MINUTES

Clear Roads 2023 Spring Technical Advisory Committee Meeting
Pooled Fund Project TPF-5(479)

Tuesday, April 18 to Thursday, April 19, 2023 (Austin, Texas)

Attendees

Members	Patti Caswell, Oregon (Chair)
Marcus Zimmerman, Alaska	Dan Whetzel, Pennsylvania
Kevin Duby, Arizona	Matthew Ouellette, Rhode Island
Jamie Yount, Colorado	Dan Varilek, South Dakota
Aidan Neely, Connecticut	Matthew Heinze, Texas
Steve Spoor, Idaho	Jessica Andrews, Utah
Craig Bargfrede, Iowa	Todd Law, Vermont
Clay Adams, Kansas	AJ Younes, Virginia
Randi Feltner, Kentucky	James Morin, Washington State
Chris Landry, Maine	Jeff Pifer, West Virginia
Scott Simons, Maryland	Emil Juni, Wisconsin
Mark Goldstein, Massachusetts	Cliff Spoonemore, Wyoming
Justin Droste, Michigan	
Paul Denkler, Missouri	Partners
Doug McBroom, Montana	Rick Nelson, AASHTO SICOP
Jasmine Dondlinger, Nebraska (Chemist)	Kevin Hensley, APWA
Mike Mattison, Nebraska	
David Gray, New Hampshire	Consultant
Joe Thompson, New York	Greg Waidley, CTC & Assoc
Brad Darr, North Dakota	Kirsten Seeber, CTC & Assoc

Materials Posted

Agenda	Research Projects In-Progress
Budget	Expense Report and Guidelines
Attendees List	Texas DOT Van Schedule
Research Proposals List	Hotel Confirmation Numbers
Research Scoring Sheet	Things to do in Austin

April 18, 2023

Introductions and Meeting Objectives

Research and Synthesis Idea Presentations

Eleven (11) research proposals and eight (8) synthesis proposals were presented and discussed by TAC members. After all the proposals were presented, each voting member of the TAC submitted scores for each research / synthesis project based on each project's own merit, using a 1-5 scale (5 being the

greatest need). Those votes were tallied after day one of the meeting and presented at the beginning of day two.

1. **Synthesis – UAV Uses for Winter Maintenance**
   - Presenter: Doug McBroom, Montana (Group 1)
   - Project Summary: With Unmanned Arial Vehicles (UAV) technologies being adopted by state departments of transportation within the USA, there is very little known in terms of what, how and even if this technology is being used for winter maintenance purposes. The purpose of this synthesis is to identify any uses and gaps of UAV in winter maintenance. Additionally, this synthesis will gather information on DOTs' general use of UAV technologies within their agencies. Understanding general uses will allow DOTs to determine if any of the uses are transferable for winter maintenance uses. Understanding how states are using UAV for winter maintenance will allow Clear Road members to incorporate them into their own programs, identify gaps in uses, and possibly lead to a Clear Roads project on UAV use for winter maintenance.

2. **Synthesis – Management (retention, legislation, policies, BMPs) of Video Recordings and Images Taken from Truck-Mounted Cameras**
   - Presenter: Joe Thompson, New York (Group 1)
   - Project Summary: With the ability to record events through AVL (dash cameras and or rear facing cameras) the subsequent questions of best practices of retention and dissemination of video recordings and images can be both a help and/or a hindrance for several aspects to operations. These include, but are not limited to, FOIL requests, training aids, social media, technologies for interpreting road conditions, emergency operations, and situational awareness. This report will be a reference for snow and ice program managers when developing policy and best practice. Additionally, road condition video/images are a source for documenting the effectiveness of snow and ice practice, as well as level of service and performance management measurements.

3. **Synthesis – Using Detention Pond Evaporator Byproduct in Brine**
   - Presenter: Jessica Andrews, Utah (Group 1)
   - Project Summary: Detention Ponds in maintenance station yards are slow to evaporate naturally and some DOTs have opted to install Evaporator Units to keep ponds at manageable water levels. Hauling away water is an expensive practice and Evaporator Units provide a solution. This evaporation process produces a salty byproduct that must then be disposed of. With the express permission of the Department of Environmental Quality one special usage of this byproduct is to mix it into the regular brine solution and use it on the roadways for snow and ice control. This report will explore the past or current usage of the evaporation byproduct in brine solutions for the use of snow and ice control on roadways.

4. **The Use of Traction Control Materials (including Clinoptilolite Zeolites) for Snow and Ice Control**
   - Presenters: Doug McBroom / Jessica Andrews
   - Project Summary: Salt can be environmentally unfriendly and corrosive to vehicles, roadways, and surrounding features/assets when used for snow and ice control. Traction materials also have environmental impacts such as air and water quality issues. Traction materials are also blown off the road by traffic sometimes in as little as 3 to 4 passes which then need to be reapplied. There has been little research by Clear Roads investigating traction materials effectiveness and impact to the roadway surfaces. Additionally other traction materials such as clinoptilolite zeolites may be an alternative solution for snow and ice control in place of traditional salt products. This project will study the effectiveness of traction control materials such as clinoptilolite zeolites, for snow and ice control as an alternative to standard salt and brine applications, as well as assessing its environmental impacts.

5. **Synthesis – Methods for Pretreatment Using Salt Brine / Blends Prior to Rain that Leads to Snow**
   - Presenter: Randi Feltner, Kentucky (Group 2)
   - Project Summary: Many winter weather events in Kentucky begin as rain followed by a transition to wintry mix/snow. When an event is expected to begin as rain, the current practice in Kentucky is to not pretreat (anti-ice) with salt brine with the reason being that the brine will not be effective as it is not expected that much material will remain on the roadway surface. Questions have come recently to be deliberated if that is really the case and does any residue remain on the roadway surface. KYTC also receives media inquiries prior to most winter events to address the application and methodology of brine application for anti-icing.

6. **Synthesis – Best Management Practices to Incentivize Vendor Winter Maintenance Contracts**
   - Presenter: AJ Younes
   - Project Summary: States such as VA and MA primarily utilize Hired Equipment Contractors for snow removal services. In recent years, the recruitment of these contractors has shrunk causing VDOT to review the terms, conditions, and incentives for snow vendors. To retain vendors, VA has introduced contractual tools such as minimum guaranteed payments, bonuses, and other incentives to keep vendors in the statewide Snow Removal Program. Within VDOT, individual districts have used these incentives to solve issues that other districts have but didn't know a solution existed. To overcome this, VA compiled all contractual tools and incentives that Districts use and shared them with the rest of the state. Something similar should occur between the Clear Roads Member States to encourage the sharing of solutions for shared problems. The compiled contractual language will provide State DOTs with insight into the methods and approaches other states use for snow removal contracting.

7. **Development of a Public Service Announcement (PSA) Library**
   - Presenter: David Gray, New Hampshire (Group 2)
   - Project Summary: There is a lack of consistent messaging for the public concerning why and how states perform winter maintenance. Additionally, some messages are being distributed statewide regarding storms that may be specific to only one part of the state. State DOT Public Information Officers need a resource of prepared communication products that have been reviewed and approved by experienced winter maintenance managers. This project would create a library of Clear Roads videos and prepared messaging that a state can choose from to communicate important topics to the traveling public. These communication products (PSAs) would be short "Winter Maintenance 101" style videos / messages that would be posted on the Clear Roads Winter Driving Safety website, whose audience is the traveling public and state Public Information Officers.

8. **Synthesis – Solid and Liquid Deicer Output Confirmation**
   - Presenter: Fellow RDG members on behalf of Scott Lucas, Ohio (Group 3)
   - Project Summary: The amount of deicing material placed on the road is critical to snow and ice operations. If too much is applied, it is a waste of money and increases environmental concerns. Too little deicer may be a wasted effort and can slow down the road clearing process. This synthesis will identify and gather information about equipment and/or processes to measure dry and liquid deicer application output amounts and to feed that information back into the application hydraulics.

9. **Understanding the Performance of Various Liquid Deicing Blends**
   - Presenter: Fellow RDG members on behalf of Tom Peters, Minnesota (Group 3)
   - Project Summary: Given various available deicing products that can be blended with salt (NaCl), it would be helpful to have guidance developed to help winter maintenance professionals be wiser with their planning and decisions regarding acquisition and application of liquid deicing blends. We need to ensure the right blend of chemicals for weather and pavement conditions, so we are efficient and cost effective when treating highways.

10. **Computer Based Training (CBT) for the Clear Roads ELDT Modules**
    - Presenter: Cliff Spoonemore, Wyoming (Group 3)
    - Project Summary: Currently the Clear Roads ELDT training modules are to be used by an in-person trainer. These slides can be customized for each individual agency to provide face-to-face training with that agency's equipment. Not everyone has a trainer available to provide the ELDT training for the operators that need to obtain their CLP. There are commercial vendors that provide ELDT Theory Training for the agency operator. Having CBT modules of the ELDT theory training would allow the hiring agency to provide online training of ELDT theory material. The individual can progress at their own pace. The agency would not have to hire an ELDT theory trainer if they don't already have a trainer assigned to this task. Completing the CBT version of the ELDT theory may make it easier for the individual to pass the DMV testing for the learner's permit (CLP) for the CDL.

11. **Synthesis – Brine-Making Practices**
    - Presenter: Patti Caswell, Oregon (Group 4)
    - Project Summary: Brine-making is picking up in the United States as a means for state DOTs to minimize the use of road salt by using liquid applications when/where appropriate. Brine makers have improved in automation over time and are largely hands off. Many DOTs are making their own salt brine for road applications. As more states join the cast of brine makers, it would be helpful to understand what is needed and ways the process can be improved based on lessons learned. This synthesis will provide states that are interested in brine making a good baseline understanding of the associated challenges, benefits, limitations, and range of options available.

12. **Solar Radiation Benefits/Chloride Reduction Potential Associated with the Use of Vegetation Management Practices Near Roads**
    - Presenter: Aidan Neely, Connecticut (Group 4)
    - Project Summary: Many states are experiencing pushback from environmental groups, regulation, and legislation policy that conflicts with vegetation management practices near highways and clear zones. It has been argued that removing vegetation near highways can raise solar radiational benefits potentially resulting in reduction of snow bonding at the start of storms and increased melting times post storm, both potentially reducing chloride use. Quantifying these assumptions with research would help stabilize some vegetation management debates and give states scientific research to build vegetation management practices based on results of this study. This project would study before and after results of roadway temperatures and chloride use to gather related data to prove or disprove the assumption that vegetation management adjacent to roads does or doesn't have a direct effect on solar radiation and potential chloride use.

13. **Development of a Chloride Reduction Playbook**
    - Presenter: Fellow RDG members on behalf of Jeremy McGuffey, Indiana (Group 4)
    - Project Summary: Many states are experiencing legislation or governmental policy that is effectively meant to regulate or reduce the amount of salt used for roadway deicing. Eventually this level of regulation is expected to reach all states whether it be from a national or local directive. This project would develop a playbook that provides all known and proven strategies that can be deployed to reduce salt usage.

14. **Development of Open-Source Artificial Intelligence to Report on Road Conditions**
    - Presenter: Fellow RDG members on behalf of Jeremy McGuffey, Indiana (Group 4)
    - Project Summary: As we move to increase our capabilities and situational awareness, we can leverage technology to do things that we previously needed humans to do. Winter road condition reporting can be automated to provide management and decision makers with better situational awareness and can improve DOT response times. This project would develop an opensource artificial intelligence (AI) program that can use existing DOT data sources to predict, and map, winter

road conditions. The program would use available data sources such as, RWIS, ITS cameras, and plow dash cams to assign a road condition value.

15. **Salt Dye Investigation – McGuffey; $125,000; 18 months**
    - Presenter: Fellow RDG members on behalf of Jeremy McGuffey, Indiana (Group 4)
    - Project Summary: Follow-up to existing research. Ex. Clear Roads 13-02 and Gerbino-Bevins 2011 (UNL) Darker colored salt has proven to absorb more sunlight in the form of heat and, in turn, is more efficient at melting ice in sunny conditions regardless of the ambient temperature. The goal of this project is to determine if there are any environmentally friendly and cost-effective ways of dyeing salt and salt brine a darker color.

16. **Update to CR 14-02 Quantifying the Impact that New Capital Projects will have on Roadway Snow and Ice Control Operations**
    - Presenter: Todd Law, Vermont (Group 4)
    - Project Summary: This would be an update to CR 14-02 to include additional capital project types in the analysis which would be included in the tool for quantifying additional resource needs. It would also review and potentially update the tool if possible.

17. **Alternative Sources for Brine and Brine-Making**
    - Presenter: Patti Caswell, Oregon (Group 4)
    - Project Summary: Brine making is picking up in the United States as a means for states to minimize the use of road salt by using liquid applications when/where appropriate. Brine makers basically take clean, drinking water and add salt to reach the appropriate concentration for road applications. Other materials may be added to the salt brine as it is loaded into the application truck, such as corrosion inhibitors. Some states have looked at and may be successfully reusing wastewater, which requires permitting to determine that the waste has a beneficial use. Many state DOTs get inquiries from various manufacturers to use their waste stream including cheese, pickle, and vodka manufacturers. Still other sources could include mineral well brine (naturally occurring), oil well brine (byproduct of fracking industry), and reclaimed truck wash water. The concern is that these water sources may contain various elements and potential pollutants that may require treatment to meet state specifications or specifications for the Clear Roads Qualified Products List. This project will Identify various recycled or alternative water sources for use in brine making and determine their feasibility of use.

18. **Synthesis – Investigation of Non-Destructive De-Icing Chemicals for Preservation of Concrete Bridge Decks**
    - Presenter: Dan Varilek, South Dakota (Group 5)
    - Project Summary: It is common practice in South Dakota to utilize chlorides to remove ice from roads and bridges. Chlorides work by lowering the freezing point of the surface. For example, ice that would normally form and create a driving hazard at 30 degrees, now, will not form until 25 degrees. While removing ice from the travel way is a necessity for safe travels, chlorides and especially chloride mixes, seep into concrete surfaces and cause damage. This is a major concern for bridge decks. Damage to the concrete deck and eventual steel corrosion reduce the life of the structure. There are alternative chemicals, which also lower the surface freezing point, without causing damage to the concrete surface. The report would provide solutions and best practices for the use of non-chloride chemicals on concrete bridge decks.

19. **Quantifying the Economic Value of Snow and Ice Operational Success**
    - Presenter: Mark Goldstein, Massachusetts (Group 5)
    - Project Summary: Snow and ice budget allocations may seem high to the layperson; however, the economic benefits of these expenditures may dwarf the outlay. The goal of this project will be to compare costs associated with a state's snow and ice program to the benefits gained from those

expenditures. This analysis will be applied to different regions of the U.S to demonstrate the value of Clear Roads' states' snow and ice budgets at a time when these budgets are stretched thin.

Clear Roads Budget and Available Funds

- Income through FFY23: $1,875,000
- Expenses through FFY23: $1,492,036
- Funds available for research in 2023: $382,964
    - A new Clear Roads administration contract is programmed for 2023. This will be a two-year contract for $500,000. This will mean that there will be no funds programmed for the Clear Roads administration contract in 2024. Thus, to provide more consistent funding for Clear Roads 2023 and 2024 research, Clear Roads will allow less than half of the administration contract, or about $200,000, to be used in programming 2023 research. Therefore, funding available for research in 2023 is now about $583,000.

Recently Completed Project Report

18-02 High Performance Blade Evaluation

- Project Champion: Craig Bargfrede
- See *Slides from Final Webinars* on members only page.

Recently Completed Project Report

20-04 Expanded Use of AVL/GPS Technology

- Project Champion: David Gray
- See *Slides from Final Webinars* on members only page.

Washington State Report

- See presentation posted on members only page.

New York State Report – Joe Thompson

- See presentation posted on members only page.

Business Roundtable

- The AASHTO MaC will be in Portland, Maine July 16- 20. The Maintenance Operations working group will have a webinar ahead of the meeting again with general updates from the pooled funds. They are looking for a Clear Roads topic to showcase with a speaker.
    - ACTION ITEM: Todd Law will present on the decision support tool that was developed as part of Quantifying the Impact That New Capital Projects Will Have on Roadway Snow and Ice Control Operations (CR 14-02) and the update to this tool, which has been approved as a 2023 project.

April 19, 2023

Selection of 2023 Projects

Based on the rankings received, the TAC approved the following eight projects, including five projects for RFP and three syntheses to be completed by CTC. The total funding is estimated at $630,000. A '*' denotes that a subcommittee member is a non-voting member.

CR 23-01 Development of a Public Service Announcement Library [Score: 4.100]

- Investigator: To be determined via RFP.
- Budget Estimate: $100,000
- Chairman: David Gray
- Co-Chair: Steve Spoor

- Subcommittee: Dan Varilek, Emil Juni, Kevin Duby, Jeff Pifer, and Tom Peters

CR 23-02 Quantifying the Economic Value of Snow and Ice Operational Success [Score: 3.600]

- Investigator: To be determined via RFP.
- Estimated Budget: $100,000
- Chairman: Mark Goldstein
- Co-Chair: AJ Younes
- Subcommittee: Doug McBroom, Randi Feltner, Emil Juni, Joe Thompson, Marcus Zimmerman, Steve Spoor Matthew Heinze, and Tom Peters

CR 23-03 Update to CR 14-02: Quantifying the Impact that New Capital Projects will have on Roadway Snow and Ice Control Operations [Score: 3.333]

- Investigator: To be determined via RFP.
- Estimated Budget: $150,000
- Chairman: Todd Law
- Co-Chair: Emil Juni
- Subcommittee: AJ Younes, Joe Thompson, Chris Landry, Paul Denkler, Mark Goldstein, Matthew Ouellette, and Tom Peters

CR 23-04 Solar Radiation Benefits / Chloride Reduction Potential Associated with the Use of Vegetation Management Practices Near Roads [Score: 3.133]

- Investigator: To be determined via RFP.
- Estimated Budget: $125,000
- Chairman: Aidan Neely
- Co-Chair: Jessica Andrews
- Subcommittee: James Morin, Doug McBroom, Joe Thompson, David Gray, Kevin Duby, Rick Nelson, and Tom Peters

CR 23-05 Computer-based Training for the Clear Roads ELDT Modules [Score: 3.400]

- Investigator: To be determined via RFP.
- Estimated Budget: $75,000?
    - May be done by AASHTO's TC3.
    - Clay Adams will follow up with them on the week of 4/24.
- Chairman: Cliff Spoonemore
- Co-Chair: Clay Adams
- Subcommittee: Rick Nelson, Scott Simons, Justin Droste, Doug McBroom, Kevin Duby, Landon Mays, and Tom Peters

CR 22-S1 Synthesis: Management of Video Recordings and Images taken from Truck-mounted Cameras [Score: 3.833]

- Investigator: CTC & Associates
- Estimated Budget: $40,000
    - To be paid for using remaining funds allotted for CR 20-03.
- Chairman: Joe Thompson
- Co-Chair: Clay Adams
- Subcommittee: Matthew Ouellette, Justin Droste, Dan Whetzel, Aidan Neely, Kevin Duby, and Tom Peters

CR 22-S2 Synthesis: Brine-making Practices [Score: 3.567]

- Investigator: CTC & Associates
- Estimated Budget: $20,000

- Chairman: Patti Caswell
- Co-Chair: Marcus Zimmerman
- Subcommittee: Emil Juni, Chris Landry, Craig Bargfrede, Clay Adams, and Tom Peters

CR 22-S3 Synthesis: UAV Uses for Winter Maintenance [Score: 3.433]

- Investigator: CTC & Associates
- Estimated Budget: $20,000
- Chairman: Doug McBroom
- Co-Chair: Cliff Spoonemore
- Subcommittee: Aidan Neely, Craig Bargfrede, Todd Law, Marcus Zimmerman, Dan Varilek, and Tom Peters

MOTION (Joe Thompson; Aidan Neely seconds) – To fund the projects listed above. Motion passed. motioned to approve the projects up to number 12. move forward with the projects as discussed. Aidan seconded. Motioned carries.

Follow Up Action Items:

- Will hold on scoping the CBT project to see if it can be completed by TC3. Clay will discuss with TC3n the week of April 24
- UAV synthesis may be done as a Topic of Interest to the TAC.
- Brad Darr may conduct the synthesis on water from evaporator ponds as a Topic of Interest to the TAC.

Update on Projects in Progress

18-06: Standard Test Procedures for Ice Melting Capacity of Deicers

- **Contractor**: Washington State University
- **Subcommittee Members**: Jasmine Dondlinger, Jeff Pifer, Doug McBroom, Patti Caswell, James Morin, Tom Peters, Dave Hansen*, Rick Nelson*
- **Current End Date**: September 2023
- **Status**: The research team prepared the Standard Test Procedures, Executive Summary, and Resolution to go before AASHTO's Maintenance Committee – Technical Working Group on Maintenance Operations. That TWG recommended the IMC Test Method for approval in late July. The same documents then went before the AASHTO Committee on Materials and Pavements (CoMP), a week later. The CoMP determined they would need more time to review the test method. Preliminary voting on a recommendation for approval occurred at their meeting in November 2022. It now moves forward to concurrent voting by multiple AASHTO committees will in the summer of 2023. If fully approved by AASHTO, the IMC Test Method will be published in 2024.

20-05: Using GIS to Highlight Highway Segments Sensitive to Deicing Materials

- **Contractor**: SRF Consulting Group
- **Subcommittee Members**: Joe Thompson*, Mark Goldstein, Patti Caswell, Jessica Andrews, Dan Whetzel, Chris Landry, Jamie Yount, Laura Shanley, Tom Peters
- **Current End Date**: September 2023
- **Status**: An amendment was executed to add funds / time to allow SRF to upgrade the Geospatial Tool and provide Getting Started and Usage Guides to make the Tool more implementable. Meeting in May to demonstrate the Tool. SRF will present project at the Minnesota Water Resources Conference in October 2023.

20-06: Salt Shed Design Template

- **Contractor**: Wilfred Nixon and Associates
- **Subcommittee Members**: James Morin, Cliff Spoonemore, Dan Varilek, Craig Bargfrede, Paul Denkler, Matthew Ouellette, Alastair Probert, Mike Mattison, Tom Peters, Jim Rogers*, Pat Jeffrey*
- **Current End Date**: July 2023
- **Status**: This project will result in a set of three scalable salt shed designs that can be used as a template to meet the needs of a variety of sites throughout Clear Roads member states. The designs will account for existing building codes and state and federal regulations associated with environmental and related concerns.

21-01: Grip Sensor Technology and Salt Applications

- **Contractor**: Western Transportation Institute, Montana State University
- **Subcommittee Members**: Kevin Duby, James Morin, TBD (IN), Patti Caswell, Emil Juni, Matthew Heinze, Justin Droste, James Roath*, Tom Peters
- **Current End Date**: August 2023
- **Status**: The literature review, survey, and case studies are complete. The next step is to develop an algorithm methodology which will be used to develop a decision matrix that attempts to incorporate road condition (grip, pavement temperature) and atmospheric variables (air temperature, etc.), chemical treatments and plowing, and weather forecast data to support decision-making in winter maintenance operations.

21-02: Update to CR 13-04: Best Practices for Protecting DOT Equipment from the Corrosion Effect of Chemical Deicers

- **Contractor**: Washington State University
- **Subcommittee Members**: Todd Law, Steve Spoor, Matthew Ouellette, Jeff Pifer, Cliff Spoonemore, Chris Landry, Tom Peters
- **Current End Date**: February 2024
- **Status**: The survey and market analysis have been posted for subcommittee review. *[The survey aimed to reveal info on not only corrosion protection coatings, but also on other corrosion prevention methods, corrosion on DOT vehicles, best coatings for DOT vehicles, and lessons learned from the past. In contrast, this questionnaire for the Market Analysis aims to gather info specifically on coating systems that are currently used by not only Clear Road members but also other end users and personnel in the market. It also takes info from the Survey, such as names of widely used coatings like Fluid Film and Crown and uses them to further narrow down the selection of coatings.] The experimental plan [At least three metal substrate types, three different coating systems, and at least two deicer types (NaCl/CaCl2 blend, with or without a corrosion inhibitor) will be included and for each combination at least five corrosion coupons will be used to improve the reliability of the test results]* has also been posted for subcommittee review. A meeting is scheduled for early May to review these deliverables.

21-03: Efficacy, Costs and Impacts on Non-Cl Deicers

- **Contractor**: Western Transportation Institute, Montana State University
- **Subcommittee Members**: Doug McBroom, Craig Bargfrede, Jasmine Dondlinger, Patti Caswell, Jessica Andrews, Laura Shanley, TBD (IN), Tom Peters
- **Current End Date**: September 2023
- **Status**: The literature review and survey are complete. The PI expects to submit the QPL Evaluation and Testing Recommendations (Task 3) around mid-April. Task 3 will evaluate the Clear Roads QPL along with information collected in the literature review and survey to determine if sufficient information is provided to compare the efficacy and environmental

impacts of 7-9 non-chloride deicers or if additional environmental and performance testing should occur for some of these products.

21-04 Training Module Development for Evaluation of Storm Severity Index / Winter Severity Index Variables

- **Contractor**: Focus EduVation
- **Subcommittee Members**: James Morin, Kevin Duby, Justin Droste, James Roath*, Paul Denkler, Dan Whetzel, Scott Rattay, Kevin Hensley*, Tom Peters
- **Current End Date**: June 2023 (Amending to December 2023)
- **Status**: Task 1 (Project Initiation) and Task 2 (Implementation Plan Review) are complete. Task 3 involves the development of Instructional Plans. The research team provided the first Instructional Plan (Upper Mgmt) for subcommittee review and the project team met on March 14 to discuss. The research team is now taking the instructional plan for Upper Managers and putting it into its e-learning format and should be ready for subcommittee review in April. While this is happening, the subcommittee is reviewing the instructional plan for Managers (Module 2). Once Module 1 is complete and Module 2 has been reviewed / revised for content, the research team will put Module 2 into the e-learning format. This same process will continue for Module 3 (Supervisors). With all three Modules in e-learning format, then the only remaining tasks will be the final report and webinar.

21-06: Calculating Plow Cycle Times from AVL Data

- **Contractor**: AECOM Technical Services
- **Subcommittee Members**: Jamie Yount, David Gray, Dan Whetzel, Emil Juni, Dan Varilek, Jessica Andrews, Steve Spoor, Patti Caswell, Mike Mattison, Kevin Hensley*, Tom Peters
- **Current End Date**: April 2024
- **Status**: The literature review, survey, and user stories are complete. The project team met in early March to review the methodology. The next step is for the research team to develop a case study to demonstrate how the methodology will be used. After that an online tool framework will be developed before the final report and webinar.

21-07: Determining the Migration of Chloride-Based Deicers through Different Soil Types

- **Contractor**: Washington State University
- **Subcommittee Members**: Aidan Neely, Doug McBroom, Mark Goldstein, James Morin, Patti Caswell, Joe Thompson, TBD (IN), Matt Kraushar*, Tom Peters
- **Current End Date**: November 2023 (Amending to June 2024)
- **Status**: The literature review and survey are complete. The revised Test Plan was posted for review on 4/15. An amendment is in process.

22-01: Comprehensive Guide to Pre-wetting Application Rates and Methods

- **Contractor**: Washington State University
- **Subcommittee Members**: James Morin, Patti Caswell, Kevin Duby, TBD (IN), Aidan Neely, Doug McBroom, Joe Thompson, Dan Varilek, Tom Peters
- **Current End Date**: September 2024
- **Status**: Held the project kickoff meeting on February 24. The research team is moving forward with the literature review and drafting the survey questions for subcommittee review.

22-02: Best Management Practices for Liquid Chloride Storage and Pumping Systems

- **Contractor**: Western Transportation Institute, Montana State University

- **Subcommittee Members**: Chris Landry, Mark Goldstein, Clay Adams, Nathan Morian, Dan Whetzel, Jamie Yount, Matthew Heinze, Scott Simons, Tom Peters
- **Current End Date**: N/A
- **Status**: Provided MnDOT with the final work plan to be used for contracting on 4/16.

22-03: Effects of Additives in Deicing Salts at Lower Temperatures

- **Contractor**: Western Transportation Institute, Montana State University
- **Subcommittee Members**: Jessica Andrews, Steve Spoor, Kevin Duby, Mike Mattison and Jasmine Dondlinger, TBD (IN), Doug McBroom, Patti Caswell, Tom Peters
- **Current End Date**: August 2024
- **Status**: Held project kickoff meeting on March 22. The research team is currently working on the literature review and draft survey questions.

22-04: Evaluation of Direct Liquid Application of Salt Brine vs Granular Salt as Measured Through Various Performance and Safety Metrics

- **Contractor**: University of Wisconsin – Madison
- **Subcommittee Members**: Emil Juni, Matthew Heinze, John Oliva, Justin Droste, Joe Thompson, Jeff Pifer, Paul Denkler, Tom Peters
- **Current End Date**: N/A
- **Status**: UW-Madison's office of Research and Sponsored Programs is working on reviewing / signing contract. MnDOT will execute the contract before we schedule the project kickoff meeting.

22-05: Use of Dashboards for Winter Operations

- **Contractor**: AECOM Technical Services
- **Subcommittee Members**: Kevin Duby, Doug McBroom, Jessica Andrews, Emil Juni, Aidan Neely, Mike Mattison, Craig Bargfrede, Joe Thompson, Todd Law, David Gray, Paul Denkler, Tom Peters
- **Current End Date**: June 2024
- **Status**: Conducted project kickoff meeting on March 29. The research team is moving forward with the literature review and draft survey questions.

22-06: pH Waiver for Deicing Products and the QPL

- **Contractor**: N/A
- **Subcommittee Members**: Patti Caswell, Doug McBroom, James Morin, Jamie Yount, Steve Spoor, Jasmine Donglinger, David Gray, Tom Peters
- **Current End Date**: N/A
- **Status**: RFP was posted on March 10. Proposals were due April 7. Received one proposal from WSU, which was posted for subcommittee review on 4/15.

Operating Procedures – Updates

- Chemist travel.
  - Voted on / approved by the TAC that Clear Roads will fund the travel of a chemist to both the spring and fall face-to-face meetings.
  - Action Item: Add this to the Operating Procedures.
- Matching funds.
  - Needs to be a policy that Clear Roads doesn't provide documentation to researchers that Clear Roads funds can be used as a match to a UTC's research funds.

    - Reason: To document this, no member agency could have a conflict. Thus, extensive time / effort would need to be expended to confirm. Not enough time in CTC contract, nor do we need to burden members.
    - **MOTION** (Mike Mattison; Emil Juni seconds) – To include in the operating procedures that Clear Roads will not provide documentation for a university to use Clear Roads funds as a match for research funds. Motion carries.
- Meeting schedules.
    - Face-to-face meetings will be the 3rd week of April and September unless facility availability prevents this.
    - Action Item: Add to the Operating Procedures.
- Schedule for synthesis projects.
    - Each year, there is the possibility of the TAC asking the CR admin contractor to conduct synthesis projects – either in April or September. If synthesis projects are requested in September, then the administrative contract will need to be amended mid-year (before the regular annual summer amendment).
    - TAC discussed the possibility of…
        - Adding funds to the administrative contract to conduct a specified number of synthesis projects each year.
        - Write into the admin contract because it's not in there under Information Services now.
        - Limit synthesis proposals to Spring only.
    - Table this until MnDOT can weigh in.
- Sharing research data services.
    - Data collected as part of the research. When publishing, researchers get requests for the raw data from Journals. CR needs to be aware that the data is being requested.
    - Minnesota owns the data from the project. It's written in the research project contracts. Pre-existing intellectual proprietary belongs to the researcher.
    - A journal would have to request the data from MN and follow their procedures such as a FOI request.
    - Action Item: Will follow up with MnDOT on the procedure they want to use for sharing data from Clear Roads research projects.
- Lead state attendance.
    - Tom wanted to bring a maintenance-orientated staff person to the meetings.
    - MN not paying into the pf because they match it with work. Can't do it so want to include a second MnDOT person attend.
    - Current policy for attending meetings is one member per state. Otherwise gets too big to find a meeting space and being able to hear what's going on because room size is so big.
        - Second person can come when a member is transitioning out and a new person is taking their place.
        - Host state can bring extra staff.
    - Mark – Why wouldn't Tom hand off his role to another MN staff completely? Patti – He's agreed to be the procurement liaison for the pooled fund. Someone from MN Procurement says that a MN rep has to be at all meetings and on every project. Provides administrative input on all projects and the pooled fund overall. New member would be the voting member. Don't have to vote on this now. Talk to Tom first.
    - Steve – What is it cost to send one person to a meeting? $1,500 - $2,000. For MN it would be an extra $3,000 - $4,000 per year (two meetings).
    - **MOTION** (Doug McBroom; Craig Bargfrede seconded) To allow the lead state to send two people, one technical voting member and one administrative member, to each member. Motion carries per communication with Tom Peters and MnDOT.

Recently Completed Project Report
20-04 Expanded Use of AVL/GPS Technology

- Project Champion: David Gray
- See *Slides from Final Webinars* on members only page.

Recently Completed Project Report
21-05 Evaluation of EVT and Alternative Fuels for Winter Operations

- Project Champion: Justin Droste
- See *Slides from Final Webinars* on members only page.
- Chevron was interviewed as a part of the project. Upon reviewing the report, Chevron asked that their content be revised. Those revisions were not in line with the tone of the fact-based report, so the content from the Chevron interview was redacted.
  - Does the TAC approve the reposting of this redacted version? => Yes.
  - Action Item: Repost redacted version.

Qualified Products List Update

- Vendors are starting to get trained on how to submit products. More of them send complete packages.
- Three products were approved last year.
- Looking at three current products for approval.
- Working with CTC to develop the online deicing product submittal form for vendors.
- Revising specifications documentation this fall with minor updates for clarification.
- Have a contract in place with a vendor to scan all archived paper documents from ITD when the QPL was with Pacific Northwest Snowfighters.

Alaska State Report

- See presentation posted on members only page.

Implementation Webinars

- A goal of Clear Roads is to do research – the results of which member agencies will use. Implementation webinars can provide the information an agency needs to take the next step towards putting Clear Roads research findings into practice.
  - Rick Nelson has offered AASHTO SICOP as a resource to help set up a webinar and advertise.
  - Open it up beyond Clear Roads so others can learn.
- A state representative coordinates with CTC to facilitate the webinar.
- The first implementation webinar was on the topic of ELDT on November 16, 2022.
- Ideas for new implementation webinars:
  - CR 12-04: Snowplow Operator and Supervisor Training.
    - Kevin Duby is taking the lead. Looking for two other states to join him.
    - Panel discussion with the states talking about using the project results.
    - Schedule it for summer 2023.
    - Action Item: Kevin to send an email to the TAC to recap the webinar and ask for a couple of volunteers.
  - CR 14-02: Quantifying the Impact That New Capital Projects Will Have on Roadway Snow and Ice Control Operations.
    - ACTION ITEM: Todd Law will do an implementation webinar on this topic.
  - CR 20-07: AWSSI Enhancements, Phase 2.
    - How to use it at an agency.

- Action Item: Chris Landry will see if Brian Burne will do this webinar before he retires.

Research Use Surveys.

- Focused on a single project.
- They are administered a year or more after the project has finished, which allows states to have enough time and experience with the project results.
- Survey results are not being used by Clear Roads members.
- Clear Roads Research Implementation Survey, which is administered every three years, is essentially accomplishing the same goal.
- Clear Roads Chair recommends we stop conducting Research Use Surveys.

April 20, 2023

FHWA Adaptive Route Optimization Forum – Neal Hawkins, IA State

- See presentation and recording posted on the members only page.

Future Meetings

2023

Fall Meeting: Salt Lake City, UT. Week of September 18 or 25.

- Details to draft an RFB have been submitted to MnDOT.
- Backup: Kalispell, MT.

2024

Spring Meeting: Annapolis, MD. Week of April 15th.

- Details to draft an RFB have been submitted to MnDOT.
- Maryland DOT has already scouted the area hotels.
- Backup: Blacksburg or Richmond, VA.

Fall Meeting: Kalispell, MT. Week of September 16th.

- Details to draft an RFB will be submitted this summer.
- Backup: Boise, ID.

2025

Spring Meeting: Blacksburg or Richmond, VA. Week of April 14.

National Winter Maintenance Peer Exchange (Fall): Location and date TBD.

- Boise could be a backup. There is a hotel and the convention center that would work.
- **MOTION**: (Cliff Spoonemore; Clay Adams seconds) That Clear Roads supports a PE in fall 2025. Motion carries.

SICOP Report

- See Update posted on members only page.

APWA Report

- See Update posted on members only page.

FHWA Report

- Sent a PPT that is posted on the members only page.

Chair and Vice Chair Elections

- Chair: Craig Bargfrede, Iowa.
- Vice Chair: Doug McBroom, Montana.
- Vice Chair (in waiting): Kevin Duby, Arizona.