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GRIFFIN transportation group inc.
30 Bonny View Drive
Fall River, NS B2T 1R2

October 9, 2014

Alan Stevens, P.Eng.
CivTech Engineering & Surveying Limited
1 Broom Road
Dartmouth, NS B2W 5G2

RE: A Traffic Impact Statement for a proposed development on Club Road, HRM

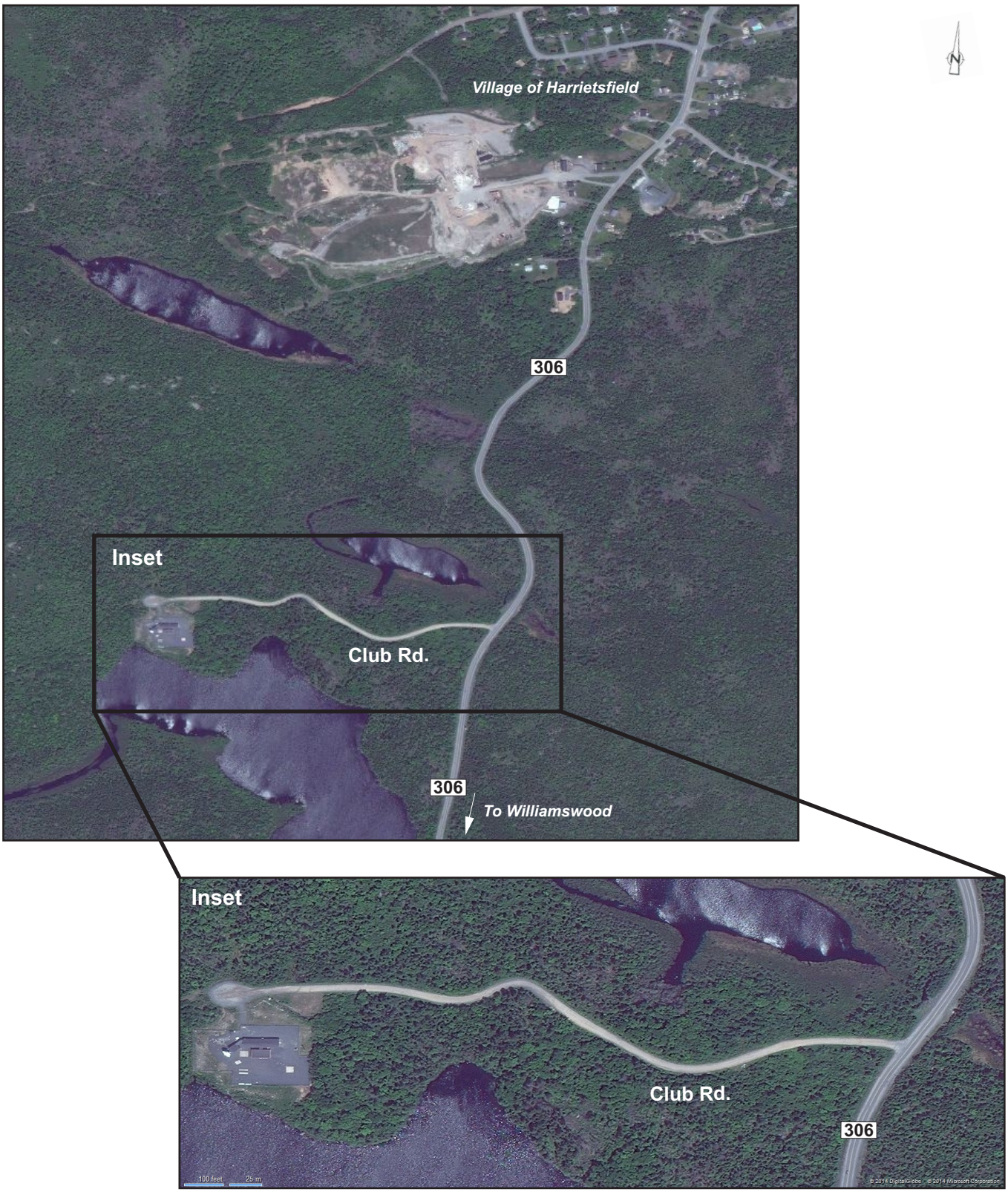
Dear Mr. Stevens:

INTRODUCTION

At the request of *CivTech Engineering & Surveying* (CivTech), the GRIFFIN transportation group inc. has carried out a traffic impact statement in support of the planning application process that is required for proposed changes to a property located on Club Road, Harrietsfield, Halifax (formerly HRM). Club Road is located on the west side of Route 306 about 1.7 km south of the Village of Harrietsfield. A key map and general site context is provided in *Figure 1*.

It is understood that the approving agency for the planning application documents is Halifax and the approving road agency is the Nova Scotia Department of Transportation and Infrastructure Renewal (NSTIR). The subject property is currently defined as a Special Facility Zone (P-5) under the Chebucto Peninsula Land Use By-Law (LUB), Planning District 5. A planning application process has been undertaken to change the current zoning through a site specific plan amendment process to permit two new businesses to operate from an existing 4,100 ft^2 building on Club Road.

The property owners have indicated their desire to operate two proposed business from this existing building including a garbage waste disposal business and a “signs and display” business. Given the potential variations in number of employees, material delivery, business growth, etc. the approach taken for this impact statement focuses less on the specifics of the proposed business operations and uses a more generic “light industrial” land use type to assess the potential traffic impacts associated with the future development of these lands.



Source: Bing Maps

GRIFFIN transportation group inc.

www.griffininc.ca

Key Map and Site Context

Figure 1

STUDY AREA AND SITE CONEXT

Harrietsfield is located along Route 306 (Old Sambro Road) in Halifax (formerly HRM). Club Road connects to Route 306 about 1.7 km south of the Village of Harrietsfield. It is a cul-de-sac road with a gravel surface and is currently gated to prevent vehicle access.

Route 306 is generally aligned in a north-south direction and is under the jurisdiction of the Nova Scotia Department of Transportation and Infrastructure Renewal (NSTIR). It has an asphalt surface with one travel lane in each direction and a rural, open ditch cross-section. The posted speed limit in the vicinity of the Club Road intersection is 70 km/h, however, due the curvilinear alignment there are horizontal curves immediately north and south of Club Road with advisory speed tab signs of 50 km/h. It should also be noted that Halifax Metro Transit provides service along Route 306 with a PM peak period headway of one hour.

EXISTING TRAFFIC CONDITIONS

In order to assess the traffic operations along Route 306 in the vicinity of the Club Road intersection there was a need to develop a set of baseline traffic volumes. The source of these volumes included:

- Historical NSTIR vehicle counts on Route 306, about 0.5 km south of Whitehead Road, recorded during October 2013; and
- A site visit and field review on September 17th, 2014 that included the recording of weekday PM peak hour volumes, operating speeds and available sightlines.

A summary of the historical and observed traffic volume information on Route 306 in the vicinity of Club Road is summarized in *Table 1*.

Table 1: PM Peak Hour Traffic Volume Data for Route 306

Direction	NSTIR 2013	Observed 2014
Northbound	-	101 vph
Southbound	-	309 vph
Total 2-way volume	401 vph	410 vph

vph – vehicles per hour

ACCESS SIGHTLINE REVIEW

A review of the available sightlines associated with the Route 306 / Club Road intersection was carried out. The review was based on the guidelines contained in the Transportation Association of Canada's (TAC) Geometric Design Guide for Canadian Roads. These guidelines use "design speed" for determining criteria such as minimum stopping sight distance (SSD). The design speed is associated with a range of observed vehicle operating speeds on the roadway.

A set of speed survey observations were recorded on September 17th, 2014 and the 85th percentile operating speeds were found to be 76 km/h in both the north and southbound directions. The posted speed limit is 70 km/h. These speed data were applied to the sightline review and the results include the following:

- Looking north, sightlines were 120 m and meet the minimum SSD requirement for the posted speed limit of 70 km/h but not the observed operating speeds.
- Looking south, sightlines were 150m and exceed the minimum SSD requirement for an 80 km/h operating speed.

Figure 2 shows the available sightlines along Route 306 from the Stop location on Club Road.

Figure 2: Sightlines Along Route 306 at Club Road

Looking North on Route 306

Looking South on Route 306

Following the NSTIR policy, it was concluded that minimum stopping sight distances for a 70 km/h posted speed limit are available in both directions. Although sightlines to the north meet the minimum NSTIR requirements, minimum design values are associated with increased road safety risk.

SITE TRIP GENERATION

To facilitate the traffic operations analysis at the Club Road intersection under typical operating conditions, there was a need to determine the number of vehicles that would be entering and exiting the site. 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 businesses and/or land use types.

Based on the review of the existing site conditions and information regarding the proposed businesses, it was determined that using the ITE trip generation information for a Light Industrial land use type (ITE Land Use 110) contained in the ITE's *Trip Generation, 9th Edition* document was

most appropriate for this assessment. As noted earlier, the existing building on site has a floor area of about 4,100 ft^2 and it is understood that the two proposed businesses will operate out of this existing building. However, in order to assess a worst case scenario, a much larger development of 50,000 ft^2 was assumed in the analysis and will account for both the proposed businesses as well as additional future development along Club Road. A summary of the vehicle trip generation characteristics for the subject lands is summarized in *Table 2*.

Table 2: Site Trip Generation

Total Floor Area	AM Peak				PM Peak			
	Trip Rate[A]	In	Out	Total	Trip Rate[A]	In	Out	Total
Light Industrial Businesses (ITE Code 110)								
50,000 ft^2	0.92	40	6	**46**	0.97	6	43	**49**

A – ITE average trip rate used and is based on 1,000 ft^2 of floor area.

As shown in *Table 2*, a number of Light Industrial businesses with a total building floor area of 50,000 ft^2 is expected to generate a total of 46 trips (40 inbound and 6 outbound) and 49 trips (6 inbound and 43 outbound) during the weekday AM and PM peak hours, respectively.

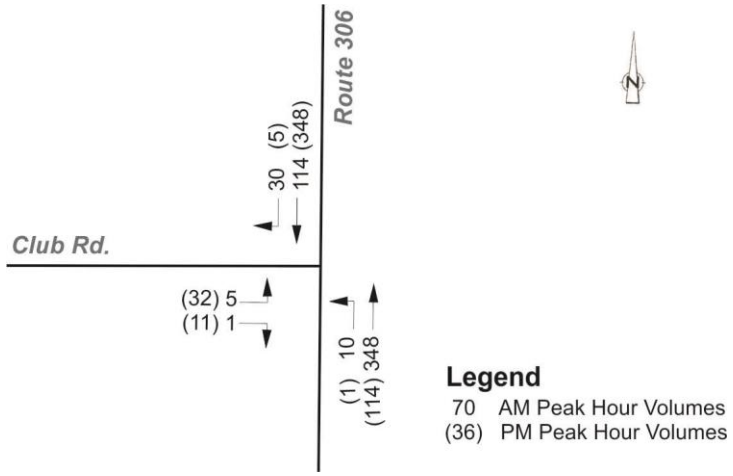
TRAFFIC OPERATIONS REVIEW

An intersection capacity analysis process was carried out to ensure that the Route 306 / Club Road intersection will continue to operate with acceptable levels of capacity and delay times under future Total 2020 traffic conditions. The analysis methodology followed NSTIR traffic impact study guidelines using Trafficware's *Synchro 8* software tool for two-way stop-controlled intersections. A set of future 2020 peak hour traffic volumes was assembled for this analysis based on the following:

- Observed weekday PM peak hour volumes; plus
- A 2%/year growth rate out to a 2020 planning horizon; plus
- The site-generated trips contained in Table 2.

The future Total 2020 peak hour traffic volumes applied to this assessment are shown in *Figure 2*.

Figure 2: Total 2020 Peak Hour Traffic Volumes



The future Total 2020 analysis results for the critical eastbound (outbound) shared left-right turn movement indicate an average delay time between 12 and 13 seconds (i.e. level of service B) and a volume-to-capacity ratio of 0.09[1]. These results suggest there will be considerable residual capacity for the critical outbound movements under future Total 2020 conditions and the intersection can continue to function at acceptable levels of service well into the future.

A supplementary analysis was also carried out to identify the need for an exclusive southbound auxiliary right turn lane on Route 306 to accommodate the right turning vehicles onto Club Road. Following NSTIR guidelines, the Ohio Department of Transportation right turn lane warrant methodology was applied. The warrant criteria for a 70 km/h posted speed limit indicates that a southbound advancing volume of 300 vph and a right turning volume of 20 vph will require an exclusive lane. The 2020 forecast volumes shown in *Figure 2* are below these thresholds and therefore the warrant criteria are not met.

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[1] The analysis assumed increased numbers of large trucks and a 15% heavy vehicle percentage was used.

CONCLUSIONS & RECOMMENDATIONS

The following conclusions were gleaned from the traffic impact assessment of the proposed development on Club Road:

- The subject property is currently defined as a Special Facility Zone (P-5) under the Chebucto Peninsula Land Use By-law. A planning application process has been undertaken to change the current zoning through a site specific plan amendment process to permit two new businesses to operate from an existing 4,100 ft^2 building.
- Although the current application is to utilize the existing 4,100 ft^2, the trip generation assessment reviewed the impacts of a much larger development to provide a worst case scenario. As such, the site-generated trip forecasts were based on a total of 50,000 ft^2 of Light Industrial land use (ITE Code 110). This amount of development is expected to generate a total of 46 trips (40 inbound and 6 outbound) and 49 trips (6 inbound and 43 outbound) during the weekday AM and PM peak hours, respectively.
- The Club Road intersection analysis results under future Total 2020 traffic conditions indicate there is considerable residual capacity for the critical eastbound (outbound) movements. This suggests the intersection can accommodate future traffic growth beyond the 2020 planning horizon, even with a development in the range of 50,000 ft^2.
- The available sightlines along Route 306 at Club Road meet the NSTIR's minimum stopping sight distance requirements for a posted speed limit of 70km/h (110m). However, available sightlines to the north along Route 306 are only 120m, near the NSTIR's minimum requirement, and minimum design values are associated with increased road safety risk.
- The Route 306 / Club Road intersection will operate with acceptable levels of service and delay times under future Total 2020 operating conditions. It was determined that no exclusive auxiliary turn lanes are required and the provision of one travel lane in each direction along both Route 306 and Club Road will provide sufficient capacity.

In summary, the site-generated traffic associated with 50,000 ft^2 of Light Industrial development will have a marginal and acceptable level of impact on the traffic operating conditions at the Route 306 / Club Road intersection beyond the 2020 planning horizon. Based on the analysis findings it is recommended that:

- The Route 306 / Club Road intersection be upgraded to NSTIR and/or HRM design guidelines including the provision of appropriate sight triangles. The intersection design must also accommodate large tractor-trailer combination vehicles.

- All signage and lane markings be installed following the Transportation Association of Canada's (TAC) Manual of Uniform Traffic Control Devices for Canada (MUTCDC) guidelines.

CLOSING

Based on the findings flowing from the traffic impact statement assessment there are no mitigating measures required on the external roadways in the vicinity of the Route 306 / Club Road intersection to accommodate the proposed site specific plan amendment for the subject property.

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

Original Signed

James J. Copeland, P.Eng.
Principal – Transportation Engineer
GRIFFIN transportation group inc.