## ATTACHMENT G:

 Proposed Plan of Subdivision for BH-2 (SDMM)

## ATTACHMENT H:

Flood Limit Analysis for BH-2 (SDMM)

NOVTEMBER 20,2018 SCALE: 1" $=20$
SDHM






CROSS SECTION (4)

$$
\text { VERT: } 1^{\prime \prime}=10^{\prime}
$$




Z:\SDMM\33000-33999\33900\33908\Design\33908 - Storm Period Flow Summary.xlsx

## ATTACHMENT I:

 Revised Traffic Impact StatementMarch 12, 2019

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

## 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 (the site locations are shown in Figure 1) and are being developed by Tabrizi Rugs.

## SITE DESCRIPTION -

While there is currently a single family home on the BH-2 site with access to Glenmount Avenue, the majority of the sites are 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 -



Figure 1 - Location of Subject Sites

The BH-1 site is planned to be residential while the BH-2 site is now planned to be commercial with some residential units connecting to Glenmount Avenue. Total unit counts for the two sites include:

- 73 apartment units (BH-1);
- 16,000 square feet of commercial (BH-2); and,
- 5 single family homes (including the 1 existing home) (BH-2).

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

Table 1 - Unit Counts and Site Plans for BH-1 and BH-2


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

## 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 $60 \mathrm{~km} / \mathrm{h}$ on a $+6 \%$ grade and of 92 m for an approach speed of $60 \mathrm{~km} / \mathrm{h}$ on a $-6 \%$ grade. |
| :---: | :---: |
| Driveway for Underground Parking | 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 $60 \mathrm{~km} / \mathrm{h}$ on a $-6 \%$ grade (See Photo 2). <br> 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 $\mathrm{km} / \mathrm{h}$ on $\mathrm{a}+6 \%$ 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). |
|  | Photo 1 - Looking left (toward Bedford Highway) from the proposed driveway to underground parking <br> Photo 2 - Looking right from the proposed driveway to underground parking |

## 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 the 16,000 SF retail area;
- A single shared driveway access to Glenmount Avenue for 4 of the single family units; and,
- Continued use of a driveway to Glenmount Avenue for the remaining 1 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 $65 \mathrm{~km} / \mathrm{h}$ on a $-3 \%$ grade (See Photos 3 and 4).


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

## DESCRIPTION OF EXISTING STREETS AND INTERSECTION -

Bedford Highway is an arterial road that runs north-south between Bedford and Windsor Street in Halifax. In the subject area, the Bedford Highway has a $50 \mathrm{~km} / \mathrm{h}$ posted speed limit, sidewalk on the west side ending at Southgate Drive and a twolane cross section and marked bicycle lanes. Machine traffic counts collected by HRM Traffic Management in October 2018 between Larry Uteck Boulevard and Southgate Drive indicate a two-way volume on Bedford Highway of approximately 16,700 vehicles per day (vpd) with two-way volumes of approximately 950 vehicles per hour (vph) in the AM peak hour and $1,350 \mathrm{vph}$ in the PM peak hour. A planning study by HRM is currently underway to improve mobility of transit and active transportation through the corridor.

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 $\mathrm{km} / \mathrm{h}$ 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 3,500 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-desac 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


Figure 2 - Bedford Highway at Southgate Drive Intersection Layout 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. The Integrated Mobility Plan (HRM, 2017) identifies the Bedford Highway as a Transit Priority Corridor.

## TRIP GENERATION PROPOSED SITE-

The number of trips that will be generated by the proposed development has been estimated using rates published in Trip Generation, $10^{\text {th }}$ Edition (Institute of Transportation Engineers, Washington, 2017). Trip generation estimates are summarized in Table 2. Since one of the single family homes onto Glenmount Avenue is existing and there are no planned changes to its use, the generation of new development trips to Glenmount Avenue is four single family homes.

Traffic Impact Statement BH-1 and BH-2, Southgate Drive, Bedford, NS
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) ${ }^{1}$

| Multifamily Housing (Mid-Rise) <br> (Land Use 221) | 73 | 0.09 | 0.27 | 0.27 | 0.17 | 7 | 19 | 20 | 13 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |

Trip Generation Estimate for BH-2 with Bedford Highway Access ${ }^{2}$

| Retail <br> (Land Use 826) | 16 | 0.76 | 0.60 | 1.19 | 1.52 | 12 | 10 | 19 | 24 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |

Trip Generation Estimate for BH-2 with Glenmount Avenue Access ${ }^{1}$

| Single Family Residential (Land Use 210) | 4 | 0.19 | 0.56 | 0.62 | 0.37 | 1 | 2 | 2 | 1 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Total Estimated Trips |  |  |  |  |  | 20 | 31 | 41 | 38 |
| 20\% Trip Reduction to Account for Internal Site Trips and Non-Auto Modes ${ }^{5}$ |  |  |  |  |  | -4 | -6 | -8 | -8 |
| Total Vehicle Trips Generated By This Development |  |  |  |  |  | 16 | 25 | 33 | 30 |

Notes: 1. Trip generation rates are 'vehicles per hour per unit' for the indicated land use, prepared using published rates from Trip Generation, 10th Edition (Institute of Transportation Engineers, Washington, 2017).
2. Since the $10^{\text {th }}$ Edition does not include rates for Specialty Retail, rates for Land Use 826 from the $9^{\text {th }}$ Edition have been used. Rates for 'Peak Hour of Adjacent Street Traffic' has been used to estimate PM peak hour trips. AM trip rates have been assumed to be $50 \%$ of PM rates with reversal of directional split.
3. Units are 'number of units' for residential, '1000 Sq. Ft Gross Leasable Area' for Retail.
4. Vehicles per hour for peak hours
5. Trip generation estimates have been reduced by $20 \%$ to account for trips between complementing land uses within the development as well as non-auto modes. This considers the Integrated Mobility Plan (HRM 2017) target of at least $26 \%$ non-auto for the inner Suburban Areas.

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 | 26 two-way trips <br> (7 entering and 19 exiting) | 33 two-way trips <br> (20 entering and 13 exiting) |
| BH-2 Via Bedford Highway | 22 two-way trips <br> (12 entering and 10 exiting) | 43 two-way trips <br> (19 entering and 24 exiting) |
| BH-2 Via Glenmount Avenue | 3 new two-way trips <br> (1 entering and 2 exiting) | 3 new two-way trips <br> (2 entering and 1 exiting) |
| Total Combined Sites <br> (BH-1 and BH-2) | 51 two-way trips <br> (20 entering and 31 exiting) | 79 two-way trips <br> (41 entering and $\mathbf{3 8}$ exiting) |

With the $20 \%$ reduction for internal trip capture between complementing land uses and consideration of non-auto modes, it is estimated that the development will generate:

- 41 new two-way vehicle trips ( 16 entering and 25 exiting) during the AM peak hour; and,
- 63 new two-way vehicle trips ( 33 entering and 30 exiting) during the PM peak hour.


## SUMMARY -

1. Plans are being prepared for the development of a 73 unit apartment building, 16,000 square feet of retail area, and 5 single family homes (including one existing home).
2. Vehicular access to the apartment (lot BH-1) site will be via an underground parking garage with connection to Southgate Drive. An additional surface parking lot with access from Southgate Drive will be provided.
3. Vehicular access to 16,000 square foot retail area (lot $\mathrm{BH}-2$ ) will be via a single driveway onto the Bedford Highway. The 5 BH-2 single family homes will be accessed from Glenmount Avenue.
4. It is estimated that once developed, the combined site will generate a total of 51 new two-way trips (20 entering and 31 exiting) during the AM peak hour and 79 two-way trips ( 41 entering and 38 exiting) during the PM peak hour.
5. After considering a $20 \%$ reduction in trips to account for onsite synergies and non-auto modes, it is estimated that once developed, the combined site will generate a total of 41 new two-way vehicle trips (16 entering and 25 exiting) during the AM peak hour and 63 new two-way vehicle trips ( 33 entering and 30 exiting) during the PM peak hour.

## CONCLUSION -

6. The development of the combined site as a 73 -unit apartment building, a 16,000 square foot retail building, and 5 single family homes (including 1 existing) 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.


ATTACHMENT J:
Preliminary Landscape Plan for BH-1 and BH-2 (A49)



