Parth Knolls LLC, 87 Hawkes Avenue

53 Unit Apartment Development

TRAFFIC CAPACITY STUDY

Prepared By:

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10 North Street
Cold Spring, NY 10516

January 22, 2016

Table of Contents

1.0 SUMMARY OF TRAFFIC CAPACITY IMPACTS. 3

2.0 TRAVEL SPEEDS. 4

3.0 CAPACITY ANALYSIS. 5

3.1 Traffic Control Devices. 5
3.2 Existing Volumes. 5
3.3 No Build Traffic Volumes. 6
3.4 Future Traffic with Project - Build Condition. 7
3.5 Capacity Analysis. 9
3.6 Mitigation Measures. 10

ATTACHMENTS. 11

A Traffic Volumes Figures
B Traffic Counts
C Level of Service Criteria
D Capacity Analysis

Traffic Capacity Study
for
Parth Knolls LLC, 87 Hawkes Avenue

Town of Ossining, Westchester County, New York

January 22, 2016

1.0 Summary of Traffic Capacity Impacts

This report examines existing traffic operations in the vicinity of the proposed Parth Knolls LLC Project, herein referred to as "Project", and future conditions on the road network without and with the proposed Project completed and occupied. The Project is adjacent to Hawkes Avenue and the project entails 53 apartment dwelling units. The description of the network's present day operations is referred to as the Existing Condition. Future transportation operations are then examined for the No Build Condition (without the Project) and Build Condition (with the Project). The No Build Condition is the future baseline upon which the effect of project traffic is based and the Build Condition represents the combination of the No Build Condition plus the traffic that would result from development and operation of the proposed project. Future operations (No Build and Build) are analyzed for the year 2018.

The New York State Department of Environmental Conservation (NYS DEC) workbook guidelines (NYS DEC, SEQR Environmental Assessment Forms Guidance Documents {Workbook}, page 60-62) suggests use of a 100 trip peak hour threshold for the resultant traffic increase to be substantial enough to warrant full evaluation of traffic impacts (a capacity analysis) for uncongested locations. This project is anticipated to generate 30 a.m. peak hour trips and 46 p.m. peak hour trips.

The Hawkes Avenue traffic is light, being under 250 vehicles per hour.

The Project is proposed to have two accesses on Hawkes Avenue. The southern existing access is proposed as ingress only due to sight distance issues. A new full access would be constructed north of the existing access.

A New York State Department of Transportation highway work permit will not be required for the accesses as currently proposed.

The proposed development will maintain an acceptable Level of Service according to Section 3.0 of this report. Anticipated levels of service are and will remain A or B for all intersections and driveway connection movements based on a scale of A to F where levels of service A to D are considered acceptable. No capacity related mitigation measures are necessary or proposed.

2.0 Travel Speeds

The posted speed limit on Hawkes Avenue is 30 miles per hour. Traffic volumes are sufficiently low as to provide free flow conditions and thus two entire days of traffic were used to determine 85th percentile speeds.

The southbound travel speed was 46 miles per hour and the northbound was 44 miles per hour on Hawkes Avenue. Northbound travel speeds south of the site would be slower based on the volumes entering from the NYS Route 9A ramp.

A separate report is provided on sight distance. For sight distance considerations the existing southern access was made an entrance only for the proposed development.

3.0 Capacity Analysis

3.1 Traffic Control Devices

The Local Road Network

The subject site is located in the Town of Ossining, Westchester County, New York, north off of Hawkes Avenue and east of NYS Route 9A. An existing house on the project site has a driveway nearly opposite Woods Brooke Terrace.

Appendix A Figure 1 illustrates the local road network and key intersections in the Project vicinity.

Intersection Analysis

The following intersections were investigated in this traffic study:

1. Kitchawan State Road (NYS Route 134) and Hawkes Avenue
2. NYS Route 9A northbound ramp, Whitetail Circle, and Hawkes Avenue
3. Woods Brooke Terrace and Hawkes Avenue

There are no traffic lights within the study area. All driveways and intersections within the study area are stop controlled, except the Hawkes Avenue right turn channel to Kitchawan is yield controlled.

3.2 Existing Volumes

Traffic Counts

The Existing Conditions evaluation for the proposed project site is based on 2016 traffic counts. The Existing Conditions data form the basis of the year 2018 Future Conditions (future year with and without the proposed action).

Appendix A Figures 2 and 3 provide the existing weekday a.m. and p.m. peak hour traffic volumes, respectively, at the study intersections. Manual counts (Appendix B) for the weekday peak hours were collected on Thursday, January 7, 2016.

Intersection counts were used to ascertain the hour with the greatest traffic volume or "peak hour". The individual peak hours are used in all level of service calculations as they represent the highest volume and therefore typically the worst case traffic condition.

3.3 Future Traffic Without the Project - No Build Traffic Volumes

No Build Traffic

Traffic impact is typically determined by comparing projected future traffic conditions without the project's traffic in the Build Year to the projected traffic conditions with project-generated traffic in the Build Year. In this case, it is expected that construction of the project will be complete within three years, thus traffic expected at the end of the year 2018 is evaluated to assess the No-Build and Build Conditions.

The No-Build Condition is a scenario that establishes a future baseline condition. The No-Build Condition is determined using a number of factors: (1) improvements in the local road network that are planned or underway; (2) traffic from general population growth in the local area; and (3) traffic from identified development projects in the project site vicinity.

Roadway Improvements

No major improvements are programmed in the Transportation Improvement Program through 2018 (New York Metropolitan Transportation Council, http://www.nymtc.org/files/TIP_listing_oct2015/MHS_Oct15.pdf, October 2, 2015). Also the NYMTC's 2014-2040 Regional Transportation Plan, entitled *A Shared Vision for a Sustainable Region*, adopted on September 4, 2013 shows no major improvements on this section of the Route 9A corridor.

Improvements in the US Route 9 Community Emphasis Corridor identified in the Regional Transportation Plan paralleling NYS Route 9A may provide some relief to NYS Route 9A in this area.

Background Growth

To evaluate the impact of the proposed development, traffic projections were prepared for the year when the development would be completed (2018). In determining future traffic volumes, existing traffic volumes are projected forward using a generalized growth factor that accounts for area-wide growth and any other projects that might be in the area.

The No-Build traffic volumes represent future traffic operating conditions without the development of the Project and are a benchmark against which potential project-related traffic impacts can be measured.

A growth rate of two percent (2%) per year cumulative over three years was used as background growth (including other project traffic). This is a conservatively high growth background rate. The NYS Route 9A, as an indicator or actual background growth, has been declining since about 2003 as shown in Table 1.

Table 1 Average Annual Daily Traffic	
Year	Route 9A Traffic Volumes
	(Station 87_ 0624)
2003	39870
2007	35710
2011	34034
2014	33903*

* New York State Department of Transportation (NYS DOT) forecast.
Source: New York State Department of Transportation (NYS DOT) Historical Average Annual Daily Traffic https://www.dot.ny.gov/highway-data-services.

The traffic growth to 2018 was added to the existing volumes, resulting in the No-Build volumes, which are shown in Appendix A Figure 4 and 5.

3.4 Future Traffic With the Project - Build Condition

Trip Generation

The proposed apartment development will consist of 53 dwelling units. The trip generation rates based on *Trip Generation*[1] are computed in Table 2. The trips generated are shown in Table 3.

Capacity Analysis Threshold

The New York State Department of Environmental Conservation (NYS DEC) guidelines suggest use of a threshold of 100 peak hour trips increase in traffic (above No Build Conditions) to be substantial enough to warrant full evaluation of traffic impacts (a capacity analysis) for uncongested locations[2]. The purpose of this threshold is to avoid unnecessary traffic capacity studies where the traffic models are not going to show substantial changes in traffic operations.

Trip generation rates for the proposed apartments are shown in Table 1. Trip generation for the 53 apartments peaks at 46 trips (See Table 2). For the proposed project, the estimated traffic generated will be slightly less than 50 percent of the threshold for a capacity study. In response to the request of the Town's traffic consultant, however, a capacity analysis was conducted.

[1] Institute of Transportation Engineers, Trip Generation 9th edition, Washington, DC, 2012.
[2] The NYS DEC workbook guidelines revised the environmental assessment forms, effective October 7th of 2013 (NYS DEC, SEQR Full Environmental Assessment Forms workbook threshold Question 13).

Table 2
Trip Generation Rates

Land Use {ITE Code}	Trip Rates *						
	Weekday				Weekend		Weekday
	A.M. Peak Hour		P.M. Peak Hour		Saturday Peak Hour		Daily
	In	Out	In	Out	In	Out	Total
Apartments 53 dwelling Units {220}	0.112	0.448	0.574	0.309	0.386	0.386	8.391

* Hourly Trip Generation Rates from Institute of Transportation Engineers Trip Generation 9th edition, 2012.

Saturday distribution estimated at 50% in and 50% out.

Table 3
Site Trip Generation

Land Use {ITE Code}	Trip Generated *									
	Weekday						Weekend			Weekday
	A.M. Peak Hour			P.M. Peak Hour			Saturday Peak Hour			Daily
	In	Out	Total	In	Out	Total	In	Out	Total	Total
Apartments 53 dwelling Units {220}	6	24	30	30	16	46	20	20	40	445

* See Table 1 for trip generation rates.

No reduction taken for removal of existing house on the project site.

Site Trip Distribution

The site generated trips (Table 3) during the peak periods are distributed based on Appendix A Figures 6 and 7. The resultant trips shown in Appendix A Figures 8 and 9. Project trips are added to No Build volumes (Appendix A Figures 4 and 5) to obtain the Build Condition volumes (Appendix A Figures 10 and 11).

The distribution of traffic is not sensitive as a shifting 10 percent of the entering or exiting traffic is only a one to three trip change.

3.5 Levels of Service

Measure of Effectiveness Criteria

The Highway Capacity Manual[3] quantifies the quality of traffic flow in terms of levels of service (LOS). There are six levels of service, with level of service A indicating very low levels of delays and level of service F indicating high levels of delays associated with congestion. These represent a qualitative measure of operational conditions within a traffic stream, and the perception of conditions by motorists and/or passengers.

Levels of service at unsignalized intersections are only calculated for minor movements since the through movement on the major street is not affected by intersection traffic control.
A volume to capacity ratio of "1" means the volume is equal to the theoretical capacity. A volume-to-capacity ratio of one indicates there is not available capacity to handle additional traffic at the intersection and the level of service is consider F.

Level of service E or F is generally considered unacceptable for signalized intersections. Detailed information concerning measures of effectiveness criteria (delay, level of service, and volume to capacity ratios) are provided in Attachment C.

Level of Service Analyses

All intersections operate with all movements at level of service B or better for the Existing, No Build, and Build conditions. The results of the level of service analyses for the study intersections are summarized in Table 4. Level of service calculations are provided in Appendix D.

Capacity analyses performed in this report are consistent with the most recent version of the Highway Capacity Manual[3]. The software used to perform this analysis is Synchro.

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

Table 4
Level of Service Summary All Conditions
Hawkes Avenue Intersections

Intersection Road	Lane Group Approach Direction - Movement	Levels of Service (Delay in Seconds per vehicle) Volume to Capacity Ratio					
		A.M. Weekday Peak Hour			P.M. Weekday Peak Hour		
		Existing	No Build	Build	Existing	No Build	Build
Kitchawan (NYS Route 134) and Hawkes Avenue (unsignalized)							
Kitchawan (Rt 134)	EB - L, T	A (7.5) 0.07	A (7.5) 0.07	A (7.5) 0.07	A (7.6) 0.07	A (7.7) 0.08	A (7.7) 0.09
Hawkes Avenue.	SB - L	B (11.1) 0.13	B (11.4) 0.14	B (11.6) 0.16	B (11.3) 0.08	B (11.6) 0.09	B (12.0) 0.11
	SB - R	A (8.7) 0.06	A (8.8) 0.06	A (8.8) 0.07	A (8.9) 0.05	A (8.9) 0.05	A (8.9) 0.05
NYS Route 9A Northbound Ramp, Whitetail Circle and Hawkes Avenue (unsignalized)							
Hawkes Avenue.	NB - L, T, R	A (0.0) 0.00	A (0.0) 0.00	A (0.0) 0.00	A (7.4) 0.00	A (7.4) 0.00	A (7.4) 0.00
Hawkes Avenue.	SB - L, T, R	A (7.5) 0.02	A (7.5) 0.02	A (7.5) 0.03	A (7.6) 0.01	A (7.6) 0.01	A (7.7) 0.01
Whitetail Circle	EB - L, T, R	B (10.0) 0.02	B (10.1) 0.02	B (10.3) 0.02	B (10.7) 0.01	B (10.8) 0.01	B (11.1) 0.01
NYS Route 9A NB ramp**	EB - L, T, R	A (9.9) 0.02	B (10.0) 0.02	A (9.9) 0.02	A (9.6) 0.11	A (9.7) 0.11	A (9.9) 0.14
Woods Brooke, Southern Site Access, and Hawkes Avenue (unsignalized)							
Hawkes Avenue.	NB - L*, T, R	–	–	A (7.7) 0.00	–	–	A (7.4) 0.02
Hawkes Avenue.	SB - L, T, R*	A (0.0) 0.00	A (0.0) 0.00	A (0.0) 0.00	A (7.5) 0.00	A (7.5) 0.00	A (7.5) 0.00
Woods Brooke	WB - L, R	A (9.7) 0.05	A (9.8) 0.05	B (10.0) 0.06	A (9.6) 0.01	A (9.7) 0.02	B (10.2) 0.02
North Site Access and Hawkes Avenue (unsignalized)							
Hawkes Avenue.	NB - L, T	–	–	A (7.6) 0.01	–	–	A (7.4) 0.00
North Site Access	EB - L, R	–	–	A (9.3) 0.03	–	–	A (8.9) 0.02

NB = Northbound, SB = Southbound, EB = Eastbound, WB = Westbound.
L = left, R= right, T = through, (e.g. WB-L = Westbound left).

* Movement is effectively in the Build Condition only. Northbound is a free movement Existing and No Build Conditions.

** Improvement in a.m. peak hour level of service from B in the No Build Condition to A in the Build Condition is a result of adding low delay right turning traffic.

3.6 Mitigation Measures

No mitigation measures were determined to be necessary and none are proposed as a result of the additional traffic being added to the traffic network.

Restricting the south access to be an entrance only is related to sight distance and not any capacity restriction.

ATTACHMENT A

Traffic Volumes Figures

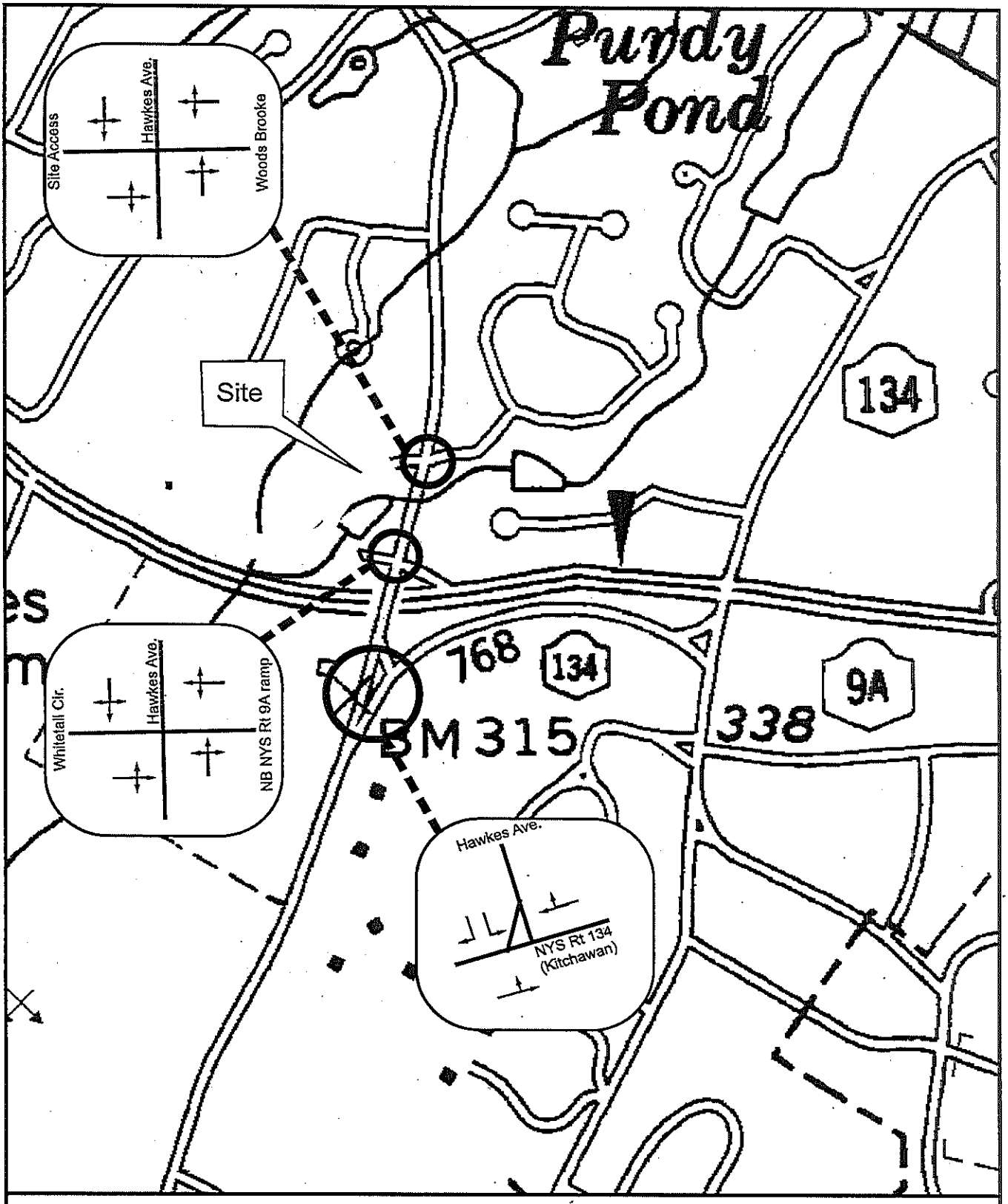

Figure 1: Site Location
Parth Knolls LLC. 87 Hawkes Avenue
Town of Ossining, Westchester County, New York
Base Map: New York State Department of Transportation
Ossining Quadangle
Approx. Scale: 1 inch = 600 feet

File 15015 01/02/16
W:\Hawkes\Figure 1.cdr

Tim Miller Associates, Inc.,10 North Street, Cold Spring, New York 10516 (845) 265-4400 Fax (845) 265-4418

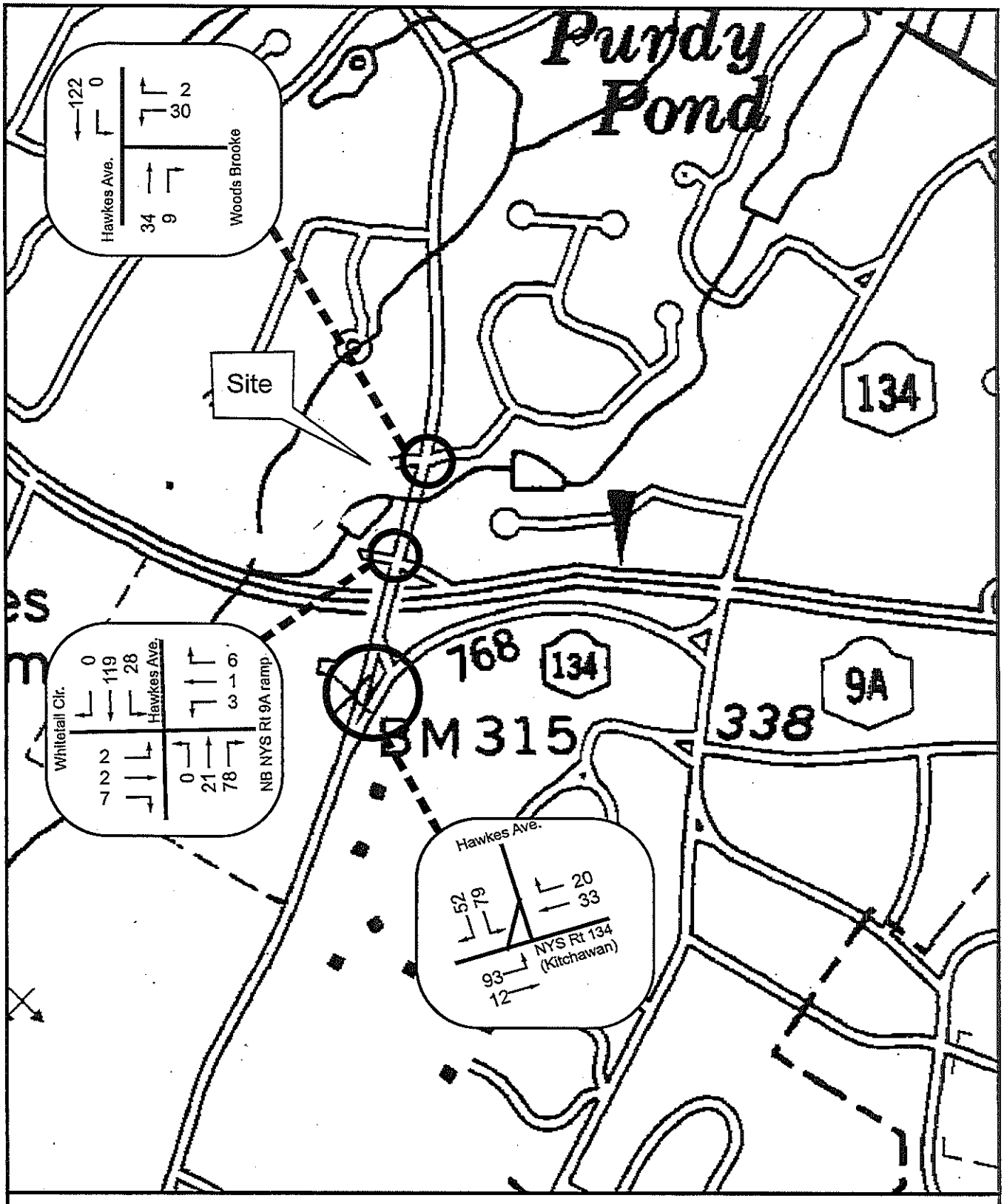

Figure 2: Existing AM Peak Hour Traffic
Parth Knolls LLC. 87 Hawkes Avenue
Town of Ossining, Westchester County, New York
Base Map: New York State Department of Transportation
Ossining Quadangle
Approx. Scale: 1 inch = 600 feet

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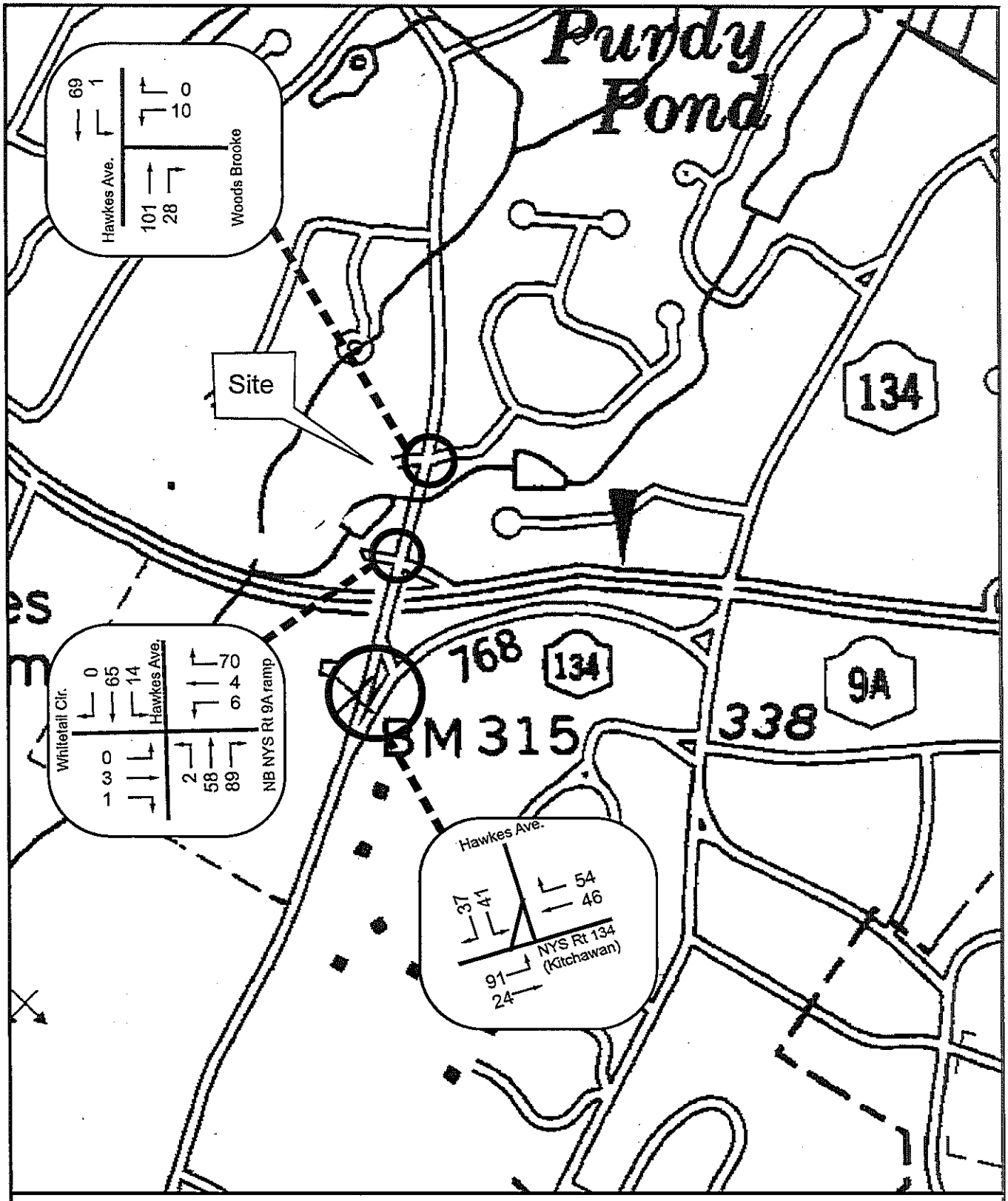

Figure 3: Existing PM Peak Hour Traffic
Parth Knolls LLC. 87 Hawkes Avenue
Town of Ossining, Westchester County, New York
Base Map: New York State Department of Transportation
Ossining Quadangle
Approx. Scale: 1 inch = 600 feet

File 15015 01/02/16
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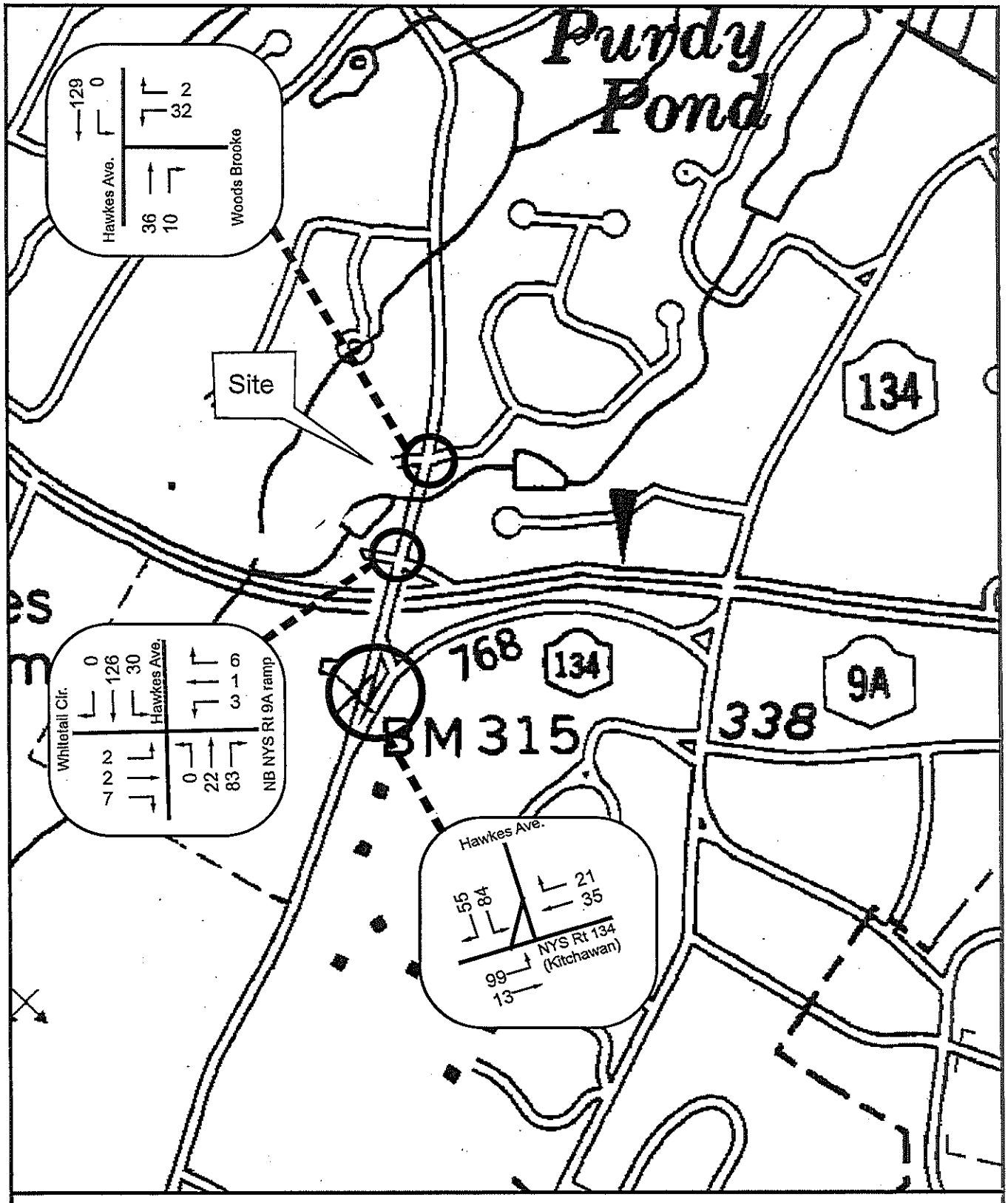

Figure 4: No Build AM Peak Hour Traffic
Parth Knolls LLC. 87 Hawkes Avenue
Town of Ossining, Westchester County, New York
Base Map: New York State Department of Transportation
Ossining Quadangle
Approx. Scale: 1 inch = 600 feet

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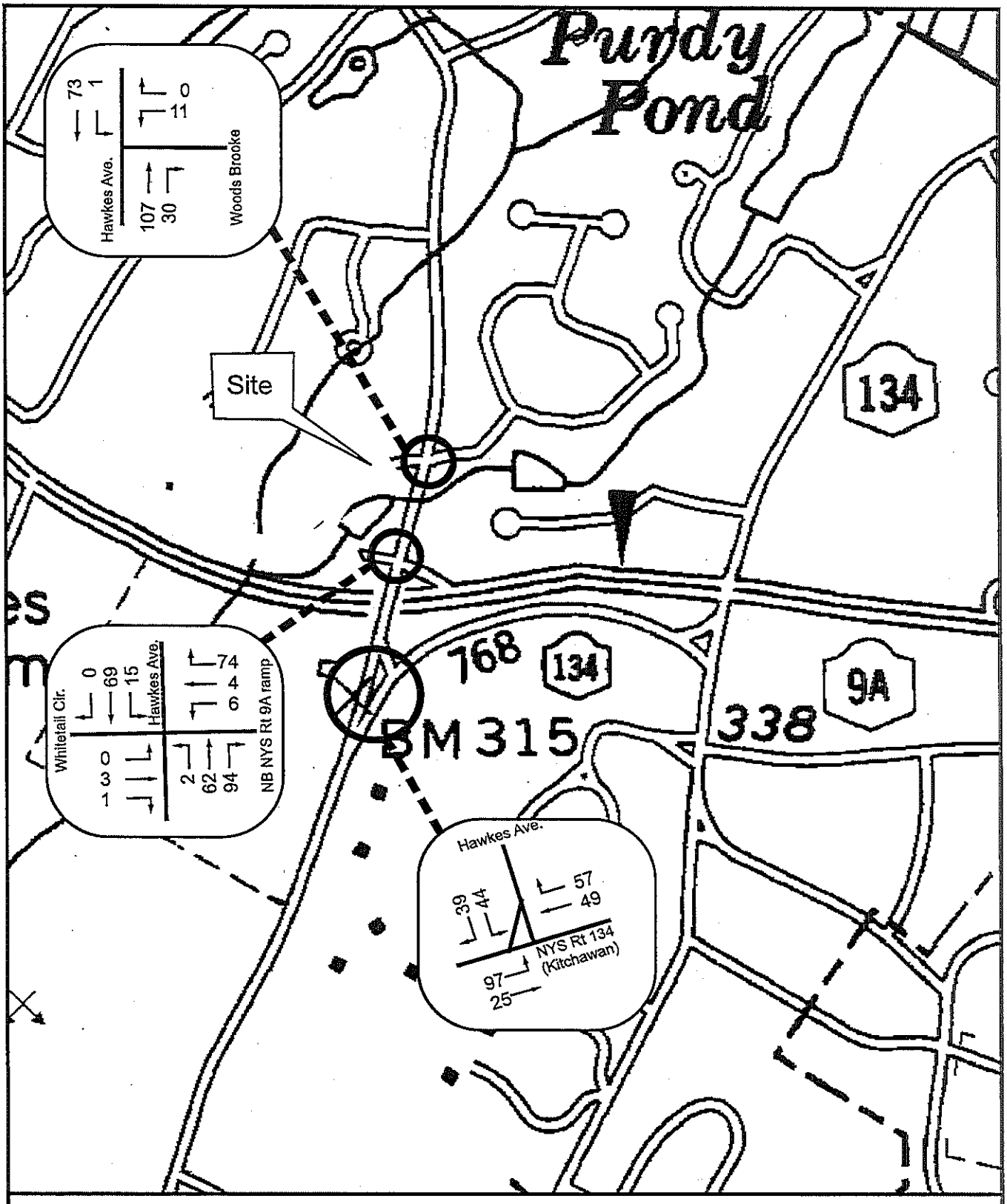

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Figure 5: No Build PM Peak Hour Traffic
Parth Knolls LLC. 87 Hawkes Avenue
Town of Ossining, Westchester County, New York
Base Map: New York State Department of Transportation
Ossining Quadangle
Approx. Scale: 1 inch = 600 feet

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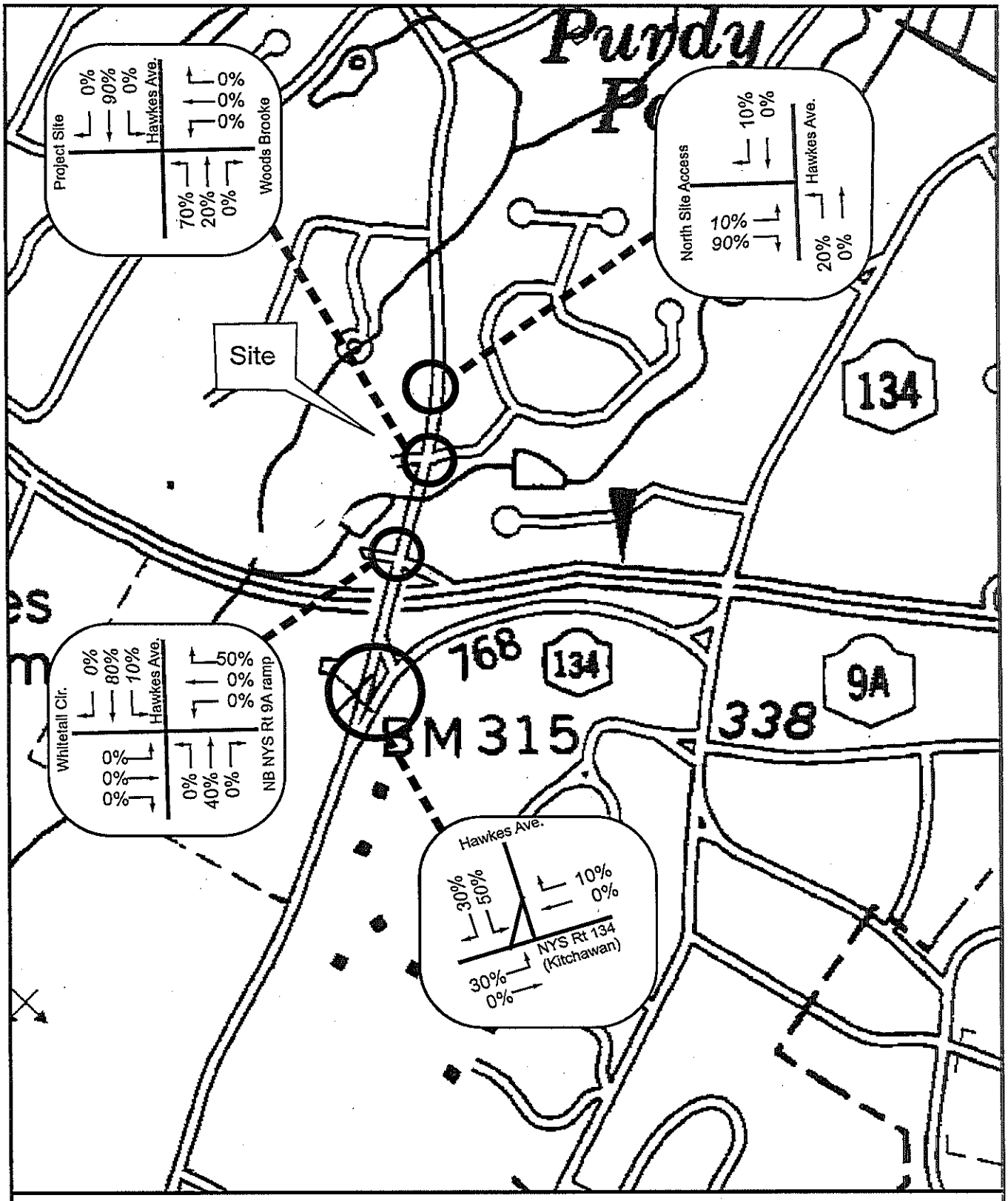

xx% outbound traffic
xx% inbound traffic

Figure 6: Site Distribution AM Peak Hour Traffic
Parth Knolls LLC. 87 Hawkes Avenue
Town of Ossining, Westchester County, New York
Base Map: New York State Department of Transportation
Ossining Quadangle
Approx. Scale: 1 inch = 600 feet

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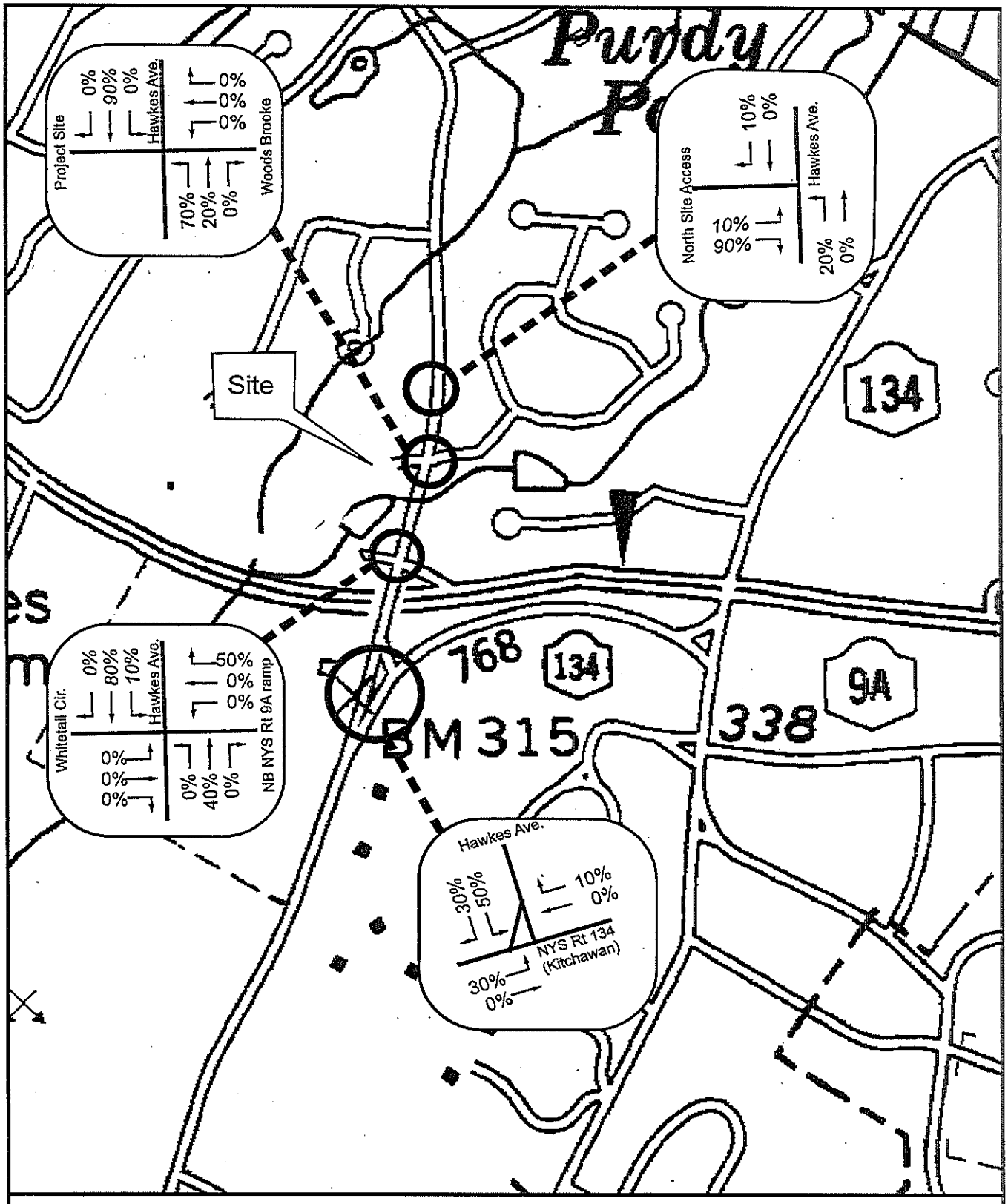

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xx% outbound traffic
xx% inbound traffic

Figure 7: Site Distribution PM Peak Hour Traffic
Parth Knolls LLC. 87 Hawkes Avenue
Town of Ossining, Westchester County, New York
Base Map: New York State Department of Transportation
Ossining Quadangle
Approx. Scale: 1 inch = 600 feet

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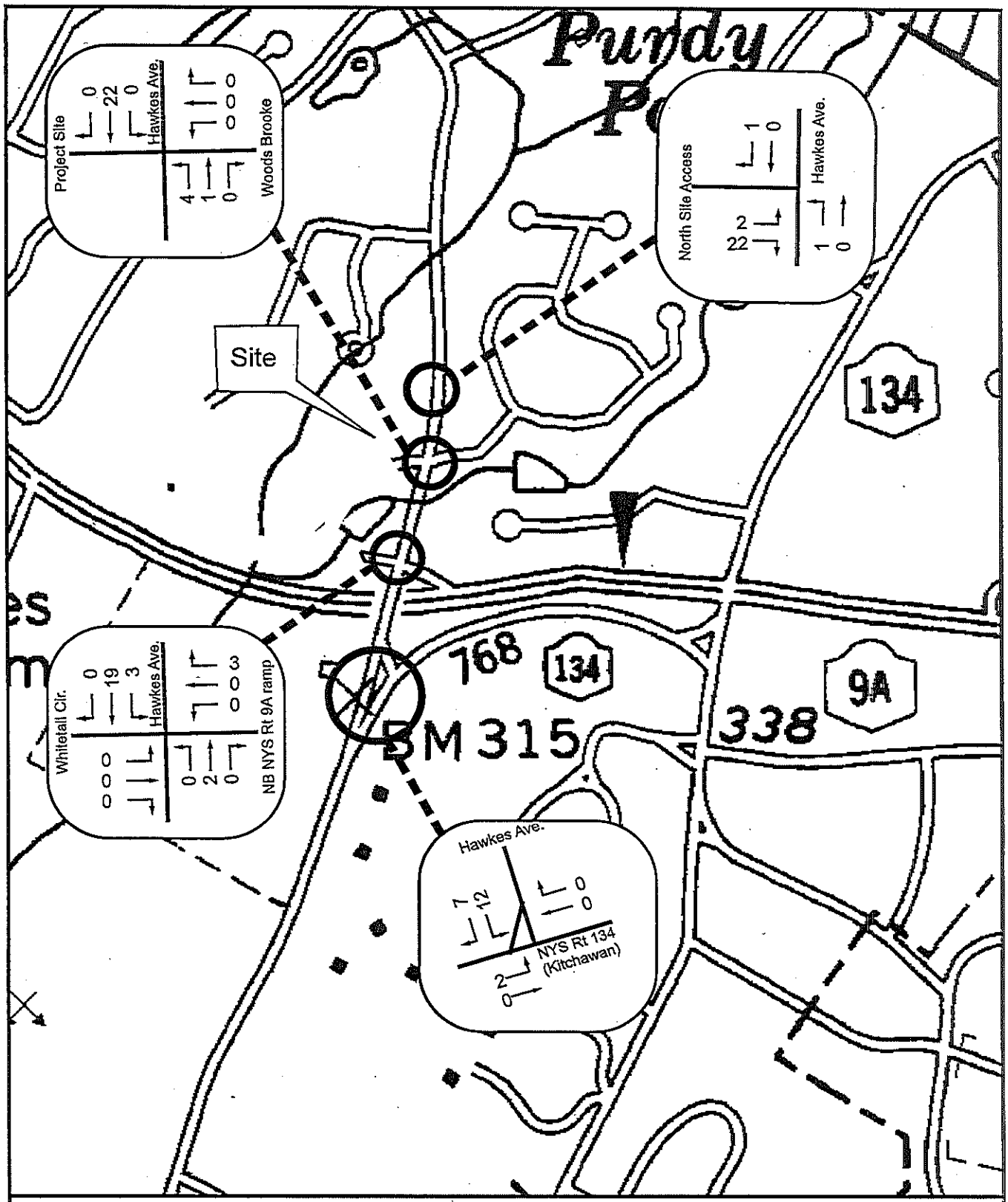

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Figure 8: Site Generated AM Peak Hour Traffic
Parth Knolls LLC. 87 Hawkes Avenue
Town of Ossining, Westchester County, New York
Base Map: New York State Department of Transportation
Ossining Quadangle
Approx. Scale: 1 inch = 600 feet

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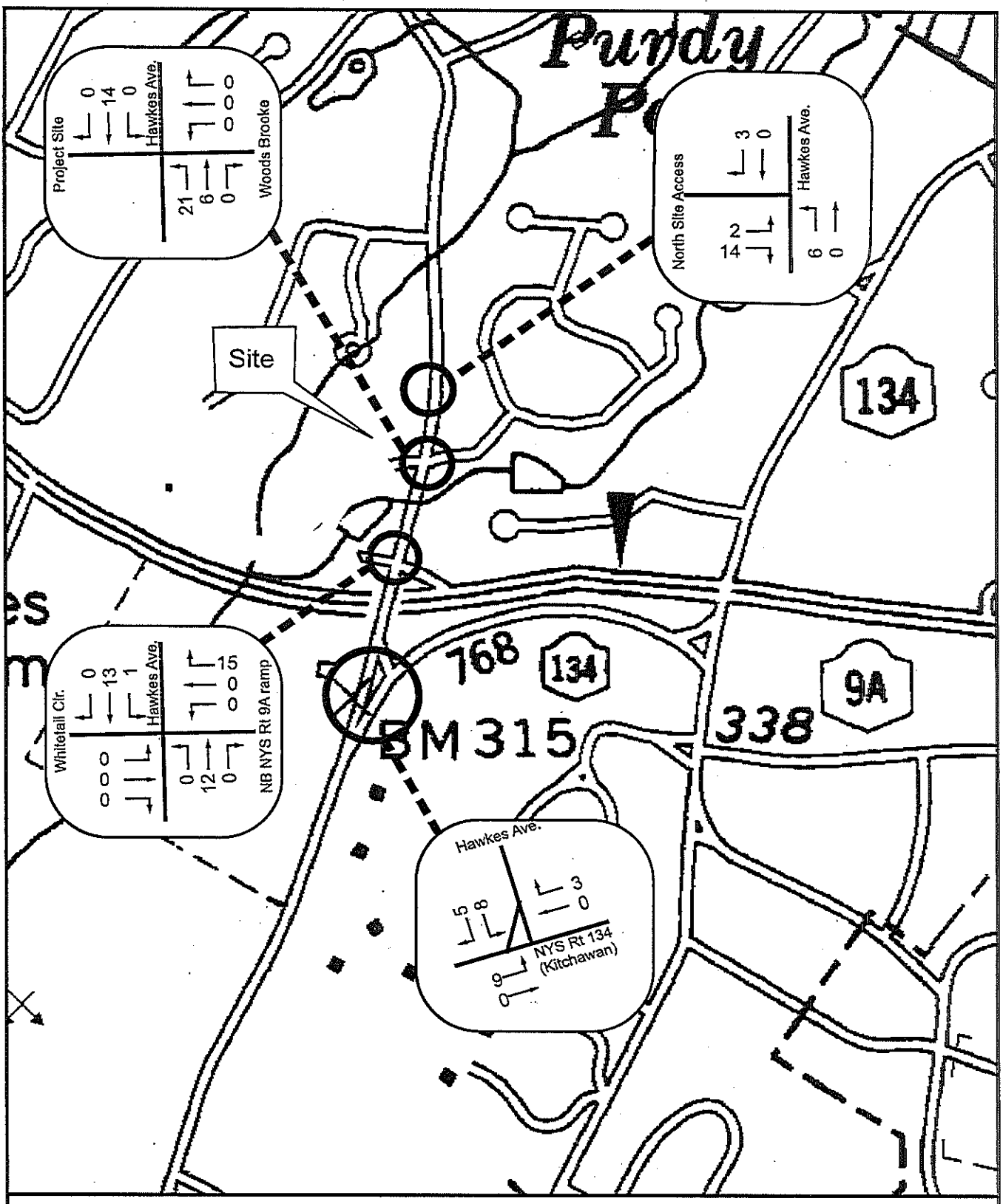

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Figure 9: Site Generated PM Peak Hour Traffic
Parth Knolls LLC. 87 Hawkes Avenue
Town of Ossining, Westchester County, New York
Base Map: New York State Department of Transportation
Ossining Quadangle
Approx. Scale: 1 inch = 600 feet

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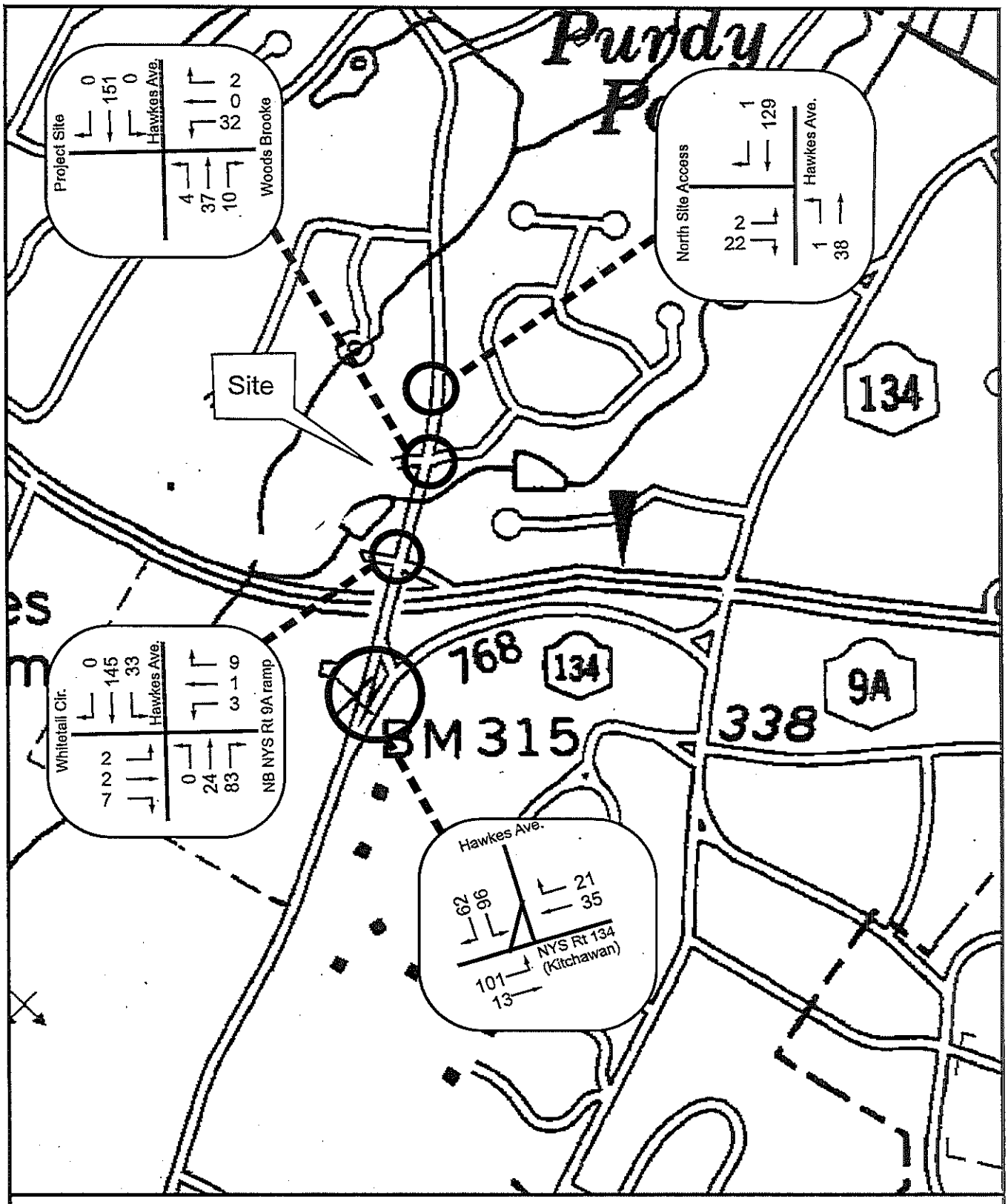

Figure 10: Build AM Peak Hour Traffic
Parth Knolls LLC. 87 Hawkes Avenue
Town of Ossining, Westchester County, New York
Base Map: New York State Department of Transportation
Ossining Quadangle
Approx. Scale: 1 inch = 600 feet

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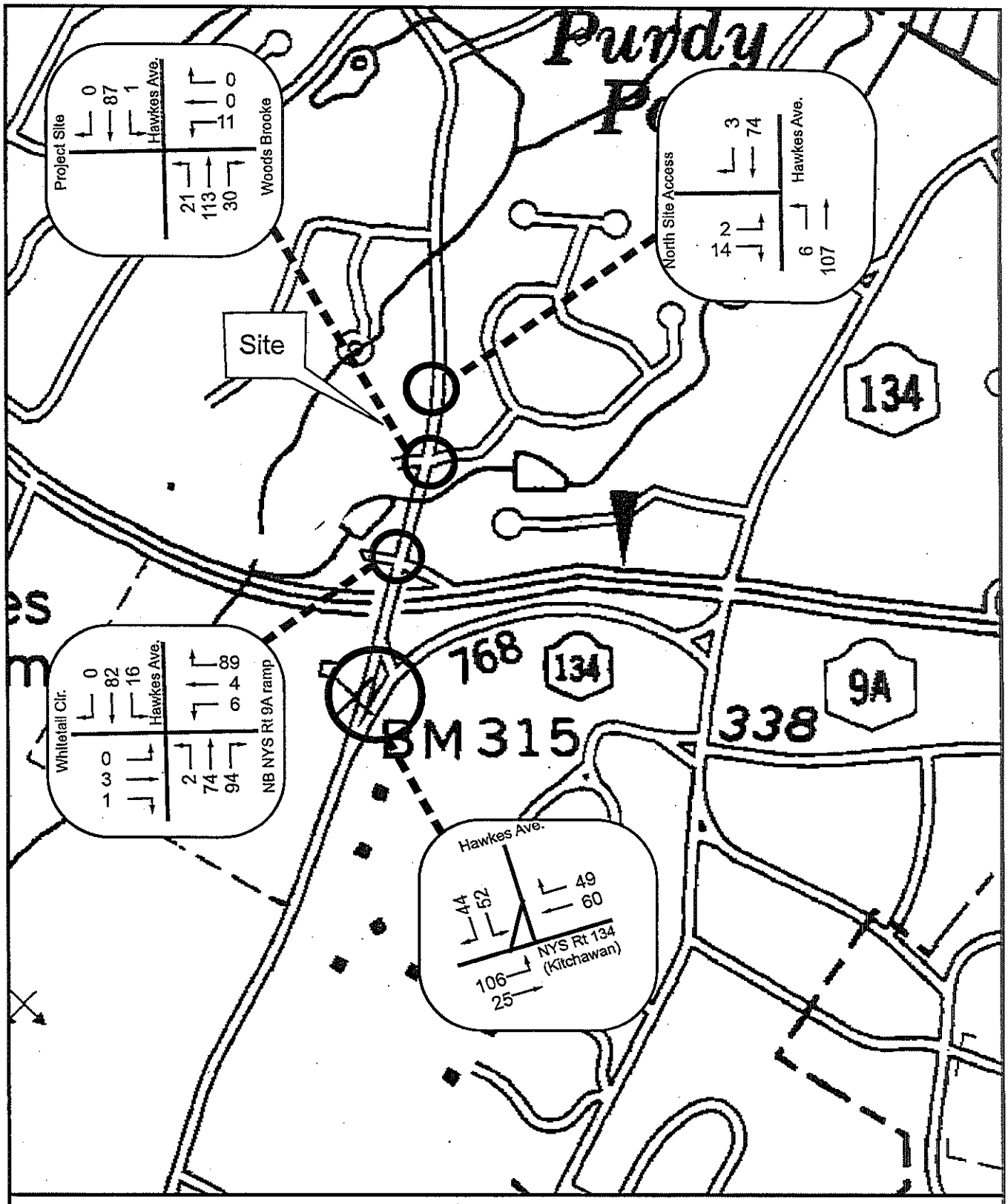

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Figure 11: Build PM Peak Hour Traffic
Parth Knolls LLC. 87 Hawkes Avenue
Town of Ossining, Westchester County, New York
Base Map: New York State Department of Transportation
Ossining Quadangle
Approx. Scale: 1 inch = 600 feet

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ATTACHMENT B

Traffic Counts

WEEKEND PEAK 15 MINUTE COUNTS

PROJECT	Parth Knolls, LLC, 87 Hawkes Avenue	TIM MILLER ASSOCIATES, INC.
LOCATION	Hawkes Avenue and Kitchawan Road	
DATE	Thursday, January 7, 2016	
TIME	7:00 AM to 9:30 AM	

15 Minute Traffic

START TIME	END TIME	Kitchawan Road EB				Kitchawan Road WB				Hawkes Avenue SB								GRAND TOTAL
		left 1	thru 2	right	Total	left	thru 3	right 4	Total	left 5	thru	right 6	Total	left	thru	right	Total	
07:00 AM	07:15 AM	14	5		19		16	7	23	12		10	22					64
07:15 AM	07:30 AM	24	8		32		8	4	12	18		15	33					77
07:30 AM	07:45 AM	22	3		25		9	3	12	13		14	27					64
07:45 AM	08:00 AM	21	0		21		11	7	18	21		12	33					72
08:00 AM	08:15 AM	16	1		17		5	6	11	27		11	38					66
08:15 AM	08:30 AM	13	5		18		6	6	12	22		8	30					60
08:30 AM	08:45 AM	11	7		18		13	2	15	16		11	27					60
08:45 AM	09:00 AM	14	5		19		4	7	11	12		10	22					52
09:00 AM	09:15 AM	13	9		22		10	5	15	14		13	27					64
09:15 AM	09:30 AM	11	11		22		9	6	15	16		9	25					62
TOTAL		159	54		213		91	53	144	171		113	284					641

WEEKEND PEAK HOURLY APPROACH VOLUMES

PROJECT	Parth Knolls, LLC, 87 Hawkes Avenue
LOCATION	Hawkes Avenue and Kitchawan Road
DATE	Thursday, January 7, 2016
TIME	7:00 AM to 9:30 AM

TIM MILLER ASSOCIATES, INC.

HOURLY SUMMARY

START TIME	END TIME	Kitchawan Road EB left 1	thru 2	right	Total	Kitchawan Road WB left	thru 3	right 4	Total	Hawkes Avenue SB left 5	thru	right 6	Total	left	thru	right	Total	GRAND TOTAL
07:00 AM	08:00 AM	81	16		97		44	21	65	64		51	115					277
07:15 AM	08:15 AM	83	12		95		33	20	53	79		52	131					279
07:30 AM	08:30 AM	72	9		81		31	22	53	83		45	128					262
07:45 AM	08:45 AM	61	13		74		35	21	56	86		42	128					258
08:00 AM	09:00 AM	54	18		72		28	21	49	77		40	117					238
08:15 AM	09:15 AM	51	26		77		33	20	53	64		42	106					238
08:30 AM	09:30 AM	49	32		81		36	20	56	58		43	101					238
07:15 AM	08:15 AM	83	12		95		33	20	53	79		52	131					279
Peak 15 Minutes																		77
Peak Hour Factor																		0.91
Trucks					3				1				2					
%trucks					3%				2%				2%					

WEEKEND PEAK 15 MINUTE COUNTS

PROJECT	Parth Knolls, LLC, 87 Hawkes Avenue	TIM MILLER ASSOCIATES, INC.
LOCATION	Hawkes Avenue, Whitetalle Circle, and NB Route 9A ramps	
DATE	Thursday, January 7, 2016	
TIME	7:00 AM to 9:30 AM	

15 Minute Traffic

START TIME	END TIME	Hawkes Avenue SB				Whitetalle Circle EB				Hawkes Avenue NB				NB Route 9A ramps WB				GRAND TOTAL
		left 1	thru 2	right 3	Total	left 4	thru 5	right 6	Total	left 7	thru 8	right 9	Total	left 10	thru 11	right 12	Total	
07:00 AM	07:15 AM	3	19	0	22	0	0	1	1	0	6	20	26	1	0	3	4	53
07:15 AM	07:30 AM	3	28	0	31	0	0	2	2	0	6	19	25	0	0	1	1	59
07:30 AM	07:45 AM	8	23	0	31	1	1	1	3	0	4	21	25	3	0	0	3	62
07:45 AM	08:00 AM	10	30	0	40	0	0	2	2	0	4	22	26	0	1	2	3	71
08:00 AM	08:15 AM	7	38	0	45	1	1	2	4	0	7	16	23	0	0	3	3	75
08:15 AM	08:30 AM	6	29	0	35	0	0	0	0	0	8	12	20	0	0	3	3	58
08:30 AM	08:45 AM	3	26	0	29	0	0	1	1	0	2	11	13	1	0	3	4	47
08:45 AM	09:00 AM	2	19	0	21	0	0	1	1	0	5	16	21	1	0	10	11	54
09:00 AM	09:15 AM	2	21	0	23	0	1	2	3	0	6	12	18	3	0	2	5	49
09:15 AM	09:30 AM	0	23	0	23	0	0	0	0	0	12	7	19	2	0	3	5	47
TOTAL		44	256	0	300	2	3	12	17	0	60	156	216	11	1	30	42	575

WEEKEND PEAK HOURLY APPROACH VOLUMES

PROJECT	Parth Knolls, LLC, 87 Hawkes Avenue	TIM MILLER ASSOCIATES, INC.
LOCATION	Hawkes Avenue, Whitetaile Circle, and NB Route 9A ramps	
DATE	Thursday, January 7, 2016	
TIME	7:00 AM to 9:30 AM	

HOURLY SUMMARY

START TIME	END TIME	Hawkes Avenue SB left 1	thru 2	right 3	Total	Whitetaile Circle EB left 4	thru 5	right 6	Total	Hawkes Avenue NB left 7	thru 8	right 9	Total	NB Route 9A ramps WB left 10	thru 11	right 12	Total	GRAND TOTAL
07:00 AM	08:00 AM	24	100	0	124	1	1	6	8	0	20	82	102	4	1	6	11	245
07:15 AM	08:15 AM	28	119	0	147	2	2	7	11	0	21	78	99	3	1	6	10	267
07:30 AM	08:30 AM	31	120	0	151	2	2	5	9	0	23	71	94	3	1	6	12	266
07:45 AM	08:45 AM	26	123	0	149	1	1	5	7	0	21	61	82	1	1	11	13	251
08:00 AM	09:00 AM	18	112	0	130	1	1	4	6	0	22	55	77	2	0	19	21	234
08:15 AM	09:15 AM	13	95	0	108	0	1	4	5	0	21	51	72	5	0	18	23	208
08:30 AM	09:30 AM	7	89	0	96	0	1	4	5	0	25	46	71	7	0	18	25	197
07:15 AM	08:15 AM	28	119	0	147	2	2	7	11	0	21	78	99	3	1	6	10	267
Peak 15 Minutes																		75
Peak Hour Factor																		0.89
Trucks					3				1				2				2	
%trucks					2%				9%				2%				20%	

WEEKEND PEAK 15 MINUTE COUNTS

PROJECT	Parth Knolls, LLC, 87 Hawkes Avenue	TIM MILLER ASSOCIATES, INC.
LOCATION	Hawkes Avenue and Woods Brooke Terrace	
DATE	Thursday, January 7, 2016	
TIME	7:00 AM to 9:30 AM	

15 Minute Traffic

START TIME	END TIME	Hawkes Avenue NB left	thru 1	right 2	Total	Woods Brooke Terrace WB left 3	thru	right 4	Total	Hawkes Avenue SB left 5	thru 6	right	Total	left	thru	right	Total	GRAND TOTAL
07:00 AM	07:15 AM		6	2	8	6		0	6	0	20		20					34
07:15 AM	07:30 AM		5	2	7	6		2	8	1	24		25					40
07:30 AM	07:45 AM		3	1	4	8		0	8	0	22		22					34
07:45 AM	08:00 AM		5	1	6	5		1	6	0	31		31					43
08:00 AM	08:15 AM		7	5	12	11		0	11	0	37		37					60
08:15 AM	08:30 AM		19	2	21	6		1	7	0	32		32					60
08:30 AM	08:45 AM		3	2	5	6		1	7	0	21		21					33
08:45 AM	09:00 AM		14	1	15	5		0	5	0	17		17					37
09:00 AM	09:15 AM		9	2	11	5		0	5	0	17		17					33
09:15 AM	09:30 AM		8	3	11	6		0	6	0	15		15					32
TOTAL			79	21	100	64		5	69	1	236		237					406

WEEKEND PEAK HOURLY APPROACH VOLUMES

PROJECT	Parth Knolls, LLC, 87 Hawkes Avenue
LOCATION	Hawkes Avenue and Woods Brooke Terrace
DATE	Thursday, January 7, 2016
TIME	7:00 AM to 9:30 AM

TIM MILLER ASSOCIATES, INC.

HOURLY SUMMARY

START TIME	END TIME	Hawkes Avenue NB left (1)	Hawkes Avenue NB thru (2)	Hawkes Avenue NB right	Hawkes Avenue NB Total	Woods Brooke Terrace WB left (3)	Woods Brooke Terrace WB thru	Woods Brooke Terrace WB right (4)	Woods Brooke Terrace WB Total	Hawkes Avenue SB left (5)	Hawkes Avenue SB thru (6)	Hawkes Avenue SB right	Hawkes Avenue SB Total	left	thru	right	Total	GRAND TOTAL
07:00 AM	08:00 AM		19	6	25	25		3	28	1	97		98					151
07:15 AM	08:15 AM		20	9	29	30		3	33	1	114		115					177
07:30 AM	08:30 AM		34	9	43	30		2	32	0	122		122					197
07:45 AM	08:45 AM		34	10	44	28		3	31	0	121		121					196
08:00 AM	09:00 AM		43	10	53	28		2	30	0	107		107					190
08:15 AM	09:15 AM		45	7	52	22		2	24	0	87		87					163
08:30 AM	09:30 AM		34	8	42	22		1	23	0	70		70					135
07:30 AM	08:30 AM		34	9	43	30		2	32	0	122		122					197
Peak 15 Minutes																		60
Peak Hour Factor																		0.82
Trucks					4				1				4					
%trucks					9%				3%				3%					

WEEKEND PEAK 15 MINUTE COUNTS

PROJECT	Parth Knolls, LLC, 87 Hawkes Avenue	TIM MILLER ASSOCIATES, INC.
LOCATION	Hawkes Avenue and Kitchawan Road	
DATE	Thursday, January 7, 2016	
TIME	3:30 PM to 6:30 PM	

15 Minute Traffic

START TIME	END TIME	Kitchawan Road EB				Kitchawan Road WB				Hawkes Avenue SB								GRAND TOTAL
		left 1	thru 2	right	Total	left	thru 3	right 4	Total	left 5	thru	right 6	Total	left	thru	right	Total	
03:30 PM	03:45 PM	16	2		18		9	10	19	3		13	16					53
03:45 PM	04:00 PM	33	16		49		11	12	23	9		10	19					91
04:00 PM	04:15 PM	11	6		17		6	18	24	7		7	14					55
04:15 PM	04:30 PM	18	8		26		9	17	26	15		6	21					73
04:30 PM	04:45 PM	22	8		30		9	10	19	8		6	14					63
04:45 PM	05:00 PM	34	3		37		13	14	27	12		10	22					86
05:00 PM	05:15 PM	17	5		22		15	13	28	6		15	21					71
05:15 PM	05:30 PM	22	6		28		5	16	21	13		6	19					68
05:30 PM	05:45 PM	19	5		24		6	15	21	11		3	14					59
05:45 PM	06:00 PM	22	6		28		4	15	19	12		4	16					63
06:00 PM	06:15 PM	20	4		24		5	12	17	10		4	14					55
06:15 PM	06:30 PM	18	5		23		4	11	15	9		2	11					49
TOTAL		252	74		326		96	163	259	115		86	201					786

WEEKEND PEAK HOURLY APPROACH VOLUMES

PROJECT	Parth Knolls, LLC, 87 Hawkes Avenue
LOCATION	Hawkes Avenue and Kitchawan Road
DATE	Thursday, January 7, 2016
TIME	3:30 PM to 6:30 PM

TIM MILLER ASSOCIATES, INC.

HOURLY SUMMARY

START TIME	END TIME	Kitchawan Road EB left 1	thru 2	right	Total	Kitchawan Road WB left	thru 3	right 4	Total	Hawkes Avenue SB left 5	thru	right 6	Total	left	thru	right	Total	GRAND TOTAL
03:30 PM	04:30 PM	78	32		110		35	57	92	34		36	70					272
03:45 PM	04:45 PM	84	38		122		35	57	92	39		29	68					282
04:00 PM	05:00 PM	85	25		110		37	59	96	42		29	71					277
04:15 PM	**05:15 PM**	**91**	**24**		**115**		**46**	**54**	**100**	**41**		**37**	**78**					**293**
04:30 PM	05:30 PM	95	22		117		42	53	95	39		37	76					288
04:45 PM	05:45 PM	92	19		111		39	58	97	42		34	76					284
05:00 PM	06:00 PM	80	22		102		30	59	89	42		28	70					261
05:15 PM	06:15 PM	83	21		104		20	58	78	46		17	63					245
05:30 PM	06:30 PM	79	20		99		19	53	72	42		13	55					226
04:15 PM	**05:15 PM**	**91**	**24**		**115**		**46**	**54**	**100**	**41**		**37**	**78**					**293**
Peak 15 Minutes																		86
Peak Hour Factor																		0.85
Trucks					1				1				1					
%trucks					1%				1%				1%					

WEEKEND PEAK 15 MINUTE COUNTS

PROJECT	Parth Knolls, LLC, 87 Hawkes Avenue	TIM MILLER ASSOCIATES, INC.
LOCATION	Hawkes Avenue, Whitetaile Circle, and NB Route 9A ramps	
DATE	Thursday, January 7, 2016	
TIME	3:30 PM to 6:30 PM	

15 Minute Traffic

START TIME	END TIME	Hawkes Avenue SB				Whitetaile Circle EB				Hawkes Avenue NB				NB Route 9A ramps WB				GRAND TOTAL
		left 1	thru 2	right 3	Total	left 4	thru 5	right 6	Total	left 7	thru 8	right 9	Total	left 10	thru 11	right 12	Total	
03:30 PM	03:45 PM	4	12	0	16	0	0	1	1	0	11	15	26	6	0	9	15	58
03:45 PM	04:00 PM	3	19	0	22	0	1	0	1	2	17	27	46	2	1	14	17	86
04:00 PM	04:15 PM	2	10	0	12	0	0	0	0	3	15	10	28	1	2	10	13	53
04:15 PM	04:30 PM	2	17	0	19	0	0	2	2	0	18	17	35	4	1	11	16	72
04:30 PM	04:45 PM	2	12	0	14	0	0	1	1	1	10	21	32	1	0	9	10	57
04:45 PM	05:00 PM	3	19	0	22	0	1	1	2	1	21	26	48	1	2	16	19	91
05:00 PM	05:15 PM	5	16	0	21	0	1	0	1	0	10	20	30	3	1	17	21	73
05:15 PM	05:30 PM	3	17	0	20	0	0	0	0	1	14	21	36	2	1	20	23	79
05:30 PM	05:45 PM	3	13	0	16	0	1	0	1	0	13	22	35	0	0	17	17	69
05:45 PM	06:00 PM	2	15	0	17	0	0	0	0	0	15	22	37	1	0	15	16	70
06:00 PM	06:15 PM	2	12	0	14	0	0	1	1	0	11	21	32	1	1	15	17	64
06:15 PM	06:30 PM	2	9	0	11	0	0	1	1	0	10	20	30	0	0	10	10	52
TOTAL		33	171	0	204	0	4	7	11	8	165	242	415	22	9	163	194	824

WEEKEND PEAK HOURLY APPROACH VOLUMES

PROJECT	Parth Knolls, LLC, 87 Hawkes Avenue	TIM MILLER ASSOCIATES, INC.
LOCATION	Hawkes Avenue, Whitetaile Circle, and NB Route 9A ramps	
DATE	Thursday, January 7, 2016	
TIME	3:30 PM to 6:30 PM	

HOURLY SUMMARY

START TIME	END TIME	Hawkes Avenue SB left 1	thru 2	right 3	Total	Whitetaile Circle EB left 4	thru 5	right 6	Total	Hawkes Avenue NB left 7	thru 8	right 9	Total	NB Route 9A ramps WB left 10	thru 11	right 12	Total	GRAND TOTAL
03:30 PM	04:30 PM	11	58	0	69	0	1	3	4	5	61	69	135	13	4	44	61	269
03:45 PM	04:45 PM	9	58	0	67	0	1	3	4	6	60	75	141	8	4	44	56	268
04:00 PM	05:00 PM	9	58	0	67	0	1	4	5	5	64	74	143	7	5	46	58	273
04:15 PM	05:15 PM	12	64	0	76	0	2	4	6	2	59	84	145	9	4	53	66	293
04:30 PM	05:30 PM	13	64	0	77	0	2	2	4	3	55	88	146	7	4	62	73	300
04:45 PM	**05:45 PM**	**14**	**65**	**0**	**79**	**0**	**3**	**1**	**4**	**2**	**58**	**89**	**149**	**6**	**4**	**70**	**80**	**312**
05:00 PM	06:00 PM	13	61	0	74	0	2	0	2	1	52	85	138	6	2	69	77	291
05:15 PM	06:15 PM	10	57	0	67	0	1	1	2	1	53	86	140	4	2	67	73	282
05:30 PM	06:30 PM	9	49	0	58	0	1	2	3	0	49	85	134	2	1	57	60	255
04:45 PM	**05:45 PM**	**14**	**65**	**0**	**79**	**0**	**3**	**1**	**4**	**2**	**58**	**89**	**149**	**6**	**4**	**70**	**80**	**312**
Peak 15 Minutes																		**91**
Peak Hour Factor																		**0.86**
Trucks					3				0				3				1	
%trucks					4%				0%				2%				1%	

WEEKEND PEAK 15 MINUTE COUNTS

PROJECT	Parth Knolls, LLC, 87 Hawkes Avenue	TIM MILLER ASSOCIATES, INC.
LOCATION	Hawkes Avenue and Woods Brooke Terrace	
DATE	Thursday, January 7, 2016	
TIME	3:30 PM to 6:30 PM	

15 Minute Traffic

START TIME	END TIME	Hawkes Avenue NB				Woods Brooke Terrace WB				Hawkes Avenue SB								GRAND TOTAL
		left	thru 1	right 2	Total	left 3	thru	right 4	Total	left 5	thru 6	right	Total	left	thru	right	Total	
03:30 PM	03:45 PM		19	2	21	3		1	4	0	10		10					35
03:45 PM	04:00 PM		25	4	29	4		0	4	1	19		20					53
04:00 PM	04:15 PM		22	6	28	2		0	2	0	9		9					39
04:15 PM	04:30 PM		20	6	26	7		0	7	1	14		15					48
04:30 PM	04:45 PM		18	7	25	3		0	3	1	10		11					39
04:45 PM	05:00 PM		23	9	32	3		0	3	0	20		20					55
05:00 PM	05:15 PM		24	7	31	2		0	2	1	20		21					54
05:15 PM	05:30 PM		30	6	36	3		0	3	0	15		15					54
05:30 PM	05:45 PM		24	6	30	2		0	2	0	14		14					46
05:45 PM	06:00 PM		25	5	30	3		0	3	0	14		14					47
06:00 PM	06:15 PM		21	5	26	2		0	2	0	12		12					40
06:15 PM	06:30 PM		18	2	20	1		0	1	0	10		10					31
TOTAL			269	65	334	35		1	36	4	167		171					541

WEEKEND PEAK HOURLY APPROACH VOLUMES

PROJECT	Parth Knolls, LLC, 87 Hawkes Avenue	TIM MILLER ASSOCIATES, INC.
LOCATION	Hawkes Avenue and Woods Brooke Terrace	
DATE	Thursday, January 7, 2016	
TIME	3:30 PM to 6:30 PM	

HOURLY SUMMARY

START TIME	END TIME	Hawkes Avenue NB left	thru 1	right 2	Total	Woods Brooke Terrace WB left	thru	right 4	Total	Hawkes Avenue SB left 5	thru 6	right	Total	left	thru	right	Total	GRAND TOTAL
03:30 PM	04:30 PM		86	18	104	16		1	17	2	52		54					175
03:45 PM	04:45 PM		85	23	108	16		0	16	3	52		55					179
04:00 PM	05:00 PM		83	28	111	15		0	15	2	53		55					181
04:15 PM	05:15 PM		85	29	114	15		0	15	3	64		67					196
04:30 PM	05:30 PM		95	29	124	11		0	11	2	65		67					202
04:45 PM	**05:45 PM**		**101**	**28**	**129**	**10**		**0**	**10**	**1**	**69**		**70**					**209**
05:00 PM	06:00 PM		103	24	127	10		0	10	1	63		64					201
05:15 PM	06:15 PM		100	22	122	10		0	10	0	55		55					187
05:30 PM	06:30 PM		88	18	106	8		0	8	0	50		50					164
04:45 PM	**05:45 PM**		**101**	**28**	**129**	**10**		**0**	**10**	**1**	**69**		**70**					**209**
Peak 15 Minutes																		55
Peak Hour Factor																		0.95
Trucks					0				1				2					
%trucks					0%				10%				3%					

ATTACHMENT C

Level of Service Criteria

Traffic: Performance Measures

Introduction

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

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

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

The Highway Capacity Manual[3] describes the level of service criteria as:

> *Level of service for two way stop controlled intersections is determined by the computed or measure control delay. For motor vehicles, level of service is determined for each minor-street movement (or shared movement) as well as major-street left turns by using criteria given in Exhibit 19-1 . Level of service is not defined for the intersection as a whole or for the major street-street approaches for three primary reasons: (a) major-street through vehicles are assumed to experience zero delay; (b) the disproportionate number of major-street through vehicles at a typical two way stopped controlled intersection skews the weighted average of all movements, resulting in a very low overall average delay for all vehicles; and (c) the resulting low delay can mask important level of service deficiencies for minor movements. As Exhibit 19-1 notes, level of service is assigned to the movements if the volume-to-capacity ratio for the movement exceeds 1.0, regardless of the control delay.*
>
> *The level of service criteria for two-way stop-controlled intersections are somewhat different from the criteria used in Chapter 18 for signalized intersections, primarily because user perceptions differ among transportation facility types. the expectation is that a signalized intersection is designed to carry higher traffic volumes and will present greater delay than unsignalized intersection. Unsignalized intersections are also associated with more uncertainty for users, as delays are less predictable than they are at signals, which can reduce user's delay tolerance.*

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

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

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

The Highway Capacity Manual[4] includes the following concerning level of service F at two-way stop-controlled intersection lane groups:

> *Level of service F occurs when there are not enough gaps of suitable size to allow minor street vehicles to enter or cross through traffic on the major-street, resulting in long average control delays (greater than 50 seconds per vehicle). Depending on the demand on the approach, long queues on the minor approaches may result....*
>
> *Level of service F may also appear in the form of drivers on the minor street selecting smaller-than-usual gaps...*
>
> *Even with a level of service F estimate, most low-volume minor-street approaches would not meet any of the Manual on Uniform Traffic Control Devices volume or delay warrants for signalization...*
>
> *In some cases, the delay equations predict delays greater than 50 seconds for minor -street movements under very low volumes conditions on the minor street (fewer than 25 vehicles per hour). On the basis of the first term of the delay equation, the level of service F threshold is reached with a movement capacity of approximately 85 vehicles per hour or less, regardless of the minor-street movement volume.*

Two-Way Stop Controlled (Unsignalized) Intersections
Level of Service Criteria Automobile Mode For Lane Groups

Average Control Delay (Seconds Per Vehicle)	Volume-to-capacity Ratio less than or equal to one **Level of Service**	Volume-to-capacity Ratio greater than one **Level of Service**
less than or equal to 10	A	F
greater than 10 and less than or equal to 15	B	F
greater than 15 and less than or equal to 25	C	F
greater than 25 and less than or equal to 35	D	F
greater than 35 and less than or equal to 50	E	F
greater than 50	F	F

Modified from Transportation Research Board of the National Academies, HCM 2010 Highway Capacity Manual, Washington D.C., Volume 3 page 19-2, Exhibit 19-1, 2010. Abbreviations and mathematical symbols have been replaced for reader clarity.
Level of service is not calculated for major street approaches or for the intersection as a whole.
Major Street through vehicles are assumed to experience no delay.

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

ATTACHMENT D

Capacity Analysis

Intersection	
Int Delay, s/veh	7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	93	12	33	20	79	52
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	Yeild
Storage Length	-	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	3	3	-	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	3	3	2	2	2	2
Mvmt Flow	102	13	36	22	87	57

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	58	0	-	0	265	47
Stage 1	-	-	-	-	47	-
Stage 2	-	-	-	-	218	-
Critical Hdwy	4.13	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.227	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1540	-	-	-	724	1022
Stage 1	-	-	-	-	975	-
Stage 2	-	-	-	-	818	-
Platoon blocked, %						
Mov Cap-1 Maneuver	1540	-	-	-	675	1022
Mov Cap-2 Maneuver	-	-	-	-	675	-
Stage 1	-	-	-	-	975	-
Stage 2	-	-	-	-	763	-

Approach	EB	WB	SB
HCM Control Delay, s	6.6	0	10.1
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1540	-	-	-	675	1022
HCM Lane V/C Ratio	0.066	-	-	-	0.129	0.056
HCM Control Delay (s)	7.5	0	-	-	11.1	8.7
HCM Lane LOS	A	A	-	-	B	A
HCM 95th %tile Q(veh)	0.2	-	-	-	0.4	0.2

HCM 2010 TWSC
5: Hawkes Av./Hawkes Ave. & Rt 9A NB ramp

Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR
Vol, veh/h	2	2	7	3	1	6	0	21	78
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-
Grade, %	-	5	-	-	5	-	-	5	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	9	9	9	20	20	20	2	2	2
Mvmt Flow	2	2	8	3	1	7	0	24	88

Major/Minor	Minor2			Minor1			Major1		
Conflicting Flow All	268	308	134	269	264	67	134	0	0
Stage 1	197	197	-	67	67	-	-	-	-
Stage 2	71	111	-	202	197	-	-	-	-
Critical Hdwy	8.19	7.59	6.79	8.3	7.7	6.9	4.12	-	-
Critical Hdwy Stg 1	7.19	6.59	-	7.3	6.7	-	-	-	-
Critical Hdwy Stg 2	7.19	6.59	-	7.3	6.7	-	-	-	-
Follow-up Hdwy	3.581	4.081	3.381	3.68	4.18	3.48	2.218	-	-
Pot Cap-1 Maneuver	622	546	880	602	569	940	1451	-	-
Stage 1	747	686	-	884	790	-	-	-	-
Stage 2	904	766	-	719	668	-	-	-	-
Platoon blocked, %								-	-
Mov Cap-1 Maneuver	606	533	880	584	556	940	1451	-	-
Mov Cap-2 Maneuver	606	533	-	584	556	-	-	-	-
Stage 1	747	670	-	884	790	-	-	-	-
Stage 2	896	766	-	694	653	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	10	9.9	0
HCM LOS	B	A	

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1451	-	-	733	751	1479	-	-
HCM Lane V/C Ratio	-	-	-	0.017	0.015	0.021	-	-
HCM Control Delay (s)	0	-	-	10	9.9	7.5	0	-
HCM Lane LOS	A	-	-	B	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0	0.1	-	-

Intersection			
Int Delay, s/veh			

Movement	SBL	SBT	SBR
Vol, veh/h	28	119	0
Conflicting Peds, #/hr	0	0	0
Sign Control	Free	Free	Free
RT Channelized	-	-	None
Storage Length	-	-	-
Veh in Median Storage, #	-	0	-
Grade, %	-	5	-
Peak Hour Factor	89	89	89
Heavy Vehicles, %	2	2	2
Mvmt Flow	31	134	0

Major/Minor	Major2		
Conflicting Flow All	111	0	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.12	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.218	-	-
Pot Cap-1 Maneuver	1479	-	-
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	1479	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	SB
HCM Control Delay, s	1.4
HCM LOS	

Minor Lane/Major Mvmt	

Intersection	
Int Delay, s/veh	1.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	30	2	34	9	0	122
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0		8			4
Peak Hour Factor	82	82	82	82	82	82
Heavy Vehicles, %	3	3	9	9	3	3
Mvmt Flow	37	2	41	11	0	149

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	196	47	0	0	52	0
Stage 1	47	-	-	-	-	-
Stage 2	149	-	-	-	-	-
Critical Hdwy	6.43	6.23	-	-	4.13	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.527	3.327	-	-	2.227	-
Pot Cap-1 Maneuver	790	1019	-	-	1548	-
Stage 1	973	-	-	-	-	-
Stage 2	876	-	-	-	-	-
Platoon blocked, %			-	-		
Mov Cap-1 Maneuver	790	1019	-	-	1548	-
Mov Cap-2 Maneuver	790					
Stage 1	973	-	-	-	-	-
Stage 2	876		-	-		

Approach	WB	NB	SB
HCM Control Delay, s	9.7	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	801	1548	-
HCM Lane V/C Ratio			0.049		
HCM Control Delay (s)	-	-	9.7	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	0.2	0	-

Intersection	
Int Delay, s/veh	5.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	91	24	46	54	41	37
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	Yeild
Storage Length	-	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	3	3	-	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	107	28	54	64	48	44

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	118	0	-	0	328	86
Stage 1	-	-	-	-	86	-
Stage 2	-	-	-	-	242	-
Critical Hdwy	4.11	-	-	-	6.41	6.21
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	2.209	-	-	-	3.509	3.309
Pot Cap-1 Maneuver	1476	-	-	-	668	976
Stage 1	-	-	-	-	940	-
Stage 2	-	-	-	-	801	-
Platoon blocked, %						
Mov Cap-1 Maneuver	1476	-	-	-	619	976
Mov Cap-2 Maneuver	-	-	-	-	619	-
Stage 1	-	-	-	-	940	-
Stage 2	-	-	-	-	742	-

Approach	EB	WB	SB
HCM Control Delay, s	6	0	10.2
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1476	-	-	-	619	976
HCM Lane V/C Ratio	0.073	-	-	-	0.078	0.045
HCM Control Delay (s)	7.6	0	-	-	11.3	8.9
HCM Lane LOS	A	A			B	A
HCM 95th %tile Q(veh)	0.2	-	-	-	0.3	0.1

Intersection	
Int Delay, s/veh	3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR
Vol, veh/h	0	3	1	6	4	70	2	58	89
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-
Grade, %	-	5	-	-	5	-	-	5	-
Peak Hour Factor	86	86	86	86	86	86	86	86	86
Heavy Vehicles, %	0	0	0	1	1	1	2	2	2
Mvmt Flow	0	3	1	7	5	81	2	67	103

Major/Minor	Minor2			Minor1			Major1		
Conflicting Flow All	275	284	76	234	232	119	76	0	0
Stage 1	108	108	-	124	124	-	-	-	-
Stage 2	167	176	-	110	108	-	-	-	-
Critical Hdwy	8.1	7.5	6.7	8.11	7.51	6.71	4.12	-	-
Critical Hdwy Stg 1	7.1	6.5	-	7.11	6.51	-	-	-	-
Critical Hdwy Stg 2	7.1	6.5	-	7.11	6.51	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.509	4.009	3.309	2.218	-	-
Pot Cap-1 Maneuver	631	581	980	677	628	920	1523	-	-
Stage 1	876	786	-	853	768	-	-	-	-
Stage 2	802	721	-	871	784	-	-	-	-
Platoon blocked, %									
Mov Cap-1 Maneuver	566	573	980	666	620	920	1523	-	-
Mov Cap-2 Maneuver	566	573	-	666	620	-	-	-	-
Stage 1	875	777	-	852	767	-	-	-	-
Stage 2	726	720	-	856	775	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	10.7	9.6	0.1
HCM LOS	B	A	

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1523	-	-	639	874	1394	-	-
HCM Lane V/C Ratio	0.002	-	-	0.007	0.106	0.012	-	-
HCM Control Delay (s)	7.4	0	-	10.7	9.6	7.6	0	-
HCM Lane LOS	A	A	-	B	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0.4	0	-	-

Intersection	
Int Delay, s/veh	

Movement	SBL	SBT	SBR
Vol, veh/h	14	65	0
Conflicting Peds, #/hr	0	0	0
Sign Control	Free	Free	Free
RT Channelized	-	-	None
Storage Length			
Veh in Median Storage, #	-	0	-
Grade, %		5	
Peak Hour Factor	86	86	86
Heavy Vehicles, %	4	4	4
Mvmt Flow	16	76	0

Major/Minor	Major2		
Conflicting Flow All	171	0	0
Stage 1	-	-	-
Stage 2			
Critical Hdwy	4.14	-	-
Critical Hdwy Stg 1			
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.236		
Pot Cap-1 Maneuver	1394	-	-
Stage 1		-	
Stage 2	-	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	1394	-	-
Mov Cap-2 Maneuver			
Stage 1	-	-	-
Stage 2			

Approach	SB
HCM Control Delay, s	1.3
HCM LOS	

Minor Lane/Major Mvmt	

Intersection	
Int Delay, s/veh	0.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	10	0	101	28	1	69
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	8	-	-	4
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	4	4	0	0	3	3
Mvmt Flow	10	0	105	29	1	72

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	194	120	0	0	134	0
Stage 1	120	-	-	-	-	-
Stage 2	74	-	-	-	-	-
Critical Hdwy	6.44	6.24	-	-	4.13	-
Critical Hdwy Stg 1	5.44	-	-	-	-	-
Critical Hdwy Stg 2	5.44	-	-	-	-	-
Follow-up Hdwy	3.536	3.336	-	-	2.227	-
Pot Cap-1 Maneuver	790	926	-	-	1444	-
Stage 1	900	-	-	-	-	-
Stage 2	944	-	-	-	-	-
Platoon blocked, %			-	-		
Mov Cap-1 Maneuver	789	926	-	-	1444	-
Mov Cap-2 Maneuver	789	-	-	-	-	-
Stage 1	900	-	-	-	-	-
Stage 2	943	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.6	0	0.1
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	789	1444	-
HCM Lane V/C Ratio	-	-	0.013	0.001	-
HCM Control Delay (s)	-	-	9.6	7.5	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Int Delay, s/veh	7.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	99	13	35	21	84	55
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	Yeild
Storage Length	-	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	3	3	-	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	3	3	2	2	2	2
Mvmt Flow	109	14	38	23	92	60

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	62	0	-	0	282	50
Stage 1	-	-	-	-	50	-
Stage 2	-	-	-	-	232	-
Critical Hdwy	4.13	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.227	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1535	-	-	-	708	1018
Stage 1	-	-	-	-	972	-
Stage 2	-	-	-	-	807	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1535	-	-	-	657	1018
Mov Cap-2 Maneuver	-	-	-	-	657	-
Stage 1	-	-	-	-	972	-
Stage 2	-	-	-	-	749	-

Approach	EB	WB	SB
HCM Control Delay, s	6.7	0	10.4
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1535	-	-	-	657	1018
HCM Lane V/C Ratio	0.071	-	-	-	0.14	0.059
HCM Control Delay (s)	7.5	0	-	-	11.4	8.8
HCM Lane LOS	A	A	-	-	B	A
HCM 95th %tile Q(veh)	0.2	-	-	-	0.5	0.2

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR
Vol, veh/h	2	2	7	3	1	6	0	22	83
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-
Grade, %	-	5	-	-	5	-	-	5	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	9	9	9	20	20	20	2	2	2
Mvmt Flow	2	2	8	3	1	7	0	25	93

Major/Minor	Minor2			Minor1			Major1		
Conflicting Flow All	284	327	142	285	280	71	142	0	0
Stage 1	209	209	-	71	71	-	-	-	-
Stage 2	75	118	-	214	209	-	-	-	-
Critical Hdwy	8.19	7.59	6.79	8.3	7.7	6.9	4.12	-	-
Critical Hdwy Stg 1	7.19	6.59	-	7.3	6.7	-	-	-	-
Critical Hdwy Stg 2	7.19	6.59	-	7.3	6.7	-	-	-	-
Follow-up Hdwy	3.581	4.081	3.381	3.68	4.18	3.48	2.218	-	-
Pot Cap-1 Maneuver	605	530	870	585	554	934	1441	-	-
Stage 1	733	676	-	878	786	-	-	-	-
Stage 2	898	759	-	706	657	-	-	-	-
Platoon blocked, %								-	-
Mov Cap-1 Maneuver	588	517	870	567	540	934	1441	-	-
Mov Cap-2 Maneuver	588	517	-	567	540	-	-	-	-
Stage 1	733	659	-	878	786	-	-	-	-
Stage 2	890	759	-	680	641	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	10.1	10	0
HCM LOS	B	B	

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1441	-	-	718	737	1470	-	-
HCM Lane V/C Ratio	-	-	-	0.017	0.015	0.023	-	-
HCM Control Delay (s)	0	-	-	10.1	10	7.5	0	-
HCM Lane LOS	A	-	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0	0.1	-	-

Intersection	
Int Delay, s/veh	

Movement	SBL	SBT	SBR
Vol, veh/h	30	126	0
Conflicting Peds, #/hr	0	0	0
Sign Control	Free	Free	Free
RT Channelized	-	-	None
Storage Length			
Veh in Median Storage, #	-	0	-
Grade, %		5	
Peak Hour Factor	89	89	89
Heavy Vehicles, %	2	2	2
Mvmt Flow	34	142	0

Major/Minor	Major2		
Conflicting Flow All	118	0	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.12	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.218	-	-
Pot Cap-1 Maneuver	1470	-	-
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	1470	-	-
Mov Cap-2 Maneuver		-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	SB
HCM Control Delay, s	1.4
HCM LOS	

Minor Lane/Major Mvmt	

Intersection	
Int Delay, s/veh	1.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	32	2	36	10	0	129
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	8	-	-	4
Peak Hour Factor	82	82	82	82	82	82
Heavy Vehicles, %	3	3	9	9	3	3
Mvmt Flow	39	2	44	12	0	157

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	207	50	0	0	56	0
Stage 1	50	-	-	-	-	-
Stage 2	157	-	-	-	-	-
Critical Hdwy	6.43	6.23	-	-	4.13	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.527	3.327	-	-	2.227	-
Pot Cap-1 Maneuver	779	1015	-	-	1542	-
Stage 1	970	-	-	-	-	-
Stage 2	869	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	779	1015	-	-	1542	-
Mov Cap-2 Maneuver	779	-	-	-	-	-
Stage 1	970	-	-	-	-	-
Stage 2	869	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.8	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	790	1542	-
HCM Lane V/C Ratio	-	-	0.052	-	-
HCM Control Delay (s)	-	-	9.8	0	-
HCM Lane LOS	-	-	A	A	
HCM 95th %tile Q(veh)	-	-	0.2	0	-

Intersection	
Int Delay, s/veh	5.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	97	25	49	57	44	39
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	Yeild
Storage Length	-	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	-3	3	-	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	114	29	58	67	52	46

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	125	0	-	0	349	91
Stage 1	-	-	-	-	91	-
Stage 2	-	-	-	-	258	-
Critical Hdwy	4.11	-	-	-	6.41	6.21
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	2.209	-	-	-	3.509	3.309
Pot Cap-1 Maneuver	1468	-	-	-	650	969
Stage 1	-	-	-	-	935	-
Stage 2	-	-	-	-	787	-
Platoon blocked, %						
Mov Cap-1 Maneuver	1468	-	-	-	599	969
Mov Cap-2 Maneuver	-	-	-	-	599	-
Stage 1	-	-	-	-	935	-
Stage 2	-	-	-	-	725	-

Approach	EB	WB	SB
HCM Control Delay, s	6.1	0	10.3
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1468	-	-	-	599	969
HCM Lane V/C Ratio	0.078	-	-	-	0.086	0.047
HCM Control Delay (s)	7.7	0	-	-	11.6	8.9
HCM Lane LOS	A	A	-	-	B	A
HCM 95th %tile Q(veh)	0.3	-	-	-	0.3	0.1

Intersection	
Int Delay, s/veh	3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR
Vol, veh/h	0	3	1	6	4	74	2	62	94
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-
Grade, %		5			5			5	
Peak Hour Factor	86	86	86	86	86	86	86	86	86
Heavy Vehicles, %	0	0	0	1	1	1	2	2	2
Mvmt Flow	0	3	1	7	5	86	2	72	109

Major/Minor	Minor2			Minor1			Major1		
Conflicting Flow All	290	299	80	246	244	127	80	0	0
Stage 1	113	113	-	131	131	-	-	-	-
Stage 2	177	186	-	115	113	-	-	-	-
Critical Hdwy	8.1	7.5	6.7	8.11	7.51	6.71	4.12	-	-
Critical Hdwy Stg 1	7.1	6.5	-	7.11	6.51	-	-	-	-
Critical Hdwy Stg 2	7.1	6.5	-	7.11	6.51	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.509	4.009	3.309	2.218	-	-
Pot Cap-1 Maneuver	615	567	975	663	616	910	1518	-	-
Stage 1	869	781	-	844	762	-	-	-	-
Stage 2	790	712	-	864	779	-	-	-	-
Platoon blocked, %									
Mov Cap-1 Maneuver	548	560	975	653	608	910	1518	-	-
Mov Cap-2 Maneuver	548	560	-	653	608	-	-	-	-
Stage 1	868	772	-	843	761	-	-	-	-
Stage 2	710	711	-	849	770	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	10.8	9.7	0.1
HCM LOS	B	A	

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1518	-	-	627	865	1382	-	-
HCM Lane V/C Ratio	0.002	-	-	0.007	0.113	0.012	-	-
HCM Control Delay (s)	7.4	0	-	10.8	9.7	7.6	0	-
HCM Lane LOS	A	A	-	B	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0.4	0	-	-

Intersection	
Int Delay, s/veh	

Movement	SBL	SBT	SBR
Vol, veh/h	14	69	0
Conflicting Peds, #/hr	0	0	0
Sign Control	Free	Free	Free
RT Channelized	-	-	None
Storage Length	-	-	-
Veh in Median Storage, #	-	0	-
Grade, %		5	
Peak Hour Factor	86	86	86
Heavy Vehicles, %	4	4	4
Mvmt Flow	16	80	0

Major/Minor	Major2		
Conflicting Flow All	181	0	0
Stage 1	-	-	-
Stage 2		-	-
Critical Hdwy	4.14	-	-
Critical Hdwy Stg 1		-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.236	-	-
Pot Cap-1 Maneuver	1382	-	-
Stage 1		-	-
Stage 2	-	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	1382	-	-
Mov Cap-2 Maneuver			
Stage 1	-	-	-
Stage 2		-	-

Approach	SB
HCM Control Delay, s	1.3
HCM LOS	

Minor Lane/Major Mvmt	

Intersection	
Int Delay, s/veh	0.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	11	0	107	30	1	73
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	8	-	-	4
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	4	4	0	0	3	3
Mvmt Flow	11	0	111	31	1	76

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	205	127	0	0	143	0
Stage 1	127	-	-	-	-	-
Stage 2	78	-	-	-	-	-
Critical Hdwy	6.44	6.24	-	-	4.13	-
Critical Hdwy Stg 1	5.44	-	-	-	-	-
Critical Hdwy Stg 2	5.44	-	-	-	-	-
Follow-up Hdwy	3.536	3.336	-	-	2.227	-
Pot Cap-1 Maneuver	779	918	-	-	1434	-
Stage 1	894	-	-	-	-	-
Stage 2	940	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	778	918	-	-	1434	-
Mov Cap-2 Maneuver	778	-	-	-	-	-
Stage 1	894	-	-	-	-	-
Stage 2	939	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.7	0	0.1
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	778	1434	-
HCM Lane V/C Ratio	-	-	0.015	0.001	
HCM Control Delay (s)	-	-	9.7	7.5	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Int Delay, s/veh	7.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	101	13	35	21	96	62
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	Yeild
Storage Length	-	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	3	3	-	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	3	3	2	2	2	2
Mvmt Flow	111	14	38	23	105	68

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	62	0	-	0	286	50
Stage 1	-	-	-	-	50	-
Stage 2	-	-	-	-	236	-
Critical Hdwy	4.13	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.227	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1535	-	-	-	704	1018
Stage 1	-	-	-	-	972	-
Stage 2	-	-	-	-	803	-
Platoon blocked, %						
Mov Cap-1 Maneuver	1535	-	-	-	653	1018
Mov Cap-2 Maneuver	-	-	-	-	653	-
Stage 1	-	-	-	-	972	-
Stage 2	-	-	-	-	744	-

Approach	EB	WB	SB
HCM Control Delay, s	6.7	0	10.5
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1535	-	-	-	653	1018
HCM Lane V/C Ratio	0.072	-	-	-	0.162	0.067
HCM Control Delay (s)	7.5	0	-	-	11.6	8.8
HCM Lane LOS	A	A	-	-	B	A
HCM 95th %tile Q(veh)	0.2	-	-	-	0.6	0.2

Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR
Vol, veh/h	2	2	7	3	1	9	0	24	83
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-
Grade, %	-	5			5			5	
Peak Hour Factor	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	9	9	9	20	20	20	2	2	2
Mvmt Flow	2	2	8	3	1	10	0	27	93

Major/Minor	Minor2			Minor1			Major1		
Conflicting Flow All	316	357	163	316	311	74	163	0	0
Stage 1	237	237	-	74	74	-	-	-	-
Stage 2	79	120	-	242	237	-	-	-	-
Critical Hdwy	8.19	7.59	6.79	8.3	7.7	6.9	4.12	-	-
Critical Hdwy Stg 1	7.19	6.59	-	7.3	6.7	-	-	-	-
Critical Hdwy Stg 2	7.19	6.59	-	7.3	6.7	-	-	-	-
Follow-up Hdwy	3.581	4.081	3.381	3.68	4.18	3.48	2.218	-	-
Pot Cap-1 Maneuver	571	505	844	552	528	930	1416	-	-
Stage 1	703	652	-	874	783	-	-	-	-
Stage 2	893	757	-	676	634	-	-	-	-
Platoon blocked, %									
Mov Cap-1 Maneuver	552	491	844	533	513	930	1416	-	-
Mov Cap-2 Maneuver	552	491		533	513				
Stage 1	703	634	-	874	783	-	-	-	-
Stage 2	882	757		649	616				

Approach	EB	WB	NB
HCM Control Delay, s	10.3	9.9	0
HCM LOS	B	A	

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1416	-	-	688	753	1468	-	-
HCM Lane V/C Ratio	-	-	-	0.018	0.019	0.025	-	-
HCM Control Delay (s)	0	-	-	10.3	9.9	7.5	0	-
HCM Lane LOS	A	-	-	B	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.1	0.1	-	-

Intersection	
Int Delay, s/veh	

Movement	SBL	SBT	SBR
Vol, veh/h	33	145	0
Conflicting Peds, #/hr	0	0	0
Sign Control	Free	Free	Free
RT Channelized	-	-	None
Storage Length	-	-	-
Veh in Median Storage, #	-	0	-
Grade, %	-	5	-
Peak Hour Factor	89	89	89
Heavy Vehicles, %	2	2	2
Mvmt Flow	37	163	0

Major/Minor	Major2		
Conflicting Flow All	120	0	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.12	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.218	-	-
Pot Cap-1 Maneuver	1468	-	-
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	1468	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	SB
HCM Control Delay, s	1.4
HCM LOS	

Minor Lane/Major Mvmt	

Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR
Vol, veh/h	0	0	0	32	0	2	4	37	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	8	-
Peak Hour Factor	92	92	92	82	82	82	82	82	82
Heavy Vehicles, %	2	2	2	3	3	3	9	9	9
Mvmt Flow	0	0	0	39	0	2	5	45	12

Major/Minor	Minor1			Major1		
Conflicting Flow All	245	245	51	184	0	0
Stage 1	61	61	-	-	-	-
Stage 2	184	184	-	-	-	-
Critical Hdwy	6.43	6.53	6.23	4.19	-	-
Critical Hdwy Stg 1	5.43	5.53	-	-	-	-
Critical Hdwy Stg 2	5.43	5.53	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	2.281	-	-
Pot Cap-1 Maneuver	741	655	1014	1350	-	-
Stage 1	959	842	-	-	-	-
Stage 2	845	746	-	-	-	-
Platoon blocked, %						
Mov Cap-1 Maneuver	738	0	1014	1350	-	-
Mov Cap-2 Maneuver	738	0	-	-	-	-
Stage 1	955	0	-	-	-	-
Stage 2	845	0	-	-	-	-

Approach	WB	NB
HCM Control Delay, s	10.1	0.6
HCM LOS	B	

Minor Lane/Major Mvmt	NBL	NBT	NBR	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1350	-	-	750	1541	-	-
HCM Lane V/C Ratio	0.004	-	-	0.055	-	-	-
HCM Control Delay (s)	7.7	0	-	10.1	0	-	-
HCM Lane LOS	A	A	-	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0	-	-

Intersection	
Int Delay, s/veh	

Movement	SBL	SBT	SBR
Vol, veh/h	0	151	0
Conflicting Peds, #/hr	0	0	0
Sign Control	Free	Free	Free
RT Channelized	-	-	None
Storage Length	-	-	
Veh in Median Storage, #	-	0	-
Grade, %		4	
Peak Hour Factor	82	82	82
Heavy Vehicles, %	3	3	3
Mvmt Flow	0	184	0

Major/Minor	Major2		
Conflicting Flow All	57	0	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.13	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.227	-	-
Pot Cap-1 Maneuver	1541	-	-
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	1541	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	SB
HCM Control Delay, s	0
HCM LOS	

Minor Lane/Major Mvmt

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	2	22	10	38	129	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	5	5	-
Peak Hour Factor	82	82	82	82	82	82
Heavy Vehicles, %	2	2	9	9	3	3
Mvmt Flow	2	27	12	46	157	1

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	229	158	159	0	-	0
Stage 1	158	-	-	-	-	-
Stage 2	71	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.19	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.281	-	-	-
Pot Cap-1 Maneuver	759	887	1379	-	-	-
Stage 1	871	-	-	-	-	-
Stage 2	952	-	-	-	-	-
Platoon blocked, %				-		-
Mov Cap-1 Maneuver	752	887	1379	-	-	-
Mov Cap-2 Maneuver	752	-	-	-	-	-
Stage 1	871	-	-	-	-	-
Stage 2	943	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.3	1.6	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1379	-	874	-	-
HCM Lane V/C Ratio	0.009	-	0.033	-	-
HCM Control Delay (s)	7.6	0	9.3	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	5.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	106	25	49	60	52	44
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	Yeild
Storage Length	-	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	3	3	-	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	125	29	58	71	61	52

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	128	0	-	0	372	93
Stage 1	-	-	-	-	93	-
Stage 2	-	-	-	-	279	-
Critical Hdwy	4.11	-	-	-	6.41	6.21
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	2.209	-	-	-	3.509	3.309
Pot Cap-1 Maneuver	1464	-	-	-	631	967
Stage 1	-	-	-	-	933	-
Stage 2	-	-	-	-	770	-
Platoon blocked, %						
Mov Cap-1 Maneuver	1464	-	-	-	576	967
Mov Cap-2 Maneuver	-	-	-	-	576	-
Stage 1	-	-	-	-	933	-
Stage 2	-	-	-	-	703	-

Approach	EB	WB	SB
HCM Control Delay, s	6.2	0	10.6
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1464	-	-	-	576	967
HCM Lane V/C Ratio	0.085	-	-	-	0.106	0.054
HCM Control Delay (s)	7.7	0	-	-	12	8.9
HCM Lane LOS	A	A	-	-	B	A
HCM 95th %tile Q(veh)	0.3	-	-	-	0.4	0.2

Intersection	
Int Delay, s/veh	3.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR
Vol, veh/h	0	3	1	6	4	89	2	74	94
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-
Grade, %	-	5	-	-	5	-	-	5	-
Peak Hour Factor	86	86	86	86	86	86	86	86	86
Heavy Vehicles, %	0	0	0	1	1	1	2	2	2
Mvmt Flow	0	3	1	7	5	103	2	86	109

Major/Minor	Minor2			Minor1			Major1		
Conflicting Flow All	332	333	95	280	278	141	95	0	0
Stage 1	133	133	-	145	145	-	-	-	-
Stage 2	199	200	-	135	133	-	-	-	-
Critical Hdwy	8.1	7.5	6.7	8.11	7.51	6.71	4.12	-	-
Critical Hdwy Stg 1	7.1	6.5	-	7.11	6.51	-	-	-	-
Critical Hdwy Stg 2	7.1	6.5	-	7.11	6.51	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.509	4.009	3.309	2.218	-	-
Pot Cap-1 Maneuver	570	538	954	624	585	892	1499	-	-
Stage 1	844	761	-	826	748	-	-	-	-
Stage 2	764	699	-	839	760	-	-	-	-
Platoon blocked, %									
Mov Cap-1 Maneuver	494	529	954	612	575	892	1499	-	-
Mov Cap-2 Maneuver	494	529	-	612	575	-	-	-	-
Stage 1	842	750	-	824	747	-	-	-	-
Stage 2	670	698	-	822	749	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	11.1	9.9	0.1
HCM LOS	B	A	

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1499	-	-	595	850	1366	-	-
HCM Lane V/C Ratio	0.002	-	-	0.008	0.135	0.014	-	-
HCM Control Delay (s)	7.4	0	-	11.1	9.9	7.7	0	-
HCM Lane LOS	A	A	-	B	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0.5	0	-	-

Intersection	
Int Delay, s/veh	

Movement	SBL	SBT	SBR
Vol, veh/h	16	82	0
Conflicting Peds, #/hr	0	0	0
Sign Control	Free	Free	Free
RT Channelized	-	-	None
Storage Length			
Veh in Median Storage, #	-	0	-
Grade, %	-	5	-
Peak Hour Factor	86	86	86
Heavy Vehicles, %	4	4	4
Mvmt Flow	19	95	0

Major/Minor	Major2		
Conflicting Flow All	195	0	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.14	-	-
Critical Hdwy Stg 1			
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.236	-	-
Pot Cap-1 Maneuver	1366	-	-
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	1366	-	-
Mov Cap-2 Maneuver		-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	SB
HCM Control Delay, s	1.3
HCM LOS	

Minor Lane/Major Mvmt

Intersection	
Int Delay, s/veh	1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR
Vol, veh/h	0	0	0	11	0	0	21	113	30
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-
Grade, %		0			0			8	
Peak Hour Factor	92	92	92	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	4	4	4	0	0	0
Mvmt Flow	0	0	0	12	0	0	22	119	32

Major/Minor	Minor1			Major1		
Conflicting Flow All	273	273	135	92	0	0
Stage 1	179	179	-	-	-	-
Stage 2	94	94	-	-	-	-
Critical Hdwy	6.44	6.54	6.24	4.1	-	-
Critical Hdwy Stg 1	5.44	5.54	-	-	-	-
Critical Hdwy Stg 2	5.44	5.54	-	-	-	-
Follow-up Hdwy	3.536	4.036	3.336	2.2	-	-
Pot Cap-1 Maneuver	712	631	909	1515	-	-
Stage 1	847	747	-	-	-	-
Stage 2	925	813	-	-	-	-
Platoon blocked, %					-	-
Mov Cap-1 Maneuver	700	0	909	1515	-	-
Mov Cap-2 Maneuver	700	0	-	-	-	-
Stage 1	833	0	-	-	-	-
Stage 2	924	0	-	-	-	-

Approach	WB	NB
HCM Control Delay, s	10.2	0.9
HCM LOS	B	

Minor Lane/Major Mvmt	NBL	NBT	NBR	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1515	-	-	700	1424	-	-
HCM Lane V/C Ratio	0.015	-	-	0.017	0.001	-	-
HCM Control Delay (s)	7.4	0	-	10.2	7.5	0	-
HCM Lane LOS	A	A	-	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0	-	-

Intersection			
Int Delay, s/veh			

Movement	SBL	SBT	SBR
Vol, veh/h	1	87	0
Conflicting Peds, #/hr	0	0	0
Sign Control	Free	Free	Free
RT Channelized	-	-	None
Storage Length	-	-	-
Veh in Median Storage, #	-	0	-
Grade, %	-	4	-
Peak Hour Factor	95	95	95
Heavy Vehicles, %	3	3	3
Mvmt Flow	1	92	0

Major/Minor	Major2		
Conflicting Flow All	151	0	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.13	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.227	-	-
Pot Cap-1 Maneuver	1424	-	-
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	1424	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	SB
HCM Control Delay, s	0.1
HCM LOS	

Minor Lane/Major Mvmt	

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	2	14	6	107	74	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	5	5	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	0	0	3	3
Mvmt Flow	2	15	6	113	78	3

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	204	79	81	0	-	0
Stage 1	79	-	-	-	-	-
Stage 2	125	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.1	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.2	-	-	-
Pot Cap-1 Maneuver	784	981	1529	-	-	-
Stage 1	944	-	-	-	-	-
Stage 2	901	-	-	-	-	-
Platoon blocked, %						
Mov Cap-1 Maneuver	781	981	1529	-	-	-
Mov Cap-2 Maneuver	781					
Stage 1	944	-	-	-	-	-
Stage 2	897	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.9	0.4	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1529	-	951	-	-
HCM Lane V/C Ratio	0.004	-	0.018	-	-
HCM Control Delay (s)	7.4	0	8.9	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-