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Pedestrian Crossover Policy Staff Report to Council

Report Number: 2024-04

Department(s): Engineering Services

Author(s): M. Kryzanowski, Manager, Transportation Services

Meeting Date: February 5, 2024

Recommendations

1. That the report entitled Pedestrian Crossover Policy, dated February 5, 2024, be received; and,
2. That the contents of Appendix 1 be approved; and,
3. That the Parking By-law be reviewed, and necessary Stopping Prohibitions for Pedestrian Crossovers (PXO) be added; and,
4. That the implementation of a pilot Type B PXO at Gorham Street & Muriel Street be approved in the amount of \$36,000, to be funded through the Transportation Operating Budget for 2024; and,
5. That Staff be authorized and directed to do all things necessary to give effect to this resolution.

Executive Summary

The development of the policy was initiated in response to public requests and is based on the Ontario Traffic Manual. The discussion outlines additions to the Town's existing Transportation Management Policy, including Pedestrian Crossover (PXO) policy details, definitions, warrant processes, and a pedestrian crossover selection matrix. The warrant process involves a preliminary assessment, traffic and pedestrian studies, and criteria such as the minimum distance to existing traffic control installations and pedestrian system connectivity. Two case studies, Gorham Street at the Muriel Street intersection and Red Deer Street at the pedestrian trail entrance, were used to evaluate whether they qualify for a PXO using the proposed warrant process and the Pedestrian Crossover Selection Matrix. It was determined that Gorham Street at Muriel Street meets the warrants, whereas Red Deer Street at the pedestrian trail entrance does not.

It is therefore being recommended that a Type B PXO be installed at the Gorham Street at Muriel Street location.

Purpose

The purpose of this report is to recommend the addition of a new Pedestrian Crossover Policy to be added to the existing Transportation Management Policy, and to evaluate two case studies using the new policy methods. This new policy will provide definitions, warrants, and a pedestrian crossover selection matrix.

Background

In response to requests from the general public, Town Council directed the development of a Pedestrian Crossover Policy for Newmarket. Staff developed this new policy based on the Ontario Traffic Manual (OTM) Book 15 - Pedestrian Crossing Treatments, which incorporates PXOs introduced by the Ministry of Transportation of Ontario in 2016.

Discussion

The Transportation Management Policy is organized into two main sections. The primary section outlines the general guidelines, while the appendices provide specific items, warrants, or limitations of the policy. The recommended changes to the Transportation Management Policy are outlined in Appendix 1 of this report.

The new addition to the primary section of the Transportation Management Policy to incorporate PXO's describes the general policy, including how PXO's can be requested and where to find the procedure for reviewing PXO requests. Furthermore, it is recommended to introduce six new definitions in 'Appendix A – Definitions'. These additions encompass terms such as PXO, Assisted Pedestrians, Unassisted Pedestrians, and the various types of PXOs (B, C, and D). The last section of Appendix 1 includes the procedures and warrants for new Pedestrian Crossovers, which staff suggest including in 'Appendix C - Traffic Management'.

The warrant process starts with the Preliminary Assessment, focusing on sight distance, the maximum paved road width, and the distance from the railway. This initial step is mandatory before proceeding any further with the warrants. After passing the Preliminary Assessment, an 8-hour study of vehicle and pedestrian volumes is conducted at the site. The evaluation consists of four types of warrants: Total Traffic Volumes, Total Pedestrian Volumes, Existing Traffic Control Devices, and Pedestrian System Connectivity.

The criteria specify that the total traffic volume should exceed 750 vehicles within the 8-hour count, and the total pedestrian count must reach a minimum of 100 within the same timeframe. Adjustments to the pedestrian volume will be made based on the number of assisted pedestrians, including children under the age of 12, senior citizens, and

individuals with mobility challenges or those needing special assistance. Each of these individuals are counted as two pedestrians.

Warrant C requires a minimum distance of 200 metres from existing traffic control devices, such as traffic signals or all-way stop controls. Meanwhile, Warrant D focuses on enhancing Pedestrian System Connectivity.

The last warrant, Warrant E, focuses on existing school crossing guard locations. Since school-aged children can safely cross the street under the supervision of a school crossing guard, their volume is deducted from the total pedestrian volume.

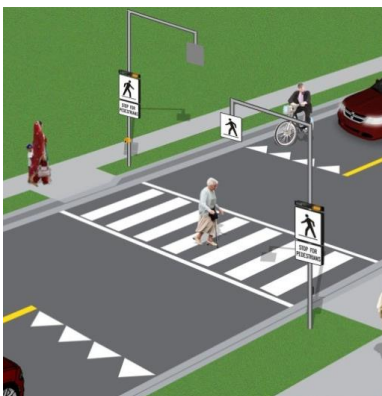
Any location that meets 100% of traffic & pedestrian volumes and is located 200 meters away from the existing traffic control devices can be warranted. Similarly, any site that meets 100% of traffic & pedestrian volumes and that offers the potential of improved pedestrian system connectivity can also be warranted.

The type of PXO being recommended for warranted sites is determined using the Pedestrian Crossover Selection Matrix, which takes into consideration two-way traffic volume, paved road width, and the presence of a raised refuge island. For example, a typical 8.5 metre wide local road with 950 vehicles within an 8-hour study would be classified as requiring a Type C PXO, according to the Matrix.

The last clause of the policy indicates that 'difficult locations may require a safety audit by the consultant.' This provision is intended to address complex situations that may not be adequately addressed by the standard policy.

PXO Installation

There are three types of PXOs that can be implemented with this policy.



Type B PXO



Type C PXO



Type D PXO

Type B pedestrian crossovers are specifically characterized by the mandated use of regulatory and warning signs (side-mounted and overhead-mounted crossover signs), Rapid Rectangular Flashing Beacons (RRFBs), and pavement markings are outlined in OTM Book 15.

Type C pedestrian crossings require the use of regulatory and warning signs (side-mounted only), RRFBs, and pavement markings as detailed in OTM Book 15.

Type D pedestrian crossings are specifically characterized by the mandated use of regulatory and warning signs (side-mounted only), along with pavement markings as detailed in OTM Book 15.

All types of PXO’s require stopping prohibitions within 15 m of the crosswalk. Therefore, Staff will review the Parking By-law and will add the necessary stopping prohibitions.

Additional Components

In addition to the components outlined in OTM Book 15, staff recommend the inclusion of ‘Yield to Pedestrian’ flexible bollards for drivers, and informational signage for pedestrians, as shown below. These additional components aim to educate both pedestrians and drivers on the safe use of PXOs.



Flexible Bollard at PXO



Information Signage for Type B & C PXOs



Information Signage for Type D PXOs

PXO Installation Costs

The table below shows the estimated installation cost for each PXO type as of 2022.

PXO Type	Description	Approximate Installation Cost
Type “B”	Signs (overhead and ground mounted), pavement markings, and RRFBs	\$26,000
Type “C”	Signs (ground mounted), pavement markings, and RRFBs	\$20,000
Type “D”	Signed (ground mounted) and pavement markings	\$5,000

Case Studies

Transportation Services has received formal requests to review two locations for new PXO's. The proposed locations and the warrant process and results of the studies using the new PXO policy are presented below.

Gorham Street at Muriel Street

Gorham Street is an east-west collector road with an average daily volume of 8,600 vehicles. The road has a width of 8.5 metres and consists of two lanes. Near Muriel Street, Gorham Street has parking restrictions on both sides, and there is an existing school crossing guard location on Gorham Street at Muriel Street.

1) Preliminary Assessment

The site has adequate sight distance, road width, and no nearby railway. Thus, the site meets all the criteria in the preliminary assessment.

2) Warrants

As the site is an existing school crossing guard location, either Warrants A, C, and E, or Warrants A, D, and E, must be fulfilled at 100% to justify a crosswalk.

The table below shows the 8-hour vehicle and pedestrian volume study data that were collected (May 2023) and the results. One thing to note is how the total pedestrian volume was calculated. The pedestrian volume study reveals that, during the 8 peak hours, there were 47 unassisted pedestrians, 34 assisted pedestrians, and 21 elementary school-aged children who crossed the street.

The formula for calculating pedestrian volume for an existing school crossing guard location is as follows:

$$\text{Adjusted volume} = \text{Unassisted Pedestrian Volume} + 2 \times (\text{Assisted Pedestrian Volume} - \text{Elementary School Aged Children})$$

Thus, the adjusted pedestrian volume for Gorham Street at Muriel Street can be calculated as: $47 + 2 \times (34 - 21) = 73$

Warrant	Threshold	Data	Result
A. Total Traffic Volume (8-hour)	750	5,625	Met
C. Existing Traffic Control Devices	>200m	630m	Met
E. Total Pedestrian Volumes for Existing School Crossing Guard Locations	70	73	Met

Gorham Street at Muriel Street would meet 100% of Warrants A, C, and E, making it eligible for a PXO under the new policy. The next step is choosing the PXO type based on the Pedestrian Crossover Selection Matrix.

3) Pedestrian Crossover Type Selection

The Two-way Vehicular Volume of the proposed site is 5,625, placing it in the third row of the Pedestrian Crossover Selection Matrix (see table below). Given that the Paved Road Width of Gorham Street is 8.5 m, a Type B PXO can be implemented on Gorham Street at Muriel Street.

Two-way Vehicular Volume		Paved Road Width			
Lower Bound	Upper Bound	Less than or Equal to 7.5m	Between 7.6m and 11.3m	More than 11.3m w/ raised refuge	More than 11.3m w/o raised refuge
750	2,250	Type D	Type C	Type D ¹	Type B
2,250	4,500	Type D	Type B	Type D ¹	Type B
4,500	6,000	Type C	Type B	Type C ¹	Type B
6,000	7,500	Type B	Type B	Type C ¹	Type B
7,500	17,500	Type B	Type B		

¹ Use of two sets of side mounted signs for each direction (one on the right side and one on the median)

Red Deer Street at Pedestrian Trail Entrance

Red Deer Street is an east-west local road with a two-lane cross-section. The average daily volume is 1,380, and the width of the road is 8.5 metres. There are parking restrictions on both sides of Red Deer Street near the trail entrance.

1) Preliminary Assessment

The proposed site has adequate road width and no railway nearby; however, the site has limited sight distance for both drivers and pedestrians due to the curve and existing trees. As a result, the site does not meet the preliminary assessment. Additionally, there is an existing mailbox adjacent to the trail entrance, which could create greater issues as PXOs should maintain no stopping within 15 metres of a PXO.

With an unsatisfactory preliminary assessment, the proposed site would not grant the opportunity for progressing with the studies for warrants. Hypothetically, if the trees at the curve are cut and the mailbox is relocated, the site distance could be achieved. This makes it difficult to make decisions on this site. Thus, this site would be eligible for progressing studies for warrants if those actions were taken. If the proposed site meets the warrant requirements, a safety audit by the consultant will be required due to the complexity of the location.

2) Warrants

For the proposed site to be warranted, either Warrant A, B, and C or A, B, and D must meet 100%.

The table below shows the 8-hour vehicle and pedestrian volume study data (October 2023) and the results. The pedestrian volume study indicates that there were 58 unassisted pedestrians, and 2 assisted pedestrians who crossed the street during the 8 peak hours. The formula for calculating pedestrian volume is as follows:

Adjusted volume = Unassisted Pedestrian Volume + 2 x Assisted Pedestrian Volume

Therefore, the adjusted pedestrian volume for Red Deer St at the Trail Entrance can be calculated as: $58 + 2 \times 2 = 62$

Warrant	Threshold	Data	Result
A. Total Traffic Volumes (8-hour)	750	937	Met
B. Total Pedestrian Volumes (8-hour)	100	62	Not Met
C. Existing Traffic Control Devices	>200m	92 m	Not Met
D. Pedestrian System Connectivity	Yes	Yes	Met

Red Deer Street at the Trail Entrance would not meet either Warrants A, B, and C or Warrants A, B, and D. Therefore, the site is not eligible for a new PXO, and no safety audit is required.

Conclusion

The proposed Pedestrian Crossover Policy serves as an appropriate tool for determining the ideal locations for PXO's in Newmarket. It is recommended that the contents of Appendix 1 be included into the Transportation Management Policy. It is also recommended that a Type B PXO be implemented on Gorham Street at Muriel Street.

Business Plan and Strategic Plan Linkages

Well-planned and connected...strategically planning to improve information, access and enhance travel to, from, and within Newmarket.

Consultation

No consultation was undertaken in preparation of this report.

Human Resource Considerations

While no additional resources are required, adopting the policy amendments aligns with the current traffic software being used, making reviews and analyses easier to conduct, thus improving staff efficiency.

Budget Impact

The estimated cost for the new Type B PXO on Gorham Street at Muriel Street is approximately \$36,000.00. Funding for this project can be drawn from the Transportation Services Business unit. Further, since this PXO will be the first for the Town, additional technology may be required to assess compliance and operations. This additional cost can also be drawn from the 2024 Transportation Services budget.

Attachments

Appendix 1- Proposed Pedestrian Crossover Policy

Approval

Rachel Prudhomme, Director, Engineering Services

Peter Noehammer, Commissioner, Development & Infrastructure Services

Contact

For more information or questions regarding this report, please contact Mark Kryzanowski, Manager, Transportation Services, at 905-895-5193 extension 2508 or MKryzanowski@newmarket.ca.