“TOP TEN” Roundabout Myths and Misunderstandings

Prepared by: Mark Doctor, FHWA
Myth #10 - Roundabouts and traffic circles are the same thing

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What comes to mind when I say Roundabout?

Look Kids – Big Ben, Parliament!
Modern roundabouts are different from the older “Rotary” style intersections!!!

Source: “A Policy on Geometric Design of Rural Highways”, AASHO 1965
Roundabout Evolution

- **1900’s to 1940’s – Rotaries and Traffic Circles Emerge**
  - Columbus Circle in NYC credited as the first

- **1950’s – Circular intersections out of favor**

- **1960’s – Great Britain tries redesigns of circular intersections**
  - Adopted mandatory “yield at entry” rule

- **1980’s – “Modern Roundabouts” widely used in**
What is a Modern Roundabout?

Published Definitions from Key References:

**Manual on Uniform Traffic Control Devices**

A circular intersection with yield control of all entering traffic, channelized approaches, and appropriate geometric curvature, such that travel speeds on the circulatory roadway are typically less than 50 km/h (30 mph).

**AASHTO “Green Book” - A Policy on Geometric Design of Highways and Streets**

“Modern roundabouts” are defined by two basic operational and design principles:
- Yield-at-Entry
- Deflection of Entering Traffic
Kingston, NY – Traffic Circle

No control of entry
High speed

Large diameter (600 ft +)

High speed weaving here
Kingston, NY
Traffic Circle reconstructed to Roundabout

Smaller diameter
(Typically 120 - 250 feet)
Common distinctions between modern roundabouts and older rotary type intersections:

Typically, modern roundabouts are –

- smaller than rotaries
- designed for slower entry, circulating, and exit speeds
- always following a “yield-at-entry” traffic control principle
- designed with a raised splitter island to slow and deflect traffic prior to entry
- designed to facilitate safer pedestrian crossings
- designed to follow a same lane entry/lane exit principle at multilane roundabouts (NO LANE CHANGES in the circulatory roadway)
Signalized Traffic Circles are not Roundabouts !!!

Dupont Circle, Washington, DC

Is Not a Roundabout
Traffic calming circles are not roundabouts

Examples of traffic calming circles - NOT ROUNDABOUTS
Examples of traffic circle features inconsistent with a modern roundabout

- Traffic on circular roadway has the Yield control
- Parking on circulatory road
- Stop Control
FACT: Roundabouts are a subset of circular intersections.
Myth #9 - Roundabouts cause more crashes

- FACT: Study after study conclusively shows that modern roundabouts reduce motor vehicle crashes.

- The Insurance Institute for Highway Safety (www.highwaysafety.org) "most serious kinds of crashes at conventional intersections are virtually eliminated by roundabouts...Crashes that do occur tend to be minor because traffic speeds are slower."

- Studies of intersections around the U.S. that have been converted from stop signs or traffic signals to modern roundabouts.
  - Total crashes were reduced by 39%
  - Serious crashes were reduced by 76%
  - Fatal or incapacitating injuries reduced by 89%
What makes roundabouts safer?

Two key reasons:

1) They reduce the number of potential conflicts
2) They reduce speeds (higher-speed crashes are more likely to result in serious injury or death)

- 32 conflict points
  - High-speed
  - High-angle
  - High-energy

- 8 conflict points
  - Low-speed
  - Low-angle
  - Low-energy
That all sounds good in theory .... but what do the “numbers” show?

NCHRP Report 572 – *Roundabouts in the US*

Before-after studies at 55 US intersections

- 35% overall decrease in crashes
- 76% decrease in injury crashes
- 81% decrease in fatal/incapacitating crashes for single lane urban roundabouts
- 71% decrease in fatal/incapacitating crashes for single lane rural roundabouts

*Roundabouts are SAFER !!!*
Myth #8 - The public will never accept roundabouts

Photo source: NYSDOT
FACT: Public Attitude Toward Roundabouts Quickly Changes After Construction

<table>
<thead>
<tr>
<th>Attitude</th>
<th>Before Construction</th>
<th>After Construction</th>
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<tbody>
<tr>
<td>Very Negative</td>
<td>23%</td>
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<tr>
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Drivers Who Favor or Oppose Roundabouts

Insurance Institute for Highway Safety
From Opposition To Support

ITE Journal Sept 2002: Surveys in Kansas, Maryland and Nevada
Getting Used to Roundabouts

National studies show that communities usually oppose the idea (roundabouts) at first, Washington State DOT engineer Brian Walsh said, “our experience here in Washington have mirrored that; we have had a lot of people not very happy about the idea of roundabouts, but after they are constructed, those fears mostly go away.”

Washington State DOT built its first state-highway roundabout in 1998 in Port Orchard, where a triangular intersection on Highway 160 had produced 39 crashes in three years. In the first 18 months after the roundabout opened, only two accidents occurred.

The Seattle Times June 5, 2002
Sometimes it takes perseverance!!!
Opponents Can Become Proponents

Letter to the Editor:

“I must admit it! I was wrong. The roundabout at Marsh and Hamilton roads appears to be working. Congrats to the Ingham County Road Commission and to Meridian Township”

Okemos, MI
Myth #7 - Roundabouts cost more

- Actual costs depend on several site specific conditions
- Most agencies find the initial construction cost of a roundabout is comparable to the initial construction cost of a signal
- A “life-cycle” cost comparison should be used since roundabouts do not require signal equipment maintenance ($15,000 + per year). Over the long run, roundabouts are typically less expensive than signals
- In some instances a roundabout may cost less because fewer lanes may be needed than at a signalized intersection. Typically the number of turn lanes can be reduced and in some instances the improved efficiency at the intersection allows the number of through lanes to be reduced.
Comparison of Typical ROW Needs:
Roundabout vs Comparable Signalized Intersection

LEGEND
- Red: Area required for roundabout but not for signal
- Blue: Area required for signal but not for roundabout
Comparison of ROW Needs:
Urban Roundabout Alternative vs Signalized Intersection with Turn Lanes

The additional ROW needed for turning/storage lanes is often much more extensive than the corner properties needed for a roundabout.
R.O.W. Comparison

Main St. and Center St.
Hamburg, NY

Source: NYSDOT
Fact: Roundabouts are very efficient from a traffic operations perspective and for a given volume will typically have less delay time than a signal or stop controlled intersection.

Roundabouts must be designed to accommodate the proper demand volumes. An oversaturated roundabout will operate poorly as will an oversaturated signalized intersection.
Myth #5 – Fire trucks and other large vehicles can’t make it through a roundabout

Fact: A well-designed modern roundabout includes a “truck apron” sized in accordance with the appropriate design vehicle for the highway type.
Myth #4 - Roundabouts are not good for pedestrians and bicyclists

Fact: Roundabouts are very pedestrian friendly
- The splitter islands provide a space for pedestrians in the middle of each crossing. Therefore, pedestrians only need to cross one direction of traffic at a time.
- The pedestrian crosswalks are set at least one full car length back from the yield line. That way, pedestrians do not have to cross in front of drivers that are looking for their gap in traffic. Experience has shown that the stopped vehicle one car length back from the yield line is more aware of pedestrians.
Comparison of Vehicle / Pedestrian Conflicts

16 Conflicts

8 Conflicts
Myth #3 – Roundabouts aren’t good for older drivers

Some Demographic Facts:

- Americans aged 85 and older are the fastest growing part of the population.
- The size of the population aged 65 and older is projected to double over the next 30 years.
- By 2020 one in five people will be aged 65 or older.
- In other words - before 2020, the 85th percentile design driver will be someone aged 65 or older.
Older users are especially at risk at intersections

• About 35%-40% of pedestrian deaths among people aged 65 and older occur at intersections.

• Older drivers are about twice as likely to be killed while driving through an intersection than younger drivers.

• Drivers 85 years of age and older are more than 10 times as likely as drivers in the 40-49 age group to have multi-vehicle intersection crashes.

“There is agreement that elderly road users require mobility, and that they should be accommodated by the highway’s design and operational characteristics to the greatest extent practicable. Thus, designers and engineers should be aware of the problems and requirements of the elderly, and consider applying applicable measures to aid their performance.” — AASHTO Green Book
What Roundabouts Provide:

- Lower speeds
  - Situation changes slowly
- Very forgiving environment
- More time to make the right response
- Judging gaps is easy and mistakes are not lethal
- NO demand to accurately judge closing speeds of fast traffic
- Low energy crashes: low closing speeds, low angle, low impact
- No wide visual scans needed
- Reduced need to look over one’s shoulder
- Uncomplicated situations; simple decision-making
The Acacia Roundabout
Clearwater, FL
...opened in December, 2001
Myth #2 – Roundabouts are bad for the nearby businesses

Fact: Most business owners agree that slower speeds and safer travel enhance business along the corridor.

Fact: Some “blighted” communities have actually experienced economic revitalization following roundabout projects.
Case Study: Golden, Colorado
South Golden Road before Improvements

AFTER
Case Study: Golden, CO
South Golden Road – 15,000 ADT

- $1.3M project in 1999 to construct four roundabouts, landscaping, medians & sidewalks
- Significant drop in number and severity of crashes
  - 1997 crash rate = 5.9 crashes/MVM
  - 2004 crash rate = 0.2 crashes/MVM
- Slower speeds but faster travel time thru corridor
- 60% sales tax revenue increase along corridor
  - *Roundabouts are good for business !!!*
Myth #1 – The roundabout center island is a great place to put a park, a monument, or a fountain.
“Musica” at the Music Row Roundabout – Nashville, TN
Roundabout Landscaping

Bloomington, IN
Principles for Good Roundabout Landscaping

- Make the center island more conspicuous
- Minimize roadside hazards
- Maintain adequate sight distance
- Discourage pedestrian traffic through the center island
- Improve area aesthetics
For more information ....

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