MINUTES

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

Tuesday, April 16 to Thursday, April 18, 2024 (Annapolis, Maryland)

Attendees (In-person)

Members	David Gray, New Hampshire
Marcus Zimmerman, Alaska	Joe Thompson, New York
Mike Chapman, Colorado	Aaron Murra, North Dakota
Aidan Neely, Connecticut	Dean Alatsis, Ohio
Alastair Probert, Delaware	Patti Caswell, Oregon
Steve Spoor, Idaho	Dan Whetzel, Pennsylvania
Craig Bargfrede, Iowa (Chair)	Matthew Ouellette, Rhode Island
Clay Adams, Kansas	Dan Varilek, South Dakota
Randi Feltner, Kentucky	Matthew Heinze, Texas
Chris Landry, Maine	Jessica Andrews, Utah
Dan Houck, Maryland	Todd Law, Vermont
Rynell Hyman, Maryland	AJ Younes, Virginia
Scott Simons, Maryland	James Morin, Washington State
Keith Thomas, Maryland	Jeff Pifer, West Virginia
Tyler Zimmerman, Maryland	Emil Juni, Wisconsin
Mark Goldstein, Massachusetts	Chris Romo, Wyoming
Justin Droste, Michigan	
Joe Huneke, Minnesota	Partners
Tom Peters, Minnesota (Lead State)	Kevin Hensley, APWA
Paul Denkler, Missouri	
Doug McBroom, Montana (Vice Chair)	Consultants
Jasmine Dondlinger, Nebraska (Chemist)	Greg Waidley, CTC & Assoc
Mike Mattison, Nebraska	Kirsten Seeber, CTC & Assoc
Andrew Lawrence, Nevada	

Materials Posted

Agenda
Budget
Attendees List
Research Proposals List
Research Scoring Sheet
Research Projects In-Progress
Expense Report and Guidelines
Maryland DOT Van Schedule
Hotel Confirmation Numbers

April 16, 2024

Introductions and Meeting Objectives

- Clear Roads chair, Craig Bargfrede, facilitated member introductions and reviewed the meeting agenda.
- Dan Houck, Maryland DOT Director of Maintenance, providing opening remarks and a welcome to Maryland.

Qualified Products List (QPL) Update

Patti C provided a history of the QPL for those who are new to Clear Roads.

Doug M lead the discussion of potentially creating a new QPL Category 4 for a lower moisture salt.

- Vendors have to dry the salt to get to that level and TX pays for that. Having a .5% moisture makes no sense for states with high humidity, as moisture content will go up in the humidity.
- TX wants a new category under Cat 4 for low moisture salt. Two options…
    - Option 1: Do nothing. TX would have to spec category 4A and loosen up the moisture content. The disadvantage would be that not everyone on the same playing field. If leave as is, TX may have to pay more for kiln-dried salt.
    - Option 2: Develop the category. Potential to level the playing field so all vendors know what they are getting and lower the cost. If add a new category there is a chance to decrease the cost due to increased competition.
- It was decided that it would be a good idea to gather information from vendors and then present that information to the TAC during the fall meeting.
- Between the spring and fall meetings, members will also do some follow-up research to determine how important this is to them.
- Patti C may facilitate this by email.
- Matthew H (Texas) is okay with this.

Patti C and Greg W led a discussion proposing a process that would approve projects for the QPL outside of the normal project proposal process.

- New process would have QPL projects presented before the rest of the projects and voted on (approve or reject) by the TAC (two-thirds majority would apply). This would then determine the amount of funding available for the remaining project proposals and the process would move forward as it typically does.
- **MOTION** (Todd Law; Dave Gray seconds) – $150,000 would be made available for QPL projects for each 5-year iteration of the Clear Roads pooled fund. Any QPL projects needing funding beyond the $150,000 would need to compete for research funds just like any other research or synthesis projects every spring. Motion carries.
    - CR 22-06 pH Waiver for Deicing Products and the QPL, used up for $150,000 for Clear Roads Pooled Fund Study, Phase III [TPF-5(479)], thus the two QPL projects for 2024 will need to compete against the other fifteen projects proposed for 2024 funding.

Winter Maintenance Product Sample Proficiency Program

See presentation on members page.

Research and Synthesis Idea Presentations

Eleven (9) 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. **Update to Test Method 5 (Corrosion Effectiveness)**
   - Presenter: Jasmine Dondlinger, Nebraska (QPL Subcommittee)
   - Project Summary: Products that include a corrosion inhibitor must pass the Category specific limits of corrosion effectiveness, following Test Method 5 in the Clear Roads Guidance Document. This project will establish coupon MPY variation limits and corrosion effectiveness repeatability / reproducibility requirements that can be incorporated into Test Method 5.

2. **Toxicity Standards for the Qualified Products List**
   - Presenter: Doug McBroom, Montana (QPL Subcommittee)
   - Project Summary: The goal of the project is to develop toxicity standards for the QPL to better evaluate and process deicers that are submitted to the QPL for evaluation. This will protect the Clear Roads states further ensuring that the deicers pass any toxicity standards that this research develops.

3. **Synthesis – Predictive Methods to Update the Road Report**
   - Presenter: Doug McBroom, Montana (Group 1)
   - Project Summary: This synthesis will conduct a survey of states to determine how they receive updates for road conditions if they have attempted automatic updates (successful or unsuccessful) providing next steps and obstacles to avoid when implementing, or updating, advanced traveler information systems.

4. **The Use of Traction Control Materials for Snow and Ice Control**
   - Presenters: Jessica Andrews, Utah; Kevin Donovan, Illinois; Andrew Lawrence, Nevada; Doug McBroom, Montana (Via Group 2)
   - Project Summary: 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. The project will also assess environmental impacts, such as air and water quality issues of traction control materials.

5. **Synthesis – Maximizing the Conspicuity of Maintenance Vehicles II**
   - Presenter: Jeff Pifer, West Virginia (Group 2)
   - Project Summary: This synthesis will Revisit and update CR16-S3 and CR14-06 and improve conspicuity of maintenance equipment for reduction or elimination of collisions and accidents.

6. **Synthesis – Application and Accuracy of Plow Up / Down Technology**
   - Presenter: Jessica Andrews, Utah and Patti Caswell, Oregon (Via Group 2)
   - Project Summary: Oftentimes, we use comparison studies to analyze and evaluate the effectiveness and efficiency of various wintertime technology. These studies usually contain many different uncontrollable variables largely affecting the results. Being able to accurately track difficult-to-track data, such as when plow blades are up or down, can provide one more control in data analysis. This synthesis will give states guidance on the different equipment options currently available for tracking plow up / down data as well as their respective accuracy and efficiency. Having another source of reliable, accurate data can open the door to more possible analysis studies. It will also generate ideas for utilizing this data in analyses of winter maintenance methods (such as plow blade comparison studies).

7. **Synthesis – Snow & Ice, 2030 – Be Ready for Change within the Snow & Ice Fighting Industry**
   - Presenter: Mark Goldstein, Massachusetts (Group 3)
   - Project Summary: As newer technologies emerge, and deicing material application methodologies evolve, while environmental degradation increases and contracted drivers become scarce, this

synthesis would explore the latest innovations, trends and hurdles the Snow & Ice fighting industry is both blessed with and encumbered by. This synthesis is meant to highlight the most promising emerging trends and technologies and point to available implementation guidance (akin to 17-01).

8. **Synthesis – Update on Status of AVL / GPS for Winter Operations**
   - Presenter: Clay Adams, Kansas (Group 3)
   - Project Summary: The technology of AVL/GPS/Telematics has been very successful when it comes to tracking equipment, providing location, breadcrumbs, as well as information on excessive speed, harsh braking, erratic driving, and engine maintenance codes. There seems to be less success when it comes to information from the spreader controller on material usage. In some cases, it depends on the make, model, version, year of the controller for the systems to be able to track and report usage of the solid and liquid materials being dispensed. For agencies with a mix of controllers, finding a single AVL provider can be difficult. This synthesis will determine if there are systems that are able to track material usage on various spreader controllers accurately enough to track material usage for inventory purposes.

9. **Winter Road Condition Requirements for Autonomous Vehicles**
   - Presenter: Marcus Zimmerman, Alaska (Group 4)
   - Project Summary: The goal of this project is to understand the required road conditions for AVs to safely operate during the winter to allow state transportation agencies to make decisions regarding the management of their roadways and AV systems.

10. **Effective Pretreatment Methods for Events Beginning as Rain**
    - Presenter: AJ Younes, Virginia; Randi Feltner, Kentucky; Matthew Heinze, Texas (Via Group 4)
    - Project Summary: States are experiencing shifts in weather patterns that have resulted in more rain prior to freezing temperatures in a large portion of the country. There is plenty of research supporting the best treatment practices for snow and ice, but little to be said about rain that may precede the event. Rainfall poses many challenges to pretreatment and with little research to support effective pretreatment methods, many snow removal organizations are left questioning what effective pretreatment methods are. This project will determine the best treatment methods for winter weather events beginning as rain/freezing rain and inform snow removal organizations of those methods through informative products.

11. **Correlation of Laboratory Chemical Tests with Field Performance**
    - Presenter: Mike Mattison, Nebraska (Group 4)
    - Project Summary: The performance of deicing chemicals in actual usage on roads during various weather conditions is of great importance to highway maintenance managers. Evaluating chemicals in the field is difficult due to the many variables that cannot be controlled. This project will devise a scientific method to compare laboratory test results and characteristic measurements (e.g. gradation, viscosity) that can be performed at most state DOT test labs with performance evaluations in controlled or well-defined conditions on roadways.

12. **Synthesis – Best Practices for Research Implementation**
    - Presenter: Mike Mattison, Nebraska (Group 4)
    - Project Summary: Significant quantities of quality research exist, but how much of it is used by agencies? This synthesis will explore winter maintenance-related technology and methods that could be used by office and field personnel (especially field personnel) to improve performance that may not be visible to them or understood by them. A guidance document that describes the most successful methods for putting research into practice will enable agencies to improve their performance in winter maintenance operations using best practices with a proven track record.

13. **Synthesis – Simulators for Training Snowplow Drivers**
    - Presenter: Paul Denkler, Missouri (Group 4)
    - Project Summary: This synthesis will look at the current state of practice related to the use of simulators in winter maintenance training. How are simulators currently being used? Are they beneficial in providing advanced training prior to someone going out on the road?

14. **Salt Management Training for Non-DOT End Users**
    - Presenter: Scott Simons, Maryland (Group 5)
    - Project Summary: The goal of this project is to create training unique to non-DOT salt end users. This could then be used to lessen the burden of explanation and guidance from DOTs, while also cutting down on overutilization of salting resources by all the others. The end goal is for the overuse of salt to stop everywhere, so why do it with just the DOTs?

15. **Using GIS to Identify Highway Segments Sensitive to Deicing Materials – Phase II**
    - Presenter: Joe Thompson, New York and Mark Goldstein, Massachusetts (Via Group 5)
    - Project Summary: The geospatial tool, as developed for CR 20-05 Using GIS to Highlight Highway Segments Sensitive to Deicing Materials, requires a power user skill set and processing requirements beyond the average end user. Other issues with this form of the tool include, lack of computing power, access to national databases, and outdated software (ArcGIS 2.9). This project will provide a location for S&I Managers to go and use the tool for operational planning. Use the geospatial tool developed in CR 20-05 to display results on a map in an online environment.

16. **Synthesis – Use and Performance of Fixed Automated Spray Technology (FAST) Systems and Non-Chloride Deicers on Bridge Decks to Reduce Corrosion to Bridge Components**
    - Presenter: Todd Law, Vermont (Group 5)
    - Project Summary: The current practice for VT AOT is to use chloride deicers on bridge decks along with the roadways. Sodium and Magnesium Chloride have caused corrosion to the bridge components, including steel and concrete. In the past, a Fixed Automated Spray Technology (FAST) system utilizing Acetates and / or Formates was used for deicing with reduced corrosion to the bridge decks. Many of these systems were removed due to difficulties in application methods and needed repairs. This synthesis will determine current practices related to the use of FAST systems and/or alternatives to chloride-based deicers.

17. **Quantitative and Nonproprietary Understanding of Pavement Surface Friction for Winter Road Maintenance Operations**
    - Presenter: Mike Chapman, Colorado (Group 5)
    - Project Summary: The goal of this project is to perform a comprehensive and quantitative investigation to provide a baseline understanding of how winter pavement surface friction is affected by key influencing factors. Many sensors for winter road maintenance assessment estimate the friction coefficient based on pavement surface condition and water/ice amount, overlooking the impact of salt type and quantity, as well as thermal factors identified in previous studies. This investigation will involve simulation of typical winter road surface conditions and salt application scenarios, under well-controlled laboratory settings. Various data obtainable through existing mobile equipment, including physical, thermal, chemical, and electrical information will be monitored and analyzed, aiming to uncover their cause-and-effect relationships with pavement surface friction.

Clear Roads Budget and Available Funds

- Income through FFY24: $2,825,000
- Expenses through FFY24: $2,450,419
- Funds available for research in 2024: $374,581

    - Based on CTC contract and meetings expenses for 2025, research funds available for research in 2025 are anticipated to be $645,000. Clear Roads voted in favor of averaging the research funds for 2024 and 2025, thus making $510,000 available for each year.
- States behind with their contributions: Arizona (2023) and Oregon (2023).
- States needing to transfer 2024 funds: AZ, CT, IL, KS, ME, MN, NE, NH, NJ, OR, OK, RI, SD, TX, UT, WA, WV, WY.

Clear Roads Online Equipment Database
Steve S led a discussion about the importance of the database.

- If member states complete the survey for each equipment product category, then other member states will have resources to reach out to when it is time for them to purchase new equipment or if vendors reach out to them via sales calls.
- This could be a more efficient and cost-effective way to collect this information than through research or synthesis projects. It's also easier to keep the information current.
- Currently, there are only four equipment product categories serving as a pilot of sorts. If this pilot is successful, and there's interest, the number of equipment product categories could be expanded.
- **ACTION ITEM**: Greg W will send out emails (one for each equipment product category) to only those who still need to input their state's data.

Maryland State Report

- See presentation posted on members only page.

April 17, 2024

Minnesota State Report

- See presentation posted on members only page.

Selection of 2024 Projects
Based on the rankings received, the TAC approved the following seven projects, including three projects for RFP and four syntheses to be completed by CTC. The total funding is estimated at $500,000. For a pdf document containing all of the proposals listed above on day one, visit the All Proposed Projects page.

CR 24-01 Toxicity Standards for the Qualified Products List [Score: 3.429]

- Investigator: To be determined via RFP.
- Budget Estimate: $150,000
- Chairman: Doug McBroom
- Co-Chair: Patti Caswell
- Subcommittee: Jasmine Dondlinger, Mike Chapman, Shannon Holland, Jessica Andrews, Randi Feltner, and Tom Peters

CR 24-02 Effective Pretreatment Methods for Events Beginning as Rain [Score: 3.514]

- Investigator: To be determined via RFP.
- Estimated Budget: $150,000
- Chairman: AJ Younes
- Co-Chair: Randi Feltner and Matthew Heinze
- Subcommittee: Dan Whetzel, Emil Juni, Dean Alatsis, Anthony Ennas, Samantha Canulli, and Tom Peters

CR 24-03 Salt Management Training for Non-DOT End Users [Score: 3.486]

- Investigator: To be determined via RFP.
- Estimated Budget: $100,000
- Chairman: Scott Simons
- Co-Chair: Mike Mattison
- Subcommittee: Aidan Neely, AJ Younes, Matthew Ouellette, Paul Denkler, Anthony Ennas, Samantha Canulli, and Tom Peters

CR 24-S1 Synthesis: Predictive Methods to Update the Road Report [Score: 3.657]

- Investigator: To be determined via RFP.
- Estimated Budget: $25,000
- Chairman: Doug McBroom
- Co-Chair: Randi Feltner
- Subcommittee: Dan Whetzel, Craig Bargfrede, Joe Huneke, Joe T, Chris Landry, Chris Romo, and Tom Peters

CR 24-S2 Synthesis: Snow & Ice, 2030 – Be Ready for Change within the Snow & Ice Fighting Industry [Score: 3.714]

- Investigator: CTC & Associates
- Estimated Budget: $25,000
- Chairman: Mark Goldstein
- Co-Chair: AJ Johnson
- Subcommittee: Andy Lawrence, Carl Fedders, Marcus Zimmerman, Aaron Murra, Matthew Heinze, Chris Landry, Mike Warren (MT), Jeremy McGuffey, and Tom Peters

CR 24-S3 Synthesis: Update on the Status of AVL / GPS for Winter Operations [Score: 3.657]

- Investigator: CTC & Associates
- Estimated Budget: $25,000
- Chairman: Clay Adams
- Co-Chair: Jessica Andrews
- Subcommittee: Randi Feltner, Paul Denkler, Dave Gray, Dean Alatsis, Carl Fedders, Alastair Probert, Joe Huneke, and Tom Peters

CR 24-S4 Synthesis: Best Practices for Research Implementation [Score: 3.571]

- Investigator: CTC & Associates
- Estimated Budget: $25,000
- Chairman: Mike Mattison
- Co-Chair: Dan Whetzel
- Subcommittee: Craig Bargfrede, Scott Simons, Todd Law, Dean Alatsis, Kevin Hensley, Andy Lawrence, Clark Moe, and Tom Peters

VOTE – TAC voted to approve funding for the projects listed above. CTC need an amendment to their contract of approximately $100,000 to conduct this work. Since an amendment was recently processed to add funds for contracting with hotels for the next two meetings and three synthesis projects from 2023, Tom P suggested we wait about six months to process this amendment. The timing should work out well as the 2023 synthesis projects will be completed by then and CTC will be ready to work on the 2024 synthesis projects.

AASHTO Snow & Ice Terminology Task Force
Joe T described the process for selection / definition of terminology.

- 24 terms will be included on the first ballot. These were the most critical / core snow and ice terms as determined by AASHTO.
- The process took a year to develop and accept the first 24 terms. Now that the process is in place, the pace at which terms are identified and accepted should move more quickly.

Business Roundtable (topics discussed)

- Active transportation (Washington State)
- Vehicle-mounted temperature sensors (Iowa)
- Spreader controllers (Massachusetts)
- MDSS and DTN technologies (Nebraska)
- Contractors for winter maintenance (New Hampshire)

Update on Projects in Progress

20-06: Salt Shed Design Template

- **Contractor**: Wilfred Nixon and Associates
- **Subcommittee Members**: James Morin, Chris Romo, Dan Varilek, Craig Bargfrede, Paul Denkler, Matthew Ouellette, Alastair Probert, Mike Mattison, Pat Jeffrey, and Tom Peters
- **Current End Date**: January 2024 (contract expiration date was exceeded. An amendment is being processed to extend the project to July 2024)
- **Status**: The PI is working on taking what he's provided for the Scalable Designs (Task 4) and expanding it into a Design Guide, while also providing the recommendations (should have been included in T3, Analysis) in the Design Guide or Final Report.

21-01: Grip Sensor Technology and Salt Applications

- **Contractor**: Western Transportation Institute, Montana State University
- **Subcommittee Members**: James Morin, Mike Mattison, Nick Evans, Patti Caswell, Emil Juni, Matthew Heinze, Justin Droste, James Roath, and Tom Peters
- **Current End Date**: August 2024
- **Status**: The literature review, survey, and case studies are complete. Colorado DOT's 2022-2023 RWIS data was provided. The research team is working to collect the 2023-2024 winter season data from GeoTab, Teconer, and CDOT to allow for expansion of the analysis and refinement of the decision matrix tool.

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, Chris Romo, Chris Landry, and Tom Peters
- **Current End Date**: August 2024
- **Status**: The research team is conducting lab testing. 1) Hardness Testing (completed August 12, 2023); 2) Adhesion Testing (completed August 23, 2023); 3) open circuit potential and electrochemical impedance spectroscopy testing (completed Dec. 22, 2023); and 4) Salt Spray [Scribe and non-scribe methods for various coating products] (completed spring 2024). The research team is currently processing and analyzing all the lab test data and plan to submit the draft analysis report by end of April.

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

- **Contractor**: Focus EduVation
- **Subcommittee Members**: James Morin, Justin Droste, James Roath*, Paul Denkler, Dan Whetzel, Scott Rattay, Kevin Hensley, and Tom Peters
- **Current End Date**: January 2024 (contract expiration date was exceeded. An amendment is being processed to extend the project to July 2024)
- **Status**: Training modules are mostly complete. The project team needs to meet one final time to review the three training modules and obtain final comments / approval from the subcommittee. Then a final report / webinar to wrap things up.

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, Nick Evans, Matt Kraushar, and Tom Peters
- **Current End Date**: October 2024
- **Status**: The research team is significantly behind schedule in the execution of the laboratory experimental plan, due to underestimated complexity of soil column tests, unexpected delay in reconfiguring the horizontal column tests, and delays in fabricating additional soil columns (to greatly increase the number of soil column tests they can run concurrently, because each test needs 5 replicates). With the addition of new soil columns, they estimate that it would take another six months before they can conclude all the laboratory tests, i.e., Task 3 (Execution of the Testing Plan).

  To accelerate the lab testing, they'd like to seek approval by the project subcommittee to proceed with Task 4 (Additional Lab Testing) – additional lab testing using beet juice / salt brine blend - without waiting for the completion of Task 3.

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

- **Contractor**: Washington State University
- **Subcommittee Members**: James Morin, Patti Caswell, Nick Evans, Aidan Neely, Doug McBroom, Joe Thompson, Dan Varilek, Randi Feltner, Dan Whetzel, Joe Huneke, and Tom Peters
- **Current End Date**: September 2024 (Amendment submitted to extend project to March 2025)
- **Status**: The literature review and survey are complete. The research team submitted the Initial Synthesis (Task 3) in March and comments from the subcommittee were due 4/12. The Initial Synthesis summarizes current and best practices to identify the most reasonable materials, liquid-to-solid pre-wetting rates, wet solid application rates, and procedures and equipment to test in the field investigation.

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, Mike Chapman, Matthew Heinze, Scott Simons, Patti Caswell, Marcus Zimmerman, Alastair Prober, and Tom Peters
- **Current End Date**: December 2024
- **Status**: The agency and vendor surveys are complete as are the in-depth interviews. The results of the interviews have been submitted and the project team met on 4/12 to review and provide comments on that deliverable.

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

- **Contractor**: Western Transportation Institute, Montana State University
- **Subcommittee Members**: Jessica Andrews, Steve Spoor, Mike Mattison and Jasmine Dondlinger, Nick Evans, Doug McBroom, Patti Caswell, Dean Alatsis, and Tom Peters
- **Current End Date**: August 2024
- **Status**: The revised Testing Plan was submitted on January 17. The research team has acquired deicing additives and brines and has begun testing.

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, AJ Johnson, Justin Droste, Joe Thompson, Jeff Pifer, Paul Denkler, Joe Huneke, and Tom Peters
- **Current End Date**: December 2024 (Submitted an amendment to extend project one year)
- **Status**: Literature Review and Survey are complete. Project team met in December to review the draft Agency Survey Findings and Field-Testing Protocol. During that December meeting, the subcommittee gave their official approval to move onto Part II (data collection and analysis) of this project. Since the research team experienced a lack of data collection testing sites during the 2023-2024 winter season, Clear Roads has provided them with an additional year for data collection.

22-05: Use of Dashboards for Winter Operations

- **Contractor**: AECOM Technical Services
- **Subcommittee Members**: Doug McBroom, David Gray, Jessica Andrews, Emil Juni, Aidan Neely, Mike Mattison, Craig Bargfrede, Joe Thompson, Todd Law, Paul Denkler, AJ Younes, Alastair Probert, Aaron Murra, Dean Alatsis, and Tom Peters
- **Current End Date**: June 2024
- **Status**: The literature review and survey are complete. All case study interviews are complete. The interview meeting notes were drafted and sent to agencies for final review. The research team has received comments from 2 of the 5 agencies. Case study reports are currently being drafted. Once agency feedback is complete (any time now), the project team will meet to review the case studies. Then submit final report and conduct webinar.

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

- **Contractor**: Washington State University
- **Subcommittee Members**: Patti Caswell, Doug McBroom, James Morin, Mike Chapman, Steve Spoor, Jasmine Dondlinger, David Gray, Joe Thompson, AJ Younes, and Tom Peters
- **Current End Date**: April 2025
- **Status**: The project kickoff meeting was conducted in December. The research team needed to add a survey to the literature review to identify deicing products of a certain pH range. A Letter to File was submitted on the research team's behalf. The research team is having trouble obtaining samples to test. Will likely need to process an amendment.

23-01: Development of a Public Service Announcement Library

- **Contractor**: Western Transportation Institute, Montana State University
- **Subcommittee Members**: David Gray, Steve Spoor, Ellen Mattila (PIO; ID), Dan Varilek, Julie Stevenson (PIO; SD), Emil Juni, Jeff Pifer, Randi Feltner, Chris Romo, and Tom Peters
- **Current End Date**: March 2025

- **Status**: Project kickoff meeting was conducted on January 17. Draft survey questions were reviewed and approved by the subcommittee and the survey was sent out on March 4.

23-02: Quantifying the Economic Value of Snow and Ice Operational Success

- **Contractor**: AECOM Technical Services
- **Subcommittee Members**: Mark Goldstein, AJ Younes, Doug McBroom, Randi Feltner, Emil Juni, Joe Thompson, Marcus Zimmerman, Steve Spoor, Matthew Heinze, Paul Denkler, and Tom Peters
- **Current End Date**: June 2025
- **Status**: The project kickoff meeting was conducted on March 21. The research team is working on the literature review.

23-03: Updating the Impact of Capital Projects Decision Support Tool

- **Contractor**: University of Vermont
- **Subcommittee Members**: Todd Law, Emil Juni, AJ Younes, Joe Thompson, Chris Landry, Paul Denkler, Mark Goldstein, Matthew Oullette, and Tom Peters
- **Current End Date**: December 2025
- **Status**: The kickoff meeting was conducted on February 15. Draft survey questions were provided to the subcommittee for review on March 28. Comments on those draft questions were due April 12.

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

- **Contractor**: Bolton & Menk, Inc.
- **Subcommittee Members**: Aidan Neely, Jessica Andrews, James Morin, Doug McBroom, Joe Thompson, David Gray, Dan Whetzel, Joe Huneke, Rick Nelson, and Tom Peters
- **Current End Date**: January 2026
- **Status**: Project kickoff meeting was conducted on March 19. The research team is working on the literature search.

Pennsylvania State Report

- See presentation posted on members only page.

Recently Completed Project Report

21-06 Calculating Plow Cycle Times from AVL Data

- Project Champion: David Gray
- See *Spring 2024 State Reports / Industry Reports / Project Reports* on members only page.

Recently Completed Project Report

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

- Project Champion: Jasmine Dondlinger
- See *Spring 2024 State Reports / Industry Reports / Project Reports* on members only page.

Recently Completed Project Report

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

- Project Champion: Joe Thompson
- See *Spring 2024 State Reports / Industry Reports / Project Reports* on members only page.

Nebraska State Report

- See presentation posted on members only page under TAC Meeting Presentations.

Bay Bridge Reconstruction

- Presentation by Scott Simons.

April 18, 2024

Future Meetings

With our most recent amendment to the Admin Contract, the process for contracting with hotels for Clear Roads spring and fall meetings has changed. Previously, the State of Minnesota put out an RFP for hotels. Now, CTC has been tasked with finding, negotiating, and contracting with the hotel. This should allow Clear Roads to contract with meeting hotels at least a year in advance.

2024

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

- Currently negotiating a contract with the Hilton Garden Inn.
- The entire TAC showed interest in tours of the Glacier National Park (bus tour and lake tour).

2025

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

- 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: Denver, CO. Week of September 15.

- This will be the National Winter Maintenance Peer Exchange or a joint meeting of Clear Roads, Aurora, and AASHTO SICOP.
- About the same time as the APWA Western Snow Conference.
    - Add Kevin Hensley to the planning committee.
- Details of the meeting format will be worked out during the upcoming planning meetings.

2026

Spring Meeting: Kentucky. Week of April 20.

- Kansas City, MO is the backup.

Fall Meeting: Massachusetts. Week of September 14.

- Maine is the backup.

FHWA Report

- Integrated Modeling for Road Condition Prediction (IMRCP)
- See presentation on the members only page.

APWA Report

- See Update posted on members only page.

Virtual Meeting Platform

- States are using Microsoft Teams and would like CTC to conform.

- CTC will investigate this and keep the TAC apprised of its progress.

Clear Roads News Posts

- Iowa DOT employees cannot open links within emails that originate with Constant Contact.
    - This is apparently due to hackers using these communications to access government agency IT systems.
    - No other states were aware of this issue.
- Another issue is that many members were not receiving Clear Roads News Posts as they seem to be going straight to their junk mail.
- At this time, CTC will not change its mail delivery system. However, every time CTC posts a news item, the Administrator will follow this up with a standard email notifying members to visit the actual page on the Clear Roads website.