



# RESEARCH

## FY2012 Local Road Research Board At-A-Glance

This publication provides a guide to the Local Road Research Board's Fiscal Year 2012 research activities. It includes a graphical account of progress on all active research projects during this period; a list of reports and research implementation products completed during this time; and an overview of the LRRB, including current goals and research highlights.

### About LRRB

For more than 50 years, the LRRB has brought important developments to transportation engineers throughout Minnesota. Those developments range from new ways to determine pavement strength to innovative methods for engaging the public. Today, the LRRB remains true to its important mission: supporting and sharing the latest transportation research applications with the state's city and county engineers.

### How the LRRB Works

Each year, the LRRB's 10-member board, including city and county engineers and key MnDOT decision-makers, approves and funds the most innovative proposals from transportation practitioners for research projects addressing the needs of local transportation practitioners. Once approved, research is conducted by investigators from MnDOT, regional universities and consulting firms, with the LRRB monitoring its progress and MnDOT providing administrative support and technical assistance.

### Sharing the Results

Once research has been completed, the Research and Implementation Committee ([www.lrrb.org/ric.aspx](http://www.lrrb.org/ric.aspx)) communicates the results and facilitates their practical application. The RIC uses a variety of methods to reach engineers and others with new developments, including presentations, videos, written reports, pamphlets, seminars, workshops, field demonstrations, Web-based technologies and on-site visits.

### Submitting Ideas

The LRRB is continually on the lookout for research that addresses transportation issues facing Minnesota's cities and counties, and that ultimately helps improve the quality of Minnesota's transportation systems. Please submit your research ideas to the LRRB at [www.lrrb.org/submit-ideas](http://www.lrrb.org/submit-ideas).

## LRRB MISSION

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

## LRRB STRATEGIC GOALS

The LRRB sponsors research projects that improve Minnesota's local government road system with regard to:

- 1. Design—**  
the determination of the need for and nature of a proposed road system project
- 2. Construction—**  
the implementation of the plans and specifications from the road system design process
- 3. Maintenance/Operations—**  
the operation and maintenance of the road system investment
- 4. Environmental Compatibility—**  
the integration of the local road system into the community to minimize adverse environmental impacts while contributing to economic and social well-being

## WEBSITE REDESIGN

In 2012, the LRRB redesigned its website to better keep local engineers up-to-date with the latest practices and technologies for designing safer, longer lasting local roads. The new site:

- Provides a cleaner looking design, improves navigation and access to information, and eliminates redundancy and outdated information
- Improves search functionality and provides easy access to search content
- Provides an improved process for submitting ideas

To obtain more information about the projects listed in this publication, search for reports and Technical Summaries, and initiate queries, visit [www.lrrb.org](http://www.lrrb.org). The website lists LRRB members, provides news and events information, explains more about the LRRB's mission and plans, and provides links to a variety of Web-based tools to help in areas such as pavement design, management and rehabilitation; geosynthetics design; crash data analysis; and connections to local and national resources.

## LRRB BOARD MEMBERS

### 2012

Rick West (Chair), Otter Tail County  
 Julie Skallman, State Aid Division  
 Tom Ravn, MnDOT Office of Construction &  
 Innovative Contracting  
 Linda Taylor, MnDOT Research Services  
 Bruce Hasbargen, Beltrami County  
 Lyndon Robjent, Carver County  
 Tim Stahl, Jackson County  
 Steve Koehler, City of New Ulm  
 John Powell, City of Savage  
 Laurie McGinnis, University of Minnesota CTS

### 2011

Rick West (Chair), Otter Tail County  
 Julie Skallman, State Aid Division  
 Tom Ravn, MnDOT Office of Construction &  
 Innovative Contracting  
 Linda Taylor, MnDOT Research Services  
 Mitch Anderson, Stearns County  
 Bruce Hasbargen, Beltrami County  
 Sue Miller, Freeborn County  
 Deb Bloom, City of Roseville  
 Steve Koehler, City of New Ulm  
 Laurie McGinnis, University of Minnesota CTS

## RESEARCH IMPLEMENTATION COMMITTEE (RIC) MEMBERS

### 2012

Rich Sanders (Chair), Polk County  
 Jeff Hulsether, City of Brainerd  
 Mitch Rasmussen, Scott County  
 Dave Robley, Douglas County  
 Tim Stahl, Jackson County  
 Klayton Eckles, City of Woodbury  
 Walter Leu, MnDOT  
 Rick Kjonaas, MnDOT  
 Maureen Jensen, MnDOT  
 Nicole Peterson, MnDOT  
 Farideh Amiri, MnDOT  
 Jim Grothaus, University of Minnesota

### 2011

Rich Sanders (Chair), Polk County  
 Tom Colbert, City of Eagan  
 Jeff Hulsether, City of Brainerd  
 Mitch Rasmussen, Scott County  
 Tim Stahl, Jackson County  
 Sue Miller, Freeborn County  
 Walter Leu, MnDOT  
 Rick Kjonaas, MnDOT  
 Maureen Jensen, MnDOT  
 Ben Worel, MnDOT  
 Farideh Amiri, MnDOT  
 Jim Grothaus, University of Minnesota

# LRRB Completed Reports and Implementation Products in FY2012

## FUNDING SOURCE KEY

<b>LRRB</b>	<b>Local Road Research Board</b>
<b>SP&amp;R</b>	<b>State Planning &amp; Research (FHWA)</b>
<b>SRP</b>	<b>State Research Program</b>
<b>COPTRS</b>	<b>Cooperative Program for Transportation Research and Studies</b>

LRRB Identifier	Report Title	Report Number	Contractor	Investigator	Technical Liaison	Project Coordinator	Start Date	End Date	Funding Source	Project Cost
INV 645	RIC: Decision Tree for Stormwater BMPs	2011RIC01	SRF Consulting Group, Inc.	Mike Marti	Michael Sheehan	Bruce Holdhusen	2/19/09	12/31/12	LRRB	\$51,748
INV 645	RIC: Best Practices for Recreation Trails	2011RIC05	SRF Consulting Group, Inc.	Mike Marti	Tom Behn	Bruce Holdhusen	2/19/09	12/31/12	LRRB	\$27,608
INV 768	Monitoring Geosynthetics in Local Roadways (LRRB 768) 10-Year Performance Summary	2011-20	MnDOT Materials Lab	Timothy Clyne	Luane Tasa	Daniel Warzala	10/1/00	9/1/11	LRRB	\$30,000
INV 854	TPF-5(148): Effects of Implements of Husbandry (Farm Equipment) on Pavement Performance	2012-08	University of Minnesota	Lev Khazanovich	Shongtao Dai	Bruce Holdhusen	10/12/07	5/31/12	LRRB, SP&R, SRP, Partnership Funds, Other State Funds	\$275,239
INV 878	MPR-6(024): Porous Asphalt Pavement Performance in Cold Regions	2012-12	MnDOT Materials Lab	Matthew Lebens	Larry Matsumoto	Bruce Holdhusen	7/26/07	4/30/12	LRRB, SP&R, Other State Funds	\$59,400
INV 879	MPR-6(027): Pervious Concrete Cells on MnROAD Low-Volume Roads	2011-23	MnDOT Materials Lab	Bernard Izevbekhai	Mark Maloney	Bruce Holdhusen	7/30/07	9/30/11	LRRB, SP&R, Other State Funds	\$48,000
INV 890	Vehicle Speed Impacts of Occasional Hazard (Playground) Warning Signs	2012-06	University of Minnesota	John Hourdos	Amy Marohn	Shirlee Sherkow	6/30/09	2/28/12	LRRB	\$79,647
INV 891	Performance Assessment of Oversized Culverts to Accommodate Fish Passage	2011-19	University of Minnesota	John Nieber	Petronella DeWall, Nicole Danielson-Bartelt	Nelson Cruz	8/7/09	8/31/11	LRRB, SRP, COPTRS	\$83,428
INV 892	The Road to a Thoughtful Street Tree Master Plan	2011TREE01	University of Minnesota	Gary Johnson	Daniel Gullickson	Sandra McCully	4/8/10	9/30/11	LRRB	\$20,000
INV 901	Concrete Delivery Time Study	2011-26	American Engineering Testing, Inc.	Dan Vruno	Maria Masten	Shirlee Sherkow	3/29/10	1/31/12	LRRB, SRP, Other State Funds	\$99,411
INV 902	Material Control Testing Rates for Low-Volume Roads	2012-17	Minnesota State University, Mankato	Brian Wasserman	Joseph MacPherson	Farideh Amiri	6/1/10	7/31/12	LRRB	\$25,000
INV 908	Minnesota's Best Practices and Policies for Safety Strategies on Highway and Local Roads	2011-21	CH2M Hill	Howard Preston	Mark Vizecky	Farideh Amiri	3/30/11	9/30/11	LRRB	\$61,272
INV 916	Use of Social Media by Minnesota Cities and Counties	TRS1104	CTC & Associates LLC	Patrick Casey, Brian Hirt	Linda Taylor	Shirlee Sherkow	N/A	N/A	LRRB	N/A
INV 916	Far-Field Testing of Noise Wall Effectiveness: Survey of State Practice and Literature Scan	TRS1202	CTC & Associates LLC	Patrick Casey, Mark Linsenmayer	John Welle	Farideh Amiri, Shirlee Sherkow	N/A	N/A	LRRB	N/A
INV 919	Use of StreetPave for Design of Concrete Pavements for Cities and Counties in Minnesota	2012-10	Braun Intertec Corporation	Matthew Oman	Malaki Ruranika	Farideh Amiri	10/19/11	3/31/12	LRRB	\$18,314
INV 926	Innovative Bridge Construction for Minnesota Local Roads	TRS1203	HDR Engineering	Daniel Dorgan	Steve Misgen	Shirlee Sherkow	12/9/11	7/31/12	LRRB	\$24,976



### COMMON FUNDING SOURCES

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

# LRRB RESEARCH

## Active Research Projects in FY2012

LRRB Identifier	Title	Contract #	Contractor	Investigator	Technical Liaison	Project Coordinator	Start Date	End Date	Funding Source	Total Cost	Amount Paid	% Paid
INV 645	RIC Implementation of Research Findings, FY2009-FY2011	93463	SRF Consulting Group, Inc.	Mike Marti	Rich Sanders	Farideh Amiri	4/17/09	12/31/12	LRRB	\$497,697	\$482,022	97%
INV 645	RIC Implementation of Research Findings, 2012-2014	98383	SRF Consulting Group, Inc.	Mike Marti	Rich Sanders	Farideh Amiri	6/20/11	7/31/14	LRRB	\$465,497	\$92,581	20%
INV 645	RIC: Best Value Procurement Development	93103 W016	HNTB Corporation	Steve Howe	None	Farideh Amiri	8/5/09	7/31/12	LRRB, Partnership Funds	\$140,547	\$90,626	64%
INV 645	RIC: Dust Control	93463 Task 6.7	SRF Consulting Group, Inc.	Mike Marti	Rich Sanders	Farideh Amiri	1/22/11	12/31/12	LRRB	\$31,350	\$25,000	80%
INV 645	RIC: ADA Transition Plan for Local Agencies	98383 Task 1	SRF Consulting Group, Inc.	Mike Marti	Mitch Rasmussen	Farideh Amiri	6/20/11	7/31/14	LRRB	\$29,119	\$29,119	100%
INV 645	RIC: Complete Streets	98383 Task 2	SRF Consulting Group, Inc.	Mike Marti	Jeff Hulsether	Farideh Amiri	6/20/11	7/31/14	LRRB	\$45,708	\$12,680	28%
INV 645	RIC: Unpaved Roads	98383 Task 3	SRF Consulting Group, Inc.	Mike Marti	TBD	Farideh Amiri	6/20/11	7/31/14	LRRB	\$48,336	\$0	0%
INV 645	RIC: Toward Zero Deaths	98383 Task 4	SRF Consulting Group, Inc.	Mike Marti	TBD	Farideh Amiri	6/20/11	7/31/14	LRRB	\$94,304	\$0	0%
INV 645	RIC: Research and Implementation Roadmapping	98383 Task 5	SRF Consulting Group, Inc.	Mike Marti	TBD	Farideh Amiri	6/20/11	7/31/14	LRRB	\$141,452	\$0	0%

LRRB Identifier	Title	Contract #	Contractor	Investigator	Technical Liaison	Project Coordinator	Start Date	End Date	Funding Source	Total Cost	Amount Paid	% Paid
INV 645	RIC: LRRB Outreach and Marketing	98383 Task 6	SRF Consulting Group, Inc.	Mike Marti	Julie Skallman	Farideh Amiri	6/20/11	7/31/14	LRRB	\$60,826	\$12,165	20%
INV 645	RIC: 2012 Truck Weight Enforcement Training Program	99008 W059	University of Minnesota	Jim Grothaus	Richard Kjonaas	Daniel Warzala	4/12/12	8/31/13	LRRB, Other State Funds, SRP	\$30,000	\$0	0%
INV 668	Local Technical Assistance Program (LTAP), FY2011	89261 W0225	University of Minnesota	Jim Grothaus	Julie Skallman	Farideh Amiri	8/30/10	10/31/11	Other Federal Funds, LRRB	\$440,500	\$440,500	100%
INV 668	Local Technical Assistance Program (LTAP), FY2012	99008 W05	University of Minnesota	Jim Grothaus	Julie Skallman	Farideh Amiri	9/23/11	11/30/12	LRRB, Other Federal Funds	\$441,500	\$220,750	50%
INV 825, INV 899	Performance Monitoring of Olmsted CR 117/104 and Aggregate Base Material Update	LAB899	MnDOT Materials Lab	Matthew Lebens	Michael Sheehan	Alan Rindels	6/8/10	2/28/15	LRRB	\$36,000	\$0	0%
INV 840-1	Performance of PG 52-34 Oil on Local Roads	LAB840	MnDOT Materials Lab	Shongtao Dai	Brian Noetzelman	Daniel Warzala	6/22/06	12/31/11	LRRB	\$56,200	\$56,200	100%
INV 854	TPF-5(148): Vibrating Wire and Horizontal Clip Data Analysis	89261 W0101	University of Minnesota	Ahmed Tewfik	Thomas Burnham	Bruce Holdhusen	6/10/08	12/31/11	LRRB, SP&R, SRP, Partnership Funds, Other State Funds	\$66,500	\$66,500	100%
INV 863	TPF-5(153): Optimal Timing of Preventive Maintenance for Addressing Environmental Aging in HMA Pavements	95099	Asphalt Institute	Mike Anderson	Thomas Wood	Bruce Holdhusen	3/30/10	11/30/13	LRRB, SP&R, Other Federal Funds	\$286,185	\$81,913	29%
INV 864	MPR-6(022): Recycled Asphalt Pavements	LAB864	MnDOT Materials Lab	Eddie Johnson	Gregory Johnson	Bruce Holdhusen	1/4/08	12/31/12	SP&R, LRRB, Other State Funds	\$275,000	\$165,500	60%
INV 865	TPF-5(132): Low Temperature Cracking in Asphalt—Phase II	89261 W0103	University of Minnesota	Mihai Marasteanu	Timothy Clyne	Bruce Holdhusen	6/17/08	8/31/12	LRRB, SP&R, SRP	\$475,000	\$305,660	64%
INV 867	TPF-5(149): Composite Pavements Design and Construction Guidelines for Thermally Insulated Concrete Pavements	89261 W090	University of Minnesota	Lev Khazanovich	Timothy Clyne	Nelson Cruz	1/30/08	1/30/13	SP&R, LRRB	\$438,980	\$366,987	84%
INV 868	MPR-6(029): HMA Surface Characteristics Related to Ride, Texture, Friction, Noise and Durability	98283	Purdue University	Rebecca McDaniel	Timothy Clyne	Bruce Holdhusen	8/11/11	7/3/13	SP&R, LRRB, Other State Funds	\$50,000	\$14,635	29%
INV 868	MPR-6(029): HMA Surface Characteristics	LAB868	MnDOT Materials Lab	Timothy Clyne	Gregory Johnson	Bruce Holdhusen	9/18/07	6/30/13	LRRB, SP&R, Other State Funds	\$250,000	\$122,625	49%
INV 897	Developing Salt-Tolerant Sod Mixtures for Use as Roadside Turf in Minnesota	89261 W0211	University of Minnesota	Eric Watkins	Dwayne Stenlund	Daniel Warzala	6/8/10	8/31/14	LRRB	\$176,516	\$61,779	35%

LRRB Identifier	Title	Contract #	Contractor	Investigator	Technical Liaison	Project Coordinator	Start Date	End Date	Funding Source	Total Cost	Amount Paid	% Paid
INV 898	Estimating the Crash Reduction and Vehicle Dynamic Effects of Flashing LED Stop Signs	89261 W0195	University of Minnesota	Gary Davis	Bradley Estochen	Shirlee Sherkow	6/28/10	11/30/12	LRRB, ITS Institute, COPTRS	\$112,000	\$40,000	36%
INV 900	Hennepin/Minneapolis LED Light Study	96737	Hennepin County	Robb Luckow	Susan Zarling	Shirlee Sherkow	6/25/10	9/30/12	LRRB	\$50,000	\$48,000	96%
INV 903	RIC: Best Practices for Sign Reduction on the Local System	98039	CH2M Hill	Howard Preston	Mark Vizecky	Farideh Amiri	6/6/11	7/31/12	LRRB	\$26,515	\$19,081	72%
INV 904	Stripping of Hot Mixed Asphalt Pavements Under Chip Seals	LAB904	MnDOT Materials Lab	Thomas Wood	Thomas Tesch	Daniel Warzala	7/19/10	12/31/12	LRRB	\$40,000	\$22,000	55%
INV 906	LTAP Gravel Road Maintenance Independent Online Distance Training (ODL)	89261 W0230	University of Minnesota	Jim Grothaus	Richard West	Daniel Warzala	11/3/10	5/31/12	LRRB	\$45,000	\$45,000	100%
INV 907	Impact of Garbage Haulers on Pavement Performance	98108	Minnesota State University, Mankato	W. James Wilde	Deb Bloom	Daniel Warzala	2/22/11	8/31/13	LRRB	\$54,000	\$2,000	4%
INV 909	Planning and Implementation of Complete Streets at Multiple Scales	99008 W011	University of Minnesota	Carissa Schively Slotterback	Scott Bradley	Bruce Holdhusen	10/4/11	6/30/13	SRP, LRRB	\$101,271	\$11,252	11%
INV 911	Best Practices Synthesis and Guidance in At-Grade Trail Crossing Treatments	89264 W04	University of Wisconsin – Madison	David Noyce	Lisa Austin	Bruce Holdhusen	6/14/11	10/31/12	SRP, LRRB	\$96,866	\$51,662	53%
INV 912	Improved Approach to Enforcement of Road Weight Restrictions	99008 W013	University of Minnesota	Rajesh Rajamani	Benjamin Timerson	Nelson Cruz	9/21/11	11/30/13	SRP, LRRB	\$90,000	\$20,000	22%
INV 913	LRRB Workshop: Shaping Research on Systems Planning for Local Roads	89261 W0258	University of Minnesota	Linda Preisen	Susan Miller	Farideh Amiri	2/4/11	11/30/11	LRRB	\$22,093	\$22,093	100%
INV 914	Research Using Waste Shingles for Stabilization or Dust Control for Gravel Roads and Shoulders	LAB914	MnDOT Materials Lab	Thomas Wood	Tim Stahl	Daniel Warzala	5/11/11	1/31/14	LRRB, SRP	\$77,000	\$0	0%
INV 915	Implications of Modifying State Aid Standards: Urban, New or Reconstruction (Mn Rules 8820.9936) to Accommodate Various Roadway Users (Complete Streets)	89264 W07	University of Wisconsin – Madison	David Noyce	Paul Stine	Bruce Holdhusen	6/28/11	11/30/12	LRRB	\$117,700	\$17,246	15%
INV 916	LRRB Technical Transfer Material Development	98725	CTC & Associates LLC	Patrick Casey	Julie Skallman	Sandra McCully	5/20/11	9/30/13	LRRB	\$71,804	\$41,012	57%
INV 917	Two-Lane Roundabout Field Research Regarding Signing and Striping	89261 W0271	University of Minnesota	John Hourdos	Kristin Asher	Shirlee Sherkow	6/30/11	10/31/13	LRRB	\$105,000	\$25,000	24%
INV 918	Implementation of TONN 2010	98319	Minnesota State University, Mankato	W. James Wilde	Rich Sanders	Farideh Amiri	5/4/11	12/31/12	LRRB, SRP	\$35,000	\$0	0%
INV 921	Frost Video Update and Enhancement	00669	SRF Consulting Group, Inc.	Mike Marti	Benjamin Worel	Shirlee Sherkow	6/14/12	8/31/13	LRRB, Partnership Funds	\$63,271	\$0	0%

LRRB Identifier	Title	Contract #	Contractor	Investigator	Technical Liaison	Project Coordinator	Start Date	End Date	Funding Source	Total Cost	Amount Paid	% Paid
INV 922	System Preservation Guide—A Planning Process for Local Government Management of Transportation Networks	99373	SRF Consulting Group, Inc.	Brian Shorten	Susan Miller	Farideh Amiri	1/19/12	11/30/14	LRRB	\$698,876	\$53,854	8%
INV 923	Guidelines for Local Concrete Infrastructure and Updating the State Aid Concrete Pavement Rehabilitation Best Practice Manual (2006)	99008 W07	University of Minnesota	Jim Grothaus	Ronald Dahlquist	Shirlee Sherkow	9/23/11	5/31/12	LRRB	\$37,000	\$37,000	100%
INV 925	Advanced LED Warning Signs for Rural Intersections Powered by Renewable Energy (ALERT) System—Phase II	99008 W025	University of Minnesota – Duluth	Taek Kwon	Victor Lund	Alan Rindels	12/14/11	6/30/14	LRRB	\$86,596	\$0	0%
INV 927	LRRB Outreach Website	340	HNTB Corporation	Timm Claudon	Lowell Schafer	Sandra McCully	2/2/12	1/31/14	LRRB	\$99,991	\$24,589	25%
INV 929	Investigation and Assessment of Colored Concrete Pavement	LAB929	MnDOT Materials Lab	Alexandra Akkari	Dallas Larson	Bruce Holdhusen	4/24/12	4/28/14	LRRB	\$45,000	\$0	0%
INV 932	Determination of Effective Impervious Area in Urban Watersheds	99008 W054	University of Minnesota	John Gulliver	Scott Anderson	Shirlee Sherkow	6/29/12	7/31/15	LRRB	\$150,000	\$0	0%
INV 934	Field Evaluation of Friction Measurement and Applicator Control Systems for Winter Road Maintenance	99008 W056	University of Minnesota	Rajesh Rajamani	Rich Sanders	Daniel Warzala	6/29/12	11/30/13	LRRB	\$40,000	\$0	0%
INV 936	LRRB Focus Groups	99008 W060	University of Minnesota	Linda Preisen	Richard West	Linda Taylor	3/30/12	7/31/13	LRRB	\$17,000	\$4,257	25%
INV 998	FY2011 Operational Research Program for Local Transportation Groups (OPERA)	89261 W0210	University of Minnesota	Jim Grothaus	Mark Maloney	Farideh Amiri	9/9/10	9/30/11	LRRB	\$90,000	\$90,000	100%
INV 998	FY2012 Operational Research Program for Local Transportation Groups (OPERA)	99008 W019	University of Minnesota	Jim Grothaus	Julie Skallman	Farideh Amiri	9/23/11	11/30/12	LRRB	\$90,000	\$0	0%
INV 999	RSS Report Publication Services, FY2011	89261 W0219	University of Minnesota	Arlene Mathison	Sandra McCully	Sandra McCully	7/15/10	8/31/11	SRP, LRRB	\$35,913	\$35,913	100%
INV 999	MnDOT RSS Report Publication Services, FY2012	99008 W018	University of Minnesota	Arlene Mathison	Farideh Amiri	Sandra McCully	10/11/11	11/30/12	SRP, LRRB	\$36,861	\$28,936	79%



Since 1959, the LRRB has facilitated both new transportation research and the sharing of the latest knowledge among Minnesota city and county engineers. In the last 15 years, it has sponsored more than 200 projects and offered local communities tools to improve pavement management and rural safety; upgrade crash analysis software; evaluate the performance of stormwater treatment technology; explore the environmental benefits of porous pavements; and better calibrate snowplow sanders. The impact of LRRB-sponsored research multiplies as more and more engineers see the potential applications through the LRRB RIC's technology transfer efforts.

## GRASS-ROOTS INVOLVEMENT

The transportation practitioners who are responsible for county highways and city streets best understand the problems and challenges in providing safe, efficient roadways. The LRRB makes it easy for them to participate in setting the research agenda.

## MAKING A DIFFERENCE

The LRRB's current research includes projects to explore better methods to inspect and maintain timber bridges, determine best practices in applying Complete Streets principles to design work, and evaluate the impacts of implements of husbandry on our roads and bridges.

## BENEFITING TRANSPORTATION PRACTITIONERS

Transportation practitioners involved with LRRB projects have benefited by:

- Networking outside of the office and working with those who share similar interests
- Keeping up-to-date on current topics within their area of expertise and learning about cutting-edge technologies
- Working on real problems they otherwise wouldn't have the resources to address



Produced by CTC & Associates for:

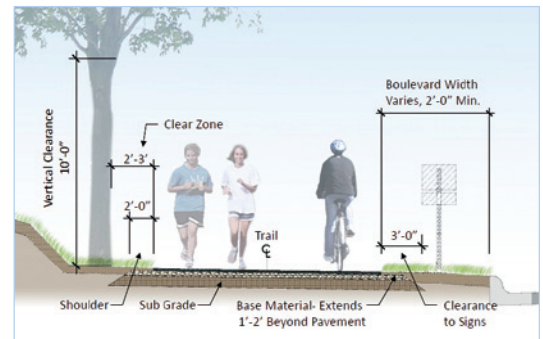
Minnesota Department of Transportation  
Office of Policy Analysis, Research and Innovation  
Research Services Section  
MS 330, First Floor  
395 John Ireland Blvd.  
St. Paul, MN 55155-1800  
[www.dot.state.mn.us/research](http://www.dot.state.mn.us/research)

## FY2012 LRRB Research Highlights

**Report 2012-17**, "Material Testing Rates for Low-Volume Roads," will save local governments money by reducing the amount of testing required for the materials going into local roads. The previous testing specifications were designed for statewide use, but since lower-traffic roads don't undergo the stresses of state highways, the testing was excessive. In fact, some required lab test results would take longer to generate than the duration of many local construction projects. By surveying Minnesota inspectors, project engineers and contractors, and reviewing information about current material control practices and the risks associated with changing various requirements, investigators confirmed that a less stringent testing regimen could be implemented safely, and they developed a new [State Aid for Local Transportation Schedule of Materials for Low Volume Roads](#).

**INV 923**, "Minnesota Concrete Flatwork Specifications for Local Government Agencies," developed up-to-date local concrete infrastructure guidelines that can be used to update the 2006 [State Aid Concrete Pavement Rehabilitation Best Practices Manual](#). Investigators also developed training materials to present the new specifications to local design and inspection personnel. These materials will provide guidance for product selection and testing to ensure that concrete flatwork construction projects in Minnesota's cities and counties will be consistent, resulting in higher quality and more durable concrete.

**Report 2011 RIC05**, "Maintenance of Recreational Trails," leveraged past LRRB-funded research into best practices for preserving trails to design and administer a workshop for city and county maintenance managers. This guidance covered the pavement life cycle, identifying and prioritizing maintenance needs, building a maintenance schedule and more. It was presented through the Minnesota Local Technical Assistance Program at various Minnesota locations as well as through national forums like the American Public Works Association conference. Maintaining trails is much more cost-effective than rehabilitation, and this project will help ensure the safety and enjoyment of trail users throughout Minnesota.



**The Maintenance of Recreational Trails workshop provided guidance for maintaining trail pavement as well as designing and maintaining vegetation, signage and other elements.**