

IE6.8 Attachment 17

Attachment 17 - Traffic Control Warrants Review

The following warrants and policies for traffic control measures were assessed as part of this review and are discussed further in the report:

- Traffic Control Signals
- Pedestrian Crossovers (PXO)
- All-Way Stop Controls
- Zebra Crosswalk Markings
- Pedestrian head start signals, also known as Leading Pedestrian Intervals (LPI)
- School Crossing Guards

Traffic Control Signal (TCS)

The use of a Traffic Control Signal is intended to provide alternating right-of-way at an intersection, or provide right-of-way for pedestrians at a mid-block crossing, while maximizing safety and efficiency. Signal warrants help to ensure that traffic control signals are installed when the signals provide net benefit for road user safety, considering a wide range of factors.

The Province of Ontario publishes the Ontario Traffic Manual (OTM), which establishes guidelines for the uniformity of treatment in the design, application and operation of traffic control devices and systems across Ontario. The OTM is periodically updated and Transportation Services staff use the latest version as soon as practicable after it is published.

Transportation Services staff currently use the Ontario Traffic Manual (OTM) Book 12 - Traffic Signals. The OTM Book 12 - Traffic Signals outlines a process to assess, justify the need, and establish a warrant for the installation of traffic signals. The warrant includes consideration of many factors, such as vehicle volumes, delays to cross traffic, collision history, pedestrian volume and delay, and projected future traffic volumes.

When reviewing the potential need for a new traffic control signal at a particular location, in addition to the numerical justification for traffic signals described above, staff also apply engineering judgement about the location being considered for a traffic signal, even if the numerical requirements of the warrant are not met. In order to enhance this assessment, a checklist has been created to consider other factors that are relevant the traffic signal warrant. This contextual assessment includes consideration of road width, posted speed limit, operating speeds, adjacent land uses (including new development in the area), pedestrian desire lines and demographics, presence of a transit stop, sight lines, and distance between existing signalized crossing opportunities.

Recommended Change

In addition to the guidance provided through the OTM Book 12 - Traffic Signals and staff expertise and knowledge of local context, staff will also use the newly developed contextual assessment checklist as part of all future traffic signal investigations. Recommendations in future staff reports on traffic signals will be based upon this more

contextual consideration and will likely result in a TCS being recommended despite not meeting the numerical warrant.

Pedestrian Crossover (PXO)

Pedestrian crossovers (PXOs) provide pedestrians with protected crossing opportunities by requiring motorists to yield to pedestrians within, or waiting to enter the crosswalk. PXOs are generally appropriate for roadways with a posted speed of 50 km/h or less and a maximum of 4 lanes where non-signalized pedestrian crossings would be installed.

The current criteria to establish a warrant for the installation of a PXO is based on OTM Book 12 Justification 6 - Pedestrian Volume and Delay, which are:

- Pedestrian Justification Based on Pedestrian Volume and Vehicular Volumes
- Pedestrian Justification Based on Pedestrian Delay

In addition to the warrant/justification analysis, Transportation staff use Environmental Safety Characteristics to ensure that the installation of a PXO would be appropriate. These characteristics are comprised of eight operating and physical factors:

- Speed;
- Roadway Width;
- Traffic Volume;
- Turning Movements;
- Visibility;
- TTC Stops and/or Loading Zones;
- Driveways, and
- Distance to Adjacent Controls.

These factors are considered and in some cases engineering judgement may be applied to recommend a traffic control signal (TCS) instead of a PXO.

In 2016, the Province released an updated version of the OTM Book 15 - Pedestrian Crossing Treatments. Book 15 provides guidelines for justification, treatment system selection and treatment system design for PXOs, including three new PXO types.

Recommended Change

The most significant difference between the City's current way of assessing the need for a PXO and what is prescribed in OTM Book 15 is the 8-hour pedestrian traffic threshold. OTM Book 12 used by staff, recommended a minimum 8-hour pedestrian volume threshold of 200 pedestrians, whereas OTM Book 15 has a minimum 8-hour pedestrian volume threshold of 100 pedestrians. This change will likely have a significant impact in the number of pedestrian crossovers recommended in the City.

Currently the City installs Level 1 Type 'A' PXOs only, but by adopting OTM Book 15 - Pedestrian Crossing Treatments, Level 2 Types 'B', 'C', and 'D' PXOs, described below, can now be considered for installation. The new Level 2 PXOs are intended for low-

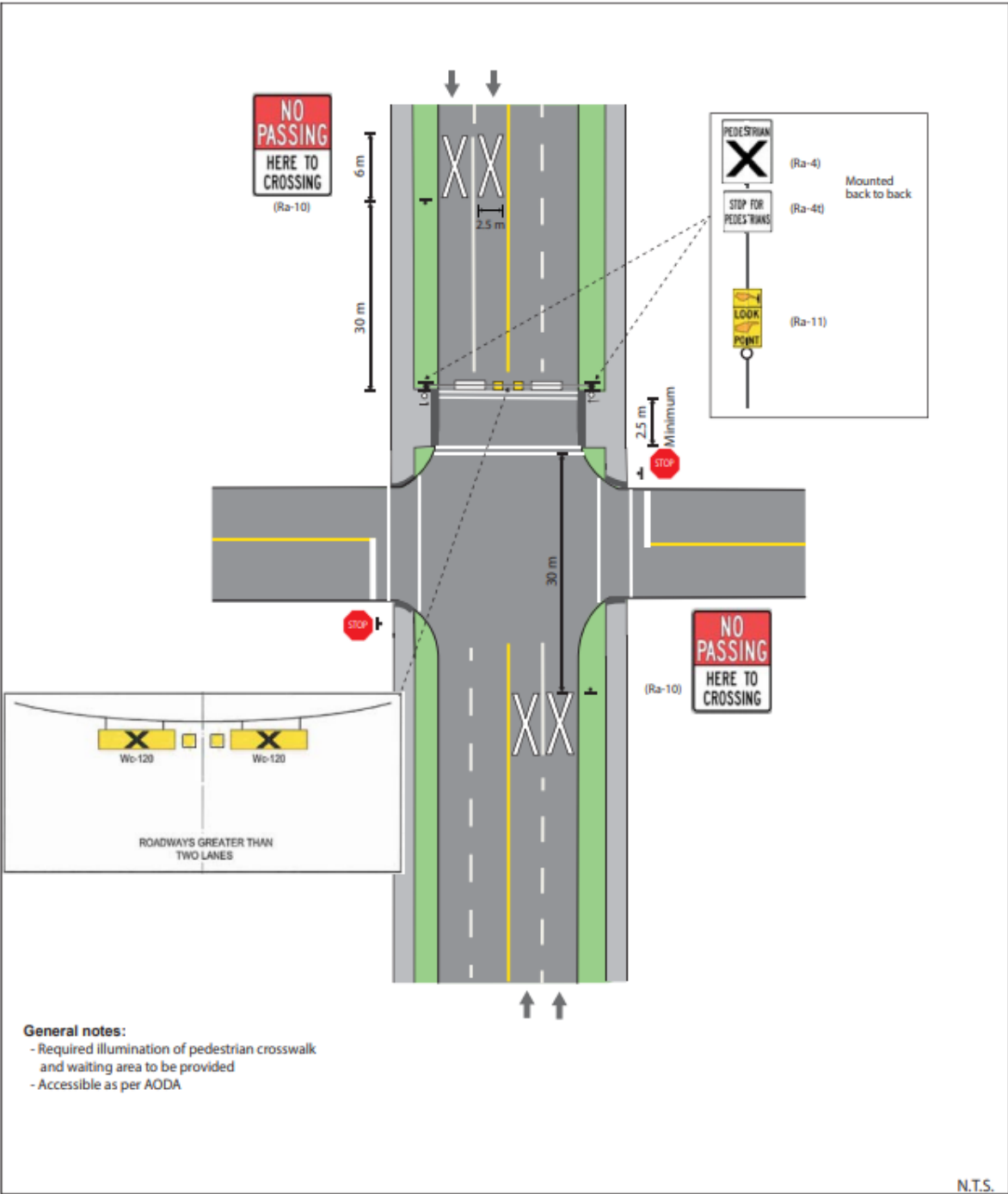
speed, low-volume roads. Staff are currently piloting Level 2 PXOs at five locations in the City. Evaluation of the pilot, taking place later in 2019, will assist in the development of design guidelines and specifications for their placement.

In addition, engineering judgement would continue to be used when assessing the need for a PXO when the technical criteria have not been met. Consideration of the surrounding area will be given to identify any land uses or TTC stops that attract a consistent number of pedestrians crossing mid-block, even if the number of pedestrians does not meet the threshold of the technical warrant.

Once it is determined that a pedestrian crossover is required, defined technical criteria are used to select the type of PXO that would be most appropriate.

Types of Pedestrian Crossovers (PXO)

Pedestrian Crossover Level 1 Type A – Intersection (2-way)

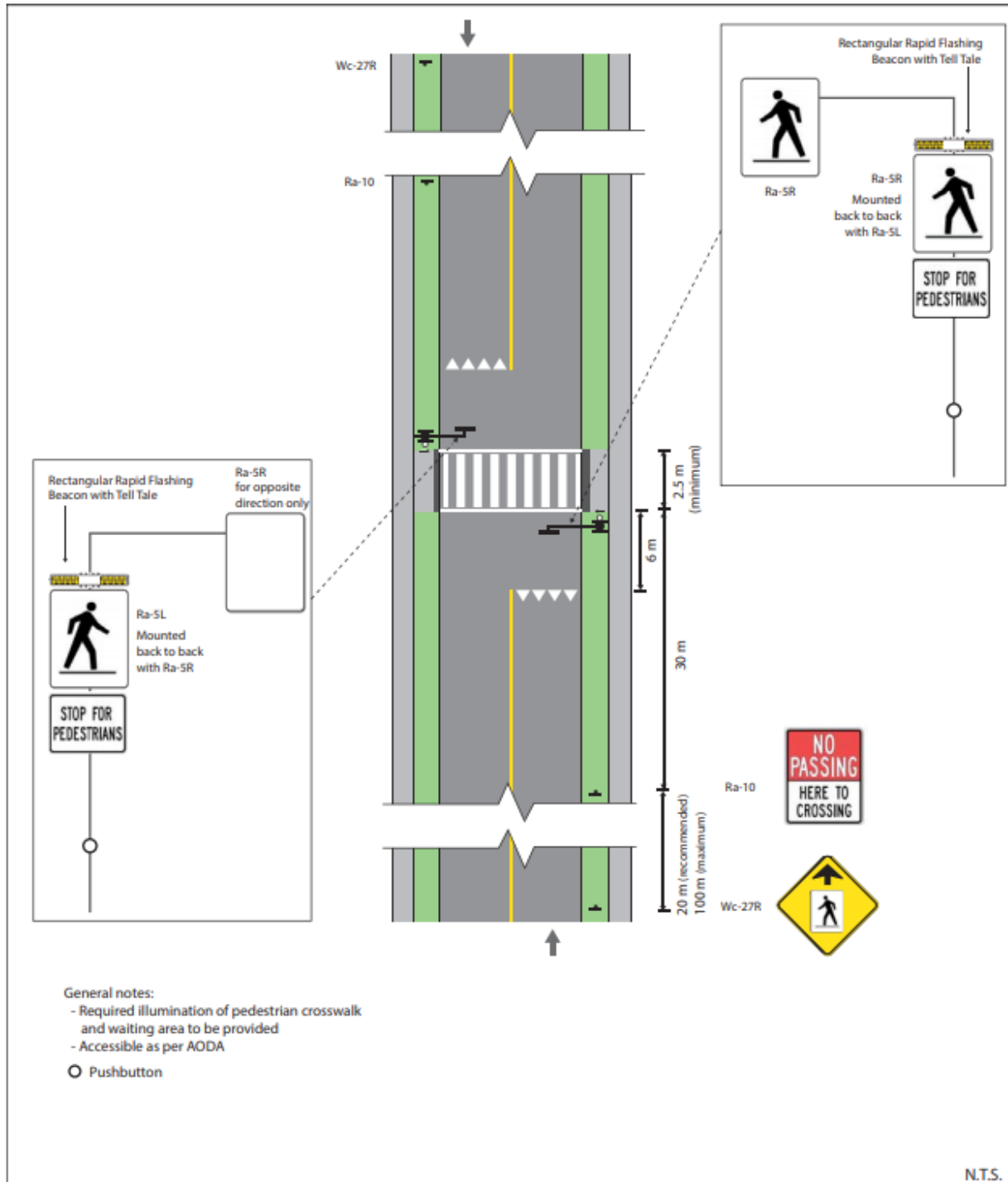


Source: OTM Book 15 - Pedestrian Crossing Treatments - June 2016

Level 1 Type A PXO includes:

- Regulatory and warning signs (internally illuminated overhead warning signs),
- Flashing amber beacons, and
- Pavement markings prescribed and illustrated by Ontario Regulation 402/15.

Pedestrian Crossover Level 2 Type B – Mid-block (2-lane, 2-way)

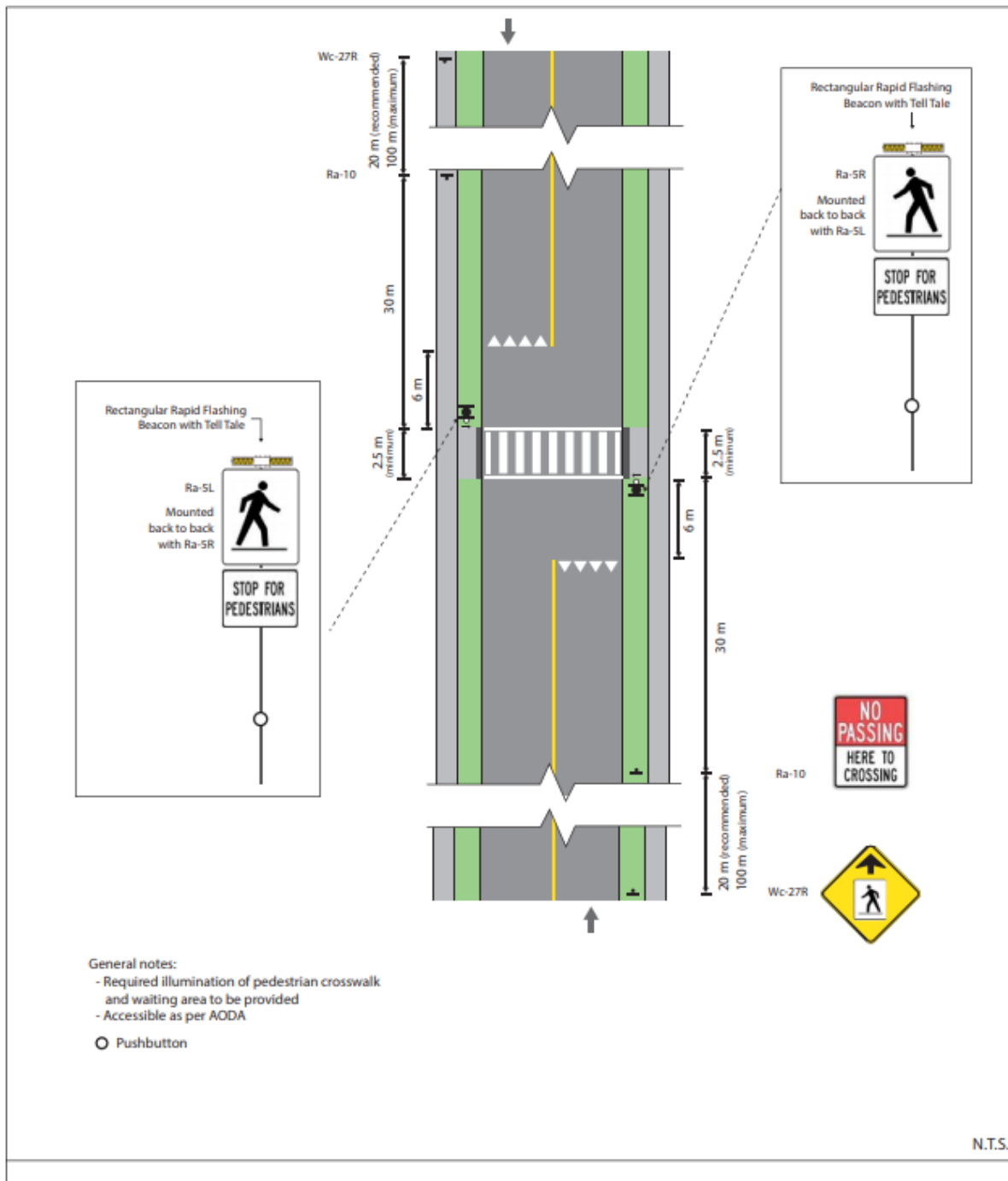


Source: OTM Book 15 - Pedestrian Crossing Treatments - June 2016

Level 2 Type B PXO includes:

- Regulatory and warning signs (both the side mounted and over-head regulatory signs),
- Rapid rectangular flashing beacons (RRFB), and
- Pavement markings prescribed and illustrated by Ontario Regulation 402/15.

Pedestrian Crossover Level 2 Type C – Mid-block (2-lane, 2-way)

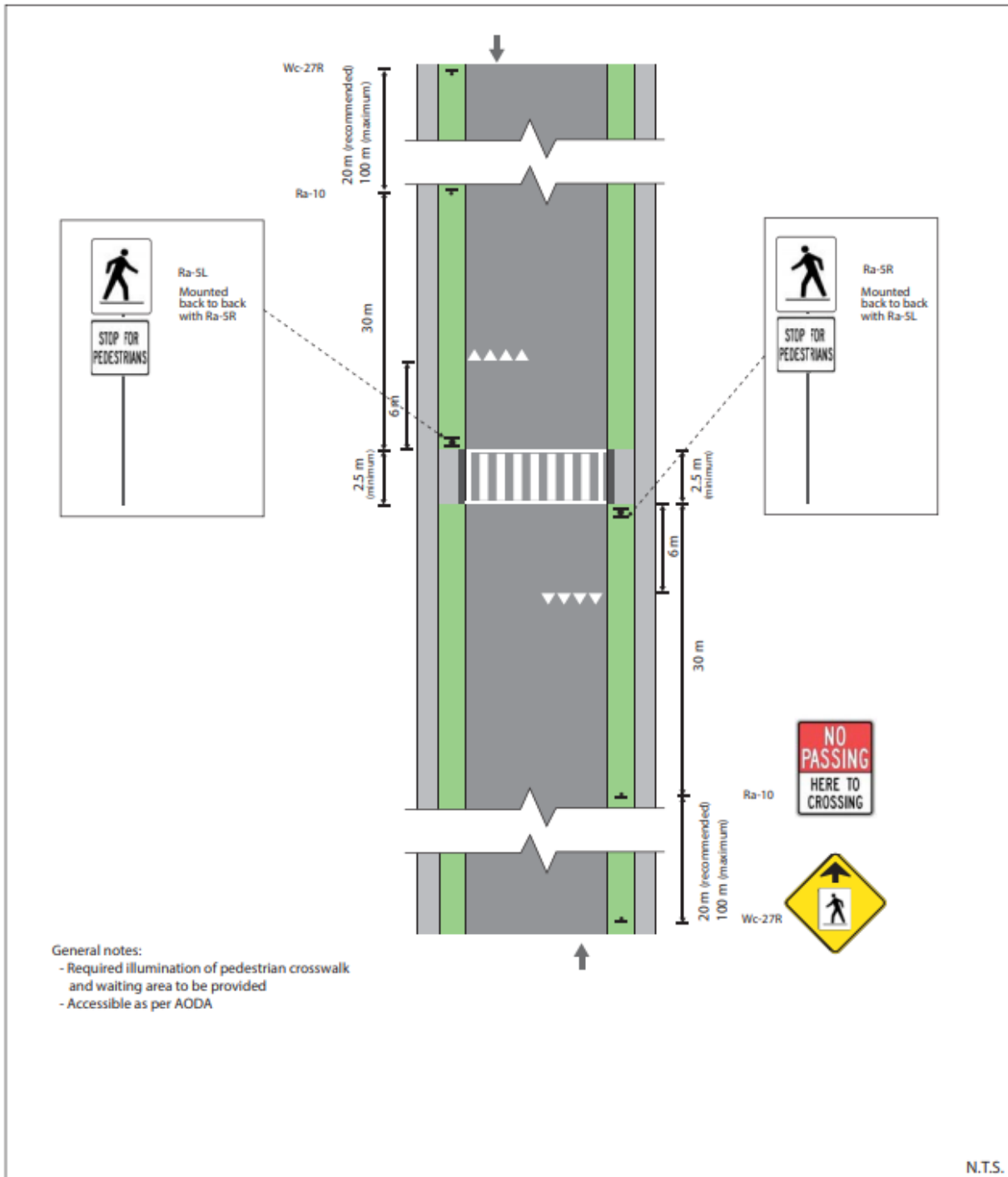


Source: OTM Book 15 - Pedestrian Crossing Treatments - June 2016

Level 2 Type C PXO includes:

- Regulatory and warning signs (only side mounted regulatory signs),
- Rapid rectangular flashing beacons (RRFB), and
- Pavement markings prescribed and illustrated by Ontario Regulation 402/15.

Pedestrian Crossover Level 2 Type D – Mid-block (2-lane, 2-way)



Source: OTM Book 15 - Pedestrian Crossing Treatments - June 2016

Level 2 Type D PXO includes:

- Regulatory and warning signs (only side mounted regulatory signs and does not require flashing beacons), and
- Pavement markings prescribed and illustrated by Ontario Regulation 402/15.

All-Way Stop Control (AWSC)

In 2002, City Council approved the Warrant for All-Way 'Stop' Sign Control. On roadways with a posted speed of 50 km/h or less, all-way stop control can minimize right-of-way conflicts. The following criteria are considered in determining if an all-way stop control is justified:

- Road Classification
- Collision History
- Volume of Vehicles (including heavy vehicles and bicycles) and Pedestrian

A review of the current warrant showed that the basic criteria are largely relevant, but that specific weighting factors can be amended to better address the needs of pedestrians.

Recommended Change

The OTM Book 12 - Traffic Signals categorizes *assisted pedestrians* as children under the age of 12, senior citizens, disabled pedestrians and other pedestrians requiring special consideration or assistance.

It is recommended that a pedestrian factor of "2" be applied to all pedestrians. The total pedestrian volume used in the warrant would be based on the adjusted volume where 'Adjusted Volume' is equal to two times the Pedestrian Volume. This change would also be consistent with other traffic control measure warrants, such as the traffic control signal and the pedestrian crossover.

Zebra Crosswalk Markings

Zebra crosswalk markings are longitudinal lines installed across the pedestrian crosswalk, parallel to the driver's direction of travel. The white bands are 60 centimetres wide and spaced 60 centimetres apart. The zebra design increases the number of markings within the crosswalk area, thereby increasing visibility of the pedestrian crosswalk area for drivers and pedestrians during both the day time and night time.

In 2006, City Council adopted a Zebra Crosswalk Policy whereby zebra crosswalk markings would be the standard crosswalk marking treatment for all signalized crossings and pedestrian crossovers. This treatment has been implemented as part of all road reconstruction and resurfacing projects and for new traffic control signal installations.

Recommended Change

Enhanced pedestrian crosswalk markings (i.e. zebra markings) will also be installed at stop-controlled intersections in the following areas:

- Pedestrian Safety Corridors
- School Safety Zones
- Senior Safety Zones

In addition, zebra markings could also be installed at stop-controlled intersections where safety might be an issue.

This is a practice that has already been in effect as these areas have been rolled out over the past couple of years.

Pedestrian Head Start Signals

Pedestrian head start signals, also known as leading pedestrian intervals (LPIs), provide pedestrians with the opportunity to begin crossing the street before vehicles are allowed to proceed. Currently the City has implemented LPIs at over 94 intersections, with an additional 100 intersections to be installed in 2019.

Currently, the assessment of each intersection for an LPI considers documented safety or visibility concerns, intersection configuration, pedestrian and vehicle volumes, vehicle delay, number of collisions, nearby schools, and population of senior citizens. This is a reactive approach to selecting locations for LPIs.

Recommended Change

Under a proactive approach to application of LPIs, majority of existing and new traffic control signals will have this safety feature as a default. Through a consultant study staff are currently developing the decision making criteria, screening signalized intersections and identifying locations where the LPI feature is not feasible or suitable. The additional 5 seconds of pedestrian head start could have a negative impact on overall intersection operations and the screening process takes this into consideration.

Large scale roll out of LPIs will require modifications at hundreds of traffic signals. Implementation will be phased over the next several years and priority will be determined based on a systemic review of the traffic signal network and intersection conditions in addition to coordination with planned corridor traffic signal reviews as a part of the Congestion Management Plan.

School Crossing Guards

Delivery of the school crossing guard program will be fully transferred from Toronto Police Services (TPS) to Transportation Services as of August 1, 2019.

In preparation for the full transfer of the program, Transportation Services worked with TPS and School Boards to establish a new process for approving new school crossing guard locations. Prior to April 8, 2019, new school crossing guard location requests were studied and approved by TPS. Since April 8, 2019, all new school crossing guard requests started being processed by the Transportation Services with the timelines outlined in Table 1.

Table 1 Processing Timelines for New School Crossing Guard Requests

Submission Deadline	Data Collection Months	Notification of Results
January 31	Spring (April and May)	August
July 31	Fall (October and November)	February

Recommended Change

Improved warrant that incorporates Vision Zero criteria will be developed during the third quarter of 2019. All new requests for crossing guards received for the July 31, 2019 submission deadline will be assessed based on the improved warrant. School Crossing Guards will be considered alongside other suitable safety improvements to address particular safety concerns at each individual location.