INFORMATION/EDUCATION SYNTHESIS ON ROUNDABOUTS

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Final Report

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FEDERAL HIGHWAY ADMINISTRATION

September 2013

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RESEARCH PROGRAMS

MDT

Information/Education Synthesis on Roundabouts

Final Report

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16. Abstract

Roundabouts have seen increased application across the United States as one of the Federal Highway Administration's nine proven safety countermeasures. In Montana, however, there has been strong public opposition to some of the roundabout projects proposed by the Montana Department of Transportation (MDT). Montana's experience regarding public apprehension of roundabouts is not unique. Other states have encountered the same lack of public support for roundabouts. The reasons for the lack of public acceptance vary, but typically include driver apprehension, safety and cost concerns. Consequently, it has been generally recognized that public acceptance and buy-in of roundabouts is essential to moving their use forward. Understanding what other states and locales have developed to facilitate roundabout education and outreach is crucial in refining MDT's approach to the problem. Consequently, the research presented in this report was undertaken to identify strategies to use in public meetings and other venues to promote roundabouts as a preferred approach to intersection control and as an effective safety countermeasure.

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Executive Summary

Roundabouts have seen increased application across the United States as one of the Federal Highway Administration's nine proven safety countermeasures. In Montana, however, there has been strong public opposition to some of the roundabout projects proposed by the Montana Department of Transportation (MDT). Montana's experience regarding public apprehension of roundabouts is not unique. Other states have encountered the same lack of public support for roundabouts. The reasons for the lack of public acceptance vary, but typically include driver apprehension, safety and cost concerns. Public acceptance of roundabouts is essential to moving their use forward. Understanding the public education and outreach efforts other states and locales have used to address this issue is crucial in refining MDT's approach to the problem. Consequently, the research presented in this report was undertaken to identify strategies to use in public meetings and other venues to promote roundabouts as an acceptable approach to intersection control when it offers the best design alternative in a particular situation.

The results of the literature review found that the use of public meetings/forums to bring the public into the process was advisable. A willingness to engage in meaningful dialogue with the public during such meetings helps in addressing the participants concerns with roundabouts, as does demonstrating that a full range of design alternatives have been considered. An agency must keep in mind that different audiences will have different concerns, and the message and its delivery should be structured accordingly.

Based on survey responses and telephone interviews, it was clear that a majority of agencies have encountered similar issues of public opposition early in their development and deployment of roundabouts. Many staff members stressed that early roundabouts should be built where they are most likely to be successful (i.e. operate well, produce safety benefits, etc.). A key finding of the agency survey and follow-up interviews was that no agency appears to engage in promotion of roundabouts through media campaigns. No agency has developed advertisements that champion the use of roundabouts. Rather, agencies appear to recognize that project-specific justification for roundabouts based on the clear benefits they may offer is needed before they are proposed to the public.

A survey of Montanans found that 61 percent of respondents opposed roundabouts. Only 14 percent of respondents indicated that improvements to education and outreach on roundabouts would likely change their opinion. However, 38 percent of respondents indicated their views toward roundabouts had changed over time, primarily positively (one respondent did indicate a shift to a negative view following use of a roundabout). Most of those surveyed (56 percent) had seen MDT-produced or other information on roundabouts, with some finding the materials useful and others finding it too technical or uninformative. Recommended improvements to outreach materials made by respondents included considering the use of videos, simulations, and three-dimensional renderings, as well as increased education to help drivers learn how to navigate roundabouts.

While many states use roundabouts to some extent on their roadway systems, not all have developed dedicated websites that present information on roundabouts. For states that have developed websites, the content was straightforward, introducing what roundabouts are, highlighting their benefits, answering basic questions, providing driver guidance, and presenting images, videos, and/or maps of existing roundabout. Not all states have developed their own roundabout videos; the videos that do exist focus on educating drivers on how to use them, or

promoting their advantages and benefits. Most videos used local (for that state) footage of successful applications. Aside from videos, some states also developed radio public service announcements (PSAs), which were also brief and highlighted driving tips.

Researchers also reviewed transportation-specific outreach efforts not directly related to roundabouts. Typically, these efforts focused on safety, and the approach employed in most cases was the same: a dedicated website that contained background information and statistics, as well as embedded videos (or links to them) and radio spots that served as the public media outreach components. In some cases, printed materials, primarily posters, were also developed. The use of social media (Facebook, Twitter, and YouTube) was mixed, although it would appear that use of these mechanisms is growing. Outside of the transportation field, public outreach approaches were similar to those employed by transportation agencies. Traditional approaches such as television and radio commercials (PSAs) were cited, along with other print mediums such as brochures and mailings.

Overall, this synthesis shows that agencies have provided a number of different types of outreach materials, relative to their focus and delivery mechanism. The information disseminated has generally centered on how to use them, highlighting the safety and other benefits they provide. In terms of the types of media available to provide roundabout education and outreach, some were more traditional, such as television and radio commercials in the form of PSAs, while some are more recent such as websites and social media. The messages conveyed via the different media are largely the same, being educational or informative in nature. Project specific outreach efforts universally are centered on public meetings.

Based on the information reviewed during the course of this research, this synthesis presents a number of recommendations. When considering roundabouts in general (for example, statewide), a promotional campaign could be considered, although no such effort has been pursued elsewhere. Many states interviewed during the survey portion of this work indicated that they did not pursue such an approach to avoid the appearance of "selling" the concept. Rather, education and outreach efforts for roundabouts were often conducted on a project-by-project basis, and focused on presenting facts to explain why a roundabout was the preferred alternative. Before even proposing a roundabout, agencies should take care to establish that it is the right solution for a site and that it will be successful.

When considering roundabouts for a specific project, transportation agencies are advised to hold an initial meeting with local government officials. When meeting with the public and presenting roundabouts during public meetings, the materials and discussion points should be tailored for the audience, and information should be uncomplicated and non-technical. When roundabouts are new to an area, it may be a good idea to air PSAs that discuss how to use them. The use of newspaper and print media (pamphlets/brochures) should also be pursued, as these can provide more details than short video and audio announcements. Agencies may also consider placing a longer video(s) on the internet to provide more detail on different aspects of roundabouts. Outreach to local television, radio, and newspaper media outlets should be employed during all phases of a proposed project. Maintenance and expansion of dedicated roundabout webpages should continue, and supplemental approaches to roundabout education and outreach should be considered, as needed.

1) INTRODUCTION

Roundabouts are a form of at-grade traffic control that has seen increased application across the United States in recent decades. They are one of the Federal Highway Administration's nine proven countermeasures for improving highway safety. In Montana, however, there has been strong public opposition to some of the roundabout projects proposed by the Montana Department of Transportation (MDT). While MDT staff members have presented facts and figures to the public on the effectiveness of roundabouts to generate support for these projects, the public has remained skeptical about their benefits. As a result, MDT has determined it is necessary to identify other effective and efficient strategies to use in public meetings and other venues. This information would be used to develop strategies to promote roundabouts as a preferred approach to intersection control and as an effective safety countermeasure.

Montana's experience regarding public apprehension of roundabouts is not unique. Other states have encountered the same lack of public support for roundabout projects. In fact, it is so common that some researchers refer to it as "roundabout anxiety" (Robinson and Bared, 2000). The reasons for the lack of public acceptance vary, but typically include driver apprehension and cost concerns (roundabouts being more costly than most alternatives). As a result, many prospective roundabout projects are never built due to public opposition.

As it is generally recognized that public acceptance and buy-in of roundabouts is essential to moving their use forward, many states and locales have developed successful approaches to be used in this regard. Furthermore, there are other education and information programs used by states that are not transportation-related that may be transferable to roundabout education. Collectively, this experience can provide MDT with additional tools and approaches that can be used to educate the public on roundabouts, and in the process, engender support for these projects in the future.

1.1. Background

Currently, roundabouts are used throughout the nation and have been positively received in many locales. However, the path to public acceptance has not been easy. Many agencies have experienced initial public rejection of proposed roundabouts and have had to modify their approaches and strategies in presenting roundabouts to shift that opinion over time. However, in many cases, by employing different approaches to public education and information campaigns, agencies have successfully developed support for roundabout projects. Based on this observation, the Western Transportation Institute at Montana State University (WTI) conducted an in-depth review of agency practices specific to roundabouts, combined with approaches by states/agencies from outside the transportation field to education and information campaigns. The goal of this effort was to provide MDT with several options to consider for use working with the public on future roundabout projects.

Based on the information identified during the course of the research, a number of benefits were expected. First and foremost, MDT would have new options to consider and employ when presenting roundabouts to the public as a viable intersection improvement option. If presented effectively, the public would benefit from the increased safety and operational efficiencies offered by roundabouts. Roundabouts have proven effective in reducing fatal and injury crashes as well as facilitating traffic flow, and the traveling public in Montana would similarly benefit. Additionally, financial benefits would be expected through reduced property damage, medical

costs and transportation costs (i.e., due to reduced travel times). Thus, the identification of effective approaches to generate public acceptance and support of roundabouts through outreach and education would provide MDT with another viable and important intersection design alternative.

1.2. Research Objective and Scope

The objective of this research was to prepare a comprehensive synthesis to help MDT select the best ways to promote and educate stakeholders and the public on roundabouts in Montana. To meet this objective, the research team pursued three primary tasks: a literature review of existing education/information campaigns for roundabouts, a survey/interview of states regarding their experiences with educating stakeholders and the public on roundabouts and a review of other state/agency education/information campaigns that have been successful (not necessarily transportation-specific).

1.3. Report Overview

This report is organized in eight chapters. Chapter 1 presents an introduction to the project, including background, objectives, and scope. Chapter 2 presents the results of a literature review, summarizing information related to roundabout outreach and education efforts. Chapter 3 presents the results of a survey of transportation agencies, documenting their use of roundabouts, experiences with and approaches to roundabout education and outreach and other thoughts and feedback. Chapter 4 summarizes results of a survey of Montanans regarding their views on roundabouts in general, as well as education and outreach efforts. Chapter 5 summarizes existing roundabout outreach and media materials available from different agencies, namely websites and videos. Chapter 6 documents other education and media campaigns that have been used by agencies, both transportation and non-transportation-related, to identify additional approaches that might be transferable to roundabout efforts. Chapter 7 categorizes the different approaches to education and outreach identified in earlier chapters by the type of information being conveyed, as well as the media used to convey it. Finally, Chapter 8 provides conclusions and recommendations based on the overall research effort.

2) LITERATURE REVIEW

The first task in this research effort was to conduct an in-depth search and review of literature and other available information pertaining to state, provincial and international roundabout education/information campaigns. The objective was to provide a complete picture of campaigns and approaches that have been used and their results (when documented). The research approach employed a comprehensive literature search through sources such as, but not limited to, the Transport Research International Documentation (TRID) database, the EI Compendex database, Federal Highway Administration (FHWA) websites, Transportation Research Board (TRB) websites, Institute of Transportation Engineers (ITE) websites, American Association of State Highway and Transportation Officials (AASHTO) websites, state DOT websites and other databases (e.g., Google Scholar). The literature review focused on peer-reviewed papers and journal articles, agency reports, agency websites dedicated to roundabouts and other relevant documentation and information. The following sections discuss the literature identified by this effort, and summarize the content, delivery mechanism(s) and success of all approaches/campaigns; to the extent, this information was available.

2.1. Approaches to Education and Outreach

The Pennsylvania Department of Transportation's (PennDOT) *Guide to Roundabouts* provides a brief discussion of the need to educate the public to address issues with roundabout acceptance (Michael Baker Jr. Inc., 2001). The guide cites public meetings as the forum to use to bring the public into the design process and to ask questions. Brochures, videos, and public service announcements on television, radio and in newspaper are all listed as approaches to addressing roundabout outreach and acceptance. Aside from this limited discussion however, the guide does not provide any further information or examples.

A synthesis conducted for the Wisconsin Department of Transportation looked at different aspects of roundabouts and public acceptance (CTC & Associates, 2002). This effort included contacting DOTs that had implemented roundabouts to learn about their experiences with public acceptance and promotion of roundabouts. The survey identified several primary promotional strategies/approaches that agencies used successfully, including:

- Foresight and careful planning.
- Meetings with the public on their own "turf."
- Visual aids during presentations.
- Partnering with the press for education and awareness.

The synthesis reported that in Florida a simple (as opposed to a complex) PowerPoint presentation was found to work well for meetings, along with a willingness to have dialogue with the audience. Kansas found that public meetings, brochures, videos, design boards, and driver alert cards (e.g. how to use a roundabout) worked well. Georgia found that holding public meetings in the style of a town hall format was effective. Nevada used an open forum public meeting format, as well as newspaper articles, displays, videos and brochures to address public concerns. The open forum format involved the use of displays for people to move around and look at, allowing for a conversational approach to discussing alternatives and concerns.

The synthesis also provided a summary of guidelines for marketing roundabouts, including:

- Initiate public involvement as soon as practical, such as during the planning stage.
- Employ public meetings to bring the public into the design process.
- Use information brochures and prepare videos.
- Engage local media (television, radio, newspapers) to provide information and coverage.

Additionally, soliciting the feedback of local government officials, emergency responders, and local businesses early in the process was found to assist in developing support.

The Kansas Roundabout Guide (Kittelson and Associates, 2003) dedicates an entire chapter to public involvement considerations. The guide notes that public meetings, particularly during the design phase, are important for the introduction of a roundabout in an area with public opposition. The guide indicates that a number of issues should be considered prior to such meetings.

> "To gain the most benefit from a public meeting it may be helpful to think about who are the advocates and who are the opponents of a roundabout project? Why are people opposing roundabout implementation? What information does the public need to know to understand why a roundabout is being proposed? What role can the public play in providing input and guidance?" (Kittelson & Associates 2003)

Given that the answers to these questions will vary by agency, no responses or approaches to addressing them are outlined by the guide. Instead, the guide notes that educational programs can be used to overcome opposition. The guide indicates that brochures for distribution at public meetings are an approach to education, such as the brochure that was in use in Kansas at that time (Figure 1). The examples in the Kansas brochure are engineering focused, which would not address the needs of agencies that are seeking to develop less engineering-focused materials for the public.

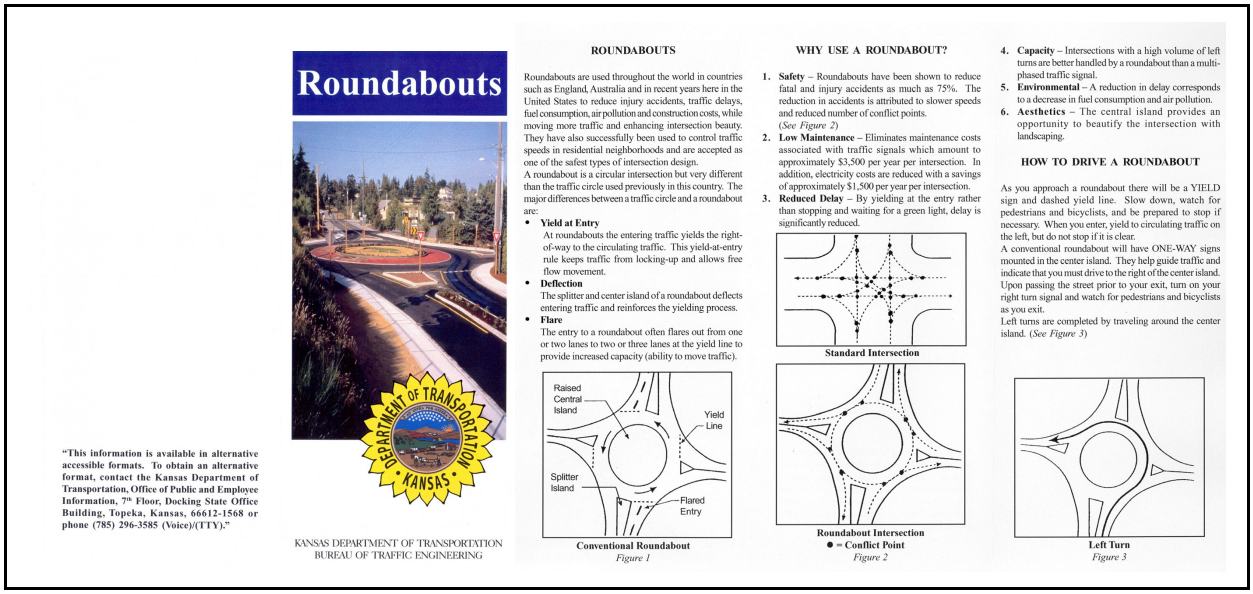

Figure 1: Example of Kansas roundabout brochure

Kliska and Winn (2005) discussed successful approaches to public education for roundabouts that were used in Grand Junction, Colorado. The city initially began the roundabout process by establishing the need for the project and building consensus in moving forward. This included:

- Defining the problem being addressed, and what would happen if it was not addressed.
- Establishing that the city must address the problem.
- Demonstrating that the full range of alternatives was considered and explaining the technical analyses used to support the alternative selected.
- Evaluating the impacts of the prospective project from the point of view of potentially affected interests.

Once the need for a roundabout was established, approaches were pursued to address public opposition. These included inviting recognized roundabout experts to speak at public outreach meetings, using conceptual photos to illustrate the project, implementing driver education campaigns and developing informational brochures. Of note, consent building with the public was pursued from the onset of a project in order to understand and address the concerns of different parties.

Slagle (2006) discussed educating the public on roundabouts in Washington County, Minnesota. Target groups with concerns included elected officials, senior citizens, parents, pedestrians, business owners and public safety officials. The county's approach was to start public education early in the planning process, with a focus on addressing the concerns of different audiences, and developing a strategic communications plan. The communications plan focused on the target audiences, key messages, and communications mediums/approaches with due consideration of and the available budget. In educating the public, the key message focused on what a modern roundabout is, how it works, how to drive through it and its safety and operational benefits. Communications and outreach methods included mailings, open houses, public displays, computer simulations, and partnering with groups in the community. Communication mediums also included television and newspapers. The key lesson drawn from these outreach efforts was that a consistent message is necessary across all approaches.

Barnett (2008) provided an overview of the approaches made to address opposition and educate the public in Springfield, Oregon. A multimedia approach toward outreach was used that included newspaper articles, group presentations, television interviews, brochures, direct mailings, radio ads and interviews, a telephone hotline and an animated cartoon. The focus and content of these approaches was not discussed.

Boddy (2008) discussed Nova Scotia's experience with roundabouts, including public awareness, education and support efforts. Approaches taken to educate the public on roundabouts included a full sized demonstration at an empty airfield, development of brochures highlighting the positive attributes of roundabouts and information handouts on how to drive or walk through them. No discussion of the content or effectiveness of these approaches was provided.

Pochowski and Myers (2010) evaluated the roundabout programs of Kansas, Maryland, New York, and Wisconsin to provide information for other states to consider in developing their programs. Through interviews and a review of existing state guides, the researchers determined that agency buy-in, public perception and establishment of a statewide policy were all crucial factors in the success or failure of roundabout programs. It was recommended that agencies

focus on these areas to ensure the success of their own programs. Specific approaches used to develop public buy-in and acceptance included:

- Kansas
  - Developed a roundabout brochure, and distributed postcards with information on roundabouts for both drivers and pedestrians.
- Maryland
  - Handouts, brochures, and presentations are used for every proposed roundabout. With roundabouts becoming more common, use of a dated roundabout video was discontinued.
- New York
  - A generic roundabout flyer and standard presentation were developed. Someone from the DOT attends all public meetings for roundabout projects, with the central office providing a presentation when necessary.
- Wisconsin
  - Developed a standard presentation for public meetings.

The second edition of NCHRP Report 672, *Roundabouts: An Informational Guide* is a comprehensive guide for the planning, design, construction, maintenance, and operation of roundabouts (Rodegerdts, et al., 2010). The document includes a discussion of various aspects of public involvement and acceptance of roundabouts. This includes discussions of the techniques available for informing and educating the public on roundabouts, which are identified and discussed in the following paragraphs.

The report stresses that the targeted audience makes a difference in the type of information presented and the approach (es) used. Identifying the target audience is the initial step in developing public outreach. All questions and concerns that the target group may have should be considered and addressed during outreach efforts. Additionally, technical versus general materials and approaches will need to vary depending on the specific audience. In some cases, introductory material may be appropriate, while in others, more specific project-related materials may be more useful. The purpose of all information presented should be clearly communicated.

Public meetings were cited in this NCHRP report as a useful forum for informing stakeholders about proposed roundabout projects and bringing them into the design process. Public input should be sought throughout the process to identify potential problems and develop acceptance of a project. Public meetings with affected stakeholders prior to initial project approval were recommended, even if they are not required by an agency. Tools to use at such meetings included project posters, maps, brochures and other visual displays. Large-scale roundabout models or simulations were other tools that were recommended.

The report indicated that informational brochures specific to a project or that provide general information have been widely used with success. These brochures can include drawings, photos, general facts (i.e. benefits compared to alternatives), and other information of interest related to roundabouts. Websites were another tool used to educate the public, noted particularly for their ability to provide more detailed and specific information compared to brochures. Videos were another medium for providing information to the public. The researchers state that the typical roundabout video was 10 to 15 minutes in length. Depending on the audience, this may or may

not be an appropriate amount of time and level of detail. If a shorter approach is needed, mediums such as television, radio commercials, or public service announcements may be more appropriate. Newspaper stories were a final approach to outreach and education that was cited in the report.

The City of Bend, Oregon, developed a coloring book aimed at third through fifth grade students and their parents to address negative public perceptions of the proposed use of roundabouts near a school (FHWA, 2011a). The book contained information including basic roundabout terminology, signage, pedestrian, and bicyclist use and driver responses to emergency vehicle presence. It also highlighted the safety advantages of roundabouts compared to traditional intersections. Additional public outreach materials included brochures for the public, a video, and a dedicated website. By addressing the public's misunderstandings, the awareness and support of roundabouts increased in the community.

Savolainen, et al. (2011, 2012b) conducted a review of roundabout public education and information programs and materials in the U.S. for the Michigan Department of Transportation. Early on, researchers identified a key issue regarding the public's confusion over the difference between roundabouts and traffic circles. This review stressed that there is a need to clearly differentiate between these designs at the onset of any project. Regarding public education programs, a survey of states (44 total) indicated 30 percent held public meetings, 30 percent published brochures, 9 percent used television and radio and 30 percent reported doing no education efforts (note that some states used multiple efforts in combination). Most states also used the internet to discuss different aspects of roundabouts and provide videos, driving instructions, etc. Approximately 59 percent of states reported that they conducted public information and education campaigns before construction of a roundabout. Public feedback on projects was solicited by 86 percent of respondents. Additional public outreach efforts included the use of scale models at public information meetings (in Kansas) to demonstrate roundabout operations. During the course of the research, outreach materials were developed for future use in Michigan, including posters highlighting modern roundabouts, roundabouts already installed in the state and the benefits of roundabouts, as well as a brochure to educate roundabout users. Also of interest to the present work, a survey of the public indicated that television (59 percent) and the internet (42 percent) were the most popular mediums for receiving roundabout education materials.

The Virginia Department of Transportation (VDOT) (Virginia DOT, 2012) has used a variety of methods to conduct public outreach and promote roundabouts. Among other approaches, they developed a 15-week series of roundabout facts that was presented on the VDOT website. The facts were presented as one or two page flyers covering different aspects of roundabouts. Articles were also submitted to local newspapers and magazines where roundabouts were being planned. Finally, a video informing viewers of the design elements and operational characteristics of roundabouts was developed for use on VDOT's website and at public meetings. Specific to public meetings, VDOT recognized that outreach was not "one size fits all" and tailored their approach at such meetings to address local concerns at and issues for each particular location.

Woodmansey and Spalding (2012) discussed the use of roundabouts in Billings, Montana on the Shiloh Road corridor. To address the concerns of local residents and the project advisory committee, MDT hosted a roundabout demonstration in a large, empty parking lot for the public to observe. The demonstration involved passenger vehicles, large trucks and emergency vehicles

performing different intersection movements in a full-scale roundabout laid out with traffic cones. This demonstration provided the public with an opportunity to physically observe the operation of a roundabout and gave MDT the opportunity to record video that could be used in the future. The demonstration allowed stakeholder concerns to be addressed and provided answers to questions that could be used at future meetings.

The FHWA's Roundabout Outreach and Education Toolbox (FHWA 2013) website[1] provides a resource for outreach to aid in obtaining public support for roundabouts. The website provides implementation guidance, case studies and success stories and product/outreach examples (videos, brochures, etc.) used by agencies in the past. Using the toolkit, a user can perform searches for information pertaining to outreach strategies and products (brochures, videos, etc.) that have been used in the past. Searches can be performed by the stage of the project (planning, design, etc.) that outreach is to address, as well as by other parameters.

2.2. Public Viewpoints

Retting, et al. (2002) conducted a survey of public opinion before and after roundabout construction in three U.S. communities: Hutchinson, Kansas; Harford County, Maryland; and Reno, Nevada. Prior to construction, approximately 55 percent of respondents were opposed to roundabouts being built. Following construction, 40 percent of those previously opposed were supportive of roundabouts. Those who opposed roundabouts previously indicated that they were against them because they either favored a signal or thought a roundabout would be unsafe or confusing. Those who continued to oppose after construction cited these same reasons for ongoing opposition. The researchers concluded that communities considering roundabouts need to develop effective educational and promotional programs that enumerate the benefits of roundabouts. However, no specific approaches to accomplish this were discussed.

In a follow-up to earlier work, Retting, et al. (2007) looked at long-term trends in public opinion on roundabouts following their construction. Telephone surveys were conducted one to five years following roundabout construction in Kansas, Maryland, and Nevada. Results found that, depending on the state, 22 to 44 percent of respondents favored roundabouts before construction, while 57 to 87 percent favored them after construction. Support was higher among young males (18-34) and lower among older drivers (65+). While approaches to addressing public opposition and education were not discussed, the results of this work indicate that older drivers are a group that warrants additional attention in order to understand and address their concerns and opposition to roundabouts.

Krzeminski (2008) discussed the consensus building efforts for roundabouts that were conducted by the town of Windermere, Florida. Past experiences of citizens with circular intersections in the area (not roundabouts) led to initial opposition. Before addressing the public, residents were sent a questionnaire to identify their concerns. Workshops and meetings were then developed to educate the public on roundabouts and how they operate, providing photo examples, videos and traffic simulations of different traffic control options.

Savolainen, et al. (2012a) looked at statewide public perception of roundabouts in Michigan using a web-based survey. A total of 11,972 respondents participated in the survey, providing feedback on general perceptions, positive and negative experiences and points of confusion as a roundabout user. Results indicated that 51.1 percent of respondents were slightly or strongly

[1] http://safety.fhwa.dot.gov/intersection/roundabouts/roundabouttoolbox/index.htm

opposed to roundabouts. Roundabouts were viewed by 52.7 percent of respondents to be a less safe design alternative, while 22.7 percent thought that they were less operationally efficient than other intersection designs. Respondents with less experience using roundabouts were most strongly opposed to them, as were females, pedestrians, motorcyclists, and commercial vehicle drivers. Based on these findings, particularly the relationship between limited experience with and subsequent opposition to roundabouts, the researchers recommended that agencies attempt to educate users on roundabout operation when they are proposed and during attendant planning activities. Recommended approaches included the use of videos, targeted content in driver manuals and websites. Although not listed by the researchers, the use of a full size demonstration in a parking lot could be another effective approach to provide concerned drivers exposure to roundabout operations before their implementation.

2.3. Case Studies

In some cases, roundabout projects initially opposed by the public have become accepted following construction. In addition to these, the researchers identified two cases where campaigns have been employed to address opposition and lead to roundabout construction. The following sections briefly highlight these cases.

2.3.1. Clearwater, Florida

The community of Clearwater, Florida encountered opposition to its first roundabout during construction (FHWA, 2011b). After the roundabout opened, several minor crashes on one of the exits further contributed to that opposition (although this situation was addressed through geometric, signage and pavement marking changes). There was concern that opposition would continue when proposing additional roundabout sites. To address this issue, the city began to use citizen design charrettes.

The charrette process consists of multiple steps. First, a design team visits sites where roundabouts may be proposed to determine if they are a feasible alternative. Second, the team meets with focus groups of project stakeholders to address their concerns and garner support for the project. Third, the team conducts half-day training sessions with the community. The purpose of these training sessions is to educate attendees on traffic flow, traffic calming measures such as roundabouts, and to hold a discussion on the benefits and concerns with different design options. Fourth, the team analyzes the feedback received thus far in the process and prepares for a follow-up meeting. Fifth, the team conducts another charrette in which participants develop a vision for the new intersection. Finally, the team reviews feedback from this second meeting and uses it to develop a consensus-based design.

Sixteen new roundabouts have been constructed using the citizen design charrette process following the first, controversial one. The process led participants to become comfortable with and supportive of proposed roundabout designs and convince others not present at meetings of the value of the design. The engagement of stakeholders early on and throughout the process served to both educate the public on roundabouts and develop support for them.

2.3.2. Green Bay, Wisconsin

When proposing the construction of two roundabouts in a school zone outside of Green Bay, Wisconsin, local officials were met with opposition from residents who were unsure how the intersections would work (FHWA, 2011c). Specifically, residents were concerned that

roundabouts would increase congestion, produce more crashes, and present a maintenance problem during winter weather. To address these concerns, a number of different approaches were employed.

Project officials held public meetings during which residents were invited to voice their concerns. These concerns were addressed by knowledgeable transportation planning and engineering representatives who sought to educate attendees on the benefits of roundabouts. The experiences of similar communities were also shared to illustrate how roundabouts could be expected to function. Visual aids were also used to illustrate the differences between roundabouts and traffic circles, which is typically a point of confusion for the public. These illustrations were particularly helpful in shifting public opinion. Finally, a video was made of the intersection before and after construction to show how the roundabout performed. The intent in making this video was to provide additional outreach material to be used on other proposed roundabout projects throughout the state.

The concerted effort to educate the public on roundabouts, particularly their differences from traffic circles, resulted in significant support. Wisconsin has since gone on to build a number of roundabouts statewide using the lessons learned from Green Bay to continue developing public support.

2.4. Chapter Summary

The results of the literature review identified a number of points that should be considered when conducting public education and outreach related to roundabouts. A recurring point raised by multiple references was the use of public meetings/forums to bring the public into the overall process. The earlier the public can be engaged, such as during the planning stages of a project, the more opportunity there is to develop consensus and acceptance of a roundabout alternative. Planning for such meetings is essential and the use of visual aids, whether mock-ups, simulations or other means, is helpful. Showing a willingness to hold a dialogue and engage with the public during meetings helps in addressing concerns with roundabouts, as does demonstrating that a full range of alternative designs has been considered. Collaborating with the press to alert the public on a project and educate them on why a roundabout is proposed has proven useful over time.

In general, an agency must keep in mind that different audiences will have different concerns, and the message being presented should be tailored accordingly. One interesting observation from the literature review is that it appeared, although not explicitly stated by any reference, that there is a split view toward the information being presented to the public at meetings. To some extent, the presentation of facts and figures was advocated (an engineering-centric approach) while in others, a more toned down, informal approach was employed that was more conversational or interactive with the public.

A number of approaches to roundabout outreach and education were presented in the literature. These included:

- Brochures
- Videos
- Simulations
- Television, radio and newspaper stories/interviews
- Displays/mock-ups

- Conceptual images
- Full-size demonstration (parking lot)
- Direct mailings
- Dedicated website
- Telephone hotline

As this list indicates, there are a number of different approaches that can be used as components for outreach and education efforts. Depending on the exact needs of an agency, many of these could be used in combination to meet the needs of different target audiences.

In terms of public viewpoints toward roundabouts, MDT's experience with opposition is not unique. Past surveys have shown that the public is typically opposed to the use of a roundabout before it is constructed, often by a large margin. Following construction, much of that opposition shifts towards support by those surveyed. For those opposed to roundabouts, the primary concerns are related to safety and driver confusion. These concerns are often the result of past driving experiences, typically through traffic circles, which have influenced a respondent's perceptions toward roundabouts.

3) AGENCY EXPERIENCE

The experience of Montana in encountering public resistance to roundabouts is not unique. While the literature review identified some documents discussing roundabout education/information campaigns, more specific experiences and approaches reside with agency staff members who have directly worked on roundabout projects. This information is largely undocumented; rather, it exists within the institutional memory of an agency. Consequently, part of the research conducted by this project was to survey agencies to learn about their experiences with public education and outreach for roundabouts, from their proposed use through their construction.

This survey was conducted in two steps. The first portion consisted of an online survey, conducted through SurveyMonkey, which sought basic information from agencies (whether roundabouts were considered in projects, if an agency had encountered public opposition). This survey is presented in Appendix A of this report. The key piece of information obtained from the online survey was contact information (name, email, telephone) for agency personnel who could discuss past and present experience with roundabout public education and outreach. These contacts were later interviewed via telephone to obtain firsthand information and insights into roundabout education and outreach. The questions posed to interviewees were developed in consultation with the MDT project technical panel, and are presented in Appendix B.

This chapter summarizes the results of the agency survey. It offers insights into the common issues encountered by agencies when proposing roundabouts, how approaches toward public education and outreach have evolved over time and discusses the different mechanisms employed by agencies when interacting with the public during different parts of roundabout projects. The information for each agency contacted is presented on an individual basis rather than collectively. This allows for the complete picture of an agency's experiences to be considered in one frame of reference.

3.1. Online Survey Results

The initial agency survey was distributed through MDT's Research Section to the research offices of other agencies. The email provided a link to the survey website, as well as a request that the link be forwarded to a contact within the agency that worked closely with the planning and design of roundabouts. The survey was distributed on February 13, 2013 and available to participants until February 28, 2013. A total of 30 responses were obtained from the following agencies:

- States:
  - Alabama Department of Transportation*
  - Alaska Department of Transportation & Public Facilities*
  - Connecticut Department of Transportation*
  - Florida Department of Transportation (District Three)
  - Florida Department of Transportation*
  - Georgia Department of Transportation*
  - Illinois Department of Transportation*
  - Indiana Department of Transportation*
  - Kansas Department of Transportation*

  - Louisiana Department of Transportation and Development*
  - Maine Department of Transportation*
  - Michigan Department of Transportation*
  - Michigan Department of Transportation (communications)
  - Mississippi Department of Transportation
  - Missouri Department of Transportation*
  - Nebraska Department of Roads*
  - Nevada Department of Transportation*
  - North Dakota Department of Transportation
  - Pennsylvania Department of Transportation
  - Ohio Department of Transportation
  - South Carolina Department of Transportation
  - South Dakota Department of Transportation
  - Utah Department of Transportation*
  - Washington State Department of Transportation
  - West Virginia Department of Transportation
  - Wisconsin Department of Transportation*
- Canadian Provinces:
  - British Columbia Ministry of Transportation and Infrastructure
  - Quebec Ministry of Transportation
  - Saskatchewan Ministry of Highways & Infrastructure
- Other:
  - Federal Highway Administration

Asterisks indicate agencies that were contacted during follow-up telephone interviews. These agencies are also shown in the map presented in Figure 2. Note that in some cases, multiple survey responses were obtained from the same agency.

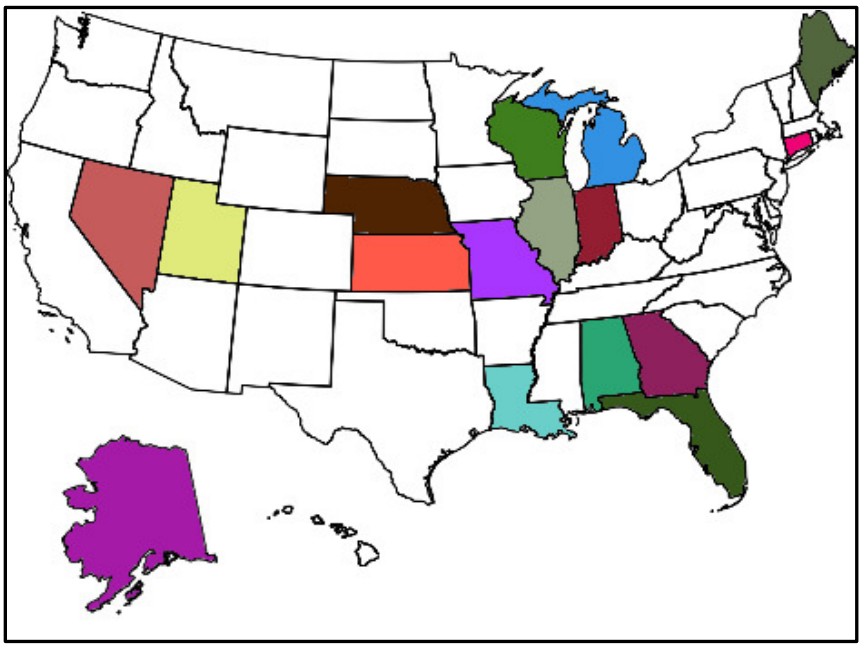

Figure 2: Agencies contacted in follow-up telephone interviews

As part of the survey, respondents were asked whether their agency considered roundabouts as an intersection alternative for traffic control. A total of 29 of the 30 respondents indicated that their agency did consider roundabouts as an alternative, while one respondent was unsure.

Next, respondents were asked whether their agency currently had any issues with public reluctance to accept roundabouts. A total of 19 respondents indicated that they encountered such issues, while nine indicated that there were currently no such reluctance. Two respondents were unsure whether there was public reluctance. As a follow-up question, respondents were asked whether their agency had experienced any reluctance toward roundabouts in the past. A total of 23 respondents indicated that their agency had encountered reluctance in the past, four had not, and three were unsure. Collectively, these results indicate that MDT is not unique in its experiences with public reluctance to roundabouts.

3.2. Agency Interviews

Based on the results of the initial agency survey, the researchers were provided with contact information (name, email, and telephone) for each survey participant. This allowed for follow-up telephone interviews to obtain firsthand information and insights into roundabout education and outreach. The following sections provide a summary of the information provided by agency personnel during telephone interviews. Note that while every attempt was made to contact each survey respondent, only sixteen of the survey participants (all from state DOTs) were available to complete the follow-up telephone interview during the course of the project.

3.2.1. Alabama Department of Transportation

At present, the Alabama DOT (ALDOT) does not have any roundabouts on their system, as there is not agency support for them at this time. However, if such designs are employed in the future, there is an expectation that there will be negative reaction from the public. The intention in presenting roundabouts as a design concept in the future is to be proactive and employ public education and meetings to present the benefits of roundabouts. In particular, it is expected that the information presented will point to the success stories from roundabouts built in other states.

A less technical approach would be employed in presenting information to the public. Information would be geared toward laypersons, with the use of computer renderings and models (simulation) to present proposed designs. Brochures/pamphlets and websites would also be used to provide more information. Finally, outreach stories would be pursued with different television, radio, and newspaper outlets in the area of a project. It is expected that ALDOT's PIO office would be involved with roundabout efforts, although outreach would likely be handled via consultants with PIO supervision.

ALDOT employed a successful approach to outreach related to an upgrade project on Interstate 65. Specifically, the project had a dedicated website to provide information to the public. ALDOT was able to direct people to the website, including via radio and newspaper advertising. No cases of unsuccessful outreach or media campaigns were cited.

In general, there are staff members at ALDOT who are in favor of roundabouts, but a critical mass of support has not yet developed. When such support does exist and ALDOT pursues roundabouts, proper design and location are viewed as being critical for success.

3.2.2. Alaska Department of Transportation & Public Facilities

The Alaska Department of Transportation & Public Facilities (ADOT&PF) has constructed approximately 17 roundabouts since 2001. ADOT&PF has used public presentations from the beginning to reach the public on roundabout projects. There has been public reluctance to projects over the years, but once a roundabout is constructed, it is accepted. The state has found that selling the idea of a roundabout based on lower costs, reduced delay, and improved safety has generally worked. One perception that ADOT&PF has confronted a number of times is exceptionality; that is, while the public is willing to recognize that a roundabout worked somewhere else, they are adamant that it will not work in their community. This issue has been addressed by presenting the public with the benefits of roundabouts during presentations.

Presentations are made at public meetings, followed by questions and answers, as well as a "show and tell" portion that presents the concept, drawings, etc. The presenter is typically an ADOT&PF staff member who is a good listener and who can turn public questions into an opportunity to highlight the benefits of roundabouts. The state provides information on using roundabouts in the driver's manual, as well as general information presented on a dedicated website. Aside from this information, news stories by television, radio, and newspapers have been written for different projects. This has become less important as roundabouts become more common. Each region in Alaska has a PIO who can assist in the development of roundabout materials. This work may also be performed by contractors, depending on the project.

In the past, Alaska has had success in introducing flashing yellow arrows via radio spots and a dedicated website. The messages have been project-specific and explained how the arrows will improve the highway system and how to respond when they are encountered. This approach has also been employed when introducing high-intensity activated crosswalks (HAWKs).

In general, people are cautious using roundabouts in Alaska, which has an impact on their efficiency. Experience has found that the first 5 to 10 roundabout projects in a state (or locale if a community is the proposing entity) will be tough, particularly from the perspective of public reluctance. However, once a number have been constructed, opposition tends to decline. Currently, ADOT&PF's problems regarding roundabouts more often focus on driver confusion on multi-lane roundabouts.

3.2.3. Connecticut Department of Transportation

The Connecticut Department of Transportation (ConnDOT) has been building roundabouts for approximately 10 years, although only five have been constructed. Initially, the New York DOT made a presentation to ConnDOT staff to educate them on roundabouts and their benefits. This same information was then used by ConnDOT in their initial public education and outreach presentations. Before meeting with the public, however, ConnDOT staff met with city officials from the community to discuss the project. This gave local government an opportunity to "beat ConnDOT up" on the idea and a chance for ConnDOT staff to respond and develop initial support from local government. When meeting with the public, a focus has been made on the safety impacts of roundabouts, and project renderings have been presented.

The approach to public outreach and education has evolved over time. There were initial issues with public reluctance, and the design renderings helped with explanations and advocacy. While visual aids are important, another critical component is to focus on the purpose of the roundabout (safety or traffic flow) and tailor presentations based on that focus. It has also been useful to

show comparisons between traffic circles and roundabouts to explain the differences between them in terms of size, function, etc. Finally, the traffic calming aspects of roundabouts should also be stressed. By focusing on the positives, including the landscaping opportunities, support can begin to develop.

Promotion materials developed by ConnDOT include pamphlets that are sent out to residents before construction begins. The focus of the pamphlets is on how to use a roundabout rather than design aspects or other facts. There has been an effort to avoid making the information too complicated, which might irritate the public. For example, roundabout use has been simply explained as being like making a right turn from a driveway. If a double lane roundabout is constructed in the future, the pamphlet materials will need to be revised.

Media such as television, radio, and newspapers are not used to promote roundabouts. There is a video posted to ConnDOT's website on how to drive in a roundabout, but in large part, the DOT tries to avoid overselling the concept. Instead, the preferred approach is to explain why a roundabout is a good solution; if a community is largely opposed after initial outreach efforts, the roundabout concept is dropped and the DOT moves on to different alternatives.

ConnDOT does not have a PIO office, so there is no assistance in developing roundabout materials such as presentations or pamphlets. In the absence of such an office, no examples of successful or unsuccessful outreach campaigns had been directly produced.

General thoughts related to roundabouts included the use of additional tools in presenting roundabouts at meetings, such as simulations (VISSIM). These help to show how traffic will operate using a nice visual tool. ConnDOT is also looking at doing more detailed three-dimensional renderings in the future for use at meetings. Finally, as more roundabouts are constructed, more examples of successful applications will be available for future presentations. When starting out with a new program, the initial installations need to be placed where they will be successful, providing cases that can be described in future meetings.

3.2.4. Florida Department of Transportation

The Florida DOT (FDOT) has been building roundabouts on the state system in recent years (the approximate year this began was unknown). Presently, there are fewer than 10 completed roundabouts, but local communities are becoming more interested in them. The approach taken to promoting roundabouts has significantly changed over time. FDOT initially pushed the concept heavily in the mid-1990s, but did not get anywhere in terms of acceptance. In more recent years, projects have simply been proposed in locations where there are lower traffic volumes, with the idea that these projects will be a good starting point for getting the public (and drivers in general) accustomed to roundabouts.

Public presentations are made by FDOT to local government officials, unless the project is of significant size, in which case there are public meetings. The presentations to local officials are more detailed and engineering-based since the audience typically understands the overall concepts.

Specific promotional materials are not presented to the public; instead, a gradual transition process is employed in the physical layout of the site as the roundabout is constructed. Initially, traffic cones are laid out at the site, followed by half dome reflector buttons and then full concrete curbing. This is done to allow drivers to familiarize themselves with the roundabout in a low-impact environment. No specific forms of media are employed to promote roundabouts to

the public. The consensus is that unless local officials are supportive of the project from the beginning, promotional efforts will be ineffective. Most promotional work for other projects is handled in-house by the PIO. If promotional products such as pamphlets and presentations are developed in the future for roundabouts, then the PIO would be involved along with local project staff. No examples of successful or unsuccessful past outreach and promotional efforts were identified.

3.2.5. Georgia Department of Transportation

The Georgia DOT (GDOT) has been building roundabouts since approximately 2003, although the program has seen increased construction in recent years. To date, approximately 140 roundabouts have been built. When initially approaching the presentation of roundabout information to the public, GDOT follows their design manual policy carefully (Georgia Department of Transportation, 2013). The design policy related to roundabout outreach was published about three years ago; prior to that, no formal policy was in place (the design manual policy on public outreach for roundabouts is reproduced in Appendix C). The approach now used requires the project manager to meet with the local government and then the public for all prospective roundabout projects. The exception to such meetings is when there is an existing roundabout constructed near the proposed site that is working well.

Prior to the design manual approach, there was a good deal of public reluctance and opposition to roundabouts. GDOT recognized that staff needed to be more informed on what they would say at public meetings. However, since the design manual policy was put into place, public meetings have been more favorable and roundabouts have been received more positively. Public meetings are informal, with the public "dropping in" throughout the allotted time. No formal presentations are made. GDOT staff members are present to answer questions in an informal setting, as well as to collect comments. This staff includes a roundabout subject matter expert or an individual with considerable knowledge of roundabouts.

Outreach materials include trifold pamphlets, posters, videos (those from FHWA and other states, not Georgia-specific), and scale models. VISSIM simulations may also be developed for a site, and GDOT also has a roundabouts website. The public likes these materials and they are developed on a project-specific basis, except for the pamphlets and videos. The pamphlet has been revised a few times over the years. No other forms of media are used for outreach.

The PIO office does not assist in the development of roundabout outreach materials; the design section handles this work. GDOT has had a successful outreach effort unrelated to roundabouts that is worth noting. During resurfacing work on a freeway through downtown Atlanta, GDOT implemented numerous continuous lane closures throughout an entire summer. GDOT conducted an extensive outreach campaign throughout the process that included speeches to anyone who would host them; meetings with major local employers; paid advertisements in newspapers, on television, and on radio; collateral materials such as gas station placards; and the distribution of fold out detour maps through various outlets. Collectively, this effort cost approximately $850,000 [2].

General thoughts on roundabouts include consideration of the adoption of a public involvement process specific for roundabout projects as part of the design manual or similar documents.

[2] Speer, David. Email communication with the author. March 8, 2013.

Meeting with local officials and obtaining their buy-in to a project is also important. This greatly reduces public criticisms at meetings.

3.2.6. Illinois Department of Transportation

The Illinois DOT (IDOT) has been building roundabouts since 2007 and has constructed six to date. Outreach and education efforts related to roundabout projects have been no different from what was already done for intersection reconstruction projects. That being said, an enhanced stakeholder process consisting of more public meetings is employed for roundabout projects. Given the relative newness of roundabout construction in the state, the outreach process has not evolved over time. Interestingly, many of the roundabout projects constructed and proposed have been suggested by local governments, indicating at least some initial public support exists.

Presentations on roundabouts at public meetings are made by DOT staff members, sometimes augmented by consultants on a project-specific basis. Some technical information is presented, but most information is non-technical in order to facilitate understanding. Animations and visual aids are used during presentations to further present and explain concepts. No additional information, such as pamphlets, has been developed for outreach. Television, radio, and newspapers are not used at present to promote roundabouts, although IDOT does try to engage local media and provide them with information that can be used in stories on a particular project. The PIO section does not assist in roundabout-related efforts, although they are available to assist with press-related questions.

IDOT's safety bureau has been particularly successful in outreach and education campaigns geared toward reducing fatalities, seat belt compliance and the use of child safety seats. This outreach has been through various media forms and is coordinated with police, the National Highway Traffic Safety Administration (NHTSA), the American Traffic Safety Services Association (ATSSA), and others.

Additional thoughts provided on the development of roundabouts included the need for deep and broad public involvement from the start of a project, as well as the need to stress the safety benefits roundabouts offer.

3.2.7. Indiana Department of Transportation

The Indiana DOT (InDOT) has been building roundabouts for approximately five years. In Indiana, local projects have led the way in this respect, with roundabouts being built on the state system later. No approximate figure was available for the number of roundabouts that have been constructed in Indiana to date. The initial approach taken to presenting roundabouts to the public involved the identification of intersections in need of improvement for which roundabouts were one recommended alternative. The concept was proposed at town hall/public meetings, and meetings were held with local officials and stakeholders.

This approach to public outreach evolved over time. Some communities were able to post roundabout information on their websites, while in others, information kiosks were set up in high-traffic locations such as libraries. Some communities were more open-minded to the idea of roundabouts than others were, but in most locales, the concept is slowly gaining acceptance. One approach InDOT has begun to incorporate is pointing out other applications that have been successful in the state. However, in smaller communities, opposition remains.

The public meeting presentations made by InDOT staff members are less technical in order to easily get the information across to the public. The project-specific presentation is always put together by central office staff. Additional promotional materials include a dedicated project website for larger projects, as well as FHWA pamphlets. These approaches/materials have not changed over time; InDOT prefers to continue using FHWA materials. Different forms of media are also employed, depending on the project. This entails the media director from a respective district office going out to educate the public on a project by involving different media (television, radio, and newspaper). InDOT's PIO generally handles the development of specific outreach materials, unless the project is very large.

One outreach campaign not specific to roundabouts that has been successful was related to noise abatement/noise walls. InDOT is always answering questions on this issue, so they have undertaken campaigns to educate the public on the reasons behind their noise abatement and noise wall practices. This has entailed the development of positive messaging concepts presented via the internet. In addition, snow removal and pothole repair messages have been presented through different media in the past with some success.

In terms of general thoughts, it is important to appropriately sign roundabouts. InDOT has received public feedback on this issue in the past. Overall, Indiana is still working on winning the public over to the idea of roundabouts, which is similar to what other states have had to do. It is viewed as an ongoing process that needs to evolve over time.

3.2.8. Kansas Department of Transportation

The Kansas Department of Transportation (KDOT) has built 30 roundabouts on the state highway system since 1997. An additional 150 roundabouts have also been constructed off the state system during this time period. Initially, roundabouts were poorly received. When one of the early roundabouts was constructed, the public perception was that KDOT was "experimenting" on them. However, once the public started to use that particular roundabout, they liked it. The first few that are proposed and constructed are the hardest to do because of public opposition and they need to be built at sites where they will work.

Over time, the lesson that KDOT has learned is that they have to approach proposing roundabouts the right way. In addition to public meetings, KDOT uses other approaches to educate and reach out to the public. These include the use of videos[3], VISSIM simulation models for selected sites, brochures, and before and after studies to show how roundabouts have worked in Kansas. Both technical and non-technical KDOT staff members are present at meetings to answer questions on specific aspects of roundabouts (e.g., traffic engineering or design, driving expectations, etc.). Project-specific handouts and simulations are also typically developed. Experience has shown that public meetings are a good opportunity to talk with people interested in the project and answer their questions and concerns. KDOT also tries to meet with affected stakeholders, such as trucking firms, to discuss design vehicles for a specific project. Finally, information is also provided to groups such as the American Association of Retired Persons (AARP) to distribute to their members.

KDOT does not specifically employ television, radio, newspapers, or other media to promote roundabouts. However, stories have made it into the media for specific projects via reports on the associated public meetings. KDOT is currently rewriting their roundabout guide, and it will

[3] http://www.youtube.com/watch?v=HnIxJ2CTBXk

be provided to different entities, although it is not clear if the media will be among them. The PIO generally handles the development of different roundabout materials in-house, with assistance from the traffic engineering section. No alternative outreach campaigns conducted by KDOT were identified as being particularly effective or ineffective.

In terms of general thoughts related to roundabouts, it is crucial that agency representatives are prepared regardless of the project and know what they are talking about. The design, signing, and pavement markings for the roundabout need to be correct once constructed in order to avoid leading people into the wrong lane. Finally, overdesign can be a concern, and most roundabouts should be designed with a single, expandable lane initially. This type of design can accommodate expansion if it is needed in the future.

3.2.9. Louisiana Department of Transportation and Development

The Louisiana Department of Transportation and Development (LA DOTD) has been building roundabouts since approximately 2001, with 15 now in place on the state system. Initially, the approach to presenting information to the public centered on public meetings. At these meetings, attendees were told that LA DOTD would be installing roundabouts. This approach was not well received by the public. Since then, LA DOTD has developed a number of supplemental aids to present to the public at meetings, including a large-scale model of a roundabout, complete with cars and signage, simulation videos (VISSIM) and videos from other locations where roundabouts have been built in the state. A testimonial from a mayor of one community is also presented that speaks to the benefits that resulted from the roundabout installation. Presentations are still made using LA DOTD or consultant staff, and these are less technical in nature.

A general brochure on roundabouts has been developed and posted on the LA DOTD website to explain how to drive a roundabout. Project-specific VISSIM simulation videos are also posted on the website. While promotion through other forms of media is not used, invitations are sent to local media to the public meetings being held on roundabout projects. LA DOTD is interested in developing a YouTube video for roundabouts as well, but there is not presently any funding available. The PIO office at LA DOTD does assist as needed in putting together materials, but it has limited capabilities. No specific successful or unsuccessful outreach campaigns were cited, although contracted outreach has been done in the past for an interstate widening project.

In general, LA DOTD's experience with roundabouts is that installations are politically driven, and there is a need to get buy-in from local officials on a proposed roundabout. This is done by having a pre-meeting with local government before presenting a concept to the public. This meeting does not always go smoothly, but once there is support and the project is built, the public begins to accept it. There have been cases where local support could not be obtained and in those cases, the roundabout was not built.

3.2.10. Maine Department of Transportation

The Maine DOT (MaineDOT) has been installing roundabouts on the state system for around 16 years, with approximately 20 constructed during that period. The first installations did not go well, as they were poorly constructed. In addition, there are two older traffic circles that have the highest crash rates in the state, a fact the public is aware of and which they bring up in roundabout discussions. Consequently, there is some opposition to roundabouts when they are proposed. However, the general experience with roundabouts has been that once they are constructed, the public likes them.

Proposing and moving forward with roundabouts has become less challenging over time. The public perception has changed and now most people like them. Based on that change, MaineDOT focuses on the safety aspects of roundabouts when presenting them to the public. The issue now has moved to their cost; legislators would prefer the less expensive option (signals) be used. In such cases, the safety benefits of roundabouts are stressed, especially for pedestrians.

Current presentations on proposed roundabouts are made during the project development phase. Presentations are made by Ourston Roundabout Engineering, a Wisconsin-based firm. One of the tools used during public presentations is a scale model of a roundabout (conceptual model) with cars and trucks to show how the roundabout will operate with different vehicles. The presentations that are made are less technical, since experience has found that the public does not understand the engineering aspects of roundabouts very well.

Regarding promotional materials, MaineDOT uses flyers and a general website (that contains information applicable to any location). The website has been completed more recently. Aside from these, alternative forms of media are not directly used. However, experience has shown that when a new location is proposed, there is a good deal of local news coverage through various outlets. The PIO provides assistance with roundabout outreach as needed and the office is fairly robust, although understaffed. No other agency-specific media campaigns that were either successful or unsuccessful could be cited.

General thoughts on roundabouts include recognizing that the need for public knowledge is key when conducting outreach. In Maine, the conversion of traffic circles to roundabouts led to a drop in crashes, which provided a tangible benefit to point out during presentations. A peer review process is used in roundabout designs (Ourston Roundabout Engineering provides an external review), which facilitates the identification of design improvements. The biggest issue MaineDOT now faces is related to cost; construction costs are the most contested aspect of roundabouts and need to be justified over alternatives such as signals.

3.2.11. Michigan Department of Transportation

The Michigan DOT (MDOT) has been building roundabouts since the early 2000s (some traffic circles were built earlier), with 98 constructed to date. These roundabouts are a mixture of single and double lane configurations. The initial approach was to install roundabouts without input from the public. No information was provided; no media campaigns were used. There were public meetings in conjunction with projects, but these were primarily to present project information. The use of roundabouts was met with opposition under this approach.

Over time, MDOT has reached out to the media to present information to the public on roundabouts. As more roundabouts have been built, the public is seeing their value and gaining experience in using them. This has helped to reduce opposition to new projects. At public meetings, local DOT staff associated with the project handle presentations. The presentation is less technical and includes background information and options related to the project. Recent work has developed promotional information for roundabouts in the state (that work is discussed elsewhere in this report (i.e., Savolainen, et al., 2011 and Savolainen, et al., 2012b)), including pamphlets.

Although other forms of media are not specifically used to promote roundabouts, television news has covered some projects with stories. Now that materials have been developed through

research, pamphlets are being distributed at rest areas. MDOT also tries to get information out on their website. MDOT's communications office generally handles work internally and has assisted in compiling roundabout materials. The majority of the content for these materials was developed by a Wayne State University research project (Savolainen, et al., 2011 and Savolainen, et al., 2012b).

Aside from roundabouts, MDOT has conducted outreach via advertising to alert the public to the installation of cable barrier systems in the state. The purpose of this outreach was to help the public understand why these systems were being installed. However, the success of this approach is unknown. Deer awareness outreach has not been successful in the state, despite the distribution of materials to the public. No significant changes in deer-vehicle collisions accompanied this outreach effort.

Other thoughts on roundabouts center on developing an understanding among drivers of how to drive through them. The layout needs to be simple for drivers, so ensuring the most appropriate design is in place is crucial.

3.2.12. Missouri Department of Transportation

The Missouri DOT (MoDOT) has been building roundabouts since the early 2000s, and has approximately 50 on its system at the current time. The first few locations were opposed by the public, and so MoDOT conducted more public outreach events. However, there are now enough roundabouts throughout the state system that proposals for new locations are generally accepted by the public without any problems.

The traditional approach to outreach has always been through public meetings, but over time, public resistance has decreased. The primary change over time has been from justifying why roundabouts should be considered to pointing out the successful applications. The successful development of roundabouts in the state has reached a point where people now look for opportunities to use them. The presentations made to the public are less technical, but more sophisticated tools such as simulation (VISSIM) are incorporated. The presentations are made by DOT staff, primarily from engineering and customer service.

Additional outreach materials produced by MoDOT include a pamphlet and video to educate the public on how to drive a roundabout. Other forms of media are not generally used, although local newspaper stories for specific projects have occurred in the past. MoDOT's PIO (Customer Service) has put the education materials (pamphlet and video) together in-house, although staff is limited. As indicated earlier, staff from this section assists in public meetings.

One alternative outreach and education campaign in Missouri that has been successful in the past was the promotion of diverging diamond interchanges. This concept was promoted to the public by the development of a driving simulation video that explained the concept to viewers. The absence of public backlash to the concept and project informally indicated that this outreach approach was successful.

General thoughts on roundabouts centered on making sure they are designed, signed, and striped correctly to avoid driver confusion. It is essential to make sure they are used in locations where they will be successful. This gives an agency something to point back to in future projects. Outreach materials such as pamphlets available at local businesses have been effective in the past. Finally, VISSIM simulations have been a very useful tool during meetings to demonstrate how the roundabout will work.

3.2.13. Nebraska Department of Roads

The Nebraska Department of Roads (DOR) has been constructing roundabouts since 2004, with approximately five built to date. The initial approach taken to public outreach followed the National Environmental Policy Act (NEPA) process, and included public presentations and meetings. This approach is still used, recognizing that it must be tailored to each specific situation.

The Nebraska DOR approach to public meetings is to use a loose, one-on-one format where individual members of the public can meet and talk with DOR staff members. Animation and simulation are now used, and comparisons are made between the proposed site and a roundabout that has been built at another site. Experience has shown that if there is a good purpose and need for the project, it will be accepted. Additionally, meetings with local stakeholders before a public outreach meeting occurs has been an effective approach to learning about concerns. The information presented in meetings focuses on safety concerns and benefits and is less technical. Presentations are handled by communications staff and public comments are collected via a submission process (these are addressed at a later time during documentation).

Outreach materials include a general pamphlet and videos, but the impression of the DOR is that these are not very effective given their generic nature. Site-specific information is produced for each project to address this, although the use of this information is limited to public presentations. Aside from the general outreach materials, alternative media forms are not used. One of the reasons that television, radio, and newspapers are not used is to avoid labeling a project as being of a certain type (i.e. labeling something as being a roundabout project instead of an intersection improvement before a decision has been made). Once a project moves along following the public meeting, then a story may appear discussing the roundabout. The DOR's PIO office has assisted with outreach efforts, specifically in the development of the video and pamphlet. No specific examples of successful or unsuccessful outreach campaigns were identified.

General thoughts on roundabouts included the need to exhaust all potential options when considering alternatives. During that process, an agency should show why other alternatives, e.g., adding signs, signals, etc., will (or have not) worked. Once constructed, the public is generally accepting. In one case, the DOR had a community ask for a roundabout to be constructed to serve as a community gateway, which showed that once exposed to successful applications, roundabouts could be an attractive alternative for the public.

3.2.14. Nevada Department of Transportation

The Nevada Department of Transportation (NDOT) has built three or four roundabouts on minor arterials in the Las Vegas area and three more north of the city. A few additional sites (three or four) have also been constructed in the northern portion of the state. Collectively, these roundabouts were built beginning in the late 1990s through the present.

The initial approach to presenting information to the public regarding the proposed use of roundabouts was primarily through public meetings. Over time, this approach has not evolved very much, although NDOT is still working on changes internally. A roundabout consultant has been hired who will be doing a two-day workshop for NDOT that will discuss other mechanisms for public outreach and education (note that this workshop had not occurred before the date of the telephone interview).

Regarding the public meetings currently employed, the entity presenting information to the public may be NDOT staff or a consultant, depending on the project. The approach taken by these presentations is less technical, usually focusing on drivers or other local stakeholders. The presentations often focus on the quality of life aspects offered by roundabouts as well (e.g. reduced idling and emissions, pedestrian safety, etc.). No promotional materials such as brochures have been developed to date, although NDOT's YouTube video[4] on roundabouts could be considered partly promotional (its primary focus is on how to drive through a roundabout). Aside from this use of video, no alternative media (television, radio, or newspaper) approaches are used to promote roundabouts.

NDOT's Public Information Officer (PIO) is involved in roundabout projects and engineering staff work with the PIO section staff to put together material on roundabouts for meetings. The PIO section is well staffed, and handles roundabout assistance in-house rather than through a consultant.

With respect to the effectiveness of other media campaigns that have been conducted by NDOT, the present highway safety campaign that focuses on safety messages to the public has been effective. The Nevada Broadcasters Association is also under contract to run public service announcements (PSAs) on their media outlets throughout the state, which has been effective in getting DOT messages to the public.

Aside from the current approaches employed in Nevada, the general experience of NDOT with roundabouts is that there is still public resistance to them, although acceptance develops once they are built. There is still entrenched opposition to roundabouts that probably cannot be addressed. The key aspect to keep in mind is that transportation engineers need to be careful not to build roundabouts where they are not appropriate. If roundabouts are constructed where they will be most useful and work properly, they will be successful and can be used to promote them in the future.

3.2.15. Utah Department of Transportation

The Utah DOT (UDOT) has constructed a single roundabout to-date on the state highway system. However, on local/municipal roads, roundabouts have been built since approximately 2000. Consequently, UDOT does not have an established approach to roundabout outreach. The general view is that they should not be built on most state routes because of the higher posted speed limits negating their attractiveness as an improvement alternative.

In general, UDOT's approach to outreach on projects is to make presentations when a project manager determines them to be needed. When presentations are made, they are less technical so that meeting attendees can easily understand the information. The PIO typically handles the development of outreach materials, although that can be contracted to consultants on larger projects. It is expected that for many roundabout projects in the future, the development of outreach materials would be contracted outside UDOT.

UDOT has had success in the past with promoting the development of diverging diamond interchanges and other unique designs such as continuous flow intersections. These outreach efforts have included movie theater trailers discussing the designs and projects, as well as website animations and project pamphlets.

[4] http://www.youtube.com/watch?v=Pke54GzMSjo

3.2.16. Wisconsin Department of Transportation

The Wisconsin DOT (WisDOT) has been building roundabouts since 2004. Approximately 20 roundabouts currently are built per year. At present there are 193 roundabouts on the state system. Initially WisDOT educated the public using information and approaches that had worked in other states, including information from FHWA regarding the safety benefits achieved. WisDOT also developed two videos to use in their outreach efforts; one was a testimonial from a location where roundabouts had been installed and the second focused on the safety benefits that result from their use.

Over time, WisDOT has adapted the approach taken to outreach on its roundabout projects. The state's roundabout guide is updated every couple of years. The information used in outreach has also changed over time. Originally, there were the videos, and then newspaper ads were added to educate the public on how to drive roundabouts. Information on driving roundabouts was also put on a dedicated panel on state highway maps, and an information flyer was included with license plate renewals. Right now, WisDOT is working with the trucking industry to combat the myth that a semi-truck cannot be driven through a roundabout.

Public meetings in Wisconsin typically take on an open house format where the public can ask questions, review display panels, etc. However, this approach has not been as effective as when a presentation (approximately 20 minutes) is made. When a presentation is made, it is less technical and handled by the consulting firm working on the project. The general use of promotional materials has varied by location and included those items listed in the previous paragraphs. In general, the impression of WisDOT has been that the information provided has helped in generating acceptance, although that acceptance largely develops following installation. Additional media forms are not used in outreach because of costs. YouTube has been considered, but how to tag a video appropriately to attract views is a question they have not been able to answer.

The PIO assists in developing roundabout materials in Wisconsin, with most work done in-house. If a project is large, then such work may be contracted outside WisDOT. Regarding past outreach efforts, it is unclear to WisDOT how effective the newspaper ads were in explaining how to drive roundabouts. The pamphlets distributed with license plate renewals also produced mixed feedback, as some of the public likes roundabouts and others do not. Four million copies of the instructional pamphlets were distributed, representing significant contact with the public.

The general thought related to roundabouts is that a continuous education effort is required at all levels (statewide and local) to inform and educate the public about them. Information needs to be distributed to as many groups as possible as part of the overall effort.

3.3. Chapter Summary

Through the agency survey and telephone interviews, it is clear that MDT's experience of public opposition to proposed roundabouts is not unique. A majority of the agencies that provided information have encountered similar issues early in their development of roundabouts. Based on this experience, several agencies provided information that will be useful for MDT to consider in developing roundabout projects in the future. Many staff members who were interviewed stressed that early roundabouts should be built where they are most likely to be successful (i.e. operate well, produce safety benefits, etc.). These roundabouts can then be

reported on at future public meetings as success stories, while noting the similarities with the proposed site.

Experience has shown that, even for projects that were significantly opposed, once a roundabout is constructed, the public general accepts them. In many cases, agency contacts indicated that roundabouts had become so accepted that some communities began to make requests for them. This result ties in to another key point: buy-in from local government officials is essential for addressing public reluctance. If local government is opposed, it is less likely that the public will accept a project. Meeting with local government officials, answering their questions, explaining why a roundabout is the preferred option and demonstrating that other alternatives have been considered is the recommended approach to meeting this need.

In summarizing the results of the interviews with agencies, it was found that they all use public meetings as a primary method of public outreach on roundabout projects. At the other end of the spectrum, it appears that no agency has used media campaigns to promote roundabouts. Most agencies incorporate a formal presentation as part of their public meetings, typically less technical in nature and often customized to the audience and location. Some agencies further employ visualizations, physical models, and physical demonstrations of roundabout operations. Occasionally agencies were found to use brochures and other printed materials to disseminate information on roundabouts, often indicating how to drive through them. Of course, in today's technological society, many agencies posted information on roundabouts and/or roundabout projects on their websites, often including some form of video. No information appeared to be available on formal assessment of the effectiveness of these various outreach approaches. That being said, a general sense was obtained that generally initial outreach to local government officials, public meetings, video, simulation models and physical demonstrations were effective. A key finding of the agency survey and follow-up interviews was that it appears that no agency engages in promotion of roundabouts through media campaigns. In other words, no agency has developed advertisements that champion the use of roundabouts, although the Federal Highway Administration's web-based general videos could be considered to be championing roundabouts. Rather, agencies appear to believe that project-specific justification for roundabouts is needed before they are proposed to the public. Using direct advertising to develop interest in or acceptance of roundabouts in general or for a specific project was not viewed by any agency interviewed as holding potential in swaying public opinion. However, this does not prevent such a course of promotion from being pursued, particularly on a trial basis.

With respect to successful or unsuccessful outreach campaigns not specific to roundabouts, some agency contacts provided general examples. In most cases, these involved the development of websites and handout materials (e.g., brochures). Many agencies indicated that their PIO was involved in the development of such materials, although to varying extents. In one unique case, an agency employed brief trailers in movie theaters to explain a new roadway design. Only one unsuccessful campaign was cited, specifically related to promotional materials to increase public awareness of deer-vehicle collisions. The agency contact that cited that campaign was not sure as to why the materials were not effective.

4) PUBLIC SURVEY

In order to understand how MDT can better approach the public when proposing a roundabout, it is critical to understand how Montanan's currently view roundabouts and MDT's current approach to outreach and education. To obtain this understanding, a web-based survey was developed and distributed to Montana residents who had attended public meetings for projects that incorporated a roundabout. Specifically, those attendees who had provided comment and feedback (either verbal statements or written submissions, both positive and negative) specifically discussing roundabouts were identified as prospective survey participants. The thought was that these individuals were likely to provide meaningful insights into public views on roundabouts and also provide constructive feedback regarding MDT's approach to public outreach and education about them. Specifically, the intent of the survey was to understand why the public supports or opposes roundabout projects and to determine what information/approaches would be useful in helping to educate them on why that design might be chosen over another intersection treatment.

4.1. Methodology

The approach for this aspect of the research involved first identifying prospective survey participants and then distributing a web-based survey to them. Based on discussions with the project panel, the most straightforward approach available to identify potential survey participants was to examine MDT public meeting records (sign-in sheets) and comment files such as environmental impact statements and environmental assessments (http://www.mdt.mt.gov/pubinvolve/eis_ea.shtml) associated with proposed projects that included the construction of roundabouts. This information was available from MDT primarily in hard copy files for the specific project, as well as in the meeting minutes for specific projects available electronically on MDT's website. The researchers reviewed the comments and feedback from these meetings and recorded the name and email addresses of attendees so that the link to the online survey could be distributed to them. Hard copy files for each project (if available) were reviewed on-site at MDT headquarters. Approximately 180 email addresses were recorded by this approach. The specific projects from which information was obtained included:

- Kalispell MT 35 project
- Missoula East/West Interchange project
- Billings Shiloh Road reconstruction
- The Bigfork North and South project
- Missoula Russell Street reconstruction
- Billings Airport entrance
- Red Lodge Northwest project
- Bozeman College Street and 11th Avenue intersection reconstruction
- Billings Bench Boulevard project

A web-based survey was developed and posted on SurveyMonkey that sought the views of participants on a number of different aspects of roundabouts, including their general views/opinions of a) roundabouts, b) MDT's approach to roundabout presentation/outreach, and

c) different presentation/outreach approaches that could be used. The full survey that was developed and distributed is presented in Appendix D. A link to the survey was distributed to prospective respondents via email on March 12, 2013, and the survey remained active until April 15, 2013. Prior to this end date, no responses had been received for approximately two weeks. Of the approximately 180 email contacts identified, 30 were returned as having undeliverable addresses. Consequently, the approximate pool of survey participants was 150. A total of 61 responses to the survey were received, corresponding to a response rate of 41 percent. Given the challenge of identifying contacts whose information (particularly email addresses) was still current, this response rate was higher than expected by the researchers.

The following sections discuss the results of the public survey. However, before discussing the survey results, a summary of general public views and opinions expressed during public meetings and via comment submissions for different roundabout projects in the state are presented. This information provides a baseline understanding of what people thought of roundabouts specific to each project and gives a frame of reference when examining the results of the public survey conducted during this research.

4.2. Past MDT Project Public Feedback and Comment

During the course of identifying contact information for prospective survey participants, the researchers reviewed different data sources pertaining to MDT projects either specific to or incorporating roundabouts. In total, nine projects in the state of Montana were identified that had public comments concerning roundabouts. Table 1 presents these projects, as well as the number of people whose comments indicated that they were either for or against the use of roundabouts. As the table indicates, a large portion of those who provided comment were opposed to a roundabout.

Table 1: Projects incorporating roundabouts in Montana and public support

Project	FOR	AGAINST
Kalispell MT 35	5	67
Missoula East/West Interchange	15	16
Billings Shiloh Road reconstruction	6	18
Bigfork North and South	1	9
Missoula Russell Street reconstruction	3	7
Billings Airport entrance	1	6
Red Lodge Northwest project	5	2
Bozeman College Street and 11th Avenue intersection	2	0
Billings Bench Boulevard	0	1
TOTAL	**38**	**126**

During the review of comments, the general rationale provided by each commenter in support of or against the use of roundabouts was noted. In general, several categories of comments in support of roundabouts were observed among all projects from roundabout supporters. These categories are described as follows:

- Safety: safer than alternatives or would decrease the accident rate compared to existing conditions.
- Efficiency: more efficient, cause less delay, less traffic congestion, and provide faster travel times than alternatives.
- Cost: less costly than or comparable to alternatives.
- Bike / Pedestrian Safety: safer for bicyclists and/or pedestrians.
- Other: preferable for other reasons (often aesthetics and landscaping).

The number of times each of these reasons for supporting the use of roundabouts was given in the public comments (by those who support roundabouts) is reported in Figure 3. Also indicated in this figure are the specific projects from which these comments were received.

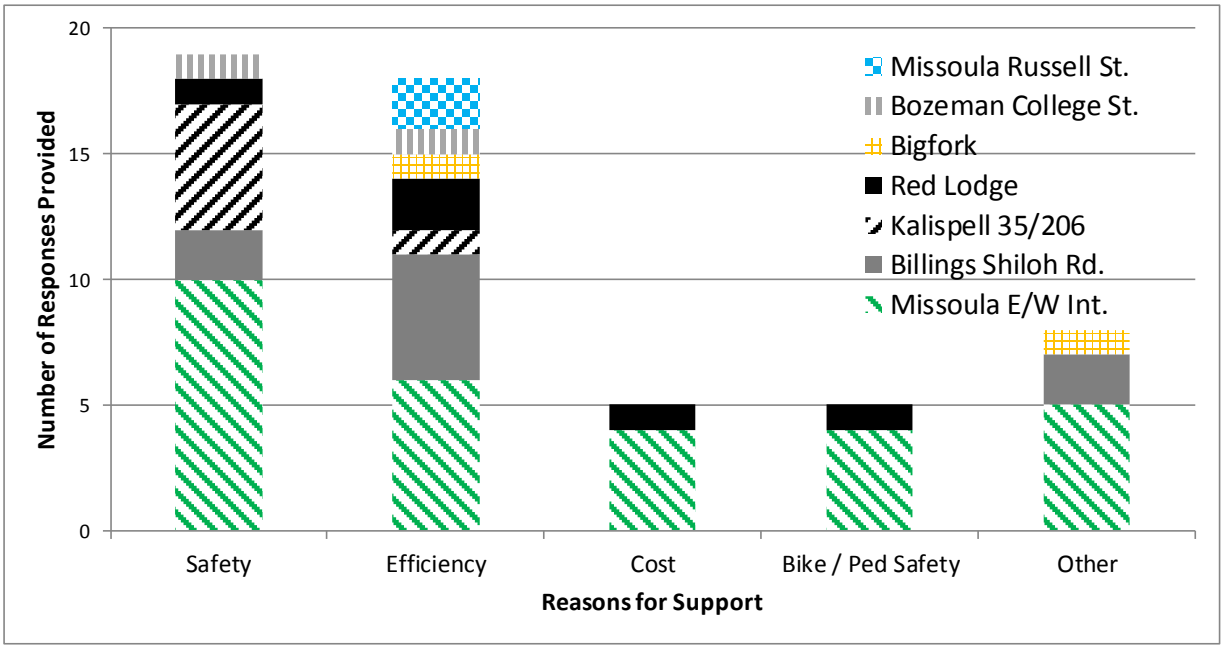

Figure 3: Reasons supporting the use of roundabouts

As Figure 3 shows, most of the comments received in support of the use of roundabouts for each project were centered on safety and operational efficiency. This result might be expected, as safety and operations are two of the most evident benefits of roundabouts to those familiar with them.

As the earlier table indicated, a large number of negative comments concerning roundabouts were received collectively from all projects. As in the case of the positive comments, the negative comments from those against roundabouts could be grouped in several general categories, as described below:

- Trucks: large trucks (and other large vehicles such as RVs, farm equipment, etc.) could not easily travel through them.
- Safety: less safe than alternatives, or would increase the accident rate compared to existing conditions.

- Driver Confusion: most drivers get confused by roundabouts and would not be able to easily use them.
- Efficiency: less efficient, cause more delay, more traffic congestion and slower travel times than alternatives.
- Cost: overall cost of the roundabout was more than or not comparable to alternatives.
- Bike / Pedestrian Safety: roundabouts are less safe for bicyclists and/or pedestrians.
- Snow Removal: snow removal from roundabouts was not possible or overly difficult.
- High Approach Speed: speeds on the approach lanes to the intersection were too high to allow for the use of a roundabout.
- Right of Way (ROW): a roundabout takes too much right-of-way.
- Saw No Need: no need for a roundabout (often stated as "I have never observed a wreck at this location, therefore no roundabout is needed").
- Emergency Response: emergency response times would suffer from the installation.
- Other: not desirable for other reasons.

The number of times each of these reasons against the use of roundabouts was given in the public comments (by those against roundabouts) is reported in Figure 4. Also indicated in this figure are the specific projects from which these comments were received."

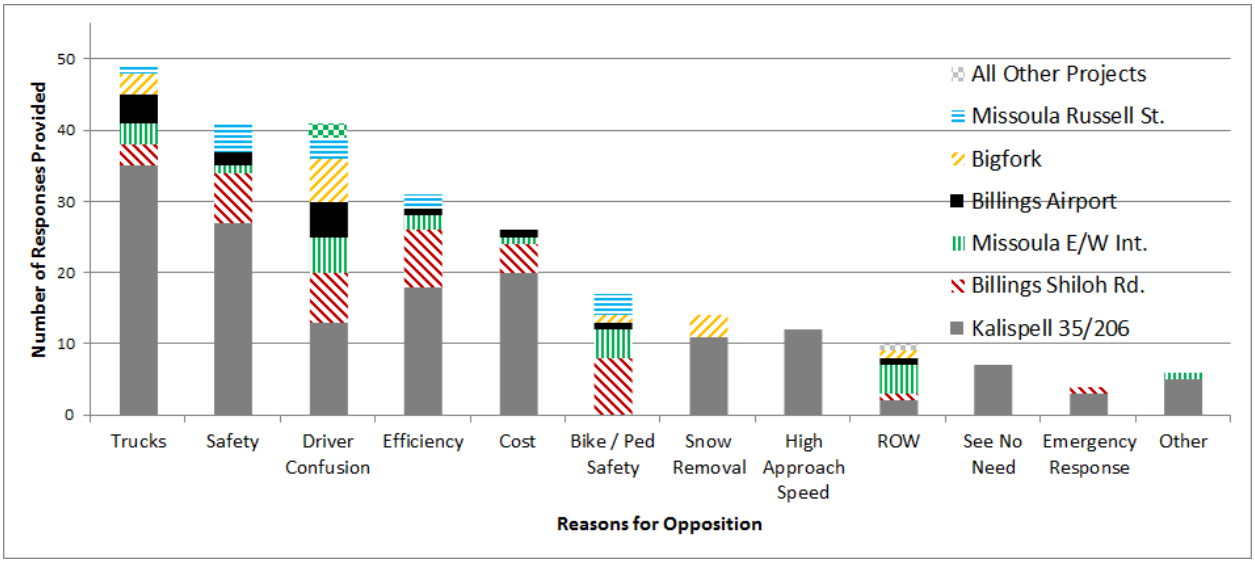

Figure 4: Reasons against the use of roundabouts

As Figure 4 shows, most of the comments received against the use of roundabouts for each project were centered on the inability of trucks to navigate such installations, increased crashes (safety), driver confusion, reduced efficiency, high cost, and bicycle/pedestrian safety concerns. These arguments were not unexpected, as they frequently appear in literature and were mentioned by survey contacts at other agencies. Note that the "exceptionality" viewpoint that "roundabouts won't work here" was not directly expressed in the comments reviewed. In most cases, roundabout opponents cited specific concerns rather than a blanket statement.

In summary, while each project received feedback from the public in support of roundabouts, a far larger proportion of comments received came from those opposed to their use. This is consistent with the experience of other agencies throughout the country. Those in support of

roundabouts stressed their safety and operational benefits, while those that opposed roundabouts cited navigation problems for trucks, increased crashes, driver confusion, reduced efficiency, and high cost as negatives relative to their use.

The information in this section provides a useful baseline of what public viewpoints and thoughts were on roundabouts. The next section presents the results of a public survey completed as part of this project to determine current public views on roundabouts.

4.3. Public Survey Results

As previously stated, a total of 61 responses were received from 150 individuals invited by email to participate in the public survey. While for many of the questions posed in the survey the participants were provided multiple responses from which to select an answer, some questions also provided an opportunity to provide textual feedback. The text provided by respondents for such questions is presented below when appropriate to provide the reader more information and context on participant responses. Note that when such responses are provided in the following sections they have not been edited in any way.

4.3.1. Roundabout Acceptance

The first survey question asked respondents whether they were opposed to the use of roundabouts in Montana. As the results of Figure 5 indicate, 61 percent of respondents (36 responses) indicated they were not opposed (i.e. supported) the use of roundabouts in Montana, while 39 percent (23 responses) indicated that they opposed roundabouts. This is an interesting contrast to the percentages of positive and negative feedback received at public meetings and during comment periods. For prior projects, approximately 23 percent of comments received were supportive of roundabouts, while 77 percent were negative. Of course, those opposed to a project or design are more likely to attend and provide feedback at a public meeting or via written channels to voice their opinion. Relative to the 61 survey participants, there is no way to tell whether they previously had provided positive or negative comments at the public meetings, or if each of these constituencies is represented in the same proportion in the commenter and survey populations. Therefore, a determination of whether a change in attitudes occurred is not possible; rather, these results provide an interesting point to consider.

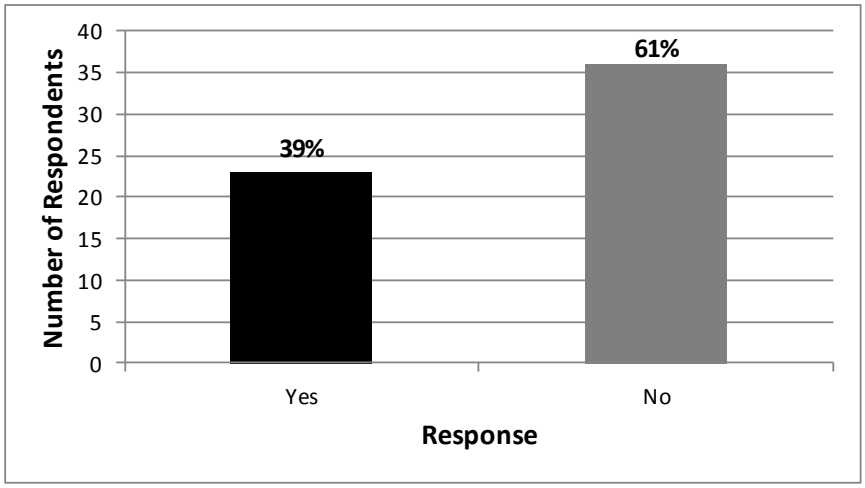

Figure 5: Are you opposed to roundabouts?

When asked whether improved roundabout information would change their perceptions, approximately 14 percent of respondents (6 of 42 responding to the question) answered yes. However, none of the respondents that indicated yes to this question had responded that they were opposed to roundabouts in the previous question. In other words, those who were opposed to roundabouts indicated they would remain so, even if they were provided with better information. This result indicates that there may be a segment of the public that simply cannot be convinced to consider the use of roundabouts prior to their installation; instead, this may be a segment of the population that will either always remain opposed or will need to see (and drive) the constructed roundabout before they will re-evaluate their position.

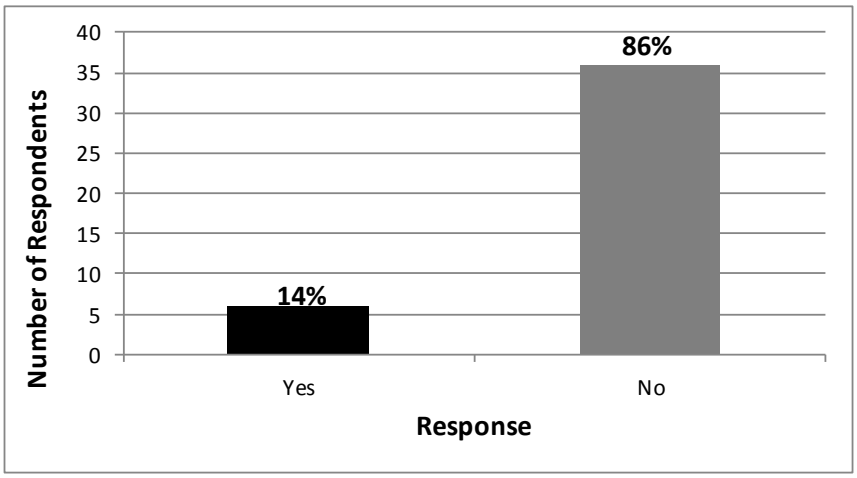

Figure 6: Would improved information change your views?

4.3.2. Changes to Opinion over Time

The next survey question asked respondents whether their opinion of roundabouts had changed over time. Approximately 38 percent of respondents (23 responses) indicated that their opinion toward roundabouts had changed over time, while 62 percent (38 responses) indicated their opinion had not changed.

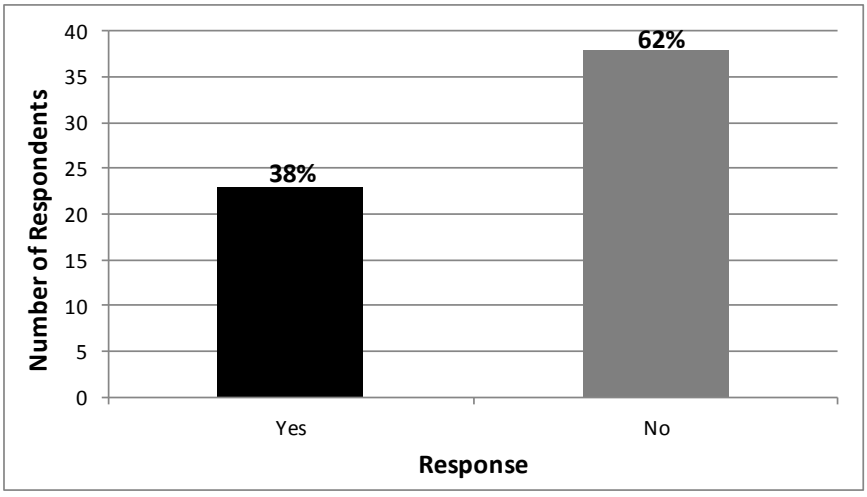

Figure 7: Has your opinion of roundabouts changed over time?

Respondents who indicated that their opinion on roundabouts had changed were asked to elaborate how it had changed. This feedback is provided below. Included in the comments are those from respondents who changed their opinion from negative to positive after having used and become familiar with roundabouts. Additionally, some respondents indicated their opinion changed from negative to positive by the information presented to them about roundabouts. Finally, one respondent's opinion changed from positive to negative following firsthand experience. Comments received in response to this question are:

- In certain places they seem to make a lot of sense and keep traffic moving freely. Lower Miller Creek and Higgins Avenue in Missoula. The roundabout on Expressway is too confusing.
- After using them in Montana and Arizona, I found it easier in some instances to navigate congested areas.
- Roundabouts have their place in large cities where more streets intersect. Anchorage has recently used roundabouts to control speed, but the intersections are clearly marked with arrows on how to use inner and outer lanes. I feel that rural Montana does not fit into that format and that there are much more efficient ways of slowing traffic on rural highways.
- I like them now that I am getting used to them, two lane wide ones get pretty crazy, but the one at 11th and college [Bozeman] seems to work well
- I thought they'd be great at first. First hand experience with them and comments I've heard about them have convinced me they're expensive and most importantly, cumbersome to use, for cars but especially for big trucks.
- I am so glad they are finally coming to this country.
- I can now tolerate them, however I still believe they pose an extreme risk of accidents when used by people not used to them.
- using them
- I used to be opposed to them, but having been exposed to their use in other cities in the US, in Missoula, and in Europe, I now think they are way, way more effective than traffic lights.
- Poor question- There are many types and applications of 'roundabouts' MTDOT has proposed some locations that are problematical! Some are OK!
- Yes. Having lived in France for one year, we routinely used roundabouts throughout Europe where roundabouts are common and came to know their safety, efficiency for traffic flow and low cost. Plus, they were always decorated with interesting themes, like bicycling, during the Tour de France time.
- I have read all the information I've seen about roundabouts and their usage (usually what has been published in the newspaper ads) and still do not see their benefits.
- Always thought they were a good idea.
- they are easier to use once you become familiar with them, and they save time compared to stop lights and stop signs
- I knew they were a helpful and great improvement but didn't realize just how wonderfully they work.
- the only roundabouts I'm troubled with are the ones at the base of the Rattlesnake in Missoula, because of limited space for bike riders

- I first saw them in France, some time ago. They were unfamiliar and seemed awkward. But the technical information about them (fewer accidents, less waiting at intersections) has changed my mind.
- Well they are not bad as long as everyone knows how to use them. Then it is flat INSANE!!!!
- They seem to work better than i had first thought on low to med traffic streets and keep traffic moving as claimed, but on high traffics street they are a pain and worse the stop lights. Also there are getting to be too many in one area and is very annoying. In high traffic areas one or two people that are not familiar with them can bring every thing to a stop Which is why in am apposed to them in high traffic areas and having them in very low traffic areas and especially in parking lot or in areas road that lead you from one store to the next IE Shiloh [Billings] crossing shopping area!!!!!!
- In 2000, I was asked to put a roundabout on 93 near Stevensille. We researched them, and although that wasn't a good spot for one, I found positive aspects about them and implemented roundabouts at other more appropriate locations - Kalispell, MT City, and Helena.
- The more I learn, watch, research, and do outreach to the general public, the more I see how well-designed roundabouts can eliminate injuries at intersections, provide more access for all people, save money, reduce carbon and pollution, and promote general community well-being.
- From no personal knowledge to excellent positive personal experience
- I was instructed in how they should work, specifically which lane to be in if continuing or turning off.
- Roundabouts can be useful in some places, such as in the vicinity of the commercial "box store" development between Kalispell and Whitefish, but they have been installed locally in places where they do not seem appropriate and appear to have caused re-routing to avoid them, especially by large trucks. On the new by-pass route and in the Glacier High School area there is very poor or confusing signage, and perhaps some signs are missing. My negative opinion about roundabouts is from using them, and an information campaign is very unlikely to change that.
- I am more strongly in favor of them.
- I wsa skeptical until 1) I received thorough traffic engineering information and 2) I experienced using roundabouts personally
- Hadn't had the opportunity to use them prior to the one put in here in Bozeman and I find it to be efficient and I have used the ones in Billings a lot.

As these comments suggest, many survey respondents have developed a better appreciation for roundabouts once exposed to them. Some respondents still expressed opposition to their use, which is not surprising given the experiences in other locales. Still, these comments indicate that many people tend to be more accepting of roundabouts once they have used them, which matches the experience of other communities.

4.3.3. Impressions of Roundabout Materials and Improvements

When asked whether they had seen any roundabout information produced by MDT or other agencies/groups, approximately 56 percent of respondents (34 responses) indicated that they had

seen such information, while 44 percent (27 responses) had not. This result would seem to indicate that there is still room for improvement in providing materials such as pamphlets to the general public.

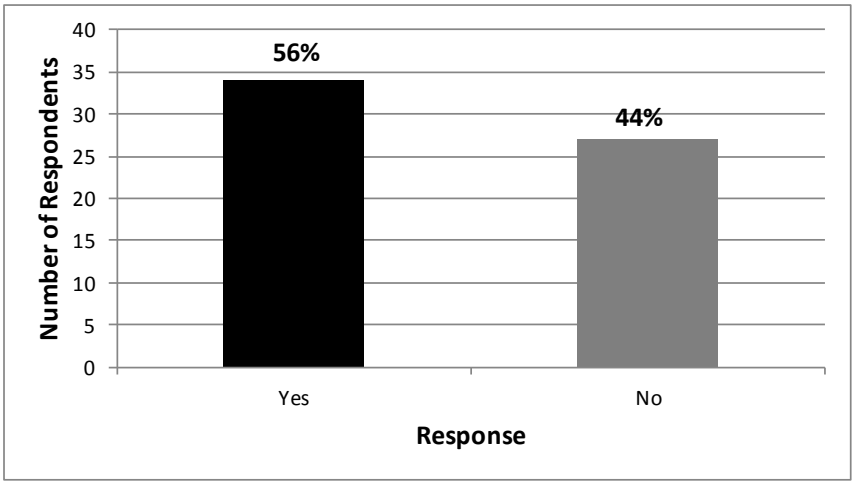

Figure 8: Have you observed information on roundabouts (from MDT or other source)?

Those who responded yes to the question were asked to provide written comments on their impressions of the materials they had seen. No obvious trends emerged from these responses; however, in two specific instances the information changed a respondent's behavior. One respondent learned to signal to exit a roundabout, and another respondent did not know how to use the roundabout until after being provided information in a public meeting. One comment indicated that the information provided in MDT's pamphlets was contradictory to that presented in a public meeting. Another specific respondent thought that bicycle friendliness should be promoted for roundabouts and the current brochure wording "cyclists, get off your bike and use the sidewalk, or use the roadway if you are very experienced" should be addressed. Additional comments indicated that the materials were "too academic" and "pedantic". Responses received to the follow-up question are:

- They can't think of another way to solve the problem, so they create a whole new problem by installing a "roundabout"
- roundabouts are good, we should have been using them decades ago.
- Good. But, I do not think a single lane figure 8 would work where they say it definitely would. We live here.
- MDT seems to promote under-designed roundabouts that focus more on low cost instead of functionality. Most roundabouts I have used in Montana cannot easily handle long rigs, including towed RVs or 18 wheelers.
- Materials are well-presented, but real-life situations are more compelling. Many people just go on ahead in roundabouts, creating either hazardous conditions or causing huge back-ups.
- I have used roundabouts in other areas and find them very easy to use and to help with keeping traffic flowing. I think they are way better than stop lights and stop signs.
- I know I've commented on something in the past, supporting the use of roundabouts, but I don't remember what, if any, materials I saw.

- AARP Driver Safety course. I understand the objectives and in some cases I think they meet the objectives - but there are many locations where I don't think they are appropriate and many of the ones I have used - are poorly designed for their location and poorly marked. Residents eventaully learn the patterns - tourists can be confused. We just returned from a trip where even with a GPS - we did not exit in the correct place from a roundabout that was not well signed.
- The written booklet MTDOT tri-fold- has information that is contradictory to verbal presentations made by MTDOT- ie (MT hwy 206/35)
- round abouts are ok for car traffic only. but when mixed with semi's they are worthless
- I think roundabouts are to expensive. Cause serious problems with big trucks. And are very confusing to many older drivers. More expansive to clear snow in the winter.
- I researched roundabouts on the Internet on their use in the USA and elsewhere.
- It was well written but as stated above did not change my opinion of them, although it did change how I use them (I now signal when I intend to exit the roundabout and being a defensive driver I generally come to a full stop before entering one if I see another vehicle in the roundabout, but because other people don't signal their intentions). I also find it rather ironic that the MDT is spending so much on signage at the roundabouts - which I find totally useless - there are too many signs for small roundabouts to be able to read them all and digest the information as one is entering the roundabout - just adds to the confusion!
- Before I went to the meeting I didn't know the procedure of driving on roundabouts and was happy to get the information provided. I think the public should also receive this information whether in newspapers or tv, etc.
- Victoria, B.C. Did away with all but one due to safety reasons- high accident rates.
- Very good.
- no applicable
- Some were too acedemic. Others were well written. Some presented roundabouts as a solution for every interstection everywhere -they are not. They are a good solution for certain locations and conditions and that should be stated in the information.
- I still am of the opinion that they are placed in areas where large trucks and farm machinery experience difficult and sometime hazardous situations trying to negotiate the roundabouts. Many are too small to accomodate the vehicles that have to use them. I don't believe the presentations fully took that into consideration.
- Decent. One detail that I think should be addressed: the mdt roundabout brochure says something like, 'cyclists, get off your bike and use the sidewalk, or use the roadway if you are very experienced.' I think it should promote the roundabout (single lane) as very friendly to cyclists. I also think MDT should do more with truckers to address their concerns.
- They are all one-sided, for the roundabouts. They give NO consideration to community input regarding the placement of roundabouts, their suitability for large trucks, the danger of them to pedestrians.
- They don't reflect the reality of negotiating them.
- Unfortunately, I remember several letters to the editor when roundabouts were installed in Billings. The complainers were misinformed and/or ignorant. Anyone who has spent time in areas that use roundabouts successfully know that there is no better solution.

- I thought they were pedantic. Apparently, they are necessary though because they roundabouts are perceived as difficult to deal with.
- All of the MDT presentation that I have attended were thorough and well done.
- GOOD AND BAD

In addition to their experiences and impressions of roundabout materials they had seen, respondents were also asked what could be improved with such materials. Common suggestions provided to improve MDT roundabout presentations and/or materials included using more/better visual aids like videos, three dimensional renderings, simulations and a small internet flash (website-based) game. Respondents also thought that more education should be used to help drivers understand how to use roundabouts. Finally, some respondents thought that the improved safety benefits associated with roundabouts should be emphasized more. The responses received regarding improvements to roundabout materials and information are:

- Roundabouts are not scenic, the best use of a roundabout is in large cities that have more streets intersecting at a particular spot -- visual signing on the side of the roadway and on arrow signing on the lanes are very helpful in safely navigating circles-- The roundabouts in Washington, D.C., Boston and large cities have been around for many years and seem to work well there--
- Get off the "roundabout" bandwagon. They're a smaller version of a "rotary", found all over New England...and being eliminated. They're a shorterm solution. Find a better solution.
- The presentation was fine. There were some changes in the design that needed to be made, particularly to facilitate safe bicycle traffic.
- Ask for input from public before they more or less tell us what they are going to do.
- FORGET ROUNDABOUTS IN MONTANA! Montana is not Europe.
- Start educating people on how to use round abouts perhaps as a commercial on the evening news, perhaps give the safety records of these structures to the people while doing this. Change is hard for older folks and it will take a lot of convincing for the older generation that don't know anything about them.
- Visuals & specific examples -- i.e. the Higgins-Hill-Beckwith roundabout in Missoula is performing fantastically well. Smooth flow of slower traffic = safety, less pollution, pleasanter driving.
- Compare roundabouts with other alternatives - discuss both pros and cons of the various approaches.
- Present both sides - it causes audience defensiveness if there is a perceived agenda and the decision appears to have already been reached.
- It might be simplest to show large diagrams and videos showing traffic flow to educate people as to how they work.
- I think it's important to help people understand that they aren't dangerous, that they aren't difficult to navigate, that they help traffic move more efficiently, and that they don't present problems for trucks.
- A potential user of a roundabout can probably visualize and evaluate a roundabout best with a 3D presentation including approaches and signage specific to that roundabout. For instance I don't think most of the local users of Highway 35 can visualize two

roundabouts - one at the south entrance to Bigfork and the one at Highway 209 without "seeing" in some way what they would look like.

- Be better prepared and have acurate Traffic counts prior to meeting- None were available for Lk Blaine road at 206/35 meeting! Inexcusabale. It was a major negative factor!
- remove them from your mind on any street with a speed limit of 35 or greater
- Move to Stop lights
- Billboards, newspaper articles, local magazines, TV news stories that show the lower cost, increased safety (from elimination of high speed entry into intersections and intersecting travel directions). Present their common use elsewhere, especially in the USA. In MT, presenting Europe as a guide may not be acceptable for some, unfortunately.
- Better explain why MDT thinks this is a good solution - and then MDT needs to monitor their usage (cameras? or visual monitoring for a time period) to see what the problems are and use that information for further education.
- Incorporate use of roundabouts into student driving or driving tests so people can learn how to use them in MT
- include in Drivers manuals, educational commercials on TV
- The presentation seemed fine but was very long.
- Forget it - we are copying Europe and they are a mess.
- I think what they do works. Maybe some aerial videos would be easy to see how well they work. Wouldn't be very expensive if done from an aerial boom truck.
- My impression of the MDT presentation on the proposed, but likely to happen, Van Buren roundabouts was that MDT was merely going through the steps without any concern about the responses by the public. In other words, it was a fait accompli.
- ANONE WITH A dirvers lincence get a picture explanation
- You are wasting taxes payer funds on your so called beautification on the round aboutS and medias ALL B.S. THE COST OF UP KEEP IS OUT OF CONTROL!!!
- do better research and prep
- Don't have any. I thought Shane, Ed and Danielle did a stellar job at explaining the advantages, disadvantages, and design challenges of the interstate ramp locations.
- I believe they need to do complete studies of each area where the actual roundabout is expected to be placed. The presentations need to be centered on that actual location--not a general area or an area in another part of the state.
- Really talk up the safety and flow benefits for all. And also talk about how a good roundabout can catalyze a 4 lane to 3 lane conversion on all approach roads.
- Do not assume that if you like them, that everyone will. Be very open to consider community comments. Not every intersection is suitable for a roundabout.
- Present the real negatives such as the inability of semi's with tractors to maneuver such a tight turn. The many curves required to lead into the intersection. The numerous head turns required to look for oncoming and intersecting traffic. The slowing required to approach the intersection. The confusion as to which turn to use when intending to go straight. The lack of visibility due to the center mound height. The elimination of the possibility for future traditional commerce to occur at an intersection. There is a reason they are called "Circles of Death" in Germany. Etc. Etc.

- Simple is better. Possibly billboards. Do they teach about roundabouts in drivers training? Kids will (indirectly?) teach their parents what they learn.
- How about a simulation, either a video showing a roundabout used from a driver's perspective or, better, a little Flash game.
- I think the presentations are adequate as is.
- I think videos work the best. Visualization of the workings of the roundabout makes it better to understand.

These results show the mixture of opinions that the respondents have on the roundabout information they have seen and the improvements that can be made to it. Some find the information available and provided to be adequate, while others do not. Similarly, improvements that can be made to the information being presented and provided range from keeping things the way they are to putting a heavier emphasis on the safety benefits and comparing the roundabout to alternatives. Additionally, at least one respondent indicated that MDT staff members at meetings need to be more conversational with those opposed to roundabouts, instead of just trying to counter with facts. The general tone of the feedback on this question also now shows the "exceptionalist" viewpoint, that is, the belief that Montana is different and roundabouts will not work here, even if they have been found effective elsewhere. Information and outreach efforts and materials will need to focus on showing why Montana can benefit from roundabouts, as well as point out how roundabouts differ from similar designs (traffic circles). In many cases, respondents pointed out that "roundabouts" haven't worked in Europe, New England and elsewhere; however, in many of these cases, the deficient design was not a roundabout. Consequently, one item for MDT to consider is explaining and illustrating in detail the differences between roundabouts and similar designs to address this particular public misperception.

4.3.4. Mediums Used to Find Information

Respondents were asked what mediums they use to obtain information of interest to them. The purpose of this question was to potentially identify approaches that MDT might use to best reach the public with information on roundabouts. Fifty-three survey participants responded to this question, with the internet being the most commonly cited medium used (cited 44 times). Newspaper and television were also highly cited mediums (cited 22 and 14 times, respectively), while other sources of information were mentioned much less often. Note that respondents could choose more than one response to this question, as well as provide their own response in the "other" category. Responses to "other" included "advocacy publications", books, local meetings, post cards, research and word of mouth.

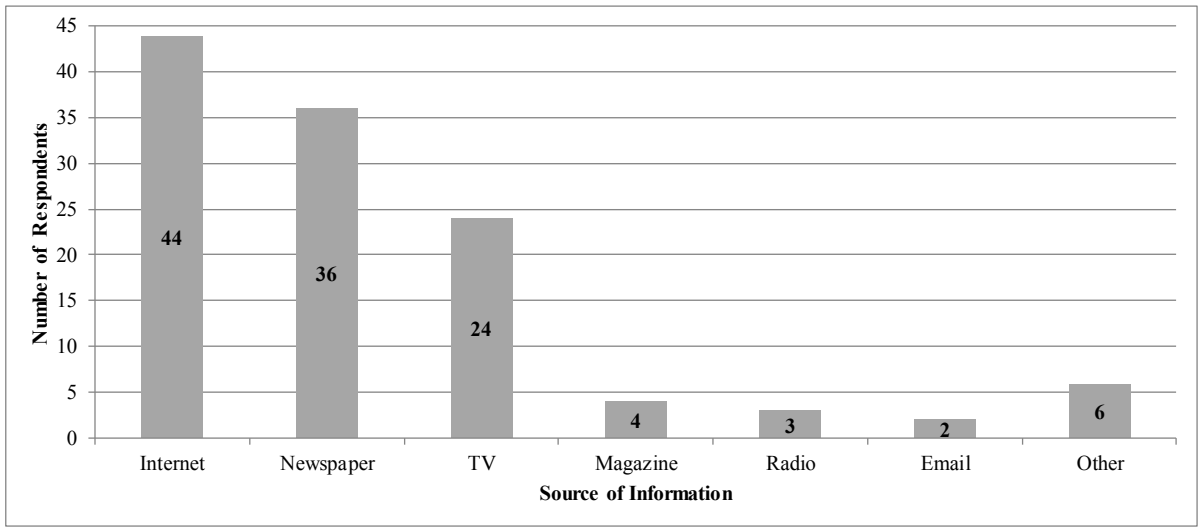

Figure 9: Mediums used to find information

A follow-up question was posed that asked respondents what their preferred medium for acquiring information on roundabouts would be. Once again, the internet was the primary source for information preferred by most respondents (cited 24 times), along with newspapers (cited 22 times) and television (cited 14 times). Once again, respondents were permitted to cite multiple mediums in response to this question, and all other mediums were mentioned must less frequently.

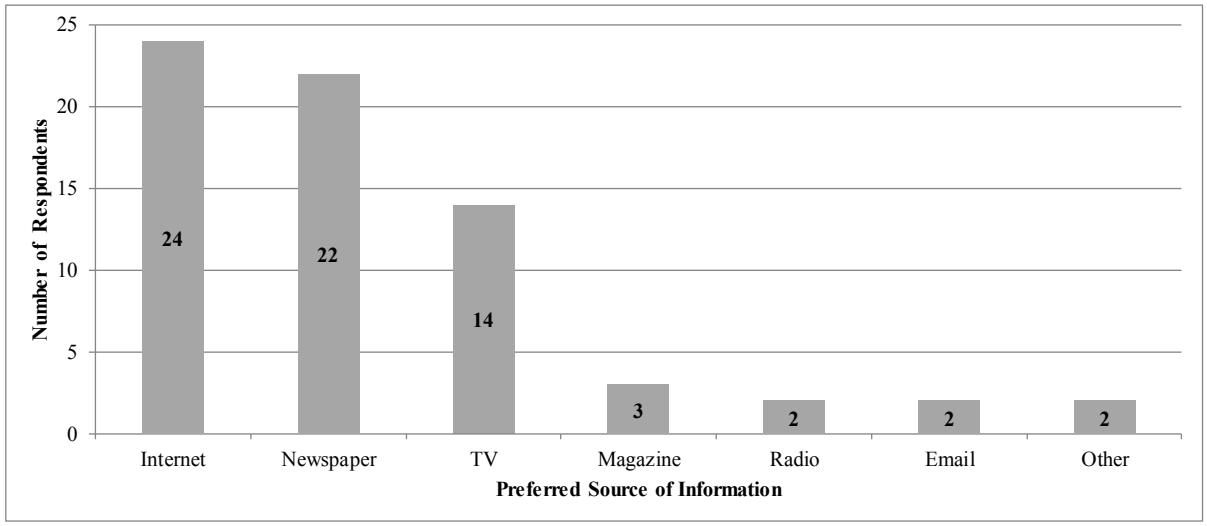

Figure 10: Preferred mediums for obtaining roundabout information

In examining the results of these questions, it is clear that the primary mechanisms that MDT should use to conduct roundabout outreach and education (aside from public meetings) is the internet, newspapers and television. Use of the internet would allow the public to track down roundabout information on their own initiative and at any time. Newspaper and television outreach would likely focus on providing information and background on individual projects, similar to what MDT already is doing (and what other states have also done).

4.3.5. Public Meeting Attendance and Impressions

Some of the survey participants were first identified as being public meeting attendees; as a result, researchers were interested in their impressions of MDT's public meetings. As shown in Figure 11, of those who participated in the survey, 46 respondents (78 percent) indicated that they attended MDT public meetings if a project was of interest to them, while 13 (22 percent) did not attend meetings. Although these results may be biased in favor of those who attend meetings (because many respondent contacts were identified through meeting minutes/comments), they do provide an indication that public meetings are one mechanism through which to educate and inform the public on roundabouts. Meetings provide an opportunity to distribute hard copy materials (fact sheets, pamphlets, etc.) on roundabouts as well.

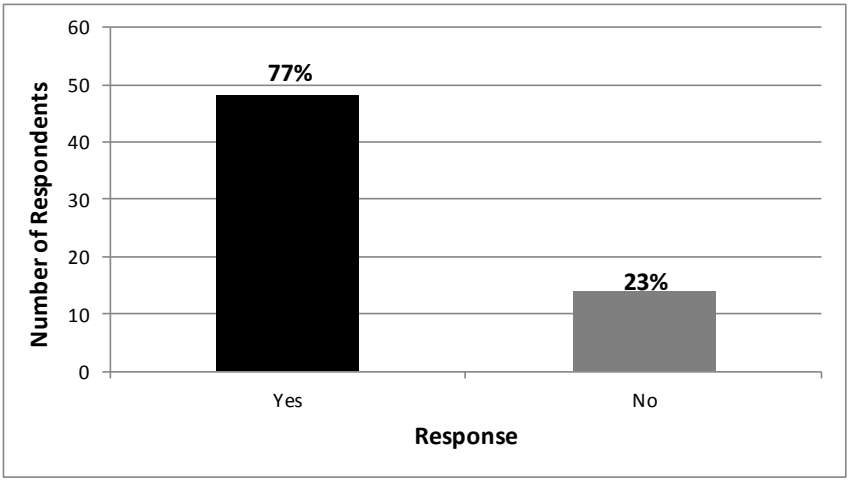

Figure 11: Have you attended MDT public meetings?

Respondents who indicated they had attended MDT meetings were asked to provide their impressions of those meetings. Thirteen comments were positive and stated the information and meeting were informative, helpful, professional, well presented, courteous, and honest. Four comments were negative, stating the materials presented were not educational and redundant, and that the organizers/presenters were unprepared and spoke poorly. A common theme identified from the comments (nine respondents) was the feeling that public concerns were not given adequate attention, and that the projects would be built regardless of public input. This is an important point to consider in light of the feedback given from other agencies during telephone interviews. Many agencies had achieved successful public outreach results by giving attention and feedback to public concerns during meetings, as well as by using comments as an opportunity to further educate and inform. Also, many agencies sought to present all of the design options considered for a project and highlight why they were not as suitable or desirable as a roundabout. Such approaches should be considered by MDT in light of the public perceptions revealed by this question.

4.3.6. Television and Radio Advertisement Preferences

In order to understand the types of commercials that might appeal to the public, respondents were asked what their favorite commercials were. The intent of this question was to identify the types of messages that might appeal to the public when considering development of roundabout-specific commercials. To that end, the following responses were received:

- The baby sitting in the Michelin tire "A lot is riding on Michelin" or something like that. I have never forgot it and I pay up for those better than average tires.
- Some cell phone and stock company commercials
- The Allstate ads based on the "mayhem" character - no question what they're talking about. I like to think I'm a smart consumer so when I see an ad that makes me think, I'm impressed. The primary thing I think about when I see an ad is that before the ad got to this point at least 2 people (and maybe more) 1 from the ad agency & 1 from the comp. in question had to think it was worth airing. If it's a particularly bad ad in quality or content it can totally change my opinion of the companies in question and in particular the people running them. An example is the ad that lasted about a week that had Bill Gates & Jerry Seinfeld for computer related. 2 heavy hitters and who knows how many more behind the scenes - perfect example of everyone (probably) patting themselves on the back on a "great" commercial that "tanked".
- Budweiser ads--provide information incorporating humor. Unlike many ads, they do not focus on 4th grade mentality.
- The Budweiser Clydesdales
- None come specifically to mind, but public service announcements might work on television if they were humorous and showed visually how roundabouts work.
- I skip most commercials - but clever ads with animals and/or humor are the ones I like - Budweiser Clydesdales are among the best of the best. The Montana commercial with the horse and the drinking cowboy was excellent. Inappropriate behavior is a total turn-off and that is too common at the moment - if it is not behavior you would encourage from your children or friends - it is not appropriate.
- For RB's, general facts showing improved safety (animations of RB flow v.s. high speed perpendicular collisions), lower cost to taxpayers (no electricity, expensive light systems) and perhaps some examples of well decorated RB's. maybe some traffic cam videos recording hi-speed intersecting accidents.
- Generally the funnier the better.
- Not overly detailed. Short to the point and memorable.
- dont. text and drive
- The pig ones - holding stick out car window and crying wee wee wee all the way home.
- Ones with humor or a clear simple message.
- I don't know that this has a direct bearing on the subject at hand. I enjoy some commercials that are entertaining, but short, direct, and leaving you informed about the usefulness of the subject matter. I don't not like commercials where people shout.
- Missoula's Jack FM sardonic, funny radio station ad series
- Trunk Monkey commercials.
- Geico

- Being cutesy or putting words into the mouth of "actors" (usually not very good ones!) is hokey. I would recommend having a spokesperson for MDT just tell it like it is, and give the audience credit for caring enough to listen when our safety is the topic.
- Local TV (Bozeman channel)

As these replies indicate, some respondents gave specific examples of their favorite commercials, while others gave general feedback and thoughts. No trends, aside from the three comments that mentioned Budweiser ads (two specifically referring to the Clydesdale horses), were identified in terms of specific commercials that appealed to the respondents. One Montana specific ad, the commercial "with the horse and the drinking cowboy", was said to be "excellent". In general, many respondents indicated that humor is preferable; others indicated that commercials that were short and to the point were preferable. Based on the feedback received, no discernible trends or preferences were identified that can be applied to any roundabout commercials (television or radio) that MDT might develop. Still, the information provided by respondents does provide different points of view to consider if such materials are developed.

4.3.7. Other Thoughts and Feedback

The final survey question asked respondents for any other feedback or comment they might have regarding roundabouts, MDT's approach(es) to informing the public on them, and other items that should be considered. The comments received were primarily related to roundabout use, not information or outreach. In general, this feedback was mixed, with some adamantly opposed to roundabouts, some in favor of their use and some partially opposed or partially in favor depending on certain conditions. Noteworthy comments specific to roundabout information and outreach included developing "short catch phrases" on how to use roundabouts, showing animations on websites, and using "simple diagrams" in the newspaper and online to help drivers understand how to use roundabouts. The following are the responses to the final survey question:

- Continue to stress the yield left, which is the opposite of the conventional wisdom. Out of town people get confused and one must always be looking for the person not yielding left.
- Education-Education! Please bring maps, survey results and a commentator who talks to the concerned faction as opposed to talking down to them.
- No, because I am not sold on them in Montana at all.
- I like roundabouts. However, putting 2 on Van Burean is not a good idea for bicyclists especially. Missoula is very much a bike town and will only get bigger in terms of numbers biking. DOT needs to consider the best ways to make biking safe in this state. Roundabout might work, but not in all areas.
- Someone or some entity seems to be obsessed with these things - I know "studies prove....". Go to the bypass south of Kalispell and watch people & rigs go around the fiasco's ..oops, roundabouts on that road. I don't need a study to tell me it's screwed up.
- They may work well within some town areas, but they are way too cumbersome for regular use on highways where speed limits are above 25 mph and there are a variety of

vehicle types--including semi-tractor-trailer combination vehicles. Also it seems to me that signage is either too sparse or mis-placed for drivers to understand quickly which turn to make--example is on the partly completed Highway 93 Bypass around Kalispell.

- Show some successful examples of roundabouts in current use.
- Give it up!
- I'm happy MDOT is looking at presenting a favorable view of roundabouts, with the apparent intent to install more.
- I still do not believe they have a place in Montana. I believe stop lights may cost more money but in the end are far less confusing.
- Roundabouts present more problems than they solve. Their cost is high to construct, they are exceedingly expense and difficult to maintain, they pose a safety hazard to navigate, and they require a tremendous amount of space. MDT needs to drop them as the "cure all" solution for every intersectional need. They certainly have a place in proper roadway design when constructed of a sufficient size to minimize the concerns listed above, but that place is very limited in number.
- Be significantly more objective when proposing projects. Infatuation with roundabouts frequently leads to proposals that are absurd.
- Just help people understand that they aren't scary and that they are effective. Make sure people understand how pedestrian/cycle access will also work at a roundabout. Help people understand that they are profoundly more efficient and effective at moving traffic, especially at keeping traffic flowing and reducing accidents. Help people understand that it doesn't take long to learn to use roundabouts, they just have to get used to them.
- If I wanted to "sell" a roundabout - I would present a "picture" of exactly what it would look like - including the signs and be able to answer questions or show how it would be used by all types of vehicles - including trucks with trailers of some type (gasoline tankers - or log trucks with pups) and large RV's that may or may not be towing another vehicle.
- Most people that have not used them before are confused for awhile, but they eventually learn. If roundabouts are new to an area, some newspaper articles or radio spots would probably be good to inform public on their use.
- Newspaper ads, interactive emails, postcards.
- Roundabouts used in urban neighborhoods (25MPH) and or collecter arterials (35MPH) may be appropriate but on heavy travelled Hwys 950-70MPH they are a hazard ! Commercial heavy haul and large RV's are an accident waiting to happen. A major problem is that drivers are used to granting R/W to vehicle on the right as opposed to traffic entering to the left!
- roundabouts should not be used on any highway that has a 35mph speed limit or higher
- cost of constructions of rounds paid for by tax papers
- Pointing out the different traffic flow that avoids the 90 degree hi-speed impact, much reduced waiting, faster commutes. A graph on billboards that displays the different flow.

Do most folks still see RB's as basically the same kind of intersection? Do they think that they're an obstacle rather than a benefit? Does the average person know that they're safer? Could you provide numbers of fatalities or accidents? What is the different costs for building, and especially maintaining, both types of intersections? Present the changes that show the benefit to the driver/taxpayer/cyclist/pedestrian, that you are providing a better solution, reducing costs to citizens, actually serving folks, not imposing some governmental BS.

- I feel the whole concept of installing roundabouts needs more study to make sure they are the correct solution for the problem.
- Short catch phrases to help people remember what they need to do in a roundabout
- include animations on web pages.
- Have a better thought out proposal that considers the many bikers using that road. The city has done counts on bikers at Broadway and Van Buren....use those counts when planning that road improvement. The proposal scares me to death.
- Not really. I just don't like roundabouts and find it strange they would have been put on our bypass. It certainly slows down the traffic and is confusing at times. I thought a bypass was supposed to help us get around towns more quickly and easily. I am hoping roundabouts aren't put in the one that will be going north of Kalispell.
- Listen to the concerns of the impacted public and actually make decisions based on public input and not what MDT wants to do.
- The environmental and health benefits need to be stressed.
- Each intersection has it's own history and issues. You can give some general information about roundabouts, but should taylor the message to the project. Focus on why it is a good solution for the particular location.
- I believe that the size of the roundabout is of utmost importance. Also people need to be informed periodically via the news media about how to properly use a roundabout. A short instructional video that could be presented on the evening news could show the correct and incorrect way to use one by cars and large trucks.
- I think that the single lane roundabout should be promoted much more, and that multi-lane roundabouts should be avoided if at all possible. I'd like to see MDT figure ways to make a single laner work, even if the models show that there is too much motor traffic for a single laner. I'd like to see MDT embrace TDM and other solutions to lower future ADT projections, to the point that a single lane, human scale roundabout would be acceptable.
- Interview Missoula drivers that use the roundabout at Higgins and Beckwith - even former critics I've spoken with are pleased with it, personal stories/experience from skeptics could be very helpful
- Well, the roundabout in question is seriously impeding my volunteers from parking at the Fire Rescue Station. You have not adequately addressed this parking issue. You could develop a flyer explaining to the community why volunteer firefighters and EMT's are

going to have to park blocks away and run across busy highways and streets to get to their emergency.

- Simple diagrams in the paper and internet with corresponding signs on the roundabouts. I now understand the signs on the bypass roundabouts after how to use the lanes was explained to me by a person with European driving experience.

As these comments indicate, respondents had a number of general thoughts related to roundabouts. Consistent with responses throughout this chapter, one observes that roundabouts have both proponents and opponents in Montana, a situation that likely continue in the future. However, the responses shed light on the general views of the public on how roundabouts should be presented, both from a project-specific standpoint and in general to ordinary drivers.

4.4. Chapter Summary

This chapter has presented information related to the thoughts and viewpoints of a group of Montanans on roundabouts in general, as well as on related roundabout outreach and education efforts. An initial review of records from past MDT projects incorporating roundabouts found a wide majority of those who provided verbal or written comment were opposed to roundabouts (77 percent of commenters). Concerns were focused on safety, efficiency, costs, bicycle and pedestrian issues, driver confusion and other aspects (e.g.. maintenance challenges). These viewpoints, combined with those expressed throughout the public survey, provide a better idea of the issues MDT might focus on when revising or developing new outreach and education materials and approaches.

A survey of the public found that 61 percent of respondents opposed roundabouts. Only 14 percent of respondents indicated that improvements to education and outreach on roundabouts would likely change their views. However, 38 percent of respondents indicated their views toward roundabouts had changed over time, primarily positively (one respondent did indicate a shift to a negative view following use of a roundabout).

A slight majority of those surveyed (56 percent) had seen MDT-produced or other information on roundabouts, with some finding the materials useful and others finding it too technical or uninformative. Recommended improvements to outreach materials made by respondents included considering the use of videos, simulations and three-dimensional renderings, as well as increased education to help drivers learn how to navigate roundabouts. In many cases throughout the survey, respondents expressed an "exceptionalist" viewpoint, i.e., "roundabouts might work somewhere else, but they won't work in Montana". This was similar to the experiences expressed by other agencies as documented in the previous chapter.

Respondents indicated that the internet, newspapers, and television were the primary mediums they used to obtain information on projects of interest to them, as well as the mediums that MDT should use to provide information on roundabouts. Consequently, MDT should consider the following mediums (in addition to public meetings) to roundabout outreach and education: the internet, newspapers and television. Use of the internet would allow the public to track down roundabout information on their own and at any time. Newspaper and television outreach would likely focus on providing information and background on individual projects. Several different advertisement campaigns, both general and specific, were cited as being the favorite of respondents. However, aside from the general opinion that humorous and brief advertisements

were preferable, no discernible trends regarding the types of campaigns MDT might consider were clear from the responses.

Respondents also provided thoughts on other improvements that could be made in terms of roundabout outreach and education. The use of visual aids and factual data from studies was preferred for public meetings. The messages related to roundabouts at such meetings should be tailored to the specific project. Additionally, at least one respondent indicated that MDT staff members at meetings need to be more conversational with those opposed to roundabouts, instead of just trying to counter with facts. This approach was also generally expressed by different agencies during the telephone interview portion of the project as well. Related to this concern, some respondents indicated that MDT should be more objective when proposing a project incorporating a roundabout, making sure that it is the best solution for the site and being able to show how it will benefit the public. Part of this effort should show how the roundabout is different from alternative designs in terms of benefits, safety, maintenance, traffic flow, etc. Finally, bicycle and pedestrian activity at the site should be addressed.

Most respondents indicated that they attend public meetings when a project is of interest to them. Many found MDT's meetings informative, while some found the meetings to be redundant and not educational, with unprepared presenters. Some respondents expressed the opinion that public concerns were not being heard or given proper attention at meetings.

In general, the information presented in this chapter matches up to the experience of other states and agencies discussed in the prior chapter. There is a segment of the public that is opposed to the roundabouts, and in most cases, it appears that little can be done to change their minds short of regularly experiencing/driving a roundabout. MDT should focus on providing outreach and education primarily through the internet, television, and newspapers. Public meetings are likely to remain the front line in getting information on a specific roundabout project out into the public arena. Such meetings give an opportunity for the public to learn more about the project and to voice their concerns. With respect to these meetings, MDT staff should consider using public comments, particularly those that are negative, as an opportunity to positively interact -perhaps in a conversational fashion rather than possibly being perceived as confrontational in providing answers. This is an approach used in other states and was also mentioned by survey participants as something to consider.

5) ROUNDABOUT MEDIA AND OUTREACH

Several states/transportation agencies have developed different materials related to roundabout outreach and education. The intent of these materials is to inform the public on roundabouts (both in general and specific projects) including their benefits and features, as well as to provide instruction on how they should be used/driven. During the course of the agency interviews (discussed earlier) several contacts indicated that their state had developed dedicated websites and/or videos related to roundabouts. Those efforts are discussed in this chapter in order to provide a better understanding of the current state of roundabout outreach and education, at least from the perspective of online media. Note that at the time of this report, all of the website links provided were active; however, this may not be true in the future, particularly with respect to online video (such as that hosted on YouTube). Also keep in mind that the absence of a dedicated roundabouts website and/or videos does not indicate that a state is not designing and building roundabouts; rather, web-based materials simply were not developed at the time this report was compiled.

5.1. State DOTs

5.1.1. Alaska

The Alaska DOT&PF maintains a website providing basic information on roundabouts (http://www.dot.alaska.gov/stwddes/dcstraffic/roundabouts.shtml), as well as links to additional resources. This includes the Alaska Roundabouts website (http://www.alaskaroundabouts.com/), which provides more detailed information to visitors, such as how to use a roundabout, myths and facts, the differences between roundabouts and traffic circles, details on the different roundabouts that have been built in Alaska, website links and other information. The information provided on the websites does not include any roundabout videos.

5.1.2. Arizona

The Arizona DOT (ADOT) roundabout website (http://www.azdot.gov/roundabouts/) provides a wide variety of information on roundabouts, including background, benefits, driving instructions, and links to additional information. Simulations have also been provided to demonstrate different driving actions for scenarios such as entering the roundabout. In addition to the website text, videos produced by ADOT are provided to further explain different aspects of roundabouts. An introduction to the modern roundabout is the subject of the first video, which provides an overview of what a roundabout is and what it is intended to do. This video has been produced in a short (2+ minutes) and long (8+ minutes) version, providing a choice regarding the level of detail provided. A second video (9+ minutes) demonstrates how a large vehicle should navigate a roundabout. The modern roundabout videos explain the different aspects of roundabouts in a well-produced package; the large vehicle navigation video is primarily just footage of trucks using a roundabout, without narration or guidance provided.

5.1.3. California

Caltrans does not maintain a general roundabout website; rather, individual districts have developed their own websites (http://www.dot.ca.gov/dist1/roundabouts/; http://www.dot.ca.gov/dist07/travel/projects/roundabout/). District 1's roundabout website provides basic information covering what a roundabout is, what its benefits are, and driving tips. District 7's website is

more detailed, covering the same information as District 1, but also providing a brief PowerPoint presentation and instructional video covering different aspects of roundabouts. The video is somewhat dated and does not necessarily compare to more recent efforts by other agencies.

5.1.4. Connecticut

The Connecticut DOT hosts a roundabout website that explains what a roundabout is, highlights installations across the state, provides guidance for users and presents one simulation video for a specific site (http://www.ct.gov/dot/cwp/view.asp?a=4109&q=467780&PM=1). The materials are basic but are effective in explaining different roundabout topics in a concise manner.

5.1.5. Delaware

The Delaware DOT maintains a roundabouts awareness website that presents information on what a roundabout is, why it is used, history, a map of sites in the state, user guidance, and answers to frequently asked questions (http://deldot.gov/information/community_programs_and_services/roundabouts/index.shtml). The site also provides a copy of the DOT's roundabouts brochure, as well as a YouTube video (http://www.youtube.com/watch?v=RL7zqrLetEw&list=UUogvGV-OXFAsAFa2MIgVHYA). The eight minute video provides an overview of roundabouts, highlighting their benefits, providing resident/user testimonials, and guidance on how to use them. The video is well-produced and is able to keeping a viewer's interest over a longer period of time.

5.1.6. Georgia

The Georgia DOT's website provides background information, images, locations, answers to questions, past presentations and other information on roundabouts (http://www.dot.ga.gov/travelingingeorgia/trafficcontrol/roundabouts/Pages/default.aspx). The website also provides the FHWA's Modern Roundabouts video for viewing. The website is straightforward and largely focuses on providing information that will be of interest to those unfamiliar with or who have questions about roundabouts.

5.1.7. Illinois

The Illinois DOT's website (http://www.ilroundabouts.com/) provides an overview of the benefits of roundabouts, how to use them, answers to questions and links to additional resources. A simulation is also provided to illustrate how traffic operates through a roundabout. The website has a nice appearance, but is somewhat limited in terms of content.

5.1.8. Iowa

The Iowa DOT's roundabout site (http://www.iowadot.gov/roundabouts/roundabouts.htm) provides background on roundabouts, highlights their benefits, presents myths and facts, answers common questions, provides user guidance, and displays a map of sites throughout the state. Definitions are also provided, as are numerous links to other resources related to roundabouts. The website is comprehensive in the materials it provides, and those materials are easy to locate and understand.

5.1.9. Kansas

The Kansas DOT's roundabout website (http://www.ksdot.org/roundabouts/default.asp) provides a step-by-step discussion of the topic. This includes background, design aspects, safety benefits, driving tips, guidance for trucks, pedestrians and bicyclists, answers to questions and additional resources. These additional resources include images of existing Kansas roundabouts, as well as a link to the Kansas roundabouts video (http://www.ksdot.org/burtrafficeng/Roundabouts/Roundabout_Guide/roundabout.wmv). The 9+ minute video covers the use of roundabouts and provides tips for driving through them. It is well produced, showing examples in use throughout the state. It also does a good job of explaining the concepts, benefits, and use of roundabouts in a manner that can be easily followed by the viewer.

5.1.10. Kentucky

The Kentucky Transportation Cabinet's (KTC) roundabouts website, while basic in terms of the information it covers, does provide a comprehensive set of links to other resources from different agencies (http://transportation.ky.gov/Congestion-Toolbox/Pages/Roundabouts.aspx). The site provides a brief summary of roundabouts, the state's informational brochure (a multi-page booklet) and a link to the state's video on roundabouts (http://www.youtube.com/watch?v=RAimpULnp2o). This video provides an overview of roundabouts and their benefits, but primarily focuses on how to drive through a roundabout. The video is well produced and easy to watch, doing a good job of covering its primary topic: driver guidance.

5.1.11. Louisiana

The Louisiana DOTD's Traffic Engineering section (http://www.dotd.la.gov/highways/traffic/) maintains a tab pertaining to roundabouts. However, the information provided on this section of the website primarily focuses on design guidance, although the state's roundabout brochure is also posted. Of greater interest from the perspective of this research are the materials posted to the state's YouTube account, which cover a variety of issues related to roundabouts. Pertinent YouTube links include:

- http://www.youtube.com/watch?v=Fy64ocjRB0o - Construction of roundabout
- http://www.youtube.com/watch?v=g3JKjCXEvm8 - Roundabout simulation
- http://www.youtube.com/watch?v=sR9DxnK5cqk – Driver guidance (through movement)
- http://www.youtube.com/watch?v=QCntx66eTKE – Driver guidance (left turn movement)
- http://www.youtube.com/watch?v=jVJArBvzYD4 – Driver guidance (right turn movement)
- http://www.youtube.com/watch?v=F2tizb2HON0 – Mayor testimonial of efficiency and safety benefits

Each video is short (2 minutes or less) and provides information in a concise, yet thorough manner. In some cases, the production is less polished than examples from other states (e.g. the construction video), but collectively, these videos provide good examples of how different information on roundabouts can be conveyed in a brief manner. In that respect, the videos are

very effective; they allow a viewer to select the topic(s) of interest to them and obtain information quickly. This approach could be transferable to a public service announcement format.

5.1.12. Maryland

The Maryland State Highway Administration's roundabout website provides a history of roundabouts, answers to questions, guidance for drivers, safety facts, existing locations and links to additional resources (http://www.sha.maryland.gov/Pages/roundabouts.aspx). The website also features a flash animation that depicts how vehicles, pedestrians, and bicyclists should use a roundabout. While not flashy, the website does sufficiently cover the most important topics related to roundabouts.

5.1.13. Michigan

The Michigan DOT's roundabouts website (www.michigan.gov/roundabouts) provides an overview of roundabouts, where they have been built in the state, answers to questions, and the benefits they provide. The materials on the state's website have been generated in part as the result of previous research discussed elsewhere in this report. Most notably, the website presents several recent videos pertaining to how to drive roundabouts. Two videos discuss certain sites, while the third video discusses driving through roundabouts in general. All three videos use simulation as opposed to on-site footage, but do a good job of presenting their information in a brief manner that is easy to follow. The videos are posted on YouTube at the following locations:

- http://www.youtube.com/watch?v=sgzgBqX8jAM
- http://www.youtube.com/watch?v=JqaFq4ZFNpo
- http://www.youtube.com/watch?v=ONacAiKXe-8&feature=youtu.be

5.1.14. Minnesota

The Minnesota DOT's website (http://www.dot.state.mn.us/roundabouts/) provides background on roundabouts, instructions on use for drivers, bicyclists and pedestrians and a list of the benefits they provide. While the information provided is somewhat basic, it is easy to follow and quickly review. The website also provides a link to a MnDOT produced video that provides background and history on roundabouts, driving instruction and other information (http://www.dot.state.mn.us/roundabouts/videos/how-about.wmv). The video is 11+ minutes in length and fairly detailed, showing footage from several sites throughout the state. While somewhat long, the video is well produced and does a good job of providing a fairly comprehensive overview of the different aspects of roundabouts.

5.1.15. Missouri

While the Missouri DOT does not appear to have a dedicated roundabout website per se, its Kansas City District does have a site discussing roundabouts (http://www.modot.org/kansascity/Roundabouts.htm). It provides very basic information including what a roundabout is, why it is used and driving instruction. The site also provides a link to MoDOT's roundabouts video (http://www.youtube.com/watch?v=X0RcTWEBtYM). This 4+ minute video provides background on roundabouts, their benefits and how to use them. It does a good job of briefly

covering different topics, providing enough information for the viewer to understand why roundabouts are desirable in certain settings. The video is well produced and uses scenes from sites around the state to illustrate its points and concepts.

5.1.16. Nebraska

The Nebraska Department of Roads' roundabout website is basic, providing a link to the state's roundabout brochure and additional links to FHWA resources (http://www.transportation.nebraska.gov/round/). In addition, the site provides a 7+ minute video (http://vimeo.com/album/2343609/video/9576402) discussing roundabouts, including what they are, their benefits and how to use them. This video is well produced and does an effective job of briefly discussing different aspects of roundabouts when showing footage from different sites in the state. The website also provides links (http://vimeo.com/album/2343609) to several brief videos produced at sites throughout the state that show footage of vehicles using specific roundabouts. These videos are primarily traffic footage with no narration, and serve to show how traffic flows through a roundabout in different settings.

5.1.17. Nevada

The Nevada DOT's roundabout website provides an overview, the benefits of roundabouts, their operation and driving instructions, as well as links to external sources for more information (http://www.nevadadot.com/Traveler_Info/Safety/Roundabouts.aspx). Although not linked directly from the website, the state has also produced a video on roundabouts. This video (http://www.youtube.com/watch?v=Pke54GzMSjo) takes a different approach from those produced by other DOTs in that roundabouts are discussed by a local school principal in a community that has benefited from them. It candidly discusses the opposition to roundabouts from the specific community, as well as how it has since proven to be a beneficial intersection option. The video also discusses how to use roundabouts.

5.1.18. New Hampshire

The New Hampshire DOT's website provides basic information on roundabouts, images from sites throughout the state, as well as links to various information produced by the state and other groups (http://www.nh.gov/dot/org/projectdevelopment/highwaydesign/roundabouts/). One of the more interesting differences from other states' roundabout websites is the inclusion of pdf files for informational posters. The posters cover a variety of topics, including features, benefits, sites throughout the state, design vehicles, bicyclist and pedestrian use and a comparison between roundabouts and traffic circles. While the distribution and use of these posters is not clear, they represent a different approach to roundabout education than was observed for many other states.

5.1.19. New York

The New York State DOT's website (https://www.dot.ny.gov/main/roundabouts) provides an overview of roundabouts, images and guidance on use through various documents. The site also provides videos of an oversized load and a snow plow navigating roundabouts. These videos are available at:

- mms://mds.dot.ny.gov/dotmedia/mexis/design/oversize.wmv
- mms://mds.dot.ny.gov/dotmedia/mexis/design/green_win2005.wmv

These videos are basic footage of the vehicles passing through the roundabout without any narration or comment.

5.1.20. North Dakota

The North Dakota DOT has only recently begun constructing roundabouts, and the brief website that has been developed attests to this (http://www.nddotdickinson.com/driving-a-roundabout). The text provided is fairly basic, touching upon how to drive a roundabout. Of greater interest are the outreach materials that are presented as linked pdf's. Outreach materials consisted of an advertisement (see Figure 12), a poster, and roundabout-themed coasters, which were assumed to be used at restaurants.

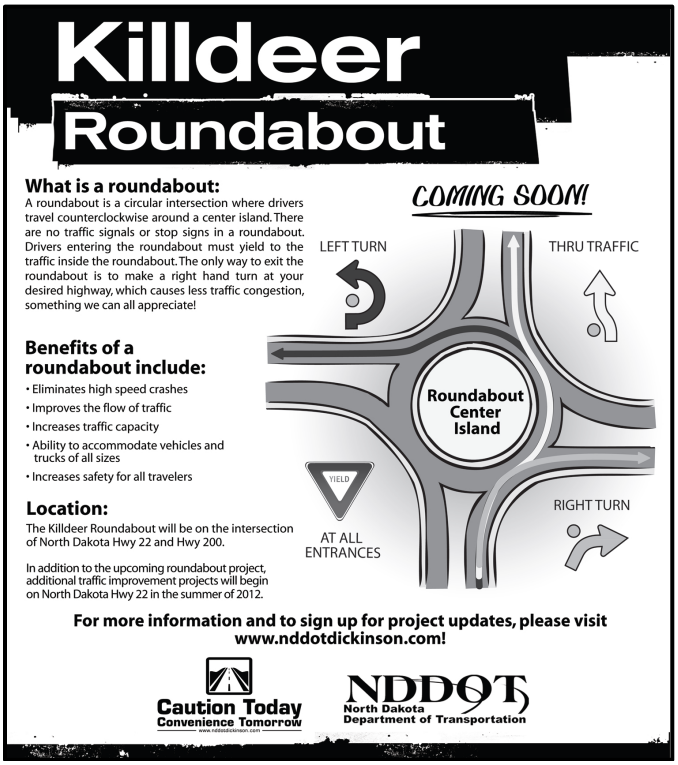

Figure 12: Advertisement explaining the Killdeer roundabout (source: North Dakota DOT, 2012)

NDDOT also produced a YouTube video showing the construction of the Killdeer roundabout, as well as a brief discussion on how to use it (http://www.youtube.com/watch?v=64bbYdgLh9o).

5.1.21. Ohio

The Ohio DOT's website provides an overview of roundabouts, answers to questions, an animation to illustrate roundabout use and links to other resources (http://www.dot.state.oh.us/districts/D07/traffic/Roundabouts/Pages/default.aspx). Note that this site was created by District 7, and it does not appear that a state-level website had been created (at the time of this report). The DOT has developed videos on different aspects of roundabouts, including:

- http://www.youtube.com/watch?v=OTqdHMX3qAo - Instructions for use

- http://www.youtube.com/watch?v=EKXq0H7af4s - Geometric components and visual lane configurations and use

These videos are fairly basic, with the first showing different traffic conditions with written captions for how to use a roundabout and the second video consisting of a simulation showing the components of a roundabout.

5.1.22. Oregon

The Oregon DOT's webpage provides an overview of roundabouts, as well as links to images, Oregon research results, instructions on use, presentations and other resources outside the state (http://www.oregon.gov/ODOT/hwy/engservices/Pages/roundabout_home.aspx). The site also notes that the state has produced an instructional video on how to use a roundabout, which is available for purchase.

5.1.23. Pennsylvania

The Pennsylvania DOT's website (http://www.dot.state.pa.us/Internet/web.nsf/Secondary?openframeset&frame=main&src=RoundaboutContactInfo?readform) covers basic roundabout information, primarily focused on the safety and capacity benefits they provide, informational brochures and links to information from other agencies. The state has also designed an interactive Shockwave file (ftp://ftp.dot.state.pa.us/public/Bureaus/design/Roundabouts/Shockwave%20Files/4501m001_july12th2004.swf) that allows the user to view different interactive displays of how drivers, pedestrians, and bicycles should use a roundabout. This particular approach provides a unique way for a user to learn about different actions when using a roundabout.

5.1.24. Rhode Island

The Rhode Island DOT's website does not provide textual information on roundabouts; rather, links are provided to a presentation developed by the state, as well as FHWA documentation (http://www.dot.ri.gov/engineering/trafficdesign/roundabouts.asp). What the site lacks in textual content, it makes up in videos. Most of the videos presented come from other agencies; however three are Rhode Island-specific:

- http://www.dot.ri.gov/video/engineering/traffic/roundabouts/10_Centerdale_Roundabout.MPG - North Providence, Rhode Island
- http://www.dot.ri.gov/video/engineering/traffic/roundabouts/11_Centerdale_Roundabout.MPG - North Providence, Rhode Island
- http://www.dot.ri.gov/video/engineering/traffic/roundabouts/12_Lincoln_Roundabout.MPG - Lincoln, Rhode Island

The videos themselves are basic, lacking narration or comment. However, they do present local roundabouts in use within the state, which would likely be of interest to residents.

5.1.25. Virginia

The Virginia DOT (VDOT) has developed one of the more comprehensive roundabout websites (http://www.virginiadot.org/info/faq-roundabouts.asp). It covers background, facts, benefits, and

driving tips. The site also presents links under these different categories to a number of specific documents and resources containing further information. VDOT has also developed an instructional video explaining how to use a roundabout (http://www.youtube.com/watch?v=UXIANTXaj2c). The video does a nice job of explaining behaviors using footage from different roundabouts throughout the state.

5.1.26. Washington

The Washington State DOT presents roundabout information on a series of webpages, based on the topic covered (http://www.wsdot.wa.gov/Safety/roundabouts/BasicFacts.htm). Topics discussed include roundabout background, driving instructions, benefits, pedestrian and bicyclist use, public opinions and a map of locations where they are located throughout the state. In addition to this information, the state has developed a five part video series on roundabouts:

- http://www.youtube.com/watch?v=vsCoI7lERGE – What roundabouts are and are not
- http://www.youtube.com/watch?v=MywmtskFiiI – How to drive a roundabout
- http://www.youtube.com/watch?v=Y05qGz5B1Wg – Pedestrian and bicyclist use
- http://www.youtube.com/watch?v=LnT1HXo7p_4 – Safety benefits
- http://www.youtube.com/watch?v=NO1bi6inF60 – What do roundabouts mean for the user (ex. reduced delay)

All videos are brief (1-4 minutes) and do a good job of concisely explaining each specific topic. They employ footage from different roundabouts throughout the state, providing context and familiarity for viewers.

5.1.27. West Virginia

While it does not have a dedicated roundabouts website, the West Virginia DOT has developed a video. This video (http://www.youtube.com/watch?feature=player_embedded&v=-_m8HzKTZK8#) discusses the use of roundabouts, as well as how to drive through them. The video is interesting in that it uses the "Modern Roundabout" footage that was used in Arizona, with West Virginia footage (primarily signage) interspersed at given points. The video appears to do a good job of in terms of getting its message across with a West Virginia focus.

5.1.28. Wisconsin

The Wisconsin DOT is another agency that has developed an extensive website for roundabouts (http://dot.wi.gov/safety/motorist/roaddesign/roundabouts/index.htm). The site covers what roundabouts are, how they work, their benefits, questions and answers and the location of sites throughout the state. One unique feature associated with the listing of locations is the provision of individual pdfs for each site illustrating the layout and features of the particular roundabout. In addition to the website information, the state has also developed a number of roundabout videos, including:

- http://www.youtube.com/watch?v=P25WbwX2z5c – All about Wisconsin roundabouts
- http://www.youtube.com/watch?v=nmIbyRcKLlE - How to drive through multilane roundabouts

- http://www.youtube.com/watch?v=_hm4GrCgh8g - Second video on driving through a multilane roundabout

These videos do a thorough job of discussing roundabouts, their benefits and how users should operate through them. The first video is especially comprehensive and nicely highlights Wisconsin's various sites.

5.1.29. Wyoming

The Wyoming DOT has developed a website (http://www.dot.state.wy.us/home/news_info/roundabouts.default.html) that aims to educate the public on how to use a roundabout. The website includes basic text and illustrations, as well as an embedded video that discusses how to drive through a roundabout. While the materials are basic, they do a good job of discussing the key topic in a concise manner.

5.2. Federal Highway Administration

The Federal Highway Administration's roundabout website provides a wealth of resources, including tools and resources to consult when considering the development of a roundabout (http://safety.fhwa.dot.gov/intersection/roundabouts/). FHWA has also produced different roundabout videos, which discuss the history of roundabouts, their benefits, and provide testimonials on them:

- http://www.youtube.com/watch?v=C6LoK0hxj7k – Modern Roundabouts video
- http://www.youtube.com/watch?v=uhHzly_6lWM – Background and benefits
- http://www.youtube.com/watch?v=uVaJQfrHzYY – History, features, etc.

The collective resources provided by FHWA give a good overview of the benefits that roundabouts can provide, as well as success stories to highlight effective applications.

5.3. Other Entities

In addition to the materials produced by different states and FHWA, other entities, such as local communities, have produced roundabout-related videos that may be of interest. These videos cover much of the same materials as state DOT videos, but with different approaches or perspectives in some cases. Among the videos identified by the researchers are:

- http://www.youtube.com/watch?v=3hKXirnvf_I - Windsor, Ontario, Canada cartoon explaining the use of a roundabout.
- http://www.youtube.com/watch?v=1DJDjaa25Co – Insurance Institute for Highway Safety video highlighting the benefits of roundabouts and their use, and touches upon how the public may be opposed before and approve of them after construction.
- http://www.youtube.com/watch?v=XcK8sjzTlWI – Indianapolis, Indiana Public Works video with driving tips for roundabouts (text and animation, no narration).
- http://www.youtube.com/watch?v=qVh04m6xHxw – Mid Ohio Regional Planning Commission video on the benefits of roundabouts and how to drive them.

- http://www.youtube.com/watch?v=Qop_nmEmXSQ – Sarasota County, Florida, video on the benefits of roundabouts and how to drive them.

In summary, some creative approaches have been employed in the examples presented in this section. For example, Windsor, Ontario, used a cartoon format to explain the different movements through a roundabout. This approach had not been used in the other examples in this chapter. The Insurance Institute for Highway Safety touches upon the reluctance of the public toward roundabouts and how that tends to change following construction. Emphasizing this point is meaningful given the studies conducted by the Institute regarding these changes that are discussed elsewhere in this report (Retting, et al., 2002, Retting, et al., 2007).

5.4. Chapter Summary

While many states use roundabouts to some extent on their systems, not all have developed dedicated websites that present information on them. The content of most websites was straightforward, introducing roundabouts, highlighting their benefits, answering basic questions, providing driver guidance and presenting images, videos and/or maps of existing roundabout locations. In reviewing the various state-level roundabout websites, a lack of "testimonials" from locales where successful applications have been installed was evident. Whether this was intentional (possibly to avoid the appearance of trying to "sell" roundabouts) or just an oversight is not clear. However, given that many of the agency personnel who were interviewed during the course of the research indicated the importance of highlighting successful roundabout applications as part of public outreach efforts, consideration should possibly be given to more use of positive feedback from communities in websites, as well as in other materials such as pamphlets and videos.

Not all states have developed their own roundabout videos, but most videos that do exist focus on educating drivers on how to use them rather than on promoting the use of roundabouts to the public. In some cases, these videos are in the form of brief Public Service Announcements (PSAs), while in other cases, states produced longer and more detailed videos on roundabouts, in general, and/or on various aspects of their design and function. The extent to which roundabouts were promoted in videos was generally limited to presenting their advantages and benefits. None of the roundabout videos reviewed came across as being "sales" pieces aimed at winning the public over; rather, the facts about roundabouts were presented, with most videos using footage from local roundabouts (for that state) to demonstrate their successful applications. Aside from videos, some states also developed radio PSAs, which were also brief and highlighted driving tips. In some cases, the scripts to these PSAs (and also to their video PSAs) were provided along with the audio/video files or links.

None of the websites, videos or other resources stood out individually as the example to follow in developing/presenting web-based roundabout materials. Rather, most materials appeared to be similar in content, although the approaches to presentation did vary in terms of depth and format. As a general observation, not as many states as would be expected post their general roundabout pamphlets/brochures developed for public meetings to their websites. Consequently, it would appear that many states are missing the opportunity to provide a simple piece of supplemental information on their websites by not posting their pamphlets/brochures. For reference, those materials that were posted to agency websites are presented in Appendix E.

6) OTHER EDUCATION/INFORMATION CAMPAIGNS

In addition to understanding what other states and agencies may have done regarding education and outreach efforts specific to roundabouts, researchers also reviewed campaigns used by other agencies and in other states not specific to roundabouts that have been successful in addressing public concerns or opposition to various agency programs. This review also looked at approaches that may not have previously been identified by or used in the transportation arena (i.e., not restricted to roundabout or transportation-related projects). Researchers were looking for an innovative or unique approach that has been effective in addressing opposition to a project that could be adapted for use in transportation. Specifically, such approaches may warrant consideration by MDT in addressing the stakeholder and public concerns with roundabouts.

The following sections present a summary of the information identified during the course of a review of education and outreach campaigns conducted by other states/agencies. The research team employed a comprehensive website search through sources such as, but not limited to, state government websites and general databases (e.g., Google). This search attempted to identify campaigns targeted at different groups by using different mediums, including public presentations, the internet, flyers/pamphlets, and media (television/radio/newspaper).

6.1. State DOT Media Campaigns

The following sections provide an overview of different education and outreach campaigns employed by state transportation agencies. These campaigns are typically focused on different aspects of traffic safety. During the course of the searches, the researchers identified a number of transportation agency websites that served as "gateways" to information campaigns. The websites provided an overview of the issue and additional information, including print materials, videos and radio recordings, and frequently asked questions.

6.1.1. Alabama

The Alabama DOT's Drive Safe Revolution website (http://drivesafealabama.org/) is focused on advancing the state's Toward Zero Deaths effort. The site itself is basic, presenting a short video on the efforts to reduce traffic crashes and fatalities, providing links to relevant resources (state safety pans) and giving visitors a mechanism to enter their email address if they wish to receive updates and notifications on the Drive Safe Revolution campaign. The approach used by ALDOT is concise, which may make it appealing to those who are looking only for a brief statement of facts and the overall effort being pursued.

6.1.2. Arizona

The Arizona DOT's Move Over AZ website (http://www.moveoveraz.org/) is a comprehensive outreach effort to alert drivers that they should move over for anyone (police, construction workers, stranded vehicles) on roadside shoulders. The site presents a number of videos that promote the effort and highlight past crashes that were caused by a failure to move over. The state statute requiring motorists to move over is linked from the website, and a quiz is also provided to test visitors on when they should move over. Statistics and answers to frequently asked questions are highlighted, and links to recent blog posts on the campaign are provided. The website also provides links to social media including Facebook, Twitter and YouTube, although these are general links and not specific sites developed for the Move Over AZ

campaign. This site does a good job of providing an overview of the problem both in text and video, while not overwhelming the visitor with facts or technical documents.

6.1.3. California

The California DOT (Caltrans) has undertaken a number of different outreach efforts for various topics, including work zone safety, roadside litter and moving over for stopped vehicles. The Slow for the Cone Zone campaign website (http://slowfortheconezone.com/) is fairly basic, providing a YouTube recording of the campaign's radio commercial, images from memorial services for construction workers killed in work zone crashes and a link to the state's traveler information website to show visitors where current work zones are located.

The Don't Trash California website (http://www.donttrashcalifornia.info/) is more advanced, with the main page providing an overview on the campaign and littering and subpages providing information on how to get involved, media campaign materials (radio and television commercials) and print materials. Print materials include billboards, advertisements from magazines and newspapers and movie theater slides. While the website is not flashy, the content provides useful detail while not being too complex.

Caltrans also promotes moving over for roadside vehicles through its Move Over (http://www.dot.ca.gov/moveover/) campaign. The message presented to the public is to move over when they see flashing lights (police or construction vehicles) on the roadside. The website is fairly basic in terms of layout and content, with links to print material layouts, a press release, and a recording of a radio public service announcement.

6.1.4. Florida

The Florida DOT's Alert Today Alive Tomorrow campaign (http://www.alerttodayflorida.com/) is focused on bicycle and pedestrian safety. Tips for pedestrians, bicyclists and drivers are all provided, in order to educate each group on proper behaviors and actions in different situations. Media materials (videos) have also been developed that lay out scenarios in which inattentive driver, bicyclist and pedestrian behaviors had tragic consequences. The videos are effective in illustrating how certain actions or inattentiveness can have significant impacts.

6.1.5. Indiana

The Indiana DOT's Hoosier Helper's website (http://www.in.gov/indot/2408.htm) educates the public on the state's program to help stranded motorists along high volume routes. The website provides background information on the program and a listing of the routes it covers. A link to a video covering the history of the program on local public television is also provided. The video is detailed and of long duration (approximately 30 minutes), which could be considered more educational in nature than outreach.

6.1.6. Kentucky

The Kentucky Transportation Cabinet has two ongoing outreach campaigns to highlight. The first, Safe Patrol (http://transportation.ky.gov/Incident-Management/Pages/Safe-Patrol.aspx), is similar to Indiana's Hoosier Helpers program, providing assistance to motorists stranded on the roadsides of freeways. Basic background information on the program is presented on the website, but no videos or other materials are provided. The second campaign, Revenge of the

Fish, highlights how litter and chemicals (motor oil) can enter waterways (http://transportation.ky.gov/Stormwater/Pages/StormwaterMedia.aspx). While little background information/text is provided, links to YouTube videos (television commercials) and radio spots are provided. The videos use humor to get the message across that actions such as littering the roadside have an impact beyond the roadway environment.

6.1.7. Missouri

The Missouri DOT's Arrive Alive campaign (http://www.savemolives.com/) is focused on addressing a wide range of unsafe driving behaviors (e.g.. drunk driving, seat belt use, etc.). Basic background facts and information are provided, as well as links to a large number of videos and radio spots from around the nation pertaining to different topic/focus areas. The website does an excellent job of highlighting the different areas of traffic safety that require improvement in the state, presenting facts and statistics related to each area and providing a number of different public service announcement links for the visitor to choose from. The linked media is too numerous to summarize, but the wide array of samples cover each topic extensively.

MoDOT's second campaign, On the Move (http://www.missourionthemove.org/), is an effort to collect feedback from the public on major transportation issues and priorities across the state. The website consists of text (no video or audio) and highlights the benefits of transportation, its economic impacts, answers to frequently asked questions and other information. Visitors are also provided with a form to suggest projects and a survey to provide feedback on the areas of transportation that they think need improvement. Although the website is simple in terms of presentation and content, it is effective in educating visitors on why transportation matters and how they can play a part in future projects.

6.1.8. Montana

MDT's Plan2Live campaign (http://plan2live.mt.gov/) is focused on addressing different behaviors that contribute to crashes, including drunk driving, seat belt use and motorcycle awareness. The website provides background information on the different topic areas, discusses facts about impaired driving, how to plan ahead before drinking and addresses various myths about drunk driving. The website provides a free blood alcohol calculator app for download to determine whether a driver will be impaired. Different videos (television and radio spots) related to these topics are provided for visitors. Finally, the campaign has also developed a Facebook page that provides facts, figures and points to consider on a frequent (daily) basis.

MDT has also undertaken a distracted driving campaign to educate the public on the hazards of driving while preoccupied (http://www.mdt.mt.gov/safety/campaigns/distracted-driving.shtml). The information provided by the website is straightforward and links are provided to state laws and regulations, as well as national information, including media campaign materials (television and radio spots).

Buckle Up Montana (http://buckleup.mt.gov/) is another MDT program targeting seat belt use. The website provides detailed information for various seatbelt user categories (children, teens, truck drivers, etc.), along with links to fact sheets on seatbelt use. Different videos (long and short in duration) are presented throughout the website to further get the message across that seatbelt use matters.

6.1.9. Nevada

The Nevada DOT's Zero Fatalities campaign (http://www.zerofatalitiesnv.com/) seeks to reduce crash fatalities in the state. The website for the program presents statistics, ways to avoid being a fatality (seatbelt use, avoiding impaired driving, etc.), discusses different state laws aimed at traffic safety and provides downloads of videos, radio spots and posters related to the overall effort. The videos and radio spots effectively communicate the importance of driving safely. Finally, the campaign provides links to Facebook, Twitter and YouTube accounts for the program. These social media are used to provide program updates and safety tips, as well as to disseminate promotional materials (e.g. video and radio spots).

6.1.10. New Hampshire

The New Hampshire DOT's Driving Toward Zero program (http://www.nhdtz.com/) is focused on eliminating crash fatalities in the state. The program uses its website, as well as radio spots, to promote different messages and strategies to address fatalities, including addressing distracted driving, moving over for vehicles on roadway shoulders and targeted seasonal messages (e.g. Christmas holiday season). The program website does an effective job of providing a good deal of detailed information in a manner that allows visitors to select what is of interest to them. Television commercials have also been developed that speak to the different program focus areas. Social media sites have been developed on Facebook, Twitter and YouTube (where television commercials are posted).

6.1.11. New Mexico

The New Mexico DOT's ENDWI program (http://www.endwi.com/home-app/) seeks to address impaired driving. The program's website provides basic information and background on the problem of impaired driving, as well as detailed information on the different penalties associated with offenses (including multiple offenses). The campaign uses television commercials, billboards, interactive displays and viral media (a mechanism not employed in other examples) to educate the public on impaired driving. In the case of viral media, the website presents links to videos of real events as they happened, primarily people driving while distracted or doing dangerous things while drinking.

6.1.12. New York

The New York State DOT's HELP (Highway Emergency Local Patrol) program (https://www.dot.ny.gov/divisions/operating/oom/transportation-systems/systems-optimization-section/ny-moves/help-program) assists stranded vehicles. The outreach effort is conducted primarily through information provided on the program website, which presents background, facts and a brief video on the effort. The outreach is fairly basic, but does effectively convey the purpose of the program and its benefits.

6.1.13. North Carolina

The North Carolina DOT has produced different videos/television commercials as part of its Don't Be a Zombie – Don't Drive Distracted campaign. The videos (available on YouTube at http://www.youtube.com/user/NCDOTcommunications) use humor to get the message across that using different devices while driving can be a distraction.

6.1.14. Texas

The Texas DOT's Talk Text Crash distracted driving campaign (http://www.txdot.gov/inside-txdot/division/traffic/safety/share-road/distracted.html) uses television and radio commercials and posters to reach the public and convey the dangers of using cellular phones while driving. The basic approach used by Texas is straightforward and effective, conveying that doing simple tasks like walking while talking on a phone are difficult and a complex task like driving is even more difficult.

6.1.15. Utah

The Utah DOT's Don't Drive Stupid campaign (http://www.dontdrivestupid.com/) is focused on addressing teenage crash fatalities. The campaign provides background information and teen driving laws on the dedicated website, as well as posters and short stories documenting tragedies that have resulted from crashes. The campaign also holds a contest for teens to produce their own videos that will be used as short commercials discussing the subject of teen driver safety.

6.1.16. Vermont

The Vermont Agency of Transportation's GO Vermont program (http://www.connectingcommuters.org/) is a resource to aid and encourage commuters to carpool and vanpool. The outreach effort is centered around the program website, which provides information on different commuter/travel options and short video testimonials/commercials from people who have benefitted from carpooling.

6.1.17. Wisconsin

The Wisconsin DOT's Zero in Wisconsin (http://www.zeroinwisconsin.gov/index.html) campaign targets crash fatalities in the state. To this end, information for a number of different focus areas (ex. drunk driving, seatbelt use, distracted driving) is covered by the program website. A large number of short videos/television and radio commercials are also posted on the website for visitors to view and hear. The approach to outreach via television and radio appears extensive, with more than 50 samples of television and radio commercials posted to the website that discuss different safety facts and crash issues.

6.1.18. Summary

As the outreach and education campaigns summarized in this section have illustrated, most of the efforts by states have focused on safety. In general, the approach employed in most cases is the same: a dedicated website for the effort that contains background information and statistics, as well as embedded videos (or links to them) and radio spots that serve as the public media outreach components. In some cases, printed materials, primarily posters, have also been developed. The use of social media (Facebook, Twitter and YouTube) was mixed, although it would appear that use of these mechanisms is growing. While no specific campaign or approach stood out as the template to follow for roundabouts, it appears that the use of video/audio is the preferred in most efforts.

6.2. Other Transportation-related Campaigns

In addition to state transportation agencies, other organizations have pursued transportation outreach activities. These have generally been conducted during the course of specific projects,

and industry trade groups such as the American Road and Transportation Builders Association (ATRBA) have recognized them as successful efforts in public outreach. Such efforts are discussed in the following sections.

6.2.1. American Road and Transportation Builders Association PRIDE Awards

ARTBA's PRIDE awards (ARTBA 2013) are focused on honoring excellence in community relations and public education as part of different transportation projects. To this end, many of the past award winners have recognized outreach and education efforts that incorporate unique aspects that might warrant consideration for future use with roundabouts. Rather than divide each brief discussion of a respective project into subsections, the different approaches of interest used by award winners are summarized in the following paragraphs.

6.2.1.1. Public Agency Award Winning Approaches

An Idaho Transportation Department (ITD) byway project employed public hearings and a booth at a country fair to reach out to the public. Newsletters and postcards about the project were also distributed to local residents and businesses. Another ITD project featured a dedicated website that provided a mechanism for public inquiry and feedback. Neighborhood associations were engaged to get their feedback on aspects of the project. Finally, news releases, brochures, newsletters and a kiosk at the local airport were also used to distribute information to the public.

A Utah DOT project used print, online and television stories to raise awareness of the benefits of a specific corridor improvement project. Print media included postcards and fliers, while online media included emails to affected businesses. Visits were also made to local schools to inform students on the dangers of being around a construction zone. Outreach for a second UDOT project included a dedicated website, email distribution lists, door-to-door canvasing of neighborhoods and stakeholder meetings.

The Massachusetts DOT used public meetings, an interactive website and social media for public outreach on a bridge replacement project. Similarly, the Colorado DOT held design and construction workshops, developed a website and issued press releases to reach out to the public during a bridge reconstruction project.

For a route reconstruction, the New Jersey DOT hosted public meetings, developed a project website, held news conferences, and used email lists and list serves to conduct public outreach. The Louisiana Department of Transportation and Development used social media and traditional approaches to communicate with target audiences for a road-widening project. This included the use of bridge construction and engineering career education programs for local students, a dedicated project website, the use of Twitter and Facebook to connect with the public and media interviews.

The Hawaii DOT, in educating the public on storm water pollution, developed a sticker book for elementary school students, as well as television and radio public service announcements.

6.2.1.1. Private Firm Award Winning Approaches

As part of a Utah Transit Authority light rail project, Stacey and Witbeck Inc. and Kiewit Western Company conducted numerous meetings with local businesses and residents, provided color flyers to commuters, developed a 24 hour hotline to address questions and concerns, and conducted "grassroots" outreach at venues such as the state fair.

During a toll-supported bridge rehabilitation project, the Delaware River Joint Toll Bridge Commission, Ammann and Whitney Pennsylvania Inc. and Portfolio Associates Inc. hosted public meetings and actively solicited public feedback on design elements and construction patterns for the project. They also used direct mailings, a telephone hotline, variable message signs, and online communications to keep the public informed.

As many of the cases presented in the past two sections indicate, different strategies have been employed by agencies/firms to conduct public outreach and education, with some being quite unique. The transferability of these to roundabout outreach and education would require some consideration, particularly with respect to the unique aspects of each project. Still, many of the ideas that have been recognized nationally may be worthwhile to pursue in Montana.

6.2.2. FHWA – Priced Managed Lanes

As part of guidance provided for pricing managed lanes, FHWA provides guidance on public outreach (Perez, et al, 2012). A section of this document covers aspects of public outreach. Guidance provided for outreach efforts includes the use of public meetings, brainstorming sessions, email lists and newsletters, social media, telephone hotlines, project websites and an office/customer service center for the public to visit. It is also recommended that a committee comprised of citizens be established to identify issues that outreach efforts should address. All of these prospective approaches could be adopted to some extent in roundabout education and outreach, depending on the needs of a particular project.

6.2.3. FHWA – Work Zones

FHWA laid out several strategies of interest when discussing outreach and public information for work zones (FHWA, 2005). First, guidance was provided regarding the steps to consider when developing an outreach plan, including:

1. Determine the appropriate size and nature of the public information and outreach campaign
2. Identify resources
3. Identify partners
4. Identify target audiences
5. Develop the message(s)
6. Determine communication strategies
7. Determine communication timing
8. Evaluate campaign effectiveness

All of these steps are applicable to outreach and education related to a specific roundabout project, but could also be adopted if a more general, statewide campaign was considered. Regarding specific approaches to outreach, the guide provided a series of mechanisms that could be used, including (but not limited to):

- Project website
- Email lists
- Direct mailings
- Brochures/flyers/pamphlets
- Videos/simulation
- Billboards
- Bus advertising
- Information center/kiosk

- Newsletters
- Legislative briefings
- Public meetings/events
- Model display of the project
- Newspaper, radio and television ads
- Project hotline
- Press kits
- Restaurant placemats/tray liners
- Personal contact
- Newspaper, radio and television articles

In examining this list, it is evident that all of these approaches could be used in some capacity to educate and reach out to the public regarding roundabouts in Montana. Most of the approaches listed have been used in many of the different projects and programs discussed throughout this report. To underscore their effectiveness, the FHWA report presented survey figures on what types of outreach were most noticed by the public. Newspaper and television articles were noticed by over 60 percent of those surveyed. Furthermore, brochures and radio stories on particular projects were also noticed/recalled by over 35 percent of respondents. This provides an indication that these approaches specifically (as well as others in general) may be most effective in roundabout outreach.

6.2.4. Road Diets

Vergis and Niemeier (2012) discussed how public perceptions toward road diets were formed. Of interest from the perspective of roundabouts, the results of public surveys found that project support and opposition were correlated to safety, travel comfort, and expectations of vehicle congestion. Project support was also correlated to age group, household proximity to the project site, knowledge of online materials and public meeting attendance. In identifying these different contributors to support and opposition, more effective approaches can be taken in planning outreach and education efforts for projects, such as the construction of roundabouts.

6.3. Other Government-Agency Campaigns

In addition to transportation-related outreach and education efforts, government entities have undertaken outreach and education campaigns on many other issues. Researchers reviewed some of these campaigns and efforts in order to identify alternative approaches that have not necessarily been considered by transportation agencies. The following sections highlight such efforts. Note that this is a small sampling of approaches that exist.

6.3.1. Carbon Storage

The National Energy Technology Laboratory (NETL) outlined public outreach and education approaches for carbon storage projects (NETL 2013). Prospective outreach and education approaches outlined by the document included:

- Integrate public outreach within project management
- Establish a strong outreach team
- Identify key stakeholders
- Develop an outreach strategy and communication plan
- Develop key messages
- Develop outreach materials tailored to audiences
- Actively oversee and manage the outreach program throughout the life of the project

- Monitor the performance of the outreach program and the changes in public perceptions and concerns
- Be flexible and refine outreach programs as needed

Each of these points is applicable to roundabout outreach and education efforts. Particularly important are the points stressing the need to develop key messages and tailor materials to specific audiences. Equally important for roundabout efforts is the need to refine programs as needed, both during the course of an individual project, as well as over time. As more roundabouts are constructed and the public becomes more familiar with them, certain aspects of outreach will likely need to change (e.g. less focus on how to drive a roundabout and more emphasis on the safety benefits achieved by a particular proposed installation).

In addition to guidance on outreach and education, the document also provided ideas to consider when developing outreach materials, which included:

- Relate materials specifically to the interests of the community
- Make materials easy to read and understand
- Provide visual appeal
- Repeat the main message at the beginning and end
- Cite credible research, researchers, and institutions when applicable
- Make materials relevant to the audience and capable of grabbing attention
- Incorporate available feedback from the intended audience as needed
- Maintain continuity and consistency among outreach materials (ex. presentation, pamphlets, etc.)
- Appeal to multiple learning styles using audio and visual aspects when applicable
- Use outreach as an opportunity for the public to interact and be involved in learning about the topic

In many cases, the points listed match those discussed elsewhere in this report. However, some points provide new insights to consider, such as repeating the key message(s) at the beginning and end of materials, whether they are presentations, pamphlets, etc. Similarly, all outreach and education materials and efforts should maintain a consistent message in order to get the primary points across in way that displays consistency. Finally, a point that is often overlooked is that different people have different leaning styles and when trying to reach a broad audience, it is useful to try to develop materials and approaches that apply to a broad range of learning styles.

6.3.2. Emergency Management

Rizzo (2011) discussed steps to public outreach efforts from the perspective of emergency management. The first step was to develop an understanding of the community, including what makes it unique and who the community leaders are. An understanding of the target audience is also crucial, as the "general public" is not really the audience. Rather, specific groups make up the target audience, such as policy makers, residents, business owners, etc. Once the audience is identified and understood, the goals of outreach should be refined to meet their needs. These goals should also be measureable whenever possible. The next step in outreach is to inventory available resources (including financial) to understand what is available to conduct the program.

This leads to the design of the outreach program itself, its implementation, and when possible, evaluation after execution.

6.3.3. Health Care Benefit Exchange

The state of Vermont's "Health Benefit Exchange Outreach and Education Plan (Department of Vermont Health Access, Undated) documented several mediums available for public outreach and education efforts that are transferable to roundabouts. These included:

- Traditional media, including television, radio and newspaper.
- Printed materials, including direct mailings, brochures, posters, palm cards, payroll inserts and table tents (information on restaurant tables).
- Online materials, including websites, social media and online banners.

The guide does not provide specific examples of the type of information or messages that can be conveyed via these media. Many of these approaches to outreach have been highlighted in earlier sections of this report, although the use of table tents is new. Collectively, they reinforce the collective set of options available for public outreach and education.

6.4. Chapter Summary

This chapter has documented existing efforts by state agencies toward outreach, both related to transportation projects and for other areas (e.g., public health). Most of the transportation-specific outreach efforts by states have focused on safety. In general, the approach employed in most cases is the same: a dedicated website for the effort that contained background information and statistics, as well as embedded videos (or links to them) and radio spots that serve as the public media outreach components. In some cases, printed materials, primarily posters, were also developed. The use of social media (Facebook, Twitter and YouTube) was mixed, although it would appear that use of those mechanisms is growing. While no specific campaign or approach stood out as the template to follow for roundabouts, it appears that the use of video/audio is the preferred approach toward reaching the public in most efforts.

Other transportation-related project outreach and education programs (both agency and consultant driven) focused on public engagement opportunities through meetings, email distribution lists, websites, door-to-door or school visits and "grassroots" efforts such as booths at events such as county fairs. Additional efforts identified in this chapter provided general guidance to consider in developing an outreach or education program. Identification and understanding of the audiences that would be addressed by any campaign was a recurring point, as was tailoring messages and materials for these different audiences.

Finally, this chapter has presented additional approaches employed in public outreach from areas outside of transportation. Much of the guidance provided by these approaches was similar to that employed by transportation agencies for general as well as roundabout-specific efforts. Traditional approaches such as television and radio commercials (public service announcements) were cited, along with other mediums such as brochures and mailings. Although not extensively cited as being used by non-transportation efforts, social media, such as Facebook, appear to be gaining more use. However, the primary conclusion drawn from the review of non-transportation efforts is that no significantly more effective approaches or mechanisms to public outreach or education are being used by other governmental entities.

7) OUTREACH APPROACHES

Based on the information collected and reviewed during the course of the research, a number of different approaches toward public outreach and education on roundabouts are available. These approaches vary both by purpose/focus (ex. driver education, general information, etc.) and delivery mechanism (hard copy materials, electronic/web-based, television, public meeting, etc.). In order to better understand the different approaches that are available to MDT, they are reviewed/discussed by purpose/focus and delivery mechanism in the sections below. In doing so, this chapter lays out different options that can be pursued individually or in combination when educating and reaching out to the public on roundabouts in Montana.

7.1. Outreach Purpose/Focus

Roundabout outreach efforts have been seen to focus on a variety of topics. Examples have been identified focusing on educating drivers, pedestrians and other roundabout users, and informing the public on roundabout benefits, etc. The following sections discuss the different types of information provided by outreach and education efforts that were identified during the course of the research. It is important to note (as mentioned before), that in general the information provided by agencies did not actively promote or "sell" the concept of roundabouts. Rather, efforts tended to focus on providing relevant information on a specific aspect of roundabouts.

7.1.1. Education on Roundabout Use

One of the primary purposes of the information provided by agencies in their public outreach efforts on roundabouts was to provide vehicle drivers, pedestrians and bicyclists instructions on how to use a roundabout. Education materials for transportation system users are employed for a wide variety of purposes by transportation agencies, so their adoption to roundabouts was expected.

7.1.2. Background Information

Two types of background information often are provided in roundabout outreach efforts: general and project-specific information. General information could consist of what roundabouts are, how they differ from other designs (e.g., traffic circles, which often are confused with roundabouts by the public), their benefits, etc. Project-specific information may vary and can include an overview, expected benefits, alternatives considered and other information. Background information is conveyed via different forms of media (television, radio, newspapers, etc.).

7.1.3. Benefits of Roundabouts

Another focus of roundabout outreach materials is the benefits they offer. A primary benefit is improved safety, which has been addressed by a wide spectrum of mechanisms ranging from video to printed materials, often addressing how they can reduce crashes and make intersections safer for pedestrians and bicyclists. The information presented to the public typically focused on illustrating how conflict points were reduced and highlighting the reductions in crashes achieved by roundabouts throughout the U.S. and internationally. In addition to highlighting the safety benefits, agencies often present other benefits of roundabouts to the public. These include, but are not limited to, improvements to operations (reduced stopping), air quality (better traffic flow, which reduces emissions), aesthetics (opportunity to provide landscaping), etc. Similar to the

types of information presented thus far, the highlighted benefits were typically presented through all available mechanisms, ranging from discussion during videos to printed materials.

7.1.4. Before and After Studies

Although not commonly used, some agencies have conducted before and after studies of roundabouts, specifically addressing their safety and operational performance. By quantifying any improvements that have been achieved, an agency has information that can be highlighted when proposing roundabouts in future locations. If local (at least in the sense of within the same state) successes can be shown, some of the public may soften their stance on the proposed roundabout.

7.2. Outreach Delivery

Aside from the type of message and information provided, the approach to disseminating information was also of interest. In this respect, a number of different approaches were identified during the course of the research, both for specific projects, and regarding roundabouts, in general. Public meetings were universally used as the primary (and perhaps only) outreach mechanism on specific projects. General information on roundabouts was most commonly made available through the internet (often with videos), radio/television spots, printed media (pamphlets and brochures) and increasingly, social media. Of course public meetings can also use/refer to general roundabout information in video, print and other formats. The following sections provide discussion of these different media.

7.2.1. Public Meetings

Public meetings are a traditional outreach method often used by transportation agencies (frequently by policy or law), and their use in roundabout outreach is no exception. Public meetings are one of the primary and perhaps the most common of the approaches used to inform -and interact- with the public on roundabout issues. Often these meeting involve presentations, two-way discussions and printed materials. Public meetings allow agency personnel to present different design alternatives, provide facts and figures on roundabouts, answer questions, conduct dialogue with stakeholders and receive feedback. The approach and content of such meetings can vary widely, particularly with respect to roundabouts, but the overall intent is to both educate the public and provide an opportunity to solicit and receive feedback. To this end, the materials employed at meetings vary widely by type, but typically include presentations (PowerPoint slides and other mediums, such as videos) and printed materials intended to educate and inform the public. As much as possible, content and delivery should be tailored to the particular audience and project and take into account that not every audience member will be familiar with engineering or transportation concepts and terms.

7.2.2. Brochures and Pamphlets

Brochures and pamphlets (note these terms are used to describe essentially the same materials) are printed materials that convey information about roundabouts. The information typically presented by these materials include an overview of what roundabouts are, how to drive them, their benefits and/or similar information. A high quality printing job is usually employed to produce such materials, as they are handed out in a wide array of venues, ranging from public meetings for projects, to rest areas and driver licensing facilities. Most of the pamphlet materials

identified during the course of this research took on a general theme, using illustrations as the primary imagery, although in some cases, local photos from constructed roundabouts in the jurisdiction were used.

7.2.3. Television Commercials

The use of television commercials for roundabouts centers on education and outreach efforts through PSAs. The messages presented during such commercials were focused on educating the public on how to use roundabouts, or to inform the public that a roundabout is being constructed or about to open. In no case during the course of the research was any television campaign identified which sought to promote roundabouts in general or to develop public support for them prior to their proposal. The video for television commercials was brief, lasting 30 seconds to 1 minute, as would be expected. It often used footage from roundabouts that have already been constructed in the area. Such commercials were straightforward and did not employ different features such as humor when making their point. In many cases, the PSAs used on television were posted to an agency's roundabouts website, further broadening the public's exposure to the message.

7.2.4. Radio Commercials

Similar to television, radio commercials for roundabouts consisted of PSAs centered on education and outreach. The messages presented during such commercials were focused on educating the public on how to use roundabouts, or to inform the public that a roundabout is being constructed or about to open. Similar to television, these commercials were straightforward and did not employ different features such as humor when making their point. Radio messages were often posted to an agency's roundabout website as well, along with transcripts of the message.

7.2.5. Newspaper

Information on roundabouts included in newspapers typically was of two types: articles generated by the paper as news stories about a project and advertisement sponsored by a public agency. News articles discussing a particular proposed roundabout project, one under construction, or one about to open were viewed as positive, with agencies sometimes asked to provide background information for the articles. In some cases, these stories featured figures illustrating how to use a roundabout. The Wisconsin DOT used newspapers to advertise how to drive through roundabouts and North Dakota used an advertisement to explain what a roundabout is, how to use it and its benefits (see Figure 11). Newspapers provide a good mechanism to reach the public, particularly if more of the public in a locale visits a newspaper's website to view content. Relative to advertising in newspapers, most transportation agencies do not see much utility in this approach.

7.2.6. Videos

Roundabout videos produced for television PSAs have to be of short duration to meet the needs of the format, so many agencies have developed longer videos to post on their internet sites. These videos generally discuss different aspects of roundabouts, including what they are, how they differ from other designs (e.g., traffic circles), their benefits and how to use them. The level of detail in such videos varies, with some being as long as 12+ minutes. In some cases, multiple

videos discussing different aspects of roundabouts have been developed. Most videos used footage from local sites, narration and/or testimonials from local officials and residents. Regardless of the approach employed in developing such videos, they appear to be a mechanism that will reach larger audiences as time goes on, given the rise of websites such as YouTube where agencies can post them.

7.2.7. Simulations

Many agencies have found that simulation videos are a useful tool in outreach and education. Simulation videos provide different perspectives (bird's eye, driver, etc.) of operations through a roundabout. The video can also be posted to a website or aired during news stories or PSAs. It can provide a visual indication of how the roundabout will operate under different traffic conditions. This can help the public understand that a roundabout can work as intended and will not cause the operational or safety problems that many unfamiliar with the design fear.

7.2.8. Conceptual Images

Like simulation videos, conceptual images help the public better understand the concept of roundabouts for a particular project. They provide an idea of what the site will look like in a manner the viewer can particularly relate to, as they are likely already familiar with the existing location. .

7.2.9. Booths

This approach to roundabout outreach and education consists of setting up booths at public events such as county fairs. The booth presents information on roundabouts, with materials that can be handed out to visitors by agency staff. This approach provides a mechanism to engage the public one-on-one in an environment that is not hostile (unlike some public meetings), allowing an opportunity for discussions to develop and questions to be answered.

7.2.10. Public Event Displays

Public event displays are large posters or kiosks set up in public locations such as shopping malls. These displays are likely to make use of existing materials previous developed by an agency, or those provided by another entity such as FHWA. They are used primarily to raise awareness of roundabouts, particularly how to use them, in areas where they are being used for the first time.

7.2.11. Posters

While they do not appear to be widely used, posters are another form of roundabout education and outreach that are available. These posters typically provide an overview of what roundabouts are and how they should be driven.

7.2.12. Models

As discussed in the previous section, scale models have been used to provide a visual illustration of roundabouts in general or at a specific site. They provide a hands-on opportunity to guide different vehicles through a roundabout and to better understand its features and movements.

7.2.13. Websites

Roundabout specific websites were discussed extensively in Chapter 5. The content and detail of roundabout websites varies greatly, but the overall intent of providing information on roundabouts in a manner that can be accessed at any time and from anywhere is particularly attractive. Many agencies present the content that they have developed for public meetings and PSAs on their websites and in the case of video, many agencies have established their own pages on websites such as YouTube.

7.2.14. Social Media

In addition to their own dedicated roundabout websites, many agencies are beginning to develop roundabout-specific social media sites on Facebook, Twitter or similar venues. These mechanisms are used to provide information such as daily facts, figures, or benefits to subscribers and provide a new mechanism to interact with the public, particularly in soliciting and answering questions and concerns. The challenge to this media approach is the need to develop new (and interesting) content on a frequent (typically daily) basis in order to maintain interest from the public.

7.2.15. Demonstrations

Roundabout demonstrations provide an opportunity to set up a full size roundabout in a location such as an empty parking lot. This display can allow the public to view different vehicle types using the roundabout as well as get a feel for how the proposed site will be laid out and its dimensions. Demonstrations also provide another opportunity to engage the public in dialogue and to answer questions.

7.2.16. Direct Mailing

Direct mailings to local households and businesses have been used by some agencies to provide educational materials on roundabouts, as well as to answer questions that typically arise. This approach does not appear to be widely used, but it does offer a way to reach a specific portion of the public who will be directly impacted by a proposed or newly constructed roundabout.

7.2.17. Telephone Hotline

Another approach, which has been used only in limited instances on larger-scale, non-roundabout projects, is a dedicated telephone hotline. While a dedicated hotline to answer questions on roundabouts may not be feasible, agencies could consider providing a specific contact at an agency who can answer roundabout questions.

7.2.18. Restaurant Materials

One final outreach media that was identified during the course of this work was the use of restaurant placemats and coasters to disseminate roundabout information. Placemats were used to provide driving instructions for roundabouts and other information. Coasters were used simply to illustrate driving maneuvers (North Dakota was the only case of this use).

7.3. Chapter Summary

As this chapter has outlined, there are a number of different types of information that have been provided regarding roundabouts, as well as different media employed to educate and reach out to the public. The types of information provided to the public on roundabouts has generally been centered on how to use them (from the perspective of drivers, pedestrians and bicyclists), highlighting the safety and other general (operational efficiency) benefits they provide, or providing other general information (ex. history, differences from traffic circles, etc.). In no observed cases did agencies provide roundabout information that took on a promotional character. Instead, agencies sought to present the facts on roundabouts and educate the public about them, likely recognizing that heavy promotion of the concept could result in generating opposition. In some cases, the type of information provided was brief/concise (e.g.. PSAs) while in others, it was more detailed (e.g., educational materials and presentations).

In terms of the delivery mechanisms used, a number of different approaches are available to disseminate roundabout education and outreach. These approaches have been used with varying success by agencies across the U.S. and worldwide. Public meetings are universally used for outreach on specific projects. For more general outreach, traditional television and radio commercials in the form of public service announcements are used, with an increasing focus on websites and social media. The messages being conveyed via the different media are largely the same, being educational or informative in nature. Some media seeks to educate roundabout users how to use roundabouts, while informative media provides an overview and background on roundabouts. Depending on the type of media employed, the amount of information conveyed can be brief/concise (ex. PSAs) or quite detailed (ex. websites and presentations).

During the course of the research, no single type of information or media stood out as being more preferable than another. In general, most agencies take the approach of educating the public on how to use roundabouts and highlighting their benefits. The wide variety of approaches to disseminating information largely depends on the target audience, as well as aspects such as available budget for outreach and so forth. The intention of presenting the different types of information and media is to highlight the different approaches that have been and are being used to provide education and outreach on roundabouts. The selection of what should be used in education and outreach efforts is something that must be carefully considered and is likely to vary from project to project. In most cases, outreach and education will be more local in scope; a statewide promotion of roundabouts is not an approach that was noted during the course of the work, aside from providing driving information in states where a large number of roundabouts have been constructed (e.g. Wisconsin).

8) CONCLUSIONS AND RECOMMENDATIONS

In Montana, there has been strong public opposition to some of the roundabout projects proposed by the Montana Department of Transportation. While MDT staff members have presented roundabout-specific facts and figures to the public in order to develop support for these projects, this approach has not proven to be effective. Consequently, this research was undertaken to identify other strategies to use in public meetings and other venues to promote roundabouts as a preferred approach to intersection control and as an effective safety countermeasure. The following sections provide a summary of the findings from the research and recommendations on how roundabout education and outreach may be handled in the future.

8.1. Conclusions

8.1.1. Literature Review

The results of the literature review identified a number of points that should be considered when conducting public education and outreach related to roundabouts. A recurring point raised by multiple references was the use of public meetings/forums to bring the public into the process. The earlier the public can be engaged, such as during the planning stages of a project, the more opportunity there is to develop consensus and acceptance of a roundabout alternative. Planning for such meetings is essential and the use of visual aids, whether mock-ups, simulations, or other means is helpful. Willingness to provide an opportunity for and to engage in a dialogue with the public during meetings helps in addressing concerns with roundabouts. Demonstrating that a full range of alternative designs have been considered also can help overcome resistance to roundabouts. Working with the press to alert the public on a project and educate them on why a roundabout is proposed has proven useful over time.

In general, an agency must keep in mind that different audiences will have different concerns and the message being presented should be tailored accordingly. One interesting observation from the literature review is that it appeared, although not explicitly stated by any reference, that there is a split view toward the information being presented to the public at meetings. To some extent, the presentation of facts and figures was advocated (an engineering-centric approach) while in others, a more toned down, informal approach was employed that was more conversational or interactive with the public.

A number of approaches to roundabout outreach and education were presented in the literature. These included:

- Brochures
- Videos
- Simulations
- Television, radio and newspaper stories/interviews
- Displays/mock-ups
- Conceptual images
- Full-size demonstration (parking lot)
- Direct mailings
- Dedicated website

- Telephone hotline

As this list indicates, there are a number of different approaches that can be used as components of outreach and education efforts. Depending on the exact needs of an agency, many of these could be used in combination to meet the needs of different target audiences.

Past surveys have shown that the public is typically opposed to the use of a roundabout before it is constructed, often by a large margin. Following construction, surveys show that much of that opposition shifts towards support of roundabouts. For those opposed to roundabouts, the primary concerns are related to safety and driver confusion. This is often influenced by past driving experiences (typically through traffic circles) that have influenced a respondent's perceptions toward roundabouts.

8.1.2. Agency Experiences with Roundabout Education and Outreach

Through the agency survey and telephone interviews, it was clear that MDT's experience of public opposition to proposed roundabouts is not unique. A majority of agencies have encountered similar issues early in their development and deployment of roundabouts. Based on this experience, several agencies provided information that will be useful for MDT to consider in developing roundabout projects in the future. Many staff members who were interviewed stressed that early roundabouts should be built where they are most likely to be successful (i.e. operate well, produce safety benefits, etc.). These sites can then be highlighted at future public meetings as success stories, while noting the similarities with the proposed site.

Experience has shown that, even for projects that were significantly opposed, once a roundabout is constructed, the public generally accepts them. In many cases, agency contacts indicated that roundabouts had become so accepted that some communities began to make requests for them. This relates to another key point: buy-in from local government officials is essential for addressing public reluctance. If local government is opposed, it is less likely that the community at-large will accept a project. Meeting with local government officials, answering their questions, explaining why a roundabout is the preferred option and demonstrating that other alternatives have been considered is the recommended approach to meeting this need.

A key finding of the agency survey and follow-up interviews was that it appears that no agency engages in promotion of roundabouts through media campaigns. No agency has developed advertisements that champion the use of roundabouts. Rather, agencies appear to believe that project-specific justification for roundabouts is needed before they are proposed to the public.

8.1.3. Public Survey of Montanans

An initial review of records from past MDT projects incorporating roundabouts found a wide majority of those who provided verbal or written comment were opposed to roundabouts (77 percent of commenters). Concerns were focused on safety, efficiency, costs, bicycle and pedestrian issues, driver confusion and other issues (e.g. maintenance challenges). These viewpoints, combined with those expressed throughout the public survey, provide a better idea of the points MDT might focus on when revising or developing new outreach and education materials and approaches.

A survey of the public conducted by this research found that 61 percent of respondents opposed roundabouts. Only 14 percent of respondents indicated that improvements to education and

outreach on roundabouts would likely change their views. However, 38 percent of respondents indicated their views toward roundabouts had changed over time, primarily positively (one respondent did indicate a shift to a negative view following use of a roundabout).

Most of those surveyed (56 percent) had seen MDT-produced or other information on roundabouts, with some finding the materials useful and others finding it too technical or uninformative. Recommended improvements to outreach materials made by respondents included considering the use of videos, simulations, three dimensional renderings as well as increased education to help drivers learn how to navigate roundabouts. In many cases throughout the survey, an "exceptionalist" viewpoint was noted, where respondents stated "roundabouts might work somewhere else, but they won't work in Montana".

Respondents indicated that the internet, newspapers and television were the primary mediums they used to obtain information on projects of interest to them, as well as the mediums that MDT should use to provide information on roundabouts. Consequently, the primary mechanisms used by MDT to conduct roundabout outreach and education (in addition to public meetings) should be the internet, newspapers and television. Respondents also provided thoughts on other improvements that could be made in terms of roundabout outreach and education. The use of visual aids and factual data from studies were preferred for public meetings. The messages related to roundabouts at such meetings should be tailored to the specific project. Additionally, at least one respondent indicated that MDT staff members at meetings need to be more conversational with those opposed to roundabouts instead of simply trying to counter with facts. Related to this, some respondents indicated that MDT should be more objective when proposing a project incorporating a roundabout, clearly demonstrating that it is the best alternative solution for the site and being able to show the benefits it will offer. In general, there is a segment of the public that is opposed to the idea of roundabouts, and in most cases, little appears to change their mind short of experiencing/driving a roundabout, often frequently.

8.1.4. Roundabout Media and Outreach

While many states use roundabouts to some extent on their systems, not all have developed dedicated websites that present information on roundabouts. In states that have developed them, the content of websites was straightforward, introducing what roundabouts are, highlighting their benefits, answering basic questions about them, providing driver guidance and presenting images, videos, and/or maps of existing roundabouts. In reviewing the various state-level roundabout websites, a lack of "testimonials" from locales where successful applications have been installed was evident. Whether this was intentional to avoid the appearance of trying to "sell" roundabouts or just an oversight is not clear.

Not all states have developed their own roundabout videos; most existing videos focus on educating drivers on how to use roundabouts. In some cases, videos were in the form of brief Public Service Announcements, while in other cases, state agencies produced longer, more dedicated videos. Generally, the focus of roundabouts videos was more on educating drivers rather than promoting the use of roundabouts to the public. When roundabouts were promoted in videos, they focused on their advantages and benefits. Most videos used local (for that state) footage to present successful applications. Aside from videos, some states also developed radio PSAs, which were also brief and highlighted driving tips.

As a final observation, not many states post their roundabout pamphlets developed for meetings to their websites. This practice could be a missed opportunity to provide a simple piece of supplemental information on their websites by posting their pamphlets/brochures.

8.1.5. Other Education and Information Campaigns

In addition to roundabout-specific efforts, it was of interest to determine other approaches to education and outreach that government agencies might employ, both related to transportation projects and for other areas (e.g. public health). Most of the transportation-specific outreach efforts by states have focused on safety. In general, the approach employed in most cases was the same: a dedicated website for the effort that contained background information and statistics, as well as embedded videos (or links to them) and radio spots that served as the public media outreach components. In some cases, printed materials, primarily posters, were also developed. The use of social media (Facebook, Twitter and YouTube) was mixed, although it would appear that use of those mechanisms is growing. While no specific campaign or approach stood out as the template to follow for roundabouts, it appears that the use of video/audio is the preferred approach toward reaching the public in most efforts.

Other transportation-related project outreach and education programs (both agency and consultant driven) focused on public engagement opportunities through meetings, email distribution lists, websites, door-to-door or school visits, and "grassroots" efforts such as booths at events such as county fairs. Additional efforts identified in this chapter provided general guidance to consider in developing an outreach or education program. Identification and understanding of the audiences that would be addressed by any campaign was a recurring point, as was tailoring messages and materials for those different audiences.

Additional approaches employed in public outreach from areas outside of transportation were similar to those employed by transportation agencies. Traditional approaches such as television and radio commercials (public service announcements) were cited, along with other mediums such as brochures and mailings. Although not extensively cited as being used by non-transportation efforts, social media, such as Facebook, appear to be gaining more use. However, the primary conclusion drawn from the review of non-transportation efforts is that no truly unique approaches or mechanisms to public outreach or education are being used by other governmental entities.

8.1.6. Outreach Approaches

A number of different types of information have been provided by agencies over time on roundabouts. The types of information provided has generally been centered on how to use them (from the perspective of drivers, pedestrians and bicyclists), highlighting the safety and other general benefits (operational efficiency) they provide, or providing other general information (e.g. history, differences from traffic circles, etc.). In no observed cases did any of the types of roundabout information provided by agencies take on a promotional character. Instead, agencies sought to present the facts on roundabouts and educate the public, likely recognizing that heavy promotion of the concept could result in generating opposition. In some cases, the type of information provided was brief/concise (e.g. PSAs) while in others, it was more detailed (e.g. educational materials and presentations).

In terms of the types of media, a number of different approaches are available to disseminate roundabout education and outreach. These approaches have been used with varying success by

agencies across the U.S. and worldwide. For project specific efforts, public meetings were universally used to disseminate and interact with the public. In more general outreach efforts, both traditional approaches such as television and radio commercials in the form of public service announcements are used, with increasing focus on websites and social media. The messages conveyed via the different media are largely the same, being educational or informative in nature. Some media seeks to educate roundabout users on how to use roundabouts, while informative media provides an overview and background on roundabouts. Depending on the type of media employed, the amount of information conveyed can be brief/concise (e.g., PSAs) or quite detailed (e.g., websites and presentations). During the course of the research, no single type of information or media stood out as more preferable than another. In general, the selection of what should be used in education and outreach efforts must be carefully considered and is likely to vary from project to project.

8.2. Recommendations

Based on the information reviewed during the course of this research, a number of recommendations can be made. These recommendations are intended for consideration during all phases of a roundabout project (or program). In many cases, the needs of an individual roundabout project will vary, and the outreach and education efforts should be tailored to meet those needs.

When considering roundabouts in general (for example, statewide), a promotional campaign could be considered, although no such effort has been pursued elsewhere. Many states interviewed during the survey portion of this work indicated that they did not pursue such an approach to avoid the appearance of "selling" the concept. Rather, education and outreach for roundabouts was often approached on a project-by-project basis, with the facts presented to explain why a roundabout was the preferred alternative at that location. However, given MDT's experience with resistance, an aggressive approach employing direct television and/or radio promotion of roundabouts might still be considered. Direct promotion of roundabouts would essentially be a "first" in the United States, as no other agencies was identified that presented the concept to the public in such a manner. If such an approach is pursued, it should consider employing information on the successful sites that are already built in the state.

Before even proposing a roundabout, care should be taken to establish that it is the right solution for a site and that it will be successful. Many of the states that were interviewed during this research indicated that building a roundabout where it will work correctly and succeed goes a long way toward developing public acceptance and support. The success of such roundabouts can then be highlighted when proposing their use in other locations. It provides a frame of reference that shows they work in similar locations, especially if residents have driven through them.

When considering roundabouts for a specific project, an initial meeting with local government officials is advisable. Many agencies have found that meeting with local officials and establishing their support before public meetings helps to increase public support for the project.

At subsequent public meetings, a few points should be kept in mind. First, the materials and discussion points should be tailored for the audience (e.g., local residents, businesses, etc.). In presenting roundabouts, information should be kept basic and non-technical. When engaging the public (e.g. taking questions) a dialogue or two-way conversation should be pursued, as opposed

to trying to explain a question away with facts. This creates an atmosphere where the public feels that their thoughts and opinions are being heard, rather than the perception that their thoughts and views have been dismissed.

Visual aids for meetings (and all roundabout materials produced) are essential in helping to explain how the alternative will operate and why it is preferred. Such visual aids can include conceptual images, scale models of roundabouts, and simulation videos. All of these approaches have been used elsewhere with good success. When a large parking lot is available, it might also be advantageous to conduct a full-size roundabout demonstration in conjunction with a project to allow the public to understand the dimensions and layout for the proposed design. In line with visual aids, printed materials, specifically pamphlets and handbills should also be employed. These materials should incorporate imagery from roundabouts that have been constructed and are successfully operating in the state.

When roundabouts are new to an area, it may be a good idea to air PSAs that discuss how to use roundabouts. These PSAs could air on television and the radio, and may be developed for a specific site or be a general video/audio script developed for statewide use. The use of newspaper and print media (pamphlets/brochures) should also be pursued as these can provide more details than short video and audio announcements. Regardless, the focus of PSAs should be on education and the benefits of roundabouts rather than promoting them in a manner that comes across as a sales pitch.

In addition to television and radio PSAs, it would be beneficial to develop a longer video(s) that can be placed on the internet, either on a dedicated roundabout website for the state or on a YouTube-type of site. A longer video can provide more detail on different aspects of roundabouts (a series of videos could also be produced to discuss individual topics in more detail) and allow viewers to learn about the subject at their convenience. Creativity should be incorporated into roundabout videos as much as possible, although most current roundabout videos that were reviewed were basic and to the point. Whenever possible, local scenes from roundabouts throughout the state should be employed in the video footage, along with testimonials from local residents and officials.

Outreach to local television, radio and newspaper media outlets should be employed during all phases of a proposed project incorporating roundabouts. In this approach, the DOT could reach out to these outlets, as is already the case for most projects, or the outlet may contact the DOT for information on the project. Regardless of the contact approach, it should be viewed as an opportunity to explain why a roundabout has been considered, what its benefits would be and other background information. Once again, the intent should not be to "sell" the roundabout, but rather, explain why it is a preferable option and how it can be a positive feature if/when constructed. The benefit of this approach is that it reaches a large audience while putting a positive light on roundabouts.

The state's dedicated roundabout webpages should be expanded. A web presence allows anyone who is interested in roundabouts to review information at their convenience. The roundabout website also offers a good opportunity to highlight successful projects and provide longer duration video footage. Many websites have provided maps and images of the different roundabout sites that have been constructed throughout the state, and this is another idea that should be considered.

Supplemental approaches to roundabout education and outreach should also be considered for use when appropriate. For example, if a roundabout is being proposed or constructed in a local community, posters, direct mailings and/or restaurant advertising (placemats and coasters) might be considered. Other efforts, such as local kiosk displays at shopping malls or booths at public events such as county fairs are other ideas that might be employed on a case-by-case basis.

Finally, publicizing the benefits of roundabouts has frequently been mentioned throughout this report as an important part of outreach and education activities. In talking with different states, several agencies indicated that pointing to local successes is critical in presenting the benefits of roundabouts. To this end, it might be a good idea to quantify some of the benefits of roundabouts that have been installed in different locations in Montana. For example, a before and after study of intersection crashes at different sites would quantify how roundabouts have reduced crashes following installation. Similar work could quantify the operational and environmental (reduced emissions) benefits as well. All of this information could be used to combat the "exceptionalist" viewpoint that while roundabouts may work elsewhere, they will not work in Montana.

8.3. Closing Remarks

Public reluctance to roundabouts is an issue that is not unique to Montana; it has occurred throughout the U.S. To this end, the experiences of other states have shown that this attitude can be countered by a variety of approaches. These approaches include traditional methods (public meetings, informational materials, PSAs, etc.) and more innovative ones (social media, simulations, etc.). Regardless of the approaches taken in reaching out and educating the public, the efforts should not come across as being promotional. Rather, efforts should present why a roundabout is a preferred alternative and how it can benefit the community at a particular site. In all cases, it is critical that the public be engaged in a discussion of a roundabout so that they understand that their thoughts and concerns are being heard and considered.

While roundabout education and outreach are important in establishing public acceptance, in many cases, it appears that there is no substitute for experience. Many people will remain skeptical of roundabouts until it has been constructed and they have used it. Only after driving a roundabout and seeing that it does work as intended do many opinions change from opposition to support. This is evidenced by the feedback obtained from the survey of Montana residents, as well as the feedback provided by other agencies during telephone interviews. However, no matter how much effort is made in educating and reaching out to the public on roundabouts, it appears there will always be a contingent of the public that is opposed to them regardless of how well they might work at different sites. This is a group that is difficult if not impossible to address with education and outreach, no matter how much effort is expended.

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10) APPENDIX A: ONLINE AGENCY SURVEY

The Montana Department of Transportation (MDT) is undertaking work to better understand how roundabout outreach and education related to stakeholders and the public can be improved. In order to obtain such information, a brief questionnaire has been compiled that seeks feedback on different aspects related to roundabouts. Participation is voluntary, and you can choose to not answer any question that you do not want to answer, and you can stop at any time.

MDT would like to document how other agencies handle educating the public and stakeholders on roundabouts, whether there has been historical opposition to roundabouts and how that may have been addressed, and what approaches and materials can be used in communicating with the public and stakeholders. The information obtained through this work will aid in the development of a guide of best approach that MDT can use in presenting roundabout use in Montana.

If you have any questions regarding this survey or project, please contact David Veneziano at the Western Transportation Institute at (406) 994-6320 or david.veneziano@coe.montana.edu

1. What state / agency do you represent?

2. Does your state/agency consider roundabouts as an intersection alternative for traffic control?

- ● Yes
- ● No
- ● Unsure

3. Regarding public or community perception,

	Yes	No	Unsure
Does your agency currently have any issues with reluctance to roundabouts?	●	●	●
Have there been any issues in the past?	●	●	●

4. Part of this effort is to learn how other agencies have addressed issues with public acceptance of roundabouts. Who is a good contact at your agency that the researchers may contact to discuss current and past roundabout outreach and education efforts?

First name

Last Name

Title / Position

Agency

Telephone

Email

11) APPENDIX B: AGENCY TELEPHONE INTERVIEW QUESTIONS

The Montana Department of Transportation (MDT) is undertaking work to better understand how roundabout outreach and education related to stakeholders and the public can be improved. In order to obtain such information, a brief questionnaire has been compiled that seeks feedback on different aspects related to roundabouts. Participation is voluntary, and you can choose to not answer any question that you do not want to answer, and you can stop at any time.

MDT would like to document how other agencies handle educating the public and stakeholders on roundabouts, whether there has been historical opposition to roundabouts and how that may have been addressed, and what approaches and materials can be used in communicating with the public and stakeholders. The information obtained through this work will aid in the development of a guide of best approach that MDT can use in presenting roundabout use in Montana.

Telephone Interview Questions:

1) If your state/agency does build roundabouts, how long have you been building them and how frequently? How many do you have in place?
2) How did your agency initially approach the process of presenting information on roundabouts to the public?
3) Has that approach evolved over time? Were issues encountered in the beginning, such as public reluctance? How were these issues addressed?
4) How are presentations presently being made? Are they engineering-focused, or less technical? Who is making the presentations?
5) What sort of promotional materials are used to promote roundabouts (ex. pamphlets)? How have these materials been received by the public? Have they been changed over time? Do you have any example materials that the researchers can look at?
6) What other forms of media are used to promote roundabouts? For example, television or radio ads, news stories, etc., YouTube videos, other approaches? Do you have any example materials that the researchers can look at?
7) Does your agency have a Public Information Officer (PIO) or other staff that have taken the time to put together (and present) the roundabout materials? How robust is your agency's PIO section; do they subcontract outreach efforts or handle them in-house?
8) Are there any other outreach or media campaigns or approaches that have been used by your agency that have been particularly successful (not roundabout-specific)? Have any been particularly unsuccessful or not well received?
9) Is there any other information you can discuss that would be helpful to this effort?

12) APPENDIX C: GEORGIA DEPARTMENT OF TRANSPORTATION DESIGN MANUAL GUIDANCE FOR ROUNDABOUT OUTREACH

The public involvement process should include outreach to local government officials and the local community and should be initiated as soon as practical during concept development. At minimum, a public information open house (PIOH) should be held for all multilane roundabouts and for single-lane roundabouts where there are no other well-functioning roundabouts in the community or nearby along the corridor. This includes minor projects for which a PIOH may not otherwise be required.

In communities where there is little familiarity with roundabouts, it is recommended that a meeting be held with local government officials prior to a PIOH. A roundabout subject matter expert or an individual with considerable knowledge of roundabouts should be present at this meeting. Below are suggested "best practices" for preparing for a PIOH.

- Prepare several large color displays that show the proposed location and layout of the roundabout. The display should include aerial photography and property lines. The following may also be included:
  - proposed pavement markings with lane arrows;
  - proposed landscaping in the central and splitter islands (if required); and
  - truck turning paths (on a separate display).
- In urban areas special attention should be given to minimizing right-of-way impacts. Where possible, use construction easements to reduce project costs and impacts to adjacent properties.
- Be prepared with a comparison of cost, safety, and operational performance of the roundabout and other feasible alternates. Accordingly, the following information should be made available at the meeting:
  - construction cost estimates for feasible alternates (e.g., roundabout and signal);
  - crash history and an assessment of roundabout safety benefits; and
  - operational and signal warrant analyses.
- Bring visual aids (e.g. videos, posters, VISSIM 2-D or 3-D simulations, and brochures) to help familiarize the public with how to drive through a roundabout.

Some visual aids are available on GDOT's roundabout website (http://www.dot.state.ga.us/travelingingeorgia/roundabouts/pages/default.aspx) and on FHWA's roundabout website (http://safety.fhwa.dot.gov/intersection/roundabouts/). Additional information regarding public involvement as well as public education is presented in Section 3.8 of NCHRP 672).

13) APPENDIX D: MONTANA RESIDENT SURVEY ON ROUNDABOUTS

The Montana Department of Transportation (MDT) is undertaking work to better understand how public outreach and education regarding roundabouts can be improved. As a past attendee at an MDT public meeting or having provided written feedback regarding roundabouts or a project involving them, you provided your contact information, and we would be interested in hearing your thoughts briefly on a few aspects related to our work. If you are willing, could you please spend a couple of minutes answering some questions related to your views and experiences with MDT's public presentation of roundabout information? Participation is voluntary, and you can choose to not answer any question that you do not want to answer, and you can stop the survey at any time.

If you have any questions regarding this survey or project, please contact David Veneziano at the Western Transportation Institute at (406) 994-6320 or david.veneziano@coe.montana.edu Thank you in advance for your assistance with this survey!

1. Name (Optional)

2. General views

	Yes	No
Are you opposed to the use of roundabouts?	◯	◯
Do you think improved information about roundabouts would change your mind?	◯	◯

3. Has your opinion of roundabouts changed over time?

◯ Yes

◯ No

If Yes, how has it changed?

4. Have you seen any information (MDT or otherwise) on roundabouts?

◯ Yes

◯ No (Skip to question 6)

If Yes, what are your impressions of those presentations or materials?

5. How would you suggest MDT improve roundabout presentations and/or materials (less technical, add a Montana scenic component, etc.)?

6. What mediums do you use to find information about topics that are of interest to you (television, internet, newspaper, etc.)?

7. Is there a particular medium that is better suited than another?

8. Do you attend MDT public meetings on projects that are of interest to you?

- ◯ Yes
- ◯ No

If yes, what are your impressions of those meetings and the information provided?

9. What are your favorite television or radio commercials? Do any stick in your mind as either good or bad examples? (Please provide any information you can, either general or specific.)

10. Do you have any other thoughts or feedback that can be considered by MDT in developing roundabout materials for the public?

Thank You!

Thank you for your assistance with this survey!

14) APPENDIX E: EXAMPLES OF AGENCY ROUNDABOUT BROCHURES

The following sections provide examples of state transportation agency brochures that are available on the internet. Note that this is not a comprehensive sample of brochures.

COMPARING ROUNDABOUTS AND TRAFFIC CIRCLES

People often confuse roundabouts and traffic circles. Roundabouts are generally smaller, and operate more simply.

	ROUNDABOUTS	OLD STYLE TRAFFIC CIRCLES
Traffic Control	Yield control is used on all entries. The circulatory roadway has no control.	Stop control (signs or signals) might be used on some approaches or within the circulatory roadway.
Right-of-Way	Circulating vehicles in a roundabout have the right-of-way.	Circulating vehicles are sometimes required to yield to vehicles entering the circle.
Deflection	Deflection is used to maintain lower-speed operation throughout a roundabout.	Some larger traffic circles provide a straight path, at higher speed, for major movements.
Channelization	Splitter islands are used to provide pedestrian refuge areas and help to deflect entering traffic.	Splitter islands are generally not used.
Circulation	All vehicles circulate counter-clockwise around and pass to the right of the central island.	Some circles allow left-turning vehicles to pass to the left of the central island.
Parking	No parking is allowed within the circulating roadway or at the entries.	Some larger traffic circles permit parking within the circulating roadway.
Pedestrian Access	No pedestrian activity takes place on the central island.	Some larger traffic circles provide for pedestrian crossing to, and activities on, the central island.
	Nationally Accepted Design Standard (FHWA)	Design standards vary by area

WHY A ROUNDABOUT?

SAFETY

* Roundabouts are safer than traditional intersection treatments.
* The number of intersection conflict points is reduced
* When accidents do occur, the lower speeds in the roundabouts tend to result in less severe accidents, and fewer injuries.

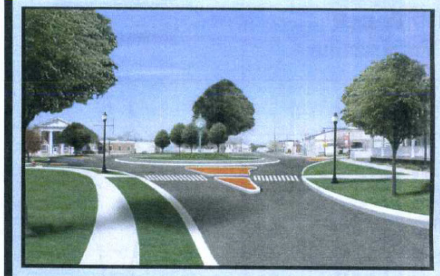
TRAFFIC OPERATIONS

* Simplified movements- one way flow
* Lower overall operating speeds and speed consistency
* Greater capacity than four way stop controlled and some signalized intersection
* Decreased overall delay

OTHER CONSIDERATIONS

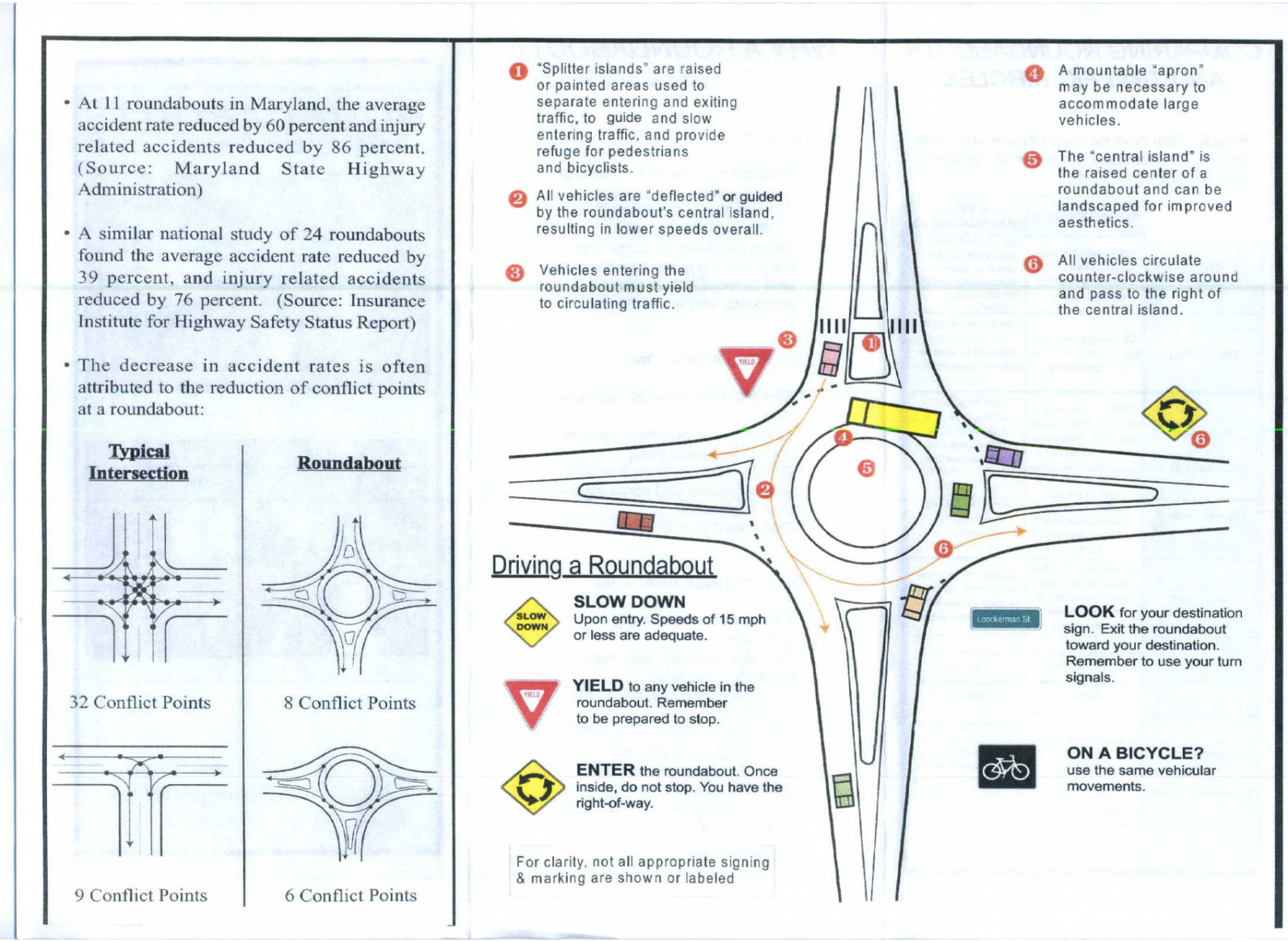
* Serves as traffic calming measure
* Provides aesthetic opportunity for landscaped island
* Can serve as a gateway to the community
* May have a higher construction cost than a signalized intersection but maintenance cost are generally lower for roundabouts
* Can be designed to accomodate larger vehicals

ROUNDABOUTS



Delaware Department of Transportation

Source: Delaware Department of Transportation



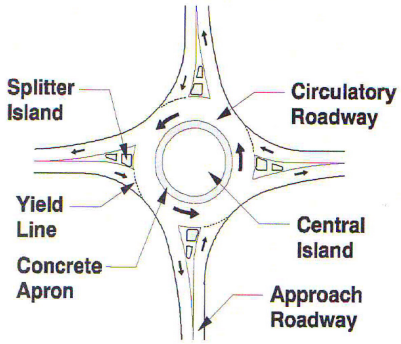
Source: Delaware Department of Transportation

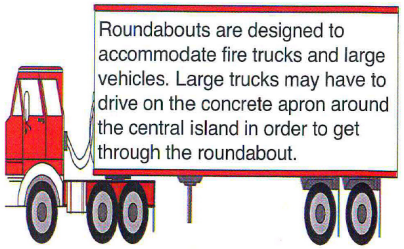
What is a roundabout?

A modern roundabout is a type of intersection that has safety, operational and aesthetic benefits for many different road users.

Roundabouts are characterized by:

- A fairly large central island
- A circular roadway on which all vehicles travel counterclockwise
- Drivers entering the roundabout yield to traffic already in the circular roadway
- Design elements that cause drivers to use the roundabout at slow speeds, including splitter islands at all approaches





Roundabouts are designed to accommodate fire trucks and large vehicles. Large trucks may have to drive on the concrete apron around the central island in order to get through the roundabout.

What are the general principles behind using a roundabout?

Think of roundabouts as a series of "T" intersections, where entering vehicles yield to one-way traffic coming from the left. A driver approaching a roundabout must slow down or stop for vehicles stopped ahead, yield to pedestrians in the crosswalk, and yield to traffic already in the roundabout. Then it's a simple matter of a right turn onto a one-way street. Once in the roundabout, the driver proceeds around the central island, then takes the necessary right hand exit.

What are the advantages of roundabouts?

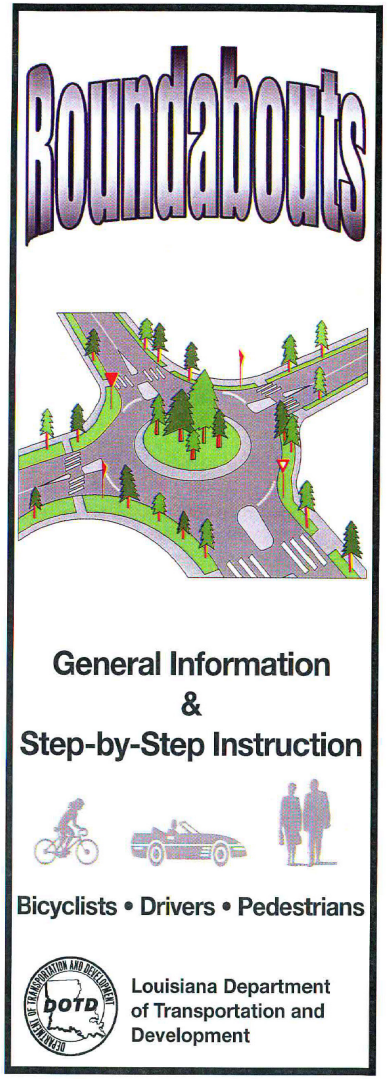
A well-designed roundabout can improve safety, operations and aesthetics of an intersection.

- **Greater safety** is achieved primarily by slower speeds and elimination of left turns
- **Operation** is improved by smooth flowing traffic (with less stop and go than a signalized intersection)
- **Aesthetics** are enhanced by landscaping and less pavement

Are there any disadvantages? What about costs?

Drivers must pay attention; pedestrians don't have a signal to help them cross and bicyclists must merge with motor vehicles to enter the roundabout.

Construction costs are generally comparable to a traffic signal. Additional landscaping requires a long-term maintenance commitment, but normally costs less in the long run than signal maintenance.



Source: Louisiana Department of Transportation and Development

Step-By-Step Instructions For Drivers & Bicyclists

NOTE TO BICYCLISTS: If you're riding a bicycle, ride as if you were driving a car. Roundabouts are designed so motorists will drive at about 15-25 MPH, close to your bicycling speed. Be assertive, so cars see you and respect your right to be on the road.

The first cue that you are approaching a roundabout is the following sign, telling you there is a roundabout ahead.

You should start slowing down. Next you will see a yield ahead sign:

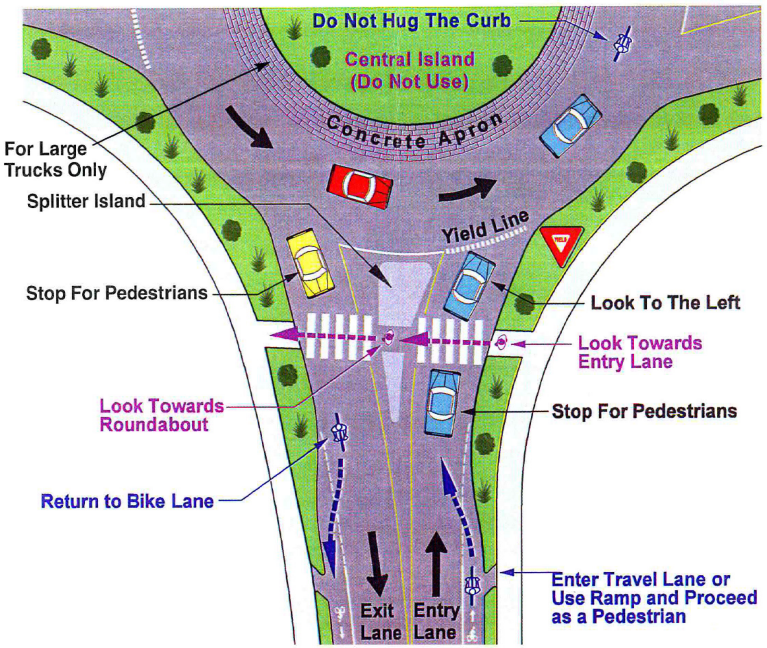
Now the roundabout will be clearly visible. Slow down to 10-15 MPH as you approach. Stay in your lane, to the right of the splitter island.

Be sure to look for bicyclists merging into the travel lane, or pedestrians wanting to cross. Be considerate, and let the bicyclists merge. If you see a person in the crosswalk, let them cross; it's the LAW.

NOTE TO BICYCLISTS: If you're riding on the shoulder or bike lane, merge into the travel lane before the shoulder ends. Prepare for this move early, look over your shoulder, and signal your intent to move into traffic. Don't be intimidated; assert your position upon entering the roundabout.

If you do not want to ride your bicycle in the roundabout, you may enter the sidewalk using the ramps, and proceed as a pedestrian. Refer to the step-by-step instructions for pedestrians for more details.

Then move slowly to the yield line, looking left. A YIELD sign will tell you to yield to traffic in the roundabout:



You may have to stop to yield to cars on your left. If the road is clear, simply enter the roundabout, turning right. You don't have to stop, just enter.

Proceed around the roundabout slowly. Don't pass bicyclists ahead of you within the roundabout, as your speeds should be nearly equal. Continue until you get to your exit. **Do not stop in the roundabout.**

*NOTE TO BICYCLISTS: Once in the roundabout, **don't hug the curb.** Ride close to the middle of the lane to prevent cars from passing and cutting you off. Watch for cars waiting to enter the roundabout, as they may not see you.*

Directional signs will tell you where to exit:

Exit carefully, **using your right turn signal.** Watch for pedestrians in or approaching the crosswalk and stop for them.

That's it, you're done! Go on to your destination and enjoy the rest of your trip.

Step-By-Step Instructions For Pedestrians

You can walk safely through a roundabout by following these simple steps:

- Proceed around the roundabout on the sidewalk and in the designated crosswalks. **Never walk in the roundabout or to the central island.**
- Cross one lane at a time to the splitter island; it's there to provide you a refuge between lanes.
- When crossing an entry lane, watch traffic coming at you down the entry lane. You have the right of way when you're in the crosswalk, but be careful - make sure that drivers can see you and stop for you.
- When crossing an exit lane, watch for cars leaving the roundabout. Some vehicles will use their right-turn signal, but some won't. You have the right of way, but proceed carefully.

Source: Louisiana Department of Transportation and Development

Round, Round
Get Around

More Economical

Reducing driver delay saves time, fuel and helps reduce pollution. Eliminating signals also saves about $5,000 a year in maintenance and electricity.

More Attractive

The island also provides a great opportunity to beautify the location with landscaping.

Roundabouts vs. Driving in Circles

It's easy to get turned around, but a roundabout is different than a traffic circle, already in use around the country. They're both circular intersections without traffic signals, but in a roundabout, entering traffic usually yields to circulating traffic, which prevents delay and allows free-flow movement. In traffic circles, circulating traffic yields to entering vehicles, which can cause backups.

For more information on
Roundabouts

contact MoDOT at
888-ASK-MODOT
(275-6636)

MoDOT

Misssouri Department of Transportation
P.O. Box 270
Jefferson City, MO 65102

www.modot.org

Illustrations courtesy of Kittelson & Associates, Portland, Ore.

SM05.041

Driving the
Roundabout
Way

Missouri Department of Transportation

Source: Missouri Department of Transportation

Driving in Circles

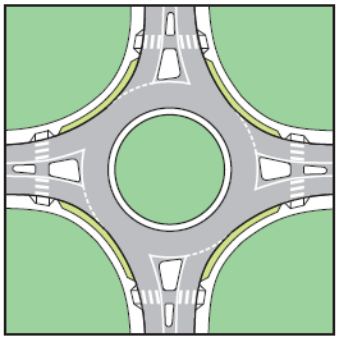
Driving in circles can be a good thing, if it means you get where you want to go quicker and safer. That's why the Missouri Department of Transportation is using roundabouts as a way to manage traffic at some intersections.

A roundabout is a one-way circular intersection that channels traffic around a central island without traffic signals.

Is Round Sound?

Roundabouts are a great alternative to a signalized intersection when a high volume of traffic needs to get through with the least amount of inconvenience. They also have many distinct benefits to the driver.

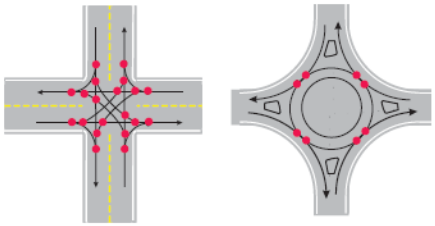
Typical roundabout configuration.



Safer

While signalized intersections have 20 conflict points, or spots where vehicles could collide, roundabouts reduce that number to eight. Fewer conflict points, combined with slower speeds and calmer traffic, can translate into as much as 75 percent fewer crashes. Because roundabouts tend to have fewer severe crashes than signalized intersections, they have fewer crash-related injuries as well.

Conflict points of signalized intersection (left) and roundabout (right).



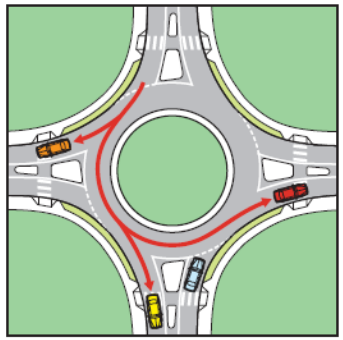
Quicker

Roundabouts reduce driver delay by allowing motorists to yield rather than stop. They can also handle higher traffic volumes, especially at intersections with many left turns, which helps vehicles get through quicker.

How to Get Around

- As drivers approach a roundabout they slow down and yield to traffic already circulating. This keeps vehicles from clogging up the circle, and it allows vehicles to enter when there is an opening.
- When a gap in traffic appears on the left, drivers enter the roundabout by turning right and following the circle until reaching their exits.
- Splitter islands and lane stripes help keep traffic moving in the right direction.

Traffic flow.



Source: Missouri Department of Transportation

How to Drive a Roundabout

As you approach a roundabout there will be a YIELD sign and dashed yield line. Slow down, watch for pedestrians and bicyclists, and be prepared to stop if necessary. Before you enter, yield to circulating traffic on the left, but do not stop if it is clear.

A conventional roundabout will have ONE-WAY signs mounted in the center island. They help guide traffic and indicate that you must drive to the right of the center island. Upon passing the street prior to your exit, turn on your right turn signal and watch for pedestrians and bicyclists as you exit. Left turns and U-Turns are completed by traveling around the center island. (See Figure 3)

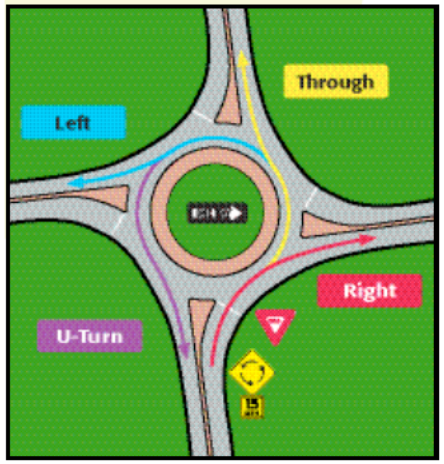


Figure 3. Roundabout Signage and Traffic Flow

For additional information please contact
Traffic Engineering Division
(402) 479-4594

www.transportation.nebraska.gov

To learn more about roundabouts visit
http://safety.fhwa.dot.gov/intersection/roundabouts/

ROUNDABOUTS

NDOR
Nebraska Department of Roads

Nebraska Department of Roads

Leaders in Public Safety and Service

February 2010

Source: Nebraska Department of Roads

Roundabout Intersections

A modern roundabout is an un-signalized circular intersection engineered to maximize safety and minimize traffic delay.

Over the last few decades, thousands of roundabouts have been installed in Europe, Australia and other parts of the world. They have gained support in the United States and drivers are becoming comfortable with their use. In the cities and towns where roundabouts have been built, and even where the public has been hesitant about accepting them initially, roundabouts ultimately have been accepted enthusiastically because of the increased safety they provide. They have also successfully been used to control traffic speeds in residential neighborhoods and are accepted as one of the safest types of intersection design.

A roundabout is a circular intersection, but very different than the traffic circle used previously in this country.

The Nebraska Department of Roads is joining with the rest of the country in using a roundabout intersection more often as a means of managing traffic, reducing traffic conflicts, increasing intersection capacity, controlling vehicle speeds, and reducing crashes at intersections.

Yield: The "Golden Rule" of Modern Roundabouts

Unlike a traditional intersection where traffic stops and waits, a Modern Roundabout is a circular intersection that converts all entering movements into right turns. There are no traffic signals or stop signs. There are *yield* signs at every entrance to the roundabout. All motorists entering a roundabout must *yield* to the circulating traffic, who has the right-of-way. An approaching motorist has to wait for a gap….a break….to appear in the flow of traffic before entering. This yield-at-entry rule keeps traffic from locking-up and allows free flow of traffic.

Emergency vehicles always have the right-of-way. If an emergency vehicle enters the roundabout, pull over immediately to the right, exiting the roundabout if possible.

Why Use a Roundabout?

- **Safety** -- Roundabouts have been shown to reduce injury accidents by 75% and fatal accidents by as much as 90%. The reduction in accidents is attributed to slower speeds and reduced number of conflict points. (See Figures 1A and 1B)
- **Low Maintenance** – Maintenance costs associated with traffic signals are eliminated which amount to approximately $3,500 per year per intersection. In addition, electricity costs are reduced with a savings of approximately $1,500 per year per intersection.
- **Reduced Delay** – By yielding at the entry rather than stopping and waiting for a green light, delay is significantly reduced.
- **Capacity** – Intersections with a high volume of left turns are better handled by a roundabout than a multi-phased traffic signal.

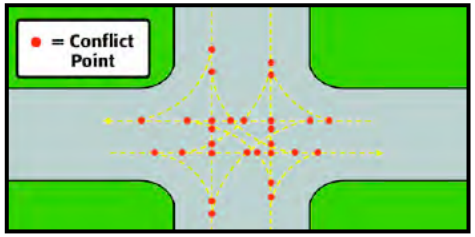


Figure 1A. Standard Intersection Conflict Points

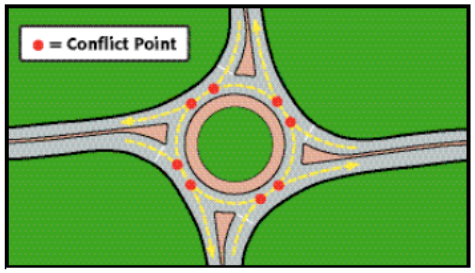
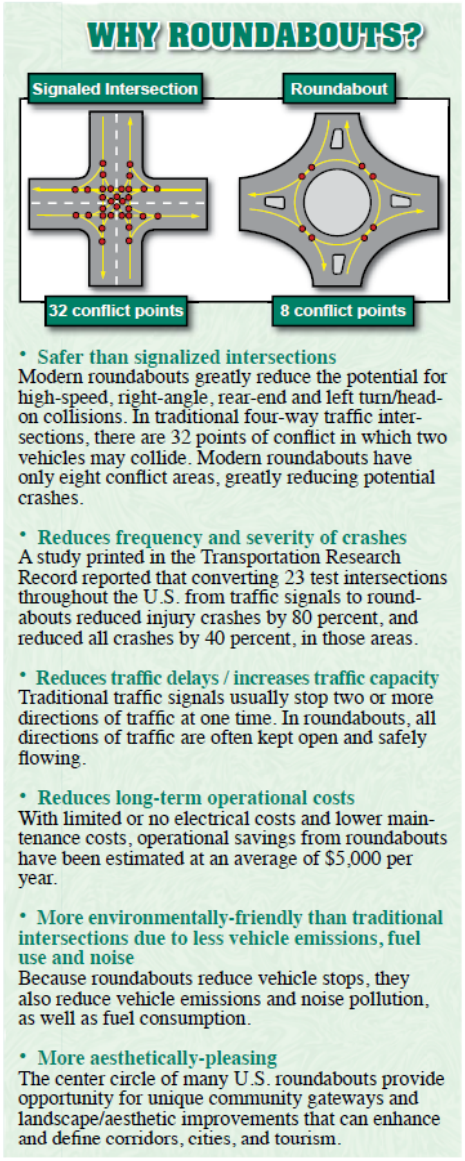


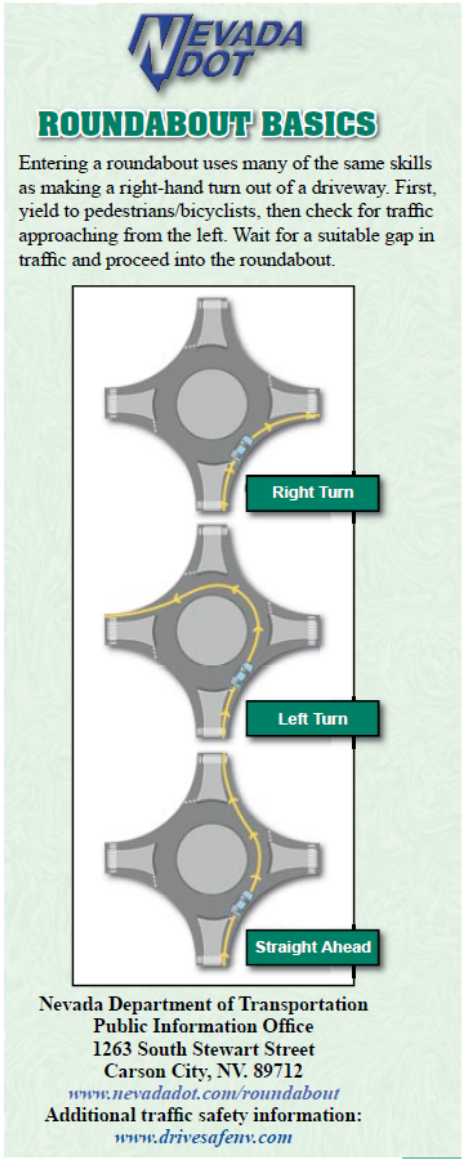
Figure 1B. Roundabout Conflict Points

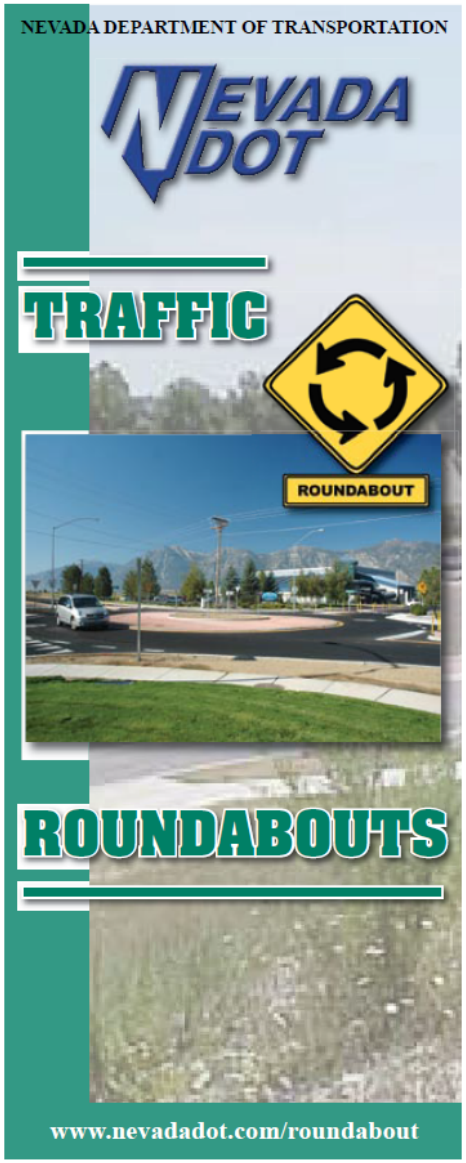
- **Environmental** – A reduction in delay corresponds to a decrease in fuel consumption and air pollution.
- **Truck Operations** – Modern roundabouts are designed to accommodate tractor-trailer vehicles through the use of *truck aprons*. The truck apron is a raised section of pavement around the central island with a mountable curb which allows for the back wheels of larger vehicles to travel over.
- **Pedestrians** – Low speeds improve bicycle and pedestrian safety at roundabouts. The splitter islands provide pedestrian refuge and shorter one-directional traffic crossing.
- **Aesthetics** – The central island provides the opportunity to beautify the intersection with landscaping.

Figure 2. Roundabout Components

Source: Nebraska Department of Roads







Source: Nevada Department of Transportation

ROUNDABOUTS

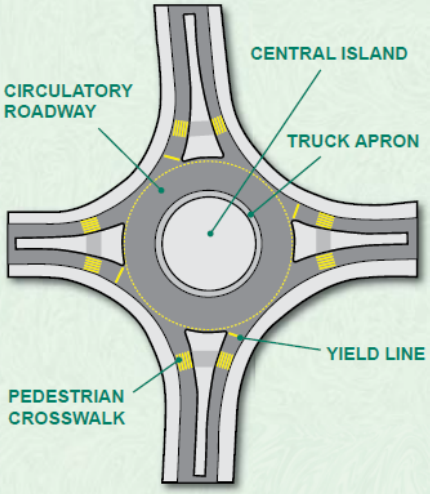
The first modern U.S. traffic roundabout was constructed in Las Vegas, Nevada in 1990. Thousands of modern roundabouts can now be found throughout the U.S., joining the over 30,000 roundabouts in France and the United Kingdom.

WHAT ARE ROUNDABOUTS

Roundabouts are one-way circular intersections in which traffic flows around a center island without stop signs or signals.

Because roundabout traffic enters and exits through right turns only and speeds are reduced, the occurrence of severe crashes is substantially less than in many traditional four-way intersections.

The lower speeds within roundabouts also allow entering traffic to access smaller gaps between circulating vehicles, increasing traffic volume and decreasing delays, congestion, fuel consumption and air pollution.



DRIVING IN A ROUNDABOUT

BEFORE A ROUNDABOUT

Slow down and yield to pedestrians/bicyclists. For multi-lane roundabouts, choose the appropriate lane.

ENTERING A ROUNDABOUT

Those in the roundabout have the right-of-way. Yield to driver's left and enter the roundabout when there is an adequate gap in circulating traffic flow. Do not enter a roundabout when an emergency vehicle is approaching in any direction.

IN A ROUNDABOUT

Following posted speed limits, proceed through the roundabout counterclockwise to the right of the center island.

Within a roundabout, do not stop for vehicles waiting to enter the roundabout. Those driving within a roundabout have right-of-way.

Use your turn signal to indicate when exiting.

Driving in a roundabout video:
www.nevadadot.com/roundabout

ROUNDABOUTS WITH MULTIPLE LANES

- Select your lane before entering a multi-lane roundabout. Use the right lane if you are making an immediate right turn or proceeding straight. Use the inside left lane to make a left or u-turn or travel through the intersection.
- Do not overtake other vehicles or bicyclists in a roundabout.
- Never travel next to commercial trucks or other large vehicles in a multi-lane roundabout.
- Do not exit from the inside, left-hand lane if there is a vehicle traveling on your right.

Important note: these roundabout driving guidelines are general guidelines. Always follow posted signs and guidelines that apply specifically to the roundabout you are traveling.

WALKING/BICYCLING IN ROUNDABOUTS

PEDESTRIANS

- Walk the perimeter of the roundabout. Never cross to the central island.
- Use designated crosswalks and watch and listen for vehicles. Even though pedestrians have the right-of-way, satisfy yourself that vehicles have recognized your presence and right to cross.
- Always use the splitter island between entries and exits for refuge.

BICYCLISTS

Bicyclists have two options while traveling through a roundabout:

- **Ride like a car**

Ride on the roundabout roadway like a car. Claim the entire circular travel lane (right hand lane in multi-lane facilities) by riding near the center of the lane as a car would. Obey the same driving rules as a vehicle.

- **Walk like a pedestrian**

Bicyclists may dismount and exit the approach lane before the splitter island and move to the sidewalk. Once on the sidewalk, walk your bicycle like a pedestrian.

TRUCKS/LARGE VEHICLES

Many roundabouts provide an area between the roadway and the central island over which the rear wheels of large trucks, trailers and other oversize vehicles can safely go. The area is known as a truck apron, and is often designated with a different type of roadway surface.

Source: Nevada Department of Transportation

NORTH CAROLINA
DEPARTMENT OF
TRANSPORTATION

Why Install a Roundabout?

Roundabouts help address safety and congestion concerns at intersections. They are designed to enhance traffic efficiency, safety and aesthetics, and minimize delay and cost for all users including motorists, pedestrians and bicyclists.

How do roundabouts affect safety?

At traditional intersections with stop signs or traffic signals, the most serious types of crashes are t-bone, left-turn, and head-on collisions. With roundabouts, these types of crashes are reduced because vehicles travel in the same direction at a lower speed.

In North Carolina, crashes of all types have been reduced by almost half where roundabouts have been installed at existing intersection locations. For more information, please see the full technical report available at www.ncdot.org/doh/preconstruct/traffic/safety/Reports/completed.html.

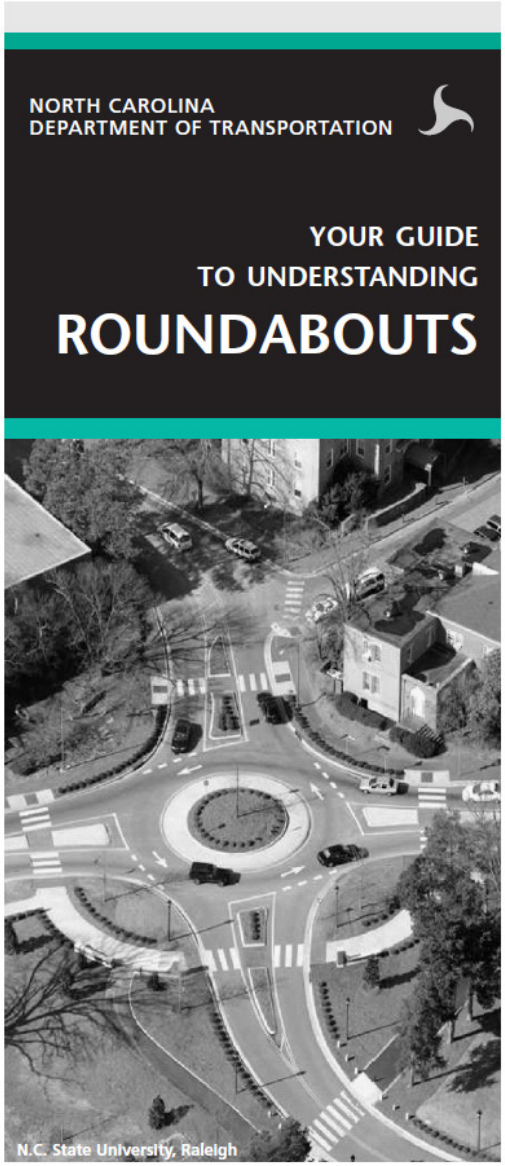
Beverly Eaves Perdue
Governor

Eugene A. Conti, Jr.
Secretary of Transportation

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

Transportation Mobility and Safety
750 N. Greenfield Parkway
Garner, NC 27529
(919) 773-2800

1,000 copies of this public document were printed at a cost of $242, or 24.2¢ each. (03/2010)



Source: North Carolina Department of Transportation

FREQUENTLY ASKED QUESTIONS

What is a roundabout?

A roundabout is an intersection requiring entering traffic to yield the right of way to traffic already in the roundabout. This keeps the traffic in the roundabout flowing and prevents traffic backups and delays.

How is a roundabout different from a traffic circle?

Modern roundabouts are generally much smaller than older traffic circles, and require vehicles to travel at a lower speed. Because of the higher speeds in traffic circles, generally they operate less efficiently and have higher crash rates than roundabouts.

What is the size of a roundabout?

The size of a roundabout is determined by the amount of vehicles, the size of the largest vehicle using the roundabout, the need to achieve appropriate speeds throughout the roundabout, and the layout of the existing intersection. A roundabout is usually constructed to accommodate a tractor trailer. The size of a single-lane roundabout is typically 120 feet across. This is about one third the length of a football field.

Who makes the decision to install a roundabout?

If the road under consideration is a state road, then NCDOT will make the decision after consulting with local governments. If the road is a local road, then the local government makes the decision.

Does a roundabout cost more to install than a traffic signal?

The initial construction cost of a roundabout is more expensive than a traffic signal; however, maintenance and utility costs of a roundabout are less than a traffic signal over time.

Will a roundabout inconvenience me and add travel time to my drive?

When operating within their capacity, roundabout intersections typically operate with shorter vehicle delays than other intersections, especially during non-peak traffic times.

Are roundabouts appropriate everywhere?

No. The choice of using a roundabout is made on a case-by-case basis. NCDOT evaluates traffic volumes and crashes at each candidate intersection individually to determine if a roundabout would be the most effective solution.

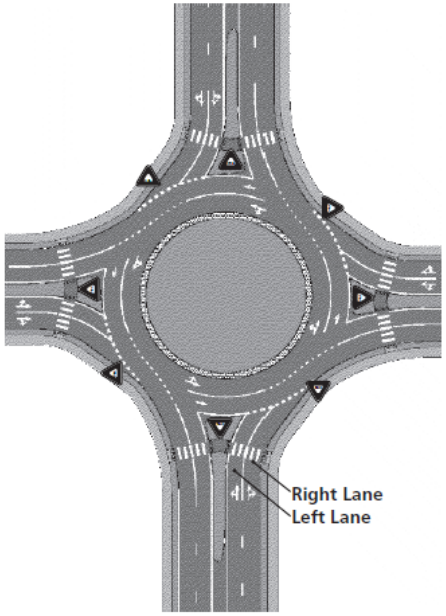
How does a pedestrian navigate a roundabout?

A pedestrian should walk around the outside, not through the middle of a roundabout. Roundabouts usually have marked sidewalks or striped crossings to help pedestrians navigate.

How does a bicyclist navigate a roundabout?

A bicyclist should follow the same rules as a vehicle or walk along the outside of a roundabout like a pedestrian.

TWO LANE ROUNDABOUT



How to drive a roundabout:

- Yield to vehicles already in the roundabout;
- Once in the roundabout, you have the right of way;
- Use your turn signal when exiting the roundabout; and
- Always be cautious and look for unexpected vehicles, pedestrians or bicycles.

How to drive a two-lane roundabout:

Prior to entering the roundabout, move into the appropriate lane as you would when approaching a traffic signal. The left lane circles the roundabout and the right lane turns right. Advance signing will provide guidance. Do not cross from the left lane in the roundabout to the right lane as you exit the roundabout.

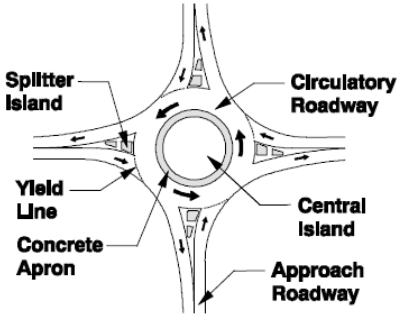
Source: North Carolina Department of Transportation

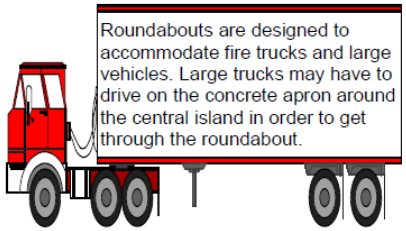
What is a roundabout?

A modern roundabout is a type of intersection that has safety, operational and aesthetic benefits for many different road users.

Roundabouts are characterized by:

- A fairly large central island
- A circular roadway on which all vehicles travel counterclockwise
- Drivers entering the roundabout yield to traffic already in the circular roadway
- Design elements that cause drivers to use the roundabout at slow speeds, including splitter islands at all approaches





What are the general principles behind using a roundabout?

Think of roundabouts as a series of "T" intersections, where entering vehicles yield to one-way traffic coming from the left. A driver approaching a roundabout must slow down or stop for vehicles stopped ahead, yield to pedestrians in the crosswalk, and yield to traffic already in the roundabout. Then it's a simple matter of a right turn onto a one-way street. Once in the roundabout, the driver proceeds around the central island, then takes the necessary right hand exit.

What are the advantages of roundabouts?

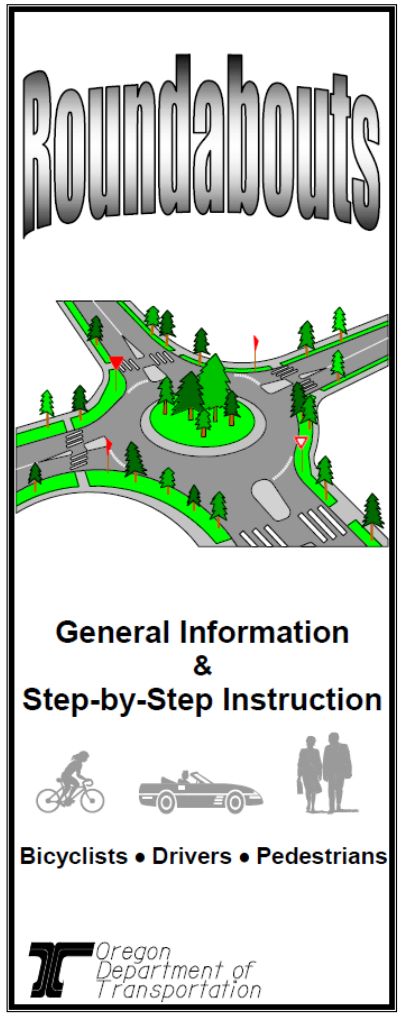
A well-designed roundabout can improve safety, operations and aesthetics of an intersection:

- **Greater safety** is achieved primarily by slower speeds and elimination of left turns
- **Operation** is improved by smooth flowing traffic (with less stop and go than a signalized intersection)
- **Aesthetics** are enhanced by landscaping and less pavement

Are there any disadvantages? What about costs?

Drivers must pay attention; pedestrians don't have a signal to help them cross and bicyclists must merge with motor vehicles to enter the roundabout.

Construction costs are generally comparable to a traffic signal. Additional landscaping requires a long-term maintenance commitment, but normally costs less in the long run than signal maintenance.



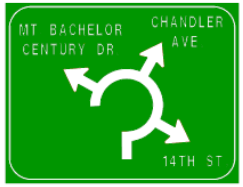
Source: Oregon Department of Transportation

Step-By-Step Instructions For Drivers & Bicyclists

NOTE TO BICYCLISTS: If you're riding a bicycle, ride as if you were driving a car. Roundabouts are designed so motorists will drive at about 15-25 MPH, close to your bicycling speed. Be assertive, so cars see you and respect your right to be on the road.

The first cue that you are approaching a roundabout is the following sign, telling you there is a roundabout ahead:

You should start slowing down. Next you will see a directional sign that shows where the exits are located on the roundabout:



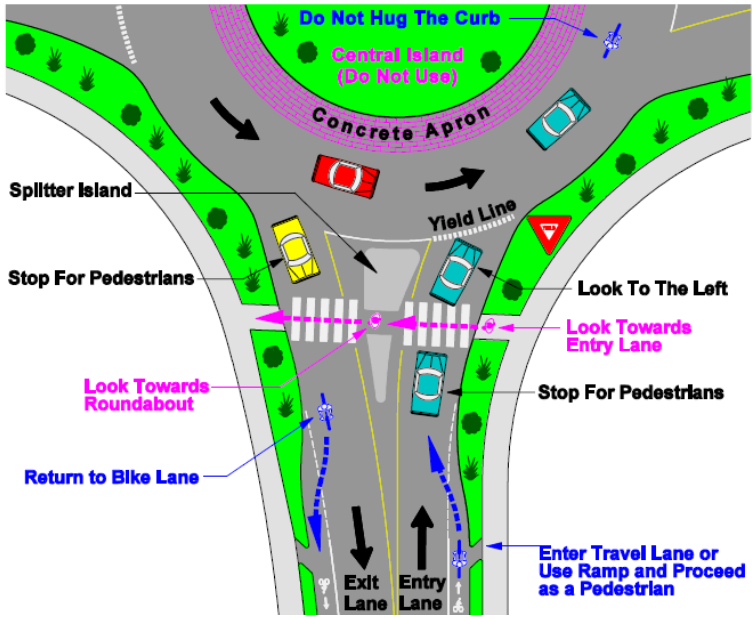
Now the roundabout will be clearly visible. Slow down to 10-15 MPH as you approach. Stay in your lane, to the right of the splitter island.

Be sure to look for bicyclists merging into the travel lane, or pedestrians wanting to cross. Be considerate, and let the bicyclists merge. If you see a person in or about to enter the crosswalk, let them cross; **it's the LAW**.

NOTE TO BICYCLISTS: If you are riding on the shoulder or bike lane, merge into the travel lane before the shoulder ends. Prepare for this move early, look over your shoulder, and signal your intent to move into traffic. Don't be intimidated; assert your position upon entering the roundabout.

If you do not want to ride your bicycle in the roundabout, you may enter the sidewalk using the ramps, and proceed as a pedestrian. Refer to the step-by-step instructions for pedestrians for more details.

Then move slowly to the yield line, looking left. A YIELD sign will tell you to yield to traffic in the roundabout:



You may have to stop to yield to cars on your left. If the road is clear, simply enter the roundabout, turning right. You don't have to stop, just enter.

Proceed around the roundabout slowly. Don't pass bicyclists ahead of you within the roundabout, as your speeds should be nearly equal. Continue until you get to your exit. **Do not stop in the roundabout**.

*NOTE TO BICYCLISTS: Once in the roundabout, **don't hug the curb.** Ride close to the middle of the lane to prevent cars from passing and cutting you off. Watch for cars waiting to enter the roundabout, as they may not see you.*

Directional signs will tell you where to exit:

Exit carefully, **using your right turn signal**. Watch for pedestrians in or approaching the crosswalk and stop for them.

That's it, you're done! Go on to your destination and enjoy the rest of your trip.

If you have questions, contact the ODOT Preliminary Design Unit at (503) 986-3564.

Step-By-Step Instructions For Pedestrians

You can walk safely through a roundabout by following these simple steps:

- Proceed around the roundabout on the sidewalk and in the designated crosswalks. **Never walk in the roundabout or to the central island.**
- Cross one lane at a time to the splitter island; it's there to provide you a refuge between lanes.
- When crossing an entry lane, watch traffic coming at you down the entry lane. You have the right of way when you're in the crosswalk, but be careful - make sure that drivers can see you and stop for you.
- When crossing an exit lane, watch for cars leaving the roundabout. Some vehicles will use their right-turn signal, but some won't. You have the right of way, but proceed carefully.

Source: Oregon Department of Transportation

How do I drive in roundabouts (continued)

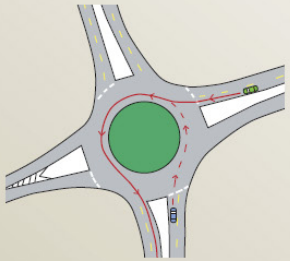
Left turn or U-turn

1) Slow down and prepare to yield as you approach the roundabout.

2) Enter the roundabout in the left lane (if there is a two-lane approach) and stay in that lane throughout the roundabout.

3) You must yield to traffic already in the roundabout.

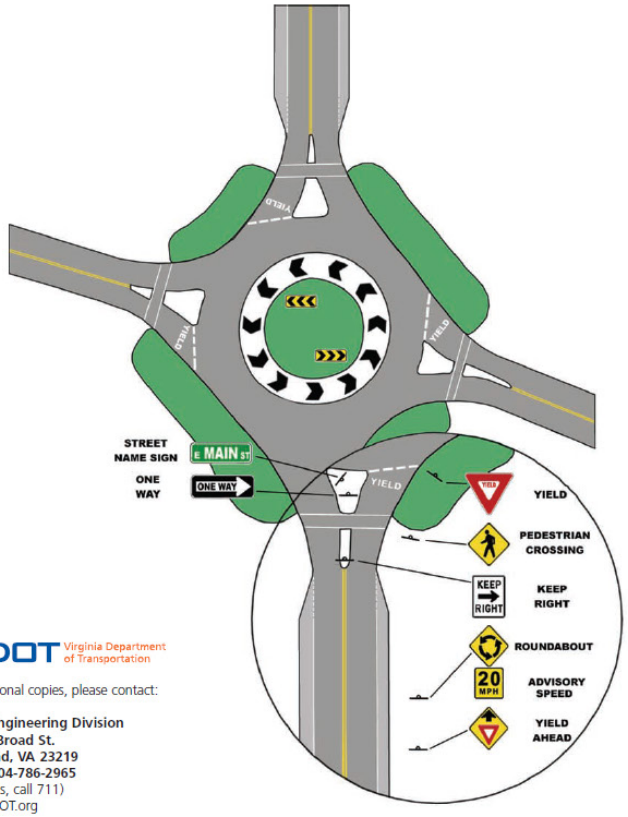
4) Signal your turn just past the exit prior to your desired exit.



Remember

- Always yield to pedestrians who may be crossing the road on your approach to the roundabout.
- Pedestrians, bicycle riders and motorcyclists are often very hard to see, so always watch for them.
- Buses and trucks may need more than one lane to enter or leave a roundabout, so keep clear of them.
- Always yield to vehicles that are in the roundabout.

Sample signing and pavement marking plan for a roundabout



VDOT Virginia Department of Transportation

For additional copies, please contact:

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Richmond, VA 23219
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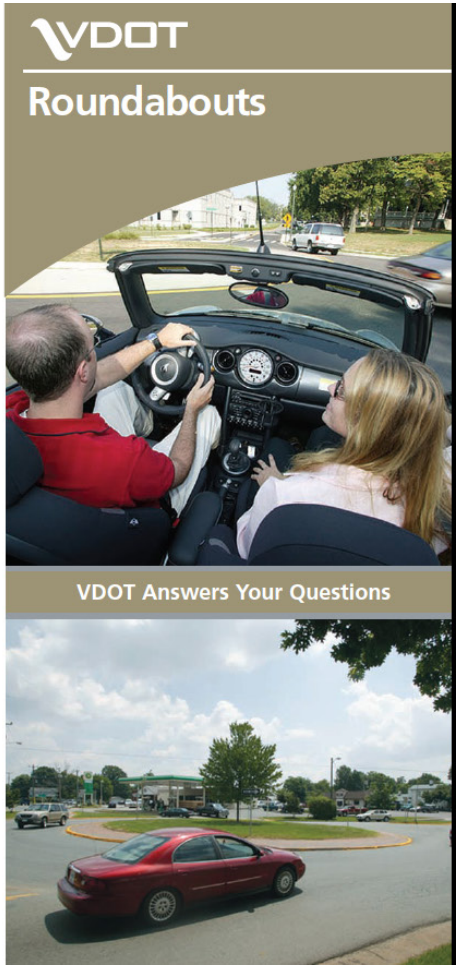
(TTY users, call 711)
VirginiaDOT.org



Source: Virginia Department of Transportation

Roundabouts in Virginia

The Virginia Department of Transportation has begun using roundabouts in certain situations to enhance safety and reduce delays encountered by the motoring public.

Roundabouts have been used effectively throughout the world for many years. In recent years, they have been used here in the United States to reduce crashes, traffic delays, fuel consumption, air pollution and construction as well as maintenance costs, while quite often moving more traffic and enhancing intersection beauty. They have also been used to control speed in residential neighborhoods and are accepted as one of the safest types of intersection designs.

Roundabouts differ from the old, larger traffic circles in three major areas:

1) A roundabout is generally smaller in diameter, requiring lower traveling speed.

2) At roundabouts, the entering traffic yields the right-of-way to the circulating traffic. This yield-at-entry rule keeps traffic from locking up and allows free flow movement.

3) The splitter and center islands of a roundabout deflect entering traffic and reinforce the yielding process.

Why use a roundabout?

- **Safety** — Roundabouts have been shown to reduce fatal and injury crashes as much as 75 percent. The reduction in crashes is attributed to slower speeds and reduced number of conflict points.
- **Low maintenance** — Eliminates maintenance and electricity costs associated with traffic signals, which could possibly be as much as $5,000 per year per intersection.
- **Reduced delay** — By yielding at the entry rather than stopping and waiting for a green light, delay is significantly reduced.
- **Capacity** — Intersections with high volumes of left turns are often better handled by a roundabout than a multi-phased traffic signal.
- **Environmental** — A reduction in delay corresponds to a decrease in fuel consumption and air pollution.
- **Aesthetics** — The central island provides an opportunity to beautify the intersection with landscaping.

What do roundabout signs look like?

Roundabouts are easy to use. You simply position your vehicle correctly and indicate where you want to go.

Roundabout "Yield" signs together with "Yield" line markings are placed at the intersection of each approach road with the roundabout.

Advance Roundabout Warning Signs advise that you are approaching a roundabout.

In Virginia, roundabouts will be either one lane or two lanes. Listed here are the procedures one must take to negotiate turns when approaching a roundabout.

How do I drive in roundabouts

Right turns

1) Slow down and prepare to yield as you approach the roundabout.

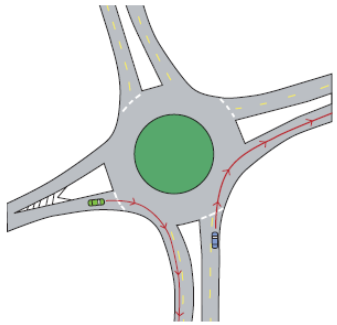
2) On the approach you must be in the right lane (if it is a dual lane roundabout).

3) You must yield to the traffic already in the roundabout.

4) Stay to the right as you approach your turn.

5) Place your right turn signal on until you have exited the roundabout.

Note: Cars in the figures show the position prior to the maneuver.



Making a right turn in a roundabout.

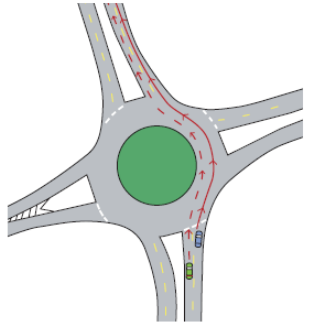
Straight ahead

1) Slow down and prepare to yield as you approach the roundabout.

2) Unless signs or lane markings indicate an exclusive right turn, approach in the right lane and stay in that lane through the roundabout. If this is a two-lane roundabout, and the right lane is blocked due to dense traffic or road obstruction, approach and continue through the roundabout in the left lane.

3) You must yield to traffic already in the roundabout.

4) Display your right turn indicator just past the exit prior to the one you plan to exit.



Driving straight ahead through a roundabout.

Source: Virginia Department of Transportation