

Traffic Impact Study (TIS)

Bomax Drive Apartments

Village of Lansing, NY

Revised October 2016

Prepared for:
Park Grove Realty, LLC
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Rochester, NY 14607

P.N. 20162212.0001



Traffic Impact Study (TIS)
Bomax Drive Apartments - Village of Lansing, NY

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1.0 INTRODUCTION

This report exists to assess the traffic impacts associated with the proposed improvement of 19.46 ± acres of undeveloped land into 140 apartment units within the Village of Lansing, NY. The site is located on the south side of Bomax Drive between Warren Road and Nor Way. One access point is proposed for the development. The proposed access point is located on Bomax Drive, nearly 1,500 feet west of the intersection at Warren Road and Bomax Drive. The project will have, at a minimum, the 1.5 off-street parking spaces per dwelling unit required by the Village of Lansing's code. There is also a bus loop proposed within the development which will enable residents to utilize public transportation. In order to preserve the quiet nature of the residential neighborhood to the west of the project, the bus route will be restricted to entering and leaving the development from the east via Bomax Drive.

2.0 EXECUTIVE SUMMARY

The project includes the development of 14 ten-unit apartment buildings resulting in a total of 140 dwelling units. The development is classified under the Institute of Traffic Engineers (ITE) land use group 220 "Apartment". The project will provide one overall connection to Bomax Drive, approximately 1,500 feet to the west of Warren Road.

This report will analyze the effect that the development will have on the intersection of Warren Road and Bomax Drive to the east, as well as the intersection of North Triphammer Road and Craft Road to the west.

3.0 EXISTING CONDITIONS

Bomax Drive is a two-lane road oriented east-westerly which is owned and maintained by the Village of Lansing. Bomax Drive is bounded by Warren Road to the east and Nor Way to the west. The road terminates at Warren Road to east and at a cul-de-sac to the west of Nor Way. Bomax Drive is classified as an "Urban local road" according to the Ithaca-Tompkins County Transportation Council's (ITCTC) *Highway Functional Classification System Urbanized Area* map published in June 2010. The posted speed limit near the proposed project is 30 miles per hour (mph).

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Warren Road (County Road 121) is a two-lane (Tompkins) County owned road oriented north-southerly and classified as a “Rural minor arterial” roadway by the ITCTC. Warren Road contains access points to the Ithaca Tompkins Regional Airport, access to a branch of the United State Post Office, and access to numerous industrial developments. Additionally, Warren Road connects the residential properties north of the project to New York State Route 13, the medical campuses south of Route 13, and Cornell University. The average annual daily traffic (AADT) was 4,749 according to the ITCTC’s *2014-2015 Traffic Counts* report. The posted speed limit near the proposed project is 45 mph.

Craft Road is a two-lane road oriented east-westerly which is owned and maintained by the Village. Craft Road is bounded by North Triphammer Road to the west and Leifs Way to the east. Craft Road serves as the access road from Bomax Drive to North Triphammer Road and is classified as an “Urban local road” according to the ITCTC. The posted speed limit near the proposed project is 30 mph.

North Triphammer Road is a two-lane road owned and maintained the Village of Lansing at the studied intersection with Craft Road. It is oriented north-southerly and classified as a “Rural minor arterial” roadway by the ITCTC. North Triphammer connects the residential properties north of the Village of Lansing to New York State Route 13, the Village’s commercial district, and Cornell University. The AADT was 9,984 according to the ITCTC’s *2014-2015 Traffic Counts* report. The posted speed limit near the intersection of North Triphammer Road and Craft Road is 30 mph.

New York State Route 13 (Route 13) is a four-lane road owned and maintained the New York State Department of Transportation (NYSDOT). It is oriented east-westerly and classified in the “Principal Arterial, Freeways” category by the ITCTC. Route 13 serves commuters traveling to and from the City of Ithaca, other portions of Tompkins County, and surrounding areas. Interstate 81 is approximately 20 miles to the northeast of the project via Route 13. Interstate 86 is approximately 30 miles to the southwest of the project via Route 13. The estimated 2014 AADT was 22,961 according to the NYSDOT’s *NYS Traffic Data Viewer* online tool. The posted speed limit is 55 mph near the electronically signaled intersection of Route 13 and Warren Road.

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4.0 METHODOLOGY

- A. Passero Associates conducted field observations and traffic counts at the intersections of Warren Road and Bomax Drive to the east of the project, and North Triphammer Road at Craft Road to the west. A map of the two studied intersections is located in Appendix A. All traffic entering and leaving the site will utilize one of the two studied intersections. Traffic was counted from 7-9 AM and 4-6 PM to determine the respective AM and PM peak hour. Existing traffic conditions are located in Appendix B. The following time periods were determined to be the peak hours:
- a. AM Peak Hour: 7:30-8:30
 - b. PM Peak Hour: 4:30-5:30
- B. The existing traffic volumes were modeled using the computer program *Synchro9* to determine the current Levels of Service (LOS) at the two intersections analyzed. LOS is a standard engineering gauge used to measure the operation of functionality of an intersection. The LOS of an intersection is rated along the same lines of academia with intersections being graded on a scale of "A" to "F." Intersections with an LOS grade of "A" represent the "best case" scenarios with little to no traffic delays. An intersection with an LOS of "F" represents a failure or unacceptable scenario. A "D" level of service is considered an acceptable level of service in rural conditions for individual intersections.
- C. An annual growth rate factor (GRF) of 2.0% was applied for two years to develop the background 2018 traffic volumes found in Appendix C. The GRF is based on the fact that there are several developments underway in the immediate area which will impact the existing traffic conditions. Background volumes are reflected in the developed conditions.
- D. The Institute of Traffic Engineers (ITE) *Trip Generation Manual*, 9th Edition land use 220: "Apartment" was used to calculate the expected trips generated by this project. The trip generations are shown in Table 4-1 below.

Land Use	Trip Generation Equation*	Trips Generated	Entering	Exiting
Apartments	AM Peak $T = 0.49(X) + 3.73$	72	14 (20%)	58 (80%)
	PM Peak $T = 0.55(X) + 17.65$	95	62 (65%)	33 (35%)

*T=Trips, X=Number of Dwelling Units=140

- E. Trips Leaving the Site (Refer to Appendix D for maps)

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- a. 80% of the total trips leaving the site are expected to travel east toward Warren Road primarily due to the convenient accessibility of Route 13 from Warren Road.
 - i. 60% of the total departure trips are expected to turn right onto Warren Road from Bomax Drive and travel south to Route 13 or continue past Route 13 toward Cornell University.
 - ii. 20% of the total departure trips are expected to turn left onto Warren Road from Bomax Drive and travel north toward the Town of Lansing.
- b. 20% of the total trips leaving the site are expected to travel west along Bomax Drive toward Craft Road and turn onto North Triphammer Road. Individuals that take this route will likely be traveling to the commercial district on North Triphammer Road to the southwest of the project. Although the aforementioned commercial district is also accessible via Route 13, traveling from North Triphammer Road may be more convenient for several reasons: shorter distance, less traffic, and less electronically signaled traffic.
 - i. 15% of the total departure trips are expected turn left onto North Triphammer Road and travel south to the commercial district, Route 13, or Cornell University.
 - ii. 5% of the total departure trips are expected to turn right onto North Triphammer Road and travel north toward the Town of Lansing, NYS Route 34, or NYS Route 34B.

F. Trips Entering the Site (Refer to Appendix D for maps)

- a. 80% of the total trips entering the site are expected to travel via Warren Road and enter from the east. This is primarily due to the accessibility of Warren Road to local business and technology developments, Route 13, and Cornell University.
 - i. 60% of the total arrival trips are expected to turn left onto Bomax Drive from Warren Road because the majority of the arrival trips utilizing Warren Road will travel from the south.
 - ii. 20% of the total arrival trips are expected to turn right onto Bomax Drive from Warren Road. These trips will likely originate from the Town of Lansing to the north of the project.

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- b. 20% of the total trips entering the site are expected to travel via North Triphammer Road and turn onto Craft Road to the west of the project. Most of the arrival trips using North Triphammer Road will likely be traveling north from Cornell University, Route 13, or the commercial district with the Village of Lansing.
 - i. 15% of the total arrival trips are expected to turn right from North Triphammer Road and travel east on Craft Road to the project. Most of the arrival trips using this route will likely be traveling from the aforementioned major developments to the southeast of the project.
 - ii. 5% of the total arrival trips are expected to turn left from North Triphammer Road and travel east on Craft Road to the project. Most of the arrival trips using this route will likely be traveling from the Town of Lansing, NYS Route 34, or NYS Route 34B to the north.

G. The trips generated by the project were combined with the 2018 background traffic to yield the 2018 proposed traffic found in Appendix E. The 2018 proposed traffic conditions represent the traffic conditions expected to occur at the studied intersections at project completion.

H. Traffic Comparison of Current Zoning and Proposed Zoning

- a. The project site is currently zoned in the Business and Technology District (BTD) which permits light industry and manufacturing uses. Based on the BTD zoning requirements set forth by the Village of Lansing, the maximum building coverage of the 19.46 acre parcel is 25%. A development utilizing the maximum permitted 25% building coverage would result in a building with approximately 200,000 square feet of gross floor area (sf GSA). The AM and PM peak hour trips calculated by using the ITE Land Use 110 (General Light Industry) for this theoretical development are shown in Table 4-2 below.

Land Use	Trip Generation Equation*		Trips Generated	Entering	Exiting
General Light Industry	AM Peak	$T = 1.18(X) - 89.78$	147	129 (88%)	18 (12%)
	PM Peak	$T = 1.43(X) - 157.36$	129	15 (12%)	114 (88%)

*T=Trips, X= Total sf GFA/1,000 sf GFA=200 (200,000 sf GFA/1,000 sf GFA)

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- b. The development of a light industrial building at the Bomax Drive site would result in nearly 80% more AM/PM peak hour trips in comparison to the proposed apartments. The current proposal has far less impact in terms of traffic.
- I. The traffic impacts of the project were analyzed with *Synchro9* to determine the LOS of the studied intersections at project completion in 2018. The LOS was determined at the following three scenarios during each AM and PM peak hour:
 - a. Existing Conditions (2016)-Existing traffic conditions based on traffic counts conducted in May 2016
 - b. Background Conditions (2018)-Anticipated traffic conditions based on annual GRF of 2.0% for two years
 - c. Developed Conditions (2018)-Background conditions combined with traffic expected to be generated by proposed project

5.0 SIGHT DISTANCE EVALUATION

Sight distance was analyzed at the proposed project entrance using the 2015 NYSDOT *Highway Design Manual Appendix 5C - Intersection Sight Distance Charts* (Appendix 5C). The proposed entrance is approximately 1,500 feet west of Warren Road and is classified under Case B (stop control on minor road) in Appendix 5C. As shown in Table 5-1 below, the sight distance at the proposed entrance is adequate based on NYSDOT recommendations.

Intersection	Posted Speed Limit (mph)	Recommended Sight Distance (Left/Right)	Actual Sight Distance (Left/Right)
Proposed Entrance on Bomax Drive	30	335 ft/290 ft	>700 ft/>700 ft

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6.0 CAPACITY ANALYSIS RESULTS

Tables 6-1 and 6-2 display the respective levels of service (LOS) for the studied intersections of Warren Road at Bomax Drive and North Triphammer Road at Craft Road. The LOS of the intersections were determined with the *Synchro 9* computer program. *Synchro 9* reports are located in Appendix F.

Table 6-1 Warren Road at Bomax Drive*						
Approach	Existing (2016) Level of Service		Background (2018) Level of Service		Developed (2018) Level of Service	
	AM	PM	AM	PM	AM	PM
Northbound						
Left	A	A	A	A	A	A
Through	A	A	A	B	A	B
Southbound						
Left	A	A	A	A	A	A
Through	A	A	B	A	B	A
Eastbound						
Left	-	B	-	B	B	B
Through	B	A	B	A	A	A
Westbound						
Left	B	C	B	C	B	C
Through	B	A	B	A	B	A
Overall LOS	A	A	A	A	A	A

*Bomax Drive to west of Warren Road, U.S. Postal Service Office driveway to east

Table 6-2 North Triphammer Road at Craft Road						
Approach	Existing (2016) Level of Service		Background (2018) Level of Service		Developed (2018) Level of Service	
	AM	PM	AM	PM	AM	PM
Northbound						
Through	A	B	A	B	A	B
Right	A	A	A	A	A	A
Southbound						
Left	A	A	A	A	A	A
Through	A	A	A	A	A	A
Eastbound						
Left	-	B	-	B	-	B
Westbound						
Through	A	B	B	C	B	C
Overall LOS	A	B	A	B	A	B

7.0 FINDINGS & OBSERVATIONS

Intersection Capacity

- A. Intersection Capacity - The intersection capacity analyses and action recommendations are located below.
 - a. Warren Road at Bomax Drive - As shown in Table 6-1 above, the AM/PM levels of service were rated as “A” for both the 2018 background and developed conditions. This means that the proposed development will not have a noticeable impact on the intersection of Warren Road and Bomax Drive during the AM/PM peak hours. No action is required to accommodate the proposed development.

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- b. North Triphammer Road at Craft Road - As shown in Table 6-1 above, the 2018 levels of service were “A” for the AM/PM background conditions and the AM developed conditions. The PM level of service of the developed conditions is rated as “B,” which is still considered a high level of service.

8.0 CONCLUSIONS

The development of 140 apartment units on Bomax Drive will have a minimal impact on the surrounding traffic network. This determination is due to the low volume of traffic expected to be generated by the development in comparison to the mature roadway network surrounding the site. The proposed public transportation route servicing the project will also reduce traffic generated from the site. The potential rezoning of the parcel will reduce the potential future number of vehicles in the area including those traveling through the residential subdivision.

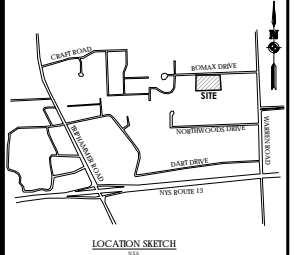
APPENDIX A. TRAFFIC COUNT LOCATIONS



PA

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Designed by Brandon S. Morgan

Revisions			
No.	Date	By	Description
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TRAFFIC STUDY LOCATIONS

BOMAX DRIVE APARTMENTS

Town/City: Village of Lansing
County: Tompkins State: New York

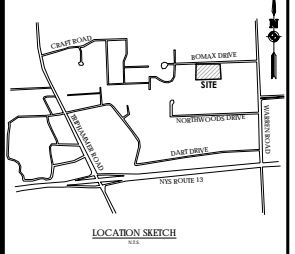
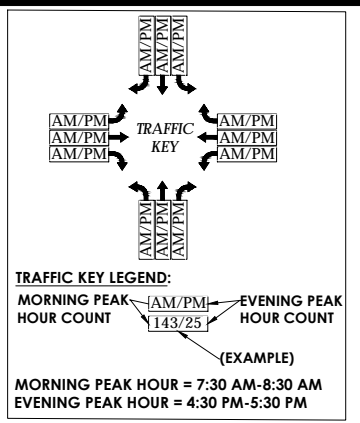
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Drawing No. A	Sheet No. 1
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APPENDIX B. 2016 EXISTING TRAFFIC VOLUMES



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Revisions			
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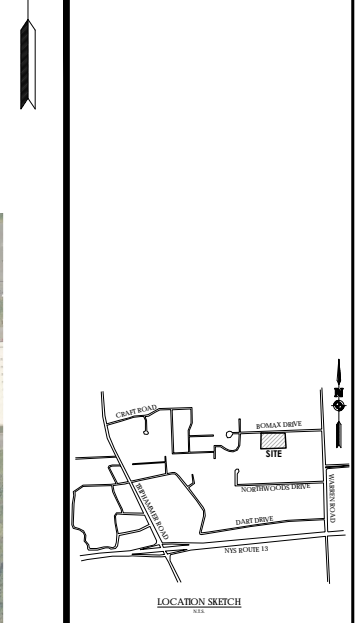
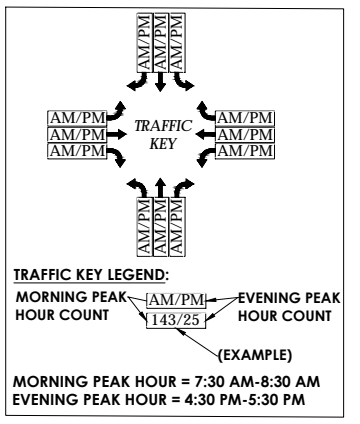
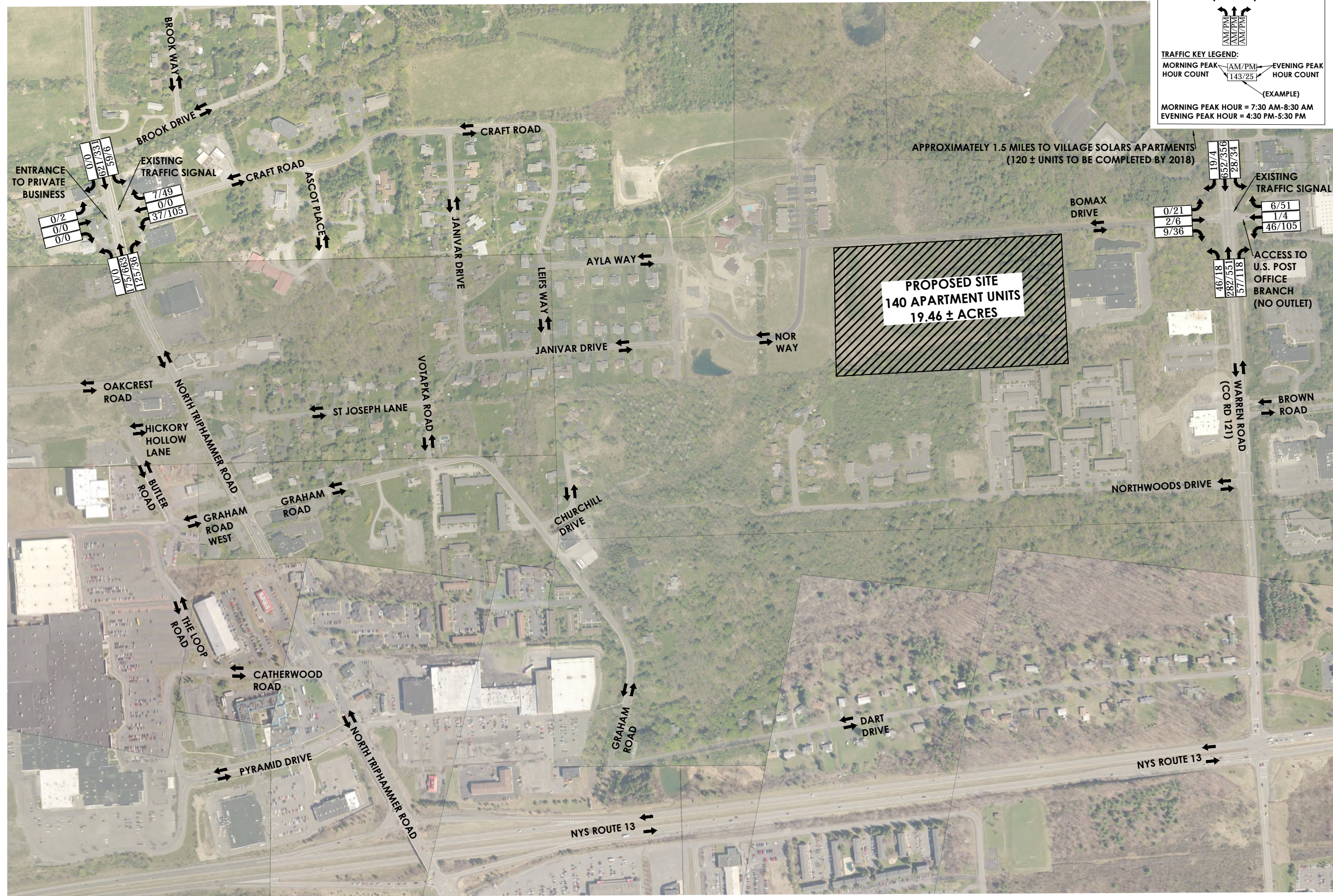
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EXISTING CONDITIONS
BOMAX DRIVE APARTMENTS
 Town/City: Village of Lansing
 County: Tompkins State: New York
 Project No.
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Drawing No. B	Sheet No. 1
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APPENDIX C. 2018 BACKGROUND TRAFFIC VOLUMES



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2018 BACKGROUND TRAFFIC

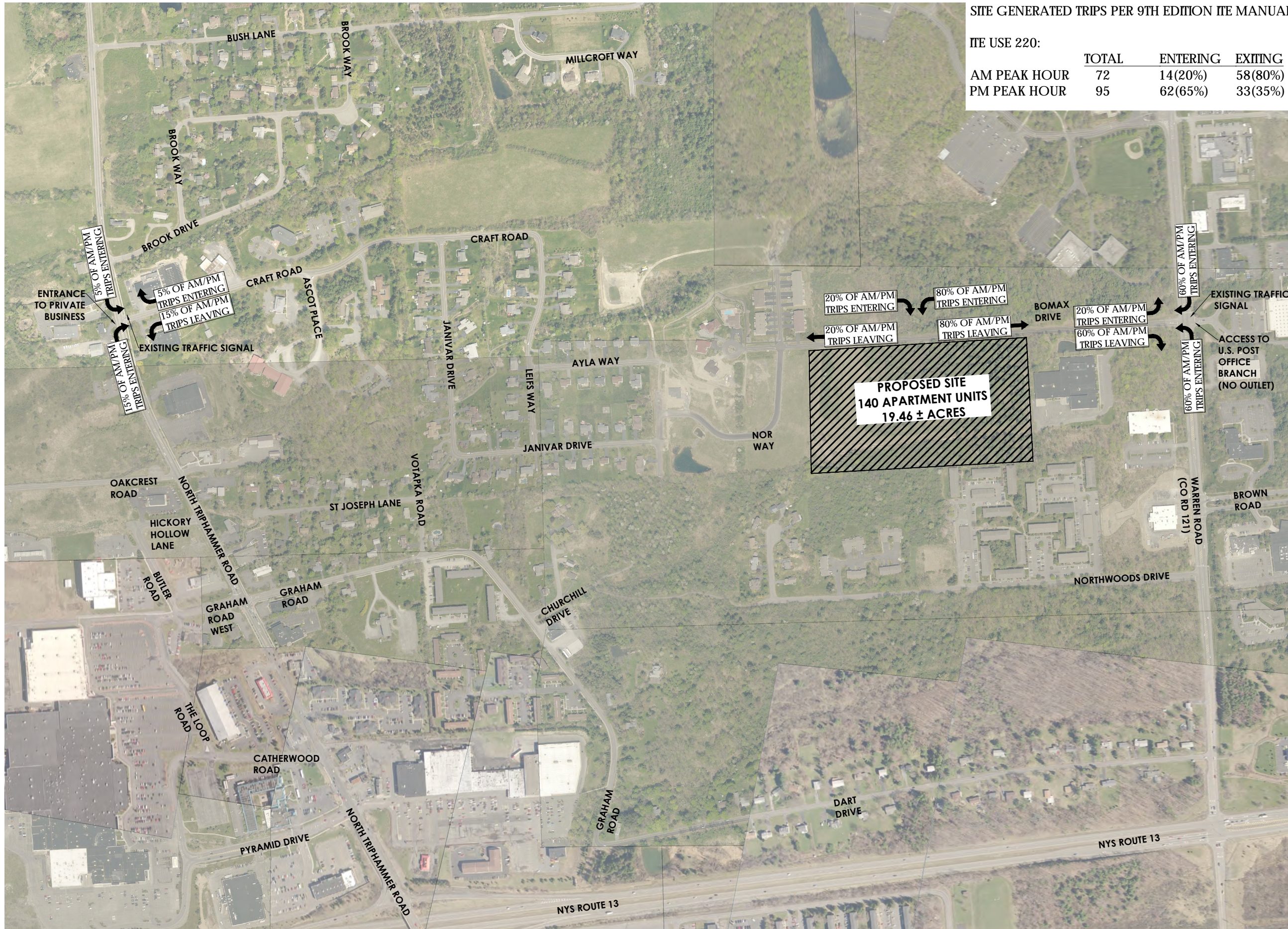
BOMAX DRIVE APARTMENTS
 Town/City: Village of Lansing
 County: Tompkins State: New York
 Project No.
20162212.0001

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APPENDIX D. TRIP GENERATION AND DISTRIBUTION



SITE GENERATED TRIPS PER 9TH EDITION ITE MANUAL

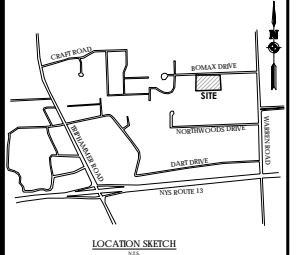
ITE USE 220:

	TOTAL	ENTERING	EXITING
AM PEAK HOUR	72	14 (20%)	58 (80%)
PM PEAK HOUR	95	62 (65%)	33 (35%)



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TRIP DISTRIBUTION

BOMAX DRIVE APARTMENTS

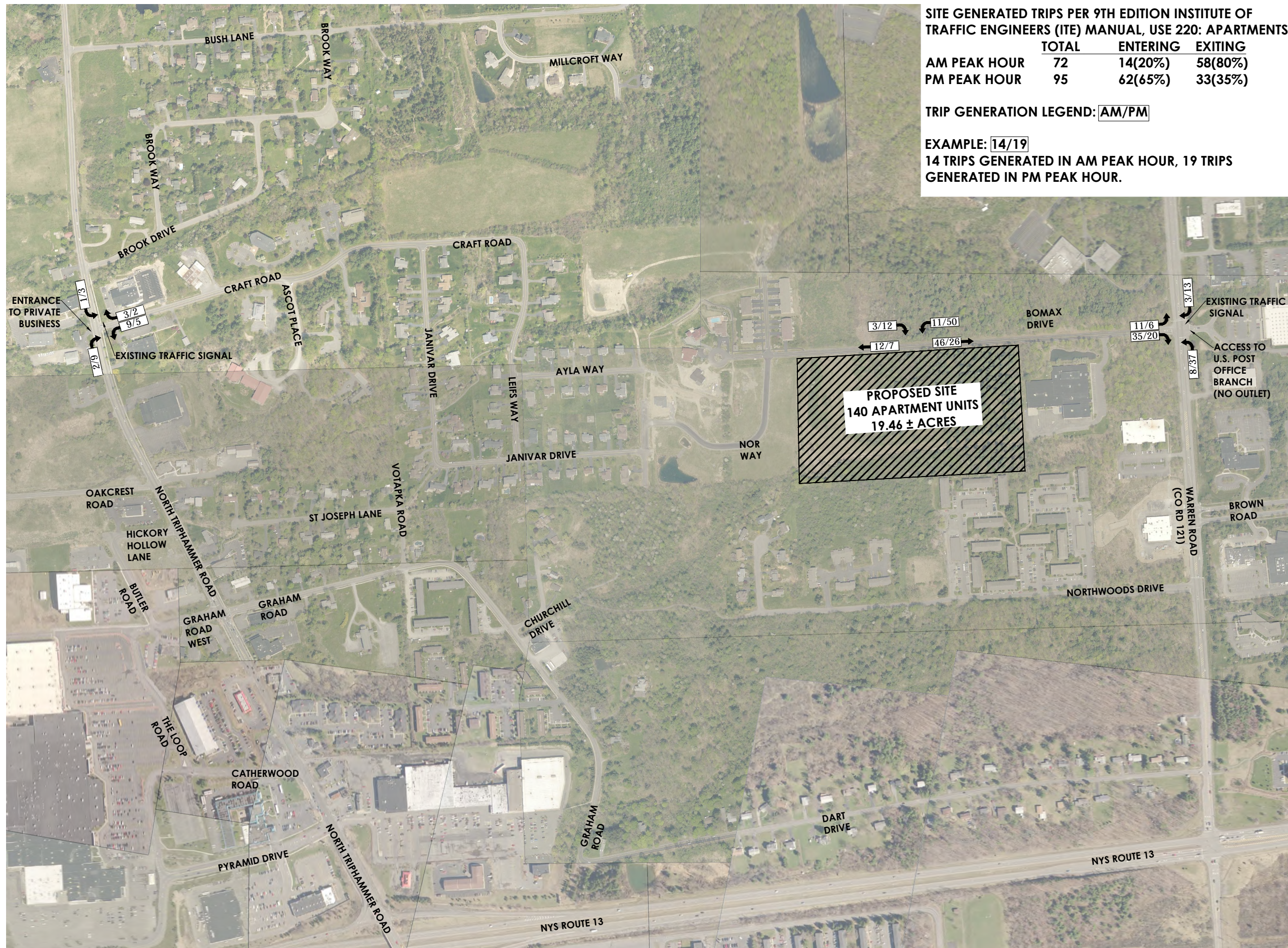
Town/City: Village of Lansing
County: Tompkins State: New York

Project No.
20162212.0001

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Date
MAY 2016

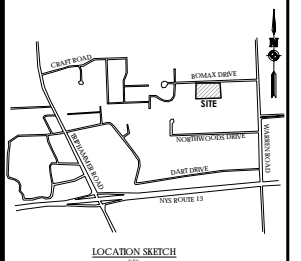


SITE GENERATED TRIPS PER 9TH EDITION INSTITUTE OF TRAFFIC ENGINEERS (ITE) MANUAL, USE 220: APARTMENTS

	TOTAL	ENTERING	EXITING
AM PEAK HOUR	72	14(20%)	58(80%)
PM PEAK HOUR	95	62(65%)	33(35%)

TRIP GENERATION LEGEND: AM/PM

EXAMPLE: 14/19
 14 TRIPS GENERATED IN AM PEAK HOUR, 19 TRIPS GENERATED IN PM PEAK HOUR.



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TRIP GENERATION

BOMAX DRIVE APARTMENTS

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 County: Tompkins State: New York

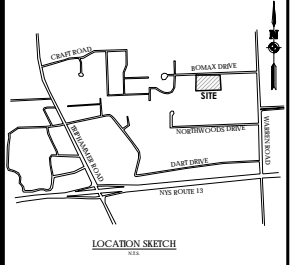
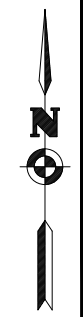
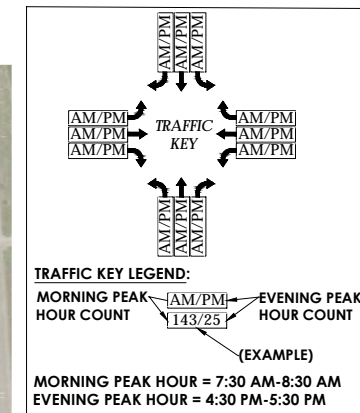
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APPENDIX E. 2018 DEVELOPED TRAFFIC VOLUMES



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2018 PROPOSED TRAFFIC
BOMAX DRIVE APARTMENTS
 Town/City: Village of Lansing
 County: Tompkins State: New York
 Project No.
20162212.0001

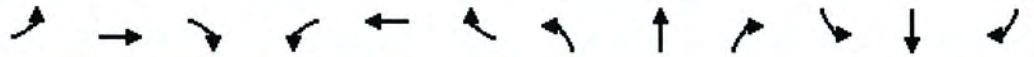
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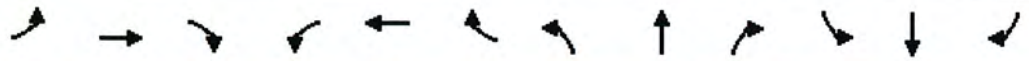
APPENDIX F. SYNCHRO 9 ANALYSIS REPORTS

Lanes, Volumes, Timings
2: Craft & Warren

Existing AM
10/10/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↗		↖	↗	
Traffic Volume (vph)	0	2	9	44	1	6	44	262	55	27	593	18
Future Volume (vph)	0	2	9	44	1	6	44	262	55	27	593	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	250		0	0		0	100		0	100		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frnt		0.875			0.869			0.974			0.996	
Flt Protected				0.950			0.950			0.950		
Satd. Flow (prot)	1863	1630	0	1770	1619	0	1770	1814	0	1770	1855	0
Flt Permitted				0.750			0.310			0.550		
Satd. Flow (perm)	1863	1630	0	1397	1619	0	577	1814	0	1025	1855	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10			7			38			5	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2077			1276			894			771	
Travel Time (s)		47.2			29.0			20.3			17.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	2	10	49	1	7	49	291	61	30	659	20
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	12	0	49	8	0	49	352	0	30	679	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Minimum Split (s)	25.0	25.0		25.0	25.0		25.0	25.0		25.0	25.0	
Total Split (s)	15.0	15.0		15.0	15.0		35.0	35.0		35.0	35.0	
Total Split (%)	30.0%	30.0%		30.0%	30.0%		70.0%	70.0%		70.0%	70.0%	
Maximum Green (s)	10.0	10.0		10.0	10.0		30.0	30.0		30.0	30.0	
Yellow Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
All-Red Time (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Flash Dont Walk (s)	15.0	15.0		15.0	15.0		15.0	15.0		15.0	15.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effect Green (s)		10.0		10.0	10.0		30.0	30.0		30.0	30.0	
Actuated g/C Ratio		0.20		0.20	0.20		0.60	0.60		0.60	0.60	
v/c Ratio		0.04		0.18	0.02		0.14	0.32		0.05	0.61	



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay		11.0		18.5	11.4		5.6	5.3		4.4	9.2	
Queue Delay		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay		11.0		18.5	11.4		5.6	5.3		4.4	9.2	
LOS		B		B	B		A	A		A	A	
Approach Delay		11.0			17.5			5.4			9.0	
Approach LOS		B			B			A			A	
Queue Length 50th (ft)		1		12	0		5	37		3	103	
Queue Length 95th (ft)		11		34	8		17	70		10	184	
Internal Link Dist (ft)		1997			1196			814			691	
Turn Bay Length (ft)							100			100		
Base Capacity (vph)		334		279	329		346	1103		615	1115	
Starvation Cap Reductn		0		0	0		0	0		0	0	
Spillback Cap Reductn		0		0	0		0	0		0	0	
Storage Cap Reductn		0		0	0		0	0		0	0	
Reduced v/c Ratio		0.04		0.18	0.02		0.14	0.32		0.05	0.61	

Intersection Summary

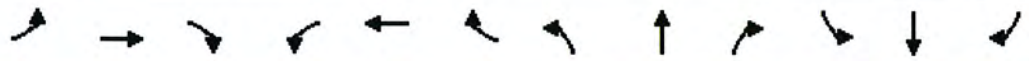
Area Type:	Other
Cycle Length:	50
Actuated Cycle Length:	50
Offset:	0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle:	60
Control Type:	Pretimed
Maximum v/c Ratio:	0.61
Intersection Signal Delay:	8.2
Intersection Capacity Utilization	54.0%
Analysis Period (min)	15
Intersection LOS:	A
ICU Level of Service	A

Splits and Phases: 2: Craft & Warren

 35 s	 15 s
 35 s	 15 s

Lanes, Volumes, Timings
8: Craft & North Triphammer

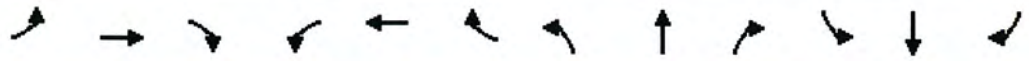
Existing AM
10/10/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↖		↗	↖	
Traffic Volume (vph)	0	0	0	36	0	7	0	168	120	57	597	0
Future Volume (vph)	0	0	0	36	0	7	0	168	120	57	597	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr't					0.977			0.938				
Flt Protected					0.960					0.950		
Satd. Flow (prot)	0	1863	0	0	1747	0	1863	1747	0	1770	1863	0
Flt Permitted					0.774					0.567		
Satd. Flow (perm)	0	1863	0	0	1409	0	1863	1747	0	1056	1863	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					44			128				
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		435			497			770			547	
Travel Time (s)		9.9			11.3			17.5			12.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	40	0	8	0	187	133	63	663	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	48	0	0	320	0	63	663	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type				Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Minimum Split (s)	25.0	25.0		25.0	25.0		25.0	25.0		25.0	25.0	
Total Split (s)	15.0	15.0		15.0	15.0		35.0	35.0		35.0	35.0	
Total Split (%)	30.0%	30.0%		30.0%	30.0%		70.0%	70.0%		70.0%	70.0%	
Maximum Green (s)	10.0	10.0		10.0	10.0		30.0	30.0		30.0	30.0	
Yellow Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
All-Red Time (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		5.0			5.0		5.0	5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Flash Dont Walk (s)	15.0	15.0		15.0	15.0		15.0	15.0		15.0	15.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effect Green (s)					10.0			30.0		30.0	30.0	
Actuated g/C Ratio					0.20			0.60		0.60	0.60	
v/c Ratio					0.15			0.29		0.10	0.59	
Control Delay					8.4			3.6		4.8	9.0	
Queue Delay					0.0			0.0		0.0	0.0	
Total Delay					8.4			3.6		4.8	9.0	

Lanes, Volumes, Timings
8: Craft & North Triphammer

Existing AM
10/10/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS					A			A		A	A	
Approach Delay					8.4			3.6			8.6	
Approach LOS					A			A			A	
Queue Length 50th (ft)					1			21		7	100	
Queue Length 95th (ft)					22			48		18	177	
Internal Link Dist (ft)		355			417			690			467	
Turn Bay Length (ft)												
Base Capacity (vph)					317			1099		633	1117	
Starvation Cap Reductn					0			0		0	0	
Spillback Cap Reductn					0			0		0	0	
Storage Cap Reductn					0			0		0	0	
Reduced v/c Ratio					0.15			0.29		0.10	0.59	

Intersection Summary

Area Type: Other
 Cycle Length: 50
 Actuated Cycle Length: 50
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 60
 Control Type: Pretimed
 Maximum v/c Ratio: 0.59
 Intersection Signal Delay: 7.1
 Intersection Capacity Utilization 50.6%
 Analysis Period (min) 15

Intersection LOS: A
 ICU Level of Service A

Splits and Phases: 8: Craft & North Triphammer

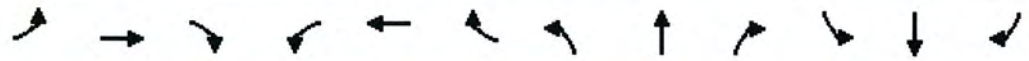
Ø2 (R) 35 s	Ø4 15 s
Ø6 (R) 35 s	Ø8 15 s

Lanes, Volumes, Timings
2: Bomax & Warren

Existing PM
10/10/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	2	9	44	1	6	44	262	55	27	593	18
Future Volume (vph)	0	2	9	44	1	6	44	262	55	27	593	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	250		0	0		0	100		0	100		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.875			0.869			0.974			0.996	
Flt Protected				0.950			0.950			0.950		
Satd. Flow (prot)	1863	1630	0	1770	1619	0	1770	1814	0	1770	1855	0
Flt Permitted				0.750			0.310			0.550		
Satd. Flow (perm)	1863	1630	0	1397	1619	0	577	1814	0	1025	1855	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10			7			38			5	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2077			1276			894			771	
Travel Time (s)		47.2			29.0			20.3			17.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	2	10	49	1	7	49	291	61	30	659	20
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	12	0	49	8	0	49	352	0	30	679	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Minimum Split (s)	25.0	25.0		25.0	25.0		25.0	25.0		25.0	25.0	
Total Split (s)	15.0	15.0		15.0	15.0		35.0	35.0		35.0	35.0	
Total Split (%)	30.0%	30.0%		30.0%	30.0%		70.0%	70.0%		70.0%	70.0%	
Maximum Green (s)	10.0	10.0		10.0	10.0		30.0	30.0		30.0	30.0	
Yellow Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
All-Red Time (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Flash Dont Walk (s)	15.0	15.0		15.0	15.0		15.0	15.0		15.0	15.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effect Green (s)		10.0		10.0	10.0		30.0	30.0		30.0	30.0	
Actuated g/C Ratio		0.20		0.20	0.20		0.60	0.60		0.60	0.60	
v/c Ratio		0.04		0.18	0.02		0.14	0.32		0.05	0.61	



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay		11.0		18.5	11.4		5.6	5.3		4.4	9.2	
Queue Delay		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay		11.0		18.5	11.4		5.6	5.3		4.4	9.2	
LOS		B		B	B		A	A		A	A	
Approach Delay		11.0			17.5			5.4			9.0	
Approach LOS		B			B			A			A	
Queue Length 50th (ft)		1		12	0		5	37		3	103	
Queue Length 95th (ft)		11		34	8		17	70		10	184	
Internal Link Dist (ft)		1997			1196			814			691	
Turn Bay Length (ft)							100			100		
Base Capacity (vph)		334		279	329		346	1103		615	1115	
Starvation Cap Reductn		0		0	0		0	0		0	0	
Spillback Cap Reductn		0		0	0		0	0		0	0	
Storage Cap Reductn		0		0	0		0	0		0	0	
Reduced v/c Ratio		0.04		0.18	0.02		0.14	0.32		0.05	0.61	

Intersection Summary

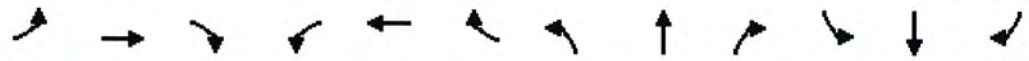
Area Type: Other
 Cycle Length: 50
 Actuated Cycle Length: 50
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 60
 Control Type: Pretimed
 Maximum v/c Ratio: 0.61
 Intersection Signal Delay: 8.2
 Intersection Capacity Utilization 54.0%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service A

Splits and Phases: 2: Bomax & Warren

Ø2 (R) 35 s	Ø4 15 s
Ø6 (R) 35 s	Ø8 15 s

Lanes, Volumes, Timings
8: Craft & North Triphammer

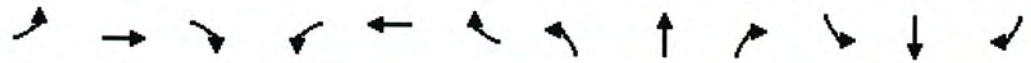
Existing PM
10/10/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Volume (vph)	2	0	0	101	0	47	0	637	35	6	318	0
Future Volume (vph)	2	0	0	101	0	47	0	637	35	6	318	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frnt					0.957			0.992				
Flt Protected		0.950			0.967					0.950		
Satd. Flow (prot)	0	1770	0	0	1724	0	1863	1848	0	1770	1863	0
Flt Permitted		0.717			0.795					0.265		
Satd. Flow (perm)	0	1336	0	0	1417	0	1863	1848	0	494	1863	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					44			10				
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		435			497			770			547	
Travel Time (s)		9.9			11.3			17.5			12.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	2	0	0	112	0	52	0	708	39	7	353	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	2	0	0	164	0	0	747	0	7	353	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Minimum Split (s)	25.0	25.0		25.0	25.0		25.0	25.0		25.0	25.0	
Total Split (s)	15.0	15.0		15.0	15.0		35.0	35.0		35.0	35.0	
Total Split (%)	30.0%	30.0%		30.0%	30.0%		70.0%	70.0%		70.0%	70.0%	
Maximum Green (s)	10.0	10.0		10.0	10.0		30.0	30.0		30.0	30.0	
Yellow Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
All-Red Time (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		5.0			5.0			5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Flash Dont Walk (s)	15.0	15.0		15.0	15.0		15.0	15.0		15.0	15.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		10.0			10.0			30.0		30.0	30.0	
Actuated g/C Ratio		0.20			0.20			0.60		0.60	0.60	
v/c Ratio		0.01			0.52			0.67		0.02	0.32	
Control Delay		16.0			19.9			10.4		4.3	5.9	
Queue Delay		0.0			0.0			0.0		0.0	0.0	
Total Delay		16.0			19.9			10.4		4.3	5.9	

Lanes, Volumes, Timings
8: Craft & North Triphammer

Existing PM
10/10/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS		B			B			B		A	A	
Approach Delay		16.0			19.9			10.4			5.9	
Approach LOS		B			B			B			A	
Queue Length 50th (ft)		1			31			120		1	42	
Queue Length 95th (ft)		5			78			217		4	77	
Internal Link Dist (ft)		355			417			690			467	
Turn Bay Length (ft)												
Base Capacity (vph)		267			318			1112		296	1117	
Starvation Cap Reductn		0			0			0		0	0	
Spillback Cap Reductn		0			0			0		0	0	
Storage Cap Reductn		0			0			0		0	0	
Reduced v/c Ratio		0.01			0.52			0.67		0.02	0.32	

Intersection Summary

Area Type: Other
 Cycle Length: 50
 Actuated Cycle Length: 50
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 60
 Control Type: Pretimed
 Maximum v/c Ratio: 0.67
 Intersection Signal Delay: 10.4
 Intersection Capacity Utilization 51.6%
 Analysis Period (min) 15

Intersection LOS: B
 ICU Level of Service A

Splits and Phases: 8: Craft & North Triphammer

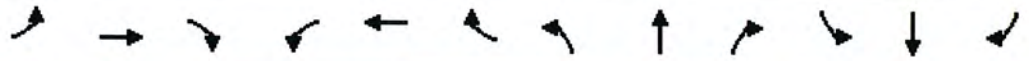


Lanes, Volumes, Timings
2: Bomax & Warren

Background AM
10/10/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	2	9	44	1	6	44	262	55	27	593	18
Future Volume (vph)	0	2	9	44	1	6	44	262	55	27	593	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	250		0	0		0	100		0	100		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.875			0.869			0.974			0.996	
Fl _t Protected				0.950			0.950			0.950		
Satd. Flow (prot)	1863	1630	0	1770	1619	0	1770	1814	0	1770	1855	0
Fl _t Permitted				0.750			0.310			0.550		
Satd. Flow (perm)	1863	1630	0	1397	1619	0	577	1814	0	1025	1855	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10			7			38			5	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2077			1276			894			771	
Travel Time (s)		47.2			29.0			20.3			17.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	2	10	49	1	7	49	291	61	30	659	20
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	12	0	49	8	0	49	352	0	30	679	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Minimum Split (s)	25.0	25.0		25.0	25.0		25.0	25.0		25.0	25.0	
Total Split (s)	15.0	15.0		15.0	15.0		35.0	35.0		35.0	35.0	
Total Split (%)	30.0%	30.0%		30.0%	30.0%		70.0%	70.0%		70.0%	70.0%	
Maximum Green (s)	10.0	10.0		10.0	10.0		30.0	30.0		30.0	30.0	
Yellow Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
All-Red Time (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Flash Dont Walk (s)	15.0	15.0		15.0	15.0		15.0	15.0		15.0	15.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effect Green (s)		10.0		10.0	10.0		30.0	30.0		30.0	30.0	
Actuated g/C Ratio		0.20		0.20	0.20		0.60	0.60		0.60	0.60	
v/c Ratio		0.04		0.18	0.02		0.14	0.32		0.05	0.61	



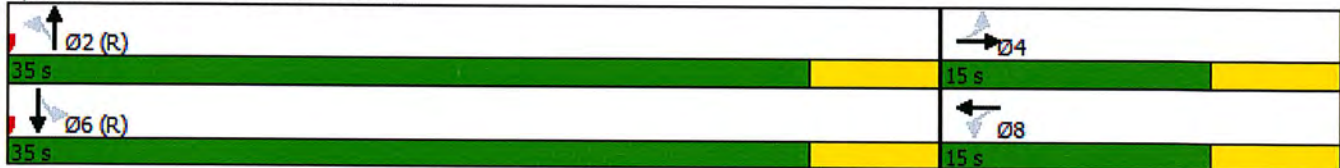
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay		11.0		18.5	11.4		5.6	5.3		4.4	9.2	
Queue Delay		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay		11.0		18.5	11.4		5.6	5.3		4.4	9.2	
LOS		B		B	B		A	A		A	A	
Approach Delay		11.0			17.5			5.4			9.0	
Approach LOS		B			B			A			A	
Queue Length 50th (ft)		1		12	0		5	37		3	103	
Queue Length 95th (ft)		11		34	8		17	70		10	184	
Internal Link Dist (ft)		1997			1196			814			691	
Turn Bay Length (ft)							100			100		
Base Capacity (vph)		334		279	329		346	1103		615	1115	
Starvation Cap Reductn		0		0	0		0	0		0	0	
Spillback Cap Reductn		0		0	0		0	0		0	0	
Storage Cap Reductn		0		0	0		0	0		0	0	
Reduced v/c Ratio		0.04		0.18	0.02		0.14	0.32		0.05	0.61	

Intersection Summary

Area Type: Other
 Cycle Length: 50
 Actuated Cycle Length: 50
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 60
 Control Type: Pretimed
 Maximum v/c Ratio: 0.61
 Intersection Signal Delay: 8.2
 Intersection Capacity Utilization 54.0%
 Analysis Period (min) 15

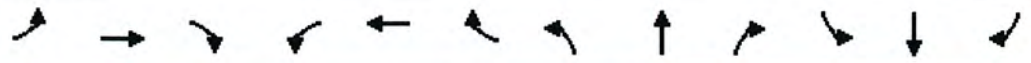
Intersection LOS: A
 ICU Level of Service A

Splits and Phases: 2: Bomax & Warren

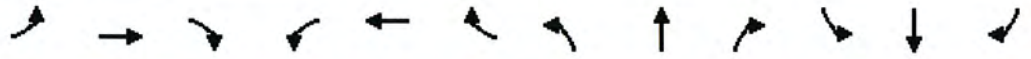


Lanes, Volumes, Timings
8: Craft & North Triphammer

Background AM
10/10/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↖	↗		↖	↗	
Traffic Volume (vph)	0	0	0	37	0	49	0	175	125	59	621	0
Future Volume (vph)	0	0	0	37	0	49	0	175	125	59	621	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t					0.923			0.937				
Fl _t Protected					0.979					0.950		
Satd. Flow (prot)	0	1863	0	0	1683	0	1863	1745	0	1770	1863	0
Fl _t Permitted					0.867					0.560		
Satd. Flow (perm)	0	1863	0	0	1491	0	1863	1745	0	1043	1863	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					54			129				
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		435			497			770			547	
Travel Time (s)		9.9			11.3			17.5			12.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	41	0	54	0	194	139	66	690	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	95	0	0	333	0	66	690	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type				Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Minimum Split (s)	25.0	25.0		25.0	25.0		25.0	25.0		25.0	25.0	
Total Split (s)	15.0	15.0		15.0	15.0		35.0	35.0		35.0	35.0	
Total Split (%)	30.0%	30.0%		30.0%	30.0%		70.0%	70.0%		70.0%	70.0%	
Maximum Green (s)	10.0	10.0		10.0	10.0		30.0	30.0		30.0	30.0	
Yellow Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
All-Red Time (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		5.0			5.0		5.0	5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Flash Dont Walk (s)	15.0	15.0		15.0	15.0		15.0	15.0		15.0	15.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)					10.0			30.0		30.0	30.0	
Actuated g/C Ratio					0.20			0.60		0.60	0.60	
v/c Ratio					0.28			0.30		0.11	0.62	
Control Delay					11.7			3.7		4.8	9.4	
Queue Delay					0.0			0.0		0.0	0.0	
Total Delay					11.7			3.7		4.8	9.4	



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS					B			A		A	A	
Approach Delay					11.7			3.7			9.0	
Approach LOS					B			A			A	
Queue Length 50th (ft)					10			23		7	107	
Queue Length 95th (ft)					41			50		19	189	
Internal Link Dist (ft)		355			417			690			467	
Turn Bay Length (ft)												
Base Capacity (vph)					341			1098		625	1117	
Starvation Cap Reductn					0			0		0	0	
Spillback Cap Reductn					0			0		0	0	
Storage Cap Reductn					0			0		0	0	
Reduced v/c Ratio					0.28			0.30		0.11	0.62	

Intersection Summary

Area Type: Other
 Cycle Length: 50
 Actuated Cycle Length: 50
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 60
 Control Type: Pretimed
 Maximum v/c Ratio: 0.62
 Intersection Signal Delay: 7.7
 Intersection Capacity Utilization 53.6%
 Analysis Period (min) 15

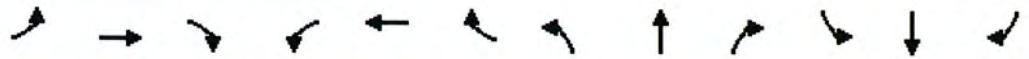
Intersection LOS: A
 ICU Level of Service A

Splits and Phases: 8: Craft & North Triphammer

Ø2 (R) 35 s	Ø4 15 s
Ø6 (R) 35 s	Ø8 15 s

Lanes, Volumes, Timings
2: Bomax & Warren

Background PM
10/10/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↗		↖	↗	
Traffic Volume (vph)	0	2	9	44	1	6	44	262	55	27	593	18
Future Volume (vph)	0	2	9	44	1	6	44	262	55	27	593	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	250		0	0		0	100		0	100		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.875			0.869			0.974			0.996	
Fl _t Protected				0.950			0.950			0.950		
Satd. Flow (prot)	1863	1630	0	1770	1619	0	1770	1814	0	1770	1855	0
Fl _t Permitted				0.750			0.310			0.550		
Satd. Flow (perm)	1863	1630	0	1397	1619	0	577	1814	0	1025	1855	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10			7			38			5	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2077			1276			894			771	
Travel Time (s)		47.2			29.0			20.3			17.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	2	10	49	1	7	49	291	61	30	659	20
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	12	0	49	8	0	49	352	0	30	679	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Minimum Split (s)	25.0	25.0		25.0	25.0		25.0	25.0		25.0	25.0	
Total Split (s)	15.0	15.0		15.0	15.0		35.0	35.0		35.0	35.0	
Total Split (%)	30.0%	30.0%		30.0%	30.0%		70.0%	70.0%		70.0%	70.0%	
Maximum Green (s)	10.0	10.0		10.0	10.0		30.0	30.0		30.0	30.0	
Yellow Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
All-Red Time (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Flash Dont Walk (s)	15.0	15.0		15.0	15.0		15.0	15.0		15.0	15.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		10.0		10.0	10.0		30.0	30.0		30.0	30.0	
Actuated g/C Ratio		0.20		0.20	0.20		0.60	0.60		0.60	0.60	
v/c Ratio		0.04		0.18	0.02		0.14	0.32		0.05	0.61	



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay		11.0		18.5	11.4		5.6	5.3		4.4	9.2	
Queue Delay		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay		11.0		18.5	11.4		5.6	5.3		4.4	9.2	
LOS		B		B	B		A	A		A	A	
Approach Delay		11.0			17.5			5.4			9.0	
Approach LOS		B			B			A			A	
Queue Length 50th (ft)		1		12	0		5	37		3	103	
Queue Length 95th (ft)		11		34	8		17	70		10	184	
Internal Link Dist (ft)		1997			1196			814			691	
Turn Bay Length (ft)							100			100		
Base Capacity (vph)		334		279	329		346	1103		615	1115	
Starvation Cap Reductn		0		0	0		0	0		0	0	
Spillback Cap Reductn		0		0	0		0	0		0	0	
Storage Cap Reductn		0		0	0		0	0		0	0	
Reduced v/c Ratio		0.04		0.18	0.02		0.14	0.32		0.05	0.61	

Intersection Summary

Area Type: Other

Cycle Length: 50

Actuated Cycle Length: 50

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 60

Control Type: Pretimed

Maximum v/c Ratio: 0.61

Intersection Signal Delay: 8.2

Intersection LOS: A

Intersection Capacity Utilization 54.0%

ICU Level of Service A

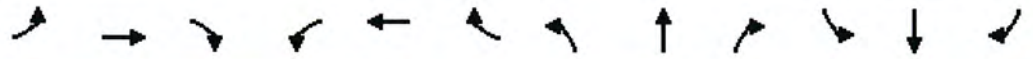
Analysis Period (min) 15

Splits and Phases: 2: Bomax & Warren

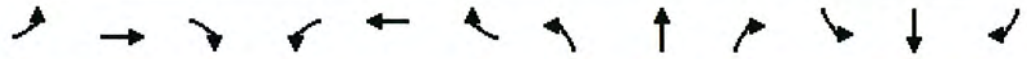
Ø2 (R) 35 s	Ø4 15 s
Ø6 (R) 35 s	Ø8 15 s

Lanes, Volumes, Timings
8: Craft & North Triphammer

Background PM
10/10/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↘		↗	↘	
Traffic Volume (vph)	2	0	0	105	0	49	0	663	36	6	331	0
Future Volume (vph)	2	0	0	105	0	49	0	663	36	6	331	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr't					0.957			0.992				
Flt Protected		0.950			0.967					0.950		
Satd. Flow (prot)	0	1770	0	0	1724	0	1863	1848	0	1770	1863	0
Flt Permitted		0.710			0.795					0.245		
Satd. Flow (perm)	0	1323	0	0	1417	0	1863	1848	0	456	1863	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					44			10				
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		435			497			770			547	
Travel Time (s)		9.9			11.3			17.5			12.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	2	0	0	117	0	54	0	737	40	7	368	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	2	0	0	171	0	0	777	0	7	368	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Minimum Split (s)	25.0	25.0		25.0	25.0		25.0	25.0		25.0	25.0	
Total Split (s)	15.0	15.0		15.0	15.0		35.0	35.0		35.0	35.0	
Total Split (%)	30.0%	30.0%		30.0%	30.0%		70.0%	70.0%		70.0%	70.0%	
Maximum Green (s)	10.0	10.0		10.0	10.0		30.0	30.0		30.0	30.0	
Yellow Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
All-Red Time (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		5.0			5.0		5.0	5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Flash Dont Walk (s)	15.0	15.0		15.0	15.0		15.0	15.0		15.0	15.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		10.0			10.0			30.0		30.0	30.0	
Actuated g/C Ratio		0.20			0.20			0.60		0.60	0.60	
v/c Ratio		0.01			0.54			0.70		0.03	0.33	
Control Delay		16.0			20.6			11.1		4.3	6.0	
Queue Delay		0.0			0.0			0.0		0.0	0.0	
Total Delay		16.0			20.6			11.1		4.3	6.0	



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS		B			C			B		A	A	
Approach Delay		16.0			20.6			11.1			6.0	
Approach LOS		B			C			B			A	
Queue Length 50th (ft)		1			33			128		1	45	
Queue Length 95th (ft)		5			#82			234		4	80	
Internal Link Dist (ft)		355			417			690			467	
Turn Bay Length (ft)												
Base Capacity (vph)		264			318			1112		273	1117	
Starvation Cap Reductn		0			0			0		0	0	
Spillback Cap Reductn		0			0			0		0	0	
Storage Cap Reductn		0			0			0		0	0	
Reduced v/c Ratio		0.01			0.54			0.70		0.03	0.33	

Intersection Summary

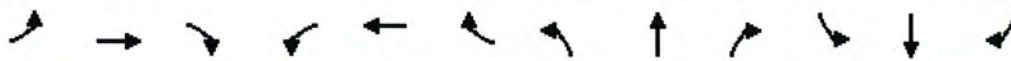
Area Type: Other
 Cycle Length: 50
 Actuated Cycle Length: 50
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 60
 Control Type: Pretimed
 Maximum v/c Ratio: 0.70
 Intersection Signal Delay: 10.9
 Intersection LOS: B
 Intersection Capacity Utilization 53.4%
 ICU Level of Service A
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 8: Craft & North Triphammer

 35 s	 15 s
 35 s	 15 s

Lanes, Volumes, Timings
2: Bomax & Warren

Developed AM
10/10/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	2	9	44	1	6	44	262	55	27	593	18
Future Volume (vph)	0	2	9	44	1	6	44	262	55	27	593	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	250		0	0		0	100		0	100		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frnt		0.875			0.869			0.974				0.996
Flt Protected				0.950			0.950			0.950		
Satd. Flow (prot)	1863	1630	0	1770	1619	0	1770	1814	0	1770	1855	0
Flt Permitted				0.750			0.310			0.550		
Satd. Flow (perm)	1863	1630	0	1397	1619	0	577	1814	0	1025	1855	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10			7			38			5	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2077			1276			894			771	
Travel Time (s)		47.2			29.0			20.3			17.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	2	10	49	1	7	49	291	61	30	659	20
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	12	0	49	8	0	49	352	0	30	679	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Minimum Split (s)	25.0	25.0		25.0	25.0		25.0	25.0		25.0	25.0	
Total Split (s)	15.0	15.0		15.0	15.0		35.0	35.0		35.0	35.0	
Total Split (%)	30.0%	30.0%		30.0%	30.0%		70.0%	70.0%		70.0%	70.0%	
Maximum Green (s)	10.0	10.0		10.0	10.0		30.0	30.0		30.0	30.0	
Yellow Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
All-Red Time (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Flash Dont Walk (s)	15.0	15.0		15.0	15.0		15.0	15.0		15.0	15.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		10.0		10.0	10.0		30.0	30.0		30.0	30.0	
Actuated g/C Ratio		0.20		0.20	0.20		0.60	0.60		0.60	0.60	
v/c Ratio		0.04		0.18	0.02		0.14	0.32		0.05	0.61	



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay		11.0		18.5	11.4		5.6	5.3		4.4	9.2	
Queue Delay		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay		11.0		18.5	11.4		5.6	5.3		4.4	9.2	
LOS		B		B	B		A	A		A	A	
Approach Delay		11.0			17.5			5.4			9.0	
Approach LOS		B			B			A			A	
Queue Length 50th (ft)		1		12	0		5	37		3	103	
Queue Length 95th (ft)		11		34	8		17	70		10	184	
Internal Link Dist (ft)		1997			1196			814			691	
Turn Bay Length (ft)							100			100		
Base Capacity (vph)		334		279	329		346	1103		615	1115	
Starvation Cap Reductn		0		0	0		0	0		0	0	
Spillback Cap Reductn		0		0	0		0	0		0	0	
Storage Cap Reductn		0		0	0		0	0		0	0	
Reduced v/c Ratio		0.04		0.18	0.02		0.14	0.32		0.05	0.61	

Intersection Summary

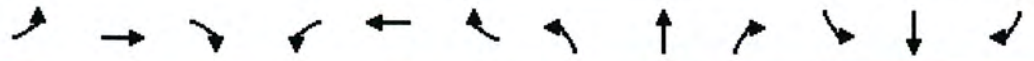
Area Type: Other
 Cycle Length: 50
 Actuated Cycle Length: 50
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 60
 Control Type: Pretimed
 Maximum v/c Ratio: 0.61
 Intersection Signal Delay: 8.2
 Intersection Capacity Utilization 54.0%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service A

Splits and Phases: 2: Bomax & Warren

Ø2 (R) 35 s	Ø4 15 s
Ø6 (R) 35 s	Ø8 15 s

Lanes, Volumes, Timings
8: Craft & North Triphammer

Developed AM
10/10/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	46	0	10	0	175	127	60	621	0
Future Volume (vph)	0	0	0	46	0	10	0	175	127	60	621	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frts					0.976			0.937				
Flt Protected					0.960					0.950		
Satd. Flow (prot)	0	1863	0	0	1745	0	1863	1745	0	1770	1863	0
Flt Permitted					0.764					0.559		
Satd. Flow (perm)	0	1863	0	0	1389	0	1863	1745	0	1041	1863	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					44			131				
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		435			497			770			547	
Travel Time (s)		9.9			11.3			17.5			12.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	51	0	11	0	194	141	67	690	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	62	0	0	335	0	67	690	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12		12		
Link Offset(ft)		0			0			0		0		
Crosswalk Width(ft)		16			16			16		16		
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type			Perm	NA		Perm	NA		Perm	NA		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Minimum Split (s)	25.0	25.0		25.0	25.0		25.0	25.0		25.0	25.0	
Total Split (s)	15.0	15.0		15.0	15.0		35.0	35.0		35.0	35.0	
Total Split (%)	30.0%	30.0%		30.0%	30.0%		70.0%	70.0%		70.0%	70.0%	
Maximum Green (s)	10.0	10.0		10.0	10.0		30.0	30.0		30.0	30.0	
Yellow Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
All-Red Time (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		5.0			5.0		5.0	5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Flash Dont Walk (s)	15.0	15.0		15.0	15.0		15.0	15.0		15.0	15.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)					10.0			30.0		30.0	30.0	
Actuated g/C Ratio					0.20			0.60		0.60	0.60	
v/c Ratio					0.20			0.30		0.11	0.62	
Control Delay					10.3			3.7		4.8	9.4	
Queue Delay					0.0			0.0		0.0	0.0	
Total Delay					10.3			3.7		4.8	9.4	



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS					B			A		A	A	
Approach Delay					10.3			3.7			9.0	
Approach LOS					B			A			A	
Queue Length 50th (ft)					4			22		7	107	
Queue Length 95th (ft)					28			50		19	189	
Internal Link Dist (ft)		355			417			690			467	
Turn Bay Length (ft)												
Base Capacity (vph)					313			1099		624	1117	
Starvation Cap Reductn					0			0		0	0	
Spillback Cap Reductn					0			0		0	0	
Storage Cap Reductn					0			0		0	0	
Reduced v/c Ratio					0.20			0.30		0.11	0.62	

Intersection Summary

Area Type: Other
 Cycle Length: 50
 Actuated Cycle Length: 50
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 60
 Control Type: Pretimed
 Maximum v/c Ratio: 0.62
 Intersection Signal Delay: 7.5
 Intersection Capacity Utilization 51.9%
 Analysis Period (min) 15

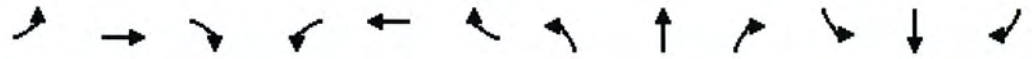
Intersection LOS: A
 ICU Level of Service A

Splits and Phases: 8: Craft & North Triphammer

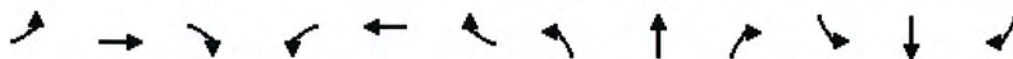
 35 s	 15 s
 35 s	 15 s

Lanes, Volumes, Timings
2: Bomax & Warren

Developed PM
10/10/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↻	↻		↻	↻		↻	↻		↻	↻	
Traffic Volume (vph)	0	2	9	44	1	6	44	262	55	27	593	18
Future Volume (vph)	0	2	9	44	1	6	44	262	55	27	593	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	250		0	0		0	100		0	100		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr tt		0.875			0.869			0.974			0.996	
Fl t Protected				0.950			0.950			0.950		
Satd. Flow (prot)	1863	1630	0	1770	1619	0	1770	1814	0	1770	1855	0
Fl t Permitted				0.750			0.310			0.550		
Satd. Flow (perm)	1863	1630	0	1397	1619	0	577	1814	0	1025	1855	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10			7			38			5	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2077			1276			894			771	
Travel Time (s)		47.2			29.0			20.3			17.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	2	10	49	1	7	49	291	61	30	659	20
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	12	0	49	8	0	49	352	0	30	679	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Minimum Split (s)	25.0	25.0		25.0	25.0		25.0	25.0		25.0	25.0	
Total Split (s)	15.0	15.0		15.0	15.0		35.0	35.0		35.0	35.0	
Total Split (%)	30.0%	30.0%		30.0%	30.0%		70.0%	70.0%		70.0%	70.0%	
Maximum Green (s)	10.0	10.0		10.0	10.0		30.0	30.0		30.0	30.0	
Yellow Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
All-Red Time (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Flash Dont Walk (s)	15.0	15.0		15.0	15.0		15.0	15.0		15.0	15.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		10.0		10.0	10.0		30.0	30.0		30.0	30.0	
Actuated g/C Ratio		0.20		0.20	0.20		0.60	0.60		0.60	0.60	
v/c Ratio		0.04		0.18	0.02		0.14	0.32		0.05	0.61	



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay		11.0		18.5	11.4		5.6	5.3		4.4	9.2	
Queue Delay		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay		11.0		18.5	11.4		5.6	5.3		4.4	9.2	
LOS		B		B	B		A	A		A	A	
Approach Delay		11.0			17.5			5.4			9.0	
Approach LOS		B			B			A			A	
Queue Length 50th (ft)		1		12	0		5	37		3	103	
Queue Length 95th (ft)		11		34	8		17	70		10	184	
Internal Link Dist (ft)		1997			1196			814			691	
Turn Bay Length (ft)							100			100		
Base Capacity (vph)		334		279	329		346	1103		615	1115	
Starvation Cap Reductn		0		0	0		0	0		0	0	
Spillback Cap Reductn		0		0	0		0	0		0	0	
Storage Cap Reductn		0		0	0		0	0		0	0	
Reduced v/c Ratio		0.04		0.18	0.02		0.14	0.32		0.05	0.61	

Intersection Summary

Area Type: Other

Cycle Length: 50

Actuated Cycle Length: 50

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 60

Control Type: Pretimed

Maximum v/c Ratio: 0.61

Intersection Signal Delay: 8.2

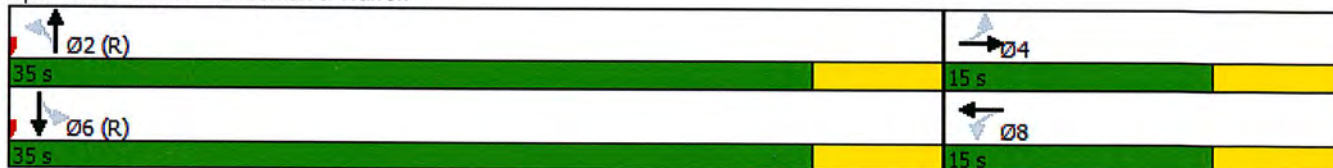
Intersection LOS: A

Intersection Capacity Utilization 54.0%

ICU Level of Service A

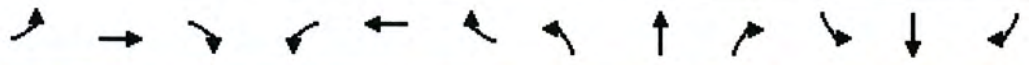
Analysis Period (min) 15

Splits and Phases: 2: Bomax & Warren



Lanes, Volumes, Timings
8: Craft & North Triphammer

Developed PM
10/10/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	0	0	110	0	51	0	663	45	9	331	0
Future Volume (vph)	2	0	0	110	0	51	0	663	45	9	331	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr't					0.957			0.990				
Flt Protected		0.950			0.967					0.950		
Satd. Flow (prot)	0	1770	0	0	1724	0	1863	1844	0	1770	1863	0
Flt Permitted		0.703			0.795					0.239		
Satd. Flow (perm)	0	1310	0	0	1417	0	1863	1844	0	445	1863	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					44			12				
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		435			497			770			547	
Travel Time (s)		9.9			11.3			17.5			12.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	2	0	0	122	0	57	0	737	50	10	368	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	2	0	0	179	0	0	787	0	10	368	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Minimum Split (s)	25.0	25.0		25.0	25.0		25.0	25.0		25.0	25.0	
Total Split (s)	15.0	15.0		15.0	15.0		35.0	35.0		35.0	35.0	
Total Split (%)	30.0%	30.0%		30.0%	30.0%		70.0%	70.0%		70.0%	70.0%	
Maximum Green (s)	10.0	10.0		10.0	10.0		30.0	30.0		30.0	30.0	
Yellow Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
All-Red Time (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		5.0			5.0		5.0	5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Flash Dont Walk (s)	15.0	15.0		15.0	15.0		15.0	15.0		15.0	15.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		10.0			10.0			30.0		30.0	30.0	
Actuated g/C Ratio		0.20			0.20			0.60		0.60	0.60	
v/c Ratio		0.01			0.56			0.71		0.04	0.33	
Control Delay		16.0			21.8			11.3		4.6	6.0	
Queue Delay		0.0			0.0			0.0		0.0	0.0	
Total Delay		16.0			21.8			11.3		4.6	6.0	

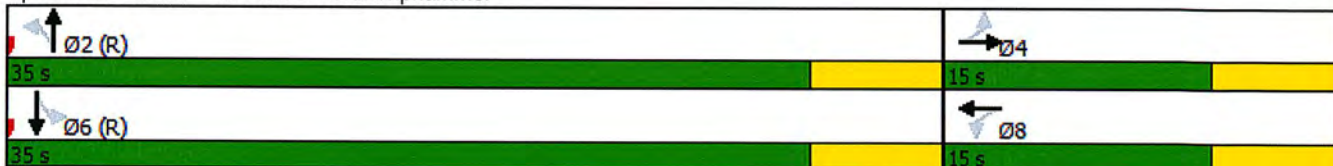


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS		B			C			B		A	A	
Approach Delay		16.0			21.8			11.3			6.0	
Approach LOS		B			C			B			A	
Queue Length 50th (ft)		1			35			131		1	45	
Queue Length 95th (ft)		5			#90			240		5	80	
Internal Link Dist (ft)		355			417			690			467	
Turn Bay Length (ft)												
Base Capacity (vph)		262			318			1111		267	1117	
Starvation Cap Reductn		0			0			0		0	0	
Spillback Cap Reductn		0			0			0		0	0	
Storage Cap Reductn		0			0			0		0	0	
Reduced v/c Ratio		0.01			0.56			0.71		0.04	0.33	

Intersection Summary

Area Type: Other
 Cycle Length: 50
 Actuated Cycle Length: 50
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 60
 Control Type: Pretimed
 Maximum v/c Ratio: 0.71
 Intersection Signal Delay: 11.2
 Intersection Capacity Utilization 54.3%
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 8: Craft & North Triphammer



APPENDIX G: ALTERNATE SITE PLAN



Client:
Park Grove Realty, LLC
46 Prince Street
Rochester, NY 14607

PASSERO ASSOCIATES
242 West Ash Street Suite 100
Rochester, New York 14614
Phone: (585) 325-1000
Fax: (585) 325-1991
Principal in Charge: John F. Caruso, P.E.
Project Manager: Jess D. Sudel, P.E.
Designed by: Brandon S. Morgan



Revisions			
No.	Date	By	Description
1			

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INDUSTRIAL USE CONCEPT
BOMAX DRIVE APARTMENTS
Town/City: Village of Lansing
County: Tompkins State: New York

Project No.
20162212.0001
Drawing No. _____ Sheet No. **1**
Scale: **1" = 100'**
Date: **JULY 2016**

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