Using Pooled Funds to Benefit Minnesota: Best Practices and Successful Examples

Clear Roads Winter Highway Operations

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What is Clear Roads?

- A Pooled Fund consisting of 28 states: CA, CO, IA, ID, IL, KS, MA, ME, MI, MO, MN, MT, ND, NE, NH, NY, OH, OR, PA, RI, SD, UT, VA, VT, WA, WI, WV, WY

- Primary activities include:
  - Studying innovative winter maintenance techniques and technologies.
  - Evaluating winter maintenance materials, equipment and methods.
  - Developing specifications and recommendations.
  - Supporting technology transfer by developing practical field guides and training curriculum to utilize the results of Clear Roads research projects.
Clear Roads Pooled Fund

- Established in 2004
- WisDOT original Lead State Agency
- MnDOT Lead DOT Agency since 2010
  - Research Services
  - Consultant Services
  - Office of Aeronautics
  - Office of Maintenance
Completed Research Highlights

Calibration Accuracy of Manual and Ground-Speed-Control Spreaders
Completed Research Highlights

National Winter Driver Safety Campaign Materials

http://clearroads.org/driver-safety-resources.html
Completed Research Highlights

Cost-Benefit Analysis Toolkit

• Phase I developed the Toolkit

• Phase II added more content and usability
Completed Research Highlights

Developing a Training Video for Field Testing of Deicing Material
Completed Research Highlights

Mapping Weather Severity Zones

U.S. Winter Severity for Winter Road Maintenance

Winter Severity data as portrayed in this map were generated from gridded decreases of mean annual snowfall amounts and the mean annual durations of snowfall, freezing rain, and freezing snow depth for which maps are imperfectly included, giving approximately equal weighting to the overall severity of winter conditions. No additional analysis was done to assign a specific meaning to these overall winter severity values and are intended only to facilitate comparison between locations. More information as to the specific process used to develop this map is available from Clear Roads.
Completed Research Highlights

Determining the Toxicity of Deicing Materials
Completed Research Highlights

Environmental Factors Causing Fatigue in Snowplow Operators
Research in Progress

• Development of a Totally Automated Spreading System
• Understanding the Chemical and Mechanical Performance of Snow and Ice Control Agents on Porous or Permeable Pavements
• Comparison of Material Distribution Systems
• Establishing Effective Salt and Anti-icing Application Rates
• Snow and Ice Control Environmental Best Management Practices Manual
• Identifying Characteristics, Benefits, and Mechanisms of Commonly Used Agricultural and Mineral By-Products in the Deicer Industry
• Cost Benefit Analysis of Various Winter Maintenance Strategies
Funded Research (underway soon)

- Snowplow Operator and Supervisor Training
- Developing Test Bed Software to Qualify Plug and Play Technology
- Synthesis on GPS/AVL Equipment Used for Winter Maintenance
- Quantifying the Impact that New Capital Projects will have on Roadway Snow and Ice Control (RSIC) Operations
- Winter Severity Mapping Enhancement
Funded Research (underway soon)

- Plug and Play Phase II
- Snow Removal Performance Metrics
- Use Of Equipment Lighting During Snow Plow Operations
- Development of a Winter Driver’s Education Program
- Snow Plow Route Optimization
- Developing a Training Video and Manual for Best Practices and Techniques in Clearing Different Interchange Configurations and Other Geometric Layouts
Partnership Projects

Pacific Northwest Snowfighters
Partner with PNS to keep the specifications and the Qualified Product List (QPL) viable as a standard for other states and provinces to rely upon
http://pnsassociation.org/

National Winter Safety Campaign
A national multimedia campaign designed to educate drivers about the importance of driving safely in winter conditions.

Plug and Play Initiative
The goal was to develop specifications that would support a “plug and play” approach to integrating electronic devices and sensors on plow trucks.

Clear Roads developed an initial specification and then engaged the vendor community to get their support and input.
Partnership Projects

Knowledge Base on Winter Maintenance Research
A Wikipedia-style knowledge base on winter maintenance research.

Computer-Based Training
Worked with AASHTO/ SICOP to develop computer-based training modules that help train snow plow drivers, maintenance crews and others.
Technology Transfer Leadership

**National Winter Maintenance Peer Exchange**
Collaboration with the Aurora pooled fund, Snow and Ice Pooled Fund Cooperative Program, FHWA, and the Pacific Northwest Snowfighters.

**Winter Maintenance E-Newsletter**
A bi-monthly e-newsletter that highlights applications of winter maintenance research and technology and the latest transportation research reports by state DOTs, universities, TRB and FHWA.

**Product Experience Feedback**
An informal survey that allows states to share experiences with new or existing products.
Clear Roads Web Site www.clearroads.org

• Details about Clear Roads projects

• Resources for winter highway operations
  • Synthesis Reports
  • E-Newsletters
  • Links to partners
  • Winter Safety Campaign Materials
Key Points of Contact

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