

# Traffic Impact Study

for the proposed

## Proposed Distribution Facility Project

**Town of Grand Island  
Erie County, New York**

Project No. 39064

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## TABLE OF CONTENTS

LIST OF TABLES.....	ii
LIST OF FIGURES.....	ii
LIST OF APPENDICES.....	iii
LIST OF REFERENCES.....	iii
EXECUTIVE SUMMARY .....	iv
I. INTRODUCTION.....	I
II. LOCATION.....	I
III. EXISTING HIGHWAY SYSTEM .....	2
IV. EXISTING TRAFFIC CONDITIONS.....	4
A. Peak Intervals for Analysis.....	4
B. Existing Traffic Volume Data.....	4
C. Field Observations .....	5
D. Existing Crash Investigation.....	5
V. EXISTING BRIDGE CONDITIONS.....	8
A. Long Rd and Bedell Road Bridges over I-190.....	8
B. NYSTA North and South Grand Island Bridges Carrying I-190.....	8
C. NYSTA North and South Grand Island Bridges Construction.....	14
VI. FUTURE AREA DEVELOPMENT AND LOCAL GROWTH.....	15
VII. PROPOSED DEVELOPMENT .....	15
A. Description of Proposed Distribution Facility Project.....	15
B. Site Traffic Generation.....	16
C. Site Traffic Distribution.....	19
VIII. FULL DEVELOPMENT VOLUMES .....	19
IX. CAPACITY ANALYSIS.....	20
A. Description of Capacity Analysis .....	20
B. Capacity Analysis Results.....	20
C. Sensitivity Analysis Results .....	23
X. LEFT-TURN TREATMENT WARRANT INVESTIGATION .....	24
XI. SIGNAL WARRANT ANALYSIS.....	24
XII. CONCLUSIONS & RECOMMENDATIONS.....	27
XIII. FIGURES.....	28

## LIST OF TABLES

TABLE I	EXISTING HIGHWAY SYSTEM.....	2
TABLE II	STUDY INTERSECTION COUNT DATES AND ACTUAL PEAK HOURS .....	4
TABLE III	SUMMARY OF CRASHES AND COMPARISON OF RATES.....	6
TABLE IV:	HISTORICAL BRIDGE TRAFFIC VOLUME DATA AVERAGE DAILY TRAFFIC IN VEHICLES PER DAY (VPD).....	9
TABLE V:	NORTH BRIDGE DATA .....	10
TABLE VI:	SOUTH BRIDGE DATA.....	10
TABLE VII:	NGIB AVERAGE WEEKDAY HOURLY TRAFFIC – NORTHBOUND COMPARISON OF JULY & NOVEMBER 2019 VS 2022 .....	11
TABLE VIII:	NGIB AVERAGE WEEKDAY HOURLY TRAFFIC – SOUTHBOUND COMPARISON OF JULY & NOVEMBER 2019 VS 2022 .....	12
TABLE IX:	SGIB AVERAGE WEEKDAY HOURLY TRAFFIC – NORTHBOUND COMPARISON OF JULY & NOVEMBER 2019 VS 2022 .....	13
TABLE X:	SGIB JULY & NOVEMBER OF 2019 AVERAGE WEEKDAY HOURLY TRAFFIC - SOUTHBOUND .....	14
TABLE XI	FACILITY SHIFT TIMES .....	16
TABLE XII	PEAK HOUR SITE GENERATED TRIPS.....	17
TABLE XIII	SITE TRIPS GENERATED DURING INTERSECTION PEAK HOURS.....	18
TABLE XIV	HOURLY DISTRIBUTION OF TRUCK TRAFFIC .....	18
TABLE XV	CAPACITY ANALYSIS RESULTS.....	21
TABLE XVI	SENSITIVITY ANALYSIS RESULTS .....	23
TABLE XVII	TRAFFIC SIGNAL WARRANT SUMMARY.....	26

## LIST OF FIGURES

FIGURE I	SITE LOCATION & STUDY AREA
FIGURE 2	LANE GEOMETRY & AVERAGE DAILY TRAFFIC
FIGURE 3A	PEAK HOUR VOLUMES – 2019 UNADJUSTED EXISTING CONDITIONS
FIGURE 3B	PEAK HOUR VOLUMES – 2019 SEASONALLY ADJUSTED BASE CONDITIONS
FIGURE 4	PEAK HOUR VOLUMES – 2022 BACKGROUND CONDITIONS
FIGURE 5	CONCEPT PLAN
FIGURE 6A	PROPOSED PEAK HOUR TRIP DISTRIBUTION - TRUCKS
FIGURE 6B	PROPOSED PEAK HOUR TRIP DISTRIBUTION - EMPLOYEES
FIGURE 7A	PEAK HOUR SITE GENERATED TRUCK TRIPS
FIGURE 7B	PEAK HOUR SITE GENERATED EMPLOYEE TRIPS
FIGURE 7C	TOTAL PEAK HOUR SITE GENERATED TRIPS
FIGURE 8	PEAK HOUR VOLUMES – FULL DEVELOPMENT CONDITIONS

FIGURE 9A PROPOSED PEAK HOUR TRIP DISTRIBUTION – EMPLOYEES  
SENSITIVITY ANALYSIS

FIGURE 9B PEAK HOUR SITE GENERATED EMPLOYEE TRIPS – SENSITIVITY ANALYSIS

FIGURE 9C PEAK HOUR VOLUMES – FULL DEVELOPMENT CONDITIONS  
SENSITIVITY ANALYSIS

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#### LIST OF APPENDICES

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- A1. COLLECTED TRAFFIC VOLUME DATA
- A2. TRAFFIC VOLUMES DATA FACILITY PEAK HOURS
- A3. MISCELLANEOUS TRAFFIC DATA AND CALCULATIONS
- A4. LOS CRITERIA/DEFINITIONS
- A5. LEVEL OF SERVICE CALCULATIONS – EXISTING CONDITIONS
- A6. LEVEL OF SERVICE CALCULATIONS – BACKGROUND CONDITIONS
- A7. LEVEL OF SERVICE CALCULATIONS – FULL DEVELOPMENT CONDITIONS
- A8. LEVEL OF SERVICE CALCULATIONS – FULL DEVELOPMENT CONDITIONS WITH  
PROJECT MODIFICATIONS AND IMPROVEMENTS
- A9. CRASH DATA AND ANALYSIS
- A10. SIGNAL WARRANT AND LEFT TURN LANE WARRANT ANALYSES, QUEUE ANALYSIS
- A11. THRUWAY BRIDGE DATA
- A12. SENSITIVITY ANALYSIS RESULTS

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#### LIST OF REFERENCES

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## EXECUTIVE SUMMARY

### OVERVIEW

The purpose of this report is to identify and evaluate the potential traffic impacts associated with the Proposed Distribution Facility Project in the Town of Grand Island, New York. The operating characteristics of the proposed access point and impacts to the adjacent roadway network are identified and project modifications and improvements are identified to minimize potential capacity and safety concerns. To define traffic impacts, this analysis establishes existing seasonally adjusted traffic conditions, projects background traffic flow including area growth, and projects changes in traffic flow due to the Proposed Distribution Facility Project.

In order to ensure a comprehensive analysis of potential traffic impacts, a geographically broad study area was selected consisting of the following nine (9) existing intersections and one (1) proposed new site driveway:

1. Long Road/Proposed Site Drive-Technology Camp of America Driveway
2. Long Road /I-190 On-Off Ramps
3. Long Road/Grand Island Boulevard
4. Grand Island Boulevard/I-190 NB Off-Ramp
5. Grand Island Boulevard/Bedell Road
6. Grand Island Boulevard/Baseline Road
7. Grand Island Boulevard/Whitehaven Road
8. Grand Island Boulevard/Staley Road (Roundabout)
9. Bedell Road/Proposed Site Driveway
10. Whitehaven Road/Baseline Road

The peak hours for the potential project traffic are different from the actual intersection peak time periods as a result of the shift times for employees. Based upon the employee arrival and departure times for the defined shifts, the peak hours used for analysis were 6:30-7:30 AM and 5:30-6:30 PM. Intersection traffic volumes during these time periods are generally similar although slightly lower than traffic volumes during the actual intersection peak hours. In contrast traffic volumes expected to be generated by the facility are considerably lower during the intersection peak hours.

The proposed project includes the development of a multistory warehouse with a footprint of approximately 823,522± square feet to house a new distribution facility. The facility will include 69± loading docks, 225± trailer parking stalls, and 1,800± employee parking stalls. Access to the proposed development will be provided via two (2) driveways; one driveway along Long Road that will provide access to the loading docks and trailer parking as well as the employee parking lot; and one driveway along Bedell Road that will only provide access to the car parking lot for employees. Trucks will not be permitted to use the Bedell Road access during construction or during facility operations.

Construction of the Proposed Distribution Facility Project is anticipated to reach full build-out in approximately 3 years, by spring 2022. Widely accepted methodology for preparing traffic impact studies requires that any projects in the study area that are currently approved and/or under construction must be considered in the traffic analysis. Projects that are contemplated but not yet

approved are not included in a traffic analysis. To account for normal increases in background traffic growth, including any unforeseen developments in the project study area, a conservative growth rate of 0.5 % per year was applied to the existing traffic volumes, based upon historical traffic growth derived from NYSDOT traffic volume data for the area, for the three-year build-out period. Traffic volumes associated with the approved Heron Pointe residential development, an approved development on Grand Island Boulevard, were also added to the background traffic volumes.

The existing, background and future operating characteristics of the site access intersection and impacts to the adjacent roadway network are identified and improvements are identified which will appropriately mitigate traffic impacts associated with the facility and minimize any capacity or safety concerns.

### **CONCLUSIONS & RECOMMENDATIONS**

This Traffic Impact Study identifies and evaluates the potential traffic impacts resulting from full build-out of the Proposed Distribution Facility Project. Based upon the comprehensive traffic analysis contained in this report, it is our firm's professional opinion that the results indicate that the Proposed Distribution Facility Project can be reasonably accommodated by the existing roadway network with the mitigations below being in place. The following sets forth our firm's conclusions and mitigation recommendations based upon the results of the comprehensive traffic analyses that have been conducted:

1. Based upon the crash details at the study intersections, the majority of crashes were rear-end collisions. These types of collisions are more common at traffic signals on high volume roadways. Recommended mitigation countermeasures include optimizing the change intervals (yellow time) at the traffic signals (to increase the length of time between phase intervals) and/or improve the visibility of the traffic signals to make drivers more aware of the operating conditions. It should be noted that Grand Island Boulevard/I-190 Off Ramp, Long Road/I-190 Off Ramp, and Grand Island Boulevard/Long Road are un-signalized intersections. In addition, the number and type of crashes documented at these intersections do not indicate the need for signalization as they are not susceptible to correction by a traffic signal.
2. The bridge that carries Long Road (CR 310) over I-190 was built in 1954 and is owned and maintained by the New York State Thruway Authority (NYSTA). There are no posted safety restrictions for this bridge. This bridge was last inspected by the NYSTA on August 30, 2018. The inspection report, included in the Appendix, indicates no flags were issued. The segment of Long Road that crosses the bridge over the I-190 currently carries approximately 1,750 vehicles per day (vpd). The proposed distribution facility is expected to add approximately 1,230 passenger vpd and approximately 240 trucks vpd traveling on Long Road over I-190 for a total of 1,470 vpd. Review of the current operating conditions and projected traffic volumes indicates that no improvements are warranted or recommended on this bridge.
3. The bridge that carries Bedell Road over I-190 was built in 1954 and is also owned and maintained by the NYSTA. There are no posted safety restrictions for this bridge. This bridge was last inspected by the NYSTA on May 17, 2018. The inspection report, included in the Appendix, indicates no flags were issued. The segment of Bedell Road that crosses the bridge currently carries approximately 918 vpd. The proposed distribution facility is expected to

add approximately 1,550 passenger vpd traveling on Bedell Road over I-190; no trucks are expected to use Bedell Road. Review of the current operating conditions and projected traffic volumes indicates that no improvements are warranted or recommended on this bridge.

4. Traffic volumes using the North and South Grand Island Bridges were considerably higher between 2004 and 2007 than they are currently. Even with the addition of the Project, the estimated 2022 traffic volumes will not exceed the 2004 through 2007 traffic volumes on these bridges when toll barriers were still in place. The NGIB currently carries an average of 58,860 vpd. The Project is expected to add approximately 1,388 passenger vehicles per day and approximately 48 trucks per day on the NGIB. As such, the Project is expected to increase traffic on the NGIB by only approximately 2.4 percent and will remain below historic peak levels achieved in 2006 when toll barriers were still in place. The SGIB currently carries an average of 71,830 vpd. The proposed distribution facility is expected to add approximately 2,301 passenger vehicles per day and approximately 436 trucks per day on the SGIB. As such, the Project is expected to increase traffic on the SGIB by only approximately 3.8 percent and will remain below historic peak levels achieved in 2004 and 2007 when toll barriers were still in place.
5. The peak hour weekday traffic on the GI Bridges in July and November occurs between 7:00-10:00 AM and 4:00-6:00 PM. The Project will have peak facility hours between 6:30-7:30 AM and 5:30-6:30 PM for employees entering and exiting the site. Additionally, the overnight shifts will end between 4:30-5:00AM. As such, the Project's shift times are designed to avoid peak travel hours on the bridges.
6. The proposed distribution facility is expected to generate approximately 707 (1,190) new trips during the AM (PM) study peak hours (6:30-7:30 AM and 5:30-6:30 PM) respectively inclusive of both passenger vehicles and trucks.
7. During the time periods of 7:30-9:00 AM and 4:00-5:30 PM (the time periods that encompass the actual intersection peak hours) the site generates significantly lower volumes of traffic; on the order of 101(214) vph respectively. Therefore, the combination of the site peak traffic and the intersection traffic volumes during the peak hours of the site represent the most critical time period for evaluation.
8. The majority of truck traffic (approx. 90%) will travel directly to and from the NYS Thruway via Long Road and the I-190. The other 10% will travel to/from the north on the I-190.
9. The combination of projected westbound traffic volumes (shown in Figure 8 of the TIS for full development conditions) turning left from Long Road onto the I-190 SB Ramps indicate warrants for left-turn treatment are not met during the weekday AM and PM peak hours; left turn treatment warrants are met for traffic turning into the site driveway. The through volumes on Long Road at the site driveway are extremely low during the peak study time periods – 17(12) vph westbound. Given the extremely low through volumes, left turn treatments are not warranted or recommended at the site driveway.

10. Signal Warrant 1 is not met at any of the study locations. Warrant 2 is met at Grand Island Blvd/Long Rd and Grand Island Blvd/I-190 NB Off-Ramp and for three (3) hours at the Long Rd/I-190 SB Ramp intersection. Given the respective operating conditions for each location and the results of the sensitivity analysis, a signal is recommended at the Long Rd/I-190 SB Ramp location only.
11. The following project modifications and improvements are recommended and, if approved by review agencies, will be constructed by the project sponsor:
- a) Long Rd/I-190 SB Ramps
    - Install a new fully actuated three-color traffic signal.
  - b) Grand Island Blvd/I-190 NB Off-Ramp
    - Construct a new right turn lane for traffic exiting the I-190 Ramp.
12. The project sponsor should continue discussions with NFTA to provide transit service on-site.

## I. INTRODUCTION

SRF Associates (“SRF”) prepared a Traffic Impact Study (“TIS”) dated February 2020 that identified and evaluated the potential traffic impacts associated with the Proposed Distribution Facility Project in the Town of Grand Island, New York. Members of the Town Board, Planning Board, and various advisory boards, as well as the Erie County Department of Public Works (“ECDPW”) and members of the general public raised questions and issued comments regarding the TIS. In response thereto, SRF prepared a Traffic Supplement dated April 6, 2020 (the “Traffic Supplement”). Subsequently, CHA Consulting Inc. (“CHA”), the Town’s traffic consultant, the New York State Department of Transportation (“NYSDOT”), the New York State Thruway Authority (“NYSTA”) and Erie County issued additional comments regarding both the TIS and the Traffic Supplement. In response thereto, SRF prepared this Revised TIS, which incorporates the Traffic Supplement and addresses all comments received to date.

The Revised TIS identifies the operating characteristics of the proposed access points and impacts to the adjacent roadway network and identifies project modifications and improvements that will appropriately mitigate traffic impacts associated with the facility and minimize potential capacity and safety concerns.

To define traffic impacts, the Revised TIS establishes existing seasonally adjusted traffic conditions, projects background traffic flow including area growth, and projects changes in traffic flow due to the Proposed Distribution Facility Project.

## II. LOCATION

The Proposed Distribution Facility Project is located west of the I-190 South Bound ramp in the Town of Grand Island, Erie County, New York. The site is currently vacant industrially zoned land. In order to ensure a comprehensive analysis of potential traffic impacts, a geographically broad study area was selected consisting of the following nine (9) existing intersections and one (1) proposed new site driveway:

1. Long Road/Proposed Site Drive-Technology Camp of America Driveway
2. Long Road /I-190 On-Off Ramps
3. Long Road/Grand Island Boulevard
4. Grand Island Boulevard/I-190 NB Off-Ramp
5. Grand Island Boulevard/Bedell Road
6. Grand Island Boulevard/Baseline Road
7. Grand Island Boulevard/Whitehaven Road
8. Grand Island Boulevard/Staley Road (Roundabout)
9. Bedell Road/Proposed Site Driveway
10. Whitehaven Road/Baseline Road

The site location and study area are shown in **Figure 1 – Site Location and Study Area** (all figures are included at the end of this report).

### III. EXISTING HIGHWAY SYSTEM

Details of the existing roadway network in the vicinity of the project site are summarized in Table I below. The Annual Average Daily Traffic (AADT) counts referenced below were obtained based upon the most recent traffic counts collected by the New York State Department of Transportation (NYSDOT).

**TABLE I**  
**EXISTING HIGHWAY SYSTEM**

ROADWAY	ROUTE <sup>1</sup>	FUNC. CLASS <sup>2</sup>	JURIS. <sup>3</sup>	SPEED LIMIT <sup>4</sup>	# OF TRAVEL LANES <sup>5</sup>	TRAVEL PATTERN/DIRECTION	EST. AADT <sup>6</sup>	AADT SOURCE <sup>7</sup>
<b>Baseline Road</b> (From Grand Island Blvd to Bedell Rd)	CR 2f49	Minor Arterial	ECDPW	45	2	Two-way/ North-South	7,423	NYSDOT (2015)
<b>Bedell Road</b> (From West River Pkwy to Grand Island Blvd)	N/A	Local Road	Town of Grand Island	45	2	Two-way/ East-West	923	NYSDOT (2012)
<b>Long Road</b> (From Grand Island Blvd to Baseline Rd)	CR 310	Major Collector	ECDPW	40	2	Two-way/ East-West	3,162	NYSDOT (2015)
<b>Long Road</b> (From I-190 SB to Grand Island Blvd)	CR 310	Major Collector	NYSDOT/ ECDPW	40	2	<del>One-way</del> Two-way/ East-West	1,761	NYSDOT (2015)
<b>Long Road</b> (From West River Pkwy to I-190 SB)	CR 310	Major Collector	ECDPW	40	2	Two-way/ East-West	1,129	NYSDOT (2015)
<b>Grand Island Boulevard</b> (From Whitehaven Rd to Staley Rd/I-190 SB On-Ramp)	NY 324	Minor Arterial	NYSDOT	45	2	Two-way/ North-South	9,899	NYSDOT (2016)
<b>Grand Island Boulevard</b> (From Long Rd to Whitehaven Rd)	NY 324	Minor Arterial	NYSDOT	45	2	Two-way/ North-South	5,870	NYSDOT (2014)
<b>Staley Road</b> (From Grand Island Blvd to Stoney Point Rd)	N/A	Major Collector	Town of Grand Island	45	2	Two-way/ East-West	8,188	NYSDOT (2014)
<b>Whitehaven Road</b> (From Grand Island Blvd to Stony Point Road)	CR 75	Major Collector	ECDPW	45	2	Two-way/ East-West	5,237	NYSDOT (2015)
<b>Baseline Road</b> (From Grand Island Blvd to Bedell Road)	CR 249	Major Collector	ECDPW	45	2	Two-way/ North-South	7,423	NYSDOT (2015)

Notes:

1. Route Name/Number: "NYS" = New York State.
2. State Functional Classification of Roadway: All are Urban.



3. Jurisdiction: "NYSDOT" = New York State Department of Transportation, "ECDPW" = Erie County Department of Public Works
4. Posted or Statewide Limit in Miles per Hour (MPH).
5. Excludes turning/auxiliary lanes developed at intersections.
6. Estimated AADT in Vehicles per Day (vpd).
7. Source (Year).

**Figure 2** illustrates the lane geometry at each of the study intersections and the AADT volumes on the study roadways.

### PEDESTRIAN FACILITIES

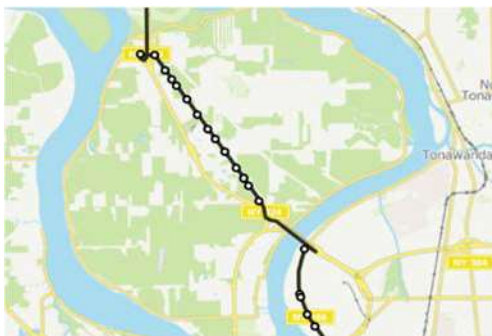
There are no existing pedestrian facilities in the vicinity of the site on either Long Road or Bedell Road.

### BICYCLE FACILITIES

Currently, no dedicated bicycle facilities exist within the study area. Bicyclists are permitted to share the road on all roadways within the study area. However, future proposed bike routes include Grand Island Blvd from Staley Rd to Buckhorn Island State Park, Whitehaven Rd from I-190 to East River Rd, Bedell Rd from Baseline Rd to Stony Point Rd, and West River Rd (now closed to vehicular traffic) from Beaver Island State Park to Buckhorn Island State Park.

### TRANSIT FACILITIES

Public transit service within the study area is provided by the Niagara Frontier Transit Metro System, Inc (NFTA). NFTA currently provides one bus route, Route #40, that provides service between Buffalo and Niagara Falls with stops on Grand Island. This bus route travels the entire length of Grand Island Blvd between Long Road and Staley Road with multiple stops along Grand Island Blvd including stops at the intersection of Grand Island Blvd/Bedell Road, Grand Island Blvd just south of Long Road, and one located at the I-190 southbound ramp at Long Road as shown on the aerial image to the right. The site plan is designed to provide an on-site location for a bus stop and the applicant is currently pursuing discussions with the NFTA about providing service on-site.



**NFTA Bus Stops on Grand Island**



## IV. EXISTING TRAFFIC CONDITIONS

### A. Peak Intervals for Analysis

Given the functional characteristics of the Proposed Distribution Facility Project, the peak hours selected for analysis are the AM and PM peak hours of the generator due to the proposed shift times for the majority of the employees working at the site (see Section VI.A. of this report for a detailed discussion of employee shift times). The combination of site traffic and adjacent through traffic produces the greatest demand during these time periods.

### B. Existing Traffic Volume Data

Weekday AM (5:00-9:00 AM) and PM (4:00-8:00 PM) peak hour volumes were collected by SRF Associates (SRF) at the study area intersections listed in Section II above with the exception of the Whitehaven Road/Baseline Road intersection where data was collected between 6:00-9:00 AM and PM 4:00-7:00 PM. Turning movement count data was collected by SRF at the study intersections on Wednesday, November 13, 2019 and Wednesday March 11, 2020. All turning movement count data were collected on typical weekdays while local schools were in session. The traffic volumes were reviewed to confirm the accuracy and relative balance of the collective traffic counts.

The count dates and actual peak hour traffic periods for each study intersection are noted in Table II below.

**TABLE II**  
**STUDY INTERSECTION COUNT DATES AND**  
**ACTUAL INTERSECTION PEAK HOURS**

INTERSECTION	COUNT DATES	AM PEAK	PM PEAK
Grand Island Blvd/Baseline Road	Wednesday November 13, 2019	8:00-9:00 AM	4:00-5:00 PM
Grand Island Blvd/Bedell Road	Wednesday November 13, 2019	7:45-8:45 AM	4:30-5:30 PM
Grand Island Blvd/I-190 NB Ramps	Wednesday November 13, 2019	7:45-8:45 AM	4:30-5:30 PM
Grand Island Blvd/Staley Road	Wednesday November 13, 2019	6:30-7:30 AM	4:15-5:15 PM
Grand Island Blvd/Whitehaven Road	Wednesday November 13, 2019	7:00-8:00 AM	4:00-5:00 PM
Long Road/ Grand Island Blvd	Wednesday November 13, 2019	7:45-8:45 AM	4:30-5:30 PM
Long Road/I-190 Ramp	Wednesday November 13, 2019	7:45-8:45 AM	4:30-5:30 PM
Long Road/Proposed Site Driveway	Wednesday November 13, 2019	7:00-8:00 AM	4:30-5:30 PM
Baseline Road/Whitehaven Road	Wednesday March 11, 2020	7:45-8:45 AM	4:00-5:00 PM



The peak hours for the potential project traffic are different from the actual intersection peak time periods as a result of the shift times for employees (see detailed discussion in Section VI.A. of this report). Based upon the employee arrival and departure times for the defined shifts, the peak hours used for analysis were 6:30-7:30 AM and 5:30-6:30 PM. Intersection traffic volumes during these time periods are generally similar although slightly lower than traffic volumes during the actual intersection peak hours. In contrast traffic volumes expected to be generated by the facility are considerably lower during the intersection peak hours (see Section VII.B. of this report).

### Seasonality

Given that traffic volumes were collected during the months of November and March, seasonal adjustments were applied based upon NYSDOT seasonal adjustment factors for these months. The 2019 weekday AM and PM peak hour unadjusted traffic volumes are reflected in **Figure 3A**. **Figure 3B** shows the seasonally adjusted traffic volumes used for analysis purposes in this study.

In terms of the traffic on the Grand Island Bridges, based upon a review of the monthly traffic using the NGIB and SGIB, the months of July and August typically have traffic volumes that are approximately 13%-16% higher than the average month while January is typically 26%-29% lower than the average month. Data for this project was collected in early November 2019 and early March 2020. The month of October was 2%-3% higher than the average month and November was 8%-9% lower than the average month. Daily traffic volumes can fluctuate between 5%-10% on average. Therefore, the count data provided in the TIS falls within the typical fluctuations of daily traffic volumes for the average month. It is also noted that the seasonal fluctuations in traffic volumes typically occur during hours outside of the commuter peak times since traffic during these time periods tend to be higher than the rest of the day. Tourists typically avoid traveling along commuter routes during peak commuter traffic time periods.

Distribution of site generated traffic (see Figures 6B and 7B) indicates that the Project is estimated to add 21(35) vehicles during the AM(PM) peak hours to the Whitehaven Road/I-190 ramp intersections. These increases are considered minimal. Therefore, and consistent with national and local guidelines regarding study area for traffic impact studies, these intersections are not included in the Revised TIS.

### **C. Field Observations**

The study intersections were observed during both peak intervals to assess current traffic operations. Signal timing information observed in the field were utilized to confirm peak hour phasing plans and phase durations during each interval. Signal timing information was also obtained from the NYSDOT. This information was used to support and/or calibrate capacity analysis models described in detail later in this report.

### **D. Existing Crash Investigation**

A crash investigation at the study area intersections was conducted to assess the safety history from June 2016 through June 2019. The data was provided by the NYSDOT and Erie County Sheriff's Department through a Freedom of Information request.

A total of 52 crashes were documented during the investigation period (3 years) of which, a large portion of the crashes occurred at the signalized intersections of Grand Island Boulevard/Whitehaven Road and Grand Island Boulevard/Baseline Road. Several crashes also occurred at the un-signalized intersection of Grand Island Boulevard/Staley Road.

The severity of the 52 documented crashes are broken down as follows:

- 22 – Reportable - Injury
- 23 – Reportable – Non-Injury
- 7 – Non-Reportable

Reportable (non-injury, injury, and fatal injury) type crashes are defined as damage to one person's property in the amount of \$1,001 or more. The Non-Reportable type crashes result in property damage of \$1,000 or less.

The crash history was further investigated to identify high incident areas. **Table III** summarizes crashes occurring at each intersection. Based on the number of crashes at each intersection, crash rates were calculated and compared to the statewide average for similar facilities. The calculated rates and comparison to statewide averages are also summarized in Table III. Crash rate calculations are included in the Appendix. Intersection rates are listed as crashes per million entering vehicles (CRASH/MEV). It should be noted that NYSDOT average crash rates are based on reportable and non-reportable type crashes.

**TABLE III**  
**SUMMARY OF CRASHES AND COMPARISON OF RATES**

INTERSECTION	TOTAL NO. OF CRASHES	ACTUAL PROJECT RATE	STATEWIDE AVERAGE RATE
Grand Island Boulevard/Long Road	3	0.40	0.54
Grand Island Boulevard/I-190 Off Ramp	2	0.37	0.18
Grand Island Boulevard/Bedell Road	5	0.74	0.54
Grand Island Boulevard/Baseline Road	14	1.18	0.54
Grand Island Boulevard/Whitehaven Road	17	1.18	0.54
Grand Island Boulevard/Staley Road	10	0.53	0.31
Long Road/I-190 Off Ramp	1	0.28	0.18

The intersections of Grand Island Boulevard/I-190 Off Ramp, Grand Island Boulevard/Bedell Road, Grand Island Boulevard/Baseline Road, Grand Island Boulevard/Whitehaven Road, Grand Island Boulevard/Staley Road, and Long Road/I-190 Off Ramp have crash rates that are higher than the state average. A majority of the crashes at these intersections are rear-end collisions, which could be associated with vehicle queuing and the current intersection geometry.

Given that several of the intersections have rates that exceed statewide averages, further investigation was performed to identify high incident areas and possible trends/causes of the crashes. It is noted that the high crash rates at the two Long Road intersections, the I-190 intersection at Grand Island Blvd and the Bedell Road intersection are attributed to the relatively low daily volume of traffic that travels through each of these intersections. All of these intersections had five or fewer crashes during the three-year study period. The results of the investigation are discussed in the following section.

**#1: Grand Island Boulevard/Long Road**

A total of three crashes were documented during the investigation period (3 years). The crashes that occurred were categorized as right angle (2) and rear end (1). No notable crash clusters were identified at this location. There are no inherent safety concerns at this intersection.

**#2: Grand Island Boulevard/I-190 Off Ramp**

A total of two crashes were documented at this intersection. The calculated crash rate is approximately two times the statewide average for other similar 3-legged un-signalized intersections. The crashes were both fixed object collisions. There are no inherent safety concerns at this intersection.

**#3: Grand Island Boulevard/Bedell Road**

A total of five crashes were documented at this intersection. The calculated crash rate is approximately 1.5 times higher than the statewide average for other similar 4-legged intersections. The crashes that occurred were categorized as other (2), sideswipe (1), fixed object (1), and right turn (1). No notable crash clusters were identified at this location. There are no inherent safety concerns at this intersection.

**#4: Grand Island Boulevard/Baseline Road**

A total of 14 crashes were documented at this intersection. The calculated crash rate is approximately two times higher than the statewide average for other similar 4-legged intersections. The majority of crashes involved were rear-end (4) collisions. The remaining crashes were categorized as other (3), left turn (3), right angle (2), head on (1), and fixed object (1). No notable crash clusters were identified at this location. Given the lack of crash clusters, there are no inherent safety concerns at this intersection.

**#5: Grand Island Boulevard/Whitehaven Road**

A total of 17 crashes were documented at this intersection. The calculated crash rate is approximately two times higher than the statewide average for other similar 4-legged intersections. The majority of crashes involved were right angle (5) collisions. The remaining crashes were categorized as bike/pedestrian (3), left turn (2), rear end (2), other (2), overtaking (1), head on (1), and fixed object (1). Notable crash clusters at this location include:

- 3 right angle collisions in the westbound direction. Two of the 3 right angle collisions occurred during evening hours when sun glare may have been a factor.

**#6: Grand Island Boulevard/Staley Road**

A total of 7 crashes were documented at this intersection. The calculated crash rate is approximately 1.5 times higher than the statewide average for other similar 4-legged intersections (there are no published crash rates specific to roundabouts). The majority of crashes involved were rear-end (4) collisions. The remaining crashes were categorized as fixed object (2), other (2), overtaking (1), and right angle (1). No notable crash clusters were identified at this location. Given the lack of crash clusters, there are no inherent safety concerns at this intersection.

**#7: Long Road/I-190 Off Ramp**

One crash categorized as a rear end traveling in the westbound direction was documented at this intersection.

The majority of crashes were caused by either driver inattention, following too closely, or slippery pavement. Human error contributing factors were the most prevalent causes of the crashes.

Based upon the crash details at the study intersections, the majority of crashes were rear-end collisions. These types of collisions are more common at traffic signals on high volume roadways. Recommended mitigation countermeasures include optimizing the change intervals (yellow time) at the traffic signals (to increase the length of time between phase intervals) and/or improve the visibility of the traffic signals to make drivers more aware of the operating conditions. It should be noted that Grand Island Boulevard/I-190 Off Ramp, Long Road/I-190 Off Ramp, and Grand Island Boulevard/Long Road are un-signalized intersections. In addition, the number and type of crashes documented at these intersections do not indicate the need for signalization as they are not susceptible to correction by a traffic signal.

## **V. EXISTING BRIDGE CONDITIONS**

### **A. Long Rd and Bedell Road Bridges over I-190**

The bridge that carries Long Road (CR 310) over I-190 was built in 1954 and is owned and maintained by the New York State Thruway Authority (NYSTA). There are no posted safety restrictions for this bridge. This bridge was last inspected by the NYSTA on August 30, 2018. The inspection report, included in the appendix, indicates no flags were issued (flags are issued in bridge inspection reports when structural or safety deficiencies are identified).

The segment of Long Road that crosses the bridge currently carries approximately 1,750 vehicles per day (vpd). The proposed distribution facility is expected to add approximately 1,230 passenger vpd and approximately 240 trucks vpd traveling on Long Road over I-190 for a total of 1,470 vpd. Review of the current operating conditions and projected traffic volumes indicates that no improvements are warranted or recommended on this bridge.

The bridge that carries Bedell Road over I-190 was built in 1954 and is also owned and maintained by the NYSTA. There are no posted safety restrictions for this bridge. This bridge was last inspected by the NYSTA on May 17, 2018. The inspection report, included in the Appendix, indicates no flags were issued.

The segment of Bedell Road that crosses the bridge currently carries approximately 918 vpd. The proposed distribution facility is expected to add approximately 1,550 passenger vpd traveling on Bedell Road over I-190; no trucks are expected to use Bedell Road. Review of the current operating conditions and projected traffic volumes indicates that no improvements are warranted or recommended on this bridge.

### **B. NYSTA North and South Grand Island Bridges Carrying I-190**

The North Grand Island bridge (NGIB) is a twin truss arch bridge. The first span was opened in 1935 and the second addition to the truss arch bridge came in 1965. This bridge is owned and maintained by the NYSTA and extends I-190 across the Niagara River from Niagara Falls to Grand Island.

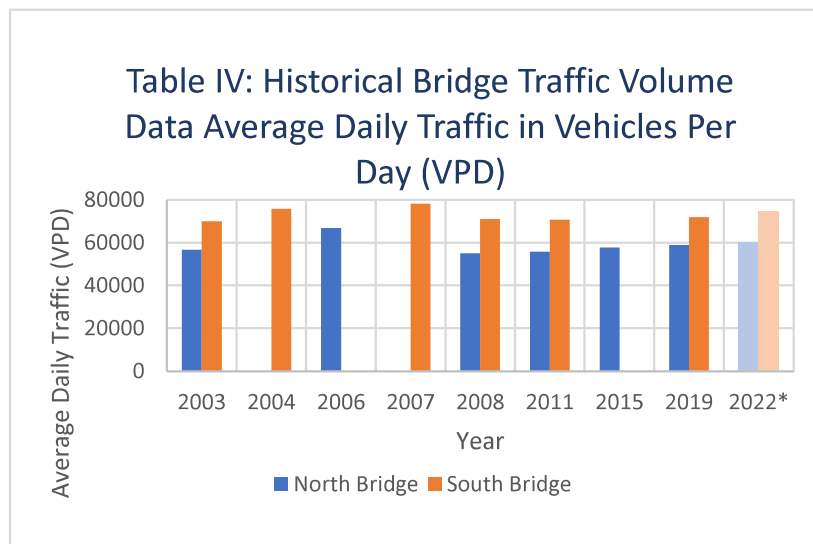
The South Grand Island Bridge (SGIB) is also a twin truss arch bridge with the first span opened in 1935 and the second opened in 1962. This bridge, which is also operated by the NYSTA, extends I-190 across the Niagara River from Tonawanda to Grand Island.

**Table IV** summarizes the historical traffic volumes on the NGIB and the SGIB and estimates future traffic volumes on the NGIB and SGIB with the Proposed Distribution Facility. Data shown in Table IV was obtained from the Greater Buffalo Niagara Regional Transportation Council (GBNRTC) and the NYSTA (Note: for some years, data is only available for one of the bridges).

As shown in Table IV, the traffic volumes using these bridges were considerably higher between 2004 and 2007 than they are currently. Even with the addition of the Project, the estimated 2022 traffic volumes will not exceed the 2004 through 2007 traffic volumes on these bridges. The NGIB currently carries an average of 58,860 vpd. The Project is expected to add approximately 1,388 passenger vehicles per day and approximately 48 trucks per day on the NGIB. As such, the Project is expected to increase traffic on the NGIB by only approximately 2.4 percent and will remain below historic peak levels achieved in 2006.

The SGIB currently carries an average of 71,830 vpd. The proposed distribution facility is expected to add approximately 2,301 passenger vehicles per day and approximately 436 trucks per day on the SGIB. As such, the Project is expected to increase traffic on the SGIB by only approximately 3.8 percent and will remain below historic peak levels achieved in 2004 and 2007.

Additionally, it is worth noting that the Grand Island Bridges require motorists to pay a toll in the northbound/southbound direction upon entering the Island only. In March of 2018 cashless tolling was implemented and the existing toll plazas were subsequently removed. This change has resulted in less congestion at these locations and improved safety. The NYSTA states the following on their website when discussing the benefits of cashless tolling on the Grand Island Bridges: "Additionally, over the last ten years, approximately 80 percent of all accidents within a tenth of a mile of the Grand Island Toll Barriers were caused by "Following Too Close" or an "Unsafe Speed." With the implementation of cashless tolling, the Thruway Authority expects accidents within these areas to be reduced." Thus, review of the current operating conditions and projected traffic volumes indicates that no improvements are warranted or recommended on these bridges.

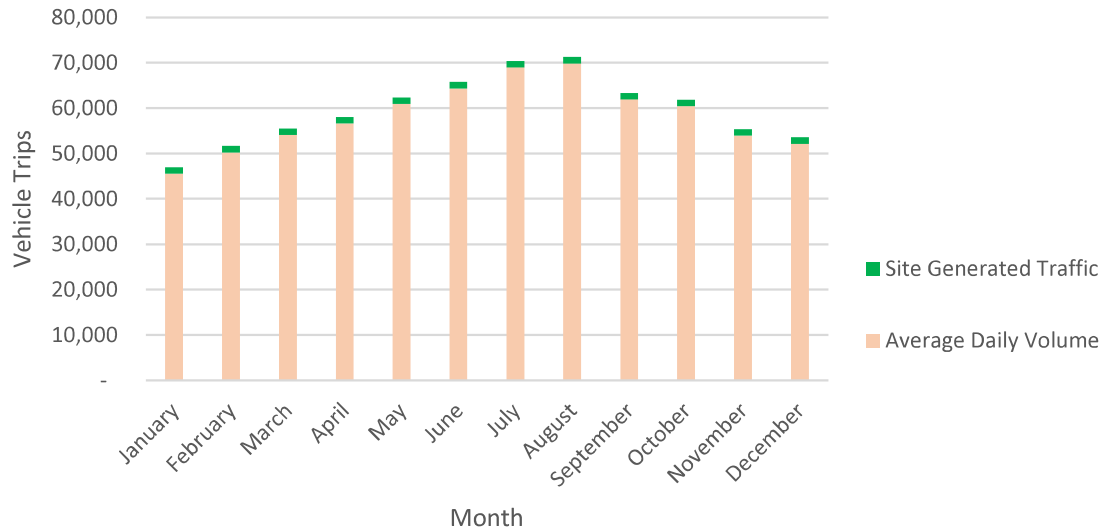


\* Estimated Future Traffic Volumes w/Distribution Facility (also includes the now defunct Cannon Design and Fantasy Island)

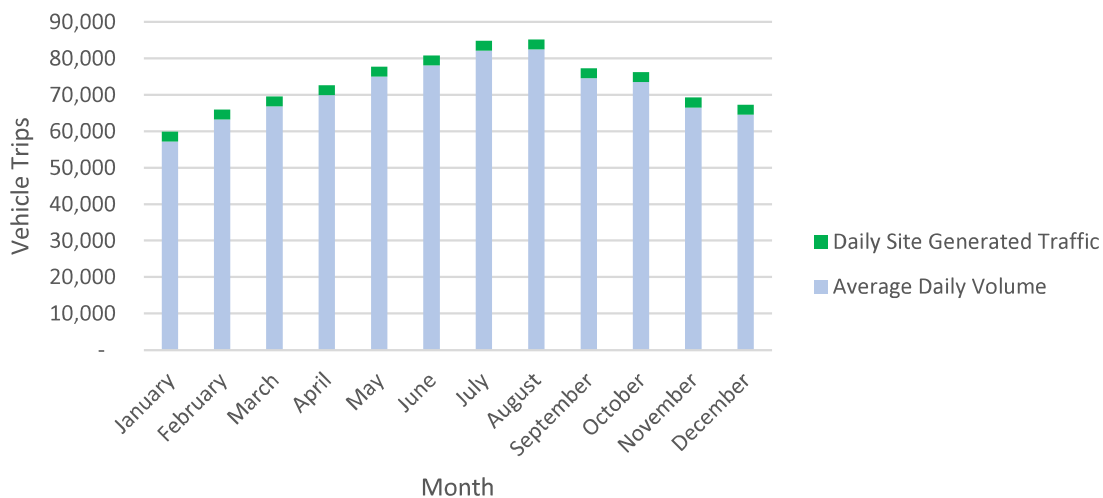
Note: Traffic volumes decreased significantly in 2008 as a result of the recession.

This analysis is consistent with more recent traffic data obtained from NYSTA. Monthly traffic volumes on both the NGIB and the SGIB were obtained from the NYSTA. **Tables V and VI** below, show the variation in traffic using the bridges between January and December 2019 (the most recent data available). The tables also show in green the traffic that will be added to the bridges as a result of the Project.

**Table V: 2019 North Bridge Data**



**Table VI: 2019 South Bridge Data**



As shown in Tables V and VI, during the peak summer season (i.e. July and August), the Project will only increase traffic on the bridges by approximately 2.1%-3.3% during the peak months of July and August.

In addition, the NYSTA provided bi-directional hourly data for both bridges during 2019. Tables VII-XI below show a comparison of the average hourly variation in traffic on a weekday using the bridges during the months of July and November.

**Table VII: NGIB Average Weekday Hourly Traffic -  
Northbound**  
Comparison of July & November 2019 vs 2022

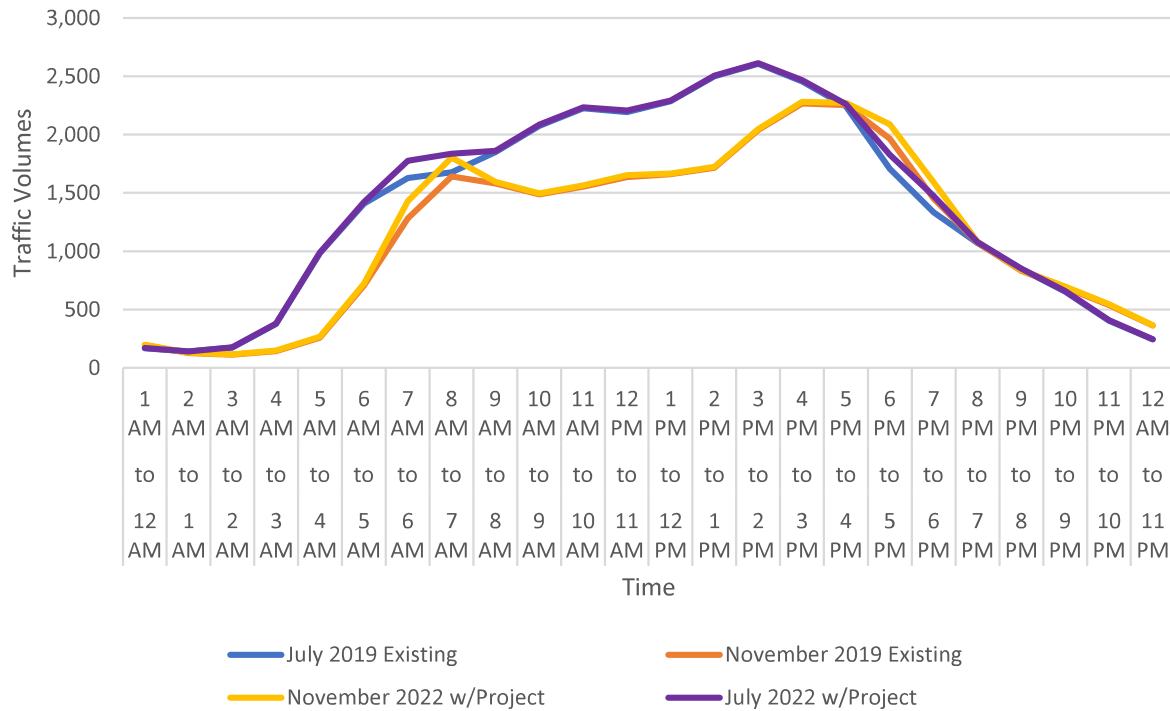
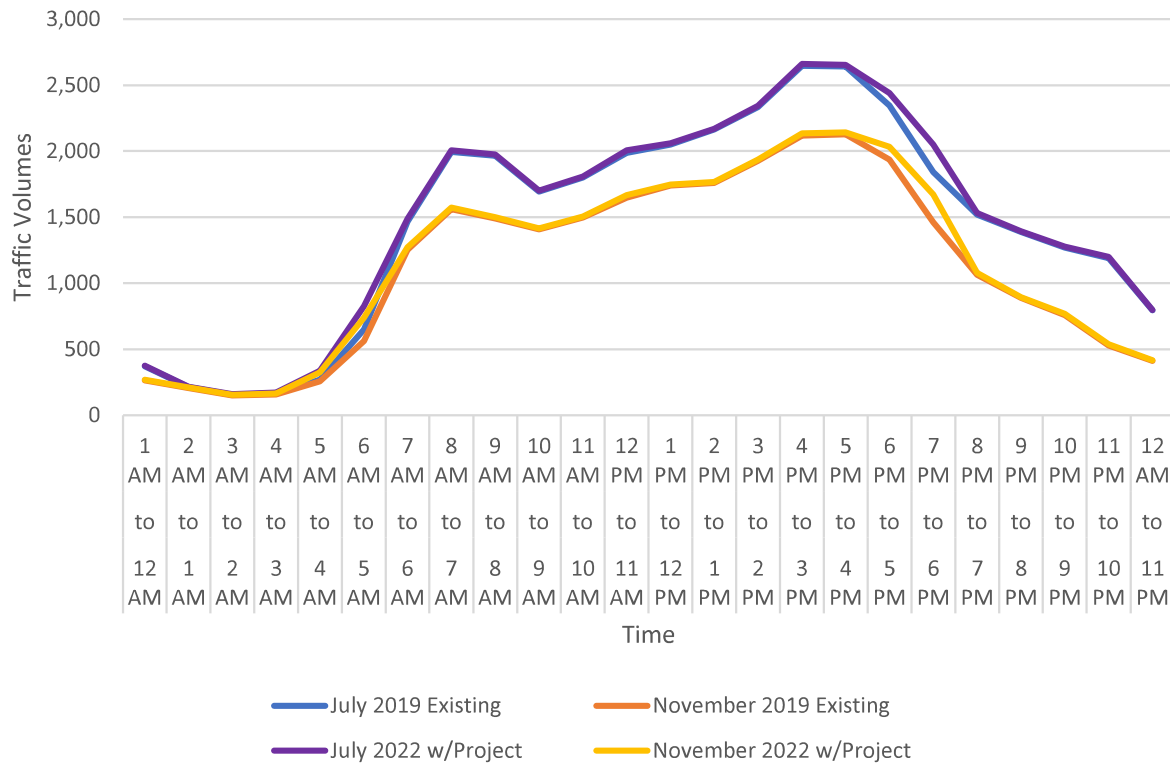
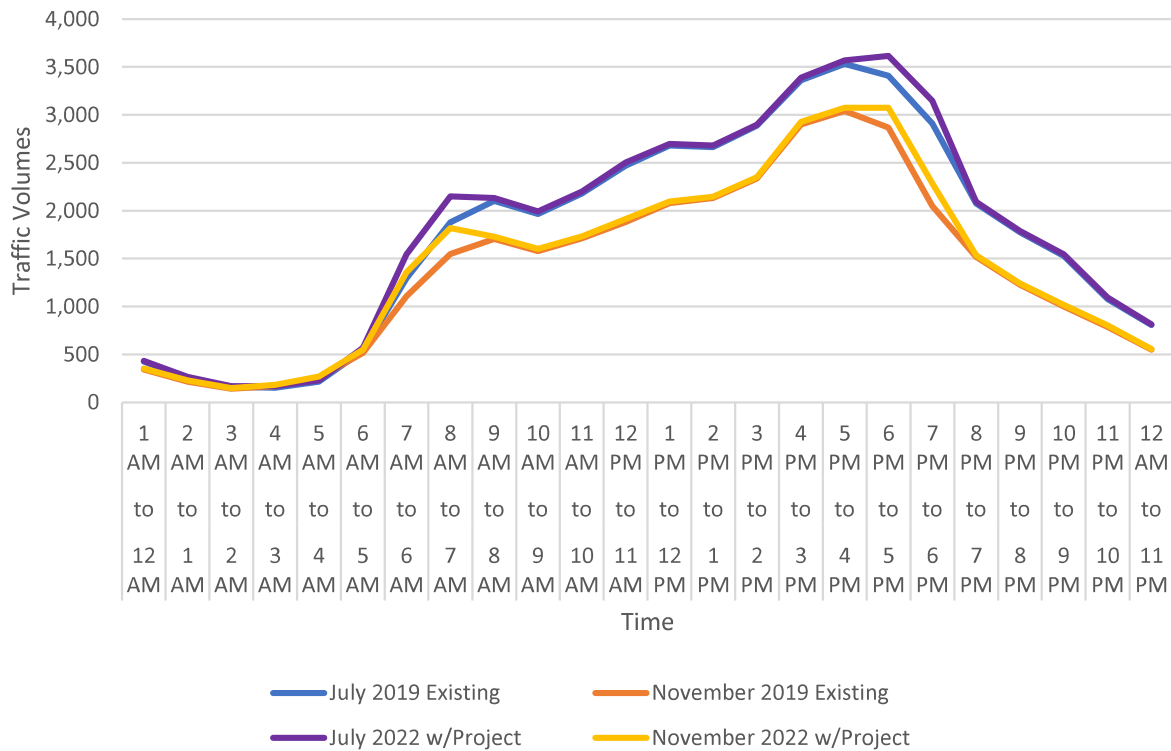


Table VIII: NGIB Average Weekday Hourly Traffic -  
Southbound  
Comparison of July & November 2019 vs 2022

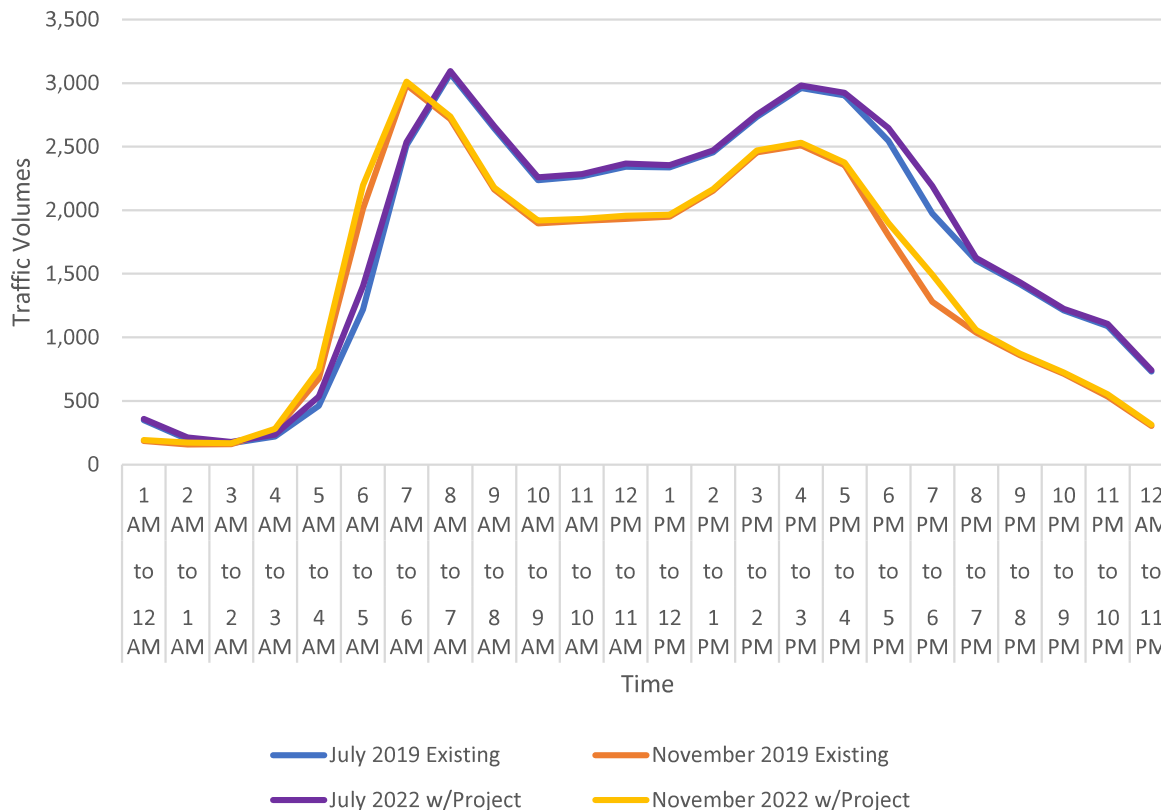




**Table IX: SGBI Average Weekday Hourly Traffic -  
Northbound Comparison of July & November  
2019 vs 2022**



**Table X: SGBI July & November of 2019  
Average Weekday Hourly Traffic - Southbound**



As shown in Tables VII - X above, the peak hour weekday traffic in July and November occurs between 7:00-10:00 AM and 4:00-6:00 PM. The Project will have peak facility hours between 6:30-7:30 AM and 5:30-6:30 PM for employees entering and exiting the site. Additionally, the overnight shifts will end between 4:30-5:00 AM. As such, the Project's shift times are designed to miss peak travel hours on the bridges.

### **C. NYSTA North and South Grand Island Bridges Construction**

Information provided by the NYSTA indicates that the bridge decks for both bridges were replaced relatively recently:

- NB SGIB – deck was replaced 2008 contract with a completion date of 2/2011
- SB SGIB – wearing surface placed in 2012 contract with a completion date of 11/2013
- NB NGIG – wearing surface placed in 2016 contract with a completion date of 12/2017
- SB NGIB – deck was replaced in 2013 contract with a completion date of 12/2015.

The bridge decks have an approximate 20-year life cycle.

The NYSTA has posted the following maintenance schedule for the Grand Island Bridges:

- **South Grand Island Bridges: Maintenance Cleaning for Steel Preservation - 2021**

- Location: S. GRAND IS. SB (OLD) Bridge
- Estimated Letting Year: 2021
- **South Grand Island Bridges: Maintenance Cleaning for Steel Preservation - 2021**
  - Location: S. GRAND IS. NB (NEW) Bridge
  - Estimated Letting Year: 2021
- **North and South Grand Island Bridges: Retrofit / Repair Roller Bearings, Pins and Hangers and North Grand Island Bridges - Steel Repairs**
  - Location: NORTH GRAND ISLAND NB (OLD) Bridge
  - Estimated Letting Year: 2021
- **North and South Grand Island Bridges: Retrofit / Repair Roller Bearings, Pins and Hangers and North Grand Island Bridges - Steel Repairs**
  - Location: NORTH GRAND ISLAND SB (NEW) Bridge
  - Estimated Letting Year: 2021
- **North and South Grand Island Bridges: Retrofit / Repair Roller Bearings, Pins and Hangers and North Grand Island Bridges - Steel Repairs**
  - Location: S. GRAND IS. SB (OLD) Bridge
  - Estimated Letting Year: 2021
- **North and South Grand Island Bridges: Retrofit / Repair Roller Bearings, Pins and Hangers and North Grand Island Bridges - Steel Repairs**
  - Location: S. GRAND IS. NB (NEW) Bridge
  - Estimated Letting Year: 2021

According to NYSTA, these steel repairs will require lane closures however, they will only be permitted to take place under nighttime operations. Notably, the Project is not expected to reach full buildout until spring of 2022 and therefore the Project may not overlap with the NFTA's proposed bridge construction.

## VI. FUTURE AREA DEVELOPMENT AND LOCAL GROWTH

Construction of the Proposed Distribution Facility Project is anticipated to reach full build-out in approximately 3 years. Widely accepted methodology for preparing traffic impact studies requires that any projects in the study area that are currently approved and/or under construction must be considered in the traffic analysis. Projects that are contemplated but not yet approved are not included in a traffic analysis. To account for normal increases in background traffic growth, including any unforeseen developments in the project study area, a conservative growth rate of 0.5 % per year was applied to the existing traffic volumes, based upon historical traffic growth derived from NYSDOT traffic volume data for the area, for the three-year build-out period. Traffic volumes associated with the approved Heron Pointe residential development on Grand Island Boulevard were also added to the background traffic volumes. All ambient growth calculations are included in the appendix. The 2022 background traffic volumes are depicted in **Figure 4**.

## VII. PROPOSED DEVELOPMENT

### A. Description of the Proposed Distribution Facility Project

The proposed project includes the development of a multistory warehouse with a footprint of approximately 823,522± square feet to house a new distribution facility. The facility will include 69±

loading docks, 225± trailer parking stalls, and 1,800± employee parking stalls. Access to the proposed development will be provided via two (2) driveways; one driveway along Long Road that will provide access to the loading docks and trailer parking as well as the employee parking lot; and one driveway along Bedell Road that will only provide access to the car parking lot for employees. Trucks will not be permitted to use the Bedell Road access during construction or facility operation. **Figure 5** illustrates the proposed concept plan.

A facility such as the one proposed is expected to operate with the shift times shown in **Table XI** below. The shift structure could technically be categorized as four shifts but operationally there are two shifts. For each shift, the start and end times for employees working the receiving side of the operation (inbound employees) and employees working the shipping side of the operation (outbound employees) are staggered by 30 minutes. Operationally there is no difference between the day and night shifts. The gap between the night shift end and the day shift start allows for equipment maintenance/repair and other such work to be performed.

**TABLE XI**  
**FACILITY SHIFT TIMES**

	Shift Start Time	Shift End Time
Day Shift – Group 1	7:00 AM	5:30 PM
Day Shift – Group 2	7:30 AM	6:00 PM
Night Shift – Group 1	6:00 PM	4:30 AM
Night Shift – Group 2	6:30 PM	5:00 AM

These shift times result in the facility peak hours of 6:30-7:30 AM and 5:30-6:30 PM for employees entering and exiting the site.

### **B. Site Traffic Generation**

The volume of traffic generated by a site is dependent on the intended land use and size of the development. Trip generation is an estimate of the number of trips generated by a specific building or land use. These trips represent the volume of traffic entering and exiting the development. Trip Generation, 10th Edition is used as a reference for this information. The trip rate for the peak hour of the generator may or may not coincide in time or volume with the trip rate for the peak hour of adjacent street traffic. In this case, volumes generated during the peak hour of the site represent a more critical volume when analyzing the capacity of the system; those intervals will provide the basis of this analysis.

According to the Institute of Transportation Engineers (ITE), the following steps are recommended when determining trip generation for proposed land uses:

- i. *Check for the availability of local trip generation rates for comparable uses.*
- ii. *If local trip data for similar developments are not available and time and funding permit, conduct trip generation studies at sites with characteristics similar to those of the proposed development.*

Trip generation data for the Proposed Distribution Facility Project are based on employee count and truck traffic data for similar distribution facilities. From this data, peak hour passenger car and truck trips were calculated for Full Development Conditions. The trip projections are based on the headcounts and truck

volumes needed to run this type of facility. The peak season headcounts and truck volumes are based on the finite operating capacity of the facility (see Peak Season discussion below). The non-peak season headcounts and truck volumes are based on how the facility will operate because of the reduced retail demand outside of the holiday season. The hourly distribution of entering and exiting cars (included in the Appendix) is based on 24-hour observations of traffic flow at other facilities. The trip projections are not based on counting multiple sites and then developing trip rates like the ITE published data. The hourly distribution of entering and exiting trucks is based on operational experience.

Not all employees enter and exit the facility during the peak AM and PM hours. The average number of employees working at the facility, approximately 900-1,000 at any given time, includes all employees. The shift headcounts account for all employee groups such as warehouse workers, management, administration, janitorial staff, etc. that will be inside the building. The various employee groups have differing shift times within the depicted day and night shifts. Moreover, employees of these facilities typically have flexible work schedules and can start and end their workdays to achieve the work life balance that best suits their individual needs. As a result, these facilities generate entering and exiting employee traffic throughout the day with a concentration around each shift's start and end times. Employees that are not working the designated shifts will enter and exit the site during off-peak hours (i.e., times other than those shown in Table XI) in significantly lower volumes than during the peak study time periods (see Table XIII and discussion below).

These types of distribution facilities typically experience carpool and transit ridership that reduces the single-occupant vehicles traveling to and from the site by approximately 19%. However, review of transit and carpool statistics for Erie County indicates that approximately 8% of people carpool to work and 4% of people use public transportation. In addition, 3% of people walk to work while less than 1% of people use a bicycle to commute to work. For analysis purposes, and to be conservative, it was assumed that 9% of employees will either carpool or use public transportation. Hence, the total peak hour employee trips were reduced by 9%.

Additionally, the Project does not generate exiting traffic during the morning commuter peak hours that would add to the commuter traffic leaving Grand Island southbound and traveling towards Buffalo given that the overnight shifts end at 4:30 and 5:00 AM. As shown in Tables VII-X in Section V.B. above, weekday traffic peak hours occurred between 7:00-10:00 AM and 4:00-6:00 PM during both July and November 2019. As such, the Project's shift times mitigate potential impacts to traffic.

**Table XII** summarizes the peak hour trips during the peak hour of the generator (6:30-7:30 AM and 5:30-6:30 PM) based upon the shift times identified in Table XI above.

**TABLE XII**  
**PEAK HOUR SITE GENERATED TRIPS \***

DESCRIPTION	AM PEAK		PM PEAK	
	ENTER	EXIT	ENTER	EXIT
Distribution Center Employees	658	29	582	592
Distribution Center Trucks	10	10	8	8
<b>Total Site Generated Trips</b> <b>(2,142 Total Employees Over 24 hours)</b>	668	39	590	600

\* Site trips generated during Facility peak hours

Under Full Development Conditions, the proposed distribution facility project is anticipated to generate 668 entering/39 exiting vehicle trips during the AM peak hour of the generator and 590 entering/600 exiting vehicle trips during the weekday PM peak hour of the generator; these volumes include both passenger vehicles and truck trips as noted in Table XII above.

**Table XIII** indicates the volumes of employee traffic that will enter and exit the site during the intersection peak periods that do not fall within the site peak hours. During the time periods of 7:30-9:00 AM and 4:00-5:30 PM the site generates significantly lower volumes of traffic. Therefore, the combination of the site peak traffic and the intersection traffic volumes during the peak hours of the site represent the most critical time period for evaluation.

**TABLE XIII  
SITE TRIPS GENERATED DURING  
INTERSECTION PEAK HOURS**

DESCRIPTION	AM 7:30-9:00		PM 4:00-5:30	
	ENTER	EXIT	ENTER	EXIT
Distribution Center Employees	69	32	129	85

#### Truck Traffic

Truck traffic is deliberately low during commuter peak times and higher at other times of the day/night. Trucks will not be permitted to use the Bedell Road access during construction or facility operation. Employees may use either Bedell Road or Long Road to access the on-site parking facilities. Table XIV below shows the hourly distribution of truck traffic entering and exiting the site.

**Table XIV: Hourly Distribution of Truck Traffic**



All trip generation information has been included in the appendix.

### Peak Season Traffic

The maximum number employees on-site (1,800) will only occur for a short duration of time during, and not the duration of, the peak operating season. The peak operating season typically coincides with the Christmas holiday season and occurs between Thanksgiving and Christmas. The TIS evaluates average operating conditions that occur on a daily basis for the majority of the year. Design of mitigation should be predicated on average or typical daily operating conditions and not a short duration peak season. This can be compared to a shopping center use where Christmas season is not used for design purposes. A discussion has been added to the updated TIS to address this concern.

### C. Site Traffic Distribution

The cumulative effect of site traffic on the transportation network is dependent on the origins and destinations of that traffic and the location of the access drives serving the site. The proposed arrival/departure distribution of traffic to be generated at this site is considered a function of several parameters, including the following:

- Existing highway network;
- Proximity and access to local area highways;
- Population centers;
- Location of employee parking on the proposed site plan; and
- Existing traffic patterns, traffic conditions, and controls

Census data for Erie County were used to determine likely origin and destination areas for the potential employees. In addition, existing traffic patterns were reviewed in detail to determine likely travel routes. The detailed distribution of site trips was based on a combination of population centers, existing traffic patterns, and google map directions to and from the site.

**Figure 6A** shows the anticipated truck trip distribution pattern percentages and **Figure 6B** shows the anticipated employee trip distribution pattern percentages for employees at full build-out of the proposed distribution facility. The majority (90%) of the truck traffic will travel directly to and from the NYS Thruway via Long Road, Grand Island Blvd, and I-190. Many factors can change the distribution patterns for employees traveling to/from the site. More employees may use the I-190 rather than using Grand Island Blvd or more employees may use Grand Island Blvd. The distribution used for analysis purposes results in certain intersection mitigation that will not change significantly if the distribution is slightly different.

**Figures 7A, 7B, and 7C** show the resulting truck, employee, and total site generated traffic (including cars and trucks) as assigned to the study area intersections for the weekday AM and PM peak hour periods under full build-out conditions.

## **VIII. FULL DEVELOPMENT VOLUMES**

The projected design hour traffic volumes were developed for the weekday AM and PM peak hours by combining the future background traffic conditions (Figure 4), and projected site generated volumes for full build-out of the proposed site (Figure 7C) in order to yield the total traffic conditions expected at full development. **Figure 8** illustrates the total weekday AM and PM peak hour volumes anticipated for the proposed development under full build-out conditions.

## IX. CAPACITY ANALYSIS

### A. Description of Capacity Analysis

A capacity analysis is a technique used for determining a measure of effectiveness for a section of roadway and/or intersection based on the number of vehicles during a specific time period. The measure of effectiveness used for the capacity analysis is referred to as a Level of Service (LOS). Levels of Service are calculated to provide an indication of the amount of delay that a motorist experiences while traveling along a roadway or through an intersection. Since the most amount of delay to motorists usually occurs at intersections, capacity analysis focuses on intersections, as opposed to highway segments.

Six Levels of Service are defined for analysis purposes. They are assigned letter designations, from "A" to "F", with LOS "A" representing the conditions with little to no delay, and LOS "F" conditions with very long delays. Suggested ranges of service capacity and an explanation of Levels of Service are included in the Appendix.

The standard procedure for capacity analysis of signalized and un-signalized intersections is outlined in the Highway Capacity Manual (HCM 2016) published by the Transportation Research Board. Traffic analysis software, Synchro 10, which is based on procedures and methodologies contained in the HCM, was used to analyze operating conditions at study area intersections. The procedure yields a Level of Service based on the HCM as an indicator of how well intersections operate.

### B. Capacity Analysis Results

Existing and background operating conditions during the peak study periods are evaluated to determine a basis for comparison with the projected future conditions. The projected future traffic volumes generated by the Proposed Distribution Facility Project were analyzed to assess the operations of the intersections in the study area.

Capacity results for existing, background and full development conditions are listed in **Table XV**. The discussion following the table summarizes capacity conditions. All capacity analysis calculations are included in the Appendices.



TABLE XV: CAPACITY ANALYSIS RESULTS

INTERSECTION	2019 EXISTING CONDITIONS		2022 BACKGROUND CONDITIONS		FULL BUILD CONDITIONS		FULL BUILD CONDITIONS W/ MITIGATION	
	AM	PM	AM	PM	AM	PM	AM	PM
1. Long Road / Islechem Driveway / Proposed North Driveway (U)								
EB left - Long Road	A 0.0	A 0.0	A 0.0	A 0.0	A 0.0	A 0.0	A 0.0	A 0.0
WB left - Long Road	-	-	-	-	A 8.4	A 8.3	A 8.4	A 8.3
NB - Proposed North Driveway	-	-	-	-	A 9.1	B 11.9	A 9.1	B 11.9
SB - Islechem Driveway	A 0.0	A 8.7	A 0.0	A 8.7	A 0.0	F 79.1	A 0.0	F 79.1
2. Long Road / I-190 Ramp (U)								
EB - Long Road	-	-	-	-	-	-	A 5.1	A 9.8
WB - Long Road	A 7.6	A 7.4	A 7.6	A 7.4	A 7.7	A 8.4	B 14.1	A 9.0
NB - I-190 Ramp	B 12.5	A 9.5	B 12.6	A 9.6	E 44.5	C 24.5	B 15.5	B 12.7
Overall LOS	-	-	-	-	-	-	B 12.5	B 10.3
3. Long Road / Grand Island Boulevard (U)								
EB left/thru - Long Road	A 8.9	A 9.5	A 8.9	A 9.6	A 9.8	C 20.7	A 9.8	C 20.7
EB right - Long Road	A 8.3	A 8.6	A 8.4	A 8.7	A 9.4	A 9.9	A 9.4	A 9.9
WB - Long Road	A 9.9	A 8.8	A 10.0	A 8.9	B 11.9	B 10.9	B 11.9	B 10.9
NB - Grand Island Boulevard	A 9.8	B 11.0	A 9.9	B 11.1	B 15.0	C 23.4	B 15.0	C 23.4
SB - Grand Island Boulevard	A 8.3	A 7.9	A 8.3	A 7.9	A 8.9	A 9.3	A 8.9	A 9.3
4. Grand Island Boulevard / I-190 NB Ramp Off (U)								
EB left - I-190 Ramp	B 10.0	B 11.7	B 10.1	B 11.8	C 18.0	C 20.8	B 12.8	C 15.2
EB right - I-190 Ramp	-	-	-	-	-	-	B 11.0	B 10.9
5. Grand Island Boulevard / Bedell Road (S)								
EB - Bedell Road	A 5.1	A 8.4	A 5.2	A 8.4	A 5.8	A 8.9	A 5.8	A 8.9
WB - Bedell Road	A 5.8	A 8.1	A 5.0	A 8.1	B 11.3	B 11.1	B 11.3	B 11.1
NB - Grand Island Boulevard	A 5.6	A 5.7	A 5.6	A 5.7	A 7.6	A 6.9	A 7.6	A 6.9
SB - Grand Island Boulevard	A 5.8	A 6.6	A 5.8	A 6.6	A 3.8	A 8.0	A 3.8	A 8.0
Overall LOS	A 7.1	A 6.8	A 7.2	A 6.7	A 6.7	A 6.4	A 6.7	A 6.4
6. Grand Island Boulevard / Baseline Road (S)								
EB left - Grand Island Boulevard	B 12.0	B 11.3	B 12.0	B 11.4	B 12.0	B 11.3	B 12.0	B 11.3
EB thru/right - Grand Island Boulevard	B 10.2	B 11.1	B 10.2	B 11.2	B 10.5	B 15.8	B 10.5	B 15.8
WB left - Grand Island Boulevard	B 12.0	B 10.9	B 12.0	B 10.9	B 12.0	B 11.5	B 12.0	B 11.5
WB thru/right - Grand Island Boulevard	B 12.0	B 15.8	B 12.0	B 16.0	B 12.7	B 15.8	B 12.7	B 15.8
NB left - Baseline Road	A 9.2	B 13.9	A 9.5	B 14.1	A 9.8	B 14.7	A 9.8	B 14.7
NB thru/right - Baseline Road	A 7.8	B 11.2	A 8.0	B 11.3	A 8.1	B 11.6	A 8.1	B 11.6
SB left - Baseline Road	A 9.4	B 14.8	A 9.6	B 14.9	A 9.8	B 15.4	A 9.8	B 15.4
SB thru/right - Baseline Road	A 8.3	B 10.9	A 8.5	B 11.0	A 8.6	B 11.4	A 8.6	B 11.4
Overall LOS	A 9.6	B 12.3	A 9.7	B 12.5	B 10.1	B 14.7	B 10.1	B 14.7
7. Grand Island Boulevard / Whitehaven Road (S)								
EB left - Whitehaven Road	B 10.5	B 17.5	B 10.8	B 17.8	B 10.6	B 17.8	B 10.6	B 16.0
EB thru - Whitehaven Road	B 11.4	B 19.1	B 11.7	B 19.5	B 11.5	B 19.6	B 11.5	B 18.8
EB right - Whitehaven Road	A 4.5	A 6.0	A 4.8	A 5.9	A 4.6	A 5.8	A 4.6	A 5.4
WB left - Whitehaven Road	B 11.5	B 19.8	B 11.9	C 20.3	B 11.7	C 20.3	B 11.7	B 19.4
WB thru/right - Whitehaven Road	B 10.1	A 9.4	A 10.4	A 9.5	B 10.3	A 9.7	A 10.3	A 9.0
NB left - Grand Island Boulevard	B 10.8	A 8.0	B 11.0	A 8.2	B 11.6	A 8.6	B 11.6	A 8.8
NB thru/right - Grand Island Boulevard	B 10.3	B 12.9	B 10.6	B 13.7	B 11.1	B 13.7	B 11.1	B 13.0
SB left - Grand Island Boulevard	B 10.1	A 10.0	B 10.2	B 10.6	B 10.8	B 12.5	B 10.8	B 12.1
SB thru/right - Grand Island Boulevard	B 11.5	A 9.0	B 11.7	A 9.3	B 12.3	B 10.3	B 12.3	B 10.1
Overall LOS	B 10.4	B 12.0	B 10.7	B 12.4	B 10.9	B 12.6	B 10.9	B 12.0
8. Bedell Road / Proposed Site Driveway (U)								
EB left - Bedell Road	N/A		N/A		A 0.0	A 0.0	A 0.0	A 0.0
SB - Proposed South Driveway					B 10.3	B 12.7	B 10.3	B 12.7
9. Grand Island Boulevard / Staley Road (ROUNDABOUT)								
EB left - Staley Road	B 11.7	B 12.2	B 12.2	B 12.6	B 12.9	B 13.4	N/A	
EB thru - Staley Road	A 6.4	A 6.6	A 6.9	A 7.0	A 7.6	A 7.8		
EB right - Staley Road	A 7.3	A 7.4	A 7.8	A 7.8	A 8.6	A 8.6		
WB left - Staley Road	B 12.6	B 11.3	B 13.0	B 11.5	B 13.0	B 12.4		
WB thru - Staley Road	A 7.5	A 5.7	A 7.9	A 5.9	A 8.0	A 6.8		
WB right - Staley Road	A 7.6	A 6.5	A 8.0	A 6.8	A 8.1	A 7.7		
NB left - Grand Island Boulevard	B 13.8	A 9.8	B 14.7	A 9.9	B 16.2	B 11.1		
NB thru - Grand Island Boulevard	A 8.8	A 4.2	A 9.8	A 4.3	B 11.3	A 5.5		
NB right - Grand Island Boulevard	A 8.7	A 4.7	A 9.7	A 4.8	B 11.1	A 6.0		
SB left - Grand Island Boulevard	A 7.3	A 7.5	A 7.3	A 7.5	A 7.3	A 7.6		
SB thru - Grand Island Boulevard	A 1.6	A 1.9	A 1.7	A 1.9	A 1.7	A 2.0		
SB right - Grand Island Boulevard	A 2.4	A 2.7	A 2.4	A 2.7	A 2.5	A 2.8		
Overall LOS	A 7.6	A 6.0	A 8.0	A 6.1	A 8.5	A 6.9		
10. Baseline Road / Whitehaven Road (S)								
EB left - Whitehaven Road	A 7.3	A 8.0	A 7.2	A 8.1	A 7.2	A 8.9	A 7.2	A 8.9
EB thru/right - Whitehaven Road	A 6.4	A 5.4	A 6.3	A 5.4	A 6.3	A 5.8	A 6.3	A 5.8
WB left - Whitehaven Road	A 7.2	A 6.8	A 7.2	A 6.9	A 7.2	A 7.4	A 7.2	A 7.4
WB thru/right - Whitehaven Road	A 7.0	A 5.9	A 7.1	A 5.9	A 7.1	A 6.4	A 7.1	A 6.4
NB left - Baseline Road	A 7.9	A 8.0	A 7.4	A 8.1	A 7.6	A 8.9	A 7.6	A 8.9
NB thru/right - Baseline Road	A 4.9	A 6.3	A 4.8	A 6.3	A 4.9	A 6.2	A 4.9	A 6.2
SB left - Baseline Road	A 6.0	A 7.3	A 6.1	A 7.4	A 6.2	A 7.4	A 6.2	A 7.4
SB thru/right - Baseline Road	A 2.5	A 5.1	A 2.3	A 5.1	A 2.3	A 5.4	A 2.3	A 5.4
Overall LOS	A 6.9	A 6.1	A 6.7	A 6.1	A 6.9	A 6.4	A 6.9	A 6.4

## NOTES:

1. A(2.8) = Level of Service (Delay in seconds per vehicle)
2. (S) = Signalized; (U) = Unsignalized
3. N/A = Approach does not exist and/or was not analyzed during this condition
4. F(=) = Delay greater than 200 seconds per vehicle

The peak hour capacity analysis results indicate that in general, most of the approaches at the study intersections will operate similarly to 2022 Background Conditions with the proposed improvements in place. The proposed improvements include: a new traffic signal located at the Long Road/I-190 SB Ramp intersection and a new eastbound right turn lane on the I-190 NB off-ramp approaching Grand Island Blvd.

#### 1. Long Rd/Islechem Driveway-Proposed North Site Driveway

The existing intersection currently operates at LOS "A" on all approaches. Adding a fourth leg to the intersection results in a decrease in LOS for the Islechem Driveway, however, the peak times for traffic entering and exiting the Islechem Driveway do not coincide with the peak traffic times for the proposed site. Review of projected operating conditions and traffic volumes indicates that no improvements are warranted or recommended at this location as a result of the proposed development.

#### 2. Long Rd/I-190 SB Ramps

The proposed development will add traffic both entering and exiting the I-190 ramps as well as through traffic on Long Rd. As a result, signalization of this intersection is recommended. No other improvements are warranted or recommended as a result of the proposed development. The intersection is projected to operate at LOS "B" or better on all approaches with a traffic signal in place.

If the distribution of employee traffic were to actually result in additional traffic using the I-190 as opposed to Grand Island Blvd, this would further reinforce the need for a traffic signal at this location. Signalizing this intersection will make it easier to get on the I-190 and travel south towards Buffalo thereby encouraging more employees to use the I-190.

#### 3. Long Rd/Grand Island Blvd

The Long Rd/Grand Island Blvd intersection currently operates as an all-way stop controlled intersection with LOS "B" or better on all approaches. During the AM peak hour, the intersection will continue to operate at LOS "B" at full build out of the proposed development. During the PM peak hour at full development, the eastbound left turn/through movement and the northbound approach will decrease to LOS "C". Given that LOS "C" remains an acceptable operating condition with delays less than 25 seconds per vehicle, no improvements are recommended at this intersection. Signal warrants were evaluated for this intersection and only the Four-Hour Warrant is met at this location, therefore signalization is not recommended.

#### 4. Grand Island Blvd/I-190 NB Off-Ramp

Traffic volumes exiting the I-190 and using this ramp are expected to increase as a result of the proposed development. Given the projected traffic volume increases and resulting operating conditions, a right turn lane exiting the off-ramp should be constructed prior to full development of the Project. A signal warrant analysis at this location indicates that only the four-hour warrant is met. A signal is not recommended at this location.

#### Intersections 5-9

The remaining intersections in the study area are projected to operate at LOS "B" or better for all movements during all peak hours studied with the exception of the westbound left turn movement at Grand Island Blvd and Whitehaven Road which is projected to operate at LOS "C" under background and full development conditions. The Grand Island Blvd/Whitehaven Rd traffic signal may adjust on its own to

increases in traffic volumes as a result of the fully actuated control. No improvements are warranted or recommended at these intersections as a result of the proposed development.

### C. Sensitivity Analysis Results

Based upon comments from the Erie County DPW, NYSDOT, and the NYSTA, an alternative trip distribution scenario has been analyzed. The three review agencies are concerned that more of the employee traffic coming to site will utilize the Long Rd driveway as opposed to Bedell Rd. Therefore, a Sensitivity Analysis has been conducted to determine the potential impacts associated with a change in the distribution pattern.

The Sensitivity Analysis assumes that 43% of the employee trips will turn left from the ramp and head north to Long Road while only 15% will turn right towards Bedell Road. **Figures 9A, 9B, and 9C** show the distribution, site generated employee trips and build conditions for the Sensitivity Analysis. Intersections 1 through 4 have been re-analyzed using this distribution. Although volumes will also change at intersections 5 and 9, these intersections will operate better than the full development conditions and thus have not been re-analyzed. **Table XVI** summarizes the results of the Sensitivity Analysis.

**TABLE XVI**  
**SENSITIVITY ANALYSIS RESULTS**

INTERSECTION	2022 BACKGROUND CONDITIONS		FULL BUILD CONDITIONS W/ MITIGATION		SENSITIVITY ANALYSIS RESULTS	
	AM	PM	AM	PM	AM	PM
<b>1. Long Road / Islechem Driveway / Proposed North Driveway (U)</b>						
EB left - Long Road	A 0.0	A 0.0	A 0.0	A 0.0	A 0.0	A 0.0
WB left - Long Road	- -	- -	A 8.4	A 8.3	A 8.9	A 8.8
NB - Proposed North Driveway	- -	- -	A 9.1	B 11.9	A 9.1	B 11.9
SB - Islechem Driveway	A 0.0	A 8.7	A 0.0	F 79.1	A 0.0	F 140.3
<b>2. Long Road / I-190 Ramp (U)</b>						
EB - Long Road	- -	- -	A 5.1	A 9.6	A 4.9	A 9.8
WB - Long Road	A 7.6	A 7.4	B 14.1	A 9.0	B 16.7	B 10.8
NB - I-190 Ramp	B 12.6	A 9.6	B 15.5	B 12.7	B 17.9	B 12.7
<b>Overall LOS</b>	- -	- -	<b>B 13.5</b>	<b>B 10.3</b>	<b>B 15.9</b>	<b>B 10.8</b>
<b>3. Long Road / Grand Island Boulevard (U)</b>						
EB left/thru - Long Road	A 8.9	A 9.6	A 9.8	C 20.7	B 10.8	C 24.4
EB right - Long Road	A 8.4	A 8.7	A 9.4	A 9.9	B 10.3	B 10.7
WB - Long Road	A 10.0	A 8.9	B 11.9	B 10.9	B 13.5	B 11.9
NB - Grand Island Boulevard	A 9.9	B 11.1	B 15.0	C 23.4	D 28.0	F 52.2
SB - Grand Island Boulevard	A 8.3	A 7.9	A 8.9	A 9.3	A 9.4	A 9.8
<b>4. Grand Island Boulevard / I-190 NB Ramp Off (U)</b>						
EB left - I-190 Ramp	B 10.1	B 11.8	B 12.8	C 15.2	C 16.5	C 20.8
EB right - I-190 Ramp	- -	- -	B 11.0	B 10.9	A 9.8	A 9.8

**NOTES:**

1. A(2.8) = Level of Service (Delay in seconds per vehicle)
2. (S) = Signalized; (U) = Unsignalized
3. N/A = Approach does not exist and/or was not analyzed during this condition
4. F(\*) = Delay greater than 200 seconds per vehicle

The results of the sensitivity analysis indicate that the northbound Grand Island Blvd approach to Long Road will decrease to LOS "D" with 28.0 sec/veh of delay during the AM peak hour and LOS "F" with 52.2 sec/veh of delay during the PM peak hour. All other movements continue to operate at LOS "C" or better. The I-190 NB off ramp at Grand Island Blvd will continue to operate at LOS "C" or better as well.

The signal warrant analysis (see Section XI below for a detailed signal warrant analysis discussion) at the Grand Island Blvd/I-190 NB Off-Ramp intersection utilizes the full traffic volumes exiting the ramp with no discount for right turns on red. Therefore, there is no difference in signal warrant analysis as a result of the change in distribution. The signal warrant analysis at this location indicates that Warrant 1 Condition A is met for only 4 hours, Condition B is met for 2 hours and Warrant 2 is met for 5 hours. Given that acceptable (LOS “C” or better) operating conditions are maintained at this location even under the sensitivity analysis, there is no compelling need to signalize this intersection.

The signal warrant analysis at the Grand Island Blvd/Long Rd indicates that Warrant 1 Condition A is not met for any hours, Condition B is not met for any hours and Warrant 2 is met for 4 hours under the proposed distribution and 6 hours under the sensitivity analysis. The proposed distribution is a more likely scenario than the majority of traffic making a series of left turns and using the Long Rd driveway. The northbound movement continues to operate at acceptable LOS “D” during the AM peak and just over the threshold (50 seconds of delay per vehicle) for LOS “F” during the PM peak hour under the sensitivity analysis. There is no compelling need to signalize this intersection.

## X. LEFT-TURN TREATMENT WARRANT INVESTIGATION

Volume warrants for left-turn treatments along Long Road at site driveway and at the I-190 SB Ramps intersection were investigated using the Transportation Board’s NCHRP Report 279, Intersection Channelization Design Guide, 1985. Provisions for left-turn lane facilities should be established where traffic volumes are high enough and safety considerations are enough to warrant the additional lane. This investigation analyzes warrants during the weekday AM and PM peak hours for the Long Road/I-190 SB Ramps intersection under full development conditions.

The combination of projected westbound traffic volumes (shown in Figure 8 of the Revised TIS for full development conditions) turning left from Long Road onto the I-190 SB Ramps indicate warrants for left-turn treatment are not met during the weekday AM and PM peak hours; left turn treatment warrants are met for traffic turning into the site driveway. The through volumes on Long Road at the site driveway are extremely low during the peak study time periods – 17(12) vph westbound. Given the extremely low through volumes, left turn treatments are not warranted or recommended at the site driveway.

## XI. SIGNAL WARRANT ANALYSIS

A traffic signal warrant analysis was completed at three of the existing study intersections at the request of the various review agencies. These intersections include Long Rd/I-190 SB Ramps, Grand Island Blvd/I-190 NB off-ramp and Long Rd/Grand Island Blvd. At the request of the NYSDOT, signal warrants at Long Rd/Grand Island Blvd were also evaluated assuming an alternative traffic distribution at the Grand Island Blvd/I-190 Off-ramp intersection. There is no change in the signal warrant analysis at the Grand Island Blvd/I-190 Off-ramp intersection as a result of the alternative distribution since no credit was taken potential for right turn on red movements.

The need for a traffic signal is determined by comprehensive investigation of existing and projected traffic conditions and physical characteristics at the location. The Standard Specifications Update for the adoption of the National MUTCD (FHWA) and the New York State Supplement were reviewed to investigate the need for a traffic control signal at this location. There are nine (9) warrants and they are as follows:

Warrant 1	Eight-Hour vehicular volume
Warrant 2	Four-Hour vehicular volume
Warrant 3	Peak Hour
Warrant 4	Pedestrian Volume
Warrant 5	School Crossing
Warrant 6	Coordinated Signal System
Warrant 7	Crash Experience
Warrant 8	Roadway Network
Warrant 9	Intersection Near a Grade Crossing

Detailed signal warrant calculations are included in the Appendix. Prior to applying warrants, the MUTCD suggests consideration of the effects of right-turn volumes on the minor street approach, and a reduction taken in the number of right turning vehicles, where appropriate. A certain number of right-turn vehicles will execute a right-turn on the red indication without actuating a traffic signal (if one were in place). For purposes of this analysis and to be conservative in determining if a signal may be needed, no reductions are taken for right turn on red. The posted speed limit on Long Rd is 40 MPH and Grand Island Blvd is 45 MPH and therefore, 70 percent thresholds in Table 4C-1, Figure 4C-2 and Figure 4C-4 are used as a basis for analysis.

Warrant 1 is subdivided into Condition A and Condition B. The Minimum Vehicular Volume, Condition A, is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal. The Interruption of Continuous Traffic, Condition B, is intended for application at locations where Condition A is not satisfied and where the traffic volume on a major street is so heavy that traffic on a minor intersecting street suffers excessive delay or conflict in entering or crossing the major street. These conditions are satisfied when, for each of any eight hours of an average day, anticipated volumes on the artery and side road are in excess of the minimum values presented in Tables 4C-1 in the MUTCD. Neither Condition A nor B are met under the full development conditions at any of the study locations.

Warrant 2, the Four-Hour Vehicular Volume signal warrant conditions, are intended to be applied where the volume of intersecting traffic is the principal reason to consider installing a traffic control signal. This warrant stipulates that for any four hours of a day, minimum threshold volumes are met on the artery and side road. This warrant is met under full development conditions for at least four (4) hours at both the Grand Island Blvd/I-190 NB off-ramp and Long Rd/Grand Island Blvd intersections. At the Long Rd/I-190 SB Ramps intersection the criteria are met for two (2) hours which indicates this warrant is not met at this location.

Warrant 3 is intended for application where minor street traffic suffers undue delay in entering or crossing the major street for one hour of the day. It stipulates that the warrant shall be applied in unusual cases (high-occupancy vehicle facilities – i.e., shopping centers) where a large number of vehicles discharge over a short period of time. Based on the proposed development, this warrant may be applicable and is met for at least one (1) hour at each of the three study intersections.

Warrant 4 is met when pedestrians experience excessive delay in crossing the major street (Long Rd and/or Grand Island Blvd) because the traffic volumes are so heavy. The study intersections currently have low pedestrian activity. This warrant is not met at any of the three locations.

Warrant 5 is met when a sufficient number of gaps in traffic do not exist for certain size and frequency of school children to cross the major roadway. Based on the proposed condition, this warrant is not applicable at these locations and is not met.

Warrant 6 is met when a traffic signal is needed to maintain progressive movement and vehicle platooning in a coordinated signal system. These intersections are not located near any coordinated signal systems therefore this warrant is not met.

Warrant 7 is met when the severity, frequency, and types of crashes are such that it is a condition susceptible to correction by a traffic signal. These locations do not meet this warrant based on the crash history analysis.

Warrant 8 is met when a traffic signal might encourage concentration and organization of traffic flow on a roadway network. This warrant primarily focuses on two major intersecting roadways, which is not the case at the study intersections. Therefore, this warrant is not met.

Warrant 9 is applicable when an intersection is located near an at-grade rail crossing. This warrant is not applicable at these locations.

**TABLE XVII**  
**TRAFFIC SIGNAL WARRANT SUMMARY**

WARRANT #	DESCRIPTION	LONG RD/ I-190 SB RAMPS		GRAND ISLAND BLVD/ I-190 NB OFF-RAMP	LONG RD/ GRAND ISLAND BLVD	
		Proposed	Sensitivity		Proposed	Sensitivity
1	Eight-Hour vehicular volume	NOT MET	NOT MET	NOT MET	NOT MET	NOT MET
2	Four-Hour vehicular volume	NOT MET	NOT MET	MET	MET	MET
3	Peak Hour	MET	MET	MET	MET	MET
4	Pedestrian Volume	NOT MET	NOT MET	NOT MET	NOT MET	NOT MET
5	School Crossing	NA	NA	NA	NA	NA
6	Coordinated Signal System	NOT MET	NOT MET	NOT MET	NOT MET	NOT MET
7	Crash Experience	NOT MET	NOT MET	NOT MET	NOT MET	NOT MET
8	Roadway Network	NOT MET	NOT MET	NOT MET	NOT MET	NOT MET
9	Intersection Near a Grade Crossing	NA	NA	NA	NA	NA

**Table XVII** summarizes each warrant and the results of the investigation. Warrant 1 is not met at any of the study locations. Warrant 2 is met at Grand Island Blvd/Long Rd and Grand Island Blvd/I-190 NB Off-Ramp and for two (2) of the required four hours at the Long Rd/I-190 SB Ramp intersection. Given the respective operating conditions for each location, a signal is recommended at the Long Rd/I-190 SB Ramp location only.



## XII. CONCLUSIONS & RECOMMENDATIONS

This Revised Traffic Impact Study identifies and evaluates the potential traffic impacts resulting from full build-out of the Proposed Distribution Facility Project. Based upon the comprehensive traffic analysis contained in this report, it is our firm's professional opinion that the results indicate that the Proposed Distribution Facility Project can be reasonably accommodated by the existing roadway network with the mitigations below being in place. The following sets forth our firm's conclusions and mitigations based upon the results of the comprehensive traffic analyses that have been conducted:

1. Based upon the crash details at the study intersections, the majority of crashes were rear-end collisions. These types of collisions are more common at traffic signals on high volume roadways. Recommended mitigation countermeasures include optimizing the change intervals (yellow time) at the traffic signals (to increase the length of time between phase intervals) and/or improve the visibility of the traffic signals to make drivers more aware of the operating conditions. It should be noted that Grand Island Boulevard/I-190 Off Ramp, Long Road/I-190 Off Ramp, and Grand Island Boulevard/Long Road are un-signalized intersections. In addition, the number and type of crashes documented at these intersections do not indicate the need for signalization as they are not susceptible to correction by a traffic signal.
2. The bridge that carries Long Road (CR 310) over I-190 was built in 1954 and is owned and maintained by the New York State Thruway Authority (NYSTA). There are no posted safety restrictions for this bridge. This bridge was last inspected by the NYSTA on August 30, 2018. The inspection report, included in the Appendix, indicates no flags were issued. The segment of Long Road that crosses the bridge over the I-190 currently carries approximately 1,750 vehicles per day (vpd). The proposed distribution facility is expected to add approximately 1,230 passenger vpd and approximately 240 trucks vpd traveling on Long Road over I-190 for a total of 1,470 vpd. Review of the current operating conditions and projected traffic volumes indicates that no improvements are warranted or recommended on this bridge.
3. The bridge that carries Bedell Road over I-190 was built in 1954 and is also owned and maintained by the NYSTA. There are no posted safety restrictions for this bridge. This bridge was last inspected by the NYSTA on May 17, 2018. The inspection report, included in the Appendix, indicates no flags were issued. The segment of Bedell Road that crosses the bridge currently carries approximately 918 vpd. The proposed distribution facility is expected to add approximately 1,550 passenger vpd traveling on Bedell Road over I-190; no trucks are expected to use Bedell Road. Review of the current operating conditions and projected traffic volumes indicates that no improvements are warranted or recommended on this bridge.
4. Traffic volumes using the North and South Grand Island Bridges were considerably higher between 2004 and 2007 than they are currently. Even with the addition of the Project, the estimated 2022 traffic volumes will not exceed the 2004 through 2007 traffic volumes on these bridges when toll barriers were still in place. The NGIB currently carries an average of 58,860 vpd. The Project is expected to add approximately 1,388 passenger vehicles per day and approximately 48 trucks per day on the NGIB. As such, the Project is expected to increase traffic on the NGIB by only approximately 2.4 percent and will remain below historic peak levels achieved in 2006 when toll barriers were still in place. The SGIB currently carries an average of 71,830 vpd. The proposed distribution facility is expected to add approximately 2,301 passenger vehicles per day and approximately 436 trucks per day on the SGIB. As such, the Project is expected to increase traffic on

the SGIB by only approximately 3.8 percent and will remain below historic peak levels achieved in 2004 and 2007 when toll barriers were still in place.

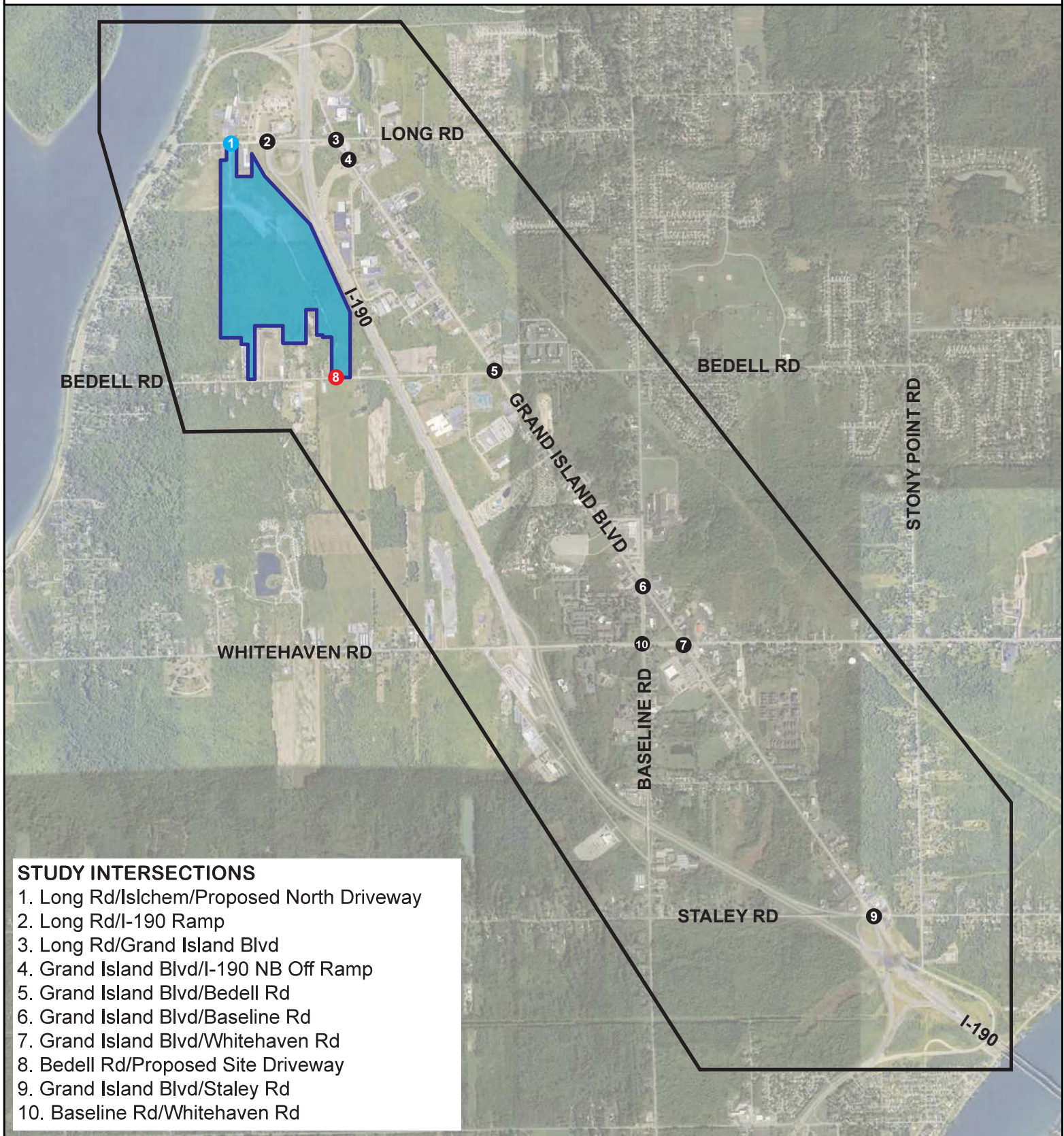
5. The peak hour weekday traffic on the GI Bridges in July and November occurs between 7:00-10:00 AM and 4:00-6:00 PM. The Project will have peak facility hours between 6:30-7:30 AM and 5:30-6:30 PM for employees entering and exiting the site. Additionally, the overnight shifts will end between 4:30-5:00AM. As such, the Project's shift times are designed to avoid peak travel hours on the bridges.
6. The proposed distribution facility is expected to generate approximately 707 (1,190) new trips during the AM (PM) study peak hours (6:30-7:30 AM and 5:30-6:30 PM) respectively inclusive of both passenger vehicles and trucks.
7. During the time periods of 7:30-9:00 AM and 4:00-5:30 PM (the time periods that encompass the actual intersection peak hours) the site generates significantly lower volumes of traffic; on the order of 101(214) vph respectively. Therefore, the combination of the site peak traffic and the intersection traffic volumes during the peak hours of the site represent the most critical time period for evaluation.
8. The majority of truck traffic (approx. 90%) will travel directly to and from the NYS Thruway via Long Road and the I-190. The other 10% will travel to/from the north on the I-190.
9. The combination of projected westbound traffic volumes (shown in Figure 8 of the TIS for full development conditions) turning left from Long Road onto the I-190 SB Ramps indicate warrants for left-turn treatment are not met during the weekday AM and PM peak hours; left turn treatment warrants are met for traffic turning into the site driveway. The through volumes on Long Road at the site driveway are extremely low during the peak study time periods – 17(12) vph westbound. Given the extremely low through volumes, left turn treatments are not warranted or recommended at the site driveway.
10. Signal Warrant 1 is not met at any of the study locations. Warrant 2 is met at Grand Island Blvd/Long Rd and Grand Island Blvd/I-190 NB Off-Ramp and for three (3) hours at the Long Rd/I-190 SB Ramp intersection. Given the respective operating conditions for each location and the results of the sensitivity analysis, a signal is recommended at the Long Rd/I-190 SB Ramp location only.
11. The following project modifications and improvements are recommended and, if approved by review agencies, will be constructed by the project sponsor:
  - a) Long Rd/I-190 SB Ramps
    - Install a new fully actuated three-color traffic signal.
  - b) Grand Island Blvd/I-190 NB Off-Ramp
    - Construct a new right turn lane for traffic exiting the I-190 Ramp.
12. The project sponsor should continue discussions with NFTA to provide transit service on-site.

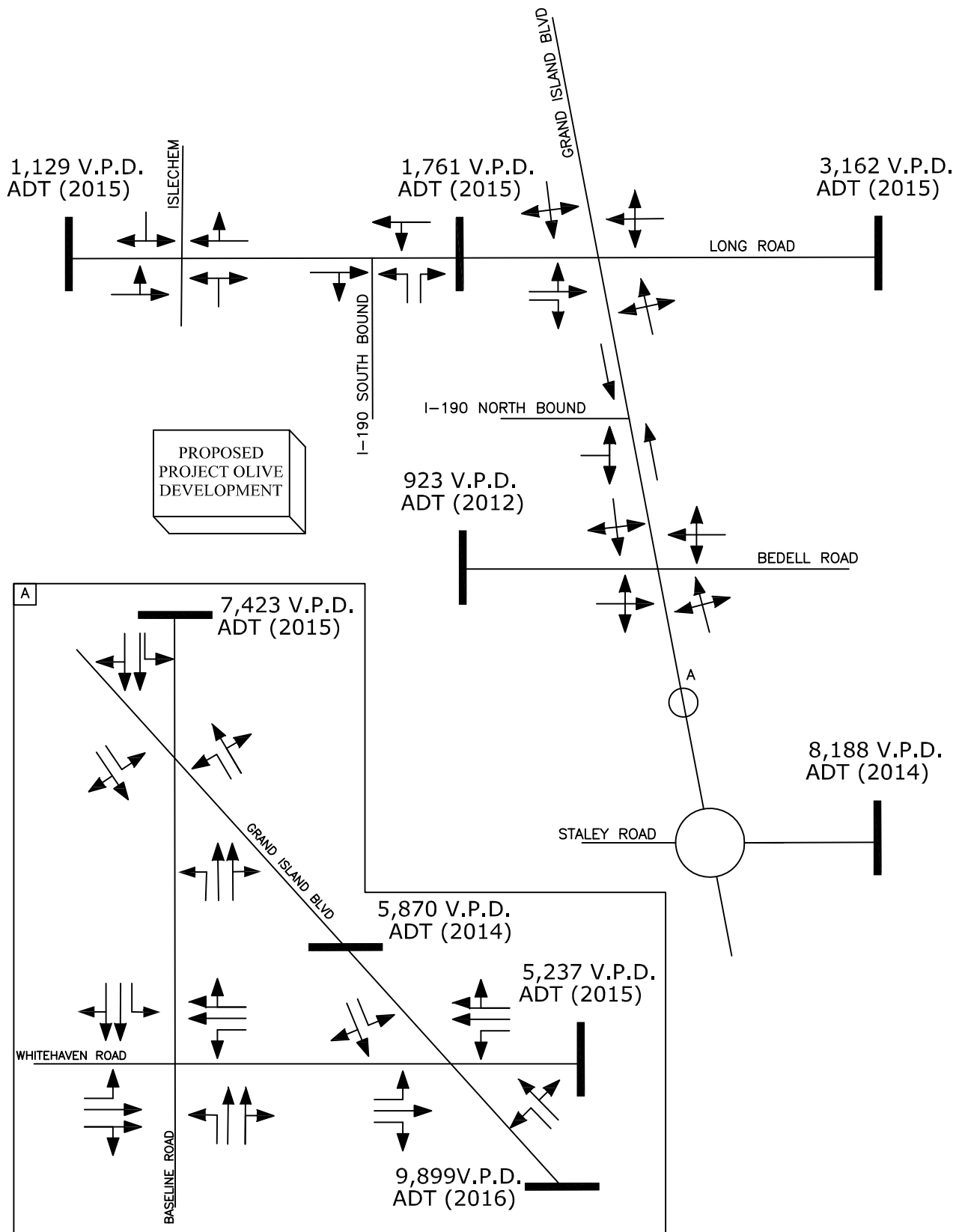
### **XIII. FIGURES**

Figures 1 through 9C are included on the following pages.



# FIGURE 1 - SITE LOCATION & STUDY AREA





Note:  
All counts by NYSDOT  
V.P.D = Vehicles Per Day

PROJECT NO: 39064 REVISION: 05/22/2020

KEY

N

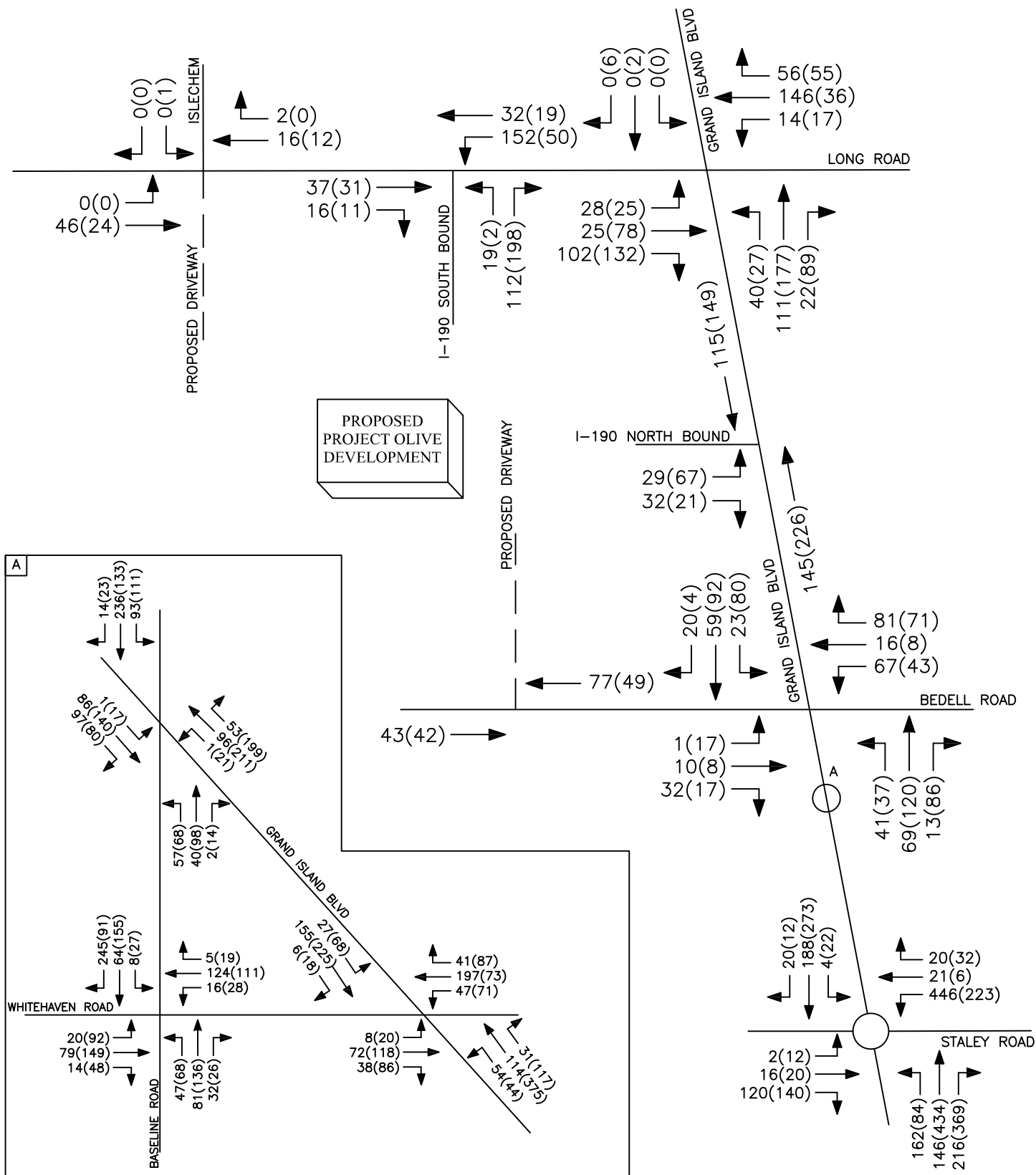
NOT TO SCALE

## FIGURE 2

LANE GEOMETRY &  
AVERAGE DAILY TRAFFIC

PROJECT OLIVE DEVELOPMENT,  
TOWN OF GRAND ISLAND, NY

**SRF**  
ASSOCIATES  
Transportation Planning / Engineering / Design  
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PROJECT NO: 39064 REVISION: 05/22/2020

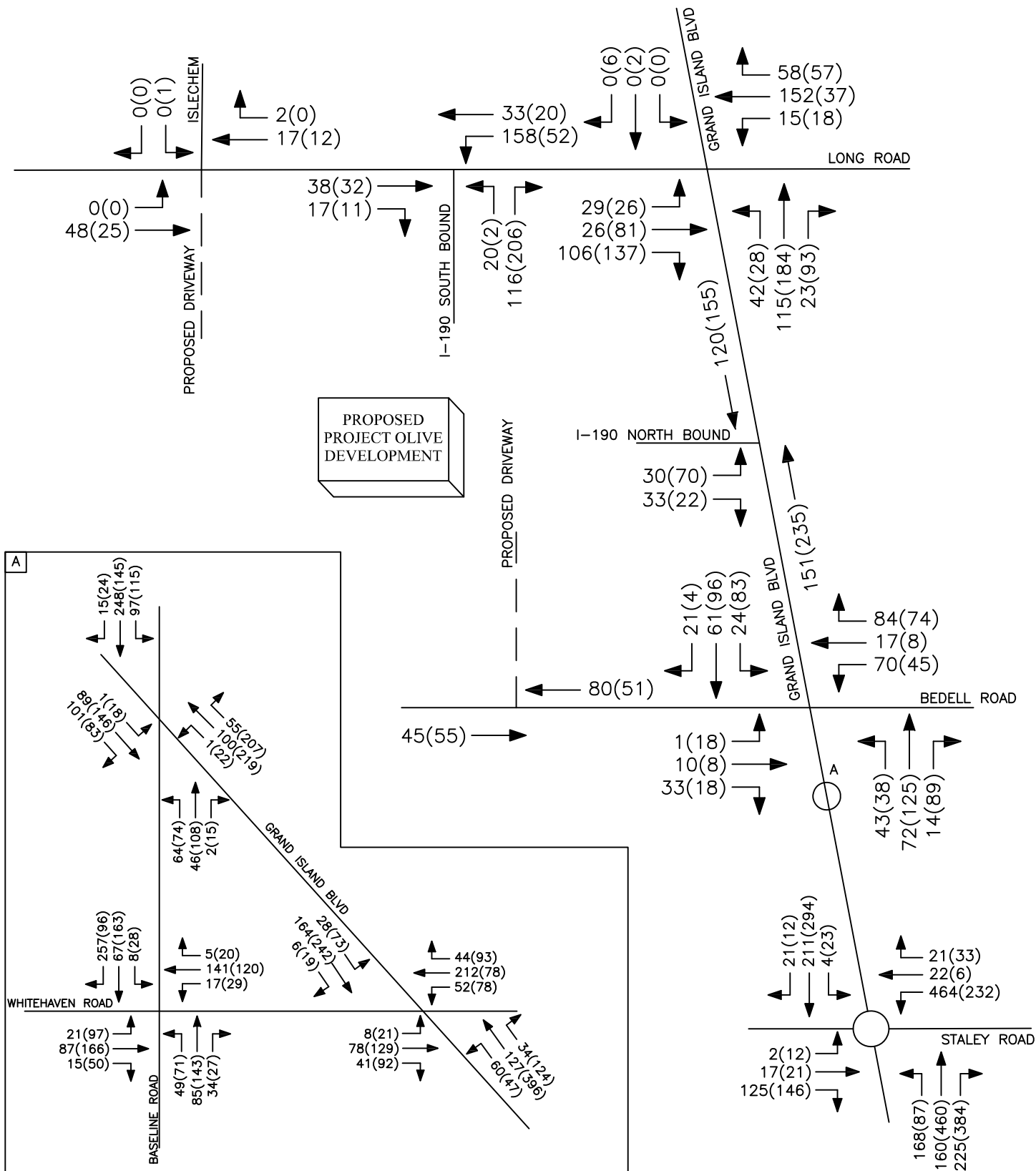
AM PEAK HOUR: 6:30AM-7:30AM  
PM PEAK HOUR: 5:30PM-6:30PM

## FIGURE 3A

PEAK HOUR VOLUMES  
2019 UNADJUSTED  
EXISTING CONDITIONS

PROJECT OLIVE DEVELOPMENT,  
TOWN OF GRAND ISLAND, NY





PROJECT NO: 39064 REVISION: 05/22/2020

AM PEAK HOUR: 6:30AM-7:30AM  
PM PEAK HOUR: 5:30PM-6:30PM



NOT TO SCALE

00(00) = AM(PM)

\*FACILITY PEAK HOURS

## FIGURE 4

PEAK HOUR VOLUMES  
2022 BACKGROUND CONDITIONS

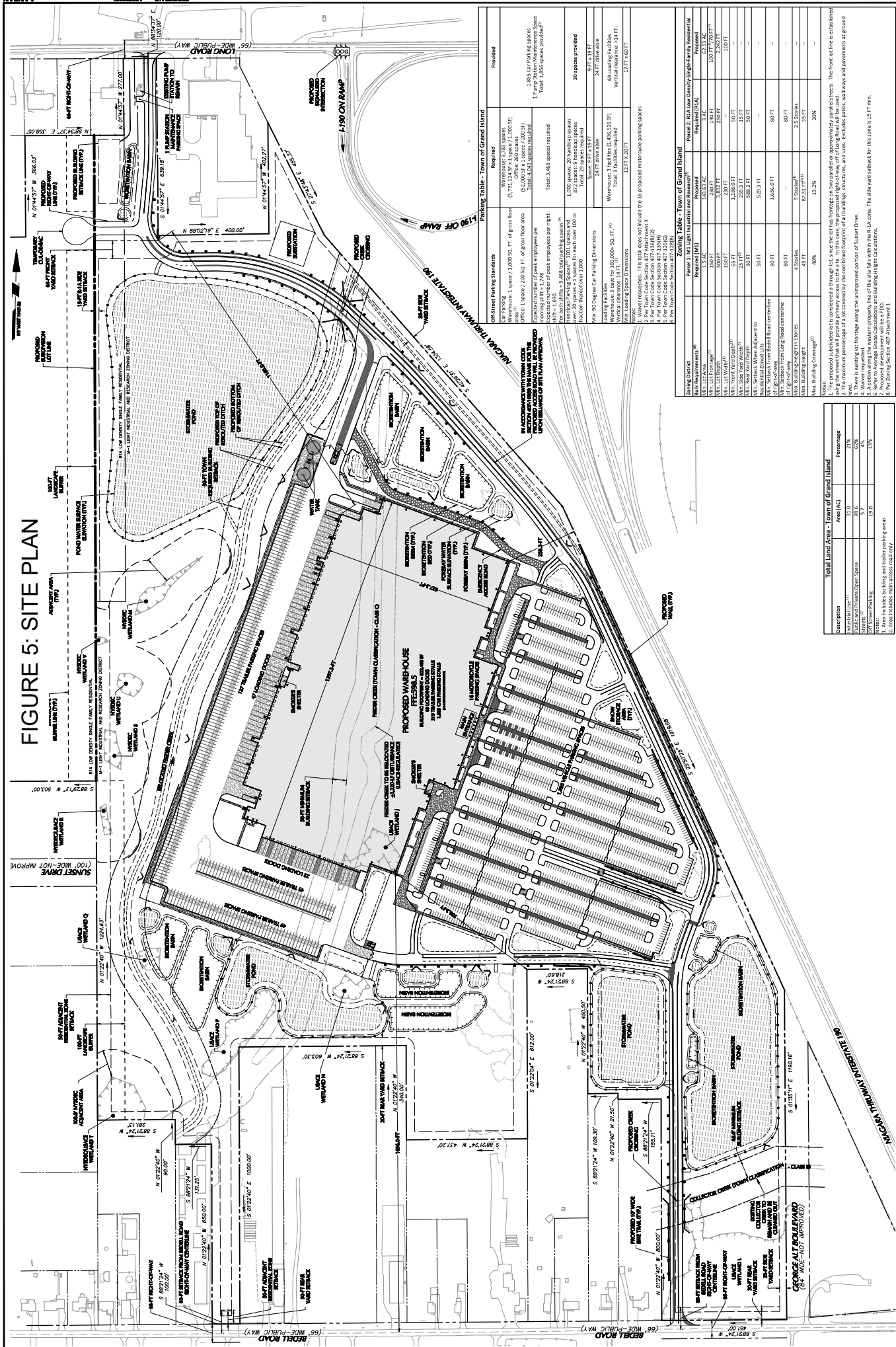
PROJECT OLIVE DEVELOPMENT,  
TOWN OF GRAND ISLAND, NY



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## FIGURE 5: SITE PLAN

[illegible][illegible]

Total Land Area - Town of Grand Island		
Description	Area (Ac)	Percentage
Industrial Use <sup>11</sup>	31.0	21%
Public and Private Open Space	89.6	62%
Streets <sup>12</sup>	5.7	4%
Off Street Parking	19.0	13%

Notes:

1. Area includes building and trailer parking areas
2. Area includes main access road only

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REVISIONS		
Date	Description	No.
06/18/20	REVISED PER TOWN COMMENTS	2.
04/06/20	ISSUE FOR BID	1.

Author	Year	Journal	Volume	Issue	Page	DOI
James, J. R., & Jones, J. E.	1993	Journal of Personality and Social Psychology	65	4	1181-1191	10.1037/0022-3514.65.4.1181
Levine, M. J., & Morey, R. C.	2005	Journal of Personality and Social Psychology	88	4	611-621	10.1037/0022-3514.88.4.611
Levine, M. J., & Morey, R. C.	2006	Journal of Personality and Social Psychology	90	4	611-621	10.1037/0022-3514.90.4.611
Levine, M. J., & Morey, R. C.	2007	Journal of Personality and Social Psychology	92	4	611-621	10.1037/0022-3514.92.4.611
Levine, M. J., & Morey, R. C.	2008	Journal of Personality and Social Psychology	94	4	611-621	10.1037/0022-3514.94.4.611
Levine, M. J., & Morey, R. C.	2009	Journal of Personality and Social Psychology	96	4	611-621	10.1037/0022-3514.96.4.611
Levine, M. J., & Morey, R. C.	2010	Journal of Personality and Social Psychology	98	4	611-621	10.1037/0022-3514.98.4.611
Levine, M. J., & Morey, R. C.	2011	Journal of Personality and Social Psychology	100	4	611-621	10.1037/0022-3514.100.4.611
Levine, M. J., & Morey, R. C.	2012	Journal of Personality and Social Psychology	102	4	611-621	10.1037/0022-3514.102.4.611
Levine, M. J., & Morey, R. C.	2013	Journal of Personality and Social Psychology	104	4	611-621	10.1037/0022-3514.104.4.611
Levine, M. J., & Morey, R. C.	2014	Journal of Personality and Social Psychology	106	4	611-621	10.1037/0022-3514.106.4.611
Levine, M. J., & Morey, R. C.	2015	Journal of Personality and Social Psychology	108	4	611-621	10.1037/0022-3514.108.4.611
Levine, M. J., & Morey, R. C.	2016	Journal of Personality and Social Psychology	110	4	611-621	10.1037/0022-3514.110.4.611
Levine, M. J., & Morey, R. C.	2017	Journal of Personality and Social Psychology	112	4	611-621	10.1037/0022-3514.112.4.611
Levine, M. J., & Morey, R. C.	2018	Journal of Personality and Social Psychology	114	4	611-621	10.1037/0022-3514.114.4.611
Levine, M. J., & Morey, R. C.	2019	Journal of Personality and Social Psychology	116	4	611-621	10.1037/0022-3514.116.4.611
Levine, M. J., & Morey, R. C.	2020	Journal of Personality and Social Psychology	118	4	611-621	10.1037/0022-3514.118.4.611
Levine, M. J., & Morey, R. C.	2021	Journal of Personality and Social Psychology	120	4	611-621	10.1037/0022-3514.120.4.611
Levine, M. J., & Morey, R. C.	2022	Journal of Personality and Social Psychology	122	4	611-621	10.1037/0022-3514.122.4.611
Levine, M. J., & Morey, R. C.	2023	Journal of Personality and Social Psychology	124	4	611-621	10.1037/0022-3514.124.4.611
Levine, M. J., & Morey, R. C.	2024	Journal of Personality and Social Psychology	126	4	611-621	10.1037/0022-3514.126.4.611
Levine, M. J., & Morey, R. C.	2025	Journal of Personality and Social Psychology	128	4	611-621	10.1037/0022-3514.128.4.611



KEY

NOT TO SCALE

N

→ = ENTERING TRIPS

→ = EXITING TRIPS

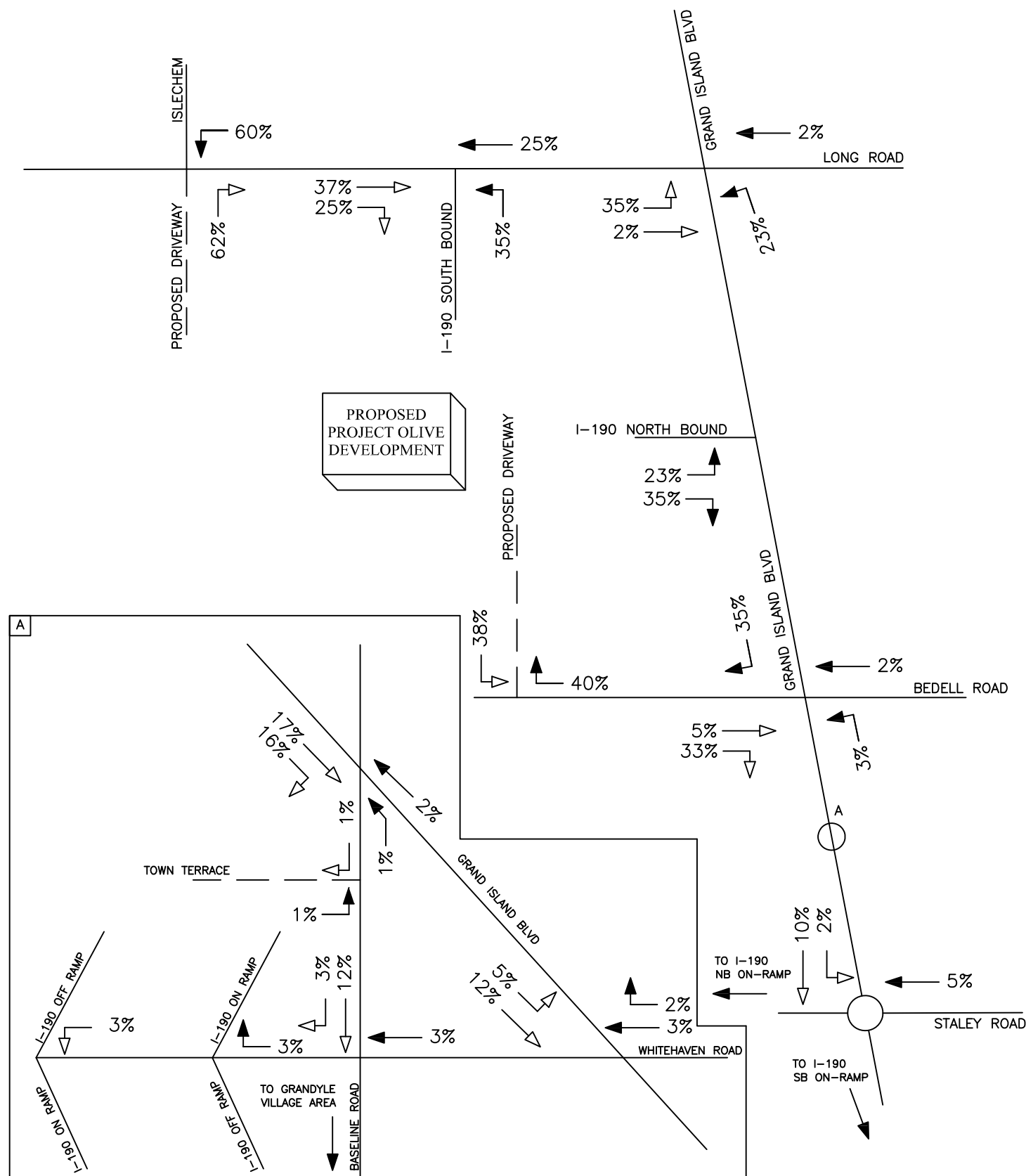


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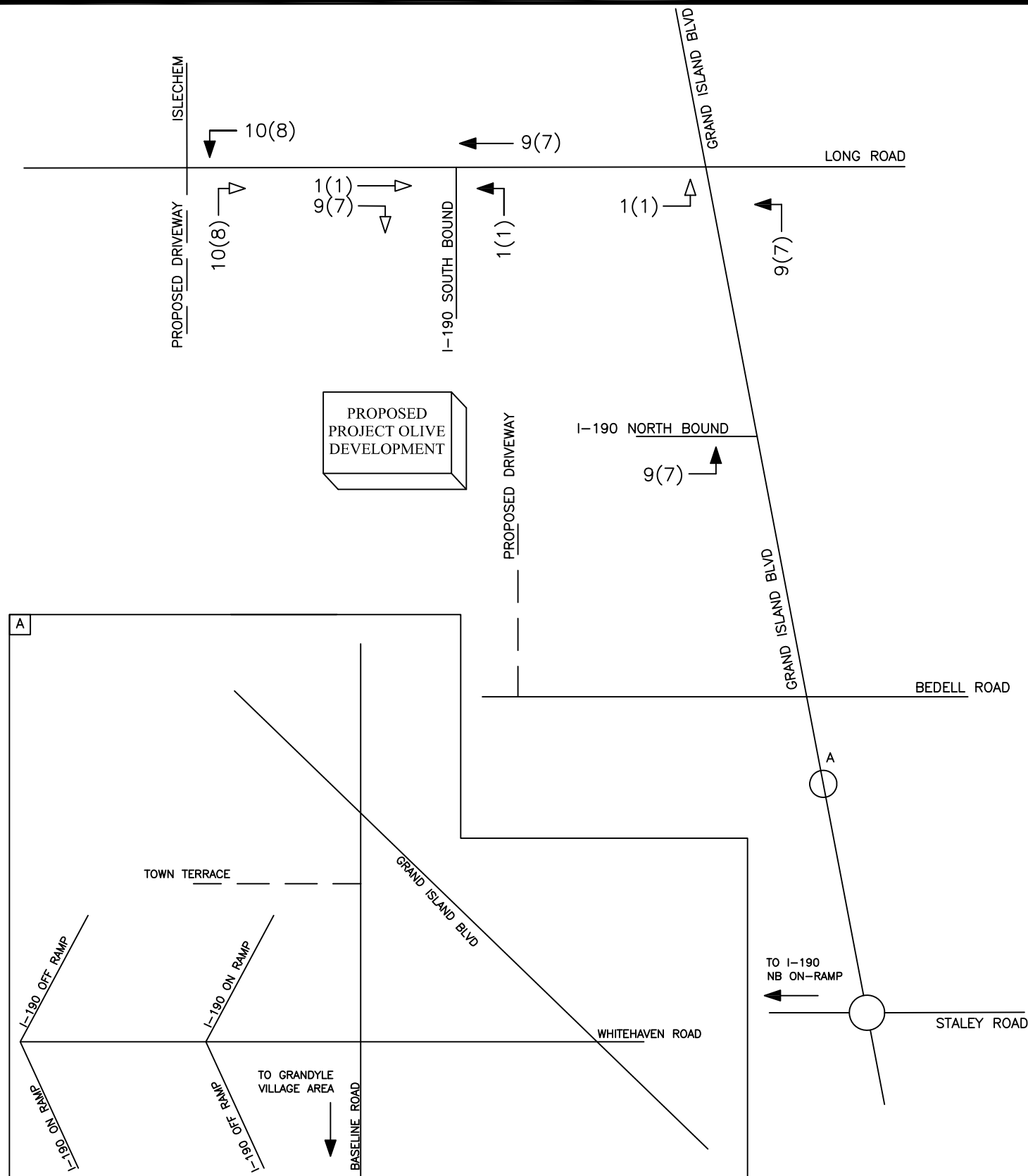
PROJECT NO: 39064 REVISION: 05/22/2020

AM PEAK HOUR: 6:30AM-7:30AM  
PM PEAK HOUR: 5:30PM-6:30PM

## FIGURE 6B

PROPOSED PEAK HOUR  
TRIP DISTRIBUTION-EMPLOYEES

PROJECT OLIVE DEVELOPMENT,  
TOWN OF GRAND ISLAND, NY



PROJECT NO: 39064 REVISION: 05/22/2020

AM PEAK HOUR: 6:30AM-7:30AM  
PM PEAK HOUR: 5:30PM-6:30PM

**KEY**

NOT TO SCALE

00(00) = AM(PM)

\*FACILITY PEAK HOURS

→ = ENTERING TRIPS

→ = EXITING TRIPS

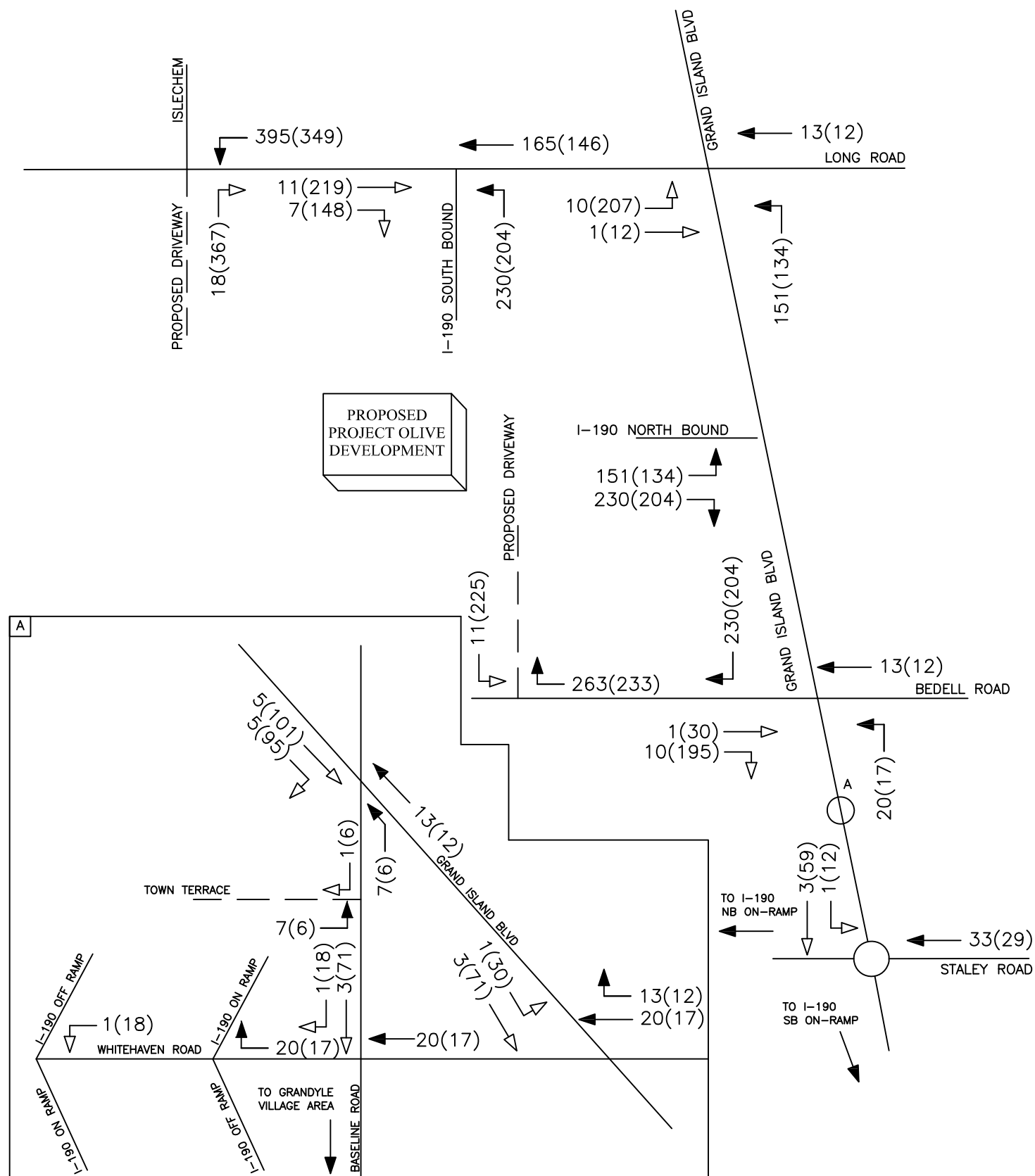
## FIGURE 7A

PEAK HOUR SITE GENERATED  
TRUCK TRIPS

PROJECT OLIVE DEVELOPMENT,  
TOWN OF GRAND ISLAND, NY

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**KEY**

NOT TO SCALE

00(00) = AM(PM)

\*FACILITY PEAK HOURS

→ = ENTERING TRIPS

→ = EXITING TRIPS

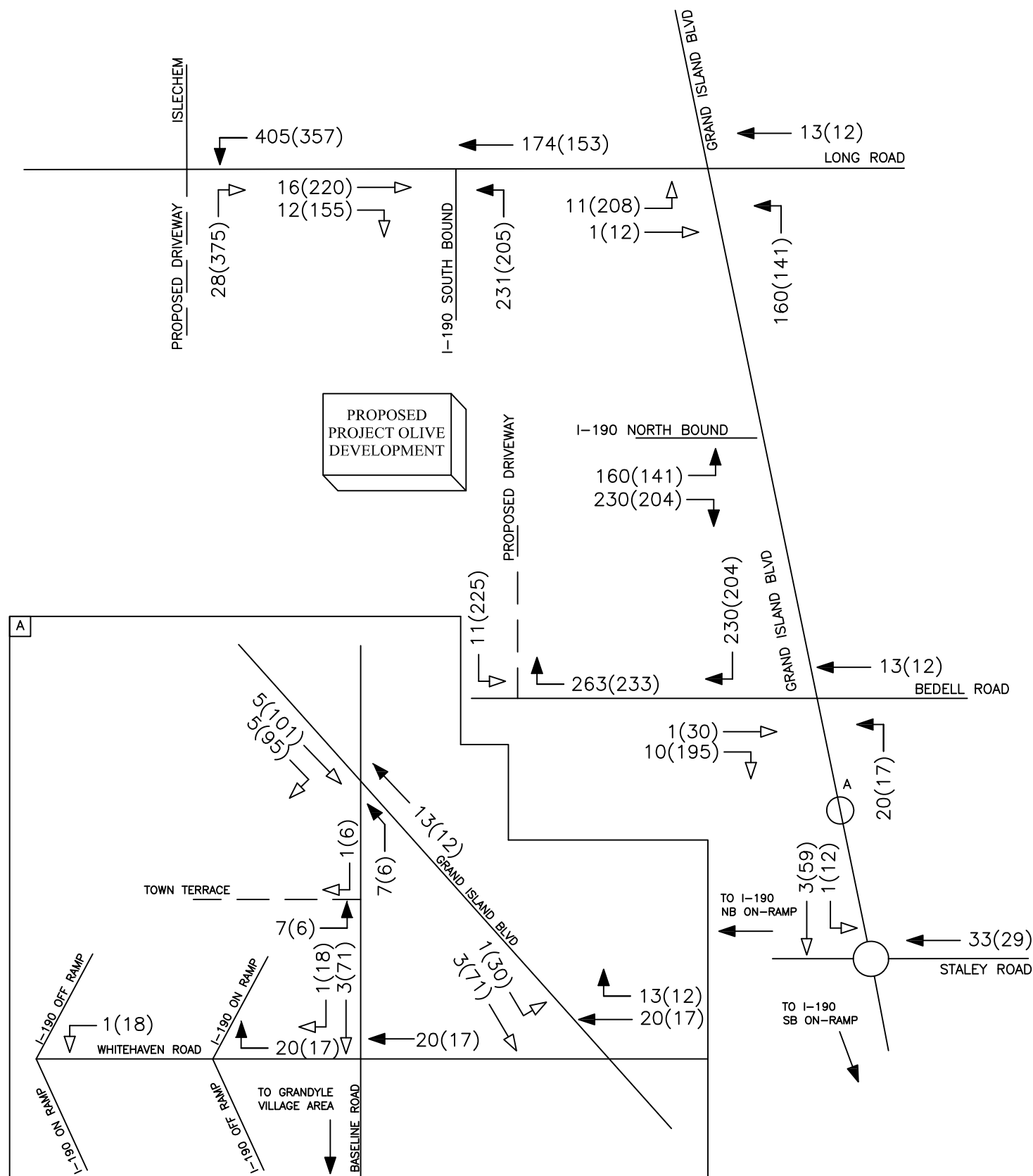
## FIGURE 7B

PEAK HOUR SITE GENERATED  
EMPLOYEE TRIPS

PROJECT OLIVE DEVELOPMENT,  
TOWN OF GRAND ISLAND, NY

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**KEY**

NOT TO SCALE

00(00) = AM(PM)

\*FACILITY PEAK HOURS

→ = ENTERING TRIPS

⇨ = EXITING TRIPS

## FIGURE 7C

TOTAL PEAK HOUR  
SITE GENERATED TRIPS

PROJECT OLIVE DEVELOPMENT,  
TOWN OF GRAND ISLAND, NY

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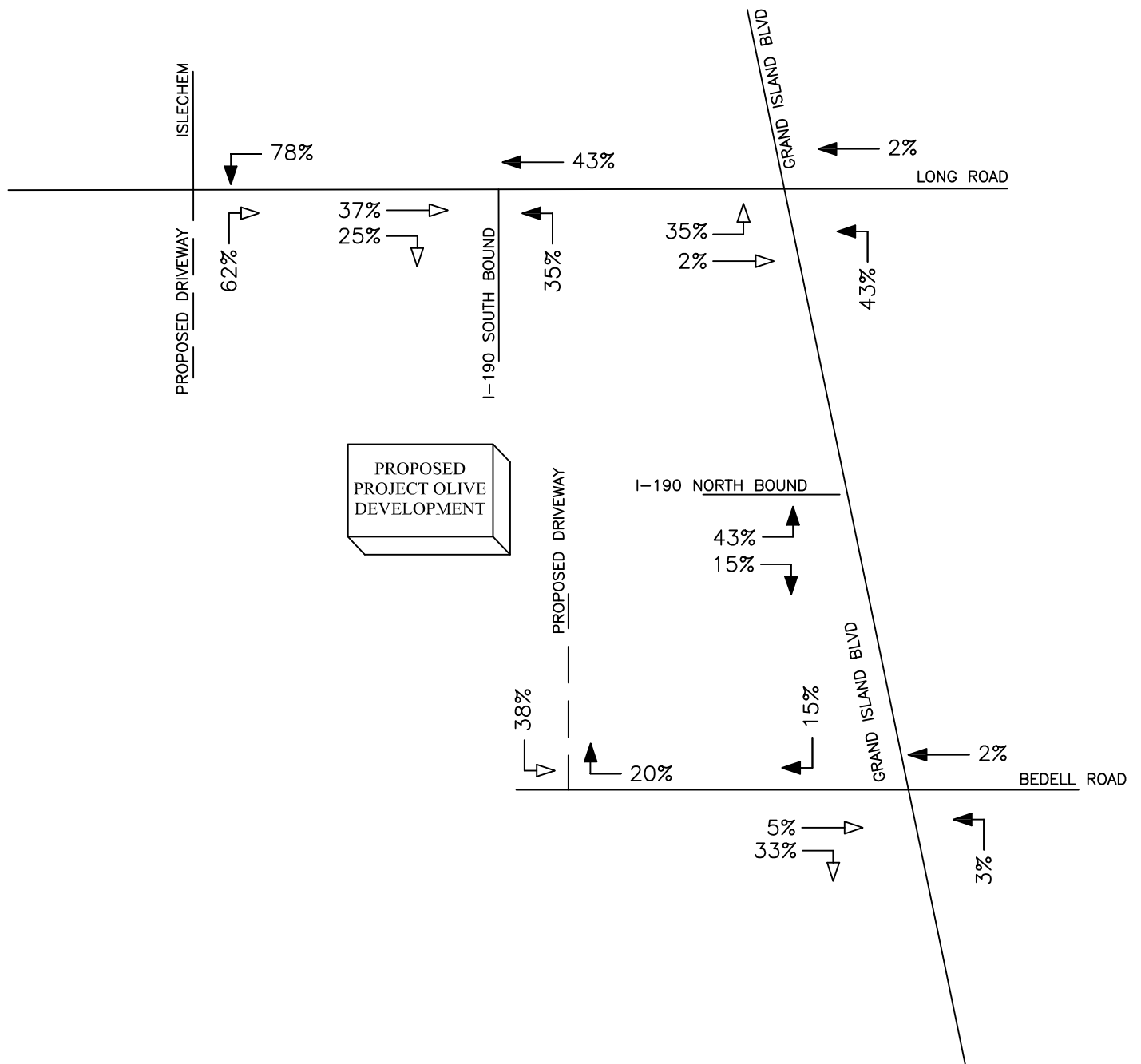
KEY



N

\*FACILITY PEAK HOURS


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



PROJECT NO: 39064 REVISION: 05/29/2020

AM PEAK HOUR: 6:30AM-7:30AM  
PM PEAK HOUR: 5:30PM-6:30PM

**KEY**

 **NOT TO SCALE**

 = ENTERING TRIPS

 = EXITING TRIPS

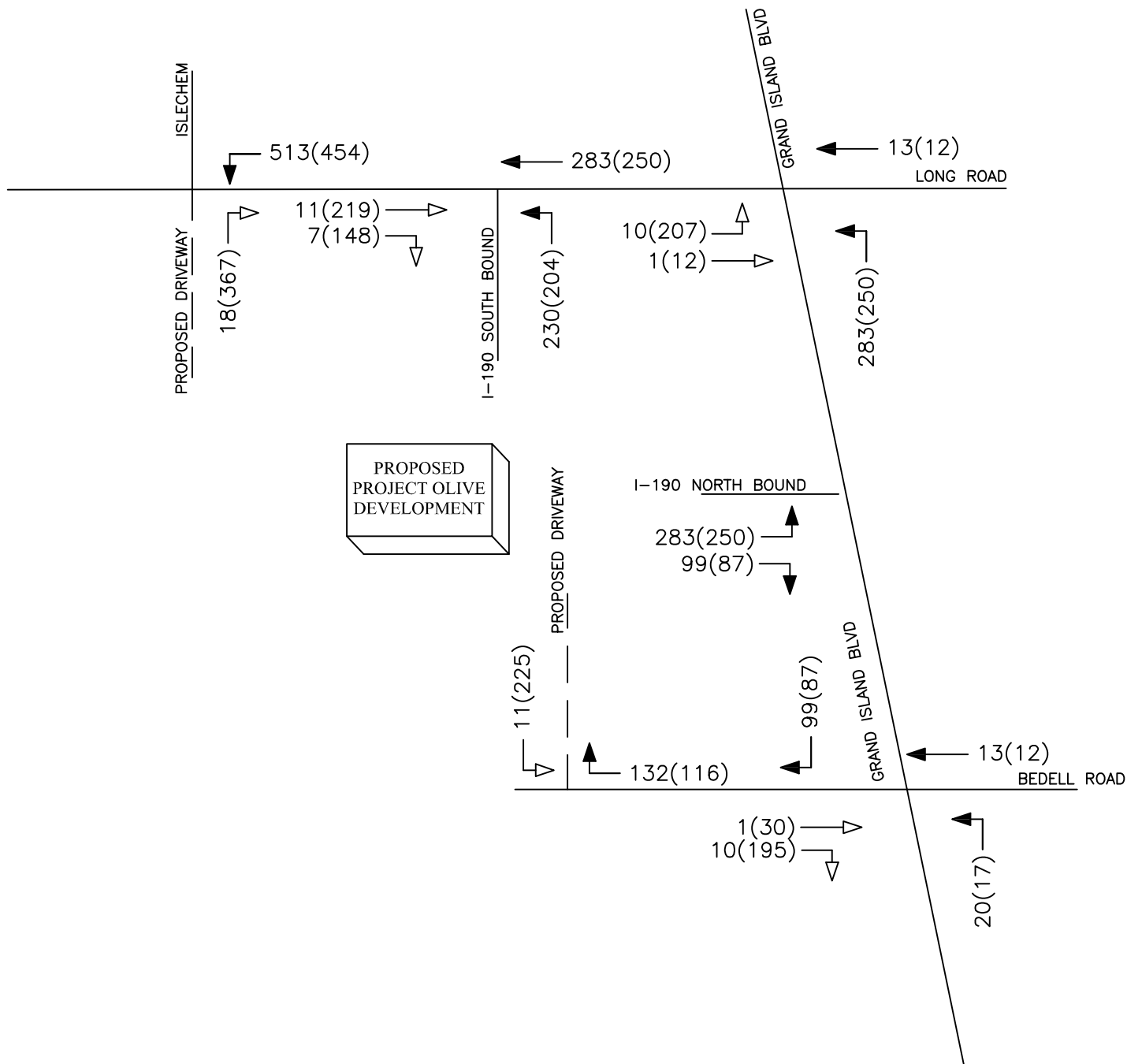
# FIGURE 9A

## PROPOSED PEAK HOUR TRIP DISTRIBUTION-EMPLOYEES SENSITIVITY ANALYSIS

PROJECT OLIVE DEVELOPMENT,  
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AM PEAK HOUR: 6:30AM-7:30AM  
PM PEAK HOUR: 5:30PM-6:30PM

**KEY**

NOT TO SCALE

00(00) = AM(PM)

N \*FACILITY PEAK HOURS

→ = ENTERING TRIPS

→ = EXITING TRIPS

## FIGURE 9B

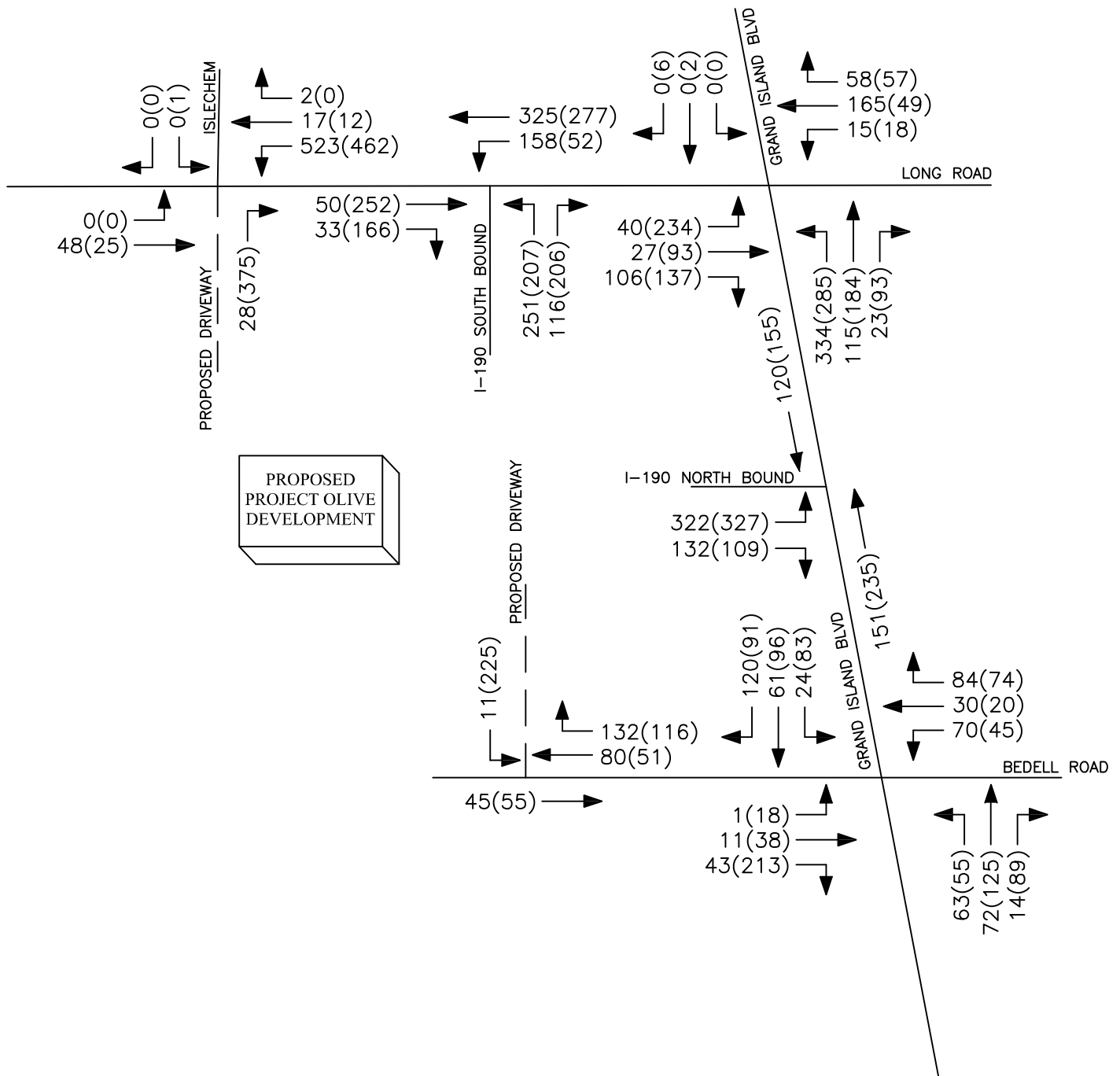
PEAK HOUR SITE GENERATED  
EMPLOYEE TRIPS  
SENSITIVITY ANALYSIS

PROJECT OLIVE DEVELOPMENT,  
TOWN OF GRAND ISLAND, NY

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AM PEAK HOUR: 6:30AM-7:30AM  
PM PEAK HOUR: 5:30PM-6:30PM



NOT TO SCALE

00(00) = AM(PM)

\*FACILITY PEAK HOURS

## FIGURE 9C

PEAK HOUR VOLUMES  
FULL DEVELOPMENT CONDITIONS  
SENSITIVITY ANALYSIS

PROJECT OLIVE DEVELOPMENT,  
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