

March 22, 2022

D'Maria Fernander
United Gulf Construction Inc.
PO Box 48099 RPO Mill Cove
Bedford, NS

[via email: dmaria@unitedgulf.ca]

**RE: Traffic Impact Analysis
910 Bedford Highway, Bedford, Nova Scotia**

Dear D'Maria Fernander,

Plans are being prepared for a multi-unit development at 910 Bedford Highway in Bedford, NS (See Figure 1). The proposed development will include a maximum of 60 apartment units and 47,492 square feet of commercial space with completion of the development anticipated for 2025. This is the Traffic Impact Analysis (TIA) required to accompany the development application.

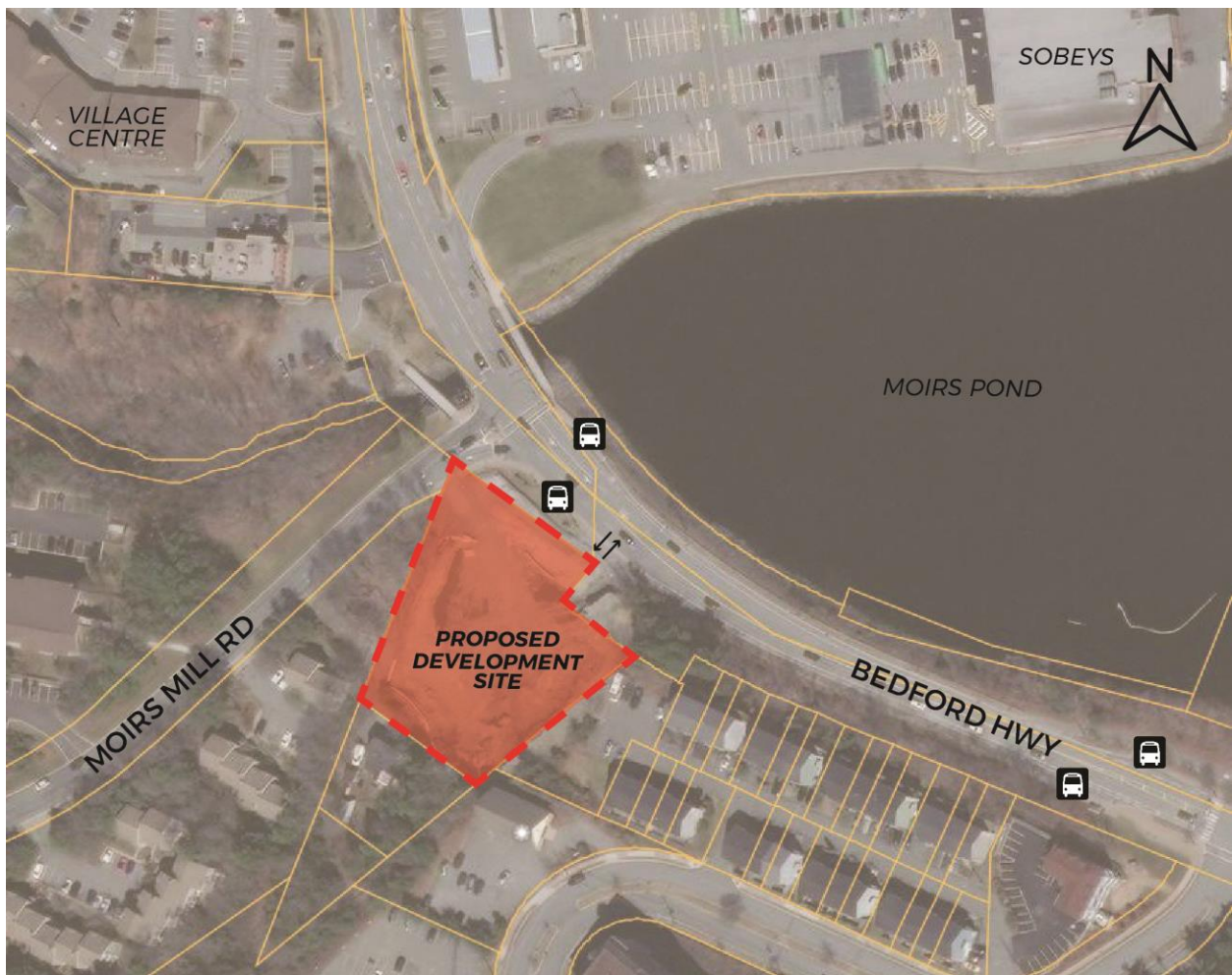


Figure 1: Study Area

SITE DESCRIPTION AND ACCESS

The proposed building site (PID 00428722) at the corner of Bedford Highway and Moirs Mill Road intersection was previously occupied by a commercial building, which was demolished between 2014 and 2015. The site has been cleared in preparation of future development and is currently unoccupied (See Photo 1).



Photo 1: Existing Site

The proposed development (See Figure 2) includes the construction of a 11-storey apartment building with 60 residential units, 47,492 square feet of commercial space, two floors of underground parking that accommodates 89 parking spaces, and a surface parking lot that accommodates 17 parking spaces. The commercial space is planned to be divided between two land uses: 17,392 ft² of general commercial use and 30,100 ft² of office space. Completion of the development is anticipated for 2025.

Access to the site is proposed from Bedford Highway via a single driveway south of the intersection with Moirs Mill Road. Sight distance appears adequate at the driveway (See Photo 2 & Photo 3).



Photo 2: Looking north (to the left) on the Bedford Highway from the proposed site driveway



Photo 3: Looking south (to the right) on the Bedford Highway from the proposed site driveway

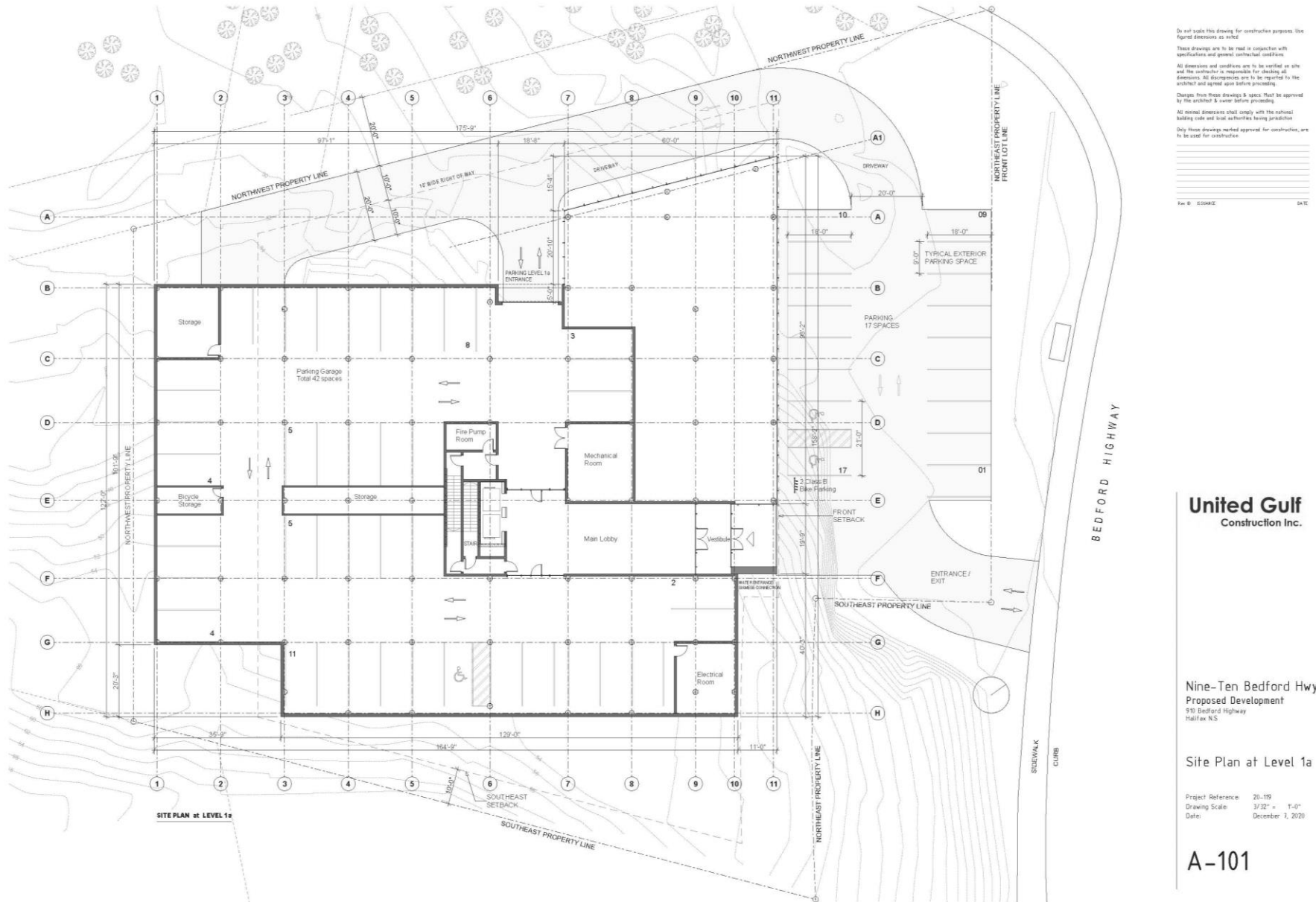


Figure 2: Site Plan

DESCRIPTION OF STREETS AND INTERSECTION

EXISTING

Bedford Highway is a two-lane arterial road that runs north-south between Bedford and Windsor Street in Halifax, NS (See Photo 4). In the subject area, the Bedford Highway has a 50 km/hr posted speed limit, sidewalk on the west side (site side) and a four-lane urban cross section which transitions to a two-lane cross section with marked bicycle lanes south of the subject site. A traffic count, conducted by WSP in February 2022, indicates a two-way traffic volume in front of the site on the Bedford Highway of approximately 1,000 vehicles per hour (vph) in the AM peak hour and 1,400 vph in the PM peak hour.



Photo 4: Bedford Highway (south of Site)

Moirs Mill Road is a minor collector roadway with a two-lane urban cross section that runs east-west for 1.4km between the Bedford Highway and its terminus in the west (See Photo 5). The roadway has a posted speed limit of 50 km/hr and a sidewalk on the south side.



Photo 5: Moirs Mill Road

Bedford Highway at Moirs Mill Road Intersection is a signalized T-intersection with a channelized right turn on the Moirs Mill Road approach (See Photo 6). The signalized intersection includes pedestrian heads crossing the west and south legs.



Photo 6: Intersection of Bedford Highway and Moirs Mill Road

PROPOSED

Future changes to the Bedford Highway were envisioned within the 2019 Bedford Highway Functional Plan which provided two functional design options to consider for implementation by the Halifax Regional Municipality (HRM). In May 2020, Regional Council passed a motion to endorse, in principle, the ‘balanced modes’ option. The ‘balanced modes’ option envisions the Bedford Highway, in the vicinity of the subject site, as a two-lane urban cross section with a sidewalk on the west side (site side) and a multi-use pathway on the east side. At the intersection of the Bedford Highway with Moirs Mill Road, it is envisioned to have one through lane on the southbound and northbound approaches, an exclusive left turn lane on the northbound approach, an inbound transit queue-jump lane on the southbound approach, and a reconfigured eastbound right turn channel into a smart channel. Currently, a 60% functional design is underway for the segment of the Bedford Highway between the Windsor Street Exchange and Kearney Lake Road, with design of the remaining segments planned to be completed in the oncoming years.

TRANSIT SERVICE

EXISTING

Halifax Transit operates routes # 8, 91 and 93 along the Bedford Highway within the study area (See Figure 3) with a transit stop immediately in front of the subject site and on the other side of the road.

Route 8 is a corridor route that offers frequent service between the Sackville Transit Terminal and Scotia Square providing access to destinations such as the Sackville Business District, Bedford Place Mall, Sunnyside Mall, Millcove Plaza, Mount Saint Vincent University, Bayers Road Centre, Spring Garden Area Business District, and Downtown Halifax.

Route 91 is a local route that offers service between West Bedford and Mumford Terminal providing access to destinations such as businesses on Innovation Drive and along Larry Uteck Boulevard, Mount Saint Vincent University, Bayers Road Centre, the Halifax Shopping Centre, and Mumford Professional Centre.

Route 93 is a local route that offers peak hour service in the peak direction between Cobequid Terminal and Scotia Square providing access to destinations such as Bedford Place Mall, Sunnyside Mall, Millcove Plaza, Mount Vincent University, and Downtown Halifax.

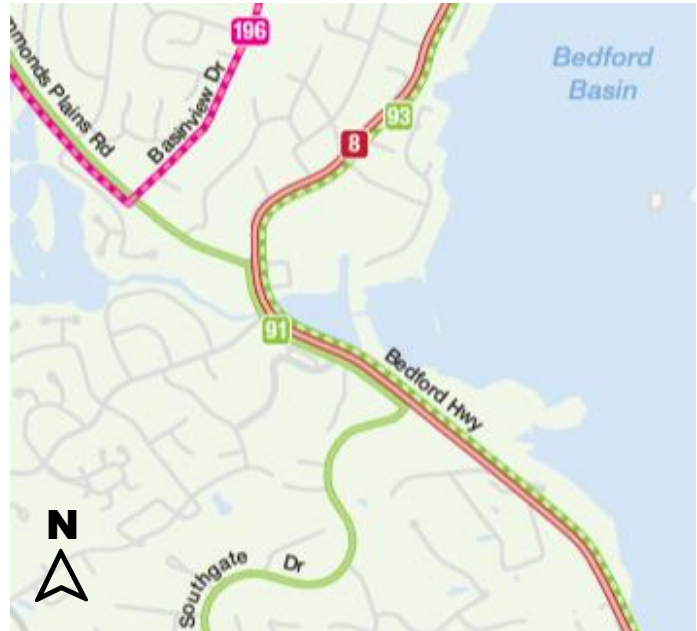


Figure 3: Halifax Transit Routes

PROPOSED

A future high-speed ferry, envisioned in HRM's Rapid Transit Strategy (2020), is in the process of being planned to connect Mill Cove to the Halifax Ferry Terminal, which will see more frequent and reliable transit service connecting the adjacent neighbourhoods with Downtown Halifax (See Figure 4). The provincial and federal governments are currently partnering with HRM to undertake the first phase of the Mill Cove ferry service.

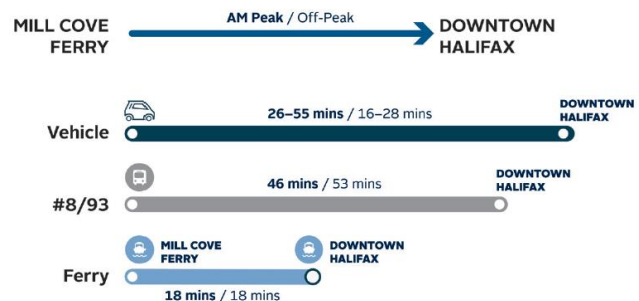
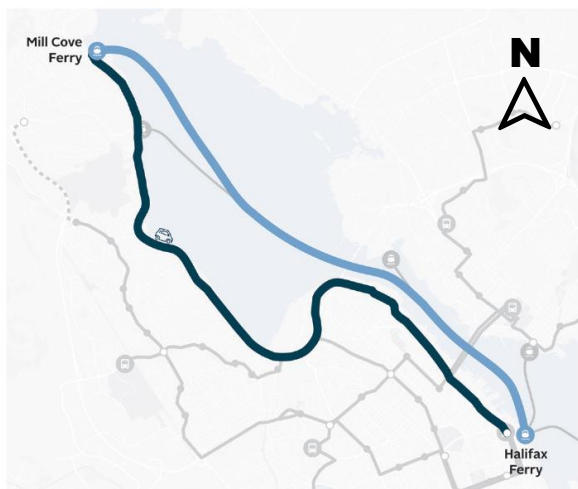


Figure 4: Mill Cove Ferry Service (pg.34, Rapid Transit Strategy)

ACTIVE TRANSPORTATION

EXISTING

As mentioned under the section ‘Description of Streets and Intersections,’ active transportation facilities that currently exist in the vicinity of the subject site are a sidewalk on the Bedford Highway on the west side (site side), a sidewalk on Moirs Mill Road on the south side, and painted bike lanes to the south of the site. Marked crossings are provided on the south and west legs of the signalized intersection of Bedford Highway with Moirs Mill Road.

PROPOSED

The ‘balanced modes’ option of the Bedford Highway Functional Plan envisions the Bedford Highway in front of the project site as having a sidewalk on the west side and a multi-use pathway on the east side. Implementation of the option would provide a continuous all ages and abilities (AAA) active transportation connection from the old Town of Bedford to the Windsor Street Exchange.

TRAFFIC VOLUME DATA

An intersection turning movement count was collected during the AM and PM peak periods at the intersection of Bedford Highway with Moirs Mill Road on Wednesday, February 16, 2022. The turning movement count has been tabulated in Table A-1, Appendix A, with peak hour volumes indicated by shaded areas.

Being consistent with the background growth rate utilized in the Bedford Highway Functional Plan, an annual growth rate of 1.0% has been utilized to project the AM and PM background peak hour volumes for 2025, which are shown diagrammatically in Figure A-1, Boxes C and D, Appendix A. It should be noted that the volumes were projected to the nearest multiple of 5.

TRIP GENERATION

When using the published trip generation rates in the *Trip Generation Manual, 11th Edition (Institute of Transportation Engineers, Washington, 2021)* the transportation engineer’s objective should be to provide a realistic estimate of the number of trips that will be generated.

The proposed development is planned to include 60 mid-rise apartment units, 17,392 ft² of general commercial space and 30,100 ft² of office space. Trips generated by Mid-Rise Apartment (Land Use 221), Strip Retail Plaza (Land Use 822) and General Office Building (Land Use 710) are estimated for the AM and PM peak hours of weekday traffic by the number of apartment units for Land Use 221 and gross floor area for Land Use 822 and 710. Since the site was unoccupied during the time that the turning movement count was conducted, no credits were applied to the trip generation estimate.

The calculation of the trip generation estimates (See Table 1) included reductions anticipated from on-site synergies, pass-by trips and non-auto trips.

On-site synergies, or cross shopping trips, represent trips that access multiple land uses on the site. For this analysis, on-site synergies have been assumed to represent 10% of base trips to the proposed development.

Pass-by trips are those which are made as ‘intervening’ stops to commercial and retail land uses for trips passing by the site. Although these trips will be included in the driveway volumes to the site, they will not increase the overall traffic volumes on the Bedford Highway or Moirs Mill Road. The site will be exposed to pass-by traffic volumes in the AM and PM peak periods. For this analysis, it has been assumed that 20% of the external commercial site trips will be pass-by trips of people already traveling on the Bedford Highway.

Non-auto trips are those that are completed through travel modes such as biking, walking or taking transit. The Halifax Integrated Mobility Plan (IMP) has a 2031 target of 26% for non-auto trips within the suburban zone. Census data from 2016 indicates that approximately 13% of commuting trips, originating within the census tract that the subject site resides in, were made by non-auto modes. Since

transit service is very accessible to residents of the site, a 15% reduction has been applied to site generated trip estimates.

The estimated number of primary trips that will be generated by the proposed development is:

- **82 primary** two-way vehicle trips (55 entering and 27 exiting) during the AM peak hour; and,
- **126 primary** two-way vehicle trips (53 entering and 73 exiting) during the PM peak hour.

The estimated number of pass-by trips that will be generated by the proposed development is:

- **8 pass-by** two-way vehicle trips (4 entering and 4 exiting) during the AM peak hour; and,
- **20 pass-by** two-way vehicle trips (10 entering and 10 exiting) during the PM peak hour.

Table 1: Trip Generation Estimates

Land Use ¹	Units ²	Trip Generation Rates ³				Trip Generation Estimates ⁴			
		AM Peak		PM Peak		AM Peak		PM Peak	
		In	Out	In	Out	In	Out	In	Out
Mid-Rise Apartments (Land Use 221)	60 Units	0.09	0.28	0.24	0.15	5	17	14	9
Strip Retail Plaza (Land Use 822)	17,392 ft ²	1.42	0.94	3.30	3.30	25	16	57	57
General Office Building (Land Use 710)	30,100 ft ²	1.34	0.18	0.24	1.20	40	5	7	36
Total Base Trip Generation Estimates						70	38	78	102
10% Reduction for On-Site Synergies (Land Use 822)						2	2	6	6
Trip Generation Estimate After Adjustment for On-Site Synergies						68	36	72	96
20% Reduction for Commercial Pass-By Trips						4	4	10	10
Trip Generation Estimate After Adjustment for Pass-By Trips						64	32	62	86
15% Reduction for Non-Auto Trips						9	5	9	13
Primary Trip Estimate for Proposed Development						55	27	53	73
NOTES: 1. Land Use Codes are from <i>Trip Generation, 11th Edition</i> (Institute of Transportation Engineers, Washington, 2021). 2. 'Number of Residential Units' for Land Use 221. '1000 ft ² of Gross Floor Area' for Land Use 822 and 710. 3. Trip generation rates are 'vehicles per hour per unit' for Land Use 221. Trip generation rates are 'vehicles per hour per 1000 square feet' for Land Use 822 and 710. 4. Trips generated are 'vehicles per hour' for AM and PM peak hours.									

TRIP DISTRIBUTION AND ASSIGNMENT

Primary site generated trips were assigned to the roadway network based on counted volumes at the intersection of Bedford Highway with Moirs Mill Road, and local knowledge of the area. Peak hour primary site generated trips were distributed with 60% from/to the north and 40% from/to the south.

Pass-by site generated trips were assigned to the roadway network based on directional distribution of counted volumes on the Bedford Highway. Both the AM and PM pass-by trips were distributed on the Bedford Highway with 50% of the trips originating from the north and 50% originating from the south.

Site generated trips (shown diagrammatically in Figure A-2, boxes A and B, Appendix A) have been added to the 2025 background volumes (Figure A-1, boxes C and D) to provide projected 2025 volumes that include site generated trips (Figure A-2, boxes C and D, Appendix A).

INTERSECTION LEVEL OF SERVICE ANALYSIS

The level or quality of performance of an intersection in terms of traffic movement is determined by a level of service (LOS) analysis. LOS for intersections is defined in terms of delay, which is a measure of driver discomfort and frustration, fuel consumption, and increased travel time. LOS criteria (See Appendix B) are stated in terms of average control delay per vehicle which includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay.

Synchro 11.0 software was used to evaluate the performance of the study intersections (Bedford Highway at Moirs Mill Road and Bedford Highway at the site access) during the AM and PM peak hour for the following scenarios: 2022 background (existing conditions), 2025 future background, and 2025 future background with site development. Summaries of the results are displayed in Table 2 and Table 3 while detailed reports are provided in Appendix B.

Table 2: Intersection Capacity Analysis for Bedford Highway at Moirs Mill Road

LOS Criteria	Control Delay (sec/veh), v/c Ratio, and 95 th %ile Queue (m) by Intersection Movement						Overall Intersection
	Moirs Mill Road		Bedford Highway				
	EB-L	EB-R	NB-L	NB-T	SB-T	SB-R	Delay
2022 Background AM Peak Hour (Page B-1)							
Delay	14.0	4.8	9.5	9.5	8.9	8.9	9.8
v/c	0.44	0.10	0.41	0.41	0.43	0.43	
Queue	24.5	4.6	24.5	24.5	25.0	25.0	
2022 Background PM Peak Hour (Page B-2)							
Delay	18.2	7.0	8.5	8.5	8.4	8.4	9.2
v/c	0.40	0.09	0.48	0.48	0.55	0.55	
Queue	24.6	5.1	34.3	34.3	40.6	40.6	
2025 Future Background AM Peak Hour (Page B-3)							
Delay	14.1	4.9	9.6	9.6	9.1	9.1	9.9
v/c	0.44	0.09	0.42	0.42	0.44	0.44	
Queue	25.4	4.7	25.6	25.6	26.3	26.3	
2025 Future Background PM Peak Hour (Page B-4)							
Delay	18.6	7.1	8.7	8.7	8.7	8.7	9.5
v/c	0.41	0.09	0.49	0.49	0.56	0.56	
Queue	25.8	5.2	36.1	36.1	43.2	43.2	
2025 Future Background AM Peak Hour with Site Development (Page B-5)							
Delay	14.5	5.0	9.6	9.6	9.3	9.3	10.0
v/c	0.45	0.10	0.43	0.43	0.46	0.46	
Queue	26.1	4.7	26.6	26.6	28.4	28.4	
2025 Future Background PM Peak Hour with Site Development (Page B-7)							
Delay	19.1	7.2	8.9	8.9	8.8	8.8	9.6
v/c	0.42	0.09	0.51	0.51	0.57	0.57	
Queue	26.5	5.2	39.2	39.2	45.8	45.8	

Table 3: Intersection Capacity Analysis for Bedford Highway at Site Access

LOS Criteria	Control Delay (sec/veh), v/c Ratio, and 95 th %ile Queue (m) by Lane					Overall Intersection
	Site Access	Bedford Highway				
	EB-LR	NB-LT	NB-T	SB-T	SB-TR	Delay
2025 Future Background AM Peak Hour with Site Development (Page B-6)						
Delay	13.4	1.2	0.0	0.0	0.0	0.6
v/c	0.07	0.02	0.22	0.22	0.13	
Queue	1.9	0.6	0.0	0.0	0.0	
2025 Future Background PM Peak Hour with Site Development (Page B-8)						
Delay	19.9	1.1	0.0	0.0	0.0	1.2
v/c	0.27	0.03	0.31	0.30	0.18	
Queue	8.7	0.7	0.0	0.0	0.0	

Analysis results for the AM and PM peak hours indicate that all movements at both intersections are expected to operate within HRM acceptable limits both without and with the addition of the site generated trips. Queue lengths of the exclusive turning movements coming from Moirs Mill Road onto the Bedford Highway are not expected to exceed the turning lane storage space.

SUMMARY

1. Plans are being prepared for a multi-use development at 910 Bedford Highway, located southwest of the intersection of Bedford Highway at Moirs Mill Road in Bedford, NS.
2. The proposed development will include up to 60 residential units, 17,392 ft² of general commercial space and 30,100 ft² of office space.
3. Vehicular access to the site is planned via a driveway off the Bedford Highway. No sight distance concerns were identified at the driveway location.
4. A trip generation estimate for the site was prepared using rates published in *Trip Generation Manual, 11th Edition* (Institute of Transportation Engineers, Washington, 2021).
 - The estimated number of primary trips that will be generated by the proposed development is:
 - **82 primary** two-way vehicle trips (55 entering and 27 exiting) during the AM peak hour; and,
 - **126 primary** two-way vehicle trips (53 entering and 73 exiting) during the PM peak hour.
 - The estimated number of pass-by trips that will be generated by the proposed development is:
 - **8 pass-by** two-way vehicle trips (4 entering and 4 exiting) during the AM peak hour; and,
 - **20 pass-by** two-way vehicle trips (10 entering and 10 exiting) during the PM peak hour.
5. Intersection capacity analysis indicates that level of performance at the Bedford Highway intersections of Moirs Mill Road and the site access are expected to be satisfactory both without and with the addition of site generated trips with all movements remaining within HRM acceptable limits in all scenarios.

CONCLUSION

6. The proposed development is not expected to have any significant impact to levels of performance on adjacent streets and intersections or to the regional street system.

If you have any questions or comments, please contact me by email at courtney.pyne@wsp.com or by telephone at 902-536-0982.

Sincerely,

Original Signed

Courtney Pyne, P.Eng. PMP
Transportation Engineer
WSP Canada Inc.



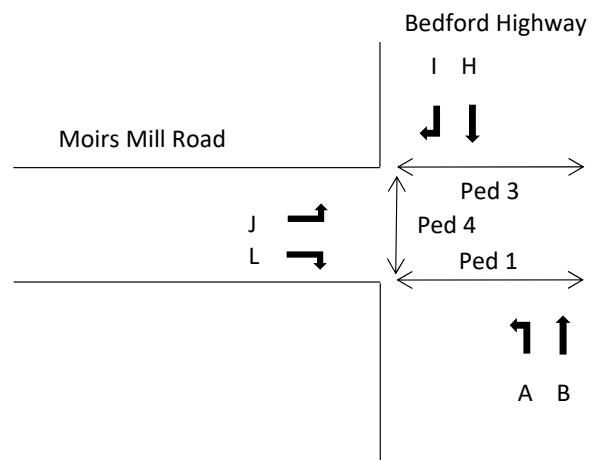


APPENDIX A
TRAFFIC VOLUME DATA

Table A-1
Bedford Highway
@
Moirs Mill Road

Bedford, NS

Wednesday, February 16, 2022

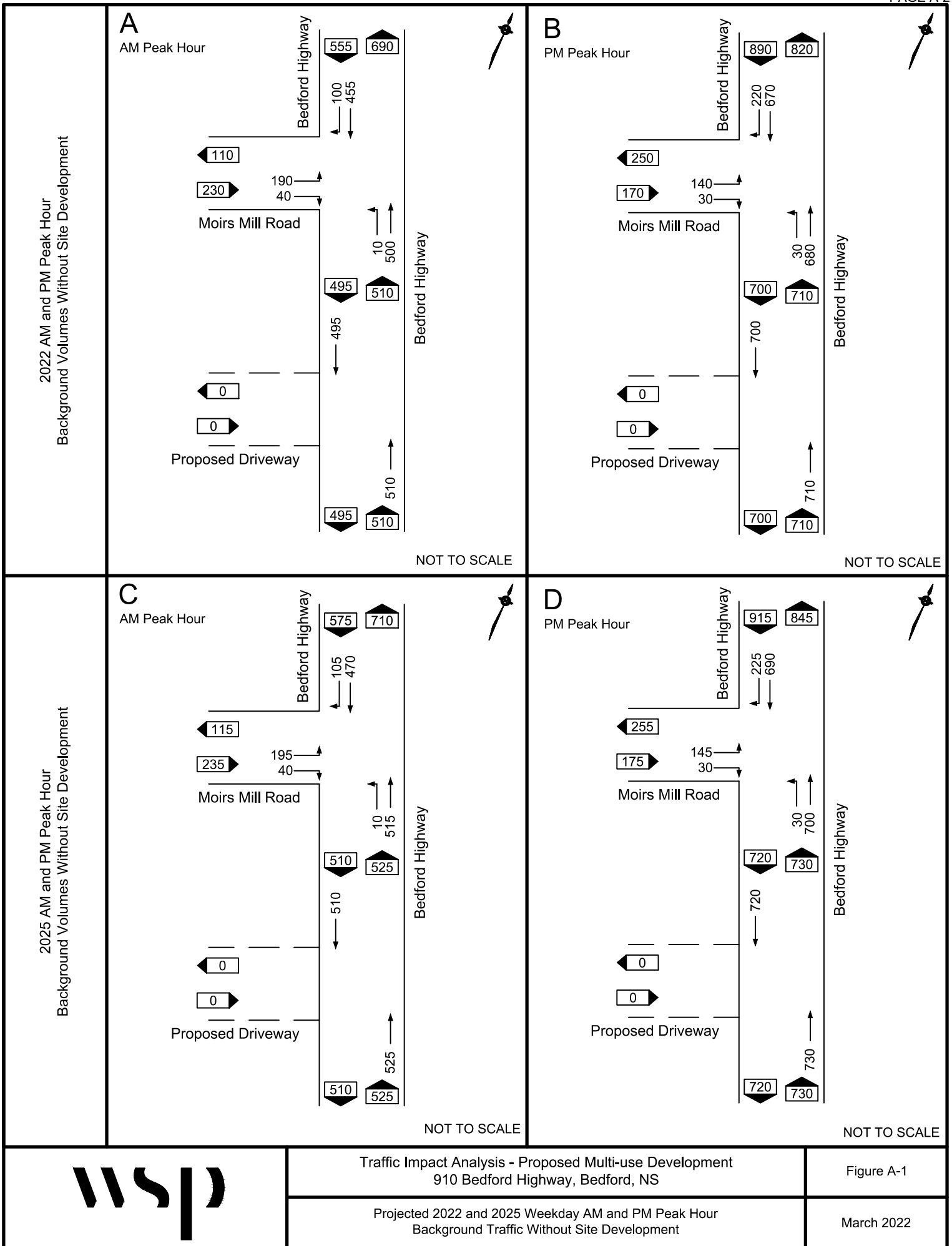


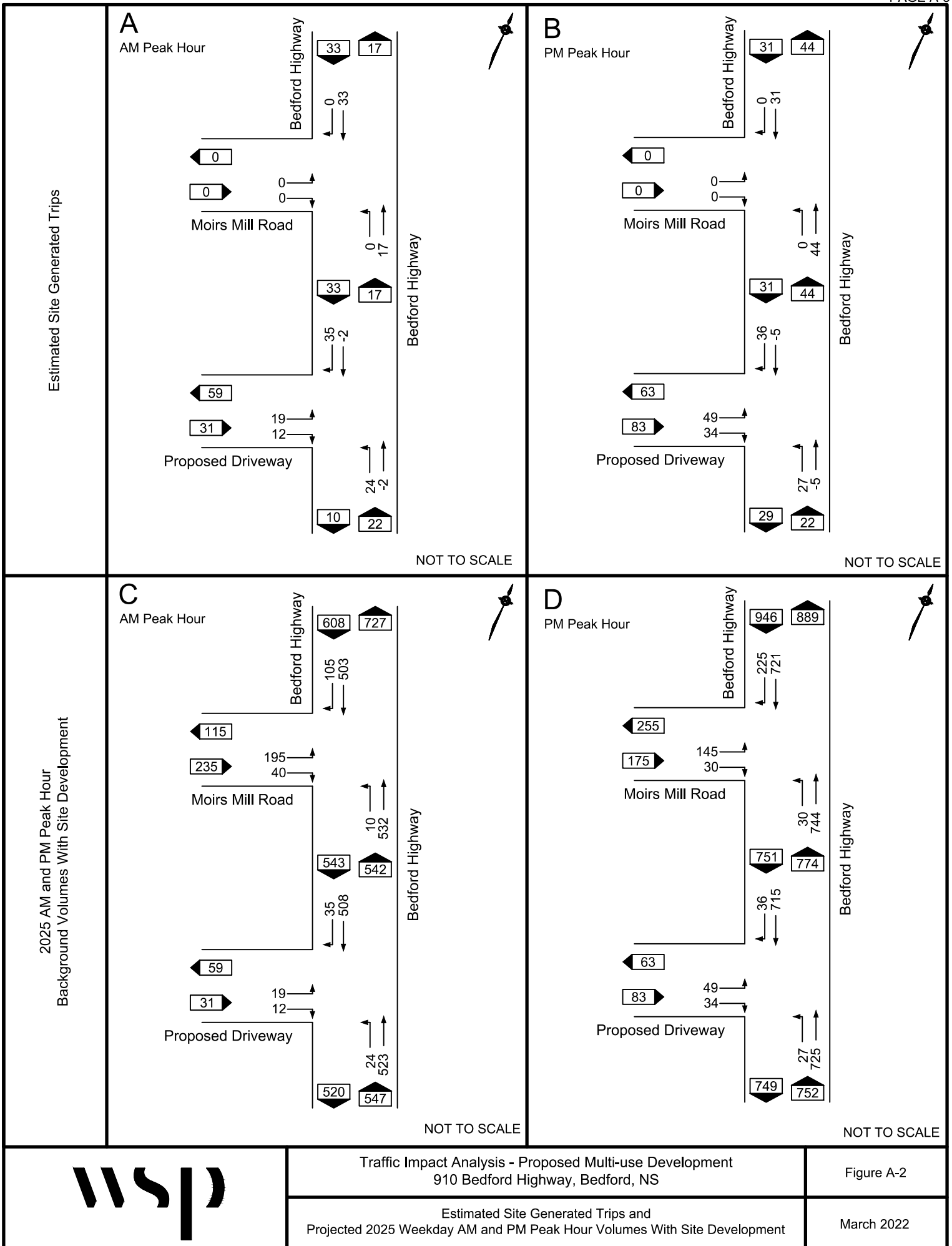
AM Peak Period Volume Data

Time	Bedford Highway Northbound Approach		Bedford Highway Southbound Approach		Moirs Mill Road Eastbound Approach		Total Vehicles
	A	B	H	I	J	L	
07:00 07:15	1	82	96	10	22	4	215
07:15 07:30	2	98	98	7	26	8	239
07:30 07:45	2	116	83	21	39	11	272
07:45 08:00	2	146	119	25	47	8	347
08:00 08:15	5	123	109	26	47	11	321
08:15 08:30	1	117	105	29	44	16	312
08:30 08:45	4	115	122	18	53	7	319
08:45 09:00	2	148	105	29	52	5	341
AM Peak Hour	12	501	455	98	191	42	1299
07:00 08:00	7	442	396	63	134	31	1073
08:00 09:00	12	503	441	102	196	39	1293
AM Peak Hour	Ped 1		Ped 3		Ped 4		Total Peds
07:00 08:00	7		0		5		12
08:00 09:00	6		0		2		8

PM Peak Period Volume Data

Time	Bedford Highway Northbound Approach		Bedford Highway Southbound Approach		Moirs Mill Road Eastbound Approach		Total Vehicles
	A	B	H	I	J	L	
15:30 15:45	3	145	157	53	24	4	386
15:45 16:00	10	163	164	47	41	4	429
16:00 16:15	11	168	186	56	33	7	461
16:15 16:30	8	182	171	51	31	10	453
16:30 16:45	2	168	151	64	37	7	429
16:45 17:00	11	171	156	42	27	4	411
17:00 17:15	8	175	162	48	40	3	436
17:15 17:30	9	164	195	64	37	7	476
PM Peak Hour	31	681	672	218	142	28	1772
15:30 16:30	32	658	678	207	129	25	1729
16:30 17:30	30	678	664	218	141	21	1752
PM Peak Hour	Ped 1		Ped 3		Ped 4		Total Peds
15:30 16:30	18		0		15		33
16:30 17:30	16		0		8		24







APPENDIX B

INTERSECTION PERFORMANCE DATA

1: Bedford Hwy & Moirs Mill Rd

2022 AM Peak Background



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	190	40	10	500	455	100
Future Volume (vph)	190	40	10	500	455	100
Satd. Flow (prot)	1770	1583	0	3536	3423	0
Flt Permitted	0.950			0.937		
Satd. Flow (perm)	1770	1558	0	3316	3423	0
Satd. Flow (RTOR)		43			40	
Lane Group Flow (vph)	207	43	0	554	604	0
Turn Type	Prot	Perm	Perm	NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4	2			
Total Split (s)	41.0	41.0	59.0	59.0	59.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0	
Act Effect Green (s)	10.0	10.0		15.1	15.1	
Actuated g/C Ratio	0.27	0.27		0.40	0.40	
v/c Ratio	0.44	0.10		0.41	0.43	
Control Delay	14.0	4.8		9.5	8.9	
Queue Delay	0.0	0.0		0.0	0.0	
Total Delay	14.0	4.8		9.5	8.9	
LOS	B	A		A	A	
Approach Delay	12.4			9.5	8.9	
Approach LOS	B			A	A	
Queue Length 50th (m)	9.0	0.0		11.9	12.1	
Queue Length 95th (m)	24.5	4.6		24.5	25.0	
Internal Link Dist (m)	203.0			32.2	133.6	
Turn Bay Length (m)		55.0				
Base Capacity (vph)	1634	1441		3316	3423	
Starvation Cap Reductn	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	
Storage Cap Reductn	0	0		0	0	
Reduced v/c Ratio	0.13	0.03		0.17	0.18	

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 37.3

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.44

Intersection Signal Delay: 9.8

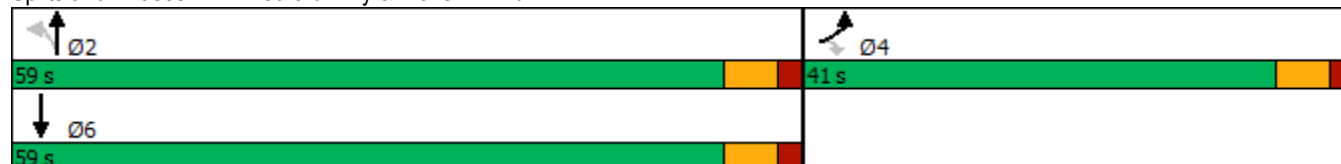
Intersection LOS: A

Intersection Capacity Utilization 41.5%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 1: Bedford Hwy & Moirs Mill Rd





Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	140	30	30	680	670	220
Future Volume (vph)	140	30	30	680	670	220
Satd. Flow (prot)	1770	1583	0	3532	3354	0
Flt Permitted	0.950			0.885		
Satd. Flow (perm)	1770	1539	0	3131	3354	0
Satd. Flow (RTOR)		33			76	
Lane Group Flow (vph)	152	33	0	772	967	0
Turn Type	Prot	Perm	Perm	NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4	2			
Total Split (s)	36.0	36.0	74.0	74.0	74.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0	
Act Effect Green (s)	9.6	9.6		23.1	23.1	
Actuated g/C Ratio	0.21	0.21		0.52	0.52	
v/c Ratio	0.40	0.09		0.48	0.55	
Control Delay	18.2	7.0		8.5	8.4	
Queue Delay	0.0	0.0		0.0	0.0	
Total Delay	18.2	7.0		8.5	8.4	
LOS	B	A		A	A	
Approach Delay	16.2			8.5	8.4	
Approach LOS	B			A	A	
Queue Length 50th (m)	9.7	0.0		18.3	21.7	
Queue Length 95th (m)	24.6	5.1		34.3	40.6	
Internal Link Dist (m)	203.0			32.2	133.6	
Turn Bay Length (m)		55.0				
Base Capacity (vph)	1192	1048		3131	3354	
Starvation Cap Reductn	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	
Storage Cap Reductn	0	0		0	0	
Reduced v/c Ratio	0.13	0.03		0.25	0.29	

Intersection Summary

Cycle Length: 110

Actuated Cycle Length: 44.7

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.55

Intersection Signal Delay: 9.2

Intersection LOS: A

Intersection Capacity Utilization 58.6%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 1: Bedford Hwy & Moirs Mill Rd





Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	195	40	10	515	470	105
Future Volume (vph)	195	40	10	515	470	105
Satd. Flow (prot)	1770	1583	0	3536	3423	0
Flt Permitted	0.950			0.937		
Satd. Flow (perm)	1770	1558	0	3316	3423	0
Satd. Flow (RTOR)		43			41	
Lane Group Flow (vph)	212	43	0	571	625	0
Turn Type	Prot	Perm	Perm	NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4	2			
Total Split (s)	41.0	41.0	59.0	59.0	59.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0	
Act Effect Green (s)	10.2	10.2		15.2	15.2	
Actuated g/C Ratio	0.27	0.27		0.41	0.41	
v/c Ratio	0.44	0.09		0.42	0.44	
Control Delay	14.1	4.9		9.6	9.1	
Queue Delay	0.0	0.0		0.0	0.0	
Total Delay	14.1	4.9		9.6	9.1	
LOS	B	A		A	A	
Approach Delay	12.6			9.6	9.1	
Approach LOS	B			A	A	
Queue Length 50th (m)	9.4	0.0		12.5	12.8	
Queue Length 95th (m)	25.4	4.7		25.6	26.3	
Internal Link Dist (m)	203.0			32.2	133.6	
Turn Bay Length (m)		55.0				
Base Capacity (vph)	1627	1436		3316	3423	
Starvation Cap Reductn	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	
Storage Cap Reductn	0	0		0	0	
Reduced v/c Ratio	0.13	0.03		0.17	0.18	

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 37.5

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.44

Intersection Signal Delay: 9.9

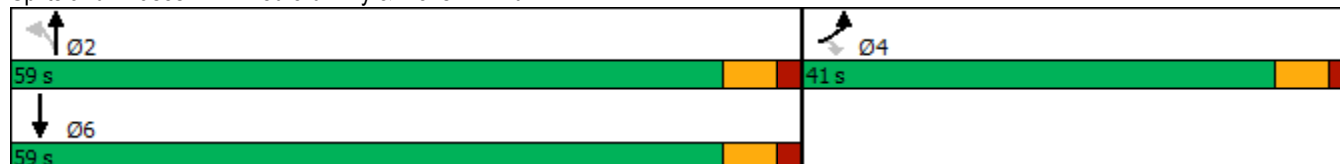
Intersection LOS: A

Intersection Capacity Utilization 42.2%

ICU Level of Service A













Analysis Period (min) 15

Splits and Phases: 1: Bedford Hwy & Moirs Mill Rd



910 Bedford Highway Traffic Impact Analysis
1: Bedford Hwy & Moirs Mill Rd

Page B-4
2025 PM Peak Background

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations				 	 	
Traffic Volume (vph)	145	30	30	700	690	225
Future Volume (vph)	145	30	30	700	690	225
Satd. Flow (prot)	1770	1583	0	3532	3354	0
Flt Permitted	0.950			0.884		
Satd. Flow (perm)	1770	1539	0	3128	3354	0
Satd. Flow (RTOR)		33			75	
Lane Group Flow (vph)	158	33	0	794	995	0
Turn Type	Prot	Perm	Perm	NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4	2			
Total Split (s)	36.0	36.0	74.0	74.0	74.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0	
Act Effect Green (s)	9.8	9.8		23.5	23.5	
Actuated g/C Ratio	0.22	0.22		0.52	0.52	
v/c Ratio	0.41	0.09		0.49	0.56	
Control Delay	18.6	7.1		8.7	8.7	
Queue Delay	0.0	0.0		0.0	0.0	
Total Delay	18.6	7.1		8.7	8.7	
LOS	B	A		A	A	
Approach Delay	16.6			8.7	8.7	
Approach LOS	B			A	A	
Queue Length 50th (m)	10.1	0.0		19.3	23.0	
Queue Length 95th (m)	25.8	5.2		36.1	43.2	
Internal Link Dist (m)	203.0			32.2	133.6	
Turn Bay Length (m)		55.0				
Base Capacity (vph)	1176	1033		3128	3354	
Starvation Cap Reductn	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	
Storage Cap Reductn	0	0		0	0	
Reduced v/c Ratio	0.13	0.03		0.25	0.30	

Intersection Summary

Cycle Length: 110

Actuated Cycle Length: 45.4

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.56

Intersection Signal Delay: 9.5

Intersection LOS: A

Intersection Capacity Utilization 59.4%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 1: Bedford Hwy & Moirs Mill Rd



1: Bedford Hwy & Moirs Mill Rd

2025 AM Peak Background With Site Development

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	195	40	10	532	503	105
Future Volume (vph)	195	40	10	532	503	105
Satd. Flow (prot)	1770	1583	0	3536	3427	0
Flt Permitted	0.950			0.937		
Satd. Flow (perm)	1770	1558	0	3316	3427	0
Satd. Flow (RTOR)		43			37	
Lane Group Flow (vph)	212	43	0	589	661	0
Turn Type	Prot	Perm	Perm	NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4	2			
Total Split (s)	41.0	41.0	59.0	59.0	59.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0	
Act Effect Green (s)	10.3	10.3		15.8	15.8	
Actuated g/C Ratio	0.27	0.27		0.41	0.41	
v/c Ratio	0.45	0.10		0.43	0.46	
Control Delay	14.5	5.0		9.6	9.3	
Queue Delay	0.0	0.0		0.0	0.0	
Total Delay	14.5	5.0		9.6	9.3	
LOS	B	A		A	A	
Approach Delay	12.9			9.6	9.3	
Approach LOS	B			A	A	
Queue Length 50th (m)	9.6	0.0		13.1	14.0	
Queue Length 95th (m)	26.1	4.7		26.6	28.4	
Internal Link Dist (m)	203.0			32.2	133.6	
Turn Bay Length (m)		55.0				
Base Capacity (vph)	1612	1422		3316	3427	
Starvation Cap Reductn	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	
Storage Cap Reductn	0	0		0	0	
Reduced v/c Ratio	0.13	0.03		0.18	0.19	

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 38.2

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.46

Intersection Signal Delay: 10.0

Intersection LOS: B

Intersection Capacity Utilization 42.6%

ICU Level of Service A










Analysis Period (min) 15

Splits and Phases: 1: Bedford Hwy & Moirs Mill Rd

	Ø2		Ø4
59 s		41 s	
	Ø6		
59 s			

2: Bedford Hwy & Site Access

2025 AM Peak Background With Site Development

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	19	12	24	523	508	35
Future Volume (Veh/h)	19	12	24	523	508	35
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	21	13	26	568	552	38
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh						
Upstream signal (m)					56	
pX, platoon unblocked	0.89	0.89	0.89			
vC, conflicting volume	907	295	590			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	652	0	296			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	94	99	98			
cM capacity (veh/h)	349	966	1125			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2	
Volume Total	34	215	379	368	222	
Volume Left	21	26	0	0	0	
Volume Right	13	0	0	0	38	
cSH	462	1125	1700	1700	1700	
Volume to Capacity	0.07	0.02	0.22	0.22	0.13	
Queue Length 95th (m)	1.9	0.6	0.0	0.0	0.0	
Control Delay (s)	13.4	1.2	0.0	0.0	0.0	
Lane LOS	B	A				
Approach Delay (s)	13.4	0.4		0.0		
Approach LOS	B					
Intersection Summary						
Average Delay			0.6			
Intersection Capacity Utilization			42.1%	ICU Level of Service		A
Analysis Period (min)			15			

1: Bedford Hwy & Moirs Mill Rd

2025 PM Peak Background With Site Development



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	145	30	30	744	721	225
Future Volume (vph)	145	30	30	744	721	225
Satd. Flow (prot)	1770	1583	0	3532	3359	0
Flt Permitted	0.950			0.885		
Satd. Flow (perm)	1770	1539	0	3131	3359	0
Satd. Flow (RTOR)		33			71	
Lane Group Flow (vph)	158	33	0	842	1029	0
Turn Type	Prot	Perm	Perm	NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4	2			
Total Split (s)	36.0	36.0	74.0	74.0	74.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0	
Act Effect Green (s)	9.9	9.9		24.3	24.3	
Actuated g/C Ratio	0.21	0.21		0.52	0.52	
v/c Ratio	0.42	0.09		0.51	0.57	
Control Delay	19.1	7.2		8.9	8.8	
Queue Delay	0.0	0.0		0.0	0.0	
Total Delay	19.1	7.2		8.9	8.8	
LOS	B	A		A	A	
Approach Delay	17.0			8.9	8.8	
Approach LOS	B			A	A	
Queue Length 50th (m)	10.4	0.0		21.0	24.5	
Queue Length 95th (m)	26.5	5.2		39.2	45.8	
Internal Link Dist (m)	203.0			32.2	133.6	
Turn Bay Length (m)		55.0				
Base Capacity (vph)	1152	1013		3131	3359	
Starvation Cap Reductn	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	
Storage Cap Reductn	0	0		0	0	
Reduced v/c Ratio	0.14	0.03		0.27	0.31	

Intersection Summary

Cycle Length: 110

Actuated Cycle Length: 46.3

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.57

Intersection Signal Delay: 9.6

Intersection LOS: A

Intersection Capacity Utilization 60.6%

ICU Level of Service B










Analysis Period (min) 15

Splits and Phases: 1: Bedford Hwy & Moirs Mill Rd



2: Bedford Hwy & Site Access

2025 PM Peak Background With Site Development

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	49	34	27	725	715	36
Future Volume (Veh/h)	49	34	27	725	715	36
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	53	37	29	788	777	39
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh						
Upstream signal (m)					56	
pX, platoon unblocked	0.83	0.83	0.83			
vC, conflicting volume	1248	408	816			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	884	0	361			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	77	96	97			
cM capacity (veh/h)	229	897	988			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2	
Volume Total	90	292	525	518	298	
Volume Left	53	29	0	0	0	
Volume Right	37	0	0	0	39	
cSH	330	988	1700	1700	1700	
Volume to Capacity	0.27	0.03	0.31	0.30	0.18	
Queue Length 95th (m)	8.7	0.7	0.0	0.0	0.0	
Control Delay (s)	19.9	1.1	0.0	0.0	0.0	
Lane LOS	C	A				
Approach Delay (s)	19.9	0.4		0.0		
Approach LOS	C					
Intersection Summary						
Average Delay			1.2			
Intersection Capacity Utilization			51.2%	ICU Level of Service		A
Analysis Period (min)			15			