



Appendix K – Pedestrian Cross-Over Policy





Pedestrian Crossover (PXO) Policy



RC SPENCER
ASSOCIATES INC.
Consulting Engineers

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1.0 Introduction

As communities strive to create safer and more pedestrian-friendly environments, the implementation of effective pedestrian crossing guidelines becomes very important. The City of Woodstock (the City), like many others, recognizes the importance of ensuring the safety of its pedestrians. While traffic control devices can help, education for both pedestrians and drivers is key. Certain demographics, like school-age children and the elderly, are at higher risk and require specific attention. It's important to carefully choose and monitor the use of traffic control measures to ensure they are effective and address the most problematic areas.

1.1 What is a Pedestrian Crossover (PXO)?

Pedestrian crossovers (PXOs) play a crucial role in ensuring pedestrian safety by providing designated crosswalks in areas where there are no traffic signals. These crossings include features such as overhead yellow lights that serve as warnings for drivers and cyclists, activating when pedestrians intend to cross via push-button mechanisms.

Advantages of a PXO

- Can guide pedestrians towards the most direct route across traffic.
- Aids in positioning pedestrians where they are most visible to oncoming vehicles.
- Enhances nighttime visibility for pedestrians crossing roads.
- Directs and concentrates pedestrian traffic to specific areas.
- Supports enforcement of pedestrian crossing rules.
- Serves as a reminder to motorists approaching areas prone to pedestrian interactions.

Disadvantages of a PXO

- May instill a false sense of security in pedestrians, leading them to unsafe positions among vehicular traffic.
- Might lead pedestrians to assume motorists will always yield, even when it's unsafe or impossible.
- Could contribute to more rear-end collisions as pedestrians misjudge motorists' actions and fail to wait for safe gaps in traffic.
- May result in increased injuries for both pedestrians and motorists.
- Risks undermining respect for pedestrian regulations and traffic controls if installed without proper justification

This Pedestrian Crossover (PXO) policy provides the basis for PXO implementation in the City of Woodstock. The program's processes for the screening, warranting, and implementing the PXOs are extracted directly from those identified in the Ministry of Transportation of Ontario's (MTO) [Ontario Traffic Manual \(OTM\) Book 15 – Pedestrian Crossing Treatments](#).

2.0 Legal Framework

Since January 1st, 2016, revisions to the Highway Traffic Act (HTA) have enabled municipalities like the City of Woodstock to install PXOs through a new legislative category. This update, including the Act itself, [regulation 402/15](#), and Book 15, provides the authority to implement PXOs on roads with reduced speed limits and moderate to low traffic flow.

OTM Book 15 includes all of the background information and justification regarding the use of PXOs as safe pedestrian crossing treatments in Ontario. It must be referred to for clarification on any interpretation of the PXOs outside of the definitions stated further below as defined in OTM Book 15. It reflects the legal framework in which the program needs to operate which encompasses the following items:

- HTA
 - Categories of Pedestrian Crossings.
 - Pedestrian Rights and Responsibilities.
 - Ontario Regulations.
- Accessibility
 - Legislative Requirements - Accessibility for Ontarians with Disabilities Act (AODA).
 - Designing for Accessibility.
 - Curb Ramps and Depressions.

Definitions for key terms pertaining to the PXO Policy are included below:

- **Pedestrian:**
 - A person who is not in or upon a vehicle, motorized or otherwise propelled.
 - A person in a wheelchair driven by muscular or any other kind of power.
 - A person pushing a bicycle, or a wheelchair.

- **Crossings** - The HTA recognizes two categories of crossings.
 - **Controlled** – where vehicles are required to stop or yield to traffic legally in the crossing, which includes pedestrians. These include:
 - Traffic Control Signals.
 - Intersection Pedestrian Signals.
 - Mid-block Pedestrian Signals.
 - Pedestrian Crossovers.
 - STOP Sign.
 - Yield Sign.
 - School Crossing when a school crossing guard is supervising.
 - **Uncontrolled** – Where pedestrians must wait for a safe gap in traffic, sufficient for them to cross the roadway, prior to attempting to enter the roadway. These include:
 - Mid-block Crossings (in the absence of traffic control signals, intersection pedestrian signals or pedestrian crossover).
 - Designated School Crossing (In the absence of a crossing guard and without other forms of control such as traffic control signals, intersection pedestrian signals, pedestrian crossover, STOP signs or yield signs).
 - Marked Crossing (at intersection in the absence of STOP or YIELD signs).
 - Roundabouts.

3.0 PXO Assessment Process

The OTM Book 15 provides a Decision Support Tool (DST) which includes two components: (1) Preliminary Assessment, and (2) Pedestrian Crossing Selection. The DST flow chart is provided in **Figure 1**. The preliminary assessment is used to check whether a location is a candidate site for a pedestrian crossing control, whether its warranted or not, and then the pedestrian crossing selection assists practitioners to choose an appropriate pedestrian crossing treatment system for the site in question.

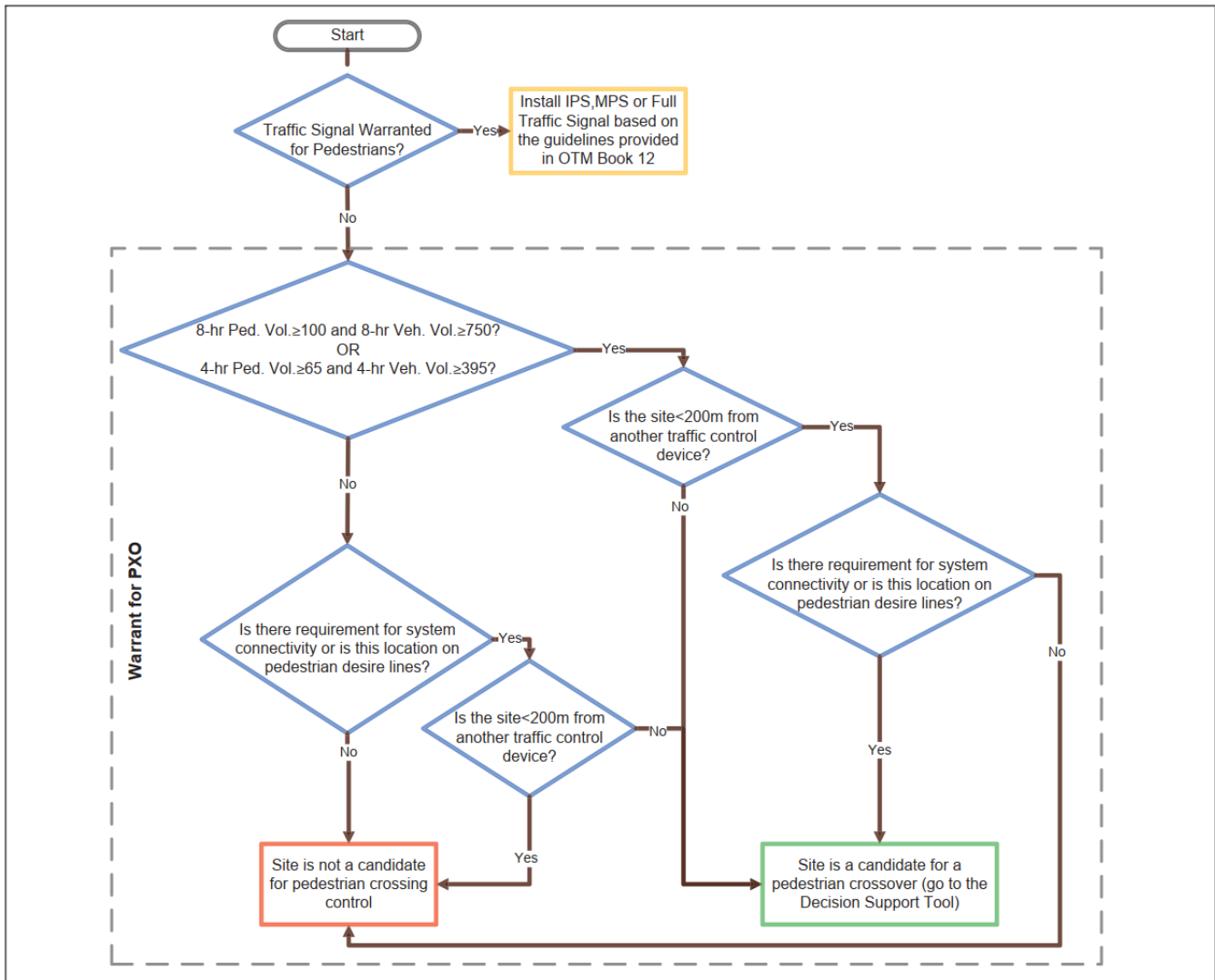


Figure 1 Decision Support Tool (DST) - Preliminary Assessment Flow Chart (OTM Book 15)

3.1 Preliminary Assessment

Even before the preliminary assessment is undertaken, it must be confirmed that the identified location has adequate sight distance for both motorists and pedestrians. Motorists must be able to

see pedestrians in the waiting area adjacent to the crossing in sufficient time to perceive their intent to cross, react and brake to a stop comfortably. Similarly, pedestrians must be able to see oncoming traffic in both directions of travel so that they do not begin to cross when motorists have insufficient time to stop. To accommodate sight lines, it may be necessary to modify curb side regulations which may include the removal or relocation of on-street parking, bus stops, loading zones, etc. These minimums stopping sight distances can be determined through standard guidance provided in the Transportation Association of Canada (TAC) Geometric Design Guide for Canadian Roads (2017).

The preliminary assessment involves the following steps:

- **Step 1:** Check whether a traffic signal is warranted for pedestrians based on Justification 6 of OTM Book 12 – Traffic Signals. The types of signals warranted through OTM Book 12 include full traffic signal, IPS, and MP. [Traffic Signal Justification Spreadsheets](#) provided by MTO can be utilized for this purpose.
- **Step 2:** If a traffic signal is not warranted, the flow chart identified in **Figure 1** assists in checking whether a PXO is warranted for the site. When referring to the flow chart, the following elements must be reviewed.
 - Does the total eight-hour pedestrian volume crossing the main road at an intersection or midblock location during the highest pedestrian traffic hours is greater than 100 “equivalent adult pedestrians” and the eight-hour vehicular volume during the same time period is greater than 750 vehicles, or
 - Does the total four-hour pedestrian volume crossing the main road at an intersection or midblock location during the highest pedestrian traffic hours is greater than 65 “equivalent adult pedestrians” and the eight-hour vehicular volume during the same time period is greater than 395 vehicles?
 - Is the distance of the site from the closest traffic control device more than 200 m.
 - Is there a need for system connectivity which includes facilitating connectivity between crosswalks and sidewalks and/or trail networks. Pedestrian desire lines may also be an indicator of a need for system connectivity.

In completing Step 2 of the preliminary assessment, the following elements should be considered:

- Eight-hour volumes should be used for urban areas. Four-hour counts may be used for rural areas with populations less than 10,000.

- Assisted pedestrian volumes should be considered as two persons. These include children under 12, seniors and those disabled with or without assistance.

If a two-way stop control intersection does not satisfy the minimum requirements for an IPS, full traffic signal, or PXO, warrants for an all-way stop should be checked.

3.2 Treatment System Selection

The second component of the DST provides guidance for pedestrian crossing treatment selection to assist practitioners in identifying which treatment system is applicable to the site based on its traffic and geometric characteristics.

Table 1 provides a guideline for the treatment system and the likely application environment.

Table 1 Pedestrian Crossing Treatment System Selection (OTM Book 15)

Type of Crossing	Treatment System	Mid-block	Intersection	Roundabout	Right-turn Channel
Traffic Signal	Full Signal		•		
	Intersection Pedestrian Signal		•		
	Mid-block Pedestrian Signal	•			
Pedestrian Crossover	Level 1 Type A	•	•		
	Level 2 Type B	•	•	•	
	Level 2 Type C	•	•	•	
	Level 2 Type D	•	•	•	•
	Stop or Yield Control		•		•
	Crossing Guard	•	•	•	•

3.3 PXO Selection

Ontario [regulation 402/15](#) defines two types of PXOs (Level 1 and Level 2) based on signs and pavement markings. Level 1 corresponds to PXO type A and Level 2 corresponds to PXO types B, C, and D. The selection of an appropriate PXO treatment (i.e. Type A, B, C, or D) is determined based on the Pedestrian Crossover Selection Matrix as shown in **Table 2**. The matrix has been developed based on the following criteria:

- Application of PXOs is limited to road segments with a posted speed limit of 60 km/h or less
- A PXO can be installed on roadways with a maximum of 4 lanes.

- Vehicular traffic volumes are collected during the 8 or 4 hours with the highest pedestrian volumes.
- A PXO must not be used where the road volume exceeds 35,000 AADT (Average Annual Daily Traffic).

PXOs should not be installed within 200m of other signal-protected pedestrian crossings, although there are some exceptions.

Table 2 Pedestrian Crossover Selection Matrix (OTM Book 15)

Two-way Vehicular Volume			Posted Speed Limit (km/h)	Total Number of Lanes for the Roadway Cross Section ¹			
Time Period	Lower Bound	Upper Bound		1 or 2 Lanes	3 lanes	4 lanes w/raised refuge	4 lanes w/o raised refuge
8 Hour	750	2,250	≤50	Level 2 Type D	Level 2 Type C ³	Level 2 Type D ²	Level 2 Type B
4 Hour	395	1,185		Level 2 Type C	Level 2 Type B	Level 2 Type C ²	Level 2 Type B
8 Hour	750	2,250	60	Level 2 Type D	Level 2 Type B	Level 2 Type D ²	Level 2 Type B
4 Hour	395	1,185		Level 2 Type C	Level 2 Type B	Level 2 Type C ²	Level 2 Type B
8 Hour	2,250	4,500	≤50	Level 2 Type D	Level 2 Type B	Level 2 Type D ²	Level 2 Type B
4 Hour	1,185	2,370		Level 2 Type C	Level 2 Type B	Level 2 Type C ²	Level 2 Type B
8 Hour	2,250	4,500	60	Level 2 Type D	Level 2 Type B	Level 2 Type D ²	Level 2 Type B
4 Hour	1,185	2,370		Level 2 Type C	Level 2 Type B	Level 2 Type C ²	Level 2 Type B
8 Hour	4,500	6,000	≤50	Level 2 Type B	Level 2 Type B	Level 2 Type C ²	Level 2 Type B
4 Hour	2,370	3,155		Level 2 Type C	Level 2 Type B	Level 2 Type C ²	Level 2 Type B
8 Hour	4,500	6,000	60	Level 2 Type B	Level 2 Type B	Level 2 Type C ²	Level 2 Type B
4 Hour	2,370	3,155		Level 2 Type C	Level 2 Type B	Level 2 Type C ²	Level 2 Type B
8 Hour	6,000	7,500	≤50	Level 2 Type B	Level 2 Type B	Level 2 Type C ²	Level 1 Type A
4 Hour	3,155	3,950		Level 2 Type C	Level 2 Type B	Level 2 Type C ²	Level 2 Type B
8 Hour	6,000	7,500	60	Level 2 Type B	Level 2 Type B	Hatched	Hatched
4 Hour	3,155	3,950		Level 2 Type C	Level 2 Type B	Hatched	Hatched
8 Hour	7,500	17,500	≤50	Level 2 Type B	Level 2 Type B	Hatched	Hatched
4 Hour	3,950	9,215		Level 2 Type C	Level 2 Type B	Hatched	Hatched
8 Hour	7,500	17,500	60	Level 2 Type B	Hatched	Hatched	Hatched
4 Hour	3,950	9,215		Level 2 Type C	Hatched	Hatched	Hatched

Type A
 Type B
 Type C
 Type D

Approaches to roundabouts should be considered a separate roadways.

¹The total number of lanes is representative of crossing distance. The width of these lanes is assumed to be between 3.0 m and 3.75 m according to MTO Geometric Design Standards for Ontario Highways (Chapter D.2). A cross sectional feature (e.g. bike lane or on-street parking) may extend the average crossing distance beyond this range of lane widths.

²Use of two sets of side mounted signs for each direction (one on the right side and one on the median)

³Use Level 2 Type B PXO up to 3 lanes total, cross section one-way.

The hatched cells in this table show that a PXO is not recommended for sites with these traffic and geometric conditions. Generally a traffic signal is warranted for such conditions.

Table 2 considers four variables to select a PXO for a site:

- 8-hour or 4-hour two-way vehicular volume of the roadway at the location of the crosswalk.
- Posted speed limit of the roadway.
- Total number of lanes for the entire roadway cross-section.

Presence of raised pedestrian refuge (i.e., refuge island or median).

4.0 Physical Design Components

The following provides an overview of the geometric requirements of a PXO. Should more detailed information on the design components for PXOs be sought, Book 15 Chapter 6 - Pedestrian Crossing Facility Design: Controlled Crossings should be reviewed.

Crosswalk

According to the HTA, a “crosswalk” means,

- a. that part of a highway at an intersection that is included within the connections of the lateral lines of the sidewalks on opposite sides of the highway, measured from the curbs or, in the absence of curbs, from the edges of the roadway, or
- b. any portion of a roadway at an intersection or elsewhere distinctly indicated for pedestrian crossing by signs or by lines or other markings on the surface.

Crosswalks must be marked for all controlled pedestrian crossing treatments.

Curb Ramps and Depressions

Curb ramps provide access for people using wheelchairs or scooters at crossings where there is an elevation change between the sidewalk and the street level crossing. Curb depressions improve accessibility for crossing activity for all pedestrians. They are typically provided in urban areas where pedestrian activity exists. Curb depressions are not intended to imply right-of-way, but rather to improve accessibility and safety where pedestrian activity has been demonstrated or is anticipated.

Specific requirements for depressed curbs are provided in Book 15 Section 2.3.3 Designing for Accessibility.

Signs

The regulatory signs must be provided, wherever conditions are met according to OTM Book 5 – Regulatory Signs and Ontario Regulation 615 with all amendments. Where right-of-way to pedestrians is being assigned at new locations through the provision of a PXO, an introductory period is required to safely carry out the transition. The complete procedure with required regulatory signs is also included in Ontario Regulation 615.

Rapid Rectangular Flashing Beacons with Tell Tale

Rapid Rectangular Flashing Beacons (RRFBs) are pedestrian-activated, high-intensity flashing beacons that warn drivers of the presence of a pedestrian in the crosswalk. RRFBs consist of two rectangular yellow indications with two tell-tale end indicators to let pedestrian know that the beacon is flashing.

RRFBs are required components for PXO Types B and C. Wherever required for an applicable PXO, an RRFB must be used for each direction of travel (see installation layouts of PXO Types B and C).

Markings

The guidelines related to design, installation, and application of pavement markings are provided in [OTM Book 11 – Markings and Delineation](#). Additionally, Ontario Regulation 615 provides information regarding requirements for pavement markings utilized with PXOs.

A yield to pedestrian line is used to indicate the point at which a vehicle approaching a crosswalk must yield to pedestrians in the crosswalk. A yield to pedestrian line is a mandatory component for PXO Types B, C, and D, and is a desirable component for PXO Type A.

Ladder crosswalk markings are a mandatory component for PXO Types B, C, and D. The outer edge of the ladder crosswalks must be minimum 1.5m from the yield to pedestrian line for two-lane roadways and minimum 6.0m from the yield to pedestrian line for multi-lane roadways.

Illumination

The design of all pedestrian crossing treatments (controlled or uncontrolled) must provide adequate lighting to enhance the safety of pedestrians. The guidelines related to planning and design of roadway lighting including lighting of pedestrian crosswalks at intersections, roundabouts and mid-blocks are provided in the TAC Guide for the Design of Roadway Lighting (Roadway Lighting Guide). The Guide also includes the warranting criteria for each application of roadway lighting.

Design Approach

Design, application and operational guidelines and procedures should be used with judicious care and proper consideration of the prevailing circumstances. In some designs, applications, or operational features, the traffic practitioner's judgement is to meet or exceed a guideline while in others a guideline might not be met for sound reasons, such as space availability, yet still produce a design or operation which may be judged to be safe. Every effort should be made to stay as close to the guidelines as possible in situations like these, and to document reasons for departures from them.