A Current State of the Practice of Roundabouts in Washington County

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Joe Gustafson, PE, PTOE
Transportation Engineer
Washington County Public Works
Stillwater, MN
Today’s Presentation

• Current sources of guidance
• What makes a roundabout?
• How a roundabout’s framework influences:
  – Design, Signing, and Striping
  – Education, Operation, and Enforcement
  – Data Collection & Reporting
• “Roundabout Diets” & 2013 Lessons
County Roundabouts to Date

• 2007 – First roundabout on County roads
• 2008 – Opened 3 single-lane roundabouts
• 2010 – Two MnDOT-owned roundabouts opened to traffic (at CSAH intersections).
• 2013 – Six more roundabouts opened along County roads (3 MnDOT, 3 County)
• 2013 – Two “Roundabout Diets” completed
• Currently 12 roundabouts, 3 are multi-lane
What makes a roundabout?

- Size? At what diameter is it too big or too small to be a roundabout?
- Traffic control? If you add signals to a roundabout, is it no longer a roundabout? Or is it a signalized roundabout?
- Geometry? Traffic circles and rotaries have flared entry too. What if it’s not “circular”?
- Operating speed?
- What about outside the USA?
- Conflict points? What are these anyway?
NCHRP 672 Says:

- 32 Conflict Points
- 8 Conflict Points

• Just one problem: This is incompatible with multi-lane roundabouts and with the MUTCD.
• No conflict point diagram is provided in NCHRP 672 for multi-lane roundabouts.
Correct Conflict Points

There is no “circle road” at a roundabout. Just a central island.

- 4 Crossing Conflicts
- 8 “Joining” Conflicts
- 8 “Separating” Conflicts

A 4-legged roundabout is 20 conflict points, not eight.
What makes a roundabout?

A roundabout is NOT a series of “T” intersections.

There is no “circle road” at a roundabout.

There is only a circular island.
Why is it important?

Legal operations and proper driver behavior are very different at these two configurations!
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Straight Out to Exit

Right Turn to Exit
It’s not just the USA…

Signalized Roundabout near Melbourne, Australia
Greensborough Highway at Civic Drive
Image Copyright DigitalGlobe, GeoEye, SinclairKnight Merz & Fugro.
How is this affecting design, education, enforcement, and operations lately?
New Minnesota State Law:

169.19 Subd. 5. Signal to turn.
“A signal of intention to turn right or left shall be given continuously during not less than the last 100 feet traveled by the vehicle before turning. A person whose vehicle is exiting a roundabout is exempt from this subdivision.”
No More Fish-Hook Arrows
“Roundabout Diets”
a.k.a. “Right-Sizing” Roundabouts

Eliminating opportunities for driver error while still preserving adequate levels of service.

In this type of crash, **Vehicle 1 is at fault** for failing to obey the lane use signs and choosing the incorrect lane. Drivers wishing to turn left **must** be in the left (inside) lane before entering the roundabout.

In this roundabout diagram, **Vehicle 1** is following a car exiting the roundabout without yielding, resulting in a head-on collision with a car entering the roundabout.

Entering vehicles must yield to ALL traffic from the left. Entry is not a “right turn” nor a “merge” situation.
“Roundabout Diet”
Woodbury, MN

Drivers making through movements from the outer lane are the ones most likely to fail to yield. This possibility has been eliminated on two of the four approaches.
“Roundabout Diet”
Woodbury, MN

Improved yielding compliance on the other two approaches. The false notion of an “inner ring” has been effectively dispelled. No more attempts to “merge”.
Improper “outside lefts” are now physically prevented from all four directions.
Is it working?

• Before conversion, “2x2” roundabout averaged 3 crashes per month.

• After conversion to “1x2” roundabout, only one crash reported in four months since.

• 92% crash reduction so far…
New County Striping Detail Sheet

- Face of curb nose
- Groove or pavement joint (no pavement marking)
- White hatch lines at 10 ft spacing and 45 degrees to curb line.
- Edge line sometimes omitted on approach to crosswalk. Otherwise align as shown.
- Refer to plan set for line widths, skip/gap patterns, and contrast requirements.
Crash Diagramming

If a roundabout is four crossing conflicts, why not diagram crashes that way?
which not enough detail was available for diagramming:

3/30/2011 (1219) L-C-D

3/30/2012 (1350) L-C-D

3/27/2011 (1350) L-C-D

Lake Street (TH 61)

East Broadway
To Lakeside Park

Bridgeview Ave (CSAH 2)

Lake Street (TH 61)
Curbs & Trucks
Curbs & Trucks
Curbs & Trucks

New “S524” curb design used in 2014
Curbs & Trucks

New “S524” curb design used in 2014 intended to be “tipped in” toward the apron.
Curbs & Trucks

If S524 gutter is not tipped in (draining away), the truck apron will be nearly 6” higher than the roundabout pavement, too high for low-boy trailers.

Too much height, too aggressive on tires.

Tipping inward creates need for additional catch basins.

Washington County intends not to use S524 in the future.
Curbs & Trucks

- MnDOT “OSOW” (Over Size / Over Weight) Task Force looking at alternative curb and apron designs.
- Task force includes freight industry representation.
- Looking at state network to ensure ability to move oversize permitted loads.
2014 Roundabout Issues

• How long will our “1x2” roundabouts handle traffic? What happens then?

• Next crash issue to tackle – Left side yield signs being hit due to inadequate deceleration, especially in snow/ice.

• New truck apron and curb designs?

• Industry acceptance of roundabout terminology.
Thank You

Questions?

www.co.washington.mn.us/roundabout_u
Six-Legged Roundabout