Frequently Asked Questions About Roundabouts

FRANKLIN REGIONAL COUNCIL OF GOVERNMENTS

April 2006

Front Cover: **Vooreheesville Roundabout, New York State**
Intersection of Route 155 and Route 85A
Single Lane Roundabout opened in 2003
Accommodates 11,000 vehicles per day

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This report was prepared under contract 35003 in cooperation with the Massachusetts Highway Department and the U.S. Department of Transportation, Federal Highway Administration

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Frequently Asked Questions About Roundabouts

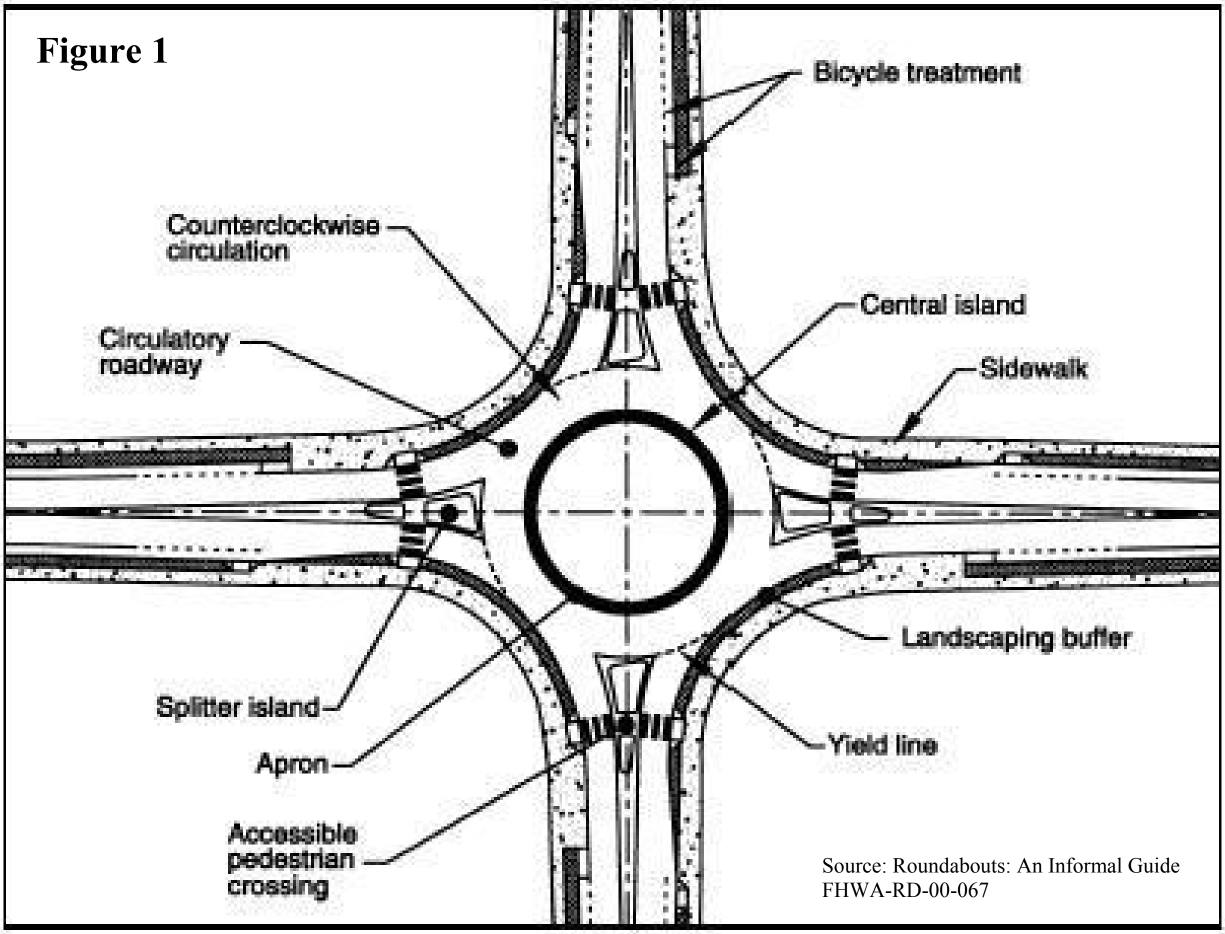
The Franklin Regional Council of Governments has for a number of years been actively promoting the consideration of Roundabouts as an alternative to stop and traffic signal intersection control. To achieve that goal the FRCOG has sponsored and given presentations on Roundabouts in the Region. This document provides answers to the most frequently asked questions that have been raised during these presentations.

General Questions

1. **What is a Roundabout?**

   A Roundabout is generally a circular shaped intersection where traffic travels in a counterclockwise direction around a center island. Vehicles entering the circulating roadway must yield to vehicles already circulating. Roundabouts have specific design elements that require vehicles to approach and proceed through the intersection at slow speeds, increasing safety and efficiency. Figure 1 below shows all the features that are included in a typical single lane Roundabout.

Figure 1



Source: Roundabouts: An Informal Guide
FHWA-RD-00-067

2. **What are the differences between Roundabouts and the Rotaries typically seen in New England?**

   Some examples of the Rotaries most people are familiar with in New England are the Greenfield Rotary at Exit 26 of Interstate 91, the Concord Rotary along Route 2, or the Sagamore Rotary at the entrance to Cape Cod. Although Rotaries and Roundabouts are generally circular in shape, there are significant differences in their appearance and operation. Rotaries are typically large, for example the Greenfield Rotary has a diameter of approximately 650 feet. This size results in high circulating vehicle speeds of between 30 and 40 miles per hour. These high circulating speeds mean that entering vehicles must wait for larger gaps between circulating traffic before entering, which reduces the volume of traffic (capacity) Rotaries can process. This lower capacity means that during peak traffic periods, long delays and congestion are very common. Finally, due to a combination of vehicle speeds, congestion and lack of adequate signage and pavement markings, the frequency of crashes is often high. Of the approximately 100 Rotaries in Massachusetts, 17 appear on MassHighway's list of the 1000 Most Hazardous Intersections.

Roundabouts are much smaller, with single lane Roundabouts typically having a diameter of between 100 and 140 feet (larger diameter to accommodate large tractor-trailers), and multi-lane Roundabouts no larger than about 250 feet in diameter. This smaller size, plus additional design features on the approaches, results in much slower entering and circulating vehicle speeds of between 10 and 25 miles per hour. These lower speeds mean entering traffic can access much smaller gaps between circulating vehicles, which results in an increased volume of traffic (capacity) being processed and minimizes delays and congestion for all users. Finally, primarily due to the lower vehicle speeds, Roundabouts all but eliminate the occurrence of fatal and serious injury crashes, while minimizing the occurrence of minor injury and property damage crashes.

The pictures below show an example from New York State, where a 660 foot diameter Rotary was replaced with a 220 foot diameter two-lane Roundabout. Figure 2 shows the roundabout being constructed within the center island. Figure 3 shows the Roundabout after the project was completed and the old roadways of the Rotary had been removed. The second picture was taken from a different angle than the first. The following symbol has been placed on the same approach on both pictures. In the first year of operation as a Roundabout, NYSDOT reported an 80% reduction in injury crashes and a 60% reduction in overall crashes. In addition average delays were reduced from over 60 seconds to less than 20 seconds per vehicle.

Figure 2 **Kingston Roundabout, New York During Construction**

Source: New York State Department of Transportation

3. Roundabouts are a new concept, so why should we experiment with them in our area?

Roundabouts are not a new concept. Much of the rest of the world has been utilizing Roundabouts for decades. Back in the 1960s, Great Britain spent millions of dollars experimenting with the design of Roundabouts to optimize their safety and capacity. Much of that experience, as well as the experience from Australia, Canada and mainland Europe, is being utilized to guide the design of Roundabouts in the U.S.. The first Roundabout in the U.S. was built in 1990 in a suburb of Las Vegas, Nevada. The first Roundabout in the Northeast was built in Montpelier, Vermont in 1995. States, such as Colorado, Florida and Maryland have had Roundabout programs for at least the last decade, and to date there are over 1000 Roundabouts in the U.S. with hundreds more in design or under construction across the nation. In Massachusetts, several Roundabouts have been built, and again, many more are in design. Locally, the City of Northampton has a Roundabout under design for the Intersection of Route 9/Bridge Road at the entrance to Look Park. The City now requires that Roundabouts be considered for all intersection improvements. Roundabouts now have a proven track record in the U.S., with several studies showing significant traffic operation and safety benefits after Roundabouts were installed. A selection of these studies has been referenced below. Additional studies can be found by conducting an internet search or visiting the websites referenced at the end of this report.

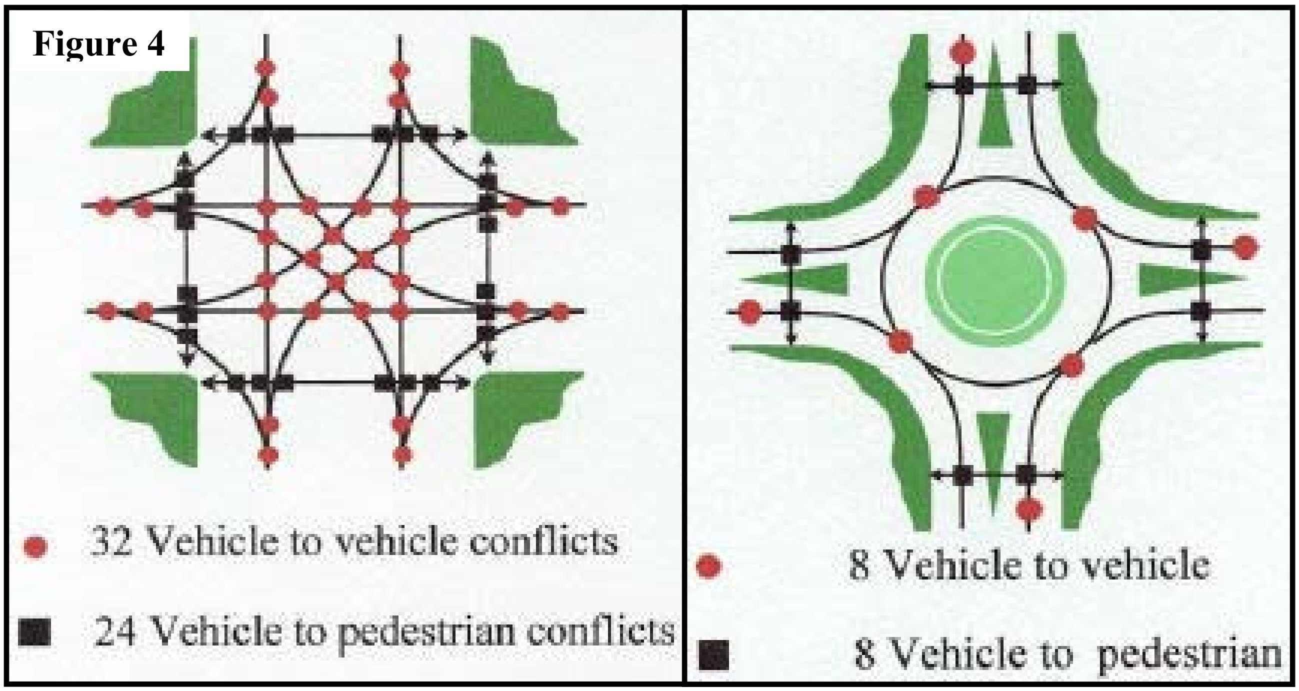
Modern Roundabout Intersections: When To Use Them? A Comparison With Signalized Intersections
Mark T. Johnson P.E., Wisconsin DOT; William A. Hange, P.E. City of Loveland
http://www.k-state.edu/roundabouts/news/ITEPaper.pdf

Crash Reductions Following Installation of Roundabouts in the United States
Insurance Institute for Highway Safety
http://www.dot.state.ny.us/roundabouts/files/insurance_report.pdf

Maryland Roundabout Safety Experience
Maryland State Highway Department
http://www.k-state.edu/roundabouts/news/RAMDUpdatedSafetyData.doc

4. Drivers are unfamiliar with how to drive Roundabouts, so how will they work in my area?

Roundabouts do not require any new driving skills. At all Roundabouts, drivers must always yield the right-of-way to vehicles in the circulating roadway. The geometric design of the approach to the circulating roadway dictates the speed that drivers will be traveling (generally between 10 and 25 miles per hour depending on the design which is tailored to the location). Roundabouts simplify and separate the driver decision-making process. As shown in Figure 4 below, at a normal cross-road intersection there are 32 vehicle-to-vehicle and 24 vehicle-to-pedestrian potential conflict points. At a Roundabout this is dramatically reduced to 8 vehicle-to-vehicle and 8 vehicle-to-pedestrian potential conflict points. Entering a Roundabout requires basically the same skills as making a right turn out of a driveway, i.e. first yield to pedestrians on the sidewalk, then check for traffic approaching from the left. If there is traffic, yield and wait for a suitable gap. If there is none, make the turn and enter the traffic stream.



Questions to ask when considering a Roundabout

5. Are Roundabouts an appropriate solution for all locations?

NO. A Roundabout may not be the appropriate solution for all locations. Therefore, it is important to conduct a detailed evaluation of whether a Roundabout, stop sign or traffic signal option is the most effective option for a location. A Roundabout may not be a suitable option in locations where:

- there is limited available space (right-of-way), such as a town center where buildings may be built close to the edge of the street;
- there is a large concentration of pedestrians wishing to cross, as this may impact the capacity of the Roundabout to process vehicles;
- and, traffic volumes are heavily unbalanced, i.e. one entry has a volume of traffic significantly greater than the other entries. If this situation occurs for a limited time each day, i.e. one peak

period, the situation may be mitigated by using measures such as metering traffic signals to break up the entering flow and allowing traffic to enter from the other entries.

6. Are Roundabouts safer than traffic signals?

Research in the U.S. and abroad has shown that Roundabouts experience lower crash rates than both traffic signal and stop sign controlled intersections. The Insurance Institute for Highway Safety conducted a study of 24 intersections located throughout the U.S. where Roundabouts replaced traffic signals or stop signs. This study found fatality and incapacitating injury crashes were reduced by 90%, injury crashes were reduced by 76%, pedestrian related crashes were reduced by 30 to 40% and overall crashes were reduced by 39%[1]. The impacts on bicycle related crashes could not be determined, due to the small number of bicycle crashes recorded both before and after the Roundabout installations.

At Roundabouts the geometric design features ensure that vehicle speeds are low, therefore, when collisions do occur the severity is typically nothing more than a fender-bender type crash. Secondly, as described in question 4, the number of potential conflict points at roundabouts is significantly fewer at Roundabouts. Most people assume traffic signal controlled intersections are safe, and in most instances traffic signals can improve safety at an intersection. But there are inherent dangers at signalized intersections. For example, during the year 2003, approximately 9,200 people lost their lives in crashes at intersections. Of those fatalities, 934 were directly attributable to red light running at intersections controlled by traffic signals. Aggressive driving is recognized as a growing problem on the nation's roadways[2] and red light running is one of the most common results of this behavior.

In general, single lane Roundabouts are shown to be far safer than traffic signals. As additional entry lanes are added to roundabouts, the crash rates begin to increase, with three lane Roundabouts having a similar crash rate to traffic signals. Although, it should be noted that the crashes at multi-lane Roundabouts remain less severe than at traffic signal controlled intersections.

7. Are Roundabouts more efficient than traffic signals?

Efficiency can be measured by the volume of traffic processed (capacity) and the length of delay incurred by all users. Roundabouts are typically more efficient than traffic signals. At traffic signals there is "lost time" where vehicles on all approaches are stopped simultaneously between phases when the signal changes from green on one approach and turns to green on another. At Roundabouts, vehicles can enter the circulating roadway whenever there is a suitable gap, most often without coming to a full stop. Additionally, vehicles can enter from multiple approaches simultaneously. These factors mean that Roundabouts can typically process more vehicles in a given time with less delay than traffic signals. During off-peak traffic periods Roundabouts excel, as there is no need to be stopped waiting for a green light. The reduced delays at Roundabouts translate into less fuel being wasted and less polluting emission being produced.

8. What are the benefits of Roundabouts over other intersection types?

- **Slower Vehicle Speeds**
  - Provides more time for drivers to judge and react to other drivers and pedestrians;
  - Are advantageous to older and novice drivers;

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[1] Source: Crash Reductions Following Installation of Roundabouts in the United States, Insurance Institute for Highway Safety (http://www.dot.state.ny.us/roundabouts/files/insurance_report.pdf)

[2] http://safety.fhwa.dot.gov/intersections/redl_facts.htm

- Reduces the occurrence and severity of crashes;
- Makes for a more comfortable pedestrian and bicycling environment.

➢ **Crash Reduction**
- Fatalities and incapacitating injuries have been shown to be reduced by 90%;
- Injury crashes have been shown to be reduced by 76%;
- Pedestrian crashes have been shown to be reduced by 30 to 40%;
- All crashes have been shown to be reduced by 39 %.

➢ **Efficient Traffic Flow**
- Traffic Capacity (volume of vehicles processed) can be increased by 30 to 50%;
- Results in reduced vehicle emissions and fuel use;
- Reduces the need for storage lanes that are often seen at signalized intersections.

➢ **Reduced Costs**
- No signal equipment to install and repair;
- Savings estimated at an average of $5,000 per year in electricity and maintenance costs;
- Service life of a Roundabout is 25 years vs. 10 years for traffic signals.

➢ **Aesthetics**
- The center island provides an opportunity for landscaping, placing monuments, etc.

9. Are Roundabouts appropriate for intersections near schools?

YES. Numerous Roundabouts have now been built at or near schools across the U.S. with great success. The low speed and safety aspects for both drivers and pedestrians at the intersection, along with the traffic calming effects seen several hundred feet from the intersection, make Roundabouts an ideal choice near schools. In Brown County, Wisconsin, two single lane roundabouts were constructed at intersections along a section of roadway where an elementary, a middle, and a high school were located. The roadway by the school was designated by the Sheriff's Department as a hazardous area, due to vehicle speeds and lack of pedestrian and bicycle facilities. Due to the hazardous nature of the area, all students were bused to the schools, with bicycling strongly discouraged, through the banning of storage of bicycles on school property. After the Roundabouts were constructed in front of the schools, the hazardous designation was removed and the students were allowed to walk and bicycle to school crossing at the Roundabout aided by a crossing guard. The Massachusetts town of Dedham constructed a Roundabout in 2004 for traffic calming purposes near the Riverdale Elementary School. The City of Northampton, in western Massachusetts, is currently designing a Roundabout to be located approximately 1,000 feet from the JFK Middle School. It is expected that students will utilize the crossings at the Roundabout on their way to and from school each day.

More information on the Brown County, Wisconsin Roundabouts can be found in the following report:

Lineville Road Roundabout Study
Brown County Planning Commission
http://www.co.brown.wi.us/Planning/forms/lineville_roundabout_study.pdf

10. Are Massachusetts Roundabouts being removed because they do not work?

NO. This is a common myth spread by those who are typically uninformed. They are confusing Rotaries with Roundabouts (see question 2). In Massachusetts, there has been much talk about removing the old inefficient and high crash Rotaries and replacing them with traffic signals. In some

[3] Source: Insurance Institute for Highway Safety Study of 24 Roundabouts in 8 States that had been converted from Traffic Signals or Stop Sign Control. http://www.carsafety.org/sr/pdfs/sr3505.pdf

cases the safety and traffic flow problems seen at many of the Rotaries could potential be solved by adapting some of the pavement marking and signage techniques used at roundabouts. The FRCOG as been working with MassHighway to develop such a solution for the Greenfield Rotary at Exit 26 of Interstate 91, which it hopes will be used as a model for Rotaries throughout the State.

11. How does the public perceive Roundabouts, both before and after construction?

Primarily, due to unfamiliarity with Roundabouts, a majority of the public will oppose them when they are first proposed. It is important to educate the public on the various options that are available and inform them on the advantages and disadvantages of each of the options. After construction, these attitudes typically change and a larger majority of the public then supports the Roundabout. Below are the results of surveys conducted before and after the installation of Roundabouts in three States: Kansas, Maryland and Nevada.

	Before Construction		After Construction	
Strongly Favor	16%	31%	32%	63%
Somewhat Favor	15%		31%	
Don't Know	14%		9%	
Somewhat Oppose	14%	55%	13%	28%
Strongly Oppose	41%		15%	

Source: ITE Journal, Sept 2002. Retting, et al.

Designing, Constructing and Maintaining Roundabouts

12. Do Roundabouts have to be circular in shape?

NO. Roundabouts do not have to be perfectly round in shape. Roundabouts can be squashed and elongated to accommodate many different circumstances. However, care must be taken to ensure that the design principles are maintained as much as possible to ensure that non-circular Roundabouts maintain as many of the benefits of a circular Roundabout as possible.

13. Do Roundabouts take up too much space to be practical in most situations?

A single lane Roundabout typically will have a diameter of between 100 and 140 feet, whereas, a comparable traditional cross road intersection may have a cross-section (equivalent to diameter) of 50 feet to 60 feet. For locations with limited available space (due to structures or environmental circumstances) a roundabout will likely not fit. But, often a single lane Roundabout can take the place of a signalized intersection that requires turning lanes to accommodate queuing traffic at red lights. These turning lanes can extend several hundred feet back from the intersection requiring the widening of the roadway for that distance. In these instances it may be easier or desirable to take the additional land required only at the intersection for a single lane Roundabout which would not need additional storage lanes to accommodate queuing traffic.

14. Do traffic flows need to be balanced at each approach for Roundabouts to work?

NO. Although Roundabouts do operate most efficiently when the traffic flows are balanced between each of the approaches, this is not a requirement for Roundabouts to work well. Unless the traffic flows are excessively unbalanced, and have minimal left turns, (i.e. the majority of traffic goes straight through), Roundabouts will likely operate as well, if not better than, a traffic signal. The problem with heavily unbalanced flows is that suitable gaps at adjacent approaches may not be sufficient to allow vehicles to enter the circulating roadways. Often, adding additional lanes to the most heavily trafficked approaches will alleviate some of problems. In the most extreme cases, "metering" traffic signals can be placed on the heavily trafficked approach that periodically turns red stopping the traffic from entering the circulating roadway and creating gaps at adjacent approaches. These metering signals are often triggered by detection of queues on the adjacent approaches and typically only function for a short period each day, such as during the morning or afternoon rush hours.

15. Can Roundabouts be constructed in low volume urban situations?

YES. One of the benefits of Roundabouts is their "traffic calming" (i.e. lower speeds) effects for several hundred feet in either direction. Additionally, this traffic calming effect is not dependent on the interaction with other vehicles, but due to the design elements that limit speed. Therefore, the speed reductions are seen 24 hours a day, 7-days a week, no matter the traffic volumes.

16. How is snow cleared from a Roundabout?

Typically a snow plow truck will start on the inner most section of the circulating roadway, often on the truck apron and keep circulating in a spiral outward with each revolution until the whole circle is cleared. Either the same plow vehicle or a second plow vehicle will clear the snow from the approaches and exits. Many Roundabouts have been built in snowy parts of the U.S.. Some of the first examples of Roundabouts in the U.S., were in the ski areas of Vail, Colorado. The New York State Department of Transportation (NYSDOT) has created a short video of how they plow their Roundabouts. This video is available for viewing on the NYSDOT Roundabout website at: http://www.dot.state.ny.us/roundabouts/round.html

Accommodations

17. How are large trucks and fire equipment accommodated at Roundabouts?

Roundabouts are designed to accommodate all the turning movements of the largest vehicle that is expected to traverse the intersection. In most cases this is a tractor trailer, either 55 or 67 feet in length. If the circulating roadway was constructed at the width necessary to fully accommodate these large vehicles, it would be very difficult to maintain the geometric features that keep vehicle speeds low because the circulating roadway would have to be very wide. Therefore, to accommodate the sweep of the trailer wheels of a tractor trailer as it makes its way through the Roundabout, a truck apron is constructed around the inside of the circulating roadway. The truck apron has an approximately 3 or 4 inch curb where it meets the circulating roadway to deter smaller vehicles from cutting across it. Additionally, the apron is constructed of a different material or colored differently than the circulating roadway, to distinguish it and to make it clear that the truck apron is not something to be driven over by smaller vehicles. Early experiences have shown that it is important to not construct the truck apron and sidewalks of the same material, as at Roundabouts where this occurred, some pedestrians confused the apron as a sidewalk. The circulating roadway is typically limited to 18 to 20 feet in width which is sufficient to accommodate a typical school bus without having to use the truck apron.

The two pictures on the next page show examples of truck aprons at Roundabouts. Figure 5 shows a typical application of a truck apron. The apron is a different color and texture and separated from the circulating roadway by a sloped curb. Figure 6 shows a tractor trailer negotiating a roundabout with a truck apron. The tractor unit remains in the circulating roadway, while the wheels of the trailer track across the truck apron.

Figure 5

Source: Franklin Regional Council of Governments
Voorheesville Roundabouts, NY

Figure 6

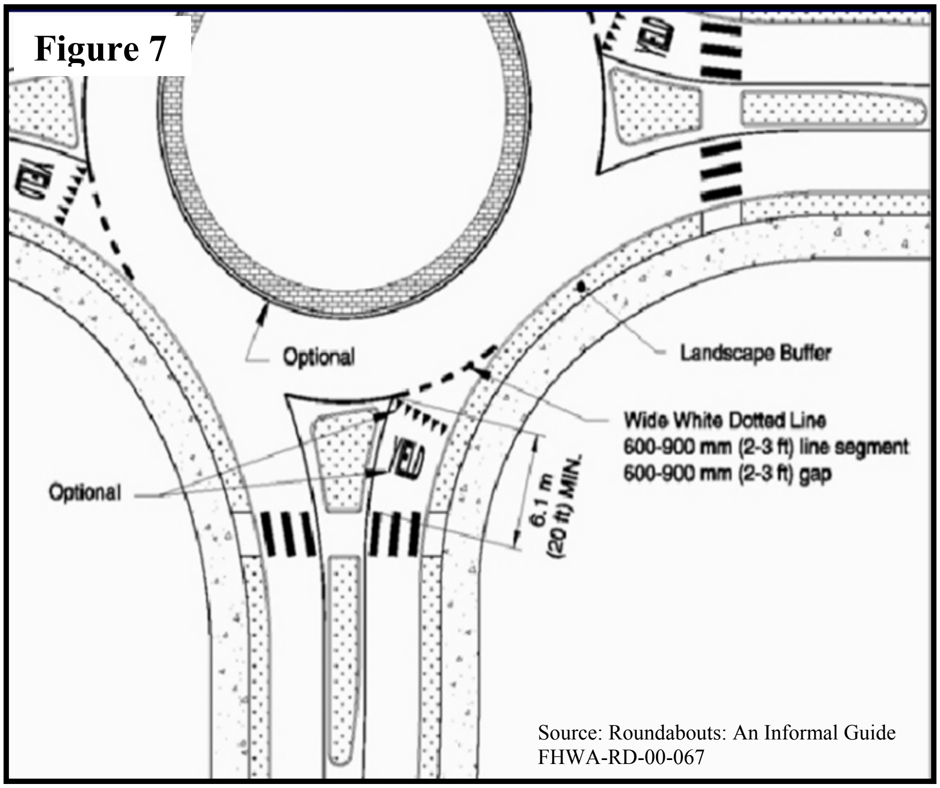
Source: Washington State Department of Transportation
http://www.wsdot.wa.gov/Projects/roundabouts/

Since emergency vehicles are typically smaller than tractor trailer units, they are easily accommodated at Roundabouts, and because Roundabouts typically experience less delay and less queuing traffic, emergency vehicles are rarely delayed by traffic at Roundabouts.

18. How are pedestrians accommodated at Roundabouts?

Pedestrians use marked crosswalks generally located one car length (20 feet) back from the yield line on the approaches, and one car length (20 feet) back from the edge of the circulating roadway on exits. All Roundabouts have splitter islands that separate the approach and exit lanes. This splitter island is used as a pedestrian refuge for crosswalks requiring pedestrians to only cross a single direction of traffic at a time. For single lane Roundabouts, the exposed crossing distance is typically 14 to 18 feet between the curb and the splitter island. Vehicles speeds are typically slow as they approach the crosswalks and they must yield or stop (depending on state law) for pedestrians in a crosswalk. Since the crossing distance is short, pedestrians clear the roadway quickly and vehicle delays are minimal. Sidewalks are placed around the circumference of the Roundabout and connect to the various crossing point. Pedestrians should never be directed to the center island. Figure 7 to the right shows the typical pedestrian crossing pavement markings used at single lane roundabouts

Figure 7



Source: Roundabouts: An Informal Guide
FHWA-RD-00-067

19. How are the visually impaired accommodated at Roundabouts?

As Roundabouts have become more common, the issue of access for the visually impaired has been raised. People with limited or no sight rely on their hearing to determine when it is safe for them to cross. At Roundabouts, the visually impaired have expressed concern that they are unable to determine when a vehicle has stopped to let them cross due to the noise from circulating traffic. Additionally, the visually impaired have difficulty in discerning whether a circulating vehicle is continuing to circulate the roundabout or if it is going to exit to where they wish to cross.

These concerns led the U.S. Access Board to include in their initial draft *Accessibility Guidelines for Public Rights of Way* a requirement that all crossings at Roundabouts have a pedestrian activated traffic signal. This decision was received by roundabout engineers and proponents as an excessive mandate that would threaten the viability of roundabouts due to the increased costs and the loss in efficiency that traffic signals could produce. This draft requirement resulted in productive discussions between the engineering community and Access Board, and research is now being conducted to determine the best techniques to accommodate the visually impaired at Roundabouts.

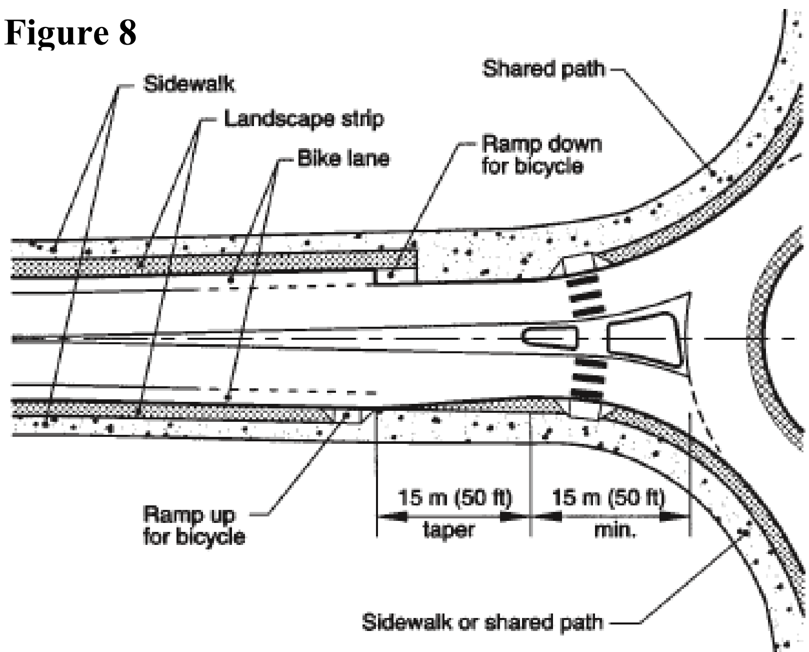
Based on these discussions the Access Board in its revised draft of the *Accessibility Guidelines for Public Rights of Way*[4] is no longer requiring pedestrian activated traffic signals at single lane roundabouts, but keeps the requirement for multi-lane crossings.

When designing the pedestrian accommodations (sidewalks and crosswalks) at a Roundabout, it is important to include features that will assist the visually impaired in navigating around the Roundabout. These features include a planted buffer strip between the roadway and the sidewalk, and/or a raised lip at the edge of the sidewalk to be used as a guide for those using canes. Additionally, tactile strips (areas with small raised domes) should be placed at the curb of all crossing points. More information on accommodating the visually impaired at Roundabouts can be obtained at: http://www.access-board.gov/research/Roundabouts/bulletin.htm

20. How are bicyclists accommodated at Roundabouts?

Bicyclists should be encouraged to either share the travel way with vehicles in a Roundabout, or dismount, and use the sidewalk and crosswalk system to navigate through the Roundabout. At single lane Roundabouts, vehicle speeds entering and circulating the Roundabout are typically comparable to bicyclist speeds. Therfore, bicyclists can comfortably “claim the lane” moving to the center of the lane to travel through the Roundabout. Research has shown that bicyclists are at greater risk of being hit by a motor vehicle if they hug the outer edge of the Roundabout, possibly because they are less visible at this location. For this reason, bicycle lanes should not be placed in Roundabouts. On roadways with bike lanes, the lanes should be ended approximately 100 feet from the circulating roadway and bicyclist should be encouraged to either merge into the travel lane, or leave the roadway via a ramp and dismount at the sidewalk and walk their way around the Roundabout. At multi-lane Roundabouts, it is more important to provide an off-road alternative for bicyclists as multiple lanes may be intimidating for more bicyclists. Figure 8 on the right shows an option of how to treat the termination of a bike lane on the approach to a Roundabout. Other options that angle the ramps between 30 and 45 degrees to the bike lane are gaining favor. Making these ramps of a different material than the sidewalks will help prevent visually impaired pedestrians from confusing the ramps as part of the sidewalk and walking inadvertently into the roadway. A selection of treatments for bicyclists can be viewed at a presentation at http://www.teachamerica.com/roundabouts/RA055A_ppt_Moule.pdf

Figure 8



Source: Roundabouts: An Informal Guide FHWA-RD-00-067

[4] - http://www.access-board.gov/prowac/draft.htm

Rules when Driving a Roundabout

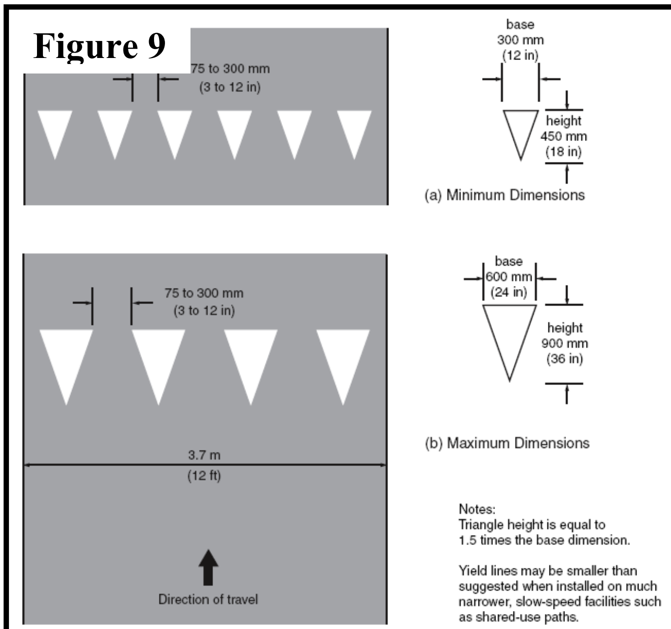
21. How do I react if I am in a Roundabout and an emergency vehicle approaches?

You should react similar to the way you would at any other location where you would encounter an emergency vehicle. If there is an opportunity to safely move to the side of the roadway you should do so. If you are in the circulating roadway and the emergency vehicle is following you, you should continue to your exit and move to the side as soon as possible. If you are in the circulating roadway and the emergency vehicle is on an approach you will be passing, stop and let the emergency vehicle enter into the Roundabout, then continue on your way.

22. What does a line of painted white triangles at the entrance of a Roundabout mean?

The white triangles indicate the line where vehicles should stop if yielding to conflicting traffic in the circulating roadway. They are placed in conjunction with the yield sign at the entrance to a Roundabout. Figure 9 shows the details of the triangles and figure 10 shows how they should be placed on a Roundabout approach. These triangles are the universal pavement marking for "yield" and may also be encountered at traditional intersections controlled by yield or instead of a painted stop bar at marked crosswalks.

Figure 9



Source: Manual on Uniform Traffic Control Devices

Figure 10

Source: New York State Department of Transportation

Resources:

There are growing volumes of resources available on Roundabouts in the U.S., most of which are available on the internet. An internet search on "Roundabouts" will produce links to several hundred sites. Starting on the next page is a listing of some of the best resources, all of which are available online.

Guidelines

Roundabouts: An Informal Guide – Federal Highway Administration (FHWA-RD-00-067) [http://www.tfhrc.gov/safety/00068.htm]

Roundabout Design Guidelines – Ourston Roundabout Engineering, 2001 [http://www.ourston.com/10c_Design_DesignGuidelines.htm]

Maryland Department of Transportation, Roundabout Design Guidelines [http://www.ite.org/traffic/documents/tcir0019.pdf]

Florida Department of Transportation, Roundabout Design Guidelines [http://www.dot.state.fl.us/trafficoperations/pdf/Florida_Roundabout_guide_2nd_Ed.pdf]

Manual on Uniform Traffic Control Devices – Federal Highway Administration [http://mutcd.fhwa.dot.gov/pdfs/2003r1/pdf-index.htm]

Massachusetts Highway Department, Project Development and Design Guide [Chapter 6 – Intersection Design]
http://www.vhb.com/mhdGuide/mhd_GuideBook.asp

State Department of Transportation Roundabout Websites

New York State Department of Transportation [http://www.dot.state.ny.us/roundabouts/guide.html]

Kansas Department of Transportation [http://www.ksdot.org/burTrafficEng/Roundabouts/Roundabout_Guide/RoundaboutGuide.asp]

Wisconsin Department of Transportation [http://www.dot.wisconsin.gov/safety/motorist/roaddesign/roundabout-design.htm]

Arizona Department of Transportation [http://www.dot.state.az.us/CCPartnerships/Roundabouts/history.asp]

Maryland Department of Transportation [http://www.sha.state.md.us/safety/oots/roundabouts/safety.asp]

Informative Websites

Northeast Area Roundabouts
http://members.cox.net/near/

Modern Roundabouts, the Website
http://roundabout.kittelson.com/

Public Roads Magazine Article on Roundabouts
http://www.tfhrc.gov/pubrds/fall95/p95a41.htm

Kansas State University
http://www.k-state.edu/roundabouts/

Informational Brochures

Federal Highway Administration
http://www.vtsprawl.org/Pdfs/teamsafe_rndabout.pdf

New York State Department of Transportation
http://www.dot.state.ny.us/roundabouts/files/roundabbrochure.pdf

Oregon Department of Transportation
http://egov.oregon.gov/ODOT/HWY/ENGSERVICES/docs/pdf/HowDrive.pdf

Missouri Department of Transportation
http://www.modot.state.mo.us/newsandinfo/documents/RoundaboutBrochure.pdf

Town of Norfolk, Massachusetts
http://www.virtualnorfolk.org/public_documents/NorfolkMA_documents/towndocs/F000193A7/S0045B59F.-1/roundabout.pdf

City of Olympia, Washington
http://www.ci.olympia.wa.us/publicworks/transportation/images/pdf/Walking_Biking_Driving_Roundabouts.pdf

Palm Beach County, Florida
http://www.co.palm-beach.fl.us/PubInf/Publications/pdf_files/Engineering/RoundaboutBrochure.pdf

Informational Videos Online

Kansas Department of Transportation
http://www.ksdot.org/burtrafficeng/Roundabouts/Roundabout_Guide/RoundaboutGuide.asp

Washington State Department of Transportation
http://www.wsdot.wa.gov/eesc/cae/DesignVisualization/Video/Portfolio/Modern_Roundabouts/index.htm

Overland Park, Kansas
http://www.opkansas.org/_Res/Traffic_and_Transportation/Roundabouts/driving.cfm

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