

Summary: Insurance Institute for Highway Safety. 2014.

[Complete Q&A from the Insurance Institute may be viewed at:

<http://www.iihs.org/iihs/topics/t/roundabouts/qanda>

What is a roundabout?

The modern roundabout is a circular intersection with design features that promote safe and efficient traffic flow. It was developed in the United Kingdom in the 1960s and now is widely used in many countries, and increasingly in the United States.

Slow speeds aid in the smooth movement of vehicles into, around, and out of a roundabout. Drivers approaching a roundabout must reduce their speeds, look for potential conflicts with vehicles already in the circle and be prepared to stop for pedestrians and bicyclists.

How do roundabouts differ from older traffic circles?

Modern roundabouts are much smaller than older traffic circles — also known as rotaries — and roundabouts require vehicles to negotiate a sharper curve to enter. These differences make travel speeds in roundabouts slower than speeds in traffic circles.

How do roundabouts affect safety?

Roundabouts promote safety in several ways. At traditional intersections with stop signs or traffic signals, some of the most common types of crashes are right-angle, left-turn, and head-on collisions. These types of collisions can be severe because vehicles may be traveling through the intersection at high speeds. With roundabouts, these types of potentially serious crashes essentially are eliminated because vehicles travel in the same direction and at low speeds — generally less than 20 mph in urban areas and less than 30-35 mph in rural areas. Installing roundabouts in place of traffic signals can also reduce the likelihood of rear-end crashes and their severity by removing the incentive for drivers to speed up as they approach green lights and by reducing abrupt stops at red lights.

Studies of intersections in Europe and Australia that were converted to roundabouts have reported 25-87 percent reductions in injury crashes and 36-61 percent reductions in all crashes.⁵ Studies of intersections in Europe and

Australia that were converted to roundabouts have reported 25-87 percent reductions in injury crashes and 36-61 percent reductions in all crashes.[5](#)

What design features can help minimize crashes at roundabouts?

Design features that encourage drivers to slow down are the key to optimizing roundabout safety. Traffic signs (e.g., speed limit signs well in advance of roundabouts and larger "roundabout ahead" and yield signs), pavement markings and lighting should be adequate so that the drivers are aware that they are approaching a roundabout and alerted to reduce their travel speeds. Center island landscaping can promote slower speeds and focus drivers' attention on the roadway close to them by limiting their through vision.

How do roundabouts affect traffic flow?

Several studies conducted by IIHS and others have reported significant improvements in traffic flow following conversion of traditional intersections to roundabouts. Most research has focused primarily on conversions of traditional intersections to single-lane roundabouts. A study of three intersections in Kansas, Maryland and Nevada where roundabouts replaced stop signs found that vehicle delays were reduced 13-23 percent and the proportion of vehicles that stopped was reduced 14-37 percent. [11](#) A study of three locations in New Hampshire, New York and Washington state where roundabouts replaced traffic signals or stop signs found an 89 percent average reduction in vehicle delays and a 56 percent average reduction in vehicle stops. [12](#) A study of 11 intersections in Kansas found a 65 percent average reduction in delays and a 52 percent average reduction in vehicle stops after roundabouts were installed. [13](#)

Because roundabouts improve the efficiency of traffic flow, they also reduce vehicle emissions and fuel consumption. Installing roundabouts in place of traffic signals or stop signs has been found to reduce carbon monoxide emissions by 15-45 percent, nitrous oxide emissions by 21-44 percent, carbon dioxide emissions by 23-37 percent and hydrocarbon emissions by 0-42 percent. [14](#)[15](#)[16](#) Constructing roundabouts in place of traffic signals or stop signs reduced fuel consumption by an estimated 23-34 percent.[17](#)[18](#)[19](#)

Can roundabouts accommodate larger vehicles?

To accommodate vehicles with large turning radii such as trucks, buses and tractor-trailers, roundabouts provide an area between the circulatory roadway

and the central island, known as a truck apron, over which the rear wheels of these vehicles can safely track.

Are roundabouts safe for pedestrians?

Roundabouts generally are safer for pedestrians than traditional intersections. In a roundabout, pedestrians walk on sidewalks around the perimeter of the circular roadway. If they need to cross the roadway, they cross only one direction of traffic at a time. In addition, crossing distances are relatively short, and traffic speeds are lower than at traditional intersections.

Studies in Europe indicate that, on average, converting conventional intersections to roundabouts can reduce pedestrian crashes by about 75 percent. [21](#)[22](#) Single-lane roundabouts, in particular, have been reported to involve substantially lower pedestrian crash rates than comparable intersections with traffic signals. [23](#)

Do drivers like roundabouts?

Drivers may be skeptical of or even opposed to roundabouts when they are proposed. However, several Institute studies show that opinions quickly change when drivers become familiar with them. A 2002 Institute study in three communities where single-lane roundabouts replaced stop sign-controlled intersections found 31 percent of drivers supported the roundabouts before construction, compared with 63 percent shortly after. [11](#) Another study surveyed drivers in three additional communities where a one- or two-lane roundabout replaced stop signs or traffic signals. Overall, 36 percent of drivers supported the roundabouts before construction compared with 50 percent shortly after. [25](#) Follow-up surveys conducted in these six communities after roundabouts had been in place for more than one year found the level of public support increased to about 70 percent on average. [26](#)

How do roundabouts affect older drivers?

Older drivers are more likely than other drivers to be wary of roundabouts, but they also are particularly likely to benefit from them in terms of improved safety. Relative to other age groups, senior drivers are over involved in crashes occurring at intersections. In 2012, 37 percent of fatal passenger vehicle crashes involving drivers 70 and older were intersection crashes, compared with 24 percent of fatal crashes of drivers younger than 70.

What kinds of intersections are good candidates for roundabouts?

Roundabouts are appropriate at many intersections, including high crash locations and intersections with large traffic delays, complex geometry (more than four approach roads, for example), frequent left-turn movements, and relatively balanced traffic flows. Roundabouts can be constructed along congested arterials and at freeway exits and entrances, in lieu of traffic signals.