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Characteristics of Successful Roundabout Projects

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Introduction

Roundabouts, which are simply modern versions of their primitive ancestors—traffic circles and rotaries—have safety, environmental, and cost-saving features superior to those of traditional intersections. But implementing roundabout projects sometimes proves difficult, and it would be useful to know what makes for a successful roundabout project. Of course, all successful construction projects share some obvious characteristics: designers, contractors, tradespeople, suppliers, and a host of other people must execute their jobs well if success is to be achieved.

The purpose of the present course is limited to identifying some characteristics that are especially important for achieving successful *roundabout* projects. The process of identification will include a detailed discussion of the advantages roundabouts offer over traditional intersections and a review of roundabout projects that the U.S. Department of Transportation considered worthy of mention.

Advantages of roundabouts (From Roundabouts A Safer Choice, FHWA-SA-08-006)

A roundabout is a type of circular intersection with yield control of entering traffic, islands on the approaches, and appropriate roadway curvature to reduce vehicle speeds. Modern roundabouts are different from rotaries and other traffic circles. For example, roundabouts are typically smaller than the large, high-speed rotaries still in use in some parts of the country. In addition, roundabouts are typically larger than neighborhood traffic circles used to calm traffic.

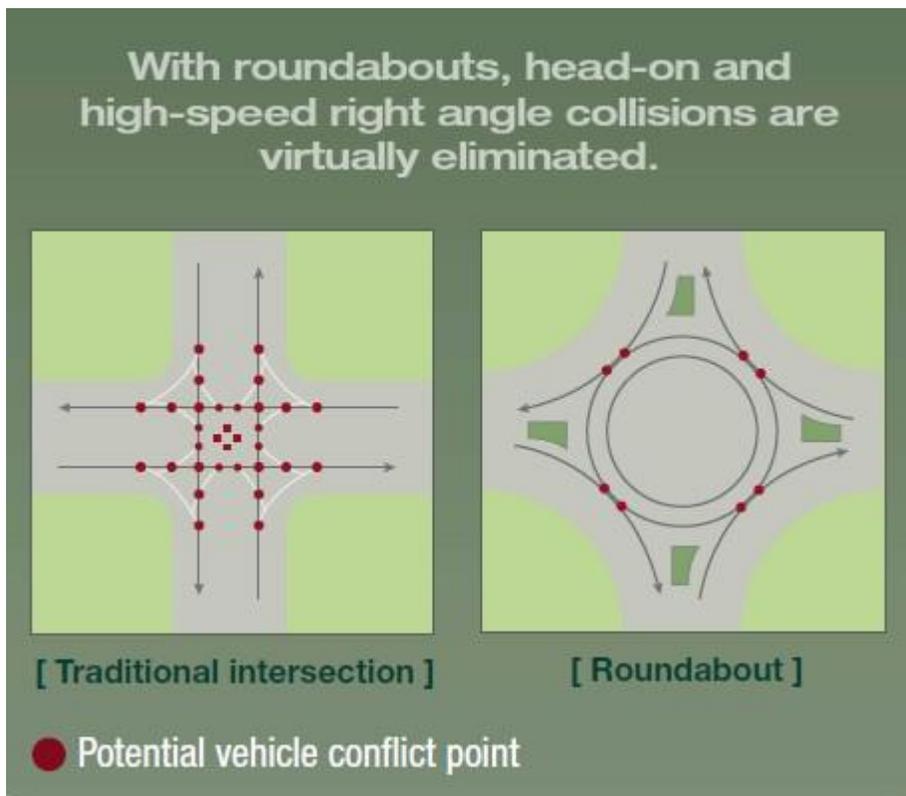
A roundabout has these characteristics:



Roundabouts offer many advantages over other types of intersections. For example roundabouts

1. Improve safety

- More than 90% reduction in fatalities
- 76% reduction in injuries
- 35% reduction in all crashes
- Slower speeds are generally safer for pedestrians



2. Reduce congestion

- Efficient during both peak hours and other times
- Typically less delay

3. Reduce pollution and fuel use

- Fewer stops and hard accelerations, less time idling

4. Save money

- Often no signal equipment to install, power, and maintain

- Smaller roundabouts may require less right-of-way than traditional intersections
- Often less pavement needed

5. Complement other common community values

- Quieter operation
- Functional and aesthetically pleasing

Examples of Successful Roundabout Projects are illustrated in the subsequent pages

Hosting General Information Briefings to Promote Roundabouts

Location Austin, Texas

Roundabout Selling Points for Elected Officials, Real Estate Industry, and the Public

- ✓ “Green Solution”
 - Less pollution
 - Less noise
- ✓ Reduced roadway congestion
- ✓ Improved traffic safety
- ✓ Neighborhood centerpiece
- ✓ Contributes to a sense of place

Strategies Employed

- ✓ Conducted a technical briefing for elected officials, decision-makers, and other professionals (e.g., real estate industry with a vested interest in local property values).
- ✓ Scheduled the event in coordination with a technical training course to include experienced roundabout consultants as presenters.
- ✓ Emphasized the benefits that officials and their constituents would realize as a result of installing roundabouts.
- ✓ Built personal relationships with key representatives from multiple agencies.



Introduction

After experiencing the safety and operational benefits of roundabouts in their city, Austin Transportation Department (ATD) staff decided to undertake an effort to promote their wider use in Texas. The ATD hosted an informational briefing in an effort to encourage other agencies in the State to begin using roundabouts—a proven strategy for improving safety, operations, and quality of life in local communities. They invited people from fellow public agencies, industry groups, and other stakeholders to learn about Austin’s positive experiences with roundabouts. In addition to describing the general benefits of roundabouts at the briefing, they advised attendees how to explore the use of roundabouts in their own cities.

Background

The City of Austin experienced rapid growth and faced a number of transportation-related challenges over the last 20 years. That resulted in increased traffic and more congestion, and more people regularly walking and biking throughout the city. Consequently, the Austin Transportation Department (ATD) went looking for creative solutions to address multimodal safety, mobility, and capacity issues – and found roundabouts as one of the solutions.

Realizing that many other cities and local agencies in Texas would benefit from their experience and expertise with roundabouts, ATD decided to share that knowledge with elected officials and professionals in other jurisdictions using an informational briefing as a way to educate and inspire others across the Lone Star state.

Approach

As the state capitol, the City of Austin has the opportunity for regular interaction with elected officials throughout the State. ATD staff also maintains regular communication with peers from other cities and public agencies and professionals in related fields such as emergency response, freight transportation, and consultant services. Over the course of regular discussions with these individuals, ATD determined that roundabouts were an important topic that would benefit from a more formal and detailed discussion tailored to the needs and interests of all stakeholders. Working with supportive state and local elected officials, ATD staff conducted an informational briefing entitled “Enhancing Quality of Life with Roundabouts,” at the Texas State Capitol Building. ATD staff led the briefing with roundabout consultants providing much of the

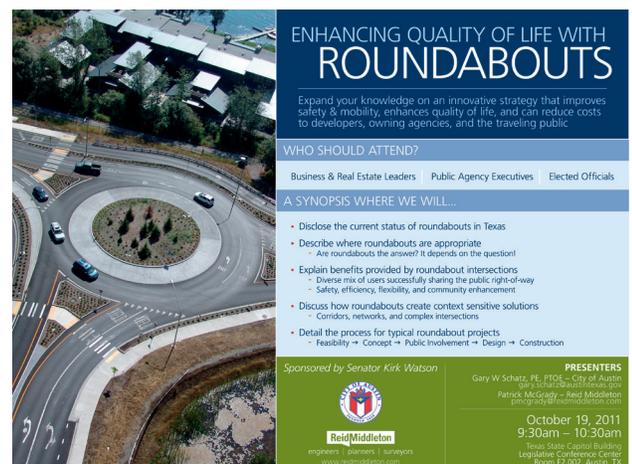


Figure 1: Announcement for the Roundabout Informational Briefing

Lessons Learned

- Define the differences between roundabouts and traffic circles clearly. There are still common misperceptions about roundabouts.
- Tailor the benefits of roundabouts to the audience. For example, if the audience includes developers, discuss how roundabouts can help them save money on some capital improvements.
- Peer involvement is critical. Consultants can provide technical expertise, but elected officials and decision-makers can be more open to conversation with another public agency.
- Identify and invite roundabout champions. Reach out to agencies and stakeholders to find those who are favorable to roundabouts.
- Conduct continuous outreach. After initial contact, champions must maintain relationships with colleagues and stakeholders to facilitate long-term partnerships.
- Identify stakeholders of varying interests that can help provide support to a common goal (i.e., pedestrian groups, bicycle advocates, developers, elected officials, municipalities or public works, etc.). Remember, there is no single target audience.

Learn More

Austin Transportation Department
City of Austin, Texas

512.974.1150

<http://www.austintexas.gov/email/transportation>

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technical presentation. Organizers scheduled the briefing to coincide with a two-day workshop on roundabouts for fellow transportation professionals to make the entire effort even more valuable for all parties involved.

Before the briefing, ATD staff provided handouts and other materials to attendees to supplement the formal presentation. As attendees arrived, consultants played a video that highlighted geometric and operational characteristics of roundabouts, comparisons to traffic circles, and methods for all road users to traverse a roundabout. The video and handouts introduced attendees to the basics of well-designed modern roundabouts and their benefits before the actual briefing began.



Figure 2: Roundabout at Auditorium Shores, Austin, TX
Source: Google Earth Pro

- Facilitate a continuous flow of traffic, thereby reducing congestion.
- Reduce the likelihood and severity of crashes due to lower speeds (15-20 mph).
- Accommodate more vehicles than other traffic control or intersection designs when located and designed appropriately.
- Accommodate emergency vehicles, school buses, and other heavy vehicles.
- Contribute to a more friendly setting for pedestrians and bicyclists, including school-age children, due to lower vehicle speeds.
- Reduce congestion and delay, which leads to environmental benefits such as lower fuel consumption, less pollution, and less noise.
- Contribute to a sense of place as community gateways or neighborhood centerpieces.

Results

The briefing brought together a variety of elected officials, decision-makers, and stakeholders with different levels of understanding of the definition and purpose of roundabouts. In addition to addressing questions and concerns, the session provided an opportunity to establish contacts, providing a network resource for stakeholders to continue the discussion in the future. It also allowed public sector and industry peers to meet in a common setting while subject matter experts provided information tailored to their needs and interests. Attendees left the briefing with a better understanding of the characteristics and benefits of modern roundabouts, and the knowledge of how to use roundabouts to improve traffic safety and operations in their communities.

More Information

Austin Transportation Department: <http://austintexas.gov/department/transportation>

Mobility 35: <https://my35construction.org/>

“These roundabouts would not have been possible a few years ago, but working with TxDOT and other regional leaders to better understand how these innovative intersections work have opened up new horizons.”

Gary Schatz

Assistant Director - Transportation Management
Austin Transportation Department

Engaging the Public Through Print and Web Outreach

How Carmel, Indiana, Uses Innovative Media to Shape Public Perception of Roundabouts

Location

Carmel, Indiana
(Central United States)

Implementation Stage

City of Carmel staff prefer to start outreach 10 months to a year before construction to get people on board early. However, until construction begins, staff note that citizens may be less likely to take roundabout outreach seriously.

- ✓ Planning
- ✓ Design
- ✓ Construction
- ✓ Launch

Roundabout Type/Setting

Multi-lane roundabouts in an urban setting.

Target Audience

- ✓ General Public

Strategies Employed

- ✓ Branded project website
- ✓ Informational direct-mail postcards
- ✓ Video animations of future corridors
- ✓ Public involvement at open houses and community meetings



Background

In the late 1990s, the City of Carmel, Indiana, began installing roundabouts within its jurisdiction, where they soon became a common type of intersection design. This change in intersection design policy stemmed from an influential roundabout champion—the City’s mayor. Mayor Jim Brainard took office in 1996 and subsequently pushed for the installation of a roundabout at an intersection that, at that time, was in the project development phase for major rehabilitation. His interest in roundabouts stemmed from his visits to Europe, where modern roundabouts are common, and a ski trip to Vail, Colorado, where the city had installed a roundabout to reduce recurring congestion experienced during peak skiing season. Since the mayor’s first push in 1996, the City of Carmel has constructed over 60 roundabouts with the support of the public.

In 2007, the City proposed building a pair of roundabouts at major cross-streets along a popular/central parkway to enable the free flow of traffic along the route. As depicted in Figure 2, the roundabout, situated on a bridge, would have a teardrop shape and would be elevated above the Parkway. The City chose this shape because it would result in a smaller overall project footprint. As these roundabouts would have a unique shape compared with many of the City’s other roundabouts, the City knew they would need to do extensive outreach to ensure the public would be supportive of the project, both before construction began and during the build-out of the intersections.

Approach

As a first step, the City decided to give the project a “catchy” name that would be used on all outreach materials—Project CarmelLink. Staff developed products to facilitate communication among all stakeholder groups, including the City, community groups, businesses, and citizens. This project’s comprehensive outreach program included:

- Postcards – Provided information to local homes and businesses across the city with general project information, specific road closure and detour details, and general roundabout driving techniques
- Managed mailing list – Emailed postcard information to all members of the list
- Roundabout stickers – Described “rules of the road” for roundabouts
- Video animations of the future corridor – Helped citizens visualize what the corridor would look like once the roundabouts were completed, posted online throughout the project and used extensively at community meetings
- Branded project website – Provided information on the history of the project, a project calendar, links to roundabout-related educational materials, news articles, and frequently asked questions



Figure 1: The CarmelLink logo.



Figure 2: Overhead photo of the completed roundabout installed above the Keystone Parkway at 136th Street.

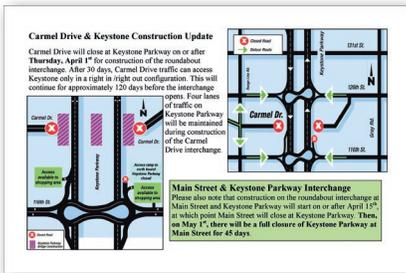


Figure 3: The City of Carmel mailed postcards, like the one above, to residents and businesses around each zone of the construction to inform them of detours, project durations, and other pertinent information, all for about \$1 per card to print and mail.

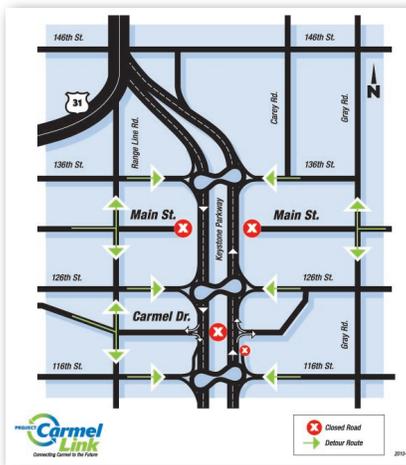


Figure 4: The map above was used to inform motorists and local residents of the new intersection patterns along the Keystone Parkway's CarmelLink Project.

- Community meetings – Provided a quarterly forum for the Neighborhood Association Network and the Small Business Association Network to discuss any concerns or questions related to the roundabout project with Mayor Brainard during the planning and construction process.

Results

Led by the strong support of a champion mayor, the City has successfully gained the support of the public for roundabout projects. The City has not conducted any benchmarking or satisfaction surveys, but according to City Engineer Mike McBride, "You know things are going well when the phones are quiet. This is one of the best measures of success, in our minds." From the safety and mobility side, the City tracks crash counts, minutes saved per commute, and other quantitative safety information at each roundabout installed across the jurisdiction. During the 2008 construction season alone, crashes along the Keystone Parkway corridor decreased 25 percent as compared to 2007 before the beginning of construction for the roundabouts.

The combination of outreach strategies, including public meetings with the mayor and City engineering staff, postcards, and an engaging branded project website enabled the city to successfully influence public perception of roundabout projects. Staff monitoring website hits during the construction of the roundabouts found that 15 percent of people went to the project website via a search engine, while over 80 percent of people either went to the site directly or were linked from a referring site, such as the City's roundabout website. Staff feel that these statistics show that they were able to engage the public in checking in regularly for project updates.

Lessons Learned

- Use hard data to help sell the case for roundabouts to people— sharing data on the minutes of time saved per commute resonates well with citizens.
- Publishing project updates frequently helps engage citizens in the construction process.
- Begin developing outreach products early in the planning and construction cycle.
- Take the time to sit down and talk with people about a proposed project. It takes time to get people on board, but once you do, City staff feel that a project can be successful.

Outreach Investment

City of Carmel staff stated that the outreach products were a very low-cost investment but required a fair amount of staff time to pull together. Each postcard cost about \$1 to print and mail. The videos that the City developed have been used for years, so in the long term, the costs are considered to be very low. For this project, the City hired consultants to assist with the development of a project website, but most of the other outreach products were developed in-house.

Related Products

General Information Website

<http://carmel.in.gov/departments-services/engineering/roundabouts>

Video

CarmelLink video player (includes virtual drive-through simulation and project update videos)

<http://www.carmellink.com/>

Project Website

CarmelLink roundabout project website

<http://carmel.in.gov/departments-services/engineering/roundabouts>

Brochure

City of Carmel Roundabouts – Improving the Quality of Life

<http://carmel.in.gov/home/showdocument?id=4898>

Learn More

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In Florida, Clearwater's Public Charrettes Produce Strong Support for Roundabouts

Location

Clearwater, Florida
(Southeastern United States)

Implementation Stage

- ✓ Planning
- ✓ Design

Roundabout Type/Setting

Single-lane and multi-lane roundabouts in suburban settings

Target Audience

- ✓ General Public

Strategies Employed

- ✓ Public meetings (utilizing the Citizen Design Charrette structure)

Charrette Publicity Outlets

- ✓ Television stations (public and cable channels)
- ✓ Newspaper advertisements
- ✓ Electronic message boards within interested communities
- ✓ Automated phone messages sent to residents' home phones
- ✓ Announcements at neighborhood committee meetings
- ✓ Hand-delivered flyers and/or direct-mail letters to neighborhood residents



Figure 1: A Clearwater man proudly signs the conceptual traffic calming design (including roundabouts) that he and his neighbors collaborated to create.



Background

In 1999, the City of Clearwater, Florida, opened its first roundabout on New Year's Eve to much fanfare. The new roundabout replaced several signalized intersections and promised to alleviate congestion and improve pedestrian flow along a nine-intersection loop corridor. However, during construction and after opening, the local media gave extensive coverage to controversy over the project, with many residents liking the project and many not. Public concerns were further raised by numerous minor fender-benders at one of the two-lane exits (modifying the geometry, signage, and lane markings reduced the problem).

Given the mixed reaction to the first roundabout, public support for future roundabouts could have been a problem. Yet, 17 more roundabouts have been built in Clearwater and all were proposed by residents and strongly supported by the public. The City decided to involve local residents early in subsequent roundabout projects through "Citizen Design Charrettes" as part of its public outreach efforts, which succeeded by producing successful, "win-win" roundabout projects over time.

Approach

The City of Clearwater uses a public engagement technique called the "citizen design charrette" in the planning and design phases of most roundabout projects. According to Ken Sides, senior professional

engineer for the City, a citizen design charrette is a "compressed, highly interactive experience that involves

the public at the very beginning of the design process," directly engaging the local community in the development of a proposed roundabout. This consensus-based meeting helps ensure that all stakeholders are informed, involved, and supportive of the proposed improvements, thus empowering them to become proponents of the planned improvements. The City thoroughly publicizes the charrettes through many outlets (see list to left under *Charrette Publicity Outlets*).

The charrette process follows a proven and repeatable format that helps to reduce the planning time needed. Each day of the 6-day process focuses on a different aspect of the roundabout planning and design process, as explained below:

Day 1: The charrette facilitation team visits the neighborhood where residents requested traffic calming and examines intersections where roundabouts may be proposed.

Day 2: The team conducts a series of focus groups with project stakeholders, including emergency responders, elected officials, and public works staff to address any concerns they might have and garner their support for the project.

"The public doesn't just ... react to alternatives put before it, but actually performs a constructive, pro-active role in generating their traffic calming plan themselves."

– Ken Sides, P.E., PTOE, AICP
City of Clearwater, Florida



Figure 2: All residents' traffic safety concerns were recorded on flip charts. Charrette participants use a technique called "dot voting" to rank their concerns, to guide them in the next phase of the charrette: conceptual design.



Figure 3: The public charrettes attract citizens of all ages, including families with small children and older adults who were interested in making their streets and intersections safer.

Related Products

Charrette Participant Resources

Streets and Sidewalks, People and Cars, a Citizens Guide to Traffic Calming (Reference Book provided to participants at charrettes to guide discussion) https://www.lgc.org/resource/streets_and_sidewalks/

Traffic Calming Mid-block Treatment Matrix (provided to participants to help show the benefits and costs of various mid-block traffic calming treatments during charrettes) http://www.walkable.org/images/1_TCIIntersection.jpg

Learn More

City of Clearwater

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Day 3: The team conducts a half-day training session with the community, educating them on traffic flow and various traffic calming measures, including roundabouts, and a candid session where residents and the team discuss the benefits and concerns associated with design options (see Figure 2).

Day 4: The team analyzes the input collected during the first charrette session and prepares for the second session.

Day 5: The team conducts an evening public charrette in which participants develop a collaborative vision for the new intersection. Breakout groups develop and present a conceptual traffic-calming design, using a large map of the neighborhood, colored markers, and a large version of the *Street Doctor's Guide to Traffic Calming* (see Figures 1 and 3). Participants note similarities/differences between the other groups' conceptual designs.

Day 6: The consultant team synthesizes the results of the second public session resulting in a consensus-based design. At the end of this last session, citizens can self-nominate to be a part of a small technical team that works with the city to implement the design or a larger public outreach team that continues to engage the community in the construction of the safer intersection.

After the charrette process concludes, the City employs engineering firms to prepare engineering plans from the community-approved conceptual plans, followed by construction.

Results

Engineer Ken Sides said that, as a direct result of Clearwater, Florida's use of the public charrette process, the City has successfully developed and implemented 16 roundabouts in the past 10 years. By involving the affected communities from the beginning of the planning process, residents feel comfortable with and are supportive of the roundabout design, and are able to convince other community members who have not attended the meetings of the value of the design. When concerned residents call the City, staff can point to the proceedings of the charrettes and demonstrate that the proposed roundabout was proposed by residents and strongly supported by residents.

Lessons Learned

Engage affected communities and elected officials early and often, and allow them to provide input on key design considerations. Resident-based conceptual design of roundabouts is a powerful tool for increasing public support for roundabouts.

The "citizen design charrette" process is a proven method for successfully educating and engaging the public in roundabout design, and increasing public support for proposed roundabouts.

If challenges can be identified and addressed quickly with community input on a proposed roundabout, public perceptions of roundabouts can be swayed in a positive manner.

Hiring a skilled, neutral facilitator can help ensure that charrette participants feel comfortable contributing freely.

Outreach Investment

According to Sides, the outreach investment to implement the public charrette process for a given roundabout costs relatively little, accounting for a portion of the design cost, which in turn is typically 15 percent of the roundabout's total construction cost.

Iowa DOT Provides “Expert-on-Hand” Technical Assistance to Promote Roundabouts Across the State

Location

State of Iowa
(Central United States)

Implementation Stage

- ✓ Planning
- ✓ Design
- ✓ Construction
- ✓ Launch
- ✓ Post-Implementation

Roundabout Type/Setting

Single- and multi-lane roundabouts in urban and rural settings

Target Audience

- ✓ Engineers
- ✓ Elected Officials/Managers

Strategies Employed

- ✓ Expert-on-hand
- ✓ Website
- ✓ Managed mailing list

Background

Small localities in Iowa, as in other states, do not necessarily have the resources to staff a full-time traffic engineer dedicated to analysis and design of intersection safety enhancement projects, including roundabouts. The Iowa Department of Transportation (DOT) created an innovative program—the Traffic Engineering Assistance Program (TEAP)—to deliver this very service to help smaller jurisdictions by providing an “expert-on-hand,” who visits the jurisdiction, gathers input from local stakeholders, and makes recommendations to help the agency identify, analyze, and implement traffic safety improvements. In 2004, Iowa DOT expanded its expert-on-hand repertoire to include roundabout analysis, design, and outreach support. They implemented this expansion in response to frequent questions about roundabout feasibility, how to design a roundabout effectively, and how to generate support from the local community.

Approach

The TEAP provides a variety of traffic safety engineering consulting services, including identifying and recommending intersection improvements based on traffic and safety data, dealing with unwarranted traffic control devices, and accommodating pedestrians and bicyclists. Through this program, Iowa DOT also offers no-cost, expert-level roundabout design reviews to any local road agency that needs related technical assistance during any stage of the project delivery process. The program provides up to 100 hours of consulting time to qualifying local agencies with no local match required.

Iowa DOT also provides an educational component led by an Iowa DOT traffic safety engineer, who is available to work with local agencies to help generate stakeholder support for roundabouts from, for example, the general public, local businesses, and elected officials. The traffic safety engineer can attend local community meetings with the general public and/or elected officials as requested.

In 2008, Iowa DOT held two one-day conferences for local engineering staff that brought together engineers and county staff from across the State to provide an

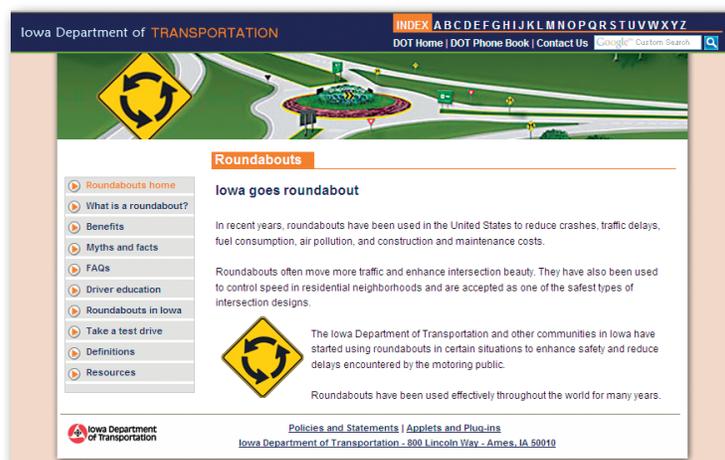


Figure 1: Screenshot of the Iowa DOT roundabout information website.

Before



After

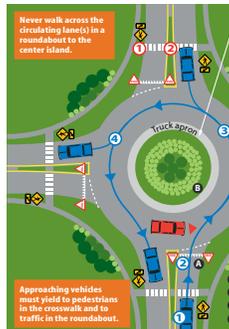


Figure 3: Before and After – County-led project with assistance provided through Iowa DOT’s expert roundabout review program. Black Hawk County, Iowa. Images Courtesy of Iowa DOT

Roundabouts

Roundabouts are intersections that direct traffic in a counterclockwise direction around a center island. They have no stop signs or traffic signals. Yield signs, directional signs and pavement markings guide traffic through the intersection. Traffic generally continues to move, but at a slower speed that reduces traffic backup encountered at traditional intersections controlled by stop signs or traffic signal lights.

Roundabouts are generally safer than other intersections because they tend to reduce head-on, right angle and left-turning traffic crashes. They encourage slower speeds and eliminate left turns across traffic. Roundabouts can improve pedestrian safety by offering a short crossing of one-way traffic moving at slow speeds.



This diagram of a single-lane roundabout is an example only and does not represent all roundabout designs.

46 3. Safe Driving Tips

Single-lane Roundabout (see diagram below)

Motorists

- 1 Approach: Slow down to the posted advisory speed. Yield to pedestrians in the crosswalk. They have the right-of-way.
- 2 Enter: As you approach the yield line markings (shark's teeth), yield to vehicles in the roundabout. Wait for a gap in traffic, then merge into traffic in the roundabout in a counterclockwise direction.
- 3 Proceed: Continue through the roundabout until you reach your street. Avoid stopping in the roundabout.
- 4 Exit: Signal, then exit the roundabout to your right. Yield to pedestrians in the crosswalk.

Pedestrians (see diagram below)

- 1 Approach: At the pedestrian crosswalk, look left.
- 2 Cross: Cross to the raised splitter island. Look right. Finish crossing to the opposite sidewalk.

Cyclists

Generally, cyclists should walk their bicycles across the pedestrian crosswalk using the same rules as pedestrians. Experienced cyclists may navigate roundabouts like motorists. Do not hug the curb. Bicyclists using the roundabout should follow the same rules as motorists. Ride in the middle of the lane to prevent vehicles from passing. Yield to pedestrians in crosswalks.

introduction to roundabouts, including an overview of outreach techniques that have been successfully implemented, both in Iowa and elsewhere in the United States. Experts from across the country, including representatives from regions that have successfully implemented roundabouts such as the City of Clearwater (Florida), Washington State DOT, and Kansas DOT, discussed their agencies’ experiences with roundabouts, what worked well, challenges that they faced, and lessons learned.

The Iowa DOT also manages a traffic and safety e-mail list with over 300 subscribers (including university staff, DOT staff, local consultants, and city/county engineering and public works staff), enabling wide, but targeted, distribution of important roundabout-related messages with the click of a button.

Results

Iowa DOT staff believe that this program has worked well, pointing to the various successful roundabout projects and programs around the State. According to Tim Simodynes, traffic safety engineer with Iowa DOT, “If a city is interested in considering a roundabout, they usually have questions. Having experts available to answer those questions correctly is what makes the roundabout outreach a success. The TEAP helps us to do that for jurisdictions of all sizes.”

Because of TEAP, the local municipalities and engineers have changed their perception of roundabouts. “If they are open-minded and you give them the facts, they are usually sold on roundabouts. Naturally...a first reaction is that a roundabout is a bad idea, but it just takes education,” said Mr. Simodynes.



Figure 2: Screenshot of the Iowa DOT TEAP website.

Lessons Learned

In addition to bringing a traffic safety engineer to a public meeting, it can be helpful to show examples of successful roundabout implementations from other comparable regions of the country and provide contact information for those jurisdictions.

Outreach Investment

Iowa DOT considers TEAP to be a very cost-effective choice, because the program costs are primarily for the program engineer’s salary and/or consultant time, relative to the safety benefits that jurisdictions of all sizes reap with the technical and outreach assistance delivered through the program.

Related Products

Websites

- Iowa Goes Roundabout website <https://iowadot.gov/traffic/roundabouts>

Traffic Engineering Assistance Program website

- <https://iowadot.gov/traffic/traffic-and-safety-programs/traffic-engineering-assistance-program-teap>

Learn More

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Designing Roundabouts for Truck Traffic

Location

Paola, Kansas

Site Characteristics and Implementation Results

- ✓ Opened in 2002 with AADT of 8,500 and 20% trucks.
- ✓ The first rural and high-speed approach roundabout in Kansas.
- ✓ Combined two closely-spaced intersections to form a five-leg roundabout.
- ✓ Reduced overall crashes by 67% and severe crashes by 100% based on a comparison of 6 years of before and after data.

Strategies Employed

- ✓ Reached out to key freight stakeholders early in the project development process in order to obtain and incorporate feedback.
- ✓ Selected an appropriate design vehicle based on freight that travels through this intersection.
- ✓ Invested in an independent peer review by an expert roundabout designer.
- ✓ Modified curb height to help large trucks better traverse the intersection.
- ✓ Used advance transverse rumble strips in lieu of reverse curves to help raise intersection awareness and reduce approach speeds.



Introduction

Maneuvering through intersections can be challenging for trucks, and these challenges become even more pronounced when the load is exceptionally large or heavy. Oversize/overweight (OSOW) vehicles are particularly sensitive to how intersections are designed. The geometry of roundabouts must be carefully considered to achieve a good balance between safety for all users and the basic ability of freight to flow through the intersection. Working together, road agencies, freight company owners, and truck operators can improve both the design of roundabouts and the ability of drivers to navigate them.

Safe and efficient movement of trucks on rural highways is vital to the Kansas economy.

Background

With over 140,000 miles of public roads, Kansas has the third-most public road miles of any State, although its population ranks only 33rd. More than 90 percent of those miles are considered rural, and a substantial portion of the vehicle-miles traveled involves commercial motor carriers on rural highways carrying long-distance freight loads or goods related to the State's extensive agriculture industry. As a result, the safe and efficient movement of trucks on rural highways is vital to the Kansas economy.

Additionally, recent trends in the renewable energy industry have increased the volume of OSOW vehicles on Kansas roadways. For example, transporting a blade for wind turbines requires an OSOW vehicle with trailers as long as 80 feet without rear-wheel steering.

In 1996, the Kansas Department of Transportation (KDOT) identified the intersections of Kansas Highway 68 (K-68) with Old Kansas City Road and Hedge Lane near Paola as a high-crash location. The location featured two closely-spaced intersections: Old Kansas City Road and K-68 was a four-leg, two-way stop-controlled intersection; Hedge Lane terminated at a T-intersection with K-68 approximately 200 feet away. All were two-lane roads. The posted speed limits were 65 mph along K-68 and 55 mph on Old Kansas City Road. The combined average annual daily traffic (AADT) at the intersections was approximately 8,500, 20 percent of which were large trucks.

In 1998, KDOT temporarily changed the Old Kansas City Road intersection to all-way stop control with larger signs and a flashing beacon, but right-angle and high-severity crashes continued. Rather than install a traffic signal, KDOT evaluated other solutions

with the potential to reduce crashes and accommodate future traffic volume growth, and determined that a roundabout was the best solution. Given the high volume of truck traffic using the intersection, KDOT carried out targeted outreach efforts to understand the needs of area freight stakeholders and adjust the roundabout design to accommodate their operations.



Figure 1 & 2: K-68 Before and After
Source: Google Earth Pro

Based on freight stakeholder input, KDOT reduced truck apron curb heights at the roundabout to provide a more forgiving edge of traveled way for large trucks.

Lessons Learned

Roundabouts can provide substantial safety improvements at rural, high-speed approach intersections.

Proactive outreach to freight-specific businesses gets them involved in the design process, resulting in roundabout features that can work better for trucks.

Other Resources

KDOT QuickFacts

http://www.ksdot.org/PDF_Files/QuickFacts2010.pdf

Kansas Roundabout Guide

http://www.ksdot.org/Assets/wwwksdotorg/bureaus/burTrafficEng/Roundabouts/Roundabout_Guide/KansasRoundaboutGuideSecondEdition.pdf

Roundabouts in Kansas Video

<http://www.youtube.com/watch?v=HnlxJ2CTBXk>



Figure 3: Truck navigating a roundabout
Source: KDOT

Approach

The Paola area is home to a number of freight-related businesses, including a major warehouse distribution center and a commercial vehicle driving school. KDOT knew the new roundabout needed to accommodate large vehicles. They also understood the importance of the roundabout providing both safety and operational benefits compared to other intersection designs. KDOT undertook several stakeholder involvement activities prior to and during the design process in order to deliver a project that would meet agency safety goals and serve the freight community.

For most projects on state highways, KDOT evaluates a combination semi-tractor and 53-foot trailer (an AASHTO WB-67) as the design vehicle, while also considering possible OSOW loads that might travel through the intersection. With the Paola roundabout located east of a Walmart distribution center, KDOT knew there would be a high volume of truck traffic using the intersection. Accordingly, their first key decision was to continue their practice of using a WB-67 semi-trailer as the design vehicle for the roundabout. This assisted with the alignment design of the approaches and circulating roadway to provide sufficient accommodation for freight traffic and emergency vehicles to safely and efficiently navigate through the intersection.

With a draft design completed in-house, KDOT hired an external roundabout design expert to conduct a peer review of the roundabout's ability to accommodate trucks and achieve the desired safety improvement. KDOT used the resulting design when meeting with freight stakeholders, many of whom had expressed initial opposition to the roundabout idea. KDOT contacted representatives from the freight industry to present the roundabout design, discuss the other intersection options considered, and solicit feedback. This allowed KDOT to present their concept and justification for the roundabout while also being responsive to stakeholder concerns.

Results

As a result of the outreach efforts to freight stakeholders, KDOT reduced curb heights on the truck aprons at the roundabout to provide a more forgiving edge of traveled way to large trucks. Additionally, KDOT had planned to use reverse curves on the approaches to the roundabout to help reduce speeds into the intersection. However, to alleviate the concerns expressed by the stakeholders, KDOT agreed to use elongated splitter islands with advance transverse rumble strips instead.

KDOT proceeded to construct the roundabout and opened it to traffic in 2002. It was a "first" roundabout for Kansas in two ways: the first with high-speed approaches and the first in a truly rural setting. Additionally, the roundabout featured five legs, due to combining the two original intersections – one four-leg and one three-leg - into a single intersection that preserved the 55 mph and 65 mph posted speed limits on the approaches. Data shows a marked reduction in crashes after construction. From 1995-2000, there were 33 crashes with 42 injuries in the six years prior to the roundabout installation. After the roundabout was installed, these numbers declined dramatically with 11 crashes and zero injuries in the six years following installation (2003-2008).

Despite some initial trepidation, the roundabout has exceeded the expectations of the agency and the public for improving safety and accommodating freight movement. The success of this installation has led KDOT to install five more roundabouts at rural, high-speed approach intersections on the State highway system, and two more are planned for construction. In addition, KDOT used the knowledge and experience gained from this project to create the *Kansas Roundabout Guide* to assist local Kansas agencies in assessing the viability of roundabouts in their areas. The second edition of the guide was published in spring 2014.

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Making Roundabouts Work for Pedestrians and Bicycles

Location

Madison, Wisconsin

Examples of Strategies Employed in Madison

Pleasant View Rd – Valley View Rd– Junction Rd Roundabout

- ✓ Bicycle Ramps are provided on all approaches, with two approaches having a second exit ramp.
- ✓ Widened Sidewalks
- ✓ This roundabout has a pedestrian/bicyclist underpass
- ✓ A truck gore
- ✓ Vane islands are provided on all approaches

Pleasant View Rd, Mineral Point Rd

- ✓ Bicycle Ramps are provided on all approaches, with two approaches having a second exit ramp.
- ✓ Widened Sidewalks
- ✓ A truck gore
- ✓ Vane islands are provided on all approaches

Lien Rd, Zeier Rd, and Thompson Dr

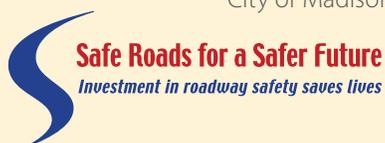
- ✓ Bicycle Ramps are provided on all approaches.
- ✓ Widened Sidewalks
- ✓ Truck gores on all approaches



Figure 1: Junction Road - Pleasantview Road

“Lower approach and circulating speeds can improve safety for all users.”

- Robert Arseneau
City of Madison



Background

The City of Madison, Wisconsin has been building roundabouts for over fifteen years. Their first modern roundabout, constructed and opened to traffic in 1999, was successful and accepted by the local residents. Soon the modern roundabout became the City's preferred intersection design, whenever feasible, and this priority continues today.

Over time, people traveling across Madison have become more familiar with roundabouts and have gained confidence in their performance. However, Madison has also made walking and biking a high priority with ambitious goals, so concerns for pedestrian and bicyclist safety and access are still expressed at nearly every initial public meeting involving a roundabout proposal. To address these concerns and build roundabouts that are multimodal, City staff has collected a library of design techniques, which are intended to improve pedestrian and bicyclist safety. These techniques are applied in a holistic manner, considering all users and their needs, throughout the design process, to arrive at a balanced and optimal design.

Approach

Madison's approach to accommodating pedestrians and bicyclists is to consider their needs from the beginning of the design process, along with motorized traffic. The specific needs of each group are studied and prioritized, leading to a balanced design that serves all users. The concept of “balance” is very important, since choices about design features and geometry can result in tradeoffs between competing project goals. For example, reducing the number of lanes and lane widths improves pedestrian crossing safety, but can also reduce motor vehicle capacity of the intersection.

Non-Motorized User Consideration

The safety and comfort of all users (motorized and non-motorized) is improved when approach and circulating speeds are reduced. Speeds can be managed in multiple ways, including more pronounced entry curvature, narrower lanes and strategic use of landscaping features, to name a few. Even in cases where features that reduce speeds through a roundabout also reduce capacity, it is still possible to deliver a project that creates a safer, more usable intersection for pedestrians and bicyclists, that is also more efficient for motorized traffic even at high volume intersections. This is the basis of the City's holistic approach to roundabouts.

Landscaping features can be used to elicit more driver caution and alertness and to reduce speeds, but it must be carefully designed to screen only unnecessary information, such as the view of vehicles beyond the immediate conflict areas, while allowing the driver to focus on driving tasks, non-motorized users, and appropriate yielding. Judicious use and maintenance of landscaping can result in safer roundabouts.

A thoughtful approach to signing each roundabout can help reduce sign clutter and provide drivers with the ability to focus on the actions of pedestrians and bicyclists, while still providing the information needed to maneuver the roundabout comfortably and safely.

Lessons Learned

- Reducing vehicle speeds can benefit all users, motorized and non-motorized.
- Avoid “over-signing” that creates clutter and may distract drivers or hide pedestrians.
- Ensure that roadway lighting properly illuminates critical features at and along the roundabout, especially the pedestrian and bicycle facilities.
- Using landscaping to limit excessive sight distance can improve safety for all users, but must be designed carefully.
- Balanced, multimodal roundabout designs are possible when the needs of all users are considered explicitly and consistently throughout the project development process.



Figure 2: Pleasentview Road - Mineral Point

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Pedestrian Considerations

Pedestrian safety for people of all ages and abilities is improved by lower vehicle speeds, shorter crossing distances, greater visibility and conspicuity, and drivers that are more attentive and focused on the pedestrians and crossings. Visibility of pedestrians at the intersection, especially the crosswalks, is critically important. The driver's view of the crosswalks, ramps and landings, and refuge areas should not be obstructed by signs, landscaping or any other feature. Crosswalks should be placed to allow drivers to see the crossing well in advance and to allow a focus on pedestrians that are present. During low-light conditions, visibility can be achieved or improved by ensuring that the intersection lighting is provided, and designed to avoid “negative contrast” or silhouetting at crosswalks.

At some roundabouts, there may be concerns about not enough gaps in traffic or that drivers will not yield appropriately to allow pedestrians to cross the street safely. Appropriate pavement markings and signing can improve motorists' tendency to yield, but other factors such as public information, enforcement campaigns, and pedestrian education have also been shown to work well. A rectangular rapid flashing beacon (RRFB) is an effective device to install at crossings where pedestrians may have difficulty crossing. The City has found that placing the conduit needed for RRFBs (or other treatments) is a low cost strategy that provides flexibility to address pedestrian crossing experience at a future date.

Bicyclist Considerations

Bicyclists approaching a roundabout can vary greatly in their cycling experience, skill and confidence. The majority of highly experienced bicyclists may decide to ride through the roundabout, while less experienced bicyclists may decide to exit the street and proceed as pedestrians across the roundabout. Knowledge about the user population should inform how to approach the design. For instance, a nearby elementary school or playground could result in regular use by inexperienced bicyclists who prefer to use the shared use paths and crosswalks. Wider bicycle off and on ramps and sidewalks, along with adequate refuge on the splitter islands to allow room for both pedestrians and bicycles, could better accommodate these users. Bicycle exit ramps should be provided on all approaches to allow bicyclists the option to exit the street before entering the roundabout.

In the City's experience, bicyclists who choose to ride through the roundabout usually prefer to ride near the center of their lane. This allows the bicyclist to control the lane and discourages motor vehicles from attempting to pass, while in the roundabout. Keeping the entry lanes less than 14 feet in width allows bicyclists better control of the lane. Truck gores for multi-lane roundabouts help to maintain narrower approach lanes while also channelizing and separating approach traffic.

When a roundabout gets larger and more complex due to traffic volumes, more bicyclists will choose to exit the street before entering the roundabout and cross at the crosswalks. In these cases, greater emphasis should be given to the facilities that allow bicyclists to do this, such as adding a second exit ramp on higher volume approaches that give a bicyclist another chance to exit the street. Wider sidewalks or a shared use path provides room for pedestrians (including those walking their bicycles) and a safe route to the next street crossing or ramp for bicyclists to re-enter the street as they proceed past the roundabout.

More Information

The City of Madison's website on roundabouts can be found here:
<http://www.cityofmadison.com/trafficEngineering/trafficRoundabouts.cfm>

Seeing Is Believing: Missouri DOT Convinces Skeptics That Roundabouts Work

Location

State of Missouri
(Central United States)

Implementation Stage

- ✓ Planning

Roundabout Type/Setting

Single-lane roundabouts in urban, suburban, and rural settings

Target Audience

- ✓ General Public
- ✓ Elected Officials/Managers

Strategies Employed

- ✓ Meeting with local elected officials and planning commission members privately to gain buy in, then giving presentations at city council meetings, planning commissions, community service groups, neighborhood associations, etc.
- ✓ Meeting with journalists in the area to discuss roundabouts
- ✓ Targeting younger people who become ambassadors to their parents, educating them about new concepts, and address concerns of older drivers, who often then become advocates for roundabouts
- ✓ Offering a roundabout video and distribute it as widely as possible



Background

The first roundabout in the State of Missouri, built about 10 years ago, was designed for a golf course community in the Kansas City area. Even in that context, trying to convince the local community that a roundabout would work was difficult. Many people confused modern roundabouts with European-style traffic circles, and assumed they were hard to navigate, and intimidating to drivers, pedestrians, and bicyclists alike. To overcome these misconceptions, traffic engineers from the Missouri Department of Transportation (MoDOT) held local public meetings to explain the difference between roundabouts and traffic circles, how modern roundabouts work, and why they were more desirable than adding a new traffic signal within a quarter mile of an existing signalized intersection. MoDOT's larger goal was to build many roundabouts in the Kansas City area, but the difficulties MoDOT experienced trying to gain public acceptance of this first roundabout became the catalyst for a proactive outreach and education program focused on the benefits of roundabouts.

Since the implementation of this first roundabout, MoDOT has installed over two dozen roundabouts in the Kansas City area, increasing community support over time with each new project. For every roundabout project, staff used a variety of outreach techniques to reach all target audiences and age groups who might be affected by the project.

Approach

MoDOT began actively introducing roundabouts into Missouri communities about eight years ago. Its outreach approach communicated a core set of messages explaining the benefits of roundabouts compared with traditional signalized intersections, including that they are safer for vehicles and pedestrians, they reduce congestion and emissions, and, in some cases, they can decrease the amount of right-of-way needed compared with signalized or stop-controlled alternatives.

The first strategy MoDOT uses to build support is "showing up." When a roundabout is planned, MoDOT staff reach out to community groups, town council, and civic meeting forums and offer to give a roundabouts presentation. They invite local journalists to attend and report on the meeting and/or roundabout project. They talk directly with skeptics about their concerns, and convey the benefits roundabouts provide. MoDOT has also distributed a video, titled *All About a Roundabout*, via YouTube and to driver education programs across the state. They also speak to driver education classes about roundabouts. MoDOT has found that if young people are taught early about roundabouts, they can become champions, enabling them to teach their parents about roundabouts. MoDOT also visits places where senior citizens gather, such as community centers, to help ensure older drivers and pedestrians understand how to navigate roundabouts.

"...Young people help us get the roundabout message to the community."

**– Steve Porter,
MoDOT**

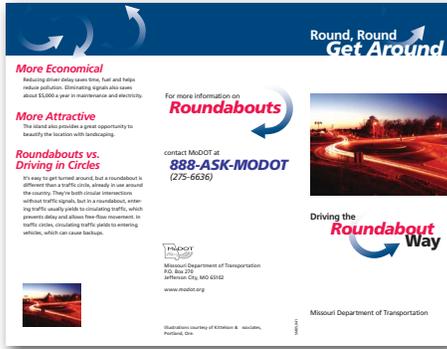


Figure 1: MoDOT's roundabout brochure is a proven tool for communicating effectively to the public about roundabouts.

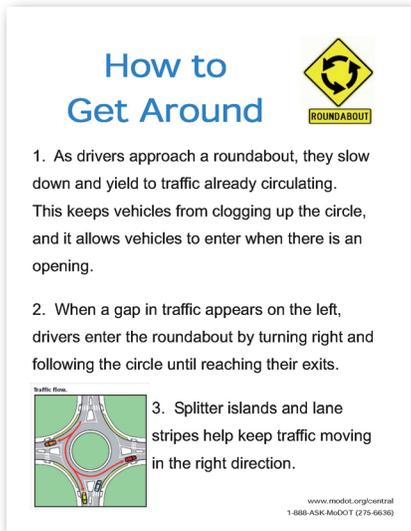


Figure 2: MoDOT uses this flyer as a quick attention-grabber to explain roundabouts to various citizen demographics.

Learn More

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MoDOT staff also work with individuals who are skeptical that their vehicles will be unable to traverse a roundabout safely due to size and/or turning radius. For example, the transportation director for the Belton school district, who doubted the roundabout would work, insisted on a test drive with a school bus on the roundabout before the pavement had been laid. Naturally, the bus driver experienced some difficulties, resulting in a flurry of phone calls to the mayor's office from concerned parents. One month later, after the pavement was set, MoDOT staff invited the transportation director and the bus driver to drive the roundabout again. The second time was the charm, and the director became a strong proponent of roundabouts. The presence of journalists for the test drive on the completed roundabout made the community aware of the director's support for the roundabout, convincing even more people of the project's value.

Results

There are currently more than two dozen roundabouts in the Kansas City area. MoDOT believes this is a direct result of their successful outreach efforts. Steve Porter, senior public relations specialist with MoDOT notes that once people experience modern roundabout intersections, "They believe."

Older drivers have also been convinced: A senior citizen approached a MoDOT official at a local town council meeting to admit that he had been skeptical of the roundabouts when they were first proposed, but a year after their completion he had come to realize that they were "the right thing to do."

Lessons Learned

- Initiate outreach with the community at the first hint that a roundabout intersection might be considered.
- Reach out to the elders of the community. Talk with them, explain how roundabouts work and their advantages. They will "get it" and support you.
- Target high schools because young people are eager to learn new concepts and become ambassadors.

Outreach Investment

MoDOT considers its outreach investment to be relatively moderate. The MoDOT Central Office in Jefferson City produced the roundabouts video and the brochures, and maintains the website. On occasion, custom-produced, project-specific flyers have been developed for some roundabout projects.

Related Products

General Information Website

<https://www.modot.org/roundabouts>

Brochure

Round, Round, Get Around – Driving the Roundabout Way

https://epg.modot.org/files/4/4d/233.3_Round,_Round_Get_Around.pdf

Video

All About a Roundabout

<http://www.youtube.com/watch?v=X0RcTWEBtYM>

Choosing a Roundabout as a Multimodal Solution

Location

Santa Cruz, California

Strategies Employed

- ✓ Solicited a third-party, independent expert to verify for the community that a roundabout will improve safety and mobility for all users.
- ✓ Used a consistent message when communicating to the project stakeholders about why a roundabout is the right choice for the intersection.
- ✓ Targeted and educated pedestrian and bicycle advocacy groups to gain their support.



Source: City of Santa Cruz

Figure 2: Pedestrians using the roundabout.



Source: City of Santa Cruz

Figure 3: Bicyclist using the the roundabout.



Figure 1: Location of Santa Cruz, CA

Source: Santa Cruz, CA

Introduction

The City of Santa Cruz, California, is committed to creating and maintaining a walkable and bikeable community. Master plans adopted for pedestrians in 2003 and bicycles in 2008 back up that commitment with city policies to improve the quality of life for non-motorized road users.

Located on Monterey Bay, Santa Cruz is a vibrant community that has received national recognition and awards for being a “bicycle friendly community.” Residents of the city, students at the nearby University of California Santa Cruz, and visitors to the coastline all contribute to a diverse and active-lifestyle community. The city’s General Plan 2030 states:

“We will provide an accessible, comprehensive, and effective transportation system that integrates automobile use with sustainable and innovative transportation options—including enhanced public transit, bicycle, and pedestrian networks throughout the community.”

In addition, transportation safety and mobility around and through the community are important to the city, and the city’s staff is encouraged to consider innovative ideas and solutions to improve traffic flow and safety. As part of a revitalization of the connection between downtown and beach areas of Santa Cruz, and in keeping with active transportation goals, the city studied upgrading the intersection of Pacific Avenue, Center Street, and Depot Park from an all-way stop to a single-lane roundabout.

Background

Located less than ¼ mile from the historic Municipal Wharf, and adjacent to Depot Park, the intersection of Pacific Avenue at Center Street serves as a historic gateway between downtown Santa Cruz and the beach properties along the coast. The intersection experienced daily congestion due to traffic going to and from downtown and the beaches, especially on weekends. Being next to a park and close to the coast, pedestrians and bicyclists were also regular intersection users.

In 2005, the City of Santa Cruz undertook a feasibility study to evaluate the intersection operations and traffic control. Part of the study examined replacement of the existing all-way stop with either a roundabout or a traffic signal. The study documented the existing use patterns of all travel modes and counted the number of pedestrian crossings and bicycle turning movements at the intersection.

The feasibility study recommended a roundabout as the most balanced solution for pedestrians, bicyclists and motor vehicles. The roundabout requires fewer lanes on each approach than an equivalent traffic signal, which means shorter pedestrian crossing distances. Additionally, lower speeds associated with the roundabout foster a safer and more comfortable environment for all users.

Lessons Learned

- Strategically identify a location that seems like a good fit for a community's first roundabout then conduct a thorough, independent expert evaluation to inform early decisions.
- Connect the benefits of a proposed roundabout to important community values, including the goals set in long-range plans.
- Conduct extensive outreach by soliciting input and feedback and always following up on questions. These were simple, key steps with a great impact.
- Leverage strategic success to promote future roundabouts where they are feasible.



Figure 4: Bicyclist using the roundabout.

Approach

Following the recommendation of the feasibility study, the city programmed the project for construction in 2011. City personnel knew public outreach and communication were critical for successful completion since this would be the first modern roundabout in the community. Specifically, they planned a significant effort to reach and educate the pedestrian and bicycle advocacy groups. The city used consistent, positive messaging as the foundation for communicating to the general public and advocacy groups that a roundabout was the right choice. The city utilized the following talking points:

- Independent, expert analysis verified that a roundabout would operate more safely and efficiently than a traditional traffic signal.
- Pedestrians of all ages and abilities have a better experience since crosswalks are shorter and vehicle speeds are lower.
- Bicyclists can comfortably ride in the roadway since single lane roundabout geometry has fewer conflict points and lower speeds.
- The features of a roundabout create a “gateway” to the community thanks to improved aesthetics, including using the central island as an opportunity for a public art showcase.
- This intersection was well-suited for a successful first roundabout in the community due to the mix of modes, existing road layouts, and adjacent development.

Results

In addition to engaging the general public, city officials met with two prominent pedestrian and bicycle advocacy groups within the community to receive their input and answer their questions. Following this outreach, the city and the engineering consultant presented the findings to the Santa Cruz City Council. The advocacy groups spoke out in favor of the project and the city council unanimously approved the project for construction.

Conclusion

City staff sensed that the intersection was a good opportunity for a first roundabout in Santa Cruz and community support for the roundabout was achieved through a deliberate, thoughtful process. An accomplished expert was enlisted to equip city staff with the needed knowledge about roundabouts. Thus, the city was able to connect the proposed roundabout to community values of innovation, aesthetics, safety, and the environment. Efforts by the city to work with pedestrian and bicycling groups in the community resulted in additional support needed for the project to proceed. The City of Santa Cruz now uses the success of this roundabout as a model for other proposed locations.

More Information

City of Santa Cruz General Plan 2030:

<http://www.cityofsantacruz.com/index.aspx?page=348>

City of Santa Cruz Pedestrian Master Plan:

<http://www.cityofsantacruz.com/Modules/ShowDocument.aspx?documentid=25777>

City of Santa Cruz Bicycle Transportation Plan 2008:

<http://www.cityofsantacruz.com/Modules/ShowDocument.aspx?documentid=2496>

Feasibility Report (Beach Area Roundabout and Traffic Signal Project):

<http://www.cityofsantacruz.com/Modules/ShowDocument.aspx?documentid=2494>

Learn More

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Sioux Falls, South Dakota Conducts Roundabout Rodeo

Location

Sioux Falls, South Dakota
(Central United States)

Implementation Stage

- ✓ Construction

Roundabout Type/Setting

Single-lane roundabout in a
suburban setting

Target Audience

- ✓ General Public
- ✓ Emergency Responders
- ✓ Elected Officials/Managers

Strategies Employed

- ✓ Mock driveable roundabout/
roundabout rodeo event
- ✓ Website
- ✓ Radio broadcast

Background

In 2008, the City of Sioux Falls, South Dakota was nearing completion of construction of one of the first roundabouts in the State, near a newly constructed local university campus. The City recognized that helping local residents feel comfortable with the new intersection design and confident in navigating it would be important to a successful launch. Fortunately, City engineering staff had recently attended the Transportation Research Board's 2nd International Roundabout Conference in the spring of 2008, where they heard presentations from other agencies about the importance of outreach and education. Inspired by similar experiences from other jurisdictions, the City decided to set up a mock, driveable roundabout in a local parking lot and host South Dakota's first "roundabout rodeo." This event would provide local residents and other interested parties the opportunity to experience the new intersection design first-hand in a non-threatening environment before construction on the new roundabout was complete.

Approach

Using traffic cones, City engineers laid out the mock roundabout according to the same specifications as the one under construction (see Figure 1). Various efforts to publicize the event were used—announcements in newspapers and on television, at community meetings, and through the City website. Local residents were invited to drive, ride their bikes, or walk through the mock roundabout. City engineers also individually invited emergency responder organizations (fire, emergency medical services, and police) and elected officials/managers to come learn about and try the new roundabout design. Engineers made themselves available to event participants, answering questions and clarifying misconceptions as drivers navigated the mock roundabout.

The City also invited local television and newspaper journalists to come to the event and report on the rodeo. Four media organizations took pictures of the



Figure 1: A view of Sioux Falls' mock driveable roundabout set up in a nearby parking lot.



Figure 2: A view of Sioux Falls' mock driveable roundabout set up in a nearby parking lot.



Figure 3: A wide-load tractor-trailer configuration vehicle navigating the mock driveable roundabout.



Figure 4: A view of Sioux Falls' mock driveable roundabout set up in a nearby parking lot.

event, interviewed participants, and featured stories that described the benefits of roundabouts and the success of the roundabout rodeo. As a follow-up activity, city engineers participated in a local radio broadcast on roundabouts, and fielded questions from the listening audience about the new roundabout.

Results

More than 130 people attended the roundabout rodeo, driving all types of vehicles including semi-trucks, tractor-trailers, fire trucks, minivans, and bicycles (see Sioux Falls Engineering News under *Related Products*). According to city engineers, all participants navigated the mock roundabout with ease and reported positive feedback about the experience. Elected officials and emergency responders reported being much more comfortable with the roundabout construction after this outreach activity.

Lessons Learned

- Designing the mock roundabout to actual specifications increases the realism of the experience and helps to dispel concerns when stakeholders can experience the actual intersection in advance.
- If a jurisdiction is planning a roundabout rodeo, it is best to set up the mock roundabout near the roundabout construction to increase participation in the event.

Outreach Investment

The City of Sioux Falls staff report that the outreach investment for a mock driveable roundabout was relatively low. Costs incurred included \$800 to rent equipment (extra cones, signs, etc.) and staff hours to plan, publicize and staff the event. In terms of promoting the event and reporting on the results of the event, three local television stations and a newspaper featured content on the event, thus providing additional public outreach at no cost to the City.

Related Products

General Information Website

Sioux Falls Roundabout

<https://www.siouxfalls.org/public-works/engineering/roundabouts>

Learn More

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VDOT's Roundabouts Review Committee Spearheads Internal and External Outreach Efforts

Location

State of Virginia
(Mid-Atlantic United States)

Implementation Stage

- ✓ Planning
- ✓ Design
- ✓ Construction
- ✓ Launch
- ✓ Post-Implementation

Roundabout Type/Setting

One-lane and two-lane roundabouts in urban, suburban, and rural areas.*

Target Audience

- ✓ General Public
- ✓ Elected Officials/Managers

Strategies Employed

- ✓ 15-week series of facts
- ✓ Video
- ✓ Website
- ✓ Inserts into Virginia Driver's Manual
- ✓ Brochure entitled VDOT Roundabouts – VDOT Answers Your Questions
- ✓ Public meetings/presentations
- ✓ Articles in newspapers and magazines
- ✓ Inserts into VDOT's Board of Supervisors Manual

* Twenty-five percent are being installed on primary routes, and 75 percent installed on secondary routes—local streets and residential routes



Background

In 2003, when the Virginia legislature passed a resolution encouraging the consideration of roundabouts as an alternative to signalized intersections where feasible, the Virginia Department of Transportation (VDOT) quickly realized it needed to accelerate its efforts on implementing roundabouts into intersection safety policies across the State. Because there were only a few VDOT engineers with roundabouts experience, leadership realized it would be necessary to create internal guidance and conduct educational outreach for its own staff, and it would need to begin educating the public about these new, unfamiliar round intersections. VDOT's Central Office created a Roundabouts Review Committee to spearhead these efforts and provide technical reviews, subject matter expertise, and a range of public outreach efforts addressing issues and concerns associated with individual roundabout projects.

Approach

VDOT has used a variety of methods to reach out to the public and promote modern roundabouts. Its Roundabouts Review Committee released a 15-week series of roundabout facts to the public via the VDOT website. The committee also created a mailing list of VDOT staff interested in learning more about roundabouts who received the facts directly via email. These facts were presented as simple, one- to two-page flyers that provided information about various aspects of roundabouts. Topics ranged from roundabout benefits to interesting facts presented at conferences to interesting news stories about roundabouts, from public radio, for example. The facts themselves are short blurbs with photos or a story about a new roundabout in the State to increase readability. They were originally emailed to everyone from the governor and VDOT staff to local engineers.

VDOT also submitted articles to local newspapers and magazines in areas where roundabouts were planned and developed a video on the "Virginia Experience with Roundabouts" to supplement outreach. The video, created with the help of Washington State DOT and the Virginia Department of Education, informed viewers about key design elements and operational characteristics of roundabouts, benefits of

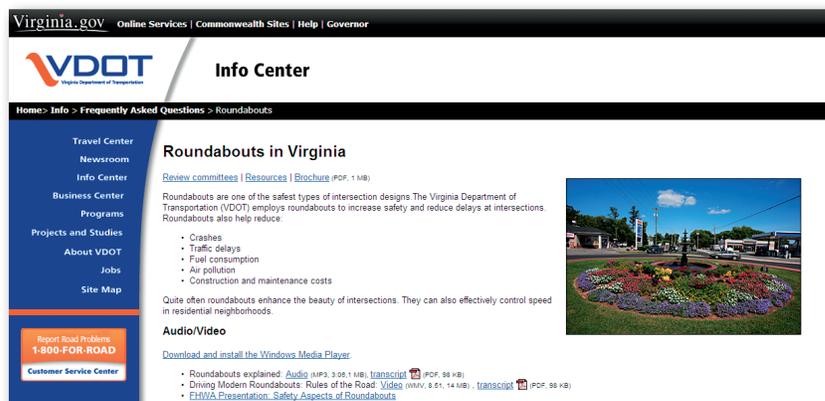


Figure 1: VDOT's roundabout website highlights the 15-week roundabout FAQ series on the homepage.

- Roundabouts have been around forever - **false**
- Roundabouts are unsafe to Pedestrians and Bicyclists - **false**
- The public avoids using Roundabouts - **false**
- They are unsafe next to schools - **false**

Figure 2: Sample slide from VDOT's public outreach presentation.

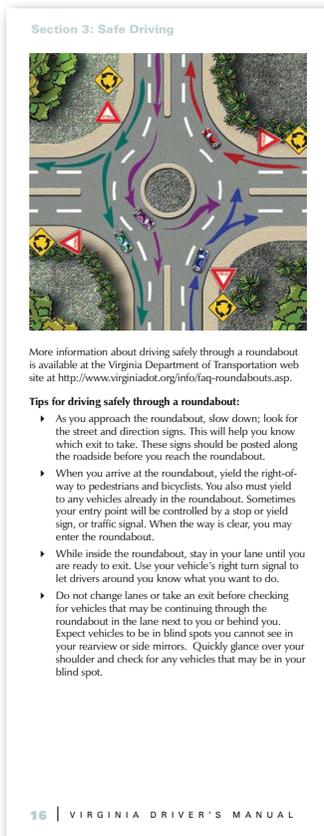


Figure 3: Roundabout information from Virginia's DMV driver's manual.

Learn More

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roundabouts, and how to safely navigate a roundabout. The video also provided a link to a brochure, titled VDOT Roundabouts – VDOT Answers Your Questions. In addition, VDOT updated the State's driving manual to include driving tips for roundabouts and integrated a section on roundabouts into the Virginia Board of Supervisors Manual, which is distributed to every county in the State as a reference guide to VDOT responsibilities.

Results

VDOT considers its outreach activities to be very successful to date, and notes that there have been many occasions in which the Roundabouts Review Committee attended public outreach meetings where the community's initial sentiment toward roundabouts was very negative. However, once the presentation had been given, questions had been answered, and misconceptions had been corrected, community members generally became enthusiastic supporters of roundabout construction in their area.

Lessons Learned

- Public outreach efforts should not take a "one-size-fits-all" format. Outreach efforts are most successful when they are tailored to address specific local concerns or "hot button" issues for the proposed roundabout location.
- Deliberate, sustained, and redundant outreach is extremely beneficial for helping audiences absorb the information.
- Conversations with other states to understand the issues they have faced and effective practices they have used can help an agency anticipate and resolve problems before they arise. For example, the input provided by Washington State DOT for the VDOT video that teaches young drivers how to navigate a modern roundabout was vital to that cost-effective effort.
- Providing examples of existing roundabouts that closely match the location where a proposed roundabout project is being considered is a useful practice.

Outreach Investment

VDOT's Roundabouts Review Committee structure and activities are very low-cost, involving limited investment in developing the outreach tools. Individual VDOT divisions around the state cost-effectively execute the majority of outreach activities surrounding the implementation of a roundabout using materials developed by VDOT through this outreach effort.

Related Products

Manuals

Board of Supervisors Manual

http://www.virginiadot.org/business/resources/local_assistance/BOS_manual.pdf

Virginia DMV Driver's Manual

<http://www.dmv.state.va.us/webdoc/pdf/dmv39.pdf>

General Information Website

Roundabouts in Virginia

<http://www.virginiadot.org/info/faq-roundabouts.asp>

Roundabout Facts

<http://www.virginiadot.org/info/faq-roundabouts.asp>

Montpelier, Vermont, Constructs Roundabout Thanks to Local Roundabouts Steering Committee

Location

Montpelier, Vermont
(North-Eastern United States)

Implementation Stage

All phases of roundabout construction, including:

- ✓ Planning
- ✓ Design
- ✓ Construction
- ✓ Launch
- ✓ Post-Implementation

Roundabout Type/Setting

Single-lane roundabouts in a suburban location

Target Audience

- ✓ General public
- ✓ Elected Officials
- ✓ Engineers/Managers

Strategies Employed

- ✓ Presentations
- ✓ Public Meetings
- ✓ Flyers
- ✓ Brochures



Background

In the 1980s, a regional transportation plan for Montpelier, Vermont, identified the intersection of Main and Spring Streets as deficient. The three-way “T” intersection lacked pedestrian facilities and created a confusing traffic pattern for the public due to a triangular central island and a commercial driveway. To complicate matters further, a middle school was located nearby, which meant a number of children traversed this intersection to get to and from school.

Although the City planned to install a signal, a group of citizens approached the City Council about constructing a roundabout at the location instead. They successfully lobbied the Council to create a steering committee to investigate the feasibility of a roundabout at the intersection of Main and Spring Streets.

Because there were no roundabouts in the region at this time, and because this was several years before roundabouts were embraced by FHWA, the community as well as the Montpelier Department of Public Works were concerned about the validity of the design. With the assistance of a consultant experienced in constructing roundabouts in Florida, the City completed the design.

Approach

The Roundabouts Steering Committee actively lobbied the City Council and worked with the media to tout the benefits of roundabouts and dispel common myths. While the Roundabout Steering Committee engaged the media to gain public support, they also prepared informational pamphlets for distribution to drivers’ education programs at the local schools. The group also worked closely with the Montpelier Department of Public Works and the Vermont Agency of Transportation (AOT), which performed a pre- and post-construction traffic study. Once the roundabout was opened, the committee placed a flyer in the local newspaper with instructions on how to drive the new roundabout to assist citizens in navigating this new type of intersection.

“There was... skepticism in house. We were inventing the wheel here, so to speak.”

— Thomas J. McArdle
Assistant Director of Public Works
Montpelier, Vermont

Results

Engaging the public and elected officials through the Roundabouts Steering Committee gave Montpelier, Vermont the distinction of constructing one of the first modern roundabouts in the northeast, and one of the earliest in the entire United States as well. A follow-up survey conducted one year after the project’s completion showed that 85 percent of the respondents had a favorable or neutral opinion of the roundabout.



Figure 1: Overhead photo of the second roundabout completed in Montpelier.

In addition, this roundabout has improved safety, reducing speeds at the intersection of Main and Spring Streets, and providing more favorable crossing conditions for pedestrians. Officials at the middle school affected by the roundabout have said that the intersection is much safer after the construction. Prior to construction, a limited number of pedestrians traversed the intersection, but after the roundabout construction, a large number of students use the route on their way to and from school (30-50 in the mornings and 150 in the afternoons).

Montpelier's pioneering effort with Vermont's first roundabout has been followed by successful installations of roundabout intersections in Brattleboro and Manchester, and a second roundabout recently has been completed in Montpelier.

Lessons Learned

- Public outreach is a critical step in the planning process. It's important to engage the local emergency service agencies, schools, stakeholders, and residents in an intersection design alternative review process.

Outreach Investment

There were costs associated with the printing of flyers but much of the public relations work was completed gratis for the Montpelier Department of Public Works by a volunteer and staunch roundabout advocate.

ROUNDABOUTS

What is a Modern Roundabout?

A modern roundabout is a new circular intersection design able to slow traffic while lowering delays and handling higher traffic volumes. Modern roundabouts have proved to more safely accommodate vehicles, pedestrians and bicyclists than alternatives, like stop signs or traffic

signals. U-turns are permitted! Compared to other types of intersections, roundabouts save energy, reduce pollution, and require less land and maintenance. No intersections are perfect, but roundabouts generally provide the best conditions for movement of pedestrians, bicyclists, and all types of motor vehicles.

For Drivers...

Signs at Roundabouts

ROUNDABOUT AHEAD
A "Roundabout Ahead" and a "Reduced Speed Ahead" signs tell you that you are approaching a roundabout

REDUCED SPEED AHEAD
The "Advisory Speed Limit 15" sign tells the driver the maximum safe operating speed approaching the roundabout and operating through the roundabout



Roundabout Yield Signs mean yield, that is, slow or stop at the entry line to the circular roadway when there are vehicles there—vehicles in the circulating roadway have the right-of-way over vehicles entering the roadway.

Remember: Vehicles must give way to pedestrians.

Pedestrians, bicycle riders and motorcyclists are often very hard to see. They are particularly at risk, so always keep an eye out for them.

Approaching the Roundabout

Slow down to about 10-15 mph when approaching the roundabout (the advisory speed limit for motor vehicles at the Montpelier roundabout is 15 mph). Also, be prepared to stop for pedestrians because pedestrian crossings are located one car length before the

entry line and one car length after the exit points.

Yield at the Roundabout

Always yield at the entry line to vehicles already in the roundabout.

Enter the roundabout only when there is an adequate and safe gap in the traffic.

Remember: bicyclists and motorcyclists are the most difficult to see when entering a roundabout.—be on the lookout for them when entering the circulating roadway.

Signaling at Roundabouts

It is important and courteous to let others know your intentions, and it is the Vermont law. When approaching, show a right signal for right hand turns, no signal for through travel, and left signal for left hand turns. When nearing your exit point, use a right turn signal just past the exit before your exit.

One Lane Roundabouts – It's Quite Simple

Learn More

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Figure 2: A flier developed to outline roundabout features.

Washington County, MN Educates Drivers Through Roundabout U

Location

Washington County, Minnesota
(Central United States)

Implementation Stage

- ✓ Planning
- ✓ Design
- ✓ Construction
- ✓ Launch
- ✓ Post-Implementation

Roundabout Type/Setting

Single- and Multi-lane
Roundabouts in Urban and Rural
Settings

Target Audience

- ✓ General Public
- ✓ Elected Officials/Managers

Strategies Employed

- ✓ Logo use across all materials
- ✓ Educational website
- ✓ Brochures (benefits of roundabouts, how to drive roundabouts, roundabout “rules of the road”)
- ✓ Public meetings (including Open Houses, Booths and Grocery Stores, and County Fairs)
- ✓ Promotional items (balloons, stickers, food, etc.)
- ✓ Mock-walkable roundabout
- ✓ Advertisements in newspapers



Background

In 2007, Washington County, Minnesota, began the process of planning for the widening of a two-lane, all-way, stop-controlled intersection in a residential area to accommodate growth in volume. The County Public Works Department considered implementing a four- or six-lane signal-controlled intersection configuration, but the analysis showed that the expected signalized system would require much more land than county residents and elected officials would approve for construction.

The jurisdiction decided a multi-lane roundabout was the best solution for enhancing safety while efficiently accommodating projected traffic volumes and maintaining a pedestrian-friendly intersection.

However, during the planning stage, Washington County staff attended several public meetings where concerned citizens repeatedly asked the same kinds of questions, such as “How do you drive through a roundabout?” and “Will a roundabout be safe?”

Approach

Washington County staff recognized a need to raise broad awareness about the benefits of modern roundabouts. They developed an online “Roundabout University” – “Roundabout U” – encompassing a wide variety of public outreach techniques designed to increase knowledge about, and equip people to help raise awareness and support for, roundabouts. The program started with a website, and has grown to include a range of products over time. To tie all of the products together, staff developed a logo for use on all materials. The original Roundabout U website presented the benefits of roundabouts, how to successfully navigate a roundabout, what proposed roundabouts would look like, and project updates.

The website has since expanded to include a range of general roundabout public outreach products that are easily adaptable for specific projects and needs across the County. The current website contains, in addition to the original material developed, a section on common misconceptions of roundabouts, and a list of roundabouts implemented across the County. Supplemental Roundabout U products include:

- A Step-by-Step Guide to Driving a Multi-Lane Roundabout brochure, providing a seven-step guide to successfully navigating a multi-lane roundabout
- A series of flyers that police officers provide to the public to help explain laws regarding yielding in a roundabout and proper lane use
- Promotional materials and advertisements in newspapers that raise awareness about educational roundabout-related events
- Public engagement events at local grocery stores, county fairs, and open houses - At each of these events, staff provide a variety of products, including food, balloons, and stickers to encourage families with small children to approach the booth and learn about

Roundabout U

Figure 1: The Roundabout U Logo used in Washington County, Minnesota for all roundabout-related outreach materials.

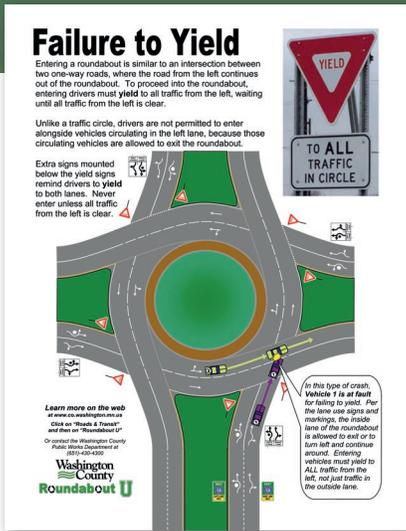


Figure 3: Police Officers distribute handouts like this to citizens pulled over for traffic violations in roundabouts. These flyers provide officers with a quick and effective way to communicate roundabout laws to people.



Figure 2: Brochure describing, in a visually appealing manner, how to successfully navigate a multi-lane roundabout.

roundabouts. Staff discuss how to safely drive a roundabout and how to cross a roundabout as a pedestrian. They also provide project updates and answer citizens' questions about roundabouts.

Potential Outreach Idea:
Use a walkable mock roundabout or toy car-sized roundabout at your next public outreach event to provide a hands-on way to learn about roundabouts.

Results

Anecdotal responses from citizens, elected officials, and internal staff have affirmed the success of the program.

According to staff, the outreach has been so successful that other jurisdictions across Minnesota have asked to borrow outreach materials and bring in Washington County Public Works Department staff as experts-on-hand to help sway public perception of proposed roundabouts. The products are designed to be adaptable and customizable, making it easy for other agencies to apply what Washington County has developed to their own roundabouts.

Lessons Learned

- Use a consistent message across all outreach products.
- Use several outreach products to get the message across. This jurisdiction won an uphill battle in explaining the difference between traffic circles and roundabouts to persons from other parts of the country who were familiar with traffic circles.
- Early communication is key when engaging with the public.
- Work with your local law enforcement early and often to ensure everyone is on the same page with regard to roundabout laws.
- Look closely at your jurisdiction to develop targeted outreach materials for specific population segments that may otherwise be overlooked (e.g., younger drivers, out-of-state drivers, and older drivers).

Outreach Investment

Washington County Public Works believes that their Roundabout U program is a relatively low-cost investment, as compared with the construction of a comparable signalized intersection. All products were developed in-house initially, and updates to materials to customize them for specific audiences/roundabout projects take no more than a few hours. Ads in the newspapers reached a broader audience, but were quite expensive to produce relative to their benefit.

Related Products

General Information Website

Washington County's Roundabout U Website
<https://www.co.washington.mn.us/490/Roundabout-U>

Video

How About a Roundabout? The Minnesota Experience
<https://www.youtube.com/watch?v=xuvqCIEjPxQ>

Brochure

Roundabout U: A Step-by-Step Guide to Driving a Multi-Lane Roundabout
<https://www.co.washington.mn.us/DocumentCenter/View/6395/Roundabout-U-Brochure-Oct2014?bidId=>

Learn More

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Washington State Focuses on Outreach, Illustrates How to Drive a Roundabout

Location

State of Washington
(Pacific Northwest United States)

Implementation Stage

- ✓ Planning
- ✓ Design
- ✓ Construction
- ✓ Launch
- ✓ Post-Implementation

Roundabout Type/Setting

Multi-lane and single-lane roundabouts in urban, suburban, and rural settings

Target Audience

- ✓ General Public
- ✓ Elected Officials

Strategies Employed

- ✓ Educational website
- ✓ Brochures
- ✓ Educational videos demonstrating how to drive a roundabout
- ✓ Mock walkable roundabout
- ✓ Drivable mock roundabout (roundabout rodeo)

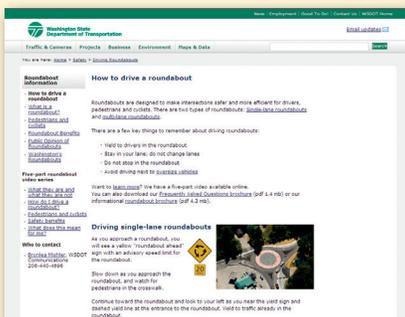


Figure 1: WSDOT's how to drive a roundabout web site.



Background

The Washington State Department of Transportation (WSDOT) faced resistance planning its first roundabouts in 1997 because the concept of “round” intersections was new and unknown to the general public. Aware of the compelling benefits that properly designed modern roundabout intersections offer compared with traditional intersections, the agency hoped to build many of them to increase safety and ease congestion across the State highway network. Through a concerted outreach campaign using public meetings, traffic safety design courses with local municipalities, and print/web outreach, the agency successfully overcame initial resistance to roundabouts. WSDOT has since built more than 200 roundabouts and plans several more as part of the State’s continued focus on road user safety and congestion reduction. The agency attributes its success with roundabouts in part to the proactive and effective public outreach program that informed the public of the benefits of these designs, helped build support for them, and taught people how to navigate roundabouts safely and successfully.

Approach

WSDOT realized that it would need an effective outreach program targeting the public and businesses, as well as elected officials, in order to gain acceptance and buy-in during the planning/ design process on its early roundabout implementations. When WSDOT first started its to push for the construction of roundabouts across the State, it focused on educating the general public

“Roundabout intersection discussions are becoming more prevalent in transportation circles as their benefits are obvious to any community where they are built. Outreach and education ... should be on the same solid footing as ... traffic safety and design pieces.” – Brian Walsh, WSDOT

about engineering safety aspects of roundabouts (e.g., slower intersection speeds, reduction in intersection conflict points). WSDOT typically begins with internal outreach efforts aimed at DOT decision makers. Once agency support has been obtained, WSDOT approaches local elected officials to obtain their support for proposed roundabouts. They have found that this approach allows for a more cohesive message to be presented to the public.

Launched in 2005, WSDOT’s “How to Drive a Roundabout” website was designed to present educational information to the public about the value and benefits of roundabouts as well as guidance on how to navigate single- and multi-lane roundabouts successfully. The site also provides printable brochures that correct common misconceptions about roundabouts. WSDOT also developed guidelines for pedestrians and cyclists on how to use roundabouts and a five-part video, accessible on YouTube and the WSDOT website. The video explains how to navigate a modern

Related Products

General Information Website

"How to Drive a Roundabout,"
<http://www.wsdot.wa.gov/safety/roundabouts>

Five-Part Video Series

Part 1: Roundabouts: What they are and what they are not

<http://www.youtube.com/watch?v=vsCol7IERGE>

Part 2: How do I drive a roundabout?

<http://www.youtube.com/watch?v=MywmtskFiil>

Part 3: Pedestrians and cyclists

<http://www.youtube.com/watch?v=Y05qGz5B1Wg>

Part 4: Safety benefits

http://www.youtube.com/watch?v=LnT1HXo7p_4

Part 5: What does this mean for me?

<http://www.youtube.com/watch?v=NO1bi6inF60>

Brochures

Roundabouts – Frequently Asked Questions

http://www.wsdot.wa.gov/NR/rdonlyres/09CE6ADF-92CD-4A04-8F82-453B314819C6/0/Roundabout_brochure_80910.pdf

Rules of the Roundabout

https://www.wsdot.wa.gov/sites/default/files/2014/09/23/webRoundabout_Folio_Statewide_English_040615.pdf

Learn More

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roundabout as a motorist, pedestrian, and cyclist, and why roundabouts are so much safer than traditional signalized and stop-controlled intersections. DVDs of the video and hard copies of the brochure are available in all county libraries and have also been distributed to driver training programs across the State. The brochures are also available online for download and are distributed at WSDOT open-house events.



Figure 2: WSDOT sets up a mock drivable roundabout to help drivers learn how to navigate the design.

WSDOT also hosts a variety of public engagement events to help educate citizens about how to drive a roundabout. The agency has hosted "roundabout rodeos," where people are invited to bring their largest vehicles and drive through a full-size mock roundabout. WSDOT also developed a portable, vinyl mock walkable roundabout to provide hands-on roundabout education indoors or in other environments where the full "rodeo" is not practical.

Results

With over 200 roundabouts in Washington State and more planned, WSDOT's public outreach efforts have paid off. A recent study showed that at nine of the State's intersections that were converted from a stop-controlled intersection to a roundabout configuration, fatal and serious injury crashes decreased 80 percent under the new configuration. The early and sustained public outreach investments helped to allay public concern with the new intersection designs by not only making the public aware of the benefits of roundabouts but also familiarizing the public with the design through the combination of video, print, and "experiential" outreach through mock roundabouts and roundabout rodeos. Experiencing the roundabouts in safe, non-threatening environments helped make road users feel comfortable with the design, which contributed to successful rollouts of these new intersections. As with most roundabouts, once the public tried them, they wanted more.

Outreach Investment

The outreach investment for this type of initiative is the hours staff spent developing each product, plus costs to print brochures and DVDs. All written materials and graphic design were developed and approved in-house by a group of 10 staff members, some working full-time and others contributing or providing creative direction for specific products. The products were also developed with the oversight/input of engineering staff to ensure that the appropriate message was being conveyed to the public. Ninety percent of the video was done in house over the course of 3 months using video editing software that the agency owned.

Lessons Learned

- Supplement any project-specific roundabout public outreach with comprehensive general outreach about roundabouts.
- Shorter videos are better. WSDOT split its 10 minute video into 5 segments, enhancing viewability.
- Secure the support of internal agency managers and local elected officials on roundabout projects before initiating public outreach.

Washington State Hosts Roundabout Rodeo

Location

Bellingham, Washington
(Northeastern United States)

Implementation Stage

- ✓ Planning
- ✓ Design
- ✓ Construction

Roundabout Type/Setting

Multi-lane Roundabout in a rural location

Target Audience

- ✓ General public

Strategies Employed

- ✓ Mock Drivable Roundabout
- ✓ Expert on Hand

Background

Although Washington State has been constructing roundabouts in different localities across the state since the mid-1990s, there are still many communities without these types of intersections and citizens who are not familiar with what roundabouts are and how they are navigated. The City of Bellingham, in Whatcom County, WA, is an example of this type of community, and provided the setting for a memorable experience for the Washington State Department of Transportation (WSDOT).

The initial proposal for Bellingham's first roundabout was at a four-legged intersection where 18 collisions had occurred in a single year, and officials wanted to build a roundabout to improve conditions at that intersection and along the corridor. Similarly, in another part of Whatcom County, the community was struggling with the idea of roundabouts being constructed on a major highway near a border crossing. Residents voiced concerns about how viable the roundabouts would be for use by not only local farm equipment, but also the large freight trucks that moved on the corridor back and forth across the U.S.-Canadian border. Although meetings and face-to-face question and answer sessions were held, uncertainty persisted, and WSDOT faced stiff resistance from individuals who could not envision the concept or who still did not believe that the larger vehicles would be able to navigate the roundabouts safely. So, WSDOT decided to show them.

Approach

WSDOT decided to give a physical demonstration – not by building a roundabout per se – but by laying out one in a parking lot with cones, sandbags, and spray-on paint so that residents could come and experience driving a roundabout for themselves. This type of event is commonly called a mock drivable roundabout or a roundabout rodeo.

WSDOT invited local farmers, fire departments, emergency services, school buses, city and county buses, and any other concerned residents that would be interested in learning about how to navigate a roundabout successfully. The goal was to dispel myths about roundabouts and promote their benefits. The agency encouraged the public to "bring the biggest, widest trailers you've got." Staff also contacted the local media about the event, and the additional publicity brought even more people out to see the demonstration, drive through the mock roundabout and experience it for themselves.

"Traffic engineer Phil Rust was one of the engineers that climbed aboard buses and semis all day. He felt that letting drivers get a hands-on feel for the size and shape made the mock roundabout a worthwhile project."

— Brian Walsh
State Traffic Design Engineer Washington
Department of Transportation



Figure 1: A large truck yielding before entering the mock roundabout.



Figure 2: A snow plow approaching the mock roundabout.



Figure 3: A large truck and a school bus navigating the mock roundabout.

Many people drove the roundabout and reported a positive experience to the local media. In one instance, however, a truck driver didn't approach the roundabout in a way that it could be successfully navigated, so a WSDOT engineer got into the truck to show the driver how to set up his entry correctly so that the vehicle would traverse the roundabout without mishap. There were also a number of WSDOT staff present to brief truck drivers as well as the drivers of automobiles, tractors, and any other vehicles on the proper way to traverse the roundabout before trying to enter it. Traffic engineers were also available to enter each vehicle and talk drivers through it, offering tips and advice for driving through the mock roundabout in the form of hands-on education.

Results

WSDOT reports highly positive results from interacting directly with the public through the use of a roundabout rodeo. One of the more constructive results of having the "experts on hand" to talk with people is that a variety of myths about roundabouts were debunked, including concerns about pedestrian safety, size accommodations for large trucks, and how emergency response vehicles would safely traverse a roundabout. The presence of the WSDOT staff to explain to truck drivers about the wide truck apron used to accommodate larger vehicles and to show them the proper way to approach and navigate the mock roundabout went a long way toward dispelling that myth.

Lessons Learned

- A roundabout rodeo is best used when a jurisdiction is installing the first roundabout in a locality, as a larger percentage of the population is unfamiliar with the concept and will be more likely to attend the event.
- Make sure that you schedule the trucks that are interested in attending the roundabout rodeo as much as you possibly can. It works best if trucks come on a staggered but regular basis.
- If you can engage the media and have dedicated coverage for the event, it shows the public and elected officials that this type of outreach is worthwhile.
- Have knowledgeable people from the design staff that are pro-roundabout present at the rodeo ("expert-on-hand"). Many questions are asked during these activities, and the people with the answers need to be present.
- Be sure to talk with local trucking companies and other businesses with a large stake in the success of the community to obtain their participation before an outreach event like a roundabout rodeo.

Outreach Investment

According to WSDOT, the primary costs associated with a roundabout rodeo are the cost of labor for design staff, marketing staff, and the engineers who will be present at the event.

Related Products

General Information Website

"How to Drive a Roundabout,"

<http://www.wsdot.wa.gov/safety/roundabouts>

Video

Roundabout Rodeo Footage from Whatcom County, WA

<http://www.youtube.com/watch?v=HAQZ4muePOo>

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Engaging Freight Stakeholders in the Roundabout Design Process

Location

Wisconsin

Strategies Employed

- ✓ Provided designers access to truck training simulators and “ride-alongs” to gain a driver’s perspective with respect to maneuvering through a roundabout.
- ✓ Developed representative freight vehicles in the WisDOT design library that designers can use to simulate vehicle travel through a proposed roundabout.
- ✓ Established an “OSOW freight network” for WisDOT and the freight industry to identify intersections with particular OSOW needs.
- ✓ Worked with trucking company managers on training to educate their drivers on proper navigation of roundabouts.



Figure 1: Oversize truck entering a roundabout designed to accommodate OSOW vehicles.



Roundabout intersections are purposely designed to improve safety and efficiency through a combination of geometry and traffic control that results in reduced speeds and minimal delay. However, when the geometry does not adequately accommodate the needs of trucks and freight, unexpected complications can result. Working together, road agencies, freight company owners, and truck operators can strategically improve both the design of roundabouts and the ability of drivers to navigate them.

IN WISCONSIN, AS BOTH FREIGHT TRUCK TRAFFIC AND THE NUMBER OF ROUNDABOUTS INCREASED, SO DID THE NEED FOR BETTER PARTNERSHIP AMONG STAKEHOLDERS.

Background



Figure 2: Roundabout with OSOW features.

Positioned between two major freight generating metropolitan regions—Chicago and Minneapolis/St. Paul—the State of Wisconsin plays an important role in national and regional interstate commerce. Much of the state’s freight traffic is considered “pass-through” (i.e., neither its origin nor destination is in the state). Nearly 76 percent of the goods moving throughout Wisconsin are shipped by trucks. An important and

growing category of truck traffic in the state consists of oversize/overweight (OSOW) loads, which have unique characteristics that set them apart from conventional trucks.

Enhancing freight mobility is a top priority of the Wisconsin Department of Transportation (WisDOT). As Wisconsin businesses and consumers rely on a transportation system that allows freight to move in a safe and efficient manner, it is important that WisDOT respond to the needs of freight carriers. Accordingly, WisDOT’s long-range transportation plan, *Connections 2030*, includes a key policy linked to economic growth: partner with stakeholders to ensure that freight movements are safe and reliable and provide positive environmental and community impacts.

The emphasis on safety is taken seriously by WisDOT, and this is reflected in the *Wisconsin Strategic Highway Safety Plan (2011-2013) (SHSP)*, which presents a “Zero Deaths” vision and stresses the importance of partnerships as the key to success in saving lives and preventing injuries. With intersections representing 26 percent of statewide traffic fatalities and 49 percent of non-fatal traffic injuries, the SHSP identifies “improving the design and operation of intersections” as one of the *Highest Priority Issue Areas*. Among several strategies for addressing this issue is to “increase the number of roundabout installations,” which WisDOT has done faithfully, in the process becoming a national leader.

The combination of freight traffic growth, particularly the OSOW vehicles, and an increasing number of roundabouts along the state trunk highway network has led to a rare opportunity to collaborate with freight stakeholders on the design parameters and implementation process for these intersections.

Lessons Learned

- Outreach is most effective when it begins early in the process.
- Regular, proactive outreach improves communication between freight stakeholders and the road agency.
- Effective dialogue enables stakeholders to identify the true source of problems, which may sometimes be resolved with a simpler solution than first anticipated.
- It is important to consider anticipated truck demands in new roundabout designs to extend the service life of the intersection and improve operations.
- Developing a relationship between industry and the road agency requires patience from the participants and a commitment to collaborate.
- Stakeholders do not all speak the same “language.” Ensure all parties involved understand the details of concerns, needs, goals, and strategies.

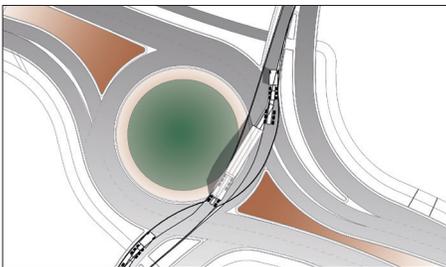


Figure 3: OSOW roundabout design drawing.

Wisconsin Points of Contact

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Approach

To gain a better understanding of the issues, WisDOT’s Freight Operations section used consultants to develop a program of regular outreach to key freight transportation entities in the state. This effort was modeled on past successful outreach experiences and it was structured as a cooperative endeavor between the State DOT and freight community. The WisDOT Freight Operations consultant team obtained and incorporated industry input into design parameters and processes for roundabouts. At the same time, WisDOT was able to provide insight to trucking representatives on how roundabouts factored in to a safer highway system for all users.

While WisDOT initially envisioned a program of outreach from the DOT to the freight community, the effort actually evolved into an effective means of two-way communication. The meetings resulted in a mutual understanding of the issues WisDOT and stakeholders face, some shared and some not. The discussions helped to identify, define, and prioritize the concerns with the understanding that solutions may require compromise by one or more parties. Some of the issues are summarized in the table below.

Shared Goals	WisDOT Objectives	Freight/Trucking Industry Objectives
<ul style="list-style-type: none"> • Roads that are safer, where fewer people are killed or injured in traffic-related crashes • A highway system that is reliable and efficient 	<ul style="list-style-type: none"> • Construct cost-effective, balanced projects that serve all users well • Roundabout designs that achieve the necessary reduction in speed to ensure safety 	<ul style="list-style-type: none"> • A highway system that allows businesses to thrive and add value to the state economy • Intersections that provide adequate geometric space to maneuver efficiently • Drivers who are properly educated on how to maneuver roundabouts and drive defensively

The public-private partnership has provided ample opportunities for stakeholder groups to address concerns, clarify misconceptions, and educate one another. This improved ability to work together to promote common goals has resulted in roundabouts that serve the freight and trucking industries better while still helping to achieve statewide intersection safety goals.

Results

The WisDOT Freight Operations consultant team’s outreach program has successfully demonstrated how cooperative efforts between WisDOT and the freight industry can result in better intersection designs, and has expanded discussions beyond roundabouts.

For example, at a meeting with specialized carriers that focused on OSOW issues, the WisDOT Freight Operations consultant team discovered that it would be beneficial to define an “OSOW freight network” to help identify intersections where additional considerations for OSOW vehicles are needed, such as modified truck aprons or removable sign post assemblies.

The outreach program has also identified driver education and instruction needs. A particular roundabout near a distribution center had an unusual incidence of loads shifting as trucks traveled through the roundabout. The Freight Operations consultant team met with stakeholders at the distribution center to discuss this issue and found that the shifting load incidents had some common sources, including incomplete driver training and improper methods of securing cargo. As a result of the meeting, the freight stakeholders identified training needs and implemented solutions accordingly. This eliminated the need to make potentially costly changes to the roundabout.

Wisconsin Roundabouts Calm Traffic, Improve School Zone Safety

Location

Green Bay, Wisconsin
(Central United States)

Implementation Stage

- ✓ Planning
- ✓ Design
- ✓ Construction

Roundabout Type/Setting

Single and multi-lane roundabouts

Target Audience

- ✓ General Public
- ✓ Elected Officials
- ✓ School Officials

Strategies Employed

- ✓ Meetings with the public
- ✓ Field trips to the roundabout site
- ✓ An easily adaptable PowerPoint presentation
- ✓ A follow-on study comparing before and after statistics and conditions

**“People were expecting
European Vacation [the movie].
They had never seen what
we were talking about.”**

– Cole Runge,
Brown County Planning
Commission



Background

In 1999, the intersection outside of a Green Bay, Wisconsin, metro area elementary and middle school complex located near a major highway had become a problem. As traffic volume on the adjacent highway grew, local officials became concerned about vehicle speed. The county sheriff got involved, and eventually the community decided to prohibit children from walking and biking to school out of concern for their safety. Plans to build a new high school on the same road were also underway, which exacerbated local residents' safety concerns.

Local Brown County officials had the option to expand the highway to four lanes to accommodate projected growth, adding turn lanes and traffic signals, but transportation planners and local residents feared this option would make the school zone less safe. The Brown County Planning Commission recommended constructing two simple roundabouts to calm traffic in and around the school zones and improve safety and access for pedestrians and bicyclists. But local residents, unclear about how a roundabout intersection would work, were vocal in their opposition. A concerted effort to obtain public support for these school zone roundabouts was needed.

Approach

Once transportation planners settled on roundabouts as the best option for enhancing the safety and traffic flow of the school zone, they approached the schools' administrators and the local school board to explain what they wanted to do, how a roundabout intersection would work, and why they believed it was the safest and best option. Planners addressed their concerns, answered their questions, and obtained their valuable support, which helped pave the way for a public announcement about the plan.

However, even with this support, local residents resisted this unfamiliar intersection alternative. It quickly became apparent that most of those who objected believed that roundabouts would increase congestion and possibly cause even more crashes, endangering students. There were also several objections based on weather concerns: Green Bay averages nearly 50 inches of snowfall per year, and many residents were concerned whether the roundabout could be maintained during severe winter weather.

To address the multitude of concerns and misunderstanding regarding roundabouts, transportation planning officials visited the elected bodies of the affected communities and held public meetings, inviting residents to come and voice their concerns. For these meetings, the County provided knowledgeable transportation planning and engineering representatives, who educated local residents about the dramatic safety benefits of roundabouts. They shared roundabout experiences from other locales, such as Vermont and Colorado, that have similar winter climates, which the residents accepted as relevant, "apples to apples," comparisons.

Planners also brought visual aids to explain the differences between roundabouts and traffic circles, which turned out to be extremely useful. By walking through the



Figure 1: Overhead view of the second Lineville Road roundabout, neighboring a local school complex (in lower left corner).

Lessons Learned

- Be prepared. Before approaching any individuals or groups, anticipate questions and concerns and have the information needed to address them.
- Don't reinvent the wheel. Roundabouts have been used more frequently in the last decade, and many localities have studied various safety aspects of roundabouts. There are a lot of statistics available from areas similar to those where roundabouts are being considered.
- Perseverance through educational outreach is important.
- Create an image of what the reconstructed intersection will look like without a roundabout. When people see pictures of a roundabout versus the multilane signalized intersection alternative to accommodate the same level of traffic, they often start to reconsider the value of a roundabout.

Learn More

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differences between roundabouts and traffic circles, the County succeeded in shifting public perception, and residents became supportive.

As the roundabouts began to take shape during construction, Green Bay planners shuttled groups of students and school officials to the construction site, allowing them to walk through the new intersections and discussing how they were going to work. The Planning Commission videotaped the "before" intersection and the "after" intersection and developed a video to be used for subsequent roundabout outreach in the State.

Results

Brown County's outreach efforts paid off: Since 1999, Brown County, the Wisconsin Department of Transportation, and the county's communities have built 26 roundabouts in the county, and the county and its partners plan to build at least 33 more within the next 6 years. While many people initially confused roundabouts with traffic circles, the concerted effort to educate the public and clarify key misunderstandings helped the county successfully gain public support. Targeting the school board and administrators whose schools were affected by the change, as well as local residents and elected officials, was gutsy but effective. Once construction was completed, the increased safety results spoke for themselves.

A follow-up study conducted in 2001 showed that at one of the roundabout locations, the number of vehicles entering the intersection increased from 5,600 per day in 1998 before the roundabout construction to 10,800 per day in 2001, and yet crashes and injuries decreased significantly, from an average of three crashes and five injuries per year during the 1996-1998 period to no reported crashes between August 1999 and October 2001.

The sheriff's department was so pleased with the safety improvements and speed calming effects from the roundabouts that, in 2000, the previous prohibition policy was reversed, allowing students to walk and bike to school.

Outreach Investment

The cost of the outreach effort, relative to the cost of implementing the roundabouts, was very low. There was a small investment in slides and staff labor for presentations, but aside from labor, there were very few additional investments.

Related Products

General Information Website

"Roundabouts and Traffic Calming,"

<https://www.browncountywi.gov/departments/planning-and-land-services/planning/roundabouts-and-traffic-calming/>

Presentation

"Pedestrian Safety at Roundabouts Presentation for Howard-Suamico School Board,"

[http://www.public.applications.co.brown.wi.us/Plan/PlanningFolder/transpotation/Pedestrian%20safety%20at%20roundabouts%20presentation%20\(Brown%20County%20Planning%20Commission\)%20-%20November%2026%20%202007.pdf](http://www.public.applications.co.brown.wi.us/Plan/PlanningFolder/transpotation/Pedestrian%20safety%20at%20roundabouts%20presentation%20(Brown%20County%20Planning%20Commission)%20-%20November%2026%20%202007.pdf)

Video

Lineville Road Roundabout Footage

http://www.public.applications.co.brown.wi.us/Plan/PlanningFolder/Video/Roundabout/Roundabout_All.WMv

Study

Lineville Road Roundabout Study

https://www.browncountywi.gov/i/f/export/file/lineville_roundabout_study.pdf

Comment

The descriptions of the roundabout projects show that project promoters employed a wide variety of techniques to gain public acceptance. The list is long:

- Conducting a two-day workshop on roundabouts for fellow transportation professionals
- Maintaining relationships throughout the project lifetime with colleagues and stakeholders working towards roundabout implementation
- Distributing postcards
- Maintaining a managed mailing list
- Distributing roundabout stickers
- Developing video animations
- Implementing a branded project website
- Participating in community meetings
- Conducting citizen design charrettes
- Providing an expert-on-hand to serve smaller jurisdictions
- Consulting with representatives of the freight industry
- Using balanced, multimodal roundabout designs to serve all users
- Sending staff to make presentations at community groups, town councils, and civic meeting forums
- Speaking to driver education classes
- Focusing on pedestrian and bicycle advocacy groups
- Setting up mock roundabouts (roundabout rodeos)
- Distributing one- to two-page flyers
- Submitting articles for local newspapers and magazines
- Talking with other states to understand the issues they have faced and effective practices they have used
- Creating a Roundabouts Steering Committee
- Distributing informational pamphlets for driver education programs
- Distributing flyers with instructions on how to navigate a roundabout

Creating an online Roundabout U

Conducting public engagement events at local grocery stores, county fairs, and open houses

Beginning the project by educating internal staff at traffic agencies

Bringing groups of students and school officials to the roundabout construction site

Sharing roundabout experiences from other locales

Conclusions

Two characteristics that are especially important for achieving a successful roundabout project can now be identified:

1. For a proposed intersection, a roundabout offers a superior engineering solution (safety, environmental, cost) compared to what a traditional intersection design offers.
2. Proponents of roundabouts devote considerable energy, resources and creativity to overcoming initial public hostility and skepticism and replacing them by public acceptance and often even enthusiastic support.

These two characteristics are certainly not *sufficient* to produce a successful project—people in many occupations must perform their jobs well too—but the above-mentioned characteristics are *necessary*. It is hard to imagine a proposed roundabout project succeeding without at least both of these characteristics being present.

Appendix. First Responders, Pedestrian and Bicycle Safety, and Rural Highways

What is a Roundabout?

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.

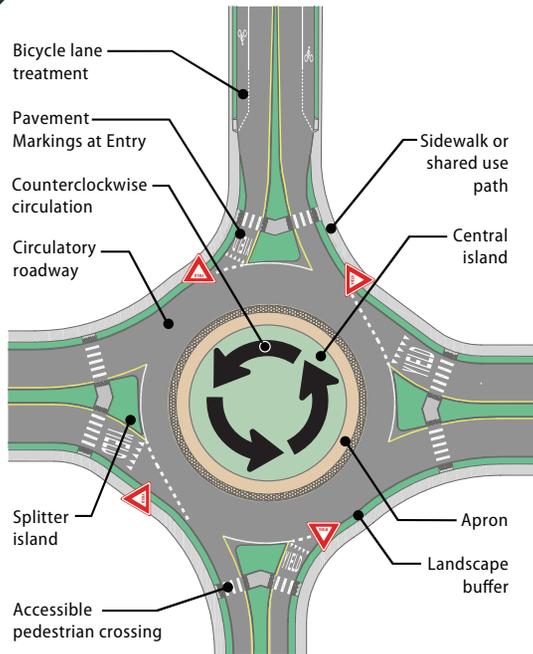


Figure 1. Modern Roundabout Schematic

Roundabouts have certain essential distinguishing features:

- **Counterclockwise Flow.** Traffic travels counterclockwise around a center island.
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- **Low Speed.** Curvature that results in lower vehicle speeds (15-25 mph) throughout the roundabout.

FHWA 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. They also provide significant operational benefits compared to conventional intersections.

On average, roundabouts reduce severe crashes – those resulting in injury or loss of life – by 78-82%¹

¹ *Highway Safety Manual*, American Association of State Highway and Transportation Officials, Washington, DC, 2010.

Educational Resources

Wisconsin Guidance on Reacting to Emergency Vehicles in Roundabouts

<https://wisconsin.dot.gov/Documents/safety/safety-eng/roundabouts/br-emergencyveh.pdf>

Minnesota DOT Roundabout Animation

www.dot.state.mn.us/roundabouts/emergency.html

Washington State DOT Videos on Roundabouts and How to Drive Them

<https://www.youtube.com/watch?v=P3k65uS5-EE>

<http://www.youtube.com/watch?v=MywmtskFiil>

British Columbia MOT Video on Navigating a Roundabout with Emergency Vehicles

<https://www.youtube.com/watch?v=Tk9n1uVa8LE>

Strengthening Partnerships

Incorporating EMS into Strategic Highway Safety Plans

<http://safety.fhwa.dot.gov/hsip/shsp/ems/connection/>

For More Information

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To learn more about roundabouts, please visit:

safety.fhwa.dot.gov

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Cover photo sources, top to bottom: Jeff Shaw, FHWA; Brad Estochen, MnDOT; Jeff Young, McHenry County Highway Department



U.S. Department of Transportation
Federal Highway Administration

ROUNDBABOUTS & First Responders Saving Lives Together



Shared Mission – Shared Benefits

Saving lives and preventing serious injuries are the highest priority of both first responders and highway agencies. Roundabouts are safer intersections that result in fewer severe crashes requiring emergency response.

Safer intersections are important for first responder occupational safety and health, too. Studies show that most fatalities resulting from a crash involving a fire truck occur at, or are related to, an intersection. Further, angle crashes are the most common fatal crash type involving fire trucks.² The International Association of Fire Fighters (IAFF) and others cite intersections as high risk locations for all emergency response disciplines.³



Source: Howard McCulloch, NYS DOT

Roundabouts are also a very efficient type of intersection. They do not have the same stop-and-go conditions as traditional intersections.

- Roundabouts keep people moving, but at speeds where injury risk is greatly reduced.
- Roundabouts can reduce or eliminate lines of stopped traffic typical of stop signs and traffic signals, making them easier to navigate throughout the day and night.
- Unlike traffic signals, roundabouts don't depend on electricity to function, so they are not susceptible to power outages.

¹ Highway Safety Manual, American Association of State Highway and Transportation Officials, Washington, DC, 2010.

² Campbell, K.L., *Traffic Collisions Involving Fire Trucks in the United States*, UM-TRI-99-26, Ann Arbor, MI: University of Michigan Transportation Research Institute, Ann Arbor, MI, 1999

³ International Association of Fire Fighters (IAFF), *Best Practices for Emergency Vehicle and Roadway Operations Safety in the Emergency Services*, Washington, DC 2010

⁴ Bailey, E.D., Sweeney, T., *Considerations in Establishing Emergency Medical Services Response Time Goals*, National Association of EMS Physicians, Lenexa, KS, 2003

Designing for First Responders



Source: Jeff Young, McHenry County Highway Department

Roundabouts are not designed to inhibit traffic. Rather, they are optimized for the safety and efficiency of all users. Roundabouts can be designed for large trucks, including a special purpose apparatus such as a ladder truck. This is accomplished by using features such as:

- Wider entry and exit lanes for efficient movement of traffic through the roundabout.
- Mountable aprons and curbs intended for use by vehicles with a wide and/or long wheelbase.
- Curvature and radii that allow for easy turning movements, including u-turns.



Source: Brad Estochen - MnDOT

“Before the first roundabout was constructed in our city, our station arranged to visit one nearby so that we could experience it firsthand. That answered a lot of questions and helped build confidence in roundabouts.”

- Brad Estochen
Minnesota DOT Safety Engineer &
Firefighter and EMT for the City of Woodbury

Frequently Asked Questions

When the first roundabout in a community is proposed, it is natural for first responders to have questions and concerns. Several of the most common questions are addressed below:

Q: Will all our vehicles be able to maneuver through a roundabout?

A: Roundabouts work for many types of large vehicles. Partnering with the road agency to conduct a “test drive” (laying out the roundabout in a large open area using cones and temporary devices) can help evaluate and influence the design.

Q: What about emergency response times?

A: At any intersection, traffic conditions vary throughout the day. Roundabouts can actually improve travel times by eliminating unnecessary stops and delays. Furthermore, the IAFF and other public health and safety organizations recognize that small differences in travel times rarely, if ever, impact incident or patient outcomes.^{3,4}

Q: How will drivers in our community know how to react to approaching emergency vehicles?

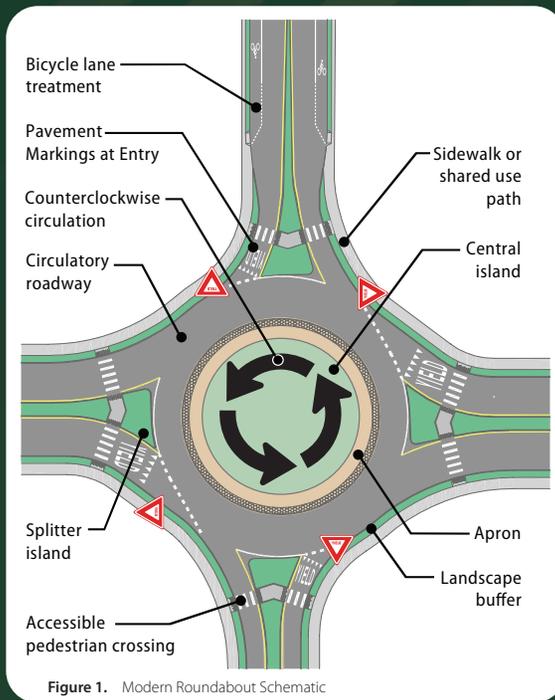
A: In this way, roundabouts are no different from other intersections – drivers must clear the intersection, pull off to the right, and let the emergency vehicle pass. To help educate drivers, there are many excellent resources available from states and cities where roundabouts are common. First responders can contribute to general roundabout education and outreach in a community by helping explain to the public how to react when an emergency vehicle approaches.

Q: Why consider roundabouts when we have traffic signal preemption in our city?

A: The use of preemption devices at signalized intersections remains a worthwhile option. However, in addition to being safer, roundabouts are viable in many places where traffic signals are not. Furthermore, even where signal preemption is used, first responders must obey state laws and department policies, and proceed cautiously – likely at speeds comparable to a roundabout.

What is a Roundabout?

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 essential distinguishing features:

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On average, roundabouts reduce severe crashes – those resulting in injury or loss of life – by 78-82%¹

¹ *Highway Safety Manual*, American Association of State Highway and Transportation Officials, Washington, DC, 2010.

Educational Resources

Michigan “How to Use a Roundabout – Sharing the Road” Informational Brochure

www.michigan.gov/documents/mdot/MDOT_RoundaboutPedBikeBrochure_465164_7.pdf

New York Guidance for Roundabout Users

www.dot.ny.gov/main/roundabouts/guide-users/pedestrians

Washington State videos for Roundabouts and Pedestrians and Bicycles

www.wsdot.wa.gov/Safety/roundabouts/PedestriansCyclists.htm

Leveraging Partnerships

PEDSAFE Pedestrian Safety Guide & Countermeasure Selection System - Roundabouts

www.pedbikeinfo.org/data/faq_details.cfm?id=3454

BIKESAFE Bicycle Safety Guide & Countermeasure Selection System – Roundabouts

www.pedbikesafe.org/PEDSAFE/countermeasures_detail.cfm?CM_NUM=25

Choosing Roundabouts for Safe Routes to School

www.saferoutesinfo.org/program-tools/case-study-bellingham-wa

AARP Livable Communities Fact Sheet Series

www.aarp.org/livable-communities/info-2014/livability-factsheet-modern-roundabouts.html

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Cover photo source: Google Earth Pro

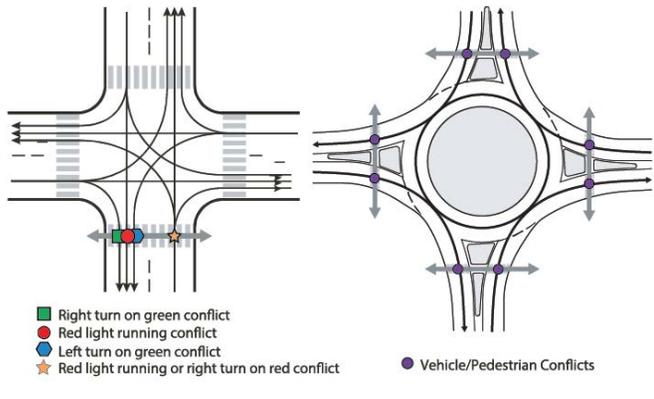


U.S. Department of Transportation
Federal Highway Administration

ROUNDABOUTS with Pedestrians & Bicycles

A Safe Choice for Everyone





Less conflict. Roundabouts have fewer conflict points. A single lane roundabout has 50% fewer pedestrian-vehicle conflict points than a comparable stop or signal controlled intersection. Conflicts between bicycles and vehicles are reduced as well.

Lower speed.

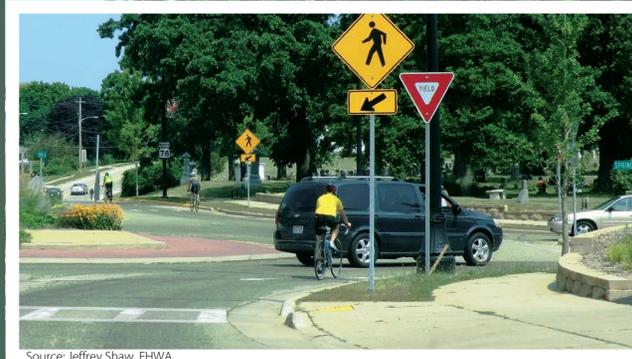
Traffic speed at any road or intersection is vitally important to the safety of everyone, and especially non-motorized users. Lower speed is associated with better yielding rates, reduced vehicle stopping distance, and lower risk of collision injury or fatality. Also, the speed of traffic through a roundabout is more consistent with comfortable bicycle riding speed.



Source: Janet M. Barlow, Accessible Design for the Blind



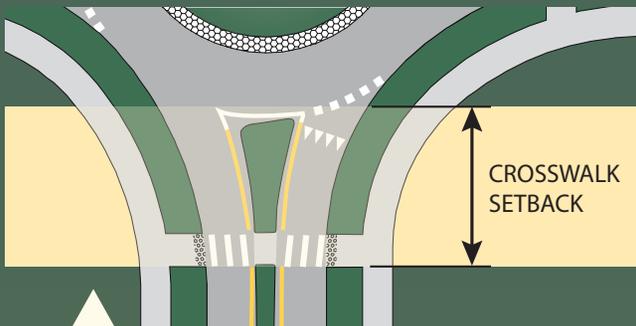
Source: Hillary Isebrands, FHWA



Source: Jeffrey Shaw, FHWA

Features for All Users. Adding certain treatments at roundabouts can enhance the experience for both pedestrians and bicycles.

- At more complex roundabouts, such as those with multiple lanes, certain design elements and enhanced crossing treatments can improve accessibility for visually impaired pedestrians.
- Where bicycle facilities lead to a roundabout, providing an option to bicyclists to either ride in the travel lane or use a ramp to and from a separated shared use path.



Shorter, setback crossings.

Pedestrians cross a shorter distance of only one direction of traffic at a time since the entering and exiting flows are separated. Drivers focus on pedestrians apart from entering, circulating and exiting maneuvers.



Source: City of Santa Cruz



Source: www.pedbikeimages.org / Dan Burden

State Hwy 55 at County Hwy KK

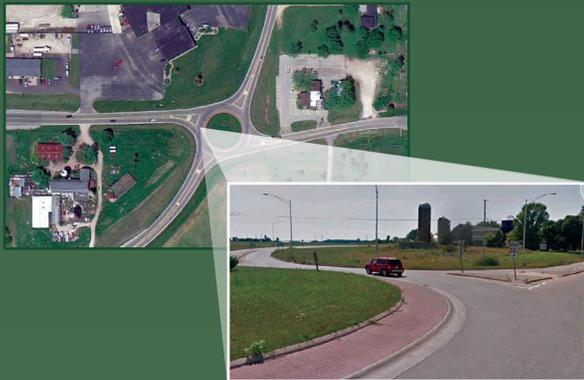
Calumet County, Wisconsin

The intersection of State Trunk Highway 55 (STH 55) and County Trunk Highway KK (CTH KK) was originally a two-way stop-controlled intersection with a 55 mph posted speed limit on each approach. In a five-year period (2001-2005), 30 crashes occurred at the intersection resulting in 17 people injured and one person killed.

The Wisconsin Department of Transportation (WisDOT) added intersection warning signs along STH 55 in advance of CTH KK and lowered the approach posted speed limits to 45 mph, but crashes continued to occur.

In 2006, WisDOT decided to reconstruct the intersection as a roundabout. They modified the design to account for the high-speed approaches by providing longer splitter islands and pavement markings, along with enhanced signing. These features help drivers recognize the roundabout well in advance, and to reduce their speed accordingly.

In the six-year period after construction, WisDOT reports there have been 11 total crashes resulting in one person injured and zero fatalities. These significant reductions in crashes made this project a success for WisDOT, and helped them move forward with other roundabouts along rural highways throughout the state.



FHWA 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. They also provide significant operational benefits compared to conventional intersections.

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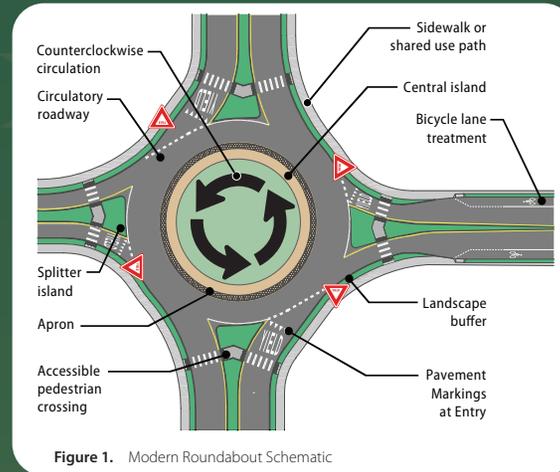


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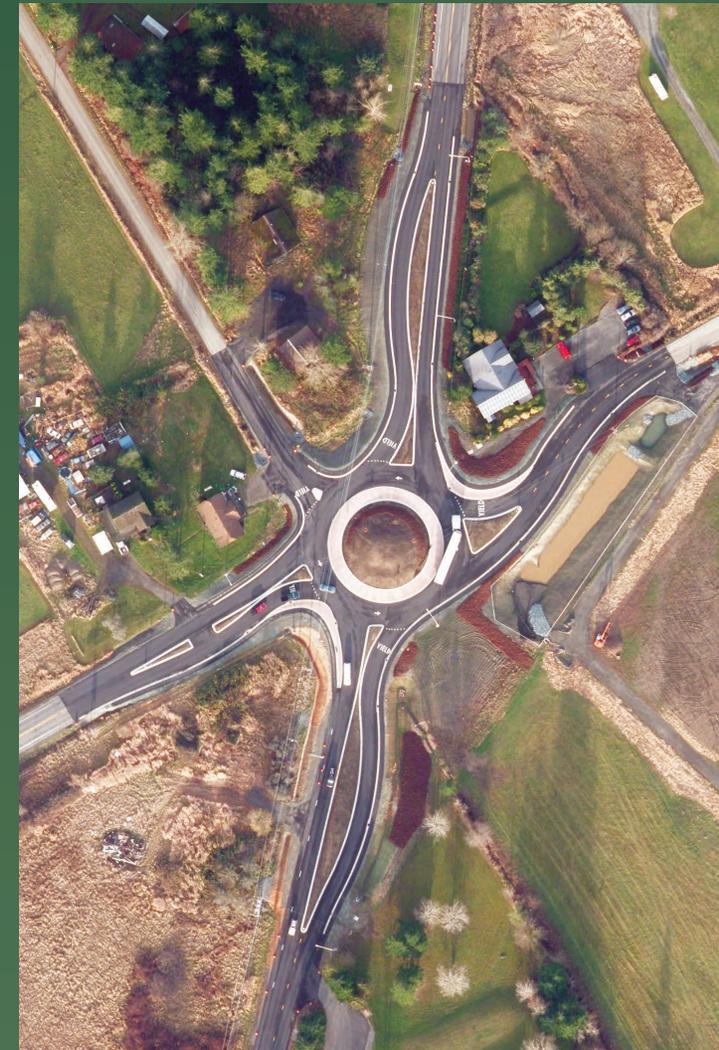


Cover image source: Washington State Department of Transportation (WSDOT)



U.S. Department of Transportation
Federal Highway Administration

ROUNDABOUTS & Rural Highways



Common Problems/Concerns

Crashes at rural intersections often involve high speeds, which tend to result in severe injuries or fatalities. Roughly $\frac{1}{3}$ of annual intersection fatalities in the U.S. occur along rural, two-lane highways.

In many rural environments, drivers can miss a stop sign or traffic signal, leading to running through a stop sign or red light and resulting in an angle crash.

For a driver turning left across oncoming traffic, it can sometimes be difficult to judge the speed of the approaching vehicle, resulting in misjudged gaps, and potentially severe crashes.

It doesn't seem like people would slow down for a roundabout along rural highways. Motorists will just drive right into or over the roundabout because they won't be able to slow down in time.

In the northeastern U.S., circles are being signalized or removed because they do not work.

Why build something "different", when all that is needed is either stop signs or a traffic signal?



Why Consider a Roundabout

Roundabouts are geometrically designed for drivers to negotiate the intersection at speeds in the range of 15-25 mph, regardless of the posted speed limits on approaches.

Because roundabouts require vehicles to yield and then navigate around a raised, circular island, the possibility of an angle crash is significantly reduced.

With roundabouts, there is no need to make a turn across opposing traffic. Entering vehicles yield to traffic already in the circle, and proceed when there is a safe gap.

High-speed approaches to roundabouts include advance signing, pavement markings and raised channelization. With proper design, drivers adjust their speeds, slow on approach, and navigate the roundabout safely.

The old traffic circles and rotaries that are common in the northeastern U.S. are not modern roundabouts.

Improvements like stop signs and signals, while very familiar, aren't always the safest choice. With intersections representing about one-quarter of annual U.S. traffic fatalities and roughly half of all injury crashes, safer designs are needed that improve mobility while saving lives.



Real World Results*

Roundabouts constructed at intersections along high-speed, two-lane rural highways reduced overall crashes by up to 68% and reduced injury crashes by up to 88%.

Roundabouts constructed at intersections along high-speed, two-lane rural highways eliminated 83% of angle-type crashes.

There were 11 fatal crashes in the 5 year "before" period and ZERO fatal crashes in the 5 year "after" period at 19 roundabouts constructed along high-speed, two-lane rural highways in six different states (KS, MD, MN, OR, WI, and WA).

Researchers compared traffic speeds of approaches to roundabouts and stop-controlled intersections. At 100 feet before the yield or stop lines, the speed of traffic at the roundabouts was 2.5 mph lower than at the stop-controlled locations.

Roundabouts are designed for slower speeds, require entering traffic to yield to vehicles already in the circular roadway, and to eliminate the need to weave or change lanes to exit.

Since the late 1990s, an ever growing number of State DOTs and local road agencies are finding that roundabouts work in their jurisdictions. Their potential for saving lives is too significant to ignore.

* Sources:

Isebrands, H., S. Hallmark, N. Hawkins. "Effects of Approach Speed at Rural High-Speed Intersections" Transportation Research Record: Journal of the Transportation Research Board, Volume 2402, Transportation Research Board, National Research Council, Washington, DC, 2014

Isebrands, H. and S. Hallmark. "Statistical Analysis and Development of a Crash Prediction Model for Roundabouts on High-Speed Rural Roadways" Transportation Research Record: Journal of the Transportation Research Board, Volume 2389, Transportation Research Board, National Research Council, Washington, DC, 2012