

U.S. Department of Transportation

Federal Highway Administration

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Safety

Roundabouts and Mini Roundabouts

[Outreach & Education](#)

[Technical Materials](#)

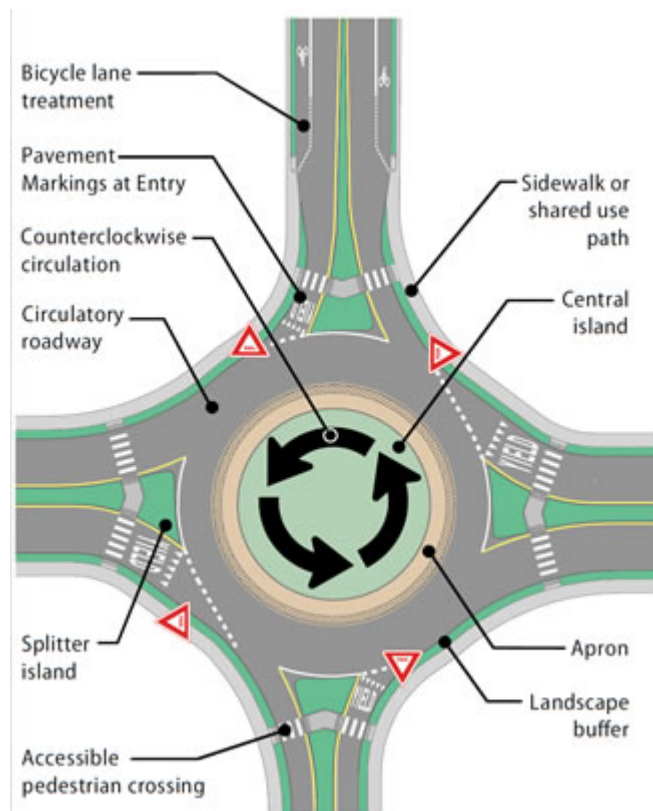
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A roundabout is a type of circular intersection, but is quite unlike a neighborhood traffic circle or large rotary. Roundabouts have been proven safer and more efficient than other types of circular intersections.

Roundabouts have certain distinguishing features and characteristics (as shown in the adjacent diagram). While these noted features are common to many roundabouts, they are not always present, as roundabouts are adapted to the context of the location. In fact, roundabouts don't even need to be perfectly circular! Successful roundabouts come in all shapes and sizes. Some are oval-, teardrop-, peanut- and dogbone- shaped. Some have as few as three legs and others as many as six. There are small, simple mini roundabouts, and larger, more complex multilane roundabouts. However, regardless of size, circular shape, or number of legs, the fundamental and essential characteristics of all roundabouts include:



Counterclockwise Flow. Traffic travels counterclockwise around a center island.

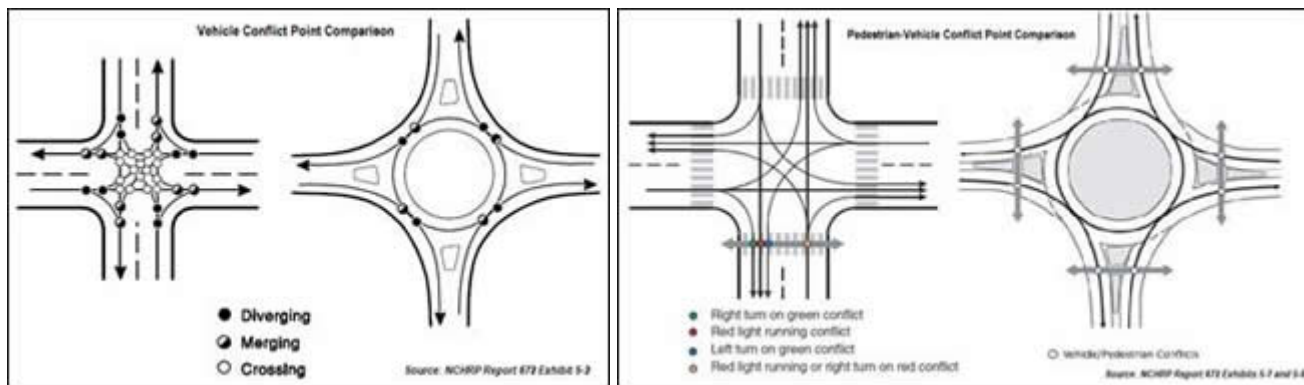
Entry Yield Control. Vehicles entering the roundabout yield to traffic already circulating.

Low Speed. Curvature that results in lower vehicle speeds, generally 15-25 MPH, throughout the roundabout.

Roundabouts can provide lasting benefits and value in many ways. They are often safer, more efficient, less costly and more aesthetically appealing than conventional intersection designs. Furthermore, roundabouts are an excellent choice to complement other transportation objectives – including Complete Streets, multimodal networks, and corridor access management – without compromising the ability to keep people and freight moving through our towns, cities and regions, and across the Nation. The FHWA Office of Safety identified roundabouts as a [Proven Safety Countermeasure](#) because of their ability to substantially reduce the types of crashes that result in injury or loss of life. Roundabouts are designed to improve safety for all users, including pedestrians and bicycles.

Most significantly, roundabouts **REDUCE** the types of crashes where people are seriously hurt or killed by 78-82% when compared to conventional stop-controlled and signalized intersections, per the AASHTO Highway Safety Manual.

By reducing the number and severity of conflict points, and because of the lower speeds of vehicles moving through the intersection, roundabouts are a significantly safer type of intersection. The diagram below excerpted from [*Roundabouts: An Informational Guide, Second Edition*](#) (published as NCHRP Report 672) illustrates the difference in conflict points between a conventional, four-legged intersection and an equivalent single lane roundabout. There are 32 conflict points associated with a conventional intersection – 8 merging (or joining), 8 diverging (or separating) and 16 crossing. In contrast, there are only 8 total conflict points at an equivalent roundabout – 4 merging and 4 diverging. Not only are conflict points halved with the roundabout, the type of conflicts that remain are the same-direction variety, which result in substantially less severity, and as a result, less likelihood of injury. The reduction of both the total number of conflict points and their severity is also true for pedestrians, also shown below in diagrams excerpted from the *Guide*.



Outreach and Education

Like any new technology or idea, it is necessary that people understand how roundabouts work and why they are needed. This conversation begins by communicating the magnitude and importance of the intersection safety challenge. With roughly $\frac{1}{4}$ of all traffic fatalities in the United States associated with intersections, it is critical that safer designs are implemented as widely and routinely as possible. But safer designs must also keep people and goods moving. Roundabouts have proven to be a safer *and* more efficient type of intersection. Still, because they may be unfamiliar to most people, successful implementation of a roundabout requires extra outreach and education. To help state and local road agencies advance roundabouts, the FHWA produces materials intended to communicate the advantages and benefits of roundabouts to a variety of different audiences. Many of these resources can be found in the [*Roundabouts Outreach & Education Toolbox*](#), and are also listed below:

Modern Roundabouts: A Safer Choice



+ Information Videos

- *Modern Roundabouts: A Safer Choice* [[YouTube](#)] [[WMV](#)] [[MOV](#)] – Script Text [[HTML](#)] [[PDF](#)]
- *Modern Roundabouts: An Innovative Solution to Intersection Safety Concerns* [[YouTube](#)]

+ Informational Brochures

+ Intersection Safety Case Study Series

+ Roundabouts Outreach & Education Toolbox [[HTML](#)]

+ Other Pedestrian and Bicycle Case Studies and Educational References

+ *Public Roads* Magazine Articles

Technical Materials

- Turbo Roundabouts – Informational Primer [[PDF](#)] *NEW!!!*
- Roundabouts: An Informational Guide, Second Edition (published as NCHRP Report 672) (TRB/FHWA 2010) [[PDF](#)]
- Roundabouts: An Informational Guide, First Edition (FHWA, 2000) **SUPERCEDED** [[PDF](#)]
- Roundabouts Technical Summary (FHWA, 2009) [[HTML](#)] [[PDF](#)] [[PPT](#)]

- Mini Roundabouts Technical Summary (FHWA, 2009) [[HTML](#)] [[PDF](#)] [[PPT](#)]
- Safety Aspects of Roundabouts (Short Version) (FHWA, 2007) [[HTML](#)] [[PDF](#)] [[PPT](#)]
- Safety Aspects of Roundabouts (Long Version) (FHWA, 2007) [[HTML](#)] [[PDF](#)] [[PPT](#)]
- Manual on Uniform Traffic Control Devices (FHWA, 2009)
- Full Document [[HTML](#)] [[PDF](#)] – Part 2 Signing [[HTML](#)] – Part 3 Markings [[HTML](#)]
- Temporary Traffic Control for Building & Maintaining Single & Multilane Roundabouts (ATSSA/FHWA, 2012) [[HTML](#)] [[PDF](#)]
- An Evaluation of Signing for Three-Lane Roundabouts (FHWA, 2010) [[HTML](#)] [[PDF](#)]

+ Roundabouts and the ADA

Other Resources

- National Highway Institute Course #380096 "Modern Roundabouts: Intersections Designed for Safety" [[HTML](#)] [[PDF](#)]
- Transportation Research Board Roundabouts Conference Proceedings (via TeachAmerica) [[2005](#)] [[2008](#)] [[2011](#)] [[2014](#)] [[2017](#)]
- Proceedings from Northeast U.S. Roundabouts Peer Exchange (2010) [[Materials](#)] [[Recordings](#)]
- State Highway Agency Roundabouts Resources (click on orange-shaded boxes to open link in browser):

AK									ME
	WA	MT	ND	MN	MI	PA	NY	VT	NH
	OR	ID	SD	WI	IN	WV	NJ	MA	RI
	NV	WY	NE	IA	OH	MD	DE	CT	
	CA	UT	KS	IL	KY	VA	DC		
HI		NM	CO	MO	TN	NC			
		AZ	OK	AR	MS	SC			
			TX	LA	AL	GA			
						FL	PR		

State & Federal Research

- Evaluation of Safety and Mobility of Two-Lane Roundabouts (Minnesota, 2017) [[PDF](#)]
- Strategies for Effective Roundabout Approach Speed Reduction (Minnesota, 2017) [[PDF](#)]
- Roundabout Practices (NCHRP Synthesis 488) (2016) [[PDF](#)]

- Estimating the Life-Cycle Cost of Intersection Designs (NCHRP Web-Only Document 220) (2016) [[PDF](#)] and Tool [[XLS](#)]
- Evaluation of Heavy Vehicles on Capacity Analysis for Roundabout Design (Nexttrans, 2016) [[PDF](#)]
- Roundabout Design Training for Alaska's Engineers (PacTrans, 2015) [[PDF](#)]
- Evaluation of Alternative Intersections and Interchanges Volume I - Roundabout Capacity and Rollover Analysis for Heavy Vehicles (Indiana, 2015) [[PDF](#)]
- Evaluating the Performance of Corridors with Roundabouts (NCHRP Report 772) (2014) [[PDF](#)]
- Accelerating Roundabout Implementation in the United States (Seven Volume Series) (FHWA, 2015)
 - Volume I – Evaluation of Rectangular Rapid-Flashing Beacons (RRFB) at Multilane Roundabouts – Final Report [[PDF](#)]
 - Volume II – Assessment of Roundabout Capacity Models for the Highway Capacity Manual – Final Report [[PDF](#)]
 - Volume III – Assessment of the Environmental Characteristics of Roundabouts – Final Report [[PDF](#)]
 - Volume IV – Review of Fatal and Severe Injury Crashes at Roundabouts – Final Report [[PDF](#)]
 - Volume V – Evaluation of Geometric Parameters that Affect Truck Maneuvering and Stability – Final Report [[PDF](#)]
 - Volume VI – Investigation of Crosswalk Design and Driver Behaviors – Final Report [[PDF](#)]
 - Volume VII – Human Factor Assessment of Traffic Control Device Effectiveness – Final Report [[PDF](#)]
- Evaluating the Performance of Corridors with Roundabouts (published as NCHRP Report 772) (2014) Report [[PDF](#)] – Appendices B-J [[PDF](#)] – Appendix K [[PDF](#)] – Appendices L-O [[PDF](#)] – Overview Presentation [[PPT](#)]
- Kansas Roundabout Guide, Second Edition (A Companion to NCHRP Report 672) (Kansas, 2014) [[PDF](#)]
- Implementation, Driver Behavior and Simulation: Issues Related to Roundabouts in Northern New England (Vermont, 2014) [[PDF](#)]
- Roundabouts and Access Management (Florida, 2014) [[PDF](#)]
- Effect of Signing and Lane Markings on the Safety of a Two-Lane Roundabout (Minnesota, 2014) [[PDF](#)]
- Information/Education Synthesis on Roundabouts (Montana, 2013) [[PDF](#)]
- Best Practices for Roundabouts on State Highways (Indiana, 2013) [[PDF](#)]
- Wisconsin Roundabout Guide (Wisconsin, 2013) [[PDF](#)]
- Statewide Roundabout Operations Monitoring and Evaluation (Wisconsin, 2013) [[HTML](#)]
- Developing Safety Performance Measures for Roundabout Applications in the State of Oregon (Oregon, 2013) [[PDF](#)]

- Accommodating Oversize/Overweight (OSOW) Vehicles at Roundabouts (Kansas, 2013) [[PDF](#)]
- Investigation of Pedestrian/Bicycle Risk in Minnesota Roundabout Crossings (Minnesota, 2012) [[PDF](#)]
- Demonstration of Roundabout Lighting Based on the Ecoluminance Approach (New York, 2012) [[PDF](#)]
- Joint Roundabout Truck Study (Minnesota/Wisconsin, 2012) [[PDF](#)]
- A Study of the Impact of Roundabouts on Traffic Flows and Business (Kansas, 2012) [[PDF](#)]
- Texas Roundabout Guidelines (Texas, 2011) [[PDF](#)]
- Evaluating the Performance and Safety Effectiveness of Roundabouts (Michigan, 2011) [[PDF](#)]
- Improving Drivers' Ability to Safely and Effectively Use Roundabouts: Educating the Public to Negotiate Roundabouts Final Report (Michigan, 2011) [[PDF](#)]
- Roundabouts in the United States (published as NCHRP Report 572) (2007) Report [[PDF](#)] – Appendices [[PDF](#)]
- Lane Restriction Signing and Markings for Double Lane Roundabouts (Multistate Pooled Fund Study, 2007) [[PDF](#)]
- Operational Performance of Kansas Roundabouts (Kansas, 2004) [[PDF](#)]
- Modern Roundabout Practice in the United States (published as NCHRP Synthesis 264) (1998) [[PDF](#)]

National Partners

- Transportation Research Board Roundabouts Committee (ANB75) Home Page [[HTML](#)] – Archived Webinars [[HTML](#)]
- AARP Livability Fact Sheet Series on Modern Roundabouts [[HTML](#)]

Excerpt from AARP Fact Sheet (emphasis added):

*"The Modern Roundabouts fact sheet can be used by policy makers, transportation planners, community leaders and citizen activists to educate themselves and others about the **benefits of modern roundabouts for traffic management, economic development, public health and safety and the quality of life for residents of all ages.**"*

- Insurance Institute for Highway Safety (IIHS) Roundabouts Topic Overview [[HTML](#)]

Excerpt from IIHS Overview:

"Roundabouts are a safer alternative to traffic signals and stop signs. Roundabouts improve traffic flow and are better for the environment. Roundabouts generally are safer for pedestrians."

- Institute of Transportation Engineers (ITE) Roundabout Committee [[HTML](#)], Consideration Policy (D-10) [[PDF](#)] and Informational Report [[PDF](#)]

Excerpt from ITE Policies (March 2012):

*"Recognizes the safety, operational, and sustainability benefits of well-designed roundabouts and **recommends the use of roundabouts be considered** when intersections are being*

planned, designed or modified."

- American Road and Transportation Builders Association (ARTBA) [[HTML](#)]

Excerpt from ARTBA "Vision Zero" Policy Premise (emphasis added):

*"In conjunction with reducing fatalities, ARTBA believes our transportation system must be improved to reduce the severity of incidents. In some situations (**such as the use of roundabouts**), a possible increased rate in the frequency of accidents is a viable trade-off for a decrease in the severity of injuries. We need to prioritize the quality of human life and health above the rate of traffic incidents.*

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