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Att: Ron & Einat Omessi
ROMS KAIG Spryfield Ltd.
43 Paper Mill Ln
Bedford, NS B4A 3W5

RE: A Traffic Impact Statement for a proposed development at civic #386 Cow Bay Road

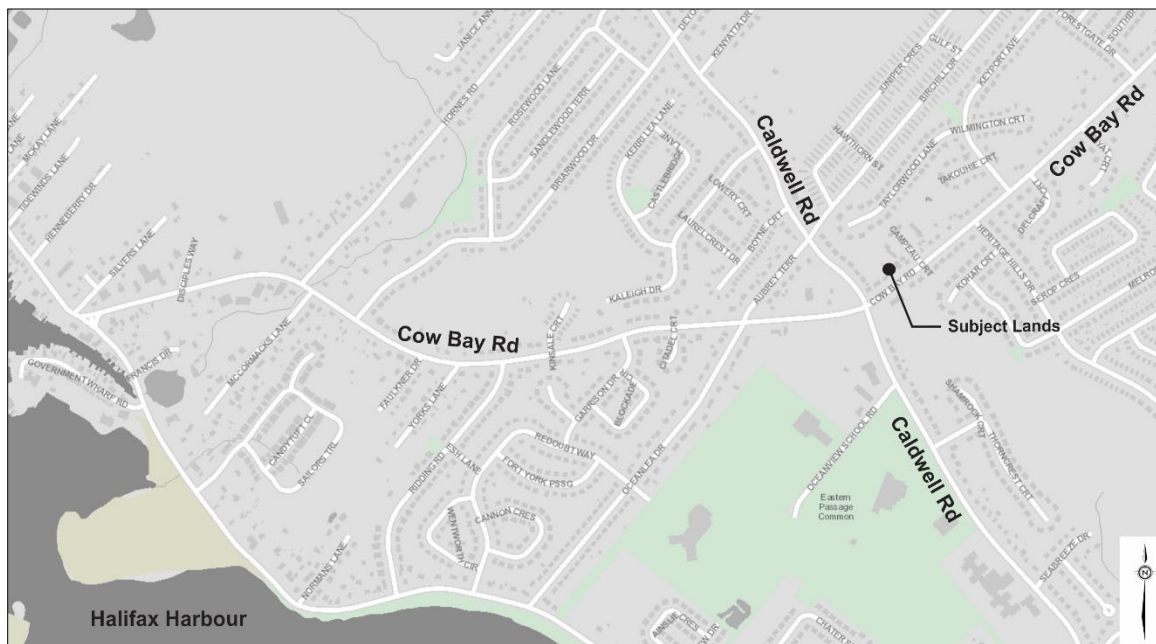
1.0 INTRODUCTION

At the request of *ROMS KAIG Spryfield Ltd. (ROMS KAIG)*, the GRIFFIN transportation group inc. has completed a qualitative Stage 1 traffic impact assessment in support of the planning approval process for a proposed residential development located at civic #386 Cow Bay Road (PID #40082265), in the community of Eastern Passage, Halifax Regional Municipality (HRM). The subject lands are currently occupied by a detached dwelling unit (R1) and two accessory buildings. The property is bound by the Cow Bay Road right-of-way to the south, a commercial business to the east, and another residential unit to the west. The location of the subject property is shown in *Figure 1*.

The subject PID measures about 0.43 acres. It appears to have a Two-unit Dwelling (R-2) zone designation within the *Eastern Passage / Cow Bay Land Use By-Law*. *ROMS KAIG* is proposing to replace the existing building structures with a new two-floor building that will contain up to 12 residential apartment-style units. The new residential building will be setback from the Cow Bay Road right-of-way by about 30m. A new off-street parking lot will be located between the street right-of-way and the new building and will contain up to 16 parking spaces.

The existing vehicle access is located near the southwest corner of the property. This existing access will be closed and relocated to the southeast corner of the property. Therefore, under the future proposed conditions there will continue to be only one vehicle access serving the subject property.

Figure 1: Existing Site Location



2.0 STUDY AREA AND CURRENT TRAFFIC CONDITIONS

2.1 - Overview

Through the study area, Cow Bay Road is generally aligned in an east-west direction and forms the south boundary to the subject lands. This corridor is considered to be one of the main commuter corridors to/from the large employment areas in Dartmouth and Halifax.

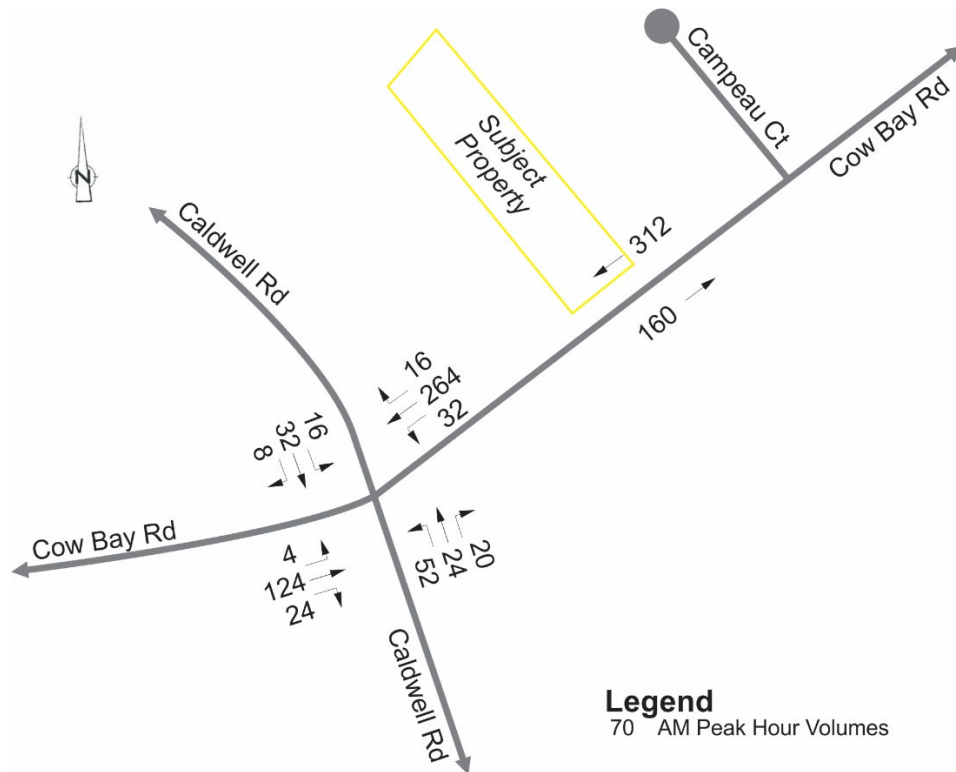
Cow Bay Road has a two-lane, two-way urban cross-section with auxiliary turn lanes at the major intersections. The signalized intersection of Cow Bay Road and Caldwell Road is located immediately to the west of the subject property. During the weekday AM peak hour volumes were observed to be moderate, there was limited vehicle queuing at the signalized intersection, and there appeared to be a substantial amount of residual capacity in the Cow Bay Road corridor.

2.2 - Existing Traffic Volume Review

GRIFFIN carried out a site visit on August 17th, 2021 to observe existing traffic conditions in the vicinity of the subject property. Since the main vehicle access to the new development will connect to Cow Bay Road – and there is a signalized intersection located about 80 m to the west – our traffic volume assessment focused on the Cow Bay Road / Caldwell Road intersection. The intersection volumes helped to establish through volumes on Cow Bay Road in the vicinity of civic #386 as well as identify any operational concerns associated with the operations of the signalized intersection (eg. westbound queues blocking upstream driveways).

GRIFFIN recorded a vehicle turning movement count at the adjacent signalized intersection during the weekday AM peak hour. A summary of the AM peak hour vehicle flows are summarized in Figure 2.

Figure 2: Observed AM Peak Hour Traffic Volumes (August 2021)



The weekday AM peak hour two-way flow along Cow Bay Road at the civic #386 driveway was observed to be 472 vehicles / hour (vph), with peak flows of 312 vph in the westbound (inbound) direction. These peak hour volumes equate to approximately 4,500-5,000 vehicles / day (vpd).

Although the Transportation Association of Canada (TAC) does not provide guidance with respect to the absolute maximum capacity for various street classifications, HRM has identified a typical daily capacity in their Municipal Design Guidelines document. HRM has identified a collector street capacity of about 12,000 vpd and arterial streets more than 20,000 vpd. Of course these values will vary based on site-specific conditions such as number of through lanes, presence of on-street parking, transit and so forth. However, they offer some context and guidance for our qualitative assessment. In conclusion, the observed weekday demand of 5,000 vpd is well below the capacity of a collector street and significantly below that of an arterial street. This suggests there is a substantial amount of residual capacity in the Cow Bay Road corridor to accommodate future traffic growth.

No traffic flow concerns were observed during our AM peak hour site visit in the vicinity of the site. Although queues formed during the red signal phase of the Cow Bay Road / Caldwell Road intersection, the critical westbound queues were considered to be minimal and did not extend to the civic #386 access.

2.3 - Vehicle Operating Speed Data

Using a hand-held radar unit, GRIFFIN gathered vehicle operating speed data along Cow Bay Road on August 17th, 2021 in the vicinity of the civic #386 driveway. All the speed recordings were assembled and an 85th percentile vehicle speed was calculated. This value has been identified as a reasonable “design” speed that is used by many road agencies across North America to set regulatory speed limits on roadways.

The calculated 85th percentile vehicle operating speed on Cow Bay Road was determined to be 61 km/h and included vehicles traveling in both directions. As such, 60 km/h was chosen as the design speed for the sight distance assessment that is discussed later in Section 3.3. It should be noted that the regulatory posted speed limit is 50 km/h.

2.4 – Pedestrian and Active Transportation Facilities

Pedestrian sidewalks are provided along the south side of Cow Bay Road. Metro Transit bus stops are located adjacent to civic #386, one on the north side of the street and one on the south side. Since there is no sidewalk on the north side of the street, there is no connecting sidewalk for pedestrians to move to/from the north transit stop.

Although there is some pedestrian connectivity currently offered in the study area, there is an opportunity for HRM to improve connectivity between the active and transit modes.

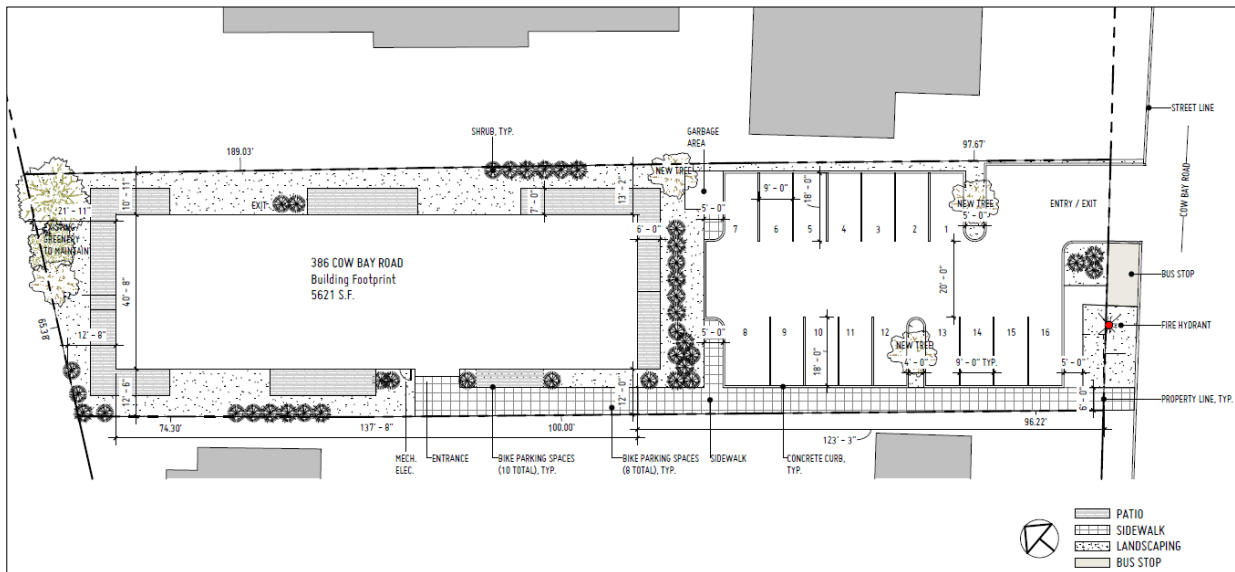
3.0 NEW VEHICLE ACCESS AND VISIBILITY

3.1 – Location and Operation

As noted earlier, the existing driveway will be closed and relocated to the southeast corner of the property. It will serve the new parking lot containing up to 16 parking spaces. The proposed access will accommodate two-way flow to/from the parking area.

The proposed site layout is illustrated in *Figure 3*.

Figure 3: Proposed Site Layout



Source: Jarsky Architects

3.2 – Driveway Corner Clearance

A corner clearance review was carried out to ensure the proposed primary access connecting to Cow Bay Road is located a sufficient distance away from the nearest intersections. Providing adequate space between an intersection and a driveway reduces road safety risks and reduces the likelihood of overlapping turns occurring at both the driveway and intersection.

The corner clearance distance is comprised of three components: the intersection corner radius, a length of tangent, and the curb return radius / flare dimension at the driveway. Both the HRM and the Transportation Association of Canada (TAC) provide guidance with respect to minimum corner clearance distances. The minimum required distance is typically based on site-specific conditions and a summary of the existing street characteristics are contained in *Table 1*.

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Table 1: Summary of Corner Clearance Characteristics – Proposed Access

Site Characteristic	Description
Predominant Land Use Type	Predominantly a residential land use area along Cow Bay Road.
Street Classification	Cow Bay Road appears to function as a major collector street with moderate volumes.
Street Width and Speed Limit	Cow Bay Road has one travel lane in each direction, an auxiliary turn lane associated with an adjacent signalized intersection and a regulatory speed limit of 50 km/h.
Intersection Type	The two adjacent intersections include: <ul style="list-style-type: none"> - Cow Bay Road / Caldwell Road – a major intersection (signalized) as defined by TAC. - Cow Bay Road / Campeau Court intersection – a minor intersection (stop-controlled) as defined by TAC.

GRIFFIN then reviewed both the HRM and TAC corner clearance guidelines using the site-specific characteristics contained in *Table 1*. The comparison of required versus available distances to the east and west of the proposed driveway location are summarized in *Table 2*.

Table 2: Summary of Corner Clearance Assessment

Corner Clearance	HRM Guidelines ^D (HRM By-Law S-300)	TAC Guidelines (GDGCR – Chapter 8)	Available Distance ^C
To the West – between the access and signalized intersection at Caldwell Road.	30 m	25 m total distance ^A (includes radii)	71 m (excludes radii)
To the East – between the access and unsignalized intersection at Campeau Court.	8 m	20 m total distance ^B (includes radii)	40 m (excludes radii)

A – TAC Figure 8.8.2, condition B, driveway upstream of traffic signal.

B – TAC Figure 8.8.2, condition F, driveway downstream of stop-control.

C – Tangent distance between driveway and intersection, excludes corner radii and flares.

D – Defined as the distance to the “nearest street line”. There is some ambiguity regarding the definition of the “street line”.

GRIFFIN concluded the available corner clearance exceeds the minimum requirements of both HRM and TAC in both directions along Cow Bay Road.

3.3 – Driver Visibility

A driver sight distance review was carried out at the proposed driveway location 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. A summary of the SSD assessment is provided in *Table 3*.

Table 3: Summary of Stopping Sight Distance Measurements – New Access (60 km/h)

Measurement Location	Travel Direction	Available SSD	TAC Required SSD		Does Available Exceed Required?
			Base ^A	Slope Adjusted	
1. Proposed Access (as shown in Figure 3)	Eastbound (outbound)	111 m	85 m	85 m (0%) ^B	Yes
	Westbound (inbound)	174 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 Cow Bay Road on the approaches to the new access.

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. As noted in earlier in Section 2.3, the operating speed in the westbound (inbound) direction was based on a design speed of 60 km/h.

GRIFFIN concluded the proposed access location provides sufficient stopping sight distance along Cow Bay Road, in both directions. Therefore, the new access for the proposed development shown in *Figure 4* meets minimum TAC design guidelines for stopping sight distance.

The existing driver visibility towards the proposed driveway location is shown in *Figure 4*.

Figure 4: Driver Views Along Cow Bay Road at #386 Access



*Eastbound (outbound) driver
view along Cow Bay Road
(towards new access).*



*Westbound (inbound) driver
view along Cow Bay Road
(towards new access).*

4.0 VEHICLE TRIP GENERATION

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 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), in the most recent *Trip Generation, 10th Edition* document. Based on information provided by the client, a two-floor building containing a total of 12 apartment-style units will replace the existing single family dwelling and accessory buildings. GRIFFIN determined that the most applicable ITE land use code would be:

- *Multifamily Housing (Low-rise) – ITE Land Use Code 220*: ITE describes this land use as one that includes at least three other dwelling units within a building with one or two levels.

A review of the ITE's empirical survey data was then carried out to select the most appropriate trip rate calculation method for this land use type. Upon reviewing the empirical survey results for Land Use Code 220 it was determined that the use of the regression formula for the general urban/suburban area appeared to be the most appropriate.

The trip generation calculations for the proposed development are summarized in *Table 4*.

Table 4: Site Trip Generation for the Proposed Residential Development

	Size	Trip Rate	New Vehicle Trips / Hour		
			In	Out	Total
AM Peak Hour					
Multifamily Housing (Low-rise) (ITE Code 220)	12 Units	0.50/unit ^A	1 (23%)	5 (77%)	6
AM Peak Total Trips ^B			1	5	6
PM Peak Hour					
Multifamily Housing (Low-rise) (ITE Code 220)	12 Units	0.75/unit ^A	6 (63%)	3 (37%)	9
PM Peak Total Trips ^B			6	3	9

A – ITE's formula rate used.

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

Based on the results contained in *Table 4*, the proposed development is expected to generate up to 6 trips/hour (1 inbound and 5 outbound) during the weekday morning peak hour and 9 trips/hour (6 inbound and 3 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 six to ten minutes during the peak times of the day. Traffic volume increases of this magnitude are considered to be very small, manageable, and will have a negligible impact on traffic operations.

5.0 VEHICLE PARKING

Using the parking information provided by the proponent, all new off-street parking will be provided above ground, between the Cow Bay Road right-of-way and the new building. A total of 16 vehicle parking stalls are proposed. The only access to this new parking will be provided via a new driveway connecting to Cow Bay Road.

This amount of off-street parking supply is slightly higher than one space per residential unit and appears to be generally 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 a transit route – with a transit stop along the property frontage – it is suitable to provide minimum parking supply rates.

6.0 CONCLUSIONS AND RECOMMENDATIONS

6.1 – Conclusions

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

- The civic #386 property contains a detached dwelling unit (R1) and two accessory buildings. The property measures about 0.43 acres and currently has a Two-unit Dwelling (R-2) zone designation. The existing vehicle driveway is located in the southwest corner of the property which connects to Cow Bay Road.
- The proponent is proposing to remove the detached dwelling unit and accessory buildings and replace it with a two-floor multi-unit building that will contain up to 12 apartment-style units. A development of this magnitude is expected to generate up to 6 trips/hour (1 inbound and 5 outbound) during the weekday morning peak period and 9 trips/hour (6 inbound and 3 outbound) during the weekday afternoon peak period.
- The site driveway will be relocated to the southeast corner of the property. Our review concluded the following:
 - *Driver visibility:* The stopping sight distance at the new site access location was assessed and appears to meet TAC minimum SSD requirements for the expected operating speeds. The regulatory speed limit along Cow Bay Road is 50 km/h.

- *Driveway corner clearance:* Available distances to the nearest intersections were reviewed east and west of the proposed driveway location using both HRM and TAC guidelines. It was determined that minimum requirements are met in both directions. Further, the proposed access location shifts to the east, which will result in the following:
 - *Clearance to the West:* An increase in the available corner clearance distance to the signalized intersection relative to existing conditions, and
 - *Clearance to the East:* A reduction of the available corner clearance distance to Campeau Court yet will still exceed HRM and TAC minimum requirements.
- Our qualitative traffic operational assessment suggests the new site-generated peak hour trips will have a very small and negligible impact on the study area streets and intersections. The new vehicle trips were calculated to add - on average - about one vehicle every six to ten minutes during peak times. As such, there is expected to be sufficient residual capacity along the Cow Bay Road corridor to accommodate the expected increase in traffic associated with the proposed development.

6.2 – Recommendations

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 access can accommodate an appropriate design vehicle. The site design – including the driveway and parking areas – 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. *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.
4. *Pedestrian Connectivity:* That HRM carry out a feasibility review or needs assessment to determine if the Municipality can/should provide a pedestrian facility along the north side of Cow Bay Road – connecting the signalized crosswalks at the Cow Bay Road / Caldwell Road intersection with the HRM transit bus stop at civic #386.

7.0 CLOSING

The findings flowing from this qualitative traffic impact statement suggest the expected new vehicle trips generated by the proposed 12-unit residential development is 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 Signed

James J. Copeland, P.Eng.

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

