Traffic Impact Study

for the proposed

Student Housing Development

City of Oneonta
Otsego County, New York

Project No. 32059

December 2012
Revised February 13, 2012

Prepared For:

Newman Development Group, LLC
1737 Union Street #226
Schenectady, NY 12309
ATTN: Jeffrey R. Smetana, CPA, Vice President

Prepared By:

3495 Winton Place
Building E, Suite 110
Rochester, New York 14623

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

LIST OF REFERENCES

1. Special Report 209: Highway Capacity Manual. Transportation Research Board. National Research Council, Washington, DC. 2000.
2. Trip Generation, Eighth Edition. Institute of Transportation Engineers. Washington D.C. 2008.
3. Traffic Volume Report. NYSDOT. Albany, New York. 2011.
4. New York State Department of Transportation Traffic Data Viewer. 2012. Retrieved from https://www.dot.ny.gov/tdv

EXECUTIVE SUMMARY

OVERVIEW

The purpose of this report is to identify and evaluate the potential traffic impacts that the proposed Student Housing Development may have on the adjacent highway network.

The proposed development includes 114 (330 beds) apartment-style student housing units. Additionally, four three-bedroom townhouse units are proposed along the entrance road to the development. The report investigates the existing traffic volumes and projects the future weekday AM and afternoon peak hour travel conditions at the intersections of: (1) East Street/Bugbee Road and (2) Blodgett Drive/Bugbee Road.

The proposed development site is located at the northern terminus of Blodgett Drive in the City of Oneonta, Otsego County, New York. The proposed site development area is bounded by forest land to the north and east, Farone Drive to the south, and athletic fields to the west. Peak hour traffic counts were obtained at the study intersections during peak hours.

Construction of the proposed development is anticipated to reach full build-out in two years. City of Oneonta officials were contacted to discuss projects within the study area that are under construction and/or approved. There are no projects identified within the immediate study area.

To account for normal increases in background traffic growth, including any unforeseen developments in the project study area, a growth rate of 0.5% per year has been applied to the existing traffic volumes, based upon historical traffic growth and NYSDOT projections for the area, for the two year build-out period.

The operating characteristics of the access driveways and impacts to the adjacent roadway network are identified and mitigating measures, if any, are provided to minimize any capacity or safety concerns.

CONCLUSIONS & RECOMMENDATIONS

This study evaluates the potential traffic impacts resulting from the projected traffic volumes from the proposed student housing development. Based upon our comprehensive analysis, the results indicate that the proposed project will not have significant adverse traffic impacts to the existing roadway network. The following sets forth conclusions based upon the results of the analyses:

1. The proposed student housing units are expected to generate approximately 35 trips during the AM peak hour and 49 trips during the afternoon peak hour.

2. The design of the proposed development along with the proximity of the project site to SUNY Oneonta's campus and the availability of Oneonta Public Transit will encourage use of transit, walking and bicycling.

3. There are no significant, adverse traffic impacts to the surrounding roadway network based upon full development conditions.

I. INTRODUCTION

The proposed development includes 114 (330 beds) apartment-style student housing units. Additionally, four three-bedroom townhouse units are proposed along the entrance road to the development. This report investigates the existing traffic volumes and projects the future weekday AM and afternoon peak hour travel conditions at the intersections affected by the development: (1) East Street/Bugbee Road and (2) Blodgett Drive/Bugbee Road.

In an effort to define traffic impact, this analysis determines the extent of existing traffic conditions, projects background traffic flow including area growth, and projects changes in traffic flow due to the proposed development.

The operating characteristics of the study intersection and impacts to the adjacent roadway network are identified and mitigating measures, if any, are provided to minimize any capacity or safety concerns.

II. LOCATION

The proposed development site is located at the northern terminus of Blodgett Drive in the City of Oneonta, Otsego County, New York. 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).

The proposed site development area is bounded by forest land to the north and east, Farone Drive to the south, and athletic fields to the west.

III. EXISTING HIGHWAY SYSTEM

East Street is functionally classified as an urban minor arterial roadway, under the jurisdiction of the City of Oneonta. Within the study area, motorists travel north and south with one travel lane in each direction. Annual Average Daily Traffic (AADT) on East Street was approximately 4,152 vehicles per day (vpd) in 2008. This figure is based on the most recent traffic counts collected by the New York State Department of Transportation (NYSDOT). The posted speed limit on East Street is 45 miles per hour (MPH) north of Bugbee Road. South of Bugbee Road, the speed limit is posted as an area-wide 25 MPH.

Bugbee Road is a local roadway. Within the study area, it travels east/west and provides one travel lane in each direction. Average Daily Traffic (ADT) on Bugbee Road is approximately 2,910 vpd based on turning moving count data collected by SRF & Associates (SRF) in 2012. The posted speed limit is 25 MPH.

Blodgett Drive is a local roadway. Within the study area, it travels north/south with one travel lane in each direction. The ADT on Blodgett Drive is approximately 550 vpd based on turning moving count data collected by SRF in 2012. The area-wide speed limit is 25 MPH.

Existing AADT information was obtained from the NYSDOT *Traffic Volume Report 2011* and *NYSDOT Traffic Data Viewer Website*. **Figure 2** illustrates the lane geometry at each of the study intersections and the ADT volumes on the study roadways.

IV. EXISTING TRAFFIC CONDITIONS

A. Peak Intervals for Analysis

Given the functional characteristics of the land uses proposed for the site (student housing), the peak hours selected for analysis are the weekday morning commuter and afternoon school peaks. The combination of site traffic and adjacent through traffic produces the greatest demand during these time periods.

B. Existing Traffic Volume Data

Weekday AM (6:45-8:15 AM) and afternoon (1:45-3:15 PM) peak hour volumes were collected by SRF at the intersections of: East Street/Bugbee Road and Bugbee Road/Blodgett Drive. Data collection was conducted between Tuesday, November 27th 2012 and Wednesday, November 28th, 2012. The peak hour traffic periods generally occurred between 7:00-8:00AM and 2:00-3:00PM for the study intersections.

The weekday AM and afternoon existing condition peak hour volumes are reflected in **Figure 3**.

V. FUTURE AREA DEVELOPMENT AND LOCAL GROWTH

Construction of the proposed development is anticipated to reach full build-out in two years. City of Oneonta officials were contacted to discuss projects within the study area that are under construction and/or approved. There are no projects identified within the immediate study area.

To account for normal increases in background traffic growth, including any unforeseen developments in the project study area, a growth rate of 0.5% per year has been applied to the existing traffic volumes, based upon historical traffic growth and NYSDOT projections for the area, for the two year build-out period.

The background traffic volumes are depicted in **Figure 4**.

VI. PROPOSED DEVELOPMENT

A. Description

The proposed development includes 114 (330 beds) apartment-style student housing units. Additionally, four three-bedroom townhouse units are proposed along the entrance road to the development.

Access to the proposed housing units will be provided through the existing Blodgett Drive and Farone Drive roadways. All site generated traffic will ultimately use Blodgett Drive as the main roadway for all entering and exiting traffic.

See **Figure 5** for the proposed site plan.

B. Site Traffic Generation

The next step in the evaluation is to determine the additional traffic attributable to the development as defined, vehicle trips entering and exiting the site.

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, 8th 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. Volumes generated during the peak hour of adjacent street traffic, in this case the weekday AM and afternoon commuter peaks, represent a more critical volume when analyzing the capacity of the system; those intervals will provide the basis of this analysis.

ITE does not have corresponding Land Use Codes for University Student Housing Apartments and Townhomes. However, this report uses the ITE Land Use Code of Low-Rise Apartments (ITE #221), as it is most comparable to student housing as determined from data collected by SRF at other similar sites.

Table 1 summarizes the volume of projected trips for the weekday AM and afternoon peak hours. All trip generation calculations are included in Appendices of this report.

TABLE I: SITE GENERATED TRIPS

DESCRIPTION	SIZE	AM PEAK		AFTERNOON PEAK	
		ENTER	EXIT	ENTER	EXIT
Student Housing Apartments	118 Units*	14	52	53	29

* *Total number of units including apartments and townhouses*

C. *Determination of Alternative Travel Modes (Transit/Pedestrian/Bicycle Trips)*

The proposed development intends to create a walkable housing development centered around transit, pedestrian and bicycle facilities. The design of this development encourages students to use alternative modes of transportation and give a higher quality of life without complete dependence on a vehicle for mobility.

As such, the anticipated volume of pedestrian/bicycle and transit trips is quantified to provide a reduction in the expected vehicular trips generated by the proposed housing development. Based on the proximity of the project site to SUNY Oneonta's campus and the availability of Oneonta Public Transit, the following assumptions are used in this analysis:

- Transit usage – 10%
- Pedestrian/Bicycle trips – 20%

Table II shows the various trip percentage reductions described above that are applied to the site generated volumes and resulting "new" traffic that will be added to the existing highway system for the weekday AM and afternoon peak periods under full development conditions.

TABLE II: TRIP REDUCTION AND PRIMARY TRIPS

DESCRIPTION	SIZE	AM PEAK		AFTERNOON PEAK	
		ENTER	EXIT	ENTER	EXIT
Student Housing Apartments	118 Units	12	42	45	24
Transit (10%)		-1	-4	-5	-2
Pedestrian/Bicycle (20%)		-2	-8	-9	-5
Sub-Total of Reductions		*-4*	*-15*	*-14*	*-7*
Total Site Generated Traffic		***8***	***27***	***32***	***17***

D. *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:

- Employment centers;
- Existing highway network;
- Proximity to the City of Oneonta;
- Existing traffic patterns; and
- Existing traffic conditions and controls

Figure 6 shows the anticipated trip distribution pattern percentages for full build-out of the proposed student housing development. **Figure 7** shows the resulting total site generated traffic as assigned to the site driveways and study area intersections for the weekday AM and afternoon peak hour periods under full build-out conditions.

VII. FULL DEVELOPMENT VOLUMES

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

It is noted that the analysis are based upon a greater number of units, and thus a slightly higher volume of site generated trips, than are currently proposed. Therefore, the results discussed below are slightly worse than can actually be expected.

VIII. CAPACITY ANALYSIS

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 typically 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 best conditions and LOS "F" the worst. 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 2000) published by the Transportation Research Board. Traffic analysis software, Synchro 7, which is based on procedures and methodologies contained in the HCM 2000, was used to analyze operating conditions at study area intersections. The procedure yields a Level of Service (LOS) based on the HCM 2000 as an indicator of how well intersections operate.

Existing operating conditions during the peak study periods are evaluated to determine a basis for comparison with the projected background and future conditions. The future traffic conditions generated by the development 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 III**, below. The discussion following the table summarizes capacity conditions. All capacity analysis calculations are included in the Appendices.

TABLE III: CAPACITY ANALYSIS RESULTS

INTERSECTION	*EXISTING CONDITIONS*		*BACKGROUND CONDITIONS*		*FULL DEVELOPMENT CONDITIONS*	
	AM	*AFTER-NOON*	*AM*	*AFTER-NOON*	*AM*	*AFTER-NOON*
East Street / Bugbee Road / Meadowbrook Lane						
Eastbound – Bugbee Road	A (9.4)	B (10.1)	A (9.4)	B (10.1)	A (9.6)	B (10.4)
Westbound – Meadowbrook Lane	C (15.5)	C (15.9)	C (15.6)	C (16.0)	C (16.6)	C (18.1)
Northbound – East Street	A (6.2)	A (5.8)	A (6.2)	A (5.8)	A (6.3)	A (6.1)
Blodgett Drive / Bugbee Road						
Eastbound – Bugbee Road	A (1.0)	A (0.4)	A (0.9)	A (0.4)	A (1.2)	A (0.9)
Southbound – Blodgett Drive	B (10.9)	B (10.5)	B (11.0)	B (10.5)	B (11.8)	B (11.1)

East Street / Bugbee Road / Meadowbrook Lane

The intersection of East Street with Bugbee Road-Meadowbrook Lane currently operates at LOS "C" or better on all approaches. No changes in levels of service are anticipated as a result of the proposed housing development. Therefore, no improvements are warranted or recommended for this intersection.

Blodgett Drive / Bugbee Road

The Blodgett Drive/Bugbee Road intersection operates at LOS "B" or better on all approaches under existing, background, and full development conditions. No changes in LOS are anticipated and no improvements are warranted or recommended for this intersection.

IX. CONCLUSIONS & RECOMMENDATIONS

This study evaluates the potential traffic impacts resulting from the projected traffic volumes from the proposed student housing development. Based upon our comprehensive analysis, the results indicate that the proposed project will not have significant adverse traffic impacts to the existing roadway network. The following sets forth conclusions based upon the results of the analyses:

1. The proposed student housing units are expected to generate approximately 35 two-way vehicular trips during the morning peak hour and 49 two-way trips during the afternoon peak hour.

2. The design of the proposed development along with the proximity of the project site to SUNY Oneonta's campus and the availability of Oneonta Public Transit will encourage use of transit, walking and bicycling.

3. There are no significant, adverse traffic impacts to the surrounding roadway network based upon full development conditions.

X. FIGURES

Figures 1 through 8 are included on the following pages.

FIGURE 1 - SITE LOCATION AND STUDY AREA

Legend

- Study Intersection
- Study Site
- Study Area

PROPOSED STUDENT HOUSING

CITY OF ONEONTA, NY

Feet

0 250 500 1,000

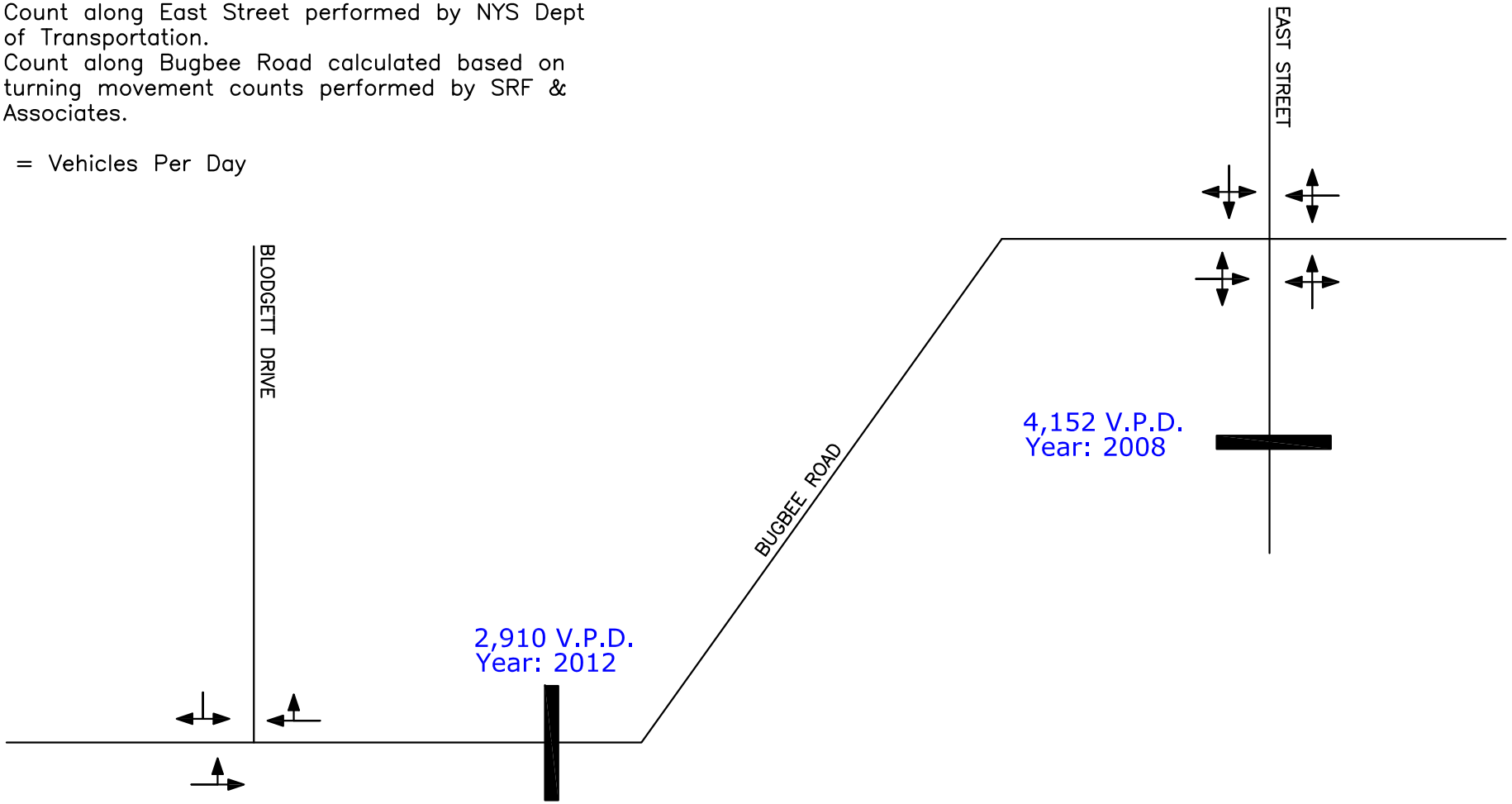
N

SRF ASSOCIATES
WWW.SRFA.NET
Transportation Engineering & Planning Consultants

Notes:

1. Count along East Street performed by NYS Dept of Transportation.
2. Count along Bugbee Road calculated based on turning movement counts performed by SRF & Associates.

V.P.D = Vehicles Per Day



SRF ASSOCIATES
WWW.SRFA.NET
Transportation Engineering & Planning Consultants

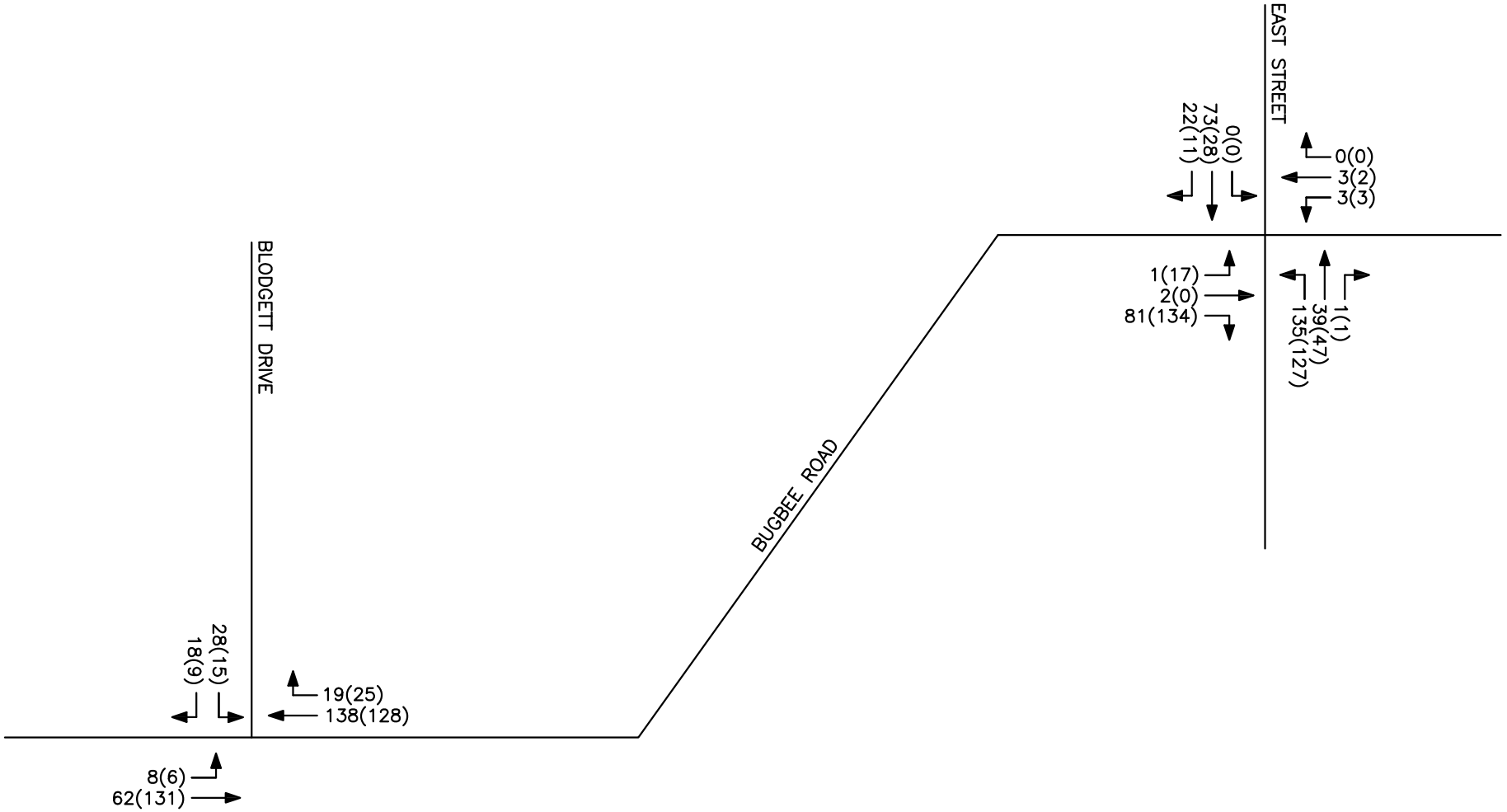
N
NOT TO SCALE

FIGURE 2

LANE GEOMETRY &
AVERAGE DAILY TRAFFIC

PROPOSED STUDENT HOUSING
ONEONTA, NY

KEY



SRF ASSOCIATES
WWW.SRFA.NET
Transportation Engineering & Planning Consultants

N
NOT TO SCALE

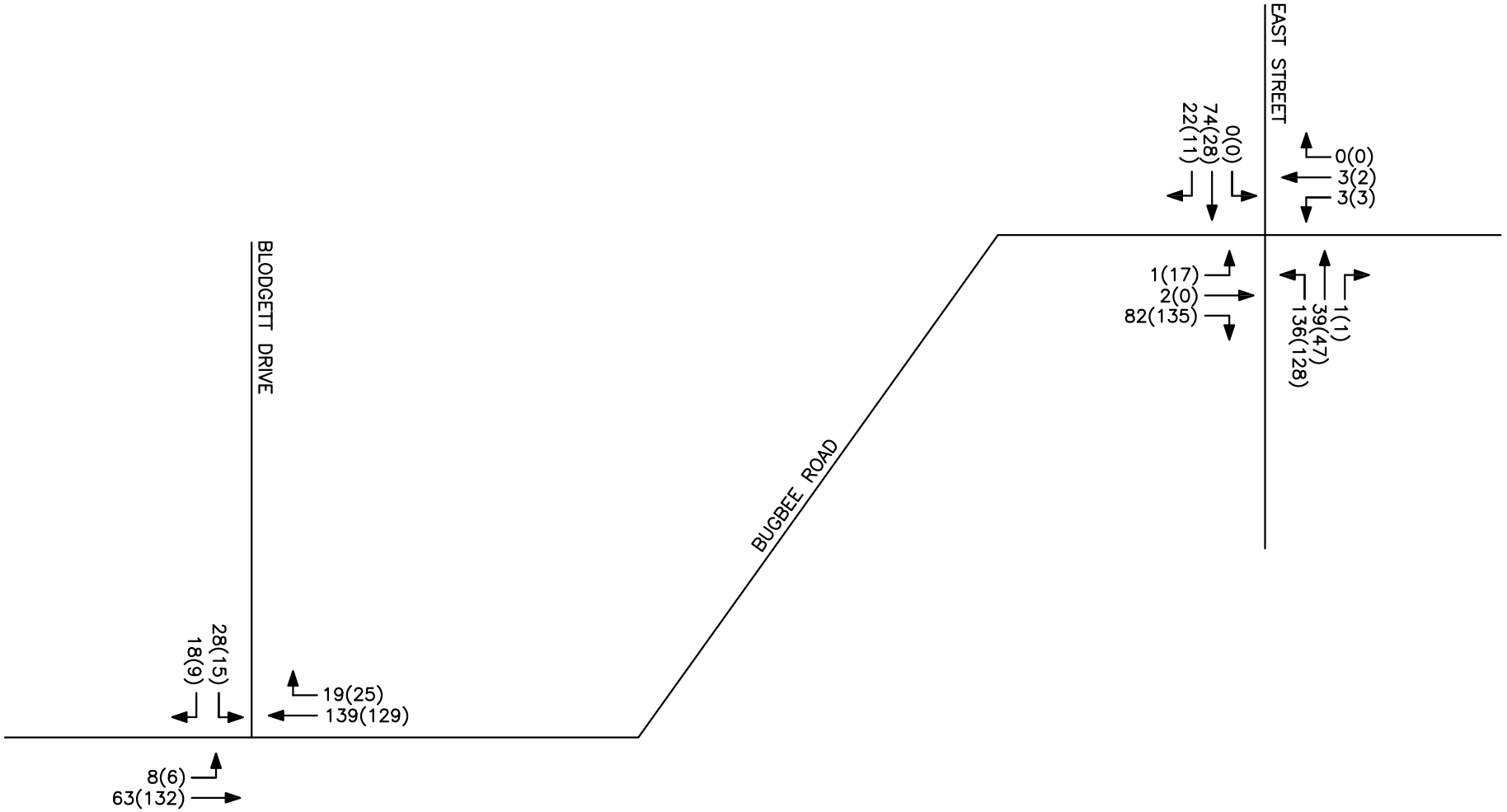
FIGURE 3

PEAK HOUR VOLUMES
2012 EXISTING CONDITIONS

PROPOSED STUDENT HOUSING
ONEONTA, NY

KEY

00(00) = AM(MD)



SRF ASSOCIATES
WWW.SRFA.NET
Transportation Engineering & Planning Consultants

N
NOT TO SCALE

FIGURE 4

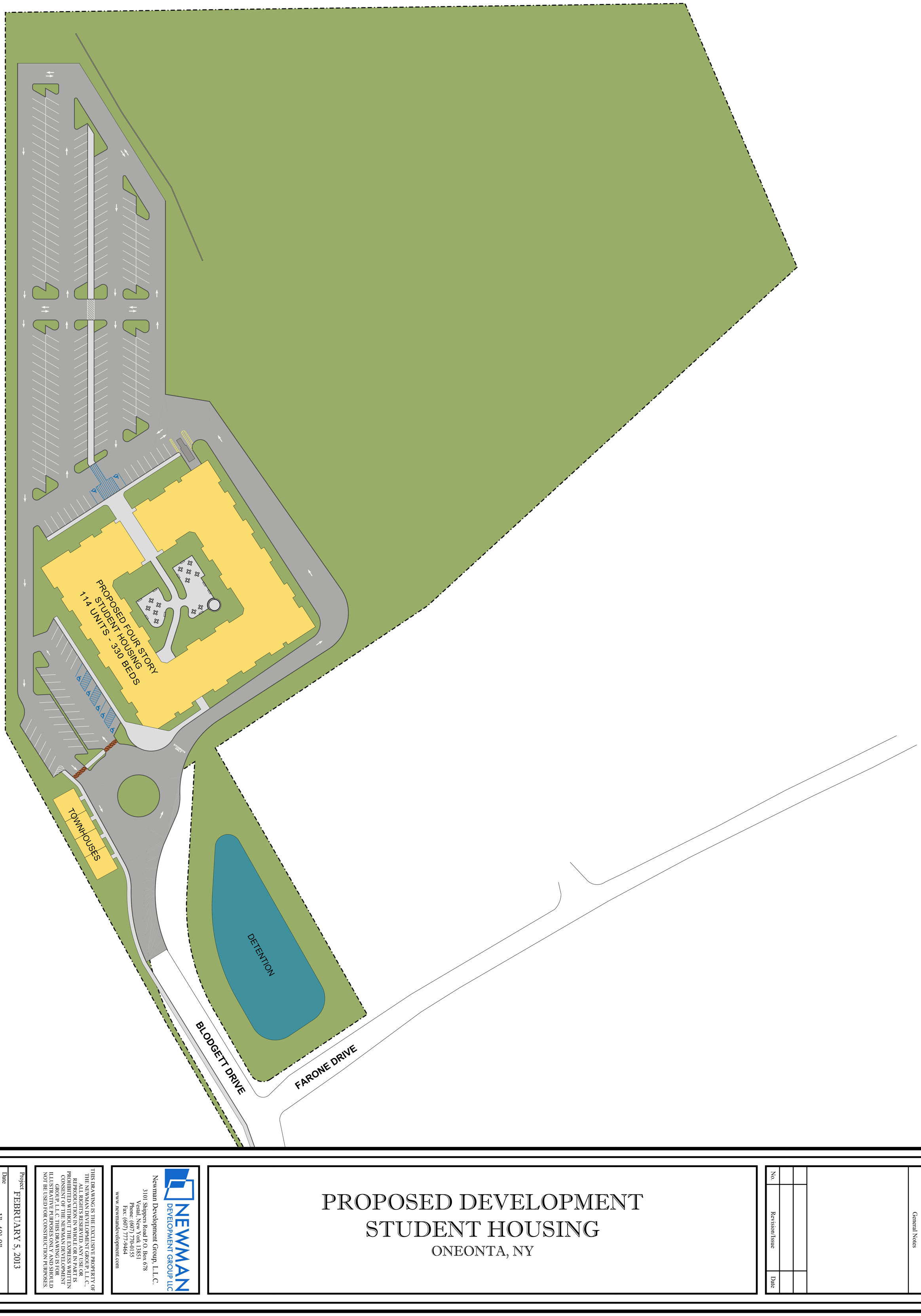
PEAK HOUR VOLUMES
2014 BACKGROUND CONDITIONS

PROPOSED STUDENT HOUSING
ONEONTA, NY

KEY

00(00) = AM(MD)

FIGURE 5 - CONCEPT SITE PLAN



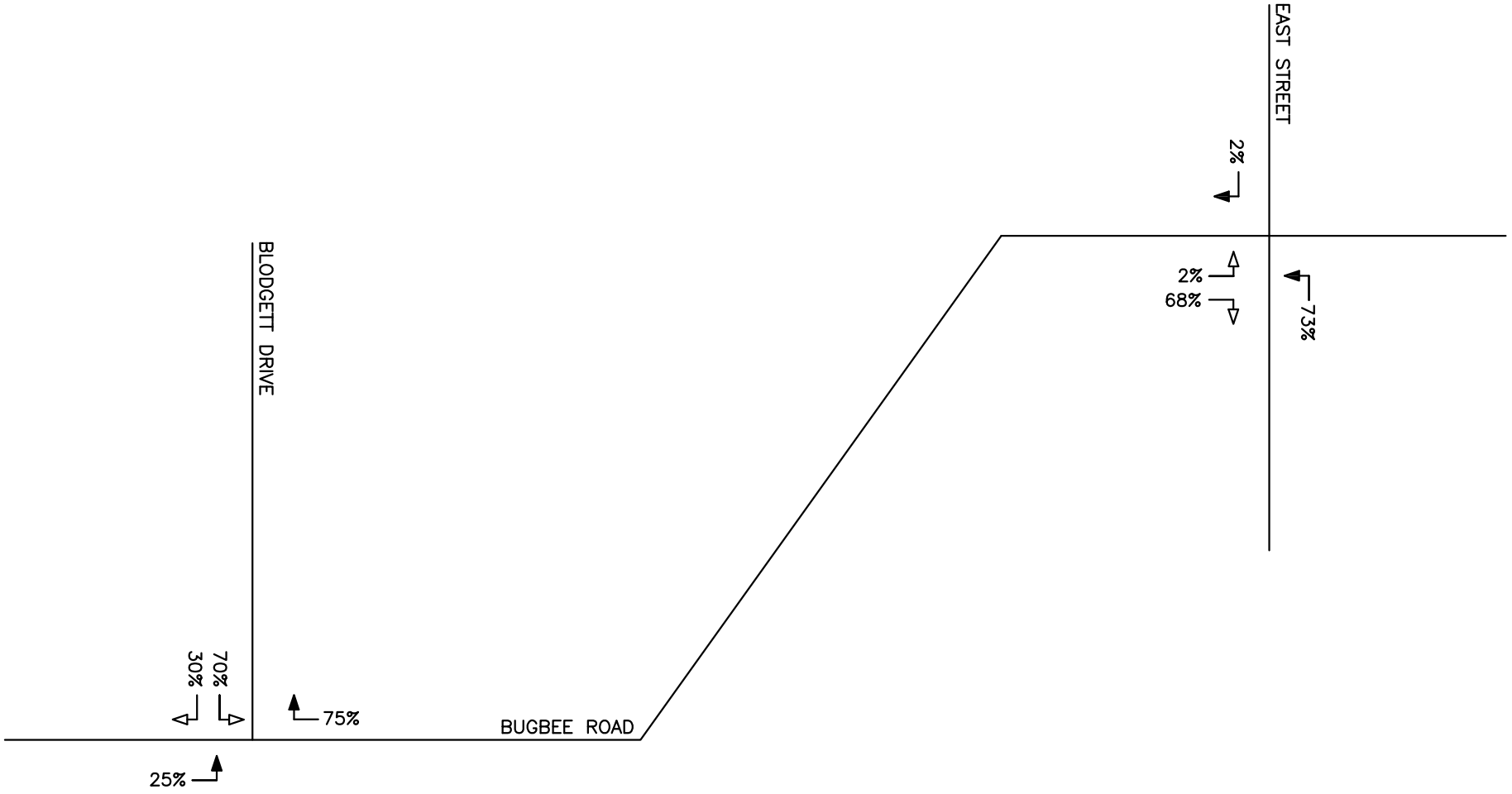
PROPOSED DEVELOPMENT
STUDENT HOUSING
ONEONTA, NY

No.	Revision/Issue	Date

General Notes

NEWMAN DEVELOPMENT GROUP LLC
Newman Development Group, L.L.C.
3101 Shippers Road P.O. Box 678
Vestal, New York 13851
Phone: (607) 770-0155
Fax: (607) 777-9464
www.newmandevelopment.com

Project	FEBRUARY 5, 2013
Date	1"=40'-0"
Scale	SP-1



SRF ASSOCIATES
WWW.SRFA.NET
Transportation Engineering & Planning Consultants

N
NOT TO SCALE

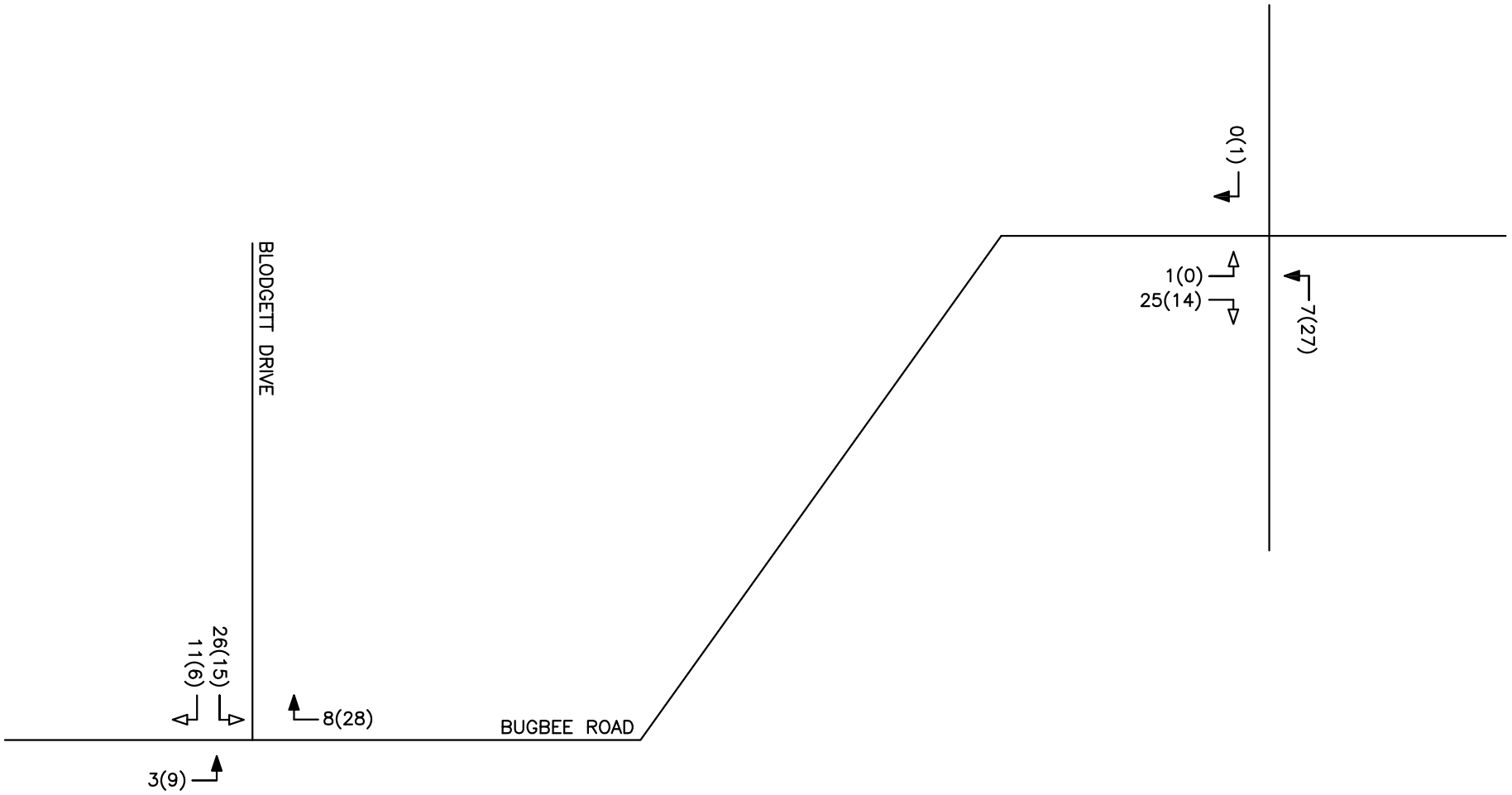
FIGURE 6

TRIP DISTRIBUTION

PROPOSED STUDENT HOUSING
ONEONTA, NY

KEY

→ = ENTERING TRIPS
→ = EXITING TRIPS



SRF ASSOCIATES
WWW.SRFA.NET
Transportation Engineering & Planning Consultants

N
NOT TO SCALE

FIGURE 7

SITE GENERATED TRIPS

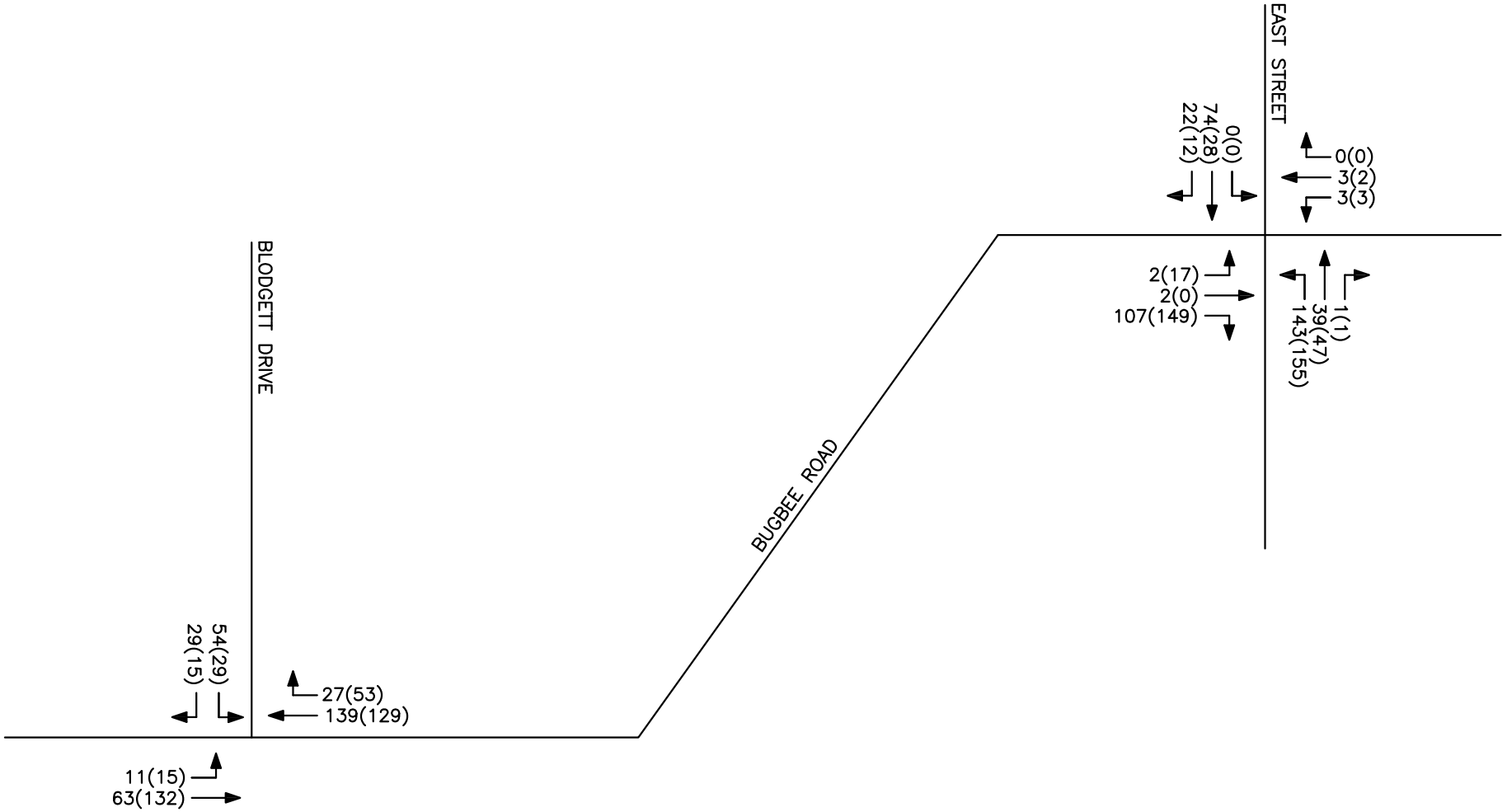
PROPOSED STUDENT HOUSING
ONEONTA, NY

KEY

00(00) = AM(MD)

→ = ENTERING TRIPS

→ = EXITING TRIPS



SRF ASSOCIATES
WWW.SRFA.NET
Transportation Engineering & Planning Consultants

N
NOT TO SCALE

FIGURE 8

PEAK HOUR VOLUMES
FULL DEVELOPMENT CONDITIONS

PROPOSED STUDENT HOUSING
ONEONTA, NY

KEY

00(00) = AM(MD)

APPENDICES

A1

Collected Traffic Volume Data

SRF & Associates
3495 Winton Place, Building E, Suite 110
Rochester, NY 14623

File Name : Blodgett.Bugbee.AM.Peak
Site Code : 11281211
Start Date : 11/28/2012
Page No : 1

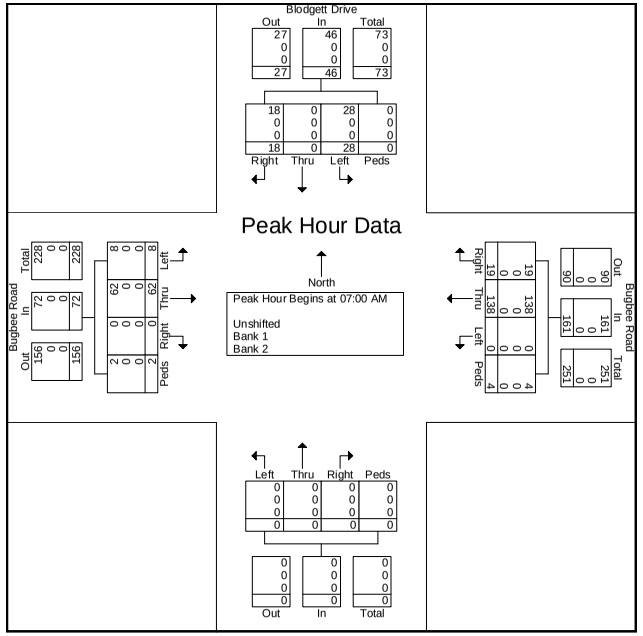
Groups Printed- Unshifted - Bank 1 - Bank 2

	Blodgett Drive Southbound				Bugbee Road Westbound				Northbound				Bugbee Road Eastbound				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	9	0	9	0	4	13	0	1	0	0	0	0	0	17	4	0	57
07:15 AM	1	0	7	0	2	29	0	0	0	0	0	0	0	14	1	1	55
07:30 AM	3	0	7	0	4	32	0	1	0	0	0	0	0	17	0	0	64
07:45 AM	5	0	5	0	9	64	0	2	0	0	0	0	0	14	3	1	103
Total	18	0	28	0	19	138	0	4	0	0	0	0	0	62	8	2	279
08:00 AM	7	0	5	0	5	26	0	1	0	0	0	0	0	9	9	1	63
Grand Total	25	0	33	0	24	164	0	5	0	0	0	0	0	71	17	3	342
Apprch %	43.1	0	56.9	0	12.4	85	0	2.6	0	0	0	0	0	78	18.7	3.3	
Total %	7.3	0	9.6	0	7	48	0	1.5	0	0	0	0	0	20.8	5	0.9	
Unshifted	25	0	33	0	24	164	0	5	0	0	0	0	0	71	17	3	342
% Unshifted	100	0	100	0	100	100	0	100	0	0	0	0	0	100	100	100	100
Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bank 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bank 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

SRF & Associates
3495 Winton Place, Building E, Suite 110
Rochester, NY 14623

File Name : Blodgett.Bugbee.AM.Peak
Site Code : 11281211
Start Date : 11/28/2012
Page No : 2

	Blodgett Drive Southbound					Bugbee Road Westbound					Northbound					Bugbee Road Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	**9**		**9**		**18**	4	13	0	1	18	0	0	0	0	0	0	**17**	**4**		**21**	57
07:15 AM	1	0	7	0	8	2	29	0	0	31	0	0	0	0	0	0	14	1	**1**		
07:30 AM	**3**	**0**	**7**	**0**	**10**	**4**	**32**	**0**	**1**	**37**	**0**	**0**	**0**	**0**	**0**	**0**	**17**	**0**	**0**	**17**	**64**
07:45 AM	**5**	**0**	**5**	**0**	**10**	**9**	**64**	0	**2**	**75**	0	0	0	0	0	0	14	3	1	18	**103**
Total Volume	18	0	28	0	46	19	138	0	4	161	0	0	0	0	0	0	62	8	2	72	279
% App. Total	39.1	0	60.9	0		11.8	85.7	0	2.5		0	0	0	0		0	86.1	11.1	2.8		
PHF	.500	.000	.778	.000	.639	.528	.539	.000	.500	.537	.000	.000	.000	.000	.000	.000	.912	.500	.500	.857	.677
Unshifted	18	0	28	0	46	19	138	0	4	161	0	0	0	0	0	0	62	8	2	72	279
% Unshifted																					
Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bank 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bank 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



SRF & Associates
3495 Winton Place, Building E, Suite 110
Rochester, NY 14623

File Name : Blodgett.Bugbee.Afternoon.Peak
Site Code : 00122712
Start Date : 11/27/2012
Page No : 1

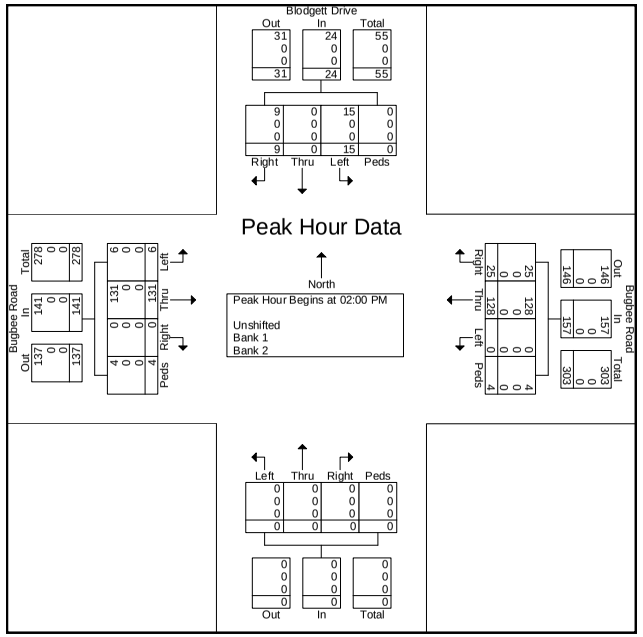
Groups Printed- Unshifted - Bank 1 - Bank 2

	Blodgett Drive Southbound				Bugbee Road Westbound				Northbound				Bugbee Road Eastbound				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
01:45 PM	2	0	2	0	4	32	0	0	0	0	0	0	0	26	2	1	69
Total	2	0	2	0	4	32	0	0	0	0	0	0	0	26	2	1	69
02:00 PM	1	0	5	0	6	17	0	1	0	0	0	0	0	19	1	1	51
02:15 PM	2	0	4	0	3	53	0	0	0	0	0	0	0	40	1	1	104
02:30 PM	3	0	4	0	12	41	0	3	0	0	0	0	0	42	2	1	108
02:45 PM	3	0	2	0	4	17	0	0	0	0	0	0	0	30	2	1	59
Total	9	0	15	0	25	128	0	4	0	0	0	0	0	131	6	4	322
03:00 PM	0	0	6	0	5	15	0	0	0	0	0	0	0	19	1	0	46
Grand Total	11	0	23	0	34	175	0	4	0	0	0	0	0	176	9	5	437
Apprch %	32.4	0	67.6	0	16	82.2	0	1.9	0	0	0	0	0	92.6	4.7	2.6	
Total %	2.5	0	5.3	0	7.8	40	0	0.9	0	0	0	0	0	40.3	2.1	1.1	
Unshifted	11	0	23	0	34	175	0	4	0	0	0	0	0	176	9	5	437
% Unshifted	100	0	100	0	100	100	0	100	0	0	0	0	0	100	100	100	100
Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bank 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bank 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

SRF & Associates
3495 Winton Place, Building E, Suite 110
Rochester, NY 14623

File Name : Blodgett.Bugbee.Afternoon.Peak
Site Code : 00122712
Start Date : 11/27/2012
Page No : 2

	Blodgett Drive Southbound					Bugbee Road Westbound					Northbound					Bugbee Road Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 02:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 02:00 PM																					
02:00 PM	1	0	**5**															**1**			
02:15 PM	**2**	**0**	**4**	**0**	**6**	**3**	**53**	0	0	**56**	0	0	0	0	0	0	40	1	1	42	104
02:30 PM	**3**				**7**	**12**			**3**								**42**	**2**		**45**	**108**
02:45 PM	3	0	2	0	5	4	17	0	0	21	0	0	0	0	0	0	30	2	1	33	59
Total Volume	9	0	15	0	24	25	128	0	4	157	0	0	0	0	0	0	131	6	4	141	322
% App. Total	37.5	0	62.5	0		15.9	81.5	0	2.5		0	0	0	0		0	92.9	4.3	2.8		
PHF	.750	.000	.750	.000	.857	.521	.604	.000	.333	.701	.000	.000	.000	.000	.000	.000	.780	.750	1.000	.783	.745
Unshifted	9	0	15	0	24	25	128	0	4	157	0	0	0	0	0	0	131	6	4	141	322
% Unshifted																					
Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bank 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bank 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



SRF & Associates
3495 Winton Place, Building E, Suite 110
Rochester, NY 14623

File Name : East.Bugbee.AM.Peak
Site Code : 11272012
Start Date : 11/28/2012
Page No : 1

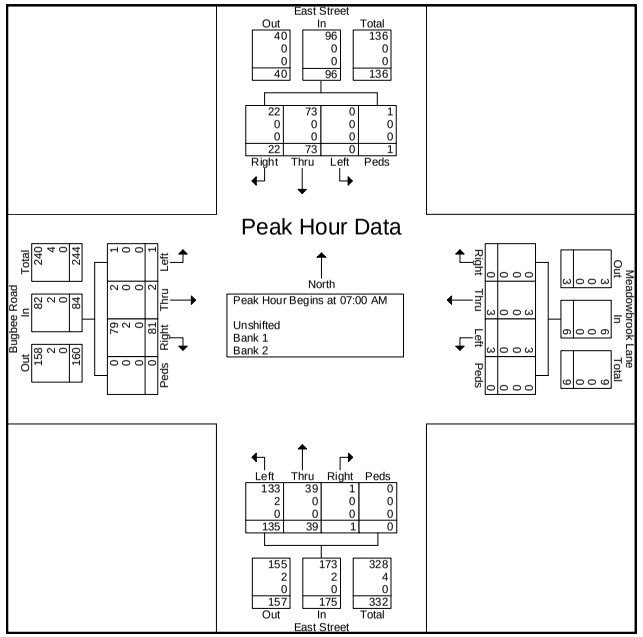
Groups Printed- Unshifted - Bank 1 - Bank 2

	East Street Southbound				Meadowbrook Lane Westbound				East Street Northbound				Bugbee Road Eastbound				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
06:45 AM	1	8	0	0	0	0	1	0	1	3	19	0	8	0	0	0	41
Total	1	8	0	0	0	0	1	0	1	3	19	0	8	0	0	0	41
07:00 AM	3	17	0	0	0	0	0	0	0	4	14	0	25	1	0	0	64
07:15 AM	3	23	0	1	0	0	0	0	1	17	28	0	25	0	0	0	98
07:30 AM	8	19	0	0	0	1	2	0	0	11	39	0	16	0	1	0	97
07:45 AM	8	14	0	0	0	2	1	0	0	7	54	0	15	1	0	0	102
Total	22	73	0	1	0	3	3	0	1	39	135	0	81	2	1	0	361
08:00 AM	5	17	0	0	0	0	0	0	0	6	22	0	7	0	0	0	57
Grand Total	28	98	0	1	0	3	4	0	2	48	176	0	96	2	1	0	459
Apprch %	22	77.2	0	0.8	0	42.9	57.1	0	0.9	21.2	77.9	0	97	2	1	0	
Total %	6.1	21.4	0	0.2	0	0.7	0.9	0	0.4	10.5	38.3	0	20.9	0.4	0.2	0	
Unshifted	28	98	0	1	0	3	4	0	2	48	173	0	93	2	1	0	453
% Unshifted	100	100	0	100	0	100	100	0	100	100	98.3	0	96.9	100	100	0	98.7
Bank 1	0	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	6
% Bank 1	0	0	0	0	0	0	0	0	0	0	1.7	0	3.1	0	0	0	1.3
Bank 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bank 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

SRF & Associates
3495 Winton Place, Building E, Suite 110
Rochester, NY 14623

File Name : East.Bugbee.AM.Peak
Site Code : 11272012
Start Date : 11/28/2012
Page No : 2

	East Street Southbound					Meadowbrook Lane Westbound					East Street Northbound					Bugbee Road Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 06:45 AM to 08:00 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	3	17	0	0	20	0	0	0	0	0	0	4	14	0	18	**25**	**1**	0	0	**26**	64
07:15 AM	3	**23**	0	**1**	**27**	0	0	0	0	0	**1**	**17**	28	0	46	25	0	0	0	25	98
07:30 AM	**8**							**2**		**3**	0	11	39	0	50	16	0	**1**			
07:45 AM	**8**	**14**	**0**	**0**	**22**	**0**	**2**	1	0	3	0	7	**54**	**0**	**61**	15	1	0	0	16	**102**
Total Volume	22	73	0	1	96	0	3	3	0	6	1	39	135	0	175	81	2	1	0	84	361
% App. Total	22.9	76	0	1		0	50	50	0		0.6	22.3	77.1	0		96.4	2.4	1.2	0		
PHF	.688	.793	.000	.250	.889	.000	.375	.375	.000	.500	.250	.574	.625	.000	.717	.810	.500	.250	.000	.808	.885
Unshifted	22	73	0	1	96	0	3	3	0	6	1	39	133	0	173	79	2	1	0	82	357
% Unshifted													98.5	0	98.9	97.5	100	100	0	97.6	98.9
Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	2	0	0	0	2	4
% Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	1.5	0	1.1	2.5	0	0	0	2.4	1.1
Bank 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bank 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



SRF & Associates
3495 Winton Place, Building E, Suite 110
Rochester, NY 14623

File Name : East.Bugbee.Afternoon.Peak
Site Code : 11272012
Start Date : 11/27/2012
Page No : 1

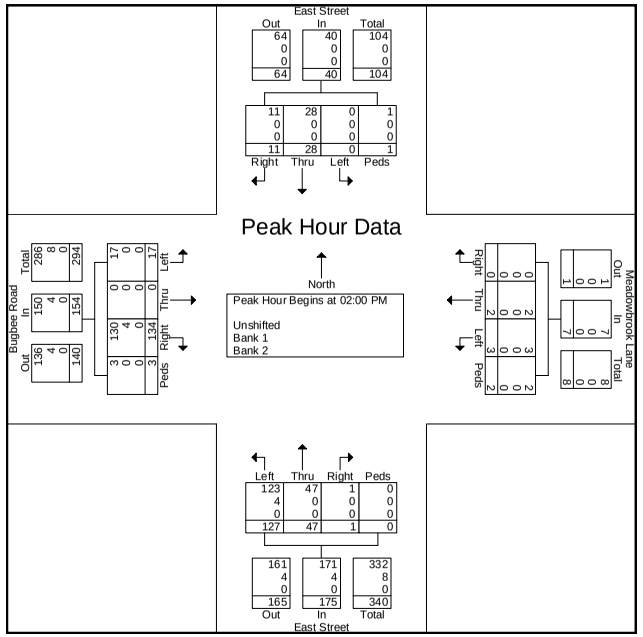
Groups Printed- Unshifted - Bank 1 - Bank 2

	East Street Southbound				Meadowbrook Lane Westbound				East Street Northbound				Bugbee Road Eastbound				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
01:45 PM	0	5	0	0	0	0	0	0	1	8	28	0	22	2	1	0	67
Total	0	5	0	0	0	0	0	0	1	8	28	0	22	2	1	0	67
02:00 PM	2	6	0	0	0	1	2	0	0	10	19	0	19	0	5	0	64
02:15 PM	4	6	0	0	0	0	1	1	1	9	51	0	47	0	2	0	122
02:30 PM	2	8	0	1	0	1	0	1	0	14	36	0	45	0	6	1	115
02:45 PM	3	8	0	0	0	0	0	0	0	14	21	0	23	0	4	2	75
Total	11	28	0	1	0	2	3	2	1	47	127	0	134	0	17	3	376
03:00 PM	1	2	0	0	0	0	1	0	0	8	21	0	20	1	2	1	57
Grand Total	12	35	0	1	0	2	4	2	2	63	176	0	176	3	20	4	500
Apprch %	25	72.9	0	2.1	0	25	50	25	0.8	26.1	73	0	86.7	1.5	9.9	2	
Total %	2.4	7	0	0.2	0	0.4	0.8	0.4	0.4	12.6	35.2	0	35.2	0.6	4	0.8	
Unshifted	12	35	0	1	0	2	4	2	2	63	170	0	170	3	20	4	488
% Unshifted	100	100	0	100	0	100	100	100	100	100	96.6	0	96.6	100	100	100	97.6
Bank 1	0	0	0	0	0	0	0	0	0	0	6	0	6	0	0	0	12
% Bank 1	0	0	0	0	0	0	0	0	0	0	3.4	0	3.4	0	0	0	2.4
Bank 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bank 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

SRF & Associates
3495 Winton Place, Building E, Suite 110
Rochester, NY 14623

File Name : East.Bugbee.Afternoon.Peak
Site Code : 11272012
Start Date : 11/27/2012
Page No : 2

	East Street Southbound					Meadowbrook Lane Westbound					East Street Northbound					Bugbee Road Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 01:45 PM to 03:00 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 02:00 PM																					
02:00 PM	2	6	0	0	8	0	**1**	**2**		**3**	0	10	19	0	29	19	0	5	0	24	64
02:15 PM	**4**								**1**		**1**		**51**		**61**	**47**					**122**
02:30 PM	2	**8**	0	**1**	**11**	0	1	0	1	2	0	**14**	36	0	50	45	0	**6**		**52**	115
02:45 PM	3	8	0	0	11	0	0	0	0	0	0	14	21	0	35	23	0	4	**2**		
Total Volume	11	28	0	1	40	0	2	3	2	7	1	47	127	0	175	134	0	17	3	154	376
% App. Total	27.5	70	0	2.5		0	28.6	42.9	28.6		0.6	26.9	72.6	0		87	0	11	1.9		
PHF	.688	.875	.000	.250	.909	.000	.500	.375	.500	.583	.250	.839	.623	.000	.717	.713	.000	.708	.375	.740	.770
Unshifted	11	28	0	1	40	0	2	3	2	7	1	47	123	0	171	130	0	17	3	150	368
% Unshifted													96.9	0	97.7	97.0	0	100	100	97.4	97.9
Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	4	0	4	4	0	0	0	4	8
% Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	3.1	0	2.3	3.0	0	0	0	2.6	2.1
Bank 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bank 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



A2

Miscellaneous Traffic Data and Calculations

Proposed Student Housing Development
Summary of Trip Generation Calculation
2/13/2013

Estimated Trips based on ITE Rates*

AM Peak Hour		PM Peak Hour		
Enter	Exit	Enter	Exit	
12	42	45	24	
Transit trip reductions				
-1	-4	-5	-2	
Pedestrian/Bicycle trip reductions				
-2	-8	-9	-5	
-4	-15	-14	-7	***Total Reduction of Trips Generated***
8	27	32	17	***Total Resulting Trips Generated***

Trips Reduction Rates

Transit	**10%**
Pedestrian/ Bicycle	**20%**

Total Site Generated Trips

Description	Size	AM Peak Hour		PM Peak Hour	
		Enter	Exit	Enter	Exit
Student Housing	124 Units	8	27	32	17

** Rates for Low-Rise Apartments (Land Use Code 221)*

PROPOSED STUDENT HOUSING, ONEONTA, NY

AM PEAK

			Num of yrs						
			2						
LOCATION NUMBER	**INTERSECTION DESCRIPTION**	Existing Volume	Bkgd Volume	**Proposed Student Housing**				Total Site Trips	Full Build Volumes
				Enter Dist. %	Exit Dist. %	Trips IN	Trips OUT		
			0.5%			8	27		
1	East Street / Bugbee Road								
	SR	22	22	2%		0		0	22
	ST	73	74						74
	SL	0	0						
	WR	0	0						
	WT	3	3						3
	WL	3	3						3
	NR	1	1						1
	NT	39	39						39
	NL	135	136	73%		6		6	142
	ER	81	82		68%		18	18	100
	ET	2	2						2
	EL	1	1		2%		1	1	2
2	Blodgett Drive / Bugbee Road								
	SR	18	18		30%		8	8	26
	ST	0	0						
	SL	28	28		70%		19	19	47
	WR	19	19	75%		6		6	25
	WT	138	139						139
	WL	0	0						
	NR	0	0						
	NT	0	0						
	NL	0	0						
	ER	0	0						
	ET	62	63						63
	EL	8	8	25%		2		2	10

PROPOSED STUDENT HOUSING, ONEONTA, NY

AFTERNOON PEAK

			Num of yrs 2						
LOCATION NUMBER	**INTERSECTION DESCRIPTION**	Existing Volume	Bkgd Volume 0.5%	**Proposed Student Housing** Enter Dist. %	Exit Dist. %	Trips IN 32	Trips OUT 17	Total Site Trips	Full Build Volumes
1	East Street / Bugbee Road								
	SR	11	11	2%		1		1	12
	ST	28	28						28
	SL	0	0						
	WR	0	0						
	WT	2	2						2
	WL	3	3						3
	NR	1	1						1
	NT	47	47						47
	NL	127	128	73%		23		23	151
	ER	134	135		68%		12	12	147
	ET	0	0						
	EL	17	17		2%		0	0	17
2	Blodgett Drive / Bugbee Road								
	SR	9	9		30%		5	5	14
	ST	0	0						
	SL	15	15		70%		12	12	27
	WR	25	25	75%		24		24	49
	WT	128	129						129
	WL	0	0						
	NR	0	0						
	NT	0	0						
	NL	0	0						
	ER	0	0						
	ET	131	132						132
	EL	6	6	25%		8		8	14

A3

Level of Service:
Criteria and Definitions

Level of Service Criteria

Highway Capacity Manual 2000

SIGNALIZED INTERSECTIONS

Level of Service is a qualitative measure describing operational conditions within a traffic stream, based on service measures such as speed and travel time, freedom to maneuver, traffic interruptions, comfort, and convenience. Level of Service for signalized intersections is defined in terms of delay specifically, average total delay per vehicle for a 15 minute analysis period. The ranges are as follows:

Level of Service	Control Delay per vehicle (seconds)
A	< 10
B	10 – 20
C	20 – 35
D	35 – 55
E	55 – 80
F	>80

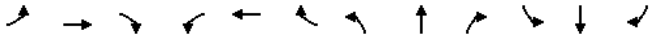
UNSIGNALIZED INTERSECTIONS

Level of Service for unsignalized intersections is also defined in terms of delay. However, the delay criteria are different from a signalized intersection. The primary reason for this is driver expectation that a signalized intersection is designed to carry higher volumes than an unsignalized intersection. The total delay threshold for any given Level of Service is less for an unsignalized intersection than for a signalized intersection. The ranges are as follows:

Level of Service	Control Delay per vehicle (seconds)
A	< 10
B	10 – 15
C	15 – 25
D	25 – 35
E	35 - 50
F	>50

A4

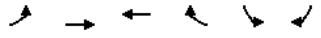
Level of Service Calculations: Existing Conditions



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	1	2	81	3	3	0	135	39	1	0	73	22
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.81	0.81	0.81	0.50	0.50	0.50	0.72	0.72	0.72	0.89	0.89	1.00
Hourly flow rate (vph)	1	2	100	6	6	0	188	54	1	0	82	22
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	526	524	93	624	534	55	104			56		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	526	524	93	624	534	55	104			56		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	99	90	98	98	100	87			100		
cM capacity (veh/h)	413	401	964	321	395	1012	1488			1549		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	104	12	243	104
Volume Left	1	6	188	0
Volume Right	100	0	1	22
cSH	919	354	1488	1549
Volume to Capacity	0.11	0.03	0.13	0.00
Queue Length 95th (ft)	10	3	11	0
Control Delay (s)	9.4	15.5	6.2	0.0
Lane LOS	A	C	A	
Approach Delay (s)	9.4	15.5	6.2	0.0
Approach LOS	A	C		

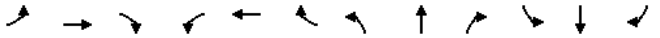
Intersection Summary				
Average Delay	5.8			
Intersection Capacity Utilization	28.1%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	8	62	138	19	28	18
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.86	0.86	0.54	0.54	0.64	0.64
Hourly flow rate (vph)	9	72	256	35	44	28
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	291				364	273
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	291				364	273
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				93	96
cM capacity (veh/h)	1271				631	766

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	81	291	72
Volume Left	9	0	44
Volume Right	0	35	28
cSH	1271	1700	678
Volume to Capacity	0.01	0.17	0.11
Queue Length 95th (ft)	1	0	9
Control Delay (s)	1.0	0.0	10.9
Lane LOS	A		B
Approach Delay (s)	1.0	0.0	10.9
Approach LOS			B

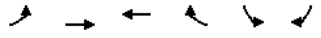
Intersection Summary			
Average Delay	1.9		
Intersection Capacity Utilization	20.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	17	0	134	3	2	0	127	47	1	0	28	11
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.74	0.74	0.74	0.58	0.58	0.58	0.72	0.72	0.72	0.91	0.91	0.91
Hourly flow rate (vph)	23	0	181	5	3	0	176	65	1	0	31	12
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	457	456	37	637	462	66	43			67		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	457	456	37	637	462	66	43			67		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	95	100	83	98	99	100	89			100		
cM capacity (veh/h)	467	444	1035	294	441	998	1566			1535		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	204	9	243	43
Volume Left	23	5	176	0
Volume Right	181	0	1	12
cSH	911	339	1566	1535
Volume to Capacity	0.22	0.03	0.11	0.00
Queue Length 95th (ft)	21	2	10	0
Control Delay (s)	10.1	15.9	5.8	0.0
Lane LOS	B	C	A	
Approach Delay (s)	10.1	15.9	5.8	0.0
Approach LOS	B	C		

Intersection Summary				
Average Delay	7.2			
Intersection Capacity Utilization	32.0%	ICU Level of Service	A	
Analysis Period (min)	15			



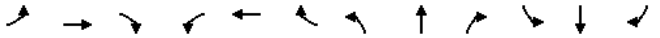
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	6	131	128	25	15	9
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.78	0.78	0.70	0.70	0.86	0.86
Hourly flow rate (vph)	8	168	183	36	17	10
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	219				384	201
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	219				384	201
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				97	99
cM capacity (veh/h)	1351				615	840

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	176	219	28
Volume Left	8	0	17
Volume Right	0	36	10
cSH	1351	1700	684
Volume to Capacity	0.01	0.13	0.04
Queue Length 95th (ft)	0	0	3
Control Delay (s)	0.4	0.0	10.5
Lane LOS	A		B
Approach Delay (s)	0.4	0.0	10.5
Approach LOS			B

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	21.8%	ICU Level of Service	A
Analysis Period (min)	15		

A5

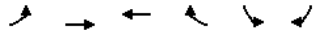
Level of Service Calculations: Background Conditions



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	1	2	82	3	3	0	136	39	1	0	74	22
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.81	0.81	0.81	0.50	0.50	0.50	0.72	0.72	0.72	0.89	0.89	1.00
Hourly flow rate (vph)	1	2	101	6	6	0	189	54	1	0	83	22
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	530	527	94	629	538	55	105			56		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	530	527	94	629	538	55	105			56		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	99	89	98	98	100	87			100		
cM capacity (veh/h)	410	398	963	317	393	1012	1486			1549		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	105	12	244	105
Volume Left	1	6	189	0
Volume Right	101	0	1	22
cSH	918	351	1486	1549
Volume to Capacity	0.11	0.03	0.13	0.00
Queue Length 95th (ft)	10	3	11	0
Control Delay (s)	9.4	15.6	6.2	0.0
Lane LOS	A	C	A	
Approach Delay (s)	9.4	15.6	6.2	0.0
Approach LOS	A	C		

Intersection Summary					
Average Delay			5.8		
Intersection Capacity Utilization			28.2%	ICU Level of Service	A
Analysis Period (min)			15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	8	63	139	19	28	18
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.86	0.86	0.54	0.54	0.64	0.64
Hourly flow rate (vph)	9	73	257	35	44	28
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	293				367	275
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	293				367	275
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				93	96
cM capacity (veh/h)	1269				628	764

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	83	293	72
Volume Left	9	0	44
Volume Right	0	35	28
cSH	1269	1700	675
Volume to Capacity	0.01	0.17	0.11
Queue Length 95th (ft)	1	0	9
Control Delay (s)	0.9	0.0	11.0
Lane LOS	A		B
Approach Delay (s)	0.9	0.0	11.0
Approach LOS			B

Intersection Summary				
Average Delay		1.9		
Intersection Capacity Utilization		20.0%	ICU Level of Service	A
Analysis Period (min)		15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	17	0	135	3	2	0	128	47	1	0	28	11
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.74	0.74	0.74	0.58	0.58	0.58	0.72	0.72	0.72	0.91	0.91	0.91
Hourly flow rate (vph)	23	0	182	5	3	0	178	65	1	0	31	12
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	460	459	37	641	464	66	43			67		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	460	459	37	641	464	66	43			67		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	95	100	82	98	99	100	89			100		
cM capacity (veh/h)	464	442	1035	292	439	998	1566			1535		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	205	9	244	43
Volume Left	23	5	178	0
Volume Right	182	0	1	12
cSH	910	337	1566	1535
Volume to Capacity	0.23	0.03	0.11	0.00
Queue Length 95th (ft)	22	2	10	0
Control Delay (s)	10.1	16.0	5.8	0.0
Lane LOS	B	C	A	
Approach Delay (s)	10.1	16.0	5.8	0.0
Approach LOS	B	C		

Intersection Summary				
Average Delay	7.2			
Intersection Capacity Utilization	32.2%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	6	132	129	25	15	9
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.78	0.78	0.70	0.70	0.86	0.86
Hourly flow rate (vph)	8	169	184	36	17	10
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	220				387	202
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	220				387	202
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				97	99
cM capacity (veh/h)	1349				613	839

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	177	220	28
Volume Left	8	0	17
Volume Right	0	36	10
cSH	1349	1700	682
Volume to Capacity	0.01	0.13	0.04
Queue Length 95th (ft)	0	0	3
Control Delay (s)	0.4	0.0	10.5
Lane LOS	A		B
Approach Delay (s)	0.4	0.0	10.5
Approach LOS			B

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	21.8%	ICU Level of Service	A
Analysis Period (min)	15		

A6

Level of Service Calculations: Full Development Conditions

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	1	2	107	3	3	0	143	39	1	0	74	22
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.81	0.81	0.81	0.50	0.50	0.50	0.72	0.72	0.72	0.89	0.89	1.00
Hourly flow rate (vph)	1	2	132	6	6	0	199	54	1	0	83	22
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	549	547	94	680	557	55	105			56		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	549	547	94	680	557	55	105			56		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	99	86	98	98	100	87			100		
cM capacity (veh/h)	396	385	963	281	380	1012	1486			1549		

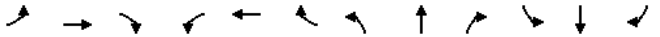
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	136	12	254	105
Volume Left	1	6	199	0
Volume Right	132	0	1	22
cSH	925	323	1486	1549
Volume to Capacity	0.15	0.04	0.13	0.00
Queue Length 95th (ft)	13	3	12	0
Control Delay (s)	9.6	16.6	6.3	0.0
Lane LOS	A	C	A	
Approach Delay (s)	9.6	16.6	6.3	0.0
Approach LOS	A	C		

Intersection Summary				
Average Delay			6.1	
Intersection Capacity Utilization			30.1%	ICU Level of Service
Analysis Period (min)			15	

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	11	63	139	27	54	29
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.86	0.86	0.54	0.54	0.64	0.64
Hourly flow rate (vph)	13	73	257	50	84	45
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	307				381	282
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	307				381	282
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				86	94
cM capacity (veh/h)	1253				615	757

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	86	307	130
Volume Left	13	0	84
Volume Right	0	50	45
cSH	1253	1700	658
Volume to Capacity	0.01	0.18	0.20
Queue Length 95th (ft)	1	0	18
Control Delay (s)	1.2	0.0	11.8
Lane LOS	A		B
Approach Delay (s)	1.2	0.0	11.8
Approach LOS			B

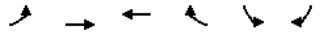
Intersection Summary				
Average Delay			3.1	
Intersection Capacity Utilization			24.1%	ICU Level of Service
Analysis Period (min)			15	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	17	0	149	3	2	0	155	47	1	0	28	12
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.74	0.74	0.74	0.58	0.58	0.58	0.72	0.72	0.72	0.91	0.91	0.91
Hourly flow rate (vph)	23	0	201	5	3	0	215	65	1	0	31	13
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	536	535	37	735	540	66	44			67		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	536	535	37	735	540	66	44			67		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	94	100	81	98	99	100	86			100		
cM capacity (veh/h)	405	390	1035	241	387	998	1564			1535		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	224	9	282	44
Volume Left	23	5	215	0
Volume Right	201	0	1	13
cSH	893	284	1564	1535
Volume to Capacity	0.25	0.03	0.14	0.00
Queue Length 95th (ft)	25	2	12	0
Control Delay (s)	10.4	18.1	6.1	0.0
Lane LOS	B	C	A	
Approach Delay (s)	10.4	18.1	6.1	0.0
Approach LOS	B	C		

Intersection Summary				
Average Delay	7.5			
Intersection Capacity Utilization	34.5%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	15	132	129	53	29	15
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.78	0.78	0.70	0.70	0.86	0.86
Hourly flow rate (vph)	19	169	184	76	34	17
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	260				430	222
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	260				430	222
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				94	98
cM capacity (veh/h)	1304				574	817

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	188	260	51
Volume Left	19	0	34
Volume Right	0	76	17
cSH	1304	1700	639
Volume to Capacity	0.01	0.15	0.08
Queue Length 95th (ft)	1	0	7
Control Delay (s)	0.9	0.0	11.1
Lane LOS	A		B
Approach Delay (s)	0.9	0.0	11.1
Approach LOS			B

Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	29.5%	ICU Level of Service	A
Analysis Period (min)	15		