



MINUTES

Clear Roads 2006 Kickoff Meeting:

Pooled Fund Project #TPF-5(092) - Test and Evaluation of Materials, Equipment and Methods for Winter Highway Maintenance

Wednesday and Thursday, February 20 and 21, 2006
Holiday Inn Select Minneapolis/St. Paul, Beacon Conference Room

Attendees:

Tom Martinelli, Wisconsin DOT	Dennis Belter, Indiana DOT
Dennis Burkheimer, Iowa DOT	Tim Jackson, Missouri DOT
Linda Taylor, Minnesota DOT	Tim Croze, Michigan DOT
Diana Evans, Ohio DOT	Lee Smithson, AASHTO
Bob Blackburn, Blackburn & Associates	Ed Fleege, Blackburn & Associates
Duane Amsler, Blackburn & Associates	Kim Linsenmayer, CTC & Associates
Pat Casey, CTC & Associates	Andrea Thomas, CTC & Associates (by phone)
Dylan Casey, CTC & Associates (by phone)	

Materials Distributed:

Agenda	CTRE update document: Improving Snow Plow Design:
Blackburn study update PowerPoint presentation	Highway Maintenance Concept Vehicle Phase V
Blackburn Fax Cover and call report form	Problem statements and summary sheet
Blackburn Results from Snow Belt States Survey	Problem statement preliminary ranking sheet
Blackburn document on calibration variables	List of 2005 problem statements
CTC study update outline	List of TRB 2006 Winter Maintenance Papers
CTC timeline of progress	Clear Roads budget
CTC draft phone survey report	Summary of potential publications for Clear Roads
CTC draft anti-icing/anti-fogging surveys	articles
CTC draft survey distribution lists	CTC e-newsletter examples
CTC draft e-mail survey announcement	
CTC flyer for survey project	

Meeting Objectives

The group met to review and select research problems statements for 2006, hear updates on the status of three Clear Roads research projects, and discuss administrative and marketing plans for the pooled fund for the coming year.

Calibration Accuracy of Manual and Ground-Speed-Controlled Salters

Blackburn and Associates gave a presentation of their progress on this study since it began in October. Specifically, they reviewed the results of their literature search and survey and their plans for yard testing. Below are a few highlights from this presentation:

- Maine conducted a similar study when they were transitioning from manual to ground speed controllers. They discovered the challenge of weighing the truck before and after as a means of determining salt usage—1200 pounds of slush could come back on the truck.
- Most states are using ground speed controllers. Most don't know the appropriate amount of liquid to use.
- Most of the controllers in use are closed-loop systems, which have sensors for both the speed and the belt to allow for a ratio comparison. Local agencies tend to use manual controllers.
- They've obtained calibration procedures and manuals and have begun evaluating the procedures.

- The team contacted vendors, explained the study and got vendor support for the yard and field tests.
- There are plenty of variables to consider when calibrating spreaders with regard to product delivery and consistency, the truck's hydraulic system, etc. The team identified control measures to use in testing the spreaders that would address these variables.

Blackburn and Associates also raised some questions for the TAC, some of which would need to be addressed further after the meeting.

- What role should manual controllers have in the study? Where should they be tested?
Manual controllers will primarily be used for gathering field data. Blackburn and Associates indicated that they would run a truck with a manual controller right behind a truck a truck with a ground speed controller on the same route during a storm event to gather data for comparison. Dennis Belter said he would try to find a location in Indiana that has one of each kind of controller in the same place. Tom Martinelli will look into options for testing in Wisconsin. Tim Jackson said that Missouri is phasing out manual controllers but would look into potential locations as well.
- How does the TAC want to address the following issues: highway community's varying interest in calibration, variability of add-on pumps, range of liquid prewetting rate?
The group was not able to address these issues fully at the meeting. Next steps will be finalized through e-mail exchanges in the days after the meeting.

Next steps:

- The TAC needs to provide locations and contact people to schedule the yard and field tests for ground speed controllers.
- Blackburn's team will finalize the calibration protocol and testing procedures to be used in the yard and field testing portion of the study.

>Action Items

Blackburn and Associates: Send the TAC a description of what information exactly is needed from each state to prepare for the yard testing.

TAC Members: Look into options for testing manual controllers along with ground speed controllers in your states.

Synthesis of Best Practices for Eliminating Fogging and Icing on Winter Maintenance Vehicles

CTC & Associates gave a presentation on the progress of this study since it began in September. The team had completed a literature search, which was reviewed by the TAC in the fall, conducted a phone survey to gather information about the problem and potential solutions, drafted two surveys for more detailed information gathering, and drafted survey distribution lists.

Below is a summary of the discussion that took place:

- Dennis Burkheimer pointed out the need to look at proposed solutions from a safety perspective. For example, if the double pane window in use in South Dakota doesn't meet the truck safety standards, then it should not be recommended for use in the final report.
- There was concern that the distribution lists didn't include all of the leaders in the field who have hands on experience with the fogging and icing problems and the solutions to address them. CTC should include individuals with titles like Shop Foreman, Equipment Manager, and Fleet Manager in the list. The TAC members agreed to help provide the names of these individuals in their states.
- The distribution list for manufacturers was pretty short and didn't include all of the truck manufacturers the states work with. CTC indicated that is difficult to get beyond the sales front line in these companies. The TAC agreed to provide the contact names that they have with these manufacturers (International, Sterling, GMC, Ford).
- The group discussed breaking the agency/contractor survey into two parts, one intended for those who work closely with the plow drivers and one for those responsible for purchasing decisions. This would help shorten the survey and tailor it to the different audiences.
- CTC asked the TAC if a paper version of the survey would be necessary. The TAC indicated that some respondents would not be very comfortable working and typing on a computer and may be less likely to participate as a result.
- Linda Taylor suggested that a test run of the survey would be a good idea to make sure the survey isn't confusing or frustrating to the respondents.

>Action Items

TAC Members: Review the draft distribution lists and edit the names listed under their states. Send CTC the names and e-mails of field and equipment managers responsible for plowing and truck manufacturers they work with so that they can be added to the lists.

CTC & Associates: Revise the main survey to make it shorter and to have two sections for the different audiences. Revise the distribution lists based on TAC feedback.

Snow Plow Design Update

Dennis Burkheimer invited questions on the CTRE report provided before the meeting that documents CTRE's proposed tasks for the snow plow design work.

- A charrette will be held in late spring to discuss in detail which snow plow prototypes should be tested and why. Dennis Burkheimer requested that all TAC members provide at least one name from their state as a potential participant in the charrette.
- Iowa has the resources to build at least one design resulting from the charrette. Missouri has the ability to build a prototype and Indiana has a shop as well. Someone is needed to build and test the prototype under CTRE's guidance.
- This project is viewed as a continuation from the original Maintenance Concept Vehicle pooled fund SPR3-060. The need for an updated snow plow design was originally identified in the 1996 focus group discussions for the project. The original pooled fund was started by the state DOTs in Iowa, Minnesota and Michigan. Later Wisconsin and Pennsylvania joined the effort. Project administration will remain the same as the previous work with Iowa receiving and making payment of invoices.

>Action Items

TAC Members: Send Dennis Burkheimer names of potential participants for the charrette.

NCHRP Carbide Blade Proposal

The TAC discussed the status of the proposals submitted by Clear Roads (through Wisconsin) on developing a standardized method of measuring wear on carbide inserts. There wasn't enough interest in the project to get funding, but there is still a need for the project. Iowa goes through 1500 blades per year, and costs will continue to increase. Lee Smithson pointed out that this process has only illuminated the need for Clear Roads.

Iowa has done some grind testing and ICE blades had poor performance. However, Michigan tested the blades with snow and the ICE ones performed better.

Lee Smithson suggested taking an experienced underbody operator out, measuring the down pressure, recording it and running a test to determine typical down pressure amount. Then do a test in which you drag the blade at that pressure to test its performance. If you can normalize the down pressure for testing, then manufacturers would be interested in using a standard test.

Dennis Burkheimer said that there would be about \$35,000 left in the Concept Vehicle funds after the snow plow work, which could be enough for a small phase one study on carbide blades. Dennis agreed to talk with CTRE about to see what they could do for this amount.

>Action Items

Dennis Burkheimer: Talk to CTRE to find out how much work related to carbide testing could be done with the remaining \$35,000.

Problem Statements

Nine projects were formerly submitted for consideration. TAC members provided an overview of each of their proposed projects, and the group discussed any questions and concerns related to them. Each project is summarized in the problem statements submitted by the members. Below are some of the discussion points that arose for each project.

Tim Croze - Michigan

Tim said to throw out his proposal on Field Testing of Carbide Inserts on Underbody Plows and combine the goals with the discussion planned with CTRE for evaluating carbide blades.

Dennis Belter - Indiana

Agricultural Products vs. Salt Brine, Magnesium Chloride, and Calcium Chlorides for Anti-Icing and De-Icing

- Similar to MnDOT proposal on effectiveness of deicing
- New products come out regularly but we don't know if they're as effective as the makers claim. Do they decrease corrosiveness? What's the environmental impact? How much vehicle corrosion results? The products are very expensive. You can combine them with other products to lower cost, but it's just an unverified claim. Dennis wants multiple stage comparison, not just lab test, especially on corrosiveness. Part of the challenge is that vendors blend products differently every year.
- Some research already underway: Wilfred Nixon's is currently doing this research—undercutting, corrosion, etc. Lab set up and products from around the country. Supposed to be done two years ago—now due to be done 1/07. Also, [NCHRP 6-16](#) is almost done—selection of snow and ice materials based on their environmental impacts. This study will give acceptable test protocol to vendors, but it doesn't include corrosion or agricultural-based products.
- Lee Smithson asked if it might make sense to have a pooled fund project on this topic, mainly focused on corrosion.
- Dennis Burkheimer suggested that a literature search on the performance and effects of agricultural products versus other products could be a phase one project.
- Linda Taylor said that Minnesota prescreens ag products for safety and environmental impacts in a lab, and insists on field testing the product for one year before using it. Dennis Burkheimer said that Iowa also has screening process. This may be the way to go. Linda said that a problem with this is that you need a facility for storage, cooperation on testing, etc. to follow through.

Automated snow route design

- The Casper system developed in the late 90s in Indiana was helpful but very labor intensive and difficult to use. In Minnesota, a similar system using Arcview was tried that was also too labor intensive. The program was beyond the capabilities of their maintenance people to use, and wasn't dynamic enough for the constantly changing conditions.
- A Midwest Transportation Consortium study looked at where to place your maintenance buildings, salt sheds, etc. for optimum efficiency.
- You need to be able to throw in all routes in an area and parameters (miles, deadhead, etc.) and figure out best routes. Also need to be able to adjust for a varying number of plows.

Linda Taylor - Minnesota

Effectiveness of Deicing Materials and Procedures

- Linda wants to take a real-world look at tying application rates to conditions. There's a location in Minnesota that would be ideal for the testing. We could provide batches of chemicals and look at different rates, lowering them each time to determine an effective range.
- This study is different than the one Dennis Belter is proposing because it's not focused on agricultural products. However, you could still use the same test environment.

Ergonomics for Plow Driving

- This is a big issue for operators but not for management.
- Focus on how best to reduce stress to them in their environment.
- Linda said that vendors are coming with new seats and controls, but they're more complicated and harder to use.

Dennis Burkheimer - Iowa

Contour adjusting wing

- Goal is an automated way for a plow wing to adjust to the contour of the shoulder, like combines will according to the contours of the field.
- Dennis says he's looking for something that responds to environment, not just a hydraulic wing that would give you the option of going up and down.

National Snow and Ice Conference

- Idea is to invite 2 representatives from each Snow Belt state DOT, one from the weather world and one from the maintenance world. Meet for 2-3 days for peer exchange of sorts—share ideas, methods, what works, doesn't work, etc.

- Presented idea to Aurora last summer, and they agreed to contribute \$25,000. Asking Clear Roads and Paul Pisano (FHWA) for \$25,000 each as well. Aurora and Clear Roads would have an opportunity to showcase their efforts as a part of the event. Some money would be needed to cover the administrative efforts for hotel and travel arrangements. The rest would cover travel.
- Great opportunity to bring together all parts of the country, not just regions.
- Tom Martinelli asked about piggybacking on another conference to take advantage of the travel arrangements in place and the vendors gathered. Possible meetings to piggyback on include the 2007 road weather workshop, the 2008 TRB 7th International Snow and Ice Symposium, the 2007 Eastern snow conference, which includes vendors and is only for one day.

Material Application Sensor

- Idea is to put a device on the back of a truck to assess the accuracy of the spreader
- Do a literature search, pick a few items and test them

Tom Martinelli

Development of Additional Lessons for AASHTO/SICOP Computer Based Training Program

- A recent meeting took place to discuss expanding the training. There was concern that it's getting too big and maybe should have separate CD ROMs for topics not related to anti-icing and RWIS.
- Lee Smithson said that he has the videotapes from Iowa on proper plowing techniques, which should be pretty easy to put into computer-based training. Some states have training academies for driving trucks. Need to take the best of the programs and give them to Steve for the training. Have a pretest to find out what driver knows.
- The computer-based training would still be valuable for those with training academies. You could do a pretest, customized training and then post test.
- Tom Martinelli said that he showed the training at a conference and did a survey to gauge interest. Most said they would be interested. But it will be a challenge to have a group sit down together to go through the lessons. It would get more use if you could jump around in lessons—pick and choose topics. Also, it's hard to convince people that all operators should go through the training. It may make the most sense for just the new people.
- Dennis Burkheimer noted that you can get better buy-in when you train in areas people are familiar with like plowing and snow fences rather than antiicing and RWIS.
- The TAC discussed whether or not an in kind contribution of expertise would be sufficient. Tom emphasized the need for making some sort of financial contribution.

TRB Update

Dennis Belter talked to the group about his experience at the 2006 TRB Annual Meeting. He attended meetings related to the Winter Maintenance Committee, Aurora, SAFETEA-LU, a new task force on surface transportation weather, performance measures, maintenance quality assurance, homeland security, pavement preservation, and more.

Kim Linsenmayer provided a listing of the papers on the 2006 TRB CD ROM that relate to winter maintenance, which CTC identified for the TAC.

Clear Roads Budget

Kim Linsenmayer provided an overview of the budget for Clear Roads, highlighting what funds are available for new projects this year. Below is a brief summary:

- \$525,000 has been committed to the pooled fund by seven states. Of this amount, \$375,000 will be available by September 2006.
- \$302, 867.52 expenses (administration, travel and research projects already under contract)
- Estimated available funds for research projects in 2006: \$375,000 - \$302,867.52 = \$72,132.48

Ranking the Proposals

Each TAC member gave the nine problem statements a score on a scale of 1 (no needed) to 5 (absolute need). Four projects emerged from this vote with strong overall support:

- Development of Additional Lessons for AASHTO/SICOP Computer Based Training Program
- National Snow and Ice Conference
- Determining the Effectiveness of Deicing Materials and Procedures
- Agricultural Products vs. Salt Brine, Magnesium Chloride and Calcium Chloride for Anti-icing and De-icing
- Field Testing of Carbide Inserts on Underbody Plows

The group discussed how to go about funding the most projects given how little money is available in 2006. Below is a summary of the steps the TAC decided to take:

- **Ergonomics Project:** The project on ergonomics for truck drivers received strong report from some of the group, but the cost is too high for this year. Dennis Burkheimer said that he would pass on the results of a recent Iowa survey of drivers about their equipment. In addition, Tom Martinelli requested that CTC & Associates complete a Transportation Synthesis Report on the topic in an effort to identify current practices and equipment in use that successfully address the problem.
- **National Snow & Ice Conference:** The TAC agreed to show support for the conference this year but would not commit funds until next year, since the conference wouldn't be able to happen this year anyhow. The group will plan for 2007. Dennis Burkheimer will get a planning group together to determine the focus of the meeting. Dennis Belter, Linda Taylor and Diana Evans agreed to help.
- **Concept Vehicle Funds:** The snow plow design work that CTRE is doing with the Concept Vehicle funds will use up all but about \$35,000 of the remaining money. Dennis Burkheimer made a motion that projects 3, 5, and 6 (Contour Adjusting Wing, Material Application Sensor, and Field Testing of Carbide Inserts on Underbody Plows) be added to the CTRE contract in some form. (For example, CTRE could perform literature searches, getting background down pressure data, looking into the new state of the art sensors and mounting them for observation, etc.) The sensors would be the priority for this additional CTRE work. Dennis Belter seconded the motion and all other members were in favor (although four of the five pooled fund member states represented in this vote comprise a majority, Lee Smithson volunteered to contact Pennsylvania to get their approval).
- **Agricultural Products:** The group will support this project by reviewing Wilfred Nixon's report when it is complete, reviewing the upcoming NCHRP 6-16 report, and supporting the new NCHRP proposal being put together by Don Walker. Testing of some agricultural products may be added in the future on to the testing of deicing materials in Minnesota, described below.
- **Effectiveness of Deicing Materials and Procedures:** The TAC agreed (motion by Dennis Burkheimer and second by Dennis Belter) to set aside \$50,000 for this research project this year. Linda Taylor will be the project champion and will draft the RFP. The TAC will review the draft in about a month.
- **Computer Based Training:** Dennis Burkheimer moved to have Clear Roads support the computer-based training with \$20,000 this year, if needed. Dennis Belter seconded the motion and all other members were in favor. Tom Martinelli will be the project champion and will draft a letter to Lee Smithson detailing this Clear Roads commitment.

>Action Items

Dennis Burkheimer: Send the report from the Iowa driver survey to the TAC.

CTC & Associates: Complete a Transportation Synthesis Report on Ergonomics for Plow Driving and post the results, along with the Iowa driver survey results, on the Clear Roads Web site. Notify the Snow and Ice Listserv of the document and track hits to the site in response to the posting.

Dennis Burkheimer: Put together planning team to determine focus of 2008 Snow and Ice Conference.

Dennis Belter, Linda Taylor and Diana Evans: Assist Dennis Burkheimer and others with planning for the 2008 Snow and Ice Conference.

Lee Smithson: Contact Pennsylvania DOT to obtain their concurrence on the proposed continuation of the Maintenance Vehicle Project.

CTC & Associates: Send a WisDOT RFP template to Linda for use in drafting the work sections of the deicing RFP.

Linda Taylor: Draft the RFP for the deicing project, describing the work to be completed and the expected deliverables by March 24th.

CTC & Associates: Work with the TAC to schedule a teleconference the week of March 27th or April 3rd to review the RFP on deicers.

Tom Martinelli: Send a letter to Lee Smithson on behalf of Clear Roads showing support of additional modules with \$20,000, if needed.

All TAC Members: Contact their winter maintenance training staff about getting their help with materials for the computer based training. Gather any manuals available to pass on for use in the training.

Diana Evans: Talk to the ODOT training academy about getting their help with materials for the computer based training.

Linda Taylor: Talk to the MnDOT training academy about getting their help with materials for the computer based training.

Tom Martinelli: Talk with Don Walker to see if the NCHRP problem statement on winter chemicals is still going to be submitted this year. Offer Clear Roads support and name for the problem statement.

Aurora Update

Dennis Belter provided a brief update of the activities of the Aurora group. This pooled fund currently has 13 U.S. members and 3 international members. Many of the states involved in Clear Roads are also involved in Aurora. For information on all Aurora projects and activities, visit their Web site at www.aurora-program.org.

Clear Roads Administration and Marketing

Kim Linsenmayer presented ideas to the TAC for where to put CTC efforts in promoting and administering Clear Roads in 2006.

- Kim can put together a mailing to DOT research program administrators and TAC member counterparts in other states to inform them of Clear Roads activities and push for new members. The TAC liked this idea.
- Kim showed the TAC examples of electronic newsletters that CTC had done that highlight recently completed research and recent efforts to apply research results in the field. Kim suggested that CTC put together an e-newsletter monthly for Clear Roads that is focused on winter maintenance. The newsletter would go out to TAC members and be posted on the Clear Roads Web site. Advertising the newsletter would hopefully draw more states to the site and encourage membership. The TAC supported this idea.
- Last fall, CTC put together a list of potential publications for Clear Roads articles. The TAC agreed to have CTC move forward in identifying submission deadlines and developing promotional Clear Roads pieces. CTC will also support the TAC in their ideas for articles.
- Kim suggested that it might be useful to the TAC to have their state research projects related to winter maintenance posted on the Clear Roads Web site for review and comparison. The TAC agreed that this would worthwhile to pursue in the future.

In addition, the group discussed other ways to market Clear Roads and emphasize the group's difference from SICOP and Aurora. Lee Smithson said that he would be talking with Marcia Brink at CTRE about developing a brochure that summarizes the goals and activities of all three pooled funds to help people understand the difference. It should cost less than \$10,000 to develop. SICOP and Aurora will contribute to the cost. Dennis Burkheimer offered to have the brochure printed at Iowa DOT as Clear Roads' contribution. Kim will help provide information about Clear Roads to Marcia

The TAC discussed how to recruit new members through the outreach of the TAC members. Tom Martinelli indicated that having a list of state research maintenance engineers in other states would help them know who best to approach. Kim agreed to put this together.

>Action Items

CTC & Associates: Develop monthly winter maintenance e-newsletter for Clear Roads and distribute.

CTC & Associates: Put together list of state maintenance engineers for the TAC.

CTC & Associates: Identify timing in other states for making pooled fund funding decisions. Put together mailing about Clear Roads to research administrators and maintenance engineers (with TAC involvement).

CTC & Associates: Write an article promoting Clear Roads and submit for publication.

CTC & Associates: Develop a PowerPoint presentation on Clear Roads for Dennis Belter to use at the Aurora meeting on May 9th.

Next Meeting

The next meeting will be a conference call in late March or early April to discuss the draft RFP. After that the group will meet in June, July, or August to review and score the proposals received. This meeting will take place in Madison. Kim will be contacting TAC members to determine their availability.

For questions about these minutes or anything else related to the administration of this pooled fund project, contact: Kim Linsenmayer, CTC & Associates LLC, kim.linsenmayer@ctcandassociates.com, 608-628-3806.