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Mr. Faisal Al-Hammadi
FH Development Group Ltd.
153 Sackville Drive
Lower Sackville, NS B4C 2R3

RE: A Traffic Impact Statement for a proposed development at civic #541 Pleasant Street

Dear Mr. Al-Hammadi:

1.0 INTRODUCTION

At the request of *FH Development Group Ltd. (FHD)*, the GRIFFIN transportation group inc. has completed a qualitative Stage 1 traffic impact assessment in support of the planning approval process for a proposed mixed-use building located at civic #541 Pleasant Street (PID #00227496), in the community of Dartmouth, Halifax Regional Municipality (HRM). The subject lands are situated in the northeast quadrant of the Pleasant Street / Everett Street intersection.

The property was occupied by a former used car dealership but the business is no longer operating and the building is vacant. The property has frontage on three public road rights-of-way, including Pleasant Street to the south, Everett Street to the west and MacKenzie Street to the north. The area of the subject PID is about 0.85 acres. These lands currently have a General Business (C-2) zone designation within the *Dartmouth Land Use By-Law*. Currently, the property has a total of five (5) vehicle accesses, including two connecting to the high-volume Pleasant Street corridor, one connecting to Everett Street in close proximity to the signalized intersection, and two connecting to MacKenzie Street.

FHD is proposing to construct a six-floor building that will contain a mix of 6 residential townhomes, 88 residential apartment-style units and up to 4,120 ft² of ground-floor commercial space. Since the new building will occupy most of the surface area of the property, the majority of tenant parking will be provided below grade. Vehicle access to the proposed new development will be provided via three new accesses which will include:

- *One Primary Access:* The primary access will serve the underground parking and will connect to MacKenzie Street.
- *Two Secondary Accesses:* The two secondary accesses include a north access to MacKenzie Street that will serve about 6 surface parking spaces for the townhome tenants, and a west access to Everett Street that will serve about 11 parking spaces for the commercial businesses

The location of the subject property is shown in *Figure 1*.

Figure 1: Existing Site Location



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2.0 STUDY AREA AND CURRENT TRAFFIC CONDITIONS

2.1 - Overview

Pleasant Street is generally aligned in an east-west direction through the study area and forms the South boundary to the subject lands. This street is considered to be one of the main commuter corridors between the Eastern Shore community – comprised of residential neighbourhoods and large institutional / industrial employers – and the Dartmouth/Halifax area. This corridor is an important commuter route serving cars, transit bus routes as well as the large truck traffic moving to/from the industrial businesses. Pleasant Street predominantly has a four-lane cross-section with two vehicle lanes in each direction, plus sidewalks for active transportation. This infrastructure provides a substantial amount of capacity for person-trips during the weekday peak travel times traveling via transit buses and other vehicles. During off-peak and shoulder peak times there appears to be a substantial amount of residual capacity in this corridor.

2.2 - Existing Traffic Volume Review

The two existing south driveway connections to Pleasant Street are proposed to be closed and the proposed main access to the new development will be relocated to the north on MacKenzie Street. As such, our traffic volume assessment focused on the Everett Street and Mackenzie Street corridors. GRIFFIN was able to obtain historical volumes at the Pleasant Street / Everett Street intersection recorded in May 2019. The weekday peak hour volumes are contained in *Figure 2* along with the transportation infrastructure around the subject property. These volumes are considered to be representative as the school was open and operational at this time of year.

The May 2019 weekday peak hour two-way flows along the three subject street corridors are also summarized in *Table 1*.

The HRM-recorded traffic flow data indicates that Everett Street experiences peak two-way flows that range between 140 and 200 vph. Although there are significantly higher volumes traveling along Pleasant Street, the existing traffic signals located at the Pleasant Street / Everett Street intersection interrupt the higher east-west flows and allow the relatively lower volume on Everett Street to turn to/from the Pleasant Street corridor.

Since Everett Street functions as a collector street, combined with the increased capacity offered by a set of traffic signals at Pleasant Street, the maximum capacity of this corridor appears to exceed the peak hour vehicle demand.

Generally, there appears to be a sufficient amount of residual weekday peak hour capacity along both Everett Street and MacKenzie Street to accommodate future traffic growth.

Figure 2: Transportation Infrastructure and HRM Peak Hour Traffic Volumes – May 2019

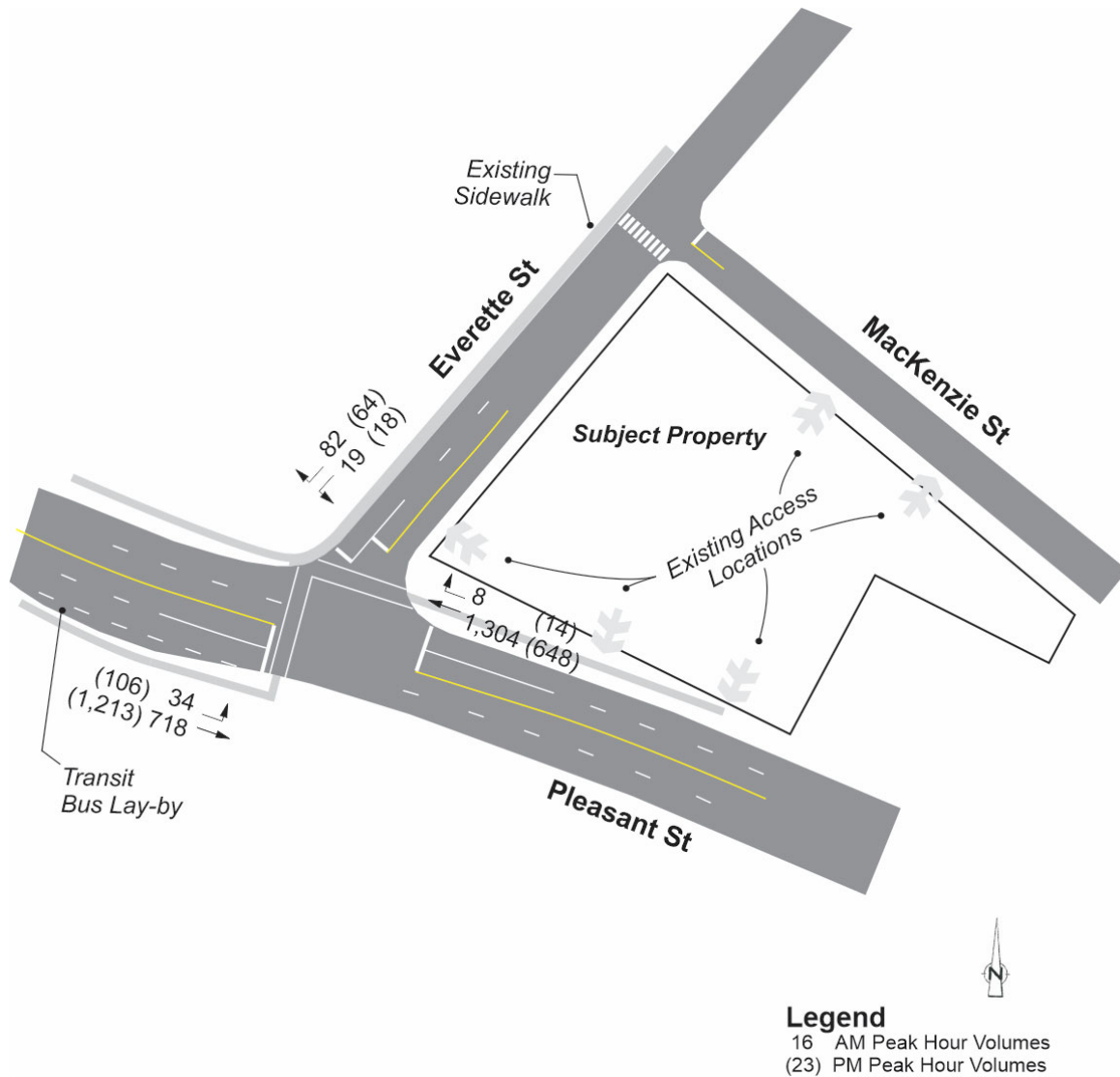


Table 1: May 2019 Weekday Two-way Peak Hour Corridor Volumes

	AM Peak Hour Two-way Flow (vph)	PM Peak Hour Two-way Flow (vph)
Pleasant Street	2,138 vph	2,031 vph
Everette Street	143 vph	202 vph
MacKenzie Street ^A	12 vph	12 vph

A – Estimated volume based on the number of housing units (1 trip/unit), and it is a cul-de-sac with only one access via Everette Street.

2.3 - Vehicle Operating Speed Data

Typically, GRIFFIN will gather free-flow vehicle operating speeds to calculate the 85th percentile speed along a roadway corridor. Our field observations focused only on the streets that would provide access to the proposed new development – Everett Street and MacKenzie Street. Based on our observations the operating speeds along these two residential streets appeared to be about 50 km/h or less. This is likely due in part to the fact that the study area intersections are in close proximity with each other, Everett Street is considered to be within a school zone and the regulatory speed limit is 30 km/h when children are present, MacKenzie Street is a cul-de-sac with a limited length, and the majority of traffic along these streets is comprised of local residents.

As such, GRIFFIN assumed a higher-than-typical 50 km/h operating speed in our assessment – where drivers were able to reach that speed between intersections. In locations where the new access was within a short distance of an adjacent intersection, GRIFFIN used a first principles approach to estimate the likely operating speed in that particular location. A detailed discussion regarding the driver sight distance assessment is provided in Section 3.3.

2.4 – Pedestrian and Active Transportation Facilities

Pedestrian sidewalks are provided along two street frontages including Pleasant Street and Everett Street. Two marked pedestrian crosswalks are also provided across Everett Street – including the signalized crossing at the Pleasant Street intersection and a unsignalized crosswalk at the MacKenzie Street intersection. These existing pedestrian crosswalks are likely heavily used by students walking to/from the adjacent elementary school on weekdays during the school year, but also provide opportunities for the future residents living in the proposed building.

In conclusion, there is good active transportation connectivity in the vicinity of the proposed development. These facilities offer connection to the commercial business area to the west, the public transit bus stops along Pleasant Street, and the ferry transit terminal situated to the west. Examples of the existing pedestrian facilities crossing Everett Street in the vicinity of the proposed development are provided in *Figure 3*.

3.0 NEW VEHICLE ACCESS AND VISIBILITY

3.1 – Overview of New Accesses

Currently, there are a total of five former driveways that served the previous business operations on these subject lands – two south accesses to Pleasant Street, a west access to Everett Street and two north accesses to MacKenzie Street. All five of these pre-existing accesses either will be closed or relocated as part of the re-development of this property.

Figure 3: Existing Pedestrian Facilities



Unsignalized pedestrian crosswalk at the Everett Street / MacKenzie Street intersection – Looking south along Everett Street.

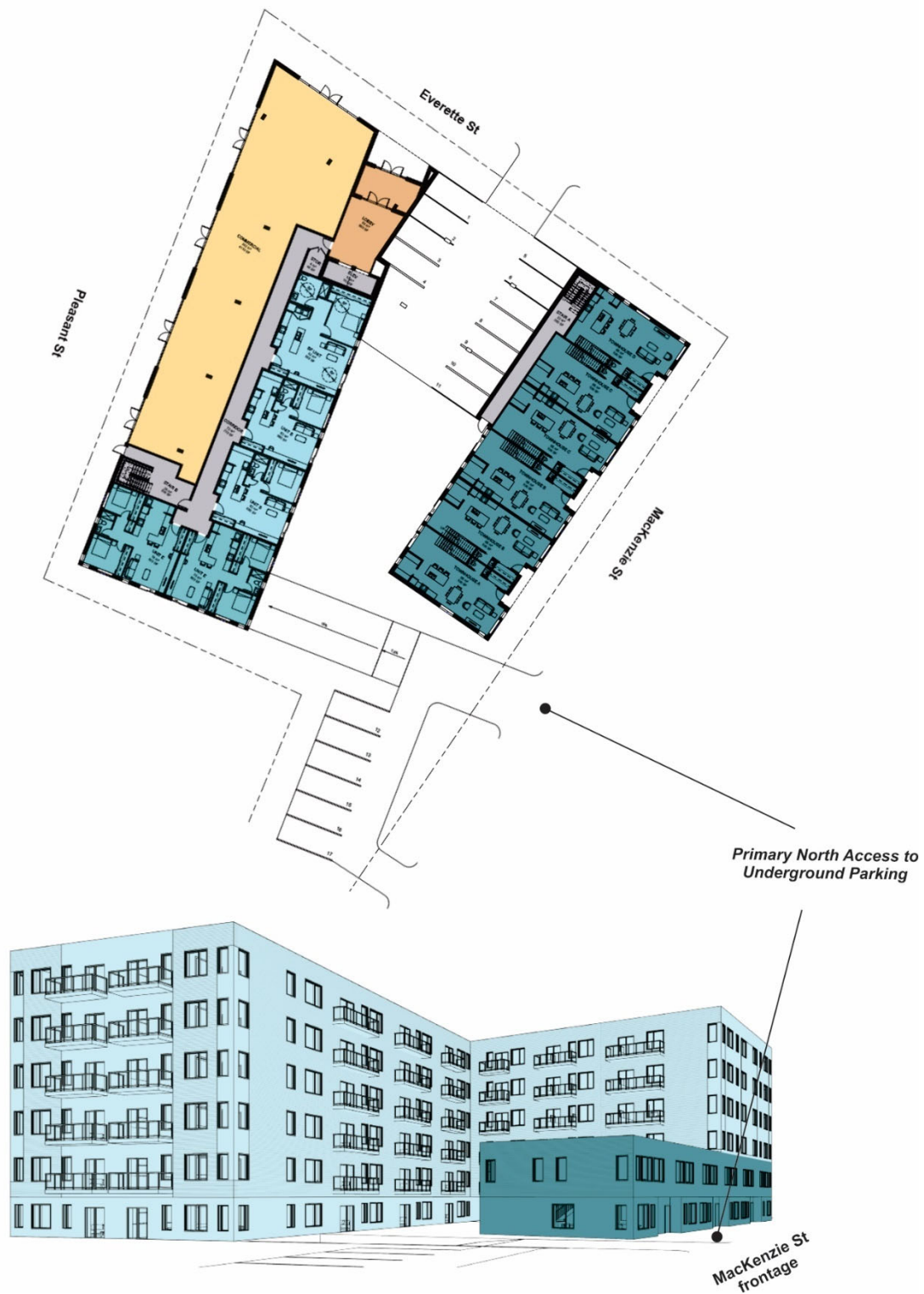


Signalized pedestrian crossings at the Pleasant Street / Everett Street intersection – Looking west along Pleasant Street.

The number of new accesses serving the proposed development will be reduced from five to three. The new primary vehicle access serving the underground parking access will be situated along the north property boundary and will connect to MacKenzie Street. This location appears to meet HRM's By-Law requirements for a new driveway as it connects to a public right-of-way having a lower volume / classification. The two secondary accesses are expected to have relatively lower volumes as they will serve the employees of the commercial businesses (west access to Everett Street), and the residents of the 6 townhome units (north access to MacKenzie Street). These secondary accesses may also accommodate deliveries and loading/unloading.

The proposed site layout, new access locations, and new building configuration is illustrated in Figure 4.

Figure 4: Proposed Site Layout



Source: TEAL Architects

3.2 – New Driveway Location Assessment

The proposed changes to the site accesses will result in traffic operational improvements due to the following:

- *Net reduction in number of accesses:* The total number of accesses will be reduced from five to three, consolidating the number of locations where vehicles turn in/out of the site.
- *New access locations follow HRM By-Laws:* The existing accesses connecting to the arterial Pleasant Street will close. The new accesses will only connect to the lower volume and lower classification streets.
- *New locations improve the existing corner clearance distances:* The Everett Street access will be relocated to a mid-block location greatly improving the corner clearance distance to the signalized intersection. The two accesses on MacKenzie Street will shift to the east increasing the existing corner clearance distance.

A summary of the access changes by street frontage is provided in *Table 2*.

Table 2: Summary of Access Changes by Street Frontage

Corridor	Description of Access Changes	Corner Clearance Changes
Pleasant Street (arterial class)	Two existing accesses will close, no new accesses proposed.	Corner clearance will be eliminated due to the closure of the existing driveways.
Everette Street (collector class)	Existing access immediately adjacent to the signalized intersection will close. New access will shift to the north opposite the school driveway.	Corner clearance distance will improve greatly. It will increase from the existing 2 m, to about 30 m. New driveway is located at the approximate centre of the mid-block distance.
MacKenzie Street (local class)	Two existing accesses will close. The two new accesses will shift to the east by about 15 m.	Corner clearance distance will improve greatly. It will increase from about 28 m, to about 38 m.

In summary, the proposed changes to the site accesses generally follow access management guidelines and are expected to improve traffic operations by creating greater separation distances between the new driveway locations and the adjacent intersections.

3.3 – Driver Visibility

A driver sight distance review was carried out at the proposed driveway locations based on the guidelines contained in the latest Transportation Association of Canada's (TAC) Geometric Design Guide for Canadian Roads document (2017) as well as the Nova Scotia Department of Transportation's field measurement best practices. At this early stage of the planning process only the minimum requirement for vehicles approaching the new access was assessed. This is referred to as stopping sight distance (SSD). The provision of adequate SSD for vehicles traveling on the main roadway ensures drivers have sufficient forward visibility to identify a hazard in the roadway, and if needed, bring their vehicle to a stop.

The field measurements were carried out by GRIFFIN using a driver eye height of 1.05 m and an object/hazard height of 0.60 m. The 0.60 m object was placed at the approximate centre of the proposed access, on the edge of the near travel lane. The vehicle operating speed varied by driveway location and considered the proximity to intersections, terminating street lengths, school zone regulatory speed limits and so forth. A summary of the SSD assessments are provided in *Table 3*.

Table 3: Summary of Stopping Sight Distance Measurements – New Site Accesses

Measurement Location	Travel Direction	Available SSD	TAC Required SSD		Does Available Exceed Required?
			Base ^A	Slope Adjusted	
1. New Primary Access - MacKenzie (as shown in Figure 4)	Eastbound ^C	45 m	35 m (30 k/h)	35 m (0%) ^B	Yes
	Westbound	120 m	65 m (50 km/h)	65 m (0%) ^B	Yes
2. New Secondary Access -Everette (as shown in Figure 4)	Northbound ^C	41 m	35 m (30 k/h)	35 m (0%) ^B	Yes
	Southbound	102 m	65 m (50 k/h)	70 m (-6%) ^B	Yes
3. New Secondary Access - MacKenzie (as shown in Figure 4)	Eastbound	75 m	65 m (50 k/h)	65 m (0%) ^B	Yes
	Westbound	90 m	65 m (50 km/h)	65 m (0%) ^B	Yes

A – 2017 TAC Chapter 2, Table 2.5.2

B – An estimate of the actual slope along the study area street on the approach to the new access.

C – Distance limited by the termination of the street at an intersection or cul-de-sac, operating speeds assumed to be 30 km/h.

Based on the results contained in *Table 2*, GRIFFIN concluded the proposed access locations appear to provide sufficient stopping sight distances for drivers traveling on the public streets.

4.0 VEHICLE TRIP GENERATION

4.1 – Overview

To assess the change in traffic volumes on the study area streets under future conditions, there was a need to determine the number of new vehicles added by the completion of the proposed mixed-use 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). GRIFFIN reviewed the proposed development type and attempted to identify the most appropriate land use type contained in the ITE's published trip generation data. GRIFFIN determined that the ITE's trip rates for mixed-use residential buildings with ground-floor commercial land use types appeared to be the most applicable (*i.e.* land use codes 230 and 231), defined as:

- *Mid-Rise Residential with 1st-Floor Commercial – ITE Land Use Code 231:* ITE describes this land use as one that includes mixed-use multi-family housing within a building that has between three and ten levels and includes commercial/retail space on the ground floor.

Since the ITE recently released its new *Trip Generation Manual, 11th Edition* document in the fall of 2021 GRIFFIN carried out a comparative review of the vehicle trip rates for land use codes 230 and 231 in both the 10th and 11th Edition documents. GRIFFIN concluded the ITE had notably changed the way the published data was collated in the most recent 11th Edition document. A summary of the two sets of trip rates are provided in *Table 4*.

Table 4: Comparison of ITE's Trip Generation Rates Between the 10th and 11th Edition Documents

	ITE trip Gen Manual	AM Peak Hour (vehicle rate)	PM Peak Hour (vehicle rate)
Land Use Code 230 – Low-rise Residential with 1 st Floor Commercial	10 th Edition ^A	n/a	n/a
	11 th Edition ^B	0.44 / unit	0.36 / unit
Land Use Code 231 – Mid-rise Residential with 1 st Floor Commercial	10 th Edition ^C	0.30 / unit	0.36 / unit
	11 th Edition ^D	n/a	n/a

A – New land use in 11th Edition, did not previously exist in 10th Edition.

B – Only two survey studies, limited data source. Data obtained from large developments with 300-450 units.

C – Only two survey studies, limited data source. Data obtained from large developments with 200+ to 400+ units.

D – No vehicle trip generation information available in the 11th Edition, only non-auto trip rates provided.

The results contained in *Table 4* suggests the latest source data presented by the ITE in its 11th Edition document is sparse and limited for Land Use Codes 230 and 231. However, the latest trip rates for a Low-rise development (Land Use Code 230) are higher than the previously published rates for a Mid-rise development (Land Use Code 231) in the 10th Edition document. Therefore, GRIFFIN applied the following to our calculations to provide a conservative estimate and quantify slightly higher-than-expected traffic forecasts:

1. Applied the ITE's 11th Edition vehicle trip rates for a Low-Rise Residential building (Land Use Code 230) to the proposed 88 apartment-style residential units and ground-floor commercial space; and
2. Applied the ITE's 11th Edition vehicle trip rates for a Multifamily Housing Low-rise (Land Use Code 220) to the proposed six townhome residential units.

A summary of our final vehicle trip generation forecasting process is provided in the following Section.

4.2 – The Forecast New Vehicle Trips

The trip generation calculations for the proposed development are summarized in *Table 5*.

Table 5: Site Trip Generation for the Proposed Mixed-Use Development

	Size	Trip Rate	New Vehicle Trips / Hour		
			In	Out	Total
AM Peak Hour					
Low-Rise Residential with 1 st Floor Commercial (Code 230)	88 units	0.44/unit ^A	9 (23%)	30 (77%)	39
Multifamily Housing (Low-Rise) - Not Close to Rail Transit (Code 220)	6 units	0.50/unit ^C	1 (24%)	2 (76%)	3
AM Peak Total Trips ^B			10	32	42
PM Peak Hour					
Low-Rise Residential with 1 st Floor Commercial (Code 230)	88 units	0.36/unit ^A	23 (71%)	9 (29%)	32
Multifamily Housing (Low-Rise) - Not Close to Rail Transit (Code 220)	6 units	0.67/unit ^C	3 (63%)	1 (37%)	4
PM Peak Total Trips ^B			26	10	36

A – ITE's average rate used.

B – New trips equal total site trips, no discounts for pass-by traffic applied.

C – ITE's formula rate used.

Based on the results contained in *Table 5*, the proposed mixed-use development is expected to generate up to 42 trips/hour (10 inbound and 32 outbound) during the weekday morning peak hour and 36 trips/hour (26 inbound and 10 outbound) during the weekday afternoon peak hour.

This generally equates to an average increase of about one additional vehicle trip added to the study area streets every one to two minutes during the peak times of the day. Traffic volume increases of this magnitude are considered to be small and manageable and will have a negligible impact on traffic operations.

5.0 OFF-STREET VEHICLE PARKING

Using the parking information provided by the proponent, a total of 78 vehicle parking spaces will be provided on the site. The vehicle parking supply will be comprised of 61 underground parking spaces, 6 surface spaces for the townhome tenants, and 11 surface spaces for the commercial businesses.

This amount of off-street parking supply equates to less than one space per residential unit and appears to be consistent with the minimum vehicle parking goals of HRM's Municipal Planning Strategy. Minimum parking supply rates promote the use of sustainable transportation modes other than single-occupant commuter vehicles. Since this proposed development is located along high-service transit routes and there is good sidewalk connectivity it appears to be a suitable candidate site for minimum parking supply rates.

It should also be noted that bicycle parking spaces are planned as part of the new development.

6.0 CONCLUSIONS AND RECOMMENDATIONS

The following conclusions were gleaned from the qualitative Stage 1 traffic impact assessment of the proposed mixed-use development:

- The subject lands are located at civic #541 Pleasant Street (PID #00227496) and measures 0.85 acres in size. This property was previously occupied by a used auto dealership. The business has been closed for some time and the vacant building remains in place. These lands currently have a General Business (C-2) zone designation within the *Dartmouth Land Use By-Law*.
- The proponent has plans to construct a new 6-floor mixed-use building that would contain up to 88 apartment-style residential units, 6 townhome units and up to 4,120 ft² of ground-floor commercial space facing Pleasant Street. GRIFFIN has determined that a development of this magnitude is expected to generate up to 42 trips/hour (10 inbound and 32 outbound) during the weekday morning peak period and 36 trips/hour (26 inbound and 10 outbound) during the weekday afternoon peak period.

- Currently, the property has five vehicle access locations. The proponent has plans to reconfigure the new access layout by consolidating the number of driveways from five to three, close the two existing driveways on Pleasant Street to comply with HRM By-law requirements, and shift the driveway locations away from intersections to improve the corner clearance distances. All these changes are expected to improve the traffic operations for drivers turning in/out of the new development.
- Driver visibility was assessed at each of the three proposed access locations. It appears that TAC minimum visibility requirements for stopping sight distance (SSD) are met for the expected operating speeds.
- Our qualitative traffic operational assessment suggests the new site-generated peak hour trips will have a negligible impact on the study area streets and intersections. The new vehicle trips are expected to add - on average - about one vehicle every one to two minutes during peak times. All the new site-generated vehicle trips are expected to move to/from the study area via Pleasant Street and turn to/from Everette Street. Since there appears to be sufficient residual capacity in both the Pleasant Street corridor and the signalized intersection at Everette Street, the site-generated trips are expected to have a marginal impact on the operations during peak travel periods.

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

1. *Design Vehicle*: That an engineering review be carried out to ensure the proposed vehicle accesses can accommodate an appropriate design vehicle. The site design will need to follow the latest HRM and Transportation Association of Canada (TAC) geometric design guidelines.
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 driveway are maintained throughout the design, construction, and final opening phases of this project.
3. *Parking and Curb Space*: That HRM give consideration to implementing a short-duration, mid-block loading zone along the south side of MacKenzie Street to accommodate deliveries, taxis and drop-off/pick-up trips associated with the new development. Further, “No Parking” restrictions should be implemented along the north side of MacKenzie Street. All other “No Parking” zones can remain.
4. *Signs and Pavement Markings*: All new or changed signs and/or pavement markings along the study area roads and within intersections should follow the latest guidelines contained in TAC’s Manual of Uniform Traffic Control Devices for Canada (MUTCDC) document.

7.0 CLOSING

The findings flowing from this qualitative traffic impact statement suggest the expected new vehicle trips generated by the proposed mixed-use development are expected to have a negligible impact on the existing traffic operations on the adjacent streets and intersections.

I would be happy to provide you with additional information or clarification regarding these matters and can be reached anytime by phone at (902) 266-9436 or by email at jcopeland@griffininc.ca.

Sincerely,

[Original to be signed]

James J. Copeland, P.Eng., RSP1

*Managing Principal – Traffic & Road Safety Engineer
GRIFFIN transportation group inc.*