



MINUTES

Clear Roads 2021 Technical Advisory Committee Meeting
 Pooled Fund Project TPF-(353)

Tuesday, September 21 to Thursday September 23, 2021 (Hybrid Meeting)

Pat Carroll, Alaska DOT/PF Kevin Duby, Arizona DOT John Oliva, Caltrans Jamie Yount, Colorado DOT Aidan Neely, Connecticut DOT Alastair Probert, Delaware DOT Steve Spoor, Idaho TD Laura Shanley, Illinois DOT Craig Bargfrede, Iowa DOT Jeremy McGuffey, Indiana DOT Clay Adams, Kansas DOT Brian Burne, Maine DOT Christopher Landry, Maine DOT Mark Goldstein, Mass DOT Justin Droste, Michigan DOT	Tom Peters, Minnesota DOT Todd Miller, Missouri DOT Paul Denkler, Missouri DOT Doug McBroom, Montana DOT Jasmine Dondlinger, Nebraska DOT Brad Darr, North Dakota DOT Øystein Larson, NPRA Bård Nonstad, NPRA Nathan Morian, Nevada DOT David Gray, New Hampshire DOT Tina Crowley, New York State DOT Jon Fleming, Pennsylvania DOT Scott Lucas, Ohio DOT Patti Caswell, Oregon DOT Joe Bucci, Rhode Island DOT	Daniel Varilek, South Dakota DOT James Stevenson, Texas DOT Rhett Arnell, Utah DOT Todd Law, Vermont AOT AJ Younes, Virginia DOT James Morin, Washington State DOT Cody Churchill, Wisconsin DOT Emil Juni, Wisconsin DOT Steve Krebs, Wisconsin DOT Jeff Pifer, West Virginia DOT Cliff Spoonmore, Wyoming DOT Kevin Hensley, APWA Rick Nelson, SICOP Kirsten Seeber, CTC & Associates Greg Waidley, CTC & Associates
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Materials Distributed

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|------------------------------|------------------|
| Agenda | TAC Email List |
| Attendees List | TAC Contact List |
| Budget | PDH Certificate |
| Research Proposals | COVID Memo |
| Projects In-Progress | Expense Report |
| Project Subcommittee Members | |

September 21, 2021

Introductions and Meeting Objectives

Proposal Discussions

The full TAC reviewed and evaluated proposals. This feedback was provided to the project selection committees prior to the selection committees submitting their scores to MnDOT in October.

- 21-01: Grip Sensor Technology and Salt Application**
 - Presenter:** Kevin Duby, Arizona DOT
 - Proposals:** Montana State University; National Center for Atmospheric Research; Wilf Nixon.
- 21-02: Update to CR 13-04: Best Practices for Protecting DOT Equipment from the Corrosive Effect of Chemical Deicers**

- **Presenter:** Todd Law, Vermont AOT
- **Proposal:** Washington State University

3. 21-03: The Efficacy and Environmental Impact of Non-Chloride Deicers

- **Presenters:** Doug McBroom, Montana DOT
- **Proposals:** None.

4. 21-04: Training Module Development for CR 18-03 Evaluation of SSI/WSI Variables

- **Presenter:** James Morin, Washington State DOT
- **Proposals:** FocusEduVation; Montana State University; Wilf Nixon.

5. 21-05: Synthesis – Evaluation of Electric Vehicle Technologies for Winter Operations

- **Presenter:** Justin Droste, Michigan DOT
- **Proposal:** Matrix Consulting Group

6. 21-06: Calculated Plow Cycle Times from AVL Data

- **Presenter:** Jamie Yount, Colorado DOT
- **Proposals:** AECOM; KCI; National Center for Atmospheric Research; Quetica; SRF Consulting Group; University of Utah.

7. 21-07: Determining the Migration of Chloride-based Deicers through Different Soil Types Adjacent to Chloride-treated Roadways

- **Presenter:** Aidan Neely, Connecticut DOT
- **Proposals:** Ohio University; Washington State University.

Clear Roads Budget

- Last year of the current pooled fund, TPF-5(353).
- Income: \$4,509,914.
- Expenses: \$4,503,047.
- Available Funds: \$6,867.

State Reports

- Missouri and Colorado

Business Roundtable (topics discussed)

- Drifting snow
- Workforce issues
- Use of Tenco extended wing plow
- Plan to meet FMCSA's deadline related to CDL certification
- Salt prices
- Brine makers (possible next item to add to CR Online Equipment DB)
- Solar panel snow fence
- Commodity contracts
- Liquid deicer specifications for contracting
- Agricultural products
- QPL and product performance
- Implementation

September 22, 2021

Update on Projects in Progress

18-02: High Performance Blade Evaluation

- **Contractor:** University of Akron
- **Subcommittee Members:** Craig Bargfrede, James Morin, Joe Bucci, Scott Lucas, Justin Droste, Aiden Neely, David Gray, Tom Peters
- **End Date:** January 2022
- **Status:** Due to difficulties with field testing, the contract was amended to increase the focus on laboratory testing. The project subcommittee and research team have received commitments to donate blades from Iowa, North Dakota, and Pennsylvania. The lab testing will take place this fall and the PI will develop a blade testing protocol based on the results of these tests.

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

- **Contractor:** Washington State University
- **Subcommittee Members:** Tom Renninger (Jasmine Dondlinger), Jeff Pifer, Doug McBroom, Patti Caswell, James Morin, Scott Lucas, Jeremy McGuffey, Tom Peters, Dave Hansen, Rick Nelson
- **End Date:** May 2022
- **Status:** The Mechanical Rocker Test Procedure, developed through Nebraska Department of Transportation research, has been proposed by Clear Roads for potential adoption as an AASHTO standard method for testing the ice melting capacity of deicers. This project will evaluate the Mechanical Rocker Test Procedure for efficacy; recommending modifications if necessary.

19-01: Expanding Application Rate Guidance for Salt Brine Blends for Direct Liquid Application and Anti-Icing

- **Contractor:** University of Wisconsin-Madison
- **Subcommittee Members:** Emil Juni, David Gray, Ty Barger, Doug McBroom, Aiden Neely, James Stevenson, Scott Lucas, Jeff Pifer, Tom Peters, Rick Nelson, Kathleen Schaefer
- **End Date:** December 2021
- **Status:** This project will provide a more complete set of application rates for various pavement temperature ranges and road surface conditions, thus this project will help facilitate expanded use of DLA and anti-icing at agencies across the country.

19-03: Measuring the Efficiencies of Tow and Wing Plows

- **Contractor:** University of California-Davis
- **Subcommittee Members:** Doug McBroom, Steve Spoor, Cliff Spoonemore, David Gray, James Morin, Jon Fleming, Justin Droste, Jeff Pifer, Tom Peters, Kohl Skalin
- **End Date:** January 2022
- **Status:** The research team has completed the all tasks except for the final report and webinar. However, it was determined by the project subcommittee that this project will not reach its full implementation potential unless the research team develops a companion user's guide to accompany the decision support tool. The project was amended to allow additional time and funds to accomplish this.

19-04: Synthesis of Technical Requirements and Considerations for an Automated Snowplow Route Optimization RFP Template

- **Contractor:** University of Vermont
- **Subcommittee Members:** Scott Lucas, Clay Adams, Brian Burne, Todd Law, Justin Droste, Jamie Yount, Tom Peters, Kevin Hensley, Jakin Koll
- **End Date:** October 2021
- **Status:** The Literature Review (Task 1) and Survey of Practice (Task 2) and Interviews (Task 3) have been completed. The List of Technical Requirements / Guidance Document (Task 4) was submitted in late July and the project subcommittee provided comments during a project meeting in August. The remaining tasks still include a vendor review of the technical requirements and the final report and webinar. An amendment request is being prepared to provide time to complete these tasks.

20-01: Entry-Level Driver Training for Maintenance Equipment Operators

- **Contractor:** Virginia Tech
- **Subcommittee Members:** Scott Lucas, Jeremy McGuffey, Clay Adams, Kevin Duby, Joe Bucci, Steve Spoor, Tom Peters, Rick Shomion, Marv Hayes, Brian Barott
- **End Date:** September 2021
- **Status:** The research team submitted all draft deliverables by early September. A meeting to discuss those deliverables was scheduled for 9/16, while the final webinar is scheduled for 9/27.

20-02: Understanding the NaCl Phase Diagram

- **Contractor:** Western Transportation Institute, Montana State University
- **Subcommittee Members:** Brian Burne, Doug McBroom, James Morin, Rhett Arnell, Dan Varilek, Aidan Neely, Tom Peters
- **End Date:** January 2022
- **Status:** The research team has completed the laboratory demonstrations (Task 2) and submitted a draft report. The project team will be meeting in early October to discuss these demonstrations as well as the one-page fact sheet (Task 3), which should be available by the end of September.

20-03: Indoor Stockpile Measurement

- **Contractor:** Subcommittee recommends CTC & Associates
- **Subcommittee Members:** James Morin, James Stevenson, Todd Miller, Rhett Arnell, Scott Lucas, Jeremy McGuffey, Emil Juni, Alastair Probert, Justin Droste, Tom Peters
- **End Date:** January 2022
- **Status:** CTC has completed the literature search and industry review (Task 2) as well as the survey and interviews (Task 3). CTC submitted a document describing the selected systems and states for system evaluation. CTC is hoping to get the TAP's approval so they may move forward with getting firm commitments from vendors and proceed with system installation and setup.

20-04: Expanded Use of AVL/GPS Technology

- **Contractor:** AECOM
- **Subcommittee Members:** David Gray, Steve Spoor, Aidan Neely, Justin Droste, Jeremy McGuffey, Mark Peters, Laura Shanley, Tom Peters, Kevin Hensley
- **End Date:** August 2022
- **Status:** The literature review (Task 1) is complete. Three different surveys (transportation agency, non-transportation agency, and vendor) were drafted and approved by the subcommittee. Those surveys have been sent out for completion and results are currently being analyzed.

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

- **Contractor:** SRF Consulting
- **Subcommittee Members:** Joe Thompson, Mark Goldstein, Patti Caswell, Rhett Arnell, Jon Fleming, Brian Burne, Jamie Yount, Laura Shanley, Tom Peters
- **End Date:** July 2022
- **Status:** The Literature Review (Task 2) is being finalized by SRF. Awaiting final comments on the survey questions (Task 3) by the subcommittee prior to sending out for completion.

20-06: Salt Shed Design Template

- **Contractor:** Wilfred Nixon and Associates
- **Subcommittee Members:** James Morin, Cliff Spoonemore, Dan Varilek, Craig Bargfrede, Todd Miller, Joe Bucci, Ty Barger, Alastair Probert, Tom Peters, Pat Jeffrey, Jim Rogers
- **End Date:** July 2022
- **Status:** PI experienced difficulties executing a contract with his subcontractor. Contract amendment was submitted to extend project an additional 6 months. PI is currently working on wrapping up the literature review (Task 1) and drafting survey questions (Task 2) for subcommittee review.

Industry Reports

- SICOP, FHWA, and APWA

State Reports

- Connecticut and Nevada

Business Roundtable

- Call for 2022 research
- Frost technologies
- Deicers and cement
- AVL
- Rear-facing cameras
- A-V equipment for meetings

September 23, 2021

Future Meetings

2022

- Spring meeting in Austin, TX; April 12 – 14, 2022.
- Fall meeting anticipated for Utah, but will depend on the timing / location of the NWMPE.

2023

- Spring meeting in Annapolis, MD.
- Fall meeting in Montana.

Industry Report – Norwegian Public Road Administration

Business Roundtable

- Qualified Products List
- Winter operations performance measures