191-15461

July 22, 2021

Mr. Connor Wallace, MCIP, LPP
Urban Planner
ZZap Consulting Inc.

via email: connor@zzap.ca

RE: Traffic Impact Statement – 600 Bedford Highway
Halifax, Nova Scotia

Dear Mr. Wallace:

Plans are being prepared for a mid-rise multi-unit development at 600 Bedford Highway, Halifax, Nova Scotia (PID 00289561). The existing site was home to the Manorhouse Furniture Store (See Photo 1) until it closed in March 2020. This is the Traffic Impact Statement for the site redevelopment.

The proposed development would involve the removal of all buildings on site to construct the seven-floor residential building with 94 units.

Photo 1 – 600 Bedford Highway

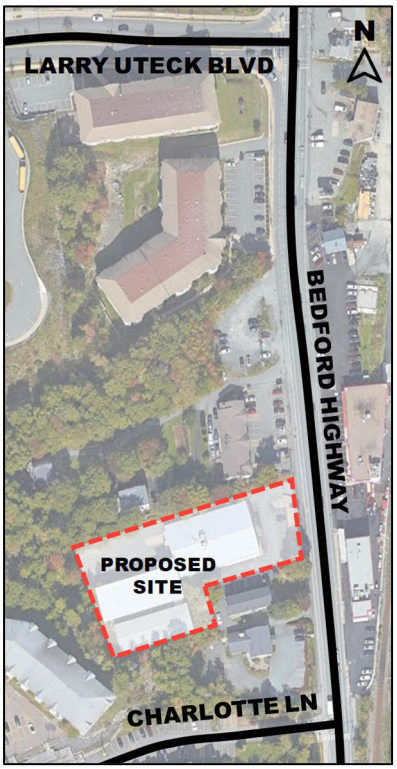


Figure 1 – Study Area

SITE DESCRIPTION AND ACCESS

The site is located at 600 Bedford Highway with access currently provided from the Bedford Highway via a full access driveway (See Photo 2). The redeveloped site is expected to have the same access configuration. Views from the driveway are displayed in Photo 3 and Photo 4.

Photo 2 - Full Access Driveway at Site

1 Spectacle Lake Drive
Dartmouth, NS, Canada B3B 1X7
Tel.: +1 902-835-9955
Fax: +1 902-835-1645
www.wsp.com

Photo 3 - Looking north (to the left) on Bedford Highway from the Site Access

Photo 4 - Looking south (to the right) on Bedford Highway from the Site Access

STREET AND INTERSECTION DESCRIPTIONS

Bedford Highway, at the site location, is a 2-lane arterial that runs along the western side of the Bedford Basin. The Bedford Highway is part of Trunk 2 that starts at the Windsor Street Exchange on the Halifax Peninsula and becomes part of Trunk 1 at its north terminus. In the vicinity of the proposed redevelopment site, it has a posted speed limit of 60 km/h and there are painted bicycle lanes on both sides of the roadway. HRM is currently undergoing a 60% functional design of the Bedford Highway, which will propose changes to the existing corridor.

Larry Uteck Boulevard is a 2-lane collector that runs between Hammonds Plains Road and the Bedford Highway. In the vicinity of the proposed development site, it has a posted speed limit of 50 km/h.

Bedford Highway at Larry Uteck Boulevard is a 3-leg signalized intersection. The northbound approach consists of a through lane and an exclusive left turn lane, the southbound approach consists of a through lane and a right channelized turn, and the eastbound approach consists of an exclusive left turn lane and a channelized right turn.

TRANSIT

HRM Transit currently operates Route 8 (Sackville), Route 90 (Larry Uteck), Route 91 (Hemlock Ravine) and Route 93 (Bedford Highway) with several northbound and southbound bus stops on the Bedford Highway near the proposed redevelopment site (See Photo 5).

Photo 5 – Transit on Bedford Highway

TRAFFIC VOLUME DATA

Turning movement counts were obtained from Halifax Regional Municipality (HRM) Traffic Management at the intersection of Bedford Highway at Larry Uteck Boulevard. Count data are summarized in Table A-1, Appendix A, with peak hours indicated by shaded areas.

TRIP GENERATION

When using the published trip generation rates in *Trip Generation Manual, 10th Edition* (Institute of Transportation Engineers, Washington, 2017) the transportation engineer's objective should be to provide a realistic estimate of the number of trips that will be generated. Generated trips for Mid-Rise Multifamily Housing (Land Use 221) and a Furniture Store (Code 890) are estimated for the AM and PM peak hours of traffic by the number of dwelling units and gross floor area (GFA), respectively. The proposed development will create 94 dwelling units and the furniture store had an approximate gross floor area of 19,000 square feet.

The estimated number of trips generated by the furniture store is:

- 5 two-way trips (4 entering and 1 exiting) during the AM peak hour; and,
- 10 two-way trips (5 entering and 5 exiting) during the PM peak hour.

The estimated number of trips that will be generated by the construction of the mid-rise residential building is:

- 34 two-way trips (9 entering and 25 exiting) during the AM peak hour; and,
- 41 two-way trips (25 entering and 16 exiting) during the PM peak hour.

The redevelopment of the site is estimated to generate:

- **23 new** two-way vehicle trips (4 entering and 19 exiting) during the AM peak hour; and,
- **25 new** two-way trips (16 entering and 9 exiting) during the PM peak hour.

As the Manorhouse Furniture Store was still operating during the time that the turning movement count was conducted, the estimated number of trips generated by the store was subtracted from that estimated for the redevelopment.

Table 1 - Trip Generation Estimates

Land Use[1]	Units[2]	Trip Generation Rates[3]				Trips Generated[4]			
		AM Peak		PM Peak		AM Peak		PM Peak	
		In	Out	In	Out	In	Out	In	Out
Proposed Re-Development									
Removal of Furniture Store[5] (Land Use 890)	19.00 KGFA	0.18	0.08	0.24	0.28	-4	-1	-5	-5
Mid-Rise Residential Building (Land Use 221)	94 units	0.09	0.27	0.27	0.17	9	25	25	16
Trip Generation Estimate						5	24	21	11
20% Reduction for Non-Vehicle Trips[6]						1	5	4	2
Total Trips generated by the Proposed Redeveloped Site						**4**	**19**	**16**	**9**

Notes:
1. Land Use Codes are from *Trip Generation Manual*, *10th Edition,* (Institute of Transportation Engineers, Washington, 2017).
2. The units for the furniture store are gross floor area (GFA) x 1,000 square feet and are dwelling units for the mid-rise residential building.
3. Trip generation rates are 'trips per hour per unit of measurement'.
4. Trips generated are 'trips per hour' for AM and PM peak hours.
5. Trips to the furniture store are applied as a credit for construction of the redevelopment.
6. In 2016, approximately 18% of trips were made by transit or using active transportation in the suburbs of Halifax. The Halifax Integrated Mobility Plan has a 26% target for non-auto trips within the suburban area by 2031 (Page 16, IMP Implementation Update, 2021). A conservative reduction of 20% was used to account for non-auto trips (transit, bicycle and walking trips) generated to the site.

LEFT TURN LANE WARRANT CRITERIA

A left turn lane warrant was considered on the Bedford Highway with added site generated trips. Left turn lane warrant criteria and results are summarized in Table 2.

Table 2 – Left Turn Lane Warrant Analysis

Criteria	Description	Warrant Consideration
Left Turn Lane Analysis	Left-turn movements on a two-lane street may cause both operational and safety problems. Operational problems result as a vehicle stopped waiting for an opportunity to turn across 'heavy' opposing traffic causes a queue of stopped vehicles to form. Safety problems result from rear end collisions when a stopped left-turning vehicle is struck by an advancing vehicle, or from head-on or right-angle collisions when a left-turning vehicle is struck by an opposing vehicle.	Based on available data, the through volumes on the Bedford Highway indicate that there is sufficient volume to meet the volume threshold for a northbound left turn lane at the site driveway. A left turn lane **is expected** to be warranted, although, there are several nearby driveways along the Bedford Highway that do not have left turn lanes to access the site. Additionally, there is a northbound bicycle lane next to the roadway, which vehicles may encroach upon to maneuver around left turning vehicles after yielding to approaching cyclists.

ACCESS REVIEW

The driveway location and number of lanes is expected to remain the same as existing (See Figure 2). Currently, the site has open driveway access onto the Bedford Highway (See Photo 6) and is fronted by a retaining wall (See Photo 7). Bedford Highway is generally a consistent grade and straight at the site access, therefore, there were no sight distance concerns identified at the driveway.

The existing driveway is narrow and may not accommodate two-way vehicle traffic. The proposed redevelopment is expected to generate 23 and 25 two-way vehicle trips during the AM and PM peak hours, respectively. Based on the estimated site generated trips, the site driveway should be widened to comfortably accommodate two-way vehicle movements. A driveway that does not provide sufficient space for two-way movements may cause queuing on the Bedford Highway for vehicles trying to gain access the redevelopment.

Figure 2 – Proposed Site Access

Photo 6 – Existing Site Access

Photo 7 – Existing Retaining Wall

SUMMARY

1. Plans are being prepared for a mid-rise residential development at 600 Bedford Highway, Halifax, Nova Scotia. The existing site was home to the Manorhouse Furniture Store up until March 2020.

2. The proposed mid-rise development will use the existing driveway access location. The available stopping sight distance appears adequate for a driveway onto the Bedford Highway.

3. Trip generation estimates were prepared using rates published in *Trip Generation, 10th Edition* (Institute of Transportation Engineers, Washington 2017). It was estimated that the proposed redevelopment will generate:
   - **23 new** two-way vehicle trips (4 entering and 19 exiting) during the AM peak hour; and,
   - **25 new** two-way trips (16 entering and 9 exiting) during the PM peak hour.

4. The through volumes on the Bedford Highway are sufficient to meet the warrant for a northbound left turn lane at the site driveway.

RECOMMENDATIONS

5. HRM should consider constructing or marking a left turn lane on Bedford Highway.

6. The site driveway should be widened to accommodate two-way vehicles movements.

CONCLUSION

7. With the site modifications to prevent queuing on the Bedford Highway, site generated trips are 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.mccarthy@wsp.com or by telephone at 902-536-0982.

Sincerely,
- Original Signed -

REGISTERED PROFESSIONAL ENGINEER
DATE
July 22, 2021
- Original Signed -
C. K. K. McCARTHY
11853
PROVINCE OF NOVA SCOTIA

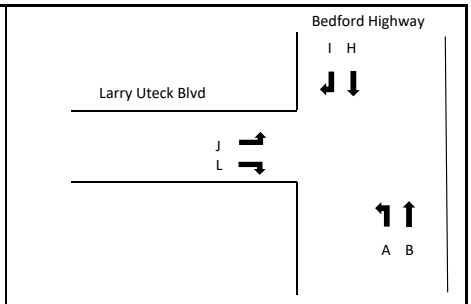
Courtney McCarthy, P.Eng.
Traffic & Transportation Engineer
WSP Canada Inc.

APPENDIX A

Table A-1

Bedford Highway
@
Larry Uteck Boulevard

Halifax, NS
Thursday, September 27, 2018



AM Peak Period Volume Data

Time		Bedford Highway Northbound Approach		Bedford Highway Southbound Approach		Larry Uteck Boulevard Eastbound Approach		Total Vehicles
		A	B	H	I	J	L	
07:00	07:15	30	60	145	12	24	110	381
07:15	07:30	42	59	86	31	21	80	319
07:30	07:45	49	76	101	20	26	64	336
07:45	08:00	37	68	60	23	30	62	280
08:00	08:15	50	80	73	21	32	92	348
08:15	08:30	36	84	89	22	36	55	322
08:30	08:45	55	88	99	24	35	54	355
08:45	09:00	29	97	84	15	33	51	309
AM Peak Hour		**170**	**349**	**345**	**82**	**136**	**252**	**1334**
07:00	**08:00**	**158**	**263**	**392**	**86**	**101**	**316**	**1316**
08:00	**09:00**	**170**	**349**	**345**	**82**	**136**	**252**	**1334**
		Ped 1		**Ped 3**		**Ped 4**		**Total Peds**
07:00	**08:00**	**3**		**0**		**6**		**9**
08:00	**09:00**	**3**		**1**		**4**		**8**

Midday Peak Period Volume Data

Time		Bedford Highway Northbound Approach		Bedford Highway Southbound Approach		Larry Uteck Boulevard Eastbound Approach		Total Vehicles
		A	B	H	I	J	L	
11:30	11:45	45	117	111	21	21	69	384
11:45	12:00	46	129	118	31	22	62	408
12:00	12:15	56	126	118	30	21	51	402
12:15	12:30	52	115	109	34	24	56	390
12:30	12:45	45	116	99	22	28	80	390
12:45	13:00	57	140	96	25	36	57	411
13:00	13:15	54	116	89	24	29	43	355
13:15	13:30	68	138	100	27	23	54	410
Midday Peak Hour		**210**	**497**	**422**	**111**	**109**	**244**	**1593**
11:30	**12:30**	**199**	**487**	**456**	**116**	**88**	**238**	**1584**
12:30	**13:30**	**224**	**510**	**384**	**98**	**116**	**234**	**1566**
		Ped 1		**Ped 3**		**Ped 4**		**Total Peds**
11:30	**12:30**	**9**		**1**		**5**		**15**
12:30	**13:30**	**5**		**0**		**2**		**7**

PM Peak Period Volume Data

Time		Bedford Highway Northbound Approach		Bedford Highway Southbound Approach		Larry Uteck Boulevard Eastbound Approach		Total Vehicles
		A	B	H	I	J	L	
15:30	15:45	83	141	110	34	33	56	457
15:45	16:00	89	147	124	31	27	64	482
16:00	16:15	87	138	96	28	22	56	427
16:15	16:30	95	141	93	40	22	50	441
16:30	16:45	79	164	123	25	21	71	483
16:45	17:00	85	158	117	52	24	47	483
17:00	17:15	91	152	131	37	27	55	493
17:15	17:30	99	148	140	43	16	56	502
PM Peak Hour		**354**	**622**	**511**	**157**	**88**	**229**	**1961**
15:30	**16:30**	**354**	**567**	**423**	**133**	**104**	**226**	**1807**
16:30	**17:30**	**354**	**622**	**511**	**157**	**88**	**229**	**1961**
		Ped 1		**Ped 3**		**Ped 4**		**Total Peds**
15:30	**16:30**	**7**		**0**		**2**		**9**
16:30	**17:30**	**13**		**0**		**5**		**18**

* Count not completed by WSP