

October 4, 2019

Mr. John Reilly
Permit Engineer
NYSDOT Region 8, Ulster County
11 Quarry Street
Kingston, NY 12401

RE: Response to Department Comments on 850 Route 28, LLC, T/o Kingston; Ulster County; CM Project 118-207, NYSDOT SEQR 18-175

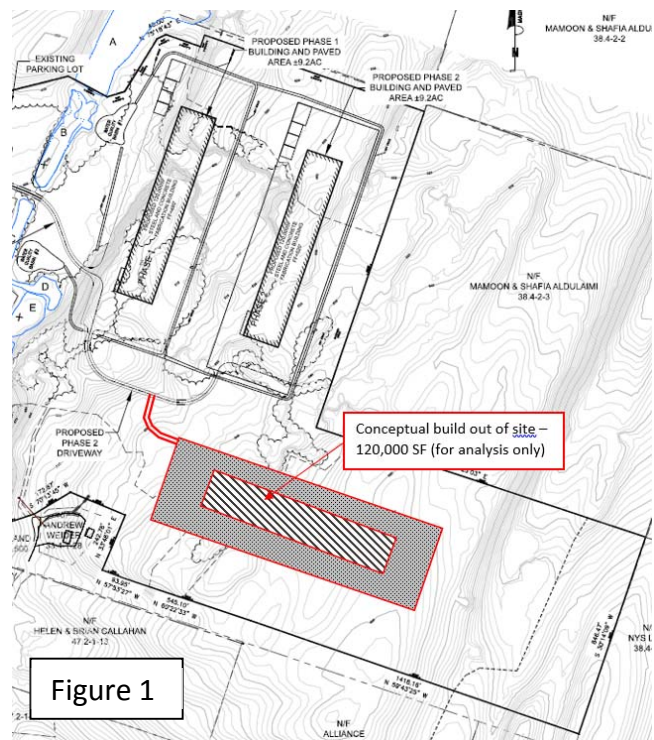
Dear Mr. Reilly:

Creighton Manning Engineering, LLP (CM) has reviewed the comments provided by the Department on June 17, 2019 regarding the proposed 850 Route 28, LLC project in the Town of Kingston. Below is a summary of the comments and our responses, noting that comment #3 did not require a response.

Comment #1: "I think you missed my point, The Department is asking that the entire buildout of the property be studied, so that any improvements in the highway can be planned such that future improvements are not precluded. The Department is not asking the applicant to make these mitigations at this time but to plan the improvements with future development. The Department is trying to avoid a situation where successive development is prevented because the future applicant would have to provide for the previous occupants use. This becomes the straw that broke the camels' back to say. Furthermore, if the site access becomes a town road the Department may be responsible for improvements if an operation problem were to develop on Route 28. So it is everybody's best interest to begin the planning process on this site."

Response: For the record, there is no plan for additional build out of the site; however, to consider the potential for additional development on the site, a third, 120,000 SF building was sited on the remaining lands, as depicted on Figure 1. Analysis of this condition is included below in response to comment #2.

Comment #2: "The Department would like to remind the applicant that if two alternative methods are used to express the trip generation, the Institute of Transportation Engineers recommends using the more conservative approach. The applicant is proposing using values that are significantly below the ITE average for similar facilities. I do not see a justification or more importantly a control that would trigger further Department involvement if the applicant traffic estimation would be exceeded. Any agreement with the current applicant would not survive a sale and the new owner could operate the site to its full ITE traffic generation potential. So the department requests the use of the higher trip generation rates be used on this project."



Response: The tenant specific trip generation is estimated in Table 1, along with the proposed building sizes based on ITE (10th Edition) assuming General Light Industrial. In addition, build out of the site assuming 360,000 SF (hypothetical) of General Light Industrial is also estimated.

Table 1 – Proposed and Alternative Land Use Trip Generation Summary

Land Use	AM Peak Hour			PM Peak Hour		
	Enter	Exit	Total	Enter	Exit	Total
Proposed Tenant Specific Manufacturing – 240,000 SF	44	24	68	14	39	53
General Light Industrial – 240,000 SF	148	20	168	20	131	151
General Light Industrial - 360,000 SF	222	30	252	30	197	227

Analysis of the proposed operations (240,000 SF – Tenant specific manufacturing) was completed previously (see November 8, 2018 analysis by Creighton Manning). Based on ITE data, the 240,000 SF light industrial use is estimated to generate 168 trips in the AM peak hour and 151 trips in the PM peak hour. These trips have been distributed and assigned to the study area intersection considering comment #4 below and analyzed. Similarly, the 360,000 SF development (hypothetical) was estimated to generate 252 trips in the AM peak hour and 227 trips in the PM peak hour. These trips were distributed, assigned, and analyzed. The summary of each analysis is provided on Figures 2 and 3, and in Table 2.

Table 2 – Unsignalized Level of Service Summary

Intersection	Build 2020		Build 2020 (with improvements)	
	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
NY Route 28/Site Driveway (240,000 SF – ITE Rates)				
Site Driveway WB LR NY Route 28 SB LT	C (21.7) A (9.3)	F (50.7) B (13.9)	B (13.6) A (9.3)	C (20.2) B (13.9)
NY Route 28/Site Driveway (360,000 SF – ITE Rates)				
Site Driveway WB LR NY Route 28 SB LT	D (27.1) A (9.7)	F (121.4) B (14.0)	B (14.6) A (9.7)	D (26.7) B (14.0)

EB, WB, NB, SB = Eastbound, Westbound, Northbound, and Southbound intersection approaches
 L, T, R = Left-turn, Through, and/or Right-turn movements
 X (Y.Y) = Level of service (Average delay in seconds per vehicle)

The analysis found that the AM peak hour generally operated adequately for both the 240,000 SF and 360,000 SF scenarios. During the PM peak hour, the site driveway operates at LOS F during each scenario. Based on the requirements of a left turn lane discussed in Comment #4 below, a left turn lane was studied as a Build with Improvement scenario. In addition to widening Route 28 to provide the eastbound left turn lane into the project site, the downstream taper was extended to allow for a center lane refuge for left turning vehicles exiting the site. Under these conditions, the egress movement from the site driveway improves to LOS C and D under the 240,000 SF and 360,000 SF development scenarios. Based on these findings, the widening of Route 28 will adequately serve the occupancy of the proposed 240,000 SF site and a hypothetical 360,000 SF.

Comment #4: "I agree that as proposed the development would not require a traffic signal at this time. The assertion that the left turn is not required is predicated on the 90 (rights in)/10 (lefts in) split on traffic entering the site (For both AM and PM). There is no justification for this extreme value. Going by the gravity model a 40/60 split (reverse in the PM) is far more reasonable and would meet the requirements for an exclusive left turn lane. 60/40 is much more reasonable assumption based on the tube counts taken from NYS DOT Traffic Data Viewer. Even a 50/50 split would meet the warrants. So the Department will request a

Left turn lane with sufficient storage be provided for this project as part of the highway work permit. Accidents - the Department concurs with the accident study contained in this submission.


Response: Medenbach and Eggers has prepared the attached concept plan for a left turn lane into the site. We note that the widening has been extended downstream to accommodate at two-way left turn lane and allow a two-stage gap acceptance for the left turn egress of the site.

Comment #5: Will construction of the site result in generating traffic above what is contained in this study?

Response: The November 8, 2018 traffic assessment included discussion of construction impacts. At the time, approximately 150,000 cubic yards (cy) of material was estimated to be removed. Since then, a more detailed estimate has been completed by the site designers; approximately 60,000 cy is estimated to be removed for Phase 1 with 102,000 cy for Phase 2. The material itself varies and will be evaluated during excavation. Some material may be used as onsite fill or stockpiled and used later (e.g. crushed rock). Regardless, the excavation phases could be as short as two years (2020, 2021). Assuming excavation of Phase 2 (102,000 cy) requires 8,500 truckloads and is completed in 8 months (April through November 2021- say 167 weekdays), this equates to approximately 50 loads per day, or about 6 to 7 loads per hour (8 hour day). This equates to 12 to 14 trips per hour and is less than the peak hour trip generation assumed in the original analysis or the analysis above of the site operating at ITE rates. Therefore, we do not anticipate construction traffic to exceed that of the completed project.

Please call our office if you have any questions or comments regarding the above responses.

Respectfully submitted,
Creighton Manning Engineering, LLP


Kenneth Wersted, P.E., PTOE
Associate

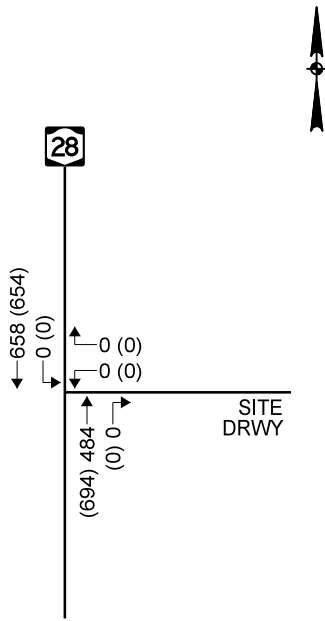
Attachments

C: Barry Medenbach – M&E
Lee Zimmer - NYSDOT

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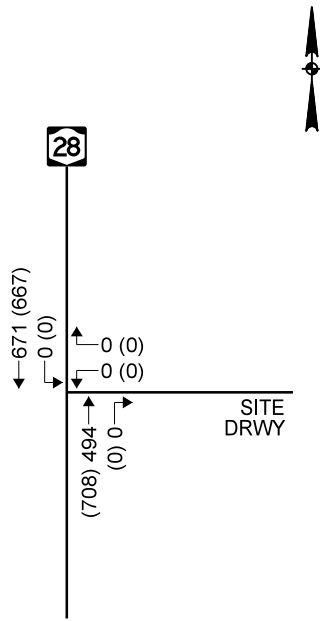
EXISTING 2018



AM PEAK HOUR (PM PEAK HOUR)

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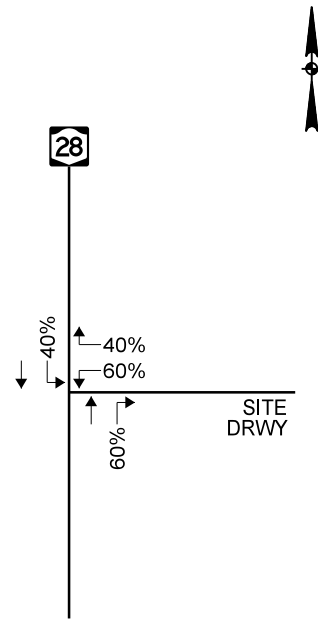
NO-BUILD 2022



AM PEAK HOUR (PM PEAK HOUR)

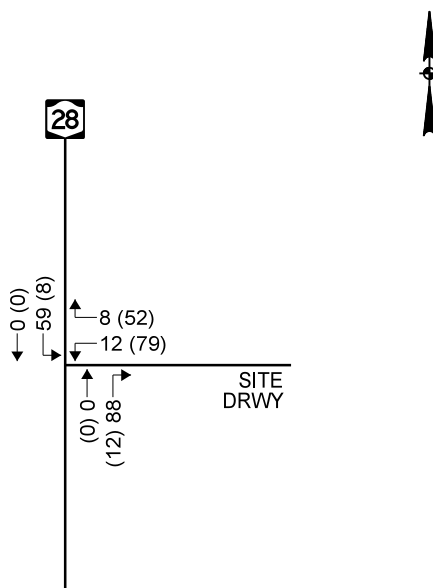
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TRIP DISTRIBUTION



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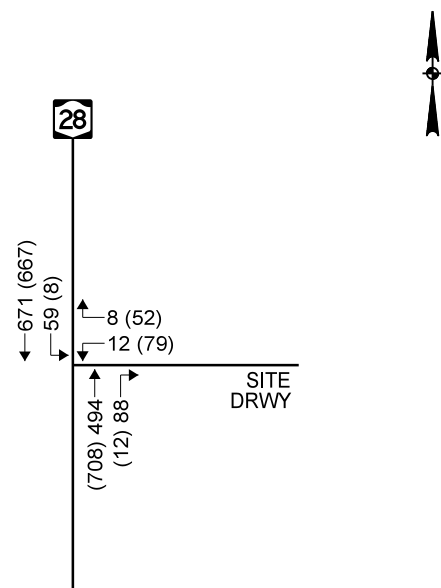
TRIP ASSIGNMENT



AM PEAK HOUR (PM PEAK HOUR)

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BUILD 2022



AM PEAK HOUR (PM PEAK HOUR)

TRAFFIC VOLUMES (240,000 SF)

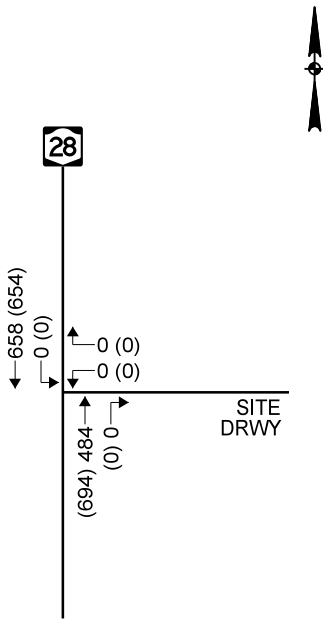
850 ROUTE 28, LLC
TOWN OF KINGSTON
ULSTER COUNTY, NEW YORK



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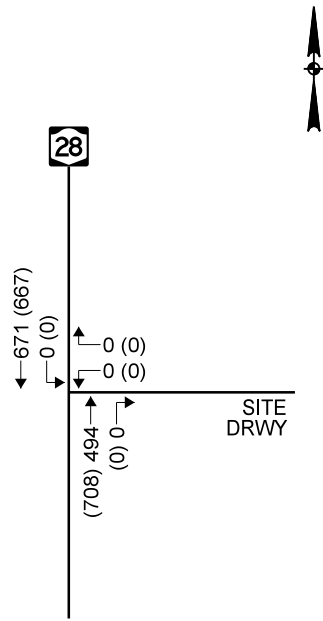
EXISTING 2018



AM PEAK HOUR (PM PEAK HOUR)

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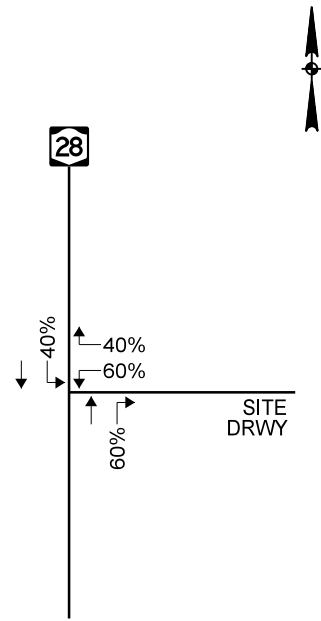
NO-BUILD 2022



AM PEAK HOUR (PM PEAK HOUR)

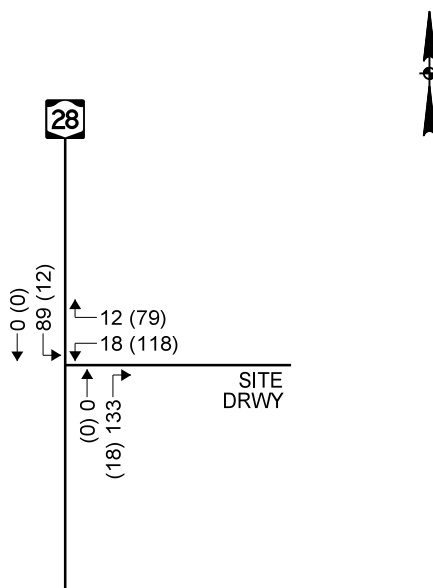
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TRIP DISTRIBUTION



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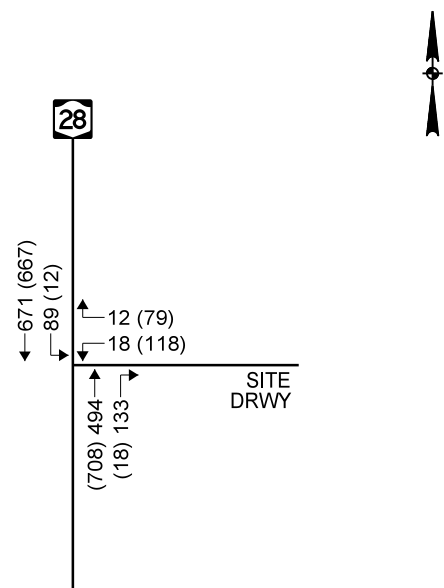
TRIP ASSIGNMENT



AM PEAK HOUR (PM PEAK HOUR)

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BUILD 2022



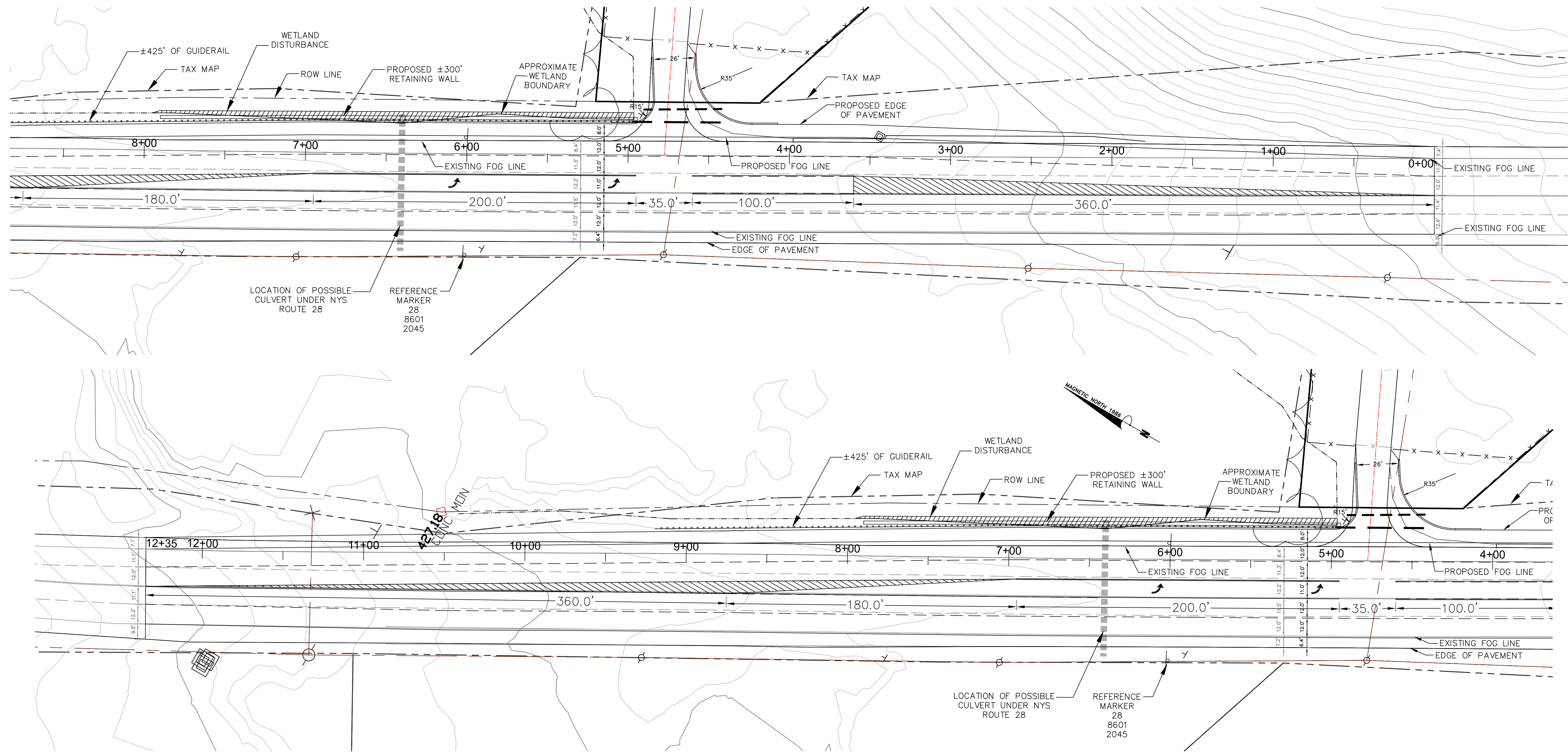
AM PEAK HOUR (PM PEAK HOUR)

TRAFFIC VOLUMES (360,000 SF)

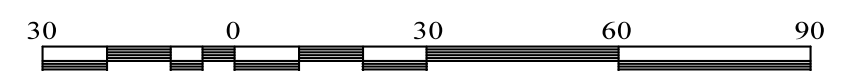
850 ROUTE 28, LLC
TOWN OF KINGSTON
ULSTER COUNTY, NEW YORK



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**HIGHWAY
IMPROVEMENT PLAN
LEFT TURN LANE**
FOR
850 ROUTE 28 LLC
TOWN OF KINGSTON
ULSTER COUNTY NEW YORK



Scale: 1" = 30'

October 4, 2019

MEDENBACH & EGGERS
CIVIL ENGINEERING & LAND SURVEYING, P.C.
STONE RIDGE, NEW YORK (845) 687-0047

BARRY MEDENBACH, P.E.
NEW YORK LIC. NO. 60142

HP-2
E17 064

MAP REVISION DATES		
DATE	REVISION	BY

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Attachment A
Level of Service Analyses

850 Route 28
Town of Kingston, New York

LOS Definitions

The following is an excerpt from the Highway Capacity Manual, 6th Edition (HCM).

Level of Service Criteria for Unsignalized Intersections

Level of service (LOS) for Two-Way Stop-Controlled (TWSC) intersections is determined by the computed or measured control delay. For motor vehicles, LOS is determined for each minor-street movement (or shared movement) as well as major-street left turns by using criteria given in Exhibit 20-2. LOS is not defined for the intersection as a whole or for major-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 TWSC 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 LOS deficiencies for minor movements. LOS F is assigned to the movement if the volume-to-capacity (v/c) ratio for the movement exceeds 1.0, regardless of the control delay.

The LOS criteria for TWSC 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 an 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 users' delay tolerance.

The LOS criteria for All-Way Stop-Controlled (AWSC) intersections are given in Exhibit 21-8. LOS F is assigned if the v/c ratio of a lane exceeds 1.0, regardless of the control delay. For assessment of LOS at the approach and intersection levels, LOS is based solely on control delay.

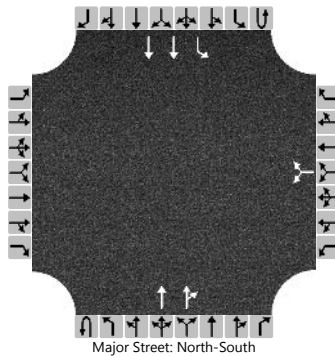
**Exhibits 20-2/21-8:
Level-of-Service Criteria for Stop Controlled Intersections**

Control Delay (s/veh)	LOS by Volume-to-Capacity Ratio	
	v/c ≤ 1.0	v/c ≥ 1.0
10.0	A	F
>10.0 and ≤ 15.0	B	F
>15.0 and ≤ 25.0	C	F
>25.0 and ≤ 35.0	D	F
>35.0 and ≤ 50.0	E	F
>50.0	F	F

HCS7 Two-Way Stop-Control Report

General Information				Site Information			
Analyst	NSB			Intersection	NY Route 28/Site Driveway		
Agency/Co.	Creighton Manning			Jurisdiction	Town of Kingston		
Date Performed	11/6/2018			East/West Street	Site Driveway		
Analysis Year	2022			North/South Street	NY Route 28		
Time Analyzed	AM Peak Hour (LUC 110)			Peak Hour Factor	0.92		
Intersection Orientation	North-South			Analysis Time Period (hrs)	0.25		
Project Description	Build						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound				
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R	
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6	
Number of Lanes		0	0	0		0	1	0	0	0	2	0	0	1	2	0	
Configuration							LR				T	TR		L	T		
Volume (veh/h)						18		12			494	133	0	89	671		
Percent Heavy Vehicles (%)						17		17					3	10			
Proportion Time Blocked																	
Percent Grade (%)						0											
Right Turn Channelized																	
Median Type Storage						Left Only								2			

Critical and Follow-up Headways

Base Critical Headway (sec)						7.5		6.9							4.1		
Critical Headway (sec)						7.14		7.24							4.30		
Base Follow-Up Headway (sec)						3.5		3.3							2.2		
Follow-Up Headway (sec)						3.67		3.47							2.30		

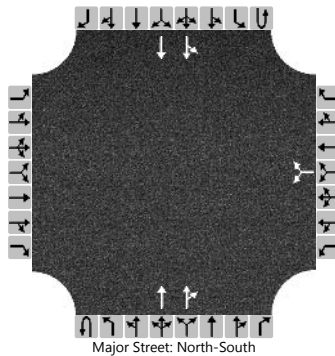
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						33									97		
Capacity, c (veh/h)						407									855		
v/c Ratio						0.08									0.11		
95% Queue Length, Q ₉₅ (veh)						0.3									0.4		
Control Delay (s/veh)						14.6									9.7		
Level of Service (LOS)						B									A		
Approach Delay (s/veh)						14.6								1.1			
Approach LOS						B											

HCS7 Two-Way Stop-Control Report

General Information				Site Information			
Analyst	NSB			Intersection	NY Route 28/Site Driveway		
Agency/Co.	Creighton Manning			Jurisdiction	Town of Kingston		
Date Performed	11/6/2018			East/West Street	Site Driveway		
Analysis Year	2022			North/South Street	NY Route 28		
Time Analyzed	AM Peak Hour (LUC 110)			Peak Hour Factor	0.92		
Intersection Orientation	North-South			Analysis Time Period (hrs)	0.25		
Project Description	Build						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	2	0	0	0	2	0
Configuration							LR				T	TR		LT	T	
Volume (veh/h)						12		8			494	88		59	671	
Percent Heavy Vehicles (%)						17		17						10		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						7.5		6.9							4.1		
Critical Headway (sec)						7.14		7.24							4.30		
Base Follow-Up Headway (sec)						3.5		3.3							2.2		
Follow-Up Headway (sec)						3.67		3.47							2.30		

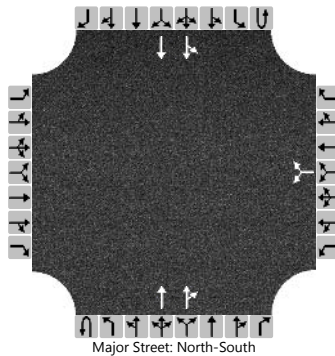
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						22									64		
Capacity, c (veh/h)						238									894		
v/c Ratio						0.09									0.07		
95% Queue Length, Q ₉₅ (veh)						0.3									0.2		
Control Delay (s/veh)						21.7									9.3		
Level of Service (LOS)						C									A		
Approach Delay (s/veh)					21.7								1.2				
Approach LOS					C												

HCS7 Two-Way Stop-Control Report

General Information				Site Information			
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Intersection Orientation	North-South			Analysis Time Period (hrs)	0.25		
Project Description	Build						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	2	0	0	0	2	0
Configuration							LR				T	TR		LT	T	
Volume (veh/h)						18		12			494	133		89	671	
Percent Heavy Vehicles (%)						17		17						10		
Proportion Time Blocked																
Percent Grade (%)						0										
Right Turn Channelized																
Median Type Storage						Undivided										

Critical and Follow-up Headways

Base Critical Headway (sec)						7.5		6.9						4.1		
Critical Headway (sec)						7.14		7.24						4.30		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.67		3.47						2.30		

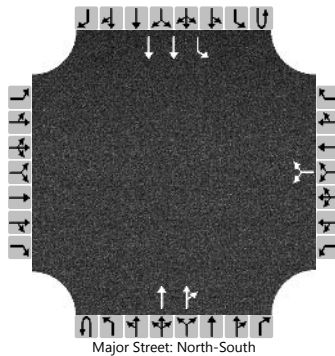
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						33								97		
Capacity, c (veh/h)						195								855		
v/c Ratio						0.17								0.11		
95% Queue Length, Q ₉₅ (veh)						0.6								0.4		
Control Delay (s/veh)						27.1								9.7		
Level of Service (LOS)						D								A		
Approach Delay (s/veh)						27.1								1.8		
Approach LOS						D										

HCS7 Two-Way Stop-Control Report

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Intersection Orientation	North-South			Analysis Time Period (hrs)	0.25		
Project Description	Build						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound				
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R	
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6	
Number of Lanes		0	0	0		0	1	0	0	0	2	0	0	1	2	0	
Configuration							LR				T	TR		L	T		
Volume (veh/h)						12		8			494	88	0	59	671		
Percent Heavy Vehicles (%)						17		17					3	10			
Proportion Time Blocked																	
Percent Grade (%)						0											
Right Turn Channelized																	
Median Type Storage						Left Only								2			

Critical and Follow-up Headways

Base Critical Headway (sec)						7.5		6.9						4.1		
Critical Headway (sec)						7.14		7.24						4.30		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.67		3.47						2.30		

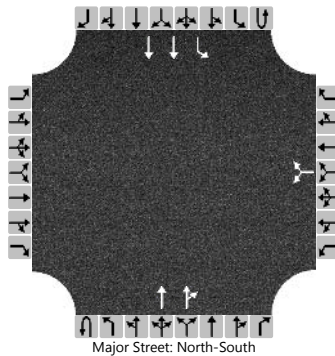
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						22								64			
Capacity, c (veh/h)						441								894			
v/c Ratio						0.05								0.07			
95% Queue Length, Q ₉₅ (veh)						0.2								0.2			
Control Delay (s/veh)						13.6								9.3			
Level of Service (LOS)						B								A			
Approach Delay (s/veh)						13.6								0.8			
Approach LOS						B								A			

HCS7 Two-Way Stop-Control Report

General Information				Site Information			
Analyst	NSB			Intersection	NY Route 28/Site Driveway		
Agency/Co.	Creighton Manning			Jurisdiction	Town of Kingston		
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Analysis Year	2022			North/South Street	NY Route 28		
Time Analyzed	PM Peak Hour (LUC 110)			Peak Hour Factor	0.92		
Intersection Orientation	North-South			Analysis Time Period (hrs)	0.25		
Project Description	Build						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound				
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R	
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6	
Number of Lanes		0	0	0		0	1	0	0	0	2	0	0	1	2	0	
Configuration							LR				T	TR		L	T		
Volume (veh/h)						79		52			708	12	0	8	667		
Percent Heavy Vehicles (%)						26		26					3	100			
Proportion Time Blocked																	
Percent Grade (%)						0											
Right Turn Channelized																	
Median Type Storage						Left Only								2			

Critical and Follow-up Headways

Base Critical Headway (sec)						7.5		6.9							4.1	
Critical Headway (sec)						7.32		7.42							6.10	
Base Follow-Up Headway (sec)						3.5		3.3							2.2	
Follow-Up Headway (sec)						3.76		3.56							3.20	

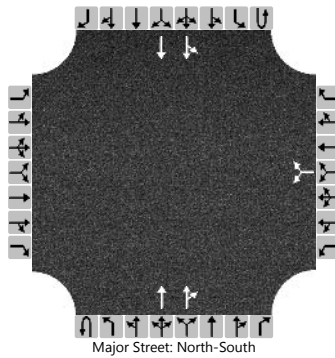
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						142									9		
Capacity, c (veh/h)						377									415		
v/c Ratio						0.38									0.02		
95% Queue Length, Q ₉₅ (veh)						1.7									0.1		
Control Delay (s/veh)						20.2									13.9		
Level of Service (LOS)						C									B		
Approach Delay (s/veh)						20.2								0.2			
Approach LOS						C											

HCS7 Two-Way Stop-Control Report

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Agency/Co.	Creighton Manning			Jurisdiction	Town of Kingston		
Date Performed	11/6/2018			East/West Street	Site Driveway		
Analysis Year	2022			North/South Street	NY Route 28		
Time Analyzed	PM Peak Hour (LUC 110)			Peak Hour Factor	0.92		
Intersection Orientation	North-South			Analysis Time Period (hrs)	0.25		
Project Description	Build						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0		0	2	0		0	2	0
Configuration							LR				T	TR		LT	T	
Volume (veh/h)						79		52			708	12		8	667	
Percent Heavy Vehicles (%)						26		26						100		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						7.5		6.9						4.1		
Critical Headway (sec)						7.32		7.42						6.10		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.76		3.56						3.20		

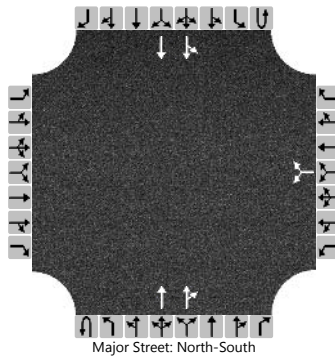
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						142								9		
Capacity, c (veh/h)						213								415		
v/c Ratio						0.67								0.02		
95% Queue Length, Q ₉₅ (veh)						4.1								0.1		
Control Delay (s/veh)						50.7								13.9		
Level of Service (LOS)						F								B		
Approach Delay (s/veh)					50.7								0.4			
Approach LOS					F											

HCS7 Two-Way Stop-Control Report

General Information				Site Information			
Analyst	NSB			Intersection	NY Route 28/Site Driveway		
Agency/Co.	Creighton Manning			Jurisdiction	Town of Kingston		
Date Performed	11/6/2018			East/West Street	Site Driveway		
Analysis Year	2022			North/South Street	NY Route 28		
Time Analyzed	PM Peak Hour (LUC 110)			Peak Hour Factor	0.92		
Intersection Orientation	North-South			Analysis Time Period (hrs)	0.25		
Project Description	Build						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	2	0	0	0	2	0
Configuration							LR				T	TR		LT	T	
Volume (veh/h)						118		79			708	18		12	667	
Percent Heavy Vehicles (%)						26		26						100		
Proportion Time Blocked																
Percent Grade (%)						0										
Right Turn Channelized																
Median Type Storage						Undivided										

Critical and Follow-up Headways

Base Critical Headway (sec)						7.5		6.9						4.1		
Critical Headway (sec)						7.32		7.42						6.10		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.76		3.56						3.20		

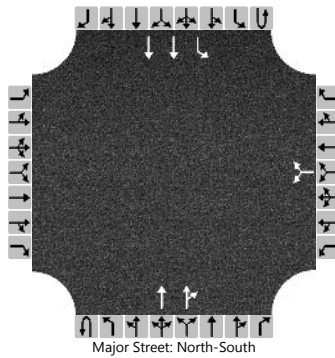
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						214								13		
Capacity, c (veh/h)						206								411		
v/c Ratio						1.04								0.03		
95% Queue Length, Q ₉₅ (veh)						9.5								0.1		
Control Delay (s/veh)						121.4								14.0		
Level of Service (LOS)						F								B		
Approach Delay (s/veh)						121.4								0.6		
Approach LOS						F										

HCS7 Two-Way Stop-Control Report

General Information				Site Information			
Analyst	NSB			Intersection	NY Route 28/Site Driveway		
Agency/Co.	Creighton Manning			Jurisdiction	Town of Kingston		
Date Performed	11/6/2018			East/West Street	Site Driveway		
Analysis Year	2022			North/South Street	NY Route 28		
Time Analyzed	PM Peak Hour (LUC 110)			Peak Hour Factor	0.92		
Intersection Orientation	North-South			Analysis Time Period (hrs)	0.25		
Project Description	Build (with improvements)						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0		0	2	0		0	1	2
Configuration							LR				T	TR		L	T	
Volume (veh/h)						118		79			708	18	0	12	667	
Percent Heavy Vehicles (%)						26		26					3	100		
Proportion Time Blocked																
Percent Grade (%)						0										
Right Turn Channelized																
Median Type Storage						Left Only						2				

Critical and Follow-up Headways

Base Critical Headway (sec)						7.5		6.9						4.1		
Critical Headway (sec)						7.32		7.42						6.10		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.76		3.56						3.20		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						214								13		
Capacity, c (veh/h)						375								411		
v/c Ratio						0.57								0.03		
95% Queue Length, Q ₉₅ (veh)						3.4								0.1		
Control Delay (s/veh)						26.7								14.0		
Level of Service (LOS)						D								B		
Approach Delay (s/veh)						26.7								0.2		
Approach LOS						D										