

November 1, 2017

Mr. Jafar Tabrizi
President, Tabrizi Rugs
180 Bedford Highway
Bedford, NS B4A 1C1

[Via Email: tabrizi@tabrizi.com]

**RE: Traffic Impact Statement
BH-1 and BH-2, Southgate Drive, Bedford, NS**

Dear Mr. Tabrizi:

Plans are being prepared for the development of two sites (PID 41119496 referred to as BH-1; and PID 00360560, referred to as BH-2). Both sites are located within the Bedford South Master Plan Area (site locations shown in Figure 1) and are being developed by Tabrizi Rugs.

SITE DESCRIPTION – The sites are currently unoccupied and are located on the southwest (BH-1) and southeast (BH-2) corners of the Bedford Highway at Southgate Drive intersection in Bedford, NS (See Figure 1). Both sites are within the Bedford South Master Plan Area.

DESCRIPTION OF PLANNED DEVELOPMENT– Both sites are planned for residential development with unit counts that include:

- 73 apartment units;
- 30 townhouse units; and,
- 1 single family home.

The breakdown of permitted and proposed units by site and current plans for each site are summarized in Table 1.

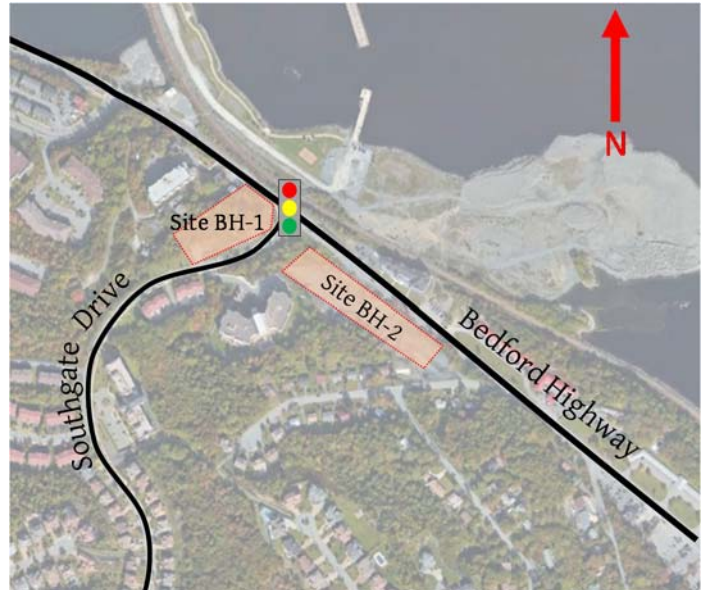




Figure 1 – Location of Subject Sites

Site	Site Plan
BH-1 (73 unit apartment building)	
BH-2 (30 townhouse units; 1 single family home)	

ACCESS FOR LOT BH-1 – Vehicular access to Lot BH-1 (See Table 1) is planned to be via an underground parking garage and a surface parking lot for short term drop off/pick up and visitor parking, both driveways will be two way and access Southgate Drive. Stopping sight distance (SSD) measurements were recorded for the proposed driveways and indicate the following:

Driveway for Surface Lot	SSD measurements recorded indicate over 100 m of available SSD for both directions of travel, which is greater than the minimum SSD of 77 m for an approach speed of 60 km/h on a +6% grade and of 92 m for an approach speed of 60 km/h on a -6% grade.
Driveway for Underground Parking	<p>SSD measurements recorded indicate over 100 m of available SSD for the northbound approach (toward Bedford Highway), which is greater than the minimum SSD of 92 m for an approach speed of 60 km/h on a -6% grade (See Photo 2).</p> <p>Vehicles from the north are traveling at lower speed after just turning from Bedford Highway. SSD measurements recorded indicate 50 m of available SSD for the southbound approach (from Bedford Highway), which is greater than the minimum SSD of 42 m for an approach speed of 40 km/h on a +6% grade. With removal of brush on the site side (seen to the left in Photo 1) it is expected that a vehicle exiting the driveway will be able to see traffic in the right turn channel and turning left from Bedford Highway. There are small trees in the boulevard on Southgate Drive that could be pruned and growth monitored to improve visibility (See Photo 1).</p> <div style="display: flex; justify-content: space-around;">   </div> <div style="display: flex; justify-content: space-around;"> <p>Photo 1 – Looking Left (toward Bedford Highway) from the proposed driveway to underground parking</p> <p>Photo 2 – Looking right from the proposed driveway to underground parking</p> </div>

ACCESS FOR LOT BH-2 – Vehicular access to Lot BH-2 (See Table 1) is planned to be via:

- A single driveway access to Bedford Highway for 18 townhouse units;
- A single driveway access to Glenmount Avenue for the remaining 12 townhouse units; and,
- Continued use of a driveway to Glenmount Avenue for the single family home.

Stopping sight distance (SSD) measurements were recorded for the proposed driveway onto Bedford Highway and indicate over 110 m of available SSD for both directions of travel, which is greater than the minimum SSD of 101 m for an approach speed of 65 km/h on a -3% grade (See Photos 3 and 4).



Photo 3 – Looking Left (toward Southgate Drive) from the proposed driveway connection to Bedford Highway



Photo 4 – Looking right from the proposed driveway connection to the Bedford Highway

DESCRIPTION OF EXISTING STREETS AND INTERSECTIONS –

Bedford Highway is a two lane arterial road that runs north-south between Bedford and Windsor Street in Halifax. In the subject area, the Bedford Highway has a 50 km/h posted speed limit, sidewalk on the west side ending at Southgate Drive and a 2 lane cross section and marked bicycle lanes. Machine traffic counts collected by HRM Traffic Management in November 2012 between Hammond Plains Road and Moirs Mill Road indicate a two-way volume on Bedford Highway of approximately 19,600 vehicles per day (vpd) with two-way volumes of approximately 1,300 vehicles per hour (vph) in the AM peak hour and 1,700 vph in the PM peak hour.

Southgate Drive is a minor collector road that runs east-west from Larry Uteck Boulevard in the west to Bedford Highway in the east. Southgate Drive has a two-lane cross section and a 50 km/h speed limit with concrete sidewalk on the south side. Machine traffic counts collected by HRM Traffic Management in October 2017 indicate a daily volume of approximately 3500 vehicles per day.

Glenmount Avenue is a local street that runs east-west from its intersection with the Bedford to its terminus with a cul-de-sac bulb. The street has two lane urban cross section and no concrete sidewalk.

The T-intersection of Bedford Highway at Southgate Drive is signalized with lane configurations that include a northbound left turn lane, a southbound right turn channelized island, and a two lane eastbound approach (See Figure 2).

TRANSIT – Halifax Transit currently operates Route #80 and #82 past the site with stops on both sides of Bedford Highway immediately in front of Site BH-2 (the existing shelter at the Halifaxbound bus stop can be seen in Photo 3). *Moving Forward Together Plan* (Halifax Transit, 2016) indicates that transit routes #8 (corridor route) and #93 will operate on Bedford Highway past the site and that route #192 will operate on Southgate Drive.



Figure 2 – Bedford Highway at Southgate Drive Intersection Layout

TRIP GENERATION PROPOSED SITE– When using the published trip generation rates in *Trip Generation, 9th Edition* (Institute of Transportation Engineers, Washington, 2012) the transportation engineer's objective should be to provide a realistic estimate of the number of trips that will be generated. For smaller developments that have unit counts well below the averages seen in the ITE studies, the use of the fitted curve equations may provide estimates that are unreasonably high for the size of the development (while underestimating trip generation for very large developments). The number of proposed single family residential units (31, combined townhouse and single family) is well below the average rates for the AM (292 average units in ITE studies) and PM (321 average units in ITE studies). Additionally, the number of apartment units (73) is below the average rates for the AM and PM (120 average units in the ITE studies). Since the use of the average rate for Single Family Detached Housing (Land Use 210, Pages 297 and 298) and Mid-Rise Apartment (Land Use 223, Pages 387 and 388) were expected to provide more realistic trip generation estimates for this development, the average rates were used.

Although the use of average rates is expected to produce a more accurate estimate of the trips generated by this development, WSP has reviewed the trip generation estimates (top section, Table 2) and compared them to those obtained using the fitted curve equations for the AM and PM peak hours to estimate the trips generated by the development using the fitted curve equations (bottom section, Table 2).

Table 2 – Trip Generation Estimates

Land Use	Units ³	Trip Generation Rates				Trips Generated ⁴			
		AM Peak		PM Peak		AM Peak		PM Peak	
		In	Out	In	Out	In	Out	In	Out
Trip Generation Estimate for BH-1 Residential Development (Access to Southgate Drive) (Average Rates) ¹									
Mid-Rise Apartment (Land Use 223)	73	0.09	0.21	0.23	0.16	7	15	17	12
Trip Generation Estimate for BH-2 with Bedford Highway Access (Average Rates) ¹									
Single Family Residential (Land Use 210)	18	0.19	0.56	0.63	0.37	3	10	11	7
Trip Generation Estimate for BH-2 with Glenmount Avenue Access (Average Rates) ¹									
Single Family Residential (Land Use 210)	13	0.19	0.56	0.63	0.37	2	7	8	5
Total Estimated Trips (Average Rates)						12	32	36	24
Trip Generation Estimate for BH-1 Residential Development (Fitted curve equations) ²									
Mid-Rise Apartment (Land Use 223)	73	Fitted Curve Equations have been Used				5	12	14	10
Trip Generation Estimate for BH-2 Residential Development (Fitted curve equations) ²									
Single Family Residential (Land Use 210)	31	Fitted Curve Equations have been Used				8	24	23	14
Total Trips with Fitted Curve Equations						13	36	37	24
% Increase in estimated trips by using the fitted curve equations						8%	13%	3%	0%
Notes: 1. Trip generation rates are 'vehicles per hour per unit' for the indicated land use, prepared using published rates from <i>Trip Generation, 9th Edition</i> (Institute of Transportation Engineers, Washington, 2012). 2. Trip generation rates use the fitted curve equation for indicated Land Use from <i>Trip Generation, 9th Edition</i> (Institute of Transportation Engineers, Washington, 2012). 3. Units are number of residential units. 4. Vehicles per hour for peak hours									

A summary of the estimated trips by access and for the combined site development is included in Table 3.

Table 3 – Summary of Estimated Trips

	AM Peak Hour	PM Peak Hour
BH-1	22 two-way trips (7 entering and 15 exiting)	29 two-way trips (17 entering and 12 exiting)
BH-2 Via Bedford Highway	13 two-way trips (3 entering and 10 exiting)	18 two-way trips (11 entering and 7 exiting)
BH-2 Via Glenmount Avenue	9 two-way trips (2 entering and 7 exiting)	13 two-way trips (8 entering and 5 exiting)
Total Combined Sites (BH-1 and BH-2)	44 two-way trips (12 entering and 32 exiting)	60 two-way trips (36 entering and 24 exiting)

SUMMARY -

1. Plans are being prepared for the development of a 73 unit apartment building and 31 low density residential units.
2. Vehicular access to the apartment (lot BH-1) site will be via an underground parking garage with connection to Southgate Drive. An addition surface parking lot with access from Southgate Drive will be provided.
3. Vehicular access to 18 of the low density (lot BH-2) residential units will be via a single driveway onto the Bedford Highway. The remaining 13 BH-2 units will be accessed from Glenmount Avenue.
4. It is estimated that once developed, the combined site will generate a total of 44 two-way trips (12 entering and 32 exiting) during the AM peak hour and 60 two-way trips (36 entering and 24 exiting) during the PM peak hour.

CONCLUSION -

5. The development of the combined site as a 73 unit apartment building and 31 low density residential units is not expected to have any significant impact on 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 patrick.hatton@wsp.com or by telephone at 902-536-0954.

Sincerely,
Original Signed

Patrick Hatton, P.Eng.
Traffic & Transportation Engineer
WSP Canada Inc.

