

We created guidebooks to help local engineers quickly select appropriate work zone layouts for low-volume roads.

[Report 2016RIC09](#)



We developed a tool to help local agencies decide when flashing yellow arrow phasing is appropriate.

[Report 2016RIC13](#)



We quantified the pavement damage caused by heavy farm equipment.

[Report 2016RIC07](#)



We validated the use of full-depth reclamation and cold in-place recycling to reduce lifetime costs when reconstructing low-traffic roads.

[Report 2016-14](#)

FY2016 Local Road Research Board

At-A-Glance

PRACTICAL IMPLEMENTATION OF RESEARCH

July 1, 2015, through June 30, 2016



LRRB
LOCAL
ROAD RESEARCH
BOARD

lrrb.org

Welcome to the Local Road Research Board At-A-Glance for Fiscal Year 2016

Since 1959, the Local Road Research Board (LRRB) has brought innovation to transportation engineers. During fiscal year 2016 (FY2016), we focused on implementing findings from research investments by creating usable products of immediate benefit to Minnesota's city and county engineers. A few of these resources are highlighted on the cover of this report; more are listed on pages 4 and 5.

The LRRB's Research Implementation Committee (RIC) communicates the results of our research through presentations, videos, workshops, field demonstrations, online training and other outreach methods. We welcome your ideas and your participation as we seek to make our streets safer, our roads and bridges last longer, and our operations more efficient. Please do not hesitate to reach out to us with any questions about LRRB's research and implementation efforts.

Mike Flaagan

2016 RIC Chair and Pennington County Engineer | MFlaagan@co.pennington.mn.us

Lyndon Robjent

2016 LRRB Chair and Carver County Engineer | LRobjent@co.carver.mn.us

Mitch Rasmussen

Outreach Subcommittee Chair, MnDOT State Aid Division | Mitch.Rasmussen@state.mn.us

THE NEXT PHASE: 2017-2018 RESEARCH IMPLEMENTATION PROJECTS

- Fleet management options and user experiences
- Base stabilization decision tree and field guide
- Gravel road management tools
- Lightly surfaced roadway training materials and workshop
- Resources for addressing citizens' safety and traffic requests
- Consolidated asset management guide for local agencies
- Americans with Disabilities Act training curriculum and materials
- Evaluation of existing local, state or Federal Highway Administration (FHWA) projects and products for updates



2016 LRRB Research Implementation Committee:

(from left) **Kelvin Howieson**, MnDOT District 3; **Bruce Holdhusen**, MnDOT Research Services and Library (staff); **John Brunkhorst**, McLeod County; **Mike Flaagan** (Chair), Pennington County; **Steve Bot**, City of St. Michael; **Joel Ullring**, MnDOT State Aid Division (staff); **Ted Schoenecker**, MnDOT State Aid Division; **Hafiz Munir**, MnDOT Research Services and Library; **Klayton Eckles**, City of Woodbury; **Jeff Brunner**, MnDOT Office of Materials and Road Research; **Jim Grothaus**, University of Minnesota Center for Transportation Studies; **Guy Kohlhofer**, Dodge County; **Tim Stahl** (liaison between RIC and LRRB), Jackson County.

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Our Mission

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

Join a Technical Advisory Panel

If your idea is selected, you may be asked to serve on a Technical Advisory Panel (TAP) to help guide the researchers. Participating on a TAP involves attending a limited number of meetings and reviewing the research results. This will put you in a good position to ensure that the research results will fit your needs and to find the most productive ways to apply these results in the field. To participate on a TAP, contact any board member.

How the LRRB Works

Our research ideas come from local Minnesota transportation practitioners like you. You can submit ideas anytime. Go to lrrb.org and click the Submit Ideas button. We'll investigate your idea and if a current solution exists, we'll share it with you. If we don't have a solution, your idea may be added to the proposals solicited from research institutions each fall. In December, the LRRB evaluates all proposals and selects some for funding.

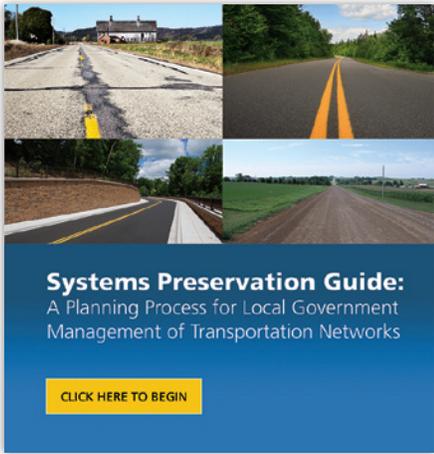


The Local Road Research Board: (from left) Mitch Rasmussen, MnDOT State Aid Division; Tom Ravn, MnDOT Office of Construction and Innovative Contracting; Laurie McGinnis, University of Minnesota Center for Transportation Studies; Lyndon Robjent (Chair), Carver County; Jeff Brunner, MnDOT Office of Materials and Road Research; Linda Taylor, MnDOT Research Services and Library; Paul Oehme (behind Linda Taylor), City of Chanhassen; Jim Foldesi, St. Louis County; Steve Koehler, City of New Ulm; Kaye Bieniek, Olmsted County; Tim Stahl, Jackson County.



TAP members attend a demonstration of light detection and ranging (lidar) technology, which can capture 3-D images for analyzing traffic, tracking assets and more.

New LRRB Resources



◀ Systems Preservation Guide: A Planning Process for Local Agencies

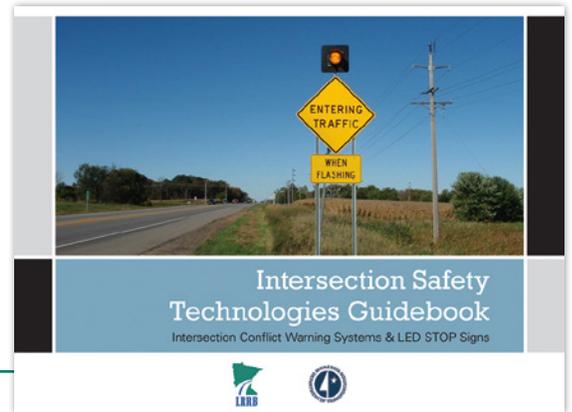
Evaluate preservation needs, communicate preservation needs to stakeholders and address preservation gaps with guidance from this handbook. The guide includes lessons learned from five pilot studies, such as the importance of a State of the County Highway System Report as a communication tool and the value of meaningful graphics that explain current conditions.

[Report 2016-34](#)

Intersection Safety Technologies Guidebook ▶

Know what factors to consider when choosing flashing LED stop signs or intersection conflict warning systems as safety treatments at rural intersections.

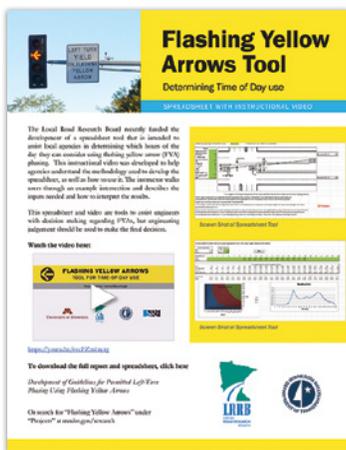
[Report 2016RIC10](#)



Temporary Traffic Control for Low-Volume Roads

Improve work zone safety by selecting work zone setups that are appropriate for low-volume roads. Two supplemental guidebooks to MnDOT's Temporary Traffic Control Zone Layouts Field Manual are now available: one for urban settings and one for rural environments.

[Report 2016RIC09](#)



◀ Flashing Yellow Arrow Decision Tool

Use a spreadsheet tool and instructional video to help determine when to employ flashing yellow arrow traffic signal phasing, which can improve intersection safety when implemented in appropriate situations.

[Report 2016RIC13](#)

Impacts of Implements of Husbandry on Local Roads ▶

Become familiar with the damage done to local roads by heavy farm equipment, which is currently exempted from state weight and load restrictions. Learn how neighboring states have addressed this issue.

[Report 2016RIC07](#)





◀ Snow and Ice Control Guidebook

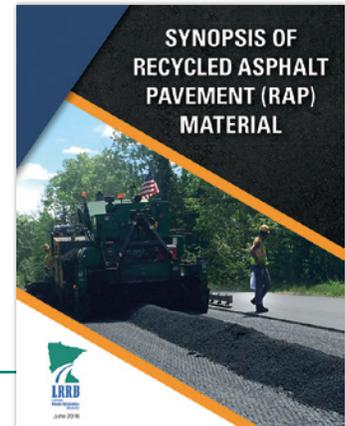
Quickly learn the basics of snow and ice control. The guide contains numerous photos, which illustrate winter maintenance strategies, equipment, materials, technologies and best practices. A slide presentation is also available for classroom instruction.

[Report 2016RIC11](#)

Synopsis of Recycled Asphalt Pavement Material ▶

Get to know the basics of recycled asphalt pavement (RAP) and how it can be used in roadway and pavement construction. This overview is geared toward agencies that have limited experience with RAP.

[Report 2016RIC08](#)



Barriers to Right of Way Acquisition and Recommendations for Change

Identify factors that increase costs and delays in the right of way acquisition process. This project developed 25 recommendations for improving the process.

[Report 2016-28](#)

Modernizing Road Construction Plans and Documentation ▶

Save time and money in the design and bidding processes by implementing 3-D modeling and electronic document management technologies. These technologies have a steep learning curve, which are likely offset by the long-term benefits.

[Report 2016-29](#)



Other resources at lrrb.org:

[Traffic Sign Maintenance/Management Handbook](#)

[Minnesota Snow and Ice Control Field Handbook for Snowplow Operators](#)

[Minnesota's Best Practices and Policies for Safety Strategies on Highways and Local Roads](#)

[Implementation of Pavement Management in Minnesota](#)

[Training Modules for Pavement Rehabilitation](#)

[ADA Transition Plan for Public Rights of Way Guide](#)

[Minnesota Research Test Section Tracking](#)

[Best Practices: Managing Interaction Between Local Authorities and Major Traffic Generators](#)



LRRB Research

Active Projects in FY2016

Projects highlighted on the front cover and pages 4 and 5 are indicated below by **bold text**.
A mark in the "TS" column indicates that a Technical Summary for this project can be found at lrrb.org.

COMMON FUNDING SOURCES

LRRB Local Road Research Board
SP&R State Planning & Research (FHWA)
SRP MnDOT State Research Program

Bridges & Structures

LRRB Identifier	Title	Report #/ Status	Investigator	End Date	Funding Source	Project Cost	TS?
INV 645	Next Generation Bridge Management Tools and Inspection	2015-47	Basak Aldemir Bektas, Iowa State University	12/31/15	LRRB, SP&R, SRP	\$72,072	X
INV 940	Cost-Effective Repairs of Timber Bridges: Solutions for Minnesota Timber Bridges	2015-45	Brent Phares, Iowa State University	11/30/15	LRRB, Partnership Funds	\$299,582	X
INV 976	Development and Integration of Advanced Timber Bridge Inspection Techniques for NBIS—Purchase Equipment and Train Users	In Progress	Victor Krause, University of Minnesota Duluth	2/28/18	LRRB	\$42,794	
INV 983	Cost-Competitive Timber Bridge Designs for Long-Term Performance	In Progress	Don Fosnacht, University of Minnesota Duluth	8/31/18	LRRB	\$212,883	
INV 1009	Field Investigation of Bridge Deck Reinforced with Glass Fiber Reinforced Polymer Rebar	In Progress	Behrouz Shafei, Iowa State University	8/31/18	LRRB, SRP	\$88,000	

Environmental

LRRB Identifier	Title	Report #/ Status	Investigator	End Date	Funding Source	Project Cost	TS?
INV 932	Determination of Effective Impervious Area in Urban Watersheds	2015-41	John Gulliver, University of Minnesota	7/31/15	LRRB	\$150,000	X
INV 965	Study of Deicing Salt Accumulation and Transport Through a Watershed	In Progress	William Herb, University of Minnesota	12/31/17	LRRB	\$164,043	
INV 979	Slope Stabilization and Repair Solutions for Local Government Engineers	In Progress	David Saftner, University of Minnesota Duluth	8/31/17	LRRB	\$78,124	
INV 984	Expanding the Success of Salt-Tolerant Roadside Turfgrasses Through Innovation and Education	In Progress	Sam Bauer, University of Minnesota	6/30/19	LRRB	\$168,974	
INV 1003	NPDES Stormwater Post-Construction Design Guidebook	In Progress	Randy Neprash, Stantec	1/31/18	LRRB	\$90,544	
INV 1006	Regional Optimization of Roadside Turfgrass Seed Mixtures	In Progress	Eric Watkins, University of Minnesota	8/31/18	LRRB, SRP	\$142,346	
INV 1007	Minnesota Culvert Manual to Accommodate Aquatic Species Passage	In Progress	Jeff Marr, University of Minnesota	12/31/18	LRRB, SP&R, SRP	\$164,353	
INV 1016	Permeable Pavement for Road Salt Reduction	In Progress	John Gulliver, University of Minnesota	8/31/19	LRRB	\$197,835	
INV 1017	Iron-Enhanced Swale Ditch Checks for Phosphorus Removal	In Progress	John Gulliver, University of Minnesota	8/31/19	LRRB, SRP	\$200,036	

TENTATIVELY FUNDED FOR FY2018: Characterization of Runoff Quality from Paved Low-Volume Roads and Optimization of Treatment Methods

Maintenance Operations

LRRB Identifier	Title	Report #/ Status	Investigator	End Date	Funding Source	Project Cost	TS?
INV 645	Fleet Management Systems for All Sizes of Local Agencies	In Progress	Michael Marti, SRF Consulting Group, Inc.	7/31/19	LRRB	\$60,526	
INV 645	Snow and Ice Control Guidebook	2016RIC11	Michael Marti, SRF Consulting Group, Inc.	6/19/16	LRRB	\$33,689	X
INV 924	Winter Chemicals Video for Local Agencies	Completed	Bryan Nemeth, Bolton & Menk, Inc. Consulting Engineers & Surveyors	10/31/15	LRRB, Other State Funds	\$17,856	
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	
INV 974	Evaluation of Bio-Fog Sealants for Pavement Preservation	2016-20	Mihai Marasteanu, University of Minnesota	8/31/16	LRRB, SRP	\$93,969	X
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	
INV 980	Pothole Prevention and Innovative Repair	In Progress	Mihai Marasteanu, University of Minnesota	8/31/17	LRRB, SRP	\$129,914	
INV 1015	Optimized Taconite-Based Pavement Repair Compound and Deployment System	In Progress	Lawrence Zanko, University of Minnesota Duluth	2/28/19	LRRB	\$100,000	
INV 1018	TRS: Alternative Deicers for Snow and Ice Control	In Progress	Laura Fay, Montana State University	7/31/17	LRRB	\$30,016	
INV 1021	TRS: State DOT Bridge Removal Programs and Policies	In Progress	Patrick Casey, CTC & Associates LLC	5/31/17	LRRB	\$10,002	

TENTATIVELY FUNDED FOR FY2018: Adaptive Management to Improve Deicing Operations

Materials & Construction

LRRB Identifier	Title	Report #/ Status	Investigator	End Date	Funding Source	Project Cost	TS?
INV 645	Impacts of Implements of Husbandry on Local Roads	2016RIC07	Michael Marti, SRF Consulting Group, Inc.	6/19/16	LRRB	\$40,072	
INV 645	Synopsis of Recycled Asphalt Pavement Material	2016RIC08	Michael Marti, SRF Consulting Group, Inc.	6/19/16	LRRB	\$27,249	
INV 885	Research Test Section Tracking—Phase II	In Progress	David Van Deusen, MnDOT Office of Materials and Road Research	12/31/17	LRRB	\$55,000	
INV 916	TRS: Mitigating Frost Heaves and Dips Near Centerline Culverts	TRS 1511	Patrick Casey, CTC & Associates LLC	1/31/16	LRRB	\$6,540	
INV 924	YouTube Video: Rumble Strips	Completed	Marc Briese, Stonebrooke Engineering, Inc.	10/31/15	LRRB, Other State Funds	\$16,890	
INV 924	YouTube Video: Roundabout Myths	Completed	Marc Briese, Stonebrooke Engineering, Inc.	10/31/15	LRRB, Other State Funds	\$19,875	
INV 935	Design Considerations for Embankment Protection During Road Overtopping Events	In Progress	Jeff Marr, University of Minnesota	8/31/17	LRRB, SRP	\$194,794	
INV 947	Investigation of Performance Requirements of Full-Depth Reclamation Stabilization	2016-09	Jialiang Le, University of Minnesota	4/30/16	LRRB, SP&R, SRP	\$95,823	X
INV 947	Investigation of Optimal Mix Design of Full-Depth Reclamation Stabilization with Cement and Emulsion	Completed Without Report	Shongtao Dai, MnDOT Office of Materials and Road Research	7/31/15	LRRB, SP&R, SRP	\$15,000	
INV 948	Flagger Operations: Investigating Their Effectiveness in Capturing Driver Attention	In Progress	Kathleen Harder, University of Minnesota	2/28/17	LRRB, SP&R, SRP	\$270,351	
INV 967	Full-Depth Reclamation for Suburban/Urban and Local Roads Application	In Progress	Mihai Marasteanu, University of Minnesota	2/28/17	LRRB	\$93,969	

Materials & Construction [cont.]

LRRB Identifier	Title	Report #/ Status	Investigator	End Date	Funding Source	Project Cost	TS?
INV 968	Modernizing Road Construction Plans and Documentation	2016-29	Jennifer Shane, Iowa State University	10/31/16	LRRB	\$146,022	X
INV 970	Alternate Design Methods to Renew Lightly Traveled Paved Roads	2016-14	Charles Jahren, Iowa State University	4/30/16	LRRB	\$64,130	X
INV 971	Optimal Recycled Asphalt Pavement Content for Minnesota Gravel Roads	In Progress	Charles Jahren, Iowa State University	8/31/18	LRRB	\$92,538	
INV 975	Prevention of Stripping Under Chip Seals	Completed Without Report	Dave Rettner, American Engineering Testing, Inc.	6/30/16	LRRB	\$100,000	
INV 981	Evaluation of Stabilized Full-Depth Reclamation	In Progress	Charles Jahren, Iowa State University	7/31/17	LRRB, SRP	\$126,992	
INV 985	Life-Cycle Cost Analysis Tool for Minnesota Pavements	In Progress	Derek Tompkins, University of Minnesota	2/28/18	LRRB	\$109,279	
INV 986	Performance Monitoring of Olmsted CR 117/104 and Aggregate Base Material Update.	In Progress	Kyle Hoegh, MnDOT Office of Materials and Road Research	6/30/20	LRRB	\$44,000	
INV 987	Optimizing Cold In-Place Recycling Applications Through Fracture Energy Performance Testing	2016-21	Daniel Wegman, Braun Intertec Corporation	6/30/16	LRRB	\$67,740	X
INV 987	Optimizing Cold In-Place Recycling Applications Through Fracture Energy Performance Testing	Completed Without Report	Shongtao Dai, MnDOT Office of Materials and Road Research	4/30/16	LRRB	\$21,700	
INV 988	TRS: Alternatives to Seal Coats	TRS 1602	Matthew Oman, Braun Intertec Corporation	1/31/16	LRRB	\$19,200	
INV 989	Slope Failure Risk Analysis	In Progress	Omid Mohseni, Barr Engineering Company	5/31/17	LRRB	\$60,000	
INV 1001	TRS: Recycled Materials in Unbound Aggregate Base Layers in Minnesota	TRS 1604	W. James Wilde, Minnesota State University, Mankato	10/31/16	LRRB	\$14,418	
INV 1013	Comparison of Performances of Structural Fibers and Development of a Specification for Using Structural Fibers in Thin Concrete Overlays	In Progress	Manik Barman, University of Minnesota Duluth	8/31/18	LRRB, SRP, SP&R	\$153,792	
TENTATIVELY FUNDED FOR FY2018: Cost-Benefit Analysis of the Effectiveness of Crack Sealing Techniques; Experimental and Computational Investigations of High-Density Asphalt Mixtures (Is Seal Coating Counterproductive or Not?)							

Multimodal

LRRB Identifier	Title	Report #/ Status	Investigator	End Date	Funding Source	Project Cost	TS?
INV 964	Traffic Impacts of Bicycle Facilities	In Progress	Greg Lindsey, University of Minnesota	7/31/17	LRRB	\$138,914	

Policy & Planning

LRRB Identifier	Title	Report #/ Status	Investigator	End Date	Funding Source	Project Cost	TS?
INV 645	Training Workshop: Americans with Disabilities Act for Local Agencies	In Progress	Michael Marti, SRF Consulting Group, Inc.	7/31/19	LRRB	\$41,611	
INV 922	Systems Preservation Guide: A Planning Process for Local Government Management of Transportation Networks	2016-34	Brian Shorten, SRF Consulting Group, Inc.	7/31/16	LRRB	\$698,876	X
INV 963	Stakeholder Attitudes, Knowledge and Engagement in Local Road Systems Planning Decision-Making	In Progress	Guillermo Narvaez, University of Minnesota	3/31/17	LRRB	\$139,793	
INV 969	Barriers to Right of Way Acquisition and Recommendations for Change	2016-28	H. David Jeong, Iowa State University	8/31/16	LRRB	\$133,895	X
INV 982	The Transportation Futures Project: Planning for Technology Change	2016-02	David Levinson, University of Minnesota	2/28/16	LRRB, SRP	\$100,000	X
INV 1002	TRS: Consolidated Asset Management for Minnesota Local Agencies	TRS 1603	Patrick Casey, CTC & Associates LLC	7/31/16	LRRB	\$9,840	
INV 1008	Effective Social Media Engagement Options for Minnesota's Diversifying Population	In Progress	Ingrid Schneider, University of Minnesota	4/30/18	LRRB, SRP	\$163,783	
INV 1014	Transportation Investment and Job Creation in Minnesota Counties	In Progress	Zhirong Jerry Zhao, University of Minnesota	3/31/18	LRRB	\$110,350	
TENTATIVELY FUNDED FOR FY2018: Prepare Local Agencies for Future of V2V/V2I and Connected Vehicle Technologies; How Locals Need to Prepare for the Future of V2V/V2I Connected Vehicles							

Traffic & Safety

LRRB Identifier	Title	Report #/ Status	Investigator	End Date	Funding Source	Project Cost	TS?
INV 645	FY2016 Traffic Sign Retroreflectivity Training Workshops	Completed Without Report	Jim Grothaus, University of Minnesota—CTS	6/30/16	LRRB, Other State Funds	\$77,510	
INV 645	Intersection Safety Technologies Guidebook	2016RIC10	Michael Marti, SRF Consulting Group, Inc.	6/19/16	LRRB	\$59,940	X
INV 645	Flashing Yellow Arrow Tool for Time-of-Day Use Instructional Video	2016RIC13	Michael Marti, SRF Consulting Group, Inc.	6/19/16	LRRB	\$29,360	
INV 645	Online Sign Management and Maintenance Training	In Progress	Michael Marti, SRF Consulting Group, Inc.	6/19/16	LRRB	\$215,019	
INV 645	Temporary Traffic Control for Low-Volume Roads	2016RIC09	Michael Marti, SRF Consulting Group, Inc.	6/19/16	LRRB	\$56,088	X
INV 645	Thinking of Building a Multilane Roundabout?	2015RIC12	Michael Marti, SRF Consulting Group, Inc.	6/19/16	LRRB	\$8,072	
INV 645	Younger Drivers Toolkit for Local Agencies	2015RIC04	Michael Marti, SRF Consulting Group, Inc.	6/19/16	LRRB	\$90,462	X
INV 924	Ineffective Specialty Signs Video for Local Agencies	In Progress	Bryan Nemeth, Bolton & Menk, Inc., Consulting Engineers & Surveyors	9/30/17	LRRB, Other State Funds	\$28,569	
INV 928	Human Factors of Vehicle-Based Lane Departure Warning Systems	2015-35	Alice Ton, University of Minnesota	8/31/15	LRRB	\$100,000	X
INV 943	Traffic Sign Life Expectancy	In Progress	Kyle Hoegh, MnDOT Office of Materials and Road Research	11/30/16	LRRB	\$37,935	
INV 955	Weigh-Pad-Based Portable Weigh-in-Motion System: User Manual	2016-07	Taek Kwon, University of Minnesota Duluth	5/31/16	LRRB, SRP	\$75,667	
INV 962	Evaluation of Safety and Mobility of Two-Lane Roundabouts	In Progress	John Hourdos, University of Minnesota	8/31/17	LRRB	\$124,920	
INV 972	Minnesota Local Agency Pavement Marking: Mining Existing Data	In Progress	Omar Smadi, Iowa State University	2/28/17	LRRB	\$65,000	
INV 973	Risk Evaluation for In-Vehicle Sign Information	2016-18	Nichole Morris, University of Minnesota	7/31/16	LRRB	\$29,365	X
INV 977	Innovative Technology Workshop on 3-D Lidar	2016-19	Brian Davis, University of Minnesota	8/31/16	LRRB	\$92,140	X
INV 978	In-Vehicle Work Zone Messages: Examining Signing Options for Improving Safe Driving Behaviors in Work Zones	In Progress	Nichole Morris, University of Minnesota	3/31/17	LRRB, SRP	\$105,167	

Traffic & Safety [cont.]

LRRB Identifier	Title	Report #/ Status	Investigator	End Date	Funding Source	Project Cost	TS?
INV 1004	Development and Demonstration of a Cost-Effective In-Vehicle Lane Departure and Advanced Curve Speed Warning System	In Progress	Imran Hayee, University of Minnesota Duluth	10/31/18	LRRB	\$124,704	
INV 1005	In-Vehicle Dynamic Curve Speed Warnings at High-Risk Rural Curves	In Progress	Brian Davis, University of Minnesota	4/30/18	LRRB, SP&R, SRP	\$161,803	
INV 1010	Signing for Effective Roundabout Approach Speed Reduction	In Progress	Susan Chrysler, Texas A&M Transportation Institute	7/31/17	LRRB, SRP	\$74,989	
INV 1011	Work Zone Intrusion Report Interface Design	In Progress	Nichole Morris, University of Minnesota	4/30/18	LRRB, SP&R, SRP	\$200,638	
INV 1012	Investigating the Necessity and Prioritizing Pavement Markings on Low-Volume Roads	In Progress	David Veneziano, Iowa State University	2/28/18	LRRB	\$71,475	

TENTATIVELY FUNDED FOR FY2018: Pavement Markings—Wet Retroreflectivity Standards; Examining Optimal Sight Distances at Rural Intersections; Investigating Inductive Loop Signature Technology for Statewide Vehicle Classification Counts; Personal Warning Sensor for Road Construction Workers; Evaluation of the Effectiveness of Stop Lines in Increasing the Safety of Stop-Controlled Intersections; Cloud-Based Dynamic Warning System

Administrative

LRRB Identifier	Title	Report #/ Status	Investigator	End Date	Funding Source	Project Cost	TS?
INV 645	FY2012-2016 Research Implementation Committee Implementation of Research Findings	In Progress	Michael Marti, SRF Consulting Group, Inc.	6/19/16	LRRB	\$985,208	
INV 645	FY2014-2016 LRRB Outreach and Marketing	In Progress	Michael Marti, SRF Consulting Group, Inc.	6/19/16	LRRB	\$47,439	
INV 645	FY2017-2019 Research Implementation Committee Implementation of Research Findings	In Progress	Michael Marti, SRF Consulting Group, Inc.	7/31/19	LRRB	\$378,285	
INV 645	LRRB Outreach and Marketing Support	In Progress	Renaee Kuehl, SRF Consulting Group, Inc.	7/31/17	LRRB	\$20,000	
INV 668	FY2015 Local Technical Assistance Program	Completed Without Report	Jim Grothaus, University of Minnesota—CTS	8/31/15	LRRB, Other Federal Funds	\$450,500	
INV 668	FY2016 Local Technical Assistance Program	Completed Without Report	Jim Grothaus, University of Minnesota—CTS	6/30/16	LRRB, Other Federal Funds	\$450,500	
INV 688	FY2017 Local Technical Assistance Program	In Progress	Jim Grothaus, University of Minnesota—CTS	6/30/17	LRRB, Other Federal Funds	\$450,500	
INV 916	FY2015 LRRB Technical Transfer Materials Development	In Progress	Patrick Casey, CTC & Associates LLC	8/31/16	LRRB	\$99,007	
INV 924	Professional Services for Careers in Civil Engineering Video	In Progress	Renaee Kuehl, SRF Consulting Group, Inc.	3/31/17	LRRB	\$82,912	
INV 927	LRRB Outreach Website	In Progress	John Przybylski, HNTB Corporation	8/31/16	LRRB	\$64,355	
INV 936	FY2014 and FY2015 LRRB Focus Groups	Completed Without Report	Jim Grothaus, University of Minnesota—CTS	8/31/15	LRRB	\$16,996	
INV 936	FY2016 and FY2017 LRRB Focus Groups	In Progress	Brenda Thomas, University of Minnesota—CTS	7/31/17	LRRB	\$29,382	
INV 998	FY2015 Operational Research Program for Local Transportation Groups (OPERA)	Completed	Jim Grothaus, University of Minnesota—CTS	9/30/15	LRRB	\$90,000	
INV 999	FY2015 RSS Report Publication Services	Completed	Arlene Mathison, University of Minnesota—CTS	11/30/15	LRRB, SRP	\$45,831	
INV 999	FY2016 RSS Report Publication Services	In Progress	Arlene Mathison, University of Minnesota—CTS	8/31/17	LRRB, SRP	\$73,035	



Lyndon Robjent, LRRB chair and Carver County Engineer, leads a discussion during a recent meeting.

2017 LRRB and RIC Meetings

Get up-to-date information on these meetings at lrrb.org.

RIC: March 13—MnROAD Conference Room

LRRB: March 23—Golden Valley

The spring meeting is devoted to programming and strategy identification, with emphasis on identifying research topics for the following year. The LRRB determines ongoing funding commitments, deciding on RIC funding every other year, and approves the next year's travel budget. Information is also provided about projects completed during the past year.

LRRB Focus Group: March TBD—TBD

The purpose of this focus group is to collect input that helps identify future research initiatives. The meeting is open to all city and county transportation practitioners (RSVP by early February). Research topics include design, environmental compatibility, maintenance, materials and construction, policy and planning, and traffic and operations.

LRRB Outreach: June 27—Grand Rapids area

LRRB and RIC: June 28-29—Grand Rapids area

Each summer, LRRB and RIC members meet in a joint session to formally adopt the upcoming year's strategic plan. The meeting always takes place outside of the metro area, and

when possible, LRRB staff arranges a field tour of a nearby research installation or project site. During the meeting, members use focus group feedback, themes and gaps identified in Research Road Map efforts and completed research reports to determine research needs for the upcoming RFP and implementation strategies for the RIC. Information is also provided about projects completed during the past year.

RIC: September 27—St. Cloud

LRRB Outreach: October 17 (tentative)—TBD

LRRB: October 18—St. Cloud

The fall meeting focuses on prioritizing university research proposals to be presented at the LRRB project selection winter meeting.

RIC: November 20—St. Cloud

LRRB: December 6-7—Minneapolis

At the winter meeting, the LRRB identifies the projects that it will fund in the upcoming fiscal year. Research investigators give brief presentations to LRRB members, who can then ask questions about the proposed projects.

Submit Your Ideas

The LRRB welcomes research ideas from Minnesota transportation practitioners. Attend a focus group (contact Mitch Bartelt at 651-366-3767) or submit your idea at lrrb.org (click the Submit Ideas button).

Watch LRRB Videos

The LRRB funds videos that communicate research results to transportation practitioners as well as the public. Check out the LRRB YouTube channel or lrrb.org/resources/videos.html.



Request a Transportation Research Synthesis

A Transportation Research Synthesis (TRS) is a short-turnaround research report that you can request to answer your research question. TRSs can summarize completed and in-progress research, or report about the state of practice among your peers in Minnesota and other states. For more information or to request a TRS, visit mndot.gov/research/transportation-research-syntheses.html.



TRS 1603, Consolidated Asset Management for Minnesota Local Agencies, includes a literature review with supplementary interviews to gauge best practices in tracking physical assets such as pavements, bridges, culverts, barriers and overhead sign structures.

The LRRB recently partnered with the National Road Research Alliance, a new multi-state pooled fund focused on solving widespread problems impacting road owners and users. Members help direct the research program at the MnROAD pavement testing facility. For more information, see mndot.gov/mnroad/nrra.



Coming in early 2017: New lrrb.org website



Operational Research Assistance Program for Local Transportation Groups

Administered by the Minnesota Local Technical Assistance Program, the Operational Research Assistance (OPERA) Program for local transportation groups was established to encourage and fund applied research and assist in developing innovations relating to methods, materials and equipment used in the construction and maintenance operations of local government transportation organizations. The current guidelines for this program are available at mnltp.umn.edu/about/programs/opera.