

5.8 ROUNDABOUTS

Roundabouts are gaining increased acceptance as a form of intersection control in North America, and their use in York Region is growing. As a result, it is important to ensure that pedestrians and cyclists can be accommodated in roundabouts.

General Guidance

In an urban context, with respect to pedestrians, sidewalks are recommended along the outer edge of the entire roundabout. Crosswalks with AODA compliant approaches should be provided at all entry/exit legs of the roundabout. Deflector islands can be utilized used as spaces for pedestrian refuge. Refuge islands make crossing the entry/exit legs easier for pedestrians as they only have to concentrate on traffic moving in one direction at a time.

The design of the inner island of the roundabout should be discourage pedestrians from crossing through the centre of the roundabout. This may be accomplished through the use of landscaping or a knee wall.

5.8.1 Single Lane Roundabouts

While there are limited applications of single lane roundabouts along Regional roads in York Region, they may be considered in rural hamlets or through residential neighbourhoods where volumes are lower. Single lane roundabouts can have operational benefits for both cyclists and pedestrians - they tend to slow vehicular speeds, can reduce delays for all users and have fewer conflict points than conventional intersections. Despite these benefits, roundabouts can present crossing challenges for the visually impaired, and may not be appropriate in all situations. Per OTM Book 18 recommendations, cyclists can share the lane in single lane roundabouts as vehicular speeds are generally reduced to 30-40 km/hr through the roundabout. Sharrow markings are used in single lane roundabouts to help improve the positioning of cyclists. They should be placed at least 30 m in advance of a roundabout within the centre of the lane on the approach, and immediately on the exit leg within the centre of the lane (per the Canadian Roundabout Design Guide). For locations where speeds may be higher, a transition to a boulevard multi-use path may be provided (see section 5.8.2)

York Region currently has two single lane roundabouts located at York-Durham Line & Durham Road 5, and Keele/Lloydtown & Aurora Road. However, these roundabouts are provided in a rural context.

Exhibit 5-60. Example of a single lane roundabout with shared boulevard facilities through the roundabout



Source: PBIC – Carl Sundstrom

5.8.2 Multi-Lane Roundabouts

Multi-lane roundabouts are less desirable from the perspective of pedestrian and cyclists. The increased potential for conflicts for pedestrians must be considered in the application of roundabouts, particularly those with visual impairments. The audible and tactile cues provided by signalized intersections are not available with roundabouts, and multiple entry and exit lanes increases the level of difficulty and exposure time while navigating the crossing. For these reasons, multi-lane roundabouts are not recommended in areas of high expected pedestrian and cycling volumes.

In situations where other factors results in the implementation of multi-lane roundabouts, treatments at the roundabout should attempt to mitigate these challenges. Per OTM Book 18 recommendations, cyclists should be given the alternative to share a vehicular lane or to use an in-boulevard bypass facility (shared with pedestrians) for multi-lane roundabouts. The priority of the pedestrian over cyclists should be clarified in these shared areas through the application of signage and pavement markings. Some change in material should clearly delineate the beginning of the shared pedestrian and cyclist space.

A sample application of these treatments for a dedicated bikeway and sidewalk are shown in Exhibit 5-62.

Exhibit 5-61. Example of a multi-lane roundabout with shared boulevard facilities through the roundabout



Source: PBIC – Dan Burden

Multi-lane Roundabout Dedicated Bikeway with Sidewalk

At a multi-lane roundabout, cyclists should be provided with the opportunity to ramp-up into the boulevard. Pedestrian priority on the shared path must be emphasized through signage and pavement markings.

Minimum	Preferred
<ol style="list-style-type: none"> 1 As no cycling facilities should be provided within the circulatory lanes of the roundabout, the bicycle lane should be marked and signed as ending 30 m in advance of the roundabout 2 A ramp (<5%) should be provided between the on-road facility and the shared path to accommodate cyclists. A tactile warning plate must be applied at the bottom of this ramp to prevent pedestrians from mistakenly entering the travel way via this ramp. Bicycle lane markings must be dashed. A sample detail for this ramp is shown in Exhibit 5-63 3 Shared use path should be made of a different construction material than the cycling facility and sidewalk to mark the beginning of a shared space. The path should be minimum 3 m, with 4 m preferred. 'Shared Pathway' signage (RB-93 – TAC) should be applied 4 A combined crossride is shown through the roundabout legs to allow for use by both pedestrians and cyclists 5 Pedestrian crossing with tactile plates and AODA – compliant curb ramps must be provided at both entry and exit legs, and tactile plates must be provided at the refuge island 6 'A 100 mm 1-1 dash yellow line should be used to provide directional guidance to cyclists and pedestrians as they navigate the shared path 7 'Reserved Bicycle Lane' (RB-91 – TAC) should be applied after the roundabout to re-confirm the designation of the cycling facility 	<ol style="list-style-type: none"> A 'Cyclists Yield to Pedestrians' signage (RB-73-OTM) can be applied where there are challenges with interactions between users B The crossing may be designed as a pedestrian crossover Type C per OTM Book 15, with yield markings in advance of each crossings, 'Pedestrian Crossing' signage (Ra-5r –OTM mounted back to back with Ra-5L – OTM and Ra-4t –OTM tabs), RRFBs and ladder crosswalk markings. Refer to OTM Book 15 for full details of pavement markings & signage. Note that if the crossing is designated as a PXO, crosswalk markings should be used in lieu of crossrides

Exhibit 5-62. Multi-lane Roundabout Concept - Dedicated Bikeway with Sidewalk

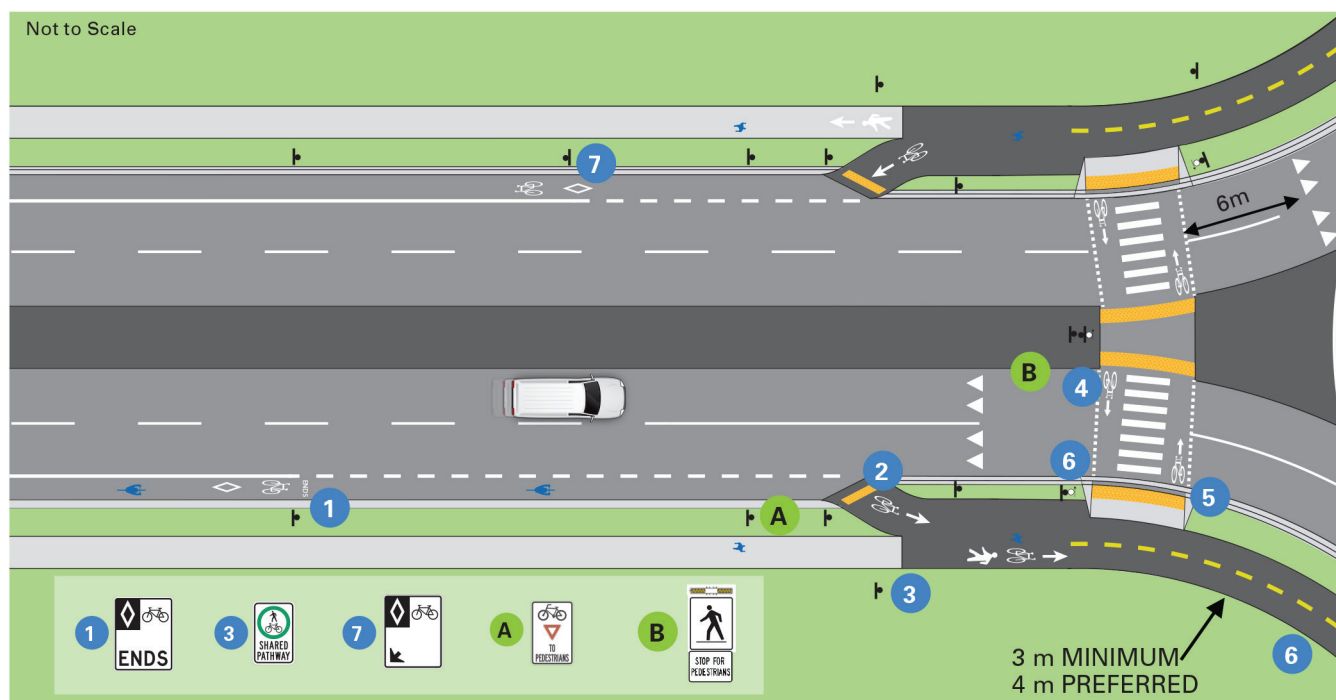


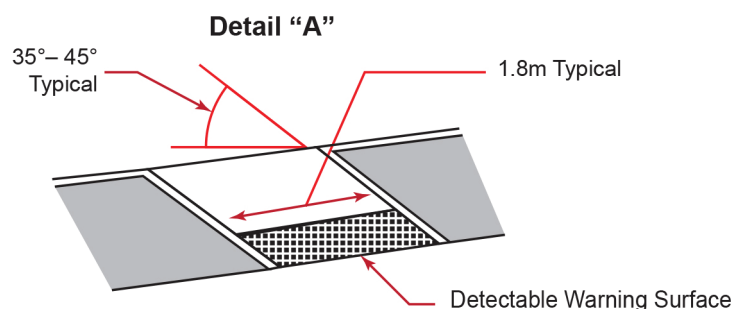
Exhibit 5-63. Example ramp treatment at a roundabout



Source: Steve Jorgenson

Although the geometry of the ramping will vary, a typical detail is shown in Exhibit 5-64.

Exhibit 5-64. Sample Ramp Detail from Bike Lane onto Boulevard



Source: Adapted from FHWA's Roundabouts Technical Summary

Treatments for different types of approaching cycling facilities can be the same through the roundabout as depicted in the example of the dedicated bikeway. In all cases, as volumes of pedestrians and cyclists are expected to be low where multi-lane roundabouts are applied, a shared pathway can be provided along the outside of the roundabout. Transitions to the shared pathway from other types of facilities are shown below.

Exhibit 5-65. Multi-use Path approaching Roundabout

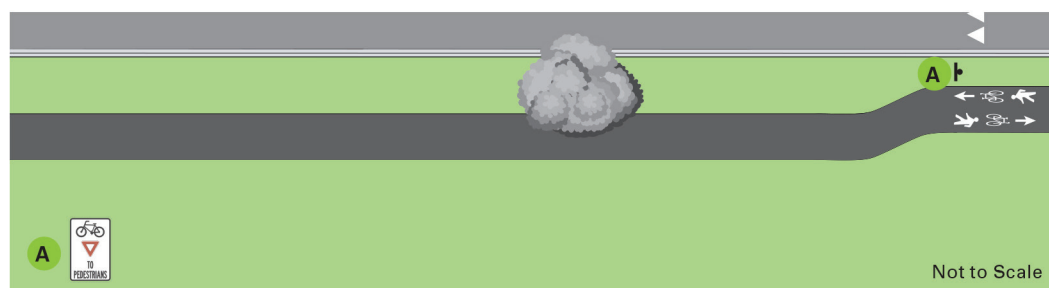
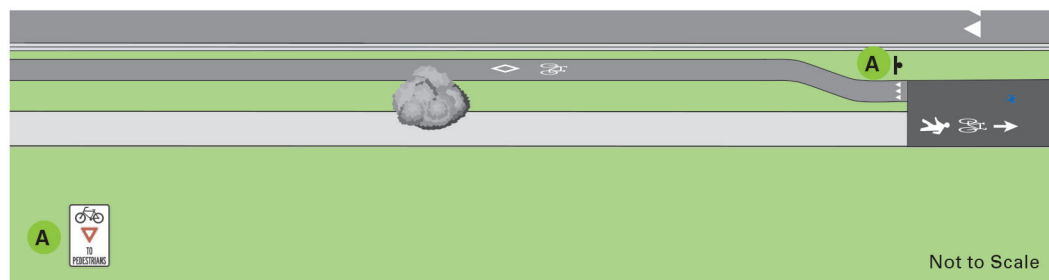


Exhibit 5-66. Raised Cycle Track approaching Roundabout

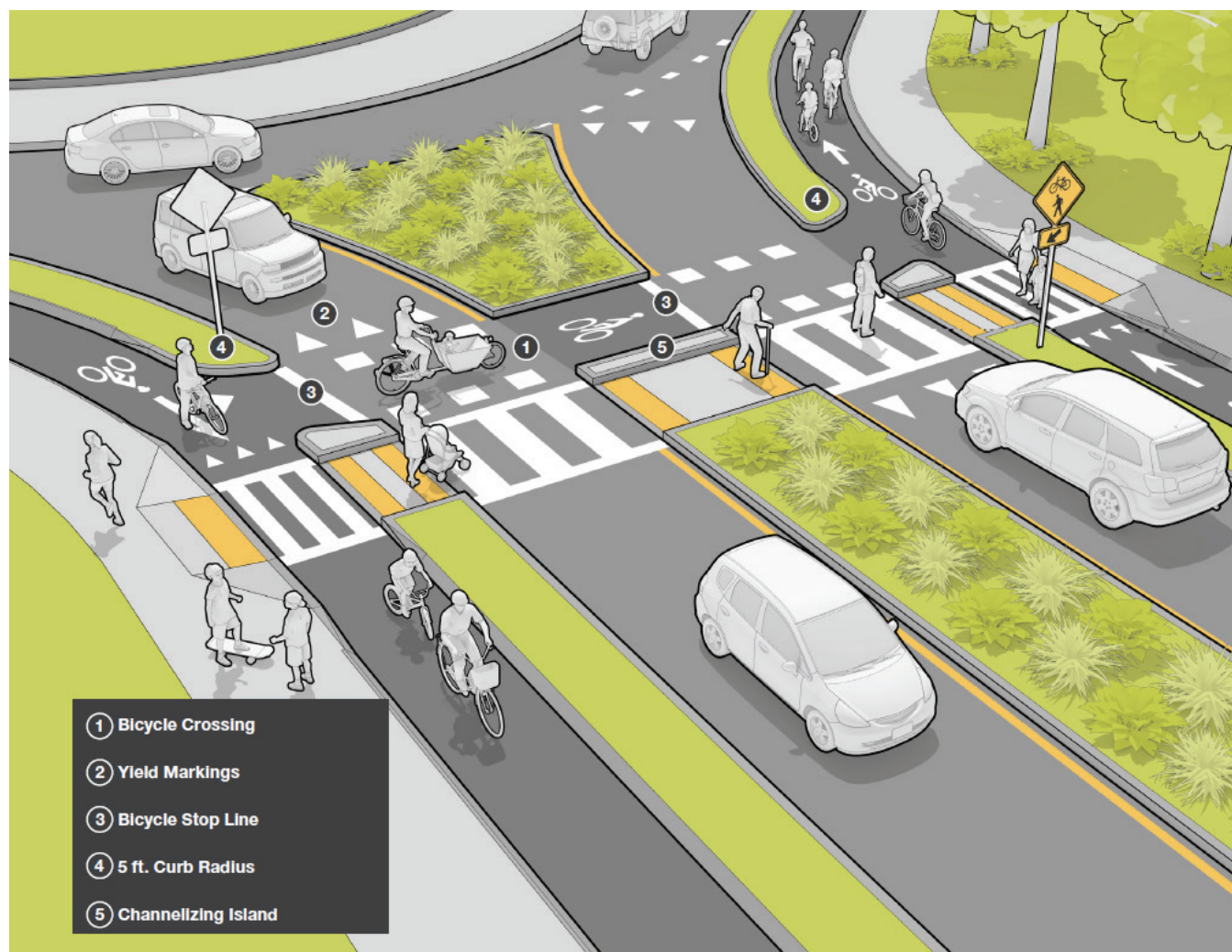


Exhibit 5-67. In-boulevard Cycle Track approaching Roundabout



In exceptional cases where high volumes of both cyclists and pedestrians are anticipated and a roundabout is selected as the preferred intersection treatment, consideration should be given to physically separating the cyclists and pedestrian streams through the intersection. An example application with fully separated streams from the MassDOT Separated Bike Lane Planning & Design Guide (2015) is shown below.

Exhibit 5-68. Sample application of roundabout with separated cycling facilities maintained through the roundabout



Source: MassDOT Separated Bike Lane Planning & Design Guide