



Research Need Statement 575

Date		5/3/19	
Need Statement Champion			
Name	Agency	E-mail	Phone
Gina Mitteco	Dakota County	Gina.mitteco@co.dakota.mn.us	952-891-7114
Idea Submitted by:		LRRB via Priority Process (3/19/19 Mtg)	
Idea Originated from:		2019 LRRB Idea Solicitation Process (<i>Pre-Screen Board mtgs</i>)	

Select Program:

MnDOT OR Local Road Research Board (LRRB)

Research OR Implementation

Need Statement Title:

Pedestrian Features in Roundabouts

Note: There was lengthy discussion on whether to combine this Need Statement (NS) with another one on roundabouts; the decision was to keep the two separate. The focus of this need statement (NS575) will be pedestrian user experience at roundabouts while the focus of NS599 will be on balancing roundabout design and ADA.

Need Statement: Describe the problem or the opportunity. Include background and objective.

Roundabouts reduce the severity of crashes at intersections, but transportation agencies have received some feedback from pedestrians indicating that roundabouts, especially larger multi-lane roundabouts, can be difficult to navigate. Local agencies are asking:

- What does the data show regarding pedestrian safety and experience at roundabouts? Does the data and observation correlate with the complaints agencies receive?
- What are the most recent best practices for pedestrian features at roundabouts?
- Is there guidance on the proper placement of pedestrian treatments within the roundabout?
- What features/tools can be implemented to help pedestrians be seen, noticed and yielded to?
- What treatments should be installed in conjunction with each other to create the safest conditions (i.e.; should rectangular rapid flashing beacon (RRFB) be installed with crosswalks)?

How does this project build upon previous research (include title or reference to a completed research effort)?

Provide names to consider for a technical advisory panel:

Name	Agency	E-mail	Phone
Jeff Pearson	Richfield	jpearson@richfieldmn.gov	612-861-9791
Craig Gray	Bemidji	craig.gray@ci.bemidji.mn.us	218-333-1850
Brad Estochen	Ramsey County	Bradley.Estochen@co.ramsey.mn.us	651-266-7116
Joe Gustafson	Washington County	Joes.gustafson@co.washington.mn.us	651-430-4351
Tim Henkel	MnDOT	Tim.henkel@state.mn.us	651-366-4829
Kristie Billiar	MnDOT	Kristie.billiar@state.mn.us	651-366-3174
Ryan Thilges	Blue Earth County	Ryan.thilges@blueearthcountymn.gov	507-304-4025



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Brain Sorenson	MnDOT	Brian.Sorenson@state.mn.us	651-234-7004
Amber Dallman	MnDOT	Amber.Dallman@state.mn.us	651-366-4189
Jack Broz	Richfield	jbroz@richfieldmn.gov	612-861-9792
Mark Krebsbach	Dakota County	Mark.krebsbach@co.dakota.mn.us	952-891-7102
Mark Vizecky	MnDOT	Mark.vizecky@state.mn.us	651-366-3839
Kent Exner	Hutchinson City	kexner@ci.hutchinson.mn.us	320-234-4212
Steve Love	Maplewood	Steve.love@maplewoodmn.gov	651-249-2404
Gina Mitteco	Dakota County	Gina.mitteco@co.dakota.mn.us	952-891-7114



Research Need Statement

Literature Search: Pedestrian Features on Roundabouts

April 10, 2019

Prepared by: Karen Neinstadt

Resources searched: Transport Database, TRB RiP, MnDOT Library Catalog

Literature Review Summary: Attached are the results from my literature search on Pedestrian Features on Roundabouts.

Most Relevant Results

Sicamous Roundabout - Taming the Octopus!

Author: Newcombe E; Pellam A

Conference Title: TAC 2018: Innovation and Technology: Evolving Transportation - 2018 Conference and Exhibition of the Transportation Association of Canada. Held: 00000-00000. 2018. 1 PDF file, 3.7 MB, 19p.

Abstract: Dubbed locally as "the Octopus", the Highway 97A / Main Street intersection forms the entrance to Sicamous, British Columbia, a tourism community with a high percentage of elderly residents, and numerous houseboat rental businesses. The original multi-leg, 45-degree skewed intersection configuration was so confusing and geometrically insufficient that local users avoided the intersection. There were no facilities for cyclists or pedestrians, resulting in significant safety concerns with students from the adjacent school crossing irregularly. The retail businesses immediately adjacent to the intersection suffered as a result. The BC Ministry of Transportation and Infrastructure (MoTI) had identified a 2-lane roundabout as a preferred option for this location but had previously received adverse comment from the trucking industry (BCTA) regarding roundabouts on numbered routes, primarily due to their perceived inability to accommodate oversized loads. The design of this roundabout therefore needed to carefully balance the safety and operational needs of all users, including oversize permit vehicles, houseboat trailers, and vulnerable users, and required acceptance from the trucking industry and public. Extensive stakeholder and community engagement, as well as innovative design elements, produced a solution with custom aprons for specific vehicle use to better separate users; standardization of materials, colour and textures to identify intended use; a roll-over median approach island to allow counterflow operation of permit vehicles with pilot cars; and reduced cross fall on circular roadway to reduce heavy vehicle racking and roll-over potential. The design is phased for a double-lane facility ultimately. However, a single-lane was constructed initially to gain familiarity and acceptance and improve safety. Active transportation needs are accommodated by multi-use pathways, cycle paths and ramps, and tactile mats are provided for the visually impaired, making it safe for all active modes and in particular the local school children.

Geometric Design Guide for Canadian Roads: Chapter 6 - Pedestrian Integrated Design.

Author: CHIU M; Clayton C; Millen G; et al

Resource: 2017. 1 v., 77p. (ISBN: 9781551876245)

Abstract: The Geometric Design Guide for Canadian Roads contains the current design and human factors research and practices for roadway geometric design. It replaces the 1999 edition of the Guide and subsequent revisions. The Guide provides guidance to planners and designers in developing design solutions that meet the needs of a range of users while addressing the context of local conditions and environments. Design guidelines for freeways, arterials, collectors, and local roads, in both urban and rural locations are included as well as guidance for integrated bicycle and pedestrian design. The Guide is organized into ten chapters to cover the entire design process from design philosophy and roadway classification to design parameters and specific guidelines for the safe accommodation of vehicles, cyclists and pedestrians on linear road elements and at intersections.. Integration with other design elements including adjacent roadway lane widths, roundabouts and bridges and other travel modes is addressed.

Safety, Mobility and Roundabouts.

Author: Wallwork Michael



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Conference Title: ITE 2012 Annual Meeting & Exhibit. Location: Atlanta.Sponsored by: Institute for Transportation Engineers.Held: 20120812-20120815. 2012. pp 1-6(Figs., Refs.)

Abstract: As communities focus more on non-motorized users, roundabouts are increasingly being included in the discussion. This paper focuses on how roundabouts can increase the safety and mobility of non-motorized users, while also benefiting motor users. A modern roundabout is a traffic control system that controls vehicles, pedestrians, bicycles, on-street transit vehicles, and sometimes even trains. Well-designed roundabouts have proven to be the safest form of intersection control while improving mobility for all users in all types of weather. Even their aesthetics can improve the pedestrian environment. Roundabouts are gaining support and popularity for their ability to significantly improve intersections. They reduce crashes, improve vehicle capacity, moderate vehicle speeds, facilitate pedestrian crossings, and improve bicycling and transit operation. Furthermore, roundabouts can extend the improved area for all users beyond the intersection when used to implement road diets.

Improved multi-lane roundabout designs for urban areas.

Author: Campbell D; Jurisich I; Dunn R

Resource: 2012/5. (476) 284p (ISBN: 9780478394160)

Abstract: This research, undertaken 2008-2010, investigated the comparative safety of multi-lane roundabouts versus signalised intersections, pedestrian facilities, vertical deflection devices and visibility to the right. Guidance for practical application of the relevant measures to enhance roundabout safety has been developed and is included in this document. The Dutch turbo-roundabout was reviewed and considered to be feasible for application in New Zealand. For intersections with four arms or more, a well-designed multi-lane roundabout should be significantly safer for vehicle users than traffic signals. Several means of adequately catering for pedestrians and cyclists at multi-lane roundabouts are feasible to implement in many cases. In the interest of road safety, a 'Roundabouts First' policy is recommended for adoption by the NZTA. The legal use of flashing signal displays and part-time signal operation are also recommended for consideration, which would potentially allow for 'Pelican' type pedestrian crossing installations, and also for signalised roundabouts to operate with less vehicle delay during off-peak periods.

Safety Investigation of Elder Drivers and Pedestrians at Roundabouts

Sponsor Organizations:

Research and Innovative Technology Administration
University Transportation Centers Program
Washington, DC 20590 United States

Performing Organizations:

Florida State University Tallahassee, FL United States

Principal Investigators:

Spainhour, Lisa

Actual Completion Date: 2014-12-23

Source Data: RiP Project 36871

Accession Number: 01530633

Funding Amount: 111800.00



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Abstract: Modern roundabouts are being installed on state and local roads in the United States at an increasing rate. Roundabouts can be less expensive to construct and operate than signalized intersections, and their use reduces vehicle delay, while enhancing the aesthetic appeal of the surrounding community. However, while most guides suggest that roundabouts should improve older driver safety, the ability of older drivers and pedestrians to successfully navigate roundabouts has not been thoroughly investigated. A brief literature review has shown that, while researchers are beginning to explore the effects of roundabouts on crash rates and severity in the U.S., little research has looked at the effect of age on those measures. The proposed research aims to examine the following: (1) the growth in modern roundabouts in the state of Florida, including the proximity of roundabouts to communities with high numbers of older adults; and (2) crash rates and severity of roundabout crashes involving older drivers and pedestrians. The study will generate important baseline knowledge on potential problem areas and from the basis for additional interdisciplinary research within the Center, including simulator studies to examine older drivers' and pedestrians' comfort with and level of success navigating roundabouts.

Access Online: <http://www.utc.fsu.edu/Spainhour>

Selection of Pedestrian Crossing Treatments (Mid-Block and Roundabouts, ADA)

Sponsor Organizations:

Purdue University/Indiana Department of Transportation
JHRP

Purdue University

1284 Civil Engineering Building, Room 4154
West Lafayette, IN 47907-1284 United States

Principal Investigators:

Alhassan, Mohammad

(260) 481-6389

alhassan@enr.ipfw.edu

Ashur, Suleiman

(260) 481-6080

Ashur@ipfw.edu

Start Date: 2013-01-01

Actual Completion Date: 2015-06-30

Source Data: RiP Project 33403

Source Agency: Indiana Department of Transportation
1101 State Office Building

Indianapolis, IN 46204 United States

Contract Numbers: SPR-3723

Status: Completed

Funding Amount: 45086.00

Abstract: The study will develop a synthesis report of studies and guidelines/manuals on pedestrian crossing treatments. The main goal is to help designers and traffic engineers use existing resources for the selection of pedestrian crossing treatments with focus on unsignalized intersections, midblock, roundabouts, and trails and bikeway crossings. The project deliverables include reports on the state-of-art selection practice, a synthesis report with guidelines on selecting pedestrian crossing treatments, and a professional development workshop for INDOT engineers to disseminate the findings of the project.

Urban Street Design Guide

Resource: MnDOT Library HE305 .N32 2013