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November 29, 2016

Town of Minto  
5941 Highway No. 89  
HARRISTON, Ontario  
N0G 1Z0

ATTENTION: Bill White  
Chief Administrative Officer/Clerk

RE: TOWN OF MINTO  
MAIN ST. / WILLIAM ST. INTERSECTION  
PALMERSTON  
OUR FILE: A3157A

Dear Mr. White:

We have undertaken a review of the intersection of Main Street and William Street in Palmerson to determine whether additional traffic or pedestrian control would be warranted. It is our understanding that the concerns at this intersection relate to pedestrians crossing Main Street, and sight distance for vehicles exiting William Street.

## **BACKGROUND**

Main Street (WR 123) is an east-west arterial road under the jurisdiction of the County of Wellington. It has one through lane in each direction and parking on both sides. The total width of the road is 13.0 m. William Street is a two-lane local road on the south side of Main Street with parking lay-by lanes on each side. On the north side of the intersection and slightly offset to the west is Jane Street, which is a one way northbound local road with parking on the west side.

Main Street is the through road and William Street is controlled by a stop sign. Because Jane Street is one way northbound, the intersection effectively operates as a tee intersection. There is an overhead flashing light, amber for Main Street and red for William Street. Pedestrian crossings have been painted on all four legs. The crosswalks on Main Street have no legal status, as pedestrians must yield to traffic on Main Street.

## **TRAFFIC COUNTS**

A eight hour traffic and pedestrian count was undertaken by the County of Wellington on May 11, 2016. During the eight hour period counted, 249 pedestrians crossed Main Street on the east side of William Street, and 123 pedestrians crossed Main Street on the west side, for a total of 372. Vehicular volumes on Main Street and William Street during this period were 3471 and 1114 respectively. Triton Engineering carried out additional pedestrian counts on November 14 and 17, 2016, which included a measurement of pedestrian delay. The pedestrian counts were split into those that crossed the road within 10 seconds of reaching the curb, and those that had to wait more than 10 seconds before crossing. This measure of pedestrian delay is used in the traffic signal warrant analysis.

The individuals undertaking the counts noted that a number of vehicles park at the Foodland parking lot and cross the street. It was also noted that drivers show courtesy towards the pedestrians and many stop for those in the Main Street crosswalks.

## **OPTIONS AND ANALYSIS**

The available options for traffic and pedestrian control at the intersection are as follows:

### **Full Traffic Signals**

The intersection could be fully signalized, with traffic heads controlling traffic on Main and William, and pedestrian heads for all four crossing. In accordance with current AODA requirements, Audible Pedestrian Signals are mandatory.

Warrants for traffic signals are based on the Justification calculations contained in Ontario Traffic Manual (OTM) Book 12 and includes seven different justifications.

#### Justifications 1 to 3 – Volume and Delay

This requires certain criteria to be met for each of the highest eight hours of traffic and includes both vehicle and pedestrian volumes. These warrants were not met, with values well under the warranted amounts.

#### Justification 4 – Minimum Four-Hour Vehicle Volume

This justification was developed by some agencies (it is not used by the Ministry of Transportation) and is applied in cases where heavy am and pm volumes do not meet the 8 hour warrants under Justifications 1 to 3, but there is high traffic during the peak hours. This warrant was not met at this location.

#### Justification 5 – Collision Experience

The warrant requires 15 accidents over a 36 month period which would be susceptible to correction by a traffic signal.

The County reported that there were five accidents in a four year period. This is well below the warrant value, and traffic signals are not justified based on collision experience.

#### Justification 6 – Pedestrian Volume and Delay

This calculation examines both pedestrian and traffic volumes for the highest eight hours of pedestrian movement. It consists of Part a, which is volume alone, and Part b which also examines delays. The latter analysis includes a consideration of the number of pedestrians that are delayed 10 seconds or more before being able to cross. The values from the count are plotted on Figure 3 and Figure 4. This justification was not met with the existing volumes at the intersection.

#### Justification 7 – Projected Volumes

This justification only applies where legs are being added to an intersection or a proposed major development is expected to add significant new traffic volumes. This does not apply to this situation.

## **Intersection Pedestrian Signals**

An Intersection Pedestrian Signal would provide traffic signal heads for Main Street actuated by pedestrian pushbutton only. A crosswalk would be provided on one side of the intersection, with pedestrian heads. William Street would continue to be controlled by a stop sign. In accordance with current AODA requirements, Audible Pedestrian Signals are mandatory.

Warrants for Intersection Pedestrian Signals are based on the Justification calculations contained in Ontario Traffic Manual (OTM) Book 12, using Justification 6. As outlined above, this justification is not met.

## **Pedestrian Cross-over**

Various types of Pedestrian Cross-overs may now be installed in Ontario, in accordance with the Ontario Traffic Manual (OTM) Book 15 - *Pedestrian Crossing Treatments* published in June 2016. There had been previous Draft versions, but the latest version has been adopted by the Province of Ontario and includes recent changes to Regulations under the Highway Traffic Act that were adopted through *Bill 31 – Transportation Statute Law Amendment Act (Making Ontario Roads Safer)*.

Prior to the publication of Book 15, the only type of PXO used in Ontario was the configuration with overhead illuminated amber signs, and pedestrian-actuated flashing amber beacons. This type of crossing is still legal in Ontario, and is now designated a Level 1, Type A PXO.

Bill 31 included changes to Regulations under the Highway Traffic Act that now permit the use of a new type of Pedestrian Crossover (PXO), designated Level 2. Within this Level are variations in the configuration called Type B, Type C, and Type D. What Level 2 PXO's have in common are black on white pedestrian crossing signs, "ladder-type" pavement markings, and the use of a yield line known as "shark's teeth markings". Illustrations of these new types of PXO are attached.

OTM Book 15 provides a Decision Support Tool (DST) describing threshold conditions for assessing pedestrian crossing needs and the selection of a Treatment System. It is noted that a study of traffic conditions and physical characteristics of a location under consideration is an important part of a complete analysis.

The Preliminary Assessment was carried out using the Flowchart tool illustrated in Figure 2 of the OTM Book 15 Decision Support Tool. The first step is to determine whether traffic signals are warranted for pedestrians, as per OTM Book 12. As outlined above, this warrant is not met. The flowchart then examines the minimum volumes for a Pedestrian Crossover. The traffic and pedestrian volumes at the intersection exceed the criteria.

A Pedestrian Cross-over should not be within 200 metres from another traffic control device. This criteria is met at this site.

The results of the Preliminary Assessment are that the intersection is candidate site for a PXO. Table 7 was then used to determine which type of PXO could be considered. While Main Street is a two-lane road, the table is based on overall width of the crosswalk when parking lanes are present. For this reason, the crossing should be analyzed as a 3-lane or 4-lane road. In either case, for a speed limit of 50 km/h, and the range of both 4 hour and 8 hour vehicular volumes, a PXO Level 2, Type B is indicated.

## **All-way Stop**

An all-way stop would provide stop signs on Main Street as well as William Street.

Warrants for all-way stop control are published in the *Ontario Traffic Manual, Book 5*. There are two separate warrant calculations, depending on the road classification. The first is for *Arterial and Major Roads*, and the second is for *Minor Roads*. Since Main Street is an Arterial Road, the intersection was analyzed as a Major Road. The major road method requires warrants to be met for eight separate hours, and includes an analysis of pedestrian activity. The warrants are not met at this site.

Further, it is noted that all-way stops should not be used where pedestrian protection is a prime concern. All-way stops are also inefficient in that they require all traffic to stop at all times, even when no conflicting movement is present.

## **SIGHT DISTANCE**

The Main Street and William Street approaches are flat and straight. There are no sight distance issues for traffic approaching the intersection from all directions.

There are sight distance restrictions for traffic stopped at the stop bar on William Street. To the west, sight distance is restricted by the building on the corner. To the east, because of the parking lot sight distances are generally favourable, although they could be partially obstructed by parked vehicles in the parking lot and on Main Street.

Once vehicles stop at the stop bar, drivers will move ahead to view oncoming traffic before proceeding with their turn. While not desirable, this situation is not uncommon in downtown areas with zero frontage buildings. Mitigating factors are the low traffic speeds, moderate traffic volumes, and presence of the flashing amber light. The low incidence of reported accidents indicates that there is not an existing safety concern.

## **REVIEW AND RECOMMENDATIONS**

### **Traffic or Pedestrian Signal**

The installation of a traffic or pedestrian signal at this intersection is not justified. We do not recommend the installation of unwarranted signals as they are inefficient and will result in additional delays.

The counts showed that the majority of pedestrians are now crossing with minimal delay (less than 10 seconds). Pedestrian delay could also be increased with the installation of a traffic signal since pedestrians must push the button to activate and wait for the light to change.

### **Pedestrian Crossover**

The recently introduced methodology in the Ontario Traffic Manual Book 15 indicates that the intersection could be a candidate site for a Level 2, Type B Pedestrian Cross-over. A Type B crossing consists of pedestrian signs (Ra-5) mounted both beside the crossing and overhead. The side mounted signs are supplemented with Double-sided Rectangular Rapid Flashing Beacons on the side-mounted sign that are actuated by the pedestrian. Pavement markings consist of a ladder crosswalk and “sharks teeth” yield lines.

This type of PXO is new and may not yet be well understood by the travelling public. The Pedestrian Cross-over that has been in use in Ontario for some time (now designated a Level 1, Type A PXO) has

been discontinued by many municipalities, and replaced with pedestrian signals. The Level 2 PXO provides a lower cost method of accommodating pedestrian movements. However, it still relies on the motorist observing that a pedestrian is about to enter (or has entered) the crosswalk and that they must stop for the pedestrian. There is also an onus on the pedestrian to make sure they are seen and to allow sufficient time and room for a vehicle to stop prior to entering the crosswalk.

Since the Level 2 type of PXO has only recently been introduced in Ontario, there is limited feedback available as to their effectiveness, safety and operations. As municipalities begin to implement this type of crossing, drivers and pedestrians will become more familiar with them. It is noted that the County of Wellington has recently installed Level 2, Type D PXO's on Toronto Street in Palmerston and at the new roundabout. We are not aware of any concerns with these installations.

If a PXO is to be considered at this intersection, more work would be required to determine the optimal location and identify any other modifications that may be required to enhance the safety and effectiveness of the crossing. Additional parking restrictions would be required which would result in the elimination of some parking spaces on Main Street.

It should also be noted that if a PXO were installed, the existing flashing amber/red lights would need to be removed.

### **All-Way Stop**

An all-way stop is not warranted in accordance with OTM Book 5, and we do not consider it to be an appropriate method of traffic control at this location.

### **DISCUSSION**

In the absence of documented operational or safety concerns, no action needs to be taken at this intersection. However, the volume of traffic and number of pedestrians crossing the road makes this a candidate site for a Type B Pedestrian Crossover. If the Town wishes to pursue this option, a request could be made to the County of Wellington.

The site would need to be further evaluated for the following:

- Crosswalk Location – The Crosswalk could be located on the east or west side of the intersection. There are higher pedestrian volumes on the east side, so this would likely be favoured;
- Parking – Parking needs to be restricted within 15m (min) to 30m (desirable) of the crosswalk;
- Configuration – The crosswalk should be as close to 90 degrees to the roadway as practical. The existing painted crosswalks are on a skew.

The existing marked crosswalks do not have any legal status, and pedestrians must yield to traffic. This may create some confusion with the existing configuration. For this reason, it is recommended that either the existing crosswalk lines be removed, or brought up to current standard for a Pedestrian Cross-over in accordance with OTM Book 15.

## SUMMARY

A review of traffic and pedestrian treatments at Main Street and William Street has been undertaken. Our findings and recommendations are summarized as follows:

- A traffic or pedestrian signal is not justified in accordance with the methodology contained in the Ontario Traffic Manual Book 12;
- An all-way stop is not warranted;
- The site is a candidate location for a Pedestrian Cross-over, Type B, in accordance with the Ontario Traffic Manual Book 15. Issues that should be addressed if this installation is considered would include location, configuration, and parking restrictions.
- Any recommendations would require the approval of the County of Wellington, which is the road authority.

We trust that this meets your current requirements, and we would be pleased to review our findings with you as required.

Yours very truly,

TRITON ENGINEERING SERVICES LIMITED



Howard Wray, P. Eng.