

Proven Safety Countermeasures

Roundabouts

The modern roundabout is a type of circular intersection defined primarily by three basic operational principles:

- ◆ Geometry that results in a low-speed environment, creating substantial safety advantages.
- ◆ Entering traffic yields to vehicles in the circulatory roadway, leading to excellent operational performance.
- ◆ Channelization at the entrance and deflection around a center island are designed to be effective in reducing conflict.

Background

There are an estimated 300,000 signalized intersections in the United States. About one-third of all intersection fatalities occur at these locations, resulting in roughly 2,300 people killed each year. Furthermore, about 700 people are killed annually in red-light running collisions. Although traffic signals can work well for alternately assigning the right-of-way to different user movements across an intersection, roundabouts have demonstrated substantial safety and operational benefits compared to most other intersection forms and controls, with especially significant reductions in fatal and injury crashes. The *Highway Safety Manual (HSM)* indicates that:

- ◆ By converting from a two-way stop control mechanism to a roundabout, a location can experience an 82 percent reduction in severe (injury/fatal) crashes and a 44 percent reduction in overall crashes.
- ◆ By converting from a signalized intersection to a roundabout, a location can experience a 78 percent reduction in severe (injury/fatal) crashes and a 48 percent reduction in overall crashes.

The benefits have been shown to occur in urban and rural areas under a wide range of traffic conditions, and ongoing research has expanded our collective knowledge on safety performance for specific scenarios. Although the safety performance of all-way stop control is comparable to roundabouts (per the HSM), roundabouts provide far greater operational advantages. Roundabouts can be an effective tool for managing speed and creating a transition area that moves traffic from a high-speed to a low-speed environment. However, proper site selection, channelization, and design features are essential for making roundabouts accessible to all users.

Guidance

Roundabouts should be considered as an alternative for intersections on federally funded highway projects that involve new construction or reconstruction. Roundabouts should also be considered when rehabilitating existing intersections that have been identified as needing major safety or operational improvements. Roundabouts have also proven to be effective at freeway interchange ramp terminals and at rural high-speed intersections.



Key Resources

Roundabouts: An Informational Guide, Second Edition (NCHRP Report 672)

http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_672.pdf

Roundabouts Outreach & Education Toolbox

<http://safety.fhwa.dot.gov/intersection/roundabouts/roundabouttoolbox/>

Roundabouts and Mini Roundabouts Technical Summaries

<http://safety.fhwa.dot.gov/intersection/roundabouts/fhwasa10006/>

<http://safety.fhwa.dot.gov/intersection/roundabouts/fhwasa10007/>

Roundabouts Informational Brochure and DVD

<http://safety.fhwa.dot.gov/intersection/roundabouts/fhwasa08006/>

<http://safety.fhwa.dot.gov/intersection/roundabouts/#video>

Public Rights-of-Way Accessibility Guidelines (NPRM Edition) (July 2011)

<http://www.access-board.gov/prowac/nprm.pdf>

Crossing Solutions at Roundabouts and Channelized Turn Lanes for Pedestrians with Vision Disabilities (NCHRP Report 674)

http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_674.pdf

Highway Safety Manual, American Association of State Highway and Transportation Officials

<http://www.highwaysafetymanual.org/Pages/default.aspx>

Crash Modification Factor (CMF) Clearinghouse [*quick search* "roundabout"]

<http://www.cmfclearinghouse.org/>

Evaluation of Safety Strategies at Signalized Intersections (NCHRP Report 705)

http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_705.pdf

Roundabouts in the United States (NCHRP Report 572)

http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_572.pdf

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FHWA Website: <http://safety.fhwa.dot.gov/intersection/roundabouts/>