

James J. Copeland, P.Eng., RSP1
GRIFFIN transportation group inc.
30 Bonny View Drive
Fall River, NS B2T 1R2

June 20, 2023

Att: Mr. Trevor Adams, P.Eng.
Arch Developments Ltd.
1100-1645 Granville Street
Halifax, NS B3J 1X3

RE: A Stage 1 Traffic Impact Statement for a proposed development at #1491 Sackville Dr

1.0 INTRODUCTION

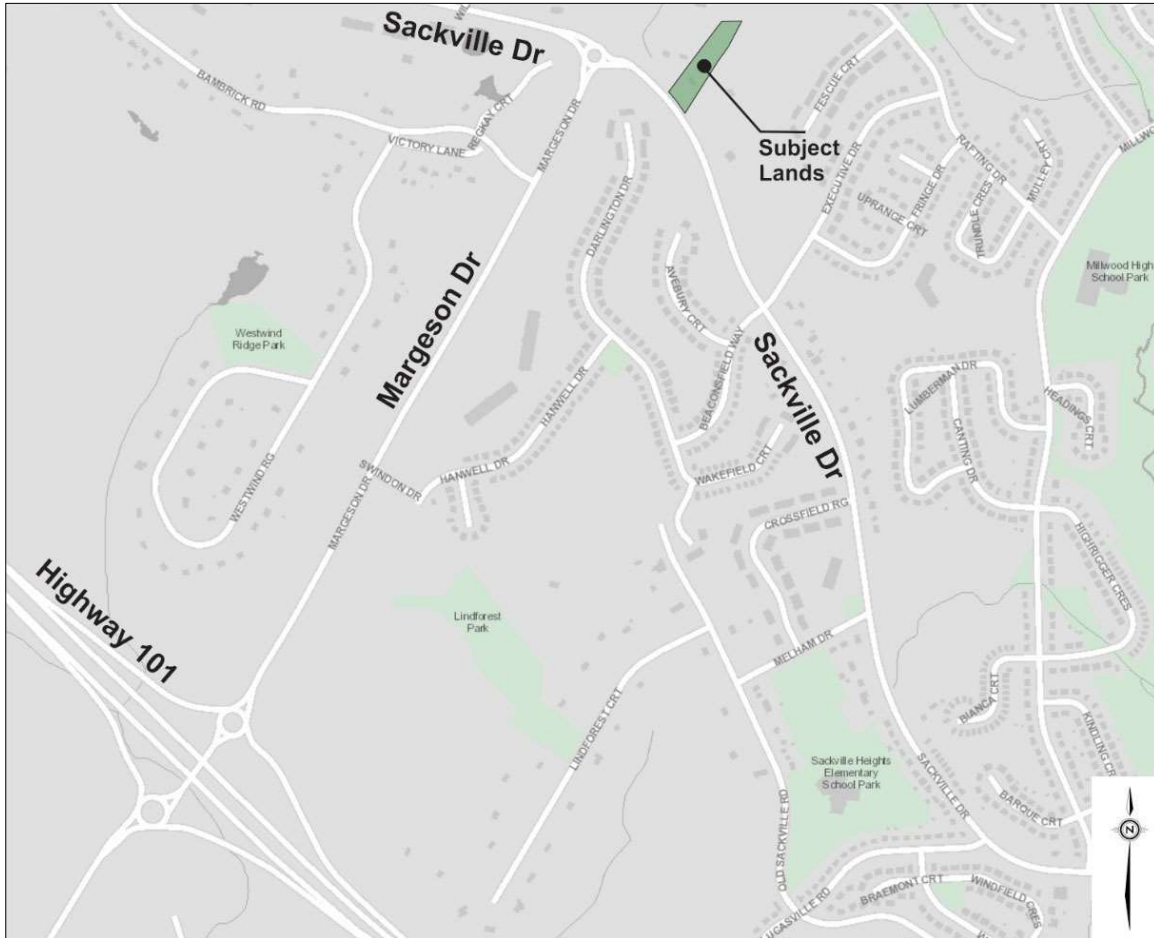
1.1 – Overview

At the request of *Arch Developments Ltd. (Arch Developments)*, the GRIFFIN transportation group inc. (GRIFFIN) has carried out a qualitative Stage 1 Traffic Impact Assessment in support of the planning application process for a proposed Mixed Use development at civic #1491 Sackville Drive, in the community of Middle Sackville, Halifax Regional Municipality (HRM). The proposed development will occur on an assembly of properties that include PID's #41516030 and a portion of #41215419. The total developable area of the property measures about 3.5 acres and appears to have a Rural Residential (R-6) zone designation, within the *Sackville Land Use By-Law* area. The location of the subject lands are contained in *Figure 1*.

It is understood that the proposed Mixed Use development will be comprised of up to 125 apartment-style units contained within a six-floor multi-unit building, plus up to 18,000 ft² of commercial space contained within a three-floor building.

Vehicle access will be provided via two driveways connecting to Sackville Drive. They include the existing driveway location near the west property boundary, plus a new driveway situated near the east property boundary. Both site driveways are conceptually shown in the proposed site layout contained in *Figure 2*.

Figure 1: Location of Subject Lands



Source: HRM GIS Map

1.2 – Terms of Reference

The qualitative Stage 1 traffic impact assessment associated with the proposed development is discussed in the following Sections. Throughout the completion of this assessment GRIFFIN has followed HRM traffic impact study guidelines for a new development located in a suburban area, as well as Institute of Transportation Engineers (ITE), and Transportation Association of Canada (TAC) guiding principles.

2.0 STUDY AREA AND SITE CONTEXT

2.1 – Street Layout Overview

Sackville Drive is generally aligned in an east-west direction, has a two-lane two-way configuration, and a rural open ditch cross-section. HRM has designated this section of the corridor as an arterial class street. It accommodates multiple travel modes including vehicles as well as active

transportation users within the marked bicycle lanes. This corridor appears to provide a balance of multi-modal mobility as well as access to numerous residential driveways.

The Sackville Drive / Margeson Drive multi-lane roundabout is located about 125 m to the west of the subject lands. Access to the Highway 101 corridor is provided through this intersection and along Margeson Drive. Conversely, the service area for local residences (i.e. groceries, banks, pharmacy, etc.) is generally located to the east along Sackville Drive.

2.2 – Existing Traffic Volume Review

GRIFFIN installed an automatic traffic recording (ATR) device on Sackville Drive immediately west of the existing civic #1491 access. The ATR unit captured two-way traffic volumes and vehicle speeds along the frontage of the proposed development. Data was recorded from Monday March 20th to Friday March 24th, 2023. During this time, schools were open and there were no significant weather events that would have changed travel patterns. Thus, the recorded traffic volume data were considered to be representative of typical conditions. A summary of the recorded peak hour volumes is provided in *Table 1*.

Table 1: Peak Hour Traffic Volumes on Sackville Drive – March 2023

	Eastbound (inbound)	Westbound (outbound)	Two-way Peak Hour Volumes
Weekday AM Peak Hour^A	518	448	966 vph
Weekday PM Peak Hour^A	580	591	1,171 vph

vph – vehicles per hour

The highest two-way volumes occurred during the weekday afternoon peak period and they were observed to be 1,171 vehicles / hour (vph). Following industry best practices, a weekday afternoon peak hour volume of this magnitude equates to about 11,500-12,000 vehicles / day (vpd).

GRIFFIN reviewed the Transportation Association of Canada (TAC) Geometric Design Guidelines to help put the observed vehicle demand on Sackville Drive into perspective. Although TAC does not provide guidance with respect to the absolute maximum capacity of streets, they provide typical volumes expected for several roadway classification types. The latest TAC guidelines suggest that minor arterial streets typically accommodate up to 20,000 vpd. Again these are guidelines for typical volumes and the maximum capacity values would be higher.

In conclusion, the observed weekday demand of about 11,500-12,000 on Sackville Drive is well below the expected capacity of a minor arterial street. This suggests there is a notable amount of residual capacity in the Sackville Drive corridor to accommodate future traffic growth.

2.3 – Vehicle Operating Speeds

As noted above, GRIFFIN installed an ATR device to gather vehicle data along Sackville Drive in the vicinity of the subject property frontage. The device recorded vehicle operating speeds and we have summarized the relevant speed information in *Table 2*, including the calculated 85th percentile vehicle operating speed and the selected design speed for the driveway visibility review.

Table 2: Sackville Drive Vehicle Operating Speeds

Travel Direction		Near West Access	Near East Access
Westbound Traffic (outbound)	Measured 85 th Percentile Speed	67 km/h	67 km/h
	Design Speed	70 km/h	70 km/h
Eastbound traffic (inbound)	Measured 85 th Percentile Speed	54 km/h ^A	63 km/h
	Design Speed	50 km/h	60 km/h

A – Operating speeds for eastbound vehicles exiting the roundabout.

The regulatory speed limit along this section of Sackville Drive is 60 km/h. The observed 85th percentile speed measurements were generally higher in the westbound (outbound direction), at 67 km/h. In the eastbound (inbound) direction speeds appeared to be influenced by the roundabout – near the west access speeds were measured to be 54 km/h and increased to about 63 km/h near the east access.

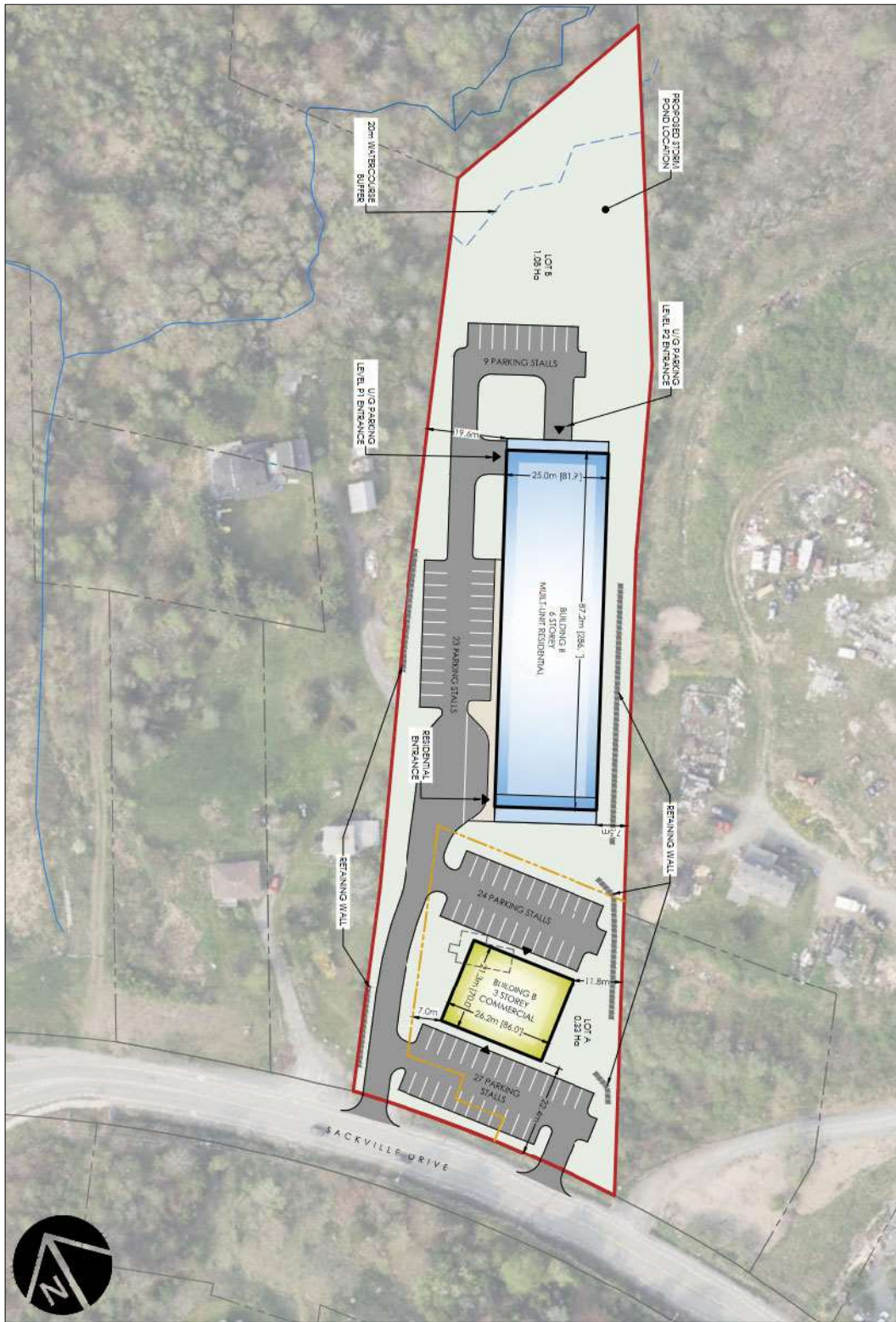
The findings of our vehicle operating speed assessment were applied to our access visibility review discussed later in Section 3.2.

3.0 THE PROPOSED DEVELOPMENT

3.1 - Overview

The proposed Mixed Use development will be comprised of two new buildings that will include a three-floor commercial building (18,000 ft²), and a six-floor 125-unit residential building. The subject property is considered to be a narrow and deep lot. Thus, the commercial building is located near the Sackville Drive property frontage, while the taller residential building will be located near the rear of the lot. A conceptual lot layout is provided in *Figure 2*.

Figure 2: Proposed Site Plan and Access Location



Source: ZZAP Architects

3.2 – Conforming with HRM Integrated Mobility Plan

In 2017, HRM Council adopted the Integrated Mobility Plan (IMP) policy providing direction for implementation of more cost-effective mobility options to meet the needs of residents across the region. This includes increased access to alternative modes such as active transportation and public transit to provide convenient and safe travel options for travelers.

We have reviewed alternative mobility options that are available in the immediate vicinity of the proposed development. These include:

- *Active Transportation:* HRM has installed managed bicycle lanes along both sides of Sackville Drive – across the subject property frontage. This provides future residents, employees, and business patrons with the option to move to/from the site via bicycle or other small wheeled devices.
- *Public Transit:* HRM currently provides public transit bus service in the study area via Bus Route #83 (Springfield). The current bus route alignment does not travel along the property frontage; however, it does travel through the Margeson Drive / Sackville Drive roundabout, about 125m west of the subject property. Walking distances to/from transit stops of less than 500m are considered acceptable and within industry guidelines.

In summary, HRM currently provides active transportation facilities and public transit service in the study area. Therefore, future patrons and residents of the proposed development will have multiple travel options which could reduce the demand for travel via commuter car.

3.3 – Vehicle Access and Driver Visibility

It is understood the proponent has plans to provide two vehicle driveways that will connect to Sackville Drive. A west access will be approximately located where the existing civic #1491 residential driveway is situated and appears to form the primary access for the new residential units. A secondary access will be located near the east property boundary and is expected to function as a secondary driveway for the commercial building.

Typically, a driver sight distance review is conducted as part of the traffic impact assessment process to identify any driver sight distance or visibility limitations up and down stream of a new site access. Thus, GRIFFIN carried out the visibility review process following the latest Transportation Association of Canada's (TAC) *Geometric Design Guide for Canadian Roads* document (2017) as well as the Nova Scotia Department of Public Works' field measurement best practices.

At this early planning stage, GRIFFIN only assessed the minimum requirement for vehicles approaching the two accesses along the major roadway – which is referred to as stopping sight distance (SSD). The provision of adequate SSD for vehicles traveling on the major roadway ensures drivers have sufficient forward visibility to identify a hazard in the roadway, and if needed, bring their vehicle to a stop.

GRIFFIN completed the field measurements during the morning of Tuesday March 14th, 2023 following NSDPW best practices and TAC guidelines. A hazard object height of 0.6m and a driver eye height of 1.05 m were used to obtain the field measurements. Measurements were recorded at the two proposed future access locations along the property frontage. The west access was assumed to be located in the same location as the existing civic #1497 residential driveway. The east access was assumed to be located about 24m north of the centre of the civic #1465 driveway. A summary of the SSD assessment at both locations is provided in *Table 3*.

Table 3: Summary of Stopping Sight Distance Measurements – Proposed Accesses

Measurement Location	Travel Direction	Available SSD	TAC Required SSD		Does Available Exceed Required?
			Base ^A	Slope Adjusted	
West Access Location 1 <i>(centre of existing access for civic #1497)</i>	Westbound (outbound)	158.5 m	105 m	100m (+3%) ^B	YES
	Eastbound (inbound)	81.0 m	65 m ^C	65 m (0%) ^B	YES
East Access Location 2 <i>(24m north of civic #1465 access, at u/p)</i>	Westbound (outbound)	173.8 m	105 m	100 m (+3%) ^B	YES
	Eastbound (inbound)	120.0 m	85 m	87 m (-3%) ^B	YES

A – 2017 TAC Chapter 2, Table 2.5.2

B – An estimate of the actual slope along Sackville Drive on the approaches to the new accesses.

C – Operating speeds exiting the roundabout at the west access were determined to be 50 km/h.

The two proposed driveways will be located on the outside of a horizontal curve in the Sackville Drive alignment, which offers good driver visibility in both directions. Further, the field measured sight distances at both locations exceed TAC minimum distance requirements. This suggests the proposed driveways can be located at any point along the property frontage and provides flexibility during the geometric design process should the new driveways need to be shifted to the east or west.

The existing driver visibility approaching the proposed driveways is shown in *Figures 3 and 4*.

This space intentionally left blank

Figure 3: Driver Views Along Sackville Drive – West Access



Looking Left (inbound)



Looking Right (outbound)

Figure 4: Driver Views Along Sackville Drive – East Access



Looking Left (inbound)



Looking Right (outbound)

4.0 VEHICLE TRIP GENERATION

4.1 – Estimate of New Vehicle Trips

To assess the change in traffic volumes on the study area streets under future conditions, there was a need to determine the expected number of new vehicles that would be added to the study area roads and intersections, explicitly associated with the proposed development. This is referred to as the trip generation calculation process. Typically, traffic engineers use trip generation rates published by the Institute of Transportation Engineers (ITE) to forecast site-generated volumes for specific land use types, if considered appropriate.

As noted earlier in this letter, the proponent has plans to construct a six-floor, 125-unit residential building, as well as a commercial building containing up to 18,000 ft² of floor space. GRIFFIN reviewed the ITE’s latest *Trip Generation Manual, 11th Edition* document to identify the most appropriate trip generation rates to apply to this type of development. The following land use types appeared to best describe the mix of land uses being proposed:

- *Apartment-Style Units*: ITE’s Multifamily Housing (Mid-Rise) – Land Use Code 221, and
- *Commercial Building*: ITE’s General Office Building – Land Use Code 710

GRIFFIN applied the ITE regression formula method for both land use types. The detailed trip generation calculations are provided in *Table 4*.

Table 4: Vehicle Trip Generation for the Proposed Development

	Size	Trip Rate	New Vehicle Trips / Hour		
			In	Out	Total
AM Peak Hour					
Multifamily Housing (Mid-Rise) (ITE Code 221)	125 units	0.34/unit ^A	10 (23%)	33 (77%)	43
General Office Building (ITE Code 710)	18,000 ft ²	2.11/1k ft ² ^A	33 (88%)	5 (12%)	38
AM Peak Total Trips			43	38	81
PM Peak Hour					
Multifamily Housing (Mid-Rise) (ITE Code 221)	125 units	0.39/unit ^A	30 (61%)	19 (39%)	49
General Office Building (ITE Code 710)	18,000 ft ²	2.22/1k ft ² ^A	7 (17%)	33 (83%)	40
PM Peak Total Trips			37	52	89

A – ITE’s regression formula was used to calculate trip rates.

Based on the results contained in *Table 4*, the proposed development is expected to generate the following peak hour trips:

- *Weekday AM Peak Hour*: 81 new vehicle trips/hour (43 inbound and 38 outbound)
- *Weekday PM Peak Hour*: 89 new vehicle trips/hour (37 inbound and 52 outbound)

This generally equates to adding one to two new vehicle trips to the study area streets and intersections every minute. This is a small change in traffic volume along a suburban arterial corridor such as Sackville Drive and is expected to be less than the variation / fluctuation in traffic volumes that is experienced from one day to the next. Thus, there is not expected to be any measurable change in operations on the study area streets and intersections explicitly associated with the proposed development.

It should be noted that our vehicle trip generation assumptions do not include any reductions to account for internal trip making between the complementary land uses, nor have we assumed

future mode share targets as set out in the Integrated Mobility Plan (IMP) – discussed previously in Section 3.2. Therefore, the number of new vehicle trips presented in *Table 4* are considered to be worst-case / conservative estimates.

4.2 – Trip Distribution and Qualitative Impacts

GRIFFIN reviewed existing travel patterns as well as the expected increases in traffic volumes associated with a number of other adjacent developments in the study area, including:

- Civic #1652 Sackville Drive (HRM Case No. 23327)
- Twin Brooks Phase 4 Residential Development (HRM Case No. 24203)
- Sunset Ridge Residential Development (TIS Letter January 12, 2023)

It is expected that the majority of drivers (60-80%) will turn to/from the west (outbound) along Sackville Drive as drivers gain access to Margeson Drive and the Highway 101 corridor. This reflects current commuter travel patterns as drivers move between their place of residence and place of work. The remaining drivers (20-40%) are expected to turn to/from the east (inbound) along Sackville Drive.

In conclusion, the splitting of a small number of new site-generated vehicle trips between inbound, outbound, left, and right turns – combined with residual capacity along Sackville Drive – suggests that no auxiliary turn lanes are required and the new driveways can function well with one inbound lane and one outbound lane.

5.0 CONCLUSIONS AND RECOMMENDATIONS

5.1 - Conclusions

The following conclusions were gleaned from the qualitative traffic impact assessment of the proposed development:

- The proponent has plans to assemble PID's #41516030 and a portion of #41215419 to create a new 3.5-acre Mixed Use development on Sackville Drive, east of the Margeson Drive roundabout. The proposed development will be comprised of up to 125 apartment-style residential units contained within one six-floor building, plus up to 18,000 ft² of commercial space contained within a three-floor commercial building.
- The vehicle trip generation calculations were completed using the latest ITE trip generation rates contained in their *Trip Generation Manual, 11th Edition*. A development of this scale is expected to generate up to **81 trips/hour** (43 inbound and 38 outbound) during the weekday morning peak period, and **89 trips/hour** (37 inbound and 52 outbound) during the weekday afternoon peak period. This equates to an average increase of only one to two new vehicles added to the study area roads every minute.

- GRIFFIN expects there will only be a minor and negligible traffic operational impact on the study area streets and intersections associated with the completion of the proposed development. This conclusion is based on the fact there is residual capacity along the adjacent section of Sackville Drive, and the proposed development will only generate a small number of new vehicle trips during peak travel periods. Further, providing two site accesses offers adequate vehicle capacity and both driveways are expected to function well without the need for auxiliary turn lanes.
- The available stopping sight distance (SSD) at the proposed new access locations appears to meet TAC minimum requirements for the measured vehicle operating speeds. Thus, drivers traveling along Sackville Drive appear to be provided with sufficient forward visibility for the expected operating speed. Once the final access locations have been established the provision of adequate driver visibility will need to be confirmed (by others) during the detailed geometric design stage of this project.

In summary, the traffic generated by the proposed 125 residential units and 18,000 ft² commercial space is expected to have an acceptable level of impact on the traffic operating conditions along Sackville Drive.

5.2 – Recommendations

Based on the findings of this qualitative review the following steps are recommended:

1. *Access Design and Design Vehicle:* That an engineering review be carried out to ensure the proposed access and internal laneway can accommodate an appropriate design vehicle (i.e. garbage truck or emergency vehicle). The design of the intersection between the new accesses and Sackville Drive (carried out by others) will need to follow the latest HRM and Transportation Association of Canada (TAC) geometric design guidelines. One inbound lane and one outbound lane at both driveway locations will provide sufficient capacity to accommodate the future traffic moving in/out of the subject lands.
2. *By-Law Requirements:* That all municipal By-law/Policy requirements for corner clearance, sight triangles and driver visibility are met to ensure driver sight distances to/from the proposed access is maintained throughout the design, construction, and final opening phases of the project.
3. *Signs and Pavement Markings:* That all new or changed signs and/or pavement markings along the study area roads and intersections should follow the latest guidelines contained in TAC's Manual of Uniform Traffic Control Devices for Canada (MUTCDC) document.
4. *Manage drainage at new driveways:* Due to the varied topography of the subject property and grades that slope towards Sackville Drive, the site design process should consider surface water drainage needs to ensure water does not run onto Sackville Drive via the new driveways. Standing or ponding water on asphalt has the potential to increase road safety risks – particularly during the winter months.

5. *New Public Transit Stop:* If not already in place, that HRM give future consideration to installing a new public transit bus stop on Route #83 in the vicinity of the Margeson Drive / Sackville Drive intersection to better accommodate the future residents and employees of this area as it continues to grow.

6.0 CLOSING

The findings flowing from this qualitative traffic impact statement suggest the new vehicle trips generated by the proposed Mixed Use development – comprised of up to 125 apartment units and 18,000 ft² of commercial space – is expected to have a negligible impact on the traffic operational performance of the study area streets and intersections. HRM has already installed managed bicycle lanes along Sackville Drive, and operates an existing public transit route located within a short walking distance to the new development. As such, there are multiple travel mode alternatives for future residents and employees – which appears to follow HRM’s Integrated Mobility Plan (IMP) policy.

I would be happy to provide you with additional information or clarification regarding these matters and can be reached anytime by phone at [REDACTED] or by email at [REDACTED]

Sincerely,

[REDACTED]

James J. Copeland, P.Eng., RSP1
Managing Principal – Traffic & Road Safety Engineer
GRIFFIN transportation group inc.

