



We tested the mechanical properties of asphalt mixes to identify high performers that would create more sustainable rural roads.
Report 2023-34

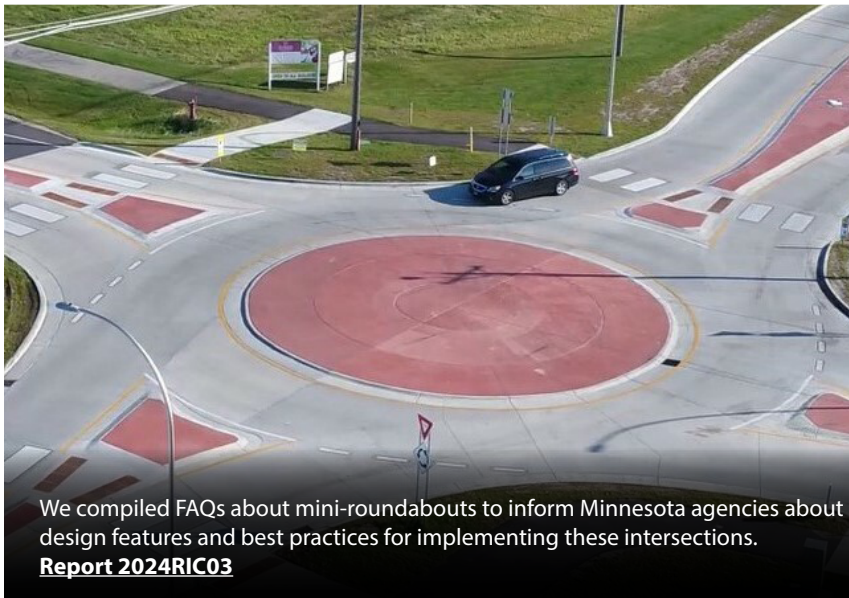


We identified behavioral factors and site characteristics that influence whether drivers yield to pedestrians. **Report 2023-24**

FY2024 LOCAL ROAD RESEARCH BOARD

At-A-Glance

July 1, 2023, through June 30, 2024 | [LRRB.ORG](https://lrrb.org)



We compiled FAQs about mini-roundabouts to inform Minnesota agencies about design features and best practices for implementing these intersections.
Report 2024RIC03



We produced a best practices manual on planting and caring for trees in the boulevard along a roadway to provide environmental benefits and visual appeal
Guidebook 2024RIC04

Welcome to the Local Road Research Board At-A-Glance for Fiscal Year 2024

Our Mission

The mission of the Local Road Research Board (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.

Our research ideas come from local Minnesota transportation practitioners like you. Submit an idea anytime by clicking on "IdeaScale" 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.



FY2024 Local Road Research Board members: (from left) Andrew Witter, Sherburne County; Duane Hill, MnDOT; Brian Giese, Pope County; Kristine Elwood, MnDOT; Wayne Sandberg, Washington County; Lon Aune, Marshall County; Katie Walker, MnDOT; Matt Leonard, City of Monticello; Mark Ray, City of Burnsville. Not pictured: Kyle Shelton, Center for Transportation Studies.

Putting Research into Practice

The LRRB's Research Implementation Committee (RIC) maximizes the impact of the work that the LRRB does by turning research results into practical applications and making them available to people in the field. RIC distributes this information to local practitioners through manuals and reports, webinars, videos, field demonstrations, and other resources and activities.



FY2024 Research Implementation Committee members: (from left) Fausto Cabral, MnDOT; Andrew Wrucke, Minnesota Local Technical Assistance Program; Aaron Holmbeck, Nobles County; Hafiz Munir, MnDOT; Ben Worel, MnDOT; Will Manchester, City of Minnetonka; Ryan Thilges, Blue Earth County; Ted Schoenecker, MnDOT; Darrick Anderson, Cass County; Matt Wegwerth, City of Grand Rapids. Not pictured: Dave Conkel, MnDOT.

LRRB Research Highlights

LRRB research has resulted in numerous tools to help local agencies manage transportation systems cost-effectively. Find our latest products under “Resources” at lrrb.org. Find out more about the projects featured here by scanning this QR code:



Policy & Planning

◀ Transportation Career Resources

Local transportation agencies strive to address maintenance worker shortages amid retirements and high turnovers. Partnering with the **Minnesota Local Technical Assistance Program**, the LRRB sought to better understand the needs of job seekers and employers to inform the creation of **MNTransportationCareers.com**. This transportation career clearinghouse includes job and internship postings, training and recruiting resources, and case studies of innovative programs to attract and retain workers. **Report 2024-21**

Another project produced a suite of short videos that local agencies can use highlighting transportation career opportunities, testimonials from workers in the field and interviews with local transportation leaders. **Minnesota Transportation Career Videos** ▶



Road Maintenance

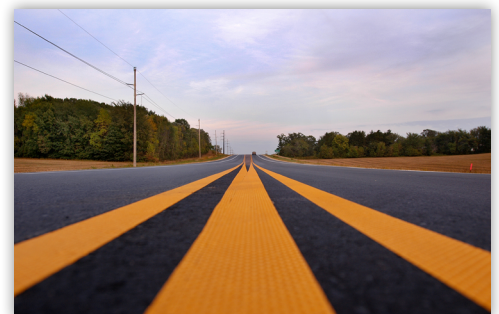
◀ Optimizing Snowplow Use with Automatic Vehicle Location Technology

Minnesota cities and counties continually explore new tools and technologies to optimize maintenance equipment and operations. One project demonstrated the costs and benefits of using automatic vehicle location and GPS to improve snowplowing operations. Results are compiled in a practitioner guidebook and accompanying **video**. **Guidebook2024RIC01**

Making Pavement Markings More Visible ▶

To enhance road safety after dark, the Federal Highway Administration issued new requirements that ensure pavement markings are sufficiently reflective and maximize visibility. The LRRB produced a video and a series of brochures that describe tools, methods and techniques that assist local agencies in complying with the new standards.

Brochures and Video 2024RIC05





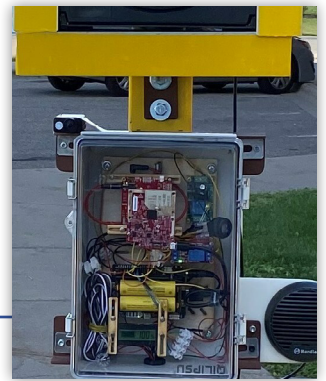
Safety

◀ Award-Winning Research on Automated Vehicles

To prioritize safety, local transportation officials seek to understand the opportunities presented by new technologies and the implications for existing transportation infrastructure. A project that explored partially autonomous vehicle capabilities such as automated lane keeping, blind-spot monitoring and adaptive cruise control and how they operated on Minnesota's roads received AASHTO's High Value Research Award. Automated vehicle functions had mixed results in effectively handling different scenarios, providing important considerations for road infrastructure and maintenance decisions. **Report 2023-23**

Developing Smart Traffic Signs to Direct Drivers Around Work Zones ▶

Another LRRB project investigated alternatives to the high-risk job of controlling traffic in work zones. Researchers developed a promising portable traffic signal prototype that sensed the trajectories of oncoming vehicles and provided audible warnings if unsafe drivers were detected. **Report 2023-26**



◀ Using Apps to Notify the Public of Road and Bridge Closures

Local road agencies wanted a way to ensure all travelers are aware of road and bridge closures. Since many drivers routinely use navigation apps, investigators sought to incorporate closure information into these third-party apps. They also recommended cities and counties that MnDOT could work with to implement a statewide reporting system. **Report 2024RIC02**

Multimodal

Measuring the Effects of Road Features on Driving Speeds ▶

When building or converting roads, city and county engineers incorporate road features according to MnDOT's **Complete Streets** approach to safeguard and accommodate all road users. An exploration of the effect of different road treatments on driver speed provided data to all Minnesota transportation agencies on roadway attributes that promote safe driving. **Report 2024-13**





Multimodal

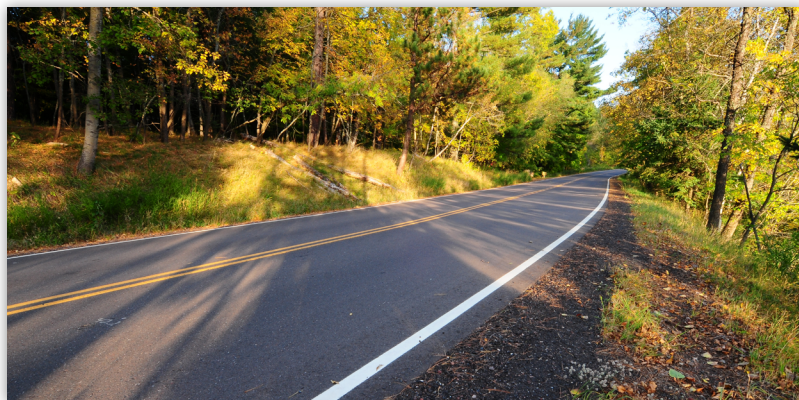
◀ Enhancing Public Transit with Autonomous Mobility Service to Cover the “Last Mile”

The benefits of public transportation are not always realized in suburban or rural settings where transit routes may not take travelers to their final destinations. To fill this mobility gap, the LRRB explored a novel approach that used autonomous vehicles to transport passengers from public transit stops to their particular destinations. Simulations demonstrated the system’s potential to increase transit efficiency and demand. **Report 2024-06**

Materials & Construction

Measuring Pavement Density for Sustainable Centerline Joints ▶

Local road engineers work to ensure asphalt is sufficiently dense to prevent centerline joint deterioration and other costly damage. Density is typically measured by removing a core sample from the pavement. An alternative to core sampling uses ground penetrating radar, demonstrated in this project. This quick and easy, nondestructive method holds promise in supporting the construction of long-lasting pavements. **Report 2023-35**

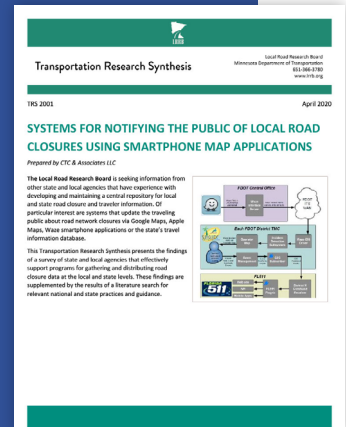


Comparing the Cost-Effectiveness of Asphalt Binders for Local Roads ▲

In another project aimed at improving asphalt pavements, the LRRB explored polymer-modified binders (PMBs) for local roads. Results showed that while PMBs can be more costly initially, the long-term performance benefits demonstrate the binders’ cost-effectiveness, even on low-volume county roads. **Report 2023-19**

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.



Other resources at lrrb.org:

- ▶ [Synthesis of Seal Coat Research in Minnesota](#)
- ▶ [Mitigating Projects Missing Deadlines](#)
- ▶ [Drainage 101: Best Practices and Resource Guide](#)
- ▶ [Speed Limit Guidance for Municipal Roadways](#)
- ▶ [Best Practices for Improving Subgrade Drainage](#)
- ▶ [Guidelines for Using Intelligent Warning Devices](#)
- ▶ [Impacts of Deferred Maintenance in Minnesota](#)



LRRB Research

Active Projects in FY2024

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

COMMON FUNDING SOURCES

LRRB Local Road Research Board
MnDOT MnDOT State Research Program

Bridges & Structures

Report #/ Status	Title	End Date	Investigator	Technical Liaison	Funding Source	Total Cost
In Progress	<u>Precast vs. Cast in Place</u>	1/31/25	Michael Marti, SRF Consulting Group, Inc.	David Conkel, Aaron Holmbeck	LRRB	\$174,997
In Progress	<u>Deck Reinforcement Detailing and Concrete Mix Additives to Reduce Bridge Deck Cracking</u>	7/31/25	Brock Hedegaard, University of Minnesota Duluth	Paul Gronvall	LRRB	\$147,000
In Progress	<u>Quantifying Benefits of Bridge Maintenance</u>	7/31/25	Basak Aldemir Bektas, Minnesota State University, Mankato	Sarah Sondag	LRRB, MnDOT	\$166,709
In Progress	<u>Understanding Driving Causes of Bridge Replacement</u>	9/30/25	Basak Aldemir Bektas, Minnesota State University, Mankato	David Hedeon	LRRB	\$163,730

Environmental

Report #/ Status	Title	End Date	Investigator	Technical Liaison	Funding Source	Total Cost
2024-23	<u>Re-Use of Minnesota Waste Material in Sustainably Design Soils: Part 2</u>	9/30/24	David Saftner, University of Minnesota Duluth	Dwayne Stenlund	LRRB, MnDOT	\$186,280
2024RIC04, 2024RIC04A	<u>Best Practices for Boulevard Tree Selection</u>	5/31/24	Susan Miller, SRF Consulting Group, Inc.	Daniel Wattenhofer	LRRB	\$54,741
Completed	<u>Best Practices for Dust Control/Issues with CaCl</u>	6/30/24	Michael Marti, SRF Consulting Group, Inc.	Bruce Hasbargen	LRRB	\$64,718
Completed	<u>Update of Stormwater Management: Best Practices Manual (From 2009)</u>	6/30/24	Andrew Erickson, University of Minnesota	Brian Giese	LRRB	\$126,895
In Progress	<u>Comparison of Compost and Proprietary Soil Amendments for Vegetation Establishment</u>	3/31/25	Bora Cetin, Michigan State University	Warren Tuel	LRRB, MnDOT	\$380,500
In Progress	<u>Addressing the Research Needs for the Sustainable Application of Threshold Discharge Area (TDA) in Stormwater Infiltration/Treatment</u>	6/30/25	John Gulliver, University of Minnesota	Mark Hansen	LRRB	\$257,765
In Progress	<u>Development of Biochar Specification Criteria as Soil Amendment for Slopes, Conveyances and Stormwater Treatment Systems</u>	6/30/25	Brian Barry, University of Minnesota Duluth	Dwayne Stenlund	LRRB	\$231,476
In Progress	<u>Roadside Vegetation Management</u>	9/30/25	Michael Marti, SRF Consulting Group, Inc.	Darrick Anderson	LRRB	\$99,999
In Progress	<u>Wet Pond Modeling for Contaminant Retention and Maintenance</u>	4/30/26	John Gulliver, University of Minnesota	Ross Bintner	LRRB	\$255,529
In Progress	<u>Assessing Effectiveness of Pond Sediment Removal for Phosphorus Management in Stormwater Ponds</u>	4/30/27	John Gulliver, University of Minnesota	Derek Asche	LRRB	\$217,696

Maintenance Operations

Report #/ Status	Title	End Date	Investigator	Technical Liaison	Funding Source	Total Cost
2023RIC10	<u>Advancing Asphalt Pavement: Strategies for Enhancing Ride Quality and Mitigating Reflective Cracking</u>	12/31/23	Michael Marti, SRF Consulting Group, Inc.	Joe Triplett	LRRB	\$99,577
2024RIC01, 2024RIC01V	<u>Using AVL/GPS Telematics to Optimize Snowplowing</u>	10/31/23	Susan Miller, SRF Consulting Group, Inc.	Joe MacPherson	LRRB	\$94,585
Completed	<u>Cutting Edges—Performance User's Guide</u>	5/31/24	Susan Miller, SRF Consulting Group, Inc.	Joe Wiita	LRRB	\$52,169
In Progress	<u>Gravel Shoulder/Road Maintenance</u>	2/28/25	John Brunkhorst, Stonebrooke Engineering, Inc.	Mike Suska	LRRB	\$89,163
In Progress	<u>Winter Maintenance: Deicing Products User Guide</u>	3/31/25	Connie Fortin, Bolton & Menk	Ryan Thilges	LRRB	\$119,789
In Progress	<u>Fleet: Life Cycle</u>	6/30/25	Jennifer Shane, Iowa State University	Mike Suska	LRRB	\$87,068
In Progress	<u>Human-Centered Testing of Rear-Facing Display to Reduce Vehicle Collisions with Snowplows</u>	8/31/25	Nichole Morris, University of Minnesota	Steven Blaufuss	LRRB, MnDOT	\$353,087
In Progress	<u>Patching (Asphalt) Best Practices</u>	8/31/25	Michael Marti, SRF Consulting Group, Inc.	None	LRRB	\$60,590
In Progress	<u>Benefit/Cost of Applying a Higher Asphalt Film Thickness (AFT) vs. Doing a Chip Seal at One Year</u>	10/31/25	Zhanping You, Michigan Technological University	Bruce Hasbargen	LRRB	\$220,000

Materials & Construction

Report #/ Status	Title	End Date	Investigator	Technical Liaison	Funding Source	Total Cost
2023-34	<u>Optimizing Asphalt Mixture Designs for Low-Volume Roads of Minnesota</u>	8/31/23	Manik Barman, University of Minnesota Duluth	Joel Ulring	LRRB	\$156,333
2023-35	<u>BMP for Issues with Asphalt Centerline Joint and Intelligent Compaction for Local Agencies</u>	10/31/23	Syed Haider, Michigan State University	Naomi Eckerd	LRRB	\$192,622
2023RIC09	<u>Pavement Design Around Utilities: Best Practice</u>	6/30/24	Jeff Stempihar, Nichols Consulting Engineers, Chtd.	Tom Trowbridge	LRRB	\$51,194
2024-01	<u>Performance Monitoring of Olmsted CR 117/104 and Aggregate Base Material Update</u>	12/31/23	Kyle Hoegh, MnDOT Office of Materials and Road Research Section	Kaye Bieniek	LRRB	\$44,000
2024-15	<u>Base Stabilization Additives: Effect on Granular Equivalency</u>	5/31/24	Halil Ceylan, Iowa State University	Chad Hausman	LRRB	\$197,864
Completed	<u>Mitigation of Tenting of Transverse Cracks and Joints in Asphalt Pavement</u>	6/30/24	Manik Barman, University of Minnesota Duluth	Matthew Hemmila	LRRB	\$150,900
Completed	<u>Seal Coats: Synthesis of Minnesota Research</u>	8/31/24	Michael Marti, SRF Consulting Group, Inc.	Joel Ulring	LRRB	\$63,213
In Progress	<u>Spray Asphalt Rejuvenators</u>	10/31/24	Michael Marti, SRF Consulting Group, Inc.	Steven Bot	LRRB	\$57,605
In Progress	<u>Evaluation of Proprietary Rejuvenators</u>	12/31/24	Muhammed Kutay, Michigan State University	JinYeene Neumann	LRRB	\$199,336
In Progress	<u>Texas Underseal</u>	12/31/24	Michael Marti, SRF Consulting Group, Inc.	Benjamin Worel	LRRB	\$60,618
In Progress	<u>Asphalt Pavement Cracking Performance Data Analysis</u>	3/31/25	Eshan Dave, University of New Hampshire	Shongtao Dai, Joseph Voels	LRRB, MnDOT	\$130,993
In Progress	<u>Benefits of Preventive Maintenance</u>	5/31/25	Basak Aldemir Bektas, Minnesota State University, Mankato	Joel Ulring	LRRB, MnDOT	\$157,926
In Progress	<u>Improving and Developing Pavement Design Inputs and Performance Functions for Cold Recycled Pavement Layers in Minnesota</u>	6/30/25	Eshan Dave, University of New Hampshire	Timothy Andersen	LRRB, MnDOT	\$163,943
In Progress	<u>Sawing and Sealing Joints in Bituminous Pavements to Control Cracking</u>	6/30/25	Mihai Marasteanu, University of Minnesota	Tom Wesolowski	LRRB	\$160,850
In Progress	<u>Investigation on Mix Design of Recycled Asphalt Pavement (RAP) Materials</u>	6/30/25	Jia-Liang Le, University of Minnesota	Eddie Johnson	LRRB	\$137,419
In Progress	<u>Pavement Design: Performance of Base vs. Subbase</u>	6/30/25	Erol Tutumluer, University of Illinois	Raul Velasquez	LRRB	\$218,809

Materials & Construction [cont.]

Report #/ Status	Title	End Date	Investigator	Technical Liaison	Funding Source	Total Cost
In Progress	<u>Use of Plastics in Road Materials (Paving)</u>	6/30/25	Halil Ceylan, Iowa State University	Jim Johnson	LRRB, MnDOT	\$139,446
In Progress	<u>The Future of Weigh Tickets</u>	8/31/25	Michael Marti, SRF Consulting Group, Inc.	Michael Flaagan	LRRB	\$60,042
In Progress	<u>Evaluation of Gravel Stabilizer Used on Gravel Roads and Gravel Shoulders</u>	1/31/26	Bora Cetin, Michigan State University	Terrence Beaudry	LRRB, MnDOT	\$319,967
In Progress	<u>Long-Term Field Performance Evaluation of Chip Seals</u>	6/30/26	Raquel Moraes, Auburn University	Joel Ulring	LRRB	\$136,347

Multimodal

Report #/ Status	Title	End Date	Investigator	Technical Liaison	Funding Source	Total Cost
2024-06	<u>Designing an Autonomous Service to Cover Transit's Last Mile in Low-Density Areas</u>	3/31/24	Alireza Khani, University of Minnesota	Chris Belden	LRRB	\$100,000
2024-19	<u>Mobile-Device Data, Nonmotorized Traffic Monitoring and Estimation of Annual Average Daily Bicyclist and Pedestrian Flows</u>	6/30/24	Raphael Stern, University of Minnesota	Michael Petesch, Suzanne Scotty	LRRB, MnDOT	\$165,829
In Progress	<u>Pedestrian Crossings</u>	12/31/24	John Brunkhorst, Stonebrooke Engineering, Inc.	Jonathan Large	LRRB	\$85,054
In Progress	<u>Crash Benefit of Nonmotorized Facilities</u>	5/31/25	Renae Kuehl, SRF Consulting Group, Inc.	Mark Vizecky	LRRB	\$99,767

Policy & Planning

Report #/ Status	Title	End Date	Investigator	Technical Liaison	Funding Source	Total Cost
2024-21FG, 2024-21	<u>Minnesota Transportation Maintenance Careers</u>	8/31/24	Katherine Stanley, University of Minnesota-CTS	Mark Ray	LRRB	\$75,625
2024RIC02	<u>Using Apps to Notify the Public of Local Road and Bridge Closures</u>	3/31/24	Dean Deeter, Athey Creek Consultants, LLC	Perry Clark	LRRB	\$51,535
Completed	<u>Public Works 101 for Elected Officials and the Public</u>	4/30/24	Michael Marti, SRF Consulting Group, Inc.	William Manchester	LRRB	\$73,221
In Progress	<u>Capital Improvement Plan (CIP) Tool</u>	10/31/24	Susan Miller, SRF Consulting Group, Inc.	Ryan Thilges	LRRB	\$53,988
In Progress	<u>Promoting a Career as a County/City Engineer</u>	11/30/24	Michael Marti, SRF Consulting Group, Inc.	Lon Aune	LRRB	\$64,824
In Progress	<u>Asset Management Tools for Local Governments</u>	12/31/24	Michael Marti, SRF Consulting Group, Inc.	Lyndon Robjent	LRRB	\$102,411
In Progress	<u>Guide for Commercial Driver's License Certification</u>	2/28/25	Michael Marti, SRF Consulting Group, Inc.	Josh Peterson	LRRB	\$60,343
In Progress	<u>Rule/Guidelines for Prescriptive Right of Way</u>	3/31/25	John Brunkhorst, Stonebrooke Engineering, Inc.	Anthony PirkI	LRRB	\$84,722
In Progress	<u>Managing Utilities in the Right of Way</u>	3/31/25	John Brunkhorst, Stonebrooke Engineering, Inc.	Darrick Anderson	LRRB	\$2,259
In Progress	<u>Right of Way Acquisition Issues</u>	4/30/25	Susan Miller, SRF Consulting Group, Inc.	Ryan Thilges	LRRB	\$76,889
In Progress	<u>Advancing Equity in Capital Investment Decision-Making</u>	6/30/25	Frank Douma, University of Minnesota	Dillon Dombrovski	LRRB	\$186,503
In Progress	<u>Evaluating Local Funding in Regional Projects</u>	6/30/25	Tim Arvidson, Stonebrooke Engineering, Inc.	Russ Matthys	LRRB	\$44,615
In Progress	<u>Haul Road and Detour Maintenance</u>	6/30/25	Mihai Marasteanu, University of Minnesota	Timothy Andersen	LRRB, MnDOT	\$153,003
In Progress	<u>MnDOT Haul/Detour Routes: Impacts on Local Roads</u>	6/30/25	Bora Cetin, Michigan State University	Tim Stahl	LRRB	\$294,389

Policy & Planning [cont.]

Report #/ Status	Title	End Date	Investigator	Technical Liaison	Funding Source	Total Cost
In Progress	<u>Residential Roadway Width: Best Practices</u>	6/30/25	Tim Arvidson, Stonebrooke Engineering, Inc.	Matt Leonard	LRRB	\$49,346
In Progress	<u>Impacts of Shared Mobility on Infrastructure Usage, Greenhouse Gas Emissions and Accessibility</u>	8/31/25	Michael Levin, University of Minnesota	Elliott McFadden	LRRB	\$161,526
In Progress	<u>Analyzing Truck Size and Weight Impacts on Vehicle Miles Traveled</u>	6/30/26	Alireza Khani, University of Minnesota	Duane Hill, Laura Roads	LRRB	\$159,000
In Progress	<u>Use of MnCORS to Support AV Operations in Rural Minnesota</u>	8/31/26	Rajesh Rajamani, University of Minnesota	Victor Lund, Matt Wegwerth	LRRB	\$178,775

Traffic & Safety

Report #/ Status	Title	End Date	Investigator	Technical Liaison	Funding Source	Total Cost
2023-26	<u>User-Centered Smart Traffic Sign Development Study</u>	6/30/25	Nichole Morris, University of Minnesota	Wayne Sandberg	LRRB, Other Federal Funds	\$240,793
2023-42	<u>Driver Comprehension of Flashing Yellow Arrows</u>	12/31/23	Gary Davis, University of Minnesota	Victor Lund	LRRB	\$213,656
2023RIC07	<u>Guidelines for Determining Speed Limits on Municipal Roadways</u>	9/30/23	Tim Arvidson, Stonebrooke Engineering, Inc.	William Manchester	LRRB	\$76,963
2024-10	<u>Performance Evaluation of Different Detection Technologies for Signalized Intersections in Minnesota</u>	5/31/24	Yao-Yi Chiang, University of Minnesota	Michael Fairbanks	LRRB, MnDOT	\$179,950
2024-13	<u>Complete Streets Speed Impacts</u>	6/30/24	Peter Savolainen, Michigan State University	Duane Hill	LRRB, MnDOT	\$155,939
2024-16	<u>Assessing Pavement Markings for Automated Vehicle Readiness</u>	6/30/24	Adam Pike, Texas A&M Transportation Institute	Ethan Peterson	LRRB, MnDOT	\$228,183
2024-17	<u>Evaluation of Static and Dynamic No Right Turn on Red Signs at Traffic Signals</u>	6/30/24	Christopher Day, Iowa State University	Susan Zarling	LRRB, MnDOT	\$81,782
2024-25	<u>Development of a Smartphone App to Warn the Driver of Unintentional Lane Departure Using GPS Technology</u>	10/31/24	Imran Hayee, University of Minnesota Duluth	Victor Lund	LRRB	\$147,145
2024-26	<u>Toward Implementation of Max-Pressure Control on Minnesota Roads—Phase II</u>	10/31/24	Michael Marti, SRF Consulting Group, Inc.	Ben Hao	LRRB	\$64,453
2024RIC03	<u>Mini-Roundabout FAQs</u>	8/31/24	Michael Marti, SRF Consulting Group, Inc.	Jon Pratt	LRRB	\$63,784
2024RIC05	<u>Methods for Maintaining Pavement Marking Retroreflectivity</u>	7/31/24	Michael Marti, SRF Consulting Group, Inc.	Girma Feyissa	LRRB	\$55,913
In Progress	<u>Development of a System to Report School Bus Stop Arm Violations</u>	11/30/24	Brian Davis, University of Minnesota	Scot Edgeworth, Mike Krukowski	LRRB, MnDOT	\$196,194
In Progress	<u>Pavement Marking/Colored Pavement Friction Differential and Product Durability</u>	12/31/24	Mihai Marasteanu, University of Minnesota	Ethan Peterson	LRRB, MnDOT	\$152,473
In Progress	<u>Development and Demonstration of a Novel Red Light Running Warning System Using Connected Vehicle to Infrastructure (V2I) Technology</u>	12/31/24	Michael Levin, University of Minnesota	Victor Lund	LRRB, Other Federal Funds	\$258,010
In Progress	<u>Pedestrian Safety and Accessibility Best Practices for Channelized Right-Turn Lanes</u>	12/31/24	Tim Gates, Michigan State University	Joe Gustafson	LRRB	\$68,160
In Progress	<u>Guidelines for Determining Speed Limits on Municipal Roadways</u>	1/31/25	John Brunkhorst, Stonebrooke Engineering, Inc.	William Manchester	LRRB	\$19,997
In Progress	<u>Safety: Developing Tools to Address Behavioral Factors</u>	1/31/25	Renae Kuehl, SRF Consulting Group, Inc.	Sara Buermann	LRRB	\$93,809
In Progress	<u>Tool to Estimate the Safety Impact of Vehicle Levels of Automation on Minnesota Roads</u>	2/28/25	Gary Davis, University of Minnesota	Scott Meier	LRRB, MnDOT	\$109,518
In Progress	<u>Behavioral Investigation of Temporary and Permanent Pedestrian Infrastructure</u>	5/31/25	Curtis Craig, University of Minnesota	Mitchell Kiecker	LRRB, MnDOT	\$205,944
In Progress	<u>Identification and Assessment of Preventive Methods to Mitigate Cognitive and Physical Declines That Influence Driving Performance of Older Drivers</u>	6/30/25	Nichole Morris, University of Minnesota	Derek Leuer	LRRB, MnDOT	\$359,847

Traffic & Safety [cont.]

Report #/ Status	Title	End Date	Investigator	Technical Liaison	Funding Source	Total Cost
In Progress	<u>Improving Safety for People Walking and Biking at Roundabouts</u>	6/30/25	Peter Savolainen, Michigan State University	Mark Wagner	LRRB	\$108,011
In Progress	<u>Multi-Method Investigation of Pedestrian Safety Impacts of Right-Turn Lanes</u>	6/30/25	Curtis Craig, University of Minnesota	Bradley Estochen	LRRB, MnDOT	\$203,696
In Progress	<u>Pedestrian Safety Around Roundabouts</u>	6/30/25	Tim Arvidson, Stonebrooke Engineering, Inc.	Zachary Johnson	LRRB	\$47,456
In Progress	<u>Taconite as a Lower Cost Alternative High Friction Surface Treatment to Calcined Bauxite for Low-Volume Roads in Minnesota</u>	6/30/25	Mihai Marasteanu, University of Minnesota Duluth	Victor Lund	LRRB	\$322,250
In Progress	<u>User-Centered Smart Traffic Sign Implementation Development Study</u>	7/31/25	Rajesh Rajamani, University of Minnesota	Wayne Sandberg	LRRB, Other Federal Funds	\$198,058
In Progress	<u>Alternative Deicer Performance Characterization: Know Before the Snow</u>	1/31/26	Stephen Druschel, Minnesota State University, Mankato	Thomas Peters	LRRB	\$121,466
In Progress	<u>Rural Intersection Enhancement and Driver Behavior Study</u>	6/30/26	Nichole Morris, University of Minnesota	Victor Lund	LRRB	\$240,927

Administrative

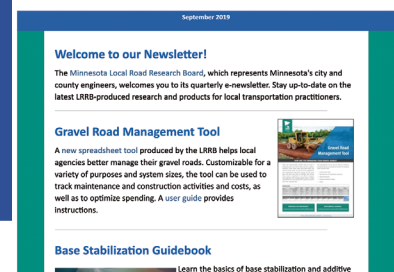
Report #/ Status	Title	End Date	Investigator	Technical Liaison	Funding Source	Total Cost
2023-39	<u>Evaluating and Communicating the Value of Research</u>	12/31/23	Rahil Saeedi, CPCS Transcom, Inc.	Catherine Walker	LRRB	\$98,618
Completed	LRRB Idea Solicitation and Need Statement Development	7/31/23	Michael Marti, SRF Consulting Group, Inc.	Kristine Elwood	LRRB	\$99,948
Completed	LRRB Technical Summaries (FY2022)	7/31/23	Brian Hirt, CTC & Associates, LLC	Micaela Kranz	LRRB	\$29,679
Completed	Local Technical Assistance Program (LTAP) (FY2023-2024)	9/30/23	Stephanie Malinoff, University of Minnesota-CTS	Kristine Elwood	LRRB, Other Federal Funds	\$300,000
Completed	LRRB Research Need Statement Development (FY2024)	6/15/24	Michael Marti, SRF Consulting Group, Inc.	Kristine Elwood	LRRB	\$122,008
Completed	<u>Local Technical Assistance Program (LTAP) Expanded Activities (FY2023-2024)</u>	6/30/24	Stephanie Malinoff, University of Minnesota-CTS	Kristine Elwood	LRRB, Other Federal Funds	\$660,000
Completed	<u>LRRB Outreach (FY2023)</u>	6/30/24	Michael Marti, SRF Consulting Group, Inc.	Kristine Elwood	LRRB	\$172,973
Completed	LRRB Technology Transfer (T2) Material Development: LRRB At-A-Glance, Videos, Other T2 Materials (FY2022-2024)	7/31/24	Mark Linsenmayer, CTC & Associates, LLC	Julie Swiler	LRRB	\$99,975
Completed	<u>Local Technical Assistance Program (LTAP) Base Operations (FY2024)</u>	9/30/24	Stephanie Malinoff, University of Minnesota-CTS	Kristine Elwood	LRRB, Other Federal Funds	\$420,000
In Progress	FY25 LRRB Research Need Statements	6/30/25	Michael Marti, SRF Consulting Group, Inc.	Kristine Elwood	LRRB	\$129,759
In Progress	Office of Research & Innovation Report Publication Services (FY2024-2025)	6/30/25	Elizabeth Andrews, University of Minnesota	Micaela Kranz	MnDOT, LRRB, COPTRS	\$117,740

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 for Updates" button on a project's webpage.



Local Road Research Board News

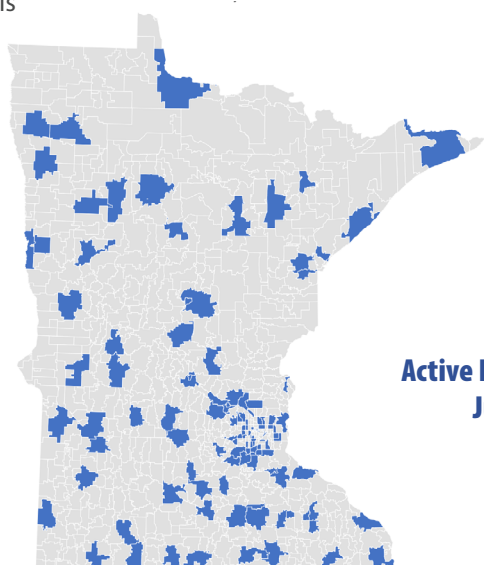


Advancing Minnesota's Transportation Systems

The LRRB is a practitioner-run organization that sponsors research and educational initiatives that address local transportation needs. The impact of this research multiplies through the efforts of the LRRB's Research Implementation Committee to assist practitioners in implementing new technologies.

TAP Member Participation

Local agency practitioners throughout Minnesota serve on LRRB Technical Advisory Panels



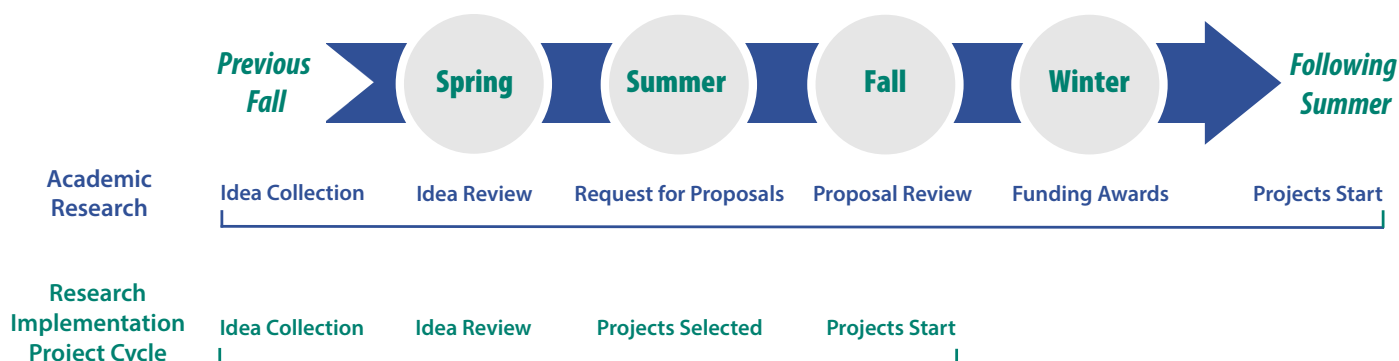
Active LRRB Members
July 2024

Join a Technical Advisory Panel

When you participate on a Technical Advisory Panel, you ensure that research results fit your needs and are applied in the most productive way in the field. Participation involves providing guidance to researchers, attending a limited number of meetings and reviewing research results. To participate, email research.dot@state.mn.us.



Annual Research Process Cycle



LRRB BY THE NUMBERS:



IN ANNUAL
FUNDING



NEW PROJECTS
EACH YEAR



ACTIVE
PROJECTS



100+ TAP CITY/
COUNTY MEMBERS



11 CITY/COUNTY
BOARD/RIC MEMBERS

A World-Class Transportation Library at Your Fingertips



Sheila Hatchell (center), our recently retired library director, received a 2024 Professional Achievement Award from the Special Libraries Association Transportation Community.

MnDOT's expert librarians are available to serve Minnesota city and county practitioners along with MnDOT employees. Request a literature search, articles, books or other publications at mndot.gov/library/asklibrarian.html or 651-366-3791.

Watch LRRB Videos

Check out the latest LRRB videos highlighting our research. They're a great resource for learning about new tools and knowledge to assist local agencies. View the videos on the LRRB YouTube channel at youtube.com/user/lrrbmn.



OPERA Program for Local Agencies: We Fund Your Ideas

Does your staff have a great idea to put into practice? The Operational Research Assistance Program (OPERA) funds innovative maintenance and construction methods developed by local agencies. Learn more at mnltp.umn.edu/opera/



Looking to reduce chloride pollution from road salt, the Cook County Highway Department received an OPERA grant to test the usability of treated sand. In an experiment that substituted potassium acetate-treated sand on a plow route for the traditional salt/sand mix, the department reduced total road salt use by 12.5%.



The LRRB partners with the National Road Research Alliance, a multistate 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.



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