

**Figure 2: Decision Support Tool – Preliminary Assessment**

to reflect a factored volume based on “equivalent adults” and the following definitions as described in OTM Book 12:

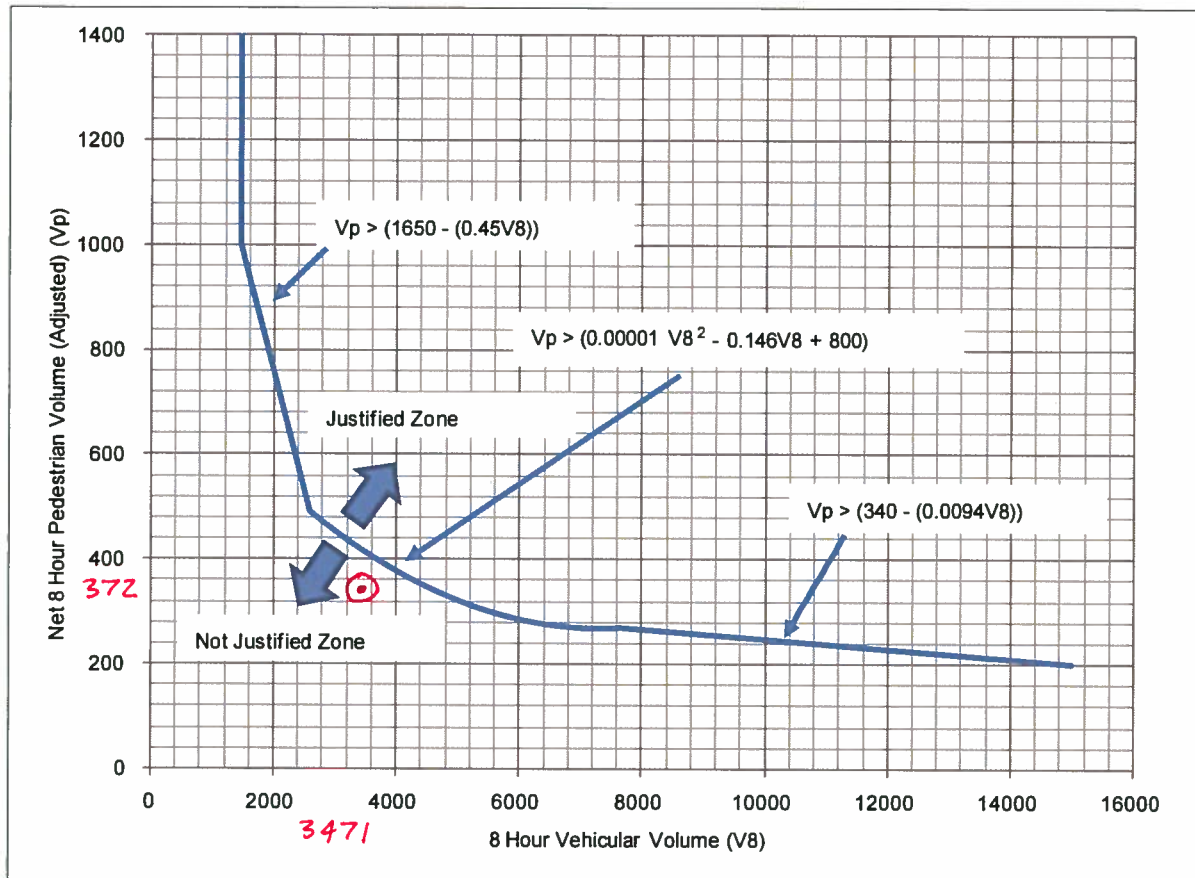
- Unassisted – Adults and adolescents at or above the age of 12 are considered “unassisted” pedestrians.
- Assisted – Children under the age of 12, senior citizens, disabled pedestrians and other pedestrians requiring special consideration or assistance are considered “assisted” pedestrians. In cases where an adult is accompanying a pedestrian included in the “assisted” category, both individuals should

be counted as “assisted” pedestrians to reflect their higher vulnerability. It should be recognized that the exact age of the pedestrian is not critical, but the observers will need to use their judgment to place each pedestrian into one of the two categories.

The factored pedestrian volume is calculated as follows:

$$\text{Adjusted volume} = \text{Unassisted Pedestrian Volume} + 2 \times \text{Assisted Pedestrian Volume}$$

Figure 3 and Figure 4 show the graphs used to determine whether a pedestrian control



**Figure 3: OTM Book 12 Justification 6 - Pedestrian Volume**

As an alternative to the 8-hour pedestrian and vehicular volumes threshold, the flow chart shown in Figure 2 allows for the use of 4-hour pedestrian and vehicular volumes. If a road authority chooses to use 4-hour pedestrian and vehicular volumes, the minimum thresholds for the total 4-hour pedestrian volume crossing the main road at an intersection or a midblock location during the highest pedestrian traffic and the total vehicular volumes during the same periods are 65 equivalent adult and 395 vehicles respectively. It should be noted that equivalent adult pedestrian volume should be calculated based on Section 4 of OTM Book 12 – Traffic Signals.

2. If the minimum pedestrian and vehicular volume requirements are not met, assess whether this site provides system connectivity or is on a desired pedestrian line. The system connectivity or pedestrian desire lines should be assessed based on sound engineering judgment and should be appropriately documented. If the site does not satisfy the system connectivity requirement or it is not on a pedestrian desire line, the site is not a candidate for a pedestrian crossing control. However, if a pedestrian crossing control can be justified based on system connectivity or pedestrian desire line requirements and the distance of the site to the nearest traffic control device is more than 200 m, then the

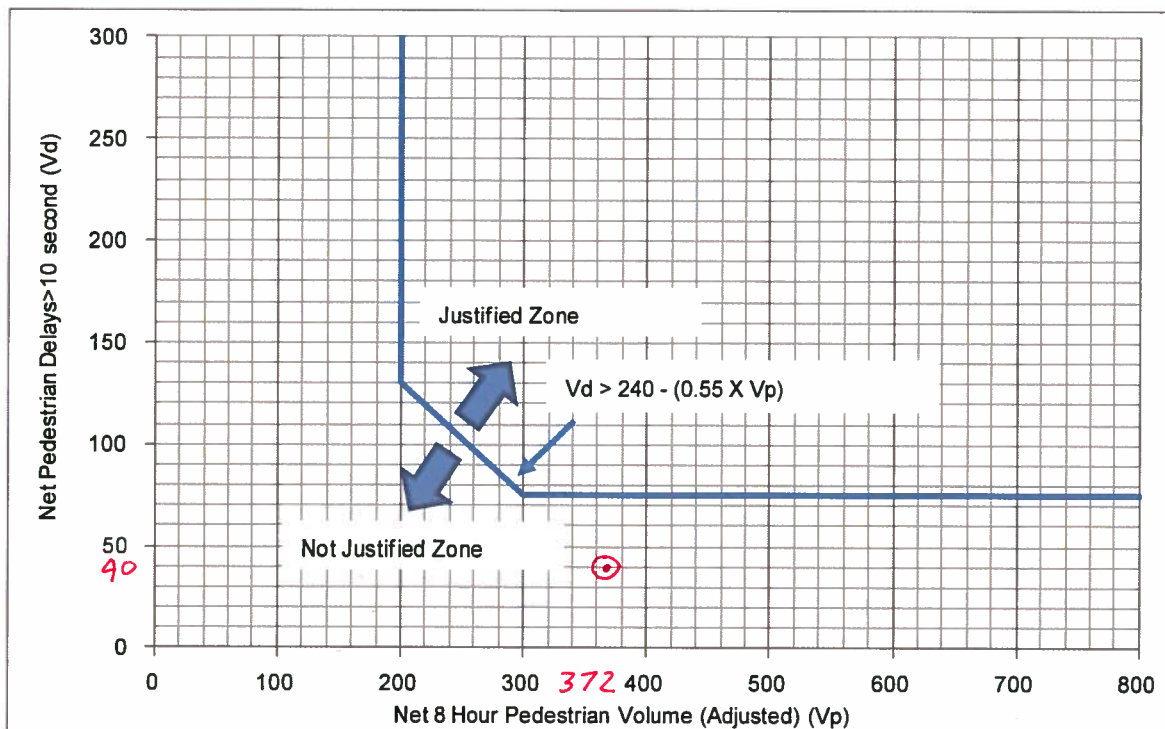


Figure 4: OTM Book 12 Justification 6 – Pedestrian Delay

site is a candidate for a pedestrian crossover. Otherwise, if the distance of the site to the closest traffic control device is less than 200 m, the site is not a candidate for a pedestrian crossing control.

The distance depends on a number of factors such as road type, traffic volume, expected queue length, pedestrian volume, and characteristics of pedestrians expected to use the facility. In the case of Ontario, this value has been set at 200 meters to avoid proliferation of traffic control devices in close proximity of each other. Having control devices in close proximity to each other can result in incorrect driver decisions, which in turn, may lead to collisions with pedestrians and other road users. Close proximity of various devices can also result in traffic flow disruptions and hence, low level of service along a corridor.

This value of 200 meters is consistent with other OTM books limiting the distance between different traffic control devices (see Section 6.1).

### 5.1.3 Stop and Yield Controlled Intersections

Stop control intersections provide an opportunity for pedestrians to safely cross the major roads of intersections. If a two-way stop control intersection does not satisfy the minimum requirements for an IPS, full traffic signal, or PXO as described in Section 5.1.1 and Section 5.1.2, warrants for all-way stop control must be checked.

Section 2 of OTM Book 5 – Regulatory Signs provides the warrant system for installation of all-way stop control at an intersection. The warrant system is based on minimum traffic volume of the

**Table 7: Pedestrian Crossover Selection Matrix**

Two-way Vehicular Volume			Posted Speed Limit (km/h)	Total Number of Lanes for the Roadway Cross Section <sup>1</sup>			
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 <sup>3</sup>	Level 2 Type D <sup>2</sup>	Level 2 Type B
4 Hour	395	1,185					
8 Hour	750	2,250	60	Level 2 Type C	Level 2 Type B	Level 2 Type C <sup>2</sup>	Level 2 Type B
4 Hour	395	1,185					
8 Hour	2,250	4,500	≤50	Level 2 Type D	Level 2 Type B	Level 2 Type D <sup>2</sup>	Level 2 Type B
4 Hour	1,185	2,370					
8 Hour	2,250	4,500	60	Level 2 Type C	Level 2 Type B	Level 2 Type C <sup>2</sup>	Level 2 Type B
4 Hour	1,185	2,370					
8 Hour	4,500	6,000	≤50	Level 2 Type C	Level 2 Type B	Level 2 Type C <sup>2</sup>	Level 2 Type B
4 Hour	2,370	3,155					
8 Hour	4,500	6,000	60	Level 2 Type B	Level 2 Type B	Level 2 Type C <sup>2</sup>	Level 2 Type B
4 Hour	2,370	3,155					
8 Hour	6,000	7,500	≤50	Level 2 Type B	Level 2 Type B	Level 2 Type C <sup>2</sup>	Level 1 Type A
4 Hour	3,155	3,950					
8 Hour	6,000	7,500	60	Level 2 Type B	Level 2 Type B		
4 Hour	3,155	3,950					
8 Hour	7,500	17,500	≤50	Level 2 Type B	Level 2 Type B		
4 Hour	3,950	9,215					
8 Hour	7,500	17,500	60	Level 2 Type B			
4 Hour	3,950	9,215					

Type A
  Type B
  Type C
  Type D

Approaches to roundabouts should be considered a separate roadways.

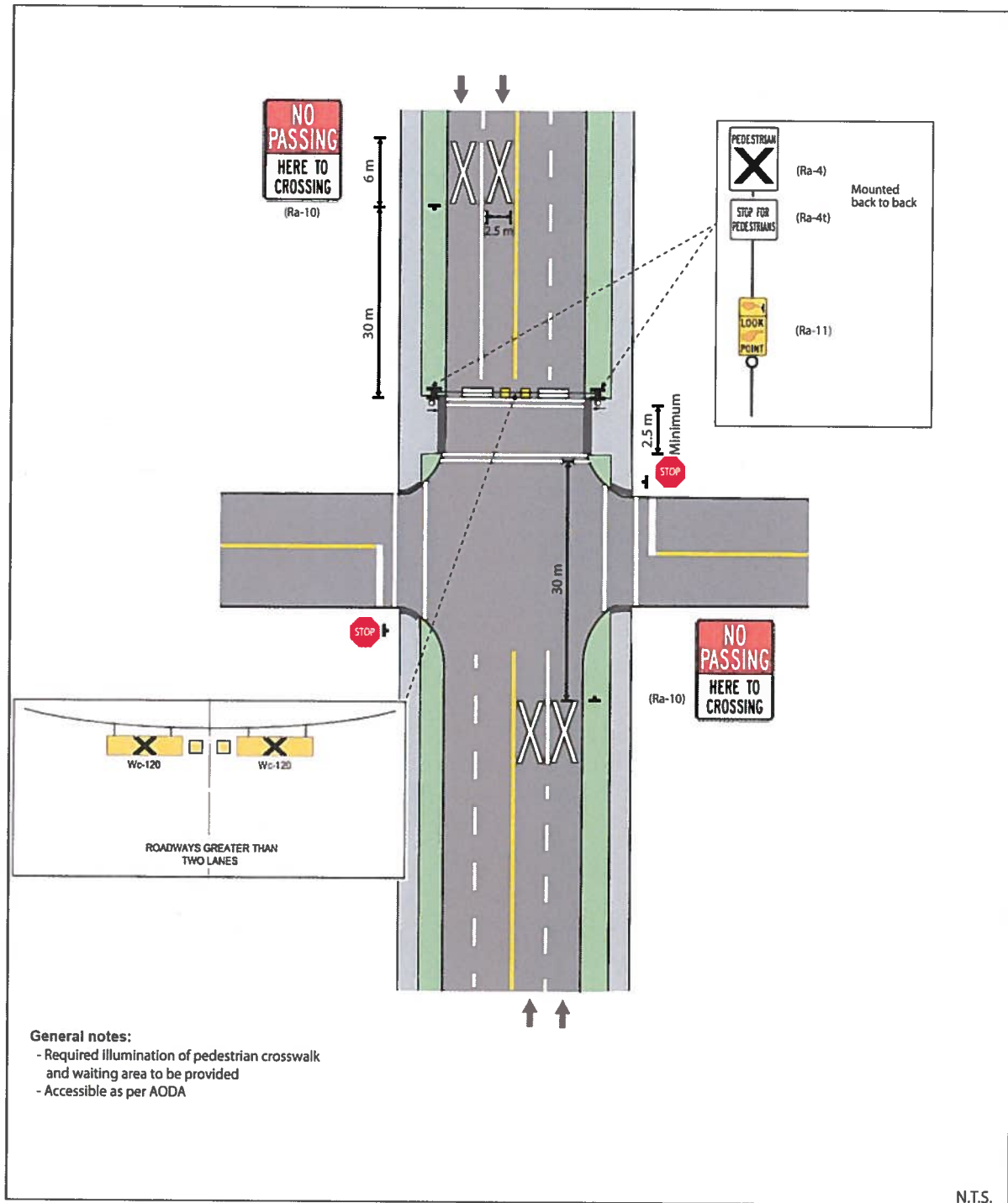
<sup>1</sup>The total number of lanes is representative of crossing distance. The width of these lanes is assumed to be between 3.0 m and 3.75 m according to MTO Geometric Design Standards for Ontario Highways (Chapter D.2). A cross sectional feature (e.g. bike lane or on-street parking) may extend the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

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

<sup>3</sup>Use 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.





**Figure 19: Pedestrian Crossover Level 1 Type A – Intersection (2-way)**

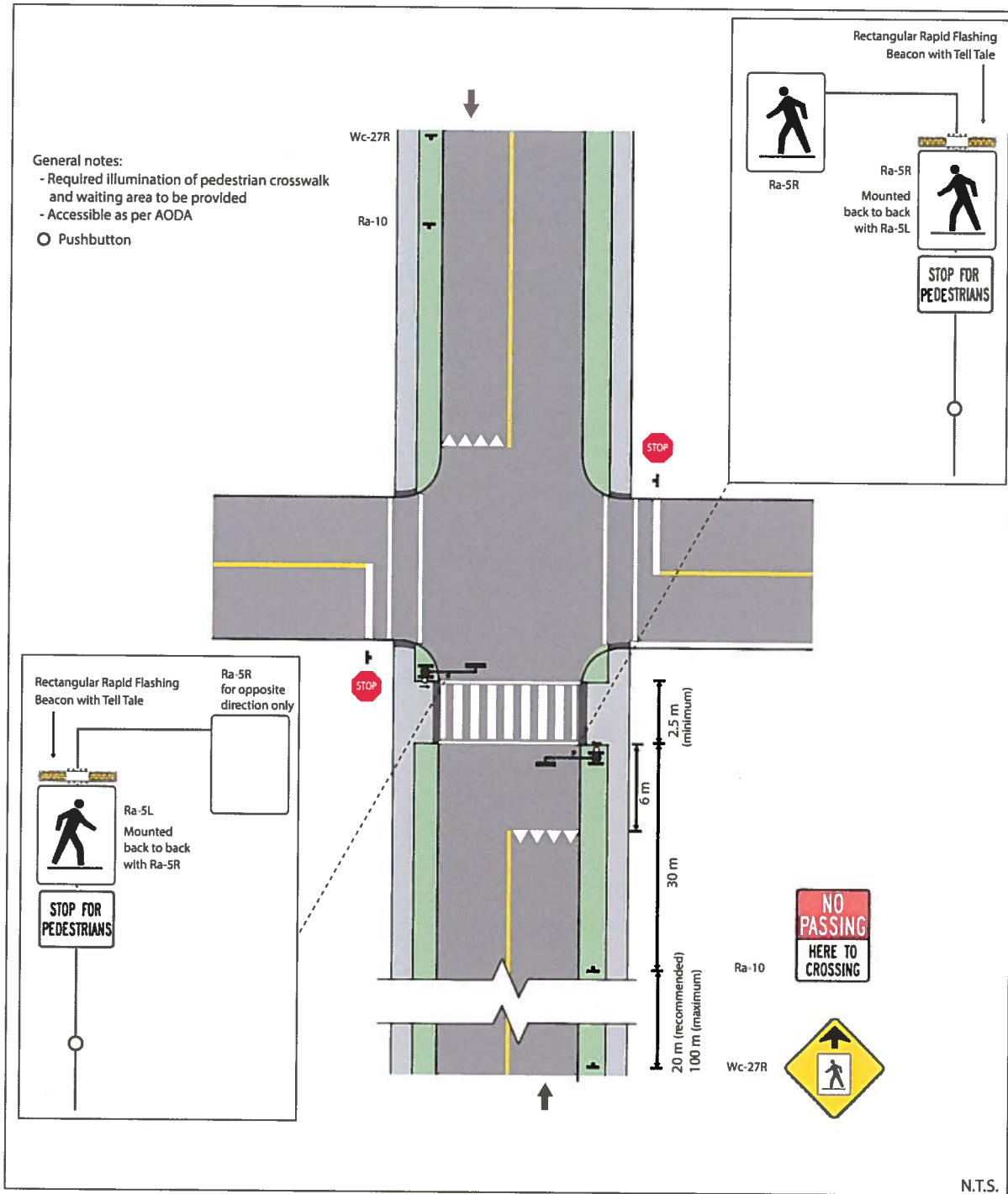


Figure 27: Pedestrian Crossover Level 2 Type B – Intersection (2-way)

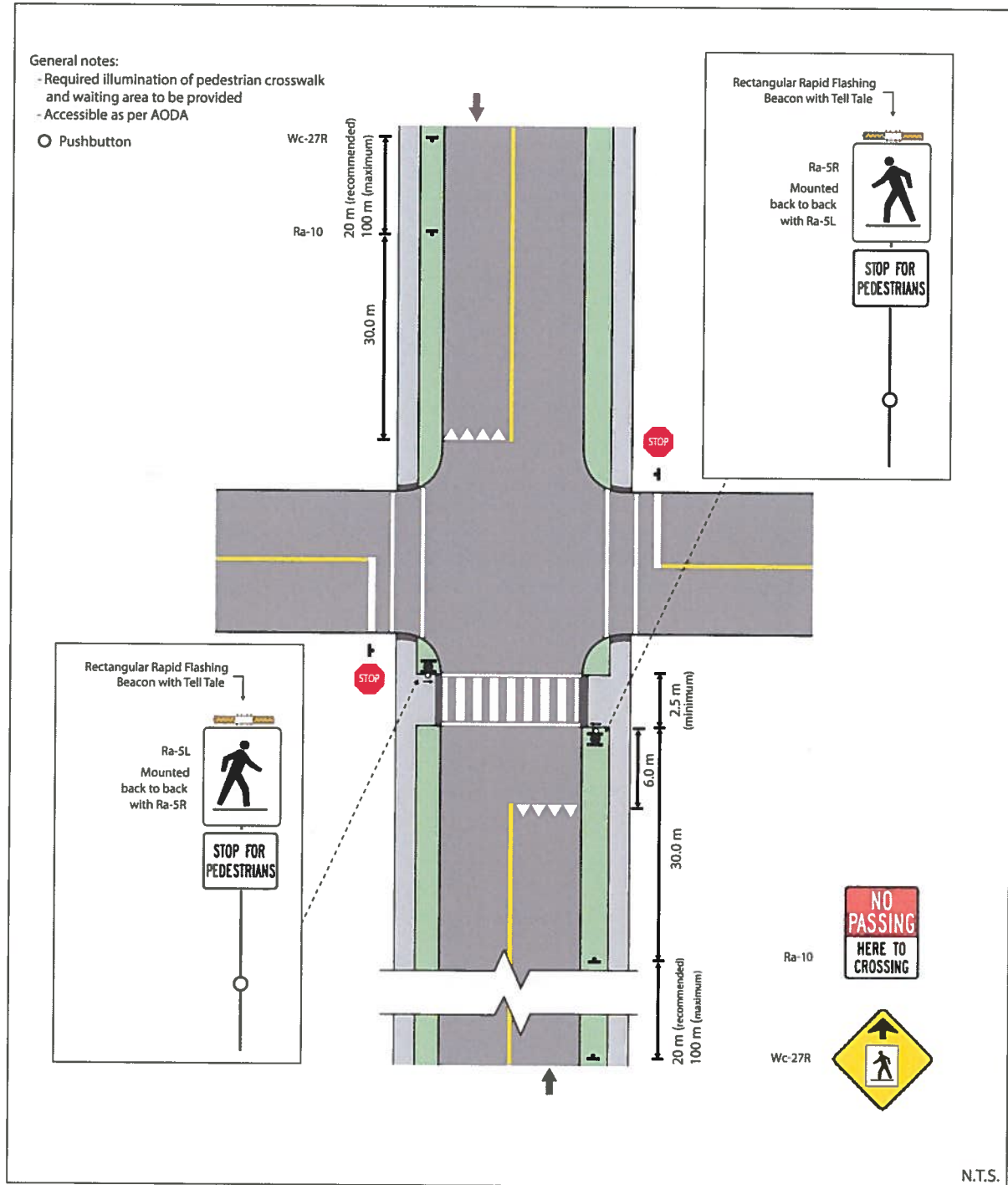


Figure 36: Pedestrian Crossover Level 2 Type C – Intersection (2-way)

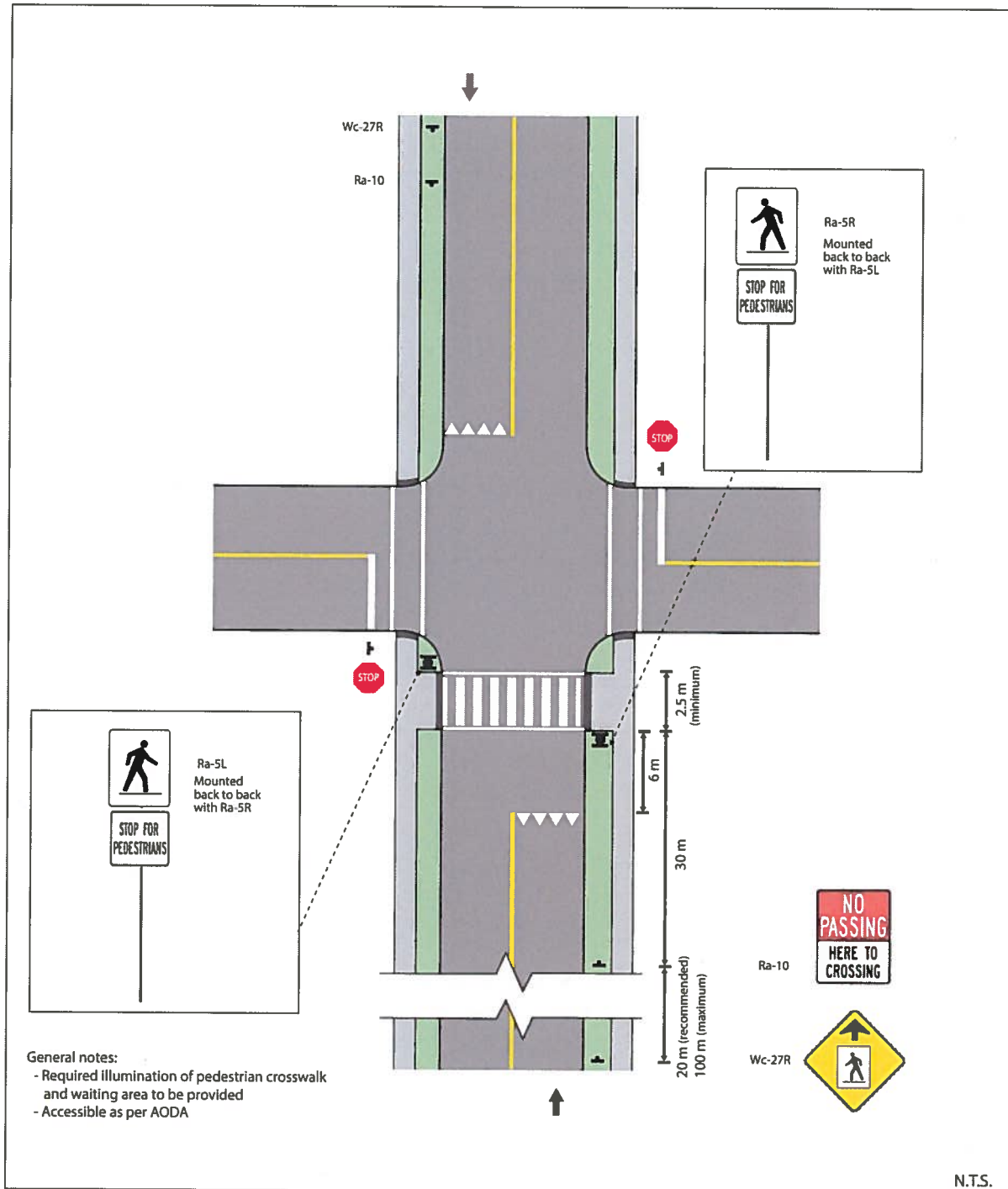


Figure 44: Pedestrian Crossover Level 2 Type D – Intersection (2-way)