DEPARTMENT OF TRANSPORTATION
OFFICE OF RESEARCH & INNOVATION

RESEARCH AT-A-GLANCE

Informing, Improving and Innovating Transportation in Minnesota

FY2025: JULY 1, 2024 – JUNE 30, 2025

mndot.gov/research

DIRECTOR'S MESSAGE

Welcome to the MnDOT Office of Research & Innovation FY2025 At-A-Glance. We are pleased to present this snapshot of the work we do to advance Minnesota's transportation systems through research, information sharing and innovation. We manage more than 200 research projects annually with funding from federal research programs, the State Research Program and the Minnesota Local Road Research Board (LRRB) on behalf of city and county agencies.

This was an exciting year for fostering innovation within MnDOT as we adopted **MnDOT's Innovation Strategy**. Research & Innovation launched the Innovation Awards and Showcase, highlighting innovations developed and implemented by offices and districts across MnDOT. We continue to put the goals and strategies detailed in our **Research Strategic Plan** into action as we do our part to champion MnDOT's mission to connect and serve all people through a safe, equitable and sustainable transportation system.

Katie Walker, Director
MnDOT Office of Research & Innovation

RESEARCH IN ACTION

Managing Your Project, Sourcing Information and Sharing Results

Our two dozen staff members serve industry professionals and officials locally, nationally and internationally. Our team is ready to help you with research management, finance and contract services, library services, and marketing and communications.

HIGH VALUE RESEARCH AWARD

Each year, the Research Advisory Committee of the American Association of State Highway and Transportation Officials (AASHTO) presents the High Value Research (HVR) Award to recognize recently completed research projects of high value. In 2025, MnDOT received an award in the main HVR category for a **Complete Streets project** that measured the effects of road features on driving speeds.

JOIN A TECHNICAL ADVISORY PANEL

You can help shape research and innovation projects in your subject area by serving on a Technical Advisory Panel (TAP). Involvement may include a few meetings and assistance developing work plans and reviewing final deliverables. Learn more and sign up at **Volunteer for a TAP**.

VALUE OF RESEARCH

The **Value of Research** (VOR) is a joint initiative by MnDOT and LRRB to develop a customized, data-driven approach to monitoring the benefits of our research projects. It involves tracking, analyzing and summarizing some of the projects' key research benefits to demonstrate return on investment potential. Results will enable agency leaders to communicate the value of research to a broad range of stakeholders.

We are currently in the middle of a three-year pilot implementation that involves 39 VOR projects. In 2026, we anticipate completing 17 projects and will begin communicating results. We also will evaluate the performance and outcomes of the pilot to refine and guide the process and implementation going forward.

INNOVATION IN ACTION:

Building a Culture of Innovation by Celebrating MnDOT's MnOVATORS

At MnDOT, innovation isn't something that happens occasionally; it occurs regularly because it's part of who we are. Across every district and office, our colleagues are finding new ways to solve problems, improve processes and better serve the people of Minnesota. Everyone at MnDOT is a MnOVATOR.

One of Research & Innovation's main goals this year was to recognize and reward the different types of innovation that happen across MnDOT. Using the agency's **Innovation Strategy** as a map for how to build an innovation culture, we developed a campaign that celebrates innovation at MnDOT, culminating with a showcase event.

The campaign invited every MnDOT office and district to nominate one innovation substantially developed and implemented in 2024-2025 in one of five award categories: Spark Award (new ideas), Upgrade Award (improvements), Flow Award (process efficiencies), Innovation of the Year Award (big impacts) and People's Choice Award (team MnDOT's overall favorite).

On Oct. 30, 2025, MnDOT Commissioner Nancy Daubenberger recognized innovators and presented awards at MnDOT's Innovation Awards and Showcase.

The response was incredible! We received nominations for **30 innovations** from across the agency, reflecting the creativity and problem-solving that thrives in every corner of MnDOT.

To select their favorite innovations, **690 staff members** cast **2,025 votes**.

The campaign culminated with the **Innovation Awards and Showcase** event on October 30, where MnDOT leadership and staff gathered to recognize MnOVATORS and the innovations that were nominated.

Beyond the campaign, Research & Innovation continues to champion creativity and continuous improvement through research partnerships, the State Transportation Innovation Council program and collaboration with other departments of transportation.

Our office will soon launch an innovation dashboard to help track progress, measure impact and share stories of innovation across the agency. We're also building a Community of Practice to connect employees, spark collaboration and keep ideas flowing agencywide.

CTS RESEARCH PARTNERSHIP AWARD

The Center for Transportation Studies (CTS) **Research Partnership Award** recognizes teams of individuals who have drawn on their expertise to accomplish goals with significant impacts in transportation. The 2025 award recognized a team of University of Minnesota researchers working with MnDOT and other universities and partners who collaborated for nearly a decade to address the challenge of establishing persistent plant growth along roadways in harsh northern climates. They developed recommendations for turfgrass seed and sod mixtures and management guidelines, resulting in both economic and environmental benefits.

(Front row, l-r) Kristine Moncada, Kenneth Graeve; (back row, l-r) Joshua Friell, Eric Watkins, Dwayne Stenlund.

NEED RESEARCH?

MnDOT uses the **IdeaScale Research Collaboration** site to collect research ideas from transportation practitioners and researchers year-round.

TPF If a research idea addresses an issue that affects multiple states, MnDOT can help practitioners establish a **transportation pooled fund (TPF)** to leverage resources through multistate collaboration.

NCHRP MnDOT can also help researchers trying to solve a problem of regional or national significance by developing a problem statement through the **National Cooperative Highway Research Program (NCHRP)**.

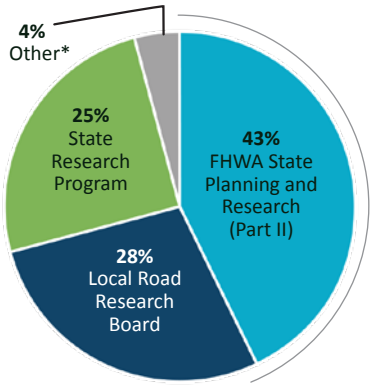
LOCAL ROAD RESEARCH BOARD

Administered by the MnDOT Office of Research & Innovation, the LRRB has been bringing innovations to local Minnesota engineers since 1959. LRRB research ideas come from local Minnesota transportation professionals, either through the IdeaScale button at **lrrb.org** or at LRRB sessions during fall State Aid prescreening meetings held around the state. The Office of Research & Innovation helps to identify existing solutions and formulate need statements to elicit project proposals. In December, the LRRB evaluates all proposals and makes funding selections.

FINANCIAL OVERVIEW

MnDOT research is funded through the MnDOT State Research Program (SRP) and Federal Highway Administration (FHWA) State Planning and Research (SP&R) Program (Part II). MnDOT's Office of Research & Innovation also manages research for the Minnesota Local Road Research Board (LRRB).

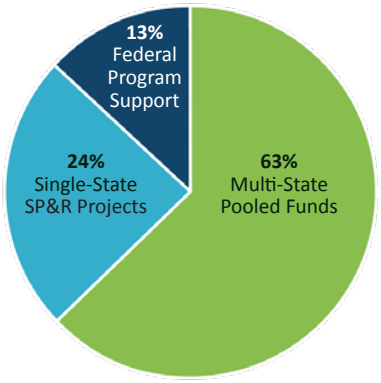
FY2025 Research Funds by Funding Source



FHWA State Planning and Research (Part II)	$	8,949,690
Local Road Research Board	$	5,889,888
State Research Program	$	5,136,950
Other*	$	758,557
Total	**$**	**20,735,085**

* Includes contributions from other MnDOT funds, partnerships with other agencies and other federal sources.

Subset: FY2025 SP&R (Part II) Funding Distribution



FHWA SP&R (Part II) funds are allocated to MnDOT for eligible state-specific needs and to participate in multi-state initiatives as shown below:

Multi-State Pooled Funds	**$**	**5,627,356**
a: Participation in Pooled Funds Led by Other States	$	783,500
b: MnDOT-Led Pooled Funds	$	4,843,856
Single-State SP&R Projects	**$**	**2,163,033**
Federal Program Support	**$**	**1,159,301**
a: National Cooperative Highway Research Program	$	943,122
b: Transportation Research Board	$	170,979
c: AASHTO	$	45,200
Total	**$**	**8,949,690**

RESEARCH HIGHLIGHTS

BRIDGES AND STRUCTURES

Reinforcing Bridge Decks to Reduce Cracking

Implementing strategies to reduce early-age cracking in bridge decks may lower maintenance costs over the service life of a bridge, potentially saving taxpayer dollars. To minimize this cracking, investigators adjusted the concrete mixture for bridge deck installations, regulated temperature differences between concrete and support girders, and reduced spacing between reinforcement bars. **Report 2025-38**

ENVIRONMENTAL

Using Recycled Tires to Manage Stormwater Runoff

Repurposing old tires as tire-derived aggregate (TDA) is a cost-effective stormwater management practice that will also keep tires out of landfills. TDA adsorbs phosphate, preventing it from reaching soil and water sources, and effectively grows biofilm, which can retain much of the zinc, copper and iron released from TDA. **Report 2025-33**

Reestablishing Roadside Vegetation After Construction Projects

New research has developed guidance for MnDOT and local transportation agencies to reestablish roadside vegetation growth that was damaged during road construction projects. Results recommended amendment application rates to balance vegetation growth with water quality considerations. **Report 2025-22**

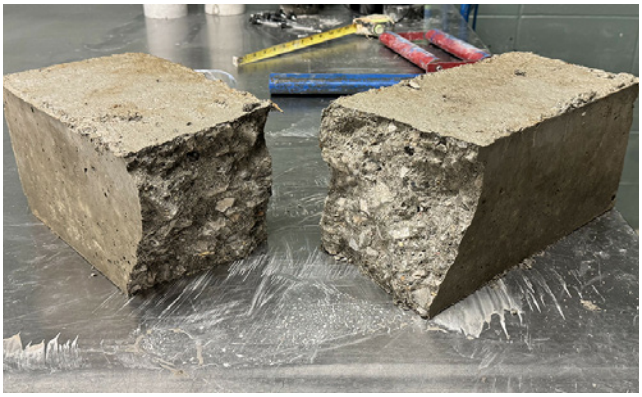
Developing Biochar Specifications for Treating Stormwater

Stormwater runoff from roads contains heavy metals and hydrocarbons that roadside bioretention systems can filter. Investigators identified optimal processing temperatures and recommended biochar characteristics for maximum stormwater contaminant removal and carbon sequestration. The next phase of this study will include field tests to further inform design guidance. **Report 2025-36**

MULTIMODAL

Impact of School Start Times on Students Who Walk or Bike to School

Early school start times do not discourage students from walking or biking to school. The results of a recent study showed that students actually walked or biked more in February—when the sun rose later—than in September. Parents and caregivers indicated that distance was the top factor for whether a student walked or biked to school. **Report 2025-21**



MATERIALS AND CONSTRUCTION

Using Plastics in Concrete Pavement Mixes

Modifying concrete mixes with recycled plastic could resolve issues related to the growing demand for paving aggregates and an overabundance of plastic waste. While further research and field testing are needed, plastic-modified pavement mixes showed high potential for equal or improved performance and significant environmental, economic and sustainability benefits. **Report 2025-28**

Evaluation of Corrugated Pipes Manufactured with Recycled Content

An increase in environmental and fiscal benefits is possible by using recycled materials to manufacture corrugated HDPE pipes. Field tests of pipes manufactured with recycled materials and those built with virgin materials showed no discernible difference in performance. **Report 2025-32**

POLICY AND PLANNING

Value of Dedicated Rights of Way for Buses

A new modeling tool identified bus route segments that would benefit from a dedicated right of way (ROW). Implementing a ROW where it is needed most can improve transit reliability and better serve riders who use buses to commute to work, complete errands and engage with the community. **Report 2025-01**

MAINTENANCE OPERATIONS

Effective Practices for Sustaining Pavement Performance

A chemical reaction between the components of concrete mixes can cause early pavement deterioration in some roads. Current repair strategies are positively affecting road surface conditions, with road smoothness and rider perception ratings increasing after maintenance work was completed. **Report 2025-29**

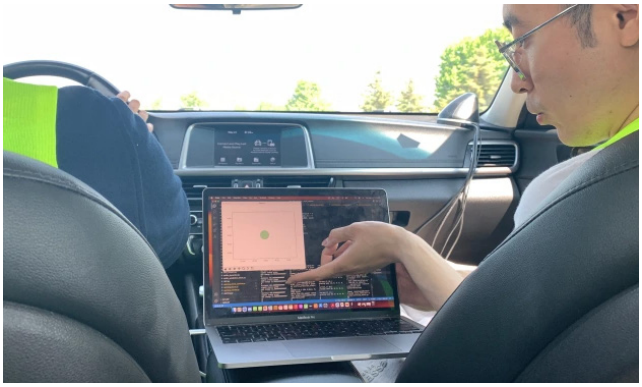
TRAFFIC AND SAFETY

Improving Pedestrian and Cyclist Safety at Roundabouts

To enhance safety at roundabouts, MnDOT and local transportation agencies examined driver behavior toward pedestrians and bicyclists at 16 roundabouts. Findings identified factors corresponding to higher yielding rates, such as roundabout size, number of lanes and location of crosswalks. These insights will guide safety considerations for designing and managing roundabouts. **Report 2025-27**

In-Vehicle Technology That Keeps Drivers from Running Red Lights

Innovative technology developed by the LRRB and MnDOT could reduce serious crashes that occur when drivers run red lights at signalized intersections. Onboard technology integrates traffic light phasing information with the location and speed of a vehicle to warn distracted drivers. **Report 2024-33**



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**.

LEVERAGING OUR RESEARCH DOLLARS

For every $1 invested in a pooled fund study with other states, MnDOT leverages $10 worth of research.

The Transportation Pooled Fund (TPF) Program allows federal, state and local agencies and other organizations to combine resources to support research into shared transportation priorities.

Minnesota leads eight pooled funds and participates in another 36. Find a summary of all pooled fund activity at **mndot.gov/research/pooled.html**.

The Clear Roads research program brings together transportation professionals and researchers from around the country to drive innovation in winter maintenance. By evaluating materials, equipment and methods in real-world conditions, the program identifies the most effective techniques and technologies to save agencies money, improve safety and mobility, and increase efficiency. **clearroads.org**

Clear Roads Project CR21-01, Grip Sensor Technology and Salt Applications, *explored how transportation agencies use pavement friction data captured by snowplows, producing a decision matrix to advise plow drivers about the type of deicing materials to use and the application rate in real time.*

The **National Road Research Alliance (NRRA)** was created by MnDOT to help fund and direct research at the MnROAD cold-weather pavement test track. NRRA finds ways to build roads faster and make them last longer, perform better, cost less to build and maintain, and have less impact on the environment. **mndot.gov/mnroad/nrra**

NRRA project centerline rumble strips (CLRS) *can reduce injury-producing crashes, but they may accelerate the deterioration of asphalt pavements. In* **Materials-Based Methods to Improve Rumble Strip Durability**, *researchers examined whether milled CLRS affect pavement performance and tested methods to increase performance without compromising safety benefits.*

North/West Passage. Minnesota initiated this pooled fund to investigate intelligent transportation systems solutions to traffic management, traveler information and commercial vehicle operations on Interstates 90 and 94 between Washington and Minnesota. **nwpassage.info**

A WORLD-CLASS TRANSPORTATION LIBRARY AT YOUR FINGERTIPS

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/ask librarian.html** *or 651-366-3791.*

FY2025 RESEARCH CONTRACTS

Each research topic area on the following pages includes two tables:

- Research reports completed in fiscal year 2025 (FY2025) followed by other research contracts active during FY2025, sorted by contract end date.
- Multi-state pooled funds and American Association of State Highway and Transportation Officials (AASHTO) projects, with MnDOT-led pooled funds listed first.

Prefixes in project titles indicate funding for projects not supported entirely by the MnDOT SRP:

- **INV** – Partial or full LRRB funded
- **MP** – 80% federally funded/20% state funded
- **TPF** – MnDOT-administered pooled fund (100% federal funds)

For more information about projects, including two-page research summaries for completed reports, search by the title on the "Search Projects" page at **dot.state.mn.us/research/projects**. For more information about pooled funds, search at **pooledfund.org**.

BRIDGES & STRUCTURES

Report Number	Title	End Date	Investigator	Technical Liaison	Total Cost
2025-32	MP-21(009): Evaluation of Corrugated HDPE Pipes Manufactured with Recycled Content	6/30/25	Michael Pluimer, University of Minnesota Duluth	Erik Brenna	$85,032
2025-38	INV 1134: Deck Reinforcement Detailing and Concrete Mix Additives to Reduce Bridge Deck Cracking	7/31/25	Brock Hedegaard, University of Minnesota Duluth	Paul Gronvall	$147,000
2025RIC05	INV-645: Cast-in-Place: Box Culvert Guidance	3/15/26	Michael Marti, SRF Consulting Group, Inc.	David Conkel, Aaron Holmbeck	$127,621
In Progress	Performance Evaluation of Reinforced Concrete Box Culverts	12/31/25	Lauren Linderman, University of Minnesota	Yihong Gao	$270,078
In Progress	MP-23(009): Understanding Causes of Concrete Culvert Pipe Joint Separation	2/28/26	Brock Hedegaard, University of Minnesota Duluth	Nicholas Olson	$232,337
In Progress	INV 1093: Quantifying Benefits of Bridge Maintenance	5/31/26	Basak Aldemir Bektas, Minnesota State University–Mankato	Sarah Sondag	$166,709
In Progress	MP-23(005): Correlation Between Deck Patching Quantities and Chloride Concentration Levels	6/30/26	Qindan Huang, Marquette University	Paul Pilarski	$227,129
In Progress	Assessing the Need for Floodplain Culverts Based on Geomorphology	8/31/26	Jessica Kozarek, University of Minnesota	Solomon Woldeamlak	$228,635
In Progress	Ice Loading on Piers for Minnesota's Bridges	8/31/26	Jessica Kozarek, University of Minnesota	Daniel Freiburger	$294,913
In Progress	MP-22(001): Develop Element-Level Bridge Performance Measures and Targets	8/31/26	Basak Aldemir Bektas, Minnesota State University–Mankato	David Hedeen	$215,704
In Progress	INV 1133: Understanding Driving Causes of Bridge Replacement	5/31/27	Basak Aldemir Bektas, Minnesota State University–Mankato	David Hedeen	$163,730
In Progress	Optimized Pre-Tensioning and Retightening Approaches for Anchor Rods for Highway Signs, Luminaires and Traffic Signals (SLTS)	5/31/27	Pedram Mortazavi, University of Minnesota	Yuying Hu	$197,579
In Progress	MP-24(003): Development of Nonproprietary Ultra-High Performance Concrete (UHPC) Prestressed Bridge Girders	8/31/28	Mary Christiansen, University of Minnesota Duluth	Arielle Ehrlich	$856,034

tables cont. ➡

Bridges & Structures Pooled Fund Studies

Study Number	Title	Lead State or Agency	Technical Liaison	Number of Participating Agencies	2025 MnDOT Contribution	Total MN Contribution
TPF-5(464)	Hydrologic and Hydraulic Software Enhancements (SMS, WMS, Hydraulic Toolbox and HY-8)	FHWA	Aislyn Ryan	5	$10,000	$50,000
TPF-5(468)	Structural Behavior of Ultra-High Performance Concrete	FHWA	Scot Larson	6	$10,000	$50,000
TPF-5(480)	Building Information Modeling (BIM) for Infrastructure	IA	Benjamin Jilk	25	$37,500	$150,000
TPF-5(486)	Center for the Aging Infrastructure: Steel Bridge Research, Inspection, Training and Education Engineering Center (SBRITE)	IN	Kevin Western	14	$30,000	$150,000
TPF-5(503)	Standardizing Rigid Inclusions for Transportation Projects—Phase I	KS	Richard Lamb	6	$0	$60,000
TPF-5(508)	Concrete Bridge Engineering Institute (CBEI)	TX	Karl Johnson	16	$50,000	$200,000
TPF-5(523)	Building Information Modeling (BIM) for Bridges and Structures—Phase II	IA	Benjamin Jilk	24	$20,000	$100,000

ENVIRONMENTAL

Report Number	Title	End Date	Investigator	Technical Liaison	Total Cost
2024-23	INV 1120: Re-Use of Minnesota Waste Material in Sustainably Designed Soils: Part 2	9/30/24	David Saftner, University of Minnesota Duluth	Dwayne Stenlund	$186,280
2024RIC07	INV 645: Chloride Deposition from Salt Application Calculator	12/31/24	Michael Marti, SRF Consulting Group, Inc.	Bruce Hasbargen	$68,536
2025-19	MP-23(008): Assessing the Deterioration of Pedestrian Assets	2/28/25	Inya Nlenanya, Iowa State University	Kristie Billiar	$100,732
2025-22	INV 1094: Comparison of Compost and Proprietary Soil Amendments for Vegetation Establishment	3/31/25	Bora Cetin, Michigan State University	Warren Tuel	$380,500
2025-23	MP-22(006): Appendix D: Infiltration Data	5/31/25	Anthony Parolari, Marquette University	Dwayne Stenlund, Steven Gebauer	$199,128
2025-33	INV 1115: Sustainable Application of Tire-Derived Aggregate (TDA) in Stormwater Infiltration and Treatment	6/30/25	John Gulliver, University of Minnesota	Mark Hansen	$257,765
2025-35	MP-22(007): Assessing a New Tool for Early Detection of Endangered Turtles on Proposed Transportation Projects	6/30/25	Mark Davis, University of Illinois	Christopher Smith	$251,676
2025-36	INV 1135: Development of Biochar Specification Criteria as Soil Amendment for Slopes, Conveyances and Stormwater Treatment Systems—Phase I	6/30/25	Brian Barry, University of Minnesota Duluth	Dwayne Stenlund	$231,476
In Progress	INV-645: Roadside Vegetation Management	1/31/26	Susan Miller, SRF Consulting Group, Inc.	Darrick Anderson	$99,999
In Progress	TPF-5(466): Use of Carbon Dioxide for Sustainable and Resilient Concrete Pavements	1/31/26	Peter Taylor, Iowa State University	Bernard Izevbekhai	$183,000
In Progress	Biochar Design Guidance: TRS	4/30/26	Erin Hunker, SRF Consulting Group, Inc.	Dwayne Stenlund	$25,439
In Progress	INV 1127: Wet Pond Modeling for Contaminant Retention and Maintenance	4/30/26	John Gulliver, University of Minnesota	Ross Bintner	$255,529

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ENVIRONMENTAL [cont.]

Report Number	Title	End Date	Investigator	Technical Liaison	Total Cost
In Progress	Development of Erosion Control Product Longevity Test Methodology	6/30/26	John Chapman, University of Minnesota	Dwayne Stenlund, Warren Tuel	$297,665
In Progress	MP-23(007): Evaluation of Conditions That Cause Negative Environmental Impacts When Using Recycled Concrete Aggregate	6/30/26	Qingli Dai, Michigan Technological University	Kenneth Graeve	$250,000
In Progress	MP-24(008): Investigating Real Storms and the Impact of Potential Climate Change Adaptations	6/30/26	Andrew Erickson, University of Minnesota	Rachel Pichelmann	$327,214
In Progress	MP-22(008): Regional Optimization of Roadside Turfgrass Seed Mixtures—Phase III	7/31/26	Eric Watkins, University of Minnesota	Dwayne Stenlund, Kenneth Graeve	$275,928
In Progress	MP-24(004): Cost–Benefit Analysis for Sustainable Energy Building Upgrades at Safety Rest Areas and Travel Information Centers	8/31/26	Yao Yu, North Dakota State University	Anthony Chevalier	$181,264
In Progress	INV 1147: Assessing Effectiveness of Pond Sediment Removal for Phosphorus Management in Stormwater Ponds	4/30/27	John Gulliver, University of Minnesota	Derek Asche	$217,696
In Progress	MP-25(004): Incorporation of Soil Health Engineered Measures on MnDOT Construction Projects and Resilient Stormwater Management	6/30/27	Bora Cetin, Michigan State University	Warren Tuel, Dwayne Stenlund	$320,307

Environmental Pooled Fund Studies

Study Number	Title	Lead State or Agency	Technical Liaison	Number of Participating Agencies	2025 MnDOT Contribution	Total MN Contribution
TPF-5(460)	Flood-Frequency Analysis in the Midwest: Addressing Potential Nonstationary Annual Peak-Flow Records	SD	Andrea Hendrickson	8	$0	$222,400
TPF-5(527)	International Conference on Ecology and Transportation 2025	WA	Christopher Smith	13	$5,000	$5,000

MAINTENANCE OPERATIONS

Report Number	Title	End Date	Investigator	Technical Liaison	Total Cost
2024-30	INV 645: Roadway Pavement Maintenance 101—Phase I	7/31/24	Rick West, Stonebrooke Engineering, Inc.	Christopher Cheney	$54,502
2025-25	Harnessing Solar Energy Through Solar Snow Fences	6/30/25	Mijia Yang, North Dakota State University	Daniel Gullickson	$227,221
2025-29	MP-22(004): Sustaining Performance of Alkali-Silica Reaction (ASR) Affected Pavements: Effective Practices and Insights	6/30/25	Fatih Bektas, Minnesota State University–Mankato	Greg Ous	$67,998
2025RIC09	INV-645: Deicing Projects User Guide	9/30/25	Connie Fortin, Bolton & Menk, Inc.	Ryan Thilges	$119,789
2025RIC10	INV 645: Smart Selection of Cutting Edges: A Practical Guide for Minnesota's Cities and Counties	7/31/25	Susan Miller, SRF Consulting Group, Inc.	Joe Wiita	$48,599
2026RIC03	INV 645: Pothole Patching Best Practices	12/31/25	Chris Sagsveen, SRF Consulting Group, Inc.	Mike Cleveland	$60,590
CR 20-06	TPF-5(353): Salt Shed Design Template	12/31/24	Wilfrid Nixon, Wilfrid A. Nixon and Associates, LLC	Thomas Peters, Sheila Johnson	$125,000

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MAINTENANCE OPERATIONS [cont.]

Report Number	Title	End Date	Investigator	Technical Liaison	Total Cost
CR 21-02	TPF-5(353): Best Practices for Protecting DOT Equipment from the Corrosion Effect of Chemical Deicers	8/31/24	Xianming Shi, Washington State University	Thomas Peters	$99,985
CR 21-04	TPF-5(353): Training Module Development for Evaluation of SSI and WSI Variables	7/31/24	Randeep Kaur Sethi, Focus EduSolutions, Inc.	Thomas Peters	$31,585
CR 22-02	TPF-5(479): Best Management Practices for Liquid Chloride Storage and Pumping Systems	12/31/24	Karalyn Clouser, Montana State University, Western Transportation Institute	Thomas Peters	$75,000
CR 22-03	TPF-5(479): Effects of Additives in Deicing Salts at Lower Temperatures	2/28/25	Laura Fay, Montana State University, Western Transportation Institute	Thomas Peters	$149,993
CR 22-05	TPF-5(479): Use of Dashboards for Winter Operations	12/31/24	Ming Shiun Lee, AECOM Technical Services, Inc.	Thomas Peters	$74,477
Complete	TPF-5(479): Comprehensive Guide to Pre-Wetting Application Rates and Methods	3/31/25	Xianming Shi, Washington State University	Thomas Peters	$199,975
Complete	TPF-5(479): Determining the Migration of Chloride-Based Deicers Through Different Soil Types	10/31/25	Xianming Shi, Washington State University	Adam Wellner	$99,978
In Progress	TPF-5(479): Updating the Impact of Capital Projects Decision Support Tool	12/31/25	Clare Nelson, University of Vermont	Adam Wellner	$150,000
In Progress	INV 645: Gravel Road and Shoulder Maintenance	12/31/25	John Brunkhorst, Stonebrooke Engineering, Inc.	Mike Suska	$95,083
In Progress	Snowplow Driver Assist System Implementation Plan	12/31/25	Brian Davis, University of Minnesota	Cory Johnson	$488,623
In Progress	TPF-5(479): Evaluation of Direct Liquid Application of Salt Brine Versus Granular Salt as Measured Through Various Performance and Safety Metrics	12/31/25	David Noyce, University of Wisconsin–Madison	Adam Wellner	$125,000
In Progress	TPF-5(479): Quantifying the Economic Value of Snow and Ice Operational Success	12/31/25	Mallory Crow, AECOM Technical Services, Inc.	Adam Wellner	$98,062
In Progress	TPF-5(479): Updating the Impact of Capital Projects Decision Support Tool	12/31/25	Clare Nelson, University of Vermont	Adam Wellner	$150,000
In Progress	INV 1136: Fleet Life Cycle	1/31/26	Jennifer Shane, Iowa State University	Mike Suska	$87,068
In Progress	TPF-5(479): Using Vegetation Management Practices Near Roads to Leverage the Benefits of Solar Radiation	1/31/26	Carolyn Dindorf	Adam Wellner	$123,086
In Progress	INV 1130: Human-Centered Testing of Rear-Facing Display to Reduce Vehicle Collisions with Snowplows	2/28/26	Nichole Morris, University of Minnesota	Steven Blaufuss	$353,087
In Progress	MP-23(002): Protection of Precious Waters from Road Salt: Mitigation Through Roadside Ditch Capture	2/28/26	Stephen Druschel, Minnesota State University–Mankato	Jed Falgren	$250,884
In Progress	TPF-5(479): 23-01 Development of a Public Service Announcement (PSA) Library	3/31/26	Laura Fay, Montana State University, Western Transportation Institute	Adam Wellner	$149,957
In Progress	TPF-5(479): Salt Management Training for Non-DOT End Users	5/31/26	Andrew Wrucke, University of Minnesota–CTS	Adam Wellner	$99,837
In Progress	TPF-5(479): Clear Roads Project Management	6/30/26	Brian Hirt, CTC & Associates, LLC	Adam Wellner	$1,130,075
In Progress	INV-645: Drone Guidelines for Maintenance Use	7/31/26	Barritt Lovelace, Collins Engineers, Inc.	Tyler Stindtman	$79,110
In Progress	INV 1078: Benefit/Cost of Applying a Higher Asphalt Film Thickness (AFT) vs. Doing a Chip Seal at One Year	8/31/26	Zhanping You, Michigan Technological University	Bruce Hasbargen	$220,000

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MAINTENANCE OPERATIONS [cont.]

Report Number	Title	End Date	Investigator	Technical Liaison	Total Cost
In Progress	TPF-5(466): MnROAD Reflective Cracking Challenge	9/30/26	Eshan Dave, University of New Hampshire	Michael Vrtis	$230,499
In Progress	TPF-5(466): Flooded Pavements Assessment App—Phase II	9/30/26	Majid Ghayoomi, University of New Hampshire	Timothy Andersen	$200,234
In Progress	TPF-5(479): Toxicity Standards for the Qualified Products List	9/30/26	Laura Fay, Montana State University, Western Transportation Institute	Adam Wellner	$114,995
In Progress	INV 645: Best Practices to Deter Beavers, Muskrats and Other Animals from Obstructing Waterways	4/30/28	John Brunkhorst, Stonebrooke Engineering, Inc.	Anthony Pirkl	
In Progress	INV 645: RIC 16: Guardrail Replacement and Maintenance Guidelines: Update 2010 Resource	4/30/28	Stonebrooke Engineering, Inc.	Nick Klisch	
In Progress	INV 645: RIC07: Software Platforms for Sign Management	4/30/28	Susan Miller, SRF Consulting Group, Inc.	Joe Wilson	$61,663

Maintenance Operations Pooled Fund Studies

Study Number	Title	Lead State or Agency	Technical Liaison	Number of Participating Agencies	2025 MnDOT Contribution	Total MN Contribution
TPF-5(479)	Clear Roads Winter Highway Operations—Phase III	MN	Adam Wellner	39	$25,000	$125,000
TPF-5(347)	Development of Maintenance Decision Support System	SD	Joseph Huneke	15	$0	$279,200
TPF-5(559)	Autonomous Maintenance Technologies—Phase II	IN	Adam Wellner	11		$116,000

MATERIALS & CONSTRUCTION

Report Number	Title	End Date	Investigator	Technical Liaison	Total Cost
2024RIC06	INV 645: Synthesis of Seal Coat Research in Minnesota	3/31/25	Michael Marti, SRF Consulting Group, Inc.	Joel Ulring	$62,069
2025-24	MP-22(003): Development of Process to Lower Global Warming Potential of Construction Materials	9/15/25	Audra Morse, Michigan Technological University	Curt Turgeon	$260,278
2025-28	INV 1138: Use of Plastics in Road Materials (Paving)	6/30/25	Halil Ceylan, Iowa State University	Jim Johnson	$139,446
2025-34, 2025-47	TPF-5(443): Continuous Asphalt Mixture Compaction Assessment Using Density Profiling System	12/31/24	Jo Sias, University of New Hampshire	Kyle Hoegh	$163,234
2025-39	INV 1103: Evaluation of Proprietary Rejuvenators	6/30/25	Muhammed Kutay, Michigan State University	JinYeene Neumann	$199,336
2025-43	INV 1137: Pavement Design: Performance of Base Versus Subbase	6/30/25	Erol Tutumluer, University of Illinois	Raul Velasquez	$218,809
2025RIC14	INV 645: The Future of Weigh Tickets	12/31/25	Chris Sagsveen, SRF Consulting Group, Inc.	Michael Flaagan	$60,042
2026-05	MP-23(006): Using Electric Vehicle Onboard Data for Pavement Quality Assessment and Management	12/31/25	Mihai Marasteanu, University of Minnesota	Curt Turgeon	$261,891
2026RIC02	INV-645: Underseals	12/31/25	Michael Marti, SRF Consulting Group, Inc.	Benjamin Worel	$60,618

tables cont. ➡

MATERIALS & CONSTRUCTION [cont.]

Report Number	Title	End Date	Investigator	Technical Liaison	Total Cost
NRRA202308	TPF-5(466): Validation of Loose Mix Aging Procedures for Cracking Resistance Evaluation in Balanced Mix Design	12/31/24	Fan Yin, Auburn University	Joseph Podolsky	$100,000
NRRA202404	TPF-5(341): Long-Term Testing and Analysis on Asphalt Mix Reclaimed Asphalt Field Sections	8/31/24	Jo Sias, University of New Hampshire	Michael Vrtis	$148,981
NRRA202501	TPF-5(341): National Road Research Alliance (NRRA): An Innovative Practical Approach to Assessing Bitumen Compatibility as a Means of Material Specification	7/31/24	Eshan Dave, University of New Hampshire	Michael Vrtis	$204,119
NRRA202503	TPF-5(466): National Road Research Alliance (NRRA): Materials-Based Methods to Improve Rumble Strip Durability	6/30/26	Dan Swiertz, Asphalt Materials, Inc.	Joseph Podolsky	$99,448
NRRA202603	TPF-5(466): National Road Research Alliance (NRRA): Standardization of Stripping Inflection Point Calculation for Hamburg Wheel Tracking Test	9/30/25	Fan Yin, Auburn University	Joseph Podolsky	$47,500
NRRA202604	TPF-5(466): Cold Reclamation and Recycling Techniques to Achieve Perpetual Pavements	9/30/25	Heidi Olson, Braun Intertec Corporation	Emil Bautista	$150,002
NRRA202605	TPF-5(466): Report on 2023 MnROAD Construction Activities	11/30/25	Bora Cetin, Michigan State University	Emil Bautista, Haluk Sinan Coban	$330,000
Complete	TPF-5(341): Analysis of Long-Term Field Performance of Spray-On Rejuvenators	5/31/25	Raquel Moraes, Auburn University	Michael Vrtis	$133,912
Complete	INV 1110: Improving and Developing Pavement Design Inputs and Performance Functions for Cold Recycled Pavement Layers in Minnesota	10/31/25	Eshan Dave, University of New Hampshire	Timothy Andersen	$163,943
In Progress	INV 1128: Investigation on Mix Design of Recycled Asphalt Pavement (RAP) Materials	12/31/25	Jia-Liang Le, University of Minnesota	Eddie Johnson	$167,419
In Progress	INV 645: Spray Asphalt Rejuvenators	12/31/25	Michael Marti, SRF Consulting Group, Inc.	Steven Bot	$57,605
In Progress	INV 1107: Evaluation of Gravel Stabilizer Used on Gravel Roads and Gravel Shoulders	1/31/26	Bora Cetin, Michigan State University	Terrence Beaudry	$319,967
In Progress	Using LCA to Reduce Embodied Carbon in Pavement Infrastructure at MnDOT	1/31/26	Zhanping You, Michigan Technological University	Curt Turgeon	$346,818
In Progress	INV 645: Best Practices Addressing Elements within the Public Right of Way During Construction	2/28/26	John Brunkhorst, Stonebrooke Engineering, Inc.	Darrick Anderson	$55,888
In Progress	TPF-5(466): Performance Evaluation of Wicking Geotextiles for Improving Drainage and Stiffness of Road Foundation	2/28/26	Bora Cetin, Michigan State University	Raul Velasquez	$238,451
In Progress	TPF-5(466): Use of Recycled Materials in Pavement Preservation	2/28/26	Adriana Vargas-Nordcbeck, Auburn University	Emil Bautista	$86,319
In Progress	TPF-5(466) Instrumentation and Data Management/Analyses for Measurement While Drilling (MWD) Technology	3/28/26	Mohammadhossein Sadeghiamirshahidi	Raul Velasquez	$216,845
In Progress	INV 1095: Benefits of Preventive Maintenance	3/31/26	Basak Aldemir Bektas, Minnesota State University–Mankato	Joel Ulring	$157,926
In Progress	INV 1117: Mitigation of Tenting of Transverse Cracks and Joints in Asphalt Pavement	3/31/26	Manik Barman, University of Minnesota Duluth	Matthew Hemmila	$150,900
In Progress	TPF-5(466): Effective Use of Traffic Speed Deflectometer for Network-based and Project-based Applications	4/30/26	Soheil Nazarian, University of Texas–El Paso	Eyoab Zegeye	$150,000
In Progress	TPF-5(466): Automated 3D GPR Analysis for Concrete Pavement Evaluation	4/30/26	Kenneth Maser	Shongtao Dai	$156,905

tables cont. ➡

MATERIALS & CONSTRUCTION [cont.]

Report Number	Title	End Date	Investigator	Technical Liaison	Total Cost
In Progress	TPF-5(466): Use of Alternative Pozzolanic Materials Toward Reducing Cement Content in Concrete Pavements	4/30/26	Nick Weitzel	Maria Masten	$206,148
In Progress	INV 1124: Sawing and Sealing Joints in Bituminous Pavements to Control Cracking	6/30/26	Mihai Marasteanu, University of Minnesota	Tom Wesolowski	$160,850
In Progress	INV 1149: Impact of Asphalt Lift Thickness on Pavement Density and Durability	6/30/26	Mihai Marasteanu, University of Minnesota	Bruce Hasbargen	$173,638
In Progress	INV 1150: Long-Term Field Performance Evaluation of Chip Seals	6/30/26	Raquel Moraes, Auburn University	Joel Ulring	$136,347
In Progress	MP-21(001): Bridge Low Slump Concrete Overlay Mix Design for Mobile Mixers	6/30/26	Tyler Ley, Oklahoma State University	Kyle Fritz, Jacob Gave	$354,612
In Progress	MP-23(004): Novel Durability Screening Method for Stabilized Geomaterials	6/30/26	Bora Cetin, Michigan State University	Raul Velasquez	$324,933
In Progress	MP-24(005): Quantify the Benefits of Using Geotextiles and Geogrids to Improve the Performance of Unbound Pavement Layers	6/30/26	Erol Tutumluer, University of Illinois	Terrence Beaudry	$192,140
In Progress	MP-24(006): Vulnerability Assessments of Critical Slope Areas Using Advanced Monitoring Techniques	6/30/26	Surya S.C. Congress, Michigan State University	Raul Velasquez	$302,416
In Progress	TPF-5(466): Field Validation of Using Warm Mix Asphalt at Reduced Production Temperatures for Balanced Mix Design	6/30/26	Fan Yin, Auburn University	Emil Bautista	$160,000
In Progress	INV 645: RIC01: How to Minimize Reflective Cracking	8/31/26	Chris Sagsveen, SRF Consulting Group, Inc.	Benjamin Worel	$87,157
In Progress	TPF-5(466): Hot Rubber Seal Coating to Survive Wet and Frozen Environments	8/31/26	Zhanping You, Michigan Technological University	Joseph Podolsky	$181,912
In Progress	TPF-5(466): Validation of Loose Mix Aging Procedures for Cracking Resistance Evaluation in Balanced Mix Design—Phase IIA	9/30/26	Fan Yin, Auburn University	Joseph Podolsky	$300,000
In Progress	TPF-5(504): Communications and Meeting Support for the Continuous Bituminous Pavement Stripping Assessment Through Non-Destructive Evaluation (NDE) Technologies Pooled Fund	9/30/26	Brian Hirt, CTC & Associates, LLC	Eyoab Zegeye	$65,132
In Progress	TPF-5(466): Establishing Applicability of Nondestructive Testing (NDT) Methods for Project-Level Evaluation	10/30/26	Soheil Nazarian, University of Texas–El Paso	Kyle Hoegh	$80,000
In Progress	MP-22(005): A Synthesis of Usage and Performance of Daylighted Bases in Comparison to Edge Drains	10/31/26	Bora Cetin, Michigan State University	Bernard Izevbekhai	$244,988
In Progress	MP-24(007): Amount of Bituminous Surface Lost Each Year	11/30/26	Ramez Hajj, University of Illinois	Ethan Peterson	$188,818
In Progress	TPF-5(466): Veta Enhancements for MDMS Standardized and Web Conversion	12/26/26	George Chang, The Transtec Group, Inc.	Rebecca Embacher	$2,625,968
In Progress	TPF-5(466): Continued Monitoring of TH 6 Reclaimed Asphalt Field Sections	12/31/26	Jo Sias	Michael Vrtis	$189,960
In Progress	INV 1112: Asphalt Pavement Cracking Performance Data Analysis	1/31/27	Eshan Dave, University of New Hampshire	Shongtao Dai, Joseph Voels	$150,642
In Progress	TPF-5(466): Reducing Embodied Carbon with Mineral-Blended Polymeric Mircrospheres	1/31/27	Peter Taylor, Iowa State University	Jacob Gave	$137,486
In Progress	TPF-5(466): The Use of Alternative Cementitious Materials in Concrete Pavements	3/31/27	Prashant Ram, Applied Pavement Technology, Inc.	Thomas Burnham	$150,000
In Progress	INV 1156: Are Current Rigid Pavement Roundabout Designs Working in Minnesota?	5/31/27	Qingli Dai, Michigan Technological University	Thomas Burnham	$195,300
In Progress	Human Factors: Optimizing Crosswalks and Aesthetic Surface Treatments (Pavement Art) for Pedestrians with Disabilities	6/30/27	Nichole Morris, University of Minnesota	Ethan Peterson	$298,641

tables cont. ➡

MATERIALS & CONSTRUCTION [cont.]

Report Number	Title	End Date	Investigator	Technical Liaison	Total Cost
In Progress	INV 1169: Design Guidance and Best Practices for the Use of Light Fill	6/30/27	Mike Lanotte, Michigan State University	Andrew Witter	$132,949
In Progress	MP-25(002): Feasibility of InSAR for Continuous Monitoring of Ground Deformation and Performance Tracking of Geotechnical Assets	8/31/27	Ali Khosravi, Auburn University	Raul Velasquez	$239,709
In Progress	INV 1155: Base Stabilization Additives: Effect on Granular Equivalency—Phase II: Long-Term Performance Evaluation of Field Demonstration Site	9/30/27	Halil Ceylan, Iowa State University	Chad Hausman	$224,910
In Progress	TPF-5(466): Use of Innovative Sustainable and Durable Materials in Concrete Pavements	2/28/28	Manik Barman, University of Minnesota Duluth	Thomas Burnham	$175,000
In Progress	INV 645: RIC 05: Asphalt Pavement Design: Synthesis of Tools and Resources	4/30/28	Michael Marti, SRF Consulting Group, Inc.	Jon Pratt	$67,411
In Progress	TPF-5(522): National Partnership to Improve the Quality of Preventive Maintenance Treatment Construction and Data Collection Practices (Research)	8/31/28	Adriana Vargas-Nordcbeck, Auburn University	Joel Ulring	$1,712,363
In Progress	TPF-5(522): Improving the Quality of Preventive Maintenance Construction and Data Collection Practices	12/31/28	Choubane Bouzid, Michigan State University	Joel Ulring	$2,506,933

Materials & Construction Pooled Fund Studies

Study Number	Title	Lead State or Agency	Technical Liaison	Number of Participating Agencies	2025 MnDOT Contribution	Total MN Contribution
TPF-5(443)	Continuous Asphalt Mixture Compaction Assessment Using Density Profiling System (DPS)	MN	Kyle Hoegh	11	$0	$125,000
TPF-5(466)	National Road Research Alliance (NRRA)—Phase II	MN	Glenn Engstrom	10	$150,000	$750,000
TPF-5(504)	Continuous Bituminous Pavement Stripping Assessment Through Nondestructive Testing	MN	Eyoab Zegeye	6	$25,000	$125,000
TPF-5(522)	Improving the Quality of Preventive Maintenance Construction and Data Collection Practices	MN	Joel Ulring	23	$50,000	$250,000
TPF-5(538)	Continuous Asphalt Mixture Compaction Assessment Using Density Profiling System (DPS)—Phase II	MN	Kyle Hoegh	19	$25,000	$100,000
TPF-5(437)	Technology Transfer Concrete Consortium	IA	Maria Masten	26	$0	$60,000
TPF-5(517)	Performance-Centered Concrete Construction	IA	Maria Masten	12	$20,000	$60,000
TPF-5(544)	Technology Transfer Concrete Consortium (2025-2029)	IA	Maria Masten	33	$16,000	$80,000
TPF-5(546)	Transportation Materials Resource Center	IA	Ceren Aydin	9	$40,000	$200,000

MULTIMODAL

Report Number	Title	End Date	Investigator	Technical Liaison	Total Cost
2025-21	MP-23(013): School Times Impact on Students Walking or Biking to School: Safe Routes to School	4/30/25	Michael Levin, University of Minnesota	Kelly Corbin, Sophie Kalow	$179,187
2025RIC01	INV 645: Rural Pedestrian Crossings	12/31/24	John Brunkhorst, Stonebrooke Engineering, Inc.	Jonathan Large	$42,275

tables cont. ➡

MULTIMODAL [cont.]

Report Number	Title	End Date	Investigator	Technical Liaison	Total Cost
In Progress	TPF-5(455): National Accessibility Evaluation—Phase II	12/31/25	Eric Lind, University of Minnesota	Jacob Granholm	$2,220,000
In Progress	INV-645: Crash Benefit of Nonmotorized Facilities	2/28/26	Renae Kuehl, SRF Consulting Group, Inc.	Mark Vizecky	$99,767
In Progress	INV 645: Best Practices for Multimodal Expansion on Rural and Urbanized Roadways	4/30/28	Chris Sagsveen, SRF Consulting Group, Inc.	Erin Laberee	$77,561

Multimodal Pooled Fund Studies

Study Number	Title	Lead State or Agency	Technical Liaison	Number of Participating Agencies	2025 MnDOT Contribution	Total MN Contribution
TPF-5(455)	Access Across America: National Accessibility Evaluation—Phase II	MN	Deanna Belden	11	$36,000	$180,000
TPF-5(509)	Mid-America Freight Coalition (MAFC)—Phase IV	WI	Andrew Andrusko	10	$52,000	$156,000
TPF-5(532)	MAASTO Connected Automated Vehicle (CAV) Steering Committee	MI	Tara Olds	10	$30,000	$150,000

POLICY & PLANNING

Report Number	Title	End Date	Investigator	Technical Liaison	Total Cost
2024-12	Utilizing Arts and Culture to Mitigate the Negative Impacts of Transportation Infrastructure on Communities	7/31/24	Julie Cidell, University of Illinois	Jessica Oh	$235,702
2024-20	goMARTI MnDOT Final Report	7/31/24	Gina Baas, University of Minnesota–CTS	Thomas Johnson-Kaiser	$109,105
2024-21	INV 645: Minnesota Transportation Maintenance Careers	8/31/24	Katherine Stanley, University of Minnesota–CTS	Mark Ray	$75,625
2025-01	Interactive Map Tool: Value of Dedicated Right of Way	6/30/25	Ying Song, University of Minnesota	Amrish Patel	$151,965
2025-46	MP-23(003): Mitigating Community Harms of Dense Highway Infrastructure: Spaghetti Junctions	9/30/25	Frank Douma, University of Minnesota	William Goff	$223,339
2025RIC03	INV 645: Tools for Capital Improvement Planning	5/31/25	Susan Miller, SRF Consulting Group, Inc.	Ryan Thilges	$53,982
2025RIC04	INV 645: Template: Public Works Presentation	12/31/25	Michael Marti, SRF Consulting Group, Inc.	William Manchester	$73,237
2025RIC06	INV 645: Evaluating Local Funding in Regional Projects	6/30/25	John Brunkhorst, Stonebrooke Engineering, Inc.	Russ Matthys	$44,615
2025RIC07	INV 645: Prescriptive Right of Way FAQ	6/30/25	John Brunkhorst, Stonebrooke Engineering, Inc.	Anthony Pirkl	$84,722
2025RIC08	INV 645: Residential Roadway Widths: Best Practices Guidebook (ADA Version)	6/30/25	John Brunkhorst, Stonebrooke Engineering, Inc.	Matt Leonard	$72,000

tables cont. ➡

POLICY & PLANNING [cont.]

Report Number	Title	End Date	Investigator	Technical Liaison	Total Cost
2025RIC12	INV 645: Right of Way Acquisition Purchasing Procedures Checklist	7/31/25	Susan Miller, SRF Consulting Group, Inc.	Ryan Thilges	$76,889
2025RIC15	INV 645: Pavement Life Cycle Cost Tool Memorandum	12/31/25	Michael Marti, SRF Consulting Group, Inc.	Lyndon Robjent	$102,411
2026-02	INV 1139: Advancing Equity in Capital Investment Decision-Making	11/30/25	Frank Douma, University of Minnesota	Dillon Dombrovski	$186,505
2026-03	INV 1129: Impacts of Shared Mobility on Infrastructure Usage, Greenhouse Gas Emissions and Accessibility	2/28/26	Michael Levin, University of Minnesota	Elliott McFadden	$161,525
2026RIC01	INV-645: Commercial Driver's License (CDL) Guidance for Local Agencies: Developing an In-House Training Program	8/31/25	Renae Kuehl, SRF Consulting Group, Inc.	Josh Peterson	$60,312
Complete	INV-645: Managing Utilities in the Right of Way	1/31/25	John Brunkhorst, Stonebrooke Engineering, Inc.	Darrick Anderson	$2,259
In Progress	INV 1102: MnDOT Haul/Detour Routes: Impacts on Local Roads	12/31/25	Bora Cetin, Michigan State University	Tim Stahl	$294,389
In Progress	INV 1118: Haul Road and Detour Maintenance	12/31/25	Mihai Marasteanu, University of Minnesota	Timothy Andersen	$153,003
In Progress	INV 1141: Transitioning to Electric Vehicle Fleets: Best Practices and a Decision Tool	12/31/25	Alireza Khani, University of Minnesota	Lyndon Robjent	$188,800
In Progress	INV 645: Best Practices for Effective Completion of Crash Reports by Law Enforcement	2/26/26	Renae Kuehl, SRF Consulting Group, Inc.	Loren Hill	$85,154
In Progress	INV 645: Best Practices for Electric Vehicles Charging Stations	2/28/26	Susan Miller, SRF Consulting Group, Inc.	Chris Hartzell	$75,560
In Progress	INV 645: Effective Purchasing of Public Works Materials, Vehicles and Equipment	2/28/26	John Brunkhorst, Stonebrooke Engineering, Inc.	Sam Muntean	$59,858
In Progress	INV 645: Evaluation of Roundabout Crash Rates/Effectiveness of Roundabout Driver Education for Local Agency Use	2/28/26	Renae Kuehl, SRF Consulting Group, Inc.	Matt Wegwerth	$85,467
In Progress	INV 645: Guidance for Reducing Urban Street Signage	2/28/26	John Brunkhorst, Stonebrooke Engineering, Inc.	William Manchester	$82,930
In Progress	INV 645: Load Posting Implements of Husbandry and Emergency Vehicles for Minnesota's Local Bridge Inventory	2/28/26	Michael Marti, SRF Consulting Group, Inc.	Moises Dimaculangan	$112,895
In Progress	INV 645: Project Development Management Best Practices	2/28/26	Susan Miller, SRF Consulting Group, Inc.	Aaron Holmbeck	$75,647
In Progress	INV 645: Promoting a Career as a County/City Engineer	3/15/26	Michael Marti, SRF Consulting Group, Inc.	Lon Aune	$95,509
In Progress	INV 645: Best Practices for Developing Requests for Proposals (RFPs)	3/31/26	John Brunkhorst, Stonebrooke Engineering, Inc.	Ryan Thilges	$70,870
In Progress	Demonstrating the Potential of OEM Telematics Data for Calculation of Distance-Based Fees (Non-Research & Innovation funded)	4/30/26	Frank Douma, University of Minnesota	Peter Olson	$272,433
In Progress	INV 1151: Analyzing Truck Size and Weight Impacts on Vehicle Miles Traveled	6/30/26	Alireza Khani, University of Minnesota	Duane Hill, Laura Roads	$159,000
In Progress	INV 1148: Use of MnCORS to Support AV Operations in Rural Minnesota	8/31/26	Rajesh Rajamani, University of Minnesota	Victor Lund, Matt Wegwerth	$178,775
In Progress	INV 1152: Comparative Analysis of Grade-Separated Pedestrian Infrastructure and At-Grade Treatments	8/31/26	Michael Levin, University of Minnesota	Jesse Thornsen	$169,652

tables cont. ➡

POLICY & PLANNING [cont.]

Report Number	Title	End Date	Investigator	Technical Liaison	Total Cost
In Progress	INV 1154: Best Practice for Oversized/Overweight Vehicles	8/31/26	Lev Khazanovich, University of Pittsburgh	Rich Sanders	$149,640
In Progress	MP-24(009): Species from Feces: A New Tool to Identify Bats in Culverts and on Bridges	9/30/26	Ron Moen, University of Minnesota Duluth	Christopher Smith	$251,997
In Progress	INV 1157: Refining the Understanding of Parking Space Requirements and Their Impact on Vehicle Miles Traveled	4/30/27	Kakan Dey, Michigan State University	Mark Vizecky	$208,407
In Progress	INV 645: Development of a Minnesota County Transportation Law Book	4/30/28	Susan Miller, SRF Consulting Group, Inc.	Wayne Sandberg	$95,461
In Progress	INV 645: Managing Utility Congestion In and Out of the Rights of Way	4/30/28	John Brunkhorst, Stonebrooke Engineering, Inc.	Darrick Anderson	
In Progress	Arts and Culture for Construction Mitigation: Highway 250 in Lanesboro, Minnesota	6/28/28	Frank Douma, University of Minnesota	Kayla Dean, Hally Turner	$139,569

Policy & Planning Pooled Fund Studies

Study Number	Title	Lead State or Agency	Technical Liaison	Number of Participating Agencies	2025 MnDOT Contribution	Total MN Contribution
TPF-5(534)	Mobility Analysis and System Transportation Efficiency Research	MN	Michael Iacono	16	$35,000	$175,000
TPF-5(453)	Automated Vehicle Pooled Fund Study	OH	Cory Johnson	8	$50,000	$250,000

TRAFFIC & SAFETY

Report Number	Title	End Date	Investigator	Technical Liaison	Total Cost
2023-26	INV 1091: User-Centered Smart Traffic Sign Development Study	6/30/25	Nichole Morris, University of Minnesota	Wayne Sandberg	$240,793
2024-25	INV 1079: Development of a Smartphone App to Warn the Driver of Unintentional Lane Departure Using GPS Technology	10/31/24	Imran Hayee, University of Minnesota Duluth	Victor Lund	$147,145
2024-26	INV 1113: Toward Implementation of Max-Pressure Control on Minnesota Roads—Phase ii	10/31/24	Raphael Stern, University of Minnesota	Ben Hao	$140,034
2024-27	Assessment of Travel-Time Reliability and Operational Resilience of Metro Freeway Corridors	12/31/24	Eil Kwon, University of Minnesota Duluth	Michael Iacono	$110,500
2024-29	Implementation of Inductive Loop Signature Technology for Vehicle Classification Counts	10/31/24	Gordon Parikh, SRF Consulting Group, Inc.	Gene Hicks	$77,728
2024-31	INV 1125: Pedestrian Safety and Accessibility Best Practices for Channelized Right-Turn Lanes	12/31/24	Tim Gates, Michigan State University	Joe Gustafson	$68,160
2024-33	INV 1121: Development and Demonstration of a Novel Red-Light-Running Warning System Using Connected V2I Technology	12/31/24	Michael Levin, University of Minnesota	Victor Lund	$258,010
2024RIC03	INV 645: Mini-Roundabout FAQs	8/31/24	Michael Marti, SRF Consulting Group, Inc.	Jon Pratt	$63,784
2024RIC05	INV-645: Methods for Maintaining Pavement Marking Retroreflectivity	7/31/24	Michael Marti, SRF Consulting Group, Inc.	Girma Feyissa	$70,446
2025-27	INV 1131: Improving Safety for People Walking and Biking at Roundabouts	6/30/25	Peter Savolainen, Michigan State University	Mark Wagner	$108,011

tables cont. ➡

TRAFFIC & SAFETY [cont.]

Report Number	Title	End Date	Investigator	Technical Liaison	Total Cost
2025-30	INV 1098: Pavement Marking/Colored Pavement: Friction Differential and Product Durability	6/30/25	Mihai Marasteanu, University of Minnesota	Ethan Peterson	$152,473
2025-31	Understanding Risks and Opportunities for Ramp Metering Control in a Mixed-Autonomy Future	6/30/25	Raphael Stern, University of Minnesota	Garrett Schreiner	$148,495
2025-37	INV 1114: Analysis of School Bus Stop-Arm Violation Reporting and Enforcement in Minnesota: Lessons Learned and Opportunities for Process Improvements	6/30/25	Brian Davis, University of Minnesota	Scot Edgeworth, Mike Krukowski	$196,194
2025-41	INV 1074: Taconite as a Lower Cost Alternative High-Friction Surface Treatment to Calcined Bauxite for Low-Volume Roads in Minnesota	6/30/25	Mihai Marasteanu, University of Minnesota	Victor Lund	$322,225
2025RIC02	INV 645: Guidelines for Determining Speed Limits on Municipal Roadways	1/31/25	John Brunkhorst, Stonebrooke Engineering, Inc.	William Manchester	$17,918
2025RIC11, 2025RIC11B, 2025RIC11V	INV 645: Roundabout Ready: Drive, Walk, Pedal Right!	6/30/25	John Brunkhorst, Stonebrooke Engineering, Inc.	Zachary Johnson	$47,456
2025RIC13	INV 645: Pavement Art on Public Roads	12/31/25	Michael Marti, SRF Consulting Group, Inc.	Randy Newton	$55,966
2026-04	INV 1105: Multi-Method Investigation of Pedestrian Safety Impacts of Right-Turn Lanes	12/31/25	Curtis Craig, University of Minnesota	Bradley Estochen	$208,502
TRS2402	Administrative Rules and Structures of Speed Safety Camera (SSC) Systems	12/31/24	Chelsea Moore-Ritchie	Mark Wagner	$45,116
TRS2405	Public Education on Automated Driver Assist Systems	10/31/24	Christine Kline, CTC & Associates, LLC	Scott Meier	$19,806
Complete	TPF-5(376), 1034404, 1031010: North/West Passage Freight Task Force—Year 7	10/31/24	Erika Witzke, CPCS Transcom, Inc.	Cory Johnson	$37,154
Complete	TPF-5(506): TPF15506A: North/West Passage: Vehicle data, Mapping and Business Models	12/31/24	Athey Creek Consultants, LLC	Cory Johnson	$122,013
Complete	TPF-5(506), TPF15506B: North/West Passage Transportation Pooled Fund Study: Freight Task Force	12/31/24	Erika Witzke, CPCS Transcom, Inc.	Cory Johnson	$79,968
Complete	Vehicle Mount Debris Removal Tool	6/30/25	Dean Deeter, Athey Creek Consultants, LLC	John McClellan	$25,981
Complete	INV 645: Impacts on Design Standards Related to Speed	9/30/25	John Brunkhorst, Stonebrooke Engineering, Inc.	Mark Vizecky	$77,504
In Progress	INV 645: Safety: Developing Tools to Address Behavioral Factors	12/31/25	Renae Kuehl, SRF Consulting Group, Inc.	Sara Buermann	$93,789
In Progress	INV 1091, 88-24(186): User-Centered Smart Traffic Sign Implementation Development Study	1/31/26	Rajesh Rajamani, University of Minnesota	Wayne Sandberg	$198,058
In Progress	INV 1132: Behavioral Investigation of Temporary and Permanent Pedestrian Infrastructure	1/31/26	Curtis Craig, University of Minnesota	Mitchell Kiecker	$256,447
In Progress	INV 1146: Alternative Deicer Performance Characterization: Know Before the Snow	1/31/26	Stephen Druschel, Minnesota State University–Mankato	Joseph Huneke	$134,203
In Progress	TPF-5(506), 1055173: TPF15506C: North/West Passage Transportation Pooled Fund Study—Phase V: 19.1 Operations Task Force, Year 12	1/31/26	Dean Deeter, Athey Creek Consultants, LLC	Cory Johnson	$119,542
In Progress	Vehicle Mount Debris Removal Tool	1/31/26	Erika Witzke, CPCS Transcom, Inc.	Cory Johnson	$49,730
In Progress	MP-23(010): Enhanced Safety of Highway Construction Site Using Low-Cost, Wearable Sensor Network	2/28/26	Youjin Jang, North Dakota State University	Michelle Moser	$149,974

tables cont. ➡

TRAFFIC & SAFETY [cont.]

Report Number	Title	End Date	Investigator	Technical Liaison	Total Cost
In Progress	INV 1100: Tool to Estimate the Safety Impact of Vehicle Levels of Automation on Minnesota Roads	6/30/26	Gary Davis, University of Minnesota	Scott Meier	$109,518
In Progress	INV 1111: Identification and Assessment of Preventive Methods to Mitigate Cognitive and Physical Declines Which Influence Driving Performance of Older Drivers	6/30/26	Nichole Morris, University of Minnesota	Derek Leuer	$414,824
In Progress	INV 1140: Roadside Feature Placement and Pedestrian Safety on Low- and Intermediate-Speed Roads	6/30/26	Kakan Dey, Michigan State University	Hannah Pritchard	$180,706
In Progress	INV 1142: Speed Impacts from Roundabouts and Other Traffic Control Devices	6/30/26	Peter Savolainen, Michigan State University	Mark Wagner	$149,003
In Progress	INV 1143: Effect of Centerlines on Prevailing Traffic Speeds on Low-Speed, Two-Lane, Two-Way Roads in Urban Contexts	6/30/26	Tim Gates, Michigan State University	Kenneth Johnson	$160,000
In Progress	INV 1144: Roundabouts, J-Turns, Etc.: Understanding Their Economic Impacts	6/30/26	Ranjit Godavarthy, North Dakota State University	Derek Leuer	$131,594
In Progress	INV 1145: Rural Intersection Enhancement and Driver Behavior Study	6/30/26	Nichole Morris, University of Minnesota	Victor Lund	$240,927
In Progress	INV 1153: User Understanding of Pedestrian Hybrid Beacon Operation	6/30/26	Kakan Dey, Michigan State University	Joe Gustafson	$196,132
In Progress	FIRST Unit Vehicle-Mounted Debris Removal Device(s) and Vehicle Lighting Upgrade(s)	8/30/26	Anton Kasella	Tiffany Dagon	$160,000
In Progress	Use of Colors in Dynamic Message Signs for Both Travel Times and Static Sign Simulation	4/30/27	Ali Zockaie, Michigan State University	Terry Haukom	$223,488
In Progress	INV 1161: Evaluation of Driver Speeds After Implementation of Speed Limit Reduction on Urban Streets	6/30/27	Peter Savolainen, Michigan State University	Victor Lund	$168,204
In Progress	INV 645: Guidance for Pavement Markings on Roadways with Less Than 6,000 Average Daily Traffic	4/30/28	Michael Marti, SRF Consulting Group, Inc.	Jon Pratt	$71,839
In Progress	INV 645: RIC02: Traffic Calming Best Practices Update	4/30/28	Renae Kuehl, SRF Consulting Group, Inc.	Matt Leonard	$116,293
In Progress	INV 645: RIC14: Identify/Develop Smartphone Wayfinding Applications for Work Zones on the Local System	4/30/28	Stonebrooke Engineering, Inc.	Nick Preisler	

Traffic & Safety Pooled Fund Studies

Study Number	Title	Lead State or Agency	Technical Liaison	Number of Participating Agencies	2025 MnDOT Contribution	Total MN Contribution
TPF-5(506)	North/West Passage Transportation Pooled Fund Study—Phase V	MN	Cory Johnson	10	$30,000	$150,000
TPF-5(322)	High Occupancy Vehicle (HOV)/Managed Use Lane (MUL)	FHWA	Brian Kary	11		$75,000
TPF-5(430)	Midwest States Pooled Fund Crash Test	NE	Khamsai Yang	19	$0	$329,000
TPF-5(435)	Aurora Program (FY2020-FY2024)	IA	Joseph Huneke	19	$0	$125,000
TPF-5(438)	Smart Work Zone Deployment Initiative (FY2020-FY2024)	IA	Michelle Moser	9	$0	$50,000
TPF-5(444)	Traffic Safety Culture—Phase II	MT	Kristine Elliott	17	$0	$50,000
TPF-5(447)	Traffic Control Device Consortium—Phase III	FHWA	Tiffany Kautz	36	$10,000	$20,000
TPF-5(451)	Road User Charge America	OR	Christopher Berrens	23	$25,000	$75,000
TPF-5(487)	Transportation Management Centers Pooled Fund Study—Phase II	FHWA	John McClellan	20	$25,000	$150,000
TPF-5(489)	Safety Service Patrol Standardization and Management Practices Pooled Fund Study	FHWA	John McClellan	14	$25,000	$125,000

tables cont. ➡

Traffic & Safety Pooled Fund Studies [cont.]

Study Number	Title	Lead State or Agency	Technical Liaison	Number of Participating Agencies	2025 MnDOT Contribution	Total MN Contribution
TPF-5(490)	Evaluating New Technologies for Roads Program Initiatives in Safety and Efficiency (ENTERPRISE)—Phase III	MI	Cory Johnson	7	$30,000	$150,000
TPF-5(501)	Roadside Safety Pooled Fund—Phase III	WA	Khamsai Yang	20	$65,000	$195,000
TPF-5(518)	Implementation of Structural Data from Traffic Speed Deflection Devices	VA	Eyoab Zegeye	27	$55,000	$165,000
TPF-5(519)	Enhanced Traffic Signal Performance Measures	IN	Derek Lehrke	1	$40,000	$120,000
TPF-5(520)	Improving Traffic Detection Through New Innovative i-LST Technology Demonstration Pilot	FHWA	Gene Hicks	24	$0	$30,000
TPF-5(533)	Midwest Roadside Safety Pooled Fund Program (FY2025-FY2029)	NE	Khamsai Yang	21	$66,000	$330,000
TPF-5(545)	Smart Work Zone Deployment Initiative (2025-2029)	IA	Michelle Moser	12	$25,000	$125,000
TPF-5(547)	Traffic Safety Culture—Phase III	MT	Kristine Hernandez	19	$15,000	$75,000
TPF-5(554)	Traffic Control Device (TCD) Consortium—Phase IV	FHWA	Tiffany Kautz	29	$0	$75,000

ADMINISTRATIVE

Report Number	Title	End Date	Investigator	Technical Liaison	Total Cost
Complete	INV 916: 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	$44,660
Complete	INV 916: LRRB Technical Summaries (FY2023 and FY2024)	6/30/25	Mark Linsenmayer, CTC & Associates, LLC	Julie Swiler	$112,146
Complete	INV 924: LRRB Rebranding	6/30/25	Nate Kass, Goff Public	Julie Swiler	$12,488
Complete	INV 936: FY25 LRRB Research Need Statements	6/30/25	Michael Marti, SRF Consulting Group, Inc.	Jackie Jiran	$129,505
Complete	INV999: Office of Research & Innovation Report Publication Services (FY2024-2025)	6/30/25	Elizabeth Andrews, University of Minnesota–CTS	Julie Swiler	$117,740
Complete	MP-22(009): MnDOT Technical Summaries (FY2023)	6/30/25	Mark Linsenmayer, CTC & Associates, LLC	Julie Swiler	$153,919
Complete	TPF-5(443): Communication Coordination and Reporting for Continuous Asphalt Mixture Compaction Assessment Using Density Profiling System (DPS) Pooled Fund	6/30/25	Katie Johnson, CTC & Associates, LLC	Kyle Hoegh	$145,391
In Progress	INV 645: LRRB Outreach: Videos	12/31/25	Michael Marti, SRF Consulting Group, Inc.	Julie Swiler	$39,970
In Progress	Developing MnDOT's Innovation Culture and Best of the Best Campaign Support	1/31/26	Tammy Meehan-Russell, The Plum Catalyst	Catherine Walker	$99,730
In Progress	INV 645: Implementation of Research Findings (FY2021-2024)	3/8/26	Stonebrooke Engineering, Inc.	William Manchester	$1,150,000
In Progress	INV 645: Research Implementation Committee (RIC) Implementation of Research Findings (FY2022-2026)	3/18/26	Michael Marti, SRF Consulting Group, Inc.	William Manchester	$2,750,000
In Progress	Geometric Design Training Series	6/30/26	Katherine Stanley, University of Minnesota–CTS	None	
In Progress	INV 927: LRRB Website Hosting and Maintenance (FY2022-2023)	6/30/26	Mark Linsenmayer, CTC & Associates, LLC	Julie Swiler	$14,987

tables cont. ➡

ADMINISTRATIVE [cont.]

Report Number	Title	End Date	Investigator	Technical Liaison	Total Cost
In Progress	INV 936: LRRB Need Statements (2025-2026)	6/30/26	Michael Marti, SRF Consulting Group, Inc.	Julie Swiler	$137,632
In Progress	MnDOT Technology Transfer (T2) Material Development: Research & Innovation At-A-Glance, Other T2 Materials (FY2022-2024)	9/12/26	Brian Hirt, CTC & Associates, LLC	Julie Swiler	$174,934
In Progress	INV 916: LRRB Technology Transfer Material Development (FY2025-2027)	6/30/27	Mark Linsenmayer, CTC & Associates, LLC	Julie Swiler	$157,830
In Progress	INV 916: LRRB Research Summaries and Related Final Report Deliverables (FY2026-2027)	6/30/27	Mark Linsenmayer, CTC & Associates, LLC	Julie Swiler	$174,600
In Progress	Implementation of Research Findings: 2025-2028	4/30/28	Susan Miller, SRF Consulting Group, Inc.	Catherine Walker	$2,340,000
In Progress	Research Implementation Committee (RIC) Master Contract	4/30/28	Michael Marti, SRF Consulting Group, Inc.	Catherine Walker	$2,340,000

Administrative Pooled Fund Study

Study Number	Title	Lead State or Agency	Technical Liaison	Number of Participating Agencies	2025 MnDOT Contribution	Total MN Contribution
TPF-5(536)	TPF-5(536): Ahead of the Curve: Migration from NCHRP to AASHTO Technical Training Solutions (TTS)	LA	28			$0

DEDICATED PROGRAMS

Title	End Date	Investigator	Technical Liaison	Total Cost
0001(224): TLTAP24: Local Technical Assistance Program (LTAP) Base Operations (FFY2024)	9/30/24	Stephanie Malinoff, University of Minnesota–CTS	Kristine Elwood	$420,000
Center for Transportation Studies Operations (FY2024-2025)	6/30/25	Kyle Shelton, University of Minnesota–CTS	Catherine Walker	$5,464,454
Local Technical Assistance Program (LTAP) Base Operations (FFY2025)	9/30/25	Stephanie Malinoff, University of Minnesota–CTS	Jackie Jiran	$420,000
INV 645B: LRRB Outreach and Marketing Support (2024-2025)	1/31/26	Michael Marti, SRF Consulting Group, Inc.	Julie Swiler	$96,582
INV645B: LRRB Outreach (FY2023)	1/31/26	Michael Marti, SRF Consulting Group, Inc.	Julie Swiler	$172,973
INV 668: Local Technical Assistance Program (LTAP) Work Plan for Expanded Activities (FY2025-2026)	6/30/26	Andrew Wrucke, University of Minnesota–CTS	Jackie Jiran	$600,000

Federal Program Support

Study Number	Title	2025 MnDOT Contribution
MP-25(001)	AASHTO Technical Services Program: Transportation Performance Management (TPM)	$45,200
TPF-5(425)	National Cooperative Highway Research Program	$943,122
TPF-5(557)	Core Program Services for a Highway Research, Development and Technology Program	$170,979

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BY THE NUMBERS

29 research ideas submitted

66,513 digital library page views

800 active Technical Advisory Panel members

21,155 e-newsletter subscribers

34,000 transportation research blog visitors

17,639 library information transactions

209 active and completed research projects during FY2025

1,175 digital and print materials circulated

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OFFICE OF RESEARCH & INNOVATION

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