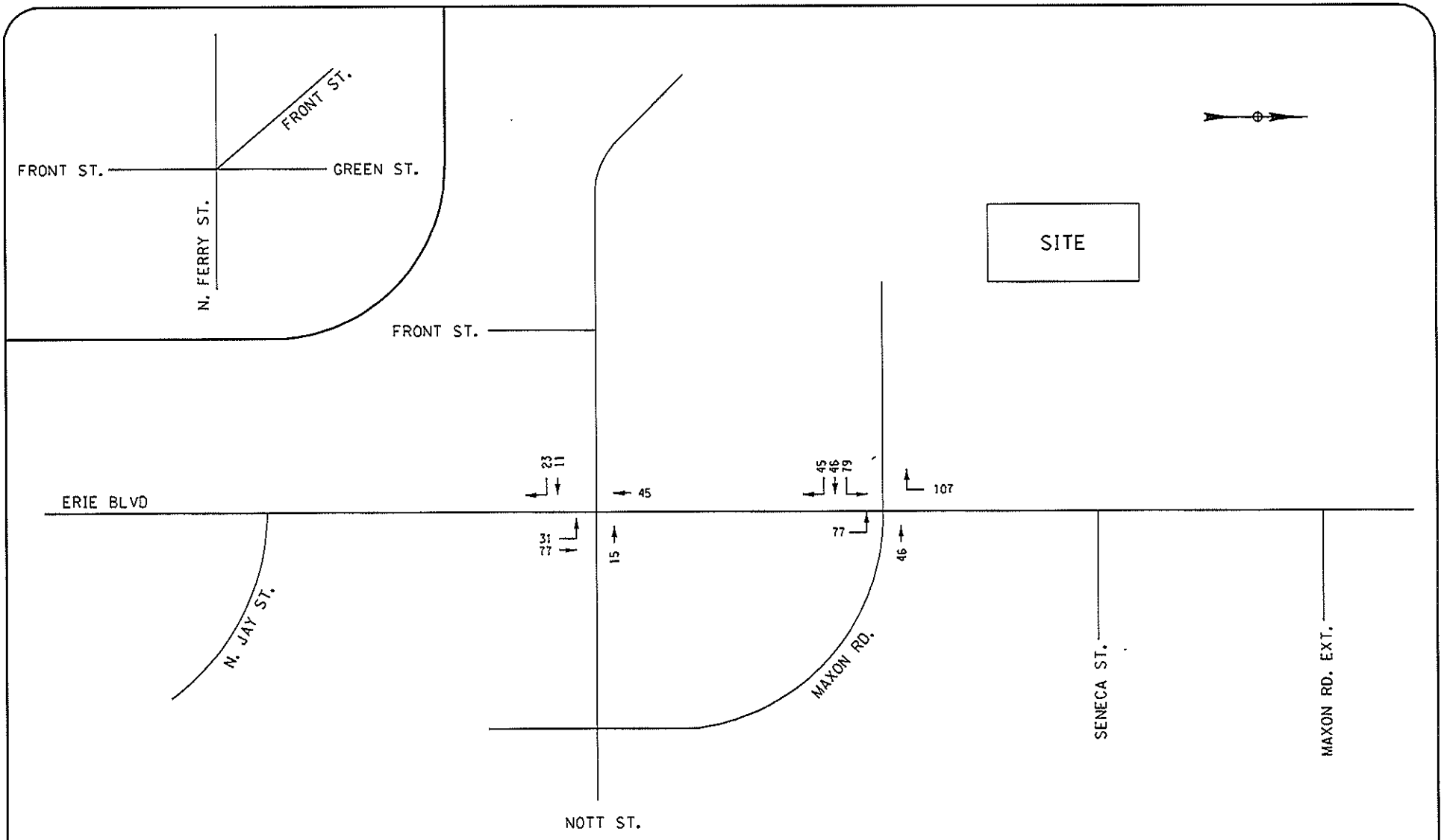

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MOHAWK HARBOR
SCHENECTADY, NEW YORK

NON-CASINO SITE
TRAFFIC VOLUMES
WEEKDAY AM PEAK HOUR

DATE: JUNE 2014

Figure
D2
Project No.
1368.002.001

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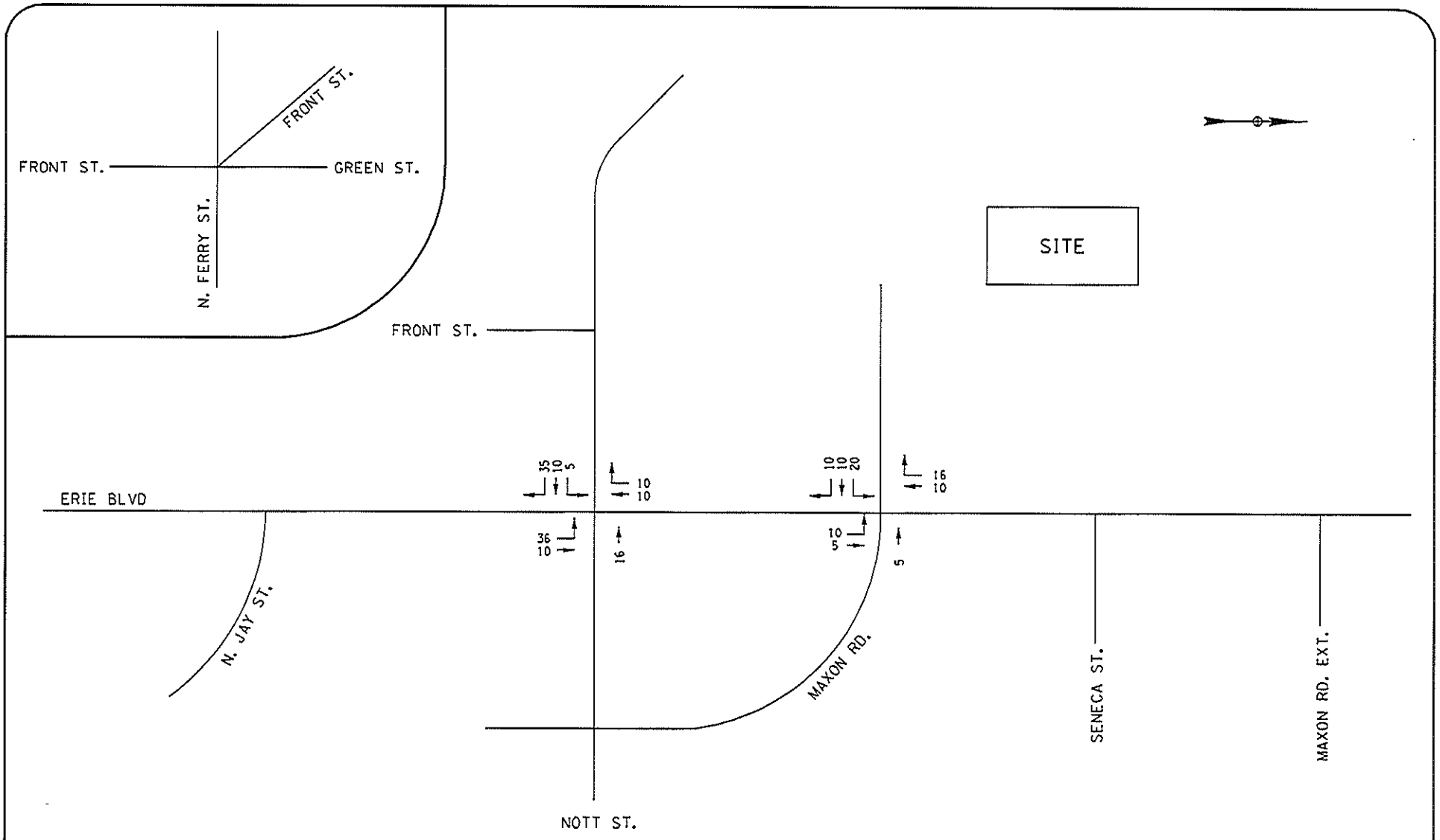

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MOHAWK HARBOR
SCHENECTADY, NEW YORK

CASINO SITE
TRAFFIC VOLUMES
WEEKDAY AM PEAK HOUR

DATE: JUNE 2014

Figure
D3
Project No.
1368.002.001

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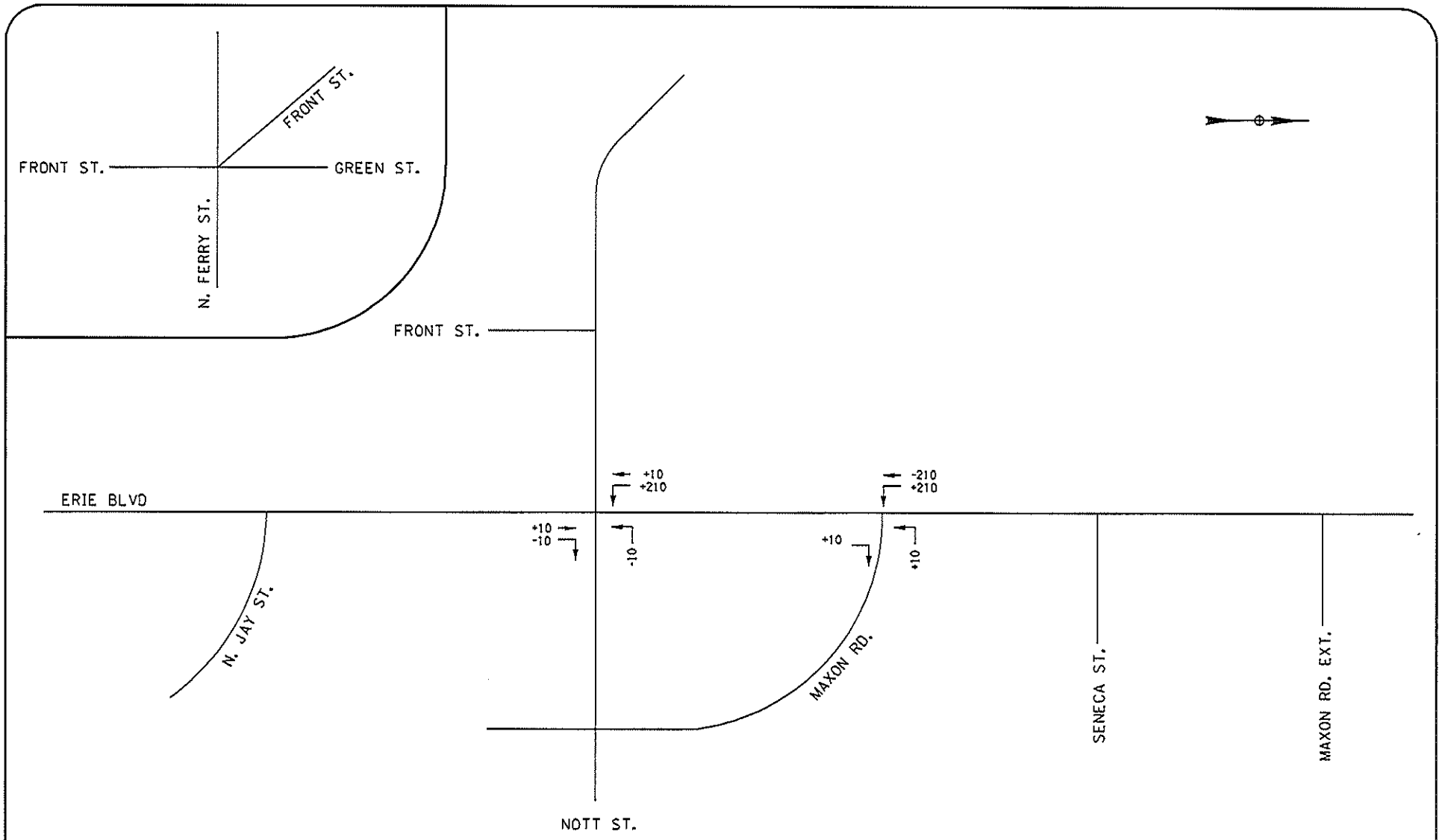

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MOHAWK HARBOR
SCHENECTADY, NEW YORK

MAXON RD. DIVERSIONS
(OPEN TO TWO-WAY)
TRAFFIC VOLUMES
WEEKDAY AM PEAK HOUR
DATE: JUNE 2014

Figure
D4
Project No.
1368.002.001

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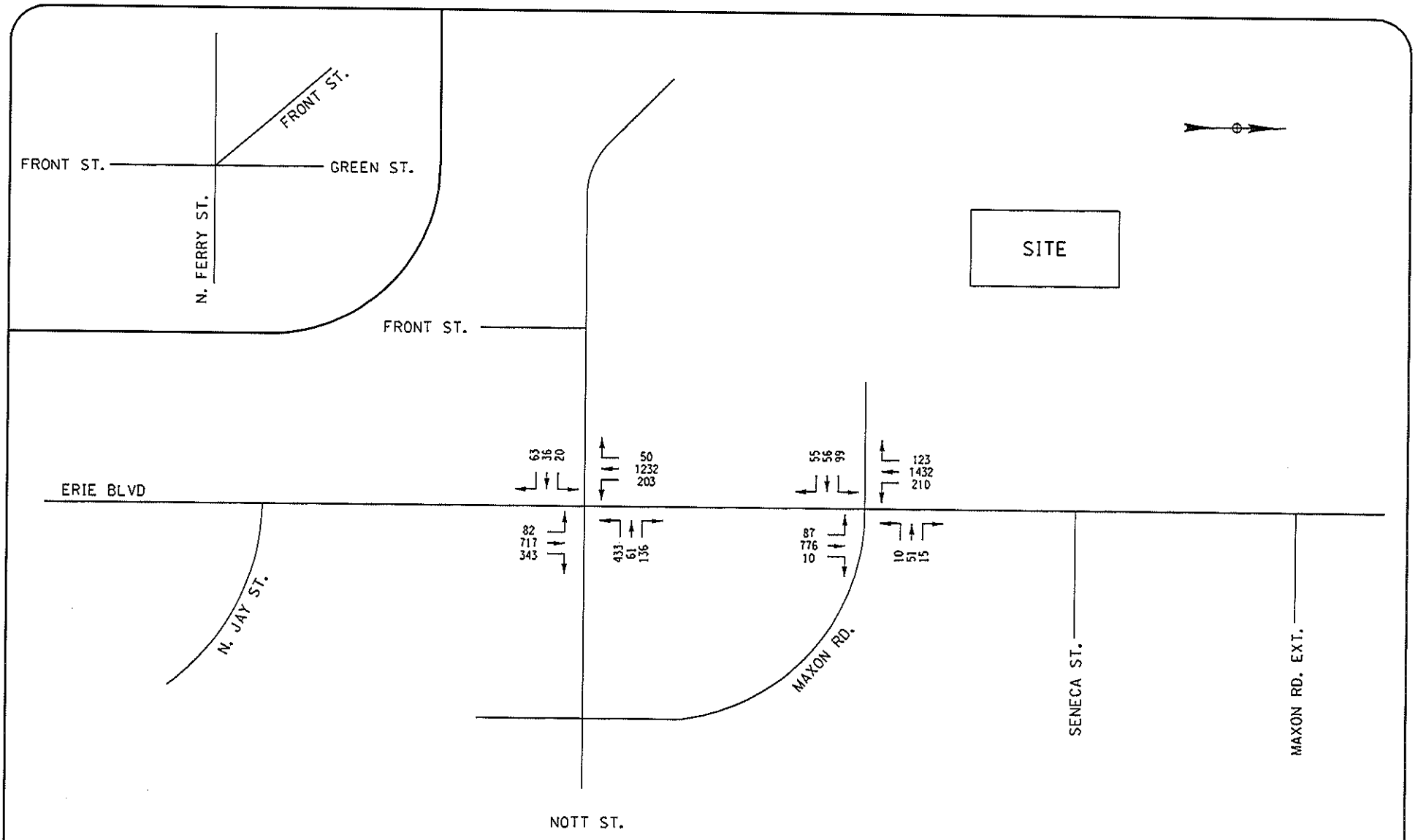

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TRAFFIC ENGINEERING & TRANSPORTATION PLANNING

MOHAWK HARBOR
SCHENECTADY, NEW YORK

2016 BUILD
TRAFFIC VOLUMES
WEEKDAY AM PEAK HOUR

DATE: JUNE 2014

Figure
D5
Project No.
1368.002.001

Table D1 – Level of Service Summary
AM Peak Hour

Intersection Approach		Control	2016 Build w/Imp
Erie Blvd/Maxon Rd/Alco Dr		S	
Erie Blvd NB	L		B (15.1)
	T		B (11.5)
	TR		B (11.4)
Erie Blvd SB	L		A (8.4)
	T		B (18.0)
	TR		B (18.6)
Alco Dr EB	L		C (30.6)
	TR		C (27.2)
Maxon Rd WB	LT		C (34.9)
	R		C (27.1)
	Overall		B (16.8)
Erie Blvd/Nott St		R	
Erie Blvd NB	LT		A (6.0)
	TR		A (4.9)
Erie Blvd SB	LT		B (12.7)
	TR		A (9.8)
Nott St EB	LTR		B (10.3)
Nott St WB	L		B (11.7)
	TR/LT		A (9.7)
	/R		A (6.2)
	Overall		A (8.9)

Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (veh/h)	87	776	10	210	1432	123	99	56	55	10	51	15
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1881	1900	1900	1883	1900	1863	1881	1900	1900	1900	1900
Adj Flow Rate, veh/h	95	843	11	228	1557	134	108	61	60	11	55	16
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	0	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	1	1	0	1	1	2	0	0	0	0	0
Cap, veh/h	232	1892	25	502	1884	161	238	165	163	69	113	253
Arrive On Green	0.05	0.52	0.52	0.09	0.56	0.56	0.05	0.19	0.19	0.07	0.07	0.07
Sat Flow, veh/h	1810	3613	47	1810	3336	285	1774	872	858	189	1621	1615
Grp Volume(v), veh/h	95	417	437	228	829	862	108	0	121	66	0	16
Grp Sat Flow(s),veh/h/ln	1810	1787	1873	1810	1789	1832	1774	0	1730	1811	0	1615
Q Serve(g_s), s	1.8	10.9	10.9	4.2	28.3	29.1	4.0	0.0	4.6	0.7	0.0	0.6
Cycle Q Clear(g_c), s	1.8	10.9	10.9	4.2	28.3	29.1	4.0	0.0	4.6	2.6	0.0	0.6
Prop In Lane	1.00		0.03	1.00		0.16	1.00		0.50	0.17		1.00
Lane Grp Cap(c), veh/h	232	936	981	502	1010	1035	238	0	328	183	0	253
V/C Ratio(X)	0.41	0.45	0.45	0.45	0.82	0.83	0.45	0.00	0.37	0.36	0.00	0.06
Avail Cap(c_a), veh/h	245	936	981	681	1095	1122	238	0	575	434	0	484
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	14.0	11.1	11.1	7.7	13.3	13.4	29.2	0.0	26.5	33.7	0.0	27.0
Incr Delay (d2), s/veh	1.2	0.3	0.3	0.6	4.8	5.2	1.4	0.0	0.7	1.2	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	5.4	5.7	2.1	15.2	16.1	0.3	0.0	2.2	1.4	0.0	0.3
LnGrp Delay(d),s/veh	15.1	11.5	11.4	8.4	18.0	18.6	30.6	0.0	27.2	34.9	0.0	27.1
LnGrp LOS	B	B	B	A	B	B	C		C	C		C
Approach Vol, veh/h		949			1919			229			82	
Approach Delay, s/veh		11.8			17.1			28.8			33.4	
Approach LOS		B			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.5	44.4		19.3	8.4	47.4	9.0	10.3
Change Period (Y+Rc), s	5.0	5.0		5.0	5.0	5.0	5.0	5.0
Max Green Setting (Gmax), s	14.0	36.0		25.0	4.0	46.0	4.0	16.0
Max Q Clear Time (g_c+I1), s	6.2	12.9		6.6	3.8	31.1	6.0	4.6
Green Ext Time (p_c), s	0.4	18.7		1.0	0.0	11.4	0.0	0.8

Intersection Summary	
HCM 2010 Ctrl Delay	16.8
HCM 2010 LOS	B

Notes

User approved pedestrian interval to be less than phase max green.

LANE SUMMARY

Site: Erie-Nott

2016 AM Build w-IMP
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Erie Blvd													
Lane 1	564	1.7	1069	0.528	100	6.0	LOS A	3.6	25.4	Full	500	0.0	0.0
Lane 2[d]	638	0.9	1209	0.528	100	4.9	LOS A	3.7	26.2	Full	500	0.0	0.0
Approach	1202	1.3		0.528		5.4	LOS A	3.7	26.2				
East: Nott St													
Lane 1	219	1.0	885	0.247	100	11.7	LOS B	1.2	8.6	Full	120	0.0	0.0
Lane 2[d]	301	1.0	1220	0.247	100	9.7	LOS A	1.4	9.6	Full	120	0.0	0.0
Lane 3	143	1.0	890	0.161	100	6.2	LOS A	0.8	5.4	Full	120	0.0	0.0
Approach	663	1.0		0.247		9.6	LOS A	1.4	9.6				
North: Erie Blvd													
Lane 1	720	1.7	885	0.813	100	12.7	LOS B	8.8	62.5	Full	500	0.0	0.0
Lane 2[d]	843	2.0	1038	0.813	100	9.8	LOS A	9.2	65.2	Full	500	0.0	0.0
Approach	1563	1.9		0.813		11.1	LOS B	9.2	65.2				
West: Front St													
Lane 1[d]	125	0.7	403	0.311	100	10.3	LOS B	1.6	11.1	Full	45	0.0	0.0
Approach	125	0.7		0.311		10.3	LOS B	1.6	11.1				
Intersection	3554	1.5		0.813		8.9	LOS A	9.2	65.2				

Level of Service (LOS) Method: Delay (HCM 2000).
Roundabout LOS Method: Same as Sign Control.
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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Appendix E – Pedestrian Checklist

Traffic Impact Study
Mohawk Harbor Redevelopment
City of Schenectady, New York

Exhibit 18-1 Pedestrian Generator Checklist

Alco Redevelopment Project Project Location: Erie Boulevard, Schenecatdy

PEDESTRIAN GENERATOR CHECKLIST		
Note: The term "generator" in this document refers to both pedestrian generators (where pedestrians originate) and destinations (where pedestrians travel to). *A check of" yes" indicates a potential need to accommodate pedestrians and coordination with the Regional Bicycle and Pedestrian Coordinator is necessary during project scoping. Answers to the following questions should be checked with the local municipality to ensure accuracy.*		
1.	Is there an existing or planned sidewalk, trail, or pedestrian-crossing facility?	**YES**☒ **NO**□
2.	Are there bus stops, transit stations or depots/terminals located in or within 800 m of the project area?	**YES**☒ **NO**□
3.	Is there more than occasional pedestrian activity? Evidence of pedestrian activity may include a worn path.	**YES**☒ **NO**□
4.	Are there existing or approved plans for generators of pedestrian activity in or within 800m of the project that promote or have the potential to promote pedestrian traffic in the project area, such as schools, parks, playgrounds, places of employment, places of worship, post offices, municipal buildings, restaurants, shopping centers, or other commercial areas, or shared-use paths?	**YES**☒ **NO**□
5.	Are there existing or approved plans for seasonal generators of pedestrian activity in or within 800 m of the project that promote or have the potential to promote pedestrian traffic in the project area, such as ski resorts, state parks, camps, amusement parks?	**YES**☒ **NO**□
6.	Is the project located in a residential area within 800 m of existing or planned pedestrian generators such as those listed in 4 above?	**YES**☒ **NO**□
7.	From record plans, were pedestrian facilities removed during a previous highway reconstruction project?	**YES**□ **NO**☒
8.	Did a study of secondary impacts indicate that the project promotes or is likely to promote commercial and/or residential development within the intended life cycle of the project?	**YES**☒ **NO**□
9.	Does the community's comprehensive plan call for development of pedestrian facilities in the area?	**YES**☒ **NO**□
10.	Based on the ability of students to walk and bicycle to school, would the project benefit from engineering measures under the Safe-Routes-To-School program? Eligible infrastructure-related improvements must be within a 3.2 km radius of the project.	**YES**□ **NO**☒
Note: This checklist should be revisited due to a project delay or if site conditions or local planning changes during the project development process. Comments: Regional Bicycle and Pedestrian Coordinator: Project Designer:		