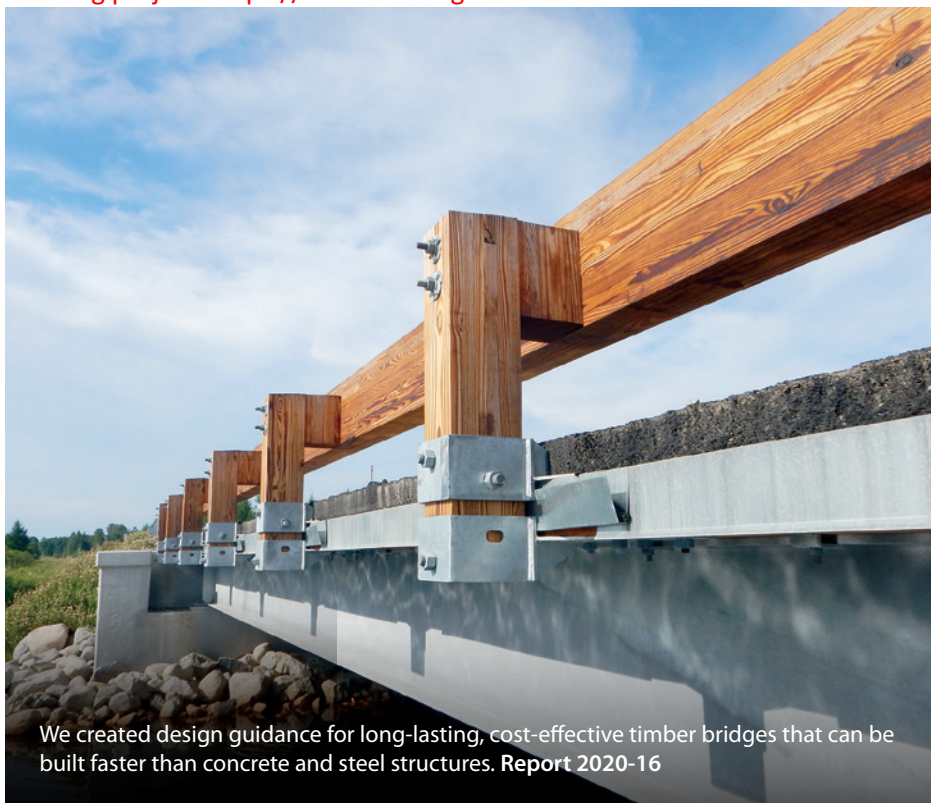




We assessed the health and economic impacts of Richfield's "Sweet Streets" program, which reconstructed streets to improve safety for pedestrians and bicyclists. **Report 2020-22**



We created design guidance for long-lasting, cost-effective timber bridges that can be built faster than concrete and steel structures. **Report 2020-16**

FY2020 LOCAL ROAD RESEARCH BOARD

At-A-Glance

July 1, 2019, through June 30, 2020 | LRRB.ORG



We evaluated using hybrid/plug-in vehicles for municipal fleets and found them to offer significant fuel economy for stop-and-go applications. **Report 2020-25**



In a study that evaluated the safety benefits of intersection stop lines, we found that they were much less effective than expected. **Report 2020-17**

Welcome to the Local Road Research Board At-A-Glance for Fiscal Year 2020

The Local Road Research Board (LRRB) has been bringing innovations to local Minnesota researchers since 1959. Our mission 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.

How LRRB Works

Our research ideas come from local Minnesota transportation practitioners like you. Contact us anytime at lrrb.org. We'll let you know whether current solutions to your problem exist or help you take your idea to the next stage of consideration for funding.

To ensure that our research is responding to city and county needs, we have the following process for selecting new projects:

1. **October prescreening meetings:** LRRB representatives hold sessions at State Aid prescreening meetings, where city and county engineers can discuss their research and technology transfer needs.
2. **January email survey:** We ask city and county engineers to prioritize the list of ideas generated from the prescreening meetings.
3. **January city/county association meetings:** We report on the ideas collected in step 1 and prioritized in step 2.

4. February to December proposal development:

We work with you to develop need statements for the top ideas. Then the LRRB issues request for proposals and selects proposals to fund.

When the LRRB approves a research proposal, the Minnesota Department of Transportation (MnDOT) provides administrative support and technical assistance. Researchers from MnDOT, universities and consulting firms conduct the research, and the LRRB monitors the progress.



Left to right:
Jim Foldesi,
LRRB Chair, St. Louis County

Mike Flaagan,
RIC Chair, Pennington County

Kristine Elwood,
*Outreach Subcommittee Chair,
MnDOT State Aid Division*

Advancing Minnesota's Transportation Systems

Research sponsored by the LRRB helps to improve the quality of Minnesota's transportation systems. The impact multiplies as more and more engineers see potential applications through the technology transfer efforts of LRRB's Research Implementation Committee (RIC).

LRRB Strategic Plan

We recently completed an extensive analysis of our current practices and engaged in stakeholder engagement, including surveys and consultations. The result is a five-year strategic plan that refines LRRB's vision and improves processes and operations. It establishes five key goals:

- Prioritize research that focuses on local transportation systems.
- Emphasize research implementation and track progress to evaluate the impact of research on practice.
- Maintain a feedback loop with researchers and local practitioners.
- Streamline project and program management.
- Evaluate our program comprehensively over time.

Improving Local Roads, Increasing Safety

High-Friction Surface Treatments for Safer Driving

Building on an LRRB-funded [2018](#)

[Transportation Research Synthesis](#), St. Louis County is testing a coarse aggregate and epoxy pavement application to increase safety on rural highway curves. [Watch a demonstration of the high-friction surface treatment on the LRRB YouTube channel.](#) The county is also evaluating a lower-cost alternative that uses taconite byproduct as the base product.



Permeable Pavements Reduce Slippery Conditions During Winter Thaw

Research showed that when snow and ice begin to melt, the meltwater infiltrates into permeable pavements, reducing the threat of slippery roads from water pooling and refreezing. [Report 2020-15](#)

Taconite Mixture Shows Promise for Pothole Repair

Researchers refined an innovative, quick pothole repair method for both concrete and asphalt pavements using taconite, a plentiful Minnesota material. This new method, which involves mixing materials in a 15-gallon barrel on-site, holds promise as a cost-competitive, long-term pothole solution. [Report 2019-46](#)



Role of Local Funding in Regional Projects

Local agencies are shouldering more of the burden for regional transportation projects. Roadway funding and grant pattern data were gathered, along with case studies and survey results, to provide guidance to local agencies for making judicious and cost-effective decisions when working with federal and state agencies on collaborative projects that include nonlocal features. [Report 2020-12](#)

New Project Investigates COVID-19 Impacts on Speed and Safety for Rural Roads and Work Zones

Minnesota's stay-at-home order reduced traffic by roughly 50%, but unexpectedly, traffic fatalities also increased by about 50%. [New research](#) will use crash records to investigate high-risk areas and develop solutions to prevent severe crashes.

New Resources for Local Agencies

LRRB research has enabled the creation of numerous tools to help cost-effectively manage the many systems that support county and city transportation needs.

Pedestrian Crosswalk Reference Guide ►

A new guide walks local agencies through the benefits, design, costs and location considerations of a dozen uncontrolled pedestrian crosswalk treatments that can improve pedestrian safety. The guidance was developed based on a review of best practices, policy and research for selecting and siting pedestrian facilities.

[Guide 2020RIC01](#)



Courtesy WSB Engineering

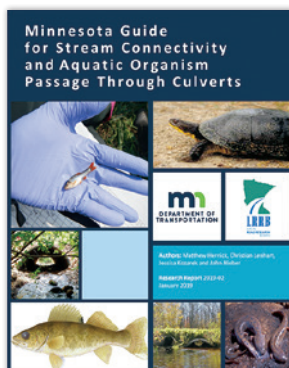
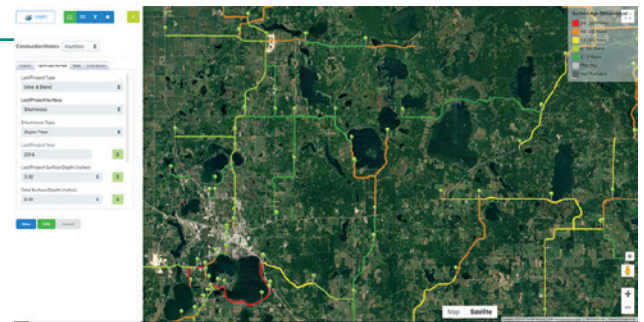
◀ A Guide to GIS Tools and Apps

A quick start guide describes various GIS tools, staffing and required data sources for asset management and their value for planning and other activities.

[Guide 2020RIC15](#)

Pavement Condition Forecasting Tool ►

An upgrade of the [Geographic Roadway Inventory Tool](#) (GRIT) allows users to enter construction planning data and generate predictions, maps, graphs and reports on how roadways will look in the future. [Report 2020-04](#)



◀ Minnesota Guide for Stream Connectivity and Aquatic Organism Passage Through Culverts

A new [culvert design guide](#) provides best practices for promoting waterway integrity and protecting aquatic wildlife. [Report 2019-02](#)

Virtual Workshop on Lightly Surfaced Roads ►

A workshop presented light surface treatments of gravel and dirt roads to control dust, maintain grades or stabilize materials. [Virtual Workshop](#)



Roadside Turfgrass Installation and Management ▼

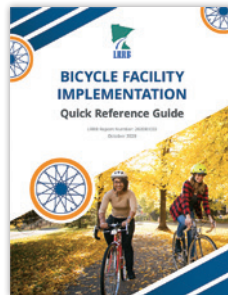
An online, self-guided course on turfgrass installation and care explains salt-tolerant turfgrass selection, seeding and soil preparation, mowing, irrigation and other practices. [Course 202003](#)



Investigators also developed a guide and video for homeowners about caring for new boulevard turfgrass. [Homeowner Guidelines](#)

Bicycle Facility Selection ▶ Quick Guide

To assist with bike facility design and selection, this quick reference directs local planners and designers to specific sections of MnDOT's new manual and other documents. The guide also answers commonly asked questions about facility planning and selection. [Guide 2020RIC03](#)



◀ Design Guidelines for Timber Bridges

New designs for timber bridges can work well as a cost-effective alternative to steel or concrete bridges in rural settings. A new report includes design guidelines for two kinds of timber decks that meet national standards. [Report 2020-16](#)

LRRB Research Featured in Roads & Bridges



Researchers placed sample pavement markings to test their visibility on a test track equipped with an overhead spray apparatus to simulate a rainy night.

Wet Retroreflective Pavement Markings

A [June 2020 article](#) in *Roads & Bridges* described LRRB-funded research to prevent crashes through pavement markings that are more visible during wet nighttime conditions. The article included a reference to a [webinar](#) on the practice. The research was documented through [Report 2020-09](#).

Implementing Rural Road Safety Research

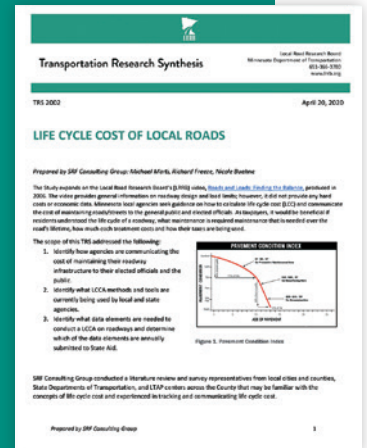
In the [July 2019 issue](#), Mark Vizecky, MnDOT State Aid Program, and Renae Kuehl, SRF Consulting Group (the LRRB's outreach consultant), discussed research implementation of Minnesota local roadway safety program results using research into public reactions to rumble strips as a case study.

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. A TRS 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/TRS.html.

[TRS 2002](#), Life Cycle Cost of Local Roads, surveyed states, Local Technical Assistance Programs, and Minnesota cities and counties to help local agencies determine life cycle costs and report road maintenance costs to elected officials and the public.



Other resources at lrrb.org:

Asset Management Guide for Local Agencies

Best Practices for Boulevard Turf Design and Maintenance

Best Practices for Managing Utility Congestion Within Rights of Way

Converting Severely Distressed Paved Roads to Engineered Unpaved Roads Webinar

Gravel Road Management Tool

Paved Recreational Trail Management Workshop

Pavement Preservation Guidelines for Local Agencies

Traffic Signal Preemption for Snowplows



LRRB Research

Active Projects in FY2020

Find active and completed projects under the “Research” tab at lrrb.org.

COMMON FUNDING SOURCES

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

Bridges & Structures

LRRB Identifier	Title	Report #/ Status	Investigator	Technical Liaison	End Date	Funding Source	Total Cost
INV 1009	Field Investigation of Bridge Deck Reinforced With Glass Fiber Reinforced Polymer (GFRP) Rebar	2020-05	Behrouz Shafei, Iowa State University	Paul Rowekamp	2/29/20	LRRB, SRP	\$88,000
INV 1035	Debonded Strands in Prestressed Concrete Bridge Girders	2019-30	Cathy French, University of Minnesota	Brian Homan	7/31/19	LRRB	\$35,000
INV 645	Mitigating Seasonal Movement at Culverts and Utilities	In Progress	Michael Marti, SRF Consulting Group, Inc.	Guy Kohnhofer	6/21/21	LRRB	\$34,676
INV 976	Development and Integration of Advanced Timber Bridge Inspection Techniques for NBIS Purchase Equipment and Train Users	Completed	Victor Krause, University of Minnesota Duluth	David Conkel, Peter Wilson	1/20/20	LRRB	\$42,794
INV 983	Development of Cost-Competitive Timber Bridge Designs for Long-Term Performance	2020-16, 2020-16A	Don Fosnacht, University of Minnesota Duluth	David Conkel	8/31/20	LRRB	\$212,883

Environmental

LRRB Identifier	Title	Report #/ Status	Investigator	Technical Liaison	End Date	Funding Source	Total Cost
INV 1016	Permeable Pavement for Road Salt Reduction	2020-15	John Gulliver, University of Minnesota	Richard McCoy	8/31/20	LRRB	\$197,835
INV 1017	Iron-Enhanced Swale Ditch Checks for Phosphorus Retention	2019-27	John Gulliver, University of Minnesota	Beth Neuendorf	8/31/19	LRRB, SRP	\$200,036
INV 1027	Characterization of Runoff Quality From Paved Low-Volume Roads and Optimization of Treatment Methods	2020-27	John Gulliver, University of Minnesota	John Welle	11/30/20	LRRB	\$192,527
INV 1038	Regional Optimization of Roadside Turfgrass Seed Mixtures—Phase II: Regional Field Trials and Economic Analysis	In Progress	Eric Watkins, University of Minnesota	Dwayne Stenlund	8/31/22	LRRB	\$467,139
INV 1039	Design and Construction of Infiltration Facilities	In Progress	John Gulliver, University of Minnesota	Dwayne Stenlund	8/31/21	LRRB	\$238,572
INV 1041	Assessing Culverts in Minnesota: Fish Passage and Storm Vulnerability	In Progress	Jessica Kozarek, University of Minnesota	Nicole Bartelt	7/31/21	LRRB	\$158,374
INV 1059	Wet Pond Maintenance for Phosphorus Retention	In Progress	John Gulliver, University of Minnesota	Leslie Stovring	6/30/22	LRRB, SRP	\$222,467
INV 1060	Reuse of Regional Waste in Sustainably Designed Soils	In Progress	Marsha Patelke, University of Minnesota Duluth	Dwayne Stenlund	1/31/22	LRRB	\$197,406
INV 984	Expanding the Success of Salt-Tolerant Roadside Turfgrasses Through Innovation and Education	2020-03	Eric Watkins, University of Minnesota	Dwayne Stenlund	2/29/20	LRRB	\$168,974
	Evaluation of Environmental Impacts of Potassium Acetate Used as a Road Salt Alternative	In Progress	John Gulliver, University of Minnesota	Nicklas Tiedeken	7/31/22	LRRB	\$214,743

Maintenance Operations

LRRB Identifier	Title	Report #/ Status	Investigator	Technical Liaison	End Date	Funding Source	Total Cost
INV 1015	Optimized Taconite-Based Pavement Repair Compound and Deployment System	2019-46	Lawrence Zanko, University of Minnesota Duluth	Perry Collins	12/31/19	LRRB	\$100,000
INV 1034	Adaptive Management to Improve Deicing Operations	In Progress	Larry Baker, University of Minnesota	Ross Bintner	12/31/20	LRRB	\$204,000
INV 1047	Techno-Economic Analysis of Implementing Hybrid Electric Utility Vehicles in Municipal Fleets	2020-25	Will Northrop, University of Minnesota	Kevin Schlagen	7/31/20	LRRB	\$100,767
INV 1065	Implementation of Lane Boundary Guidance System for Snowplow Operations	In Progress	Max Donath, University of Minnesota	Daniel Rowe	10/31/21	LRRB, SRP	\$351,831
INV 645	Best Practices for Boulevard Turf Design and Maintenance: From Seed to Turf	2019RIC09, 2019RIC09H	Michael Marti, SRF Consulting Group, Inc.	Paul Oehme	6/12/21	LRRB	\$47,393
INV 645	Best Practices to Manage Effects of Settlement and Heave at Catch Basins and Manholes	In Progress	Derek Tompkins, American Engineering Testing, Inc.	Steven Bot	7/31/21	LRRB	\$59,676
INV 645	Best Practices: Corridor Management/Maintenance of Paved Recreational Trails	2019RIC10, 2019RIC10S, 2019RIC10T	Michael Marti, SRF Consulting Group, Inc.	Steven Bot	6/12/21	LRRB	\$36,041
INV 645	Treatment Selection Guidelines for Flexible Pavements, Other Pavement Preservation Techniques (Local Agency Focused)	2020RIC02, 2020RIC02M	Michael Marti, SRF Consulting Group, Inc.	Joel Ulring	6/12/21	LRRB	\$35,879

Materials & Construction

LRRB Identifier	Title	Report #/ Status	Investigator	Technical Liaison	End Date	Funding Source	Total Cost
INV 1023	Experimental and Computational Investigations of High-Density Asphalt Mixtures	2019-41	Mihai Marasteanu, University of Minnesota	Eddie Johnson	4/30/20	LRRB, SRP	\$150,935
INV 1028	Is Seal Coating Counterproductive or Not? Evaluation of Stripping Under Chip Seals—Phase II	In Progress	Zhanping You, Michigan Technological University	Steven Bot	12/31/20	LRRB	\$140,508
INV 1040	Development of Pavement Condition Forecasting for Web-Based Asset Management for County Governments	2020-04	Bradley Wentz, North Dakota State University	Bruce Hasbargen	4/30/20	LRRB	\$92,831
INV 1045	Life Cycle Civil Integrated Management (CIM) Advancements in Preliminary Design BIM for Infrastructure	2019-36	Chris Trboyevich, SRF Consulting Group, Inc.	Lyndon Robjert	10/31/19	LRRB	\$99,955
INV 1046	Innovative Materials and Advanced Technologies for a Sustainable Pavement Infrastructure	In Progress	Jia-Liang Le, University of Minnesota	Juan Pinero	6/30/21	LRRB	\$151,514
INV 1057	Evaluating Effective Asphalt Content in Cold In-Place (CIR) Mixtures	2019-43	Daniel Wegman, Braun Intertec Corporation	Wayne Stevens	3/31/20	LRRB	\$33,553
INV 1066	Evaluation of Curing Effects on Cold In-Place Recycling (CIR)	In Progress	Eshan Dave, University of New Hampshire	Joel Ulring	4/30/22	LRRB	\$156,052
INV 1067	Construction Incentives--Are They Working?	In Progress	Mohamed Diab, Minnesota State University, Mankato	Fausto Cabral Neto	7/31/21	LRRB	\$88,620
INV 1068	Ineffectiveness of Geotextiles/Geogrids in Roadway Construction: Determine a Granular Equivalent (GE) Factor	In Progress	Vernon Schaefer, Iowa State University	Michael McCarty	7/31/21	LRRB	\$197,339
INV 1069	Optimizing Asphalt Mixture Designs for Low-Volume Roads of Minnesota	In Progress	Manik Barman, University of Minnesota Duluth	Joel Ulring	7/31/21	LRRB	\$161,333
INV 1071	Life Cycle Cost of Local Roads	TRS 2002	Michael Marti, SRF Consulting Group, Inc.	Brian Giese	8/31/20	LRRB	\$15,356
INV 1086	Evaluation of SFDR Stabilizing Products	In Progress	Michael Marti, SRF Consulting Group, Inc.	Bruce Hasbargen	7/31/21	LRRB	\$74,986
INV 645	Base Stabilization Additives: Effect on GE	In Progress	Halil Ceylan, Iowa State University	Chad Hausman	1/31/23	LRRB	\$197,864

Materials & Construction [cont.]

LRRB Identifier	Title	Report #/ Status	Investigator	Technical Liaison	End Date	Funding Source	Total Cost
INV 645	Effectiveness of Fog Seal on Chip Sealed Low-Volume Roads	In Progress	Mike Rief, WSB & Associates, Inc.	Steven Bot	7/31/21	LRRB	\$71,539
INV 645	Full Depth Reclamation (FDR) for Urban and Suburban Street Application	In Progress	Michael Marti, SRF Consulting Group, Inc.	Steven Bot	6/12/21	LRRB	\$82,214
INV 645	Lightly Surfaced Roads Training and Workshop Curriculum	2019RIC04	Michael Marti, SRF Consulting Group, Inc.	John Brunkhorst	6/12/21	LRRB	\$15,168
INV 645	Ride Quality of Asphalt Pavements (Overlays and New Construction), Performance of Overlays, Best Practices to Reduce Reflective Cracking	In Progress	Michael Marti, SRF Consulting Group, Inc.	Joe Triplett	7/31/21	LRRB	\$99,577
INV 986	Performance Monitoring of Olmsted CR 117/104 and Aggregate Base Material Update	In Progress	Kyle Hoegh, MnDOT Materials and Road Research	Kaye Bieniek	11/30/23	LRRB	\$44,000
	Construction Inspection and Documentation Training Course	Completed	Stephanie Malinoff, University of Minnesota—CTS	Rollin Larson	12/30/20	LRRB	\$137,338
	Preferred Aggregate Base Courses for Low-Volume Roads	TRS 1905	Patrick Casey, CTC & Associates, LLC	Richard West	1/31/20	LRRB	\$10,376

Multimodal

LRRB Identifier	Title	Report #/ Status	Investigator	Technical Liaison	End Date	Funding Source	Total Cost
INV 1044	How Do Complete Streets Matter for Communities? The Case of Richfield, Minnesota	2020-22	Zhirong Jerry Zhao, University of Minnesota	Jack Broz	10/31/20	LRRB	\$103,834
INV 1049	Guidance for Separated/Buffered Bike Lanes With Delineators	In Progress	John Hourdos, University of Minnesota	Paul Oehme	5/31/21	LRRB	\$90,578
INV 645	ADA Workshops for Local Agencies (FY2018)	Completed	Mindy Carlson, University of Minnesota—CTS	Kristine Elwood	8/31/19	LRRB	\$125,000
INV 645	Bicycle Facility Implementation: Quick Reference Guide	2020RIC03	Michael Marti, SRF Consulting Group, Inc.	Chad Millner	10/31/20	LRRB	\$62,994
INV 645	Uncontrolled Pedestrian Crosswalk: Quick Reference Guide	2020RIC01, 2020RIC01G	Kate Miner, Stonebrooke Engineering, Inc.	Marc Culver	5/31/20	LRRB	\$58,846

Policy & Planning

LRRB Identifier	Title	Report #/ Status	Investigator	Technical Liaison	End Date	Funding Source	Total Cost
INV 1037	Workforce Planning and Human Resource Development Strategies for Minnesota's Public Transportation Agencies	In Progress	Kenneth Bartlett, University of Minnesota	Lyndon Robjent	3/31/21	LRRB	\$137,281
INV 1043	Local Contributions to State and Regional Transportation Facilities in Minnesota	2020-12	Zhirong Jerry Zhao, University of Minnesota	Russ Matthys	8/31/20	LRRB	\$121,668
INV 1050	Converting Severely Distressed Low-Volume Paved Roads to Engineered Unpaved Roads: PowerPoint	2019-42, 2019-42G, 2019-42P, 2019-42W	Laura Fay, Montana State University, Western Transportation Institute	Tim Stahl	3/31/20	LRRB	\$100,047
INV 645	Americans With Disability Act (ADA) for Local Agencies: Training Workshop	In Progress	Michael Marti, SRF Consulting Group, Inc.	Ted Schoenecker	6/12/21	LRRB	\$40,809
INV 645	Asset Management Guide for Local Agencies	2019RIC06, 2019RIC06I	Michael Marti, SRF Consulting Group, Inc.	Lyndon Robjent	6/12/20	LRRB	\$67,128
INV 645	Expanding the Transportation Workforce in Local Agencies: Awareness-Building Activities and Development of the Training Course Roadmap for Future Civil Technicians	In Progress	Stephanie Malinoff, University of Minnesota	Chris Byrd	8/31/21	LRRB	\$99,983
INV 645	Managing Utility Congestion Within Rights of Way: Appendix A	2019RIC20, 2019RIC20A, 2019RIC20G	Bryan Nemeth, Bolton & Menk, Inc. Consulting Engineers & Surveyors	Julie Long	12/31/19	LRRB	\$59,824
INV 645	Quick Start Guide: GIS Tools and Apps, Integration With Asset Management	2020RIC15, 2020RIC15Q	Annette Theroux, Pro-West & Associates, Inc.	John Brunkhorst	2/29/20	LRRB	\$59,031
INV 645	System Preservation Guide: A Planning Process for Local Government Management of Transportation Networks	In Progress	Michael Marti, SRF Consulting Group, Inc.	Andrew Witter	6/12/21	LRRB	\$91,193

Traffic & Safety

LRRB Identifier	Title	Report #/ Status	Investigator	Technical Liaison	End Date	Funding Source	Total Cost
INV 1022	Pavement Markings: Wet Retroreflectivity Standards	2020-09	Adam Pike, Texas A&M Transportation Institute	Kenneth Johnson	3/31/20	LRRB, SRP, SP&R	\$175,062
INV 1024	Evaluation of the Effectiveness of Stop Lines in Increasing the Safety of Stop-Controlled Intersections	2020-17	John Hourdos, University of Minnesota	Nick Bauler	8/31/20	LRRB	\$150,528
INV 1025	How Locals Need to Prepare for the Future of V2V/V2I Connected Vehicles	2019-35	John Hourdos, University of Minnesota	Deb Heiser	11/30/19	LRRB	\$79,260
INV 1030	Examining Optimal Sight Distances at Rural Intersections	2019-34	Nichole Morris, University of Minnesota	Tracey Von Bargen	9/30/19	LRRB	\$170,549
INV 1033	Cloud-Based Dynamic Warning System	2019-19	Bradley Wentz, North Dakota State University	Richard West	8/31/19	LRRB	\$79,629
INV 1038	Toward Implementation of Max-Pressure Signal Timing on Minnesota Roads	In Progress	Michael Levin, University of Minnesota	Ben Hao	2/28/22	LRRB	\$177,000
INV 1048	Criteria and Guidelines for Three-Lane Road Design and Operation	In Progress	Gary Davis, University of Minnesota	Jack Broz	8/31/21	LRRB	\$155,559
INV 1051	Development and Demonstration of an In-Vehicle Lane Departure Warning System Using DSRC-Based V2V Communication	In Progress	Imran Hayee, University of Minnesota Duluth	Victor Lund	6/30/21	LRRB	\$133,656
INV 1052	Effectiveness of Teenage Support System (TDSS) on Reducing Traffic Violation Behaviors for Teenage Drivers at the Early Time of Licensure	Completed	Nichole Morris, University of Minnesota	Joe Gustafson	2/29/20	LRRB	\$93,928
INV 1064	Establishing a Repeatable Method for Presenting Nontraditional Traffic Treatments to Maximize Stakeholder Support	In Progress	Nichole Morris, University of Minnesota	Scott Thompson	6/30/22	LRRB, SRP	\$348,994
INV 1064	RCI Video Project	Completed	James Douglas, Nighthawk Marketing	Scott Thompson	8/31/19	LRRB, SRP	\$20,000
INV 1072	Notifying the Public of Local Road Closures Via Common Smartphone Map Apps	TRS 2001	Mark Linsenmayer, CTC & Associates, LLC	Darin Mielke	4/30/20	LRRB	\$14,793

Traffic & Safety [cont.]

LRRB Identifier	Title	Report #/ Status	Investigator	Technical Liaison	End Date	Funding Source	Total Cost
INV 645	Strategies for Effective Roundabout Approach Speed Reduction	In Progress	Kate Miner, Stonebrooke Engineering, Inc.	Joe Gustafson	2/28/21	LRRB	\$32,853
	Design Standards for Unobstructed Sight Lines at Left-Turn Lanes	2019-32	David Noyce, University of Wisconsin–Madison	Kristi Sebastian	8/31/19	LRRB	\$50,008

Administrative

LRRB Identifier	Title	Report #/ Status	Investigator	Technical Liaison	End Date	Funding Source	Total Cost
INV 1020	LRRB Strategic Plan 2019-2024	2019-33	Vivek Sakhrani, CPCS Transcom, Inc.	Jim Foldesi	7/31/19	LRRB	\$88,821
INV 645	LRRB Outreach and Marketing Support (2018-2019)	Completed	Renae Kuehl, SRF Consulting Group, Inc.	Shannon Fiecke	8/31/19	LRRB	\$99,886
INV 645	LRRB Outreach and Marketing Support (2019-2020)	Completed	Renae Kuehl, SRF Consulting Group, Inc.	Kristine Elwood	7/31/20	LRRB	\$99,965
INV 645	LRRB Outreach and Marketing Support (2020-2021)	In Progress	Renae Kuehl, SRF Consulting Group, Inc.	Shannon Fiecke	7/31/21	LRRB	\$99,985
INV 645	Research Implementation Committee (RIC): Implementation of Research Findings (FY2017-2019)	In Progress	Michael Marti, SRF Consulting Group, Inc.	Michael Flaagan	6/12/21	LRRB	\$792,295
INV 668	Local Technical Assistance Program (LTAP) (FY2019)	Completed	Stephanie Malinoff, University of Minnesota–CTS	Mitchell Rasmussen	9/30/19	LRRB, Other Federal Funds	\$450,500
INV 668	Local Technical Assistance Program (LTAP) (FY2020)	Completed	Stephanie Malinoff, University of Minnesota–CTS	Kristine Elwood	9/30/20	LRRB, Other Federal Funds	\$450,500
INV 668	LTAP Expanded Activities (FY2021-2022)	In Progress	Stephanie Malinoff, University of Minnesota–CTS	Kristine Elwood	6/30/22	LRRB, Other Federal Funds	\$438,000
INV 916	LRRB Technical Summaries and Project Evaluation Forms (LRRB Technical Transfer Materials Development) (FY2019)	In Progress	Patrick Casey, CTC & Associates, LLC	Shannon Fiecke	12/31/20	LRRB	\$99,913
INV 916	LRRB Technical Transfer Materials Development (FY2020)	In Progress	Patrick Casey, CTC & Associates, LLC	Shannon Fiecke	6/30/21	LRRB	\$48,961
INV 916	LRRB Technology Transfer Materials Development (FY2018)	Completed	Patrick Casey, CTC & Associates, LLC	Shannon Fiecke	2/29/20	LRRB	\$99,824
INV 916	LRRB Technology Transfer Materials Development (FY2021)	In Progress	Patrick Casey, CTC & Associates, LLC	Shannon Fiecke	7/31/21	LRRB	\$99,972
INV 927	LRRB Website Development and Hosting	In Progress	Patrick Casey, CTC & Associates, LLC	Shannon Fiecke	7/31/21	LRRB	\$39,462
INV 998	Operational Research Program for Local Transportation Groups (OPERA) (FY2019-2020)	In Progress	Mindy Carlson, University of Minnesota–CTS	Kristine Elwood	10/31/21	LRRB	\$160,000
INV 999	Office of Research & Innovation Report Publication Services (FY2020-2021)	In Progress	Arlene Mathison, University of Minnesota–CTS	Shannon Fiecke	6/30/21	LRRB, SRP, COPTRS	\$109,169

Stay Up to Date on LRRB Research

If you don't already receive LRRB e-news via the State Aid Listserv, sign up today at lrrb.org. You can also subscribe to individual research projects by selecting the “subscribe” button on a project’s webpage.



2021 LRRB and RIC Meetings

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

RIC: March 15 – Online

LRRB: March 23 – Online

The spring meeting is devoted to programming and idea selection. The LRRB determines annual program funding commitments, selects ideas for inclusion in the July research RFP, and approves the next year's travel budget. The RIC reviews recently completed research and new ideas from practitioners for possible research implementation funding.

LRRB Presentations at State Aid Prescreening Meetings: May

LRRB representatives attend State Aid prescreening meetings across the state to present the results of completed research and share project updates.

LRRB and RIC: June 23-24, Brainerd (tentative)

Each summer, LRRB and RIC members meet in a joint session. The meeting takes place outside of the metro area, and when possible, LRRB staff arranges a field tour of a nearby research installation or project site. LRRB and RIC members finalize research and research implementation need statements for proposal solicitation.

LRRB Focus Group at State Aid Prescreening Meetings: October

LRRB representatives hold focus group sessions at State Aid prescreening meetings. (Some sessions are held every other year.) City and county engineers are encouraged to bring research or technology transfer ideas to discuss with the group.

RIC: September 13, St. Cloud

LRRB: November 3, St. Cloud

At the fall meeting, the RIC selects implementation proposals for funding and forwards unfunded proposals for consideration at the LRRB winter meeting. The LRRB selects academic research proposals for presentation in December.

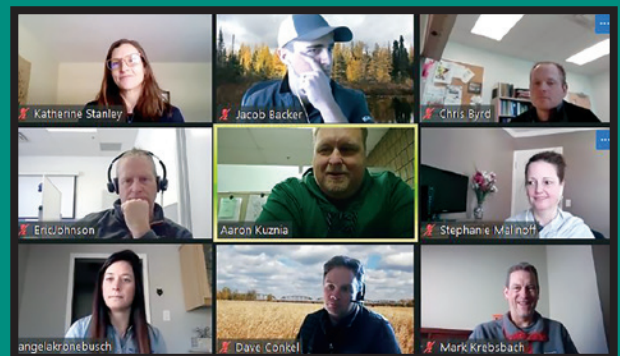
RIC: November 17, Hutchinson

LRRB: December 14-15, Minneapolis

At the final meeting of the year, the LRRB selects research proposals for funding in the upcoming fiscal year, following presentations by academic researchers. The LRRB also considers unfunded RIC proposals at this time.

Join a Technical Advisory Panel

Participating on a Technical Advisory Panel (TAP) ensures that research results fit your needs and are applied in the most productive way in the field. Participation involves helping guide researchers, attending a limited number of meetings (in person or remotely) and reviewing research results. To participate, email research.dot@state.mn.us.



LRRB By the Numbers:



IN ANNUAL
FUNDING



NEW PROJECTS
EACH YEAR



ACTIVE
PROJECTS



**100+ TAP CITY/
COUNTY MEMBERS**



**12 CITY/COUNTY
BOARD/RIC MEMBERS**

A World-Class Transportation Library



MnDOT's expert librarians are still here to serve not just MnDOT employees but also Minnesota city and county engineers. Request a literature search, interlibrary loan or special publication at 651-366-3791, library.dot@state.mn.us or mndot.gov/library.



The LRRB partners with the National Road Research Alliance, a multi-state pooled fund focused on solving widespread problems impacting road owners and users.

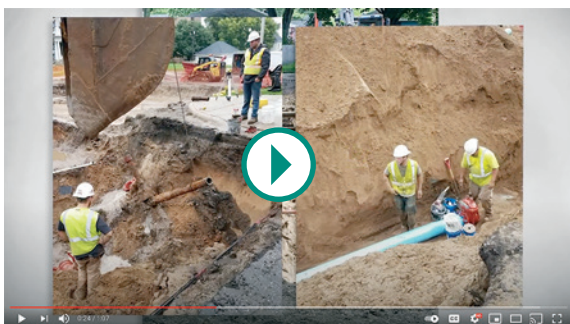
Members help direct the research program at the MnROAD pavement testing facility. For more information, see mndot.gov/mnroad/nrra.

OPERA Program for Local Agencies

Administered by the Minnesota Local Technical Assistance Program, the Operational Research Assistance (OPERA) Program funds innovative maintenance and construction methods developed and demonstrated by local agencies. Read more at mnlta.umn.edu/opera/.



A recent OPERA project involved developing a side-dumping plow truck that allowed Nicollet County Public Works to more than double its legal hauling capacity and greatly improve its operating capacity. Watch at <https://youtu.be/BloCNjhjgdg?t=52>.



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](#).



Produced by CTC & Associates for **Local Road Research Board,**
Minnesota Department of Transportation, Office of Research & Innovation,
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