

Primer on

Roundabouts in Canada



Clearbrook, British Columbia
Photo: British Columbia Ministry of
Transportation and Infrastructure

Introduction

Circular intersections have been part of the transportation system in North America since 1905, when the Columbus Circle was constructed in New York City, U.S.A. In the following decades, many traffic circles and rotaries were built in Canada and the United States. These types of circular intersections featured large diameter central islands, which enabled high-speed merging and the weaving of traffic. In addition, priority was given to entering vehicles, facilitating high-speed entries. This resulted in numerous high speed crashes and congestion and ultimately led to the decline in use of rotaries and traffic circles as forms of intersection control in North America.

The modern roundabout was a result of the British re-engineering traffic circles and rotaries throughout the United Kingdom to rectify problems associated with their less than desirable operation and safety. The first modern roundabout featured a much smaller diameter central island than a rotary or traffic circle, and adequate horizontal curvature of vehicle paths to achieve slower entry and circulating speeds. In 1966, the United Kingdom adopted a rule of the road that required entering traffic at all circular intersections to “give way” or yield to circulating traffic. The changes to the design and yielding rule improved safety performance and increased capacity of circular intersections. Since the 1970’s, the operational and safety improvements of modern roundabouts have made them popular throughout Europe, Australia and New Zealand.

In Canada, the first roundabouts did not emerge until the 1990’s. Although it is difficult to estimate the total number of roundabouts currently installed in Canada, this form of intersection control is becoming increasingly more common across the country.



Riverside Drive, Prince Edward Island
Photo: Prince Edward Island Department of
Transportation, Infrastructure and Energy

Distinguishing Roundabouts from Other Circular Intersections

In addition to roundabouts, other types of circular intersections include:

- **Neighbourhood Traffic Circles** – Neighbourhood traffic circles are typically constructed in residential areas for traffic calming and/or aesthetic reasons. In many locations, a neighbourhood traffic circle can be installed within the footprint of the existing intersection without impacting the curb lines. The intersection typically does not include raised channelization to guide the approaching driver into the circulatory roadway.
- **Traffic Circles** – Traffic circles are old-style circular intersections typically constructed in urban areas. In many cases, traffic circles are equipped with traffic signals to control one or more entries, or to facilitate high pedestrian volumes. Statues or monuments are often located within the large central island.
- **Rotaries** – Rotaries were generally installed in Canada prior to the 1960's and are characterized by large diameter central islands, sometimes greater than 100 m in diameter. Rotaries require lane changes within the circulatory roadway and therefore have large distances between intersecting approaches, contributing to their large overall diameter.

Roundabout Types and Characteristics

Roundabouts in Canada are separated into the following three basic categories according to size and number of lanes to facilitate specific performance or design issues: **mini-roundabouts**, **single-lane roundabouts**, and **multilane roundabouts**.

A broader range of roundabout configurations exist in practice today than the three categories denoted. These include grade-separated roundabouts, signalized roundabouts and double roundabouts.

Roundabouts in urban areas may feature smaller inscribed circle diameters due to smaller design vehicles and right-of-way constraints, and may include more extensive pedestrian and bicycle features. Roundabouts in rural areas typically have higher approach speeds, which may necessitate additional attention to visibility, approach alignment, and cross-section details.

Basic Features

A modern roundabout, herein referred to as a roundabout, is a type of circular intersection in which vehicles travel counter-clockwise (in Canada and other right-hand traffic rule of the road countries) around a central island, and can contain multiple lanes. Vehicles entering the roundabout must yield to circulating traffic. Roundabouts have specific geometric design



Highway 101, Margeson Road Interchange, Nova Scotia
Photo: Nova Scotia Transportation & Infrastructure Renewal

and traffic control features to enhance safety and capacity of the intersection, including:

- **Central Island** – The central island is the raised area in the centre of the roundabout, which the circulatory roadway travels around. The central island is not always circular in shape, and may be traversable in the case of a mini-roundabout.
- **Splitter Island** – Splitter islands are raised or painted areas provided between the entry and exit lanes of an intersection leg to separate traffic, deflect and slow entering traffic, and allow for a two stage pedestrian crossing.
- **Circulatory Roadway** – The circulatory roadway is the curved path used by vehicles to travel in a counter-clockwise manner around the central island.
- **Truck Apron** – A truck apron is a traversable, hard surfaced portion of the central island adjacent to the circulatory roadway with a mountable curb to accommodate the wheel tracking of large vehicles. Aprons can also be provided on the outside of the circulatory roadway at entrances and exits.
- **Entrance Line** – The entrance line is a dashed line that marks the point of entry into the circulatory roadway. In some instances, the entrance line functions as the yield line, if no separate line is present.
- **Pedestrian Crossings** – For roundabouts with pedestrian crosswalks present, the crosswalks are located upstream of the roundabout entrance line and downstream of the exit. The splitter island is cut at the crossing to allow pedestrians of all abilities to pass through. The pedestrian crossings should be accessible with detectable warnings and appropriate slopes.
- **Landscape Buffer** – Where provided, landscape buffers separate vehicular and pedestrian traffic and assist with guiding pedestrians to the designated crossing locations. The buffers, which form part of the boulevard, can also help to enhance the aesthetics and appearance of the roundabout.
- **Inscribed Circle Diameter (ICD)** – While not a geometric design or traffic control feature, the ICD is a critical design dimension that influences the operational and safety performance of a roundabout. The ICD is defined as the diameter of the largest circle that can fit into the intersection outline.



Pooles Corner, Prince Edward Island
Photo: P.E.I. Department of
Transportation, Infrastructure and Energy

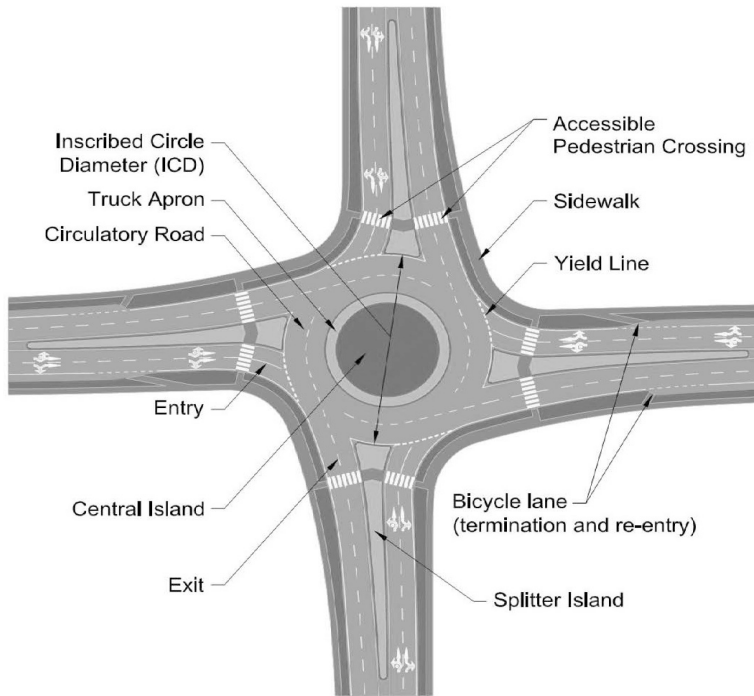


Figure 1: Basic Geometric Design and Traffic Control Features of a Roundabout

More Information

The information in this primer is extracted from the Transportation Association of Canada publication *Canadian Roundabout Design Guide*, which provides information and guidance related to the planning, design, construction, operation, maintenance and safety of roundabouts in Canada. This publication is available for purchase from TAC's online bookstore at www.tac-atc.ca.

Disclaimer

Every effort has been made to ensure that this primer is accurate and up-to-date. The Transportation Association of Canada assumes no responsibility for errors or omissions. The primer does not reflect a technical or policy position of TAC.

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McCallum Road, Abbotsford, British Columbia
 Photo: British Columbia Ministry of Transportation and Infrastructure



Travellers Rest, Prince Edward Island
 Photo: P.E.I. Department of Transportation, Infrastructure and Energy