MINUTES

Clear Roads 2020 Technical Advisory Committee Meeting
Pooled Fund Project TPF-(353)

Tuesday - Wednesday, April 21-22, 2020
Online Meeting

Pat Carroll, Alaska DOT Kevin Duby, Arizona DOT Jamie Yount, Colorado DOT John DeCastro, Connecticut DOT Steve Spoor, Idaho Trans Dept Jeremy McGuffey, Indiana DOT Craig Bargfrede, Iowa DOT Clay Adams, Kansas DOT Brian Burne, Maine DOT Scott Simons, Maryland DOT Mark Goldstein, Mass DOT Melissa Longworth, Michigan DOT Tom Peters, Minnesota DOT	Todd Miller, Missouri DOT Doug McBroom, Montana DOT Ty Barger, Nebraska DOT Jasmine Dondlinger, Nebraska DOT David Gray, New Hampshire DOT Joe Thompson, New York State DOT Larry Gangl, North Dakota 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 Agency of Trans James Morin, Washington State DOT Cody Churchill, Wisconsin DOT Allan Johnson, Wisconsin DOT Emil Juni, Wisconsin DOT Jeff Pifer, West Virginia DOT Cliff Spoonemore, Wyoming DOT Kevin Hensley, APWA Rick Nelson, SICOP Kirsten Seeber, CTC & Associates Andrea Thomas, CTC & Associates Greg Waidley, CTC & Associates

Materials Distributed
Agenda
Clear Roads Budget Overview
Research In-Progress
Research Proposals/Table
Research Ranking Sheet

<u>Tuesday, April 21, 2020</u>

Introductions and Meeting Objectives
Chairperson James Morin kicked off the day with introductions of all the attendees, a brief re-cap of the updates to TAC membership since the fall meeting, and a review of the objectives for day one. The primary focus of this meeting was to review the new projects.

<u>New representatives</u>
- Rhett Arnell, Utah DOT
- Pat Carroll, Alaska DOT
- John Oliva, Caltrans
- Jamie Yount, Colorado DOT

Not in Attendance

- John Oliva, Caltrans
- Alastair Probert, Delaware DOT
- Mark Bloome, Illinois DOT
- John Angel, Nevada DOT
- Jon Fleming, Pennsylvania DOT
- David Johnson, FHWA

Other Items of Note

- Al Johnson, WI DOT will be replaced by Emil Juni (official rep) and Cody Johnson after this meeting.

Overview of Clear Road's Goals and Activities

National research consortium focused on rigorous testing of winter maintenance materials, equipment and methods for use by highway maintenance crews.

Spring Meeting: Discuss new research idea proposals, score/rank/select projects to fund, and identify project subcommittee members.

Fall Meeting: Subcommittees present proposals received in response to each project RFP and the full TAC provides input for the subcommittee (MnDOT selection committee) to consider in their evaluations.

Research and Synthesis Proposal Presentations

Presentation and discussion of Clear Roads research proposals.

Sixteen (16) research proposals were presented and discussed by TAC members. After all the proposals were presented, each voting member of the TAC submitted scores for each 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.

The following projects were selected for funding for FY 2020:

2. Entry-Level Commercial Driver's Training (RFP)
14. Understanding the NaCl Phase Diagram (RFP)
8. Initiative: Winter Maintenance Product Proficiency Sample Program (volunteer effort by Clear Roads and AASHTO)
15. AWSSI Enhancements – Phase 2 (single source contract)
6. Indoor Automated Stockpile Measurement (RFP)
9. Expanded Use of AVL/GPS Technology Study (RFP)
11. Using GIS to Highlight Highway Segments Sensitive to Deicing Materials (RFP)
4. Snow and Ice Equipment Online Database (CTC effort)
3. Salt Shed Design Template (RFP)

Research Proposals

1. **Weather Forecasting Evaluation Tool**
   - **Presenter:** Scott Lucas, OH DOT
   - **Estimated Cost:** $180,000
   - **Estimated Duration:** 18 months

- **Goal:** To develop a program that can ingest weather forecast data from multiple sources and compare it to what actually occurred and assign the forecast a level of accuracy based on when the storm arrived, what form of precipitation fell, and how much precipitation accumulated.

2. Entry-Level Commercial Driver's Training

- **Presenter:** Scott Lucas, OH DOT
- **Estimated Cost:** $300,000
- **Estimated Duration:** 12 months
- **Goal:** There are several goals for this project:
  a) Develop Clear Road's entry level driver training (ELDT) programs for people to acquire their class B CDL, to advance from a class B to a class A CDL that meets the requirements of the new FMCSA rules.
  b) The curriculum must provide instruction that meets all the standards established in the FMCSA training rules to include on-road instruction, driver qualification, driver wellness, hours of service and whistleblower protection. Training must also meet state licensing agency requirements.
  c) Document a process for DOT's to be able to attest that they meet the specified requirements, and in the event of an FMCSA audit or investigation of the DOT, must supply documentation to verify their compliance.
  d) Develop a train the trainer program for the course.
  e) Document the process for DOT's to self-certify in the FMCSA's Training Provider Registry.

3. Salt Shed Design Template

- **Presenter:** James Morin, Washington State DOT
- **Estimated Cost:** $75,000
- **Estimated Duration:** 12 months
- **Goal:** To evaluate and design a set of standard salt sheds that could be scaled to meet the needs of a variety of sites. It is recognized that it would be difficult to design a shed that would work in every state, with every type of soil, wind load, snow load etc. However, three scales could be used for this comparison in this project: small (150- 500 ton), medium (500-4,000 ton) and large (over 4,000 ton). This project would provide a template for the member state to use as a starting point for designing and bidding these projects.

4. Snow and Ice Equipment Online Database

- **Presenter:** Jeff Pifer, West Virginia DOT
- **Estimated Cost:** $75,000
- **Estimated Duration:** 12 months
- **Goal:** To create an online database of Roadway Snow and Ice Control (RSIC) equipment on the Clear Roads website that is updated on a regular basis, thus providing members with an accurate representation of equipment used by member states in a more efficient manner in terms of time, effort, and cost.

5. Mapping Weather Severity Zones (2011-2020)

- **Presenter:** Tom Peters, Minnesota DOT
- **Estimated Cost:** $75,000
- **Estimated Duration:** 12 months

- **Goal:** To analyze weather severity in the snow and ice states following the same methodology used for Clear Roads Project 10-02, to map weather severity across the regions and states but for the time period of 2010–2020. These results could be used to both compare the time period results and possibly identify trends.

6. **Indoor Automated Stockpile Measurement**
   - **Presenter:** James Morin, Washington State DOT
   - **Estimated Cost:** $200,000
   - **Estimated Duration:** 18 months
   - **Goal:** To develop a methodology and identify tools to perform indoor salt measurement using photogrammetry, LIDAR, or some type of sensor. Also, to identify a way to accomplish real time inventory and monitoring of the sites with minimal input from maintenance staff.

7. **Quantifying the Impact that New Capital Projects Will Have on Roadway Snow and Ice Control (RSIC) Operations, Phase 2**
   - **Presenter:** Todd Law, VTrans
   - **Estimated Cost:** $100,000
   - **Estimated Duration:** 15 months
   - **Goal:** To build upon/improve the automated method of quantifying the anticipated impact that new capital projects will have on total vehicle-hours of travel (VHTs) for the RSIC fleet. This method can be used in the early stages of project development to determine if the agency will need additional resources, such as trucks, salt, fuel, and manpower to provide RSIC after the project is completed.

8. **Winter Maintenance Product Proficiency Sample Program**
   - **Presenters:** Jasmine Dondlinger and Ty Barger, Nebraska DOT
   - **Estimated Cost:** $75,000
   - **Estimated Duration:** 12 months
   - **Goal:** A Proficiency Sample Program can be utilized as a useful tool for a DOT, manufacturer/vendor, and/or third-party laboratory to monitor the quality of its services. This project would provide participating laboratories with the capability to:
     a) Compare individual testing results to a large pool of results from their peers.
     b) Verify both the testing equipment and the operator under actual testing conditions.
     c) Show evidence of conformance to testing procedures and protocols as set forth by specifying agencies or internal QA/QC programs.
     d) Receive individualized reports with performance charts to track testing results over time.

     Use an (optional) Extra Proficiency Sample Program (XPS) for training of technicians, testing or equipment verification, inter-laboratory studies, and for addressing accreditation issues related to proficiency sample testing.

9. **Expanded Use of AVL/GPS Technology Study**
   - **Presenter:** David Gray, New Hampshire DOT
   - **Estimated Cost:** $75,000
   - **Estimated Duration:** 12 months
   - **Goal:** To find out what States are using their AVL/GPS units for, to include winter and non-winter activities. List of non-winter projects or methods that AVL/GPS technology are currently being used for to benefit DOT's.

10. **Measuring the Costs and Detrimental Effects of Sand Use in Winter Snow and Ice Operations on the Environment**
    - **Presenter:** John DeCastro, Connecticut DOT
    - **Estimated Cost:** $75,000
    - **Estimated Duration:** 12 months
    - **Goal:** To document and understand the effects of the use of sand as related to the environment and snow and ice control. The document and understand the costs and effectiveness when used as the major component in snow and ice control. To document the process of removing sand deposition on the roads, within drainage systems, ponds, and waterbodies.

11. **Environmental Prioritization of Highway Segments Relative to Snow and Ice Operations Using Standard GIS Layers**
    - **Presenter:** Joe Thompson, New York State DOT
    - **Estimated Cost:** $100,000
    - **Estimated Duration:** 12 months
    - **Goal:** With the inability to identify environmentally sensitive corridors (beats/routes), the state is unable to assign the proper equipment and apply chemicals at the appropriate rates to avoid further environmental degradation of both surface and ground water with chloride and sodium. To provide better operational planning, thus allowing states to make more informed decisions regarding application of chemicals and use of other snow fighting methods.

12. **Application Matrix for Enhanced Salt at Higher Temperatures**
    - **Presenter:** Steve Spoor, Idaho Transportation Department
    - **Estimated Cost:** $125,000
    - **Estimated Duration:** 18 months
    - **Goal:** To review, analyze, and verify the application rates of enhanced solid salts such as Ice Slicer and Ice Kicker at higher temperatures as a means of determining if these products are more efficient at higher temperatures. We already know they can be used at lower temperatures.

13. **Winter Weather Trends and Material Usage**
    - **Presenter:** Jon Fleming, Pennsylvania DOT
    - **Estimated Cost:** $100,000
    - **Estimated Duration:** 12 months
    - **Goal:** To review, analyze, and present snow amounts and long-term trends over a period of 50 years. Use the information associated with the trends and correlate that information with individual state quantities and hours of staff involved with snow removal operations. States can then associate their own costs. Costs of fighting winter will vary with inflation and time, while material usage, equipment and staff hours will remain as a constant.

14. **Understanding the NaCl Phase Diagram**
    - **Presenter:** Brian Burne, Maine DOT
    - **Estimated Cost:** $75,000
    - **Estimated Duration:** 12 months
    - **Goal:** To provide a better understanding of the phase diagram and how solutions beyond the eutectic point will behave on the road by providing a Clear Roads phase diagram that is clear for

the snow fighting industry and has an in-depth discussion paper backing it up. In other words, to get everyone on the same page.

15. **AWSSI Enhancements – Phase 2**
    - **Presenter:** Brian Burne, Maine DOT
    - **Estimated Cost:** $40,000
    - **Estimated Duration:** 12 months
    - **Goal:** To provide additional enhancements to the AWSSI tool as described below:
        a) Research the weather data in the 36 Clear Roads states and add one station to each state (providing that state has a location with enough data to support adding an additional station). If a state does not have the data to support an additional station, that station can be added to a different state that does have sufficient data instead.
        b) Update the 1980 to 2014 Averages Map. The intent of this tasking would be to bring the averages map, found at https://mrcc.illinois.edu/research/awssi/avgMap1980-2014-Brettschneider.pdf, up through the 2019-2020 winter season.
        c) Add the ability to download the daily seasonal data for any given station during the current season.
        d) Add the ability to select up to 5 specific historical seasons (user-selected), to be added to any station's current year chart.

16. **Cost-Benefit Analysis Toolkit, Phase 3**
    - **Presenter:** James Morin, Washington State DOT
    - **Estimated Cost:** $125,000
    - **Estimated Duration:** 18 months
    - Goal: Clear Roads has completed two cost-benefit analysis projects – they include *08-02: Cost-Benefit Analysis Toolkit* and *11-01: Cost-Benefit Analysis Toolkit (Phase II)*. It has been seven years since the phase II Toolkit was completed and the Toolkit is in need of updates as much of the assumptions are based on old financial data and there is extraneous html code visible where it should not be. The goal of this project would be to:
        a) Update financial assumptions
        b) Clean up html code
        c) Expand functionality
        d) Provide ongoing technical support

Clear Roads Budget and Available Funds

Greg Waidley provided an overview of the Clear Roads budget, including amounts committed and transferred by the states, as well as the expenses from research, meetings, and administration. Clear Roads has approximately $1,274,000 to spend on new 2020 research projects from TPF-5(353).

Discussion item: Can we use extra money to have an in-person meeting in a state that would cost more than they normally spend?

- Greg Waidley – Cost has not been an issue lately. There aren't too many states that are too expensive. Sometimes it's more a matter of access to the locations.
- Clay Adams – There has been some reluctance on MN's part and as a pooled fund to spend excess dollars on travel and lodging. The philosophy is that there needs to be self-control on what we spend on travel vs. research.

- Tom Peters – MN does not put a limit on lodging. The TAC should be cognizant of location but not limit themselves. The pooled fund does not have to restrict itself at this point. He recommends spreading the hosting around among members as there is great value in that. Greg does a good job of checking out the locales and the associated costs.
- Greg Waidley – The projected cost for the Fall 2020 meeting is $30,000 for the Clear Roads meeting and $60,000 for the peer exchange.

Discussion item: Can anyone provide a Clear Roads update the AASHTO Maintenance Committee meeting this summer?
- Cliff Spoonemore will be attending the meeting and will provide the update.

Wednesday, April 22, 2020

Selection of FY 2020 Research Projects

Based on the rankings received, the TAC approved the following nine projects, including six projects for RFP, a second phase to a current project, one CTC effort, and one Clear Roads initiative. The total funding is estimated at $890,000. TAC members volunteered to serve on subcommittees. The names underlined below will serve as co-chairs for the subcommittees. A '*' denotes that a subcommittee member is a non-voting member.

CR 20-1: Entry-level Commercial Driver's Training
- Subcommittee members: Scott Lucas, Jeremy McGuffey, Clay Adams, Kevin Duby, Joe Bucci, Steve Spoor, Marv Hayes* and Brian Barott* (both MnDOT members added post-meeting)
- Duration and Funding: 12 months and $200,000

CR 20-2: Understanding the NaCl Phase Diagram
- Subcommittee members: Brian Burne, Doug McBroom, James Morin, Rhett Arnell, Dan Varilek, John DeCastro, and Tom Peters
- Duration and Funding: 12 months and $100,000

CR 20-3: Indoor Automated Stockpile Measurement
- Subcommittee members: James Morin, James Stevenson, Todd Miller, Rhett Arnell, Scott Lucas, Jeremy McGuffey, Emil Juni, Alastair Probert, and Tom Peters
- Duration and Funding: 18 months and $200,000

CR 20-4: Expanded Use of AVL/GPS Technology Study
- Subcommittee members: David Gray, Steve Spoor, John DeCastro, Melissa Longworth, Jeremy McGuffey, Kevin Hensley, John Oliva, and Tom Peters
- Duration and Funding: 12 months and $75,000

CR 20-5: Using GIS to Highlight Highway Segments Sensitive to Chloride-based Deicers
(Original title: Environmental Prioritization of Highway Segments Relative to Snow and Ice Operations Using Standard GIS Layers)
- Subcommittee members: Joe Thompson, Mark Goldstein, Patti Caswell, Rhett Arnell, Jon Fleming, Brian Burne, Jamie Yount and Tom Peters
- Duration and Funding: 12 months and $100,000

CR 20-6: Salt Shed Design Template

- Subcommittee members: James Morin, Cliff Spoonemore, Dan Varilek, Craig Bargfrede, Todd Miller, Joe Bucci, Ty Barger, Alastair Probert, and Tom Peters
- Duration and Funding: 12 months and $75,000

CR 20-7: AWSSI Enhancements, Phase 2

- Subcommittee members: Brian Burne, Todd Law, Joe Thompson, Cliff Spoonemore, Jon Fleming, Larry Gangl, and Tom Peters
- Duration and Funding: 12 months and $40,000

Winter Maintenance Product Proficiency Sample Program

- Subcommittee members: Jasmine Dondlinger*, Doug McBroom, Dan Varilek, Patti Caswell, Scott Lucas, Jamie Yount, and Tom Peters
- Duration and Funding: 12 months and $25,000

Snow and Ice Equipment Online Database

- Subcommittee members: Jeff Pifer, Brian Burne, Clay Adams, Steve Spoor, Rhett Arnell, Melissa Longworth, and Tom Peters
- Duration and Funding: 12 months and $75,000
- The TAC approved the following synthesis project, by a "yes/no" vote, to be completed by CTC & Associates. The subcommittees will work with CTC to scope and complete the projects.

Review Role of Project Champion and Subcommittee Members, Next Steps and Subcommittee Selection

Per James Morin, it is ideal to have two co-champions, as well as five to seven subcommittee members that are highly interested and fully engaged in the project. If a TAC member rotates off Clear Roads, his or her replacement should fill the exiting member's role on the project subcommittee. Champions and subcommittee members are also responsible to complete project closeout forms and Research Use surveys. Each subcommittee should identify a dissemination plan and a budget for it.

Next Steps in the Project Development Process

Greg Waidley reviewed the next steps involved in developing the RFPs, including project scoping; posting RFPs; receiving, reviewing, and voting on the proposals submitted; and awarding the projects. Scoping meetings will be scheduled in May for each project. Scopes will be submitted to MnDOT to turn into RFPs. The RPFs will be posted on both the MnDOT and Clear Roads website. CTC will notify the Clear Roads distribution list when the RFPs are posted.

Research In-Progress Project Updates

For each active project, the TAC reviewed subcommittee members and assigned new members, if needed. Non-TAC members will be kept on the list and identified by an asterisk. They will receive project communications at their DOT emails, as appropriate. A '*' denotes that a subcommittee member is a non-voting member.

17-01: Integrating Advanced Technologies into Winter Operations Decisions

- **Contractor:** SRF Consulting Group
- **Subcommittee Members:** Jon Fleming, Scott Simons, Todd Law, John DeCastro, Melissa Longworth, Tom Peters

- **End Date:** June 2020
- **Status:** This project is in the home stretch. The follow up interviews are complete, and SRF is putting together the final deliverables. Greg Waidley reached out to SRF to ask if they will meet the June 2020 deadline. They will probably need an extension to November or December 2020. SRF is working on the NCTE request.

17-02: Standard Specifications for Plow Blades with Carbide Inserts

- **Contractor:** SRF Consulting Group
- **Subcommittee Members:** Cliff Spoonemore, Brian Burne, Clay Adams, Dan Varilek, Rhett Arnell, Tom Peters
- **End Date:** April 2020
- **Status:** The closeout webinar was held in March and the final report will be delivered in April 2020. The specifications have been approved and the hope is that the states incorporate them in some form in their next bid. SRF provided the specifications from each state and compared them in various categories. This will bring standardization to the industry.
- **Discussion:**
  - Steve Spoor is on the National Association of State Procurement Officers committee for the national carbide contract. He will provide the project results to the committee so they can use them when they start rebidding the next contract. The contract renewal is in 2021. The hope is that standardization will result in a price break and quicker supply times. The manufacturer will not have to build 15 different blades and will know their blade inventory will sell.
  - Is there a way to confirm the specifications that SRF developed are being met by the manufacturer? How will the subcommittee follow up on this? A certification can be provided on the finished carbide insert but there is no way to know if a certified piece is in a purchased blade. The winter maintenance folks use the blades purchased and aren't concerned if they are certified. They assume if the specifications have been developed, then the blade will work properly. The bigger piece of the project is the specifications on how the blades are constructed.
  - Greg Waidley – Subcommittee members should review the final report for approval this week as the project ends 4/30/20.

17-03: Aftermarket Cameras in Winter Maintenance Vehicles

- **Contractor:** SRF Consulting Group
- **Subcommittee Members:** Todd Miller, Dan Varilek, Alastair Probert, Craig Bargfrede, Tom Peters, Kevin Hensley*
- **End Date:** June 2020
- **Status:** This project is switching to the phase where MN will use the cameras in a year-long pilot project to determine how well the cameras function. They will note any issues that arise. Todd Miller will send information to the TAC about the pilot project. Because of this pilot project, a no-cost time extension amendment will be processed.

18-01: Defensive Driving for Snowplow Operators

- **Contractor:** Virginia Tech
- **Subcommittee Members:** Doug McBroom, Clay Adams, James Stevenson, Brian Burne, Steve Spoor, Larry Gangl, Tom Peters, Marv Hayes*
- **End Date:** August 2020

- **Status:** This project is almost finished. Virginia Tech has sent the project presentations and an accompanying videos to Doug McBroom. The videos demonstrates the five major crash types and the associated defensive driving maneuvers. The subcommittee is currently reviewing the project materials. This is a good project and Clear Roads is getting what they wanted out of it.
- **Discussion:**
  - Greg Waidley – Subcommittee reviews are due by 4/24/20.

18-02: High Performance Blade Evaluation

- **Contractor:** University of Akron
- **Subcommittee Members:** Craig Bargfrede, James Morin, Joe Bucci, Scott Lucas, Melissa Longworth, John DeCastro, David Gray, Tom Peters
- **End Date:** July 2020
- **Status:** This project had a lot of interest from DOTs and cities to participate in the testing. Some have dropped out for various reasons, including budget and the ability to capture accurate measurements on the blades they want to test. Only one or two organizations completed testing last winter, which was not enough to provide good data for analysis. The University of Akron is pivoting and developing a testing protocol so organizations can do their own testing.
- **Discussion:**
  - Greg Waidley – This project will be extended to July 2021. He is currently working with the PIs on the no-cost time extension amendment.

18-03: Evaluation of Storm Severity Index and Winter Severity Index Variables

- **Contractor:** The Narwhal Group
- **Subcommittee Members:** Todd Miller, James Morin, Jeremy McGuffey, James Stevenson, Todd Law, David Gray, Mark Goldstein, Tom Peters
- **End Date:** October 2020
- **Status:** This project is a deeper dive into the SSI/WSI variables and is interesting study on what everyone is doing. It brought in a lot of SSI and WSI indexes from various states and with different methodologies. The Narwhal Group has determined the indices available and the variables associated with them.

18-04: Review and Summary of Pre-wet Methods and Procedures

- **Contractor:** Washington State University
- **Subcommittee Members:** James Morin, Patti Caswell, Todd Law, Alastair Probert, Cliff Spoonemore, Doug McBroom, Mark Goldstein, Tom Peters
- **End Date:** December 2020
- **Status:** This project had challenges from the beginning. The main researcher left the project and there was a gap for some time while the Washington State University figured out who would do the work. This has been solved and the project is moving forward. The initial survey came out 3/26/20 and members should look at it. The survey is a bit lengthy and the researchers may have to reach out to fleet folks to get the information they need.
- **Discussion:**
  - The project is behind on the tasks, but Washington State University feels they can get back on track.

18-05: Alternative Methods for Deicing

- **Contractor:** Montana State University
- **Subcommittee Members:** Joe Bucci, James Morin, Jon Fleming, John DeCastro, Patti Caswell, Joe Thompson, Tom Peters, Rick Nelson*, Kai Rune Lysbakken*
- **End Date:** July 2020
- **Status:** This project looked at determining other options for deicing (mechanical, technology, timings, etc.) to reduce the amount of chemicals put down on the roads. Is there a better mousetrap? The draft final report is comprehensive and is not one size fits all. Winter maintenance folks can take pieces of it and apply it to their states/jurisdictions. There is nothing new in the report, but the refinements and case studies are interesting.

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

- **Contractor:** Washington State University
- **Subcommittee Members:** Ty Barger, Jeff Pifer, Doug McBroom, Patti Caswell, James Morin, Scott Lucas, Jeremy McGuffey, Tom Peters, Rick Nelson*
- **End Date:** July 2021
- **Status:** The kickoff meeting was held in February 2020. The subcommittee steered Washington State University away from alternative mechanisms in the interest of time and budget. They also tabled the work on granular products for now, to focus the project on liquid deicers. The labs who will conduct the testing have been identified. NE furnished the original data developed in the test procedures. The testing is scheduled to be finished by the end of July 2020 and the draft final report will be available in October 2020.
- **Discussion:**
    - Greg Waidley – Due to COVID-19 restrictions, Washington State University is probably still acquiring materials and testing has been slowed down because there are no personnel working at the labs. The hope is the testing will be completed this summer.

18-S1: Mechanic/Operating Training and Training Needs for Winter Maintenance Equipment

- **Contractor:** CTC & Associates
- **Subcommittee Members:** Larry Gangl, Brad Darr*, Jeff Pifer, Alastair Probert, Kyle Lester, Steve Spoor, Brad Burge, Chris Volkert* (CO), Tim Cunningham* (KS; AASHTO's EMTSP Panel)
- **End Date:** Ongoing
- **Status:** This project has been in the works for a while and was changed from a research project to a synthesis project. CTC & Associates has pulled out all the information they can find on states'/vendors' mechanics training that is available. The project is close to the end.

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

- **Contractor:** University of Wisconsin-Madison
- **Subcommittee Members:** Jim Hughes, Allan Johnson, David Gray, Ty Barger, Doug McBroom, John DeCastro, James Stevenson, Scott Lucas, Jeff Pifer, Tom Peters, Rick Nelson*, Kathleen Schaefer*
- **End Date:** n/a
- **Status:** This project is not yet under contract. The University of Wisconsin-Madison is working on the contract language. The project has time since the data collection can only be done in the winter. They are planning on collection taking place in the winter of 2020/2021. The Traffic Operations and Safety Laboratory (TOPS lab) will collect data from a variety of routes. They want a study route and a

control route in the same location, as much as possible. For instance, the southbound lane would be a control route using salt and the northbound lane would be a study route using liquid.

- **Discussion:**
  - In Wisconsin, it's the counties who do the winter maintenance. Need commitment to submitting their data. Ten counties committed to providing data last winter but only three provided useful data.
  - The project needs a commitment from the participating states so that we get good data and a lot of it. Data needs to be provided for every winter storm. It's critical that each DOT providing data has data champions at the district levels who can acquire, and will provide, the data. The researchers will communicate with those champions and the champions need to be in control of the data so they can provide it to the researchers. It would be beneficial if the researchers could communicate with the data champions to explain the commitment level required.
  - An effort should be made to minimize the amount / complexity of data collected by the field surveys.

19-02: Recruitment and Retention of Hwy Maintenance Workers

- **Contractor:** Western Transportation Institute, Montana State University
- **Subcommittee Members:** Cliff Spoonemore, Brian Burne, David Gray, Joe Bucci, Scott Lucas, Jeremy McGuffey, Tom Peters, Rick Shomion*
- **End Date:** January 2021
- **Status:** The Western Transportation Institute has requested an extension for this project due to a discrepancy with the start date and COVID-19.

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, Melissa Longworth, Jeff Pifer, Tom Peters, Kohl Skalin*
- **End Date:** July 2021
- **Status:** This project kickoff meeting has been held. UC-Davis has provided a literature review.

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, Melissa Longworth, Jamie Yount, Tom Peters, Jakin Koll*, Kevin Hensley*
- **End Date:** April 2021
- **Status:** This project will use a survey and interviews to capture technical requirements and provide guidance for decisions and specifications for states when developing RFPs. It will also look at lessons learned. The project kickoff meeting has been held. The University of Vermont is a bit behind on their literature review.

19-S1: Inventory and Use of Salt Spreading Systems

- **Contractor:** CTC & Associates
- **Subcommittee Members:** Jon Fleming, Patti Caswell, James Morin, and Tom Peters
- **End Date:** Ongoing

- **Status:** This project is more complicated than the normal synthesis project. The project survey has been drafted in Survey Monkey. CTC & Associates is figuring out how to present the survey, so it is as user friendly as possible. They hope to have the survey out before summer.

19-S2: Resources, Practices and Needs for Weather Forecasting to Facilitate Winter Road Maintenance

- **Contractor:** CTC & Associates
- **Subcommittee Members:** Jeremy McGuffey, Scott Lucas, Joe Bucci, Jon Fleming, and Tom Peters
- **End Date:** Ongoing
- Status: To this point, there are a couple of draft surveys on SurveyMonkey. There is a need to break down the survey questions into two parts. The two parts are -- 1) to be directed to the central office staff, and 2) to field staff. There was also discussion about how to get the field staff survey in the hands of the appropriate staff.

Clear Roads Qualified Products List

- **Contractor:** CTC & Associates
- **Subcommittee Members:** Patti Caswell, Doug McBroom, Steve Spoor, James Morin, Jasmine Dondlinger*, David Gray, Tyler Weldon*, Tom Peters
- **End Date:** Ongoing
- **Status:** They subcommittee has been working on several aspects of the QPL.
    - Product Sample Checklist - This is currently a fillable PDF form. When a vendor completes the form, it generates an email that goes to Greg Waidley and Patti Caswell. There have been a couple of glitches with this, but it works, even if a vendor must download the form first. CTC is working on creating a fillable online form on the Clear Roads website, which will…
        ~ Not allow the vendor to submit the form unless all information is provided for the category. Patti is not sure this will work. She needs to address this.
        ~ Automatically populate a database. The vendor then attaches their analytical results as backup documentation. Patti is training the submitters to input all information at one time to make it easier on the administrative side.
    - QPL Submittal Process Flowchart (will be included in the Specifications document) – This is to show vendors how much time it takes to complete the online form. Once the paperwork is submitted, then Patti lets the vendor know if we have the data (two weeks) and then if they have passed the specification (additional two weeks). Then the vendor is notified about how to submit their materials for pass/fail testing (four-eight weeks). The time estimates are conservative.
    - Tom Peters - The contract to cover lab testing is being worked on by MnDOT's research and maintenance folks. It's taking a little longer since some work was already done prior to the contract being executed.
- **Discussion:**
    - Jasmine Dondlinger – Grade one and grade two are listed in the Chemical Product Specifications and Test Protocols document. Grade one refers to west of the Rockies. To allow other suppliers to compete, she suggests adding a category on gradation. Patti Caswell – The subcommittee will investigate adding a category or chart that specifies east or west of the Rockies.

Annual Survey of State Winter Maintenance Data - Use of data and timing of survey results.

- Greg Waidley – The previous survey results were posted in January or February, which is later than normal. CTC & Associates will send out the next survey in June and are planning to wrap up the

responses by the end of the summer, prior to the Fall meeting. The results, and an interactive map, would be updated by October. Does this timeline work for the TAC?

- After discussion, the following timeline was agreed to by the TAC:
  - Send survey by 7/1/20 with a two-week deadline. Up to a two-week extension will be provided if folks are not submitting their surveys. The map and information will be posted by 10/1/20.

Dissemination/Implementation - Follow up from Fall 2019 discussion

The TAC continued a discussion that began at the last Clear Roads in-person TAC meeting. James Morin proposed that Clear Roads would set aside $5,000 to be spent on dissemination activities for each new 2020 project. They do not have to spend all the funds. If a subcommittee needs additional dissemination funds, they will make a request to the full TAC. The subcommittee could reach out to the PI for a dissemination proposal and the funds could go to the PI if the subcommittee approves. This new approach could be tested during a research cycle to see how it works. Further questions/suggestions from the members:

- Several of the members utilize LTAP and/or APWA to disseminate project results. Could an LTAP person be added to the Clear Roads TAC? Tom Peters made a presentation on Clear Roads training projects at the national LTAP meeting last year. They were open to receiving practical information from Clear Roads, which they would share with their chapters. It would then be up to the chapters to further disseminate the information to their members.
- Can project results also be disseminated to cities, counties, and municipalities?
- Greg Waidley will put the project closeout webinar presentation slide decks on them members only site so folks can use them at their agencies.
- Consider adding a dissemination section on the research project proposal form to get folks thinking about how the project results could be shared from the beginning of the project. For example, if the subcommittee feels an article on the project would be good, then add it to the project scope.
- Greg Waidley – CTC & Associates could create a list of various organizations and publications that subcommittee could consider, at the beginning of the project, sharing project results with.
- Could Clear Roads have a session at the TRB Annual Meeting?
- Can Clear Roads consider hiring a marketing company to conduct a separate marketing project?
- Clear Roads used to have an implementation subcommittee. Should the TAC consider revising the subcommittee, which would address broader issues at the program level (such as a list of organizations/publications for dissemination)? The project subcommittees would still plan the dissemination activities for their projects. The implementation subcommittee would be like the QPL list where a certain amount of funds would be set aside. It's easier to have money in a different pot to use for dissemination activities.
  - Implementation subcommittee members – James Morin, Patti Caswell, Jamie Yount, Emil Juni, Scott Lucas and Jeremy McGuffey.
  - This group will work with Greg Waidley on the suggestions listed above.

Motion (James Moring) – Authorize each subcommittee, for current and approved projects, a $5,000 budget for dissemination and implementation activities. This would be on a trial basis so if it does not work then it will not continue.

- Discussion:
  - Cliff Spoonemore – There are nine new projects and 10-20 active projects. Does the TAC want to allocate $100,000 from the research budget?
    - James Morin – The money would be well spent, and it gets the Clear Roads research results to appoint where they get implemented.

    - ~ Scott Lucas – Each subcommittee does not have to spend the dissemination funds.
    - ~ Greg Waidley – The pooled fund has $1.273M for research and just approved $890,000. If the TAC approves the $100,000, there is still $200,000 to spend.
  - Clay Adams – He has not done a good job of implementing the Clear Roads projects within his agency. He would like examples from members that have implemented them to see their successful results.
- Motion Passed.

Not enough Clear Roads members in attendance. Greg Waidley will poll eleven other members after the meeting and record their votes.

Future Meetings - Confirm dates of spring 2021

Spring 2021 Meeting

This current meeting was supposed to be in Madison, WI. MN has a contract the Sheraton Hotel for this meeting, which will now be held over for one year. Potential dates for the Spring meeting in 2021.

- Week of April 5th (6-8th) or week of April 12th (13-15th) 2021.

Motion (James Morin) – Hold the Spring 2021 meeting the week of April 12th. Motion passed.

- Greg Waidley will inform the MN folks so they can work with the Sheraton.

Fall 2021 Meeting

The TAC is considering Salt Lake City or Park City, UT with Boise, ID as the backup location.

- Rhett Arnell is fine with hosting the meeting in UT, at the end of September.
- UT options – Salt Lake City or Park City. The TAC wants to consider Park City first. Rhett Arnell will send Greg Waidley and Kirsten Seeber suggestions for hotels and restaurants. Greg Waidley would like to get the Request for Bids out to the hotels a year in advance of the meeting.
  - ~ The backup location will be Boise, ID.

Fall 2020 Maintenance Peer Exchange

- Rick Nelson does not know if there will be a peer exchange, especially since many states are eliminating travel due to COVID-19. Rick Nelson and James Bryant have a meeting on 4/30/20 and will have more guidance on which way to go after the meeting.
- The Aurora pooled fund study (led by IA DOT) has questions on whether a peer exchange fits within the FHWA funding guidelines. The IA research person feels the peer exchange portion of a pooled fund TAC meeting could not be covered by study funds. This issue will be discussed at the 4/30/20 meeting.
- The state showcase reports (webinars) are popular and they will continue to have those.