
TRAFFIC STUDY

PROPOSED GAS STATION AND CONVENIENCE STORE

**1417 ROUTE 9W
TOWN OF MARLBOROUGH, NEW YORK**

Prepared for:

CPD Energy
536 Main Street
New Paltz, NY 12561

Prepared by:



120 Bedford Road
Armonk, NY 10504
JMC Project **15119**

Date:

July 24, 2015

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Revised:

August 15, 2016

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I. INTRODUCTION

This Traffic Study has been prepared to assess existing conditions as well as future traffic operations in association with the proposed redevelopment located at 1417 Route 9W in the Town of Marlborough, NY. The 1.93 acre property is located south of Mt Rose Road and west of Route 9W. The property currently contains a vacant sit-down restaurant.

The Applicant proposes to demolish the existing building and construct a gas station with a convenience store. There are 5 gasoline pumps (10 fueling locations) and 2 diesel pumps (4 fueling locations) proposed as part of the redevelopment. The proposed redevelopment also includes a 4,800 square foot building containing a 2,000 square foot Dunkin Donuts with a drive-thru window and 2,800 square feet of convenience store.

The site's entire frontage is currently a large depressed asphalt area. The applicant proposes to improve the existing driveways by delineating two proposed driveways along Route 9W with proposed curbing. The three curb cuts originally proposed were reduced to two curb cuts based on comments expressed by the New York State Department of Transportation (NYSDOT). Based on recent NYSDOT comments, the applicant proposes to widen Route 9W to provide a left lane for vehicles entering the southern site driveway and restrict left turn movements out of the southern site driveway. The northern site driveway will restrict left turns into the proposed redevelopment. The proposed widening and curb along the site frontage will improve traffic operations and consolidate the existing points of access.

II. EXISTING CONDITIONS

A. Existing Roadway Network

JMC performed field reconnaissance at the site and adjoining roadway network in order to gather existing conditions data. The field work included a determination of lane widths, striping, horizontal and vertical alignments, signs, speed limits, traffic flows, curbing, etc.

Route 9W is a north/south state highway that extends north to Albany and south to Fort Montgomery. Within the study area, Route 9W provides one travel lane in each direction and has a posted speed limit of 40 mph.

In order to evaluate the changes in traffic associated with the proposed redevelopment, the following intersections have been analyzed:

1. Route 9W & Mt Rose Road
2. Route 9W & Site Driveway A
3. Route 9W & Site Driveway B

Route 9W intersects Mt Rose Road at a three-way unsignalized intersection. Route 9W provides a single 12 foot wide travel lane in each direction with shared turns onto Mt Rose Road. Mt Rose Road serves as the minor leg of this intersection and provides a single 12 foot wide lane with shared turning movements on relatively level grade. Mt Rose Road is controlled via a stop sign.

Route 9W intersects proposed site driveways at a three-legged unsignalized intersection. Route 9W provides a 12 foot wide travel lane with shared turning movements in each direction into the subject property. The site driveways will provide a single egress lane with shared turning movements onto Route 9W on relatively level grade.

B. Existing Volumes

Manual traffic counts were performed in order to quantify and analyze existing peak hour volumes as well as to establish base conditions for projecting future operations. The counts included truck traffic.

Traffic counts were conducted from 7:00 – 9:00 AM and from 4:00 – 6:00 PM at the Mt Rose Road intersection on Thursday, June 11, 2015. The peak hour volumes occurred between 7:15-8:15 AM during the weekday morning and 4:00-5:00 PM during the weekday

afternoon. The volumes are shown on Figures 1 and 2 "2015 Existing Volumes". All figures are included in Appendix B.

C. **Intersection Analysis Methodology**

The intersections have been analyzed based on the methodologies of the 2010 Highway Capacity Manual. Information derived from the manual relative to the level of service criteria is provided below.

1. **Level of Service for Unsignalized Intersections**

The Levels of Service (LOS) for Two Way Stop Control (TWSC) and All Way Stop Control (AWSC) intersections are determined by the computed or measured control delay and are defined for each minor movement. LOS is not defined for the intersection as a whole for TWSC intersections. LOS criteria are presented below.

<i>Unsignalized Level of Service Criteria</i>	
Level of Service	Delay Range (Seconds/Vehicle)
A	≤ 10
B	>10 and ≤ 15
C	>15 and ≤ 25
D	>25 and ≤ 35
E	>35 and ≤ 50
F	>50

Average control delay less than 10 seconds/vehicle are defined as LOS A. Follow-up times of less than 5 seconds/vehicle have been measured when there is no conflicting traffic, so control delays of less than 10 seconds/vehicle are appropriate for low flow conditions.

The LOS criteria for unsignalized intersections are somewhat different than the criteria used for signalized intersections. The primary reason for this difference is that drivers

expect different levels of performance from different kinds of transportation facilities. A number of driver behavior considerations combine to make delays at signalized intersections less onerous than delays at unsignalized intersections. For example, drivers at signalized intersections are able to relax during the red interval, whereas drivers on the minor approaches to unsignalized intersections must remain attentive to the task of identifying acceptable gaps and vehicle conflicts. Also, there is often much more variability in the amount of delay experienced by individual drivers at an unsignalized intersections versus that at signalized intersections. For these reasons, it is considered that the control delay threshold for any given LOS would be less for an unsignalized intersection than it would be for a signalized intersection.

D. Existing Operations

The intersection capacity analyses based on existing volumes and conditions are shown on Tables 2 and 3. The specific volume/capacity ratios, delay for average vehicle in seconds and the associated levels of service are summarized for each lane group, the approach as well as the overall intersection as applicable on Tables 2 and 3. During the studied peak hours, the Mt Rose Road approach operates at a level of service B while Route 9W operates at a level of service A.

III. PROJECTED CONDITIONS

A. No-Build Volumes

In order to project future traffic increases to the 2022 design year (ETC+5), the existing volumes were increased by a general growth rate of 1% per year compounded annually. No other developments have been considered in this study based on our discussion with the Town. The no-build traffic volumes are shown on Figures 3 and 4 in Appendix B. The no-build traffic volumes do not include the as-of-right re-occupancy of the vacant restaurant.

Under no-build conditions, the Mt Rose Road approach and Route 9W are projected to

operate at the same levels of service experienced under existing conditions.

B. Build Volumes

The projected traffic associated with the proposed gas station with convenience store and the Dunkin Donuts with a drive-thru is based on information published by the Institute of Transportation Engineers (ITE) in its publication Trip Generation, 9th Edition. Table 1 shows the total driveway volumes for the proposed development. Table 1 also incorporates an internal trip credit between the two proposed uses of 15% as well as a pass-by percentage of 40%. Internal trips are when trips for a multi-use development are made with a single trip to the development instead of multiple trips. Pass-by trips represent traffic which typically drives past or near the subject property and will patronize the development when it is completed.

The primary trips were routed through the intersections based on census data and locations of existing facilities. The pass-by trips were routed through the intersections based on existing traffic volumes. The primary trips and pass-by trips have been shown in the figures in Appendix B. Adding the redevelopment related traffic results in 2022 Build Volumes which reflect projected volumes after the completion of the redevelopment.

IV. FINDINGS & CONCLUSION

Intersection capacity analysis computed based on the Build Volumes indicate that the vehicles traveling along Route 9W will operate essentially the same as projected for the No-Build Volumes. Projected operations with the proposed redevelopment are shown on Tables 2 and 3.

During both analyzed hours, Mt Rose Road will operate at the same levels of service as projected under no-build conditions. The Route 9W northbound approach at all studied intersections will operate at a level of service B or better during both peak hours. Vehicles exiting the site driveways are projected to operate at a level of service F. During peak hours, exiting vehicles will have to wait for a gap in the traffic along Route 9W.

Left turns entering the site are projected to operate without extensive delays. Our office reviewed the left-turn maneuvers from Route 9W as it relates to the appropriateness of a separate left turn lane. “A Policy on Geometric Design of Highways and Streets, 2011 6th edition” published by American Association of State Highway and Transportation Officials (AASHTO) offers guidance relative to the appropriateness of providing a left turn lane on a two-lane highway based on traffic volumes and operating speed. Based on Section 9.7.3 of the AASHTO publication, the travel speed and projected volumes, a left lane should be provided for the left turning movement from Route 9W into Site Driveway B, which represents approximately 10-11% of the total northbound traffic volumes during the peak hours. The left turning movements into Site Driveway A are proposed to be prohibited.

Drawing CHP-1 - “Conceptual Highway Improvement Plan” revised 07/07/2016 incorporates a widening and improvements along Route 9W based on recent NYSDOT comments. This intersection design incorporates a dedicated northbound left turn lane into Site Driveway B and a left turn prohibition out of Site Driveway B. Site Driveway A provides a receiving lane with an acceleration lane for northbound exiting vehicles. This allows exiting vehicles making a left turn to find a gap in the southbound traffic only, as compared to waiting for a gap in both the southbound and northbound traffic. Additionally, Route 9W left turns are restricted from turning into Site Driveway A. This revision improves the level of service to a D for the Site Driveway A exiting traffic, as compared to the level-of-service F previously indicated in our Traffic Study. Additionally, Site Driveway B improves the level of service to a C for exiting traffic, as compared to the level-of-service F previously indicated in our study.

Respectfully submitted,

JMC Planning Engineering Landscape Architecture & Land Surveying, PLLC

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Project Manager

APPENDIX A

TABLES

TABLE 1**PROPOSED DEVELOPMENT VOLUMES⁽¹⁾**

LAND USE	PEAK WEEKDAY AM HOUR			PEAK WEEKDAY PM HOUR		
	ENTER	EXIT	TOTAL	ENTER	EXIT	TOTAL
a. Proposed 2,800 sf Gasoline/Service Station with Convenience Market Driveway Volumes (ITE Code 945)	117	113	230	137	136	273
b. Proposed 2,000 sf Coffee/Donut Shop with Drive-Through Window Driveway Volumes (ITE Code 937)	103	98	201	43	43	86
c. Proposed Driveway Volumes Row c = Row a + Row b	220	211	431	180	179	359
d. Internal Trip Credit (15%)	33	32	65	27	27	54
e. Net Driveway Volumes Row e = Row c - Row d	187	179	366	153	152	305
f. Pass-By Volumes (40%)	75	72	147	61	61	122
g. Primary Volumes Row g = Row e - Row f	112	107	219	92	91	183

Notes:

(1) The projected traffic is based on ITE (Institute of Transportation Engineers) Trip Generation Manual, 9th Edition.

TABLE 2**INTERSECTION OPERATIONS-PEAK WEEKDAY AM HOUR**

INTERSECTION	APPROACH	LANE GROUP	2015 EXISTING			2022 NO BUILD			2022 BUILD		
			V/C ⁽¹⁾	DELAY ⁽²⁾	LOS ⁽³⁾	V/C ⁽¹⁾	DELAY ⁽²⁾	LOS ⁽³⁾	V/C ⁽¹⁾	DELAY ⁽²⁾	LOS ⁽³⁾
1. Route 9W & Mt Rose Road (Unsignalized)	EASTBOUND	LEFT/RIGHT	0.02	13.7	B	0.02	14.4	B	0.02	14.9	B
	NORTHBOUND	LEFT/THRU	-	-	A	-	-	A	-	-	A
	SOUTHBOUND	THRU/RIGHT	-	-	-	-	-	-	-	-	-
2. Route 9W & Site Driveway A (Unsignalized)	EASTBOUND	LEFT/RIGHT							1.37	333.6	F
	NORTHBOUND	LEFT/THRU		N/A			N/A		0.12	10.5	B
	SOUTHBOUND	THRU/RIGHT							-	-	-
2a. Route 9W & Site Driveway A (Unsignalized w/ Improvements)	EASTBOUND	LEFT/RIGHT							0.48	29.1	D
	NORTHBOUND	THRU		N/A			N/A		-	-	-
	SOUTHBOUND	THRU/RIGHT							-	-	-
3. Route 9W & Site Driveway B (Unsignalized)	EASTBOUND	LEFT/RIGHT							0.84	105.3	F
	NORTHBOUND	LEFT/THRU		N/A			N/A		0.04	10.0	A
	SOUTHBOUND	THRU/RIGHT							-	-	-
3a. Route 9W & Site Driveway B (Unsignalized w/ Improvements)	EASTBOUND	RIGHT							0.21	18.4	C
	NORTHBOUND	LEFT							0.16	10.7	B
		THRU		N/A			N/A		-	-	-
	SOUTHBOUND	THRU/RIGHT							-	-	-

Notes:

- (1) V/C represents volume/capacity ratio
- (2) Delay is average seconds delay per vehicle
- (3) LOS represents level of service

TABLE 3**INTERSECTION OPERATIONS-PEAK WEEKDAY PM HOUR**

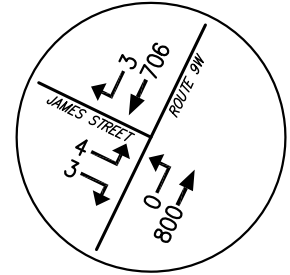
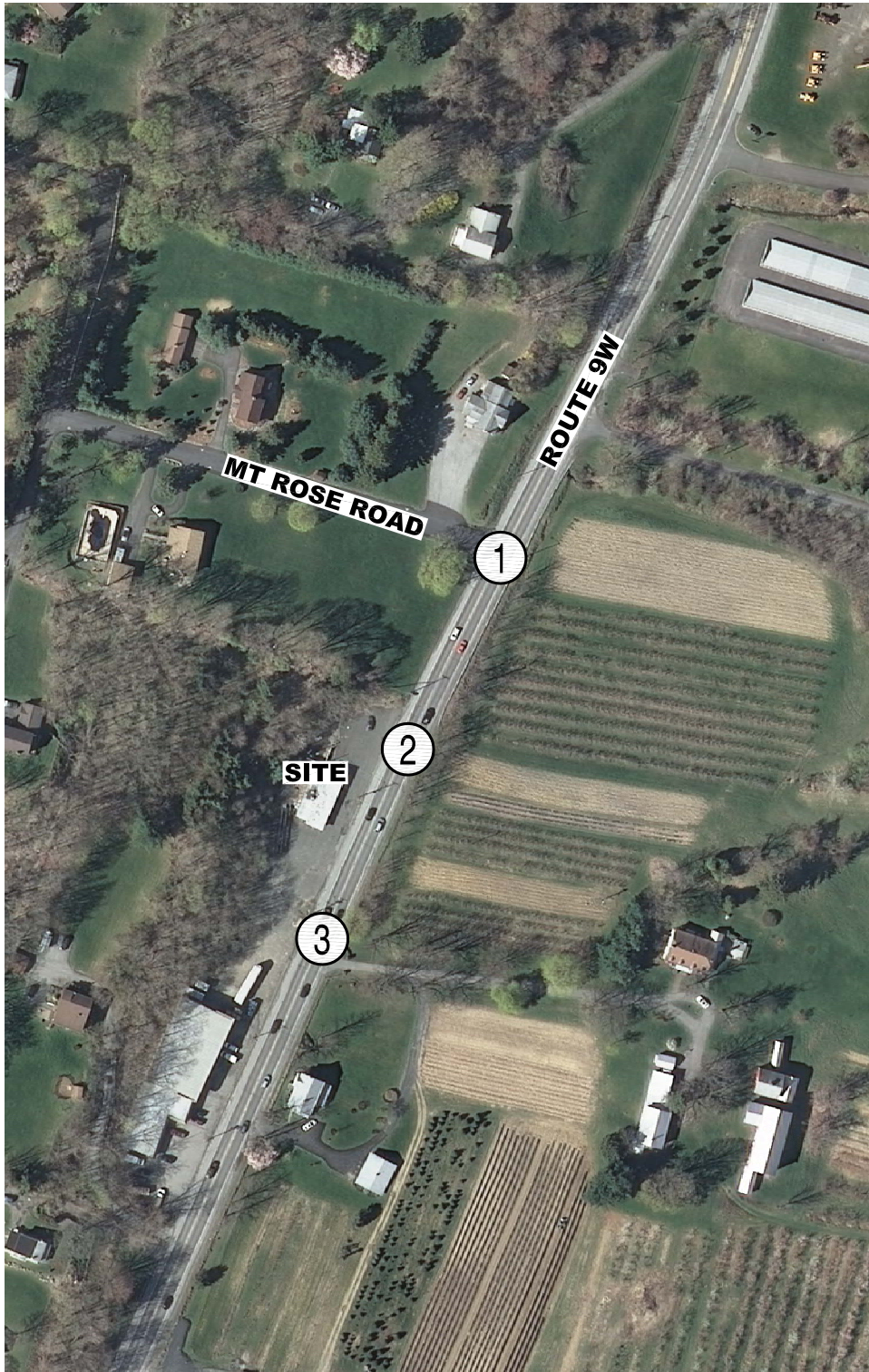
INTERSECTION	APPROACH	LANE GROUP	2015 EXISTING			2022 NO BUILD			2022 BUILD		
			V/C ⁽¹⁾	DELAY ⁽²⁾	LOS ⁽³⁾	V/C ⁽¹⁾	DELAY ⁽²⁾	LOS ⁽³⁾	V/C ⁽¹⁾	DELAY ⁽²⁾	LOS ⁽³⁾
1. Route 9W & Mt Rose Road (Unsignalized)	EASTBOUND	LEFT/RIGHT	0.01	13.8	B	0.01	14.5	B	0.01	15.1	C
	NORTHBOUND	LEFT/THRU	0.01	9.7	A	0.01	10.0	A	0.01	10.2	B
	SOUTHBOUND	THRU/RIGHT	-	-	-	-	-	-	-	-	-
2. Route 9W & Site Driveway A (Unsignalized)	EASTBOUND	LEFT/RIGHT							1.21	274.7	F
	NORTHBOUND	LEFT/THRU		N/A			N/A		0.11	10.8	B
	SOUTHBOUND	THRU/RIGHT							-	-	-
2a. Route 9W & Site Driveway A (Unsignalized w/ Improvements)	EASTBOUND	LEFT/RIGHT							0.46	30.9	D
	NORTHBOUND	THRU		N/A			N/A		-	-	-
	SOUTHBOUND	THRU/RIGHT							-	-	-
3. Route 9W & Site Driveway B (Unsignalized)	EASTBOUND	LEFT/RIGHT							0.76	91.5	F
	NORTHBOUND	LEFT/THRU		N/A			N/A		0.04	10.3	B
	SOUTHBOUND	THRU/RIGHT							-	-	-
3a. Route 9W & Site Driveway B (Unsignalized w/ Improvements)	EASTBOUND	RIGHT							0.20	19.6	C
	NORTHBOUND	LEFT							0.14	10.9	B
		THRU		N/A			N/A		-	-	-
	SOUTHBOUND	THRU/RIGHT							-	-	-

Notes:

- (1) V/C represents volume/capacity ratio
- (2) Delay is average seconds delay per vehicle
- (3) LOS represents level of service

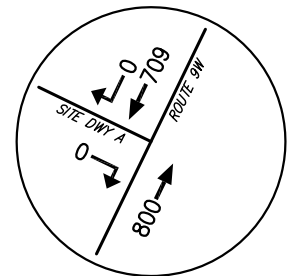
APPENDIX B

FIGURES



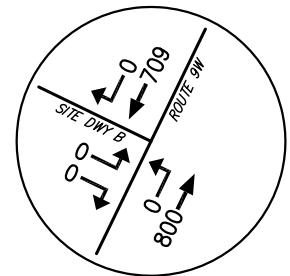
1

ROUTE 9W
& MT ROSE ROAD



2

ROUTE 9W &
SITE DRIVEWAY A



3

ROUTE 9W &
SITE DRIVEWAY B

PROPOSED GAS STATION & CONVENIENCE STORE

1417 ROUTE 9W

TOWN OF MARLBOROUGH, NEW YORK

2015 EXISTING VOLUMES

REVISED: 03/31/2016
DATE: 07/09/2015

PEAK WEEKDAY AM HOUR (7:15 - 8:15)

JMC PROJECT: 15119

FIGURE: 01

SCALE: 1" = 200'



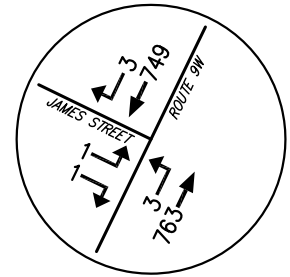
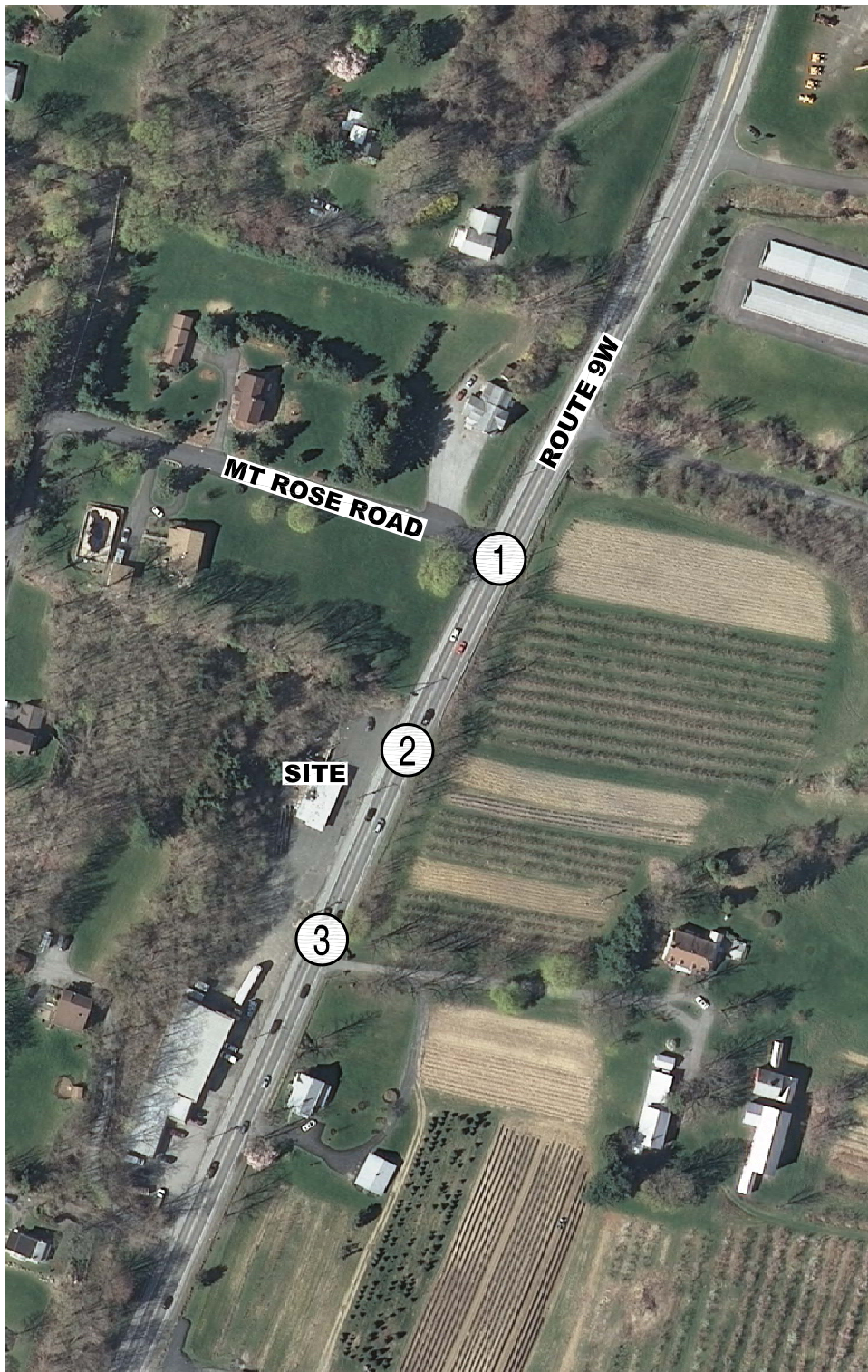
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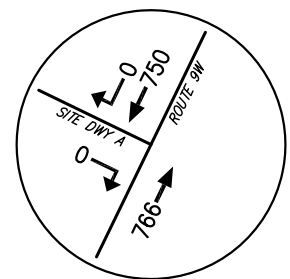


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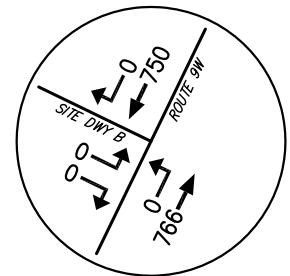
1

ROUTE 9W
& MT ROSE ROAD



2

ROUTE 9W &
SITE DRIVEWAY A



3

ROUTE 9W &
SITE DRIVEWAY B

PROPOSED GAS STATION & CONVENIENCE STORE

1417 ROUTE 9W

TOWN OF MARLBOROUGH, NEW YORK

2015 EXISTING VOLUMES

REVISED: 03/31/2016
DATE: 07/09/2015

PEAK WEEKDAY PM HOUR (4:00 - 5:00)

JMC PROJECT: 15119

FIGURE: 02

SCALE: 1" = 200'



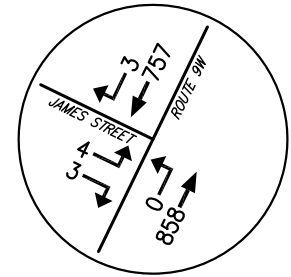
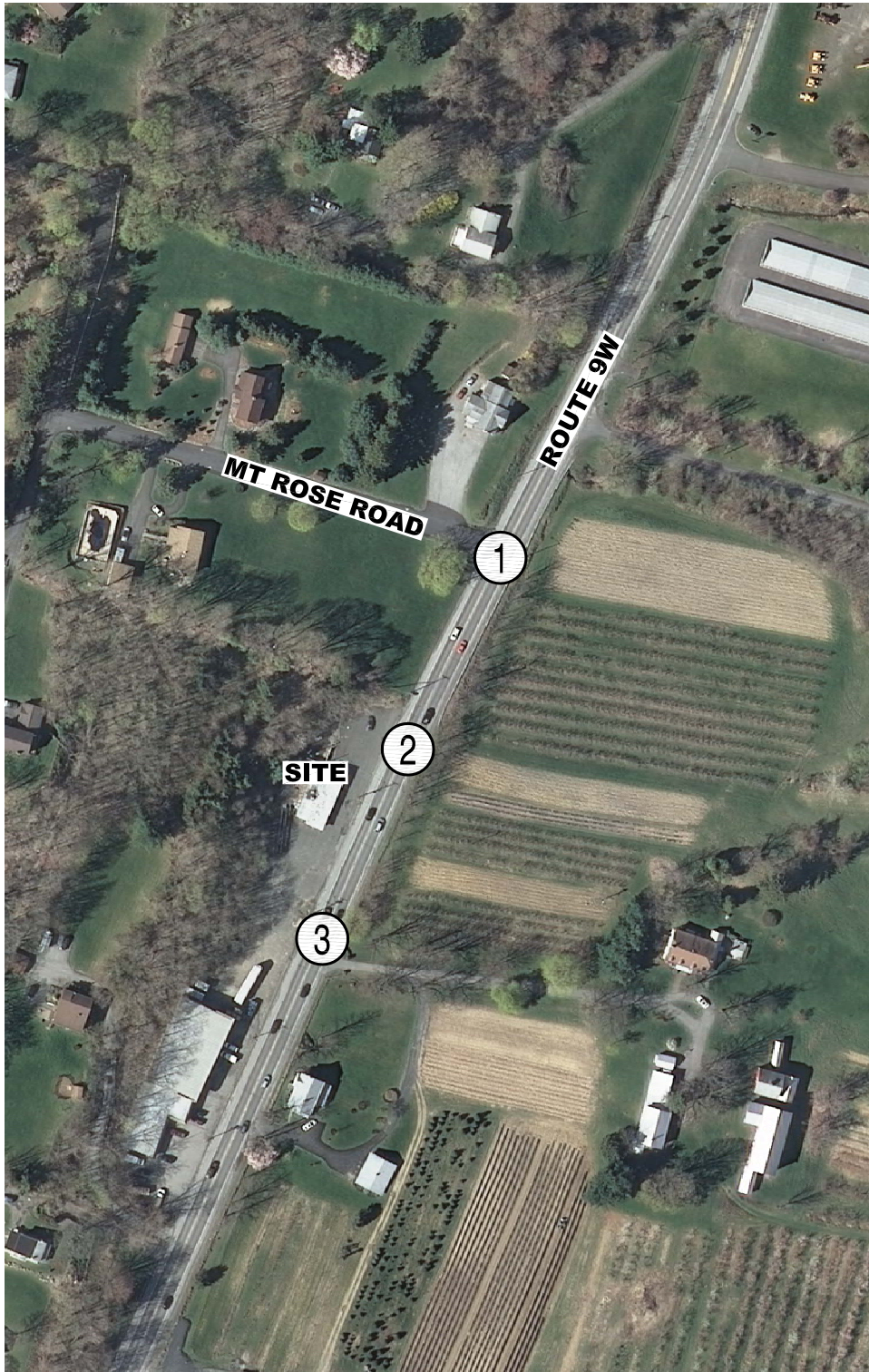
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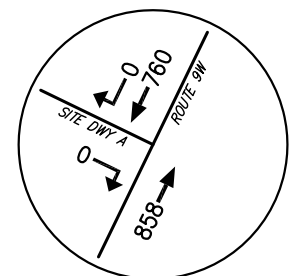


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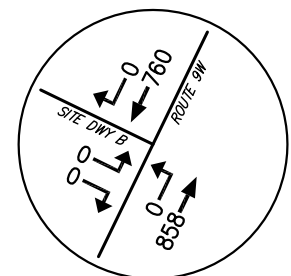
1

ROUTE 9W
& MT ROSE ROAD



2

ROUTE 9W &
SITE DRIVEWAY A



3

ROUTE 9W &
SITE DRIVEWAY B

PROPOSED GAS STATION & CONVENIENCE STORE

1417 ROUTE 9W

TOWN OF MARLBOROUGH, NEW YORK

2022 NO BUILD VOLUMES

REVISED: 03/31/2016
DATE: 07/09/2015

PEAK WEEKDAY AM HOUR (7:15 - 8:15)

JMC PROJECT: 15119

FIGURE: 03

SCALE: 1" = 200'



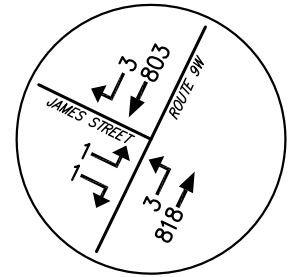
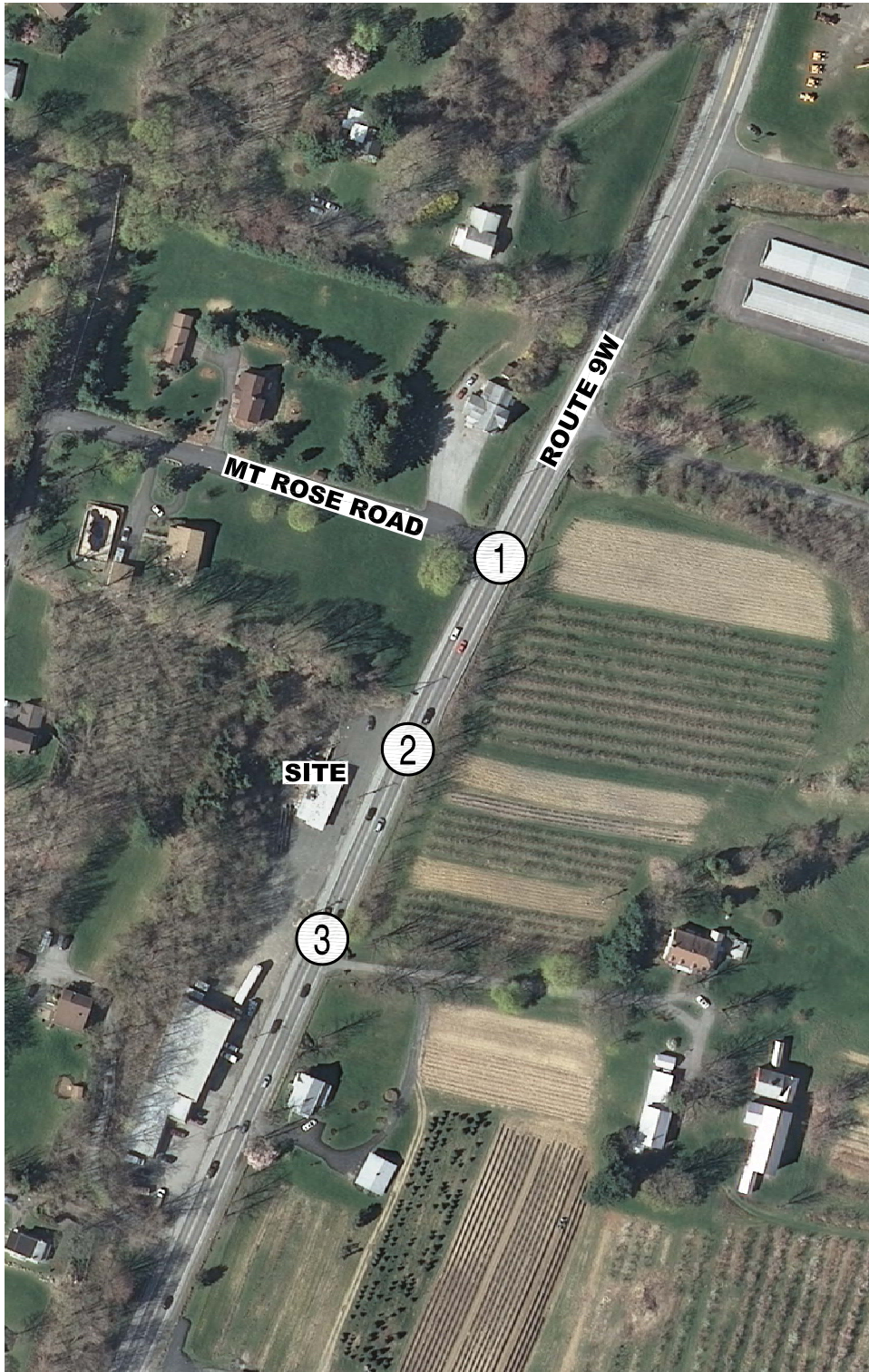
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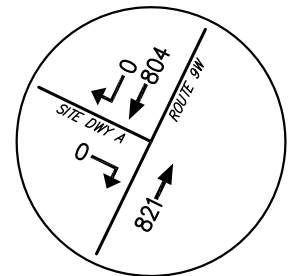
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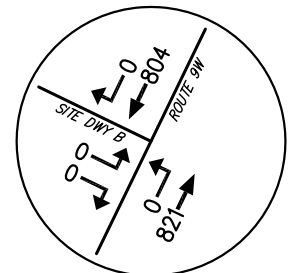
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**ROUTE 9W
& MT ROSE ROAD**



**ROUTE 9W &
SITE DRIVEWAY A**



**ROUTE 9W &
SITE DRIVEWAY B**

PROPOSED GAS STATION & CONVENIENCE STORE

1417 ROUTE 9W

TOWN OF MARLBOROUGH, NEW YORK

2022 NO BUILD VOLUMES

REVISED: 03/31/2016
DATE: 07/09/2015

PEAK WEEKDAY PM HOUR (4:00 - 5:00)

JMC PROJECT: 15119

FIGURE: 04

SCALE: 1" = 200'



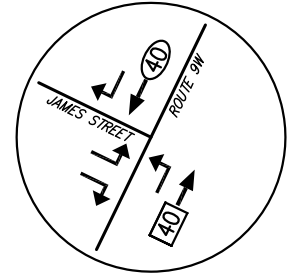
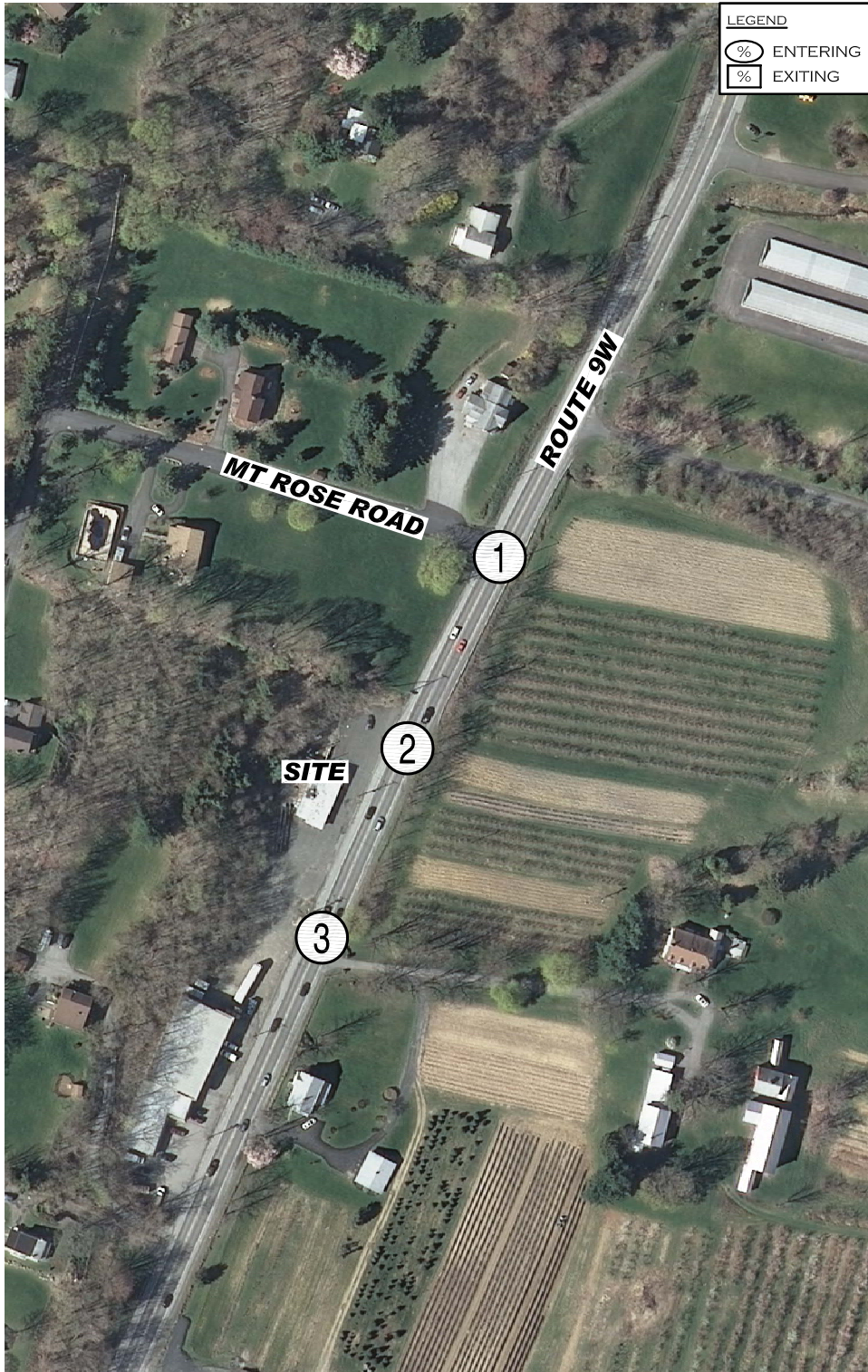
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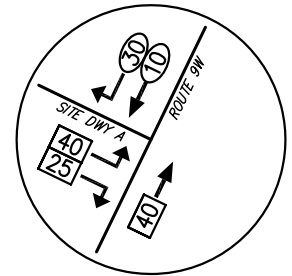


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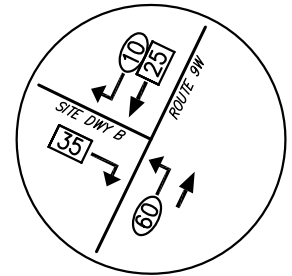
1

ROUTE 9W
& MT ROSE ROAD



2

ROUTE 9W &
SITE DRIVEWAY A



3

ROUTE 9W &
SITE DRIVEWAY B

PROPOSED GAS STATION & CONVENIENCE STORE

1417 ROUTE 9W

TOWN OF MARLBOROUGH, NEW YORK

PRIMARY TRIP DISTRIBUTIONS

REVISED: 08/15/2016
REVISED: 03/31/2016
REVISED: 11/20/2015
DATE: 07/09/2015

JMC PROJECT: 15119

FIGURE: 05

SCALE: 1" = 200'



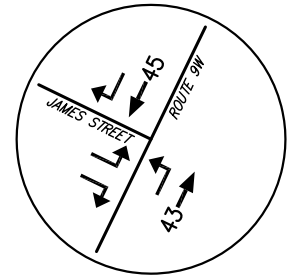
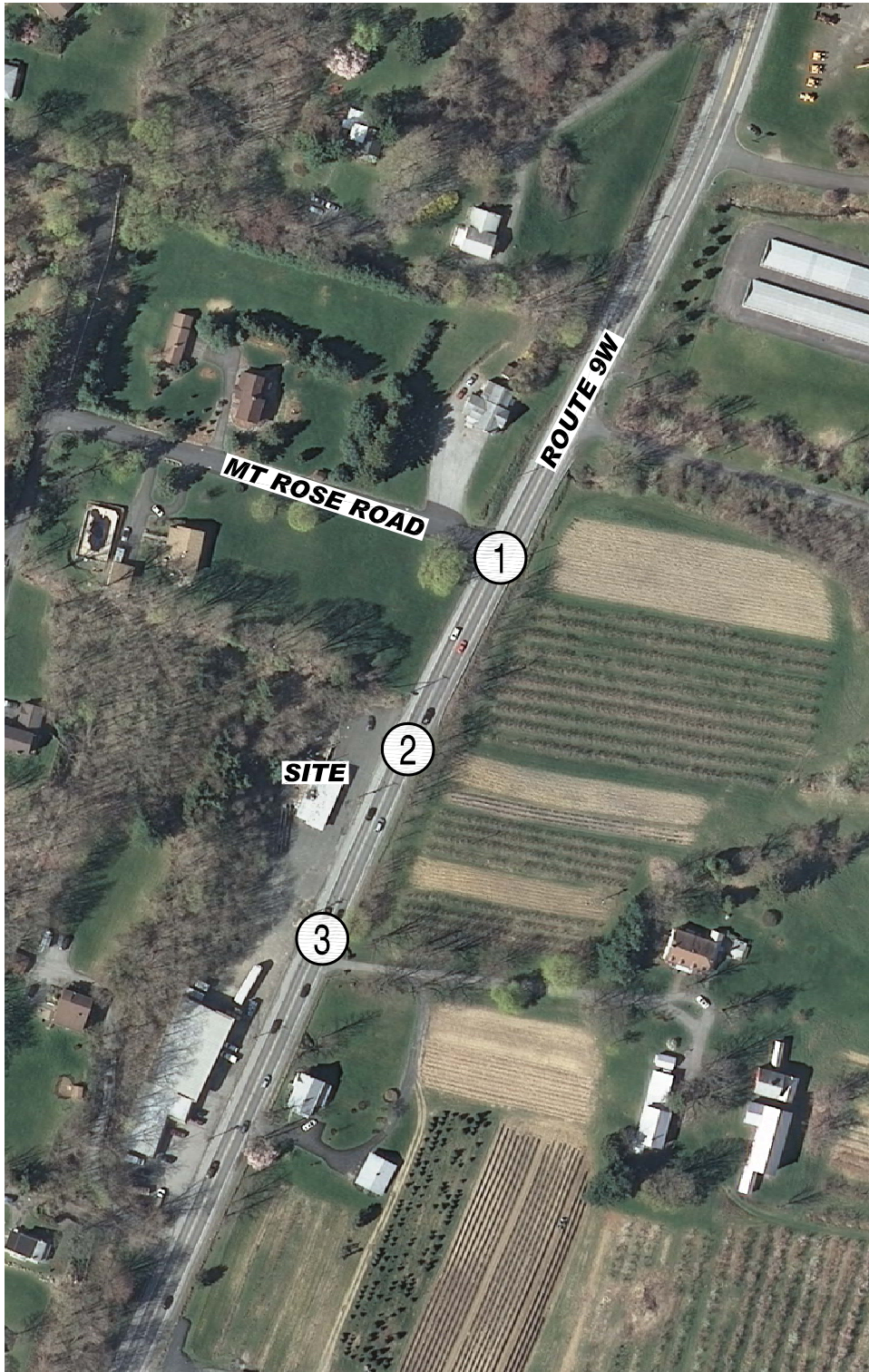
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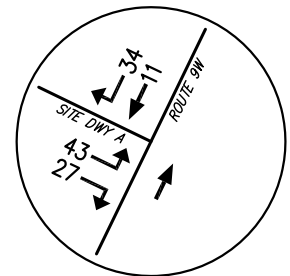


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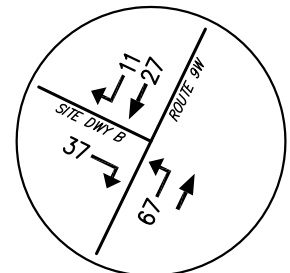
1

ROUTE 9W
& MT ROSE ROAD



2

ROUTE 9W &
SITE DRIVEWAY A



3

ROUTE 9W &
SITE DRIVEWAY B

PROPOSED GAS STATION & CONVENIENCE STORE

1417 ROUTE 9W

TOWN OF MARLBOROUGH, NEW YORK

PRIMARY VOLUMES

PEAK WEEKDAY AM HOUR

REVISED: 08/15/2016
REVISED: 03/31/2016
REVISED: 11/20/2015
DATE: 07/09/2015

JMC PROJECT: 15119

FIGURE: 06

SCALE: 1" = 200'



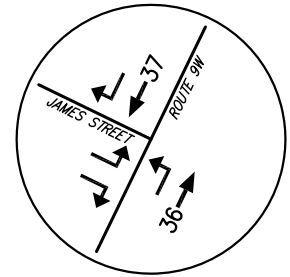
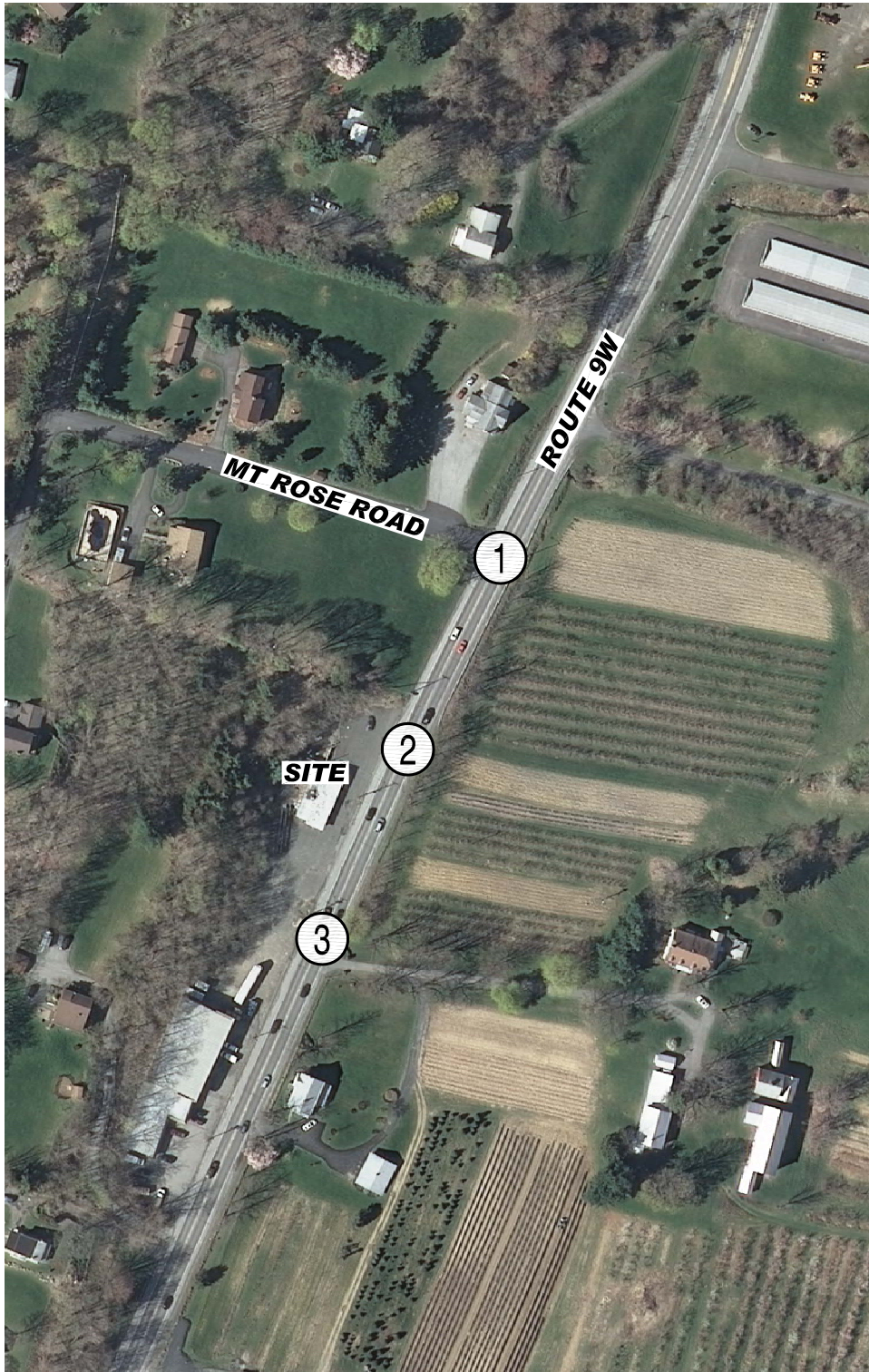
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NY 10504

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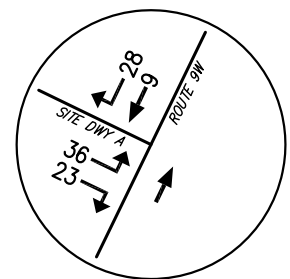
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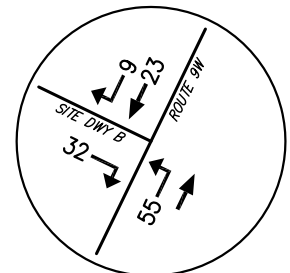
1

**ROUTE 9W
& MT ROSE ROAD**



2

**ROUTE 9W &
SITE DRIVEWAY A**



3

**ROUTE 9W &
SITE DRIVEWAY B**

PROPOSED GAS STATION & CONVENIENCE STORE

1417 ROUTE 9W

TOWN OF MARLBOROUGH, NEW YORK

PRIMARY VOLUMES

PEAK WEEKDAY PM HOUR

REVISED: 08/15/2016
REVISED: 03/31/2016
REVISED: 11/20/2015
DATE: 07/09/2015

JMC PROJECT: 15119

FIGURE: 07

SCALE: 1" = 200'



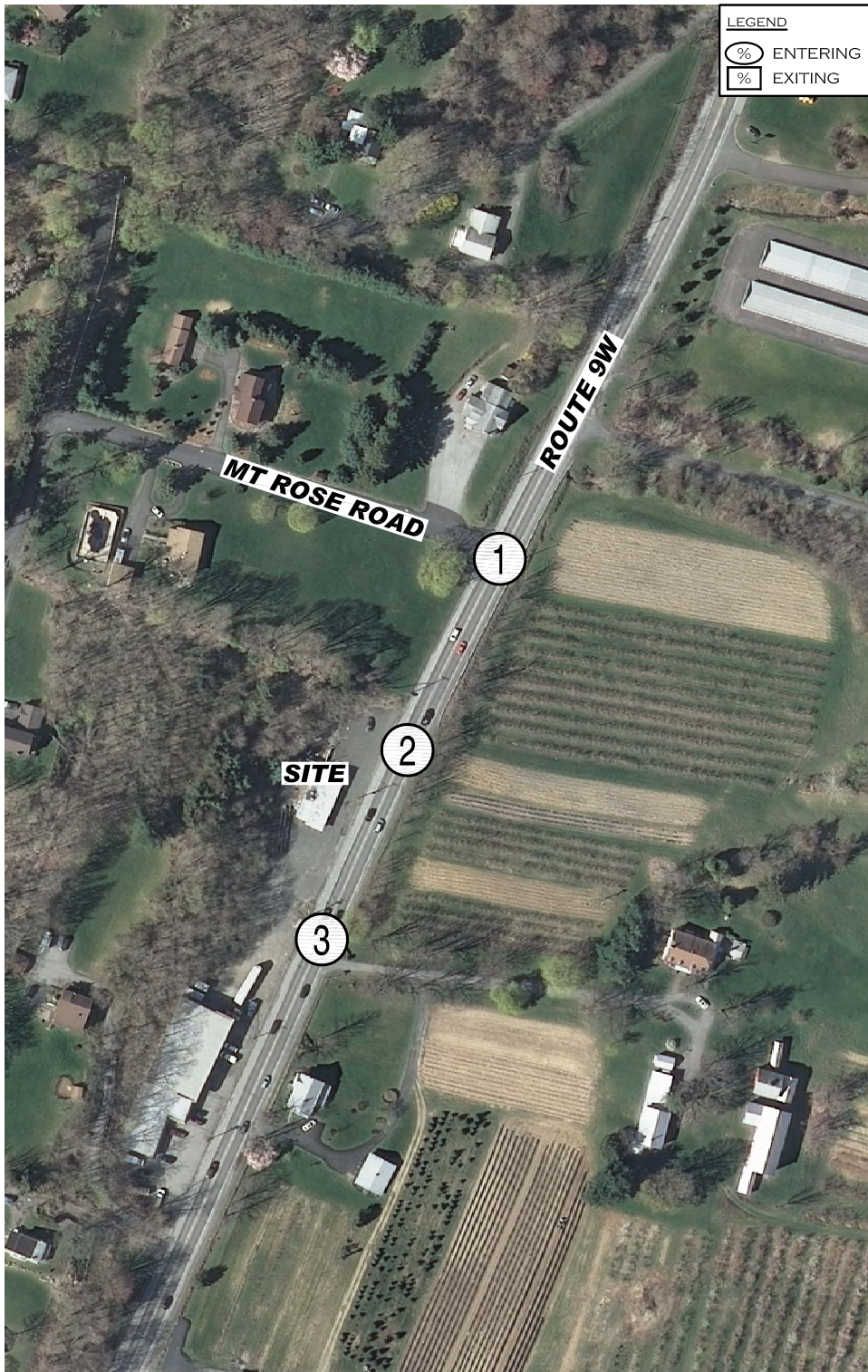
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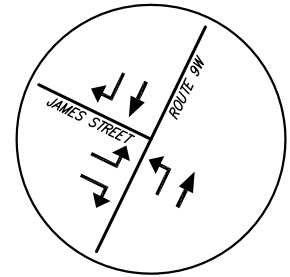


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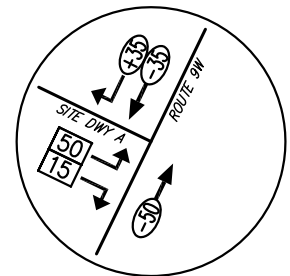
LEGEND

- ⊘ ENTERING
- ⊘ EXITING



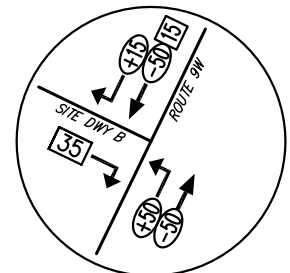
1

**ROUTE 9W
& MT ROSE ROAD**



2

**ROUTE 9W &
SITE DRIVEWAY A**



3

**ROUTE 9W &
SITE DRIVEWAY B**

PROPOSED GAS STATION & CONVENIENCE STORE

1417 ROUTE 9W

TOWN OF MARLBOROUGH, NEW YORK

PASS BY DISTRIBUTIONS

REVISED: 08/15/2016
REVISED: 03/31/2016
REVISED: 11/20/2015
DATE: 07/09/2015

JMC PROJECT: 15119

FIGURE: 08

SCALE: 1" = 200'



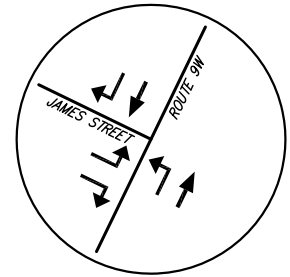
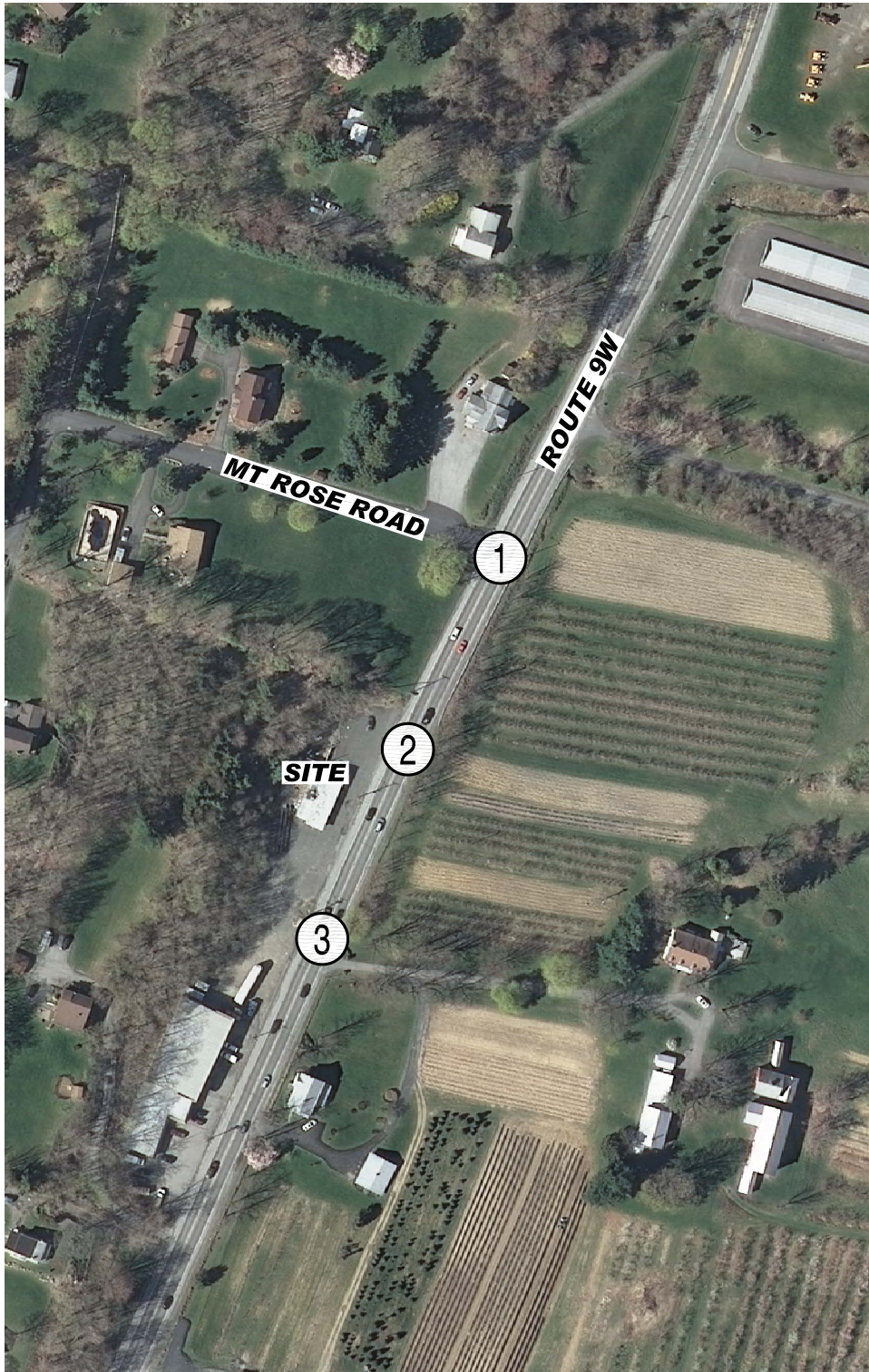
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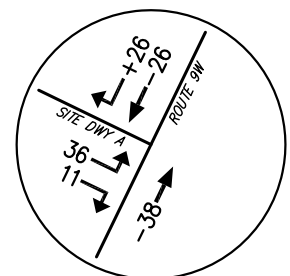
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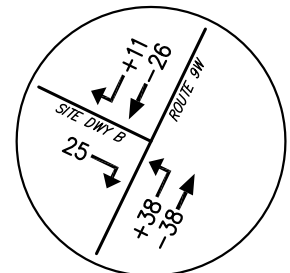
1

**ROUTE 9W
& MT ROSE ROAD**



2

**ROUTE 9W &
SITE DRIVEWAY A**



3

**ROUTE 9W &
SITE DRIVEWAY B**

PROPOSED GAS STATION & CONVENIENCE STORE

1417 ROUTE 9W

TOWN OF MARLBOROUGH, NEW YORK

PASS BY VOLUMES

PEAK WEEKDAY AM HOUR

REVISED: 08/15/2016
REVISED: 03/31/2016
REVISED: 11/20/2015
DATE: 07/09/2015

JMC PROJECT: 15119

FIGURE: 09

SCALE: 1" = 200'



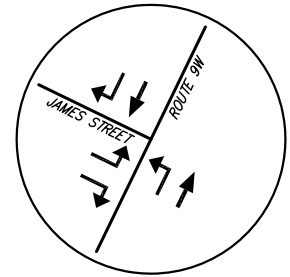
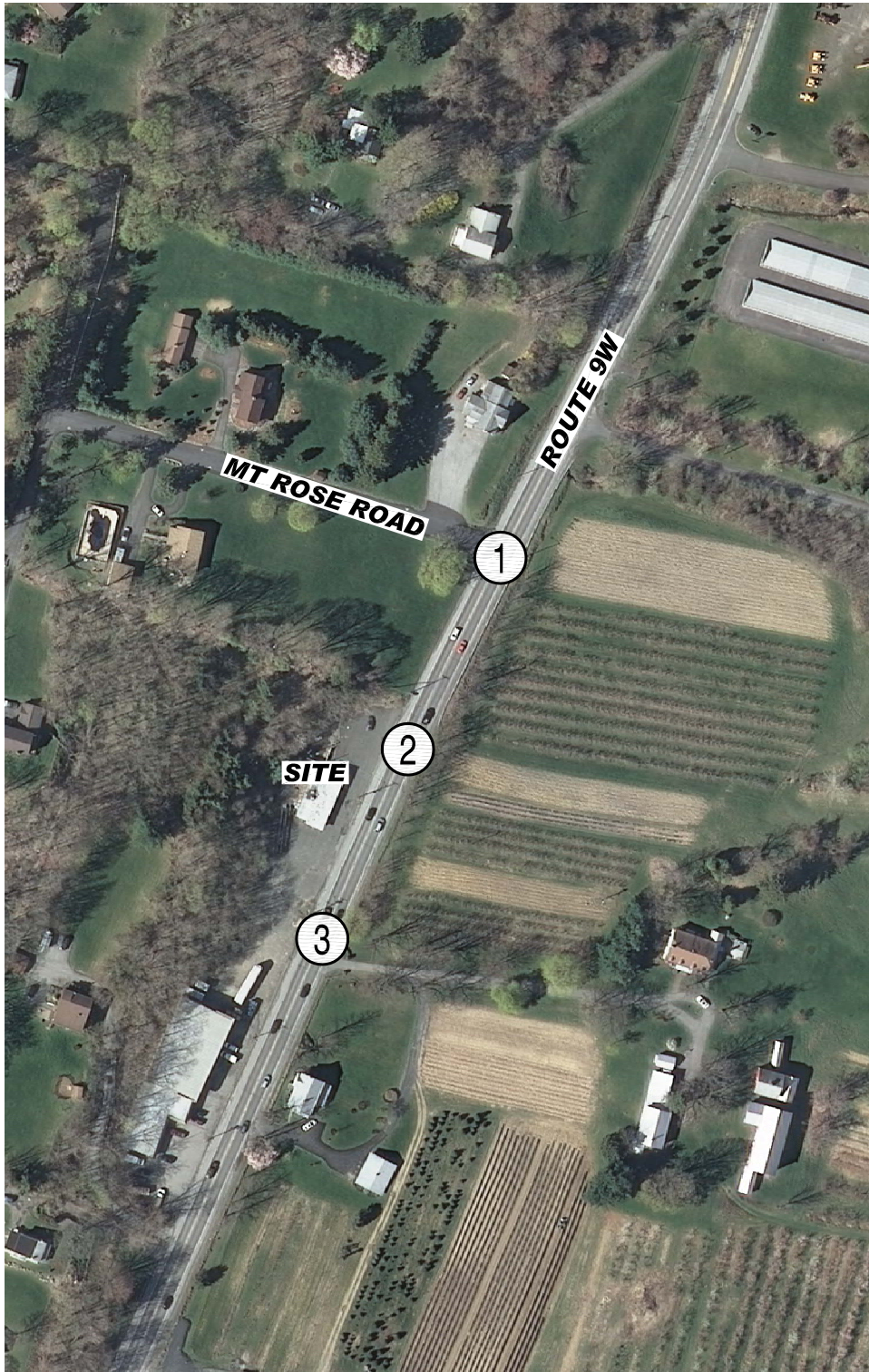
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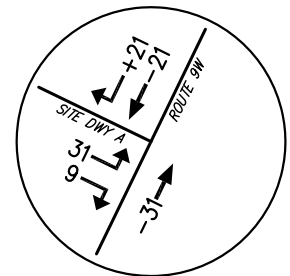


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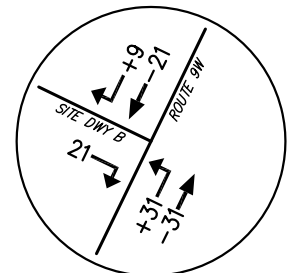
1

ROUTE 9W
& MT ROSE ROAD



2

ROUTE 9W &
SITE DRIVEWAY A



3

ROUTE 9W &
SITE DRIVEWAY B

PROPOSED GAS STATION & CONVENIENCE STORE

1417 ROUTE 9W

TOWN OF MARLBOROUGH, NEW YORK

PASS BY VOLUMES

PEAK WEEKDAY PM HOUR

REVISED: 08/15/2016
REVISED: 03/31/2016
REVISED: 11/20/2015
DATE: 07/09/2015

JMC PROJECT: 15119

FIGURE: 10

SCALE: 1" = 200'



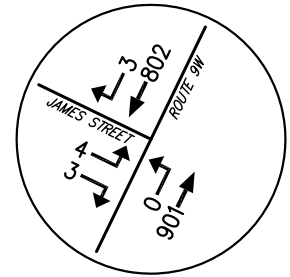
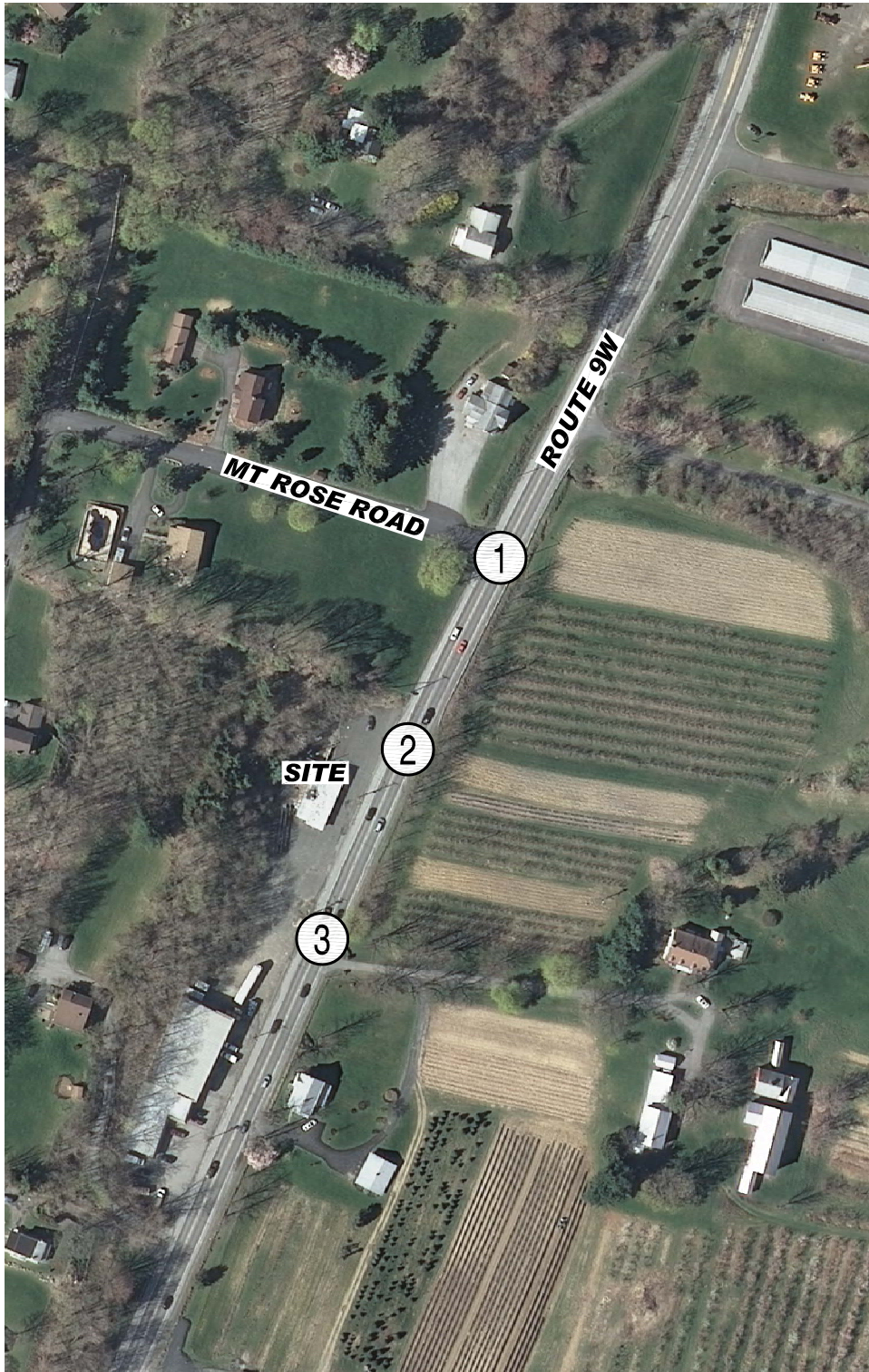
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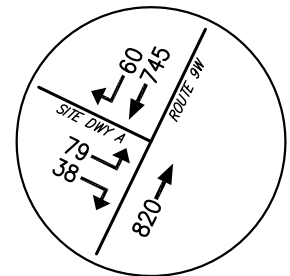


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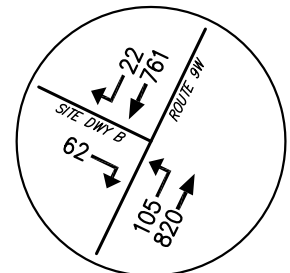
1

ROUTE 9W
& MT ROSE ROAD



2

ROUTE 9W &
SITE DRIVEWAY A



3

ROUTE 9W &
SITE DRIVEWAY B

PROPOSED GAS STATION & CONVENIENCE STORE

1417 ROUTE 9W

TOWN OF MARLBOROUGH, NEW YORK

2022 BUILD VOLUMES

PEAK WEEKDAY AM HOUR (7:15 - 8:15)

REVISED: 08/15/2016
REVISED: 03/31/2016
REVISED: 11/20/2015
DATE: 07/09/2015

JMC PROJECT: 15119

FIGURE: 11

SCALE: 1" = 200'



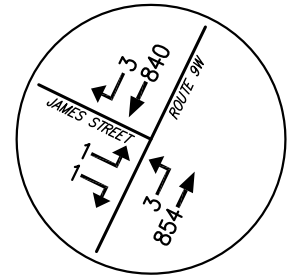
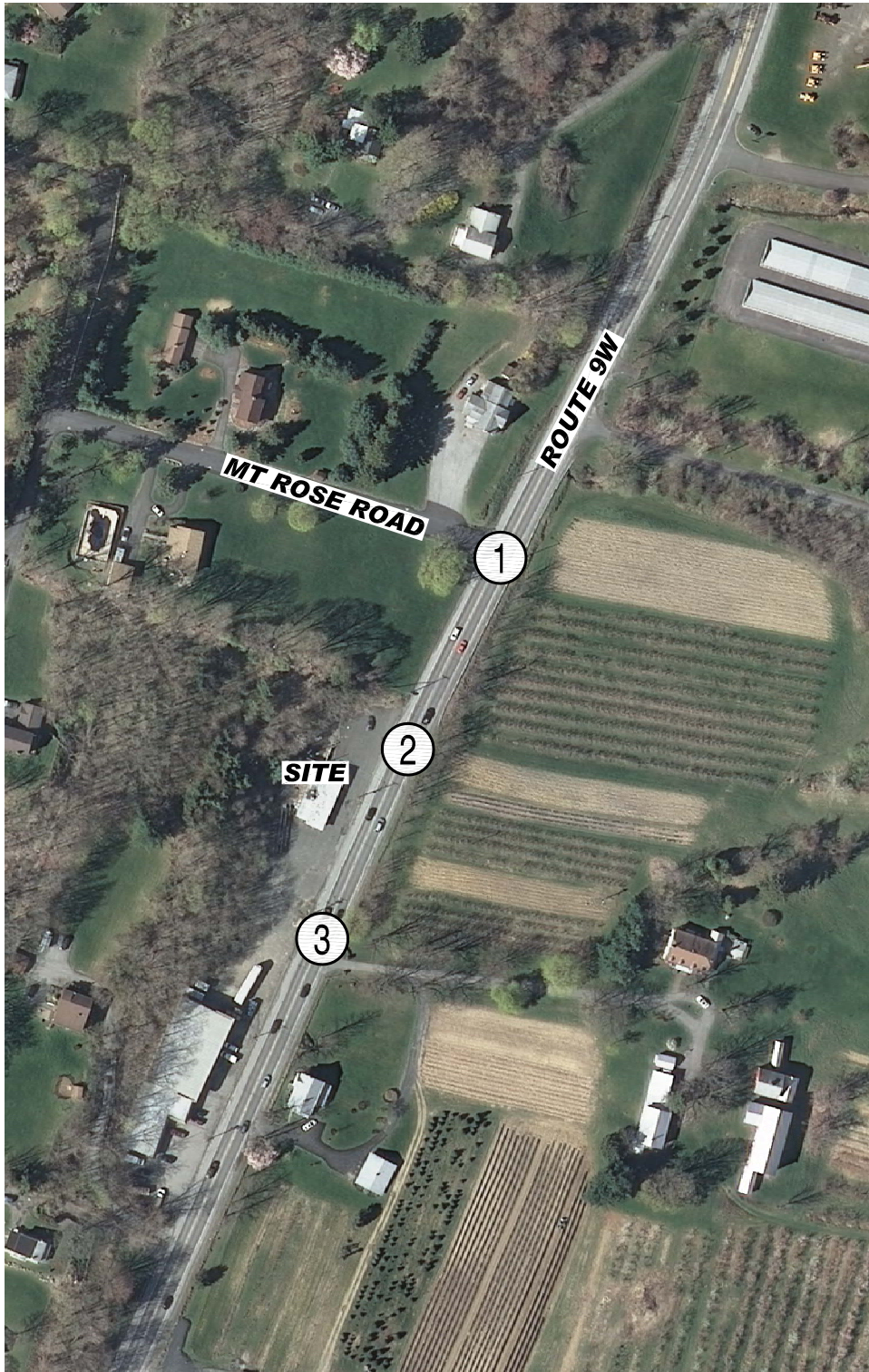
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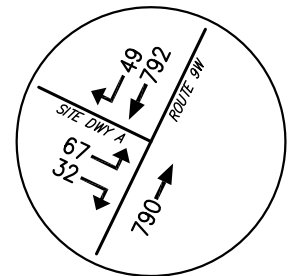
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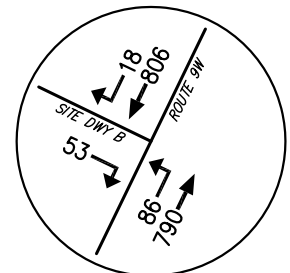
1

ROUTE 9W
& MT ROSE ROAD



2

ROUTE 9W &
SITE DRIVEWAY A



3

ROUTE 9W &
SITE DRIVEWAY B

PROPOSED GAS STATION & CONVENIENCE STORE

1417 ROUTE 9W

TOWN OF MARLBOROUGH, NEW YORK

2022 BUILD VOLUMES

PEAK WEEKDAY PM HOUR (4:00 - 5:00)

REVISED: 08/15/2016
REVISED: 03/31/2016
REVISED: 11/20/2015
DATE: 07/09/2015

JMC PROJECT: 15119

FIGURE: 12

SCALE: 1" = 200'



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APPENDIX C

CAPACITY ANALYSES

Lanes, Volumes, Timings
1: ROUTE 9W & MT ROSE RD

2015-EX-AM
3/30/2016



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	4	3	0	800	706	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)	-14%			-2%	2%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.949					
Flt Protected	0.970					
Satd. Flow (prot)	1871	0	0	1810	1775	0
Flt Permitted	0.970					
Satd. Flow (perm)	1871	0	0	1810	1775	0
Link Speed (mph)	30			40	40	
Link Distance (ft)	223			243	157	
Travel Time (s)	5.1			4.1	2.7	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Heavy Vehicles (%)	0%	0%	0%	6%	6%	0%
Adj. Flow (vph)	5	3	0	930	821	3
Shared Lane Traffic (%)						
Lane Group Flow (vph)	8	0	0	930	824	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	0.91	0.91	0.99	0.99	1.01	1.01
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 52.1% ICU Level of Service A
Analysis Period (min) 15

Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	4	3	0	800	706	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, %	-14	-	-	-2	2	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	0	0	0	6	6	0
Mvmt Flow	5	3	0	930	821	3
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1753	823	824	0	-	0
Stage 1	823	-	-	-	-	-
Stage 2	930	-	-	-	-	-
Critical Hdwy	3.6	4.8	4.1	-	-	-
Critical Hdwy Stg 1	2.6	-	-	-	-	-
Critical Hdwy Stg 2	2.6	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	371	519	815	-	-	-
Stage 1	825	-	-	-	-	-
Stage 2	798	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	371	519	815	-	-	-
Mov Cap-2 Maneuver	371	-	-	-	-	-
Stage 1	825	-	-	-	-	-
Stage 2	798	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	13.7	0		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	815	-	423	-	-	
HCM Lane V/C Ratio	-	-	0.019	-	-	
HCM Control Delay (s)	0	-	13.7	-	-	
HCM Lane LOS	A	-	B	-	-	
HCM 95th %tile Q(veh)	0	-	0.1	-	-	

Lanes, Volumes, Timings
2: ROUTE 9W & SITE DWY A

2015-EX-AM

3/30/2016

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	0	0	0	800	709	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	15	15	12	12	12	12
Grade (%)	0%			-2%	2%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	2090	0	0	1810	1775	0
Flt Permitted						
Satd. Flow (perm)	2090	0	0	1810	1775	0
Link Speed (mph)	30			40	40	
Link Distance (ft)	135			256	243	
Travel Time (s)	3.1			4.4	4.1	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Heavy Vehicles (%)	0%	0%	0%	6%	6%	0%
Adj. Flow (vph)	0	0	0	930	824	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	930	824	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	15			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.99	0.99	1.01	1.01
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	45.4%			ICU Level of Service A		
Analysis Period (min)	15					

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	0	0	0	800	709	0
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	-	-	-2	2	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	0	0	0	6	6	0
Mvmt Flow	0	0	0	930	824	0
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1754	824	824	0	-	0
Stage 1	824	-	-	-	-	-
Stage 2	930	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	95	376	815	-	-	-
Stage 1	434	-	-	-	-	-
Stage 2	387	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	95	376	815	-	-	-
Mov Cap-2 Maneuver	95	-	-	-	-	-
Stage 1	434	-	-	-	-	-
Stage 2	387	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	0	0		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	815	-	-	-	-	
HCM Lane V/C Ratio	-	-	-	-	-	
HCM Control Delay (s)	0	-	0	-	-	
HCM Lane LOS	A	-	A	-	-	
HCM 95th %tile Q(veh)	0	-	-	-	-	

Lanes, Volumes, Timings
3: ROUTE 9W & SITE DWY B

2015-EX-AM

3/30/2016



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	0	0	0	800	709	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	15	15	12	12	12	12
Grade (%)	0%			-2%	2%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	2090	0	0	1810	1775	0
Flt Permitted						
Satd. Flow (perm)	2090	0	0	1810	1775	0
Link Speed (mph)	30			40	40	
Link Distance (ft)	124			153	256	
Travel Time (s)	2.8			2.6	4.4	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Heavy Vehicles (%)	0%	0%	0%	6%	6%	0%
Adj. Flow (vph)	0	0	0	930	824	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	930	824	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	15			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.99	0.99	1.01	1.01
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 45.4% ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	0	0	0	800	709	0
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	-	-	-2	2	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	0	0	0	6	6	0
Mvmt Flow	0	0	0	930	824	0
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1754	824	824	0	-	0
Stage 1	824	-	-	-	-	-
Stage 2	930	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	95	376	815	-	-	-
Stage 1	434	-	-	-	-	-
Stage 2	387	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	95	376	815	-	-	-
Mov Cap-2 Maneuver	95	-	-	-	-	-
Stage 1	434	-	-	-	-	-
Stage 2	387	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	0	0		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	815	-	-	-	-	
HCM Lane V/C Ratio	-	-	-	-	-	
HCM Control Delay (s)	0	-	0	-	-	
HCM Lane LOS	A	-	A	-	-	
HCM 95th %tile Q(veh)	0	-	-	-	-	

Lanes, Volumes, Timings
1: ROUTE 9W & MT ROSE RD

2015-EX-PM

3/30/2016



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	1	1	3	763	749	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)	-14%			-2%	2%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.932				0.999	
Flt Protected	0.976					
Satd. Flow (prot)	1849	0	0	1919	1879	0
Flt Permitted	0.976					
Satd. Flow (perm)	1849	0	0	1919	1879	0
Link Speed (mph)	30			40	40	
Link Distance (ft)	223			243	157	
Travel Time (s)	5.1			4.1	2.7	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Adj. Flow (vph)	1	1	4	908	892	4
Shared Lane Traffic (%)						
Lane Group Flow (vph)	2	0	0	912	896	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	0.91	0.91	0.99	0.99	1.01	1.01
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 52.5% ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	1	1	3	763	749	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, %	-14	-	-	-2	2	-
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	1	1	4	908	892	4
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1808	893	895	0	-	0
Stage 1	893	-	-	-	-	-
Stage 2	915	-	-	-	-	-
Critical Hdwy	3.6	4.8	4.1	-	-	-
Critical Hdwy Stg 1	2.6	-	-	-	-	-
Critical Hdwy Stg 2	2.6	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	358	486	767	-	-	-
Stage 1	807	-	-	-	-	-
Stage 2	802	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	354	486	767	-	-	-
Mov Cap-2 Maneuver	354	-	-	-	-	-
Stage 1	807	-	-	-	-	-
Stage 2	793	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	13.8	0		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	767	-	410	-	-	
HCM Lane V/C Ratio	0.005	-	0.006	-	-	
HCM Control Delay (s)	9.7	0	13.8	-	-	
HCM Lane LOS	A	A	B	-	-	
HCM 95th %tile Q(veh)	0	-	0	-	-	

Lanes, Volumes, Timings
2: ROUTE 9W & SITE DWY A

2015-EX-PM

3/30/2016



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	0	0	0	766	750	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	15	15	12	12	12	12
Grade (%)	0%			-2%	2%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	2090	0	0	1919	1881	0
Flt Permitted						
Satd. Flow (perm)	2090	0	0	1919	1881	0
Link Speed (mph)	30			40	40	
Link Distance (ft)	135			256	243	
Travel Time (s)	3.1			4.4	4.1	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Adj. Flow (vph)	0	0	0	912	893	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	912	893	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	15			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.99	0.99	1.01	1.01
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 43.6% ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	0	0	0	766	750	0
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	-	-	-2	2	-
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	0	0	912	893	0
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1805	893	893	0	-	0
Stage 1	893	-	-	-	-	-
Stage 2	912	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	88	343	768	-	-	-
Stage 1	403	-	-	-	-	-
Stage 2	395	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	88	343	768	-	-	-
Mov Cap-2 Maneuver	88	-	-	-	-	-
Stage 1	403	-	-	-	-	-
Stage 2	395	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	0	0		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	768	-	-	-	-	
HCM Lane V/C Ratio	-	-	-	-	-	
HCM Control Delay (s)	0	-	0	-	-	
HCM Lane LOS	A	-	A	-	-	
HCM 95th %tile Q(veh)	0	-	-	-	-	

Lanes, Volumes, Timings
3: ROUTE 9W & SITE DWY B

2015-EX-PM

3/30/2016



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	0	0	0	766	750	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	15	15	12	12	12	12
Grade (%)	0%			-2%	2%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	2090	0	0	1919	1881	0
Flt Permitted						
Satd. Flow (perm)	2090	0	0	1919	1881	0
Link Speed (mph)	30			40	40	
Link Distance (ft)	124			153	256	
Travel Time (s)	2.8			2.6	4.4	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Adj. Flow (vph)	0	0	0	912	893	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	912	893	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	15			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.99	0.99	1.01	1.01
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 43.6% ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	0	0	0	766	750	0
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	-	-	-2	2	-
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	0	0	912	893	0
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1805	893	893	0	-	0
Stage 1	893	-	-	-	-	-
Stage 2	912	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	88	343	768	-	-	-
Stage 1	403	-	-	-	-	-
Stage 2	395	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	88	343	768	-	-	-
Mov Cap-2 Maneuver	88	-	-	-	-	-
Stage 1	403	-	-	-	-	-
Stage 2	395	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	0	0		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	768	-	-	-	-	
HCM Lane V/C Ratio	-	-	-	-	-	
HCM Control Delay (s)	0	-	0	-	-	
HCM Lane LOS	A	-	A	-	-	
HCM 95th %tile Q(veh)	0	-	-	-	-	

Lanes, Volumes, Timings
1: ROUTE 9W & MT ROSE RD

2022-NB-AM
3/30/2016



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	4	3	0	858	757	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)	-14%			-2%	2%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.949					
Flt Protected	0.970					
Satd. Flow (prot)	1871	0	0	1810	1775	0
Flt Permitted	0.970					
Satd. Flow (perm)	1871	0	0	1810	1775	0
Link Speed (mph)	30			40	40	
Link Distance (ft)	223			243	157	
Travel Time (s)	5.1			4.1	2.7	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Heavy Vehicles (%)	0%	0%	0%	6%	6%	0%
Adj. Flow (vph)	5	3	0	998	880	3
Shared Lane Traffic (%)						
Lane Group Flow (vph)	8	0	0	998	883	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	0.91	0.91	0.99	0.99	1.01	1.01
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 55.2% ICU Level of Service B
Analysis Period (min) 15

Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	4	3	0	858	757	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, %	-14	-	-	-2	2	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	0	0	0	6	6	0
Mvmt Flow	5	3	0	998	880	3
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1880	882	884	0	-	0
Stage 1	882	-	-	-	-	-
Stage 2	998	-	-	-	-	-
Critical Hdwy	3.6	4.8	4.1	-	-	-
Critical Hdwy Stg 1	2.6	-	-	-	-	-
Critical Hdwy Stg 2	2.6	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	342	491	774	-	-	-
Stage 1	810	-	-	-	-	-
Stage 2	782	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	342	491	774	-	-	-
Mov Cap-2 Maneuver	342	-	-	-	-	-
Stage 1	810	-	-	-	-	-
Stage 2	782	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	14.4	0		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	774	-	393	-	-	
HCM Lane V/C Ratio	-	-	0.021	-	-	
HCM Control Delay (s)	0	-	14.4	-	-	
HCM Lane LOS	A	-	B	-	-	
HCM 95th %tile Q(veh)	0	-	0.1	-	-	

Lanes, Volumes, Timings
2: ROUTE 9W & SITE DWY A

2022-NB-AM

3/30/2016



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	0	0	0	858	760	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	15	15	12	12	12	12
Grade (%)	0%			-2%	2%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Friction						
Flt Protected						
Satd. Flow (prot)	2090	0	0	1810	1775	0
Flt Permitted						
Satd. Flow (perm)	2090	0	0	1810	1775	0
Link Speed (mph)	30			40	40	
Link Distance (ft)	135			256	243	
Travel Time (s)	3.1			4.4	4.1	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Heavy Vehicles (%)	0%	0%	0%	6%	6%	0%
Adj. Flow (vph)	0	0	0	998	884	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	998	884	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	15			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.99	0.99	1.01	1.01
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 48.5% ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	0	0	0	858	760	0
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	-	-	-2	2	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	0	0	0	6	6	0
Mvmt Flow	0	0	0	998	884	0
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1882	884	884	0	-	0
Stage 1	884	-	-	-	-	-
Stage 2	998	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	79	347	774	-	-	-
Stage 1	407	-	-	-	-	-
Stage 2	360	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	79	347	774	-	-	-
Mov Cap-2 Maneuver	79	-	-	-	-	-
Stage 1	407	-	-	-	-	-
Stage 2	360	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	0	0		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	774	-	-	-	-	
HCM Lane V/C Ratio	-	-	-	-	-	
HCM Control Delay (s)	0	-	0	-	-	
HCM Lane LOS	A	-	A	-	-	
HCM 95th %tile Q(veh)	0	-	-	-	-	

Lanes, Volumes, Timings
3: ROUTE 9W & SITE DWY B

2022-NB-AM

3/30/2016



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	0	0	0	858	760	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	15	15	12	12	12	12
Grade (%)	0%			-2%	2%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	2090	0	0	1810	1775	0
Flt Permitted						
Satd. Flow (perm)	2090	0	0	1810	1775	0
Link Speed (mph)	30			40	40	
Link Distance (ft)	124			153	256	
Travel Time (s)	2.8			2.6	4.4	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Heavy Vehicles (%)	0%	0%	0%	6%	6%	0%
Adj. Flow (vph)	0	0	0	998	884	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	998	884	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	15			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.99	0.99	1.01	1.01
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 48.5% ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	0	0	0	858	760	0
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	-	-	-2	2	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	0	0	0	6	6	0
Mvmt Flow	0	0	0	998	884	0
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1882	884	884	0	-	0
Stage 1	884	-	-	-	-	-
Stage 2	998	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	79	347	774	-	-	-
Stage 1	407	-	-	-	-	-
Stage 2	360	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	79	347	774	-	-	-
Mov Cap-2 Maneuver	79	-	-	-	-	-
Stage 1	407	-	-	-	-	-
Stage 2	360	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	0	0		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	774	-	-	-	-	
HCM Lane V/C Ratio	-	-	-	-	-	
HCM Control Delay (s)	0	-	0	-	-	
HCM Lane LOS	A	-	A	-	-	
HCM 95th %tile Q(veh)	0	-	-	-	-	

Lanes, Volumes, Timings
1: ROUTE 9W & MT ROSE RD

2022-NB-PM

3/30/2016



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	1	1	3	818	803	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)	-14%			-2%	2%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.932				0.999	
Flt Protected	0.976					
Satd. Flow (prot)	1849	0	0	1919	1879	0
Flt Permitted	0.976					
Satd. Flow (perm)	1849	0	0	1919	1879	0
Link Speed (mph)	30			40	40	
Link Distance (ft)	223			243	157	
Travel Time (s)	5.1			4.1	2.7	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Adj. Flow (vph)	1	1	4	974	956	4
Shared Lane Traffic (%)						
Lane Group Flow (vph)	2	0	0	978	960	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	0.91	0.91	0.99	0.99	1.01	1.01
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 55.4% ICU Level of Service B

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	1	1	3	818	803	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, %	-14	-	-	-2	2	-
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	1	1	4	974	956	4
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1939	958	960	0	-	0
Stage 1	958	-	-	-	-	-
Stage 2	981	-	-	-	-	-
Critical Hdwy	3.6	4.8	4.1	-	-	-
Critical Hdwy Stg 1	2.6	-	-	-	-	-
Critical Hdwy Stg 2	2.6	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	329	457	725	-	-	-
Stage 1	791	-	-	-	-	-
Stage 2	786	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	325	457	725	-	-	-
Mov Cap-2 Maneuver	325	-	-	-	-	-
Stage 1	791	-	-	-	-	-
Stage 2	777	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	14.5	0		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	725	-	380	-	-	
HCM Lane V/C Ratio	0.005	-	0.006	-	-	
HCM Control Delay (s)	10	0	14.5	-	-	
HCM Lane LOS	A	A	B	-	-	
HCM 95th %tile Q(veh)	0	-	0	-	-	

Lanes, Volumes, Timings
2: ROUTE 9W & SITE DWY A

2022-NB-PM

3/30/2016



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	0	0	0	821	804	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	15	15	12	12	12	12
Grade (%)	0%			-2%	2%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	2090	0	0	1919	1881	0
Flt Permitted						
Satd. Flow (perm)	2090	0	0	1919	1881	0
Link Speed (mph)	30			40	40	
Link Distance (ft)	135			256	243	
Travel Time (s)	3.1			4.4	4.1	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Adj. Flow (vph)	0	0	0	977	957	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	977	957	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	15			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.99	0.99	1.01	1.01
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 46.5% ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	0	0	0	821	804	0
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	-	-	-2	2	-
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	0	0	977	957	0
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1934	957	957	0	-	0
Stage 1	957	-	-	-	-	-
Stage 2	977	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	73	315	727	-	-	-
Stage 1	376	-	-	-	-	-
Stage 2	368	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	73	315	727	-	-	-
Mov Cap-2 Maneuver	73	-	-	-	-	-
Stage 1	376	-	-	-	-	-
Stage 2	368	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	0	0		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	727	-	-	-	-	
HCM Lane V/C Ratio	-	-	-	-	-	
HCM Control Delay (s)	0	-	0	-	-	
HCM Lane LOS	A	-	A	-	-	
HCM 95th %tile Q(veh)	0	-	-	-	-	

Lanes, Volumes, Timings
3: ROUTE 9W & SITE DWY B

2022-NB-PM

3/30/2016



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	0	0	0	821	804	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	15	15	12	12	12	12
Grade (%)	0%			-2%	2%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	2090	0	0	1919	1881	0
Flt Permitted						
Satd. Flow (perm)	2090	0	0	1919	1881	0
Link Speed (mph)	30			40	40	
Link Distance (ft)	124			153	256	
Travel Time (s)	2.8			2.6	4.4	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Adj. Flow (vph)	0	0	0	977	957	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	977	957	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	15			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.99	0.99	1.01	1.01
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 46.5% ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	0	0	0	821	804	0
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	-	-	-2	2	-
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	0	0	977	957	0
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1934	957	957	0	-	0
Stage 1	957	-	-	-	-	-
Stage 2	977	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	73	315	727	-	-	-
Stage 1	376	-	-	-	-	-
Stage 2	368	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	73	315	727	-	-	-
Mov Cap-2 Maneuver	73	-	-	-	-	-
Stage 1	376	-	-	-	-	-
Stage 2	368	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	0	0		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	727	-	-	-	-	
HCM Lane V/C Ratio	-	-	-	-	-	
HCM Control Delay (s)	0	-	0	-	-	
HCM Lane LOS	A	-	A	-	-	
HCM 95th %tile Q(veh)	0	-	-	-	-	

Lanes, Volumes, Timings
1: ROUTE 9W & MT ROSE RD

2022-BD-AM

3/30/2016



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	4	3	0	901	802	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)	-14%			-2%	2%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.949					
Flt Protected	0.970					
Satd. Flow (prot)	1871	0	0	1810	1775	0
Flt Permitted	0.970					
Satd. Flow (perm)	1871	0	0	1810	1775	0
Link Speed (mph)	30			40	40	
Link Distance (ft)	223			243	157	
Travel Time (s)	5.1			4.1	2.7	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Heavy Vehicles (%)	0%	0%	0%	6%	6%	0%
Adj. Flow (vph)	5	3	0	1048	933	3
Shared Lane Traffic (%)						
Lane Group Flow (vph)	8	0	0	1048	936	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	0.91	0.91	0.99	0.99	1.01	1.01
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 57.4%

ICU Level of Service B

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	4	3	0	901	802	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, %	-14	-	-	-2	2	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	0	0	0	6	6	0
Mvmt Flow	5	3	0	1048	933	3
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1982	934	936	0	-	0
Stage 1	934	-	-	-	-	-
Stage 2	1048	-	-	-	-	-
Critical Hdwy	3.6	4.8	4.1	-	-	-
Critical Hdwy Stg 1	2.6	-	-	-	-	-
Critical Hdwy Stg 2	2.6	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	320	467	740	-	-	-
Stage 1	797	-	-	-	-	-
Stage 2	769	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	320	467	740	-	-	-
Mov Cap-2 Maneuver	320	-	-	-	-	-
Stage 1	797	-	-	-	-	-
Stage 2	769	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	14.9	0		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	740	-	370	-	-	
HCM Lane V/C Ratio	-	-	0.022	-	-	
HCM Control Delay (s)	0	-	14.9	-	-	
HCM Lane LOS	A	-	B	-	-	
HCM 95th %tile Q(veh)	0	-	0.1	-	-	

Lanes, Volumes, Timings
2: ROUTE 9W & SITE DWY A

2022-BD-AM

3/30/2016



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	47	38	77	852	745	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	15	15	12	12	12	12
Grade (%)	0%			-2%	2%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.940				0.990	
Flt Protected	0.973			0.996		
Satd. Flow (prot)	1912	0	0	1812	1764	0
Flt Permitted	0.973			0.996		
Satd. Flow (perm)	1912	0	0	1812	1764	0
Link Speed (mph)	30			40	40	
Link Distance (ft)	135			256	243	
Travel Time (s)	3.1			4.4	4.1	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Heavy Vehicles (%)	0%	0%	0%	6%	6%	0%
Adj. Flow (vph)	55	44	90	991	866	70
Shared Lane Traffic (%)						
Lane Group Flow (vph)	99	0	0	1081	936	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	15			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.99	0.99	1.01	1.01
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 106.9% ICU Level of Service G

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	16					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	47	38	77	852	745	60
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	-	-	-2	2	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	0	0	0	6	6	0
Mvmt Flow	55	44	90	991	866	70
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	2071	901	936	0	-	0
Stage 1	901	-	-	-	-	-
Stage 2	1170	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	60	340	740	-	-	-
Stage 1	400	-	-	-	-	-
Stage 2	298	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 44	340	740	-	-	-
Mov Cap-2 Maneuver	~ 44	-	-	-	-	-
Stage 1	400	-	-	-	-	-
Stage 2	217	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	\$ 333.6	0.9		0		
HCM LOS	F					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	740	-	72	-	-	
HCM Lane V/C Ratio	0.121	-	1.373	-	-	
HCM Control Delay (s)	10.5	0	\$ 333.6	-	-	
HCM Lane LOS	B	A	F	-	-	
HCM 95th %tile Q(veh)	0.4	-	8	-	-	
Notes						
~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon						

Lanes, Volumes, Timings
3: ROUTE 9W & SITE DWY B

2022-BD-AM

3/30/2016



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	32	62	28	897	761	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	15	15	12	12	12	12
Grade (%)	0%			-2%	2%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.911				0.996	
Flt Protected	0.983			0.998		
Satd. Flow (prot)	1872	0	0	1810	1770	0
Flt Permitted	0.983			0.998		
Satd. Flow (perm)	1872	0	0	1810	1770	0
Link Speed (mph)	30			40	40	
Link Distance (ft)	124			153	256	
Travel Time (s)	2.8			2.6	4.4	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Heavy Vehicles (%)	0%	0%	0%	6%	6%	0%
Adj. Flow (vph)	37	72	33	1043	885	26
Shared Lane Traffic (%)						
Lane Group Flow (vph)	109	0	0	1076	911	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	15			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.99	0.99	1.01	1.01
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 82.1% ICU Level of Service E

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	5.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	32	62	28	897	761	22
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	-	-	-2	2	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	0	0	0	6	6	0
Mvmt Flow	37	72	33	1043	885	26
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	2006	898	910	0	-	0
Stage 1	898	-	-	-	-	-
Stage 2	1108	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	66	341	757	-	-	-
Stage 1	401	-	-	-	-	-
Stage 2	319	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	59	341	757	-	-	-
Mov Cap-2 Maneuver	59	-	-	-	-	-
Stage 1	401	-	-	-	-	-
Stage 2	286	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	105.3	0.3		0		
HCM LOS	F					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	757	-	130	-	-	
HCM Lane V/C Ratio	0.043	-	0.841	-	-	
HCM Control Delay (s)	10	0	105.3	-	-	
HCM Lane LOS	A	A	F	-	-	
HCM 95th %tile Q(veh)	0.1	-	5.2	-	-	

Lanes, Volumes, Timings
1: ROUTE 9W & MT ROSE RD

2022-BD-PM

3/30/2016



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	1	1	3	854	840	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)	-14%			-2%	2%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.932				0.999	
Flt Protected	0.976					
Satd. Flow (prot)	1849	0	0	1919	1879	0
Flt Permitted	0.976					
Satd. Flow (perm)	1849	0	0	1919	1879	0
Link Speed (mph)	30			40	40	
Link Distance (ft)	223			243	157	
Travel Time (s)	5.1			4.1	2.7	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Adj. Flow (vph)	1	1	4	1017	1000	4
Shared Lane Traffic (%)						
Lane Group Flow (vph)	2	0	0	1021	1004	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	0.91	0.91	0.99	0.99	1.01	1.01
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 57.3% ICU Level of Service B

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	1	1	3	854	840	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, %	-14	-	-	-2	2	-
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	1	1	4	1017	1000	4
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	2026	1002	1004	0	-	0
Stage 1	1002	-	-	-	-	-
Stage 2	1024	-	-	-	-	-
Critical Hdwy	3.6	4.8	4.1	-	-	-
Critical Hdwy Stg 1	2.6	-	-	-	-	-
Critical Hdwy Stg 2	2.6	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	310	438	698	-	-	-
Stage 1	781	-	-	-	-	-
Stage 2	775	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	306	438	698	-	-	-
Mov Cap-2 Maneuver	306	-	-	-	-	-
Stage 1	781	-	-	-	-	-
Stage 2	765	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	15.1	0		0		
HCM LOS	C					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	698	-	360	-	-	
HCM Lane V/C Ratio	0.005	-	0.007	-	-	
HCM Control Delay (s)	10.2	0	15.1	-	-	
HCM Lane LOS	B	A	C	-	-	
HCM 95th %tile Q(veh)	0	-	0	-	-	

Lanes, Volumes, Timings
2: ROUTE 9W & SITE DWY A

2022-BD-PM

3/30/2016



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	40	32	63	817	792	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	15	15	12	12	12	12
Grade (%)	0%			-2%	2%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.940				0.992	
Flt Protected	0.973			0.996		
Satd. Flow (prot)	1912	0	0	1911	1866	0
Flt Permitted	0.973			0.996		
Satd. Flow (perm)	1912	0	0	1911	1866	0
Link Speed (mph)	30			40	40	
Link Distance (ft)	135			256	243	
Travel Time (s)	3.1			4.4	4.1	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Adj. Flow (vph)	48	38	75	973	943	58
Shared Lane Traffic (%)						
Lane Group Flow (vph)	86	0	0	1048	1001	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	15			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.99	0.99	1.01	1.01
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 105.3%

ICU Level of Service G

Analysis Period (min) 15

Intersection

Int Delay, s/veh 11.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	40	32	63	817	792	49
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	-	-	-2	2	-
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	48	38	75	973	943	58

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	2095	972	1001 0
Stage 1	972	-	- -
Stage 2	1123	-	- -
Critical Hdwy	6.4	6.2	4.1 -
Critical Hdwy Stg 1	5.4	-	- -
Critical Hdwy Stg 2	5.4	-	- -
Follow-up Hdwy	3.5	3.3	2.2 -
Pot Cap-1 Maneuver	58	309	700 -
Stage 1	370	-	- -
Stage 2	314	-	- -
Platoon blocked, %			- -
Mov Cap-1 Maneuver	~ 44	309	700 -
Mov Cap-2 Maneuver	~ 44	-	- -
Stage 1	370	-	- -
Stage 2	241	-	- -

Approach	EB	NB	SB
HCM Control Delay, s	274.7	0.8	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	700	-	71	-	-
HCM Lane V/C Ratio	0.107	-	1.207	-	-
HCM Control Delay (s)	10.8	0	274.7	-	-
HCM Lane LOS	B	A	F	-	-
HCM 95th %tile Q(veh)	0.4	-	6.7	-	-

Notes

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

Lanes, Volumes, Timings
3: ROUTE 9W & SITE DWY B

2022-BD-PM

3/30/2016



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	27	53	23	853	806	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	15	15	12	12	12	12
Grade (%)	0%			-2%	2%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.910				0.997	
Flt Protected	0.983			0.999		
Satd. Flow (prot)	1870	0	0	1917	1875	0
Flt Permitted	0.983			0.999		
Satd. Flow (perm)	1870	0	0	1917	1875	0
Link Speed (mph)	30			40	40	
Link Distance (ft)	124			153	256	
Travel Time (s)	2.8			2.6	4.4	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Adj. Flow (vph)	32	63	27	1015	960	21
Shared Lane Traffic (%)						
Lane Group Flow (vph)	95	0	0	1042	981	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	15			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.99	0.99	1.01	1.01
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 74.8% ICU Level of Service D

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	4.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	27	53	23	853	806	18
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	-	-	-2	2	-
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	32	63	27	1015	960	21
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	2040	970	981	0	-	0
Stage 1	970	-	-	-	-	-
Stage 2	1070	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	63	310	712	-	-	-
Stage 1	371	-	-	-	-	-
Stage 2	332	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	58	310	712	-	-	-
Mov Cap-2 Maneuver	58	-	-	-	-	-
Stage 1	371	-	-	-	-	-
Stage 2	303	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	91.5	0.3		0		
HCM LOS	F					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	712	-	126	-	-	
HCM Lane V/C Ratio	0.038	-	0.756	-	-	
HCM Control Delay (s)	10.3	0	91.5	-	-	
HCM Lane LOS	B	A	F	-	-	
HCM 95th %tile Q(veh)	0.1	-	4.4	-	-	

Lanes, Volumes, Timings
1: ROUTE 9W & MT ROSE RD

2022-BD-AM-IMP

8/15/2016



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	4	3	0	901	802	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)	-14%			-2%	2%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.949					
Flt Protected	0.970					
Satd. Flow (prot)	1871	0	0	1810	1775	0
Flt Permitted	0.970					
Satd. Flow (perm)	1871	0	0	1810	1775	0
Link Speed (mph)	30			40	40	
Link Distance (ft)	223			102	157	
Travel Time (s)	5.1			1.7	2.7	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Heavy Vehicles (%)	0%	0%	0%	6%	6%	0%
Adj. Flow (vph)	5	3	0	1048	933	3
Shared Lane Traffic (%)						
Lane Group Flow (vph)	8	0	0	1048	936	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	0.91	0.91	0.99	0.99	1.01	1.01
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 57.4% ICU Level of Service B

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	4	3	0	901	802	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, %	-14	-	-	-2	2	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	0	0	0	6	6	0
Mvmt Flow	5	3	0	1048	933	3
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1982	934	936	0	-	0
Stage 1	934	-	-	-	-	-
Stage 2	1048	-	-	-	-	-
Critical Hdwy	3.6	4.8	4.1	-	-	-
Critical Hdwy Stg 1	2.6	-	-	-	-	-
Critical Hdwy Stg 2	2.6	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	320	467	740	-	-	-
Stage 1	797	-	-	-	-	-
Stage 2	769	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	320	467	740	-	-	-
Mov Cap-2 Maneuver	320	-	-	-	-	-
Stage 1	797	-	-	-	-	-
Stage 2	769	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	14.9	0		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	740	-	370	-	-	
HCM Lane V/C Ratio	-	-	0.022	-	-	
HCM Control Delay (s)	0	-	14.9	-	-	
HCM Lane LOS	A	-	B	-	-	
HCM 95th %tile Q(veh)	0	-	0.1	-	-	

Lanes, Volumes, Timings
2: ROUTE 9W & SITE DWY A

2022-BD-AM-IMP

8/15/2016



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	79	38	0	0	745	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	15	15	12	12	12	12
Grade (%)	0%			-2%	2%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.956				0.990	
Flt Protected	0.967					
Satd. Flow (prot)	1932	0	0	0	1764	0
Flt Permitted	0.967					
Satd. Flow (perm)	1932	0	0	0	1764	0
Link Speed (mph)	30			40	40	
Link Distance (ft)	135			185	140	
Travel Time (s)	3.1			3.2	2.4	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Heavy Vehicles (%)	0%	0%	0%	6%	6%	0%
Adj. Flow (vph)	92	44	0	0	866	70
Shared Lane Traffic (%)						
Lane Group Flow (vph)	136	0	0	0	936	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	15			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.99	0.99	1.01	1.01
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 56.2% ICU Level of Service B

Analysis Period (min) 15

Intersection							
Int Delay, s/veh	3.7						
Movement	EBL	EBR	NBL	NBT	SBT	SBR	
Vol, veh/h	79	38	0	0	745	60	
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	-	-	-2	2	-	
Peak Hour Factor	86	86	86	86	86	86	
Heavy Vehicles, %	0	0	0	6	6	0	
Mvmt Flow	92	44	0	0	866	70	
Major/Minor	Minor2			Major2			
Conflicting Flow All	901	901		-	0		
Stage 1	901	-		-	-		
Stage 2	0	-		-	-		
Critical Hdwy	7.1	6.2		-	-		
Critical Hdwy Stg 1	6.1	-		-	-		
Critical Hdwy Stg 2	-	-		-	-		
Follow-up Hdwy	3.5	3.3		-	-		
Pot Cap-1 Maneuver	261	340		-	-		
Stage 1	335	-		-	-		
Stage 2	-	-		-	-		
Platoon blocked, %				-	-		
Mov Cap-1 Maneuver	261	340		-	-		
Mov Cap-2 Maneuver	261	-		-	-		
Stage 1	335	-		-	-		
Stage 2	-	-		-	-		
Approach	EB			SB			
HCM Control Delay, s	29.1			0			
HCM LOS	D						
Minor Lane/Major Mvmt	EBLn1	SBT	SBR				
Capacity (veh/h)	282	-	-				
HCM Lane V/C Ratio	0.482	-	-				
HCM Control Delay (s)	29.1	-	-				
HCM Lane LOS	D	-	-				
HCM 95th %tile Q(veh)	2.5	-	-				

Lanes, Volumes, Timings
3: ROUTE 9W & SITE DWY B

2022-BD-AM-IMP

8/15/2016

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	0	62	105	820	761	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	15	15	10	11	11	11
Grade (%)	0%			-2%	2%	
Storage Length (ft)	0	0	400			0
Storage Lanes	0	1	1			0
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.865			0.996	
Flt Protected			0.950			
Satd. Flow (prot)	0	1808	1702	1750	1711	0
Flt Permitted			0.950			
Satd. Flow (perm)	0	1808	1702	1750	1711	0
Link Speed (mph)	30			40	40	
Link Distance (ft)	124			560	72	
Travel Time (s)	2.8			9.5	1.2	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Heavy Vehicles (%)	0%	0%	0%	6%	6%	0%
Adj. Flow (vph)	0	72	122	953	885	26
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	72	122	953	911	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			10	10	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	0.88	0.88	1.08	1.03	1.06	1.06
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	53.9%			ICU Level of Service A		
Analysis Period (min)	15					

Intersection						
Int Delay, s/veh	1.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	0	62	105	820	761	22
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	400	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	-2	2	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	0	0	0	6	6	0
Mvmt Flow	0	72	122	953	885	26
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	2096	898	910	0	-	0
Stage 1	898	-	-	-	-	-
Stage 2	1198	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	58	341	757	-	-	-
Stage 1	401	-	-	-	-	-
Stage 2	289	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	49	341	757	-	-	-
Mov Cap-2 Maneuver	49	-	-	-	-	-
Stage 1	401	-	-	-	-	-
Stage 2	242	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	18.4	1.2		0		
HCM LOS	C					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	757	-	341	-	-	
HCM Lane V/C Ratio	0.161	-	0.211	-	-	
HCM Control Delay (s)	10.7	-	18.4	-	-	
HCM Lane LOS	B	-	C	-	-	
HCM 95th %tile Q(veh)	0.6	-	0.8	-	-	

Lanes, Volumes, Timings
1: ROUTE 9W & MT ROSE RD

2022-BD-PM-IMP

8/15/2016



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	1	1	3	854	840	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)	-14%			-2%	2%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.932				0.999	
Flt Protected	0.976					
Satd. Flow (prot)	1849	0	0	1811	1773	0
Flt Permitted	0.976					
Satd. Flow (perm)	1849	0	0	1811	1773	0
Link Speed (mph)	30			40	40	
Link Distance (ft)	223			102	157	
Travel Time (s)	5.1			1.7	2.7	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Heavy Vehicles (%)	0%	0%	0%	6%	6%	0%
Adj. Flow (vph)	1	1	4	1017	1000	4
Shared Lane Traffic (%)						
Lane Group Flow (vph)	2	0	0	1021	1004	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	0.91	0.91	0.99	0.99	1.01	1.01
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 57.3% ICU Level of Service B

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	1	1	3	854	840	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, %	-14	-	-	-2	2	-
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	0	0	0	6	6	0
Mvmt Flow	1	1	4	1017	1000	4
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	2026	1002	1004	0	-	0
Stage 1	1002	-	-	-	-	-
Stage 2	1024	-	-	-	-	-
Critical Hdwy	3.6	4.8	4.1	-	-	-
Critical Hdwy Stg 1	2.6	-	-	-	-	-
Critical Hdwy Stg 2	2.6	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	310	438	698	-	-	-
Stage 1	781	-	-	-	-	-
Stage 2	775	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	306	438	698	-	-	-
Mov Cap-2 Maneuver	306	-	-	-	-	-
Stage 1	781	-	-	-	-	-
Stage 2	765	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	15.1	0		0		
HCM LOS	C					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	698	-	360	-	-	
HCM Lane V/C Ratio	0.005	-	0.007	-	-	
HCM Control Delay (s)	10.2	0	15.1	-	-	
HCM Lane LOS	B	A	C	-	-	
HCM 95th %tile Q(veh)	0	-	0	-	-	

Lanes, Volumes, Timings
2: ROUTE 9W & SITE DWY A

2022-BD-PM-IMP

8/15/2016



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	67	32	0	0	792	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	15	15	12	12	12	12
Grade (%)	0%			-2%	2%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.957				0.992	
Flt Protected	0.967					
Satd. Flow (prot)	1934	0	0	0	1866	0
Flt Permitted	0.967					
Satd. Flow (perm)	1934	0	0	0	1866	0
Link Speed (mph)	30			40	40	
Link Distance (ft)	135			185	140	
Travel Time (s)	3.1			3.2	2.4	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Adj. Flow (vph)	80	38	0	0	943	58
Shared Lane Traffic (%)						
Lane Group Flow (vph)	118	0	0	0	1001	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	15			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.99	0.99	1.01	1.01
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 57.0% ICU Level of Service B

Analysis Period (min) 15

Intersection							
Int Delay, s/veh	3.3						
Movement	EBL	EBR	NBL	NBT	SBT	SBR	
Vol, veh/h	67	32	0	0	792	49	
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	-	-	-2	2	-	
Peak Hour Factor	84	84	84	84	84	84	
Heavy Vehicles, %	0	0	0	0	0	0	
Mvmt Flow	80	38	0	0	943	58	
Major/Minor	Minor2			Major2			
Conflicting Flow All	972	972		-	0		
Stage 1	972	-		-	-		
Stage 2	0	-		-	-		
Critical Hdwy	7.1	6.2		-	-		
Critical Hdwy Stg 1	6.1	-		-	-		
Critical Hdwy Stg 2	-	-		-	-		
Follow-up Hdwy	3.5	3.3		-	-		
Pot Cap-1 Maneuver	234	309		-	-		
Stage 1	306	-		-	-		
Stage 2	-	-		-	-		
Platoon blocked, %				-	-		
Mov Cap-1 Maneuver	234	309		-	-		
Mov Cap-2 Maneuver	234	-		-	-		
Stage 1	306	-		-	-		
Stage 2	-	-		-	-		
Approach	EB			SB			
HCM Control Delay, s	30.9			0			
HCM LOS	D						
Minor Lane/Major Mvmt	EBLn1	SBT	SBR				
Capacity (veh/h)	254	-	-				
HCM Lane V/C Ratio	0.464	-	-				
HCM Control Delay (s)	30.9	-	-				
HCM Lane LOS	D	-	-				
HCM 95th %tile Q(veh)	2.3	-	-				

Lanes, Volumes, Timings
3: ROUTE 9W & SITE DWY B

2022-BD-PM-IMP

8/15/2016

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	0	53	86	790	806	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	15	15	10	11	11	11
Grade (%)	0%			-2%	2%	
Storage Length (ft)	0	0	400			0
Storage Lanes	0	1	1			0
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.865			0.997	
Flt Protected			0.950			
Satd. Flow (prot)	0	1808	1702	1855	1813	0
Flt Permitted			0.950			
Satd. Flow (perm)	0	1808	1702	1855	1813	0
Link Speed (mph)	30			40	40	
Link Distance (ft)	124			560	72	
Travel Time (s)	2.8			9.5	1.2	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Adj. Flow (vph)	0	63	102	940	960	21
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	63	102	940	981	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			10	10	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	0.88	0.88	1.08	1.03	1.06	1.06
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	54.9%			ICU Level of Service A		
Analysis Period (min)	15					

Intersection						
Int Delay, s/veh	1.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	0	53	86	790	806	18
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	400	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	-2	2	-
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	63	102	940	960	21
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	2115	970	981	0	-	0
Stage 1	970	-	-	-	-	-
Stage 2	1145	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	56	310	712	-	-	-
Stage 1	371	-	-	-	-	-
Stage 2	306	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	48	310	712	-	-	-
Mov Cap-2 Maneuver	48	-	-	-	-	-
Stage 1	371	-	-	-	-	-
Stage 2	262	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	19.6	1.1		0		
HCM LOS	C					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	712	-	310	-	-	
HCM Lane V/C Ratio	0.144	-	0.204	-	-	
HCM Control Delay (s)	10.9	-	19.6	-	-	
HCM Lane LOS	B	-	C	-	-	
HCM 95th %tile Q(veh)	0.5	-	0.7	-	-	

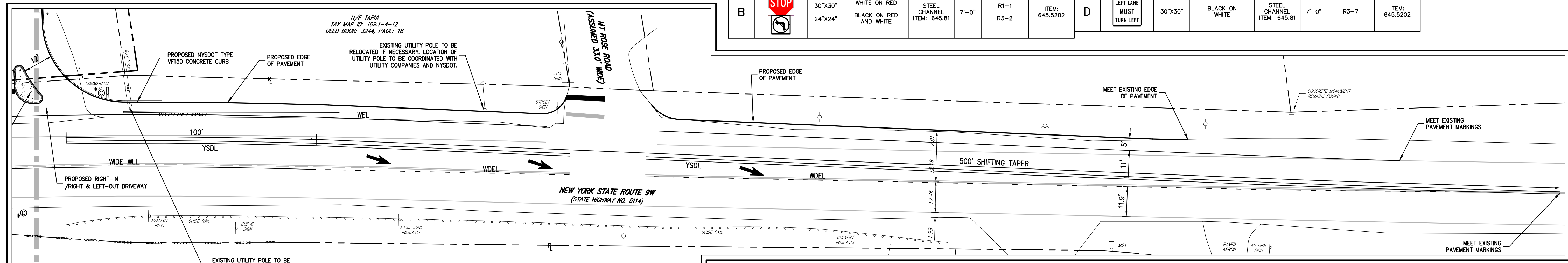
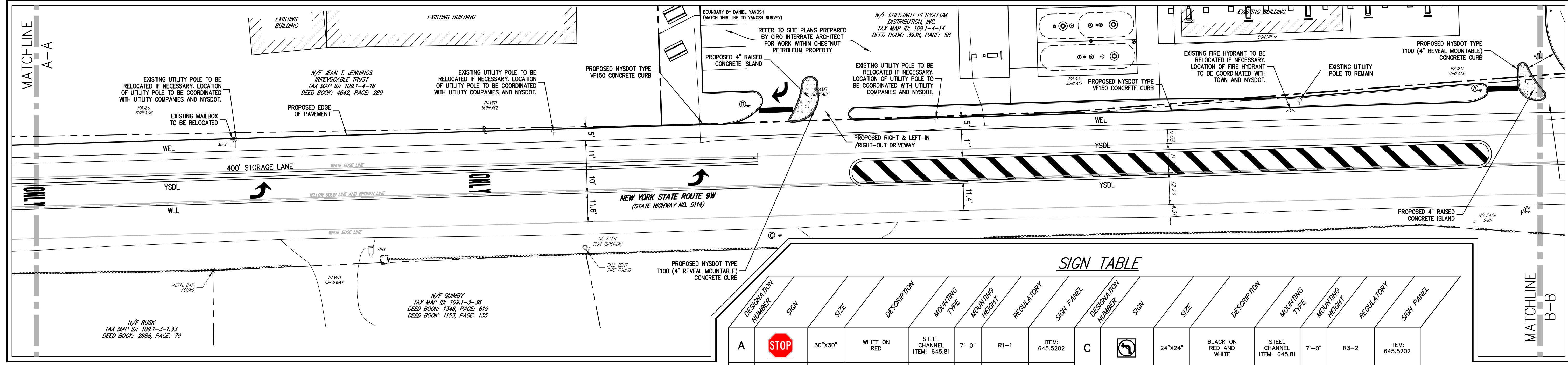
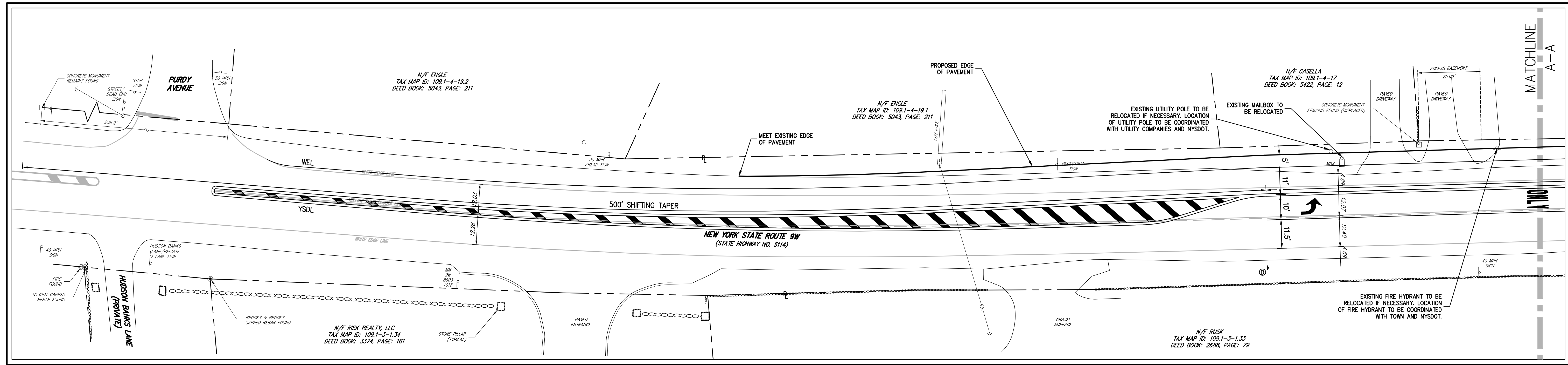
APPENDIX D

DRAWINGS

ANY ALTERATION OF PLANS, SPECIFICATIONS, PLATS AND REPORTS BEARING THE SEAL OF A LICENSED PROFESSIONAL ENGINEER OR LICENSED LAND SURVEYOR SHALL BE THE RESPONSIBILITY OF THE PROFESSIONAL PERSON BEARING THE SEAL. NO ALTERATION OF PLANS, SPECIFICATIONS, PLATS AND REPORTS SHALL BE MADE WITHOUT THE WRITTEN CONSENT OF THE PROFESSIONAL PERSON BEARING THE SEAL. SUBSECTION 2.

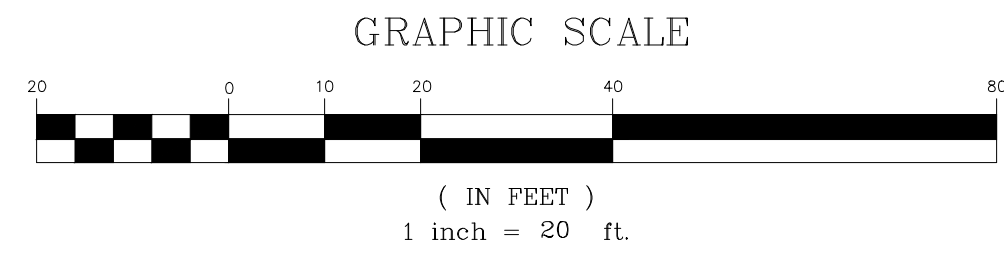
NOT FOR CONSTRUCTION

NOT FOR CONSTRUCTION



NOTES:

- EXISTING CONDITIONS DEPICTED ON THIS PLAN HAVE BEEN TAKEN FROM A SURVEY TITLED, "RIGHT OF WAY & TOPOGRAPHIC SURVEY," PREPARED BY ENGINEERING & SURVEYING PROPERTIES, DATED 10/07/2015.
- NYS ROUTE 9W DESIGN SPEED IS 50 MPH.



No.	Revision	Date	By
1.	GENERAL REVISIONS	12/15/2015	KRM
2.	GENERAL REVISIONS	03/31/2016	KRM
3.	REVISED PER NYSOT COMMENTS	07/07/2016	KRM

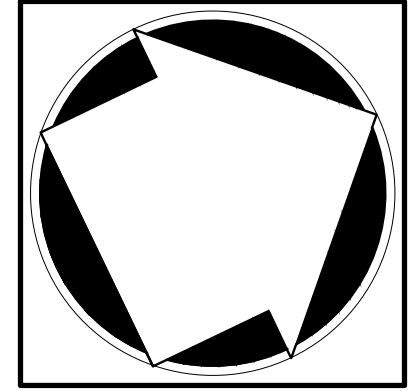
Previous Editions Obsolete

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CONCEPTUAL HIGHWAY
IMPROVEMENT PLAN
PROPOSED GAS STATION &
CONVENIENCE STORE
1417 ROUTE 9W
TOWN OF MARLBOROUGH, NEW YORK

Drawn: KRM Approved: RR
Scale: 1" = 20'
Date: 11/04/2015
Project No: 15119
SHE-10000-ALT SHEET 1.LAY
Drawing No: CHP-1