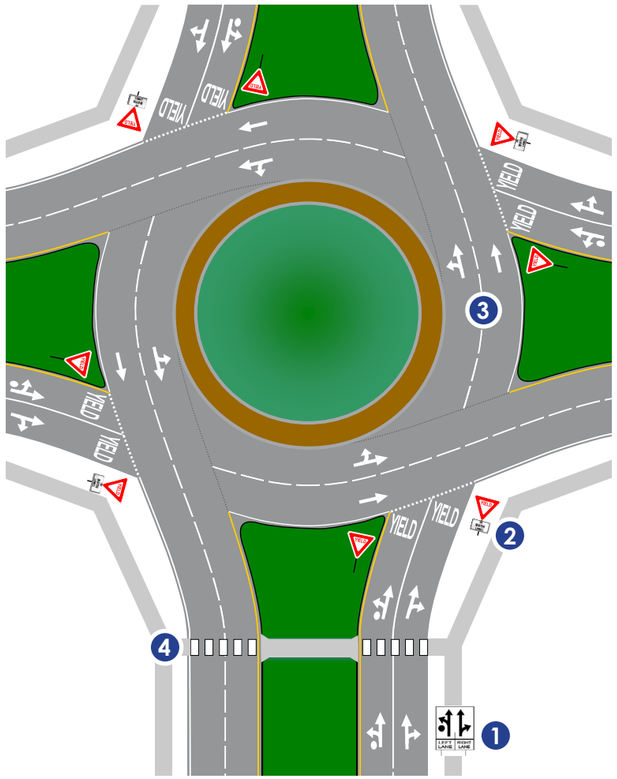
We Need To Continue To Educate Drivers

Main Principles For Multi-lane Roundabouts

1. Pick your lane early
2. Yield to ALL lanes of cross traffic when entering
3. Obey signs and lane markings within roundabout
4. Stop for non-motorized users within the crosswalk



* Image includes suggested design modifications

Video Resources

"Navigating a Multi-Lane Roundabout" Video
https://youtu.be/CEhNboz5GPk

"How About a Roundabout? The MN Experience" Video
https://youtu.be/xuvqClEjPxQ

"Roundabout Myths" Video
https://youtu.be/4qvomI8LMb8

Resources/Research in progress

- Websites:
  - MnDOT Roundabouts http://www.dot.state.mn.us/roundabouts/
  - Washington County Roundabouts www.co.washington.mn.us/roundabout_u
- LRRB Study - Effect of Signing & Lane Markings on the Safety of a Two-Lane Roundabout (Richfield Study)
  http://dotapp7.dot.state.mn.us/projectPages/pages/projectDetails.jsf?id=6991&type=CONTRACT
- LRRB Study - Evaluation of Safety & Mobility of Two-Lane Roundabouts (in progress) (Mankato, St. Cloud & Lakeville Study)
  http://dotapp7.dot.state.mn.us/projectPages/pages/projectDetails.jsf?id=12318&type=CONTRACT
- Webinar Evaluation of Safety & Mobility of Two-Lane Roundabouts
  http://www.roadwaysafety.umn.edu/events/webinarseries/2016/032216/index.html
- NCHRP 672- Roundabouts: An Informational Guide
  http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_672.pdf
- Traffic Safety Fundamentals Handbook (See page C-27)
  http://www.dot.state.mn.us/trafficeng/publ/fundamentals/2015-mndot-safety-handbook-reduced.pdf

LRRB
LOCAL ROAD RESEARCH BOARD

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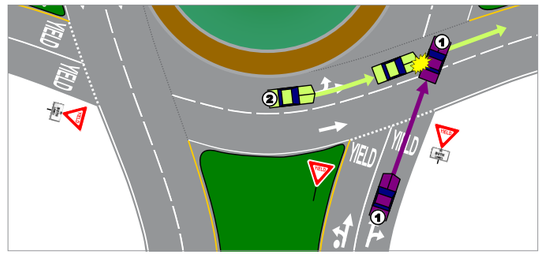
Thinking of Building a Multi-Lane Roundabout?

Multi-lane roundabouts can be an effective intersection control and reduce injury crashes if the design and layout is carefully considered. Past experience has indicated that failure to yield and improper lane use violations can be over represented at multi-lane roundabouts, leading to a higher number of property damage crashes. Two LRRB funded studies have recently been conducted to attempt to address these violations. This document is a summary of findings from these studies and local agency experience to date.

What Can Be Expected With Multi-Lane Roundabouts?

Multi-lane roundabouts tend to see an increase in crashes due to failure to yield and improper lane use violations, however these crashes tend to be minor. Crash Modification Factors (CMF) Clearinghouse research indicates that conversion from a signal controlled intersection to a multi-lane roundabout has resulted in an overall increase in crashes but the crash reduction factor for severe crashes is still in the range of 60% to 70%.

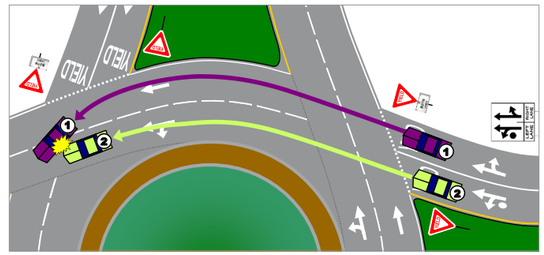
Failure to Yield



Some drivers may incorrectly perceive roundabout entry as a "right turn" or "merge" situation. When they do, drivers in the right-hand lane may fail to yield to the left lane of cross traffic, leading to a collision. In this diagram, Vehicle 1 is at fault for failing to yield to both lanes of cross traffic.

https://www.co.washington.mn.us/DocumentCenter/View/3768

Improper Lane Use



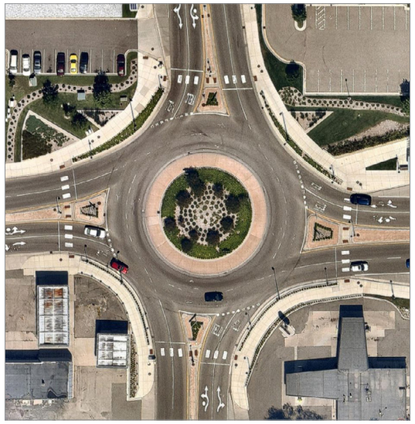
Some drivers may incorrectly perceive the roundabout as being a "circle road" and therefore may disregard lane use signs and instead attempt to turn left from the right-hand lane, thus cutting in front of the vehicle next to them. In this diagram, Vehicle 1 is at fault for failing to position themselves in the left-hand lane prior to turning left within the roundabout.

https://www.co.washington.mn.us/DocumentCenter/View/3769

Where Did We Study Multi-Lane Roundabouts?

Woodbury (Radio Dr. and Bailey Rd.)

Lakeville (CSAH 50 and CSAH 60)



Richfield (66th St. and Portland Ave.)

St. Cloud (University Dr. S. and 5th Ave. S.)

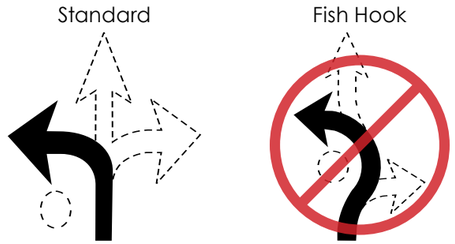
Mankato (TH22 and Madison Ave. & TH22 and Adams St.)

Suggested Design Modifications to Consider

Findings from the two LRRB funded research projects that reviewed the operations of multi-lane roundabouts as well as local agency experience indicate that the following design modifications have shown to reduce crashes and the number of improper turn and failure to yield violations.

Arrow Styles

Use standard arrows rather than "fish hook" style arrows for pavement markings and signage.



Source: MNMUTCD 2015 Figure 3C-2

Extending Solid White Lane Line

Extension of the solid white lane line between the two approaching lanes from 50 feet to 250 feet from the yield line.

Source: Washington County
Modification indicated by blue highlight

Overhead Signs

Install overhead signs designating proper lane choice based on the drivers destination, prior to entering the multi-lane roundabout.

Source: Dakota County

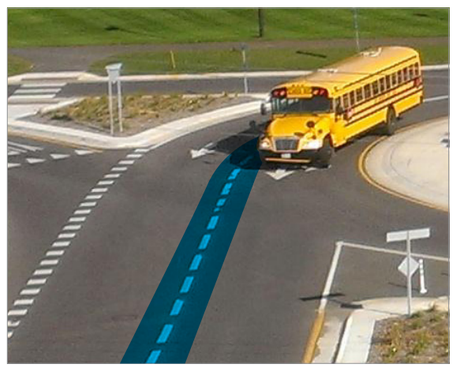
Yield to both lanes

Provide a regulatory sign that states yield "to both lanes".

Source: Washington County

Strong Skip Line

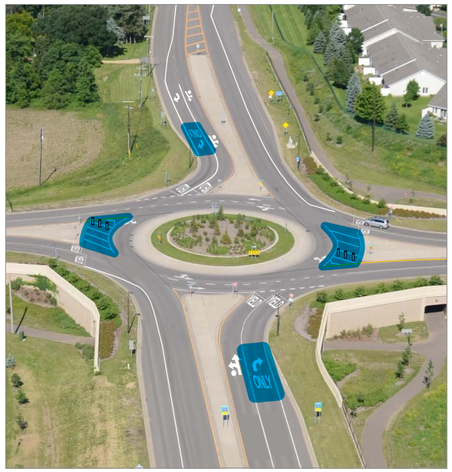
For any lane lines within the roundabout, use the 8-inch "Strong Skip" pattern rather than a combination of solid and broken lines. Use of this pattern has been shown to help reduce crashes resulting from improper lane use.



Source: Washington County
Modification indicated by blue highlight

Do not build for 20-year forecasts

Constructing roundabouts with more lanes than are needed for current traffic levels can create unnecessary opportunities for driver error. Roundabouts can be constructed to accommodate future expansion, yet be configured for current traffic levels to prevent driver error and to reinforce proper driving behaviors. This image shows a roundabout that was originally built to accommodate two through lanes in all directions, but was later modified such that the minor street approaches have only one through lane in the short term, thus reducing driver error and crashes.



Source: Washington County
Modification indicated by blue highlight

Other Design Considerations

- Avoid visual cues such as pavement joints that might encourage improper lane use
- Conduct a capacity analysis using RODEL modeling software rather than FHWA's model, which is more conservative.