



FY2017 Local Road Research Board

# At-A-Glance

ENGAGING STAKEHOLDERS TO  
SOLVE PROBLEMS

July 1, 2016, through June 30, 2017

[lrrb.org](http://lrrb.org)



We developed methodology to select and implement location-specific roundabout safety treatments. [Report 2017-14](#)



We improved multimodal planning by evaluating the traffic impacts of various bike lane and shoulder designs. [Report 2017-23](#)



Using driving simulators, we tested the safety of using smart-phones to deliver messages about work zones. [Report 2017-19](#)



We worked on a one-stop oversized/overweight permitting process for commercial haulers to consolidate jurisdiction requirements. [Report 2017-26](#)

# Welcome to the Local Road Research Board At-A-Glance for Fiscal Year 2017

The Local Road Research Board (LRRB) has been bringing innovations to local Minnesota engineers since 1959. The projects listed in this document continue to offer avenues for improving transportation-related processes ranging from high-level policy development to the design, construction and maintenance of pavements, bridges and culverts.

To learn about some of the new resources available to all LRRB members, see pages 4 and 5; for ongoing research updates and other news, visit our new-in-2017 website: [lrrb.org](http://lrrb.org).

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

- 1. October prescreening meetings:** LRRB representatives hold sessions at 16 State Aid prescreening meetings, where city and county engineers can discuss their research and technology transfer needs.
- 2. January city/county association meetings:** Here we report back on the ideas that were collected in step 1 and prioritized via an LRRB email survey.
- 3. February to December proposal development:** We work with you to develop need statements for the top ideas. Then the LRRB issues requests for proposals and selects which proposals to fund.
- 4. May prescreening meetings:** We meet again with all city and county engineers at State Aid prescreening meetings to announce which projects are moving forward and share completed research and implementation projects from the past year.



**2017 Local Road Research Board:** (from left) **Jim Foldesi**, St. Louis County; **Lyndon Robjent** (Chair), Carver County; **Paul Oehme**, City of Chanhassen; **Mitch Rasmussen**, MnDOT State Aid Division; **Kaye Bieniek** (2017 liaison between RIC and LRRB), Olmsted County; **Ben Worel**, MnDOT Office of Materials and Road Research (staff); **Tim Stahl** (2016 liaison between RIC and LRRB), Jackson County; **Laurie McGinnis**, University of Minnesota Center for Transportation Studies; **Linda Taylor**, MnDOT Research Services & Library; **Steve Koehler**, City of New Ulm; **Kevin Western**, MnDOT Office of Bridges and Structures. Not pictured: Mitch Bartelt (staff).



**2017 LRRB Research Implementation Committee (RIC):** (from left) **Steve Bot**, City of St. Michael; **Ted Schoenecker**, MnDOT State Aid Division; **Guy Kohnhofer**, Dodge County; **Klayton Eckles**, City of Woodbury; **Hafiz Munir**, MnDOT Research Services & Library; **Ben Worel**, MnDOT Office of Materials and Road Research (staff); **Kelvin Howieson**, MnDOT District 3; **Joel Ulring**, MnDOT State Aid Division (staff); **Kaye Bieniek** (2017 liaison between RIC and LRRB), Olmsted County; **Mike Flaagen** (Chair), Pennington County; **Jim Grothaus** (behind Mike Flaagen), University of Minnesota Center for Transportation Studies; **Bruce Holdhusen**, MnDOT Research Services & Library (staff). Not pictured: **John Brunkhorst**, McLeod County.

Your ideas make LRRB research happen. Please do not hesitate to reach out to us with any questions about the new process and LRRB's research and implementation efforts.

## Lyndon Robjent

2017 LRRB Chair, Carver County Engineer

## Mike Flaagan

2017 RIC Chair, Pennington County Engineer

## Mitch Rasmussen

Outreach Subcommittee Chair,  
MnDOT State Aid Engineer

# 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 or you have expertise or interest in a research area, you may be asked to serve on a Technical Advisory Panel (TAP). Participation involves helping guide researchers, attending a limited number of meetings (in person or via video conferencing) and reviewing research results. This puts you in a good position to ensure the research results fit your needs and is applied in the most productive way in the field. To participate on a TAP, contact any board member.

# How the LRRB Works

LRRB research ideas come from local Minnesota transportation professionals like you. Bring your research ideas to the October prescreening meeting. You can also submit ideas anytime. Go to [lrrb.org](http://lrrb.org) and click the **Submit Ideas** button. We will help you identify existing solutions and formulate a need statement to elicit project proposals. In December, the LRRB evaluates all proposals and decides which ones to fund.

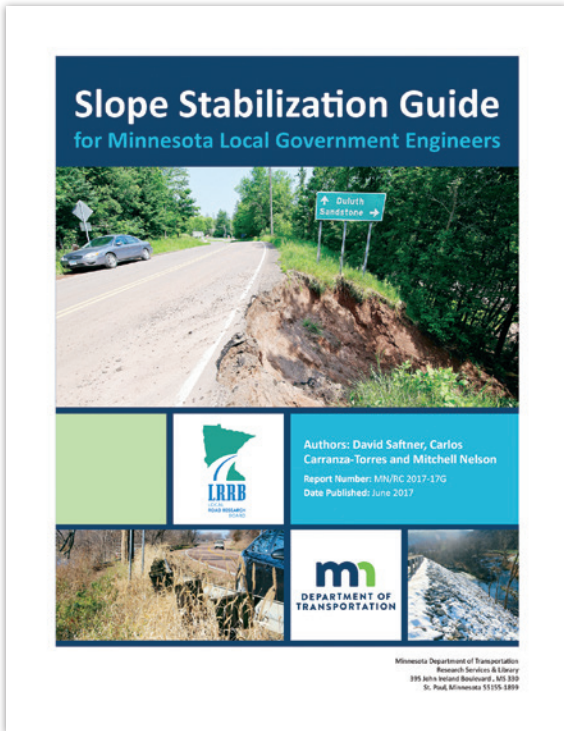


Shakopee Public Works Director Steve Lillehaug, alongside Assistant City Engineer Ryan Halverson (left) and Shoreview City Engineer Tom Wesolowski, shares his research ideas at a Metro District State Aid prescreening meeting. LRRB consultant Nicole Buehne, SRF Consulting Group, Inc. (far right), collects the ideas.



City, county and State Aid staff shared more than 200 needs for research implementation projects at the October 2017 prescreening meetings. The top-ranked ideas will be developed into need statements for possible research, implementation and outreach activities.

# New Resources for LRRB Members



## ◀ Slope Stabilization Guide for Minnesota Local Engineers

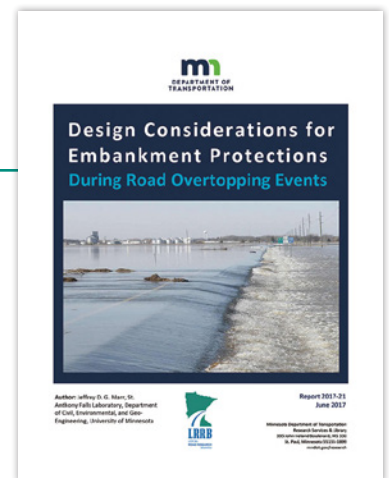
A new guide provides information for selecting and implementing simple, cost-effective methods for stabilizing slopes using locally available materials and equipment.

Report 2017-17G

## Design Considerations for Embankment Protection During Road Overtopping Events ▼

This resource offers a matrix of cost-effective erosion protection measures such as flexible geogrid that your staff can implement to mitigate flooding damage.

Report 2017-21



## Guide and Training: ADA Transition Plan for Public Rights of Way

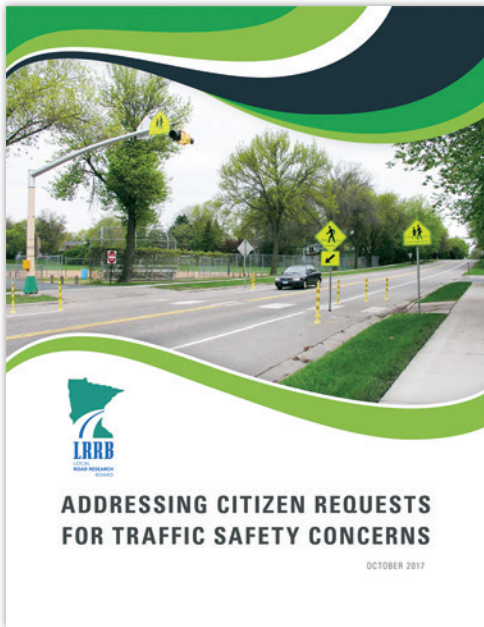
The Minnesota LTAP is offering three separate training courses that specifically target Americans with Disabilities Act (ADA) transition plan, design and construction requirements. Check out the following report for an interactive guide for developing your transition plan.

Report 2012RIC01



## ◀ “Become a Civil Engineer” Website and Video

[Becomeacivilengineer.com](http://Becomeacivilengineer.com) provides a video introduction and other resources to encourage kids to explore the world of a civil engineer.



## ◀ Addressing Citizen Requests for Traffic Safety Concerns

To install a sign or not install a sign, that is the question. The LRRB assembled resources to help city and county engineers respond to traffic safety–related citizen requests.

[Report 2017RIC05](#)

## Base Stabilization Additives for Pavement Design

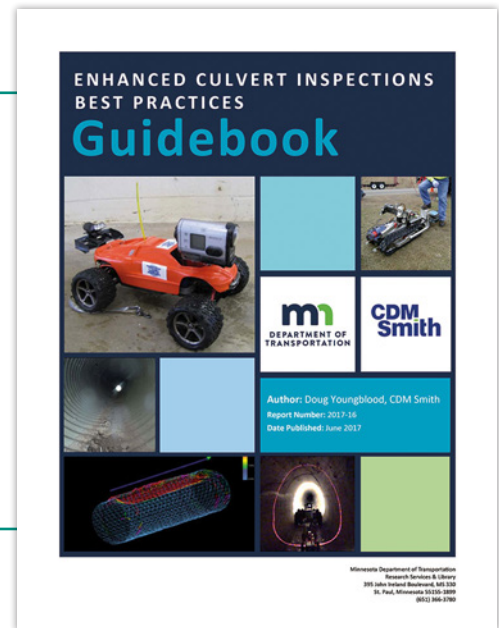
A new guide helps city and county engineers determine the road projects that are good candidates for base stabilization, specific products to use for a given project and best practices for using the products.

[Report 2017RIC02](#)

## Enhanced Culvert Inspections ▶ Best Practices Guidebook

Local agencies can use this new guide to determine when to use a conventional versus an enhanced culvert inspection method and provides a list of options, including laser ring scanners, sonar scanners and the Hydraulic Inspection Vehicle Explorer (HIVE), a remote control inspection vehicle recently developed by MnDOT staff.

[Report 2017-16](#)



## Alternate Design Methods to Renew Lightly Traveled Paved Roads

Researchers showed that cold in-place recycling and full-depth reclamation with chip seals are often more cost-effective than full pavement reconstruction of rural asphalt roads. Check out the research report for other cost-effective alternatives.

[Report 2016-14](#)

## Other resources at [lrrb.org](http://lrrb.org):

[Asphalt Patching Techniques](#)

[Systems Preservation Guide](#)

[Intersection Safety Technologies Guidebook](#)

[Traffic Control for Low-Volume Roads](#)

[Flashing Yellow Arrow Decision Tool](#)

[Impacts of Implements of Husbandry on Local Roads](#)

[Synopsis of Recycled Asphalt Pavement Material](#)

[Modernizing Road Construction Plans and Documentation](#)

[Snow and Ice Control Guidebook](#)

[Barriers to Right of Way Acquisition](#)



# LRRB Research

## Active Projects in FY2017

Projects highlighted on the front cover and pages 4 and 5 are indicated below by **bold text**. For more information about these projects, including a short Technical Summary for completed reports, search at [lrrb.org](http://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                                  | Technical Liason           | End Date | Funding Source | Project Cost |
|-----------------|---|------------------|---|----------------------------|----------|----------------|--------------|
| 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 | David Conkel, Peter Wilson | 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  | David Conkel               | 6/30/19  | LRRB           | \$212,883    |
| INV 1009        | Field Investigation of Bridge Deck Reinforced with GFRP Rebar   | In Progress      | Behrouz Shafei, Iowa State University         | Paul Rowekamp              | 8/31/19  | LRRB, SRP      | \$88,000     |
| INV 1021        | TRS: Local Bridge Removal Policies and Programs   | TRS 1702         | Patrick Casey, CTC & Associates LLC           | Kelvin Howieson            | 5/31/17  | LRRB           | \$10,002     |

## Environmental

| LRRB Identifier | Title  | Report #/ Status         | Investigator   | Technical Liaison   | End Date | Funding Source  | Project Cost |
|-----------------|--|--------------------------|--|---------------------|----------|-----------------|--------------|
| INV 965         | Study of Deicing Salt Accumulation and Transport Through a Watershed                         | In Progress              | William Herb, University of Minnesota                | Wayne Sandberg      | 12/31/17 | LRRB            | \$164,043    |
| INV 979         | <b>Slope Stabilization Guide for Minnesota Local Government Engineers</b>                    | <b>2017-17, 2017-17G</b> | <b>David Saftner, University of Minnesota Duluth</b> | <b>Blake Nelson</b> | 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                   | Dwayne Stenlund     | 6/30/19  | LRRB            | \$168,974    |
| INV 1003        | NPDES Stormwater Post-Construction Design Guidebook  | In Progress              | Randy Neprash, Stantec Consulting, Inc.              | Michael Flaagan     | 1/31/18  | LRRB            | \$89,745     |
| INV 1006        | Regional Optimization of Roadside Turfgrass Seed Mixtures                                    | In Progress              | Eric Watkins, University of Minnesota                | Dwayne Stenlund     | 8/31/18  | LRRB, SRP       | \$142,346    |
| INV 1007        | Minnesota Culvert Manual to Accommodate Aquatic Species Passage                              | In Progress              | Jeff Marr, University of Minnesota                   | Petronella DeWall   | 12/31/18 | LRRB, SRP, SP&R | \$164,353    |
| INV 1016        | Permeable Pavement for Road Salt Reduction   | In Progress              | John Gulliver, University of Minnesota               | Richard McCoy       | 8/31/19  | LRRB            | \$197,835    |
| INV 1017        | Iron-Enhanced Swale Ditch Checks for Phosphorus Removal                                      | In Progress              | John Gulliver, University of Minnesota               | Barbara Loida       | 8/31/19  | LRRB, SRP       | \$200,036    |

TENTATIVELY FUNDED FOR FY2018: Regional Optimization of Roadside Turfgrass Seed Mixtures—Phase II, Design and Construction of Infiltration Facilities, Assessing Culverts in Minnesota: Fish Passage and Storm Vulnerability.

# Maintenance Operations

| LRRB Identifier | Title  | Report #/ Status | Investigator  | Technical Liaison  | End Date | Funding Source | Project Cost |
|-----------------|--|------------------|---|--------------------|----------|----------------|--------------|
| INV 645         | Fleet Management Systems for All Sizes of Local Agencies                           | 2017RIC01        | Mike Marti, SRF Consulting Group, Inc.                                | Guy Kohlnhofer     | 7/31/19  | LRRB           | \$26,437     |
| INV 952         | Best Management Practices for Establishment of Salt-Tolerant Grasses on Roadside   | 2017-31          | Eric Watkins, University of Minnesota                                 | Dwayne Stenlund    | 9/30/17  | LRRB           | \$193,677    |
| INV 974         | Bio-Fog Seal Field Evaluation  | In Progress      | Eddie Johnson, MnDOT Office of Materials and Road Research            | Bruce Hasbargen    | 6/30/18  | LRRB, SRP      | \$20,000     |
| INV 974         | Evaluation of Bio-Fog Sealants for Pavement Preservation                           | 2016-20          | Mihai Marasteanu, University of Minnesota                             | Eddie Johnson      | 8/31/16  | LRRB, SRP      | \$93,969     |
| INV 980         | Pothole Prevention and Innovative Repair   | In Progress      | Mihai Marasteanu, University of Minnesota                             | Todd Howard        | 5/31/18  | LRRB, SRP      | \$129,914    |
| INV 998         | Operational Research Program for Local Transportation Groups (OPERA) (FY2017-2018) | In Progress      | Jim Grothaus, University of Minnesota—CTS                             | Mitchell Rasmussen | 6/30/18  | LRRB           | \$160,000    |
| INV 1015        | Optimized Tacnite-Based Pavement Repair Compound and Deployment System             | In Progress      | Lawrence Zanko, University of Minnesota Duluth                        | Perry Collins      | 2/28/19  | LRRB           | \$100,000    |
| INV 1018        | TRS: Field Usage of Alternative Deicers for Snow and Ice Control                   | TRS 1706         | Laura Fay, Montana State University, Western Transportation Institute | Ryan Peterson      | 11/30/17 | LRRB           | \$30,016     |
| INV 1034        | Adaptive Management to Improve Deicing Operations                                  | In Progress      | Larry Baker, University of Minnesota                                  | Ross Bintner       | 7/31/20  | LRRB           | \$204,000    |

TENTATIVELY FUNDED FOR FY2018: Development of Pavement Condition Forecasting for Web-Based Asset Management for County Governments.

# Materials & Construction

| LRRB Identifier | Title   | Report #/ Status | Investigator   | Technical Liaison | End Date | Funding Source | Project Cost |
|-----------------|---|------------------|--|-------------------|----------|----------------|--------------|
| INV 645         | Base Stabilization Additives for Pavement Design                                | 2017RIC02        | Daniel Wegman, Braun Intertec Corporation, and Renae Kuehl, SRF Consulting Group, Inc. | Ben Worel         | 7/31/19  | LRRB           | \$29,476     |
| INV 885         | Research Test Section Tracking—Phase II   | In Progress      | David Van Deusen, MnDOT Office of Materials and Road Research                          | Luane Tasa        | 12/31/17 | LRRB           | \$55,000     |
| INV 935         | Design Considerations for Embankment Protection During Road Overtopping Events  | 2017-21          | Jeff Marr, University of Minnesota   | John Anderson     | 8/31/17  | LRRB, SRP      | \$194,787    |
| INV 967         | Full-Depth Reclamation (FDR) for Suburban/Urban and Local Roads Application     | 2016-37          | Mihai Marasteanu, University of Minnesota  | Mark Maloney      | 2/28/17  | LRRB           | \$93,969     |
| INV 968         | Modernizing Road Construction Plans and Documentation                           | 2016-29          | Jennifer Shane, Iowa State University  | Lyndon Robjent    | 10/31/16 | LRRB           | \$146,022    |
| INV 971         | Optimal RAP Content for Minnesota Gravel Roads                                  | In Progress      | Charles Jahren, Iowa State University  | Joel Ulring       | 8/31/18  | LRRB           | \$92,538     |
| INV 975         | Prevention of Stripping Under Chip Seals  | 2017-35          | Dave Rettner, American Engineering Testing, Inc.                                       | Klayton Eckles    | 10/31/17 | LRRB           | \$18,942     |
| INV 981         | Evaluation of Stabilized Full-Depth Reclamation (SFDR)                          | In Progress      | Charles Jahren, Iowa State University  | Guy Kohlnhofer    | 4/30/18  | LRRB, SRP      | \$126,991    |
| INV 985         | Life-Cycle Cost Analysis Tool for Minnesota Pavements                           | In Progress      | Derek Tompkins, University of Minnesota  | John Brunkhorst   | 2/28/18  | LRRB           | \$54,682     |
| 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                                | Kaye Bieniek      | 6/30/20  | LRRB           | \$44,000     |

## Materials & Construction [cont.]

| LRRB Identifier | Title  | Report #/ Status | Investigator  | Technical Liaison | End Date | Funding Source  | Project Cost |
|-----------------|--|------------------|---|-------------------|----------|-----------------|--------------|
| INV 989         | Slope Failure Risk Analysis  | In Progress      | Omid Mohseni, Barr Engineering Company              | Paul Stine        | 11/30/17 | LRRB            | \$85,000     |
| INV 1001        | TRS: Recycled Materials in Unbound Aggregate Base Layers in Minnesota  | TRS 1604         | W. James Wilde, Minnesota State University, Mankato | Joel Ulring       | 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        | Maria Masten      | 8/31/18  | LRRB, SRP, SP&R | \$153,792    |
| INV 1023        | Experimental and Computational Investigations of High-Density Asphalt Mixtures   | In Progress      | Mihai Marasteanu, University of Minnesota           | Eddie Johnson     | 8/31/19  | LRRB, SRP       | \$150,935    |

TENTATIVELY FUNDED FOR FY2018: A Guide to Successfully Convert Severely Distressed Paved Roads to Unpaved Roads, Innovative Materials and Advanced Technologies for a Sustainable Pavement Infrastructure.

## Multimodal

| LRRB Identifier | Title  | Report #/ Status | Investigator                                 | Technical Liaison | End Date | Funding Source | Project Cost |
|-----------------|--|------------------|--|-------------------|----------|----------------|--------------|
| INV 645         | HCV Unified Permitting Process—Phase II                        | In Progress      | Annette Theroux, Pro-West & Associates, Inc. | Rich Sanders      | 8/31/17  | LRRB           | \$17,548     |
| INV 645         | Oversize/Overweight Vehicle Unified Permitting Process—Phase I | 2017-26          | Mike Marti, SRF Consulting Group, Inc.       | Rich Sanders      | 8/31/17  | LRRB           | \$50,176     |
| INV 964         | Traffic Impacts of Bicycle Facilities                          | 2017-23          | Greg Lindsey, University of Minnesota        | James Rosenow     | 7/31/17  | LRRB           | \$138,914    |

## Policy & Planning

| LRRB Identifier | Title  | Report #/ Status   | Investigator                               | Technical Liaison | End Date | Funding Source | Project Cost |
|-----------------|--|--------------------|--|-------------------|----------|----------------|--------------|
| INV 922         | Systems Preservation Guide: A Planning Process for Local Government Management of Transportation Networks—Interactive Presentation | 2016-34A, 2016-34B | Lance Bernard, SRF Consulting Group, Inc.  | Susan Miller      | 7/31/16  | LRRB           | \$708,172    |
| INV 963         | Stakeholder Attitudes, Knowledge and Engagement in Local Road Systems Planning and Decision Making                                 | 2017-39            | Guillermo Narvaez, University of Minnesota | Bruce Hasbargen   | 9/30/17  | LRRB           | \$139,793    |
| INV 965         | Training Workshop: Americans with Disability Act (ADA) for Local Agencies  | In Progress        | Mike Marti, SRF Consulting Group, Inc.     | Ted Schoenecker   | 7/31/19  | LRRB           | \$36,289     |
| INV 969         | Barriers to Right of Way Acquisition and Recommendations for Change  | 2016-28            | H. David Jeong, Iowa State University      | Patrick Lambert   | 8/31/16  | LRRB           | \$133,895    |
| INV 1002        | TRS: Consolidated Asset Management for Minnesota Local Agencies  | TRS 1603           | Patrick Casey, CTC & Associates LLC        | Lyndon Robjent    | 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  | Renee Raduenz     | 4/30/18  | LRRB, SRP      | \$163,783    |



## Policy & Planning [cont.]

| LRRB Identifier | Title  | Report #/ Status | Investigator                                | Technical Liaison | End Date | Funding Source | Project Cost |
|-----------------|--|------------------|---|-------------------|----------|----------------|--------------|
| INV 1014        | Transportation Investment and Job Creation in Minnesota Counties | In Progress      | Zhirong Jerry Zhao, University of Minnesota | Bruce Hasbargen   | 3/31/18  | LRRB           | \$110,350    |
| INV 1020        | LRRB Strategic Plan Update                                       | In Progress      | Donald Ludlow, CPCS Transcom, Inc.          | Lyndon Robjent    | 9/30/18  | LRRB           | \$62,734     |

TENTATIVELY FUNDED FOR FY2018: Evaluating the Impact of Local Expenditures on State and Regional Transportation Facilities, Workforce Planning and Human Resource Development for Minnesota Transportation Public Agencies, Techno-Economic Analysis of Implementing Hybrid Electric Utility Vehicles in Municipal Fleets.

## Traffic & Safety

| LRRB Identifier | Title   | Report #/ Status | Investigator   | Technical Liaison  | End Date | Funding Source          | Project Cost |
|-----------------|---|------------------|--|--------------------|----------|-------------------------|--------------|
| INV 645         | Addressing Citizen Requests for Traffic Safety Concerns   | 2017RIC05        | Renaee Kuehl, SRF Consulting Group, Inc.                           | Steven Bot         | 7/31/19  | LRRB                    | \$25,157     |
| INV 924         | Ineffective Specialty Signs Video for Local Agencies  | In Progress      | Bryan Nemeth, Bolton & Menk, Inc. Consulting Engineers & Surveyors | Gary Reihl         | 8/31/18  | LRRB, Other State Funds | \$28,569     |
| INV 943         | Traffic Sign Life Expectancy  | Completed        | Kyle Hoegh, MnDOT Office of Materials and Road Research            | Tim Plath          | 11/30/16 | LRRB                    | \$37,935     |
| INV 948         | Flagger Operations: Investigating Their Effectiveness in Capturing Driver Attention                                 | 2017-07          | Kathleen Harder, University of Minnesota                           | Robert Vasek       | 2/28/17  | LRRB, SP&R, SRP         | \$270,351    |
| INV 962         | Evaluation of Safety and Mobility of Two-Lane Roundabouts   | 2017-30          | John Hourdos, University of Minnesota                              | Joe Gustafson      | 8/31/17  | LRRB                    | \$124,920    |
| INV 972         | Minnesota Local Agency Pavement Marking: Mining Existing Data   | 2017-43          | Omar Smadi, Iowa State University                                  | Kate Miner         | 10/31/17 | LRRB                    | \$65,000     |
| INV 973         | Risk Evaluation for In-Vehicle Sign Information   | 2016-18          | Nichole Morris, University of Minnesota                            | Victor Lund        | 7/31/16  | LRRB                    | \$29,365     |
| INV 977         | Innovative Technology Workshop on 3-D Lidar   | 2016-19          | Brian Davis, University of Minnesota                               | Kaye Bieniek       | 8/31/16  | LRRB                    | \$92,140     |
| INV 978         | In-Vehicle Work Zone Messages   | 2017-19          | Nichole Morris, University of Minnesota                            | Kenneth Johnson    | 8/31/17  | LRRB, SRP               | \$105,167    |
| 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                        | Victor Lund        | 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                               | Bradley Estothen   | 4/30/18  | LRRB, SRP, SP&R         | \$161,803    |
| INV 1010        | Strategies for Effective Roundabout Approach Speed Reduction  | 2017-14          | Susan Chrysler, Texas A&M Transportation Institute                 | Joe Gustafson      | 7/31/17  | LRRB, SRP               | \$74,989     |
| INV 1011        | Work Zone Intrusion Report Interface Design   | In Progress      | Nichole Morris, University of Minnesota                            | Todd Haglin        | 4/30/18  | LRRB, SRP, SP&R         | \$200,638    |
| INV 1012        | Investigating the Necessity and Prioritizing Pavement Markings on Low-Volume Roads                                  | In Progress      | David Veneziano, Iowa State University                             | Bruce Hasbargen    | 2/28/18  | LRRB                    | \$71,475     |
| INV 1030        | Examining Optimal Sight Distances at Rural Intersections  | In Progress      | Nichole Morris, University of Minnesota                            | Tracey Von Bargaen | 3/31/19  | LRRB                    | \$170,549    |

TENTATIVELY FUNDED FOR FY2018: Guidance for Separated/Buffered Bike Lanes with Delineators, Criteria and Guidelines for Three-Lane Road Design and Operation, Design Standards for Unobstructed Sight Lines at Left-Turn Lanes, Quantifying the Impacts of Complete Streets: The Case of Richfield, Development and Demonstration of an In-Vehicle Lane Departure Warning System Using DSRC-Based V2V Communication, Effectiveness of Teenage Driver Support System (TDSS) on Reducing Traffic Violation Behaviors for Teenage Drivers at the Early Time of Licensure.

# Administrative

| LRRB Identifier | Title   | Report #/ Status | Investigator                                 | Technical Liaison  | End Date | Funding Source            | Project Cost |
|-----------------|---|------------------|--|--------------------|----------|---------------------------|--------------|
| INV 645         | LRRB Outreach and Marketing Support                                     | In Progress      | Renae Kuehl, SRF Consulting Group, Inc.      | Shannon Fiecke     | 7/31/17  | LRRB                      | \$20,000     |
| INV 645         | LRRB Outreach and Marketing Support (2017-2018)                         | In Progress      | Renae Kuehl, SRF Consulting Group, Inc.      | Shannon Fiecke     | 8/31/18  | LRRB                      | \$83,812     |
| INV 668         | FY2017 Local Technical Assistance Program (LTAP)                        | Completed        | Jim Grothaus, University of Minnesota—CTS    | Mitchell Rasmussen | 6/30/17  | LRRB, Other Federal Funds | \$450,500    |
| INV 916         | FY2015 LRRB Technical Transfer Materials Development                    | Completed        | Patrick Casey, CTC & Associates LLC          | Shannon Fiecke     | 8/31/16  | LRRB                      | \$99,007     |
| INV 916         | LRRB Technology Transfer Material Development (2017)                    | In Progress      | Patrick Casey, CTC & Associates LLC          | Shannon Fiecke     | 7/31/18  | LRRB                      | \$98,942     |
| INV 924         | State Aid: Professional Services for Careers in Civil Engineering Video | In Progress      | Renae Kuehl, SRF Consulting Group, Inc.      | Mitchell Rasmussen | 2/28/18  | LRRB, Other State Funds   | \$82,912     |
| INV 927         | LRRB Outreach Website   | Completed        | John Przybylski, HNTB Corporation            | Shannon Fiecke     | 8/31/16  | LRRB                      | \$64,355     |
| INV 927         | LRRB Website Development and Hosting                                    | In Progress      | Patrick Casey, CTC & Associates LLC          | Shannon Fiecke     | 7/31/18  | LRRB                      | \$39,419     |
| INV 936         | FY2016 and FY2017 LRRB Focus Groups                                     | In Progress      | Jim Grothaus, University of Minnesota—CTS    | Paul Oehme         | 7/31/17  | LRRB                      | \$29,382     |
| INV 999         | FY2016 RSS Report Publication Services                                  | In Progress      | Arlene Mathison, University of Minnesota—CTS | Shannon Fiecke     | 8/31/17  | LRRB, SRP, COPTRS         | \$73,035     |
| INV 999         | FY2018-2019 Research Services & Library Report Publication Services     | In Progress      | Arlene Mathison, University of Minnesota—CTS | Shannon Fiecke     | 6/30/19  | LRRB, SRP, COPTRS         | \$86,329     |



## 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/TRS.html](http://mndot.gov/research/TRS.html).

[TRS 1702](#), Local Bridge Removal Policies and Programs, provides the results of a literature review and a survey of state departments of transportation about their policies for removing low-use bridges to reduce ongoing maintenance costs.

# 2018 LRRB and RIC Meetings

Get up-to-date information on these meetings at [lrrb.org](http://lrrb.org).

## LRRB Presentations at State Aid Prescreening Meetings: May

LRRB representatives attend all 16 State Aid prescreening meetings across the state to present the results of completed research and share project updates. Research topics include design, environmental compatibility, maintenance, materials and construction, policy and planning, and traffic and operations.

## RIC: March 12—MnDOT Fort Snelling Office LRRB: April 5—MnDOT Golden Valley Office

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 and RIC: June 20-21—Rochester

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 prescreening meeting 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 12—Location TBD

## LRRB: October 17—Stearns County Public Works Building, Waite Park

The fall meeting focuses on prioritizing university research proposals to be presented at the LRRB project selection winter meeting. Our fall prescreening meetings held throughout the state provide you with an opportunity to discuss your needs for research and technology transfer.

## LRRB Focus Group at State Aid Prescreening Meetings: October

LRRB representatives will again hold sessions at all 16 State Aid prescreening meetings. City and county engineers are encouraged to bring research ideas to discuss with the group. These will be collected for consideration for funding as a research or technology transfer project.

## RIC: November 14—Location TBD

## LRRB: December 12-13—University of Minnesota, Minneapolis

At the winter meeting, the LRRB prioritizes research needs identified throughout the previous year and decides what projects will be funded in the upcoming fiscal year. Research investigators give brief presentations to LRRB members, who can then ask questions about the proposed projects.



(From left) Klayton Eckles, City of Woodbury, Ted Schoenecker, MnDOT State Aid, and Steve Bot, City of St. Michael, share a laugh while reviewing implementation projects during the summer RIC meeting.

## Submit Your Ideas

Our research ideas come from local Minnesota transportation practitioners like you. In addition to sharing your needs at a State Aid prescreening meeting, you can submit ideas any time. Visit [lrrb.org](http://lrrb.org) and click the **Submit Ideas** button. We'll let you know whether current solutions to your problem already exist and help you take your idea to the next stage of consideration for funding.

## A World-Class Transportation Library

MnDOT's expert librarians are available to not only 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](mailto:library.dot@state.mn.us) or [mndot.gov/library](http://mndot.gov/library).



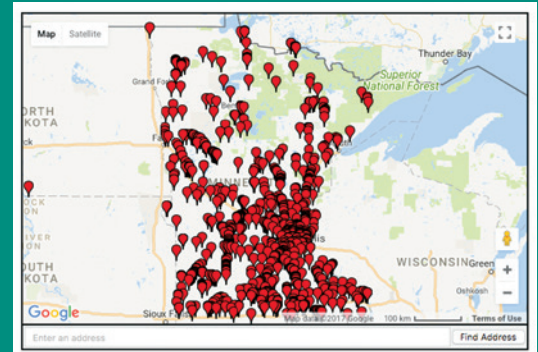
## Watch LRRB Videos

The LRRB funds videos that communicate research results to transportation practitioners as well as the public. Check out the [LRRB YouTube channel](https://www.youtube.com/channel/UC...) or [lrrb.org/resources/videos](http://lrrb.org/resources/videos).



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](http://mndot.gov/mnroad/nrra).

## New on the LRRB Website: Road Test Section Tracking



Visit [lrrb.org](http://lrrb.org) and scroll down to use our interactive portal that tracks where new products, designs or construction practices have been installed. Enter your own innovations to share them with others and ensure that lessons learned are remembered.



## 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 [mnlta.umn.edu/opera/](http://mnlta.umn.edu/opera/).