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Fall River, NS B2T 1R2

March 9, 2021

Att: Mr. Stephen Adams
Stephen Adams Consulting Services Inc.
410 McCabe Lake Drive
Middle Sackville, NS B4E 0N6

RE: A Traffic Impact Statement for a proposed re-zoning in Harrietsfield (Case #22483)

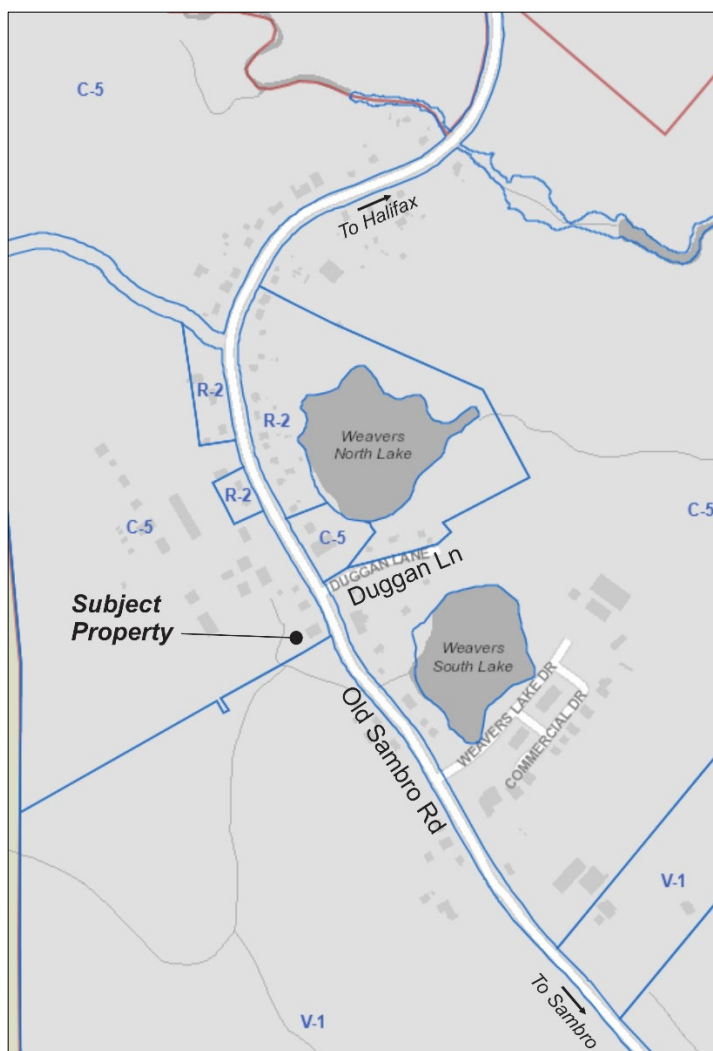
Dear Mr. Adams:

1.0 INTRODUCTION

Upon your request, the GRIFFIN transportation group inc. has completed a qualitative Stage 1 - Traffic Impact Assessment in support of the planning application process for a proposed re-zoning of civics #801, #811, and #821 Old Sambro Road (Route 306), in the community of Harrietsfield, Halifax Regional Municipality (HRM). The subject lands are located on the west side of Old Sambro Road, immediately south of Duggan Lane. An existing auto repair business operates on civic #801 (PID 40071094), while civics #811 (PID 40071102) and #821 (PID 40071110) are undeveloped. The locations of these properties are identified in *Figure 1*.

The subject properties are located in HRM's Planning District 5 (Chebucto Peninsula) Land Use By-Law area and they are located on the boundary between two separate zoning designations. Based on our discussions, it is understood that the landowner is submitting an application to HRM's Planning and Development department (Case #22483) to change the land use zoning designation to a consistent C-5 (Industrial Commercial Mix) for all three PID's. A summary of the existing and proposed zoning designations by property are provided in *Table 1*.

Figure 1: Study Area Context



Source: HRM GIS Mapping

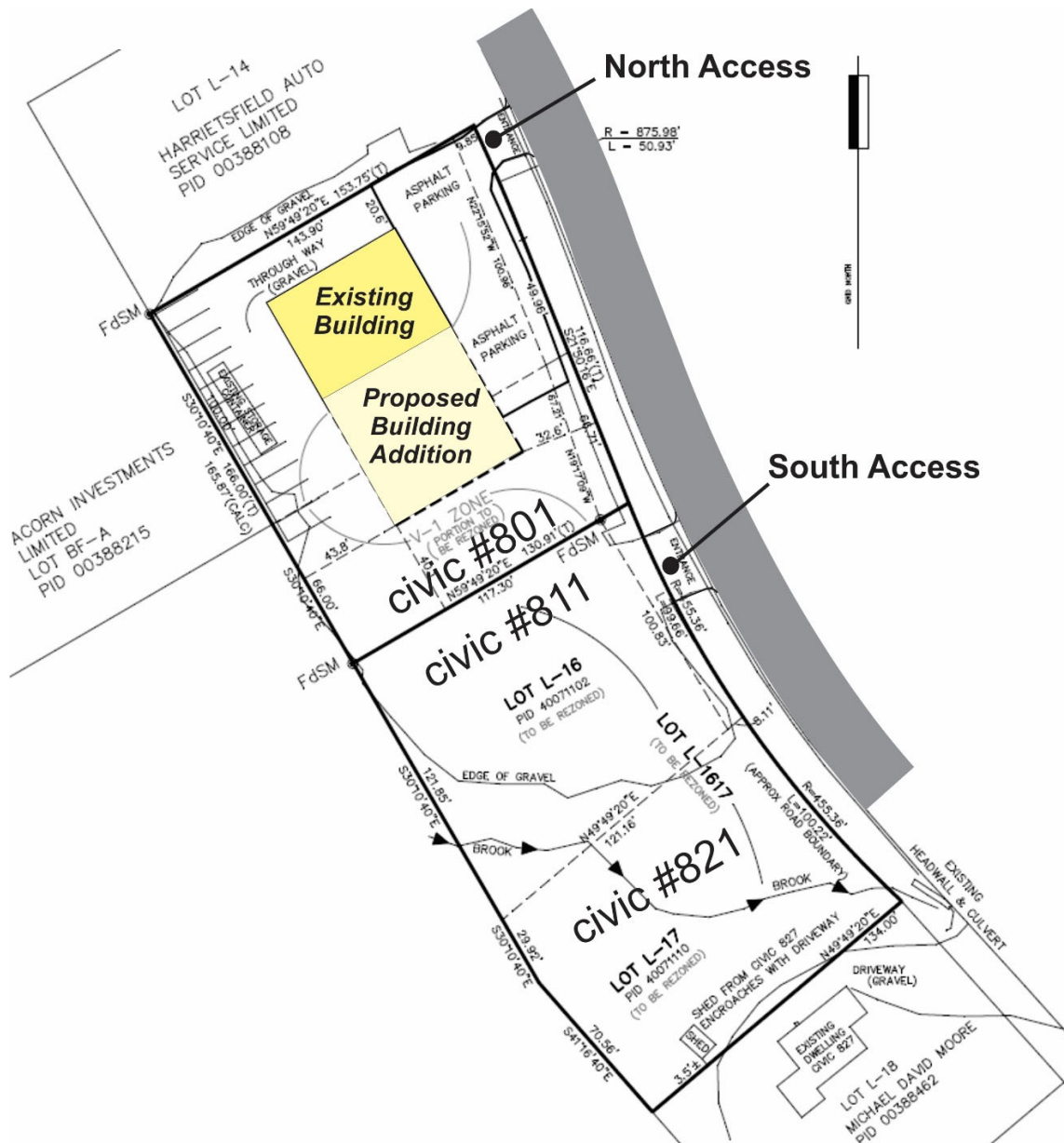
Table 1: Summary of Proposed Zone Changes

Property	Description	Land Use Zone	
		Existing	Proposed
Civic #801	North portion – existing auto repair business	C-5 – Industrial Commercial Mix	C-5 – Industrial Commercial Mix
	South portion – parking area for existing business	V-1 – Harrietsfield Village Centre	C-5 – Industrial Commercial Mix
Civic #811	Entire property	V-1 – Harrietsfield Village Centre	C-5 – Industrial Commercial Mix
Civic #821	Entire property	V-1 – Harrietsfield Village Centre	C-5 – Industrial Commercial Mix

As part of the re-zoning application process, the business owners are also proposing to expand the existing auto repair operations. A 3,600 ft² building addition is planned that will add one additional vehicle service bay, supporting operating space and up to two new employees.

The proposed site layout and access location is shown in *Figure 2*.

Figure 2: Proposed Site Layout and Property Boundaries



Source: Civitech Engineering & Surveying Limited

2.0 STUDY AREA AND SITE CONEXT

2.1 Overview

Old Sambro Road (Route 306) is generally aligned in a north-south direction through the study area. The road width measures 7.3m and provides one travel lane in each direction. This roadway has a rural, open ditch cross-section with paved shoulders.

2.2 Existing Traffic Volume Review

The NS Department of Transportation and Infrastructure Renewal (NSTIR) gathers traffic volume data on all of the roadways under their jurisdiction as part of their on-going traffic data monitoring program. GRIFFIN reviewed these available historical data to establish current vehicle demand in this corridor. The study area is located within NSTIR's Route 306 Section 20, and their most recently available volume data was gathered in May 2017. At this time, the average daily volume was determined to be about 3,950 vpd. Since this corridor is considered to function like a suburban commuter corridor during weekday morning and afternoon time periods, the inbound and outbound daily direction split is likely very similar. Further, the estimated peak hour volume is likely about 400 vehicles/hour (two-way).

The capacity of any roadway will vary depending on the number of lanes, presence of on-street parking, changes in alignment, number of driveways and so forth. Given the suburban land use area, lack of near-by signalized intersections, and moderate level of access density; GRIFFIN has estimated that this section of Old Sambro Road has an approximate practical capacity of about 1,000-1,200 vehicles/hour (two-way) and a likely daily capacity of between 10,000 and 12,000 vehicles per day. Therefore, comparing the historical 2017 volume data with our estimate of the roadway capacity yields an acceptable volume-to-capacity ratio much less than 1. This means there is residual capacity to accommodate traffic growth well into the future.

Of course, there was a provincial state of emergency in place when this assessment was completed. Based on other studies recently completed by GRIFFIN in Nova Scotia, it has been determined that the general travel demand on roadways was reduced by about 30-40% during the early stages of the state of emergency – during the spring of 2020 – depending on location, street classification and so forth. However, since that time traffic volumes have steadily increased back to near normal levels. Traffic volume monitoring services such as TomTom have reported that Halifax-area volumes are currently about 8-10% below typical levels and this trend is expected to be similar in Harrietsfield. In order to provide some context, traffic volumes typically fluctuate in the order of 10% from day to day. Thus, there is expected to some level of impact on the observed February 2021 conditions along Old Sambro Road. However, as stated above, typical volumes (*i.e.* prior to the state of emergency) are still well below the capacity of the corridor.

2.3 Vehicle Operating Speed Data

Using a hand-held radar unit, GRIFFIN gathered vehicle operating speed data along Old Sambro Road on February 22nd, 2021 in the vicinity of the existing site accesses. All of 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. In the case of this assessment, the 85th percentile vehicle operating speed was used for the stopping sight distance review at the site accesses – discussed later in Section 3.

The calculated 85th percentile vehicle operating speed on Old Sambro Road was determined to be 66 km/h and included vehicles traveling in both directions. In order to remain conservative, a 70 km/h was chosen as the design speed for the sight distance assessment discussed below. It should be noted that the regulatory posted speed limit is 60 km/h.

3.0 VEHICLE ACCESSES AND VISIBILITY

Vehicle access to/from the proposed development will be provided via the two existing driveways, as shown in *Figure 2*. It appears that the north driveway serves as the primary access for the existing business located at civic #801 and the south driveway offers access to the undeveloped civic #811/#820 lands. However, both of these driveways are currently used by the existing business.

GRIFFIN completed a sight distance review to ensure that adequate driver visibility is available at both access locations and there were no visibility constraints that presented safety concerns. This process was carried out following the guidelines contained in the latest Transportation Association of Canada’s (TAC) Geometric Design Guide for Canadian Roads document (2017). These guidelines are a nationally recognized roadway design procedure and have been adopted by the HRM. 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 – in this case Old Sambro Road – ensures that 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 – representative of a typical vehicle taillight height or other similar hazard – was placed at the approximate centre of the existing accesses, on the edge of the southbound travel lane. A summary of the field measured sight distances relative to the minimum requirements for a 70 km/h operating speed is provided in *Table 2*.

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Table 2: Summary of Stopping Sight Distance Measurements (70 km/h)

Measurement Location	Travel Direction	Available SSD	TAC Required SSD		Does Available Exceed Required?
			Base ^A	Slope Adjusted	
1. Existing Civic #801 North Access <i>(as shown in Figure 1)</i>	Northbound	105 m	104 m (70 km/h)	100 m (+3%) ^B	Yes
	Southbound	183 m		106 m (-1%) ^B	Yes
2. Existing Civic #811 South Access <i>(as shown in Figure 1)</i>	Northbound	171 m	104 m (70 km/h)	100 m (+3%) ^B	Yes
	Southbound	116 m		104 m (0%) ^B	Yes

A – 2017 TAC Chapter 2, Table 2.5.2

B – An estimate of the actual slope along Old Sambro Road on the approaches to the site access.

Based on the results contained in *Table 2*, GRIFFIN concluded that the proposed access locations provide sufficient stopping sight distances along Old Sambro Road, for a 70 km/h vehicle operating speed, at both existing access locations. Therefore, the existing access locations meet minimum TAC design guidelines for stopping sight distance and are acceptable and appropriate locations to serve the existing and any future business(es) located on these lands. It should be noted that the existing south driveway location has the ability to serve the consolidated civic #811/#821 lands.

The existing driver visibility from the proposed south driveway location is shown in *Figure 3*.

Figure 3: Driver Views Along Old Sambro Road at the Existing South Access



Existing south access (civic #811/#821), looking left along Old Sambro Road.



Existing south access (civic #811/#821), looking right along Old Sambro Road.

4.0 SITE TRIP GENERATION

4.1 *Current Business Operations*

The type of business operating at civic #801 Old Sambro Road is focused on automobile repair and operates out of a single building. The front portion of the existing building has two floors and accommodates a customer waiting area and offices for the day-to-day operations. The rear portion of the building is a single story that contains what appears to be two vehicle service bays with access via a single garage door on the south side of the building.

The peak business operations generally occur on weekday mornings and afternoons when both employees and customers are entering/exiting the site. Currently there are 4 employees that include managerial, administrative and auto technician staff.

Existing customer parking is located along the east face of the existing building. A large parking area is also located to the south of the building that accommodates a customer drop-off/pick-up area as well as storage for vehicles being serviced. This southern parking area encroaches beyond the civic #801 property boundary, and onto the civic #811 property. As such, the southern vehicle driveway connecting civic #811 is also used by this business which helps to spread the existing car trips across two accesses.

4.2 *Proposed Business Changes*

As part of the proposed re-zoning application, the existing business owners are proposing to expand the existing business at civic #801. It is understood that a 3,600 ft² building expansion will be added to the south face of the existing building and this new area will be used to increase the

ability to carry out additional auto repair services. The business owners have indicated that up to two (2) new employees and one (1) new vehicle service bay would be added.

Since the proposed re-zoning application not only applies to the civic #801 property, but also the consolidated civic #811/#821 property, GRIFFIN has assumed additional traffic will be moving in/out of the existing driveways, over and above the business expansion plans described above. This provides HRM staff with an assessment of a worst-case traffic scenario, should another business establish itself on the civic #811/#821 lands at some point in the future, for example. In order to create this potential future worst-case scenario, GRIFFIN has assumed that another similar type of business, with a similar scale of operations would locate on the civic #811/#821 property – and the new vehicle trips generated by such a business have also been included in our assessment.

4.3 New Vehicle Trip Generation

As noted in the previous Sections, there are two components to our vehicle trip generation calculations, including:

- The proposed expanded operations at the existing auto repair business at civic #801 which includes the 3,600 ft² building addition; and
- The potential, worst-case scenario of an additional similarly-sized business establishing on the civic #811/821 property as a direct result of a successful re-zoning.

Our trip generation calculations have followed a first-principles approach and used business operations information observed at another similar business in HRM to provide a basis for forecasting the expected future traffic moving in/out of the subject properties.

In 2012, GRIFFIN carried out a vehicle trip generation survey for an auto repair business on Portland Street in the community of Dartmouth. This particular business had 5 vehicle service bays, 5 employees (3 mechanics and 2 managerial/admin staff) and processed about an average of two vehicles per service bay, per day. In addition, about 70% of their customers would drop-off their vehicle for the day and return later to pick up their vehicle. These particular operational parameters were applied to estimate the future business changes at civic #801-#821 as well as consideration of customer shuttle trips (personally arranged or otherwise) and service vehicles (*i.e.* tool suppliers, couriers, etc.) entering and exiting the site. The latter typically occurs outside of the peak commuter times, but nonetheless were considered.

A summary of the expected increase in future site-generated traffic volumes is provided in *Table 3* (AM peak hour and *Table 4* (PM peak hour).

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Table 3: Site Trip Generation – Weekday AM Peak Hour

Source	Description	Units	Peak Hour Trip Rate	New Vehicles per Hour		
				In	Out	Total
Existing Business Expansion (1 new service bay, 2 new employees)						
Employees	Full-time	2	1.0	2	0	2
Customers	Stay & Wait (30%)	1	1.0	1	0	1
	Drop & Pick-up (70%) ^A	1	3.0	2	1	3
Service Vehicles	2 trips/day (off-peak)	2	0.0	0	0	0
Sub-Total (vph)				5	1	6
New Adjacent Business (3 service bays, 6 employees)						
Employees	Full-time	6	1.0	6	0	6
Customers	Stay & Wait (30%)	2	1.0	2	0	2
	Drop & Pick-up (70%) ^A	4	3.0	8	4	12
Service Vehicles	2 trips/day (off-peak)	2	0.0	0	0	0
Sub-Total (vph)				16	4	20
TOTAL NEW TRIPS (vph)				21	5	26

A – Trip rate accounts for inbound customer (drop-off) plus an additional in and out trip for their ride.

Table 4: Site Trip Generation – Weekday PM Peak Hour

Source	Description	Units	Peak Hour Trip Rate	New Vehicles per Hour		
				In	Out	Total
Existing Business Expansion (1 new service bay, 2 new employees)						
Employees	Full-time	2	1.0	0	2	2
Customers	Stay & Wait (30%)	1	1.0	0	1	1
	Drop & Pick-up (70%) ^A	1	3.0	1	2	3
Service Vehicles	2 trips/day (off-peak)	2	0.0	0	0	0
Sub-Total (vph)				1	5	6
New Adjacent Business (3 service bays, 6 employees)						
Employees	Full-time	6	1.0	0	6	6
Customers	Stay & Wait (30%)	2	1.0	0	2	2
	Drop & Pick-up (70%) ^A	4	3.0	4	8	12
Service Vehicles	2 trips/day (off-peak)	2	0.0	0	0	0
Sub-Total (vph)				4	16	20
TOTAL NEW TRIPS (vph)				5	21	26

A – Trip rate accounts for inbound customer (drop-off) plus an additional in and out trip for their ride.

Based on the results contained in *Tables 3 and 4*, the combined impact of the proposed business expansion, plus the possibility of an additional business being located at civic #811/#821, is expected to generate up to 26 new trips/hour (21 inbound and 5 outbound) during the weekday morning peak period and 26 new trips/hour (5 inbound and 21 outbound) during the weekday afternoon peak period. This generally equates to an average increase of about one additional vehicle trip added to the Old Sambro Road corridor every two to three 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 the overall traffic operations – particularly given the considerable amount of residual capacity that exists in the Old Sambro Road corridor.

5.0 FINDINGS & CONCLUSIONS

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

- **Residual Capacity in the Old Sambro Road Corridor:** Old Sambro Road has a two-lane, two-way rural cross-section with paved shoulders and open ditches in the vicinity of civic #801. There appears to be a notable amount of residual vehicle capacity along this corridor during the peak travel periods of a typical weekday that can accommodate traffic growth well into the future.
- **Worst-Case Future Traffic Assumptions:** As part of the re-zoning application for civics #801, #811, and #821, the existing business owners have plans to add a 3,600 ft² to the existing business at civic #801 that will expand the current auto repair operations. Although there are no plans for new businesses at this time, GRIFFIN has provided an estimate of the potential increase in traffic should a similarly-sized business locate on civic #811/#821 at some point in the future – specifically associated with the re-zoning. The combined increase in new site-generated vehicle trips associated with both the proposed business expansion, plus a new future business, is expected to generate up to 26 new peak hour trips/hour.
- **Future Traffic Increases are Manageable:** The combined future potential site-generated vehicle trips associated with the proposed re-zoning is considered to be low and manageable and equates to an approximate increase of about 1 new vehicle trip every 2-3 minutes during peak times. During the off-peak times of the day the number of trips moving in/out of the site will be less. Therefore, the existing accesses will have sufficient capacity to accommodate both the traffic generated by the proposed increase in operations at the existing business, plus a new future business of similar size. Further, the existing driveways are expected to function adequately with single inbound/outbound lanes and no auxiliary turn lanes on Old Sambro Road.
- **Good Driver Visibility at Both Driveways:** Driver visibility was assessed at both existing site accesses. It was determined that the available stopping sight distance (SSD) measured by GRIFFIN exceeds TAC's minimum SSD requirements for a 70 km/h operating speed. The regulatory speed limit along this section of Old Sambro Road is 60 km/h.

6.0 CLOSING

The findings flowing from this qualitative traffic impact statement suggest the expected new vehicle trips generated by the proposed 3,600 ft² business expansion at civic #801, plus any new similarly-sized business that may locate on the consolidated lands of civic #811/#821, can be accommodated within the existing roadway infrastructure. As such, there is no need to widen the existing driveways or Old Sambro Road as a result of the proposed re-zoning of civics #801, #811, and #821.

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.

