



NOTES ON ONTARIO TRAFFIC MANUAL BOOK 15: PEDESTRIAN CROSSING TREATMENTS - DRAFT REPORT

Date: September 4, 2014

Walk Toronto is a citizen advocacy group formed in 2013 to work towards making Toronto a better city for walking. Our steering committee includes engineers, city planners, and long-time advocates with many years of experience with pedestrian issues. We have about 200 supporters on our mailing list, and over 500 members of our Facebook group. We are pleased to have the opportunity to apply our extensive experience with pedestrian issues to the Ontario Traffic Manual (OTM) Book 15 – Pedestrian Crossing Treatments.

Overall, the update of the Ontario Traffic Manual (OTM) Book 15 – Pedestrian Crossing Treatments is welcome, bringing clarity, additional flexibility, and an emphasis on accessibility to the rules around pedestrian crossings.

There are a few important places where the Manual can be improved, however, to ensure pedestrian safety.

Section 3.3.2 (p. 14 & 16) - Walking Considerations

When a transportation network is designed with indirect, convoluted walking routes and long pedestrian waiting times at traffic signals, greater levels of exertion are required from those travelling on foot. Many pedestrians (particularly seniors) have limited stamina. Furthermore, they are often exposed to hostile weather conditions, unlike motorists. Pedestrians set a premium on efficiency. Therefore, we suggest that the definition of walkability be expanded. We would add “efficiently and conveniently” to the following: "It considers the ease in which pedestrians can move through the transportation network enjoyably and safely".

Also, in Table 4 (p. 16) add the following bullet point to “Perceived safety and security of route”:

- “Poor visibility at pedestrian crossings due to overgrown tree foliage, and improperly placed signage, street furniture and utility fixtures”

Section 5, Page 27-30 - decision process on installing pedestrian traffic control or PXO.

The emphasis in the decision process and the flow chart needs to be changed, and more flexibility introduced.

The question of a requirement for system connectivity or pedestrian desire lines should be the primary decision point, not pedestrian volume or proximity to other crossings.

There is a chicken-and-egg problem with relying on pedestrian volumes. Pedestrians may avoid a dangerous crossing but would use it if there was a marked crossing. Relying on existing pedestrian volumes could require pedestrians engaging in unsafe behaviour.

As well, if there is a long stretch of roadway without marked crossings for pedestrians, in the absence of marked crossings pedestrians may cross a stretch of road at various points, whereas if a marked crossing is provided they will be more likely to focus their crossings at that point. It may therefore be useful to measure pedestrian crossings across an entire block or more, rather than at a particular point.

It is also worth noting that, if a trail or other pedestrian desire line is new, it may not have significant volume at first. But it would be absurd to not put in a pedestrian crossing as the trail is completed, and instead wait for people to start using it in a potentially risky manner.

As well, for pedestrian-activated traffic signals and PXOs, the volume issue is self-regulating - the signals or crossing will not be activated unless there are pedestrians who need to cross. If no pedestrians need to cross, traffic will flow freely.

For the proximity issue, if there is a strong desire line (for example, a walk/cycle trail), less than 200 metres from a traffic control, most pedestrians will not walk even the limited distance to the traffic control. They will, instead, cross directly at the desire line.

There are already multiple locations in Toronto where there are two traffic controls within 200 metres of each other. Trying to stick to an arbitrary distance simply increases the risk of accidents and injuries when, for example, pedestrians cross directly from the exit point of a trail to its entry point directly across the street.

The flowchart should start with “Is there a requirement for system connectivity or pedestrian desire line”. If the answer is yes, then the site should be a candidate for pedestrian crossover automatically.

Other conditions should only kick in if the answer is “no”.

As well, or alternatively, the manual should note the need for exceptions where pedestrian desire lines/system connectivity requirements are particularly strong.

Fig. 4 (8-hour volume graph) – Pedestrian volume counts should be performed “during the highest 8-hour of pedestrian traffic”. In the case of trail crossings, traffic volume measurements should usually be done on a weekend, as this is when pedestrian volumes tend to be greatest on trails, while vehicular traffic on roads tends to be low (relative to weekdays). This point is worth emphasizing, since a certain temptation exists at municipal transportation departments to avoid the staff overtime expense and inconvenience entailed by weekend work.

Section 6.2.1.1 (p. 40) - Crosswalk

Traffic engineers may be reluctant to propose a crosswalk at an uncontrolled location. To remedy this reluctance, it would be helpful to elaborate on the conditions where “a crosswalk at an uncontrolled location is deemed necessary”. These should include rationales such as desire lines, and connectivity.

Section 6.2.1.2 (p. 41) - Curb ramps

Where a streetcar stop is located at an intersection, curb ramps are usually necessary in order to facilitate streetcar access. With buses, this is not always true. On Toronto’s Sherbourne St., the existing bus route complicated the introduction of protected bike lanes.

In order to avoid user conflicts, Walk Toronto generally recommends grade separations between sidewalks and cycle tracks. Unfortunately, if the Sherbourne protected bike lane were separated from the sidewalk transit waiting area, the bus would not be able to stop adjacent to the curb. Wheelchair users would have to descend a curb ramp, and then then negotiate the accessible bus entry ramp, which would be set at a relatively sharp angle.

Planners opted for an alternate solution on Sherbourne St. The bike lane was raised to sidewalk grade at all bus stops, enabling wheelchairs to board buses easily (because the accessible bus ramp can be used in an almost level position). However, the uniform grade creates minimal separation between cyclists and people on foot waiting for a bus. In our experience, this has created conflicts are common. We would suggest that collision dangers associated with the same-grade design are significant.

As protected bike lanes become more common in Ontario, it is important to address the unique user conflict issues that they can create between cyclists, transit riders and pedestrians.

Section 6.2.1.3 (p. 42) - Curb Extensions

We approve of curb extensions, and might add one more benefit to the list: aside from improving sight lines, curb extensions also make pedestrian crossings more conspicuous to motorists by virtue of the sizable street space that they occupy.

Curb extensions need to ensure that they provide space, not only for vehicles, but also for cyclists to pass through safely at the same time as a vehicle. Otherwise they create potential conflict between pedestrians and cyclists (for example, cyclists mounting the sidewalk).

Bill 173, which will soon be reintroduced in the Ontario Legislature, requires motorists to pass cyclists with a separation of at least 1m.

Section 6.2.3.6 (p. 46) - Exclusive Pedestrian Phase

This section needs to acknowledge the alternative exclusive pedestrian phase system already in use in Toronto, known as the Pedestrian Priority Phase. It allows pedestrians to cross in the same direction as traffic during the normal phases, as well as having an exclusive pedestrian phase.

This alternative Pedestrian Priority Phase system is used in locations with very high pedestrian traffic that already have extensive turn restrictions (and in some cases limited storage space for pedestrians to gather waiting to cross). The need to accommodate turning vehicles is therefore limited, and there is no need for an exclusive traffic phase in which there is no pedestrian crossing at all. As well, in some locations having pedestrians wait two phases to cross would lead to excessive pedestrian crowding in limited space at corners.

Since this is the only exclusive pedestrian phase system currently in use in Ontario, this should be the primary system described. It is also far more pedestrian-friendly, as it permits pedestrians to cross in a specific direction during two of the three phases, rather than being confined to a single phase. The Pedestrian Priority Phase is more appropriate for the urban, high-pedestrian-traffic situations described in the manual.

The exclusive pedestrian phase system in which no pedestrians can cross for two phases is not pedestrian-friendly, as it requires excessive waiting times and bunching at corners that may not provide adequate storage space. The result will be non-compliance, with pedestrians attempting risky crossings against the lights. It should be described as a secondary approach, not the primary one.

Section 6.2.3.7 (p. 46) - Leading Pedestrian Interval

It might be useful to note that the Leading Pedestrian Interval is particularly useful at T-junctions where all traffic is turning.

Section 6.2.4.5 (p. 51) - Ladder Crosswalk Markings

We are very pleased to see Ladder Crosswalk Markings required for many types of PXO crossings and recommended for others. They significantly increase pedestrian safety and comfort.

Section 6.2.4.8 (p. 52-53) - Textured or Coloured Crosswalk

We support the use of coloured admixtures in asphalt or concrete, because painted markings inevitably deteriorate. Coloured paving stones can also be problematic, in that they may settle, creating uneven surfaces that become tripping hazards and impediments for mobility devices. Ideally, the most effective colour, texture and combination of materials could be determined. If this were to become uniform throughout the province, motorists would more easily recognize standardized coloured crosswalks, increasing compliance rates.

Section 6.3.1.1/2 (p. 55-64) - Full Traffic Signal

Table 8: The “Ladder Crosswalk” should be moved from an “Optional Component” to at least a “Desirable Component”.

They should be standard at all signalized intersections - they are inexpensive to implement, improve safety, and have no drawbacks. This is even more important in Table 9 (and Figure 17), mid-block signalized crossings, as these will be less visible to drivers.

It is a bit contradictory to require ladder crosswalks at most PXO crossing but not at signalized mid-block crossings, which are likely to be in heavier-volume or higher-speed areas. To be consistent, ladder pedestrian crossing markings should be required at mid-block signalized pedestrian crossings.

¹ For a more detailed comparison between the two types of exclusive pedestrian phase systems, see Rajnath Bissessar; Craig Tonder, "Pedestrian Scramble Crossings – A Tale of Two Cities", p.3-4 http://www1.toronto.ca/City%20Of%20Toronto/Transportation%20Services/Walking/Files/pdf/pedestrian_scramble_crossings.pdf

On p. 60, table 9, “Trail Crossing signs” should be included in the “Optional Components” column.

On p. 66, table 10, Ladder crosswalk markings should likewise be “Desirable Components” rather than “Optional Components”.

Section 6.3.2 (p. 65) - PXOs

In Figure 22, we are pleased to see that signage with large walking-man symbols is now required for PXOs type B and above. These are far more visible than the traditional “X”. Given their superiority, why not make them at least “desirable” or an option for PXO type A as well?

Also, it is not clear from the text in Type B, Table 11, that the RA-4 sign referenced there is different (with a walking person symbol) from the RA-4 sign (with just an “X”) referenced in Type A

It is not clear why AODA-compliant pushbuttons are required for other types of crossings but merely “Desirable” for PXOs. Given the Ontario government’s commitment to accessibility, it seems necessary that all new push-buttons installed be required to be AODA-compliant for all types of pedestrian crossing.

In terms of pavement markings, consideration should also be given to streets on which there are bicycle lanes. Bicycle lanes should also have “yield to pedestrians” line markings.

Section 6.3.4 (p. 106) - School crossings

If school crossings are marked on the road, we agree that there is a danger that children may get confused and think they are a crosswalk and that traffic will stop for them, putting them at risk. This problem is probably also true of adults, who are often not familiar with the meaning of different pavement markings.

Given that PXOs are only actuated when a pedestrian needs to cross, the question has to be asked, why not simply make all school crossings PXOs? If there is no pedestrian activity outside school time, the PXOs will not be actuated and traffic can flow freely anyway.

As well, PXOs would contribute to the safety of the crossing guard, by enhancing their visibility. The distinct visuals and conspicuousness of PXOs make them easily recognizable by children, who will associate them with the concept of safe crossing. As a child becomes habituated to using PXOs, he or she is less likely to cross haphazardly at uncontrolled mid-block locations.

It is hard to see any disadvantage to putting in a PXO where school crossings are needed, and they would increase safety for all. It is conceivable that a long term strategy may be to phase out school crossing altogether in favour of a category of PXO with additional school crossing markers and speed reductions.

Section 6.3.5.1 (p. 110) - Roundabouts

While most roundabouts serve as traffic-calming measures that are a beneficial to pedestrians, a note of caution should be sounded about small diameter roundabouts (frequently referred to in Ontario as 'traffic circles'). In residential neighbourhoods these may be planted with one or more trees or shrubs, which reduce visibility. At the same time, the narrow diameter of a traffic circle can tempt some motorists into making an illegal, direct left turn (instead of following the correct way around the traffic circle in a counter-clockwise direction). The combination of poor visibility and higher non-compliance rates may result in increased collision risk for vulnerable road users at small traffic circles.²

Section 6.3.5.2 (p. 111) - Right Hand Turn Channels

From the pedestrian standpoint, right-hand turn channels detract from walkability, and their installation should be avoided wherever possible. After the sentence, "Some right-turn channels are also used to reduce excessive pavement areas caused by skewed and flared intersection configurations", we would add: "However, at such locations, pedestrians would benefit from a curb extension (bulb-out), instead of a right-hand turn channel."

Section 6.3.5.4 (p. 114-115) - Temporary Conditions

Work sites can pose particular problems for users of mobility devices. In the bulleted list, we would suggest specifying that:

- "Care should be taken when laying out construction-related pedestrian detours in order to facilitate passage by users of mobility devices. In particular, rectify rough surfacing and inadequate curb ramps."

Section 7 (p. 117) - Uncontrolled Crossings

² The BICE study reached this conclusion in regards to cyclists:
<http://cyclingincities.spph.ubc.ca/injuries/the-bice-study/>
<http://injuryprevention.bmj.com/content/19/5/303.short>

We are pleased to see consideration for providing infrastructure to assist pedestrians to cross safely at uncontrolled crossings. It is an important acknowledgment that uncontrolled crossings are at times an appropriate and inevitable part of pedestrian movement.

Another consideration for uncontrolled crossings is the predictability of gaps in traffic. For example, on a one-way street an uncontrolled crossing can work better because there will be predictable gaps in traffic that pedestrians can take advantage of to cross.

As well, **artificial proximity limits should not be over-emphasized – more important is pedestrian desire lines**. If there is a strong desire line within 100 metres of a traffic signal, pedestrians will still cross there. It is better to do what is possible to ensure their safety than to artificially suppose they will travel 200 metres there and back just to get to a traffic signal. Such a detour will add about 3 to 5 minutes of extra walking to the length of a pedestrian's trip, a time commitment that few people are willing to undertake.

Example

Queen's Park Crescent in downtown Toronto is a good example of the use of uncontrolled crossings and also (see above re. Section 5) the use of traffic signals less than 200 metres from each other. There are multiple desire lines crossing a 3-lane, one-way circular crescent, and heavy pedestrian traffic from university students and others. There are several uncontrolled crossing points where pedestrians use gaps in traffic created by controls less than 100 metres further down the street to cross. Moreover, the city has placed various kinds of signalized pedestrian crossings (automated and actuated) within close proximity of each other (less than 200 metres), recognizing that these strong pedestrian desire lines cannot be avoided. It should be possible to coordinate the timing of these crossing signals to minimize disruption to traffic.

Queen's Park Crescent is an example of **the importance of having flexibility in the Manual and giving pedestrian desire lines priority over other considerations** when placing both controlled pedestrian crossings and assistance or signage (e.g. "Pedestrians wait for gap") at uncontrolled crossings.