



Roundabouts Reduce Crashes and Congestion



Roundabouts boost safety and reduce congestion at intersections by eliminating many traffic conflicts, slowing vehicle speeds and increasing capacity.

Roundabouts—one-way circular intersections in which traffic flows around a center island—enhance safety and reduce congestion, making them an attractive alternative to traditional intersection traffic control.

Intersection safety has long been a highway community concern. Intersection crashes account for more than 45 percent of all crashes nationwide. Side-impact crashes, which occur mostly at intersections, cause more than one-third of all vehicle occupant deaths.

Roundabouts eliminate most of the conflicting traffic—such as left turns—that contribute to crashes at traditional intersections, which are among the most complex traffic situations that motorists encounter. A conventional four-leg intersection has 32 vehicle-to-vehicle conflict points, while a single-lane roundabout has eight conflict points. Roundabouts also promote slower traffic speeds, allowing drivers more time to avoid conflicts and reducing the severity of crashes that do occur.

Because they allow for continuous traffic flow, roundabouts increase traffic capacity by about 20 percent over conventional intersections. That can cut down on traffic queues and delays resulting from traffic signals and stop signs.

Roundabouts fit the Highways for LIFE initiative's focus on encouraging adoption of innovations that enhance safety and reduce congestion. Roundabouts at six major intersections are part of a reconstruction project on State Route 179 near Sedona, Ariz., that received a Highways for LIFE grant for its use of innovative construction and contracting methods.

Essential Elements

Not all circular intersections are roundabouts. Modern roundabouts have two key characteristics:

- **Entering traffic yields to circulating traffic.** The "yield-at-entry" rule prevents roundabouts from locking up by allowing vehicles to enter the intersection only when there are gaps in the traffic.
- **Geometric constraints slow down traffic.** The curve of the circular road and the angles of entry defined by islands or lane striping slow vehicle speeds to 25 miles per hour (40 kilometers per hour) or less.

The Federal Highway Administration recommends roundabouts for intersections where congestion and safety are a concern and traffic capacity and space requirements are met. Roundabouts must be designed to meet the needs of all road users, including drivers, pedestrians and bicyclists.

Intersection situations in which roundabouts can be beneficial include the following:

- Heavy left-turning traffic
- Long traffic-signal delays
- History of right-angle crashes
- History of crashes involving crossing traffic
- More than four legs of traffic or legs that are not at right angles



Performance Record

Modern roundabouts were developed in the United Kingdom in the 1950s to address congestion and high crash rates at high-speed traffic circles and rotaries. They've been used successfully all over the world, and more than 1,400 are in operation in the United States. Several states have more than a decade of experience with roundabout performance, including California, Colorado, Florida, Maryland, Nevada and Vermont.

Research shows that roundabouts can be safe and effective. A 2000 Insurance Institute for Highway Safety study found that roundabouts can reduce crashes by 39 percent, injury-producing crashes by 76 percent and fatal crashes by 90 percent. A 2002 Maryland State Highway Administration study found that the overall crash rate was cut by 60 percent and the injury crash rate fell 82 percent at 15 intersections where traditional intersections were replaced by roundabouts.

An Insurance Institute survey that focused on motorists, who often say they don't like roundabouts, found that twice as many drivers favored roundabouts after they were installed than before. Those who opposed roundabouts cited concerns about safety or confusion at the new intersections.

Some highway agencies are developing resources to address road users' questions about roundabouts. The Maryland State Highway Administration created a "How to Use a Roundabout" Web page at www.sha.state.md.us/safety/oots/roundabouts/info.asp, with tips for drivers, bicyclists and walkers.

To Learn More

For more information on roundabouts, visit safety.fhwa.dot.gov/intersection/roundabouts/. It includes a link to *Roundabouts: An Informational Guide (FHWA-RD-00-67)*, a comprehensive source on roundabouts with chapters on policy, planning, operation, safety, geometric design, traffic design and landscaping, and system considerations.

The FHWA Resource Center offers technical assistance and a workshop on planning and designing roundabout intersections. Among the workshop topics covered are distinguishing modern roundabouts from other types of circular intersections, roundabout geometric design principles, assessing traffic operations at a roundabout, and public education strategies. For more information, contact Mark Doctor at (404) 562-3732 or mark.doctor@dot.gov.

The National Cooperative Highway Research Program's *Report 572: Roundabouts in the United States* explores methods of estimating the safety and operational impact of roundabouts and examines updated design criteria for roundabouts. To access online, go to trb.org/news/blurbs_detail.asp?id=7086.

The "Modern Roundabouts" Web site at roundabout.kittleson.com includes a searchable database of operating and planned roundabouts, as well as a bibliography of articles, books, design guides and videotapes on roundabouts.

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