WHY DO U.S. CITIES AVOID ROUNDABOUTS?

The pros and cons that officials need to weigh before construction

By Wes Guckert, Contributing Author

ROUNDABOUTS ARE A POPULAR form of road infrastructure in Europe. Italy alone has more than 18,000 of them. Spain has about 15,000, while the United Kingdom has nearly 26,000.

France, though, is the champion with almost 43,000 roundabouts, or 664 for every million residents.

Studies show that traffic flow improves significantly wherever traditional intersections are replaced by roundabouts. Roundabouts decrease idling and stop-and-go traffic, and they reduce vehicle emissions and fuel consumption. Roundabouts have also proven to be much safer for pedestrians when properly designed and constructed.

Given the successful track record of roundabouts in Europe, it's hard to understand why the U.S. has been so slow to adopt them. There are under 10,000 roundabouts in the entire country.

Road design has evolved in some states. Florida boasts more than 1,000 roundabouts, while Virginia and New York have mandated roundabout-first policies.

Other states are far behind on this trend. North Dakota, South Dakota and Wyoming have less than 50 roundabouts combined.

One explanation for the lack of roundabouts in the U.S. is that the country was late to the party.

Even though traffic rotaries such as New York's famous Columbus Circle were introduced in the early 1900s, they largely had been replaced with traffic signals by 1950.

In 1990, America's first modern roundabout was built in Summerlin, Nev.

Other roundabouts followed in California, Florida, Colorado and Vermont, but overcomplicated designs, historical factors, and community resistance – typically charging that roundabouts were dangerous and caused more accidents than traditional intersections with red lights – have slowed adoption in the past.

Opponents have claimed that while approaching vehicles are supposed to yield to traffic already in the roundabout, many American drivers respond by either speeding up or stopping altogether.

This argument has been successful because either option can easily lead to an increase in rear-end collisions or fender-benders, and they also pose a particular danger for pedestrians and cyclists.

A frequently cited study in Belgium found that single-lane roundabouts, which typically have difficulty accommodating a throughput of more than 25,000 vehicles per day, led to a 93% increase in crashes with bicyclists.

While proponents counter that the answer is to install multilane roundabouts, that design also presents problems.

If a roundabout has too many merge points (with more than

An aerial view of Towne Centre Boulevard in Annapolis, Md. The road's three consecutive roundabouts were designed by The Traffic Group, Inc.
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four streets and multiple lanes), coupled with the gaps between entry and exit points, it might lead drivers in the outer lane to mistakenly believe those on the inner lane must shift to the outside before exiting.

Vehicles also change lanes within multilane roundabouts, and this increases the risk of collisions when drivers fail to yield. Obviously, this heightened danger also affects cyclists and pedestrians.

America's driving culture also plays a big role with its relationship to roundabouts. Large pickup trucks and sports utility vehicles don't lend themselves to the queuing and yielding aspects of roundabouts.

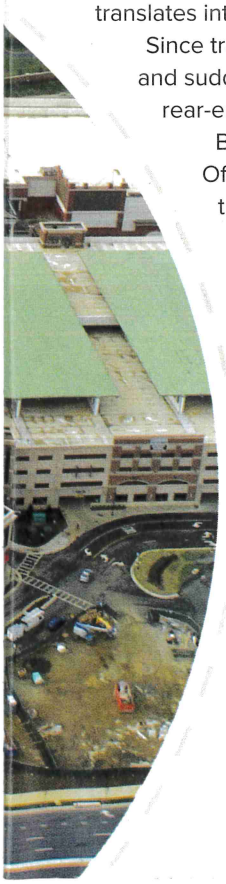
One might even surmise that roundabouts will never gain widespread acceptance in America. But that would be wrong, fortunately.

Numerous studies have concluded that roundabouts are environmentally friendly and safer than traditional intersections, and officials across the U.S. seem more open to adopting roundabouts today than ever before.

While challenges remain, there seems to be a greater recognition on the part of elected officials, local departments of transportation, traffic engineers and even the public of the benefits roundabouts offer.

Speed reduction is one advantage. When properly designed, roundabouts force vehicles to slow down to safely navigate the circle and one-way traffic flow. This allows drivers more time to react to unexpected moves by other vehicles, while significantly lowering the overall risk of accidents.

Should collisions occur, roundabouts have fewer potential conflict points and eliminate the risk of high-speed, right-angle collisions that are so common at signalized intersections. This translates into less property damage and fewer severe injuries.



Since traffic is constantly moving in the same direction and sudden stops are less likely to occur, the likelihood of rear-end collisions is vastly reduced.

Beyond safety, roundabouts enhance traffic flow. Off-peak hours especially benefit from smoother traffic flows, minimizing congestion and gridlock risks. This, in turn, reduces vehicle emissions and fuel consumption.

Installing roundabouts in place of traffic signals or stop signs can lower carbon monoxide emissions by 15-45%, nitrous oxide emissions by 21-44%, carbon dioxide emissions by 23-34%, and hydrocarbon emissions by as much as 40%. Fuel consumption can be reduced by up to 30%.

A roundabout that serves 15,000 vehicles a day can save 15,000 gallons of fuel annually compared to the same intersection controlled by a traffic signal, According to the Washington State Department of Transportation.

To realize these benefits, roundabouts must be properly designed and constructed. Before that can happen, the existing intersection must be analyzed to determine its safety level and current effectiveness. Data such as the frequency of accident occurrence, projected rate of future crashes and collision costs should be used to determine this.

This analysis must then be compared to an operational analysis measuring capacity and level of performance to determine if a roundabout is warranted and would be desirable.

Planners will also consider whether other alternatives, like intersection expansion, added traffic signage or a more innovative solution such as a diverging diamond interchange, might be more effective.

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If a roundabout project is chosen, the next step will involve using data gathered during the initial analyses to create a conceptual design.

This preliminary design will then undergo numerous analyses and modifications to determine its feasibility and eventually to provide more specific details so that the proposed roundabout is safe, easy to navigate and aesthetically pleasing.

Design and modifications typically focus on:

- The approach, which must curve in a way that progressively reduces speed and smoothly channels vehicles into and out of the roundabout.
- The center island, which must be raised to make it visible to oncoming traffic, encouraging motorists to slow down, while simultaneously providing clear sightlines.
- Effective signage and lighting, which likely include advance warning and yield signs, high-contrast pavement markings, reflectors, and highway luminaries that make it abundantly clear where drivers, cyclists, and pedestrians are supposed to be as they approach and then travel through the roundabout, as well as who has the right-of-way.

Depending on the design, size and location of the roundabout, other considerations may also come into play. The entry deflection angle, for example, can help to force drivers entering the roundabout to slow down.

Splitter islands, crosswalks, railings and landscaping can be used to reduce vehicle speeds and improve pedestrian and bicycle safety, particularly in locations where there is likely to be heavy pedestrian traffic.

Proper planning and design are critical if the benefits of roundabouts are to be fully realized. Roundabouts are safer than traditional intersections and can reduce fatal collisions by as much as 90% and injuries from vehicle accidents by about 75% – even when handling large traffic volumes. R&B

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