

## PROJECT HIGHLIGHTS



We analyzed traffic sign retroreflectivity to improve our estimates of expected traffic sign life. [Report 2014-20](#)



We developed a tool to calculate the impact of heavy vehicles on local asphalt roads. [Report 2014-32](#)



We investigated the premature deterioration of colored concrete pavements. [Report 2014-26](#)



We created a guide for choosing pedestrian crossing treatments at uncontrolled intersections. [Report 2014-21](#)



**LRRB**  
LOCAL  
ROAD RESEARCH  
BOARD

# FY2014

## Local Road Research Board

# At-A-Glance

JULY 1, 2013, THROUGH JUNE 30, 2014

This publication summarizes the Local Road Research Board's Fiscal Year 2014 research activities. It provides a list of completed and ongoing research and implementation projects, categorized by topic area.

For more than 55 years, the LRRB has brought important developments to transportation engineers throughout Minnesota—from new ways to determine pavement strength to innovative methods for engaging the public. Today, the LRRB remains true to its important mission: supporting and sharing the latest transportation research applications with the state's city and county engineers.



**Bruce Hasbargen**  
LRRB Chair  
Beltrami County

Welcome to the *FY2014 Local Road Research Board At-A-Glance*. We are pleased to present the work that the LRRB has supported over the past year as we continue our commitment to help Minnesota cities and counties maintain and improve their transportation networks and practices. The LRRB works because of you—the city and county representatives who identify projects to pursue, participate on project panels, work to implement project results and provide feedback to continually improve LRRB operations. Our members are here to serve you and represent your interests as city and county engineers. Feel free to contact any one of us to discuss your research needs and ideas.



**Julie Skallman**  
MnDOT State Aid Division

## LRRB MEMBERS

Bruce Hasbargen (Chair), Beltrami County  
 Julie Skallman, MnDOT State Aid Division  
 Lyndon Robjent, Carver County  
 Kaye Bieniek, Olmsted County  
 Tim Stahl, Jackson County  
 Steve Koehler, City of New Ulm  
 John Powell, City of Savage  
 Tom Ravn, MnDOT Office of Construction and Innovative Contracting  
 Linda Taylor, MnDOT Research Services & Library  
 Laurie McGinnis, University of Minnesota Center for Transportation Studies



**2014 LRRB members:** (standing, from left) Tim Stahl, Lyndon Robjent, John Powell, Kaye Bieniek, Tom Ravn; (seated, from left) Linda Taylor, Julie Skallman, Steve Koehler, Bruce Hasbargen, Laurie McGinnis.

## RESEARCH IMPLEMENTATION COMMITTEE MEMBERS

Jeff Hulsether (Chair), City of Brainerd  
 Dave Robley (Vice Chair), Douglas County  
 Mike Flaagan, Pennington County  
 Guy Kohlnhofer, Dodge County  
 Tim Stahl, Jackson County  
 Klayton Eckles, City of Woodbury  
 Merle Earley, MnDOT District 4  
 Ted Schoenecker, MnDOT State Aid Division  
 Jim Grothaus, University of Minnesota Center for Transportation Studies  
 Hafiz Munir, MnDOT Research Services & Library staff  
 Bruce Holdhusen, MnDOT Research Services & Library staff



**2014 RIC members:** (standing, from left) Joel Ulring (staff), Guy Kohlnhofer, Tim Stahl, Dave Robley, Ted Schoenecker, Chris Kufner (staff), Bruce Holdhusen (staff); (seated, from left) Hafiz Munir, Jeff Hulsether, Klayton Eckles, Mike Flaagan, Merle Earley. Not pictured: Jim Grothaus.



# LRRB RESEARCH

## Active Projects in FY2014

Projects highlighted on the front cover are indicated below by **bold text and a darker background**.  
 A mark in the "TS" column indicates that a Technical Summary for this project can be found at [mndot.gov/research](http://mndot.gov/research).

### COMMON FUNDING SOURCES

**LRRB** Local Road Research Board  
**SP&R** State Planning & Research (FHWA)  
**SRP** MnDOT State Research Program  
**COPTRS** Cooperative Program for Transportation Research and Studies

## Bridges & Structures

LRRB Identifier	Title	Report #/ Status	Investigator	End Date	Funding Source	Project Cost	TS?
INV 910	Partially Grouted Riprap Lab Flume Study (Matrix Riprap)	In Progress	Jeff Marr, University of Minnesota	2/28/15	LRRB, SRP	\$124,831	
INV 930	Development and Integration of Advanced Timber Bridge Inspection Techniques for NBIS	In Progress	Brian Brashaw, University of Minnesota–Duluth	1/31/15	LRRB, Partnership Funds	\$199,786	
INV 938	Culvert Design, Installation and Maintenance Independent Online Distance Learning (ODL) Course	In Progress	Jim Grothaus, University of Minnesota–CTS	10/31/14	LRRB	\$55,000	
INV 940	INV 940: Development of Cost-Effective Timber Bridge Repair Techniques for Minnesota	In Progress	Brent Phares, Iowa State University	9/30/15	LRRB, Other DOTs	\$299,582	
INV 944	MPR-4(007): Minnesota Steel Culvert Pipe Service Life Map	In Progress	Jeff Marr, University of Minnesota	8/31/15	LRRB, SRP, SP&R	\$60,678	
INV 945	Next Generation Bridge Management Tools and Inspection	In Progress	Basak Aldemir Bektas, Iowa State University	6/30/15	LRRB, SP&R, SRP	\$72,072	

## Environmental

LRRB Identifier	Title	Report #/ Status	Investigator	End Date	Funding Source	Project Cost	TS?
INV 894	Assessing and Improving Pollution Prevention by Swales	2014-30	John Gulliver, University of Minnesota	8/31/14	LRRB, SRP	\$314,000	X
INV 897	Developing Salt-Tolerant Sod Mixtures for Use as Roadside Turf in Minnesota	In Progress	Eric Watkins, University of Minnesota	2/28/15	LRRB	\$176,516	
INV 932	Determination of Effective Impervious Area in Urban Watersheds	In Progress	John Gulliver, University of Minnesota	7/31/15	LRRB	\$150,000	
INV 965	Study of Deicing Salt Accumulation and Transport Through a Watershed	In Progress	William Herb, University of Minnesota	2/28/17	LRRB	\$119,339	

## Maintenance Operations & Security

LRRB Identifier	Title	Report #/ Status	Investigator	End Date	Funding Source	Project Cost	TS?
INV 865	TPF-5(153): Optimal Timing of Preventive Maintenance for Addressing Environmental Aging in HMA Pavements	In Progress	Mike Anderson, Asphalt Institute	11/30/14	LRRB, SP&R, Other Federal Funds	\$286,185	
INV 886	Cost-Effective Pavement Preservation Solutions for the Real World	2014-33	W. James Wilde, Minnesota State University, Mankato	9/7/14	LRRB, SRP	\$94,984	X
INV 886	Cost-Effective Pavement Preservation Solutions for the Real World	In Progress	Thomas Wood, MnDOT Office of Materials and Road Research	6/30/15	LRRB, SRP	\$15,000	
INV 934	Friction Measurement System for Polk County	2013-26	Rajesh Rajamani, University of Minnesota	11/30/13	LRRB	\$40,000	X
INV 950	Major Equipment Life-Cycle Cost Analysis	In Progress	Douglas Gransberg, Iowa State University	4/30/15	LRRB	\$97,904	
INV 952	Best Management Practices for Establishment of Salt-Tolerant Grasses on Roadsides	In Progress	Eric Watkins, University of Minnesota	9/30/17	LRRB	\$193,677	

# Maintenance Operations & Security [cont.]

LRRB Identifier	Title	Report #/ Status	Investigator	End Date	Funding Source	Project Cost	TS?
INV 959	TRS: Chloride Free Snow and Ice Control Material	In Progress	Ryan Peterson, City of Burnsville	1/31/15	LRRB	\$19,800	
INV 974	Bio-Fog Seal Field Evaluation	In Progress	Eddie Johnson, MnDOT Office of Materials and Road Research	6/30/18	LRRB, SRP	\$20,000	

# Materials & Construction

LRRB Identifier	Title	Report #/ Status	Investigator	End Date	Funding Source	Project Cost	TS?
INV 645	Integrated Tools for Pavement Design and Management	2014RIC14	W. James Wilde, Minnesota State University, Mankato	2/28/14	LRRB, SRP	\$86,036	X
INV 825, INV 899	Performance Monitoring of Olmsted CR 117/104 and Aggregate Base Material Update	In Progress	Matthew Lebens, MnDOT Office of Materials and Road Research	2/28/15	LRRB	\$36,000	
INV 868	MPR-6(029): Hot Mix Asphalt Surface Characteristics Related to Ride, Texture, Friction, Noise and Durability	2014-07	Rebecca McDaniel, Purdue University	4/30/14	LRRB, SP&R, Other State Funds	\$50,000	X
INV 868	MPR-6(029): Hot Mix Asphalt Surface Characteristics	2014-28	Bernard Izevbekhai, MnDOT Office of Materials and Road Research	8/28/14	LRRB, SP&R, Other State Funds	\$205,723	X
INV 869	TERRA Board Support—FY2012-2013	In Progress	Stephanie Malinoff, University of Minnesota	11/30/14	LRRB, SP&R, SRP, Other Federal Funds	\$90,000	
INV 869	TERRA Membership Pooled Funds, FY2012-2014	In Progress	Stephanie Malinoff, University of Minnesota	9/30/14	LRRB, SP&R, SRP, Other Federal Funds	\$75,000	
INV 885	Research Test Section Tracking—Phase II	In Progress	Melissa Cole, MnDOT Office of Materials and Road Research	12/31/17	LRRB	\$70,000	
INV 889	Recycled Asphalt Pavement: Study of High-RAP Asphalt Mixtures on Minnesota County Roads	2013-15	Eddie Johnson, MnDOT Office of Materials and Road Research	8/31/13	LRRB	\$30,000	X
INV 896	Quantifying Moisture Effects in DCP and LWD Tests Using Unsaturated Mechanics	2014-13	Kimberly Hill, University of Minnesota	2/28/14	LRRB, COPTRS, SRP	\$109,900	X
INV 907	Assessing the Effects of Heavy Vehicles on Local Roadways	2014-32	W. James Wilde, Minnesota State University, Mankato	8/31/14	LRRB	\$54,000	X
INV 914	Research Using Waste Shingles for Stabilization or Dust Control for Gravel Roads and Shoulders	2014-06	Thomas Wood, MnDOT Office of Materials and Road Research	1/31/14	LRRB, SRP	\$77,000	X
INV 918	Implementation of TONN 2010	2014RIC16	W. James Wilde, Minnesota State University, Mankato	5/31/14	LRRB, SRP	\$35,000	X
INV 921	Frost Video Update and Enhancement	Completed Without Report	Michael Marti, SRF Consulting Group, Inc.	12/31/13	LRRB, Partnership Funds	\$63,271	
INV 924	YouTube Video: Rural Work Zone Safety	Completed Without Report	Tim Arvidson, Stonebrooke Engineering, Inc.	11/30/13	LRRB	\$12,740	
INV 924	Video: "Why Aren't You Working on My Road?"	Completed Without Report	Michael Marti, SRF Consulting Group, Inc.	4/30/14	LRRB	\$12,861	
INV 924	Video: LRRB Gravel Roads	Completed Without Report	Arlene Mathison, University of Minnesota—CTS	5/31/14	LRRB	\$11,528	
INV 929	Petrographic Analysis of Colored Concrete Pavement	Completed Without Report	Gerard Moulzolf, American Engineering Testing, Inc.	1/31/14	LRRB	\$40,983	
INV 935	Design Considerations for Embankment Protection During Road Overtopping Events	In Progress	Jeff Marr, University of Minnesota	3/31/17	LRRB, SRP	\$194,787	
INV 939	Lightly Surfaced Roads: Stabilized Aggregate Applications	In Progress	Charles Jahren, Iowa State University	3/31/15	LRRB	\$40,000	
INV 941	Online Technician Certification/Recertification Training	Completed Without Report	Ann Johnson, Professional Engineering Services, Ltd.	1/31/14	LRRB	\$12,433	

## Materials & Construction [cont.]

LRRB Identifier	Title	Report #/ Status	Investigator	End Date	Funding Source	Project Cost	TS?
INV 941	Online Technician Certification/Recertification Training	Completed Without Report	Eugene Olchefske, MnDOT Multimedia Development Group	1/31/14	LRRB	\$13,085	
INV 942	Aggregate Road Surface Rejuvenate	In Progress	Charles Jahren, Iowa State University	3/31/15	LRRB	\$88,910	
INV 946	Guidelines for Permeable Pavement Systems	In Progress	John Gulliver, University of Minnesota	8/31/15	LRRB	\$177,414	
INV 947	Investigation of Performance Requirements of Full Depth Reclamation Stabilization	In Progress	Jialiang Le, University of Minnesota	9/30/15	LRRB, SP&R, SRP	\$110,823	
INV 947	MPR-4(012): Investigation of Optimal Mix Design of Full Depth Reclamation Stabilization with Cement and Emulsion	In Progress	Shongtao Dai, MnDOT Office of Materials and Road Research	2/28/15	LRRB, SP&R, SRP	\$15,000	
INV 948	Flagger Operations: Investigating Their Effectiveness in Capturing Driver Attention	In Progress	Kathleen Harder, University of Minnesota	10/31/15	LRRB, SP&R, SRP	\$270,351	
INV 949	Tack Coat Testing: Measuring Field Bond Strength	In Progress	Eddie Johnson, MnDOT Office of Materials and Road Research	6/30/15	LRRB	\$68,000	
INV 954	TRS: Pavement Management Resource Centers	TRS1409	Michael Marti, SRF Consulting Group, Inc.	6/30/14	LRRB	\$14,645	
INV 961	TRS: Gravel Road Management Tools	TRS1407	Michael Marti, SRF Consulting Group, Inc.	6/30/14	LRRB	\$24,516	
INV 967	Full Depth Reclamation for Urban and Suburban Street Application	In Progress	Mihai Marasteanu, University of Minnesota	8/31/16	LRRB	\$93,969	
INV 968	Modernizing Road Construction Plans and Documentation	In Progress	Yelda Turkan, Iowa State University	12/31/15	LRRB	\$146,022	
INV 970	Alternate Design Methods to Renew Lightly Traveled Paved Roads	In Progress	Charles Jahren, Iowa State University	8/31/15	LRRB	\$64,131	
INV 971	Optimal RAP Content for Minnesota Gravel Roads	In Progress	Charles Jahren, Iowa State University	10/31/16	LRRB	\$92,538	
INV 929	Investigation and Assessment of Colored Concrete Pavement	2014-26	Thomas Burnham, MnDOT Office of Materials and Road Research	7/30/14	LRRB	\$37,435	X

## Multimodal

LRRB Identifier	Title	Report #/ Status	Investigator	End Date	Funding Source	Project Cost	TS?
INV 645	Complete Streets Implementation Resource Guide for Minnesota Local Agencies	2013RIC02	Michael Marti, SRF Consulting Group, Inc.	6/19/16		\$51,809	X
INV 909	Complete Streets: From Policy to Project	2013-30	Carissa Schively Slotterback, University of Minnesota	1/31/14	LRRB, SRP	\$99,021	X
INV 911	Best Practices Synthesis and Guidance in At-Grade Trail Crossing Treatments	2013-23	David Noyce, University of Wisconsin–Madison	10/31/13	LRRB, SRP	\$96,866	X
INV 915	Implications of Modifying State Aid Standards: Urban Construction or Reconstruction to Accommodate Various Roadway Users	2013-31	David Noyce, University of Wisconsin–Madison	12/31/13	LRRB	\$117,700	X
INV 645	2012 Truck Weight Enforcement Training Program	Completed Without Report	Jim Grothaus, University of Minnesota–CTS	8/31/13	LRRB, Other State Funds, SRP	\$30,000	

## Policy & Planning

LRRB Identifier	Title	Report #/ Status	Investigator	End Date	Funding Source	Project Cost	TS?
INV 912	Improved Approach to Enforcement of Road Weight Restrictions	2013-27	Rajesh Rajamani, University of Minnesota	11/30/13	LRRB, SRP	\$65,000	X
INV 933	Building Local Agency Capacity for Public Engagement in Local Road Systems Planning and Decision Making	2014-17	Kathryn Quick, University of Minnesota	7/31/14	LRRB	\$140,060	X
INV 951	Transportation Investment and Economic Development in Minnesota	In Progress	Zhirong Jerry Zhao, University of Minnesota	4/30/15	LRRB	\$93,468	

## Policy & Planning [cont.]

LRRB Identifier	Title	Report #/ Status	Investigator	End Date	Funding Source	Project Cost	TS?
INV 922	System Preservation Guide: A Planning Process for Local Government Management of Transportation Networks	In Progress	Brian Shorten, SRF Consulting Group, Inc.	11/30/14	LRRB	\$698,876	
INV 969	Barriers to Right of Way Acquisition and Recommendations for Change	In Progress	H. David Jeong, Iowa State University	2/28/16	LRRB	\$133,895	

## Traffic & Safety

LRRB Identifier	Title	Report #/ Status	Investigator	End Date	Funding Source	Project Cost	TS?
INV 645	HCM Unsignalized Crosswalk LOS Training	Completed Without Report	Jim Grothaus, University of Minnesota–CTS	7/31/14	LRRB	\$20,000	
INV 645	Minnesota's Best Practices for Traffic Sign Maintenance/ Management Handbook Update	In Progress	Howard Preston, CH2M Hill	10/31/14	LRRB	\$49,891	
INV 645	Online Sign Management and Maintenance	In Progress	Michael Marti, SRF Consulting Group, Inc.	6/19/16	LRRB	\$166,951	
INV 645	Road Safety—Toward Zero Death (TZD)	In Progress	Michael Marti, SRF Consulting Group, Inc.	6/19/16	LRRB	\$60,444	
INV 645	Traffic Data Collection Improvements	2014RIC51A, 2014RIC51B	Michael Marti, SRF Consulting Group, Inc.	6/19/16	LRRB	\$173,657	X
INV 645	<b>Uncontrolled Pedestrian Crossing Evaluation Incorporating Highway Capacity Manual Unsignalized Pedestrian Crossing Analysis Methodology</b>	2014-21	<b>Bryan Nemeth, Bolton &amp; Menk, Inc. Consulting Engineers &amp; Surveyors</b>	7/31/14	LRRB	\$44,666	X
INV 898	Estimating the Crash Reduction and Vehicle Dynamics Effects of Flashing LED Stop Signs	2014-02	Gary Davis, University of Minnesota	2/28/14	LRRB, ITS Institute, COPTRS	\$74,667	X
INV 917	Effect of Signing and Lane Markings on the Safety of a Two-Lane Roundabout	2014-04	John Hourdos, University of Minnesota	4/30/14	LRRB	\$105,000	X
INV 917	Two-Lane Roundabout Field Research Regarding Signing and Striping	Completed Without Report	Kristin Asher, City of Richfield	8/30/13	LRRB	\$5,000	
INV 924	Video: Bike Lane Safety	Completed Without Report	Marc Briese, Stonebrooke Engineering Inc.	4/30/14	LRRB	\$12,114	
INV 924	YouTube Video: How to Navigate a 2x2 Roundabout	Completed Without Report	David Breiter, Bolton & Menk, Inc. Consulting Engineers & Surveyors	1/31/14	LRRB	\$6,528	
INV 925	Advanced LED Warning System for Rural Intersections—Phase 2 (ALERT-2)	2014-10	Taek Kwon, University of Minnesota–Duluth	6/30/14	LRRB	\$106,192	X
INV 928	Human Factors of Vehicle-Based Lane Departure Warning Systems	In Progress	Christopher Edwards, University of Minnesota	8/31/15	LRRB	\$100,000	
INV 931	MPR-2(001): Lighting Levels for Isolated Intersections Leading to Safety Improvements	In Progress	Christopher Edwards, University of Minnesota	2/28/15	LRRB, SP&R, SRP	\$94,170	
INV 937	Development of Guidelines for Flashing Yellow Arrows for Protected/Permissive Use	In Progress	Gary Davis, University of Minnesota	3/31/15	LRRB, SRP	\$102,000	
INV 943	<b>Traffic Sign Life Expectancy</b>	2014-20	<b>Howard Preston, CH2M Hill</b>	7/31/14	LRRB	\$37,722	X
INV 943	Traffic Sign Life Expectancy	In Progress	Matthew Lebens, MnDOT Office of Materials and Road Research	11/30/16	LRRB	\$37,935	
INV 953	Development of a Digital Highway Framework to Facilitate Crash Avoidance: Serving County Roads	In Progress	Max Donath, University of Minnesota	12/31/14	LRRB	\$86,489	
INV 955	Deployment of Portable WIM Systems at ATR Sites for Data Collection and Comparative Study	In Progress	Erik Minge, SRF Consulting Group, Inc.	1/31/15	LRRB, SRP	\$80,565	
INV 955	Enhanced Capabilities for Portable WIM Systems	In Progress	Taek Kwon, University of Minnesota–Duluth	11/30/15	LRRB, SRP	\$75,667	
INV 958	Rumble Strip Noise Evaluation	In Progress	Edward Terhaar, Wenck Associates Inc.	1/31/15	LRRB	\$63,398	
INV 960	TRS: Right and Left Turn Lane Warrants	TRS1406	Howard Preston, CH2M Hill	4/30/14	LRRB	\$29,776	

## Traffic & Safety [cont.]

LRRB Identifier	Title	Report #/ Status	Investigator	End Date	Funding Source	Project Cost	TS?
INV 962	Evaluation of Safety and Mobility of Two-Lane Roundabouts	In Progress	John Hourdos, University of Minnesota	12/31/16	LRRB	\$124,920	
INV 972	Minnesota Local Agency Pavement Marking: Mining Existing Data	In Progress	Omar Smadi, Iowa State University	6/30/16	LRRB	\$65,000	

## Administrative

LRRB Identifier	Title	Report #/ Status	Investigator	End Date	Funding Source	Project Cost	TS?
INV 645	LRRB Outreach/Marketing	Completed Without Report	Michael Marti, SRF Consulting Group, Inc.	6/19/16	LRRB	\$70,038	
INV 916	FY2014 LRRB Technology Transfer Material Development	In Progress	Patrick Casey, CTC & Associates LLC	6/30/15	LRRB	\$74,994	
INV 916	FY2014-2015 LRRB Transportation Research Syntheses	In Progress	Patrick Casey, CTC & Associates LLC	6/30/15	LRRB	\$24,939	
INV 916	LRRB Technical Transfer Materials Development	Completed Without Report	Patrick Casey, CTC & Associates LLC	9/30/13	LRRB	\$99,892	
INV 927	LRRB Outreach Website	Completed Without Report	Timm Claudon, HNTB Corporation	1/31/14	LRRB	\$95,764	
INV 927	LRRB Outreach Website	In Progress	Jeff Olson, HNTB Corporation	8/31/16	LRRB	\$57,945	
INV 936	FY2014-2015 LRRB Focus Groups	In Progress	Michael Marti, SRF Consulting Group, Inc.	8/31/15	LRRB	\$15,000	
INV 936	LRRB Focus Groups	Completed Without Report	Jim Grothaus, University of Minnesota—CTS	7/31/13	LRRB	\$17,000	
INV 998	Operational Research Program for Local Transportation Groups (OPERA)—FY2012	Completed Without Report	Jim Grothaus, University of Minnesota—CTS	11/30/13	LRRB	\$90,000	
INV 998	Operational Research Program for Local Transportation Groups (OPERA)—FY2013-2014	Completed Without Report	Jim Grothaus, University of Minnesota—CTS	6/30/14	LRRB	\$135,000	
INV 999	RSS Report Publication Services—FY2013	Completed Without Report	Arlene Mathison, University of Minnesota	8/31/13	LRRB, SRP	\$30,088	
INV 999	RSS Report Publication Services—FY2014	In Progress	Arlene Mathison, University of Minnesota	8/31/14	LRRB, SRP	\$38,324	

## Dedicated Programs

LRRB Identifier	Title	Report #/ Status	Investigator	End Date	Funding Source	Project Cost	TS?
INV 668	Local Technical Assistance Program (LTAP)—FY2013 Coverage Period: 10/1/2012-9/30/2013	N/A	N/A	11/30/13	LRRB, Other Federal Funds	\$440,500	
INV 668	0001(213): Local Technical Assistance Program (LTAP)—FY2014	N/A	N/A	8/31/14	LRRB, Other Federal Funds	\$450,500	

## SUBMIT YOUR IDEAS

The LRRB welcomes research ideas from Minnesota transportation practitioners. To submit your ideas, go to [www.lrrb.org](http://www.lrrb.org) and click the Submit Ideas button on the left-hand side of the page.

SUBMIT IDEAS



The LRRB has funded several research videos to spread the word about research innovations, best practices and topics of public interest. New videos include:

- "Why Aren't They Working on My Road?"
- Minnesota Bike Lanes: Learning to Share
- Construction Zone Safety: Our Responsibility
- Road Closed Signs: Beware and Be Aware
- Navigating a Multi-Lane Roundabout
- Answers to Common Questions About Gravel Roads

Watch them at [www.youtube.com/user/lrrbmn](http://www.youtube.com/user/lrrbmn).



Produced by CTC & Associates for:

Minnesota Department of Transportation  
Office of Transportation System Management  
Research Services & Library  
Local Road Research Board  
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[mndot.gov/research](http://mndot.gov/research)

### LRRB Mission

The mission of the LRRB is to serve local road transportation practitioners through the development of new initiatives, the acquisition and application of new knowledge, and the exploration and implementation of new technologies.

### How the LRRB Works

Each year the LRRB selects research proposals that address local transportation needs. Investigators from MnDOT, regional universities and consulting firms conduct the research while the LRRB monitors its progress and MnDOT provides administrative support and technical assistance.

### Research Implementation

Once research has been completed, the Research Implementation Committee ([www.lrrb.org/ric.aspx](http://www.lrrb.org/ric.aspx)) communicates the results and facilitates their practical application. The RIC uses a variety of outreach methods, including presentations, reports and manuals, videos, workshops, field demonstrations and online training.

### LRRB Resources

Our website, [www.lrrb.org](http://www.lrrb.org), provides copies of all of our research reports as well as training materials, handbooks, research syntheses and software applications.

### Request a Transportation Research Synthesis

Transportation Research Syntheses are short-turnaround research reports that you can request to answer your research question. They can summarize completed and in-progress research, or report about the state of the practice among your peers.

TRSs completed during FY2014 include:

- TRS1409: Pavement Preservation Resource Centers
- TRS1407: Gravel Road Management Tools
- TRS1406: Right and Left Turn Lane Warrants

Contact Shirlee Sherkow at 651-366-3783 or [Shirlee.Sherkow@state.mn.us](mailto:Shirlee.Sherkow@state.mn.us) to get your report in four to eight weeks!

### Become a Technical Advisory Panel Member

You can play a vital role in guiding a research project to a successful completion. To learn more, watch our video series at [mndot.gov/research/taps.html](http://mndot.gov/research/taps.html).

