



Citizens for Safe Ground Water Inc.
c/o Samantha Lernout
slernout@ugcloud.ca

May 4, 2021

RE: Jackson Harvest Farms Haul Route– Road Safety Review

Location: 1894 Witmer Road, Wilmot, Ontario

Your File: CSGW

TNS File No.: 190119

Dear Ms. Lernout:

Citizens for Safe Ground Water Inc. retained True North Safety Group (TNS) to complete a safety review of the proposed haul route along Witmer Road to Queen Street (Regional Road 12), in Wilmot Township, Ontario. As requested, we have reviewed the proponent's Transportation Impact Study, prepared by Paradigm Transportation Solutions Limited, and dated February 2019 (the 'Paradigm report') and the Traffic Impact Study Peer Review, prepared by AECOM, and dated February 4, 2020 (the 'AECOM report'). The findings of our review are contained below.

Background

The Region of Waterloo Transportation Impact Study Guidelines (July 2014) indicate the following in relation to collision analysis components:

"The study should include a safety impact analysis to identify the effects of the development on the collision risk of the site and the adjacent road system. The study should recommend countermeasures where warranted and modifications to the site plan and the road system to enhance the level of safety for motorists, cyclists and pedestrians. Designs and recommendations should comply with the Ministry of Transportation of Ontario (MTO) Geometric Design Standards for Ontario Highways, the Ontario Traffic Manuals, and the Transportation Association of Canada Geometric Design Guide for Canadian Roads, as well as Region of Waterloo policies and practices."

Section 5 of the Paradigm report indicated:

“Given the operational analyses above, no improvements are required to the surrounding roadway network in order to accommodate the forecast traffic volumes in a safe and efficient manner, from a traffic operational perspective. However, from a safety perspective, the need for auxiliary turn lanes, sight distances, and other concerns relating to the use of the aggregate pit for the study area intersection and access were investigated.”

Both the Region of Waterloo TIS guidelines and the Paradigm report suggest that a safety review should be completed within the agreed upon study area. The Paradigm report provides a qualitative comment regarding the sight lines at the proposed pit access; however, no other road safety assessments are documented in their report.

Witmer Road is currently a relatively low travelled roadway, which may not fully exhibit the effects of the geometric or other safety deficiencies due to the low frequency of vehicle conflicts. The additional eastbound heavy trucks from the pit activities may exacerbate potential safety issues and affect use by pedestrians and cyclists.

Road Function and Speed

Queen Street (Regional Road 12) is a rural two-lane roadway under the jurisdiction of the Region of Waterloo. Witmer Road is a rural two-lane local roadway under the jurisdiction of Wilmot Township. Both are paved roadways with statutory 80 kilometre per hour (km/h) maximum speed limits.

Typically, common practice is to assume a ‘design speed’ (a road design parameter) of 10 to 20 km/h over the posted speed limit for a paved roadway. The design speed is applied in decision-making regarding the appropriate road design features (i.e., road/shoulder widths, horizontal curves, and vertical curves) and traffic control devices. Based on the character and nature of the roadways as well as our visual observations, a design speed of 90 km/h would be appropriate.

Site Access

The Transportation Association of Canada (TAC) Geometric Design Guide for Canadian Roads¹ (the ‘TAC Guide’) recommends a minimum stopping sight distance of 160 m and a decision sight distance (stopping conditions) of 185 m for a rural roadway with a design speed of 90 km/h. The decision sight distance should be provided where feasible, and the stopping sight distance should be provided along any roadway to allow drivers to come to a stop if necessary. Stopping and decision sight distances are available along Witmer Road on both approaches to the proposed pit access.

When conducting intersection assessments, consideration must be given to intersection capacity, gap availability and selection, and available sight distances. Sight distance requirements must be considered for vehicles approaching a stop-controlled condition

¹ Geometric Design Guide for Canadian Roads, Transportation Association of Canada, 2017.

(‘approach sight distance’) and for vehicles departing from the stop location into the intersection (‘departure sight distance’).

The proposed location of the pit access should be placed under side street stop-control and there are no physical impediments to it being designed to accommodate the required approach and departure sight distances for a 90 km/h design speed. **Figures 1 and 2** shows the available sight distances to the east and west along Witmer Road from the proposed access location.



Figure 1: Available sight distance from the proposed access to the west on Witmer Road (TNS 2021).

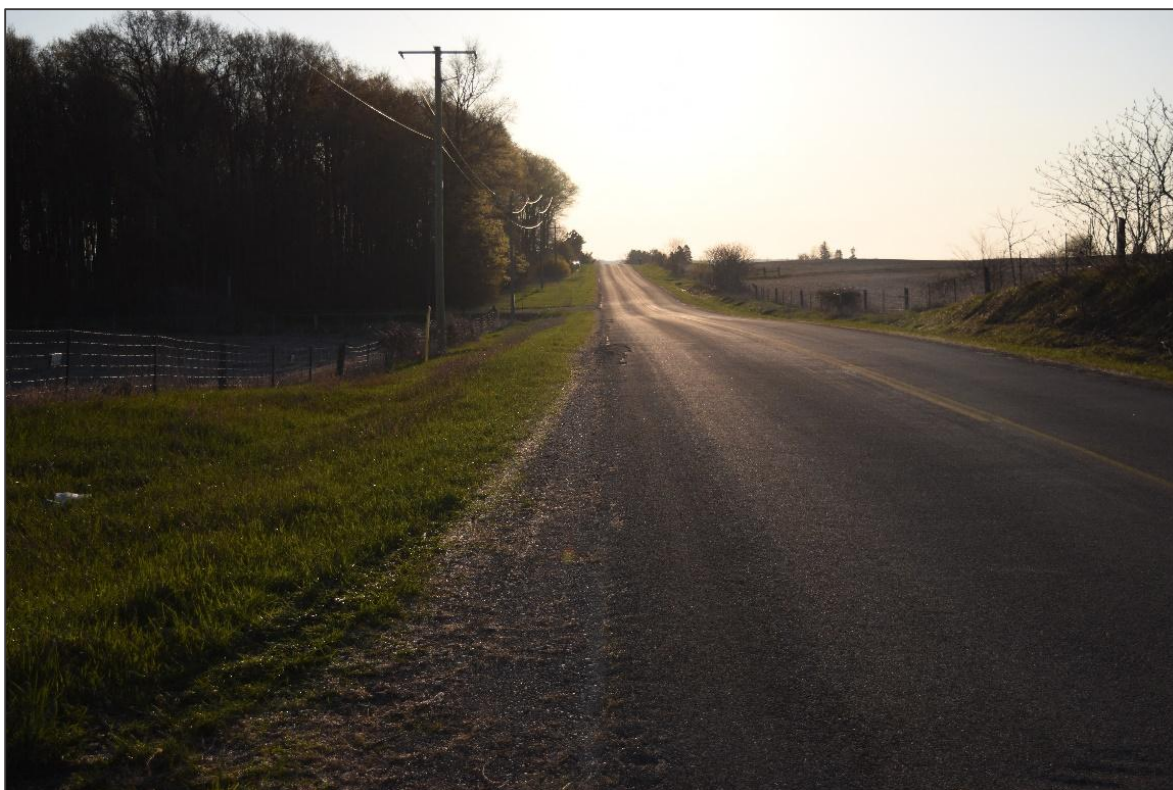


Figure 2: Available sight distance from the proposed access to the east on Witmer Road (TNS 2021).

Witmer Road Alignment and Cross-Section

Within the study area, Witmer Road is nominally straight and has a number of crest vertical curves (i.e., hills) between the pit access and Queen Street. HIDDEN DRIVEWAY and SCHOOL BUS STOP AHEAD (Wc-26) signs are provided where sight lines are limited over the crest vertical curves and conflict points are present.

Witmer Road is a school bus route for the area schools. During our morning field visit, no school bus operations were observed due to the current mandate for remote learning in Ontario. We were unable to assess the current school bus stop operations in relation to the horizontal curves and roadside cross-sections (i.e. shoulders and slopes). SCHOOL BUS STOP AHEAD signs (Wc-26) were present at one residence; however, it could not be determined if the signing was consistent with the current pick-up and drop-off locations of all students. The school bus stop locations and their operations should be comprehensively reviewed, prior to approving a truck haul route along Witmer Road.

Witmer Road has a seven meter pavement width and up to one meter of gravel shoulder width. The width of Witmer Road is appropriate for a rural local road; however, individual lane widths would not be sufficient to accommodate simultaneous users in the same lane. Insufficient width is available for a shared roadway with trucks, cyclists and pedestrians

based on current guidance in Ontario Traffic Manual Book 18 or the TAC guide. It is our understanding that Witmer Road is used for cycling and walking; however, these users were not observed during our weekday morning field investigations. In some instances, larger vehicles will be required to cross the centreline to provide sufficient clearance to cyclists and pedestrians travelling along the paved portion of the roadway. At some locations, little or no traversable shoulder is available (refer to **Figure 3**) for pedestrians or cyclists to leave the travelled portion of the roadway to give way to larger vehicles.



Figure 3: North roadside of Witmer Road approaching the Queen Street intersection (© Google 2019).

Queen Street and Witmer Road Intersection

When conducting intersection assessments, consideration must be given to intersection capacity, gap availability and selection, traffic control devices, and available sight distances. The eastbound stop sign, eastbound STOP AHEAD warning sign, northbound and southbound INTERSECTION warning signs provide sufficient advance warning and visibility for the design speed.

Intersection capacity has been addressed in the Paradigm report; however, the sight distance has not. Sight distance requirements must be considered for vehicles approaching a stop-controlled condition and for vehicles departing from the recommended stop location into the intersection.

The approach sight distance is the sight triangle formed by the position of two opposing vehicles at a hypothetical position 3.0 seconds before they would reach impact, with the vehicle on the through road (i.e., Queen Street) travelling at the prevailing speed and the vehicle on the side road (i.e., Witmer Road) travelling at a design approach speed of 30 km/h (Refer to **Figure 4**). Sight triangle requirements² at stop-controlled intersections are intended to provide each vehicle with 3.0 seconds of visibility of the presence and potential actions of the other vehicle prior to a potential impact. The sight triangle must be clear of visual obstructions so that motorists can see opposing vehicles clearly within that triangle.

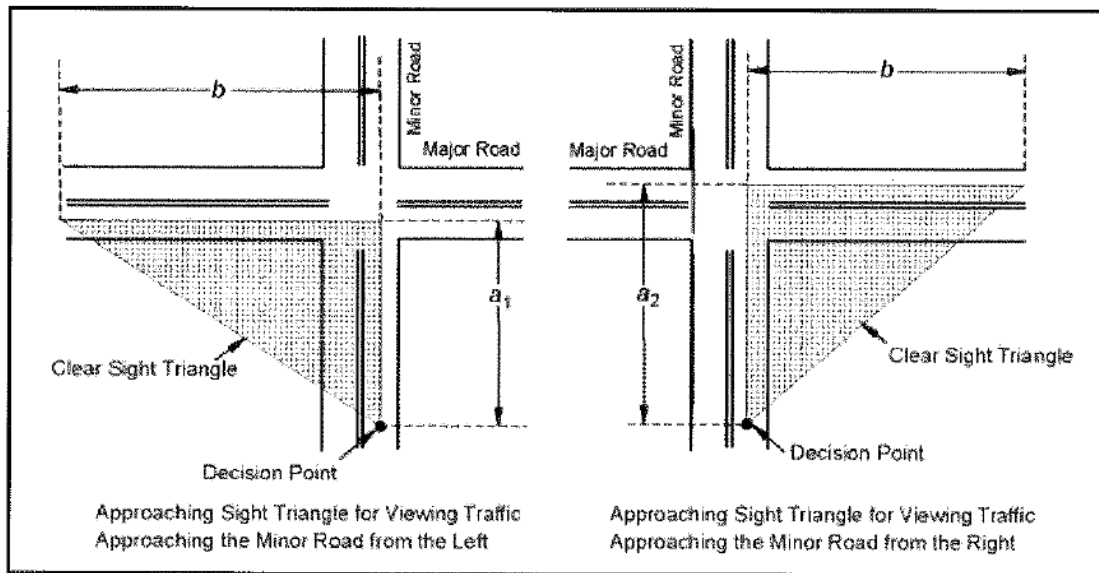


Figure 4: View of the approach sight triangle for a stop-controlled intersection (Figure 9.9.1, TAC Guide, 2017).

The approach sight distances on the southeast and southwest corners are not sufficient should a side street motorist intentionally complete a rolling stop or unintentionally enter the intersection without the right-of-way. **Figure 5** shows the northbound approach sight distance that is limited to approximately 27 to 34 m; whereas, the recommended distance is 75 m for a 90 km/h design speed. Queen Street motorists would have limited time to perceive and react to a side street motorist disregarding the right-of-way at the intersection.

² Chapter 9, Geometric Design Guide for Canadian Roads, Transportation Association of Canada, 2017.



Figure 5: Northbound Queen Street view of limited approach sight distance towards the eastbound approach to the Witmer Road intersection (TNS 2021).

From a typical stop location or decision point on a side street, a motorist needs sufficient sight distance along the main road to select a gap to enter the traffic stream or cross the roadway without significantly impeding traffic flow. The TAC Guide recommends departure sight distances (DSD), shown in **Figure 6**, for a crossing movement. In design, the DSD measured from a typical driver's eye height (1.08 metres) located on the side street, with the road user located a conservative 5.0 m back from the travel portion of the intersecting roadway.

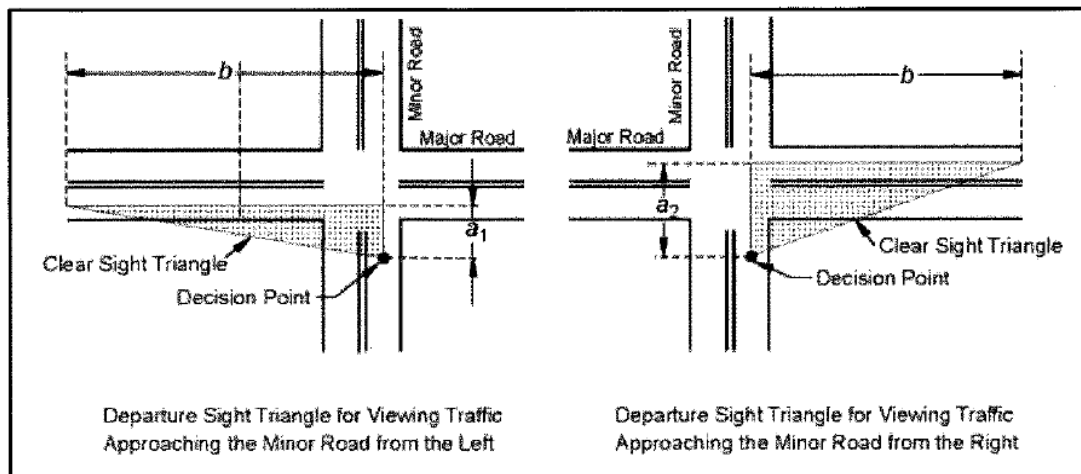


Figure 6: View of the departure sight triangle (Figure 9.9.2, TAC Guide, 2017).

DSDs from the eastbound and westbound stop-controlled approaches of the Queen Street and Witmer Road intersection were sufficient when measured according to the 5.0 m launch position. The required stop location (i.e., white stop bar) was located approximately 7.9 m west of the edge line of Queen Street, placing the motorist location 8 to 9 m back from the Queen Street travel way. From this location, the available departure sight distance is approximately 110 m as shown in **Figure 7**. The available DSD from this location are well below those required for a 90 km/h design speed.

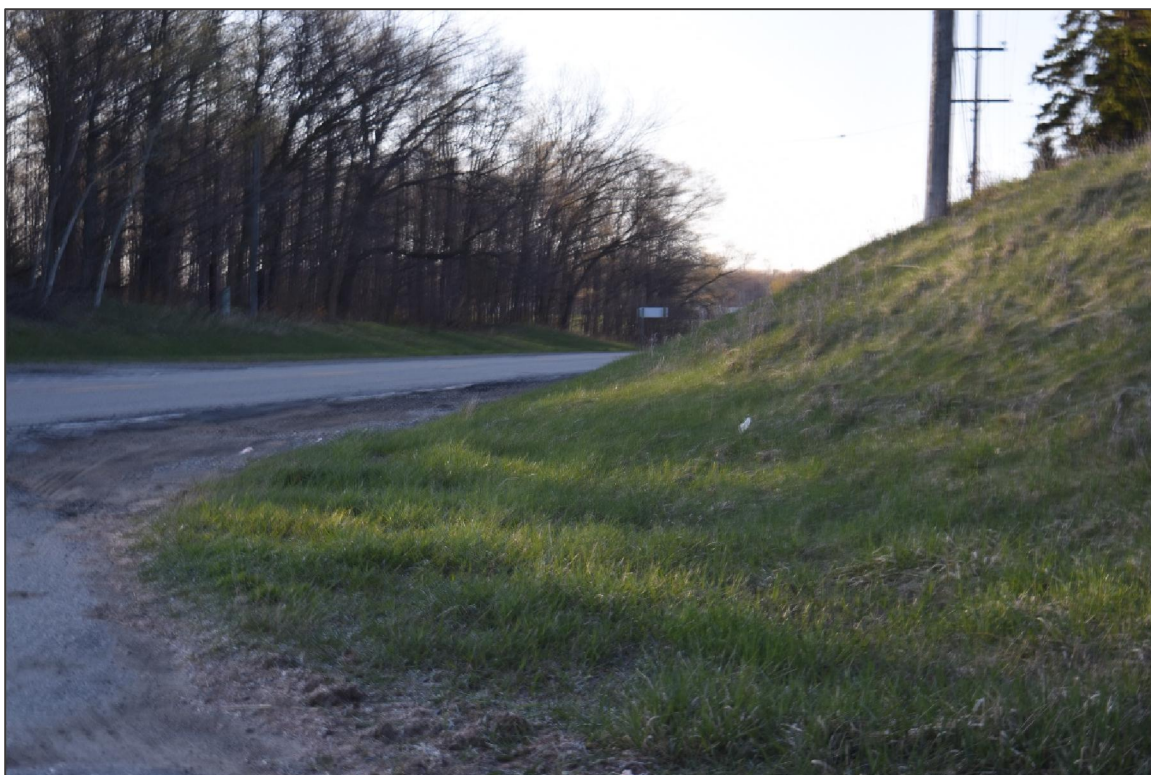


Figure 7: Available sight distance from a motorist positioned at the current eastbound stop bar location looking towards southbound traffic (TNS 2021).

The sight line requirements and traffic control device requirements (both warning signs and pavement markings) at the Queen Street and Witmer Road intersection should be reviewed to ensure that they are appropriate prior to permitting increased traffic volumes and heavy trucks from the proposed pit operations.

I trust the above meets your needs at this time. If you would like to further discuss the findings of our review, please do not hesitate to contact me.

Sincerely,



Russell Brownlee, M.A. Sc., FITE, RSP₁, P. Eng.

