



MINUTES

Clear Roads 2022 Technical Advisory Committee Meeting
 Pooled Fund Project TPF-5(479)

Tuesday, September 20 to Thursday, September 22, 2022
 Indiana Government Conference Center
 302 W Washington Street, Indianapolis, IN 46204

Marcus Zimmerman, Alaska Kevin Duby, Arizona Jamie Yount, Colorado Steve Spoor, Idaho Jeremy McGuffey, Indiana Craig Bargfrede, Iowa Clay Adams, Kansas Randi Feltner, Kentucky Brian Burne, Maine Chris Landy, Maine Sandi Sauter, Maryland Josh Stonesifer, Maryland	Mark Goldstein, Massachusetts Justin Droste, Michigan Bob Vasek, Minnesota Paul Denkler, Missouri Doug McBroom, Montana Jasmine Dondlinger, Nebraska David Gray, New Hampshire Tina Crowley, New York Scott Lucas, Ohio Alex Calvillo, Oklahoma Patti Caswell, Oregon Bill Jennueh, Pennsylvania	Joe Bucci, Rhode Island Matt Ouellette, Rhode Island Dan Varilek, South Dakota Matt Heinze, Texas Rhett Arnell, Utah Todd Law, Vermont AJ Younes, Virginia Jeff Pifer, West Virginia Emil Juni, Wisconsin Cliff Spoonemore, Wyoming Kevin Hensley, APWA Kirsten Seeber, CTC Greg Waidley, CTC
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September 20, 2022

Introductions and Meeting Objectives

- Welcome and opening remarks (JD Brooks, Deputy Commissioner of Operations, Indiana DOT)
- Introductions
 - Alex Calvillo, Oklahoma – New state
 - Randi Feltner, Kentucky – Guest state
 - New representatives
 - Alaska – Marcus Zimmerman has replaced Pat Carrol.
 - Maine – Chris Landry is replacing Brian Burne.
 - Maryland – Josh Stonesifer is replacing Sandi Sauter.
 - Missouri – Paul Denkler is replacing Todd Miller.
 - Pennsylvania – Bill Jennueh is replacing Jon Fleming.
 - Rhode Island – Matthew Ouellette is replacing Joe Bucci.
 - Representatives standing in for permanent TAC members
 - Minnesota – Bob Vasek standing in for Tom Peters.
 - Nebraska – Jasmine Dondlinger standing in for Tom Renninger.
 - Texas – Matthew Heinze standing in for James Stevenson.
 - Virginia – AJ Younes standing in for Joe Williams.
 - Members not able to attend in-person

- California – John Oliva
 - Connecticut – Aidan Neely
 - Illinois – Laura Shanley
 - Nevada – John Angel
 - Washington – James Morin
 - FHWA – Tony Coventry
 - NPRA – Bård Nonstad
 - SICOP – Rick Nelson
- Reviewed Clear Roads’ goals and activities and the agenda.

Proposal Discussions

The TAC reviewed and evaluated proposals for the following projects. Names which are underlined indicate project champion(s).

1. 22-01: Comprehensive Guide to Pre-Wetting Application Rates and Methods

- **Presenter:** Patti Caswell, Oregon
- **Proposals:** Washington State University [Since only one proposal was submitted, Clear Roads only needs to decide if they are willing to accept this proposal. No need to complete technical scoring form or meet with MnDOT]
- **Project Subcommittee:** James Morin, Patti Caswell, Kevin Duby, Jeremy McGuffey, Aidan Neely, Doug McBroom, Tina Crowley, Dan Varilek, and Tom Peters.
- **Motion to award WSU team (Cliff S). Seconded (Doug M). Motion passes.**

2. 22-02: Best Management Practices for Liquid Chloride Storage and Pumping Systems

- **Presenter:** Brian B and Chris L, Maine
- **Proposals:** None. [Since no proposal was submitted, we have 2 options: 1) Cancel project or, 2) repost RFP. If we repost, we’ll need to slightly modify scope and / or identify investigators for MnDOT to target with new RFP.]
- **Project Subcommittee:** Chris Landry, Mark Goldstein, Clay Adams, Nathan Morian, Bill Jennueh, Jamie Yount, James Stevenson, and Tom Peters.
- **Next Steps:** Greg W will work with Chris L and Mark G and reach out to potential investigators (Laura Fay, AECOM, SRF, Wilf N) to determine reasons for them not applying. Based on feedback, Clear Roads will re-post this RFP.

3. 22-03: Effects of Additives in Lowering the Freezing Point of Deicing Salts

- **Status:** Additional scoping / funds were needed before this project was ready to be posted as an RFP. Requisition form with SoW was sent to MnDOT on 9/12 to be posted as an RFP.
- **Project Subcommittee:** Rhett Arnell, Steve Spoor, Kevin Duby, Tom Renninger (Jasmine Dondlinger), Jeremy McGuffey, Doug McBroom, Patti Caswell, and Tom Peters.

4. 22-04: Evaluation of Direct Liquid Application of Salt Brine Versus Granular Salt as Measured Through Various Performance and Safety Metrics

- **Presenter:** Emil J, Wisconsin
- **Proposals:** University of Wisconsin – Madison [Since only one proposal was submitted, Clear Roads only needs to decide if they are willing to accept this proposal. No need to complete technical scoring form or meet with MnDOT]
- **Project Subcommittee:** Emil Juni, James Stevenson, John Oliva, Justin Droste, Tina Crowley, Jeff Pifer, Paul Denkler, and Tom Peters.

- **Motion to award UW-Madison team (Cliff S). Seconded (Jeremy M). Motion passes.**

5. 22-05: Use of Dashboards for Winter Operations

- **Presenter:** Kevin D, Arizona
- **Proposals:** AECOM, Resource Data, SRF, Texas A&M Transportation Institute, University of Vermont.
- **Project Subcommittee:** Kevin Duby, Doug McBroom, Rhett Arnell, Emil Juni, Aidan Neely, Scott Lucas, Craig Bargfrede, Tina Crowley, Todd Law, David Gray, Paul Denkler, and Tom Peters.

Recently Completed Project Reports

- 19-01 Expanding Application Rate Guidance for Salt Brine Blends for Direct Liquid Application and Anti-icing (Emil J, Wisconsin)
- 19-03 Measuring the Efficiencies of Tow Plows and Wing Plows (Doug M, Montana)

Industry Reports

- FHWA – Tony Coventry
- APWA – Kevin Hensley

Implementation Webinars

- Clear Roads will conduct a pilot webinar on November 16, 2022, focused on the implementation of the Entry-Level Driver Training modules. The webinar will be recorded and posted on the project page. The invitation for this first webinar will not be shared outside of the Clear Roads member states. We will revisit this issue with subsequent webinars.
- If the pilot webinar is a success, schedule another one in February 2023.

Clear Roads Budget

Overview of TPF-5(479)

- Need the FFY2022 contributions
- Income = \$700,00
- Total committed = \$950,000
- Expenses = \$886,440.45
- TPF-5(353) = Approximately \$100k remaining.
 - **Motion to fund a project related to pH Waivers and the QPL to help in spending down (353) pooled fund (Clay A). Seconded (Scott L). Motion passes.**
 - Project subcommittee (also QPL subcommittee): Jasmine D (NE), Doug M (MT), Patti C (OR), Steve S (ID), Tyler W (CO), David G (NH), James M (WA), AJ Y (VA), and Tom P (MN).

Roundtable

- Experiences with sodium chloride blended with 10% Calcium Chloride.
- Experiences / hiring practices related to disabled equipment operators. Justin D.
- Knowledge sharing related to Entry-Level Driver Training. as they are looking to get their CDL training stood up? Joe B and Scott L. willing to help.
- Snowplow operator hours and compensation.
- Salt vendor contracts.
- Field studies testing corrosion inhibitors.

September 21, 2022

Update on Projects in Progress

18-02: [High Performance Blade Evaluation](#)

- **Contractor:** University of Akron
- **Subcommittee:** [Craig Bargfrede](#) (IA), [James Morin](#) (WA), Joe Bucci (RI), Scott Lucas (OH), Justin Droste (MI), Aidan Neely (CT), David Gray (NH), Tom Peters (MN)
- **End Date:** January 2023
- **Status:** Due to difficulties with the initial field-testing plan, the contract was amended to focus on laboratory testing of Joma blades (some field-testing data from North Dakota will be included in the report). The project team has received blades from Iowa, North Dakota, Pennsylvania, and Delaware. The lab testing has been completed and the PI is developing a blade testing protocol, cost-benefit analysis, and a quick reference guide based on the results of these tests. The draft final report should be available in the next couple of months.

18-06: [Standard Test Procedure for Ice Melting Capacity of Deicers](#)

- **Contractor:** Washington State University
- **Subcommittee:** [Tom Renninger](#) (NE) ([Jasmine Dondlinger](#) (NE)), [Jeff Pifer](#) (WV), Doug McBroom (MT), Patti Caswell (OR), James Morin (WA), Scott Lucas (OH), Jeremy McGuffey (IN), Tom Peters (MN), Dave Hansen (NE), Rick Nelson (SICOP)
- **End Date:** February 2023
- **Status:** The second round of round robin testing is complete. 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 will occur at their meeting in November 2022. If they move it forward, then concurrent voting by multiple AASHTO committees will occur in the summer of 2023. If fully approved by AASHTO, the IMC Test Method will be published in 2024.

20-03: [Evaluation of Indoor Automated Stockpile Measurement Systems](#)

- **Contractor:** CTC & Associates
- **Subcommittee:** [James Morin](#) (WA), [James Stevenson](#) (TX), Todd Miller (MO), Rhett Arnell (UT), Scott Lucas (OH), Jeremy McGuffey (IN), Emil Juni (WI), Alastair Probert (DE), Justin Droste (MI), Tom Peters (MN)
- **End Date:** November 2022
- **Status:** CTC has completed data collection and analysis of the performance of the various systems under study. A draft final report was provided to the subcommittee prior to the fall meeting.

20-04: [Expanded Use of AVL/GPS Technology](#)

- **Contractor:** AECOM Technical Services
- **Subcommittee:** [David Gray](#) (NH), [Steve Spoor](#) (ID), Aidan Neely (CT), Justin Droste (MI), Jeremy McGuffey (IN), John Oliva (CA), Laura Shanley (IL), Tom Peters (MN), Kevin Hensley (APWA)
- **End Date:** February 2023

- **Status:** An executive summary, survey results, case studies, conclusions, and recommendations for brands or types of AVL/GPS equipment to acquire, multi-season uses for such units, cost-benefits associated with multi-season use of units, mechanical and system transfer processes for recommended equipment, and data collection uses for such units.

20-05: [Using GIS to Highlight Highway Segments Sensitive to Deicing Materials](#)

- **Contractor:** SRF Consulting Group
- **Subcommittee:** [Joe Thompson \(NY\)](#) ([Tina Crowley \(NY\)](#)), [Mark Goldstein \(MA\)](#), Patti Caswell (OR), [Rhett Arnell \(UT\)](#), [Jon Fleming \(PA\)](#), [Brian Burne \(ME\)](#), [Jamie Yount \(CO\)](#), [Laura Shanley \(IL\)](#), [Tom Peters \(MN\)](#)
- **End Date:** (Extending to) March 2023
- **Status:** An amendment has been submitted (already approved by Clear Roads) 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.

20-06: [Salt Shed Design Template](#)

- **Contractor:** Wilf Nixon and Associates
- **Subcommittee:** [James Morin \(WA\)](#) ([Jim Rodgers \(WA\)](#)), [Cliff Spoonemore \(WY\)](#), [Dan Varilek \(SD\)](#), [Craig Bargfrede \(IA\)](#), [Todd Miller \(MO\)](#), [Joe Bucci \(RI\)](#), [Alastair Probert \(DE\)](#), [Tom Renninger \(NE\)](#), [Tom Peters \(MN\)](#), [Pat Jeffrey \(MN\)](#)
- **End Date:** January 2023
- **Status:** The project team has met to review the survey results and discuss considerations for the various salt shed designs. The PI plans to submit the Design Analysis and Recommendations document to the subcommittee by the middle of October. From there the PI will draft the shed design templates and sizing tool. Once those deliverables are approved, then the final report and webinar may be completed. This will likely take at least until the end of the first quarter of 2023, if not later. An amendment (no-cost) will be forthcoming.

21-01: [Grip Sensor Technology and Salt Applications](#)

- **Contractor:** Western Transportation Institute, Montana State University
- **Subcommittee:** [Kevin DUBY \(AZ\)](#), [James Morin \(WA\)](#), [Jeremy McGuffey \(IN\)](#), Patti Caswell (OR), [Emil Juni \(WI\)](#), [James Stevenson \(TX\)](#), [Justin Droste \(MI\)](#), [James Roath \(MI\)](#), [Tom Peters \(MN\)](#)
- **End Date:** August 2023
- **Status:** The subcommittee received the Literature Review and Survey Questions over the summer and met with the research team in early September to review these deliverables. Survey will be administered over the fall.

21-02: [Update to CR 13-04: Best Practices for Protecting DOT Equip. from the Corrosion Effect of Chemical Deicers](#)

- **Contractor:** Washington State University
- **Subcommittee:** [Todd Law \(VT\)](#), [Steve Spoor \(ID\)](#), [Joe Bucci \(RI\)](#), [Jeff Pifer \(WV\)](#), [Cliff Spoonemore \(WY\)](#), [Chris Landry \(ME\)](#), [Tom Peters \(MN\)](#)
- **End Date:** February 2024
- **Status:** The initial stages of the project have the research team conducting a survey of the Clear Roads TAC and the Snow and Ice Listserv. The emails to the SILS went out on 8/21, while the survey to the TAC was sent out on 8/30.

21-03: [Efficacy, Cost, and Impacts of Non-Chloride Deicers](#)

- **Contractor:** Western Transportation Institute, Montana State University
- **Subcommittee:** [Doug McBroom](#) (MT), [Craig Bargfrede](#) (IA), Jasmine Dondlinger (NE), Patti Caswell (OR), Rhett Arnell (UT), Laura Shanley (IL), Jeremy McGuffey (IN), Tom Peters (MN)
- **End Date:** September 2023
- **Status:** The project team met on 9/12 to review the results of the Literature Review and draft agency and vendor surveys. Feedback is due the week of 9/26 for each of the deliverables.

21-04: [Training Module Development for Evaluation of Storm Severity Index and Winter Severity Index Variables](#)

- **Contractor:** Focus EduVation
- **Subcommittee:** [James Morin](#) (WA), [Todd Miller](#) (MO), Bill Jennueh (PA), Kevin Duby (AZ), Justin Droste (MI), James Roath (MI), Scott Rattay (OR), Kevin Hensley (APWA), Tom Peters (MN)
- **End Date:** June 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 will provide the first Instructional Plan (Upper Mgmt) for subcommittee review in October. Once revised, the Upper Mgmt Instructional Plan will be converted into the first draft module, while the Instructional Plan for Middle Mgmt is drafted and reviewed by CR. This will continue with the final instructional plan for Operators. All three modules will move through the tasks in a staggered manner.

21-05: [Evaluation of Electric Vehicle Technologies and Alternative Fuels for Winter Operations](#)

- **Contractor:** Matrix Consulting Group
- **Subcommittee:** [Justin Droste](#) (MI), [Joe Bucci](#) (RI), Aidan Neely (CT), Scott Lucas (OH), Jeff Pifer (WV), James Stevenson (TX) (Zeke Reyna (TX) and James Kuhr (TX)), Jeremy McGuffey (IN), Tom Peters (MN), Mike Cirks (MN)
- **End Date:** March 2023
- **Status:** Task 1 (Project Initiation) is complete. Multiple tasks are currently ongoing, including drafting a Fleet Profile document (Task 2), an Industry Best Management Practices Checklist (Task 3), Historical Fuel Commodity Transitions Assessment (Task 4), Alternative Fuel Use Practices Survey report (Task 5), and they are also pulling together a draft interview questions and an of OEM Suppliers List (Task 6) in preparation for those interviews.

21-06: [Calculating Plow Cycle Times from AVL Data](#)

- **Contractor:** AECOM Technical Services
- **Subcommittee:** [Jamie Yount](#) (CO), [David Gray](#) (NH), Bill Jennueh (PA), Emil Juni (WI), Dan Varilek (SD), Rhett Arnell (UT), Steve Spoor (ID), Patti Caswell (OR), Kevin Hensley (APWA), Tom Peters (MN)
- **End Date:** April 2024
- **Status:** Project team met on 8/12 to review the Literature Review and survey questions. The survey questions were revised based on discussion during the meeting. The survey will be distributed to multiple organizations via SurveyMonkey.

21-07: [Determining the Migration of Chloride-Based Deicers through Different Soil Types](#)

- **Contractor:** Washington State University
- **Subcommittee:** Aidan Neely (CT), Doug McBroom (MT), Mark Goldstein (MA), James Morin (WA), Patti Caswell (OR), Tina Crowley (NY), Jeremy McGuffey (IN), Matt Kraushar (IN), Tom Peters (MN)
- **End Date:** November 2023
- **Status:** Draft survey questions were submitted by the research team for subcommittee review. Survey will be distributed in September. Draft Literature Review will be submitted by end of September.

22-S1 [Corrosion and Connectors Don't Mix](#)

- **Contractor:** CTC & Associates
- **Subcommittee:** Cliff Spoonmore (WY), Jeff Pifer (WV), Steve Spoor (ID), Tom Renninger (NE), Chris Landry (ME), Dan Varilek (SD), and Tom Peters (MN)
- **End Date:** December 2022
- **Status:** The survey was distributed to members of Clear Roads, the Snow and Ice Listserv, and the Norwegian Public Roads Administration. Twenty-seven responses have been received from 26 different agencies including state DOT, cities, and foreign countries. In addition to these survey responses, CTC was contacted by a vendor providing KOATE, a “rust and corrosion shield for salt and sand spreaders.” The draft report will include the information provided by this vendor. CTC will begin preparing the draft report. Delivery of the draft report is anticipated by November 4.

State Reports

- Mark Goldstein, Massachusetts
- AJ Younes, Virginia

Recently Completed Project Reports

- 19-04 Synthesis of Technical Requirements and Considerations for Automated Snowplow Route Optimization (Scott L, Ohio)
- 20-02 Understanding the NaCl Phase Diagram (Brian B, Maine)

QPL Update

Patti Caswell, Oregon

Roundtable

- Researchers are offering Amazon gift cards for survey completion. They're not using Clear Roads funds, but their own discretionary funds. Many states don't allow this.
 - **Motion: Clear Roads projects will not include promotional incentives (Cliff S). Seconded (Craig B). Motion passes.**
- Inviting a chemist to the spring meetings to address projects that involve chemistry.
 - **Motion: Invite a chemist to the fall meetings. CR would pay their way. The TAC has previously approved having a chemist at the spring meetings (Doug M). Seconded (Steve S). Motion passes.**

Future Meetings

2023

- Spring: Austin, TX; April 18 – 20.
- Fall: Salt Lake City, UT; September 19 – 21.
 - SICOP – Winter Maintenance Peer Exchange may occur in fall 2023. CR TAC would need to approve funding for the peer exchange.
 - Backup: Kalispell, Montana.

2024

- Spring: Annapolis, MD; April 16 – 18.
 - Backup: Blacksburg or Richmond, VA.
- Fall: Kalispell, MT; September 17 – 19.

2025

- Spring: Blacksburg or Richmond, VA; April 22 – 24.

Set spring and fall meetings the same weeks of April and September every year.

- **Motion to set the spring and fall meetings the third weeks of April and September each year (Doug M). Seconded (Jeremy M). Motion passes.**

September 22, 2022

State Reports

- Scott Lucas, Ohio
- Rhett Arnell, Utah
- David Gray, New Hampshire
- South Dakota, Dan Varilek

SICOP Report

- Rick Nelson
 - Maintenance Committee meeting – new snow and ice guide was approved to be an AASHTO Guide. AASHTO should be publishing it soon. Will replace the current one that is about 12 years old.
 - Snow and Ice Guidelines (NCHRP project) – Also accepted as AASHTO Guide.
 - One of these is for S&I Control and the other is S&I Control Performance Measures.
 - SICOP is looking to retool their steering committee.
 - NWMPE - Need to define what the objectives will be. Recommends that CR, Arora, and SICOP plan a joint meeting to begin planning efforts.

Proficiency Sample Programs

- Jasmine Dondlinger, Nebraska