

MEMORANDUM

Ref: 2001A

To: Michael Sievert, P.E.
MJS Engineering, P.C.

From: Stephen G. Pernaw, P.E., PTOE

Subject: Response to VHB Comments dated March 4, 2021

Date: March 19, 2021

On January 14, 2021 our office published a revised “Traffic/Parking Evaluation” memorandum for the proposed student housing parking lot at 19-21 Main Street in Durham, New Hampshire. We are now in receipt of several comments from VHB, Inc., the Town’s peer review consultant. The purpose of this memorandum is to summarize our responses to those comments.

VHB Comment 1: *“The applicant should clarify if the proposed parking spaces would be assigned/designated and provide a breakdown of how many spaces would be associated with the existing student housing development at 19-21 Main Street versus the other off-site student housing developments.”*

SGP & Co., Inc. Response: According to the applicant, 55 parking stalls will be dedicated to the existing student housing development at 19-21 Main Street, and the remaining 125 spaces will be available for other off-site student housing developments.

VHB Comment 2: *“VHB concurs that the traffic counts were collected in accordance with standard traffic engineering practice.”*

SGP & Co., Inc. Response: No response required.

VHB Comment 3: *“VHB compared the existing traffic counts with Institute of Transportation Engineers (ITE) trip-generation estimates for a similar use.¹ The existing traffic counts were found to support between 30 and 70 residents.² Based on a review of the Town of Durham’s online property assessment information, there are approximately 45 student housing occupants for 19, 19A, 19B, and 21 Main Street.³ The 45 occupants allowed per the Town’s assessment information fall within the ITE methodology range for the existing site trips. Therefore, the existing site trips entering and exiting the site are consistent with trip-generation estimates (ITE methodologies).”*

SGP & Co., Inc. Response: No response required.

VHB Comment 4: *“VHB agrees that the parking observation program is consistent with standard traffic engineering practice. The results show that there are not enough parking spaces (supply = 43 spaces) to accommodate the maximum number of vehicles that currently park within the site overnight (demand = 45 vehicles).”*

SGP & Co., Inc. Response: No response required.

VHB Comment 5: “...*The study area should be expanded to include the traffic impacts from the Main Street and Madbury Road intersection (e.g., intersection analyses, queueing observations, stop delay study on the site driveway approach, etc.).*”

SGP & Co., Inc. Response: In a follow-up conversation with Mr. Plourde, it was agreed that a detailed review of the data collection video collected at the subject intersection in February 2020 (pre-Covid19) would suffice, given the effect of current pandemic on traffic volumes in the area.

Said video was reviewed for the 4:30 to 5:30 PM and 8:00 to 9:00 AM peak hour periods and the detailed results are attached (see Attachments 1-3). To summarize:

- Eastbound queuing on Main Street: Eastbound vehicle queues from the Main Street traffic signal extended to and beyond the site driveway in one instance during the PM peak hour. This driveway was blocked by a standing queue for 47 seconds (from 4:40:29 to 4:41:16), or approximately 1% of the peak hour. Vehicle queues did not extend back to this driveway during the AM peak hour.
- Westbound queuing on Main Street: Westbound queuing on Main Street from the Madbury Road intersection did not extend back to the subject driveway during the AM or PM peak hour periods.
- During the 47 seconds of the PM peak hour that Main Street queuing temporarily blocked the site driveway, no vehicles attempted to enter or exit from the site driveway.
- During both peak hour periods, there was no evidence of an exiting driver switching from a left-turn departure to a right-turn departure due to traffic conditions on Main Street, i.e.; turning right after signaling left to exit.
- Vehicle Queuing on the site driveway approach to Main Street was either nil or one vehicle.
- Exiting drivers were observed to accept a critical headway of 5.0 seconds for left-turn and right-turn departures. This information was utilized to “calibrate” the capacity analysis to reflect local operations (in response to Comment 12).

VHB Comment 6: “*Upon review of the historical traffic growth data provided in the Traffic/Parking Evaluation, traffic volumes have experienced a negative trend in traffic growth between 2015 and 2019. For conservative (worse-case) purposes and in compliance with NHDOT guidance, a 1% compounded annual rate was used to account for general population growth and traffic associated with smaller developments in the area. Therefore, VHB finds the historical growth rate methodology acceptable and consistent with standard traffic engineering practice.*”

SGP & Co., Inc. Response: No response required.

VHB Comment 7: “*Based on NHDOT methodologies, peak-month traffic volume adjustments should be based on the closest permanent recorder station that is on a similar type of roadway. The NHDOT Group Averages could be used should no permanent count station on a similar type of roadway be reasonably nearby. Upon review of NHDOT’s database, there is a count station located within 1 mile of the development site along US Route 4 (Piscataqua Road) east of NH Route 108 (Dover Road).⁸ Since Main Street adjacent to the site and US Route 4 have different characteristics⁹ and the Group 4 Averages require a higher seasonal adjustment factor (1.20 vs. 1.11), the methodology used provides a conservative (worse-case) analysis. Therefore, VHB finds the seasonal adjustment method reasonable.*”

SGP & Co., Inc. Response: No response required.

VHB Comment 8: *“The site trips associated with the proposed project were estimated based on a ratio of the existing driveway traffic counts per the number of existing spaces applied to the proposed 180 parking spaces. The methodology used in determining the volume of site trips associated with the proposed parking lot expansion project is consistent with standard traffic engineering practice.”*

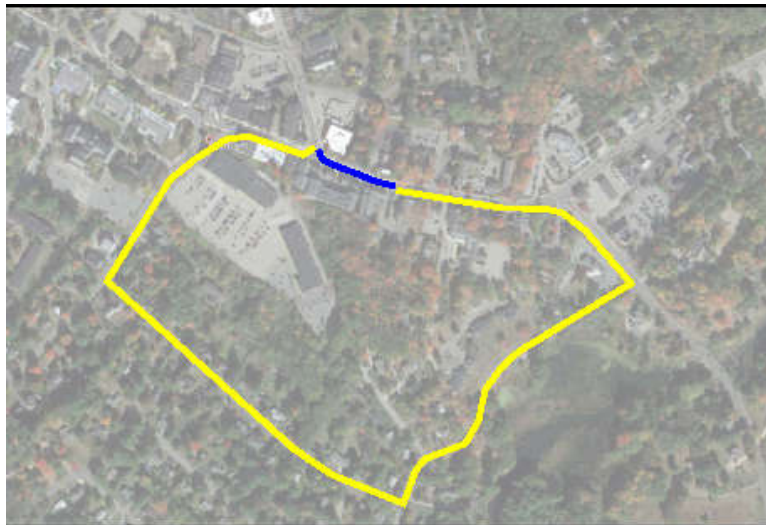
SGP & Co., Inc. Response: No response required.

VHB Comment 9: *“The proposed 180 parking spaces are intended to serve the student housing development at 19-21 Main Street. In addition, a portion of the proposed parking spaces would be associated with UNH students who would reside at other student housing developments. Should these parking spaces be purposed for another use, then the volume and frequency of the site trips could differ.”*

SGP & Co., Inc. Response: We concur, the traffic study projections, analyses, and findings apply only to the proposed expansion of the student housing parking lot, and no other hypothetical use.

VHB Comment 10: *“The applicant should conduct an assessment to determine which alternate routes motorists may consider (e.g., based on proximity, travel time, roadway characteristics, legislative class, etc.) should the left turns exiting from the site driveway be projected to experience operational deficiencies.”*

SGP & Co., Inc. Response: The analysis of traffic operations at the subject intersection suggests that drivers exiting left will not experience inordinate delays (2031 PM average control delay = 29 seconds) leaving the site driveway, and then following the “blue” route 0.08 miles on Main Street to reach Madbury Road. The diagram below shows that exiting right on the “yellow” route to reach Madbury Road will involve a travel distance of approximately 1.03 miles that includes one traffic signal and several stop signs. In our view, this is not an attractive alternative route and most exiting drivers will prefer the shorter route to Madbury Road.



VHB Comment 11 *“The applicant should revise the intersection analyses based on the current HCM 6th edition or provide support and clarification for using the older version.”*

SGP & Co., Inc. Response: There is no need to revise the analyses as the HCM 2010 methodology did not change with the HCM 6th Edition; the results are identical. Nevertheless, further evaluation of intersection operations, as requested in Comment 12, was completed using the HCM 6th Edition.

VHB Comment 12: *“Further evaluation of the intersection operations should be conducted due to the impacts associated with Main Street westbound vehicles extending from Madbury Road to the site driveway that may impact delays, v/c ratios, and queuing (see Comments 5 and 10).”*

SGP & Co., Inc. Response: As discussed in the response to Comment 5, the extent of vehicle queuing on Main Street observed during the AM and PM peak hour periods did not significantly impact traffic operations at the subject intersection. These observations demonstrated that drivers exiting left and right from the site driveway accept a critical headway of 5.0 seconds, somewhat less than the default values found in the HCM. Table 3-R (Page 5) summarizes the updated capacity analyses. The vehicle delays and v/c ratios are lower than originally reported due to “calibration” of the critical headways (see Attachments 4-12).

VHB Comment 13: *“Therefore, the applicant should conduct an evaluation of the available sight lines at the Main Street and site driveway intersection to ensure that all season safe sight distances will be provided in accordance with the Town’s standards.”*

SGP & Co., Inc. Response: Evaluation of available sight lines at the existing intersection will be conducted by MJS Engineering, P.C. and provided under separate cover.

Based on public input, the Applicant has authorized us to conduct a field visit to view the traffic signal phasing on the Main Street eastbound approach to NH108. We will summarize our findings under separate cover.

Table 3-R **Updated STOP-Controlled Intersection Capacity Analysis**
Main Street / Existing Site Driveway

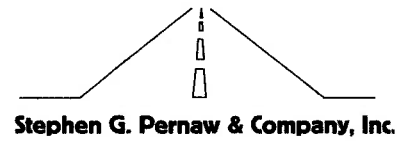
	Weekday AM Peak Hour				Weekday PM Peak Hour				Saturday PM Peak Hour				
	Delay ¹	V/C ²	LOS ³	Queue ⁴	Delay ¹	V/C ²	LOS ³	Queue ⁴	Delay ¹	V/C ²	LOS ³	Queue ⁴	
Existing Site Driveway - Left & Right-Turn Departures													
2020 Existing	10.2	0.01	B	<1	16.2	0.05	C	<1	11.9	0.02	B	<1	
2031 No-Build	10.9	0.01	B	<1	22.5	0.07	C	<1	14.0	0.02	B	<1	
2031 Build	11.1	0.03	B	<1	29.3	0.31	D	1	14.7	0.08	B	<1	
Main Street - WB Left-Turn Arrivals													
2020 Existing	7.6	0.00	A	<1	9.4	0.00	A	<1	8.7	0.00	A	<1	
2031 No-Build	7.7	0.00	A	<1	10.6	0.00	B	<1	9.4	0.00	A	<1	
2031 Build	7.7	0.00	A	<1	10.8	0.01	B	<1	9.5	0.01	A	<1	

¹ HCM Control Delay (seconds per vehicle), ² HCM Volume to Capacity Ratio, ³ HCM Level of Service, ⁴ HCM 95th Percentile Queue (vehicles)

Control Delay (seconds/vehicle)	Level of Service by Volume-to-Capacity Ratio	
	v/c ≤ 1.0	v/c > 1.0
0 - 10	A	F
> 10 - 15	B	F
> 15 - 25	C	F
> 25 - 35	D	F
> 35 - 50	E	F
> 50	F	F

Source: Transportation Research Board, Highway Capacity Manual 2010.

ATTACHMENTS



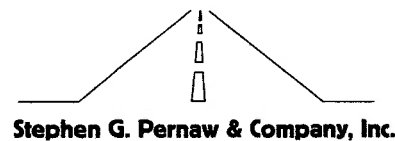
Weekday Peak Hour Vehicle Queuing Observations - Main Street, Durham, NH
Main Street / Existing Site Driveway - Durham, New Hampshire

I. PM Peak Hour Observations List (2/12/2020 from 4:30 to 5:30 PM)

Driver #	Movement	Arrival Time	Departure Time	Delay	Gap Size Accepted	Notes
1	Left Out	4:34:30	4:35:03	0:00:33	8	
2	Left Out	4:36:01	4:36:07	0:00:06	5	
EB Standing Queue Present		4:40:29	4:41:16	0:00:47		
3	Left Out	4:46:05	4:46:22	0:00:17	12	
4	Left Out	4:47:12	4:47:52	0:00:40	5	
5	Left Out	4:54:33	4:54:39	0:00:06	5	
6	Left Out	4:58:21	4:59:48	0:01:27	4	
7	Left Out	5:09:59	5:10:31	0:00:32	7	
8	Back Out	5:10:55	5:10:58	0:00:03	10	
9	Right In	5:13:42	5:13:42	0:00:00		
10	Right In	5:16:01	5:16:01	0:00:00		
11	Right In	5:16:31	5:16:31	0:00:00		
12	Right Out	5:17:43	5:17:43	0:00:00	5	
13	Left In	5:21:03	5:21:10	0:00:07	10	
14	Right Out	5:21:27	5:21:30	0:00:03	7	
15	Right In	5:22:29	5:22:29	0:00:00		
16	Right Out	5:23:20	5:23:37	0:00:17	5	
17	Right In	5:24:19	5:24:19	0:00:00		
18	Left Out	5:24:48	5:25:16	0:00:28	9	
19	Right In	5:03:27	5:03:27	0:00:00		
20	Right In	4:50:30	4:50:30	0:00:00		
21	Right In	4:42:07	4:42:07	0:00:00		

II. Observations Sorted by Movement

Driver #	Movement	Arrival Time	Departure Time	Delay	Gap Size Accepted	Notes
8	Back Out	5:10:55	5:10:58	0:00:03	10	
13	Left In	5:21:03	5:21:10	0:00:07	10	
1	Left Out	4:34:30	4:35:03	0:00:33	8	
2	Left Out	4:36:01	4:36:07	0:00:06	5	critical gap size
3	Left Out	4:46:05	4:46:22	0:00:17	12	
4	Left Out	4:47:12	4:47:52	0:00:40	5	critical gap size
5	Left Out	4:54:33	4:54:39	0:00:06	5	critical gap size
6	Left Out	4:58:21	4:59:48	0:01:27	4 *	Discard / only 1 observation.



Stephen G. Pernaw & Company, Inc.

Weekday Peak Hour Vehicle Queuing Observations - Main Street, Durham, NH

Main Street / Existing Site Driveway - Durham, New Hampshire

7	Left Out	5:09:59	5:10:31	0:00:32	7	
18	Left Out	5:24:48	5:25:16	0:00:28	9	
9	Right In	5:13:42	5:13:42	0:00:00		
10	Right In	5:16:01	5:16:01	0:00:00		
11	Right In	5:16:31	5:16:31	0:00:00		
15	Right In	5:22:29	5:22:29	0:00:00		
17	Right In	5:24:19	5:24:19	0:00:00		
19	Right In	5:03:27	5:03:27	0:00:00		
20	Right In	4:50:30	4:50:30	0:00:00		
21	Right In	4:42:07	4:42:07	0:00:00		
12	Right Out	5:17:43	5:17:43	0:00:00	5	critical gap size
14	Right Out	5:21:27	5:21:30	0:00:03	7	
16	Right Out	5:23:20	5:23:37	0:00:17	5	critical gap size

Weekday AM Peak Hour (8:00 to 9:00 AM) - Vehicle Queuing Observations

Main Street / Existing Site Driveway - Durham, New Hampshire

III. AM Peak Hour Observations List (2/13/2020 from 8:00 to 9:00 AM)

Driver #	Movement	Arrival Time	Departure Time	Delay	Gap Size Accepted	Notes
1	Left In	8:39:55	8:39:55	0:00:00	5	
2	Left Out	8:41:43	8:41:47	0:00:04	4	
3	Right In	8:56:11	8:56:11	0:00:00		
4	Left Out	8:59:31	8:59:37	0:00:06	7	

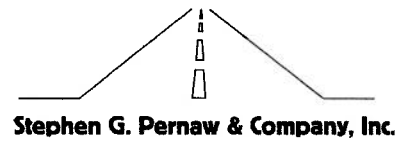
IV. Observed Standing Queues

AM: No WB standing queues observed on Main Street from 8:00 to 9:00 AM

PM: One EB standing queue observed on Main Street for 47 seconds (4:40:29 to 4:41:16)

V. Critical Gap Sizes - Durham, Main Street

Critical gap for left-turn departures =	5.0 seconds	
Critical gap for right-turn departures =	5.0 seconds	
Critical gap for left-turn arrivals =	4.1 seconds	Use HCM; field study = 1 AM and PM data point only.



Weekday Peak Hour Vehicle Queuing Observations - Main Street, Durham, NH
Main Street / Existing Site Driveway - Durham, New Hampshire

VI. Other Observations

1. During the standing queue on Main Street, no vehicles were observed entering or exiting from the site.
2. There was no evidence of an exiting driver switching from a left-turn departure to a right-turn departure.

HCM 6th TWSC

1: Site Driveway & Main Street

Intersection						
Int Delay, s/veh	0.1					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↖	↗	↖	↗	↖	↗
Traffic Vol, veh/h	150	1	1	161	2	0
Future Vol, veh/h	150	1	1	161	2	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	81	81	71	71	50	50
Heavy Vehicles, %	13	0	0	6	0	0
Mvmt Flow	185	1	1	227	4	0
Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	186	0	415	186
Stage 1	-	-	-	-	186	-
Stage 2	-	-	-	-	229	-
Critical Hdwy	-	-	4.1	-	5	5
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1401	-	702	916
Stage 1	-	-	-	-	851	-
Stage 2	-	-	-	-	814	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1401	-	701	916
Mov Cap-2 Maneuver	-	-	-	-	701	-
Stage 1	-	-	-	-	851	-
Stage 2	-	-	-	-	813	-
Approach	EB	WB	NB			
HCM Control Delay, s	0	0	10.2			
HCM LOS						B
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	701	-	-	1401	-	
HCM Lane V/C Ratio	0.006	-	-	0.001	-	
HCM Control Delay (s)	10.2	-	-	7.6	0	
HCM Lane LOS	B	-	-	A	A	
HCM 95th %tile Q(veh)	0	-	-	0	-	

HCM 6th TWSC

1: Site Driveway & Main Street

Intersection

Int Delay, s/veh 0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔	↗	↖	↗	↖	↔
Traffic Vol, veh/h	201	1	1	215	2	0
Future Vol, veh/h	201	1	1	215	2	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	81	81	71	71	50	50
Heavy Vehicles, %	13	0	0	6	0	0
Mvmt Flow	248	1	1	303	4	0

Major/Minor	Major1	Major2	Minor1	Minor2
Conflicting Flow All	0	0	249	0
Stage 1	-	-	-	249
Stage 2	-	-	-	305
Critical Hdwy	-	-	4.1	-
Critical Hdwy Stg 1	-	-	-	5.4
Critical Hdwy Stg 2	-	-	-	5.4
Follow-up Hdwy	-	-	2.2	-
Pot Cap-1 Maneuver	-	-	1328	-
Stage 1	-	-	-	797
Stage 2	-	-	-	752
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	-	-	1328	-
Mov Cap-2 Maneuver	-	-	-	615
Stage 1	-	-	-	797
Stage 2	-	-	-	751

Approach	EB	WB	NB
HCM Control Delay, s	0	0	10.9
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	615	-	-	1328	-
HCM Lane V/C Ratio	0.007	-	-	0.001	-
HCM Control Delay (s)	10.9	-	-	7.7	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

HCM 6th TWSC

1: Site Driveway & Main Street

Intersection						
Int Delay, s/veh	0.4					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔	↗	↘	↖	↗	↘
Traffic Vol, veh/h	201	4	4	215	9	0
Future Vol, veh/h	201	4	4	215	9	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	81	81	71	71	50	50
Heavy Vehicles, %	13	0	0	6	0	0
Mvmt Flow	248	5	6	303	18	0
Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	253	0	566	251
Stage 1	-	-	-	-	251	-
Stage 2	-	-	-	-	315	-
Critical Hdwy	-	-	4.1	-	5	5
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1324	-	609	862
Stage 1	-	-	-	-	795	-
Stage 2	-	-	-	-	744	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1324	-	606	862
Mov Cap-2 Maneuver	-	-	-	-	606	-
Stage 1	-	-	-	-	795	-
Stage 2	-	-	-	-	740	-
Approach	EB	WB	NB			
HCM Control Delay, s	0	0.1	11.1			
HCM LOS					B	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	606	-	-	1324	-	
HCM Lane V/C Ratio	0.03	-	-	0.004	-	
HCM Control Delay (s)	11.1	-	-	7.7	0	
HCM Lane LOS	B	-	-	A	A	
HCM 95th %tile Q(veh)	0.1	-	-	0	-	

HCM 6th TWSC

1: Site Driveway & Main Street

Intersection						
Int Delay, s/veh	0.2					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Vol, veh/h	712	8	1	372	9	3
Future Vol, veh/h	712	8	1	372	9	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	80	80	75	75
Heavy Vehicles, %	1	0	0	2	0	0
Mvmt Flow	809	9	1	465	12	4
Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	818	0	1281	814
Stage 1	-	-	-	-	814	-
Stage 2	-	-	-	-	467	-
Critical Hdwy	-	-	4.1	-	5	5
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	819	-	304	500
Stage 1	-	-	-	-	439	-
Stage 2	-	-	-	-	635	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	819	-	303	500
Mov Cap-2 Maneuver	-	-	-	-	303	-
Stage 1	-	-	-	-	439	-
Stage 2	-	-	-	-	634	-
Approach	EB	WB	NB			
HCM Control Delay, s	0	0	16.2			
HCM LOS						C
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	336	-	-	819	-	
HCM Lane V/C Ratio	0.048	-	-	0.002	-	
HCM Control Delay (s)	16.2	-	-	9.4	0	
HCM Lane LOS	C	-	-	A	A	
HCM 95th %tile Q(veh)	0.1	-	-	0	-	

HCM 6th TWSC

1: Site Driveway & Main Street

Intersection						
Int Delay, s/veh	0.2					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔	↗	↖	↗	↖	↔
Traffic Vol, veh/h	954	8	1	498	9	3
Future Vol, veh/h	954	8	1	498	9	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	80	80	75	75
Heavy Vehicles, %	1	0	0	2	0	0
Mvmt Flow	1084	9	1	623	12	4
Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	1093	0	1714	1089
Stage 1	-	-	-	-	1089	-
Stage 2	-	-	-	-	625	-
Critical Hdwy	-	-	4.1	-	5	5
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	646	-	195	380
Stage 1	-	-	-	-	326	-
Stage 2	-	-	-	-	537	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	646	-	195	380
Mov Cap-2 Maneuver	-	-	-	-	195	-
Stage 1	-	-	-	-	326	-
Stage 2	-	-	-	-	536	-
Approach	EB	WB	NB			
HCM Control Delay, s	0	0	22.5			
HCM LOS						C
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	222	-	-	646	-	
HCM Lane V/C Ratio	0.072	-	-	0.002	-	
HCM Control Delay (s)	22.5	-	-	10.6	0	
HCM Lane LOS	C	-	-	B	A	
HCM 95th %tile Q(veh)	0.2	-	-	0	-	

HCM 6th TWSC

1: Site Driveway & Main Street

Intersection						
Int Delay, s/veh	1.1					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↕	↕	
Traffic Vol, veh/h	954 ✓	34 ✓	4 ✓	498 ✓	38 ✓	12 ✓
Future Vol, veh/h	954	34	4	498	38	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	80	80	75	75
Heavy Vehicles, %	1	0	0	2	0	0
Mvmt Flow	1084	39	5	623	51	16
Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	1123	0	1737	1104
Stage 1	-	-	-	-	1104	-
Stage 2	-	-	-	-	633	-
Critical Hdwy	-	-	4.1	-	5	5
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	629	-	191	374
Stage 1	-	-	-	-	320	-
Stage 2	-	-	-	-	533	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	629	-	189	374
Mov Cap-2 Maneuver	-	-	-	-	189	-
Stage 1	-	-	-	-	320	-
Stage 2	-	-	-	-	527	-
Approach	EB	WB	NB			
HCM Control Delay, s	0	0.1	29.3			
HCM LOS						D
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	214	-	-	629	-	
HCM Lane V/C Ratio	0.312	-	-	0.008	-	
HCM Control Delay (s)	29.3	-	-	10.8	0	
HCM Lane LOS	D	-	-	B	A	
HCM 95th %tile Q(veh)	1.3	-	-	0	-	

HCM 6th TWSC

1: Site Driveway & Main Street

Intersection						
Int Delay, s/veh	0.1					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Vol, veh/h	554 ✓	2 ✓	2 ✓	417 ✓	1 ✓	3 ✓
Future Vol, veh/h	554	2	2	417	1	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	93	93	50	50
Heavy Vehicles, %	2	0	0	2	0	0
Mvmt Flow	609	2	2	448	2	6
Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	611	0	1062	610
Stage 1	-	-	-	-	610	-
Stage 2	-	-	-	-	452	-
Critical Hdwy	-	-	4.1	-	5	5
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	978	-	377	610
Stage 1	-	-	-	-	546	-
Stage 2	-	-	-	-	645	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	978	-	376	610
Mov Cap-2 Maneuver	-	-	-	-	376	-
Stage 1	-	-	-	-	546	-
Stage 2	-	-	-	-	643	-
Approach	EB	WB	NB			
HCM Control Delay, s	0	0	11.9			
HCM LOS						B
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	528	-	-	978	-	
HCM Lane V/C Ratio	0.015	-	-	0.002	-	
HCM Control Delay (s)	11.9	-	-	8.7	0	
HCM Lane LOS	B	-	-	A	A	
HCM 95th %tile Q(veh)	0	-	-	0	-	

HCM 6th TWSC

1: Site Driveway & Main Street

Intersection						
Int Delay, s/veh	0.1					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	↔
Traffic Vol, veh/h	741 ✓	2 ✓	2 ✓	558 ✓	1 ✓	3 ✓
Future Vol, veh/h	741	2	2	558	1	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	93	93	50	50
Heavy Vehicles, %	2	0	0	2	0	0
Mvmt Flow	814	2	2	600	2	6

Major/Minor	Major1	Major2	Minor1	Minor2	Minor3
Conflicting Flow All	0	0	816	0	1419
Stage 1	-	-	-	-	815
Stage 2	-	-	-	-	604
Critical Hdwy	-	-	4.1	-	5
Critical Hdwy Stg 1	-	-	-	-	5.4
Critical Hdwy Stg 2	-	-	-	-	5.4
Follow-up Hdwy	-	-	2.2	-	3.5
Pot Cap-1 Maneuver	-	-	820	-	264
Stage 1	-	-	-	-	439
Stage 2	-	-	-	-	550
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	820	-	263
Mov Cap-2 Maneuver	-	-	-	-	263
Stage 1	-	-	-	-	439
Stage 2	-	-	-	-	548

Approach	EB	WB	NB
HCM Control Delay, s	0	0	14
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	408	-	-	820	-
HCM Lane V/C Ratio	0.02	-	-	0.003	-
HCM Control Delay (s)	14	-	-	9.4	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

HCM 6th TWSC

1: Site Driveway & Main Street

Intersection						
Int Delay, s/veh	0.4					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↕	↕	
Traffic Vol, veh/h	741	8	9	558	4	13
Future Vol, veh/h	741	8	9	558	4	13
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	93	93	50	50
Heavy Vehicles, %	2	0	0	2	0	0
Mvmt Flow	814	9	10	600	8	26
Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	823	0	1439	819
Stage 1	-	-	-	-	819	-
Stage 2	-	-	-	-	620	-
Critical Hdwy	-	-	4.1	-	5	5
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	816	-	259	497
Stage 1	-	-	-	-	437	-
Stage 2	-	-	-	-	540	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	816	-	254	497
Mov Cap-2 Maneuver	-	-	-	-	254	-
Stage 1	-	-	-	-	437	-
Stage 2	-	-	-	-	530	-
Approach	EB	WB	NB			
HCM Control Delay, s	0	0.2	14.7			
HCM LOS	B					
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	406	-	-	816	-	
HCM Lane V/C Ratio	0.084	-	-	0.012	-	
HCM Control Delay (s)	14.7	-	-	9.5	0	
HCM Lane LOS	B	-	-	A	A	
HCM 95th %tile Q(veh)	0.3	-	-	0	-	