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August 19, 2021

Att: Mr. Dean Hartman
Hartie Investments Inc.
103 Ochterloney Street
Dartmouth, NS B2Y 1C7

RE: A Traffic Impact Statement for a proposed development at Civic #9 Crestfield Drive

Dear Mr. Hartman:

1.0 INTRODUCTION

At the request of *Hartie Investments Inc. (Hartie)*, the GRIFFIN transportation group inc. has carried out a qualitative Stage 1 - Traffic Impact Assessment in support of the planning application process for a proposed 53-unit residential development to be located in the southwest quadrant of the Hammonds Plains Road / Crestfield Drive intersection, in the community of Hammonds Plains, Halifax Regional Municipality (HRM). It is understood that the proposed development will be comprised of 24 single-level detached townhome units, plus 29 apartment-style units contained in a three-story building. The development will be operated and marketed as a senior adult active living complex including supporting recreational amenities for exclusive use by residents.

The development will be located on an assembly of properties including:

- PID #00420547 (civic #9 Crestfield)
- PID #00422279 (civic #1274 Hammonds Plains Road), and
- PID #40817363 (civic number unknown)

The subject lands are undeveloped with the exception of an abandoned church building located on the civic #1274 property. These lands currently have a P-2 (Community Facility) zoning designation, as part of the *Beaver Bank, Hammonds Plains, Upper Sackville Land Use By-law Area*. The location of these lands is contained in *Figure 1*.

Figure 1: Location of Subject Lands



Source: Google Maps

The qualitative traffic impact assessment associated with the proposed development is discussed in the following Sections. The proposed development is illustrated in *Figure 2*, including the new site access location, building layout and parking areas.

2.0 STUDY AREA AND SITE CONTEXT

The two key roadways in the vicinity of the proposed development include:

- *Hammonds Plains Road*: This two-lane, two-way facility appears to function as an arterial class roadway that provides a key east-west commuter travel corridor for this suburban area of HRM.
- *Crestfield Drive*: Appears to function as a local residential street due to the fact it terminates as a cul-de-sac and serves less than 100 detached residential units. It has an urban two-lane, two-way cross-section, a pavement width of 8.8 m, and is designated as traffic calmed street with speed humps to manage vehicle operating speeds.

Directly opposite the subject lands is a neighbourhood park and a Canada Post mailbox. Based on the observations made during the field review, some park patrons drive from outside this neighbourhood and park along Crestfield Drive. Of course, use of the park is seasonal and dependent on weather.

Figure 2: Proposed Site Layout



Source: Bowers Construction

3.0 EXISTING TRAFFIC CONDITIONS

Since the proposed development is located in a suburban residential area, weekday mornings and afternoons are expected to experience the highest traffic volumes on the study area streets and intersections. The peak hour volumes on Crestfield Drive are expected to be very low since it is a cul-de-sac, functions as a local residential street, and has fewer than 100 residences.

GRIFFIN gathered weekday peak period traffic volumes in April 2021 at the Hammond Plains Road / Crestfield Drive intersection to obtain a set of current data. The highest hour for traffic flow occurred during the weekday afternoon. Peak hour volumes traveling along Crestfield Drive in the vicinity of the subject lands were observed to be 57 vehicles/hour (vph) which equates to approximately 550-600 vehicles/day (vpd).

Although the Transportation Association of Canada (TAC) does not provide guidance with respect to the absolute maximum capacity of a local residential street, HRM has identified a typical daily maximum capacity for this type of street as being 3,000 vpd¹. Therefore, it was concluded that the peak vehicle demand on Crestfield Drive is well below its capacity, and there is a substantial amount of residual capacity in the corridor to accommodate future traffic growth.

¹ HRM Municipal Design Guidelines, Table 4.1, Local Street Classification.

4.0 VEHICLE TRIP GENERATION

In order 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 deemed appropriate. Based on our review of the residential units being proposed it was determined that ITE's published trip generation rates for a senior adult active living development were appropriate. As such, ITE's *Trip Generation, 10th Edition* document was used.

As noted earlier in this letter, the proponent intends to construct 24 single-level townhome units, plus 29 apartment-style units in a three-story building. The development will be marketed towards senior adult active living, and like other similar active living communities, there are on-site recreational amenities for exclusive use by residents. To remain conservative in our traffic forecasts for this new development, GRIFFIN has included additional vehicle trips associated with up to two full-time employees that could be required to maintain and service the on-site recreation amenities.

In summary, GRIFFIN has applied the following methods to estimate the site-generated vehicle trips:

- *Single-level Townhome Units*: ITE LUC 251 (Senior Adult Housing – Detached)
- *Apartment-style Units*: ITE LUC 252 (Senior Adult Housing – Attached)
- *Full-time Employees*: First principles method for two full-time employees

GRIFFIN applied the ITE regression formulas to estimate the expected number of trips moving in/out of the proposed development that would be generated by the two types of residential units. All the detailed trip generation calculations are provided in *Table 1*.

Based on the results contained in *Table 1*, the proposed development is expected to generate the following peak hour trips:

- *Weekday AM Peak Hour*: 22 new vehicle trips/hour (9 inbound and 13 outbound)
- *Weekday PM Peak Hour*: 27 new vehicle trips/hour (15 inbound and 12 outbound)

This generally equates to adding one new vehicle trip every 2-3 minutes to the study area streets and intersections.

Table 1: Site Trip Generation for the Proposed Development

	Size	Trip Rate	New Vehicle Trips / Hour		
			In	Out	Total
AM Peak Hour					
Senior Adult Housing - Detached (ITE Code 251)	24 units	0.58/unit ^A	5 (33%)	9 (67%)	14
Senior Adult Housing - Attached (ITE Code 252)	29 units	0.21/unit ^A	2 (35%)	4 (65%)	6
Full Time Employees (First Principles)	2 employees	1.0/employee	2 (100%)	0 (0%)	2
AM Peak Total Trips			9	13	22
PM Peak Hour					
Senior Adult Housing - Detached (ITE Code 251)	24 units	0.67/unit ^A	10 (61%)	6 (39%)	16
Senior Adult Housing - Attached (ITE Code 252)	29 units	0.31/unit ^A	5 (55%)	4 (45%)	9
Full Time Employees (First Principles)	2 employees	1.0/employee	0 (0%)	2 (100%)	2
PM Peak Total Trips			15	12	27

A – ITE's regression formula used to determine the per unit trip rate.

5.0 THE PROPOSED SITE ACCESS

5.1 - Overview

As shown in *Figure 2*, the proposed development has frontage along both Hammonds Plains Road and Crestfield Drive. It is understood through our discussions with the proponent that vehicles will move in/out of the senior adult active living development via a single driveway connecting to Crestfield Drive. No vehicle accesses are proposed to connect with Hammonds Plains Road. Therefore the proposed driveway configuration appears to meet HRM By-law requirements by connecting to the lower-class street – Crestfield Drive.

Currently, there are two existing driveway openings connecting to Crestfield Drive that served the former church parking lot. The proposed site plan shown in *Figure 2* would require the closure of both existing driveways and be replaced with one new driveway generally located in between the two existing driveways. The new driveway will be located about 9 m south of the existing north driveway (centre line distance).

Thus, the net change is fewer driveways along this section of Crestfield Drive. Research has shown that consolidating driveways results in a reduction of driveway density, follows good access

management guidelines, improves traffic operating conditions, and reduces road safety risk along the main street.

5.2 - Driver Visibility

Typically, a driver sight distance review is carried out as part of the traffic impact assessment process to identify any driver sight distance or visibility limitations up and downstream of a new site access. The alignment of Crestfield Drive is flat and straight and offers good visibility to the north and south of the proposed access location. GRIFFIN concluded the following during their field review:

- Visibility to/from the north is clear for 80 m to the Hammonds Plains Road intersection.
- Visibility to/from the south is clear for at least 75 m to the Belmont Avenue intersection.

Vehicle operating speed along Crestfield Drive was not recorded in the vicinity of the proposed access. Operating speeds are expected to be below 50 km/h due to the close proximity of the Hammonds Plains intersection immediately to the north, as well as the two speed humps located on either side of the proposed access – which typically limit operating speeds to about 30-40 km/h.

Based on these site-specific conditions, it was concluded that the available stopping sight distances at the proposed driveway meet or exceed TAC minimum stopping sight distance requirements for a 50 km/h vehicle operating speed.

5.3 - Corner Clearance

A corner clearance review was carried out to ensure the proposed site access was located a sufficient distance away from the Hammonds Plains Road / Crestfield Drive intersection. Providing adequate space between an intersection and the nearest driveway reduces road safety risks and the likelihood of vehicle-to-vehicle conflicts associated with vehicles turning to/from the driveway.

Both the Transportation Association of Canada (TAC) and the HRM provide guidance with respect to minimum corner clearance guidelines; however, the requirements identified by these two sources vary. The minimum required distance is based on site-specific conditions and a summary of the existing street characteristics is contained in *Table 2*.

Table 2: Summary of Corner Clearance Characteristics

Site Characteristic	Description
Predominant Land Use Type	Predominantly a residential land use area.
Street Classification	Crestfield appears to function as a local residential street that intersects with an arterial.
Street Width	Crestfield Drive has one travel lane in each direction at the proposed driveway location and measures 8.8 m wide.
Intersection Type	Appears to be a “minor intersection” as defined by TAC (stop-controlled).

Figure 3: Driver Views Along Crestfield Drive at Proposed Access



*Proposed Access:
Looking South*



*Proposed Access:
Looking North*

GRIFFIN used these site-specific conditions to identify the minimum required corner clearance distance between the Hammond Plains Road / Crestfield Drive intersection and the proposed driveway. The two key guiding documents suggested the following:

- *HRM Guidelines:* Minimum of 30 m between the street line of the nearest intersecting street and the proposed driveway (Source: *HRM’s By-Law Number S-300*).
- *TAC Guidelines:* Minimum of 2 m of tangent distance between the corner radii of the intersection and the corner radii of the proposed driveway (Source: *TAC’s GDGCR – Chapter 8 – Access, 2017*).

GRIFFIN then compared these minimum requirements to the available corner clearance associated with the proposed driveway location – determined to be about 70 m of tangent distance (*i.e.* excluding corner radii). Thus, the available corner clearance distance exceeds the minimum requirements identified above. In addition, the proposed driveway is situated further south than the nearest existing driveway – improving the current corner clearance distance.

5.4 - Proximity to the Speed Humps

As noted earlier in this letter, Crestfield Drive is designated as a traffic calmed corridor and contains two speed humps in the vicinity of the proposed site access to help manage vehicle operating speed. Currently, a speed hump is located immediately north of the existing north driveway serving the abandoned church parking area. The existing corner clearance tangent distance between the existing driveway and the speed hump is only 1.5 m, as shown in *Figure 4*.

The proposed new site driveway will be located south of this location and will improve the separation distance between the site driveway and the north speed hump. Thus, the new corner clearance tangent distance will be increased to about 10.5 m. There are no other traffic operational concerns with the new driveway location and proximity to any of the speed humps on Crestfield Drive.

Figure 4: Location of the Speed Hump



Speed hump located adjacent to existing north driveway. Proposed new driveway location will increase the separation distance.

6.0 TRAFFIC IMPACTS ON SURROUNDING STREETS

6.1 – Qualitative Assessment

All site-generated trips will travel along the short 80 m distance between the Hammonds Plains Road and the new site access. Therefore, the majority of Crestfield Drive is not expected to experience any increases in traffic volume associated with this development once it is built and occupied.

As noted earlier in this letter, Crestfield Drive has sufficient residual capacity to accommodate the expected increase of one trip every 2-3 minutes during peak times of the day. During off-peak times the frequency of new trips will be diminished and is expected to have little to no operational impact. Given the relatively low traffic demand generated by the proposed development, there is not expected to be any measurable change in operations for drivers turning to/from the Hammonds Plains Road intersection. Further evidence of this conclusion is provided in the following Section.

6.2 – Hammonds Plains Road / Crestfield Drive Intersection Commentary

In May 2021 GRIFFIN carried out an evaluation of the Hammonds Plains Road / Crestfield Drive intersection as part of another Stage 1 qualitative traffic impact assessment for an adjacent senior adult living development being planned for civic #5-#7 Kingswood Drive. This adjacent development is proposed to have a main vehicle access connecting to Kenwood Avenue and thus all traffic would enter/exit via the Crestfield Drive / Hammonds Plains Road intersection². As part of this work, and at the request of HRM Traffic Management, GRIFFIN examined both the need for traffic signals at the Hammonds Plains Road / Crestfield Drive intersection, as well as the available collision history to identify any potential operational concerns. Our findings flowing from this earlier work are summarized in the following paragraphs.

In the first step, GRIFFIN followed the latest TAC traffic signal warrant procedure to determine the need for upgrading the traffic control at the Hammonds Plains Road / Crestfield Drive intersection. Our May 2021 analysis was carried out using baseline volumes from an April 2021 turning movement count, estimates of future background traffic growth as well as additional /new traffic associated with the planned developments known to HRM's Planning Department, including:

² May 17th 2021 letter prepared by GRIFFIN summarizing a supplementary traffic operations assessment for a proposed development at civic #5-#7 Kingswood Drive, and access to Kenwood Avenue.

- *Majesty Drive*: 9,900 ft² of new commercial floor space
- *Civic #9 Crestfield Drive*: 36 new apartment units³
- *Civics #5-#7 Kingswood Drive (access via Kenwood)*: 19 new apartment units⁴

A detailed discussion of the steps taken to develop the future year traffic volumes applied to our signal warrant analysis is provided in GRIFFIN's May 17th letter submitted to HRM. The analysis of the future year peak hour conditions with the added traffic associated with the above-noted developments resulted in a total of 55 priority points. TAC's warrant threshold to upgrade the traffic control is 100 priority points. These results clearly suggest there is residual capacity to accommodate further increases in traffic along Crestfield Drive – beyond what has already been considered in our May 2021 analysis – before triggering the need for traffic signals. Thus, the existing stop-control at this intersection can remain in the short to medium term timeframe even if additional development occurs along Crestfield Drive, beyond what is already known.

In the second step, GRIFFIN carried out a review of the available collision history records at this intersection. Over the last 40-months, only one reported collision occurred (January 2018). This equates to a collision frequency rate of 0.3 collisions/year. To help provide some context, GRIFFIN referred to the Transportation Research Board's (TRB) Highway Safety Manual (HSM) which suggests that an intersection with similar characteristics typically generates 2.22 collisions/year. Thus, the actual recent historical safety performance has been better than the expected safety performance.

In conclusion, the latest development concept for civic #9 Crestfield Drive is only expected to have a marginal impact on the traffic operations at the Hammonds Plains Road / Crestfield Drive intersection and is not expected to trigger the need for traffic signals or significantly change the existing road safety risk environment.

7.0 CONCLUSIONS AND RECOMMENDATIONS

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

³ In May 2021, a 36-unit apartment complex was contemplated for civic #9 Crestfield Drive, this has since changed to the current seniors active living complex discussed in this letter. The net change in site-generated peak hour volumes is insignificant from an intersection operations perspective.

⁴ Although the Kingswood Drive / Kenwood Avenue development is being planned for senior active living, GRIFFIN used a typical residential trip rate to estimate the site-specific vehicle trips – yielding a higher-than-expected number of new trips for this development – providing a worst-case set of results for the traffic signal warrant assessment.

- The proponent has plans to develop a senior adult active living complex on a group of properties located in the southwest quadrant of the Hammonds Plain Road / Crestfield Drive intersection. As shown in *Figure 2*, there will be a total of 53 residential units plus supporting recreational amenities for exclusive use by residents. The forecast new vehicle trips are estimated to be 22 trips/hour (9 inbound and 13 outbound) during the weekday morning peak period and 27 trips/hour (15 inbound and 12 outbound) during the weekday afternoon peak period - assuming all the units are occupied plus provisions for two full-time employees (for maintenance and administration activities).
- Given the fact that the proposed development will only generate a small number of new vehicle trips, it is expected that there will only be a marginal traffic operational impact on the study area streets including Crestfield Drive and Hammonds Plains Road. Based on GRIFFIN's recent assessments associated with other future developments in this area, the proposed senior active living development is not expected to require the need for a traffic control upgrade at the Hammonds Plains Road / Crestfield Drive intersection.
- A traffic count conducted in April 2021 indicated current demand along Crestfield Drive is about 550-600 vpd, immediately south of Hammonds Plain Road. HRM's maximum capacity for this type of roadway is 3,000 vpd. Therefore, there is a substantial amount of residual capacity to accommodate future traffic growth along this local residential street.
- The proposed vehicle access is in a location with good visibility along Crestfield Drive, reduces the number of existing accesses, and increases the corner clearance distance from adjacent intersections and driveways.
- A speed hump is located on Crestfield Drive immediately north of the existing church driveway. The corner clearance distance will increase from 1.5 m to about 10.5 m with the new driveway location. Therefore, there are no traffic operational concerns with the proximity of the speed hump to the new driveway location.

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

- That the design of the proposed vehicle access follows the latest Transportation Association of Canada (TAC) and HRM design guidelines contained in the most recent edition of their Municipal Design Guidelines document. This includes the accommodation of an appropriate truck design vehicle (i.e. garbage truck or emergency vehicle).
- That the existing regulatory on-street parking restrictions be extended along the west side of Crestfield Drive to ensure good driver visibility to/from the proposed site driveway. Specifically, the existing "No Parking" zone would be extended south to the civic #11 driveway.

8.0 CLOSING

The findings flowing from this qualitative traffic impact statement suggest the new vehicle trips generated by the proposed senior adult active living development is expected to have a negligible impact on the traffic operational performance of the study area 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,



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

