

TO Jenifer Tsang, MCIP, LPP
Sunrose Land Use Consulting
via email: sunrose@eastlink.ca

April 11, 2022

RE: Transportation Impact Review - Ledwidge Lumber
195 Old Post Road, Enfield, Nova Scotia

Dear Ms. Tsang

The Trans4m Development Group completed a transportation impact review for a proposed rezoning that would allow an expansion to the existing Ledwidge Lumber facilities located at 195 Old Post Road, Enfield, Halifax County. The potential change in operations will see the addition of some new trips to the road network and the reduction of other trips as discussed in the existing and future conditions sections of this letter.

This review focuses on the anticipated operational, safety and geometric considerations associated with a proposed change in truck traffic to and from the site, and on the surrounding road network.



EXISTING CONDITIONS

The Ledwidge Lumber site's main access points occur at multiple locations along Old Post Road starting about 100 meters north of Oldham Road. This separation is desirable as it help separate decision points for drivers navigating the Old Post / Oldham Road intersection.



There are a number of low density residential roadways to the north of the site that currently accommodate about 50 single family houses. The road network appears to be arranged to allow for further future development though it is anticipated that such development would be consistent with the current low density character. All roads to the north are currently serviced by a single access using Old Post Road to Oldham Road.

Oldham Road is a low volume local rural roadway extending from Route 2 at its west end and connects to Old Guysborough Road about 7 kilometers to the east near the northeast corner of the Halifax Stanfield International Airport. In the vicinity of Ledwidge Lumber, the roadway has a posted speed of 60 kilometers per hour, a paved asphalt width of about 7 meters, gravel shoulders about 1 meter in width, and roadside ditch drainage. There are a number of vertical and horizontal curves in the vicinity of Old Post Road that are further considered under the sight distances discussions later in this review.



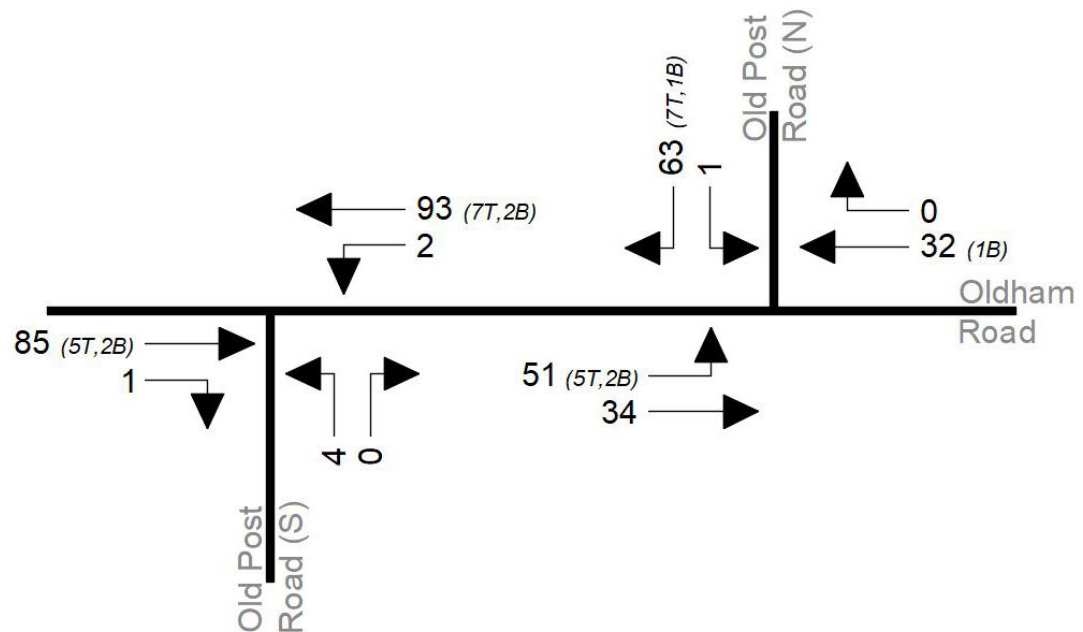
Old Post Road continues on the south side of Oldham Road and includes an offset of about 20 meters between the centerlines of the two sections of Old Post Road. The southern portion of Old Post Road is a very low volume local road way that connects to Route 2 at its south end immediately east of the Highway 2, Exit 7 northbound off-ramps. This section of road services about 13 single homes, about 56 trailer units and an auto service center. Based on recent counts, it appears most traffic from this area uses the south connection to Route 2 as opposed to the north connection to Oldham Road.

Existing Traffic

A manual traffic count was performed during the PM peak hour to get a better understanding of traffic volumes and patterns through the main intersections of Old Post Road with Oldham Road. The count volumes are summarized in the figure to the right. Note that the bracketed numbers indicated the number of trucks (T) and school buses (B) on each movement that are included in the total movement volume.

The counts represent 1 hour of count data collected between 4:15 and 5:15 PM during a typical weekday PM peak period. It is assumed that during the AM peak, volumes on Oldham and Old Post Road are likely to be similar in magnitude or potentially slightly lower.

It was noted that "inbound" and "outbound" traffic has similar volumes, most likely due to the combination of local residential traffic (outbound from HRM during the PM peak) and employee traffic (inbound during the PM Peak). It is possible that some peak periods may experience higher volumes than those shown, though are not expected to fundamentally change the conclusions of this review.



The following points are considered relevant for this review:

- » Volumes to and from the southern leg of Old Post Road are functionally non-existent. Similarly low volumes are expected during the AM peak hour.
- » Volumes between the north leg of Old Post Road and east of the site are also extremely low.
- » The highest volume movements are between Oldham Road west of the site (to and from Route 2 and Highway 102) and the north portion of Old Post Road. The majority of this traffic is divided between local residential traffic, and employee traffic related to Ledwidge Lumber.
- » The residential and employee based traffic have opposing peak travel directions during a peak hour. For example, during the PM peak hour, most residential traffic travels eastbound on Oldham Road and turns left into the residential area north of Ledwidge Lumber, while most employee based traffic exits the site on southbound Old Post Road and turns right onto Oldham Road.
- » Truck traffic represents between 5 and 10% of the total traffic on the roadways and appears to be restricted to Ledwidge Lumber vehicles (no trucks were counted as traveling through the intersections on Oldham Road). Despite the higher % of trucks, overall vehicle volumes are so low that their impact on operations is minimal.

» Site observations suggest that delays are minimal for all through and turn movements at the intersection. A Synchro model was built using the above noted volumes and suggests that the intersections operate at about 20% of their theoretical capacity with all delays being less than 10 seconds (Level of Service - LOS A), and virtually no queuing.

NODE SETTINGS	
Node #	4
Zone:	
X East (m):	1598.3
Y North (m):	31364.6
Z Elevation (m):	0.0
Description	
Control Type	Unsig
Max v/c Ratio:	0.08
Intersection Delay (s):	5.2
Intersection LOS:	A
ICU:	0.23
ICU LOS:	A



ANTICIPATED CHANGES IN TRAFFIC

Ledwidge Lumber is anticipating a number of changes to annual traffic flows in the near future resulting from the addition of a biofuel operation, which will require a supply of wood fiber in the form of sawdust, pulp chips and stemwood.

Presently, sawdust and pulp chips are trucked from the Ledwidge Site to external destinations using Oldham Road to Route 2. As a result of the new on-site wood fiber requirements, these truck trips will now remain on site and reduce truck volumes to and from the site. A summary of the anticipated changes are as follows:

- » Sawdust – 22,000 GMT at 32 tonnes per load = 688 trucks per year, or about **-3 trucks per weekday**
- » Pulp Chips – 50,000 GMT at 34 tonnes per load = 1471 trucks per year, or about **-6 trucks per weekday**.
- » Stemwood - most would have flowed to Northern Pulp in Pictou, but will now come to the Ledwidge site. New annual new trips to the site based on 58,000 GMT at 34 tonnes per load = 1706 trips per year or about **+7 trucks per weekday**.
- » LFCO product liquid: about 1350 trucks per year (4 axle bulk liquid tankers) expected to travel Monday to Friday - represents about **+5 trucks per weekday**
- » Sand Shipments - Estimated at 8 - 10 trucks per year (B-train trucks, 42 metric tonnes).
- » Ash - Estimated 35 - 40 trucks per year (standard trailer, 20 metric tonnes), represents about **+1 trucks per weekday**
- » Employee traffic: The new facility would operate in two 12hr shifts (daytime/nighttime) likely 7am to 7pm. 12-14 people are expected for the daytime shift (operational staff/maintenance/supervisors/lab staff/facility manager), and 6-7 people during the night shift (core operational staff/maintenance). All employee vehicle trips would be concentrated around the 7am/pm shift changes.
- » Other: Occasional fuel delivery truck (propane), spare parts shipping, facility visitors, etc. In the first year, when the facility is being commissioned, there is likely to be more traffic to and from the site. This could include: more frequent fuel deliveries (up to 1 per day) as there will be more start-ups; increased employees/visitors traffic; and, increased vendor and support staff to validate new equipment and train operational staff (~+4 people during daytime, +2 night time).

Operational Impacts

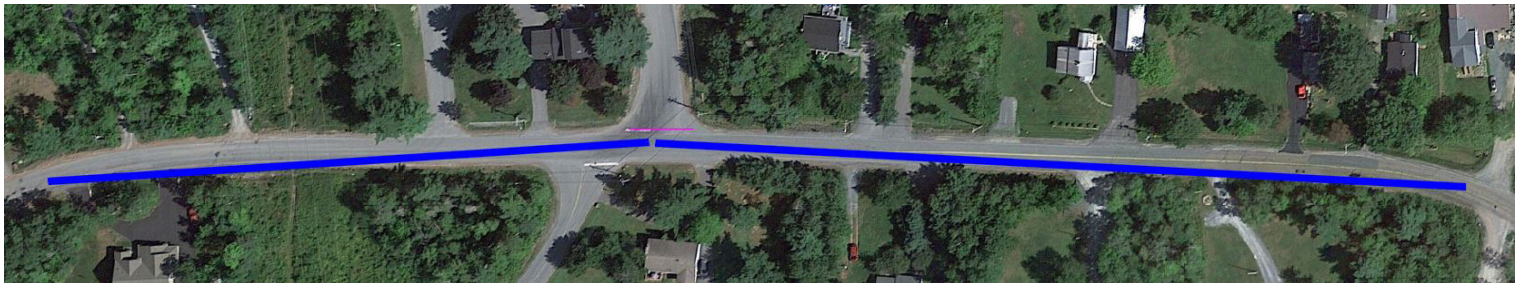
Based on the above assumptions, it could be expected that the Ledwidge site may experience an increase in truck traffic of about 4 trucks per day on a typical weekday. In a worst case scenario, this may translate to 1 or 2 truck trips during any given peak period, which functionally will have no impact on the roadway or intersection operations.

Similarly, employee based traffic may result in an increase of about 20 or 25 trips at shift change. Again, given the very low volumes of traffic on the areas roadways, this increase is not expected to have any noticeable impact on traffic operations.

Safety and Geometric Impacts

The Old Post Road (north leg) intersection with Oldham Road was reviewed for basic warrants and sight distance requirement. Basic two-way stop control on the Old Post Road legs of the intersections with free flow conditions maintained on Oldham Road are appropriate and adequate. Based on the very low volumes, traffic signal warrants or left turn warrants on Oldham Road would not be met, meaning the existing lane configurations and traffic control in place today are adequate for existing and future anticipated traffic.

Stopping sight distances were evaluated for vehicles approaching the intersections on Oldham Road. Sight distances for vehicles approaching from the west (travelling eastbound) have an available stopping sight distance of about 170 meters while vehicles approaching from the east (travelling westbound), have a stopping sight distance of about 240 meters. The Transportation Association of Canada's (TAC) Geometric Design Guide for Canadian Roads (Section 2.5) suggests minimum stopping sight distances of about 100 meters for a design speed of 70 km/hr (assumed to be posted speed + 10 km/h) based on relatively flat terrain. This suggests both approaches to the new intersection meet minimum TAC requirements for stopping sight distance.



Intersection sight distances are required for movements exiting Old Post Road (north leg) onto Oldham Road. As the counts have shown, a high percentage of all vehicles exiting the site will be making a right turn onto Oldham Road, though both right and left turn movements were evaluated in this review. Intersection sight distances assume a drivers eye location 4.4 meter setback from the edge of travel lane and per TAC recommendations.



For the right turn movement from Old Post Road (north leg) to Oldham Road, the TAC Geometric Design Guide suggests intersection sight distances of about 130 meters for a typical car and about 205 meters for larger trucks and is applicable to vehicles approaching from the east. Field measurements show that the available intersection sight distance is at least 250 meters to the east, though there is potential for some vegetation immediately east of the intersection (in the northeast quadrant - highlighted in red) to obstruct sight lines. This interference should be reviewed in the field and vegetation should be cut back as required to ensure required sight lines and available.



Old Post Road (north leg) looking east

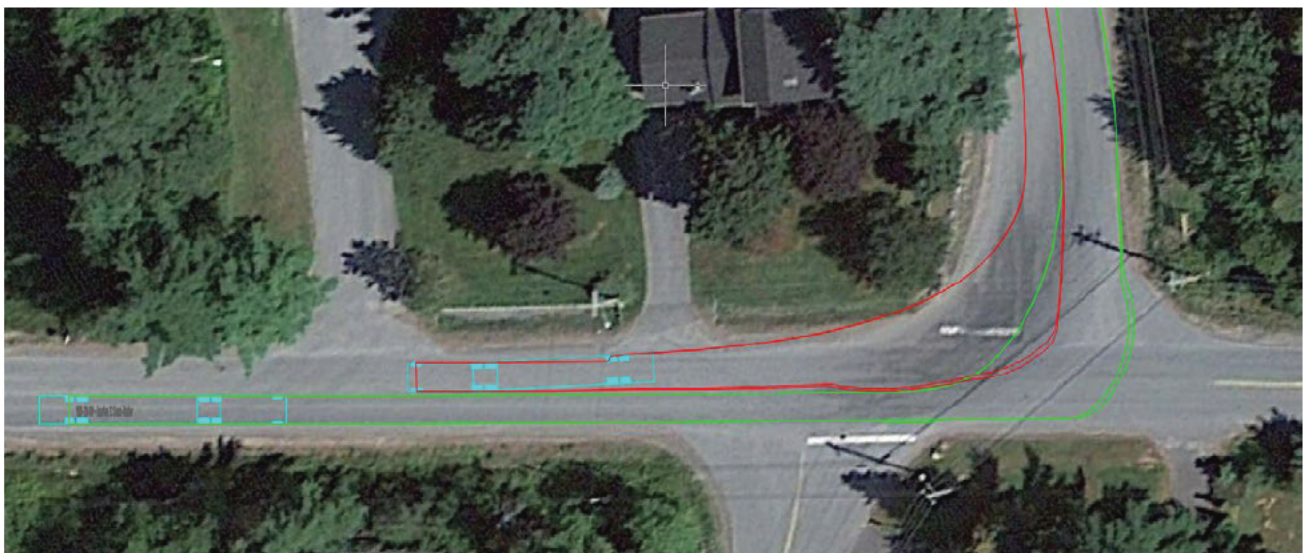
For vehicles turning left to Oldham Road, TAC suggests intersection sight distances of 150 meters for a passenger car and 223 meters for larger trucks. The field investigation shows an available sight distance of about 185 meters, which meets requirements for a car but is under the suggested distance for a larger truck. That said, risks associated with this movement are minimal because most (and potentially all) trucks make the above noted right turn movement. The very low volumes of traffic on Oldham Road further help to minimize safety performance risks for this movement. Similar to the sight lines to the east, ground based vegetation in the northwest quadrant again has the potential to obstruct sight lines and should be trimmed / removed as required to provide adequate sight lines.



Old Post Road (north leg) looking west

Truck Turning

To better understand the impact of trucks turning at the intersection, a truck turning review was completed for the left turn movement from Oldham Road to Old Post Road (green lines) as well as the opposite right turn movements exiting Old Post Road (red lines). The TAC WB-20 design truck was used for the analysis and the figure below shows that turn movements can generally be made within the intersection's paved area.



Two observations were noted with respect to the truck turning movements:

1. The right turn exit movement can be made within the existing pavement area without encroaching into the opposing eastbound through lane on Oldham Road. The curb radius in the northwest corner appears to have been built with a 2 or 3-point compound curve (appropriate for driveways with regular truck volumes) to better accommodate the swept path of larger trucks. Should the trucks swept paths regularly encroach past the paved area, minor upgrades to the shoulder (gravel or paved) in this quadrant could be considered.
2. The left turn entry movement from Oldham Road to Old Post Road can easily be made within the existing pavement area of the intersection. The truck turning figure shows that there is a potential conflict area near the centre of the intersection if two larger trucks (one entering and one exiting) are making these manoeuvres at the same time. It is expected that such a conflict will be rare based on the relatively low truck volumes to and from the site. As there are also very low volumes on Old Post Road and Oldham Road, such conflicts can be resolved with minimal impact to other vehicles on the roadway. Given the swept path of the inbound truck, consideration should be given to relocating the stop sign and associated stop bar further to the north to minimize risk of conflicts between entering trucks and smaller exiting vehicles.

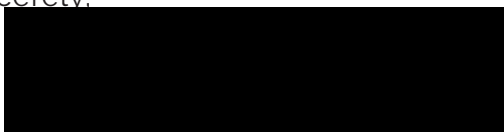
CONCLUSIONS AND RECOMMENDATIONS

This review was prepared to evaluate the impacts of a proposed re-zoning that would allow an expansion to the existing Ledwidge Lumber operations. The review suggests that transportation impacts resulting from the re-zoning can be accommodated on the existing road network. The key findings from this review include:

1. The rezoning would result in some additional truck trips to and from the site, as well as the reduction of other current truck trips on the network, resulting in a net increase of about 4 truck per day. Similarly, increases in employee traffic are expected to be minimal. These added volumes are not expected to have any noticeable operational impact on the surrounding road network.
2. All stopping sight distance requirements can be met, and intersection sight distances for relevant movements at the intersections are met. Some localized clearing of vegetation (i.e. trimming branches encroaching in the right-of-way, localized underbrush removal) adjacent to the intersection is recommended to ensure available sight distances are achieved. These are considered minor maintenance issues that should be easily resolved.
3. A number of other minor improvements with respect to the stop sign location and shoulder treatments at the intersections are included in the report for consideration, though are not considered essential to accommodate the changes in traffic.

Should there be any question or comments on the content of this review, please feel free to contact the undersigned.

Sincerely,

A black rectangular box redacting the signature of Roger N. Boychuk.

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