

# State Planning and Research Program Quarterly Report

**PROJECT TITLE:** Clear Roads Administration, Research Support and Information Services

**OBJECTIVES:** Clear Roads is a pooled fund research project aimed at rigorous testing of winter maintenance materials, equipment, and methods for use by highway maintenance crews. The Clear Roads Technical Advisory Committee (TAC) contracted with CTC & Associates LLC to perform the administrative functions associated with maintaining the pooled fund project as well as information services that support technology transfer. This report summarizes activities conducted under this contract over the last three months.

**PERIOD COVERED:** April through June 2022

**PARTICIPATING AGENCIES:** Minnesota Department of Transportation

**PROJECT MANAGER:** Tom Peters

**SP&R PROJECT NO:**  
1030951

**PROJECT IS:**

**LEAD AGENCY:** MnDOT

Planning  
 Research &  
Development

**PRINCIPAL INVESTIGATOR:**  
CTC & Associates LLC

**PROJECT BUDGET:**  
\$1,037,155.52

**PROJECT EXPENDITURES TO DATE:**  
\$933,868.95

## **WORK COMPLETED:**

### **TAC Meetings**

- Attended and supported the 2022 spring virtual meeting on April 12-14. Prepared agenda, budget, meeting materials, and minutes and provided them to the TAC.
- Coordinated with MnDOT, Clear Roads partners, and hotels, caterers, and meeting space provider to plan for the fall 2022 meeting.

### **Administration and Marketing**

- Updated the Clear Roads website with current project status, project deliverables, webinars, administrative documents, and modifications to the home page.
- Maintained and updated commitments, transfers, and overall budget information for the pooled fund in coordination with MnDOT. Communicated with TAC members and their appropriate pooled fund personnel to facilitate transfers for fiscal year 2022.
- Supported efforts of TAC members, including changes in state representation. Total number of members remains at 36, however Oklahoma DOT will be joining as of October 1, 2022.

### **Information Services**

- Used Constant Contact to distribute 3 Clear Roads news posts.
- Completed work on a Beta version of the Clear Roads Snow and Ice Equipment Online Database and distributed survey for the first attempt at data collection and display.
- Updated the Clear Roads Generic Presentation to include 2022 projects along with other updates and re-posted on the members only portion of the website for use by membership.
- Completed research briefs on the following project:
  - Expanding Application Rate Guidance for Salt Brine Blends for Direct Liquid Application and Anti-icing
  - Measuring the Efficiencies of Tow Plows and Wing Plows
- Continued work on the following research briefs:
  - Understanding the NaCl Phase Diagram
  - AWSSI Enhancements
- Conducted project closeout webinars for the following projects:
  - Understanding the NaCl Phase Diagram
- Coordinated the development and performance of two train-the-trainer webinars for the Entry-Level Driver Training for Maintenance Equipment Operators project.
- Drafting two articles for the APWA Reporter.
  - The first is for the August issue and will cover the project, Entry-Level Driver Training (CDL) for Maintenance Equipment Operators.
  - The second is for the Winter issue later this year and will address recently completed Clear Roads projects that advance winter maintenance decision-making / efficiency. Those projects include:
    - Measuring the Efficiencies of Tow Plows and Wing Plows

- Synthesis of Technical Requirements and Considerations for Automated Snowplow Route Optimization
- Training Module Development for Evaluation of Storm Severity Index and Winter Severity Index Variables
- Requested products for inclusion in the Clear Roads Product Experience Survey.
- Completed literature searches for the 2022 research projects to assist with project scoping efforts.
- Continued work on an improved online deicer product submission form for vendors on the Qualified Products List webpage. Waiting for states to complete Beta testing of the online software.

## Research Support

### *New projects*

- Facilitated meetings of the project subcommittees for the following five new FY2022 projects selected during the spring meeting and drafted scopes to be submitted to MnDOT for posting as RFPs.
  - Comprehensive Guide to Pre-Wetting Application Rates and Methods
  - Best Management Practices for Liquid Chloride Storage and Pumping Systems
  - Effects of Additives in Lowering the Freezing Point of Deicing Salts
  - Evaluation of Direct Liquid Application of Salt Brine Versus Granular Salt as Measured Through Various Performance and Safety Metrics
  - Use of Dashboards for Winter Operations
- Coordinated with MnDOT, project PIs, and Clear Roads subcommittees to kick off the following FFY2021 projects:
  - Update to CR 13-04: Best Practices for Protecting DOT Equipment from the Corrosion Effect of Chemical Deicers
  - Calculating Plow Cycle Times from AVL Data
  - Determining the Migration of Chloride-based Deicers through Different Soil Types

### *Research in progress*

- Continued coordination with the PIs and subcommittees to schedule check-in teleconferences and facilitate the review of deliverables for:
  - High Performance Blade Evaluation
  - Standard Test Procedures for Ice Melting Capacity of Deicers
  - Evaluation of Indoor Automated Stockpile Measurement Systems
  - Expanded Use of AVL/GPS Technology
  - Using GIS to Highlight Highway Segments Sensitive to Deicing Materials
  - Salt Shed Design Template
  - Grip Sensor Technology and Salt Applications
  - Update to CR 13-04: Best Practices for Protecting DOT Equipment from the Corrosion Effect of Chemical Deicers
  - Efficacy, Cost, and Impacts of Non-Chloride Deicers
  - Training Module Development for Evaluation of Storm Severity Index and Winter Severity Index Variables
  - Evaluation of Electric Vehicle Technologies and Alternative Fuels for Winter Operations
  - Calculating Plow Cycle Times from AVL Data
  - Determining the Migration of Chloride-based Deicers through Different Soil Types
- Worked with the PI and subcommittee to facilitate review of final deliverables and closeout the following projects:
  - Understanding the NaCl Phase Diagram

### *Implementation*

- Developed a brief report that captures the implementation opportunities and impacts for each research project.
- Continued to provide access (251 agencies / entities) to the training modules developed by the Clear Roads project, Snowplow Operator and Supervisor Training.
- Provided access (555 agencies / entities) to the training modules developed by the Clear Roads project, Entry-Level Driver Training (CDL) for Maintenance Equipment Operators.
- Assisted Clear Roads Chair with a presentation for the Salt Symposium in August.
- Continued to facilitate implementation discussions (at the program and project level) during regular project and face-to-face meetings as appropriate.

## **SUMMARY OF ACTIVITIES EXPECTED TO BE PERFORMED NEXT QUARTER:**

- Finalize materials for, and attend / support, the fall in-person meeting in Indianapolis, IN.
- Provide support to MnDOT in responding to questions related to the 2022 RFPs.
- Coordinate the review of responses to the 2022 RFPs.
- Create a new “Tools” webpage under the “Resources” navigation tab.
- Publish a new webpage detailing Clear Roads involvement in AASHTO’s Winter Maintenance Product Proficiency Sample Program.
- Complete collection of equipment and administer the survey for the 2021-2022 Product Experience Survey.
- Continue to collect survey responses and display results for the Clear Roads Snow and Ice Equipment Online Database.
- Complete work on the following research briefs:
  - Understanding the NaCl Phase Diagram
  - AWSSI Enhancements
- Continue to send draft dissemination plans to subcommittees for their review and comment.

- Continue to update the Clear Roads website with both project and administrative information.
- Assist with coordinating and tracking funding transfers to TPF-5(479).
- Complete and submit the final report for TPF-5(218).
- Research, write, and publish winter maintenance news posts.
- Use Constant Contact to distribute the winter maintenance news posts, completed research results, and other information.
- Continue to coordinate with investigators and the Clear Roads subcommittees on projects in progress.
- Continue to coordinate the completion of post project closeout forms and research use surveys.

**STATUS AND COMPLETION DATE:**

The contract tasks are progressing as planned. The current completion date is June 30, 2023.