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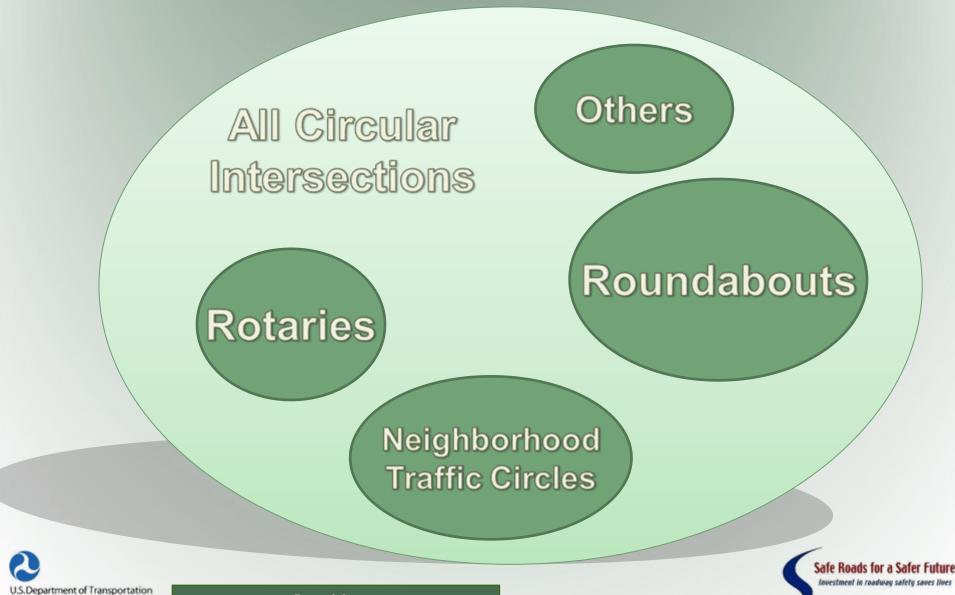
Safety Aspects of Roundabouts





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Terminology -



Roundabouts

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What isn't a Modern Roundabout?







Neighborhood Circle

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What is a Modern Roundabout?

- A compact circular intersection in which traffic flows counterclockwise around a center island
- Entering traffic yields
- Approaches are channelized to deflect traffic into a proper entry path
- Designed to slow the speed of vehicles







What is a Modern Roundabout?





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Roundabout History



- Rotaries and Traffic Circles Emerge
 - Columbus Circle in NYC credited as the first
- Circular intersections out of favor
- Great Britain tries variants of circular intersections
 - Adopted mandatory "yield at entry" rule
- Modern roundabouts widely used in Europe and Australia
- Modern roundabouts start to be built in the US



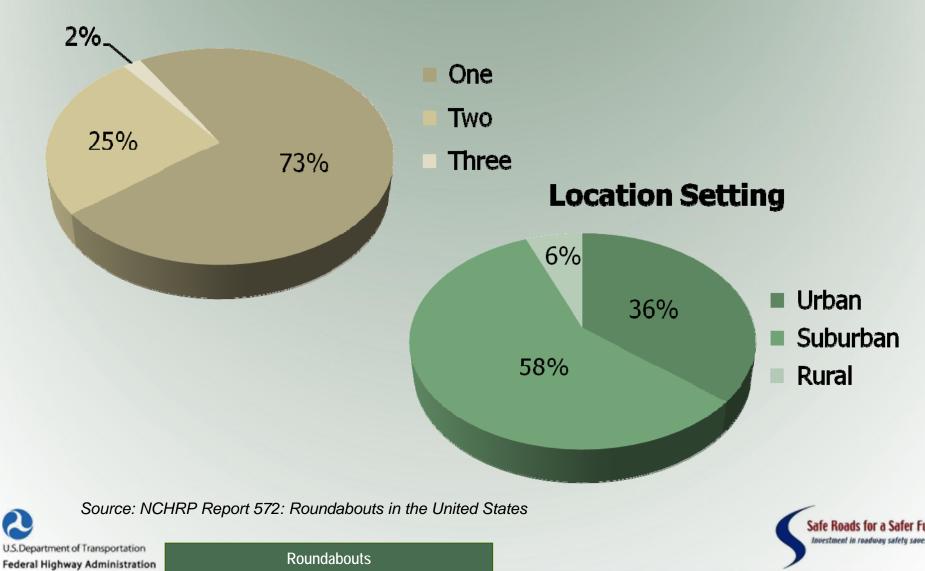




Roundabouts in the U.S.

of Circulating Lanes

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Key Features



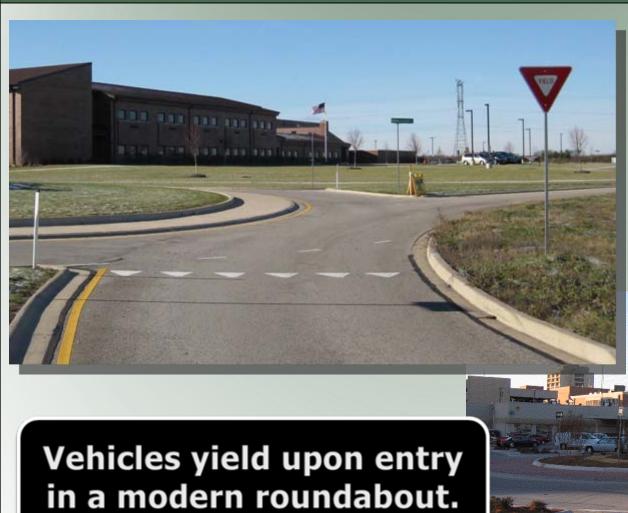


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Yield Control





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Circulatory Roadway

No traffic control in the circulatory roadway. Movement is counter-clockwise.



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Central Island



Roundabouts

Central island deflects vehicles from a straight-line path.





Splitter Island

Splitter islands separate, deflect, and slow traffic.



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Roundabouts

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Landscaping





Landscaping is needed as a visual element to drivers



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Pedestrian Access





Pedestrian crossings must conform to ADA standards.

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Truck Apron

Where trucks are common, a properly designed apron may be necessary.





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Signing and Marking





Proper signing help drivers navigate the roundabout.



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Signing and Marking



Proper signing help drivers navigate the roundabout.





Signing and Marking





Proper pavement markings help drivers navigate the roundabout.

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Why a Roundabout?

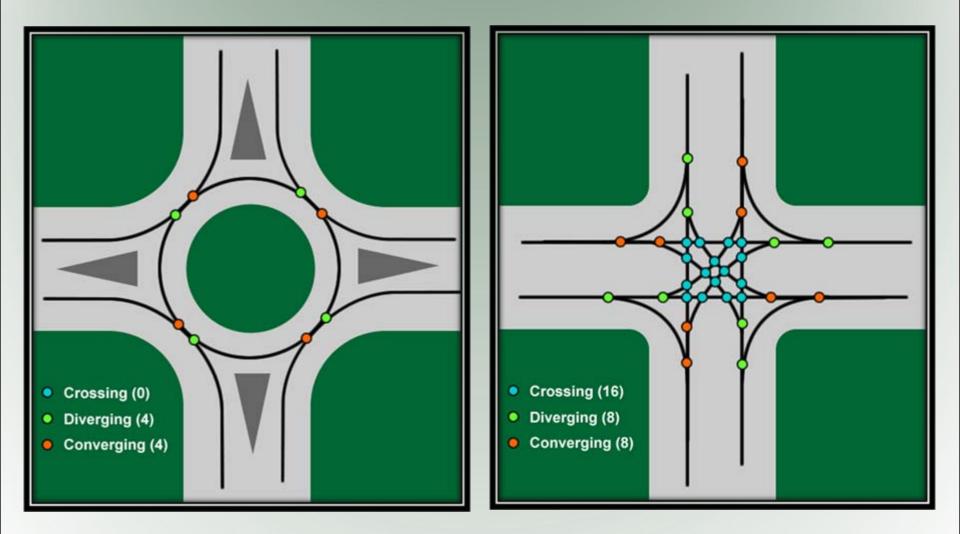




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Vehicle Conflict Points -





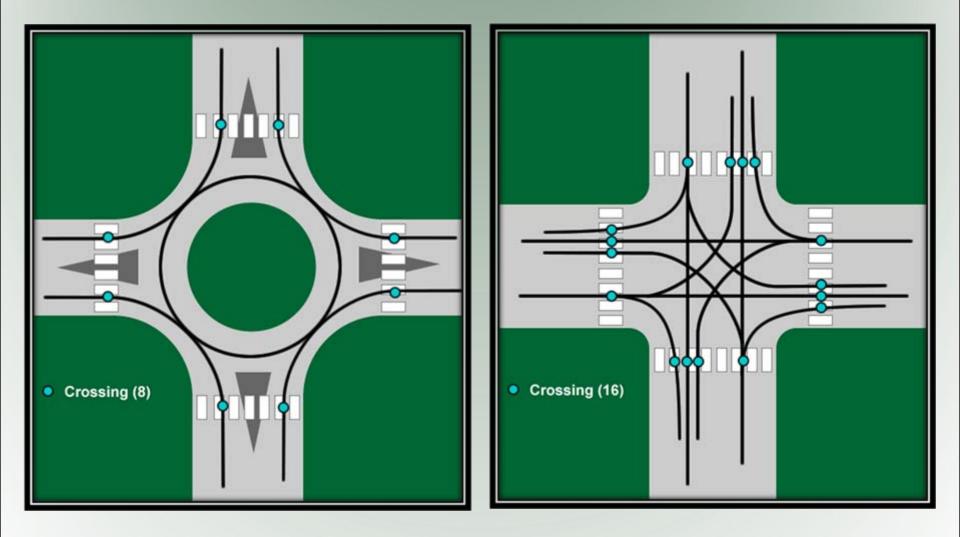
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Vehicle-Pedestrian Conflict Points





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Type of Crashes

Typical 4-leg intersection Roundabout Angle **Sideswipe** Left turn

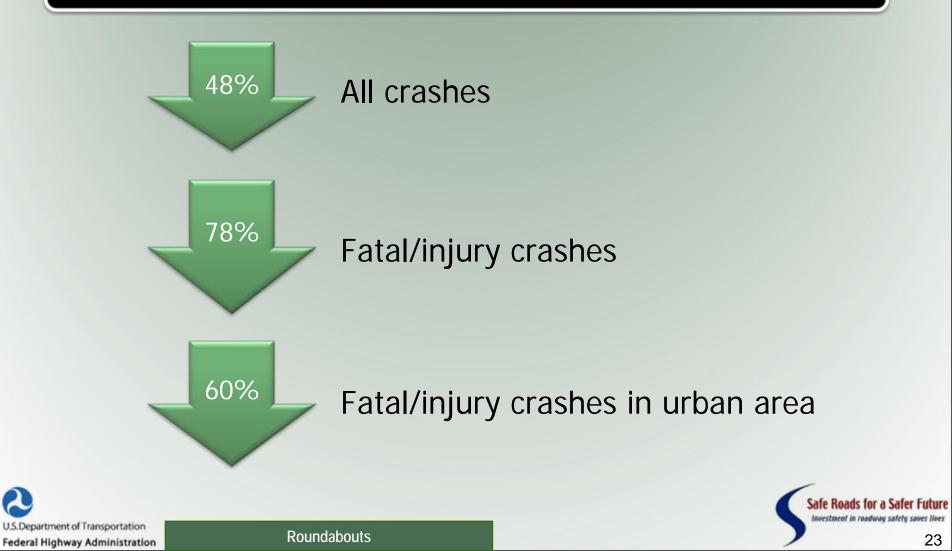




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Study Results

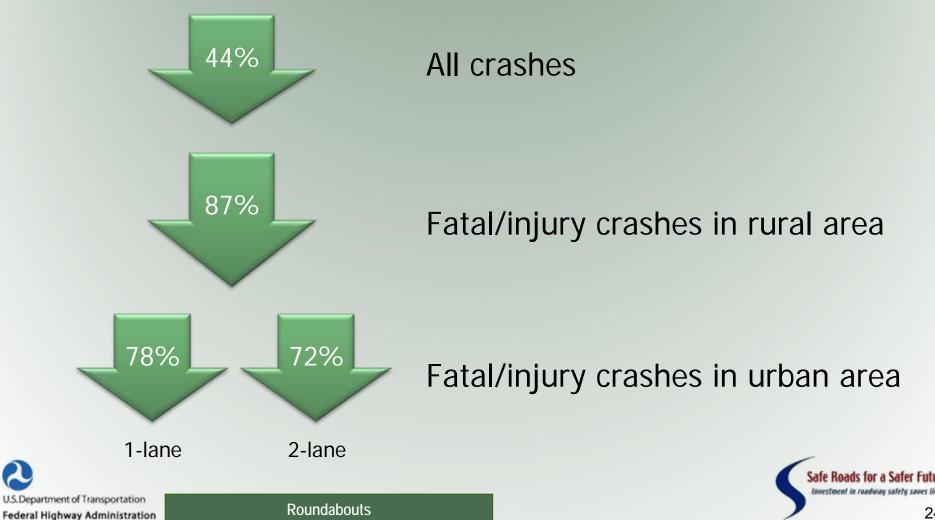
Convert signalized intersection to roundabout



Study Results

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Convert two-way stop intersection to roundabout



Older Drivers and Safety

- Narrowing of visual field
- Restricting of the area of visual attention
- Decreased motion sensitivity
- Decline in selective attention
- Decline in divided attention
- Decline in perception-reaction time (PRT)
- Loss of flexibility





Older Drivers and Safety

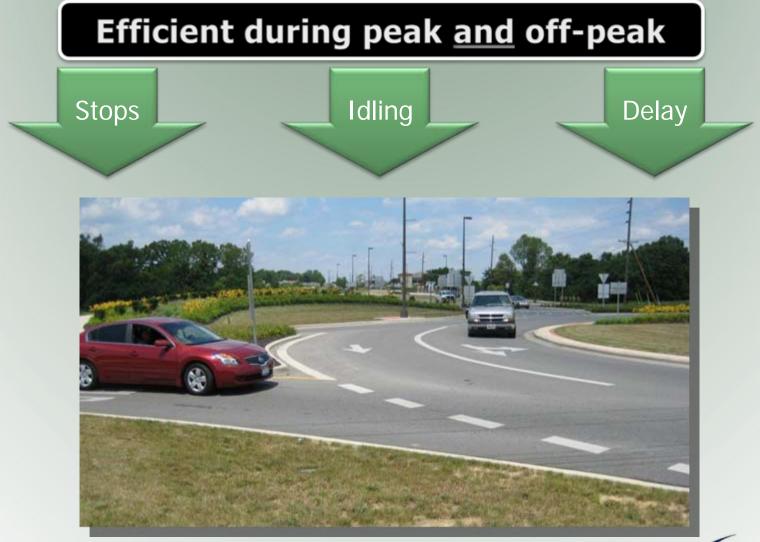
Conventional Intersection	Roundabout
High speeds	Low speeds
Little response time	Situation changes slowly/More PRT
High energy crashes	Low energy crashes
Unforgiving environment	Forgiving environment
High severity crashes	Low severity crashes
Complexity	Easier to judge gaps
Wide visual scans	Narrow visual scans



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Reduce Congestion and Pollution





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Save Money

- No signal equipment to install, power, and maintain
- May require less right-of-way
- Less pavement may be needed





Complement Community Values

Quieter

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- Functional
- Aesthetically pleasing





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Special Considerations -

- Pedestrians
- Bicyclists

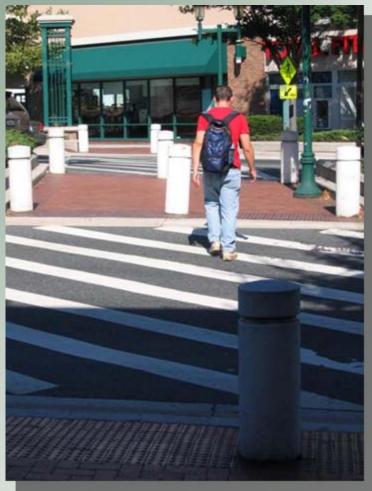
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Visually-impaired







Multi-Lane Roundabouts



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Roundabouts

safety saves lives

Mini-Roundabouts



- Smaller design for urban areas
- Speed zones < 35 mph
- Central island is often painted
- Relatively inexpensive







Rural Roundabouts

- Higher approach speeds
- Properly designed splitter island is critical







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Roundabouts

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Right-of-Way Requirements -



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Where to Consider Roundabouts -

Intersections with high crash rates/high severity rates
Intersections with complex geometry, skewed approaches, >4 approaches
Rural intersections with high-speed approaches
Freeway interchange ramp terminals
Closely spaced intersections
Replacement of all-way stops
Replacement of signalized intersections
At intersections with high left turn volumes
Replacement of 2-way stops with high side-street delay
Intersections with high U-turn movements
Transitions from higher-speed to lower-speed areas
Where aesthetics are important
Where accommodating older drivers is an objective



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Roundabouts in Corridors -





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Roundabouts in Interchanges

- Fewer queue backups
- Less bridge width possible



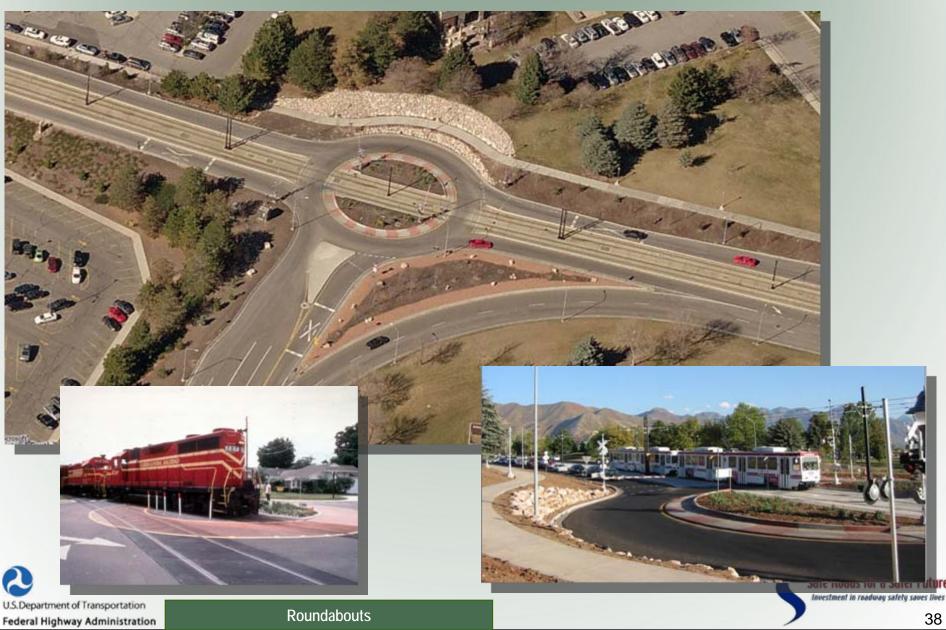


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Roundabouts and Rail Crossings

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Roundabouts and Schools -





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Roundabouts and Driveways







Issues to Review

- Context
- Space feasibility
- Physical or geometric complications
- Proximity of railroad grade crossings, drawbridges
- Traffic congestion
- Presence of oversize vehicles
- Presence of pedestrians and bicyclists

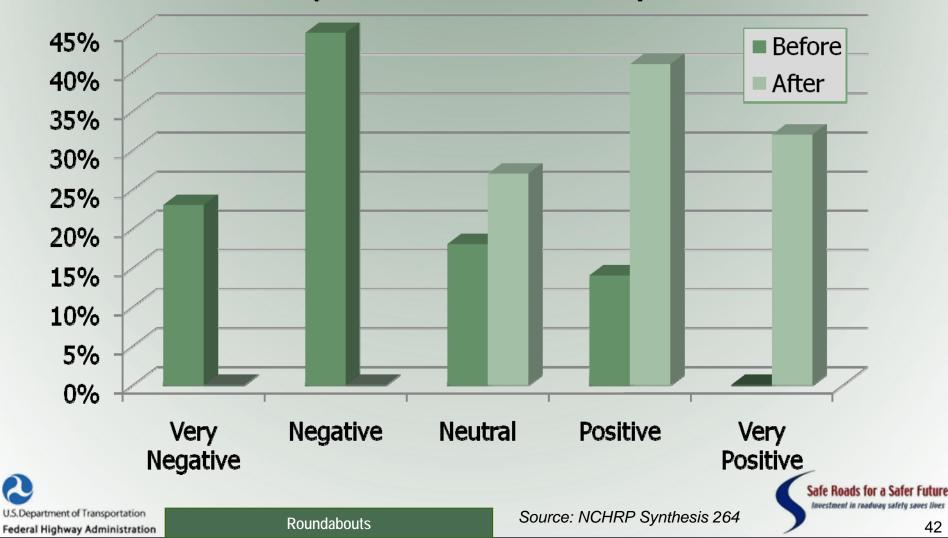




Roundabout Resistance

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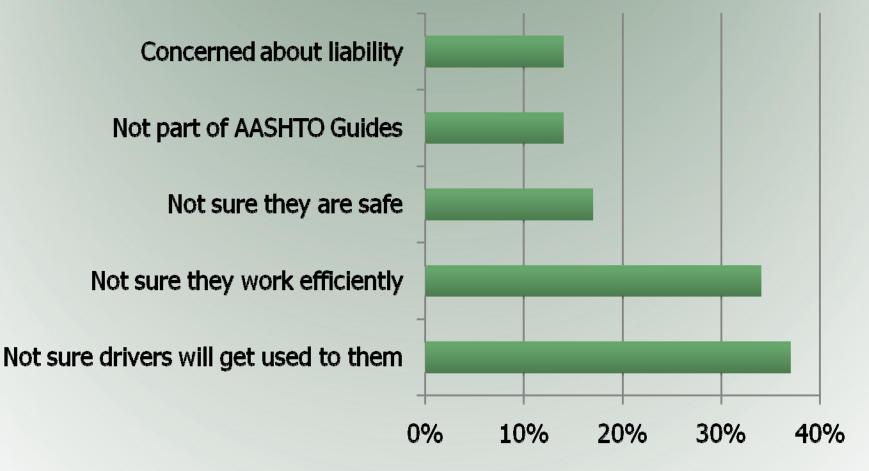
Public Attitude Towards Roundabouts (Before and After Construction)



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Roundabout Resistance

Reasons Why Agencies Have Not Built Roundabouts





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Source: NCHRP Synthesis 264

Keys to Success

• Proper design

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- Public involvement
- Stakeholder support









Roundabout Resources

Roundabouts Roundabouts A Safer Choice A proven safety solution that reduces the number and severity of intersection crashes. **History of Roundabouts** THEVELY OF INCOMPARATION OF A STATE OF A STA The modern roundations was developed in the United Kingdom to recarly problems associated with there undit controls. In 1996, the United Kingdom adopted a mandatory "pirmum", rule at an encoder intermetication, models required there are strained to prevented a conclusion protect. The rule prevented areadar intermeticates from being up by not adopted to conclusion protect. The encoder unit date and a setting and the strained and adopted and the strained and the encoder unit date wave sufficient gaps in circulating which and the strained and the encoder unit date wave sufficient gaps in circulating walks. ROUNDABOUTS What is a Modern Roundabou A modern roundatious is a one-way circular intersection without flows around a center island. Roundatiouts feature yield control for AN INFORMATIONAL GUIDE None served a center classed Discritizional insures yield control for a operandre and deproprise groupsess) and the served petter to communication of the served petter and the served devotes yield comparisons, politicismo, and disclassifications, find devotes yield comparisons, politicismo, and disclassifications, find whom are unable to judge adoption, to tradic are concludents. New whom discriming and the group of the served of group petter a disclassification of the served petter. r 3 ROUNDABOUTS



US Department of Transportation Federal Highway Administration Publication No. FHWA-RD-00-067

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NCHRP

REPORT 572

Roundabouts in the United States

TRANSPORTATION RESEARCH BOARD

Roundabouts

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HIGHWAY RESEARCH

COOPERATIVE

For More Information

- FHWA Office of Safety
 - http://safety.fhwa.dot.gov/
- Institute of Transportation Engineers
 - http://www.ite.org/
- U.S. Access Board
 - http://www.access-board.org/
- National Cooperative Highway Research Program
 - http://www.trb.org/



