



Transportation Pooled Fund Project #TPF-5(353)

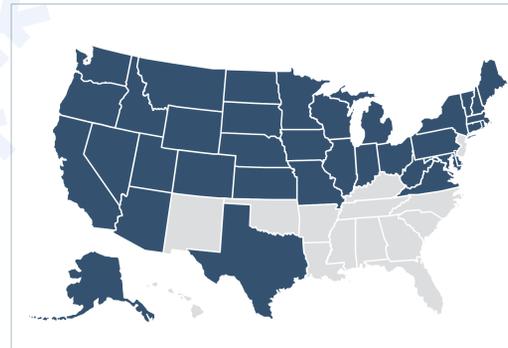
Lead state Minnesota DOT

REAL-WORLD RESULTS

The Clear Roads pooled fund project brings together **36 member states** to address shared winter maintenance challenges through research. By working together, members leverage their annual contributions into **\$900,000 in research activities** each year.

Clear Roads strongly emphasizes **real-world evaluation** of materials, equipment and methods. Research projects are designed to yield practical results that state DOTs can immediately put into practice: **reducing material use** and **environmental impacts**, and **improving efficiency** of snow and ice operations. Research activities include:

- Evaluating winter maintenance materials, equipment and methods under real-world conditions.
- Developing specifications and recommendations.
- Studying and promoting innovative techniques and technologies.
- Supporting technology transfer by developing practical field guides and training materials to promote the results of research projects.



PRACTICAL, READY-TO-IMPLEMENT RESEARCH

Snowplow Supervisor and Operator Training

Project 12-04, completed April 2017

This project created a 22-module training program that states can customize to fit their needs. The modules cover equipment and materials, principles of weather and ice, safety, environmental concerns, and winter maintenance management.



Photo by David Gonzalez, Minnesota DOT



Far-Reaching Benefits

Clear Roads has received **over 100 requests** for its Snowplow Operator and Supervisor Training materials from non-member agencies.

“Success! One county has proven less material use with just one training session for all drivers prior to last winter.”

—Allan Johnson, Wisconsin DOT

PROJECTS AND PARTNERSHIPS

Clear Roads has completed over 40 full-scale research projects since 2004. Current and recent projects include:

Recently Completed Projects

- AWSSI Enhancements in Support of Winter Road Maintenance (Feb. 2019)
- Training Video and Manual for Clearing Different Interchange Configurations and Other Geometric Layouts (Oct. 2018)
- Utilization of AVL/GPS Technology: Case Studies (July 2018)
- Training Video for the Implementation of Liquid-Only Plow Routes (June 2018)
- Emergency Operations Methodology for Extreme Winter Storm Events (May 2018)
- Equipment-Related Fatigue in Snowplow Operators (Nov. 2017)
- Best Practices for Snowplow Route Optimization (Jan. 2017)
- Cost-Benefit of Various Winter Maintenance Strategies (Sept. 2015)
- Snow and Ice Control Environmental Best Management Practices Manual (July 2015)
- Establishing Effective Salt and Anti-icing Application Rates (Feb. 2015)

In-Progress Projects

- Standard Specifications for Plow Blades with Carbide Inserts
- Integrating Advanced Technologies into Winter Operations Decisions
- Aftermarket Cameras in Winter Maintenance Vehicles
- Test Bed Software to Qualify Plug-and-Play Technology
- Mobile Sensor Technology to Assess Winter Road Conditions
- Material Application Methodologies for Winter Operations

Partnerships

- Aurora Program (road weather information systems)
- AASHTO Snow and Ice Pooled Fund Cooperative Program (SICOP)
- Pacific Northwest Snowfighters
- American Public Works Association
- Federal Highway Administration

Annual Survey of State Winter Maintenance Data

Project 15-S1 (ongoing)

Each year, Clear Roads compiles a range of winter operations data from state DOTs across the country. These metrics are displayed on an interactive map that lets states see how they compare to others in salt use, per-ton salt costs, number of plows, and more.

“This project has saved us a significant amount of time. We use it routinely for internal and external communications, comparing salt costs and equipment with other states.”

—James Morin, Washington State DOT

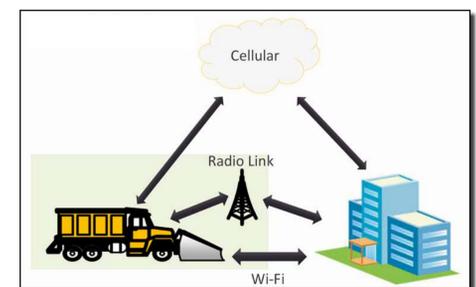


Plug-and-Play Initiative

Project 13-05 (in progress) and others

For several years, Clear Roads has led a collaborative effort to develop a universal communications protocol for in-cab electronics, allowing “plug and play” functionality regardless of the manufacturer or service provider.

This protocol will benefit both Clear Roads member states and their vendors by standardizing how critical operational data are shared on modern snow and ice vehicles, namely between compatible Automatic Vehicle Location (AVL) devices and anti-icing/deicing joystick and spreader controller systems.



Graphic courtesy of SRF Consulting Group

CONNECTIONS WITH PEERS



Clear Roads fosters connections between winter maintenance professionals across the country and around the world. Clear Roads members form a **community of practice**—peers who share effective practices and reach out to each other for advice.

Representatives from member states meet in person twice a year to select research topics, choose investigators, and manage ongoing projects.

Clear Roads provides **additional learning opportunities** for

its members by planning its in-person meetings to coincide with other national winter maintenance events when possible. In 2020, the fall meeting will coordinate with TRB’s International Conference & Workshop on Winter Maintenance and Surface Transportation Weather.



FOR MORE INFORMATION

Clear Roads is Transportation Pooled Fund Project #TPF-5(353). For more information, contact:

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